GEF

UNDP/GEF PROJECT ENTITLED "REDUCING ENVIRONMENTAL STRESS IN THE YELLOW SEA LARGE MARINE ECOSYSTEM"

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Third Meeting of the Regional Working Group for the Ecosystem Component
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National Data and Information Collection Activity - Final Reports

The activities to collect national ecosystem data and information from China and Republic of Korea was scheduled for implementation from October 2005 to March 2006. Progress reports and data collected-to-date were presented at the 2nd RWG-E Meeting (29 November–2 December 2005, Shanghai, China). Since then, the final and draft final reports and data have been submitted, and these data are being used for the regional synthesis and Transboundary Diagnostic Analysis (TDA).

The contractors for the national data collection activity were the First Institute of Oceanography - China and West Sea Fisheries Research Institute of Korea National Fisheries Research and Development Institute. One representative from each contracted institute will present the final results to the 3rd RWG-E Meeting. The reports attached hereafter, and the presentations given during Agenda 5.1.1 should highlight ecosystem status and trends of particular note, and include some summary analyses on the collected data and information.

After reviewing the reports and presentations, participants will discuss the information just presented, and suggest how certain notable data and information could be included in the regional synthesis and TDA.

It should be noted that due to various constraints existing in the participating countries regarding similarity of available data, the collected data may not be very comparable for a regional synthesis. This has largely affected the regional synthesis for better understanding of the Yellow Sea's overall health.

Following the presentation under Agenda 5.1.2, regional data and information synthesis, *members of the RWG-E will be invited to consider the existing constraints in the data and information collection, and make a proposal on how scientific understanding on Yellow Sea's health could be better enhanced.*

Final Report
for the Ecosystem Component of UNDP/GEF Yellow Sea Project

Prepared by: Korea Ecosystem Workgroup

May 2006

PROJECT TITLE: Reducing Environmental Stress in the Yellow Sea Large Marine Ecosystem
CONTRACT No.: E-I-05-rokdtainfo-2118
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PROJECT PERIOD: September 12, 2005 - March 31, 2006

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I. Activity 1: Meetings of the researchers involved in this Ecosystem Project

Meeting 1: Technical workshop on the data and information collection

We conducted a technical meeting on the data and information collection October 11-12, 2005 at NFRDI, Pusan. Fourteen persons participated in this meeting (below Table). Dr. Heo presented the outline of this project.

All the Sub Principal Investigators (PIs) agreed to collect as much as possible data and information for the project with the same format and input style, although there were still some difficulties to do so.

Participants for Technical meeting on the Data and Information Collection.

Name	Position	Organization
HEO Seung	Researcher	WSFRI
KANG Youngshil	Researcher	WSFRI
PARK Seungyun	Researcher	WSFRI
SON Jaekyoung	Researcher	WSFRI
PARK Junghyun	Researcher	WSFRI
PARK Kyungsoo	Researcher	WSFRI
KIM Hyungcheol	Researcher	WSFRI
YOON Sungjin	Researcher	WSFRI
YOON Sookkyung	Researcher	WSFRI
YOO Sinjae	Researcher	KORDI
NOH Jaehoon	Researcher	KORDI
HONG Jaesang	Professor	Inha University
YOON Geontak	Researcher	Inha University
YOO Jaewon	Researcher	Korea Insti. of Ecol.
JUNG Raehong	Researcher	NFRDI
IM Weolye	Researcher	NFRDI

II. Activity 2: Collecting Data and Information

According to the contract and project requirements, four categories of data and information should be collected: phytoplankton, zooplankton, benthos, harmful algal bloom.

2.1 Data Collection on Phytoplankton

Notable trends in serious phytoplankton studies for the YSLME region began in the 1930s by Chinese, Japanese and Korean scientists. Kokubo (1932) first reported a list of phytoplankton species list collected from the Yellow Sea, and Kurashige (1943) attempted quantitative analyses to find out the dominant species using the best available method of the time. Since then, many studies were carried out focusing on species composition and abundance.

However, serious studies focusing on phytoplankton of the Yellow Sea actually started in 1980s. The study areas were the Kyeonggi Bay, Kunsan waters concentrating on ecological investigations including distribution of phytoplankton and its relationship to environmental factors, and analyses of community structure. Although phytoplankton studies along the coastal zone were relatively active, studies beyond coastal waters were limited.

There were three occasions since 1980 for wide area phytoplankton studies of the Yellow Sea including the central part of the Yellow Sea (Table 1). Between 1983-1986, seasonal sampling surveys were conducted by KORDI (Korea Ocean Research and Development Institute) along the Korean coastal waters and central part of the Yellow Sea. Chang (1990) used these samples to provide observed species list and observed seasonal species numbers only. The study did not provide any seasonal and spatial information on species list. Also, the study listed only the average seasonal value for cell abundance and chlorophyll *a* concentration.

The Yellow Sea wide area studies including central, Korean coastal and Chinese coastal areas of the Yellow Sea were carried out by Inha University of Korea during September-October 1992 (Table 1, Fig. 1). From 54 sampling stations, phytoplankton species composition, abundance, dominant species, and chlorophyll a were analysed and physical parameters (temperature, salinity) and chemical (nitrate, phosphate, silicate) factors were also analyzed (Noh, 1995; The Yellow Sea Atlas 1998).

From the NFRDI (National Fisheries Research and Development Institute) activities, phytoplankton was a part of its survey line parameters in April, August, October of 1998 for the Yellow Sea. Phytoplankton abundance and dominant species were analyzed as well as physical and chemical factors.

Therefore, phytoplankton species composition related to phytoplankton data analyses for different water environment were processed mostly using Noh (1995) data. Chang (1990) data were added to total observed species list. Phytoplankton abundance and dominant species data were also processed mostly using Noh (1995) and Cho et al. (1998) data.

Primary production for the Yellow Sea wide area studies were carried out in September-October 1992 and April 1996 (Table 2). In 1997, NFRDI also carried out primary production studies five times as a part of their regular survey line studies in February, April, August, October, December, 1997 (Choi et al, 2002).

Son et al. (2005) also carried out spatio-temporal studies on surface primary production of the Yellow Sea combining in-situ and satellite data. The combined in-situ primary production data from the Yellow Sea by Choi et al. (1995) and Park (2000) with satellite data to produce synoptic maps of water-column integrated primary production in May and September which were derived using a primary production algorithm applied to ocean color satellite data from the Yellow Sea from 1998 to 2003.

2.2 Data Collection on Zooplankton

Serial zooplankton data were mainly collected in the Korean coastal and offshore areas of Yellow Sea from the NFRDI monitoring system from 1960's to 2000's. The other serial zooplankton data have been made from the Yellow Sea Environment Cooperative Research between Korea-China since 1997. Additionally, several zooplankton data were collected in limited areas during the limited period by universities and institutes. In particular, jellyfish data were very limited. The study on jellyfishes was started from 2004, so the information is very poor.

NFRDI has regularly carried out a serial oceanographic survey in the southeastern part of Yellow Sea (Table 3, Fig. 2) since 1965. Of oceanographic factors surveyed, zooplankton was collected 6 times (February, April, June, August, October and December) in a year with NORPAC net (mouth diameter: 0.45 cm, mesh size: 0.33mm). Zooplankton data are composed of biomass calculated with wet-weight and abundance of four major zooplankton groups: copepods, amphipods, chaetognaths and euphausiids (Table 4, 5). Unfortunately the data of zooplankton species were very limited because NFRDI only collected the data of biomass and abundance of four major groups.

Korean and Chinese scientists have conducted the Yellow Sea Environmental Cooperative Research in the Yellow Sea including the central area and coastal areas of both countries since 1997 (Fig. 3). Zooplankton data were collected once a year (October-November or December) and included the biomasses with wet weight, dry weight and ash-free weight, and abundance of zooplankton assemblages.

On the other hand, KORDI conducted seasonal sampling surveys along the Korean coastal area and central area of the Yellow during 1983-1986. Atlas of major zooplankton assemblages was provided from these surveys. In addition, Inha University of Korea carried out a survey in the Yellow Sea including central, Korean coastal and Chinese coastal areas during September-October 1992.

Additionally, many studies were carried out, focusing on species composition and abundance along the coastal area, such as Gunsan waters Kyeonggi Bay, the mid-eastern area and Asan Bay. These studies concentrated on ecological investigations including distribution of zooplankton and its relationship with environmental factors, and community structure, but didn't cover seasonal variations and the whole coastal area. Thus, the serial and regular data are very rare along coastal area and bays.

Although there were zooplankton data in the 1960s, zooplankton studies actually began in 1970's by Korean and Chinese scientists. Chen et al. (1974) first reported the Cyclopoida and Harpacticoida in the Yellow Sea. In Korea, Shim and Park (1982) studied the composition and the abundance distribution of zooplankton. But this study was conducted in April 1981, consequently there was no information on seasonal variations. Sim et al. (1988) reported on the distribution of zooplankton in the mid-eastern part of the Yellow Sea in May and December 1984. They also showed very limited zooplankton in seasonal variation. Jang and Kim (1998) described zooplankton distribution and environmental characteristics of the Yellow Sea in spring, 1996. As shown above, zooplankton data were very limited to area and period.

2.3 Data Collection on Benthos

The benthos data were collected from the KORDI from 1982 to 1985 and Inha University in 1992. These data involved species composition, benthic production and habitat modification. KORDI's data from 1982 to 1985 were published in an atlas. However, those of the macrozoobenthic data based on the Korea (Inha University) – China (Institute of Oceanology, Chinese Academy of Sciences in Qingdao) oceanographic cruise carried out in 1992 were summarised and are briefly presented here. Six transects were established in the central and southern Yellow Sea and a total of 49 stations was sampled between September 17 and October 2, 1992. The transects differed in length. Each was divided into six to ten stations (Fig. 4). Three grabs using a van Veen grab (surface area of 0.1 m^2) were taken at each station and surface sediment samples were collected simultaneously. Each biological sample was sieved on a screen (1.0-mm pore size), and macrobenthos were extracted. An analysis of particle sizes was carried out using the pipetting method (Folk, 1968). Grain-size parameters were calculated according to the equations of Folk & Ward (1957). Faunal samples were sorted, identified to species levels, if possible, and counted under a dissecting stereomicroscope. Diversity index was estimated by the Shannon-Wiener index (Shannon and Weaver, 1949). At the community level, the estimation of the benthic annual production was also made from mean annual biomass (B) and mean individual weight (W) of each benthic population by means of the empirical regression functions of P on B and W (Brey, 1990).

2.4 Data Collection on HABs

The harmful algal blooms (HABs) data in Korea were collected from the NFRDI monitoring system from 1984 to 2005. These data involved species composition, cell density, occurring areas, scale, damage to fisheries and habitat modification. The NFRDI, regional ministry of maritime affairs and fisheries (MOMAF) and national maritime police agency (NMPA) are carrying out HAB monitoring around Korean coastal waters at 77 stations monthly or daily (HAB period) by research vessels and at 92 stations weekly on shore watch and vessels, and at all coasts daily (HAB period) by Helicopter scanning from March to November to investigate the status of water quality and HAB since 1981 (Fig. 5). Furthermore, surface water temperature by NOAA, polar-orbiting weather satellites (these satellites are managed by national oceanic and atmospheric administration), and chlorophyll-a concentration by the sea-viewing wide field-of-view sensor (SeaWiFS), moderate resolution imaging spectroradiometer (MODIS) and the operations cost model (OCM) image are also studied to know the movement and horizontal distribution of HAB. Monitoring information is given to the fisherman and other user communities by facsimile, newspapers, automatic response system (ARS), internet, radio and TV broadcasting to mitigate the fisheries damages. NFRDI regularly carries out a serial oceanographic survey in the Korean coastal waters and offshore areas of the Yellow Sea. There were a total of 70 cases of HAB events that occurred in the Yellow Sea during 1984-2005 (Table 6). From 77 stations, HAB species composition, cell density, occurring areas, scale, damage to fisheries and habitat modification were analyzed (NFRDI, 2002-2005). The report of HABs data is made once in a year (January) and includes the temperature, species composition, cell density, occurring areas and scale.

III. Activity 3: Data analysis and review: Review data and information

We collected the data and information and data analysis and review carried out by the sub-PIs individually.

Meeting 2: Technical review meeting on the data and information collection and reports.

We conducted a technical meeting on the data and information collection and the findings were reported on November 15, 2005 at WSFRI, Incheon. Ffifteen persons participated in this meeting (Table 7).

Dr. Heo announced the present status of this project. The PIs of four parts introduced their data and information collected. The amount of collected data and information, source and format. The participants discussed the gaps and information of the collected data.

In addition, the participants discussed the Second Meeting of the Regional Working Group for the Ecosystem Component Shanghai, China, 29 November to 2 December 2005. As a result, the PIs of four parts will prepare the table which involve the source and format of the collected data and information. In addition, Dr. Heo, as a PI of this project, will attend this meeting and introduce the progress to the counterpart in China.

The Results of the Second Meeting of the Regional Working Group for the Ecosystem Component Shanghai, China, 29 November to 2 December 2005 are as follows:

- Mr. Zhang Xuelei presented the progress report for the data and information collection activity of China, focusing on the biological data.
- Mr. Heo Seung presented the progress report for Korea's data and information collection activity
- Members agreed that all sampling points with the associated data should be provided in the final report, as this would assist the completion of regional synthesis
- Participants agreed that the national reports should show, as much as possible, data of the variables as agreed during the 1st RWG-E Meeting. The reports should also include "status indices."
- Participants further agreed that at the end of February 2006, members should exchange their metadata, e.g. sampling gear used, or limitations of datasets. Only then, will the members decide on the most robust/practical indices to use, will finalise the table of indices, and present the final product according to the indices.
- The report of the Second Meeting of the Regional Working Group for the Ecosystem Component is in YSLME homepage (http://www.yslme.org/).

3.1 Review Data and Information on Phytoplankton

3.1.1 Species Composition of Phytoplankton

The Yellow Sea wide-area study carried out in September 1992 is the only study which examined respective species diversity observed for each station (Noh 1995). Chang's (1990) data listed total species diversity without differentiating for different stations or study period. Therefore, Noh (1995) data were used for assessing species composition for different water regions and distributional characteristics in the Yellow Sea.

Noh's (1995) data analyses showed that there were 273 species of phytoplankton in 54 different sampling stations in September 1992 (Table 15). Among them, diatom (bacillariophyceae) were the most diverse group of 67 genera and 183 species. There were 18 genera and 83 species of Dinoflagellates (dinophyceae), 2 genera and 3 species of cyanophyceae, 2 genera and 2 species of chrysophyceae, 1 genus and 1 species of chlorophyceae as well as 1 genus and 1 species of photosynthetic ciliate.

There were 23 to 126 species recorded (Table 9) for the sampling stations located along Transect A (Fig. 1) at 37 degrees north latitude. There were 126 species in shallower waters near the Korean coastal zone, whereas only low diversity of 23 species were observed in the central part of the Yellow Sea. Sampling stations located along Transect C at 36 degrees north latitude showed very high diversity in the near coastal waters of China and Korea, and again, low diversity was observed in the central part of the Yellow Sea (Table 10). There were 18 to 66 species observed for the sampling stations located along Transect D at 35 degrees north latitude, and a similar trend of high diversity in the coastal waters of China and Korea than in the central part of the Yellow Sea was observed (Table 11). Transect E also showed a similar pattern to Transects C and D (Table 12). On the other hand, relatively high diversity was observed in the Chinese coastal water with 32 to 67 species from the sampling stations located along Transect F at 33 degrees north latitude (Table 13). There were 51 to 101 species observed for the sampling stations located along Transect G at 32 degrees north latitude (Table 14). Comparatively high diversity was observed from the stations near the Chinese coastal waters and even the central part of the Yellow Sea showed higher diversity than the northern transect line (Table 8). Among the different survey transect lines, Transect G was the most diverse line, and Transects C and D showed relatively low diversity (Table 15).

3.1.2 Phytoplankton Biomass

In September 1992, phytoplankton abundance in surface water ranged from 5,570 to 343,400 cells l^{-1} with an average value of 58,930 cells l^{-1} as shown in Table 16. The average abundances were 81,470 cells l^{-1}, 31,610 cells l^{-1}, 91,420 cells l^{-1} for stations from the coastal waters of Korea, the central part of the Yellow Sea and the coastal waters of China, respectively. Surface water chlorophyll concentrations ranged from 0.19 to 3.00 ug l^{-1} with an average of 0.71 ug l^{-1}. The average concentrations were 0.74 ug l^{-1}, 0.50 ug l^{-1}, 1.01 ug l^{-1} for stations from the coastal waters of Korea, the central part of the Yellow Sea and the coastal waters of China, respectively.

In April 1998, phytoplankton cell abundance in surface water ranged from 6,637 to 702,558 cells l^{-1} with average values of 202,890 cells l^{-1} (Table 17). In August and October, phytoplankton cell abundance in surface water ranged from 6,890 to 2,707,085 cells l^{-1} and 17,564-856,025 cells l^{-1} with an average values of 204,322 cells l^{-1} and 127,717 cells l^{-1}, respectively (Tables 18, 19).

3.1.3 Dominant Phytoplankton Species

Dominant species cell abundance and degree of dominance from the 54 sampling stations of September 1992 are shown in Tables 20 to 25. In Transect A, Chaetoceros sp. and dinoflagellate sp. were dominant (Table 20). In Transect C, Dinoflgellate sp., Rhizosolenia, Skeletonema species were the dominant organisms (Table 21) and Rhizosolenia, Dinoflagellate were the dominant species in Transect F (Table 24). Tychopelagic species such as Paralia sulcata were dominant along the Korea coastal waters, and small dinoflagellates, Chatoceros and Rhizosolenia were the dominant species in the central part of the Yellow Sea.

Dominant species cell abundance and degree of dominance in April, August and October 1998 are shown in the Tables 26 to 28. Some sampling stations near the coastal waters in the April study showed tychopelagic species, Paralia sulcata, as the dominant species, whereas Skeletonema, Chaetoceros spp. were dominant in the central part of the Yellow Sea. In August, Chaetoceros and Nitzschia species were the dominant species, but *Paralia sulcata* was not a dominant species in the coastal stations. However, in October, some coastal samples showed *Paralia sulcata* as the dominant species again, and Chaetoceros spp, Rhizosolenia sp. and Cochlodinium sp. were the dominant species in the central part of the Yellow Sea.

3.1.4 Primary Production

Primary production in October 1992 study period ranged 147-1,694 mgC m^{-2} d^{-1} with an average value of 716 mgC m^{-2} d^{-1} (Table 29). The average value of primary production along the Korea coastal waters, the central part of the Yellow Sea and the Chinese coastal water were 529 mgC m^{-2} d^{-1}, 765 mgC m^{-2} d^{-1}, and 712 mgC m^{-2} d^{-1}, respectively. Decrease in the euphotic depth due to increasing turbidity in the Korean coastal waters was the main factor in the low primary production in the Korea coastal waters (Son et al. 2005). In April 1996, primary production ranged from 51 to 3,461 mgC m^{-2} d^{-1} with an average value of 645 mgC m^{-2} d^{-1} (Table 30). In 1997, there were 5 surveys in February, April, August, October, and December. The lowest average value for each station was recorded in February with 95 mgC m^{-2} d^{-1} (Table 31). The average values for April, August, and October were 872 mgC

m^{-2} d^{-1}, 894 mgC m^{-2} d^{-1}, 661 mgC m^{-2} d^{-1}, respectively, showing comparatively high values, and again the value decreased to 235 mgC m^{-2} d^{-1} in December (Table 31, 32).

Son et al. (2005) estimated primary production using both satellite data and *in-situ* data. Their estimation showed that the mean daily rate of the integrated primary production in the middle of the Yellow Sea (MYS) was 947 mgC m^{-2} d^{-1}in May and 723 mgC m^{-2} d^{-1}in September. The mean values in Chinese coastal waters and Korean coastal waters were, respectively, 590 and 589 mgC m^{-2} d^{-1}in May, and 734 and 553 mgC m^{-2} d^{-1}in September. Their computation of daily total primary production for the entire Yellow Sea was 19.7 × 10^4 tonC d^{-1} in May and 15.8 × 10^4 tonC d^{-1} in September.

3.2 Review Data and Information on Zooplankton

3.2.1 Long-term Analysis of Zooplankton

In the coastal and offshore areas of Korean waters in the Yellow Sea, long-term and seasonal trends of zooplankton biomass (wet weight) were analyzed with data produced from NFRDI during 1965-2000. Annual mean of zooplankton biomass was 139.3 mg/m^3 with range 27.8~382.9 mg/m^3 (Fig. 6). Zooplankton biomass showed increasing trend after the late 1980s. In particular, zooplankton biomass was prominently high in 1990, 1992 and 1998. Zooplankton biomass showed two peaks in a year (Fig. 7). A large peak appeared in June, while a small peak occurred in October with 254.6 mg/m^3 and 176.8 mg/m^3, respectively. It is suspected that the function and structure of food web changed in response to the oceanographic environment condition. We need to study more detail to get scientific evidence.

In the coastal and offshore areas of Korean waters in the Yellow Sea, long-term and seasonal trends of major zooplankton abundance (Copepods, Amphipods, Chaetognaths and Euphausiids) were analyzed with data produced from NFRDI during 1978-2000. Annual means of major zooplankton groups, such as copepods, amphipods, chaetognaths and euphausiids, were 251.0 inds./ m^3 , 4.3 inds./ m^3, 102.5 inds./ m^3 and 16.4 inds./ m^3, respectively (Table 33). Copepods decreased from 1978 to 1986 and then increased continuously with annual fluctuation (Fig. 8). Contrasted to copepods, amphipods sharply decreased after the early 1980s. Chaetognaths also showed decreasing trend after the mid 1980s, while euphausiids is slightly increasing after the early 1980s. It is suspected that the function and structure of food web changed in response to the oceanographic environment condition. We need to study more detail to get scientific evidence.

In seasonal changes of major four zooplankton groups, copepods showed a large peak in June with a mean value of 775.5 inds./ m^3, but a low value in December with a mean value, 75.2 inds./ m^3 (Table 34, Fig. 9). Amphipods made two small peaks in June and October with mean values of 10.2 inds./ m^3 and 7.5 inds./ m^3, respectively. Chaetognaths showed a peak in August with a mean value of 209.1 inds./ m^3, and euphsuiids revealed a peak in June with a mean value of 45.8 inds./ m^3.

3.2.2 Distribution of Zooplankton Biomass (abundance)

In the central area and coastal areas of Korea and China, the biomass of zooplankton was calculated with wet (WW), dry (DW) and ash free dry (AFDW) weights in October 2004 (NFRDI, 2005). Biomass ranged from 222.75 mg/ m^3 to 2039.81 mg/ m^3 in WW, from 0.95 mg/ m^3 to 102.85 mg/ m^3 in DW and from 0.23 mg/ m^3 to 9.43 mg/ m^3 in AFDW (Table 35). The average biomass of WW, DW and AFDW was 486.63 mg/ m^3, 26.12 mg/ m^3, and 2.00 mg/ m^3, respectively. Higher values of WW were found near the Chinese and Korean coastal areas (Fig. 10). DW was relatively high in the central area and Korean coastal area. AFDW was high near the southern coastal area of China and mid- coastal area of Korea.

On the other hand, the data of zooplankton biomass and abundance in the limited area and period were analyzed. Shim and Park (1982) described the distribution of zooplankton biomass (wet weight) in the mid-eastern area of the Yellow Sea in April 1981. Zooplankton biomass ranged from 3 mg/ m^3 to 523 mg/ m^3 with a mean of 107 mg/ m^3. There were two more zooplankton studies in the mid-eastern are of the Yellow Sea in May, 1984 and 1996 (Sim et al., 1988; Jang and Kim, 1998). In May 1984, zooplankton abundance ranged from 748 inds./ m^3 to 5,850 inds./ m^3 with a mean of 2,535 inds./ m^3, while in 1996, zooplankton abundance ranged from 568 inds./ m^3 to 5, 849 inds./ m^3.

In Kyeonggi Bay, the total abundance of copepods collected with the net ranged from 19 inds./ m^3 to 53,646 inds./ m^3 with an annual average abundance of 10,727 inds./ m^3 (Shim and Choi, 1996).

3.2.3 Species Composition of Zooplankton

There are very limited data of species composition produced from a long-term and serial oceanographic survey of NFRDI. These data included only abundance of four zooplankton groups, such as copepods, amphipods, chaetognaths and euphausiids. Of these groups, copepods are predominant.

In the central area and coastal areas of Korea and China, the compositions of zooplankton groups were analyzed in October 2004 (NFRDI, 2005). Zooplankton community was composed of 21 taxa (Table 36). Copepoda, Thaliacea, Chaetognatha, Appendicularia and Siphonophora dominated it in order. These five groups contributed to 93.7% of zooplankton abundance ranging from 83.3% to 99.9%. The total abundance was 1257.0 inds./ m^3 in mean and ranged from 131.0 inds./ m^3 to 3682.7 inds./ m^3. The highest abundance was in the southern area. The horizontal distribution of zooplankton abundance was relatively high near the Chinese coastal area. In the zooplankton community, copepods were the most dominant and abundant group, occupying 72.5% of zooplankton community with a range of 20.6% to 98.6%. They were abundant near Chinese coastal area. The second abundant taxon was Thaliacea. Its mean abundance was 98.5 inds./ m^3 and occupied 7.84% of zooplankton community. Its abundance was high in the central area. Chaetognaths were the third dominant community group and occupied 7.76% of zooplankton community with a mean abundance, 97.5 inds./ m^3. It is also abundant in the Chinese coastal area compared to other areas.

In the mid-eastern Yellow Sea, zooplankton species were classified to 33 taxa in April 1981 (Shim and Park, 1982), 13 genus and 18 species including 9 genus and 12 species of copepods in May and December 1984 (Sim et al., 1988), and 30 taxa in May 1996 (Jang and Kim, 1998).

Shim and Park (1982) reported that copepods were the most important species in zooplankton community, in particular *Oithona similes, Acartia clausi and Centropages* *mcmurrichi*. Appendicularia, Chaetognatha, Amphipoda and Euphausiid were also abundant compared to the other groups.

Sim et al. (1988) found that *Oithona similes* was the predominant species in May. They pointed out that the study area was divided into two sub-areas: *Acartia bifilosa* predominated in well mixed coastal waters of the northern area and *Oithona atlantica* frequently occurred in the remaining areas. In December, *Paracalanus parvus* was predominant; *Oithona atlantica* was frequently found in the mid-eastern Yellow Sea. Jang and Kim (1998) reported that copepods were the dominant taxonomic group comprising 61.9% of the total zooplankton in May 1996. Dominant species of copepods were *Acartia omorii, Calanus sinicus, Paracalanus indicus, Oithona atlantica, Centropages abdominalis*, and *Corycaeus affinis*. A red tide causative dinoflagellate, *Noctiluca scintillans*, comprised 30.0% of the total zooplankton abundance. The represented neritic species, *N. scintillans* and *Acartia bifilosa*, were dominant in the Korean coastal waters, while the cold water species, *A. omorii* and *C. abdominalis*, were dominant in the offshore waters.

In Kyeonggi Bay, the dominant species and groups of copepods were *Calanus sinicus, Labidocera euchaeta, Paracalanus crassirostris, Acartia bifilosa, Acartia pacifica, Oithona similes,* copepod nauplii, and copepodites during March 1993 ~ March 1994 (Shim and Choi, 1996). They comprised more than 10% of the total abundance. The seasonal succession in terms of the short time variations of dominant copepods showed that *Acartia bifilosa*, *Acartia* copepodites and nauplii dominated from spring to mid-summer and, thereafter, *Paracalanus crassirostris, P. parvus and Paracalanus* copepodites succeeded. *Acartia pacifica* was followed by Paracalanus in succession from mid to late summer and by *Paracalanus* and *Oithona similes* from early to mid-autumn. *Acartia bifilosa* dominated again from late autumn to winter. In winter, copepod community consisted of *Calanus sinicus*, and *Labidocera euchaeta* although the abundance was reduced critically.

3.3 Review Data and Information on Benthos

3.3.1 Review of the 1983~1986 KORDI Data

As already mentioned, these data are from the atlas and therefore have certain limits for analysis. These data focused on the seasonal distributions of the macrozoobenthos in terms of abundance and biomass of four major invertebrate taxa from four different cruises from 1983 to 1986. The cruises were conducted in August 1983, November 1984, May 1985 and February 1986. Unfortunately, the information is not complete because the macrozoobenthic diversity was not presented, probably due to the difficulty of the identification of the benthic macro-invertebrates.

However, some taxonomical groups of these materials were studied in more detail. Lee (1986), Lee and Huh (1988), and Lee and Chin (1989) conducted an ecological study of polychaetes using these materials representing a total of 141 species in the Yellow Sea during the study periods. In addition, their distribution patterns, ecological groups, community structures, and the controlling factors governing their distribution were analyzed and discussed as well. Dominant species were as follows: *Spiophanes bombyx, Ampharete arctica, Goniada maculata, Nephtys caeca, Nothria iridescens*.

On the other hand, a similar attempt was made for the molluscan fraction of these materials (Je, 1993; Je et al., 1988). Based on the 75 stations during the oceanographic survey of August 1983, a total of 69 molluscan species were reported. Major dominant species were bivalves such as *Thyasira tokunagai, Nucula paulula, Raeta pulchella, Nitidotellia nitidula, Nuculana yokoyamai*, an aplacophoran chaetodermatid mollusk *Chaetoderma japonica*. In addition, *Yoldia notabilis, Acila divariata, Cuspidaria semipellucida* were frequently represented. The distribution patterns and their ecological implications of these dominants were presented and interpreted in relation to the ecological factors (Je, 1993). Therefore, the information for the benthos studies from these cruises is fragmentary since the other taxonomical groups were not completed.

3.3.2 Review of the 1992 Data from Inha University – IOCAS, China Joint Cruise

Environmental Setting

The Yellow Sea is a part of North Pacific Ocean. Latitudinally, it extends to around 41°N to the north and joins the East China Sea near 31°N to the south. The Yellow Sea is 4.87×105 km^2 in area, average 44m in depths, and holds 1.94×104 km^3 of water. The sediments of the Yellow Sea are mostly terrigenous, carried by rivers and winds from the surrounding Chinese and Korean lands. It receives annually more than 1.6 billion tons of sediments from China's major rivers such as the Yellow River and the Yangtze River, both of which have formed large deltas, and a considerable amount of fine and coarse-grained sediments comes from the rivers of the Korean Peninsula as well. The Yellow Sea is connected to the East China Sea in the south, forming a linked circulation system. Major rivers discharging directly into the Yellow Sea include the Han, Yangtze, Datung, Yalu, Guang, and Shenyang. The Liao He, Hai He, and Yellow River around the Bo Hai have important effects on salinity in the western Yellow Sea, whereas the Yangtze River exerts strong influence on the hydrography of the southernmost part of the Sea. Recent reductions in Yellow River flow have led to changes in hydrography and water circulation, thereby leading to ecosystem changes. All rivers have peak runoff in summer and minimum discharge in winter. The bottom topography of the Yellow Sea is narrow and elongated in a north-south direction, with isobaths mostly running in the same direction.

Substratum property is one of the main factors that controls spatial variations of macrofaunal community in coastal areas (Sanders, 1958; Young and Rhoads, 1971; Snelgrove and Butman, 1994). The distribution patterns of macrozoobenthos can be reasonably well explained by the bottom sediment character which is frequently a controlling habitat variable for the composition of benthic macrofauna. Therefore, understanding the bottom sedimentary features is of vital importance. Especially, in central Yellow Sea, the Yellow Sea Cold Water Mass (YSCWM) is located, which is formed during winter, and may extend to the south around 27°N (Morinaga et al., 2000). Below the thermocline, it still remains unchanged and nearly motionless throughout the summer (Li and Yuan, 1992). Strong thermocline and the occurrence of the YSCWM are the distinct and relatively constant features of the southern Yellow Sea in summer. The YSCWM is the residual cold water (commonly <10°C) formed in the last winter, so its temperature changes from year to year depending on the atmospheric temperature in the last winter (Guo, 1993). With this background, the distribution of the macrozoobenthos in the Yellow Sea should be comprehended and interpreted.

Macrobenthos distribution in the Yellow Sea

The benthic fauna of the Yellow Sea has been little studied, and until now few attempts have been made to describe the distribution patterns of the macro-invertebrates covering a large portion of the Yellow Sea. The main factors influencing the macrobenthic fauna of the Yellow Sea are sediment types due to current and proximity to land, which affect the input of organic and inorganic material to the sediment, and restricted water exchange, which sometimes affects bottom oxygen conditions in the central Yellow Sea. They show an onshore-offshore gradient.

From 49 stations sampled, 23,619 specimens of benthic macro-invertebrates were collected and identified to 384 species with a total biomass of 774.804 g wet weight from an area of 14.7 m2 . Polychaeta were the most diverse group, with 186 species (48.4%). Mollusca followed with 88 species (22.9%), Crustacea with 84 (21.9%), Echinodermata with 9 (2.3%) and others with 17 (4.4%). However, in terms of numerical abundance, the polychaetes are most dominant with 14,410 specimens, contributing 61%, followed by Mollusca with 4,284 (18.1%), Crustacea with 2,971 (12.6%), Echinodermata with 1,644 (7.0%), and others with 310 (1.3%). The biomass is of primary importance in Polychaeta again with 332.229gWWt (42.9%), followed by Mollusca with 154.268 (19.9%), Echinodermata with 121.235 (15.6%), Crustacea with 84.895 (11.0%), and others with 82.177 (10.6%). Therefore, the Polychaeta is the most significant group not only in terms of macrobenthic species richness but also in terms of their abundance and biomass in the Yellow Sea (Fig 11). The community parameters such as species richness, abundance, biomass, diversity index (H'), and evenness are shown respectively in major taxonomic groups (Tables 37 to 38, Figs. 12 to 24). More specific distribution patterns of the physico-chemical parameters in the bottom water are given in Figures 25 to 35.

Benthic macrofaunal communities may be divided into two large-scale assemblages: Yellow Sea coastal shelf assemblages and Yellow Sea central clayey bottom assemblages. It is important to note that the coastal shelf area not only in Korean coast but also in Chinese coast is much higher in every community parameter such as species richness, numerical abundance, biomass, and diversity index than in the central bottom waters. However, the species composition and their abundance in the southern part of the study area appeared to be, to some extent, different from other two communities (Fig. 36). This is probably because this area of entrance into the Yellow Sea is influenced by the compositionally southern elements.

Mapping of the numerically dominant species was made for the following species as well; six polychaetes (*Ampharete arctica, Leiochrides* sp., *Mediomastus californiensis, Praxillella affinis, Spiophanes bombyx, Terebellides stroemii*), two mollusks (*Nucula nipponica, Thyasira tokunagai*), one crustacean (*Eudorella hwanghaensis*), one echinoderm (*Ophiura sarsi vadicola*) (Figs. 37 to 46, Table 39, 40). The cluster analysis of the benthic communities based on the 1992 cruise data revealed that the study area in the Yellow Sea was divided into five different communities (Fig. 47).

3.4. Review Data and Information on HABs

The incidents of harmful algal blooms, or red tides in Korean coastal waters has dramatically increased in frequency, intensity and scale during the past two decades years, with huge fishery damages by fish kills occurring recently.

In the coastal and offshore Korean waters, long-term and seasonal trends of HAB species density were analyzed with data produced from NFRDI during 1984-2005. The cell density of HAB species showed the lowest value as 20 cells/ml in Incheon coastal area in 1998, and the highest value as 53,880 cells/ml in Chungnam coastal area in 1988 (Table 6). After the early 1980's it showed a continuous increase with higher values in summer than any other season.

In the coastal and offshore Korean waters, long-term trends of HAB species composition were analyzed with data produced from NFRDI during 1984-2005. The major causative species of HABs from 1984 to 2005 are shown in Table 6.

Seven major algal taxa and one ciliate of HAB species were represented:

- Bacillariophyceae (diatoms)
- Dinophyceae (dinofilagellates)
- Cryptophyceae (cryptophytes)
- Prasinophyceae (prasinophytes)

- Euglenophyceae (euglenoids)
- Raphidophyceae (raphidophytes)
- Cyanobacteria (bluegreen algae)
- Ciliophora (ciliates).

Diatoms consisted of 9 species: *Chaetoceros* sp., *Coscinodiscus gigas, Eucampia zodiacus, Guinardia flaccida, Leptocylindrus danicus, Pseudo-nitzschia pungens, Skeletonema costatum, Thalassiosira decipiens*, *T.* sp.

Dinoflagellates consisted of 9 species: *Alexandrium* sp., *Ceratium* sp., *Cochlodinium polykrikoides, Dinophysis acuminate, Gyrodinium* sp., *Noctiluca scintillans, Prorocentrum micans, P. minimum, P. triestinum.*

One species each of cryptophyte, *Chroomonas salina*, was represented; prasinophyte, *Nephroselmis sp.*; euglenoid, *Eutreptiella gymnastica*; raphidophyte, *Heterosigma akashiwo*; bluegreen algae *Mycrocystis* sp.; and photosynthetic ciliate, *Mesodinium rubrum*.

In the 1980's, the major causative species of HABs was *Noctiluca scintillans.*

In the 1990's *Ceratium* sp., *Chaetoceros* sp., *Chroomonas salina, Coscinodiscus gigas, Guinardia flaccida, Cochlodinium polykrikoides, Heterosigma akashiwo, Mesodinium rubrum, Microcystis* sp., *Noctiluca scintillans, Prorocentrum minimum, Skeletonema costatum, Thalassiosira* sp. were the major causative species.

In the 2000's, *Alexandrium* sp., *Ceratium fusus, Chroomonas salina, Dinophysis acuminata, Eucampia zodiacus, Eutreptiella gymnastica, Gyrodinium* sp., *Heterosigma akashiwo, Leptocylindrus danicus, Mesodinium rubrum, Nephroselmis* sp., *Noctiluca scintillans, Prorocentrum micans, P. minimum, P. triestinum, Pseudo-nitzschia pungens, Skeletonema coatatum,* and *Thalassiosira* sp. were the major causative species.

Cochlodinium polykrikoides, the most harmful species to kill farmed fish in Korea, has bloomed in the whole coast of the southern coast of Korea every year from August to October since 1995 (Lee et al., 2001). Also *Heterosigma akashiwo* occurs in coastal waters of subarctic and temperate areas of both northern and southern hemispheres, and often causes mortality of cultured fish such as salmon, yellowtail, and red sea bream (Nagasaki, 2001).

HAB events occurred along the Yellow Sea during 1984-2005 and a total of 70 cases of HAB events were found (Table 41). Five cases of HAB events were found in the 1980's, 38 and 27 cases in the 1990's and 2000's, respectively. The number of cases of HAB events showed the lowest occurrence as 1 case each in the Incheon, Chungnam and Cheonbuk coastal areas, and the highest occurrence as 10 cases in the Chungnam and Cheonbuk coastal areas in 1998 (Fig. 48). In particular, the cases of HAB events showed many events from 1998 to 2000 and 2004. This is probably because this area showed a continuous increase in fish farms and recently increased occurrence of flagellates.

IV. Activity 4: Identify Gaps in Data and Information

In November 15 2005, the participants of Meeting 2 discussed the data gaps. After discussion, the participants found some problems such as data missing, and sub-PIs carried out complementary works to solve it by December 31, 2005.

4.1 Listing the Gaps in Data and Information on Phytoplankton

The autumn distribution of phytoplankton in the Yellow Sea was studied in detail by Noh

(1995). Chang (1990) carried out seasonal surveys in the Korea coastal waters and the central part of the Yellow Sea, however no record was reported for seasonal species composition distribution results; therefore, there are large gaps in the data except the autumn data from the studies conducted by Korean scientists for species composition information. Also, species composition studies for diverse major taxonomic groups including diatom and dinoflagellates are not reported.

For cell abundance, the entire Yellow Sea studies were carried out in autumn 1992. Also, for the coastal waters of Korea and the central part of Korea, cell abundances were recorded for spring, summer and autumn of 1998; therefore, only winter data are missing. Moreover, detailed data for other diverse taxonomic group such as picoplankton abundance are also missing, which is strongly recommended for future studies.

For primary production, seasonal surveys were conducted and reported for spring and autumn periods including satellite data. Winter and summer data are missing. For future studies, winter and summer primary production mapping is strongly recommended combining both satellite and *in-situ* data.

4.2 Listing the Gaps in Data and Information on Zooplankton

From a serial bimonthly oceanographic survey around Korean waters conducted by NFRDI, the data of zooplankton biomass with wet weight has been compiled in the coastal and offshore area of Korea since 1965. Abundance data of four zooplankton groups (copepods, amphipods, chaetognaths and euphausiids) have been collected since 1978; however, no data of species composition were gathered from these surveys. Several studies on species composition were carried out in the mid-eastern Yellow Sea and bays in the limited period, such as May or December. Therefore, there are large gaps in the data of species composition except in May and December. Studies of species composition mainly focused on copepods, thus there are no detailed species composition data on the other zooplankton groups.

4.3 Listing the Gaps in Data and Information on Benthos

As already mentioned above, two different data and information sets on macrobenthos in the Yellow Sea are introduced. The first one is the atlas data from the Korea Ocean Research and Development Institute, which were obtained from several cruises conducted from 1982 to 1985. Unfortunately, the benthic faunal and floral inventories in a given station in each cruise were missing, or not done, so that it was not able to understand not only the benthic biological diversities and abundances of each taxonomic group but also the distribution of the dominant species. Only the numerical abundance and biomass data of major taxonomic groups were illustrated. It should be noticed that two systematic groups, Polychaeta and Mollusca, were identified to the species level and analyzed in more details thereafter (Lee, 1987; Je, 1993) but the other groups were not made so far.

The second data and information was the outcome form the Korea-China Joint Cruise in 1992. These data on macrobenthos were complete and therefore every community parameter and distribution of the benthic dominant species were illustrated together with the macrobenthic production. In particular, the full description and data analysis on the benthic community covering all the taxonomic groups in the eastern part of the Yellow Sea were made for the first time.

4.4 Listing the gaps in data and information on HABs

The harmful algal blooms in Korean coastal waters were reported in detail by NFRDI (2002, 2004, 2005). From a serial monthly oceanographic survey around Korean waters conducted by NFRDI, the data on HABs had been compiled in the coastal and offshore area of Korea since 1981; however, no data from the studies conducted by Korean taxonomist for species composition information is available. Moreover, no detailed data other than diverse taxonomic group such as picoplankton abundance are also missing which is strongly recommended for future studies. Therefore, there are large gaps in the data on the detailed species composition of picoplankton groups.

V. Activity 5: Preparing National Information on Data Quality Assurance and Quality Control (QA/QC) Procedures

Meeting 3: Technical review meeting on data quality assurance and quality control (QA/QC) procedure

We conducted a technical meeting on the data quality assurance and quality control (QA/QC) procedure on January 24, 2006 at WSFRI, Incheon. Thirteen persons participated at this meeting (below Table).

The participants for this meeting are four sub-principal investigators of the four parts: phytoplankton, zooplankton, benthic communities and HAB events. The participants of this meeting reviewed the data quality assurance and quality control (QA/QC) procedure for preparing national information.

Participants for Technical Review Meeting on data quality assurance and quality control (QA/QC) procedure.

Name	Position	Organization
HEO Seung	Researcher	WSFRI
KANG Youngshil	Researcher	WSFRI
PARK Seungyun	Researcher	WSFRI
SON Jaekyoung	Researcher	WSFRI
PARK Junghyun	Researcher	WSFRI
PARK Kyungsoo	Researcher	WSFRI
KIM Hyungcheol	Researcher	WSFRI
YOON Sungjin	Researcher	WSFRI
YOON Sookkyung	Researcher	WSFRI
YOO Sinjae	Researcher	KORDI
NOH Jaehoon	Researcher	KORDI
HONG Jaesang	Professor	Inha Univ.
IM Weolye	Researcher	NFRDI

5.1 Providing National Information on Data Quality Assurance and Quality Control (QA/QC) Procedure on Phytoplankton

There is no known QA/QC procedure on Phytoplankton for data quality assurance. However, it traditionally follows world accepted standard methods (i.e., IOC, PICES, GLOBEC) as well as the most up-to-date reported techniques in the literature.

5.2 Providing National Information on Data Quality Assurance and Quality Control (QA/QC) Procedure on Zooplankton and Jellyfish

There is no known QA/QC procedure on zooplankton for data quality assurance in Korea. However, it traditionally follows a world accepted standard methods (i.e., IOC, PICES) as well as the most up-to-date reported techniques in the literature (Wiebe and Benfield, 2003).

5.3 Providing National Information on Data Quality Assurance and Quality Control (QA/QC) Procedure on Benthos

National requirements for the data quality assurance and quality control (QA/QC) procedure on benthos do not exist at the present time. However, the quality control should be involved from sampling benthos in the field to the data interpretation. Therefore, it is important for the benthos experts to participate in sampling, identifying, analyzing, and interpreting the data. In this regard, those Korean data, when existed, are valid and convincing. However, quality control can be provided especially by the re-identification of some voucher specimens that should be processed by other benthic experts or re-examined by taxonomists. Samples for re-identification may be selected randomly or only for problematic species.

5.4 Providing National Information on Data Quality Assurance and Quality Control (QA/QC) Procedure on HABs

There is no known quality assurance and quality control (QA/QC) procedure on HABs for the data in Korea. However, it traditionally follows a world accepted standard methods as well as the most up-to-date reported techniques in the literature. As with benthos quality control can be provided especially by the re-identification of some voucher specimens that should be processed by other HAB experts or re-examined by taxonomists. Samples for re-identification are selected randomly or for problematic species.

VI. Activity 6: Review on Present Status of Carrying Capacity of Lower Trophic Level

6.1 Preliminary Analysis and Estimate of the Carrying Capacity for Lower Trophic Level

The carrying capacity (CC, K value) is simply thought as the maximum sustainable population size without degrading the environment. The concept of carrying capacity is often used as a tool for planning and management and forms the basis of many management and development designs to ensure sustainable resources of an ecosystem. This is especially true for the marine ecosystem; however, objectives of carrying capacity have often been confused among scientists and managers. Scientists often use ecological carrying capacity approach system by frequently combining physical environmental capacity of whole ecosystem whereas managers often use economical carrying capacity approach system analyzing a few economically valuable marine resources. For the Yellow Sea Large Marine Ecosystem (YSLME), it is particularly important to involve both ecological and economical approaches, and cooperation between China and Korea will be the essential component to find out the real CC, a valuable factor to maintain the sustainable resources.

The YSLME covers an area of about 400,000km^2, and has dimension of 1,000km by 700km with a mean depth of 44m. Its ecosystem is classified as a highly productive area with greater than 300 gC/m^2/yr according to FAO report (Sugiyama et al., 2004). The residence time of the Yellow Sea Proper Water[1] is about 5-6 years and particles reside for less than 2 months in the water column (Hong et al. 1998). The YSLME is surrounded by areas of high population growth and economic development in China and Korea. Large quantity of river waters discharge into the YSLME from both sides bringing in fresh water largely contaminated waters with agricultural wastes and municipal sewage. Another contaminant pathway into the sea is through atmosphere (e.g. dust storm from Gobi dessert) having significant impacts upon the chemical mass balance of the YSLME (Hong et al. 1998).

Finding a real CC for the YSLME brings out many problems associated with the environment being heavily impacted by anthropogenic variables resulting in an expected non-equilibrium environment. This probably is the main reason why one finds difficulties in calculating any spatio-temporally stable CC for the YS. For example, although with known 276 fish species, the YSLME is a historically and regionally important global fisheries resource, and it is one of the most intensively exploited LME in the world. Such long-term over-exploitation in combination with natural fluctuation, and chemical imbalance results in pronounced continuous changes in ecosystem structure (Sugiyama et al., 2004). There were changes from larger-sized and commercially valuable species to smaller, less valuable forage fish. With technological improvement, new fishing methods were introduced (e.g. introduction of bottom trawlers in early 20th century) with more devastating effect on the ecosystem. More recently, for the YSLME, Pacific herring and chub mackerel became dominant in the 1970s, then, smaller-bodied and economically less profitable anchovy and scaled sardine increased in the 1980s and took its dominancy. Now, many fisheries species including the cold-water species such as the Pacific Cod are not seen anymore, thus shifting dynamics of both the structure and function of the YSLME, thus eventually affecting the real numbers for both economical and ecological CC of the YSLME (Sugiyama et al., 2004). That is, the CC as a single quantity is often thought of as an equilibrium point in dynamic equations of ecosystem, and with so much human intervention, the YSLME seems to find a hard time to have a long sustainable equilibrium point.

In spite of the above problems, scientists still try to fit the CC into their ecosystem modeling, and managers use the CC of individual fisheries species to implement management tools for fisheries to exercise its authority, albeit it is often only a perception and not a reality and sometimes obscure the real problems. In non-equilibrium systems like the YSLME, however, some of the principles and measurements involved, might still be of value in the monitoring of key variables which may resemble equilibrium situation more closely, and estimating the CC for the lower trophic level probably provides some insights into ecosystem structure and function for such reason.

There are some points to consider for estimating the CC for the Lower Trophic Level. The first is the objective of CC. Defining what the CC will indicate and how it will be used will be a good point to start for determining the most likely CC. Time scale (i.e., yearly, seasonally, short-term, long-term), CC target system (i.e., single species, species group, trophic level, ecosystem), driving force (e.g. El Nino), limiting factors (e.g. nutrient), feed back time (i.e., ecosystem response time), species growth rate (r value), frequency of forcing (i.e., long term cycle(e.g. 20years) may be long enough for the highest trophic levels to respond, whereas shorter variations may affect only the lower trophic level.), and other variables which may contribute to stability or instability of the ecosystem.

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[1] Yellow Sea Proper Water: This term is used by Hong et al. 1998 to describe a water mass characterized by relatively uniform temperature and salinity or a single homogenous water mass of deeper(basin) water of the Yellow Sea.

To find out the CC for the lower trophic level for YSLME, all the data including missing data must be considered before plugging into any model for a K of any target points (i.e., species, species group, trophic level, or ecosystem).

VII. Activity 7: Preparing Final Report to be Submitted to the Regional Working Groups for Ecosystem

7.1 Problem in the YSLME Coastal Area of Country

YSLME is one of the most interesting and complicated areas from a scientific perspective because of its high turbidity, sedimentation input, high inflow of freshwater, input of warm waters from the East China Sea (influence of Tsushima Warm Current), shallow depth, and so on. Such environment even challenges the most ardent ocean color scientists using satellite information in interpreting the patterns of the YSLME area.

Also, because of its political situations boarding China, Democratic People's Republic of Korea and Republic of Korea, active pursuance of scientific study has been limited. However, several attempts were made, some successful, to look at the whole YSLME system to better understand what is going on with most interesting but least studied area.

For coastal area for Korea side, several discontinuous studies have been conducted by universities, government affiliated institutes, and government laboratories. The challenge lies in the cooperation and division of studies, and willingness for funding agencies to support eco-environmental studies of such an area. It is an area of politically sensitive, hard to convince its short-term economical benefit and unwillingness for many scientists to deal with complicated international negotiations. There are techniques, and experts and willing scientists who want to carry out the study but without hassles which come with such a sensitive area.

7.2 Priority of Problem

The priority of problems would be in the willingness of funding agencies to fully support the pursuit of such research activities. With full support, funding can also be used to support personnel to deal with international relations and negotiations as well as play an active role in negotiation and arrangement of research activities. Next would be convincing governments of the importance of a long-term eco-environmental study in this area, even though the short-term economical benefits can not be foreseen. Next would be attitude of scientists toward a complicated set-up of cooperative studies with different nations. When these priorities are dealt with patience and cooperation, overcoming the challenges in YSLME can be very rewarding.

At the moment, the governance system of coastal zone of the Yellow Sea in the Republic of Korea is carried out mainly by Integrated Coastal Zone Management Act of Korea and laws and regulations of different districts under the auspices of the Ministry of Maritime Affairs and Fisheries.

Report was prepared by: the workgroup of ecosystem
And summarized by: Heo Seung

March, 2006

Annex X - Persons / institutions / websites visited or interviewed

1. **Phytoplankton**

Noh, J.H./Korea Ocean Research and Development Institute
Yoo, Sinjae/ Korea Ocean Research and Development Institute
Roh, Seung Mok/ Korea Ocean Research and Development Institute

2. **Benthos**

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Jung, R.H./National Fisheries Research and Development Institute, Korea
Yoo, J.W./Korea Institute of Coastal Ecology, Inc., Korea
Yoon, K.T./Department of Oceanography, Inha University, Korea.

3. **Zooplankton**

Min-Cheol JANG/ KORDI/
Young Shil KANG/ NFRDI/
Dong Hyun Lim/ NFRDI
Won Duk Yoon/ NFRDI
Dong-Yup KIM/ KORDI/
Woong-Seo KIM/ KORDI/
Chul PARK/ Chung Nam University/
Moon-Bo SHIM/ Inha University/

4. **HABs**

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Seung-Yoon Park/ National Fisheries Research and Development Institute, Korea
Sook-Kyung Yoon/ West Sea Fisheries Research Institute, Korea

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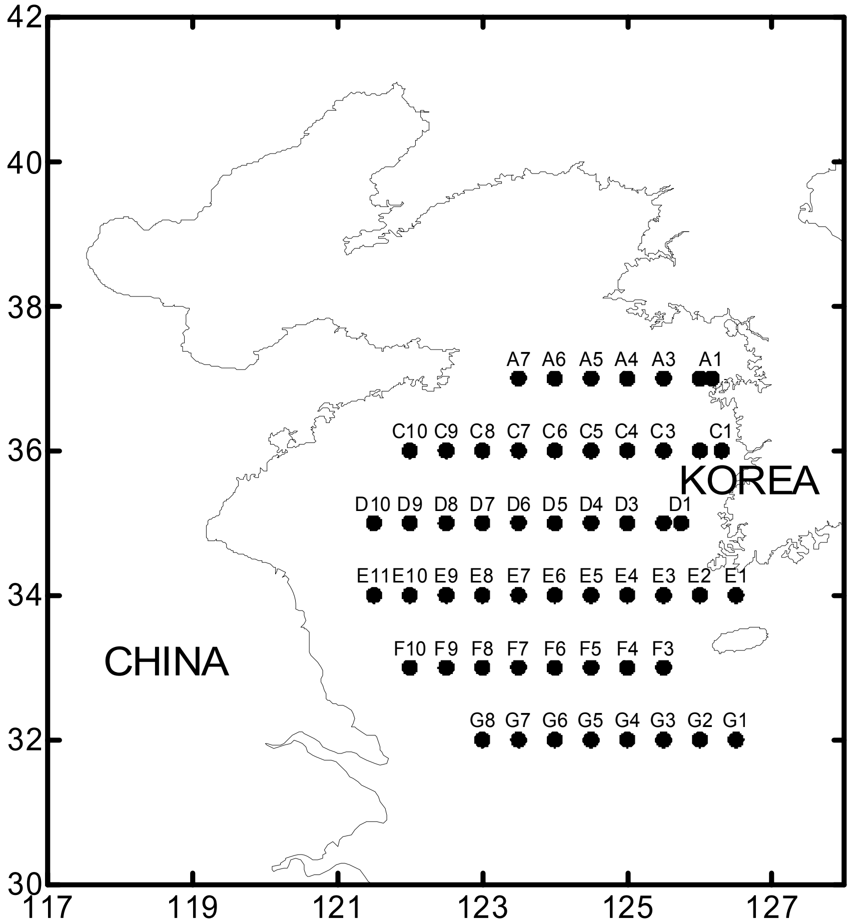

Fig. 1. Location map of sampling stations and survey transect lines in the Yellow Sea, September 1992.

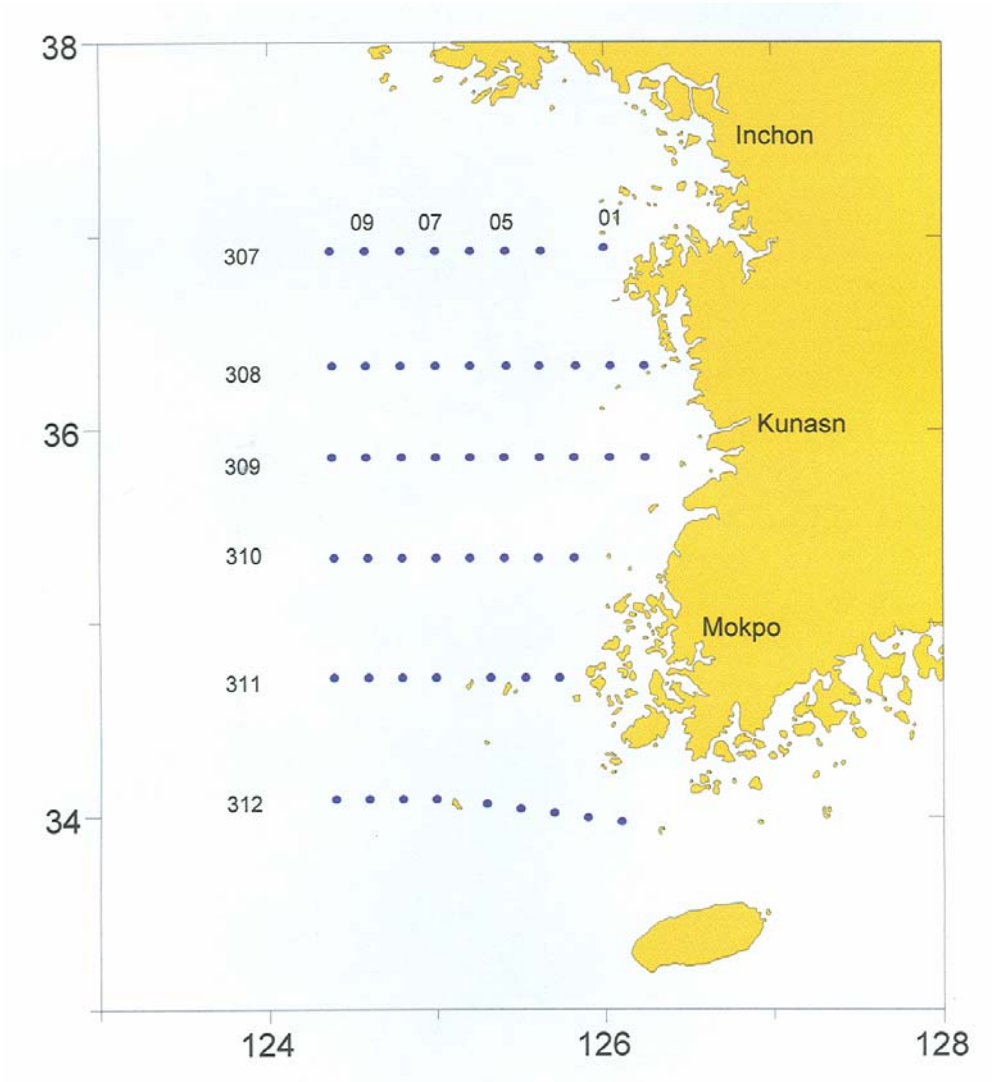

Fig. 2. Map showing the survey area and sampling station of serial Oceanographic monitoring conducted by NFRDI.

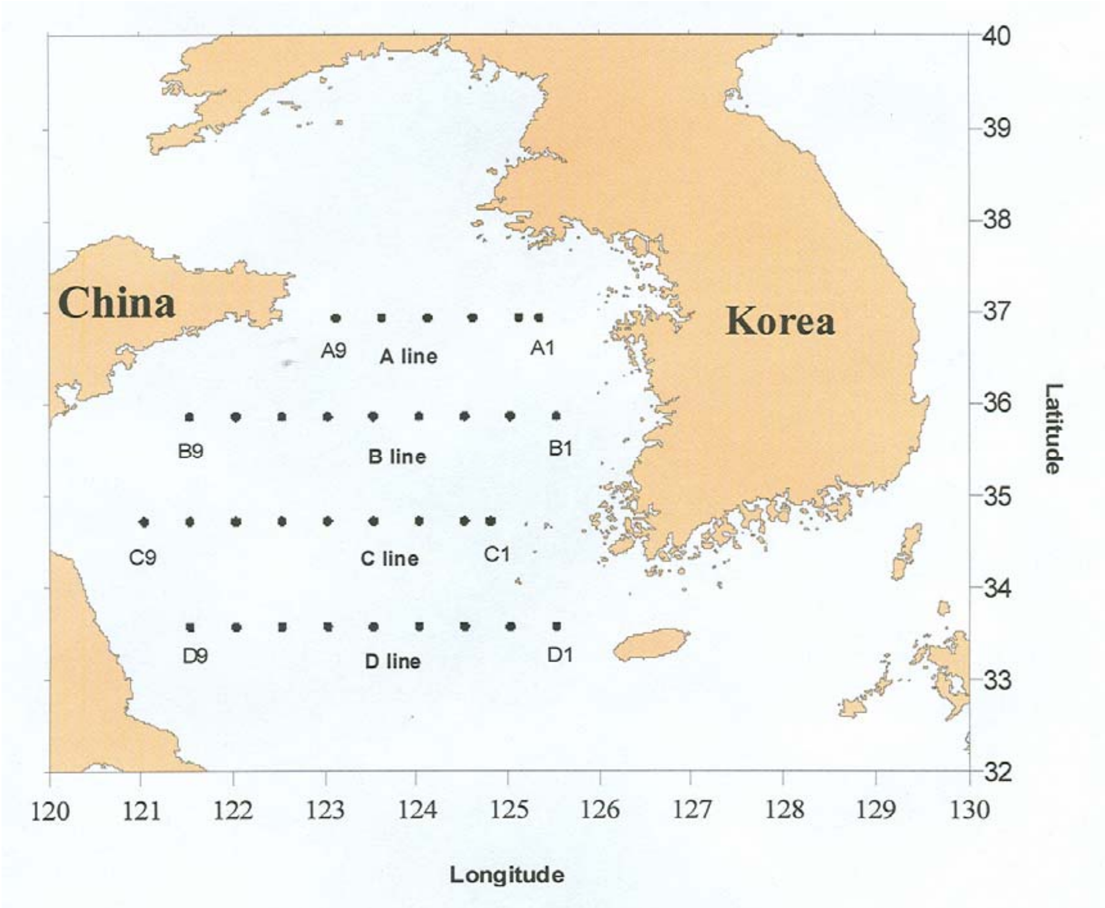

Fig. 3. Map showing the survey area and sampling stations of the Yellow Sea Environmental Cooperative Research conducted by Korean and China.

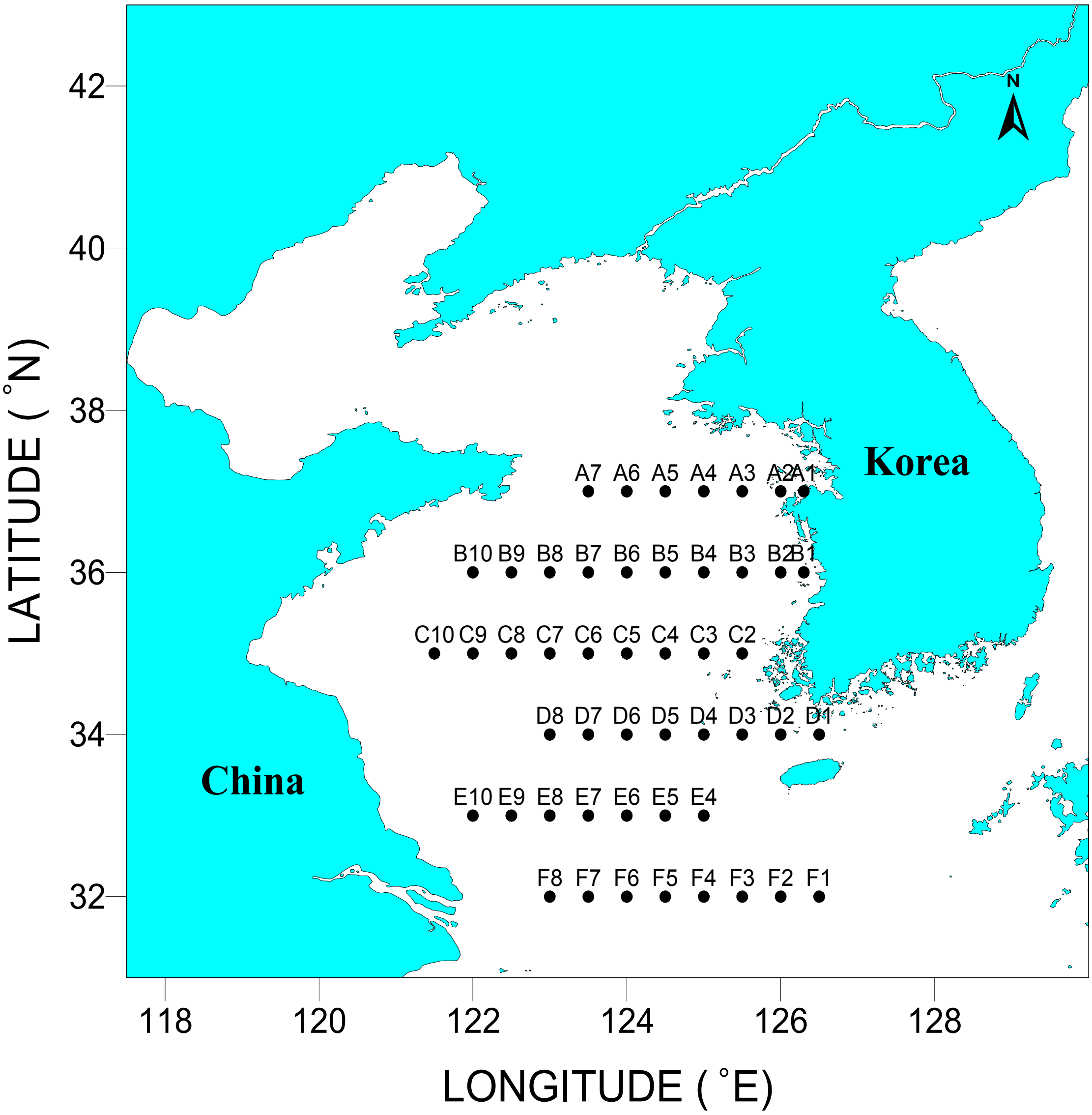

Fig. 4. Locations of the study area in 1992 Korea-China Oceanographic Cruise.

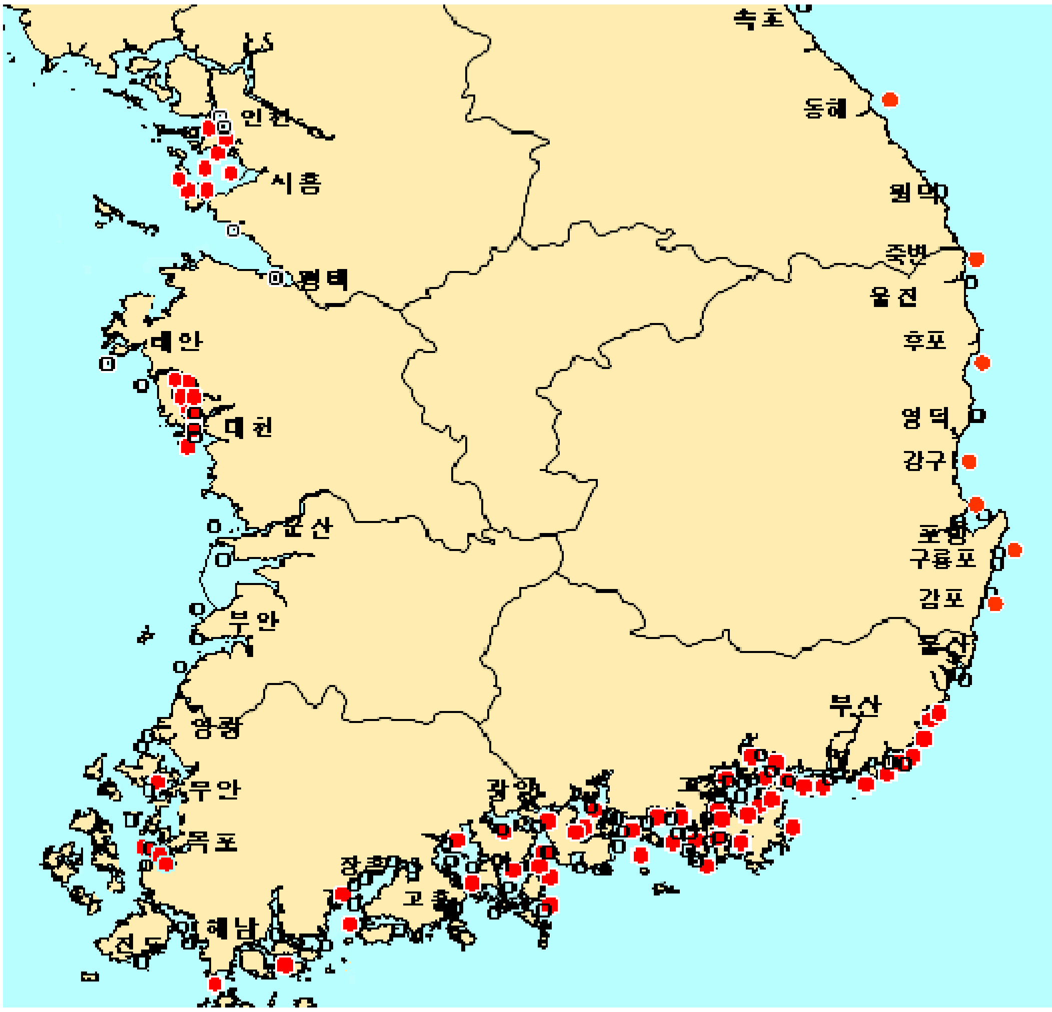

Fig. 5. HABs monitoring stations around Korea carried out by NFRDI.

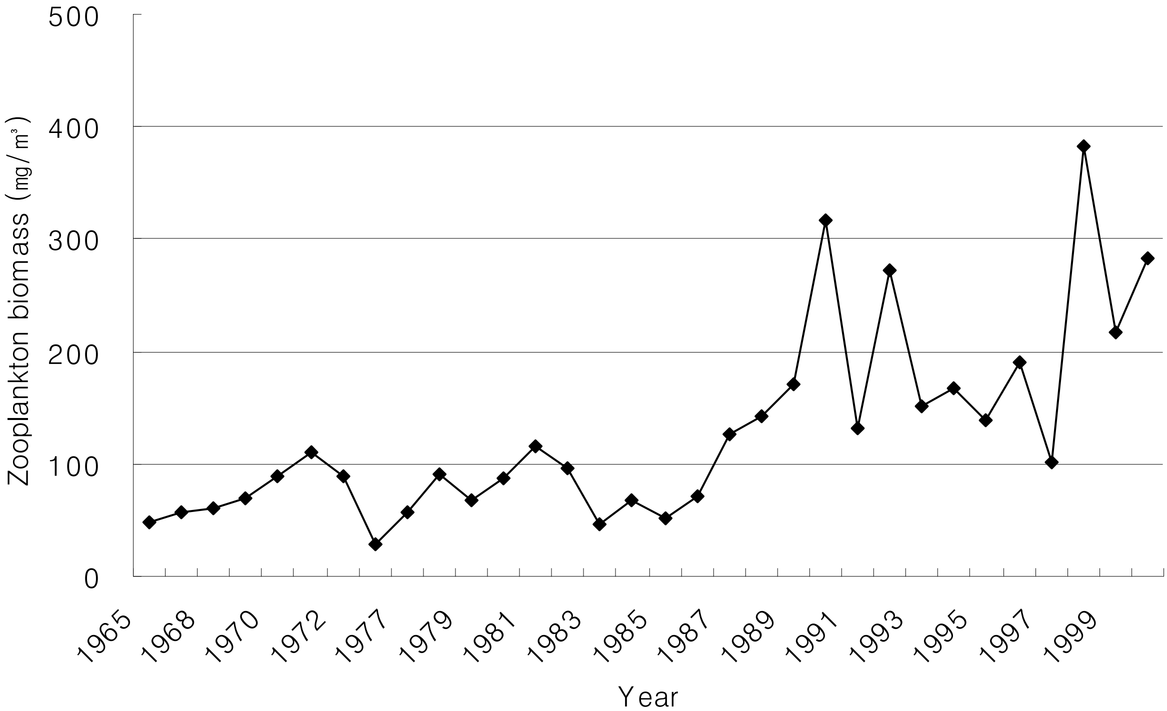

Fig. 6. Long-term change of zooplankton biomass calculated with wet weight.

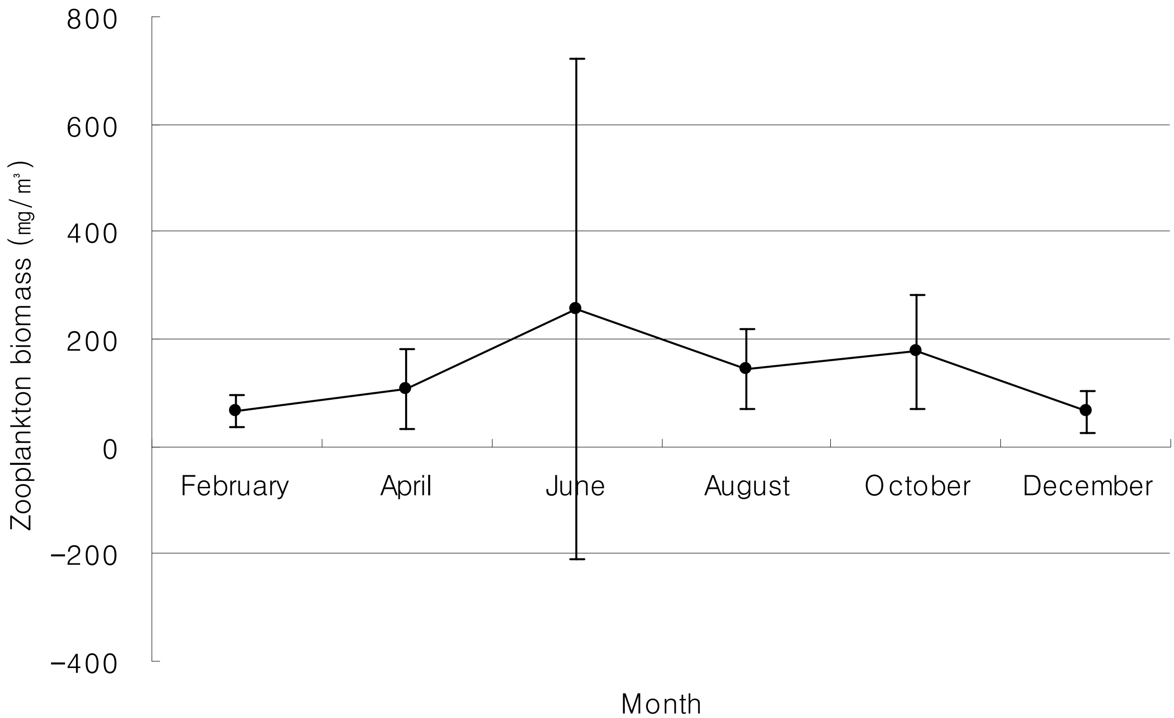

Fig. 7. Seasonal change of zooplankton biomass calculated with wet weight during 1965 ~2000.

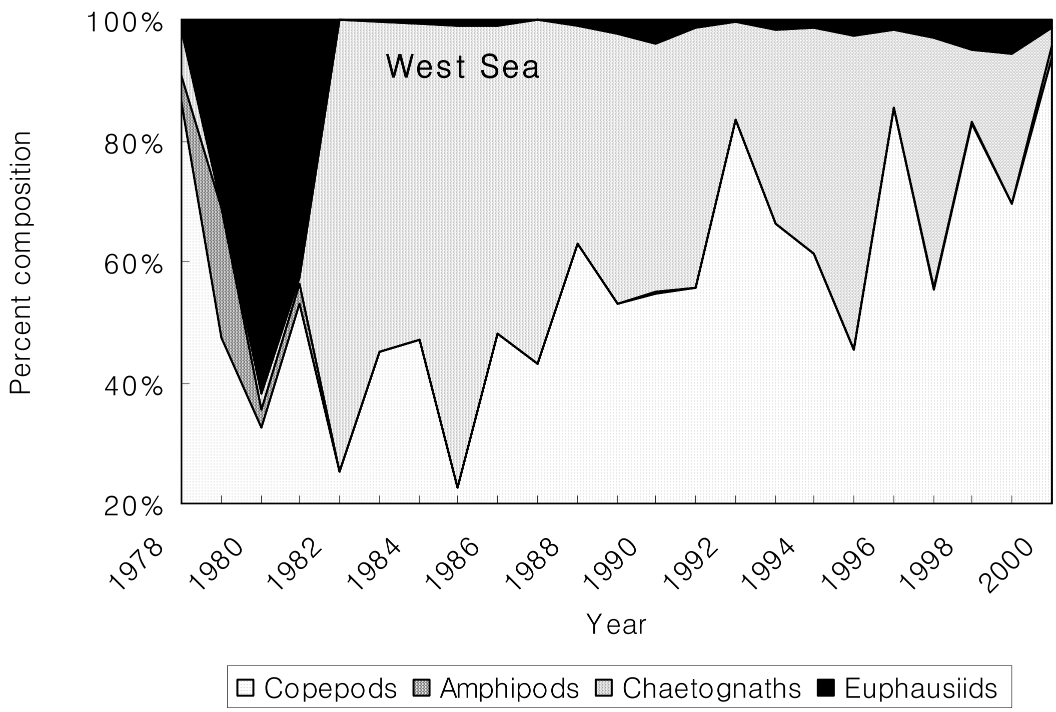

Fig. 8. Long-term change in percent composition of major four zooplankton groups during 1978 ~2000.

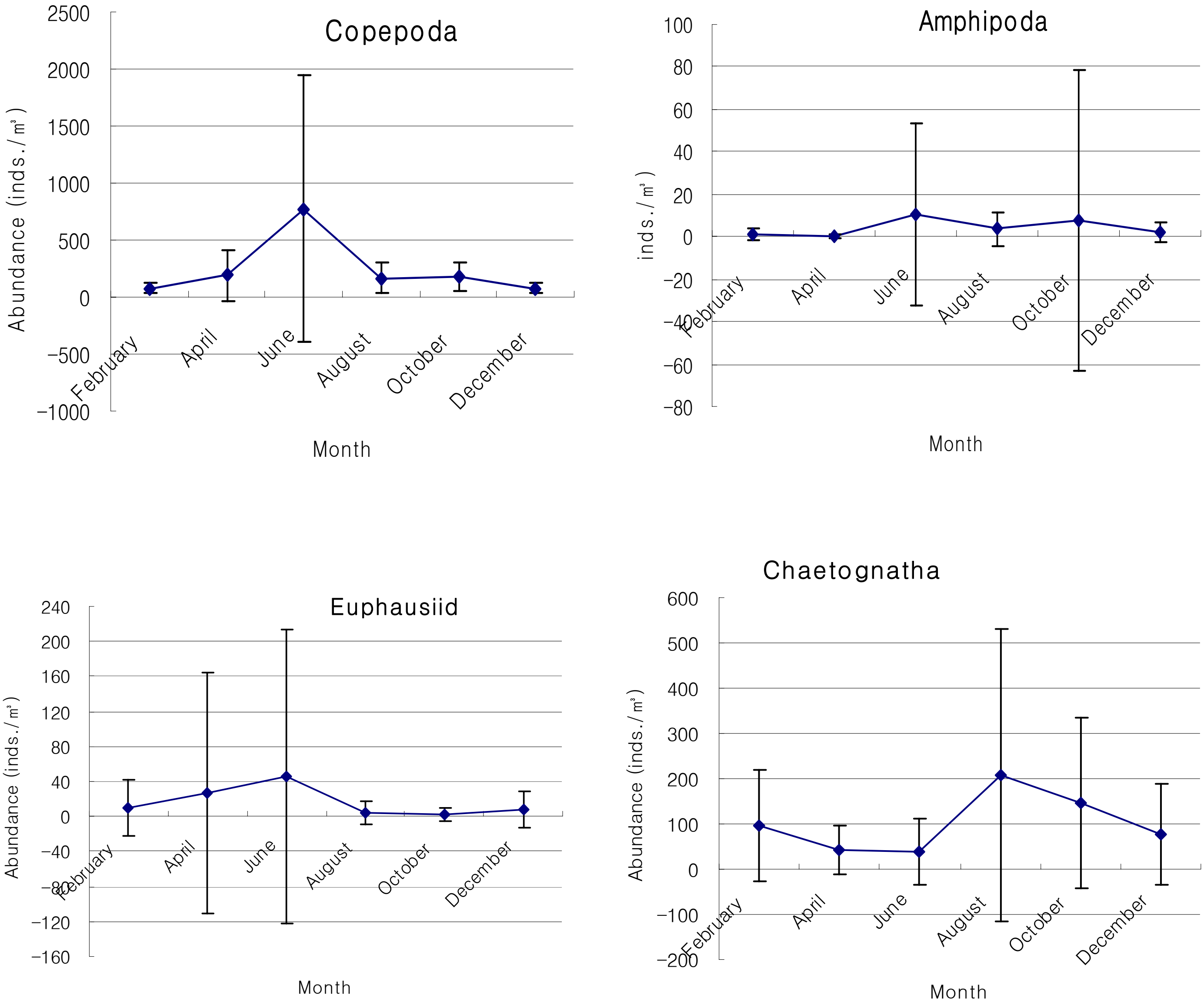

Fig. 9. Seasonal change of four zooplankton groups, copepods, amphipods, euphausiids and chaetognatha calculated with data of 1978~2000.

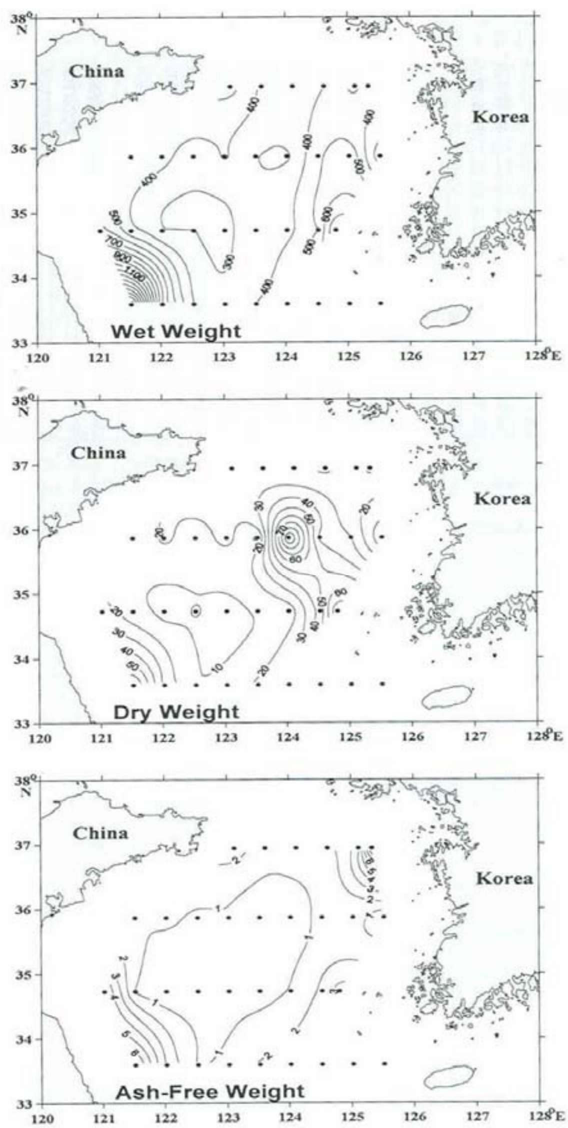

Fig. 10. Distribution of Zooplankton Biomass in October 2004.

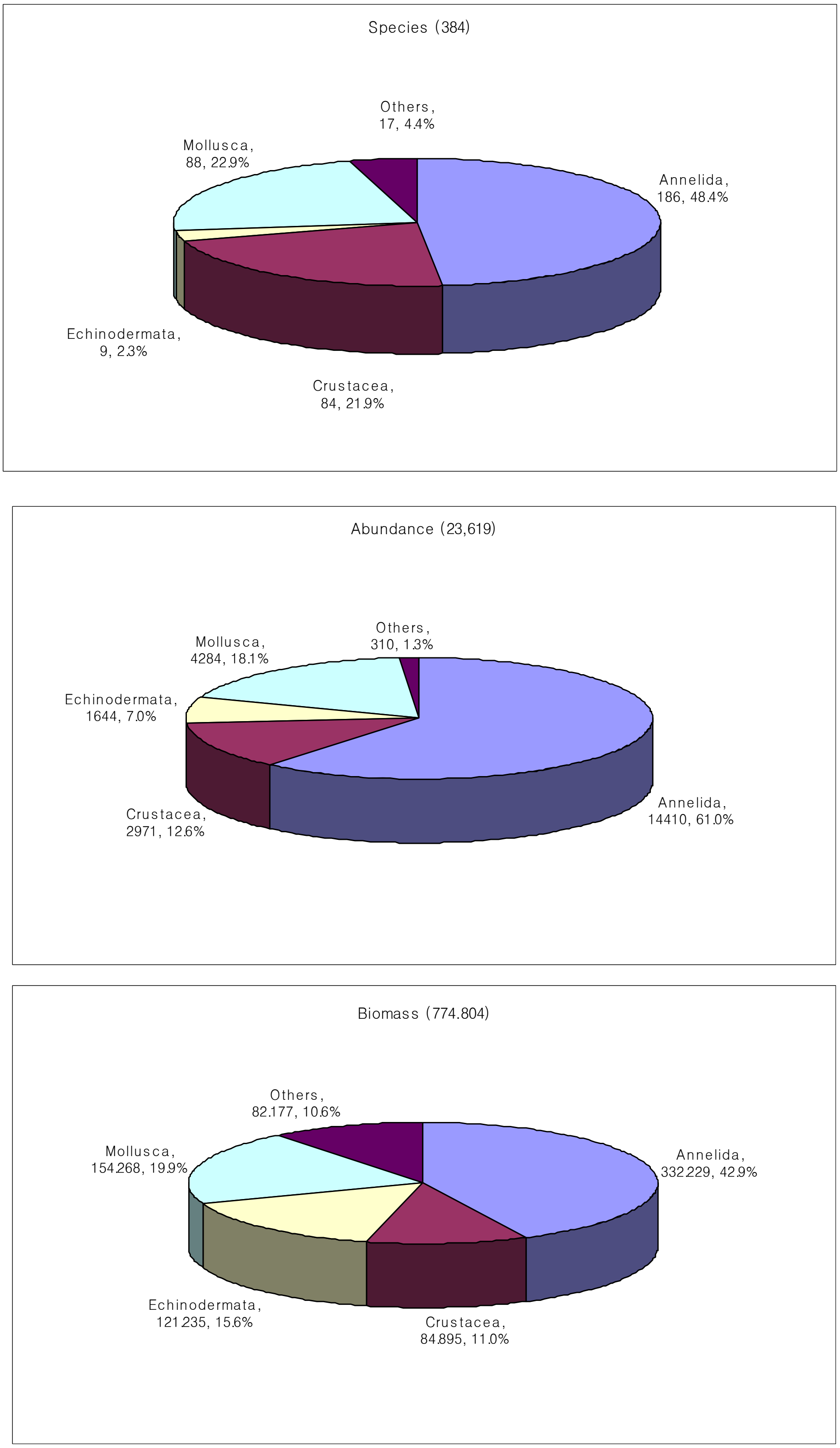

Fig. 11. Benthic community parameters. Upper: Number of Species, Middle: Abundance (Number of individuals), Lower: Biomass(g WWt) based on the 1992 Korea-China oceanographic cruise.

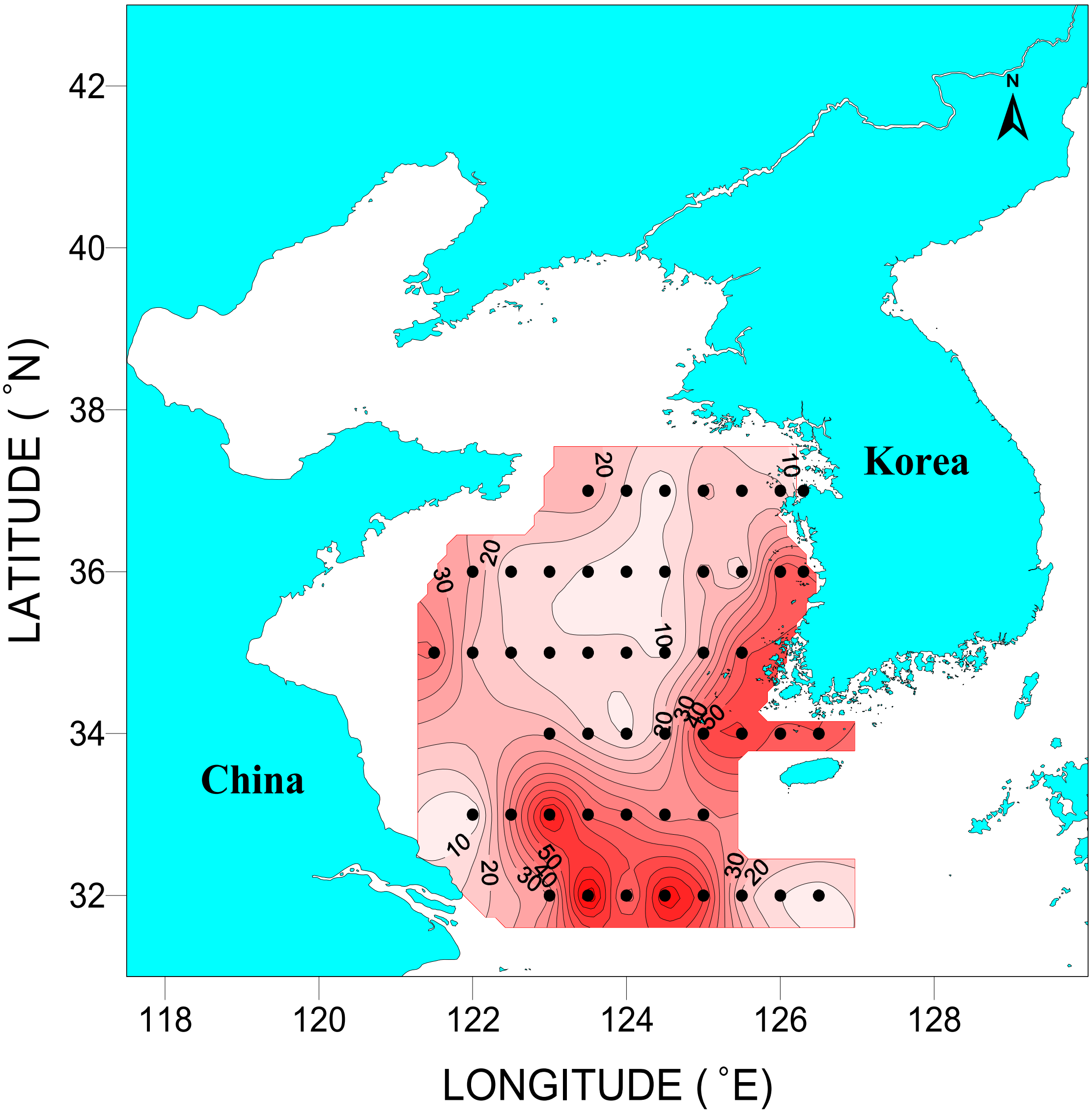

Fig. 12. Number of macrobenthic species/ $0.3m^2$ based on the 1992 Korea-China oceanographic cruise.

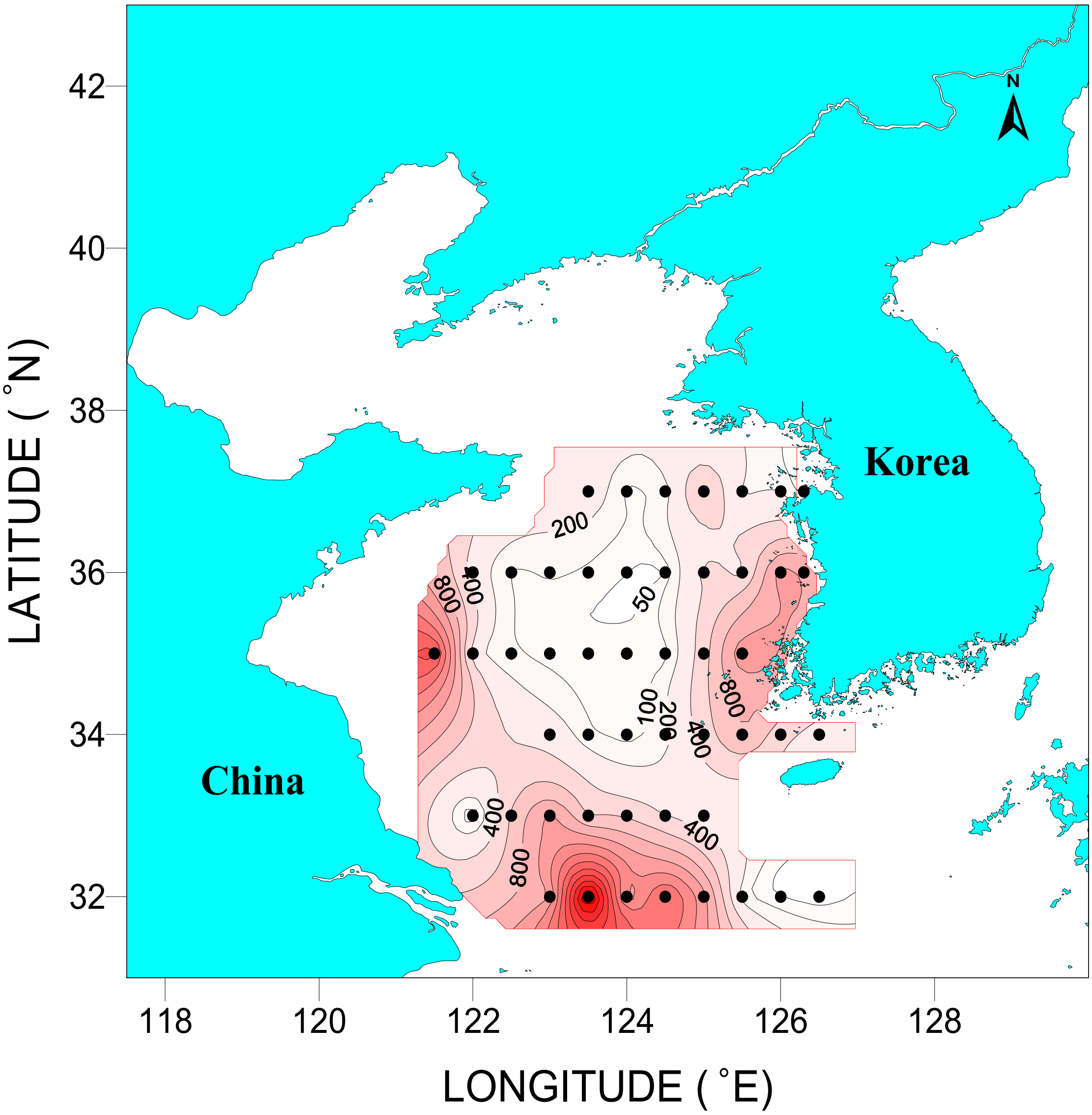

Fig. 13. Contour plot of abundance (ind./m^2) based on the 1992 Korea-China oceanographic cruise.

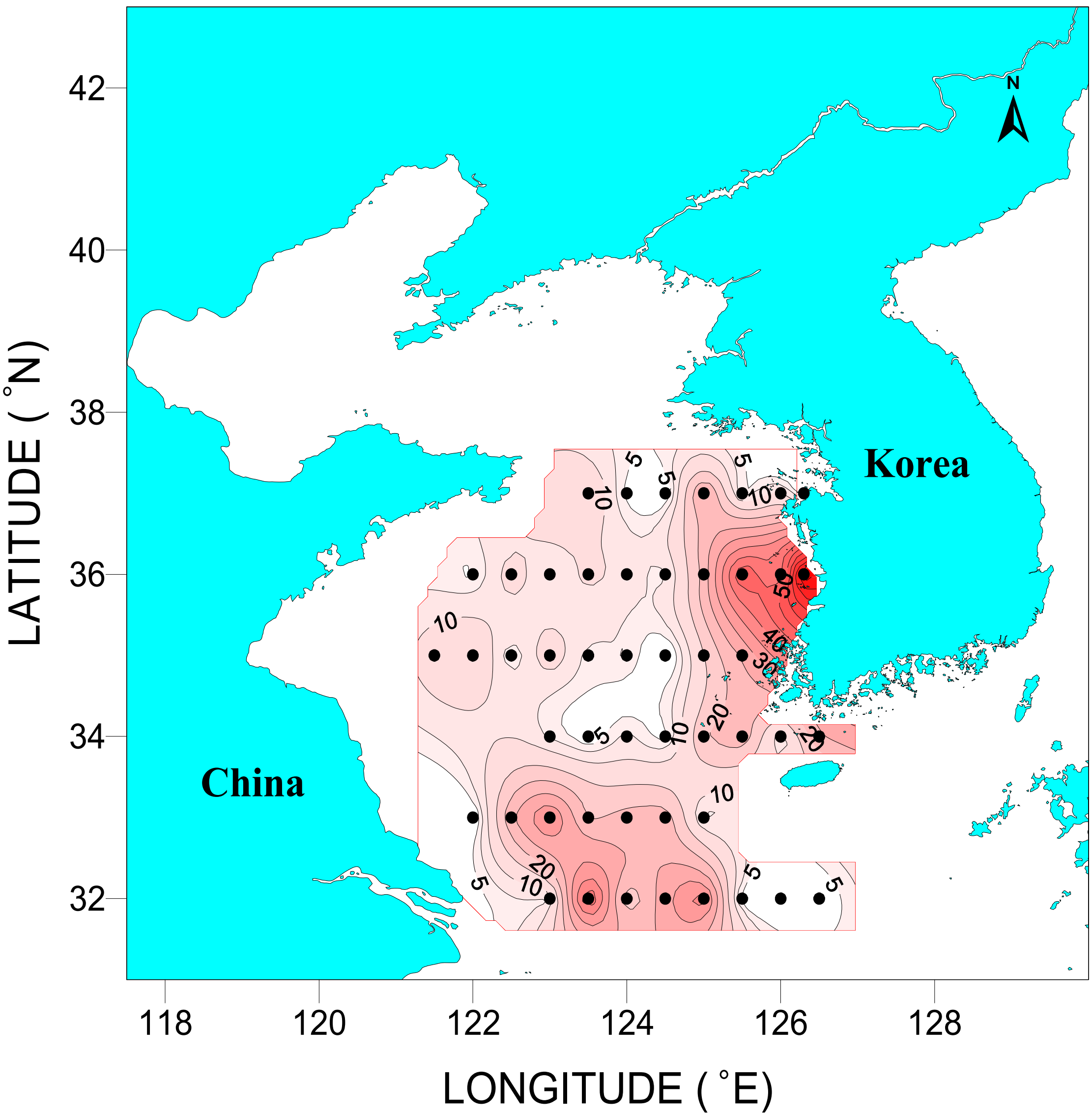

Fig.14. Contour plot of biomass (gWWt/m^2) based on the 1992 Korea-China oceanographic cruise.

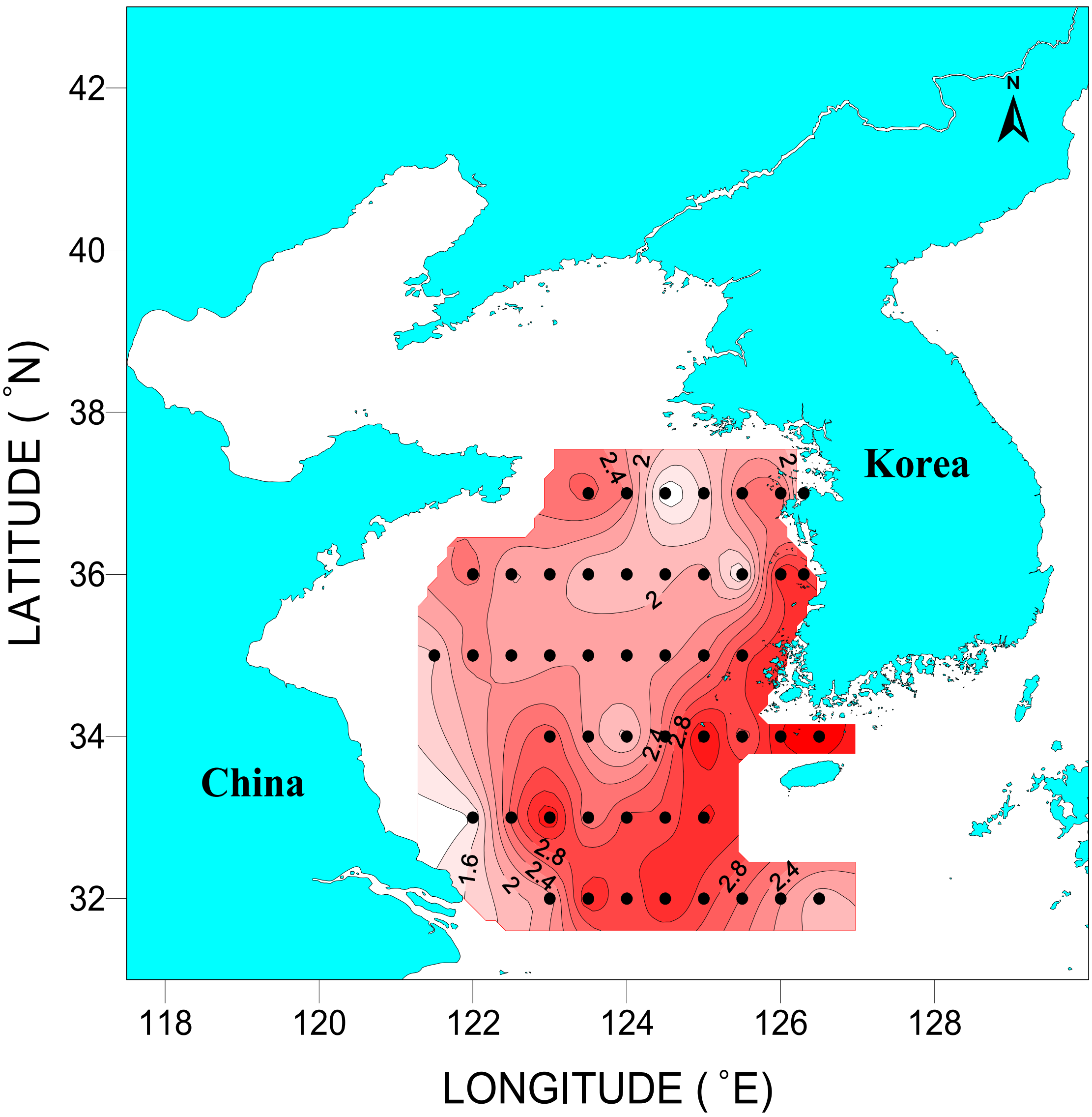

Fig. 15. Contour plot of the diversity index of the benthic communities based on the 1992 Korea-China oceanographic cruise.

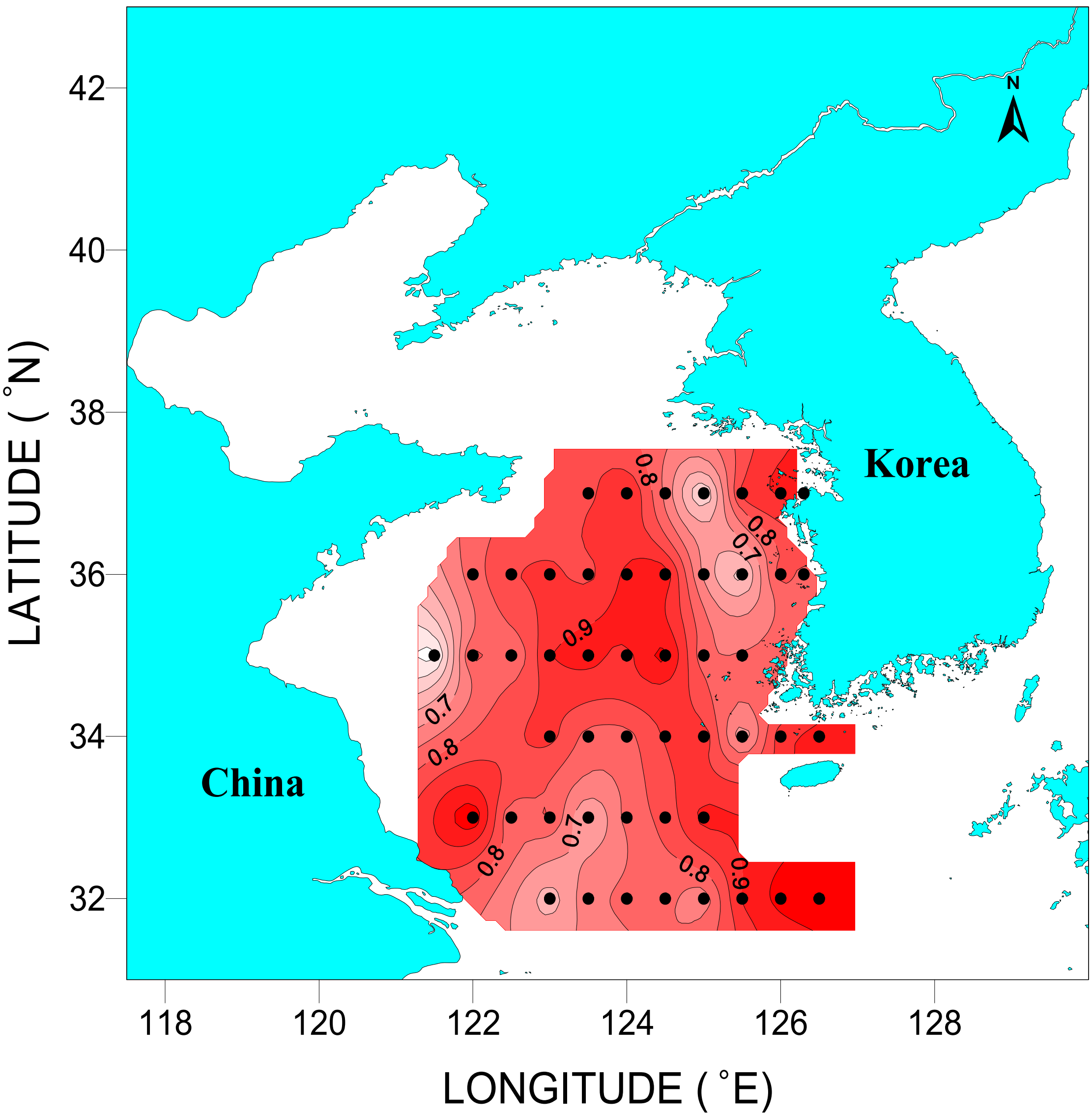

Fig. 16. Contour plot of the evenness based on the 1992 Korea-China oceanographic cruise.

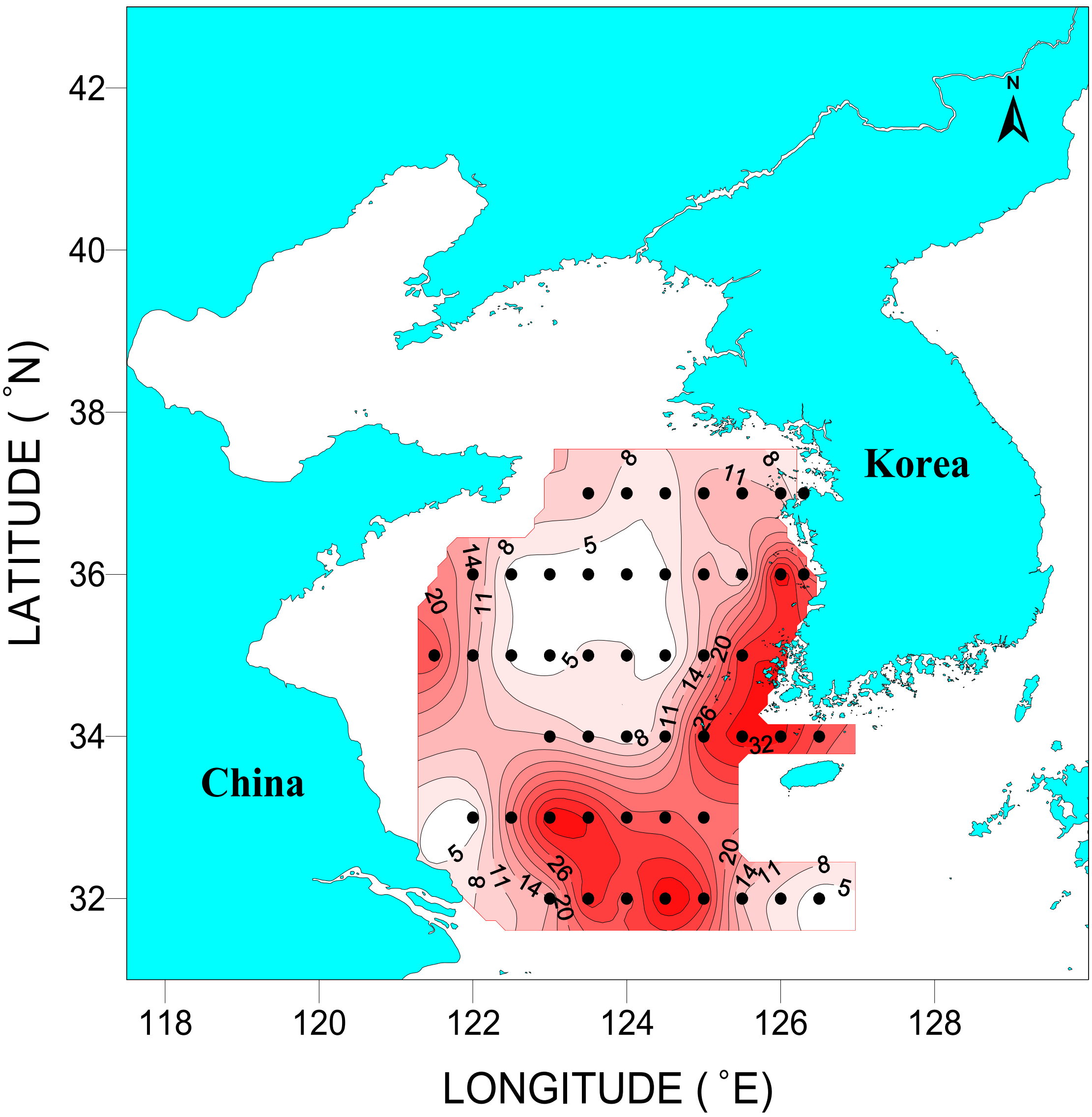

Fig. 17. Number of species (/0.3m^2) (Polychaeta) based on the 1992 Korea-China oceanographic cruise.

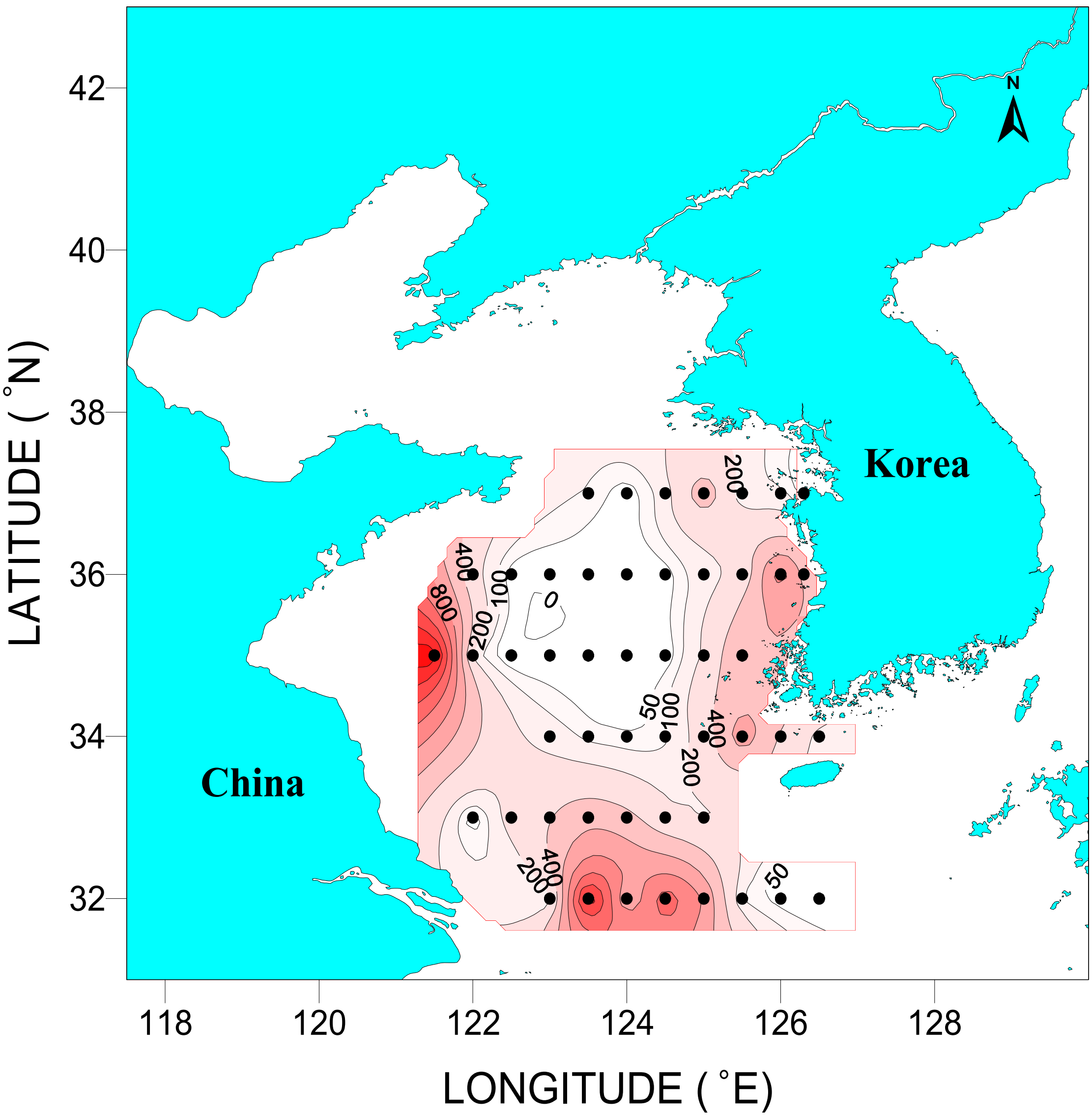

Fig. 18. Abundance of Polychaete (ind./m^2) based on the 1992 Korea-China oceanographic cruise.

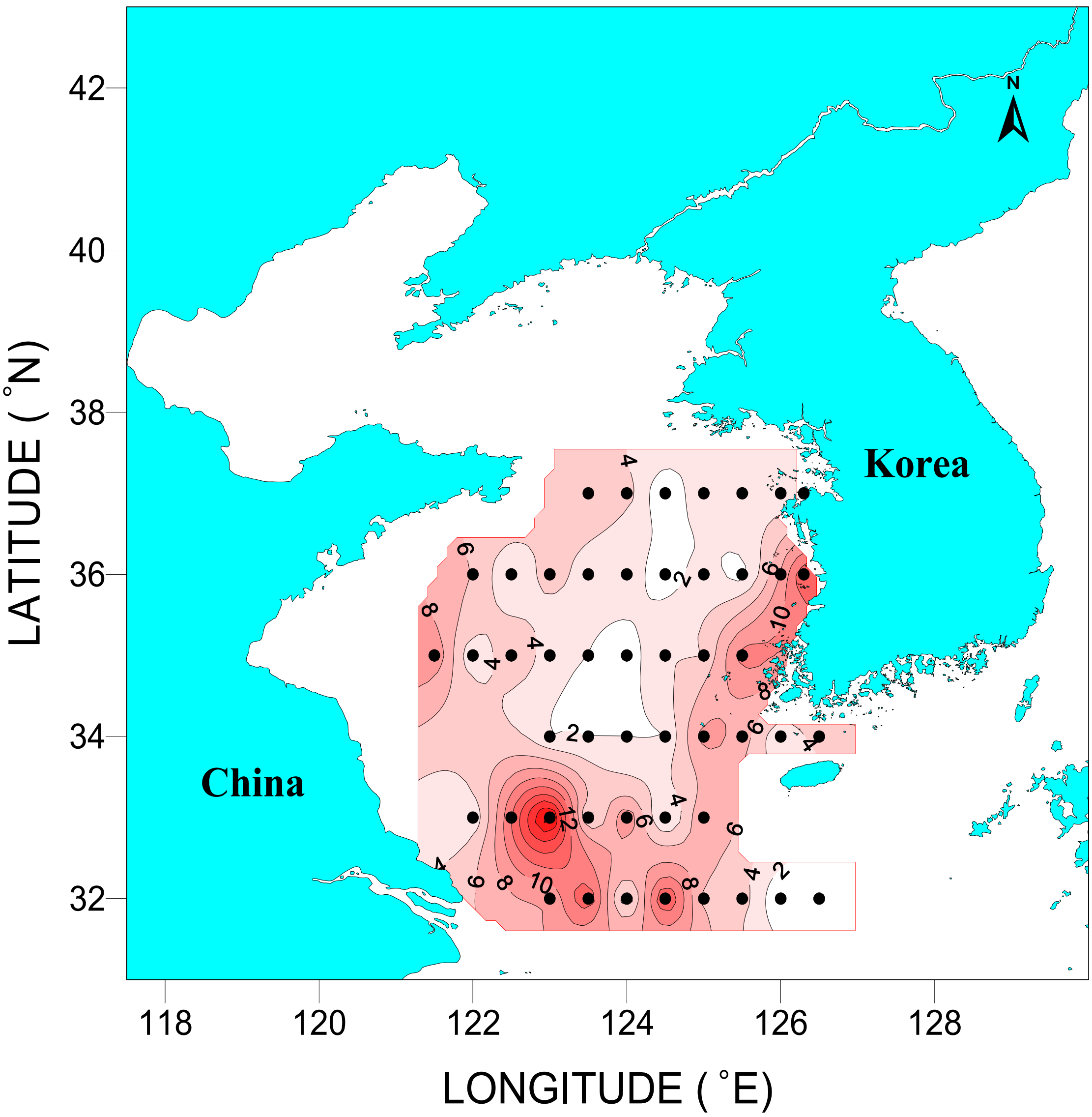

Fig. 19. Number of speices (/0.3m^2) (Crustacea) based on the 1992 Korea-China oceanographic cruise.

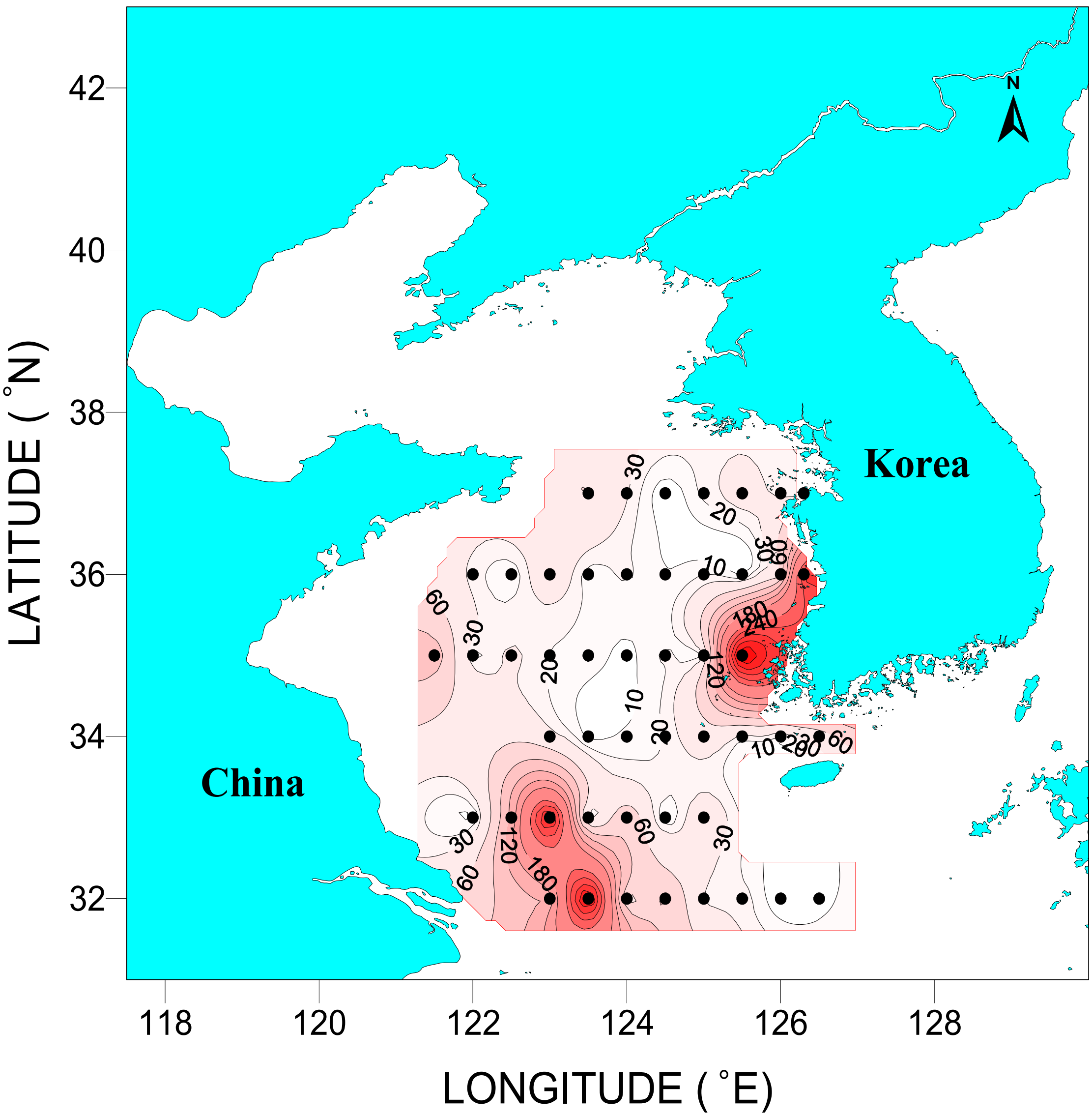

Fig. 20. Abundance of Crustacea (ind./m^2) based on the 1992 Korea-China oceanographic cruise.

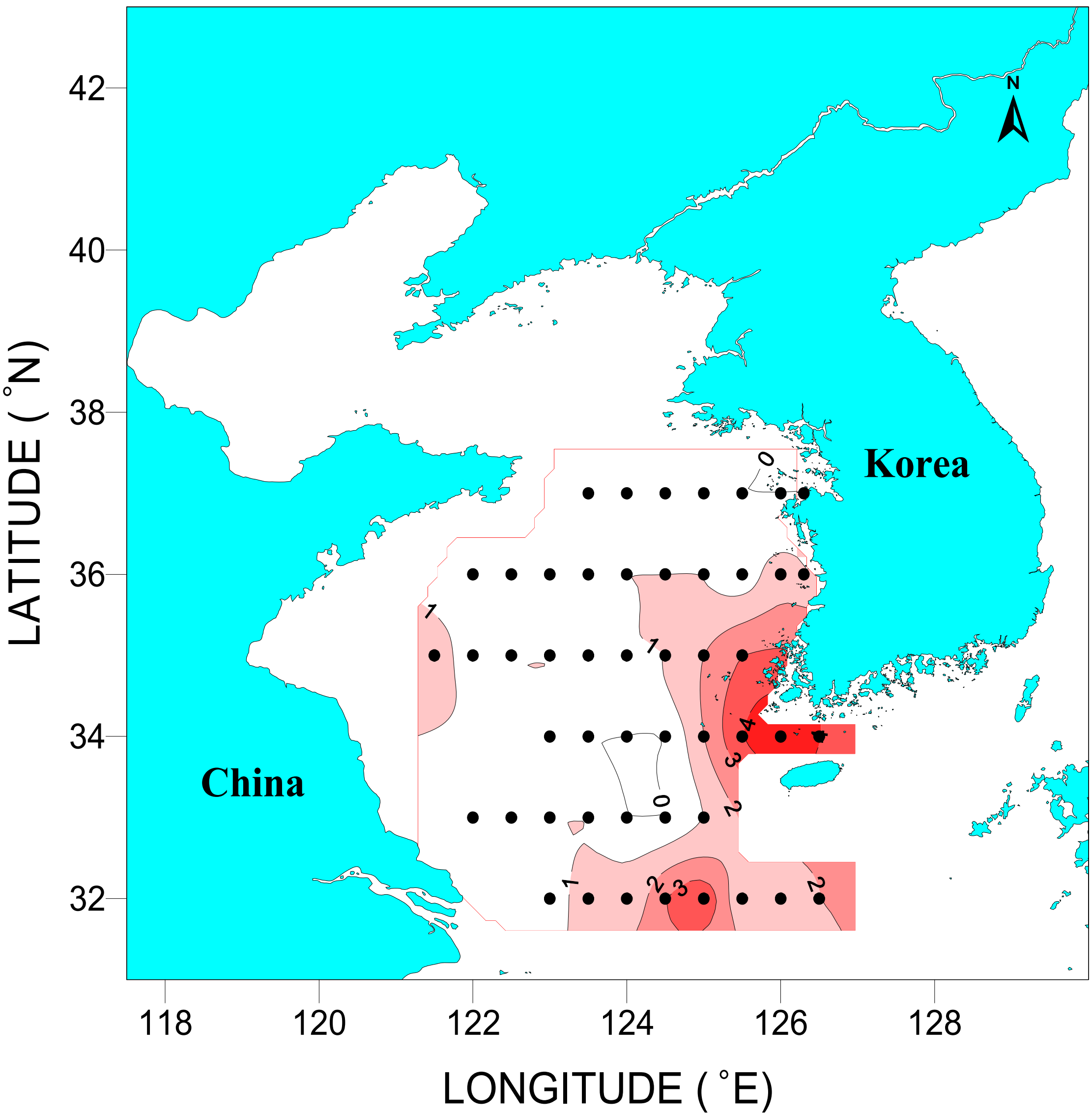

Fig. 21. Number of species (/0.3m^2) (Echinodermata) based on the 1992 Korea-China oceanographic cruise.

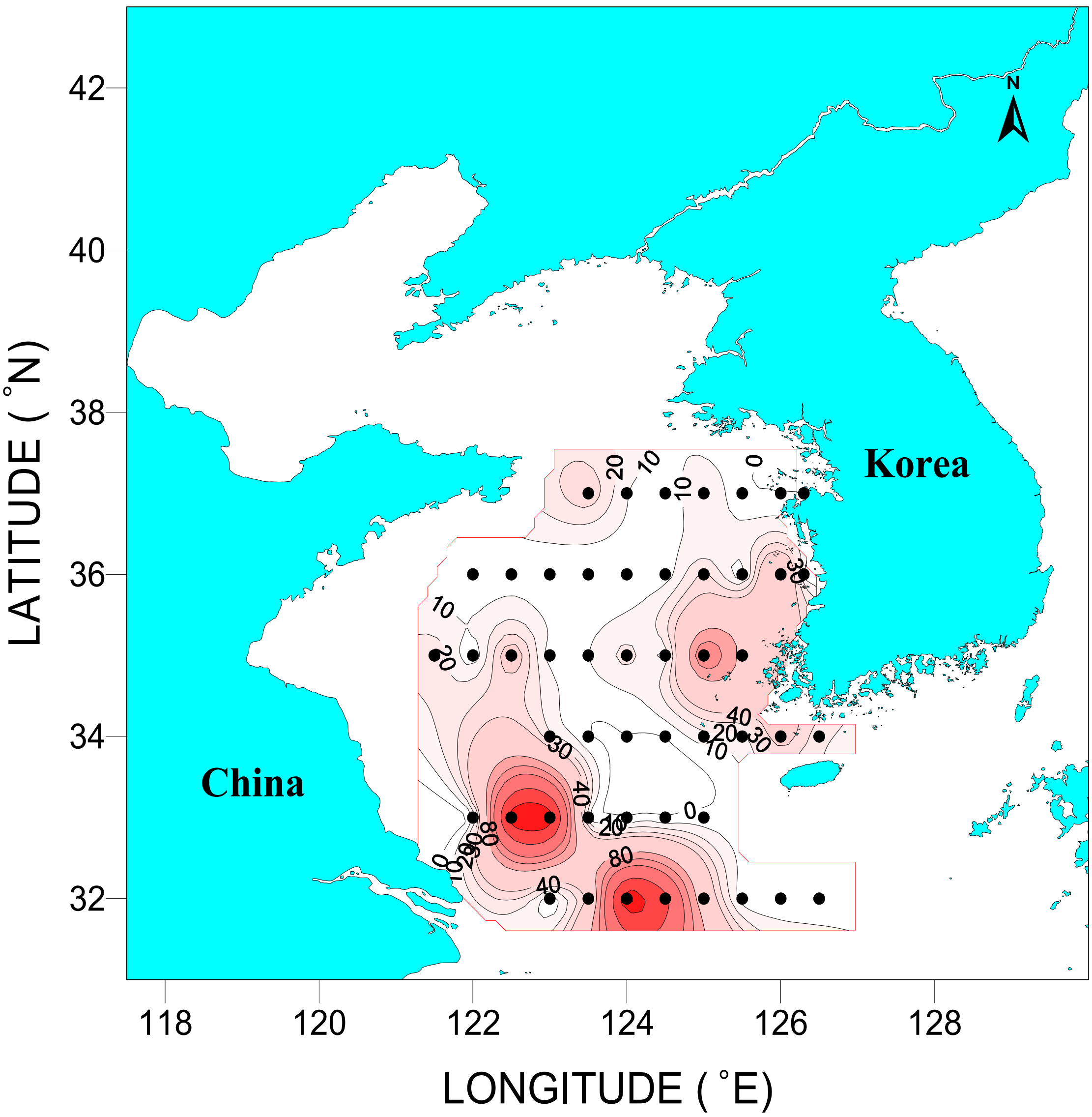

Fig. 22. Abundance of Echinodermata (ind./m^2) based on the 1992 Korea-China oceanographic cruise.

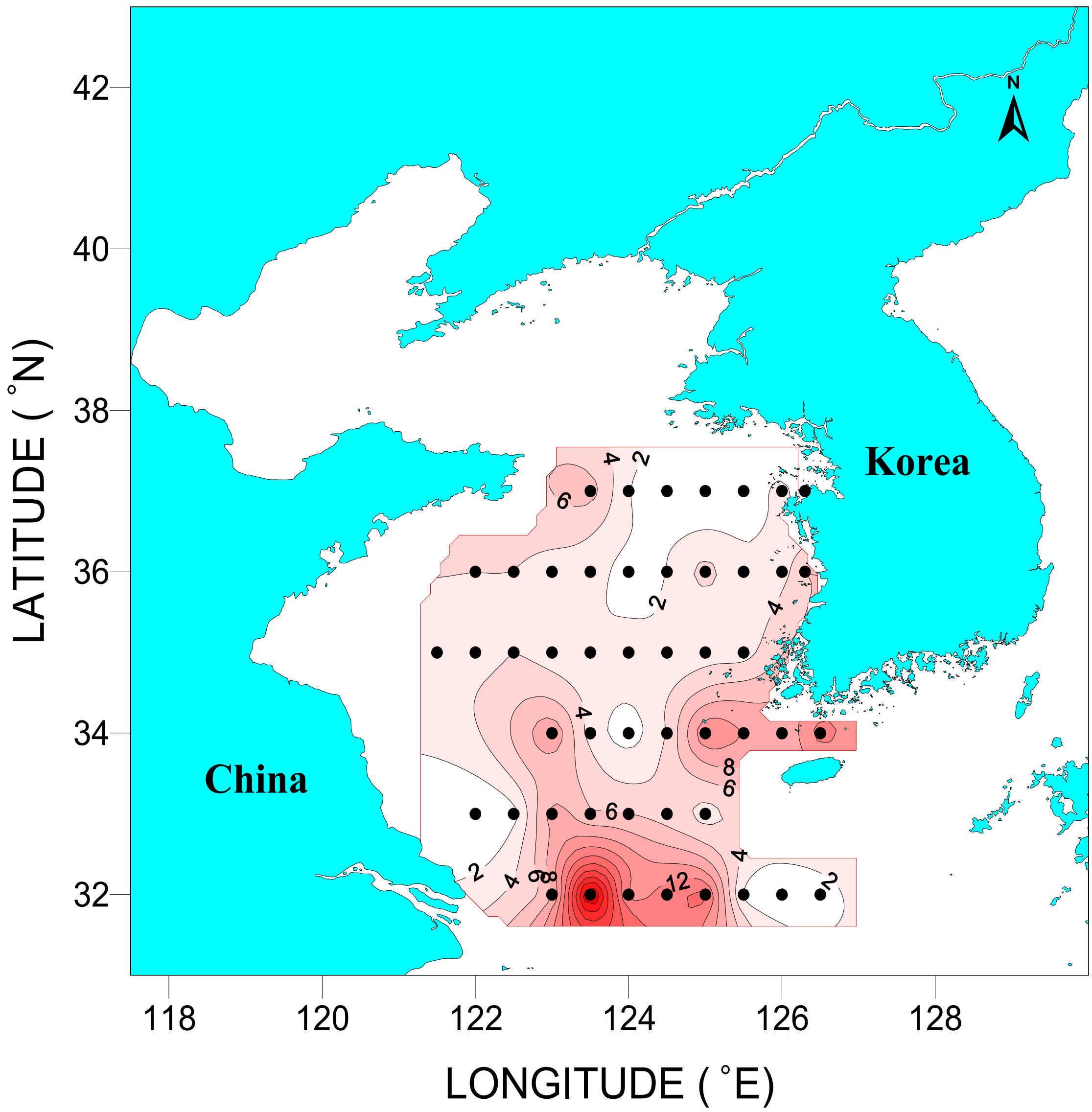

Fig. 23. Number of species (/0.3m2) (Mollusca) based on the 1992 Korea-China oceanographic cruise.

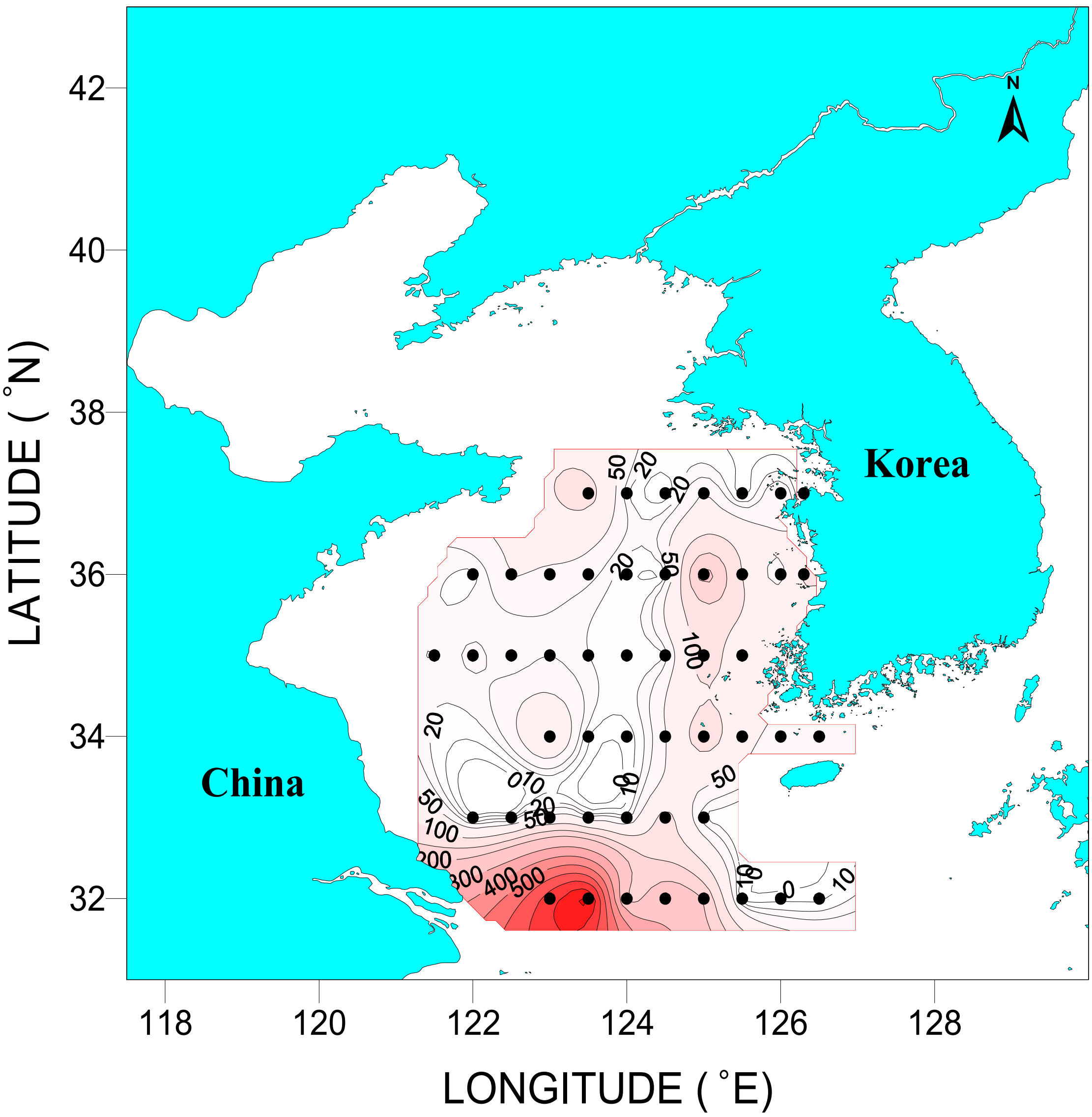

Fig. 24. Abundance of Crustacea (ind./m^2) based on the 1992 Korea-China oceanographic cruise.

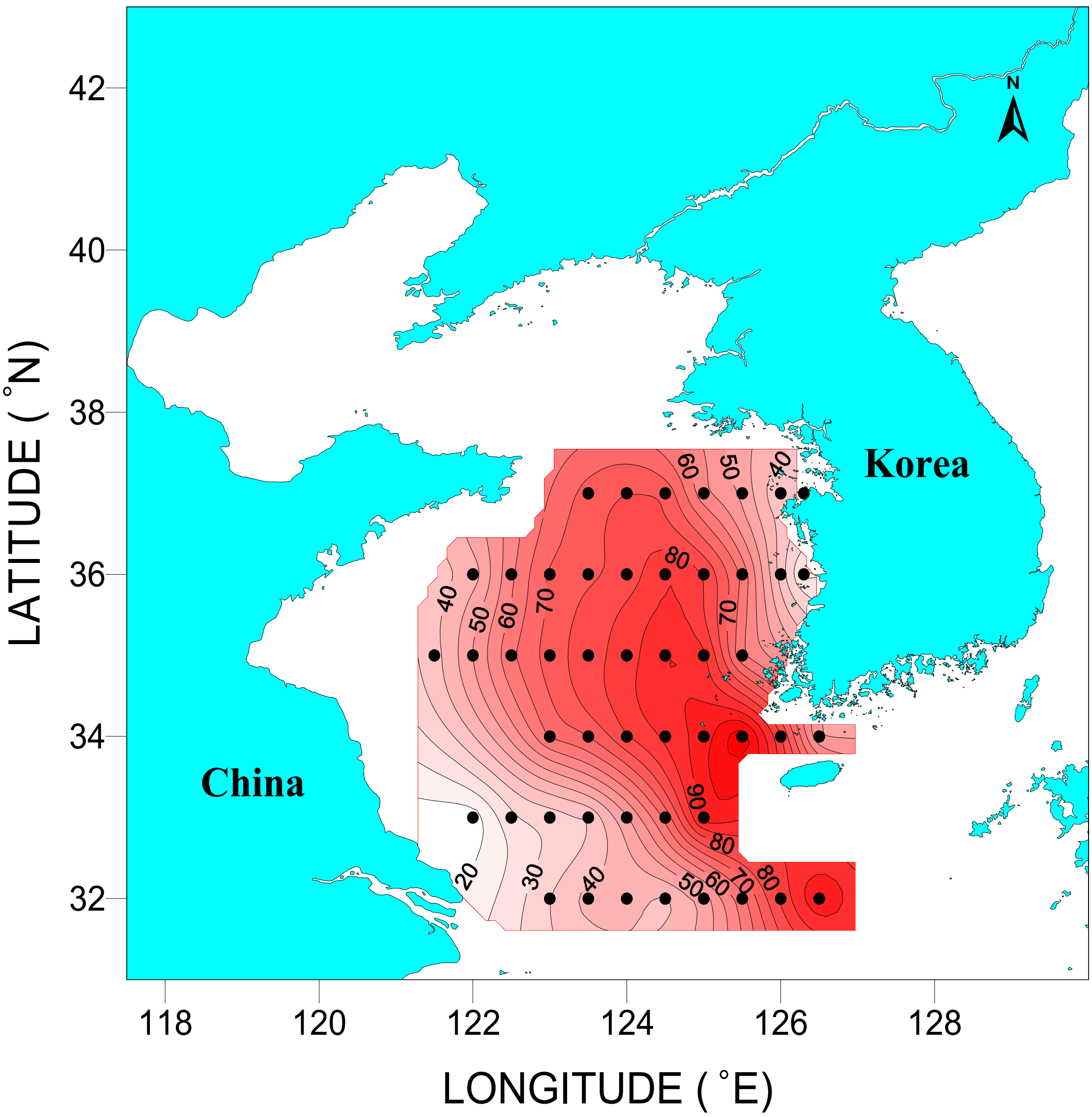

Fig. 25. Depth (*m*) distribution of the benthic survey from 1992 Korea-China oceanographic cruise.

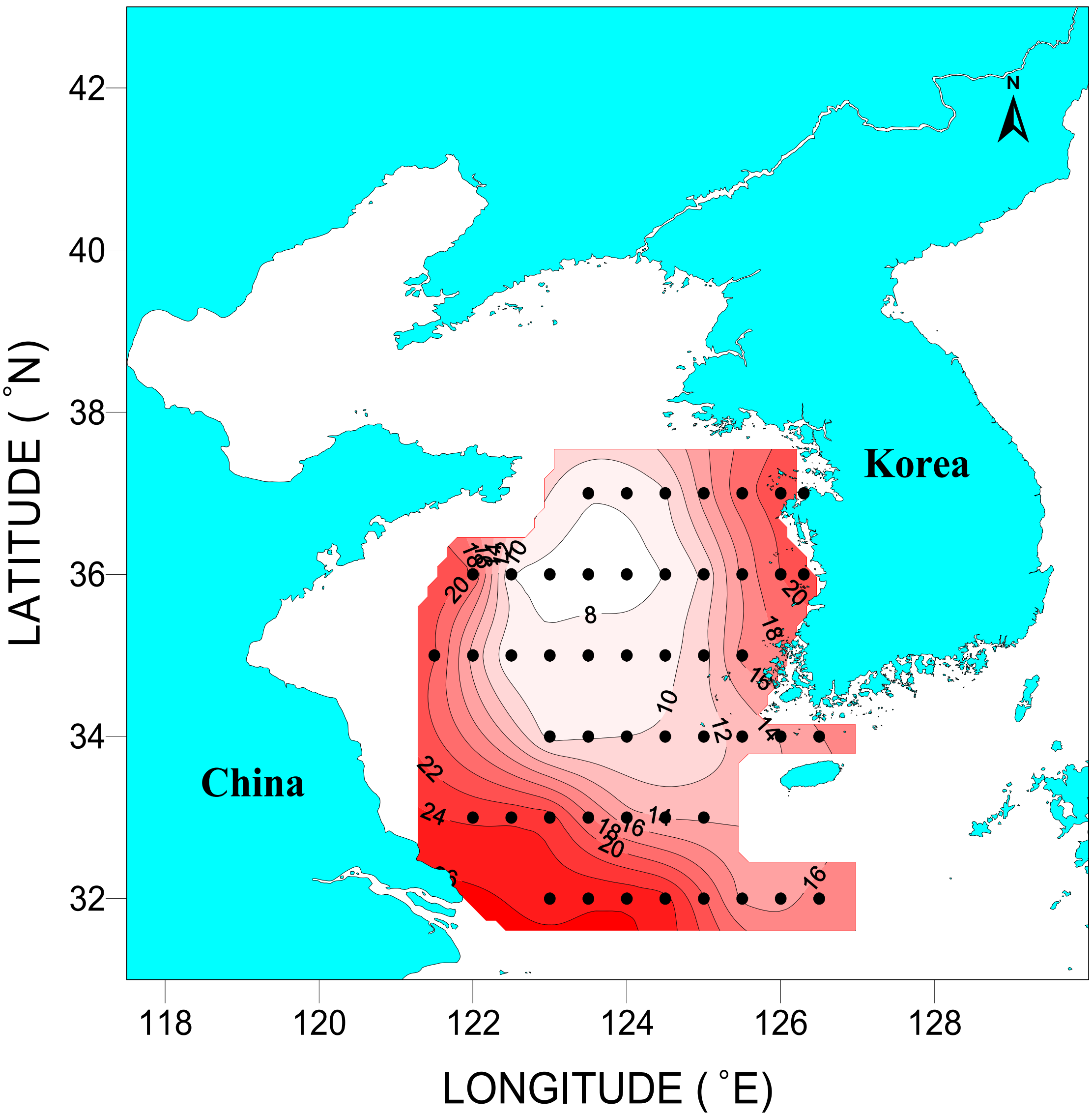

Fig. 26. Bottom water temperature (℃) from 1992 Korea-China oceanographic cruise.

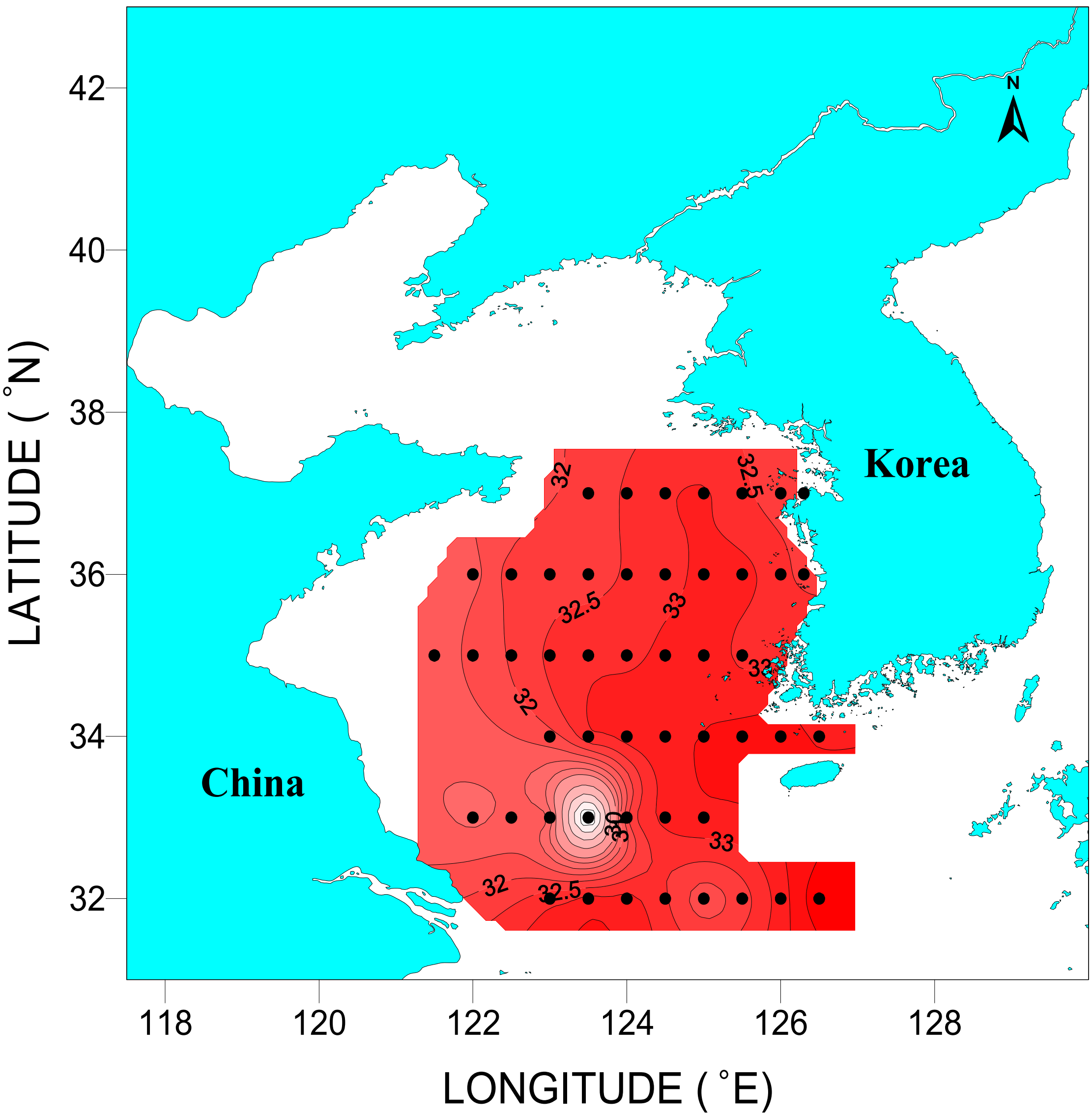

Fig. 27. Bottom water salinity (psu) from 1992 Korea-China oceanographic cruise.

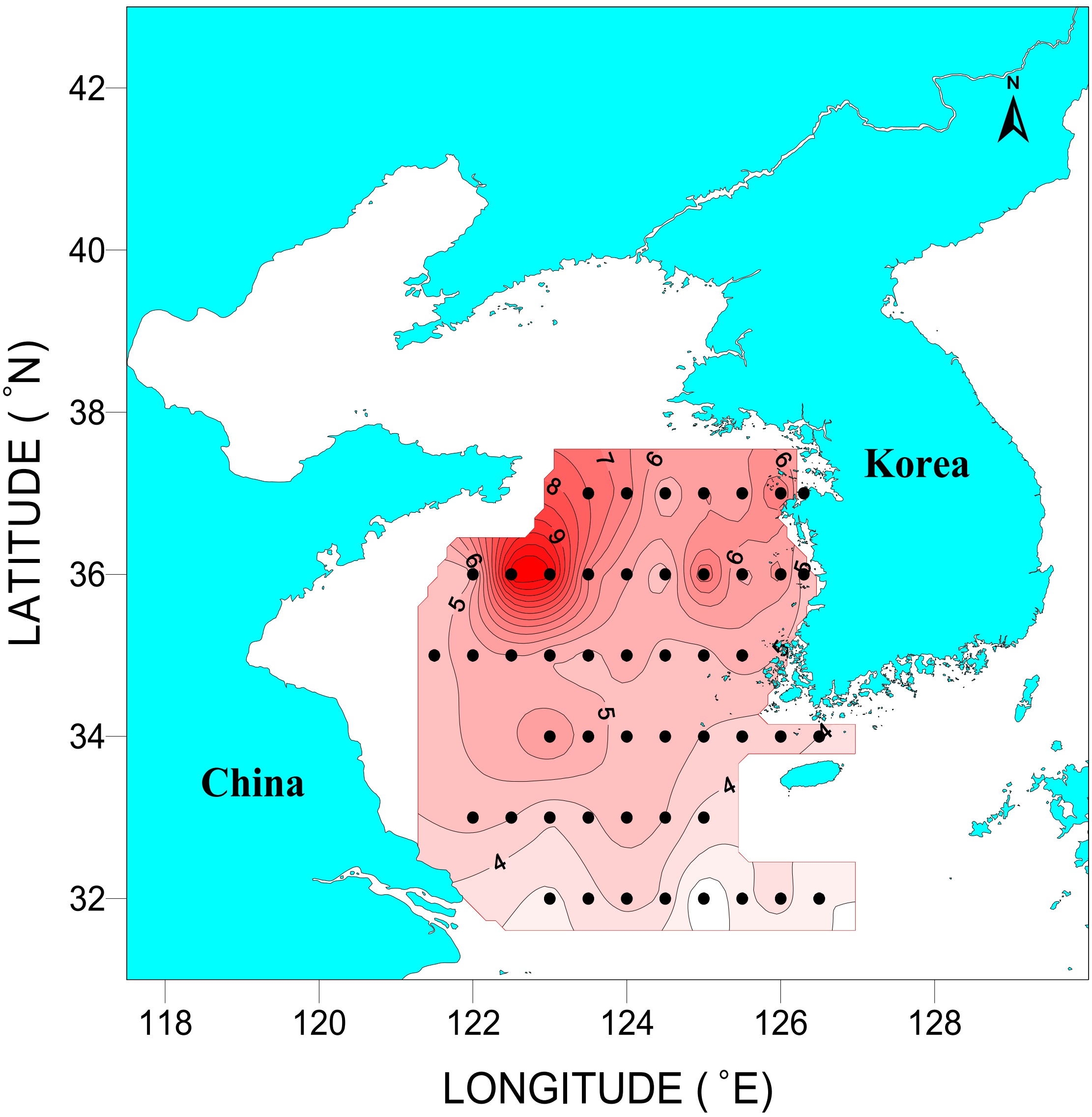

Fig. 28. Contour plot of bottom water dissolved oxygen (*ml/l*) from 1992 Korea-China oceanographic cruise.

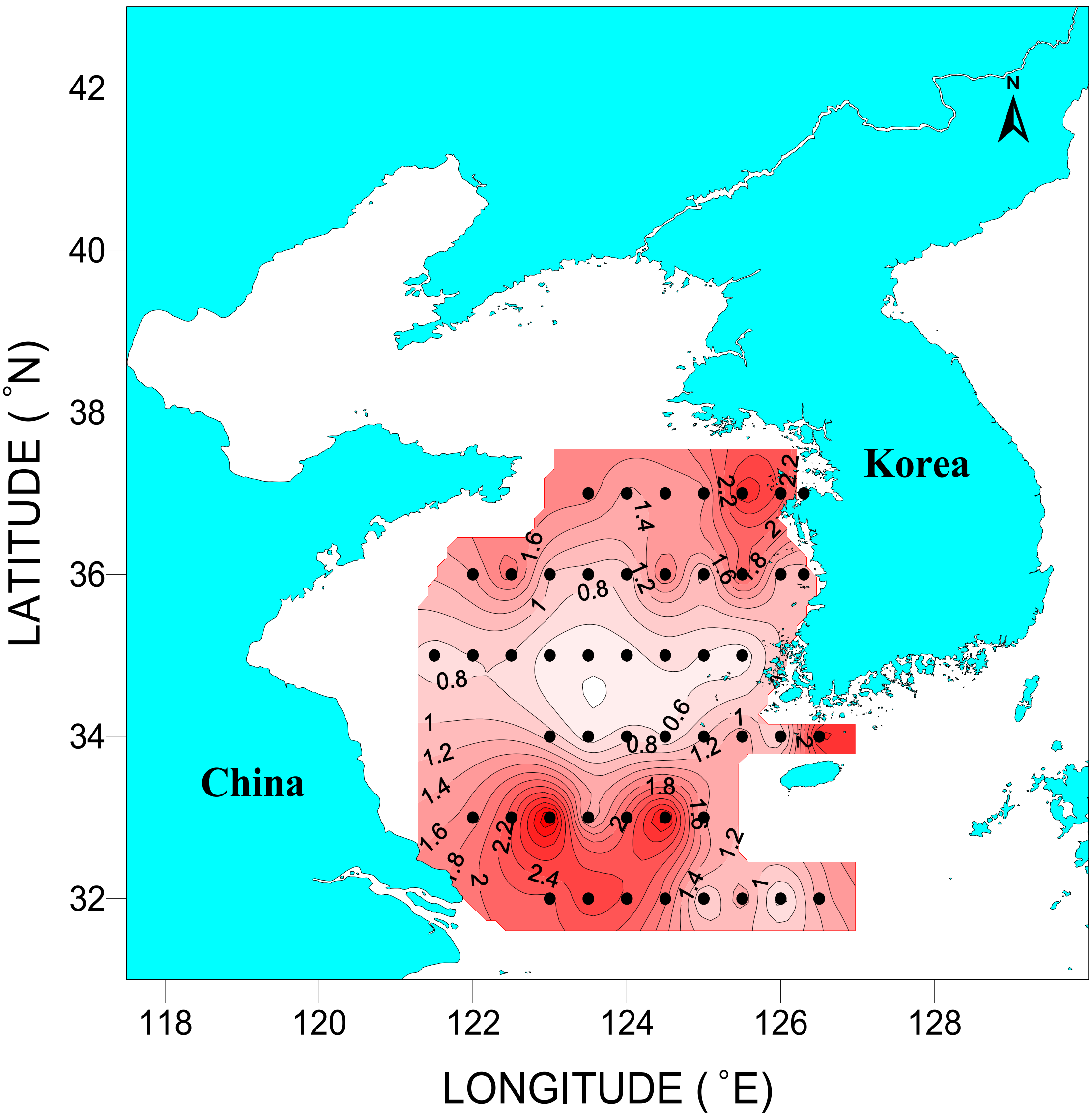

Fig. 29. COD (mgO_2/l) of the surface sediment from 1992 Korea-China oceanographic cruise.

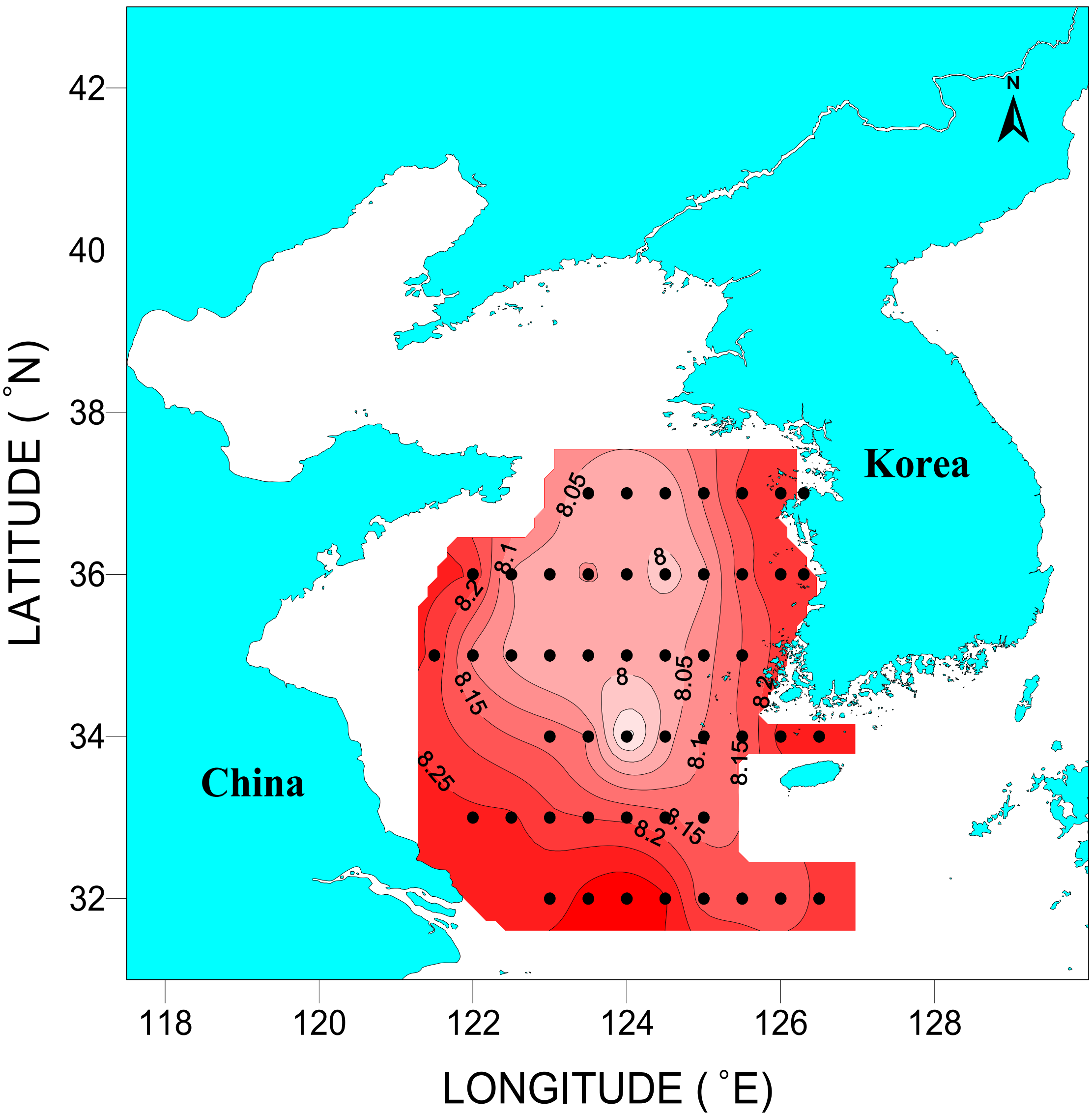

Fig. 30. pH of the bottom water from 1992 Korea-China oceanographic cruise.

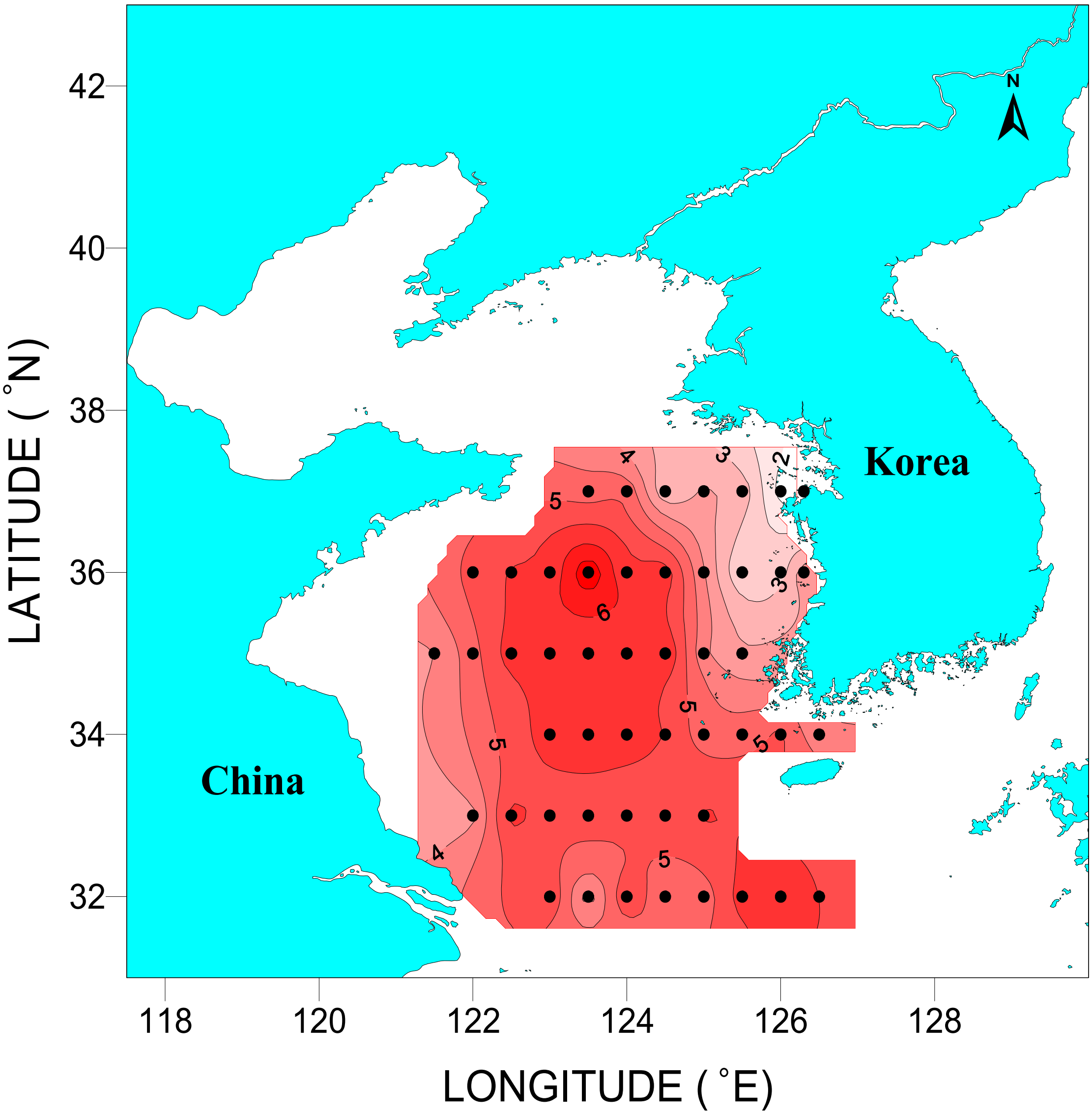

Fig. 31. Mean phi of the surface sediment from 1992 Korea-China oceanographic cruise.

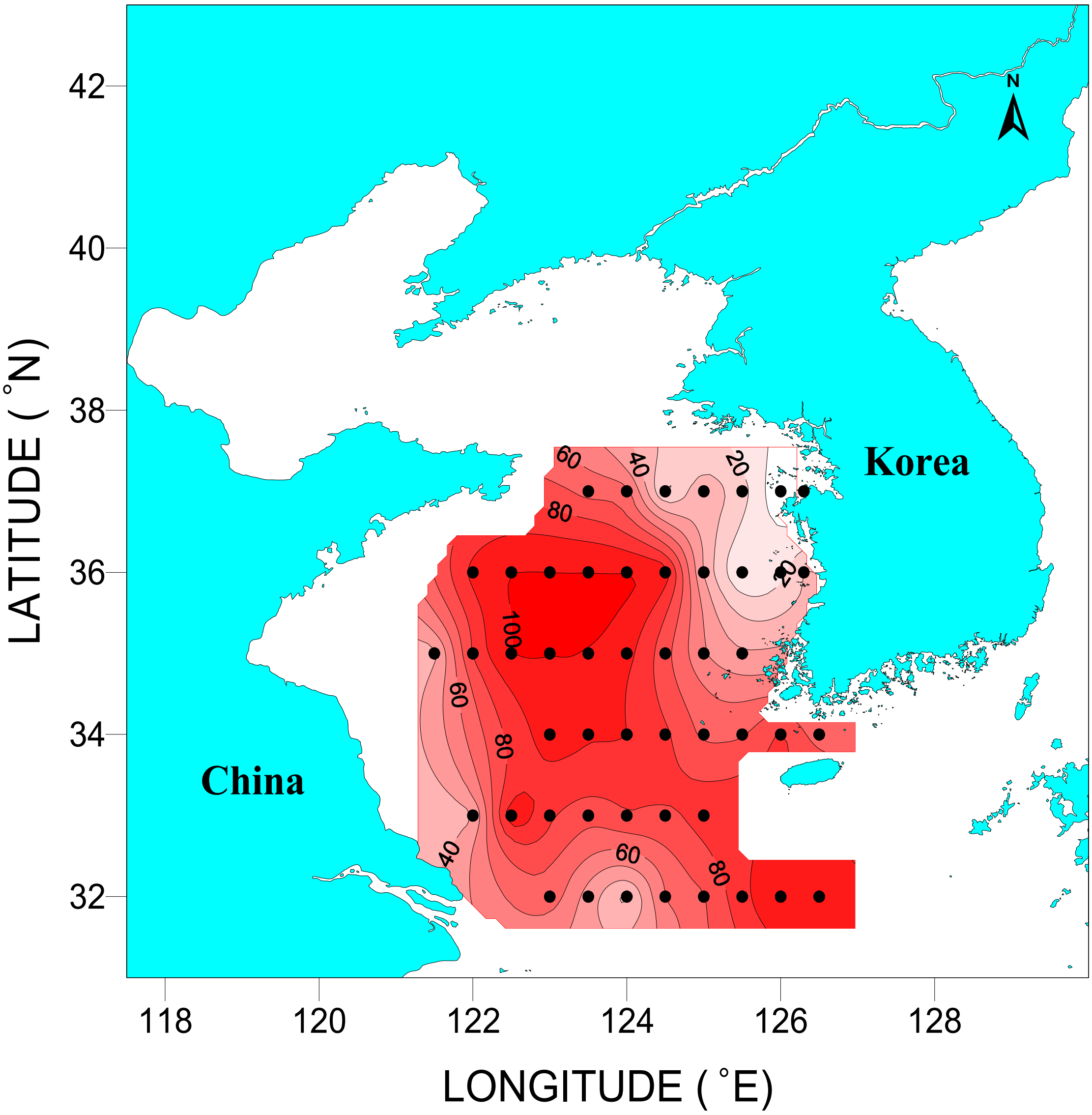

Fig. 32. Mud content (%) of the surface sediment from 1992 Korea-China oceanographic cruise.

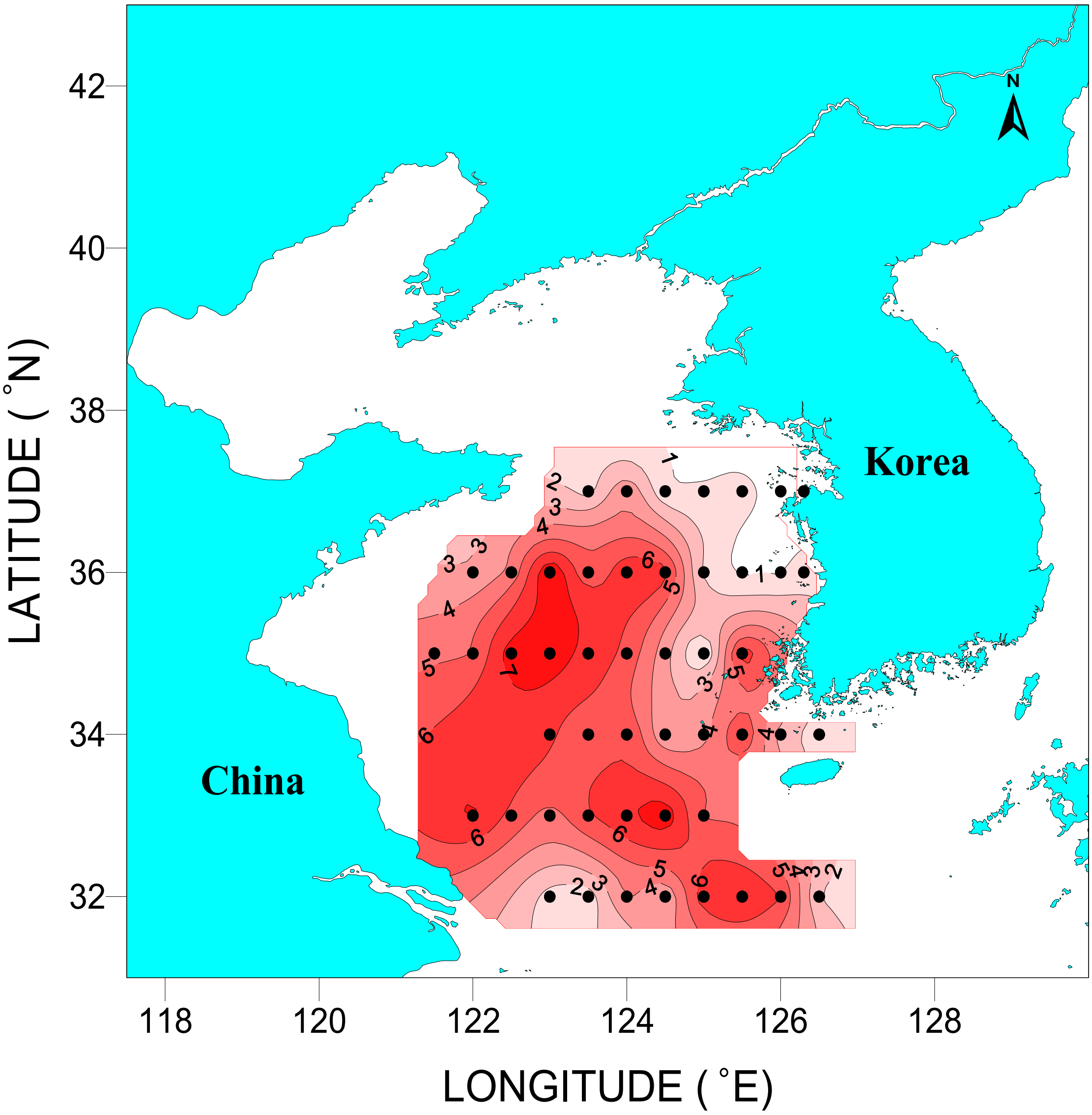

Fig. 33. Ignition loss (%) of the surface sediment from 1992 Korea-China oceanographic cruise.

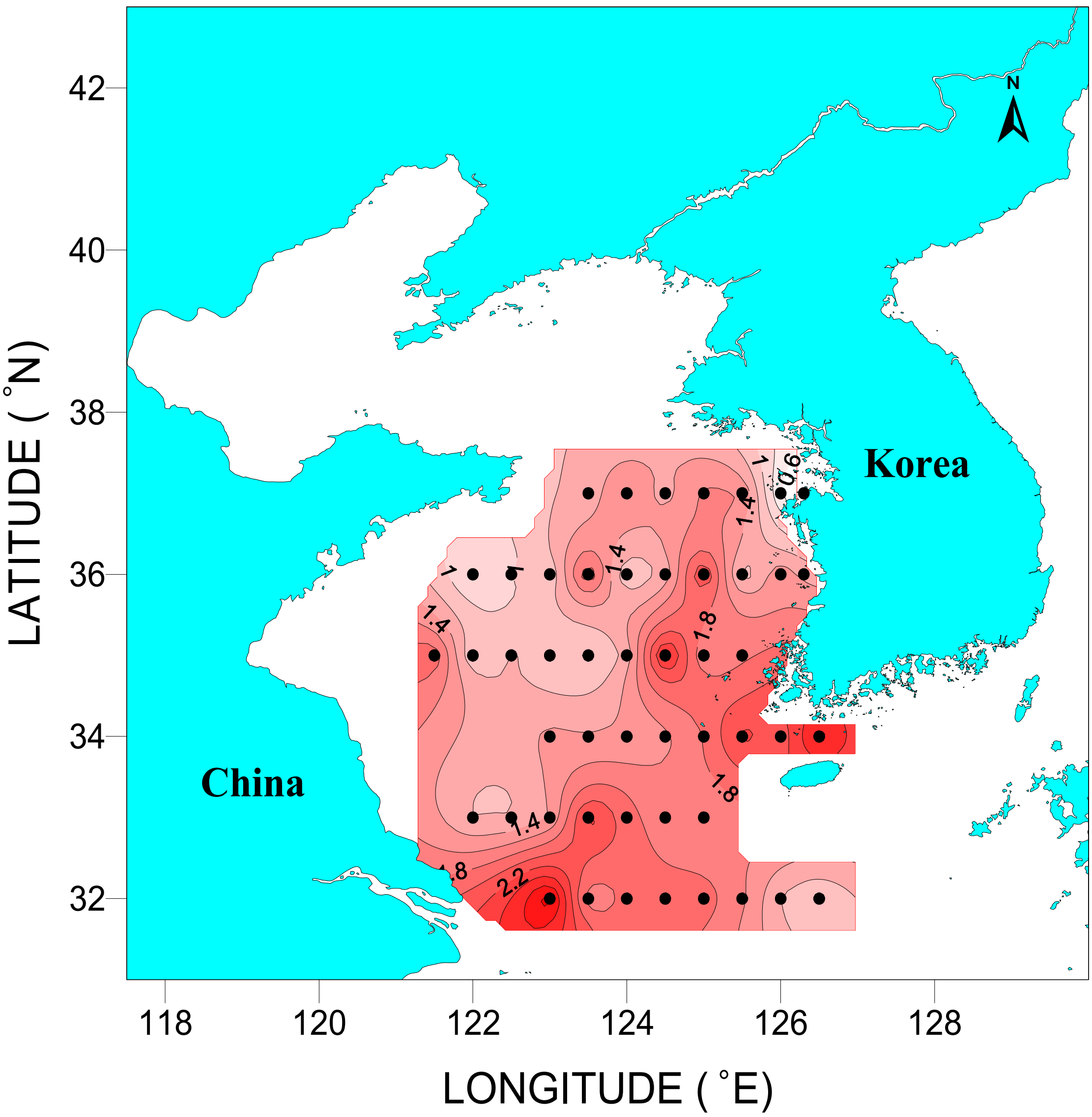

Fig. 34. Sorting value of the surface sediment from 1992 Korea-China oceanographic cruise.

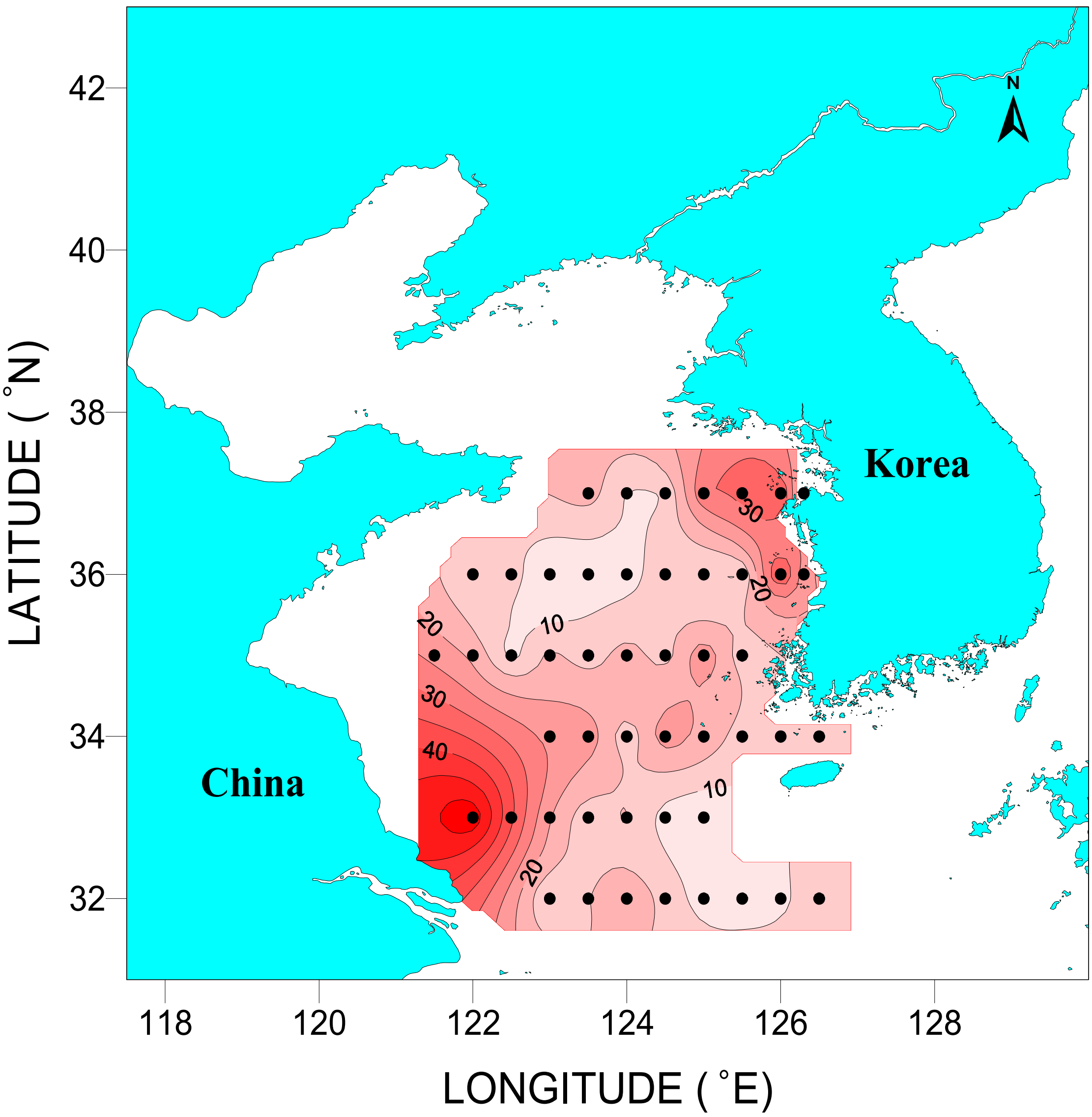

Fig. 35. Contour plot of SS (*mg/l*) from 1992 Korea-China oceanographic cruise.

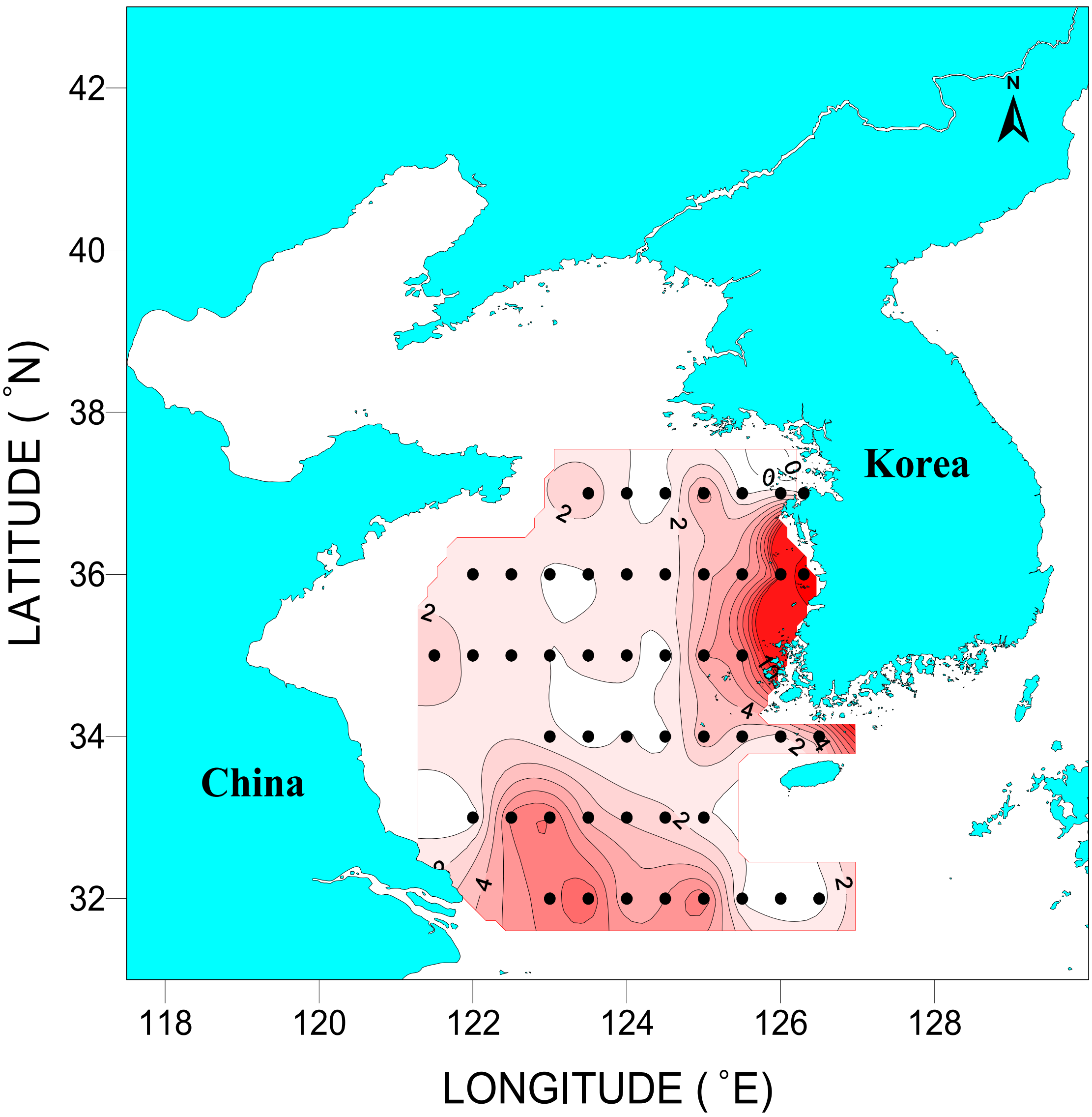

Fig. 36. Contour plot of benthic community productivity (gAFDW $m^{-2}y^{-1}$) from the benthic samples in 1992 Korea-China oceanographic cruise.

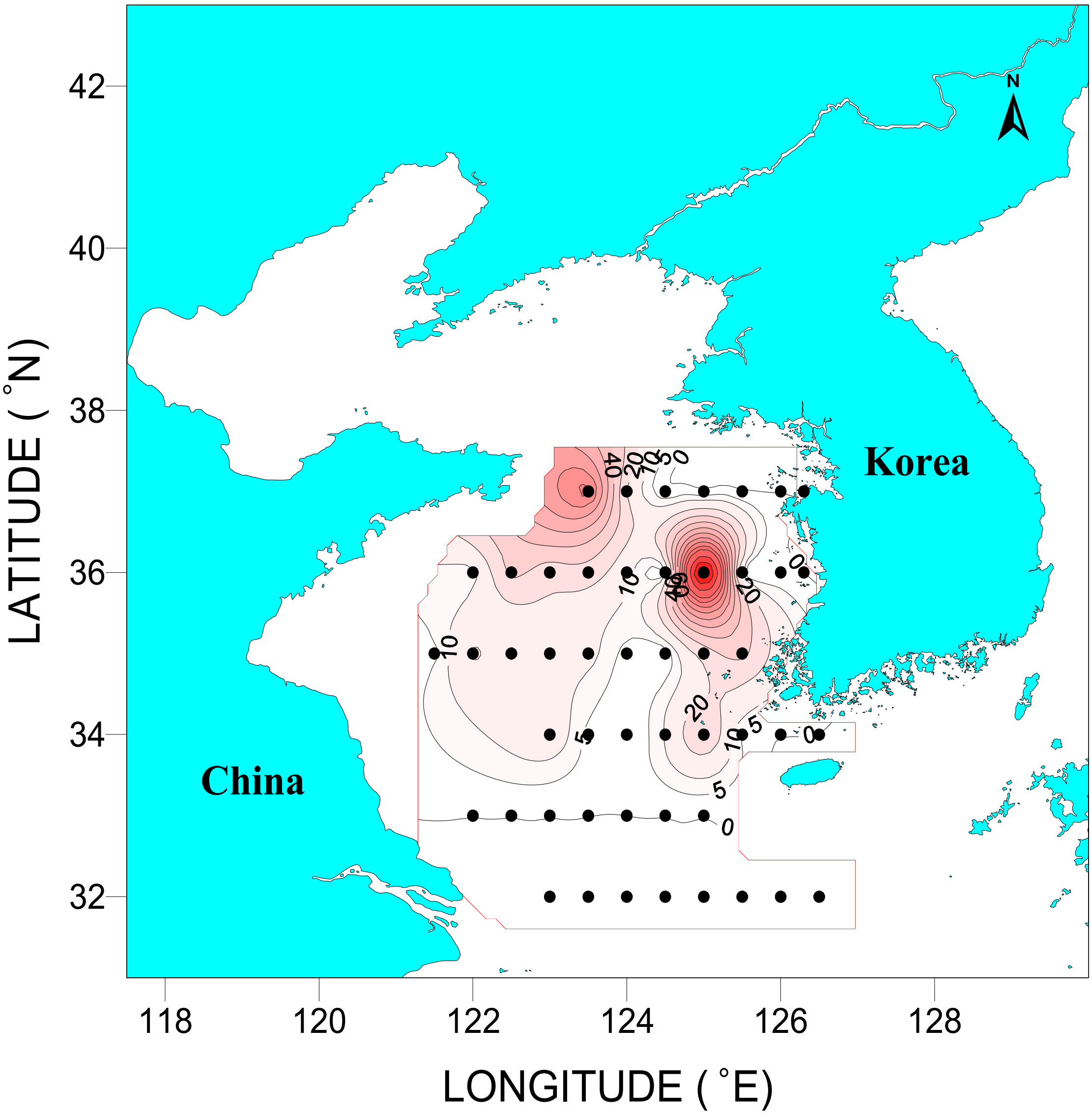

Fig. 37. Abundance of *Thyasira tokunagi* (inds./m^2) based on the data in 1992 Korea-China oceanographic cruise.

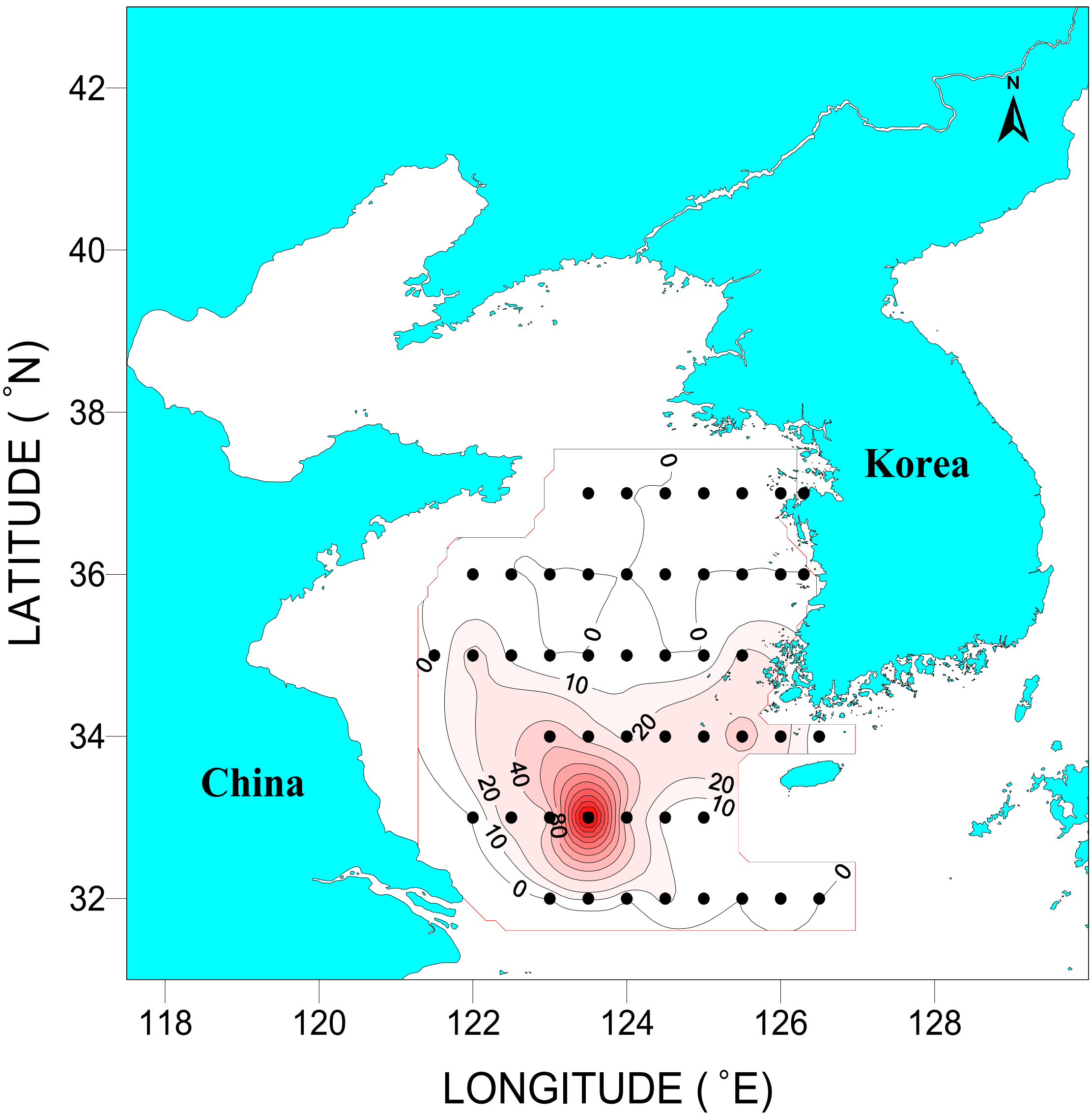

Fig. 38. Abundance of *Terebellides stroemii* (inds./ m^2) based on the data in 1992 Korea-China oceanographic cruise.

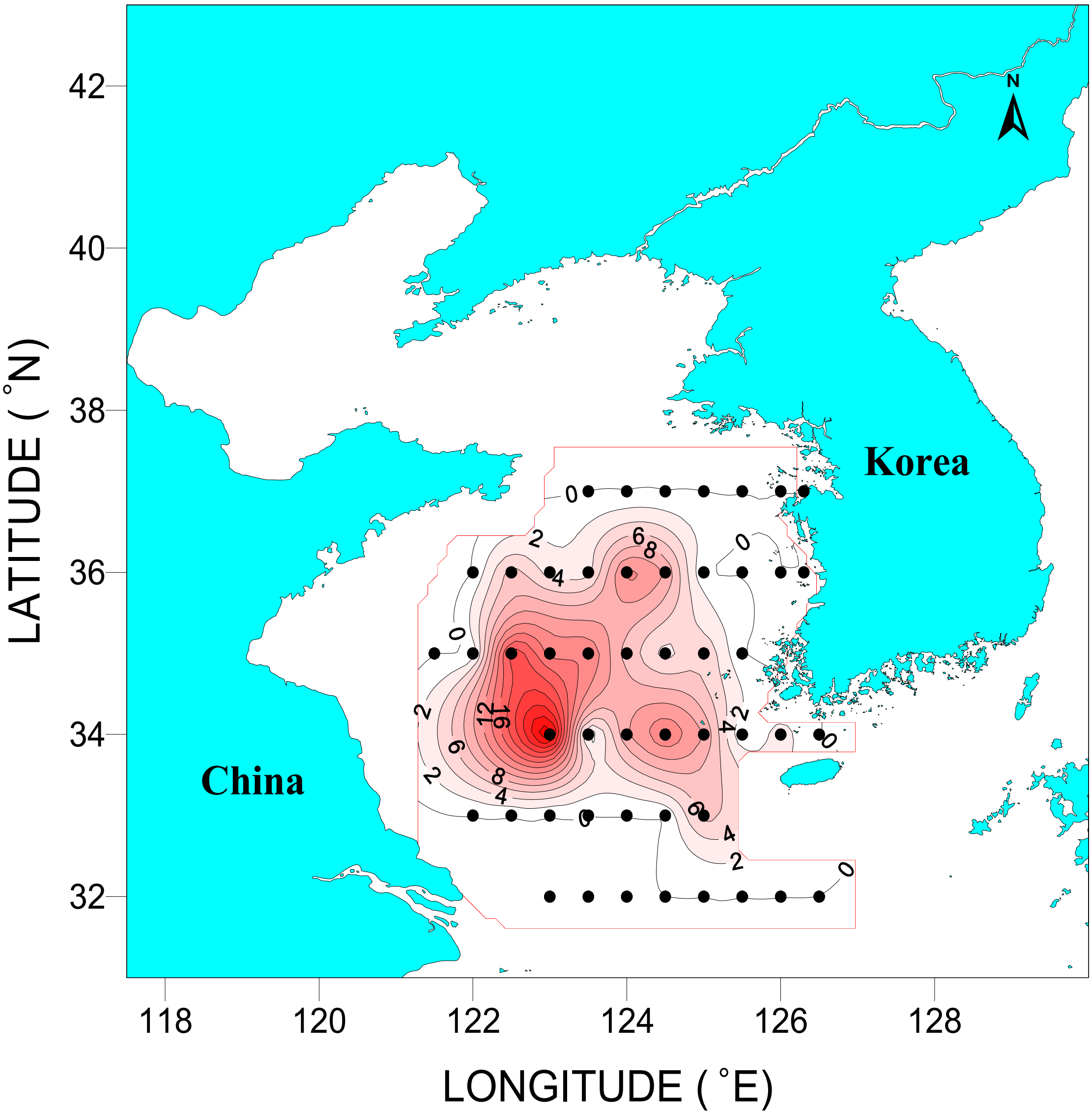

Fig. 39. Abundance of *Eudorella hwangaensis* (inds./ m^2) based on the data in 1992 Korea-China oceanographic cruise.

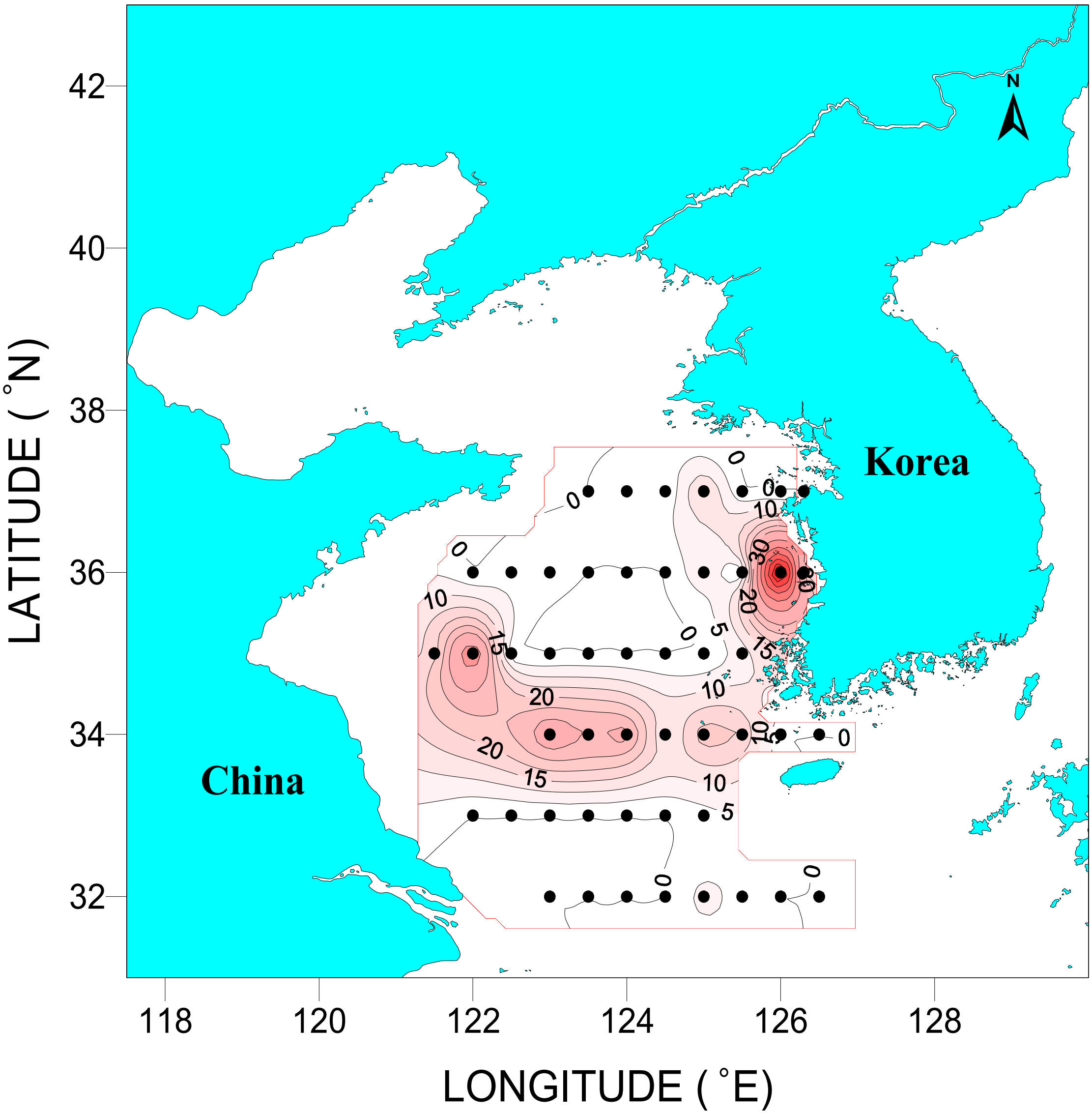

Fig. 40. Abundance of *Praxillella affinis* (inds./ m^2) based on the data in 1992 Korea-China oceanographic cruise.

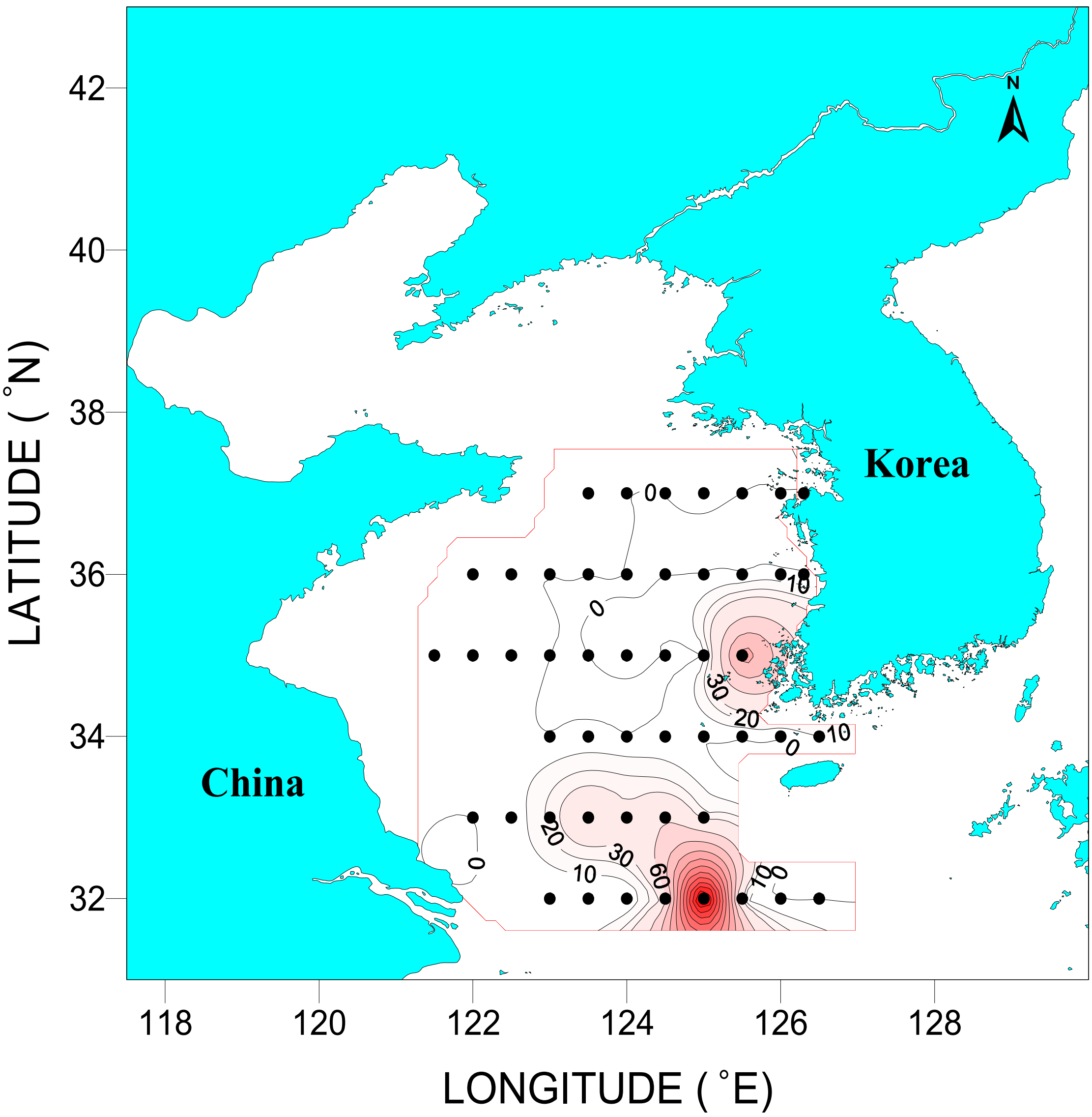

Fig. 41. Abundance of *Ampharete arctica* (inds./m^2) based on the data in 1992 Korea-China oceanographic cruise.

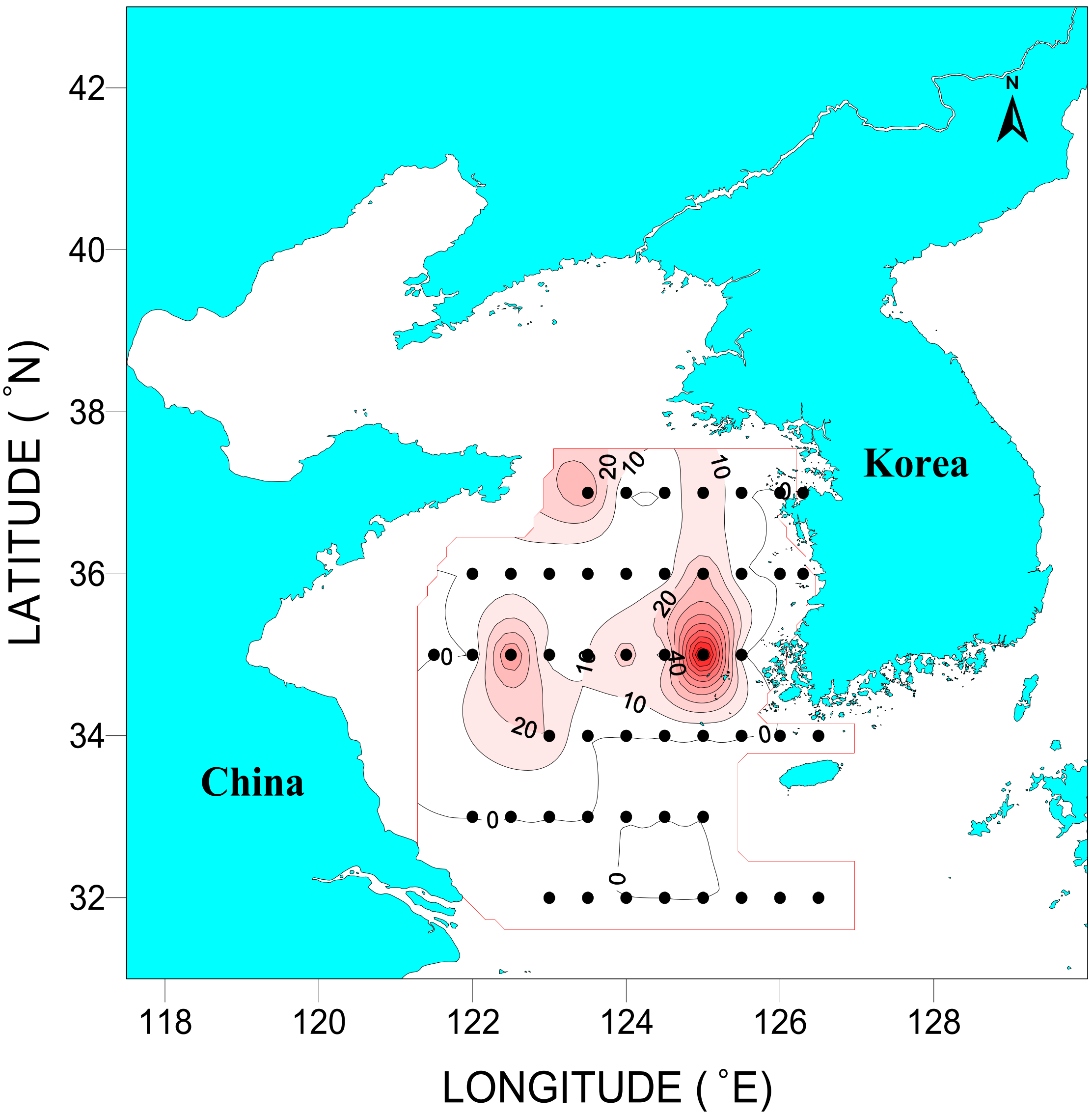

Fig. 42. Abundance of *Ophiura sarsi vadicola* (inds./m^2) based on the data in 1992 Korea-China oceanographic cruise.

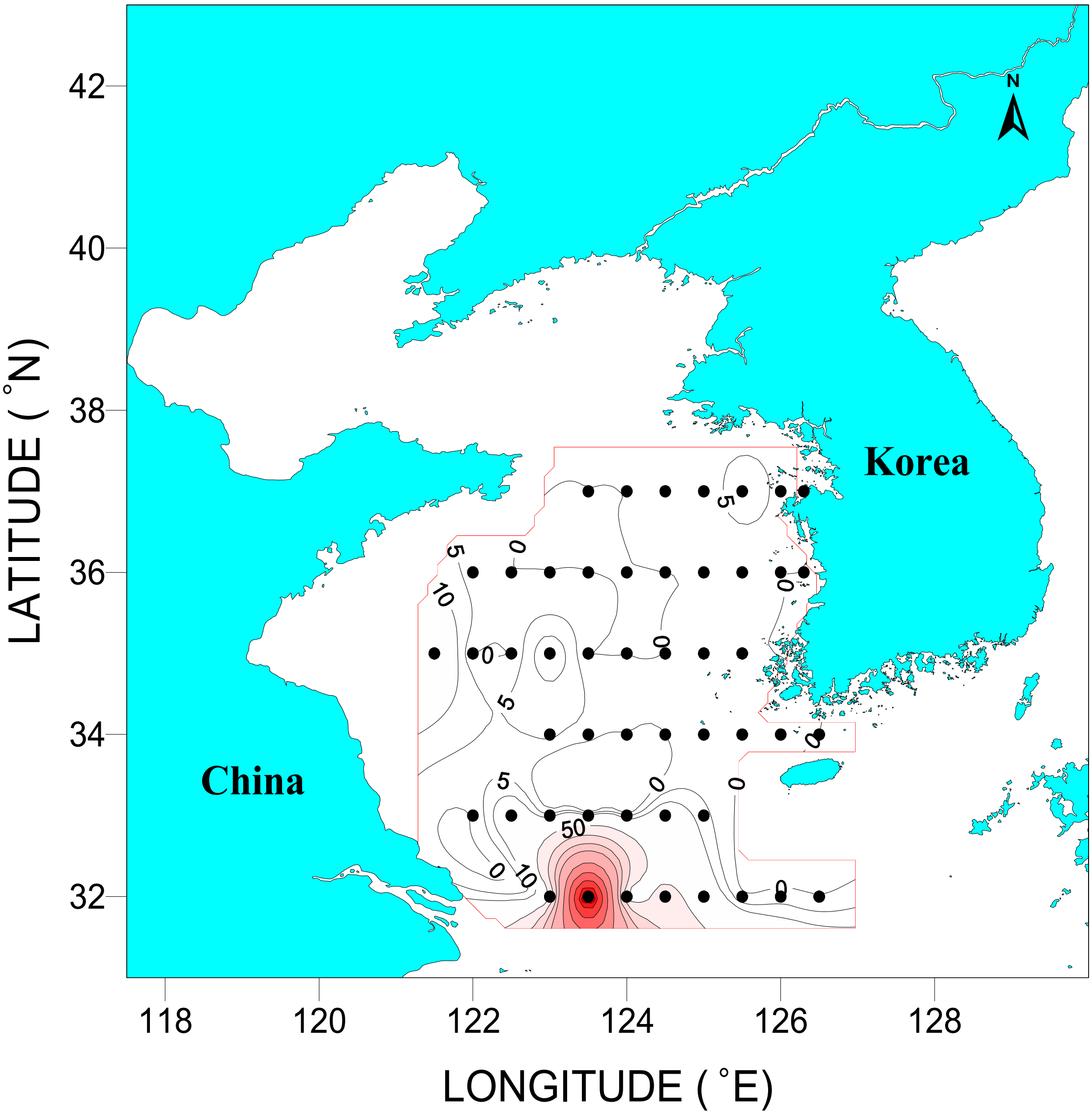

Fig. 43. Abundance of *Mediomastus californiensis* (inds./m^2) based on the data in 1992 Korea-China oceanographic cruise.

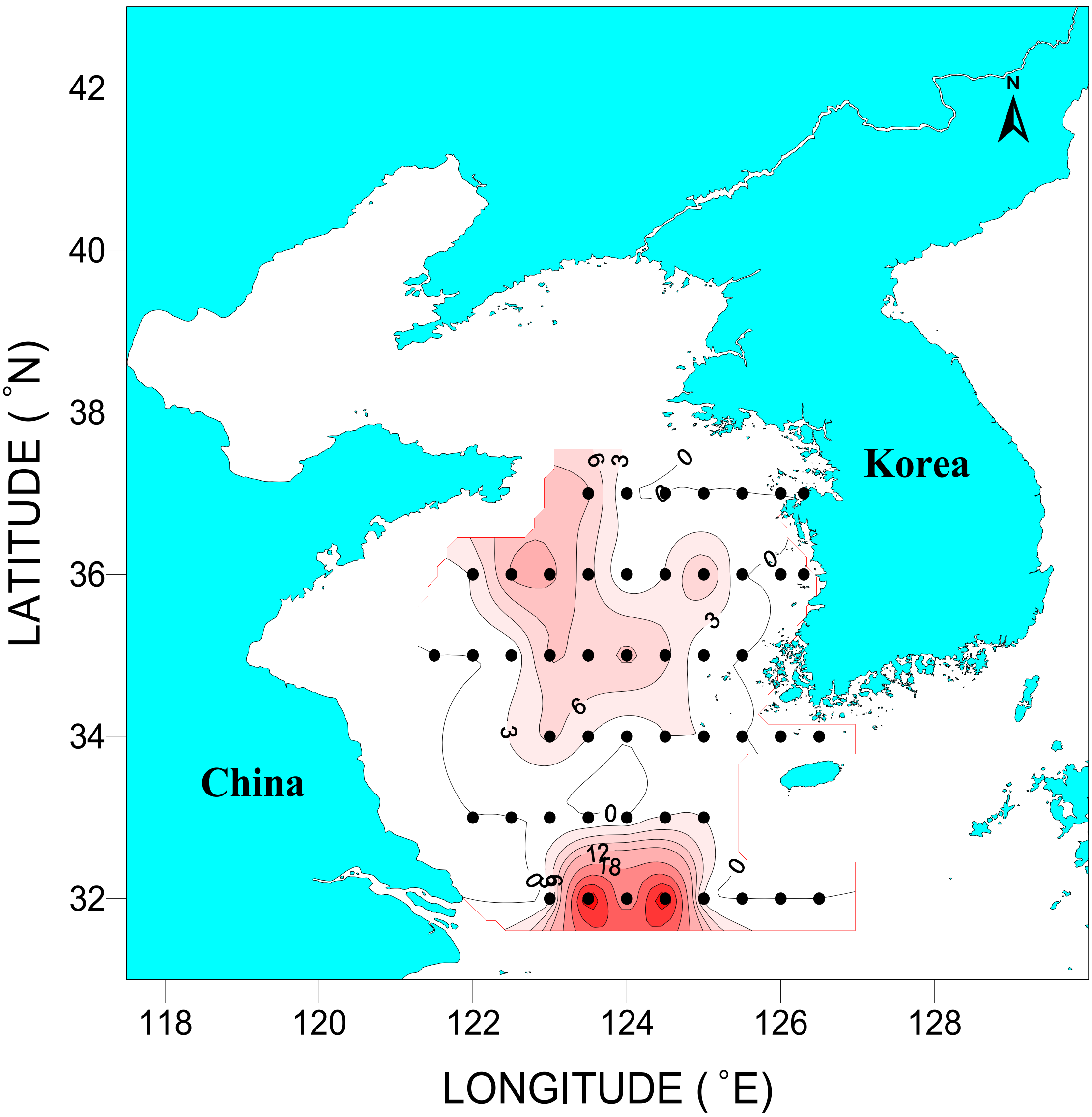

Fig. 44. Abundance of *Nucula nipponica* (inds./m^2) based on the data in 1992 Korea-China oceanographic cruise.

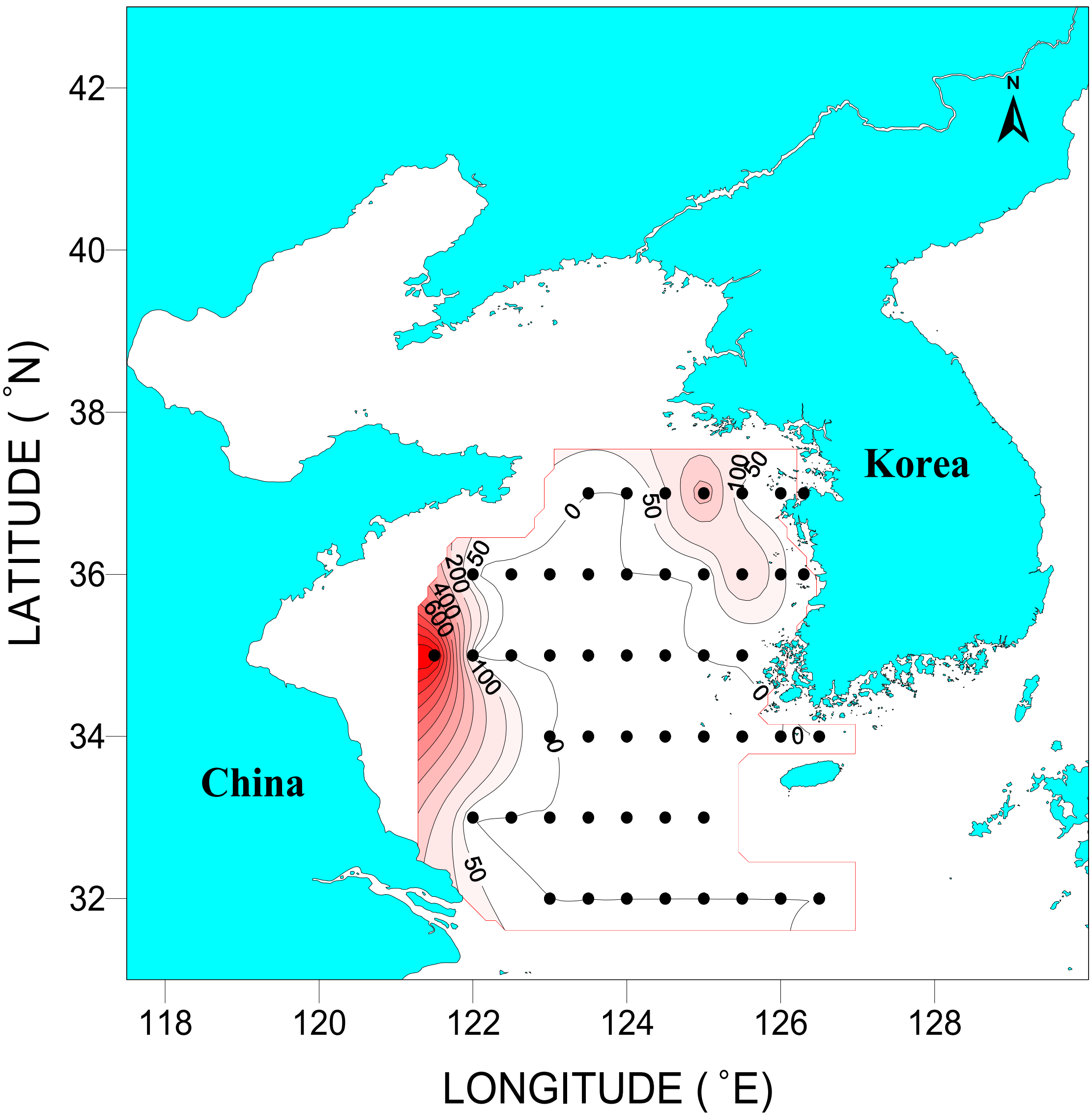

Fig. 45. Abundance of *Spiophanes bombyx* (inds./ m^2) based on the data in 1992 Korea-China oceanographic cruise.

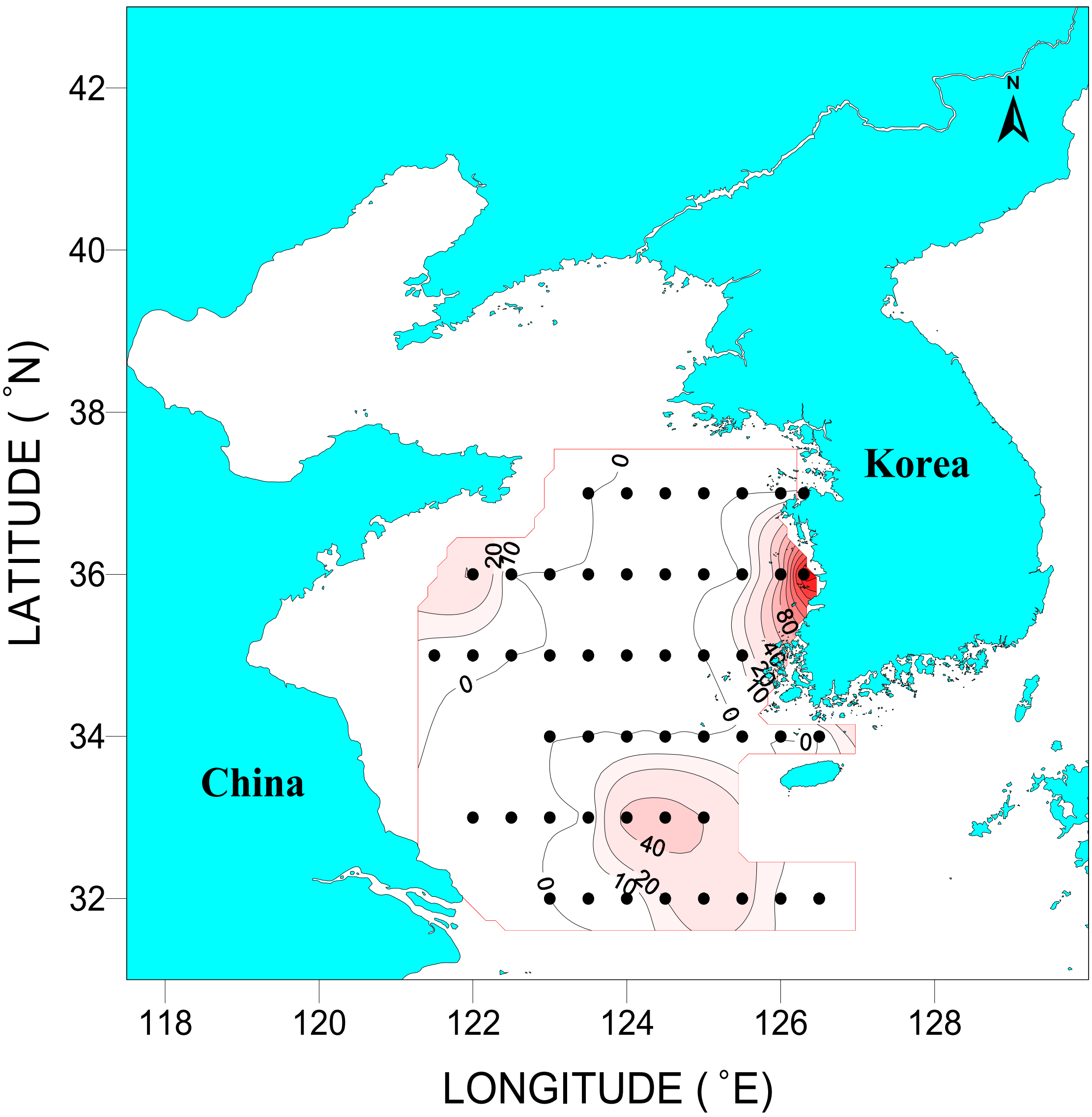

Fig. 46. Abundance of *Leiochrides* sp. (inds./ m^2) based on the data in 1992 Korea-China oceanographic cruise.

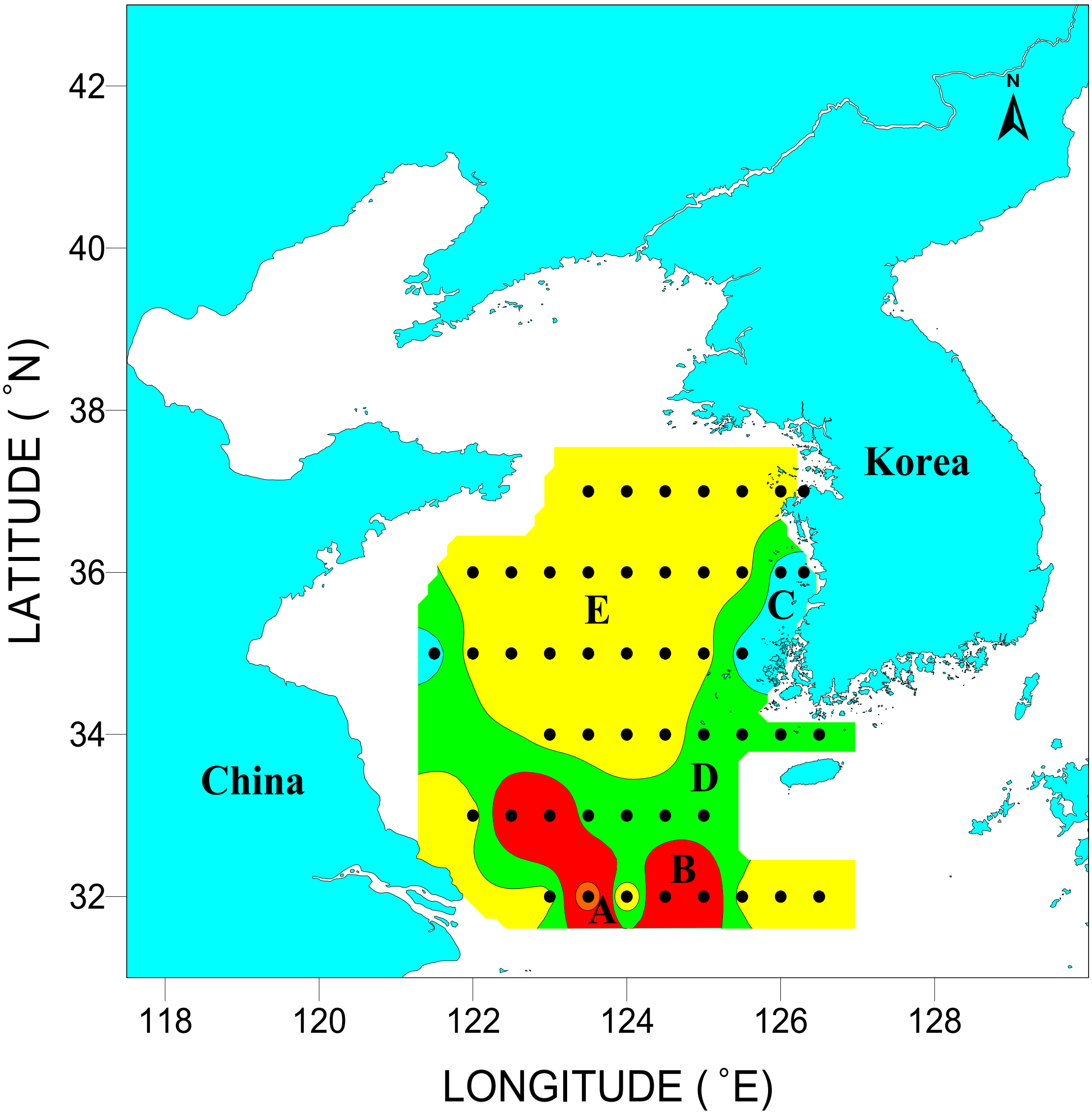

Fig.47. Cluster Analysis of the benthic communities in the Yellow Sea based on the 1992 oceanographic cruise.

A: Indomitrella-Mediomastus Community, B: Amphioplus megapomus community, C: Nephtys-Praxillella community, D: Nephtys-Praxillella community, E: Ophiura-Thyasira-Eudorella community

Table 1. Literature Survey on Phytoplankton Species Composition and Abundance.

Study area		Period	Sampling Stations	Principle Research Organization	Data					Data source
Latitude	Longitude				Species	Abundance	Dominant species	Physical parameters	Chemical parameters	
36° 50' -33° 40'	126°- 123°30'	Aug. 1983 Feb. 1984 May 1984 Nov.-Dec. 1984 May. 1985 Feb.-Mar.1986	26 26 8 30 23 25	KORDI	Total observed species	Seasonal mean		Seasonal mean	Seasonal mean	Chang(1990)
32°-37°	126°30' -121°	17.Sep-02. Oct, 1992	54	Inha Univ.	data for each stations only	data for each stations only		data for each stations only	data for each stations only	Yellow Sea Atlas (1998) Noh (1995)
33° 51'- 35° 56'	122°13' -126°15'	Apr. 1998 Aug. 1998 Oct. 1998	21 21 21	NFRDI	no data	data for each stations only				Cho et al. (1998)

Table 2. Literature Survey on Primary Production.

Study area		Period	Station	Principle Research Organization	Data				Data source
Latitude	Longitude				Primary production	Chlorophyll a	Physical	Chemical	
32° -37°	126° 30' -121°	17.sep-02. Oct, 1992	54	Inha University	Station data	Station data	Station data	Station data	Yellow Sea Atlas (1998) Choi et al. (1995) Son et al (2005)
32° -36°	121° 30' -126°	Apr. 1996	15	KORDI	Station data	Station data	Station data	No data.	Park (2000) Son et al.(2005)
33° 59' - 36° 57'	122° 13' - 126° 15'	Feb. 1997 Apr. 1997 Aug. 1997 Oct. 1997 Dec. 1997	21 25 25 14 20	NFRDI	Station data	Station data	Station data	Station data	Choi et al. 2002

Table 3. Latitude and longitude of each sampling stations of serial oceanographic monitorir

Station	Latitude	Longitude
31203	33°58.5'	125°54.0'
31205	34°02.6'	125°30.3'
31207	34°05.5'	125°00.0'
31209	34°05.5'	124°36.0'
31105	34°43.0'	125°31.9'
31107	34°43.0'	125°00.0'
31109	34°43.0'	124°35.8'
31003	35°20.1'	125°49.3'
31005	35°20.1'	125°24.4'
31007	35°20.1'	125°00.0'
31009	35°20.1'	124°35.6'
30901	35°51.3'	126°14.7'
30903	35°51.3'	125°49.3'
30905	35°51.3'	125°24.4'
30907	35°51.3'	125°00.0'
30909	35°51.3'	124°35.1'
30801	36°19.8'	126°14.4'
30803	36°19.8'	125°50.0'
30805	36°19.8'	125°25.3'
30807	36°19.8'	125°00.0'
30809	36°19.8'	124°35.1'
30703	36°56.5'	126°00.0'
30705	36°55.5'	125°25.0'
30707	36°55.5'	125°00.0'
30709	36°55.5'	124°34.8'

Table 4. Zooplankton biomass (mg/m^3) calculated with wet weight.

Station	Year	Month	Biomass	ln(Biomass)
30801	1965	4	75.40	4.32
30803	1965	4	38.00	3.64
30805	1965	4	17.00	2.83
30901	1965	4	83.70	4.43
30903	1965	4	17.50	2.86
30905	1965	4	4.30	1.46
31005	1965	4	37.50	3.62
31007	1965	4	8.00	2.08
31203	1965	4	2.90	1.06
31205	1965	4	14.20	2.65
31207	1965	4	18.90	2.94
31209	1965	4	4.20	1.44
30803	1965	6	26.00	3.26
30805	1965	6	18.50	2.92
30807	1965	6	13.00	2.56
30901	1965	6	60.50	4.10
30903	1965	6	57.00	4.04
30905	1965	6	7.50	2.01
30909	1965	6	10.70	2.37
31005	1965	6	18.50	2.92
31007	1965	6	3.00	1.10
31205	1965	6	48.50	3.88
31207	1965	6	40.80	3.71
30703	1965	8	58.40	4.07
30705	1965	8	13.00	2.56
30707	1965	8	68.60	4.23
30709	1965	8	16.00	2.77
30801	1965	8	46.20	3.83
30803	1965	8	79.00	4.37
30805	1965	8	39.40	3.67
30807	1965	8	20.30	3.01
30809	1965	8	6.00	1.79
30901	1965	8	11.40	2.43
30903	1965	8	73.60	4.30
30905	1965	8	70.00	4.25
30907	1965	8	46.80	3.85
30909	1965	8	28.00	3.33
31005	1965	8	117.40	4.77
31007	1965	8	309.00	5.73
31203	1965	8	27.20	3.30
31205	1965	8	53.10	3.97
31207	1965	8	60.00	4.09
31209	1965	8	121.60	4.80
30703	1965	10	5.60	1.72
30705	1965	10	26.60	3.28
30707	1965	10	28.50	3.35
30901	1965	10	38.50	3.65
30903	1965	10	41.00	3.71
30905	1965	10	68.00	4.22
30907	1965	10	20.90	3.04
31203	1965	10	12.30	2.51
31205	1965	10	17.00	2.83
31207	1965	10	35.50	3.57
30705	1965	12	4.60	1.53
30707	1965	12	12.50	2.53
30801	1965	12	92.00	4.52
30803	1965	12	300.10	5.70
30805	1965	12	162.30	5.09
30807	1965	12	65.50	4.18
31005	1965	12	47.20	3.85
31203	1967	2	11.60	2.45
31205	1967	2	37.60	3.63
31207	1967	2	16.90	2.83
31209	1967	2	7.90	2.07
30901	1967	4	116.30	4.76
30903	1967	4	21.40	3.06
30907	1967	4	36.80	3.61
31005	1967	4	27.70	3.32
31007	1967	4	12.60	2.53
31203	1967	4	24.00	3.18
31205	1967	4	27.70	3.32
30805	1967	6	19.10	2.95
30807	1967	6	7.40	2.00
30809	1967	6	4.60	1.53
30905	1967	6	6.50	1.87
30907	1967	6	4.60	1.53
30909	1967	6	4.20	1.44
31005	1967	6	10.80	2.38
31007	1967	6	5.90	1.77

30703	1967	8	65.70	4.19
30705	1967	8	216.60	5.38
30707	1967	8	972.00	6.88
30803	1967	8	14.30	2.66
30805	1967	8	2.60	0.96
30807	1967	8	2.80	1.03
30809	1967	8	40.50	3.70
30901	1967	8	47.60	3.86
30903	1967	8	37.60	3.63
30905	1967	8	19.60	2.98
30907	1967	8	45.00	3.81
30909	1967	8	29.40	3.38
31005	1967	8	149.70	5.01
31007	1967	8	279.30	5.63
31203	1967	8	0.40	−0.92
31205	1967	8	35.00	3.56
31207	1967	8	14.60	2.68
31209	1967	8	19.90	2.99
30703	1967	10	15.70	2.75
30705	1967	10	129.20	4.86
30707	1967	10	68.60	4.23
30709	1967	10	14.10	2.65
30803	1967	10	124.60	4.83
30805	1967	10	1.60	0.47
30807	1967	10	10.80	2.38
30809	1967	10	6.80	1.92
30901	1967	10	67.30	4.21
30903	1967	10	245.90	5.50
30905	1967	10	30.30	3.41
30907	1967	10	5.70	1.74
30909	1967	10	5.00	1.61
31005	1967	10	34.90	3.55
31007	1967	10	15.00	2.71
31203	1967	10	119.80	4.79
31205	1967	10	173.50	5.16
31207	1967	10	97.90	4.58
31209	1967	10	152.00	5.02
30703	1967	12	7.20	1.97
30705	1967	12	8.80	2.17
30707	1967	12	5.90	1.77
30709	1967	12	26.00	3.26
30803	1967	12	42.80	3.76
30805	1967	12	6.90	1.93
30807	1967	12	9.80	2.28
30809	1967	12	38.60	3.65
30901	1967	12	94.20	4.55
30903	1967	12	61.90	4.13
30905	1967	12	12.70	2.54
30907	1967	12	11.50	2.44
30909	1967	12	7.00	1.95
31005	1967	12	11.70	2.46
31007	1967	12	42.30	3.74
31203	1967	12	30.20	3.41
31205	1967	12	112.20	4.72
31207	1967	12	20.00	3.00
31209	1967	12	24.40	3.19
30901	1968	2	54.41	4.00
30903	1968	2	22.08	3.09
31005	1968	2	19.52	2.97
31007	1968	2	49.09	3.89
31203	1968	2	7.20	1.97
31205	1968	2	4.75	1.56
31207	1968	2	1.96	0.67
30703	1968	4	4.44	1.49
30705	1968	4	33.58	3.51
30707	1968	4	10.87	2.39
30709	1968	4	6.69	1.90
30803	1968	4	4.58	1.52
30805	1968	4	41.38	3.72
30807	1968	4	28.26	3.34
30809	1968	4	16.08	2.78
30901	1968	4	26.98	3.30
30903	1968	4	50.62	3.92
30905	1968	4	17.36	2.85
30907	1968	4	42.26	3.74
30909	1968	4	17.91	2.89
31005	1968	4	58.04	4.06
31007	1968	4	119.25	4.78
30703	1968	6	212.03	5.36
30705	1968	6	18.30	2.91

30707	1968	6	3.77	1.33
30709	1968	6	133.84	4.90
30803	1968	6	15.88	2.77
30805	1968	6	34.84	3.55
30807	1968	6	49.55	3.90
30809	1968	6	34.71	3.55
30901	1968	6	85.03	4.44
30903	1968	6	17.98	2.89
30905	1968	6	3.40	1.22
30907	1968	6	10.19	2.32
30909	1968	6	43.52	3.77
31005	1968	6	58.11	4.06
31007	1968	6	74.08	4.31
31203	1968	6	86.91	4.46
31205	1968	6	178.87	5.19
31207	1968	6	137.86	4.93
31209	1968	6	10.31	2.33
30703	1968	8	74.10	4.31
30705	1968	8	47.97	3.87
30707	1968	8	59.25	4.08
30709	1968	8	6.29	1.84
30803	1968	8	44.34	3.79
30805	1968	8	53.34	3.98
30807	1968	8	99.37	4.60
30809	1968	8	177.23	5.18
30901	1968	8	99.37	4.60
30903	1968	8	100.25	4.61
30905	1968	8	67.42	4.21
30907	1968	8	31.57	3.45
30909	1968	8	52.45	3.96
31005	1968	8	414.47	6.03
31007	1968	8	124.28	4.82
31203	1968	8	57.48	4.05
31205	1968	8	12.70	2.54
31207	1968	8	75.09	4.32
31209	1968	8	18.36	2.91
30703	1968	10	45.90	3.83
30705	1968	10	53.40	3.98
30707	1968	10	100.00	4.61
30709	1968	10	76.90	4.34
30803	1968	10	191.80	5.26
30805	1968	10	29.20	3.37
30807	1968	10	49.68	3.91
30809	1968	10	132.70	4.89
30901	1968	10	147.60	4.99
30903	1968	10	94.90	4.55
30905	1968	10	53.10	3.97
30907	1968	10	39.60	3.68
30909	1968	10	39.60	3.68
31005	1968	10	29.27	3.38
31007	1968	10	36.10	3.59
31203	1968	10	3.39	1.22
31205	1968	10	6.16	1.82
31207	1968	10	3.70	1.31
31209	1968	10	7.54	2.02
30703	1968	12	104.00	4.64
30705	1968	12	38.11	3.64
30707	1968	12	48.43	3.88
30709	1968	12	74.21	4.31
30803	1968	12	143.36	4.97
30805	1968	12	123.78	4.82
30807	1968	12	51.57	3.94
30809	1968	12	66.04	4.19
30901	1968	12	122.17	4.81
30903	1968	12	50.94	3.93
30905	1968	12	22.01	3.09
30907	1968	12	18.89	2.94
30909	1968	12	121.38	4.80
31005	1968	12	40.88	3.71
31007	1968	12	44.03	3.78
31203	1968	12	48.55	3.88
31205	1968	12	6.29	1.84
31207	1968	12	51.57	3.94
31209	1968	12	66.16	4.19
30703	1969	2	107.34	4.68
30705	1969	2	42.81	3.76
30709	1969	2	102.52	4.63
30803	1969	2	108.60	4.69
30805	1969	2	38.62	3.65
30807	1969	2	79.62	4.38

30809	1969	2	102.52	4.63
30901	1969	2	34.91	3.55
30903	1969	2	113.08	4.73
30905	1969	2	58.11	4.06
30907	1969	2	69.18	4.24
30909	1969	2	93.21	4.53
31005	1969	2	61.26	4.12
31007	1969	2	35.60	3.57
31203	1969	2	7.17	1.97
31205	1969	2	5.53	1.71
31207	1969	2	25.91	3.25
31209	1969	2	27.80	3.33
30703	1969	4	19.60	2.98
30705	1969	4	125.79	4.83
30803	1969	4	126.04	4.84
30805	1969	4	128.18	4.85
30903	1969	4	4.72	1.55
30905	1969	4	9.58	2.26
30907	1969	4	49.69	3.91
31005	1969	4	48.93	3.89
31007	1969	4	68.18	4.22
31203	1969	4	10.06	2.31
31205	1969	4	6.04	1.80
31207	1969	4	4.40	1.48
31209	1969	4	1.26	0.23
30703	1969	6	57.44	4.05
30705	1969	6	94.21	4.55
30707	1969	6	178.86	5.19
30709	1969	6	167.55	5.12
30803	1969	6	78.62	4.36
30805	1969	6	17.99	2.89
30807	1969	6	112.73	4.72
30809	1969	6	17.74	2.88
30901	1969	6	83.23	4.42
30903	1969	6	198.62	5.29
30905	1969	6	21.76	3.08
30907	1969	6	56.48	4.03
30909	1969	6	40.50	3.70
31005	1969	6	158.99	5.07
31007	1969	6	81.01	4.39
31203	1969	6	145.16	4.98
31205	1969	6	148.68	5.00
31207	1969	6	312.20	5.74
31209	1969	6	27.27	3.31
30703	1969	8	218.55	5.39
30705	1969	8	137.11	4.92
30803	1969	8	102.73	4.63
30805	1969	8	128.93	4.86
30807	1969	8	91.19	4.51
30809	1969	8	176.10	5.17
30901	1969	8	78.62	4.36
30903	1969	8	98.11	4.59
30905	1969	8	66.67	4.20
30907	1969	8	86.79	4.46
30909	1969	8	1.26	0.23
31005	1969	8	49.69	3.91
31007	1969	8	33.96	3.53
31203	1969	8	184.91	5.22
31205	1969	8	84.28	4.43
31207	1969	8	94.34	4.55
31209	1969	8	38.99	3.66
30703	1969	10	61.32	4.12
30705	1969	10	52.20	3.96
30707	1969	10	63.54	4.15
30709	1969	10	89.12	4.49
30803	1969	10	11.53	2.44
30805	1969	10	23.27	3.15
30807	1969	10	51.77	3.95
30809	1969	10	38.36	3.65
31203	1969	10	2.96	1.09
31205	1969	10	32.08	3.47
31209	1969	10	37.82	3.63

30705	1969	12	15.72	2.75
30707	1969	12	84.53	4.44
30709	1969	12	51.17	3.94
30803	1969	12	150.16	5.01
30805	1969	12	27.60	3.32
30807	1969	12	13.03	2.57
30901	1969	12	23.58	3.16
30903	1969	12	0.75	−0.29
30905	1969	12	35.12	3.56
30907	1969	12	9.99	2.30
30909	1969	12	9.40	2.24
31005	1969	12	35.85	3.58
31007	1969	12	135.22	4.91
31203	1969	12	10.08	2.31
31205	1969	12	2.83	1.04
31207	1969	12	40.49	3.70
31209	1969	12	22.91	3.13
30703	1970	2	93.33	4.54
30705	1970	2	63.06	4.14
30707	1970	2	34.42	3.54
30709	1970	2	40.27	3.70
30803	1970	2	56.94	4.04
30805	1970	2	62.92	4.14
30807	1970	2	14.20	2.65
30809	1970	2	43.30	3.77
30901	1970	2	90.41	4.50
30903	1970	2	52.98	3.97
30905	1970	2	50.36	3.92
30907	1970	2	146.24	4.99
30909	1970	2	108.81	4.69
31005	1970	2	88.93	4.49
31007	1970	2	54.03	3.99
31203	1970	2	37.96	3.64
31205	1970	2	23.69	3.17
31207	1970	2	74.02	4.30
31209	1970	2	39.23	3.67
30703	1970	4	48.22	3.88
30705	1970	4	125.53	4.83
30707	1970	4	53.46	3.98
30709	1970	4	19.05	2.95
30803	1970	4	30.97	3.43
30805	1970	4	24.53	3.20
30807	1970	4	69.18	4.24
30809	1970	4	56.60	4.04
30901	1970	4	147.80	5.00
30903	1970	4	32.70	3.49
30905	1970	4	64.15	4.16
30907	1970	4	15.41	2.74
30909	1970	4	130.77	4.87
31005	1970	4	28.30	3.34
31007	1970	4	52.74	3.97
31203	1970	4	43.94	3.78
31205	1970	4	44.72	3.80
31207	1970	4	14.12	2.65
31209	1970	4	73.96	4.30
30703	1970	6	132.08	4.88
30705	1970	6	94.34	4.55
30707	1970	6	122.64	4.81
30709	1970	6	99.84	4.60
30803	1970	6	6.29	1.84
30805	1970	6	26.34	3.27
30807	1970	6	8.91	2.19
30809	1970	6	84.51	4.44
30901	1970	6	59.12	4.08
30903	1970	6	69.81	4.25
30905	1970	6	99.06	4.60
30907	1970	6	58.96	4.08
30909	1970	6	148.98	5.00
31005	1970	6	154.54	5.04
31007	1970	6	124.61	4.83
31203	1970	6	14.38	2.67
31205	1970	6	74.77	4.31
31207	1970	6	113.21	4.73
31209	1970	6	83.33	4.42
30803	1970	8	49.06	3.89
30805	1970	8	95.60	4.56
30807	1970	8	103.77	4.64
30809	1970	8	99.73	4.60
30901	1970	8	41.93	3.74

30903	1970	8	154.87	5.04
30905	1970	8	70.63	4.26
30907	1970	8	107.94	4.68
30909	1970	8	131.29	4.88
31005	1970	8	56.63	4.04
31007	1970	8	116.35	4.76
31203	1970	8	103.32	4.64
31205	1970	8	158.56	5.07
31207	1970	8	105.75	4.66
31209	1970	8	78.62	4.36
30703	1970	10	79.67	4.38
30705	1970	10	147.80	5.00
30707	1970	10	6.29	1.84
30709	1970	10	53.91	3.99
30803	1970	10	48.74	3.89
30805	1970	10	41.51	3.73
30807	1970	10	660.38	6.49
30809	1970	10	26.73	3.29
30901	1970	10	41.93	3.74
30903	1970	10	25.16	3.23
30905	1970	10	23.36	3.15
30907	1970	10	66.04	4.19
30909	1970	10	77.04	4.34
31005	1970	10	183.44	5.21
31007	1970	10	229.11	5.43
31203	1970	10	15.72	2.75
31205	1970	10	144.65	4.97
31207	1970	10	308.96	5.73
31209	1970	10	650.40	6.48
30703	1971	6	256.67	5.55
30705	1971	6	66.84	4.20
30707	1971	6	125.00	4.83
30709	1971	6	106.38	4.67
30803	1971	6	87.71	4.47
30805	1971	6	131.18	4.88
30807	1971	6	175.82	5.17
30809	1971	6	134.45	4.90
30901	1971	6	28.08	3.34
30903	1971	6	31.96	3.46
30905	1971	6	33.76	3.52
30907	1971	6	138.29	4.93
30909	1971	6	101.26	4.62
31005	1971	6	59.01	4.08
31007	1971	6	78.16	4.36
31203	1971	6	23.03	3.14
31205	1971	6	207.92	5.34
31207	1971	6	81.04	4.39
31209	1971	6	41.32	3.72
30703	1971	8	92.40	4.53
30705	1971	8	134.39	4.90
30707	1971	8	134.39	4.90
30709	1971	8	68.00	4.22
30803	1971	8	15.94	2.77
30805	1971	8	30.92	3.43
30807	1971	8	69.00	4.23
30809	1971	8	83.75	4.43
30901	1971	8	103.98	4.64
30903	1971	8	290.65	5.67
30905	1971	8	155.57	5.05
30907	1971	8	219.94	5.39
30909	1971	8	212.39	5.36
31005	1971	8	363.71	5.90
31007	1971	8	192.62	5.26
31203	1971	8	207.16	5.33
31205	1971	8	350.93	5.86
31207	1971	8	108.26	4.68
31209	1971	8	108.87	4.69
30703	1971	10	37.76	3.63
30705	1971	10	56.24	4.03
30707	1971	10	56.38	4.03
30709	1971	10	84.75	4.44
30803	1971	10	32.29	3.47
30805	1971	10	33.62	3.52
30807	1971	10	124.27	4.82
30809	1971	10	32.41	3.48
30901	1971	10	26.75	3.29
30903	1971	10	43.38	3.77
30905	1971	10	54.89	4.01
30907	1971	10	52.88	3.97
30909	1971	10	124.90	4.83
31005	1971	10	52.63	3.96

31007	1971	10	177.12	5.18
31203	1971	10	129.33	4.86
31205	1971	10	122.42	4.81
31207	1971	10	28.56	3.35
31209	1971	10	155.23	5.04
30703	1972	2	31.40	3.45
30705	1972	2	125.80	4.83
30707	1972	2	119.50	4.78
30709	1972	2	137.30	4.92
30803	1972	2	14.00	2.64
30805	1972	2	195.00	5.27
30807	1972	2	235.80	5.46
30809	1972	2	70.80	4.26
30901	1972	2	347.60	5.85
30903	1972	2	45.30	3.81
30905	1972	2	106.50	4.67
30907	1972	2	129.70	4.87
30909	1972	2	114.00	4.74
31005	1972	2	98.80	4.59
31007	1972	2	110.10	4.70
31203	1972	2	31.40	3.45
31205	1972	2	62.90	4.14
31207	1972	2	28.00	3.33
31209	1972	2	22.20	3.10
30703	1972	4	31.40	3.45
30705	1972	4	27.30	3.31
30707	1972	4	15.10	2.71
30803	1972	4	18.90	2.94
30805	1972	4	8.80	2.17
30807	1972	4	10.50	2.35
30809	1972	4	22.50	3.11
30901	1972	4	78.60	4.36
30903	1972	4	44.00	3.78
30905	1972	4	91.20	4.51
30907	1972	4	62.90	4.14
30909	1972	4	43.20	3.77
31005	1972	4	78.60	4.36
31007	1972	4	29.60	3.39
31203	1972	4	41.30	3.72
31205	1972	4	10.50	2.35
31207	1972	4	98.30	4.59
30703	1972	6	84.90	4.44
30705	1972	6	37.70	3.63
30707	1972	6	252.00	5.53
30709	1972	6	220.10	5.39
30803	1972	6	109.40	4.70
30805	1972	6	28.90	3.36
30807	1972	6	107.80	4.68
30809	1972	6	10.20	2.32
30901	1972	6	83.90	4.43
30903	1972	6	106.90	4.67
30905	1972	6	116.80	4.76
30907	1972	6	50.30	3.92
30909	1972	6	86.50	4.46
31005	1972	6	134.80	4.90
31007	1972	6	153.90	5.04
31203	1972	6	80.90	4.39
31205	1972	6	283.00	5.65
31207	1972	6	16.80	2.82
31209	1972	6	52.90	3.97
30703	1972	8	251.60	5.53
30705	1972	8	62.90	4.14
30707	1972	8	128.30	4.85
30709	1972	8	41.90	3.74
30803	1972	8	40.30	3.70
30805	1972	8	52.80	3.97
30807	1972	8	150.90	5.02
30809	1972	8	82.50	4.41
30901	1972	8	73.40	4.30
30903	1972	8	62.90	4.14
30905	1972	8	120.50	4.79
30907	1972	8	125.80	4.83
30909	1972	8	188.70	5.24
31005	1972	8	73.70	4.30
31007	1972	8	72.30	4.28
31203	1972	8	19.80	2.99
31205	1972	8	10.80	2.38
31207	1972	8	11.90	2.48
31209	1972	8	42.10	3.74

30703	1972	10	34.00	3.53
30705	1972	10	34.00	3.53
30707	1972	10	132.10	4.88
30709	1972	10	38.80	3.66
30803	1972	10	49.10	3.89
30805	1972	10	88.10	4.48
30807	1972	10	53.90	3.99
30809	1972	10	94.30	4.55
30901	1972	10	304.00	5.72
30903	1972	10	138.40	4.93
30905	1972	10	145.20	4.98
30907	1972	10	146.80	4.99
30909	1972	10	233.60	5.45
31005	1972	10	47.20	3.85
31007	1972	10	204.40	5.32
31203	1972	10	85.40	4.45
31205	1972	10	31.40	3.45
31207	1972	10	157.20	5.06
31209	1972	10	27.40	3.31
31203	1972	12	28.75	3.36
31205	1972	12	18.17	2.90
31207	1972	12	33.47	3.51
31005	1973	2	10.48	2.35
31007	1973	2	23.58	3.16
31005	1973	4	43.19	3.77
31007	1973	4	42.57	3.75
31203	1973	4	29.47	3.38
31207	1973	4	34.76	3.55
30703	1973	6	121.07	4.80
30707	1973	6	6.29	1.84
30807	1973	6	13.48	2.60
30901	1973	6	192.70	5.26
30907	1973	6	61.03	4.11
31005	1973	6	2.62	0.96
31007	1973	6	17.07	2.84
31203	1973	6	26.80	3.29
31205	1973	6	28.40	3.35
31207	1973	6	15.17	2.72
30703	1973	8	8.99	2.20
30707	1973	8	36.42	3.60
30807	1973	8	6.48	1.87
30901	1973	8	16.77	2.82
30907	1973	8	45.50	3.82
31005	1973	8	11.24	2.42
31007	1973	8	23.58	3.16
31203	1973	8	21.55	3.07
31207	1973	8	7.07	1.96
31005	1973	10	9.83	2.29
31007	1973	10	4.10	1.41
31203	1973	10	28.98	3.37
31205	1973	10	29.42	3.38
31207	1973	10	17.87	2.88
31005	1973	12	13.17	2.58
31007	1973	12	9.38	2.24
31203	1973	12	7.50	2.01
31205	1973	12	3.81	1.34
31207	1973	12	0.74	−0.30
30703	1977	2	37.50	3.62
30705	1977	2	23.79	3.17
30707	1977	2	57.05	4.04

30709	1977	2	4.77	1.56
30803	1977	2	9.52	2.25
30805	1977	2	178.90	5.19
30807	1977	2	42.92	3.76
30809	1977	2	85.66	4.45
30901	1977	2	103.17	4.64
30903	1977	2	9.51	2.25
30905	1977	2	380.77	5.94
30907	1977	2	33.36	3.51
30909	1977	2	28.60	3.35
31005	1977	2	33.33	3.51
31007	1977	2	43.97	3.78
31203	1977	2	14.04	2.64
31205	1977	2	38.10	3.64
31207	1977	2	61.97	4.13
31209	1977	2	38.09	3.64
30703	1977	4	31.25	3.44
30705	1977	4	33.33	3.51
30707	1977	4	23.81	3.17
30709	1977	4	28.57	3.35
30803	1977	4	79.37	4.37
30805	1977	4	64.36	4.16
30807	1977	4	28.57	3.35
30809	1977	4	19.05	2.95
30901	1977	4	50.85	3.93
30903	1977	4	28.57	3.35
30905	1977	4	42.86	3.76
30907	1977	4	42.86	3.76
30909	1977	4	19.05	2.95
31005	1977	4	52.38	3.96
31007	1977	4	19.05	2.95
31203	1977	4	42.86	3.76
31205	1977	4	28.57	3.35
31207	1977	4	19.05	2.95
31209	1977	4	33.33	3.51
30703	1977	6	986.51	6.89
30705	1977	6	66.77	4.20
30707	1977	6	274.29	5.61
30709	1977	6	79.05	4.37
30803	1977	6	111.11	4.71
30805	1977	6	77.72	4.35
30807	1977	6	77.95	4.36
30809	1977	6	146.95	4.99
30901	1977	6	49.81	3.91
30903	1977	6	39.05	3.66
30905	1977	6	18.43	2.91
30907	1977	6	25.00	3.22
30909	1977	6	10.24	2.33
31005	1977	6	23.00	3.14
31007	1977	6	36.81	3.61
31203	1977	6	36.43	3.60
31205	1977	6	46.29	3.83
31207	1977	6	20.38	3.01
31209	1977	6	14.38	2.67
30703	1977	8	4.90	1.59
30705	1977	8	11.70	2.46
30707	1977	8	20.80	3.03
30709	1977	8	18.30	2.91
30803	1977	8	22.90	3.13
30805	1977	8	26.50	3.28
30807	1977	8	19.80	2.99
30809	1977	8	18.70	2.93
30901	1977	8	11.50	2.44
30903	1977	8	29.20	3.37
30905	1977	8	31.50	3.45
30907	1977	8	11.50	2.44
30909	1977	8	5.50	1.70
31005	1977	8	107.50	4.68
31007	1977	8	56.20	4.03
31203	1977	8	41.30	3.72
31205	1977	8	28.10	3.34
31207	1977	8	33.20	3.50
31209	1977	8	27.50	3.31
30901	1977	10	48.20	3.88
30903	1977	10	135.60	4.91
30905	1977	10	46.60	3.84
30907	1977	10	136.20	4.91
30909	1977	10	39.80	3.68
31005	1977	10	98.50	4.59
31007	1977	10	62.90	4.14
31203	1977	10	78.60	4.36

31205	1977	10	79.30	4.37
31207	1977	10	99.80	4.60
31209	1977	10	44.30	3.79
30703	1977	12	12.86	2.55
30705	1977	12	15.13	2.72
30707	1977	12	18.00	2.89
30709	1977	12	56.88	4.04
30803	1977	12	8.00	2.08
30805	1977	12	32.76	3.49
30807	1977	12	72.86	4.29
30809	1977	12	61.36	4.12
30901	1977	12	29.40	3.38
30903	1977	12	18.52	2.92
30905	1977	12	7.88	2.06
30907	1977	12	14.72	2.69
30909	1977	12	7.60	2.03
31005	1977	12	36.64	3.60
31007	1977	12	42.14	3.74
31203	1977	12	14.66	2.69
31205	1977	12	71.48	4.27
31207	1977	12	23.30	3.15
31209	1977	12	8.04	2.08
30703	1978	2	7.31	1.99
30705	1978	2	14.57	2.68
30707	1978	2	87.38	4.47
30803	1978	2	43.17	3.77
30805	1978	2	31.83	3.46
30807	1978	2	15.71	2.75
30809	1978	2	24.39	3.19
30901	1978	2	16.23	2.79
30903	1978	2	29.56	3.39
30905	1978	2	35.26	3.56
30907	1978	2	11.29	2.42
30909	1978	2	8.78	2.17
31005	1978	2	22.36	3.11
31007	1978	2	9.40	2.24
31203	1978	2	15.97	2.77
31205	1978	2	15.25	2.72
31207	1978	2	4.65	1.54
31209	1978	2	19.06	2.95
30705	1978	4	33.35	3.51
30707	1978	4	52.96	3.97
30709	1978	4	58.74	4.07
30803	1978	4	65.67	4.18
30805	1978	4	67.09	4.21
30807	1978	4	41.34	3.72
30809	1978	4	73.02	4.29
30901	1978	4	149.53	5.01
30903	1978	4	155.56	5.05
30905	1978	4	30.60	3.42
30907	1978	4	27.26	3.31
30909	1978	4	9.86	2.29
31005	1978	4	25.82	3.25
31007	1978	4	18.00	2.89
31203	1978	4	101.84	4.62
31205	1978	4	99.84	4.60
31207	1978	4	44.14	3.79
31209	1978	4	22.62	3.12
30703	1978	6	147.28	4.99
30705	1978	6	33.56	3.51
30707	1978	6	65.04	4.18
30709	1978	6	16.78	2.82
30803	1978	6	761.78	6.64
30805	1978	6	1518.20	7.33
30807	1978	6	48.12	3.87
30809	1978	6	13.68	2.62
30901	1978	6	259.84	5.56
30903	1978	6	160.72	5.08
30905	1978	6	295.40	5.69
30907	1978	6	51.62	3.94
30909	1978	6	53.90	3.99
31005	1978	6	136.70	4.92
31007	1978	6	134.28	4.90
31203	1978	6	27.22	3.30
31205	1978	6	37.56	3.63
31207	1978	6	147.78	5.00
31209	1978	6	20.92	3.04
30703	1978	8	44.25	3.79
30705	1978	8	95.62	4.56

30707	1978	8	178.04	5.18
30709	1978	8	236.66	5.47
30803	1978	8	58.30	4.07
30805	1978	8	96.16	4.57
30807	1978	8	60.60	4.10
30809	1978	8	101.04	4.62
30901	1978	8	11.03	2.40
30903	1978	8	109.76	4.70
30905	1978	8	12.60	2.53
30907	1978	8	99.00	4.60
30909	1978	8	40.96	3.71
31005	1978	8	64.70	4.17
31007	1978	8	55.20	4.01
31203	1978	8	175.50	5.17
31205	1978	8	104.34	4.65
31207	1978	8	251.66	5.53
31209	1978	8	81.52	4.40
30703	1978	10	67.20	4.21
30705	1978	10	107.90	4.68
30709	1978	10	125.28	4.83
30803	1978	10	208.16	5.34
30805	1978	10	239.54	5.48
30807	1978	10	80.36	4.39
30809	1978	10	48.18	3.87
30901	1978	10	99.25	4.60
30903	1978	10	128.67	4.86
30905	1978	10	199.50	5.30
30907	1978	10	64.85	4.17
30909	1978	10	85.84	4.45
31005	1978	10	168.62	5.13
31007	1978	10	59.74	4.09
31203	1978	10	132.18	4.88
31205	1978	10	46.02	3.83
31207	1978	10	169.51	5.13
31209	1978	10	215.42	5.37
30703	1978	12	36.03	3.58
30705	1978	12	30.18	3.41
30707	1978	12	27.42	3.31
30709	1978	12	13.88	2.63
30803	1978	12	29.62	3.39
30805	1978	12	18.72	2.93
30807	1978	12	25.58	3.24
30809	1978	12	45.08	3.81
30901	1978	12	2.36	0.86
30903	1978	12	35.80	3.58
30905	1978	12	37.42	3.62
30907	1978	12	8.38	2.13
30909	1978	12	17.26	2.85
31005	1978	12	100.84	4.61
31007	1978	12	29.66	3.39
31203	1978	12	14.06	2.64
31205	1978	12	41.20	3.72
31207	1978	12	40.58	3.70
31209	1978	12	41.76	3.73
30703	1979	2	21.40	3.06
30705	1979	2	33.50	3.51
30707	1979	2	45.50	3.82
30709	1979	2	81.30	4.40
30803	1979	2	69.00	4.23
30805	1979	2	71.40	4.27
30807	1979	2	45.70	3.82
30809	1979	2	44.50	3.80
30901	1979	2	32.40	3.48
30903	1979	2	72.20	4.28
30905	1979	2	45.10	3.81
30907	1979	2	19.60	2.98
30909	1979	2	28.00	3.33
31005	1979	2	13.90	2.63
31007	1979	2	39.50	3.68
31203	1979	2	27.80	3.33
31205	1979	2	29.20	3.37
31207	1979	2	33.10	3.50
31209	1979	2	31.50	3.45
30703	1979	4	36.10	3.59
30705	1979	4	29.30	3.38
30707	1979	4	74.30	4.31
30709	1979	4	63.40	4.15
30803	1979	4	113.80	4.73
30805	1979	4	97.70	4.58
30807	1979	4	258.60	5.56

30809	1979	4	143.80	4.97
30901	1979	4	16.00	2.77
30903	1979	4	105.60	4.66
30905	1979	4	66.40	4.20
30907	1979	4	71.80	4.27
30909	1979	4	25.90	3.25
31005	1979	4	32.80	3.49
31007	1979	4	51.20	3.94
31203	1979	4	38.50	3.65
31205	1979	4	25.70	3.25
31207	1979	4	17.90	2.88
31209	1979	4	27.70	3.32
30703	1979	6	26.83	3.29
30705	1979	6	95.18	4.56
30707	1979	6	29.41	3.38
30709	1979	6	39.31	3.67
30803	1979	6	36.48	3.60
30805	1979	6	42.98	3.76
30807	1979	6	85.46	4.45
30809	1979	6	75.44	4.32
30901	1979	6	35.88	3.58
30903	1979	6	87.74	4.47
30905	1979	6	52.32	3.96
30907	1979	6	81.35	4.40
30909	1979	6	81.41	4.40
31005	1979	6	825.10	6.72
31007	1979	6	51.88	3.95
31203	1979	6	162.46	5.09
31205	1979	6	86.71	4.46
31207	1979	6	132.86	4.89
31209	1979	6	159.56	5.07
30703	1979	8	178.30	5.18
30705	1979	8	39.25	3.67
30707	1979	8	24.53	3.20
30709	1979	8	26.64	3.28
30803	1979	8	50.25	3.92
30805	1979	8	35.39	3.57
30807	1979	8	33.21	3.50
30809	1979	8	28.30	3.34
30901	1979	8	164.63	5.10
30903	1979	8	56.83	4.04
30905	1979	8	91.95	4.52
30907	1979	8	49.18	3.90
30909	1979	8	33.95	3.52
31005	1979	8	50.23	3.92
31007	1979	8	105.00	4.65
31203	1979	8	119.74	4.79
31205	1979	8	66.97	4.20
31207	1979	8	144.90	4.98
31209	1979	8	222.00	5.40
30703	1979	10	13.73	2.62
30705	1979	10	34.06	3.53
30707	1979	10	53.28	3.98
30709	1979	10	10.97	2.40
30803	1979	10	110.49	4.70
30805	1979	10	15.36	2.73
30807	1979	10	15.61	2.75
30809	1979	10	9.97	2.30
30901	1979	10	153.55	5.03
30903	1979	10	234.65	5.46
30905	1979	10	46.64	3.84
30909	1979	10	93.53	4.54
31005	1979	10	61.25	4.11
31007	1979	10	392.29	5.97
31203	1979	10	150.78	5.02
31205	1979	10	114.64	4.74
31207	1979	10	101.60	4.62
31209	1979	10	108.36	4.69
30703	1979	12	9.01	2.20
30705	1979	12	18.24	2.90
30707	1979	12	16.20	2.79
30709	1979	12	6.26	1.83
30803	1979	12	18.52	2.92
30805	1979	12	14.93	2.70
30807	1979	12	30.99	3.43
30809	1979	12	5.57	1.72
30901	1979	12	12.56	2.53
30903	1979	12	25.64	3.24
30905	1979	12	8.05	2.09
30907	1979	12	4.61	1.53

30909	1979	12	7.07	1.96
31005	1979	12	2.45	0.90
31007	1979	12	5.52	1.71
31203	1979	12	2.76	1.02
31205	1979	12	12.25	2.51
31207	1979	12	14.76	2.69
31209	1979	12	2.39	0.87
30703	1980	2	23.57	3.16
30705	1980	2	59.61	4.09
30707	1980	2	25.62	3.24
30709	1980	2	40.68	3.71
30803	1980	2	2.62	0.96
30805	1980	2	6.04	1.80
30807	1980	2	37.99	3.64
30809	1980	2	5.39	1.68
30901	1980	2	61.74	4.12
30903	1980	2	60.42	4.10
30905	1980	2	63.75	4.15
30907	1980	2	52.69	3.96
30909	1980	2	69.17	4.24
31005	1980	2	55.34	4.01
31007	1980	2	62.85	4.14
31203	1980	2	3.03	1.11
31205	1980	2	20.37	3.01
31207	1980	2	15.66	2.75
31209	1980	2	41.26	3.72
30703	1980	4	65.28	4.18
30705	1980	4	27.79	3.32
30707	1980	4	49.74	3.91
30709	1980	4	30.04	3.40
30803	1980	4	63.83	4.16
30805	1980	4	30.06	3.40
30807	1980	4	267.12	5.59
30809	1980	4	247.91	5.51
30901	1980	4	154.15	5.04
30903	1980	4	157.12	5.06
30905	1980	4	180.82	5.20
30907	1980	4	7.23	1.98
30909	1980	4	16.49	2.80
31005	1980	4	116.06	4.75
31007	1980	4	188.34	5.24
31203	1980	4	20.49	3.02
31205	1980	4	25.67	3.25
31207	1980	4	10.37	2.34
31209	1980	4	58.16	4.06
30703	1980	6	136.61	4.92
30705	1980	6	16.32	2.79
30707	1980	6	47.33	3.86
30709	1980	6	460.50	6.13
30803	1980	6	108.83	4.69
30805	1980	6	54.77	4.00
30807	1980	6	111.75	4.72
30809	1980	6	221.78	5.40
30901	1980	6	3.10	1.13
30903	1980	6	92.45	4.53
30905	1980	6	205.16	5.32
30907	1980	6	247.70	5.51
30909	1980	6	235.76	5.46
31005	1980	6	257.90	5.55
31203	1980	6	392.33	5.97
31205	1980	6	760.59	6.63
31207	1980	6	326.25	5.79
31209	1980	6	628.86	6.44
30703	1980	8	81.10	4.40
30705	1980	8	20.59	3.02
30707	1980	8	43.05	3.76
30709	1980	8	127.92	4.85
30803	1980	8	21.92	3.09
30805	1980	8	82.06	4.41
30807	1980	8	124.62	4.83
30809	1980	8	173.90	5.16
30901	1980	8	115.53	4.75
30903	1980	8	129.14	4.86
30905	1980	8	97.63	4.58
30907	1980	8	47.00	3.85
30909	1980	8	11.77	2.47
31005	1980	8	155.74	5.05
31007	1980	8	19.12	2.95
31203	1980	8	74.36	4.31
31205	1980	8	22.88	3.13

31207	1980	8	22.88	3.13
31209	1980	8	31.72	3.46
30703	1980	10	7.36	2.00
30705	1980	10	18.19	2.90
30707	1980	10	38.14	3.64
30709	1980	10	13.31	2.59
30803	1980	10	58.13	4.06
30805	1980	10	100.97	4.61
30807	1980	10	20.18	3.00
30809	1980	10	5.12	1.63
30901	1980	10	86.22	4.46
30903	1980	10	36.76	3.60
30905	1980	10	23.25	3.15
30907	1980	10	114.62	4.74
30909	1980	10	10.83	2.38
31005	1980	10	339.42	5.83
31007	1980	10	34.44	3.54
31203	1980	10	47.54	3.86
31205	1980	10	26.05	3.26
31207	1980	10	16.17	2.78
31209	1980	10	40.69	3.71
30703	1980	12	32.35	3.48
30705	1980	12	91.61	4.52
30707	1980	12	54.55	4.00
30709	1980	12	1.76	0.57
30803	1980	12	8.03	2.08
30805	1980	12	30.30	3.41
30807	1980	12	20.21	3.01
30901	1980	12	19.84	2.99
30903	1980	12	6.79	1.92
30905	1980	12	18.52	2.92
30907	1980	12	91.24	4.51
30909	1980	12	2.90	1.06
31005	1980	12	15.46	2.74
31007	1980	12	47.47	3.86
31203	1980	12	51.00	3.93
31205	1980	12	27.77	3.32
31207	1980	12	73.96	4.30
31209	1980	12	56.97	4.04
30703	1981	2	39.27	3.67
30705	1981	2	49.31	3.90
30707	1981	2	222.42	5.40
30709	1981	2	71.15	4.26
30803	1981	2	11.57	2.45
30805	1981	2	21.79	3.08
30809	1981	2	50.60	3.92
30901	1981	2	64.38	4.16
30903	1981	2	35.05	3.56
30909	1981	2	62.37	4.13
31005	1981	2	72.07	4.28
31007	1981	2	52.02	3.95
31203	1981	2	17.24	2.85
31205	1981	2	5.47	1.70
31207	1981	2	6.91	1.93
31209	1981	2	5.12	1.63
30703	1981	4	69.66	4.24
30705	1981	4	161.46	5.08
30707	1981	4	99.89	4.60
30709	1981	4	136.42	4.92
30803	1981	4	98.38	4.59
30805	1981	4	76.22	4.33
30807	1981	4	239.30	5.48
30809	1981	4	62.64	4.14
30901	1981	4	202.84	5.31
30903	1981	4	174.75	5.16
30905	1981	4	262.40	5.57
30907	1981	4	284.50	5.65
30909	1981	4	190.68	5.25
31005	1981	4	94.43	4.55
31007	1981	4	39.54	3.68
31203	1981	4	126.57	4.84
31205	1981	4	1.80	0.59
31207	1981	4	53.81	3.99
31209	1981	4	28.87	3.36
30703	1981	6	45.25	3.81
30705	1981	6	26.44	3.27
30707	1981	6	125.08	4.83

30709	1981	6	97.66	4.58
30803	1981	6	194.95	5.27
30805	1981	6	305.10	5.72
30807	1981	6	313.42	5.75
30809	1981	6	257.82	5.55
30901	1981	6	59.42	4.08
30903	1981	6	2.37	0.86
30905	1981	6	119.71	4.79
30907	1981	6	37.65	3.63
30909	1981	6	64.42	4.17
31005	1981	6	251.29	5.53
31007	1981	6	248.95	5.52
31203	1981	6	187.93	5.24
31205	1981	6	119.01	4.78
31207	1981	6	180.99	5.20
31209	1981	6	187.27	5.23
30703	1981	8	13.90	2.63
30705	1981	8	412.28	6.02
30707	1981	8	48.38	3.88
30709	1981	8	29.06	3.37
30803	1981	8	68.23	4.22
30805	1981	8	147.90	5.00
30807	1981	8	37.34	3.62
30809	1981	8	73.20	4.29
30901	1981	8	163.09	5.09
30903	1981	8	67.42	4.21
30905	1981	8	178.69	5.19
30907	1981	8	469.66	6.15
30909	1981	8	238.17	5.47
31005	1981	8	27.38	3.31
31007	1981	8	64.95	4.17
31203	1981	8	246.55	5.51
31205	1981	8	237.35	5.47
31207	1981	8	333.79	5.81
31209	1981	8	102.41	4.63
30703	1981	10	10.90	2.39
30705	1981	10	22.95	3.13
30707	1981	10	14.37	2.67
30709	1981	10	21.27	3.06
30803	1981	10	170.37	5.14
30805	1981	10	142.14	4.96
30807	1981	10	40.61	3.70
30809	1981	10	140.36	4.94
30901	1981	10	39.31	3.67
30903	1981	10	40.68	3.71
30905	1981	10	8.43	2.13
30907	1981	10	106.44	4.67
30909	1981	10	57.07	4.04
31005	1981	10	241.91	5.49
31007	1981	10	336.61	5.82
31203	1981	10	228.99	5.43
31205	1981	10	324.07	5.78
31207	1981	10	165.79	5.11
31209	1981	10	181.25	5.20
30703	1981	12	54.10	3.99
30705	1981	12	99.76	4.60
30707	1981	12	106.56	4.67
30709	1981	12	58.25	4.06
30803	1981	12	24.55	3.20
30805	1981	12	70.84	4.26
30807	1981	12	224.30	5.41
30809	1981	12	67.69	4.21
30901	1981	12	113.71	4.73
30903	1981	12	40.40	3.70
30905	1981	12	24.93	3.22
30907	1981	12	65.81	4.19
30909	1981	12	60.31	4.10
31005	1981	12	72.29	4.28
31007	1981	12	26.24	3.27
31203	1981	12	114.66	4.74
31205	1981	12	191.49	5.25
31207	1981	12	98.10	4.59
31209	1981	12	101.32	4.62
30703	1982	2	69.42	4.24
30705	1982	2	42.13	3.74
30707	1982	2	8.88	2.18
30709	1982	2	48.35	3.88
30803	1982	2	78.03	4.36
30805	1982	2	100.86	4.61
30807	1982	2	121.61	4.80
30809	1982	2	56.09	4.03

30903	1982	2	65.68	4.18
30905	1982	2	36.13	3.59
30907	1982	2	62.54	4.14
30909	1982	2	58.44	4.07
31005	1982	2	34.19	3.53
31203	1982	2	34.42	3.54
31205	1982	2	21.42	3.06
31207	1982	2	25.51	3.24
31209	1982	2	14.83	2.70
30703	1982	4	47.23	3.86
30705	1982	4	200.42	5.30
30707	1982	4	174.61	5.16
30709	1982	4	100.48	4.61
30803	1982	4	74.97	4.32
30805	1982	4	69.06	4.23
30807	1982	4	59.46	4.09
30809	1982	4	67.84	4.22
30901	1982	4	117.67	4.77
30903	1982	4	89.98	4.50
30905	1982	4	85.59	4.45
30907	1982	4	34.71	3.55
30909	1982	4	34.81	3.55
31005	1982	4	124.06	4.82
31007	1982	4	78.97	4.37
31203	1982	4	46.64	3.84
31205	1982	4	63.77	4.16
31207	1982	4	88.53	4.48
31209	1982	4	49.52	3.90
30703	1982	6	16.08	2.78
30705	1982	6	111.95	4.72
30707	1982	6	55.41	4.01
30709	1982	6	72.97	4.29
30803	1982	6	27.04	3.30
30805	1982	6	150.86	5.02
30807	1982	6	100.89	4.61
30809	1982	6	59.57	4.09
30901	1982	6	253.02	5.53
30903	1982	6	58.06	4.06
30905	1982	6	71.80	4.27
30907	1982	6	42.64	3.75
30909	1982	6	35.84	3.58
31005	1982	6	260.22	5.56
31007	1982	6	200.68	5.30
31203	1982	6	46.04	3.83
31205	1982	6	25.79	3.25
31207	1982	6	32.24	3.47
31209	1982	6	33.15	3.50
30703	1982	8	35.15	3.56
30705	1982	8	61.94	4.13
30707	1982	8	20.85	3.04
30709	1982	8	140.27	4.94
30803	1982	8	97.20	4.58
30805	1982	8	153.31	5.03
30807	1982	8	211.01	5.35
30809	1982	8	84.72	4.44
30901	1982	8	169.81	5.13
30903	1982	8	267.25	5.59
30905	1982	8	331.74	5.80
30907	1982	8	294.65	5.69
30909	1982	8	189.15	5.24
31005	1982	8	29.37	3.38
31007	1982	8	10.36	2.34
31203	1982	8	127.76	4.85
31205	1982	8	98.33	4.59
31207	1982	8	173.80	5.16
31209	1982	8	227.02	5.43
30703	1982	10	26.71	3.29
30705	1982	10	148.68	5.00
30707	1982	10	96.92	4.57
30709	1982	10	128.81	4.86
30803	1982	10	86.21	4.46
30805	1982	10	145.79	4.98
30807	1982	10	207.95	5.34
30809	1982	10	240.23	5.48
30901	1982	10	164.67	5.10
30903	1982	10	78.76	4.37
30905	1982	10	41.25	3.72
30907	1982	10	223.09	5.41
30909	1982	10	131.83	4.88

31005	1982	10	145.64	4.98
31007	1982	10	472.09	6.16
31203	1982	10	148.57	5.00
31205	1982	10	157.72	5.06
31207	1982	10	179.51	5.19
31209	1982	10	118.71	4.78
30703	1982	12	23.23	3.15
30705	1982	12	68.86	4.23
30707	1982	12	65.65	4.18
30709	1982	12	48.67	3.89
30803	1982	12	55.88	4.02
30805	1982	12	65.59	4.18
30807	1982	12	76.96	4.34
30809	1982	12	38.94	3.66
30901	1982	12	51.41	3.94
30903	1982	12	41.09	3.72
30905	1982	12	38.18	3.64
30907	1982	12	33.72	3.52
30909	1982	12	33.58	3.51
31005	1982	12	69.17	4.24
31007	1982	12	53.77	3.98
31203	1982	12	51.60	3.94
31205	1982	12	42.19	3.74
31207	1982	12	54.81	4.00
31209	1982	12	28.50	3.35
30703	1983	2	32.22	3.47
30705	1983	2	44.54	3.80
30707	1983	2	93.72	4.54
30709	1983	2	76.92	4.34
30803	1983	2	79.07	4.37
30805	1983	2	113.79	4.73
30807	1983	2	64.00	4.16
30809	1983	2	29.94	3.40
30901	1983	2	44.20	3.79
30903	1983	2	77.03	4.34
30905	1983	2	70.66	4.26
30907	1983	2	66.50	4.20
30909	1983	2	13.39	2.59
31005	1983	2	56.87	4.04
31007	1983	2	43.13	3.76
31203	1983	2	110.71	4.71
31205	1983	2	12.78	2.55
31207	1983	2	54.40	4.00
31209	1983	2	11.01	2.40
30703	1983	4	31.38	3.45
30705	1983	4	21.75	3.08
30707	1983	4	7.06	1.95
30709	1983	4	26.09	3.26
30803	1983	4	61.67	4.12
30805	1983	4	24.25	3.19
30807	1983	4	47.93	3.87
30809	1983	4	92.16	4.52
30901	1983	4	39.53	3.68
30903	1983	4	4.50	1.50
30905	1983	4	13.05	2.57
30907	1983	4	10.77	2.38
30909	1983	4	6.66	1.90
31005	1983	4	21.93	3.09
31007	1983	4	46.82	3.85
31203	1983	4	31.25	3.44
31205	1983	4	51.19	3.94
31207	1983	4	18.42	2.91
31209	1983	4	17.92	2.89
30703	1983	6	49.56	3.90
30705	1983	6	20.16	3.00
30707	1983	6	33.07	3.50
30709	1983	6	26.28	3.27
30803	1983	6	54.13	3.99
30805	1983	6	62.39	4.13
30807	1983	6	47.62	3.86
30809	1983	6	49.12	3.89
30901	1983	6	63.67	4.15
30903	1983	6	34.88	3.55
30905	1983	6	15.12	2.72
30907	1983	6	32.85	3.49
30909	1983	6	32.43	3.48
31005	1983	6	118.07	4.77
31007	1983	6	109.65	4.70
31203	1983	6	71.88	4.27
31205	1983	6	95.58	4.56
31207	1983	6	257.63	5.55

31209	1983	6	134.20	4.90
30703	1983	8	39.08	3.67
30705	1983	8	36.74	3.60
30707	1983	8	15.55	2.74
30709	1983	8	57.31	4.05
30803	1983	8	38.59	3.65
30805	1983	8	21.53	3.07
30807	1983	8	132.20	4.88
30809	1983	8	62.56	4.14
30901	1983	8	32.38	3.48
30903	1983	8	25.45	3.24
30905	1983	8	30.22	3.41
30907	1983	8	19.44	2.97
30909	1983	8	19.75	2.98
31005	1983	8	128.85	4.86
31007	1983	8	8.83	2.18
31203	1983	8	26.23	3.27
31205	1983	8	90.87	4.51
31207	1983	8	20.49	3.02
31209	1983	8	8.23	2.11
30703	1983	10	38.31	3.65
30705	1983	10	22.27	3.10
30709	1983	10	32.27	3.47
30803	1983	10	79.16	4.37
30805	1983	10	143.20	4.96
30807	1983	10	53.99	3.99
30809	1983	10	25.28	3.23
30901	1983	10	28.21	3.34
30903	1983	10	16.89	2.83
30905	1983	10	37.64	3.63
30907	1983	10	29.31	3.38
30909	1983	10	37.54	3.63
31005	1983	10	51.92	3.95
31007	1983	10	131.00	4.88
31203	1983	10	151.41	5.02
31205	1983	10	53.65	3.98
31207	1983	10	28.53	3.35
31209	1983	10	114.25	4.74
30703	1983	12	15.58	2.75
30705	1983	12	18.38	2.91
30707	1983	12	2.81	1.03
30709	1983	12	11.13	2.41
30803	1983	12	17.22	2.85
30805	1983	12	18.55	2.92
30807	1983	12	1.91	0.65
30809	1983	12	16.62	2.81
30901	1983	12	36.99	3.61
30903	1983	12	6.42	1.86
30905	1983	12	47.78	3.87
30907	1983	12	13.45	2.60
30909	1983	12	12.73	2.54
31005	1983	12	26.81	3.29
31007	1983	12	14.86	2.70
31203	1983	12	7.46	2.01
31205	1983	12	9.77	2.28
31207	1983	12	6.49	1.87
31209	1983	12	8.73	2.17
30703	1984	2	11.45	2.44
30705	1984	2	25.96	3.26
30707	1984	2	27.11	3.30
30709	1984	2	53.73	3.98
30803	1984	2	73.30	4.29
30805	1984	2	41.92	3.74
30807	1984	2	61.78	4.12
30809	1984	2	52.36	3.96
30901	1984	2	40.72	3.71
30903	1984	2	61.25	4.11
30905	1984	2	20.37	3.01
30907	1984	2	15.06	2.71
30909	1984	2	125.62	4.83
31005	1984	2	29.34	3.38
31007	1984	2	239.88	5.48
31203	1984	2	62.26	4.13
31205	1984	2	21.86	3.08
31207	1984	2	13.67	2.62
31209	1984	2	38.58	3.65
30703	1984	4	6.65	1.89
30705	1984	4	13.79	2.62
30707	1984	4	29.35	3.38
30709	1984	4	22.55	3.12

30803	1984	4	94.91	4.55
30805	1984	4	28.99	3.37
30807	1984	4	62.62	4.14
30809	1984	4	22.69	3.12
30901	1984	4	118.18	4.77
30903	1984	4	11.38	2.43
30905	1984	4	129.97	4.87
30907	1984	4	8.53	2.14
30909	1984	4	31.06	3.44
31005	1984	4	303.46	5.72
31007	1984	4	165.64	5.11
31203	1984	4	6.33	1.85
31205	1984	4	84.86	4.44
31207	1984	4	22.25	3.10
31209	1984	4	57.39	4.05
30703	1984	6	94.48	4.55
30705	1984	6	63.22	4.15
30707	1984	6	61.21	4.11
30709	1984	6	59.78	4.09
30803	1984	6	34.16	3.53
30805	1984	6	28.11	3.34
30807	1984	6	135.49	4.91
30809	1984	6	57.84	4.06
30901	1984	6	63.42	4.15
30903	1984	6	94.82	4.55
30905	1984	6	15.61	2.75
30907	1984	6	174.36	5.16
30909	1984	6	192.87	5.26
31005	1984	6	61.16	4.11
31007	1984	6	32.34	3.48
31203	1984	6	228.47	5.43
31205	1984	6	264.54	5.58
31207	1984	6	182.92	5.21
31209	1984	6	12.57	2.53
30703	1984	8	88.51	4.48
30705	1984	8	20.06	3.00
30707	1984	8	30.29	3.41
30709	1984	8	27.32	3.31
30803	1984	8	49.15	3.89
30805	1984	8	39.20	3.67
30807	1984	8	99.33	4.60
30809	1984	8	159.17	5.07
30901	1984	8	83.89	4.43
30903	1984	8	82.32	4.41
30905	1984	8	18.94	2.94
30907	1984	8	87.50	4.47
30909	1984	8	27.04	3.30
31005	1984	8	110.86	4.71
31007	1984	8	356.87	5.88
31203	1984	8	467.74	6.15
31205	1984	8	200.90	5.30
31207	1984	8	66.60	4.20
31209	1984	8	41.39	3.72
30703	1984	10	32.18	3.47
30705	1984	10	41.07	3.72
30707	1984	10	22.26	3.10
30709	1984	10	12.99	2.56
30803	1984	10	75.49	4.32
30805	1984	10	93.24	4.54
30807	1984	10	14.54	2.68
30809	1984	10	54.69	4.00
30901	1984	10	136.93	4.92
30903	1984	10	36.49	3.60
30905	1984	10	46.69	3.84
30907	1984	10	43.33	3.77
30909	1984	10	154.36	5.04
31005	1984	10	19.42	2.97
31007	1984	10	37.27	3.62
31203	1984	10	100.80	4.61
31205	1984	10	118.07	4.77
31207	1984	10	8.06	2.09
31209	1984	10	6.61	1.89
30703	1984	12	24.32	3.19
30705	1984	12	38.38	3.65
30707	1984	12	17.11	2.84
30709	1984	12	55.47	4.02
30803	1984	12	5.96	1.79
30805	1984	12	28.33	3.34
30807	1984	12	2.30	0.83
30809	1984	12	25.45	3.24
30901	1984	12	28.58	3.35

30903	1984	12	22.00	3.09
30905	1984	12	18.94	2.94
30907	1984	12	33.34	3.51
30909	1984	12	45.81	3.82
31005	1984	12	7.96	2.07
31007	1984	12	10.80	2.38
31203	1984	12	49.10	3.89
31205	1984	12	39.95	3.69
31207	1984	12	13.55	2.61
31209	1984	12	52.35	3.96
30703	1985	2	14.68	2.69
30705	1985	2	82.67	4.41
30707	1985	2	73.11	4.29
30709	1985	2	44.78	3.80
30803	1985	2	7.99	2.08
30805	1985	2	79.20	4.37
30807	1985	2	12.55	2.53
30809	1985	2	57.22	4.05
30901	1985	2	35.02	3.56
30903	1985	2	53.82	3.99
30905	1985	2	18.57	2.92
30907	1985	2	42.03	3.74
30909	1985	2	58.47	4.07
31005	1985	2	7.13	1.96
31007	1985	2	74.91	4.32
31203	1985	2	7.31	1.99
31205	1985	2	1.57	0.45
31207	1985	2	56.24	4.03
31209	1985	2	12.39	2.52
30703	1985	4	51.34	3.94
30705	1985	4	57.08	4.04
30707	1985	4	54.89	4.01
30709	1985	4	38.66	3.65
30803	1985	4	59.46	4.09
30805	1985	4	30.44	3.42
30807	1985	4	42.19	3.74
30809	1985	4	142.07	4.96
30901	1985	4	216.50	5.38
30903	1985	4	13.80	2.62
30905	1985	4	0.66	−0.42
30907	1985	4	67.55	4.21
30909	1985	4	4.47	1.50
31005	1985	4	49.10	3.89
31007	1985	4	184.83	5.22
31203	1985	4	18.86	2.94
31205	1985	4	11.35	2.43
31207	1985	4	7.37	2.00
31209	1985	4	48.12	3.87
30703	1985	6	55.74	4.02
30705	1985	6	4.39	1.48
30707	1985	6	16.50	2.80
30709	1985	6	8.93	2.19
30803	1985	6	49.32	3.90
30805	1985	6	37.56	3.63
30807	1985	6	60.90	4.11
30809	1985	6	78.38	4.36
30901	1985	6	9.81	2.28
30903	1985	6	21.06	3.05
30905	1985	6	28.56	3.35
30907	1985	6	26.14	3.26
30909	1985	6	45.03	3.81
31005	1985	6	15.66	2.75
31007	1985	6	117.45	4.77
31203	1985	6	12.62	2.54
31205	1985	6	76.43	4.34
31207	1985	6	173.78	5.16
31209	1985	6	111.71	4.72
30703	1985	8	84.17	4.43
30705	1985	8	66.60	4.20
30707	1985	8	14.30	2.66
30709	1985	8	25.88	3.25
30803	1985	8	11.43	2.44
30805	1985	8	55.25	4.01
30807	1985	8	14.20	2.65
30809	1985	8	42.34	3.75
30901	1985	8	34.55	3.54
30903	1985	8	8.50	2.14
30905	1985	8	72.73	4.29
30907	1985	8	19.38	2.96
30909	1985	8	21.34	3.06
31005	1985	8	73.28	4.29

31007	1985	8	63.13	4.15
31203	1985	8	15.74	2.76
31205	1985	8	62.19	4.13
31207	1985	8	135.74	4.91
31209	1985	8	52.65	3.96
30703	1985	10	56.00	4.03
30705	1985	10	69.16	4.24
30707	1985	10	8.55	2.15
30709	1985	10	99.57	4.60
30803	1985	10	88.21	4.48
30805	1985	10	121.75	4.80
30807	1985	10	194.98	5.27
30809	1985	10	85.73	4.45
30901	1985	10	146.76	4.99
30903	1985	10	106.32	4.67
30905	1985	10	28.27	3.34
30907	1985	10	87.48	4.47
30909	1985	10	49.40	3.90
31005	1985	10	31.57	3.45
31007	1985	10	59.41	4.08
31203	1985	10	142.65	4.96
31205	1985	10	25.78	3.25
31207	1985	10	17.53	2.86
31209	1985	10	44.03	3.78
30703	1985	12	55.75	4.02
30705	1985	12	43.80	3.78
30707	1985	12	58.62	4.07
30709	1985	12	45.34	3.81
30803	1985	12	62.61	4.14
30805	1985	12	44.82	3.80
30807	1985	12	57.47	4.05
30809	1985	12	12.15	2.50
30901	1985	12	29.91	3.40
30903	1985	12	39.66	3.68
30905	1985	12	12.31	2.51
30907	1985	12	41.22	3.72
30909	1985	12	10.46	2.35
31005	1985	12	29.70	3.39
31007	1985	12	55.81	4.02
31203	1985	12	23.39	3.15
31205	1985	12	54.76	4.00
31207	1985	12	9.22	2.22
31209	1985	12	28.12	3.34
30703	1986	2	10.61	2.36
30705	1986	2	69.25	4.24
30707	1986	2	45.01	3.81
30709	1986	2	10.60	2.36
30803	1986	2	71.39	4.27
30805	1986	2	8.60	2.15
30807	1986	2	27.75	3.32
30809	1986	2	71.40	4.27
30901	1986	2	55.09	4.01
30903	1986	2	37.87	3.63
30905	1986	2	73.81	4.30
30907	1986	2	19.20	2.95
30909	1986	2	157.72	5.06
31005	1986	2	36.49	3.60
31007	1986	2	52.32	3.96
31203	1986	2	9.27	2.23
31205	1986	2	21.97	3.09
31207	1986	2	30.16	3.41
31209	1986	2	12.31	2.51
30703	1986	4	69.05	4.23
30705	1986	4	100.39	4.61
30707	1986	4	23.99	3.18
30709	1986	4	23.14	3.14
30803	1986	4	219.69	5.39
30805	1986	4	75.44	4.32
30807	1986	4	11.21	2.42
30809	1986	4	133.07	4.89
30901	1986	4	184.03	5.22
30903	1986	4	34.71	3.55
30905	1986	4	66.55	4.20
30907	1986	4	59.94	4.09
30909	1986	4	36.48	3.60
31005	1986	4	243.55	5.50
31007	1986	4	242.46	5.49
31203	1986	4	63.09	4.14
31205	1986	4	19.68	2.98
31207	1986	4	13.22	2.58
31209	1986	4	6.75	1.91

30703	1986	6	93.34	4.54
30705	1986	6	8.12	2.09
30707	1986	6	49.11	3.89
30709	1986	6	180.64	5.20
30803	1986	6	28.01	3.33
30805	1986	6	37.70	3.63
30807	1986	6	40.15	3.69
30809	1986	6	59.71	4.09
30901	1986	6	43.37	3.77
30903	1986	6	27.93	3.33
30905	1986	6	11.08	2.41
30907	1986	6	40.64	3.70
30909	1986	6	22.95	3.13
31005	1986	6	58.18	4.06
31007	1986	6	138.48	4.93
31203	1986	6	98.64	4.59
31205	1986	6	157.12	5.06
31207	1986	6	119.13	4.78
31209	1986	6	14.03	2.64
30703	1986	8	32.91	3.49
30705	1986	8	72.46	4.28
30707	1986	8	99.78	4.60
30709	1986	8	19.31	2.96
30803	1986	8	122.53	4.81
30805	1986	8	69.83	4.25
30807	1986	8	21.25	3.06
30809	1986	8	69.90	4.25
30901	1986	8	97.50	4.58
30903	1986	8	96.18	4.57
30905	1986	8	4.69	1.55
30907	1986	8	74.90	4.32
30909	1986	8	42.76	3.76
31005	1986	8	87.35	4.47
31007	1986	8	39.64	3.68
31203	1986	8	121.96	4.80
31205	1986	8	63.62	4.15
31207	1986	8	26.81	3.29
31209	1986	8	35.22	3.56
30703	1986	10	61.26	4.12
30705	1986	10	22.40	3.11
30707	1986	10	65.88	4.19
30709	1986	10	156.95	5.06
30803	1986	10	149.12	5.00
30805	1986	10	96.18	4.57
30807	1986	10	105.26	4.66
30809	1986	10	91.17	4.51
30901	1986	10	67.98	4.22
30903	1986	10	221.34	5.40
30905	1986	10	231.36	5.44
30907	1986	10	114.04	4.74
30909	1986	10	84.59	4.44
31005	1986	10	93.45	4.54
31007	1986	10	9.41	2.24
31203	1986	10	108.53	4.69
31205	1986	10	72.52	4.28
31207	1986	10	169.23	5.13
31209	1986	10	37.73	3.63
30703	1986	12	42.47	3.75
30705	1986	12	101.91	4.62
30707	1986	12	120.23	4.79
30709	1986	12	40.89	3.71
30803	1986	12	44.74	3.80
30805	1986	12	114.49	4.74
30807	1986	12	60.81	4.11
30809	1986	12	33.02	3.50
30901	1986	12	33.50	3.51
30903	1986	12	59.13	4.08
30905	1986	12	77.58	4.35
30907	1986	12	93.31	4.54
30909	1986	12	201.26	5.30
31005	1986	12	23.26	3.15
31007	1986	12	22.30	3.10
31203	1986	12	12.46	2.52
31205	1986	12	78.72	4.37
31207	1986	12	30.38	3.41
31209	1986	12	14.02	2.64
30703	1987	2	88.40	4.48
30705	1987	2	101.90	4.62
30707	1987	2	71.70	4.27
30709	1987	2	83.90	4.43
30803	1987	2	88.10	4.48

30805	1987	2	123.30	4.81
30807	1987	2	50.30	3.92
30809	1987	2	119.50	4.78
30901	1987	2	175.10	5.17
30903	1987	2	84.30	4.43
30905	1987	2	83.90	4.43
30907	1987	2	137.30	4.92
30909	1987	2	52.70	3.96
31005	1987	2	30.00	3.40
31007	1987	2	38.81	3.66
31203	1987	2	27.02	3.30
31205	1987	2	11.93	2.48
31207	1987	2	41.80	3.73
31209	1987	2	21.03	3.05
30703	1987	4	94.36	4.55
30705	1987	4	271.77	5.60
30707	1987	4	190.82	5.25
30709	1987	4	123.87	4.82
30803	1987	4	303.22	5.71
30805	1987	4	123.30	4.81
30807	1987	4	87.18	4.47
30809	1987	4	88.86	4.49
30901	1987	4	598.89	6.40
30903	1987	4	391.29	5.97
30905	1987	4	88.07	4.48
30907	1987	4	202.35	5.31
30909	1987	4	94.78	4.55
31005	1987	4	26.36	3.27
31007	1987	4	35.24	3.56
31203	1987	4	37.90	3.63
31205	1987	4	49.34	3.90
31207	1987	4	48.67	3.89
31209	1987	4	10.45	2.35
30703	1987	6	108.50	4.69
30705	1987	6	261.70	5.57
30707	1987	6	439.10	6.08
30709	1987	6	372.60	5.92
30803	1987	6	166.10	5.11
30805	1987	6	171.10	5.14
30807	1987	6	251.60	5.53
30809	1987	6	280.70	5.64
30901	1987	6	81.80	4.40
30903	1987	6	464.30	6.14
30905	1987	6	153.90	5.04
30907	1987	6	105.50	4.66
30909	1987	6	159.40	5.07
31005	1987	6	196.88	5.28
31007	1987	6	230.05	5.44
31203	1987	6	274.63	5.62
31205	1987	6	185.64	5.22
31207	1987	6	241.91	5.49
31209	1987	6	22.43	3.11
30703	1987	8	150.60	5.01
30705	1987	8	51.60	3.94
30707	1987	8	161.60	5.09
30709	1987	8	137.70	4.93
30803	1987	8	79.60	4.38
30805	1987	8	139.70	4.94
30807	1987	8	120.90	4.79
30809	1987	8	95.60	4.56
30901	1987	8	264.20	5.58
30903	1987	8	181.20	5.20
30905	1987	8	106.70	4.67
30907	1987	8	154.40	5.04
30909	1987	8	43.00	3.76
31005	1987	8	63.38	4.15
31007	1987	8	2.20	0.79
31203	1987	8	178.56	5.18
31205	1987	8	18.86	2.94
31207	1987	8	24.94	3.22
31209	1987	8	89.84	4.50
30703	1987	10	79.46	4.38
30705	1987	10	76.22	4.33
30707	1987	10	144.68	4.97
30709	1987	10	174.20	5.16
30803	1987	10	166.90	5.12
30805	1987	10	181.47	5.20
30807	1987	10	153.88	5.04
30809	1987	10	104.58	4.65
30901	1987	10	201.78	5.31

30905	1987	10	154.42	5.04
30907	1987	10	96.78	4.57
30909	1987	10	144.13	4.97
31005	1987	10	182.33	5.21
31007	1987	10	200.13	5.30
31203	1987	10	162.22	5.09
31205	1987	10	136.37	4.92
31207	1987	10	239.72	5.48
31209	1987	10	82.81	4.42
30703	1987	12	67.90	4.22
30705	1987	12	43.50	3.77
30707	1987	12	124.70	4.83
30709	1987	12	229.40	5.44
30803	1987	12	36.00	3.58
30805	1987	12	112.00	4.72
30807	1987	12	79.80	4.38
30809	1987	12	40.10	3.69
30901	1987	12	16.80	2.82
30903	1987	12	24.50	3.20
30905	1987	12	39.80	3.68
30907	1987	12	30.40	3.41
30909	1987	12	13.50	2.60
31005	1987	12	21.44	3.07
31007	1987	12	15.71	2.75
31203	1987	12	3.18	1.16
31205	1987	12	30.48	3.42
31207	1987	12	31.93	3.46
31209	1987	12	36.38	3.59
30703	1988	2	115.00	4.74
30705	1988	2	46.91	3.85
30707	1988	2	101.96	4.62
30709	1988	2	34.74	3.55
30803	1988	2	38.52	3.65
30805	1988	2	88.31	4.48
30807	1988	2	65.17	4.18
30809	1988	2	32.96	3.50
30901	1988	2	29.47	3.38
30903	1988	2	111.89	4.72
30905	1988	2	145.88	4.98
30907	1988	2	106.95	4.67
30909	1988	2	63.69	4.15
31005	1988	2	17.52	2.86
31007	1988	2	20.25	3.01
31203	1988	2	17.52	2.86
31205	1988	2	23.94	3.18
31207	1988	2	12.76	2.55
31209	1988	2	6.68	1.90
30703	1988	4	74.49	4.31
30705	1988	4	130.54	4.87
30707	1988	4	130.17	4.87
30709	1988	4	96.71	4.57
30803	1988	4	21.39	3.06
30805	1988	4	135.49	4.91
30807	1988	4	92.26	4.52
30809	1988	4	10.36	2.34
30901	1988	4	178.23	5.18
30903	1988	4	113.78	4.73
30905	1988	4	28.31	3.34
30907	1988	4	66.05	4.19
30909	1988	4	88.07	4.48
31005	1988	4	18.87	2.94
31007	1988	4	17.52	2.86
31203	1988	4	26.21	3.27
31205	1988	4	19.66	2.98
31207	1988	4	13.37	2.59
31209	1988	4	27.52	3.31
30703	1988	6	6.45	1.86
30705	1988	6	156.03	5.05
30707	1988	6	162.89	5.09
30709	1988	6	211.19	5.35
30803	1988	6	2.52	0.92
30805	1988	6	39.63	3.68
30807	1988	6	189.68	5.25
30809	1988	6	132.11	4.88
30901	1988	6	39.54	3.68
30903	1988	6	11.32	2.43
30905	1988	6	177.05	5.18
30907	1988	6	225.49	5.42
30909	1988	6	154.34	5.04
31005	1988	6	151.00	5.02
31007	1988	6	423.10	6.05

31203	1988	6	136.60	4.92
31205	1988	6	14.00	2.64
31207	1988	6	173.00	5.15
31209	1988	6	102.20	4.63
30703	1988	8	42.47	3.75
30705	1988	8	89.49	4.49
30707	1988	8	244.85	5.50
30709	1988	8	224.52	5.41
30803	1988	8	7.86	2.06
30805	1988	8	159.79	5.07
30807	1988	8	361.95	5.89
30809	1988	8	216.13	5.38
30901	1988	8	752.98	6.62
30903	1988	8	184.95	5.22
30905	1988	8	696.79	6.55
30907	1988	8	729.70	6.59
30909	1988	8	188.73	5.24
31005	1988	8	12.02	2.49
31007	1988	8	12.58	2.53
31203	1988	8	185.04	5.22
31205	1988	8	9.78	2.28
31207	1988	8	16.51	2.80
31209	1988	8	34.58	3.54
30703	1988	10	8.99	2.20
30705	1988	10	376.06	5.93
30707	1988	10	97.33	4.58
30709	1988	10	176.13	5.17
30803	1988	10	501.89	6.22
30805	1988	10	547.31	6.31
30807	1988	10	296.27	5.69
30809	1988	10	248.49	5.52
30901	1988	10	559.18	6.33
30903	1988	10	919.73	6.82
30905	1988	10	452.92	6.12
30907	1988	10	405.49	6.01
30909	1988	10	313.67	5.75
31005	1988	10	52.39	3.96
31007	1988	10	221.63	5.40
31203	1988	10	90.72	4.51
31205	1988	10	125.75	4.83
31207	1988	10	82.52	4.41
31209	1988	10	143.82	4.97
30703	1988	12	19.86	2.99
30705	1988	12	46.13	3.83
30707	1988	12	283.09	5.65
30709	1988	12	161.32	5.08
30803	1988	12	13.98	2.64
30805	1988	12	106.46	4.67
30807	1988	12	175.74	5.17
30809	1988	12	149.41	5.01
30901	1988	12	16.31	2.79
30903	1988	12	11.10	2.41
30905	1988	12	119.04	4.78
30907	1988	12	73.72	4.30
30909	1988	12	38.44	3.65
31005	1988	12	4.19	1.43
31007	1988	12	133.01	4.89
31203	1988	12	35.66	3.57
31205	1988	12	30.67	3.42
31207	1988	12	29.88	3.40
31209	1988	12	16.51	2.80
30703	1989	2	10.48	2.35
30705	1989	2	158.45	5.07
30707	1989	2	22.64	3.12
30709	1989	2	28.29	3.34
30803	1989	2	59.73	4.09
30805	1989	2	30.18	3.41
30807	1989	2	74.40	4.31
30809	1989	2	3.93	1.37
30901	1989	2	10.06	2.31
30903	1989	2	56.59	4.04
30905	1989	2	19.35	2.96
30907	1989	2	7.34	1.99
30909	1989	2	16.50	2.80
31005	1989	2	234.09	5.46
31007	1989	2	3.14	1.14
31203	1989	2	0.90	−0.11
31205	1989	2	10.48	2.35
31207	1989	2	9.62	2.26
31209	1989	2	16.50	2.80

30705	1989	4	64.31	4.16
30707	1989	4	107.18	4.67
30709	1989	4	148.13	5.00
30803	1989	4	250.18	5.52
30805	1989	4	162.30	5.09
30807	1989	4	78.12	4.36
30809	1989	4	22.80	3.13
30901	1989	4	50.33	3.92
30903	1989	4	954.51	6.86
30905	1989	4	114.83	4.74
30907	1989	4	77.65	4.35
30909	1989	4	103.19	4.64
31005	1989	4	184.86	5.22
31007	1989	4	28.74	3.36
31203	1989	4	83.83	4.43
31205	1989	4	44.01	3.78
31207	1989	4	14.15	2.65
31209	1989	4	35.03	3.56
30703	1989	6	204.95	5.32
30705	1989	6	91.63	4.52
30707	1989	6	17.47	2.86
30709	1989	6	96.39	4.57
30803	1989	6	163.02	5.09
30805	1989	6	19.54	2.97
30807	1989	6	29.95	3.40
30809	1989	6	41.62	3.73
30901	1989	6	33.87	3.52
30903	1989	6	200.05	5.30
30905	1989	6	32.95	3.49
30907	1989	6	296.27	5.69
30909	1989	6	172.79	5.15
31005	1989	6	130.78	4.87
31007	1989	6	35.93	3.58
31203	1989	6	140.42	4.94
31205	1989	6	29.08	3.37
31207	1989	6	96.67	4.57
31209	1989	6	70.96	4.26
30703	1989	8	134.20	4.90
30705	1989	8	872.92	6.77
30707	1989	8	242.46	5.49
30803	1989	8	71.69	4.27
30805	1989	8	443.05	6.09
30807	1989	8	337.87	5.82
30809	1989	8	204.66	5.32
30901	1989	8	717.16	6.58
30903	1989	8	266.73	5.59
30905	1989	8	115.53	4.75
30907	1989	8	405.73	6.01
30909	1989	8	186.03	5.23
31005	1989	8	439.08	6.08
31007	1989	8	218.27	5.39
31203	1989	8	334.29	5.81
31205	1989	8	244.43	5.50
31207	1989	8	94.31	4.55
31209	1989	8	57.85	4.06
30703	1989	10	35.95	3.58
30705	1989	10	74.10	4.31
30707	1989	10	124.60	4.83
30709	1989	10	147.78	5.00
30803	1989	10	237.96	5.47
30805	1989	10	654.53	6.48
30807	1989	10	304.53	5.72
30809	1989	10	186.37	5.23
30901	1989	10	448.73	6.11
30903	1989	10	670.61	6.51
30905	1989	10	281.11	5.64
30907	1989	10	156.28	5.05
30909	1989	10	83.88	4.43
31005	1989	10	1219.79	7.11
31007	1989	10	187.73	5.24
31203	1989	10	101.65	4.62
31205	1989	10	113.18	4.73
31207	1989	10	158.76	5.07
31209	1989	10	155.09	5.04
30703	1990	2	64.75	4.17
30705	1990	2	48.95	3.89
30707	1990	2	130.86	4.87
30709	1990	2	81.78	4.40
30803	1990	2	50.33	3.92
30805	1990	2	28.94	3.37

30807	1990	2	59.76	4.09
30809	1990	2	38.64	3.65
30901	1990	2	41.94	3.74
30903	1990	2	45.29	3.81
30905	1990	2	56.61	4.04
30907	1990	2	42.98	3.76
30909	1990	2	7.19	1.97
31005	1990	2	41.81	3.73
31007	1990	2	94.31	4.55
31203	1990	2	42.23	3.74
31205	1990	2	49.44	3.90
31207	1990	2	49.51	3.90
31209	1990	2	34.79	3.55
30703	1990	4	37.74	3.63
30705	1990	4	82.48	4.41
30707	1990	4	197.53	5.29
30709	1990	4	203.40	5.32
30803	1990	4	202.89	5.31
30805	1990	4	257.93	5.55
30807	1990	4	280.98	5.64
30809	1990	4	85.38	4.45
30901	1990	4	79.68	4.38
30903	1990	4	60.39	4.10
30905	1990	4	49.28	3.90
30907	1990	4	107.99	4.68
30909	1990	4	106.52	4.67
31005	1990	4	288.18	5.66
31007	1990	4	203.00	5.31
31203	1990	4	50.30	3.92
31205	1990	4	65.23	4.18
31207	1990	4	133.61	4.89
31209	1990	4	66.23	4.19
30703	1990	6	4200.00	8.34
30705	1990	6	6500.00	8.78
30707	1990	6	3900.00	8.27
30709	1990	6	4100.00	8.32
30803	1990	6	89.15	4.49
30805	1990	6	132.81	4.89
30807	1990	6	31.94	3.46
30809	1990	6	280.39	5.64
30901	1990	6	792.65	6.68
30903	1990	6	72.69	4.29
30905	1990	6	45.08	3.81
30907	1990	6	97.75	4.58
30909	1990	6	35.05	3.56
31005	1990	6	39.82	3.68
31007	1990	6	161.68	5.09
31203	1990	6	386.69	5.96
31205	1990	6	113.69	4.73
31207	1990	6	51.87	3.95
31209	1990	6	191.14	5.25
30703	1990	8	241.09	5.49
30705	1990	8	523.94	6.26
30707	1990	8	203.35	5.31
30709	1990	8	123.09	4.81
30803	1990	8	110.34	4.70
30805	1990	8	167.09	5.12
30807	1990	8	10.34	2.34
30809	1990	8	63.79	4.16
30901	1990	8	97.99	4.58
30903	1990	8	184.67	5.22
30905	1990	8	166.34	5.11
30907	1990	8	81.76	4.40
30909	1990	8	136.57	4.92
31005	1990	8	239.98	5.48
31007	1990	8	83.54	4.43
31203	1990	8	296.57	5.69
31205	1990	8	497.51	6.21
31207	1990	8	37.73	3.63
31209	1990	8	46.95	3.85
30703	1990	10	22.01	3.09
30705	1990	10	82.40	4.41
30707	1990	10	135.68	4.91
30709	1990	10	168.76	5.13
30803	1990	10	15.36	2.73
30805	1990	10	199.75	5.30
30807	1990	10	127.88	4.85
30809	1990	10	126.68	4.84
30901	1990	10	32.66	3.49
30903	1990	10	66.58	4.20
30905	1990	10	179.88	5.19

30907	1990	10	246.33	5.51
30909	1990	10	143.76	4.97
31005	1990	10	14.68	2.69
31007	1990	10	342.40	5.84
31203	1990	10	55.57	4.02
31205	1990	10	52.69	3.96
31207	1990	10	14.94	2.70
31209	1990	10	15.94	2.77
30703	1991	2	12.58	2.53
30705	1991	2	17.29	2.85
30707	1991	2	2.51	0.92
30709	1991	2	11.53	2.44
30803	1991	2	55.03	4.01
30805	1991	2	21.36	3.06
30807	1991	2	7.19	1.97
30809	1991	2	28.75	3.36
30901	1991	2	105.53	4.66
30903	1991	2	126.88	4.84
30905	1991	2	73.38	4.30
30907	1991	2	60.80	4.11
30909	1991	2	110.51	4.71
31005	1991	2	107.99	4.68
31007	1991	2	90.77	4.51
31203	1991	2	82.83	4.42
31205	1991	2	92.79	4.53
31207	1991	2	92.00	4.52
31209	1991	2	170.27	5.14
30703	1991	4	66.43	4.20
30705	1991	4	22.35	3.11
30707	1991	4	64.07	4.16
30709	1991	4	84.90	4.44
30803	1991	4	93.57	4.54
30805	1991	4	212.31	5.36
30807	1991	4	49.27	3.90
30809	1991	4	37.73	3.63
30901	1991	4	72.86	4.29
30903	1991	4	91.71	4.52
30905	1991	4	122.64	4.81
30907	1991	4	66.04	4.19
30909	1991	4	110.51	4.71
31005	1991	4	116.38	4.76
31007	1991	4	100.65	4.61
31203	1991	4	75.48	4.32
31205	1991	4	47.97	3.87
31207	1991	4	35.39	3.57
31209	1991	4	56.20	4.03
30703	1991	6	52.73	3.97
30705	1991	6	26.98	3.30
30707	1991	6	74.12	4.31
30709	1991	6	153.68	5.03
30803	1991	6	358.94	5.88
30805	1991	6	344.22	5.84
30807	1991	6	325.99	5.79
30809	1991	6	132.97	4.89
30901	1991	6	56.60	4.04
30903	1991	6	25.32	3.23
30905	1991	6	27.25	3.31
30907	1991	6	170.10	5.14
30909	1991	6	146.45	4.99
31005	1991	6	87.02	4.47
31007	1991	6	161.76	5.09
31203	1991	6	96.49	4.57
31205	1991	6	24.38	3.19
31207	1991	6	36.17	3.59
31209	1991	6	20.13	3.00
30703	1991	8	48.57	3.88
30705	1991	8	5.59	1.72
30707	1991	8	140.70	4.95
30709	1991	8	47.17	3.85
30803	1991	8	272.90	5.61
30805	1991	8	266.76	5.59
30807	1991	8	57.65	4.05
30809	1991	8	115.00	4.74
30901	1991	8	67.84	4.22
30903	1991	8	95.48	4.56
30905	1991	8	181.34	5.20
30907	1991	8	64.99	4.17
30909	1991	8	171.61	5.15
31005	1991	8	294.62	5.69
31007	1991	8	98.86	4.59
31203	1991	8	103.80	4.64

31205	1991	8	231.19	5.44
31207	1991	8	134.47	4.90
31209	1991	8	123.30	4.81
30703	1991	10	12.57	2.53
30705	1991	10	146.03	4.98
30707	1991	10	31.41	3.45
30709	1991	10	249.48	5.52
30803	1991	10	797.17	6.68
30805	1991	10	497.21	6.21
30807	1991	10	216.84	5.38
30809	1991	10	135.67	4.91
30901	1991	10	720.51	6.58
30903	1991	10	331.66	5.80
30905	1991	10	297.69	5.70
30907	1991	10	325.99	5.79
30909	1991	10	374.66	5.93
31005	1991	10	99.60	4.60
31007	1991	10	106.04	4.66
31203	1991	10	191.87	5.26
31205	1991	10	63.69	4.15
31207	1991	10	129.75	4.87
31209	1991	10	161.88	5.09
30703	1992	2	61.00	4.11
30705	1992	2	67.10	4.21
30707	1992	2	104.30	4.65
30709	1992	2	36.70	3.60
30803	1992	2	37.70	3.63
30805	1992	2	271.00	5.60
30807	1992	2	230.60	5.44
30809	1992	2	94.30	4.55
30901	1992	2	374.40	5.93
30903	1992	2	118.10	4.77
30905	1992	2	45.10	3.81
30907	1992	2	121.60	4.80
30909	1992	2	130.60	4.87
31005	1992	2	38.80	3.66
31007	1992	2	31.50	3.45
31203	1992	2	49.30	3.90
31205	1992	2	18.90	2.94
31207	1992	2	18.10	2.90
31209	1992	2	22.70	3.12
30703	1992	4	107.70	4.68
30705	1992	4	46.20	3.83
30707	1992	4	134.40	4.90
30709	1992	4	200.20	5.30
30803	1992	4	149.40	5.01
30805	1992	4	597.80	6.39
30807	1992	4	635.20	6.45
30809	1992	4	496.00	6.21
30901	1992	4	145.70	4.98
30903	1992	4	1771.40	7.48
30905	1992	4	1865.80	7.53
30907	1992	4	102.70	4.63
30909	1992	4	431.30	6.07
31005	1992	4	152.00	5.02
31007	1992	4	60.10	4.10
31203	1992	4	81.80	4.40
31205	1992	4	103.80	4.64
31207	1992	4	40.90	3.71
31209	1992	4	127.50	4.85
30703	1992	6	140.00	4.94
30705	1992	6	131.30	4.88
30707	1992	6	551.50	6.31
30709	1992	6	333.70	5.81
30803	1992	6	138.30	4.93
30805	1992	6	1253.80	7.13
30807	1992	6	397.30	5.98
30809	1992	6	388.10	5.96
30901	1992	6	321.60	5.77
30903	1992	6	349.30	5.86
30905	1992	6	1114.30	7.02
30907	1992	6	1761.00	7.47
30909	1992	6	565.80	6.34
31005	1992	6	970.90	6.88
31007	1992	6	647.10	6.47
31203	1992	6	95.40	4.56
31205	1992	6	126.60	4.84
31207	1992	6	75.50	4.32
31209	1992	6	88.10	4.48
30703	1992	8	52.10	3.95
30705	1992	8	121.10	4.80

30707	1992	8	81.70	4.40
30709	1992	8	350.10	5.86
30803	1992	8	20.40	3.02
30805	1992	8	547.50	6.31
30807	1992	8	181.30	5.20
30809	1992	8	184.20	5.22
30901	1992	8	2.50	0.92
30903	1992	8	99.20	4.60
30905	1992	8	186.60	5.23
30907	1992	8	79.70	4.38
30909	1992	8	82.20	4.41
31005	1992	8	49.30	3.90
31007	1992	8	507.80	6.23
31203	1992	8	135.30	4.91
31205	1992	8	47.20	3.85
31207	1992	8	106.90	4.67
31209	1992	8	95.60	4.56
30703	1992	10	219.00	5.39
30705	1992	10	102.00	4.62
30707	1992	10	207.30	5.33
30709	1992	10	135.20	4.91
30803	1992	10	195.00	5.27
30805	1992	10	691.30	6.54
30807	1992	10	197.10	5.28
30809	1992	10	239.90	5.48
30901	1992	10	379.40	5.94
30903	1992	10	405.00	6.00
30905	1992	10	186.60	5.23
30907	1992	10	106.50	4.67
30909	1992	10	208.90	5.34
31005	1992	10	9.40	2.24
31007	1992	10	321.70	5.77
31203	1992	10	170.10	5.14
31205	1992	10	117.20	4.76
31207	1992	10	158.10	5.06
31209	1992	10	296.90	5.69
30703	1993	2	104.10	4.65
30705	1993	2	75.50	4.32
30707	1993	2	36.40	3.59
30709	1993	2	28.30	3.34
30803	1993	2	20.60	3.03
30805	1993	2	51.70	3.95
30807	1993	2	33.20	3.50
30809	1993	2	72.80	4.29
30901	1993	2	50.30	3.92
30903	1993	2	49.00	3.89
30905	1993	2	29.40	3.38
30907	1993	2	20.00	3.00
30909	1993	2	38.60	3.65
31005	1993	2	55.60	4.02
31007	1993	2	94.40	4.55
31203	1993	2	147.80	5.00
31205	1993	2	85.00	4.44
31207	1993	2	101.40	4.62
31209	1993	2	115.00	4.74
30703	1993	4	16.20	2.79
30705	1993	4	47.20	3.85
30707	1993	4	174.70	5.16
30709	1993	4	202.30	5.31
30803	1993	4	22.20	3.10
30805	1993	4	188.60	5.24
30807	1993	4	133.20	4.89
30809	1993	4	128.50	4.86
30901	1993	4	17.60	2.87
30903	1993	4	154.50	5.04
30905	1993	4	191.80	5.26
30907	1993	4	486.30	6.19
30909	1993	4	86.30	4.46
31005	1993	4	89.10	4.49
31007	1993	4	39.50	3.68
31203	1993	4	152.00	5.02
31205	1993	4	109.30	4.69
31207	1993	4	99.10	4.60
31209	1993	4	119.90	4.79
30703	1993	6	438.20	6.08
30705	1993	6	484.30	6.18
30707	1993	6	594.20	6.39
30709	1993	6	220.10	5.39
30803	1993	6	40.90	3.71
30805	1993	6	19.60	2.98
30807	1993	6	41.90	3.74

30809	1993	6	44.00	3.78
30901	1993	6	419.60	6.04
30903	1993	6	212.30	5.36
30905	1993	6	795.60	6.68
30907	1993	6	627.90	6.44
30909	1993	6	1089.90	6.99
31005	1993	6	923.70	6.83
31007	1993	6	470.90	6.15
31203	1993	6	44.00	3.78
31205	1993	6	382.20	5.95
31207	1993	6	167.50	5.12
31209	1993	6	86.40	4.46
30703	1993	8	93.40	4.54
30705	1993	8	254.90	5.54
30707	1993	8	283.50	5.65
30709	1993	8	239.00	5.48
30803	1993	8	139.70	4.94
30805	1993	8	286.30	5.66
30807	1993	8	177.20	5.18
30809	1993	8	125.80	4.83
30901	1993	8	507.50	6.23
30903	1993	8	18.80	2.93
30905	1993	8	92.20	4.52
30907	1993	8	103.80	4.64
30909	1993	8	122.20	4.81
31005	1993	8	18.90	2.94
31007	1993	8	139.30	4.94
31203	1993	8	427.80	6.06
31205	1993	8	199.70	5.30
31207	1993	8	28.30	3.34
31209	1993	8	56.20	4.03
30703	1993	10	195.70	5.28
30705	1993	10	214.30	5.37
30707	1993	10	95.50	4.56
30709	1993	10	181.30	5.20
30803	1993	10	442.70	6.09
30805	1993	10	210.90	5.35
30807	1993	10	157.20	5.06
30809	1993	10	40.40	3.70
30901	1993	10	113.10	4.73
30903	1993	10	52.80	3.97
30905	1993	10	233.80	5.45
30907	1993	10	43.00	3.76
30909	1993	10	39.40	3.67
31005	1993	10	40.90	3.71
31007	1993	10	37.70	3.63
31203	1993	10	153.10	5.03
31205	1993	10	77.10	4.35
31207	1993	10	92.80	4.53
31209	1993	10	39.40	3.67
30703	1993	12	27.00	3.30
30705	1993	12	90.80	4.51
30707	1993	12	11.30	2.42
30709	1993	12	11.50	2.44
30803	1993	12	8.40	2.13
30805	1993	12	11.20	2.42
30807	1993	12	23.10	3.14
30809	1993	12	72.80	4.29
30901	1993	12	50.30	3.92
30903	1993	12	16.40	2.80
30905	1993	12	84.90	4.44
30907	1993	12	35.60	3.57
30909	1993	12	47.60	3.86
31005	1993	12	25.20	3.23
31007	1993	12	8.10	2.09
31203	1993	12	52.40	3.96
31205	1993	12	10.20	2.32
31207	1993	12	16.50	2.80
31209	1993	12	14.30	2.66
30703	1994	2	77.19	4.35
30705	1994	2	72.63	4.29
30707	1994	2	25.12	3.22
30709	1994	2	38.78	3.66
30803	1994	2	111.78	4.72
30805	1994	2	143.92	4.97
30807	1994	2	186.53	5.23
30809	1994	2	84.43	4.44
30901	1994	2	15.09	2.71
30903	1994	2	35.21	3.56
30905	1994	2	338.48	5.82
30907	1994	2	100.60	4.61

30909	1994	2	56.59	4.04
31005	1994	2	34.58	3.54
31007	1994	2	14.37	2.67
31203	1994	2	98.51	4.59
31205	1994	2	77.02	4.34
31207	1994	2	73.88	4.30
31209	1994	2	15.09	2.71
30703	1994	4	77.19	4.35
30705	1994	4	72.63	4.29
30707	1994	4	25.12	3.22
30709	1994	4	38.78	3.66
30803	1994	4	111.78	4.72
30805	1994	4	143.92	4.97
30807	1994	4	186.53	5.23
30809	1994	4	84.43	4.44
30901	1994	4	15.09	2.71
30903	1994	4	35.21	3.56
30905	1994	4	338.48	5.82
30907	1994	4	100.60	4.61
30909	1994	4	56.59	4.04
31005	1994	4	34.58	3.54
31007	1994	4	14.37	2.67
31203	1994	4	98.51	4.59
31205	1994	4	77.02	4.34
31207	1994	4	73.88	4.30
31209	1994	4	15.09	2.71
30703	1994	6	389.59	5.97
30705	1994	6	60.05	4.10
30707	1994	6	238.69	5.48
30709	1994	6	103.77	4.64
30803	1994	6	206.70	5.33
30805	1994	6	356.14	5.88
30807	1994	6	172.95	5.15
30809	1994	6	115.00	4.74
30901	1994	6	235.93	5.46
30903	1994	6	32.66	3.49
30905	1994	6	10.48	2.35
30907	1994	6	26.20	3.27
30909	1994	6	11.68	2.46
31005	1994	6	75.43	4.32
31007	1994	6	194.47	5.27
31203	1994	6	151.84	5.02
31205	1994	6	70.74	4.26
31207	1994	6	320.75	5.77
31209	1994	6	597.48	6.39
30703	1994	8	89.77	4.50
30705	1994	8	90.78	4.51
30707	1994	8	312.81	5.75
30709	1994	8	234.80	5.46
30803	1994	8	62.85	4.14
30805	1994	8	259.78	5.56
30807	1994	8	120.54	4.79
30809	1994	8	220.12	5.39
30901	1994	8	447.24	6.10
30903	1994	8	189.87	5.25
30905	1994	8	359.54	5.88
30907	1994	8	688.68	6.53
30909	1994	8	290.21	5.67
31005	1994	8	55.12	4.01
31007	1994	8	220.45	5.40
31203	1994	8	323.98	5.78
31205	1994	8	349.85	5.86
31207	1994	8	522.19	6.26
31209	1994	8	280.66	5.64
30703	1994	10	211.85	5.36
30705	1994	10	868.71	6.77
30707	1994	10	201.00	5.30
30709	1994	10	62.89	4.14
30803	1994	10	350.56	5.86
30805	1994	10	111.81	4.72
30807	1994	10	479.03	6.17
30809	1994	10	313.57	5.75
30901	1994	10	341.71	5.83
30903	1994	10	339.19	5.83
30905	1994	10	193.92	5.27
30907	1994	10	228.74	5.43
30909	1994	10	168.01	5.12
31005	1994	10	230.17	5.44
31007	1994	10	353.73	5.87
31203	1994	10	387.81	5.96
31205	1994	10	316.57	5.76

31207	1994	10	1167.16	7.06
31209	1994	10	261.01	5.56
30703	1994	12	37.70	3.63
30705	1994	12	12.57	2.53
30707	1994	12	5.02	1.61
30709	1994	12	16.77	2.82
30801	1994	12	9.43	2.24
30803	1994	12	40.50	3.70
30805	1994	12	35.17	3.56
30807	1994	12	76.52	4.34
30809	1994	12	48.35	3.88
30901	1994	12	12.56	2.53
30903	1994	12	188.44	5.24
30905	1994	12	212.63	5.36
30907	1994	12	80.71	4.39
30909	1994	12	49.41	3.90
31003	1994	12	90.45	4.50
31005	1994	12	15.47	2.74
31007	1994	12	22.63	3.12
31009	1994	12	15.53	2.74
31105	1994	12	132.97	4.89
31107	1994	12	392.29	5.97
31109	1994	12	44.02	3.78
31203	1994	12	44.49	3.80
31205	1994	12	1.48	0.39
31207	1994	12	247.78	5.51
31209	1994	12	64.46	4.17
30703	1995	2	61.00	4.11
30705	1995	2	67.00	4.20
30707	1995	2	46.00	3.83
30709	1995	2	81.00	4.39
30803	1995	2	42.00	3.74
30805	1995	2	48.00	3.87
30807	1995	2	59.00	4.08
30809	1995	2	126.00	4.84
30901	1995	2	53.00	3.97
30903	1995	2	276.00	5.62
30905	1995	2	63.00	4.14
30907	1995	2	77.00	4.34
30909	1995	2	68.00	4.22
31005	1995	2	7.00	1.95
31007	1995	2	28.00	3.33
31203	1995	2	27.00	3.30
31205	1995	2	56.00	4.03
31207	1995	2	48.00	3.87
31209	1995	2	89.00	4.49
30703	1995	4	70.00	4.25
30705	1995	4	4.00	1.39
30707	1995	4	174.00	5.16
30709	1995	4	53.00	3.97
30803	1995	4	102.00	4.62
30805	1995	4	49.00	3.89
30807	1995	4	71.00	4.26
30809	1995	4	77.00	4.34
30901	1995	4	108.00	4.68
30903	1995	4	430.00	6.06
30905	1995	4	53.00	3.97
30907	1995	4	78.00	4.36
30909	1995	4	159.00	5.07
31005	1995	4	29.00	3.37
31007	1995	4	39.00	3.66
31203	1995	4	53.00	3.97
31205	1995	4	44.00	3.78
31207	1995	4	34.00	3.53
31209	1995	4	61.00	4.11
30703	1995	6	425.00	6.05
30705	1995	6	140.00	4.94
30707	1995	6	85.00	4.44
30709	1995	6	152.00	5.02
30803	1995	6	196.00	5.28
30805	1995	6	351.00	5.86
30807	1995	6	362.00	5.89
30809	1995	6	79.00	4.37
30901	1995	6	2395.00	7.78
30903	1995	6	249.00	5.52
30905	1995	6	57.00	4.04
30907	1995	6	56.00	4.03
30909	1995	6	66.00	4.19
31005	1995	6	23.00	3.14
31007	1995	6	990.00	6.90
31203	1995	6	90.00	4.50

31205	1995	6	197.00	5.28
31207	1995	6	53.00	3.97
31209	1995	6	146.00	4.98
30703	1995	8	165.00	5.11
30705	1995	8	187.00	5.23
30707	1995	8	176.00	5.17
30709	1995	8	385.00	5.95
30803	1995	8	261.00	5.56
30805	1995	8	24.00	3.18
30807	1995	8	116.00	4.75
30809	1995	8	187.00	5.23
30901	1995	8	90.00	4.50
30903	1995	8	399.00	5.99
30905	1995	8	291.00	5.67
30907	1995	8	199.00	5.29
30909	1995	8	65.00	4.17
31005	1995	8	16.00	2.77
31007	1995	8	28.00	3.33
31203	1995	8	8.00	2.08
31205	1995	8	101.00	4.62
31207	1995	8	30.00	3.40
31209	1995	8	46.00	3.83
30703	1995	10	36.00	3.58
30705	1995	10	95.00	4.55
30707	1995	10	190.00	5.25
30709	1995	10	167.00	5.12
30803	1995	10	63.00	4.14
30805	1995	10	128.00	4.85
30807	1995	10	35.00	3.56
30809	1995	10	235.00	5.46
30901	1995	10	48.00	3.87
30903	1995	10	87.00	4.47
30905	1995	10	113.00	4.73
30907	1995	10	215.00	5.37
30909	1995	10	211.00	5.35
31005	1995	10	111.00	4.71
31007	1995	10	295.00	5.69
31203	1995	10	173.00	5.15
31205	1995	10	110.00	4.70
31207	1995	10	67.00	4.20
31209	1995	10	156.00	5.05
30703	1995	12	27.00	3.30
30705	1995	12	63.00	4.14
30707	1995	12	90.00	4.50
30709	1995	12	65.00	4.17
30803	1995	12	39.00	3.66
30805	1995	12	50.00	3.91
30807	1995	12	65.00	4.17
30809	1995	12	139.00	4.93
30901	1995	12	5.00	1.61
30903	1995	12	48.00	3.87
30905	1995	12	518.00	6.25
30907	1995	12	59.00	4.08
30909	1995	12	54.00	3.99
31005	1995	12	15.00	2.71
31007	1995	12	20.00	3.00
31203	1995	12	20.00	3.00
31205	1995	12	68.00	4.22
31207	1995	12	82.00	4.41
31209	1995	12	33.00	3.50
30703	1996	2	117.35	4.77
30705	1996	2	110.33	4.70
30707	1996	2	76.63	4.34
30709	1996	2	103.32	4.64
30801	1996	2	176.10	5.17
30803	1996	2	187.15	5.23
30805	1996	2	176.00	5.17
30807	1996	2	85.35	4.45
30809	1996	2	74.60	4.31
30901	1996	2	25.12	3.22
30903	1996	2	108.04	4.68
30905	1996	2	70.23	4.25
30907	1996	2	70.41	4.25
30909	1996	2	50.31	3.92
31003	1996	2	72.86	4.29
31005	1996	2	83.82	4.43
31007	1996	2	76.26	4.33
31009	1996	2	63.68	4.15
31105	1996	2	172.96	5.15
31107	1996	2	38.43	3.65
31109	1996	2	46.38	3.84

31203	1996	2	26.73	3.29
31205	1996	2	26.82	3.29
31207	1996	2	24.46	3.20
31209	1996	2	23.58	3.16
30703	1996	4	261.01	5.56
30705	1996	4	136.93	4.92
30707	1996	4	129.14	4.86
30709	1996	4	145.55	4.98
30801	1996	4	130.65	4.87
30803	1996	4	275.14	5.62
30805	1996	4	177.15	5.18
30807	1996	4	249.77	5.52
30809	1996	4	130.50	4.87
30901	1996	4	6.29	1.84
30903	1996	4	121.89	4.80
30905	1996	4	118.96	4.78
30907	1996	4	63.68	4.15
30909	1996	4	101.33	4.62
31003	1996	4	287.21	5.66
31005	1996	4	155.91	5.05
31007	1996	4	62.87	4.14
31009	1996	4	57.69	4.06
31105	1996	4	84.12	4.43
31107	1996	4	64.29	4.16
31109	1996	4	127.96	4.85
31203	1996	4	74.60	4.31
31205	1996	4	157.58	5.06
31207	1996	4	176.10	5.17
31209	1996	4	71.63	4.27
30703	1996	6	619.43	6.43
30705	1996	6	382.68	5.95
30707	1996	6	307.79	5.73
30709	1996	6	324.35	5.78
30801	1996	6	53.46	3.98
30803	1996	6	240.22	5.48
30805	1996	6	361.63	5.89
30807	1996	6	120.39	4.79
30809	1996	6	192.61	5.26
30901	1996	6	26.93	3.29
30903	1996	6	52.57	3.96
30905	1996	6	187.62	5.23
30907	1996	6	249.79	5.52
30909	1996	6	125.79	4.83
31003	1996	6	1308.18	7.18
31005	1996	6	571.43	6.35
31007	1996	6	235.85	5.46
31009	1996	6	143.87	4.97
31105	1996	6	54.48	4.00
31107	1996	6	334.03	5.81
31109	1996	6	419.02	6.04
31203	1996	6	74.68	4.31
31205	1996	6	165.09	5.11
31207	1996	6	409.90	6.02
31209	1996	6	352.07	5.86
30703	1996	8	168.34	5.13
30705	1996	8	306.53	5.73
30707	1996	8	236.57	5.47
30709	1996	8	99.73	4.60
30801	1996	8	1187.50	7.08
30803	1996	8	141.51	4.95
30805	1996	8	149.71	5.01
30807	1996	8	198.56	5.29
30809	1996	8	144.65	4.97
30901	1996	8	123.11	4.81
30903	1996	8	96.00	4.56
30905	1996	8	91.88	4.52
30907	1996	8	141.66	4.95
30909	1996	8	241.35	5.49
31003	1996	8	376.88	5.93
31005	1996	8	57.50	4.05
31007	1996	8	86.54	4.46
31009	1996	8	214.49	5.37
31105	1996	8	129.09	4.86
31107	1996	8	919.64	6.82
31109	1996	8	835.69	6.73
31203	1996	8	652.37	6.48
31205	1996	8	190.28	5.25
31207	1996	8	222.44	5.40
31209	1996	8	234.47	5.46
30703	1996	10	77.37	4.35
30705	1996	10	236.03	5.46

30707	1996	10	169.59	5.13
30709	1996	10	114.11	4.74
30801	1996	10	251.57	5.53
30803	1996	10	149.44	5.01
30805	1996	10	350.86	5.86
30807	1996	10	197.26	5.28
30809	1996	10	173.51	5.16
30901	1996	10	550.25	6.31
30903	1996	10	380.65	5.94
30905	1996	10	134.43	4.90
30907	1996	10	123.22	4.81
30909	1996	10	130.50	4.87
31003	1996	10	512.58	6.24
31005	1996	10	267.74	5.59
31007	1996	10	388.36	5.96
31009	1996	10	201.18	5.30
31105	1996	10	57.84	4.06
31107	1996	10	292.80	5.68
31109	1996	10	363.99	5.90
31203	1996	10	569.18	6.34
31205	1996	10	142.49	4.96
31207	1996	10	52.33	3.96
31209	1996	10	548.08	6.31
30703	1996	12	74.29	4.31
30705	1996	12	60.06	4.10
30707	1996	12	55.28	4.01
30709	1996	12	47.62	3.86
30801	1996	12	72.71	4.29
30803	1996	12	58.18	4.06
30805	1996	12	17.59	2.87
30807	1996	12	97.03	4.58
30809	1996	12	191.04	5.25
30901	1996	12	30.15	3.41
30903	1996	12	30.15	3.41
30905	1996	12	108.35	4.69
30907	1996	12	252.30	5.53
30909	1996	12	77.83	4.35
31003	1996	12	97.48	4.58
31005	1996	12	12.58	2.53
31007	1996	12	39.20	3.67
31009	1996	12	210.06	5.35
31105	1996	12	8.38	2.13
31107	1996	12	86.65	4.46
31109	1996	12	264.94	5.58
31203	1996	12	0.79	−0.24
31205	1996	12	25.94	3.26
31207	1996	12	72.85	4.29
31209	1996	12	72.33	4.28
30703	1997	2	190.03	5.25
30705	1997	2	91.90	4.52
30707	1997	2	40.44	3.70
30709	1997	2	29.98	3.40
30801	1997	2	98.86	4.59
30803	1997	2	135.36	4.91
30805	1997	2	49.28	3.90
30807	1997	2	115.03	4.75
30809	1997	2	112.89	4.73
30901	1997	2	31.45	3.45
30903	1997	2	129.38	4.86
30905	1997	2	75.30	4.32
30907	1997	2	59.60	4.09
30909	1997	2	83.62	4.43
31003	1997	2	194.19	5.27
31005	1997	2	66.31	4.19
31007	1997	2	131.06	4.88
31009	1997	2	181.90	5.20
31105	1997	2	261.83	5.57
31107	1997	2	233.32	5.45
31109	1997	2	217.11	5.38
31203	1997	2	3.79	1.33
31205	1997	2	20.45	3.02
31207	1997	2	115.78	4.75
31209	1997	2	143.79	4.97
30703	1997	4	65.63	4.18
30705	1997	4	72.16	4.28
30707	1997	4	59.84	4.09
30709	1997	4	37.81	3.63
30801	1997	4	94.28	4.55
30803	1997	4	161.50	5.08
30805	1997	4	184.40	5.22
30807	1997	4	92.19	4.52

30809	1997	4	183.79	5.21
30901	1997	4	7.60	2.03
30903	1997	4	105.06	4.65
30905	1997	4	171.35	5.14
30907	1997	4	237.65	5.47
30909	1997	4	173.43	5.16
31003	1997	4	102.29	4.63
31005	1997	4	135.40	4.91
31007	1997	4	134.68	4.90
31009	1997	4	22.48	3.11
31105	1997	4	74.23	4.31
31107	1997	4	111.57	4.71
31109	1997	4	73.98	4.30
31203	1997	4	16.36	2.79
31205	1997	4	72.93	4.29
31207	1997	4	43.53	3.77
31209	1997	4	113.90	4.74
30703	1997	6	2.73	1.00
30705	1997	6	0.33	−1.11
30707	1997	6	0.09	−2.41
30709	1997	6	0.65	−0.43
30801	1997	6	53.23	3.97
30803	1997	6	4.75	1.56
30805	1997	6	0.31	−1.17
30807	1997	6	0.64	−0.45
30809	1997	6	0.55	−0.60
30901	1997	6	14.58	2.68
30903	1997	6	0.24	−1.43
30905	1997	6	0.51	−0.67
30907	1997	6	1.11	0.10
30909	1997	6	0.90	−0.11
31003	1997	6	0.79	−0.24
31005	1997	6	2.45	0.90
31007	1997	6	2.13	0.76
31009	1997	6	1.31	0.27
31105	1997	6	0.41	−0.89
31107	1997	6	1.54	0.43
31109	1997	6	1.91	0.65
31203	1997	6	1.36	0.31
31205	1997	6	0.83	−0.19
31207	1997	6	1.85	0.62
31209	1997	6	3.30	1.19
30703	1997	8	103.82	4.64
30705	1997	8	180.31	5.19
30707	1997	8	133.24	4.89
30709	1997	8	216.85	5.38
30801	1997	8	12.29	2.51
30803	1997	8	193.16	5.26
30805	1997	8	170.64	5.14
30807	1997	8	116.24	4.76
30809	1997	8	139.43	4.94
30901	1997	8	51.85	3.95
30903	1997	8	133.34	4.89
30905	1997	8	82.28	4.41
30907	1997	8	65.07	4.18
30909	1997	8	115.36	4.75
31003	1997	8	105.12	4.66
31005	1997	8	170.16	5.14
31007	1997	8	165.39	5.11
31009	1997	8	111.96	4.72
31105	1997	8	79.44	4.38
31107	1997	8	271.10	5.60
31109	1997	8	91.00	4.51
31203	1997	8	541.30	6.29
31205	1997	8	353.75	5.87
31207	1997	8	137.82	4.93
31209	1997	8	257.92	5.55
30703	1997	10	27.68	3.32
30705	1997	10	51.03	3.93
30707	1997	10	146.15	4.98
30709	1997	10	92.10	4.52
30801	1997	10	50.96	3.93
30803	1997	10	107.22	4.67
30805	1997	10	211.70	5.36
30807	1997	10	81.57	4.40
30809	1997	10	48.55	3.88
30901	1997	10	2.52	0.92
30903	1997	10	67.66	4.21
30905	1997	10	23.78	3.17
30907	1997	10	193.86	5.27
30909	1997	10	68.51	4.23

31003	1997	10	47.47	3.86
31005	1997	10	123.98	4.82
31007	1997	10	317.97	5.76
31009	1997	10	570.98	6.35
31105	1997	10	25.92	3.26
31107	1997	10	324.51	5.78
31109	1997	10	248.39	5.52
31203	1997	10	286.80	5.66
31205	1997	10	141.55	4.95
31207	1997	10	283.36	5.65
31209	1997	10	243.61	5.50
30703	1997	12	85.92	4.45
30705	1997	12	77.98	4.36
30707	1997	12	43.28	3.77
30709	1997	12	97.92	4.58
30801	1997	12	107.26	4.68
30803	1997	12	64.51	4.17
30805	1997	12	76.47	4.34
30807	1997	12	83.54	4.43
30809	1997	12	105.17	4.66
30901	1997	12	156.43	5.05
30903	1997	12	27.29	3.31
30905	1997	12	42.21	3.74
30907	1997	12	64.65	4.17
30909	1997	12	100.62	4.61
31003	1997	12	137.14	4.92
31005	1997	12	101.82	4.62
31007	1997	12	24.29	3.19
31009	1997	12	100.53	4.61
31105	1997	12	57.99	4.06
31107	1997	12	52.66	3.96
31109	1997	12	128.64	4.86
31203	1997	12	120.99	4.80
31205	1997	12	105.99	4.66
31207	1997	12	46.22	3.83
31209	1997	12	58.88	4.08
30703	1998	2	112.73	4.72
30705	1998	2	131.06	4.88
30709	1998	2	268.72	5.59
30709	1998	2	155.31	5.05
30801	1998	2	549.70	6.31
30803	1998	2	214.46	5.37
30805	1998	2	92.39	4.53
30807	1998	2	134.98	4.91
30809	1998	2	113.07	4.73
30901	1998	2	277.76	5.63
30903	1998	2	191.27	5.25
30905	1998	2	106.58	4.67
30907	1998	2	98.22	4.59
30909	1998	2	52.49	3.96
31003	1998	2	68.05	4.22
31005	1998	2	55.32	4.01
31007	1998	2	102.71	4.63
31009	1998	2	97.27	4.58
31104	1998	2	272.98	5.61
31107	1998	2	33.22	3.50
31109	1998	2	73.19	4.29
31203	1998	2	32.68	3.49
31205	1998	2	75.54	4.32
31207	1998	2	107.75	4.68
31209	1998	2	120.10	4.79
30703	1998	4	110.03	4.70
30705	1998	4	79.26	4.37
30709	1998	4	161.18	5.08
30709	1998	4	78.99	4.37
30801	1998	4	41.77	3.73
30803	1998	4	42.25	3.74
30805	1998	4	50.16	3.92
30807	1998	4	117.78	4.77
30809	1998	4	139.44	4.94
30901	1998	4	168.53	5.13
30903	1998	4	68.91	4.23
30905	1998	4	60.61	4.10
30907	1998	4	115.00	4.74
30909	1998	4	138.40	4.93
30911	1998	4	173.14	5.15
30912	1998	4	103.87	4.64
30913	1998	4	137.16	4.92
30914	1998	4	469.98	6.15

31003	1998	4	107.44	4.68
31005	1998	4	70.81	4.26
31007	1998	4	89.96	4.50
31009	1998	4	46.71	3.84
31014	1998	4	151.87	5.02
31104	1998	4	70.38	4.25
31105	1998	4	20.77	3.03
31107	1998	4	57.69	4.06
31109	1998	4	101.42	4.62
31111	1998	4	126.82	4.84
31112	1998	4	88.32	4.48
31113	1998	4	34.93	3.55
31114	1998	4	61.70	4.12
31202	1998	4	38.05	3.64
31203	1998	4	18.15	2.90
31205	1998	4	111.96	4.72
31207	1998	4	8.16	2.10
31209	1998	4	28.55	3.35
30703	1998	6	475.99	6.17
30705	1998	6	3745.68	8.23
30709	1998	6	252.74	5.53
30709	1998	6	18385.89	9.82
30801	1998	6	6773.92	8.82
30803	1998	6	760.90	6.63
30805	1998	6	293.42	5.68
30807	1998	6	395.10	5.98
30809	1998	6	2946.61	7.99
30901	1998	6	264.89	5.58
30903	1998	6	151.94	5.02
30905	1998	6	125.33	4.83
30907	1998	6	340.28	5.83
30909	1998	6	794.04	6.68
31003	1998	6	106.76	4.67
31005	1998	6	340.76	5.83
31007	1998	6	493.58	6.20
31009	1998	6	475.96	6.17
31014	1998	6	777.40	6.66
31104	1998	6	514.20	6.24
31105	1998	6	435.29	6.08
31107	1998	6	254.56	5.54
31203	1998	6	1254.46	7.13
31205	1998	6	267.93	5.59
31207	1998	6	476.87	6.17
31209	1998	6	674.65	6.51
30703	1998	8	115.65	4.75
30705	1998	8	51.98	3.95
30709	1998	8	291.14	5.67
30709	1998	8	338.71	5.83
30801	1998	8	186.93	5.23
30803	1998	8	192.06	5.26
30805	1998	8	78.41	4.36
30807	1998	8	226.47	5.42
30809	1998	8	113.36	4.73
30901	1998	8	104.49	4.65
30903	1998	8	156.49	5.05
30905	1998	8	31.31	3.44
30907	1998	8	155.64	5.05
30909	1998	8	344.86	5.84
30911	1998	8	242.05	5.49
30912	1998	8	259.48	5.56
30913	1998	8	140.04	4.94
30914	1998	8	258.49	5.55
31003	1998	8	59.67	4.09
31005	1998	8	70.67	4.26
31007	1998	8	106.47	4.67
31009	1998	8	251.02	5.53
31014	1998	8	137.56	4.92
31104	1998	8	20.49	3.02
31105	1998	8	106.58	4.67
31107	1998	8	253.29	5.53
31109	1998	8	724.94	6.59
31111	1998	8	120.13	4.79
31112	1998	8	222.27	5.40
31113	1998	8	80.37	4.39
31114	1998	8	180.19	5.19
31202	1998	8	92.24	4.52
31203	1998	8	235.17	5.46
31205	1998	8	212.17	5.36
31207	1998	8	182.59	5.21
31209	1998	8	576.38	6.36
30703	1998	10	190.83	5.25

30705	1998	10	298.62	5.70
30707	1998	10	325.84	5.79
30709	1998	10	298.79	5.70
30801	1998	10	1690.61	7.43
30803	1998	10	607.58	6.41
30805	1998	10	970.40	6.88
30807	1998	10	466.14	6.14
30809	1998	10	349.38	5.86
30901	1998	10	584.74	6.37
30903	1998	10	648.83	6.48
30905	1998	10	468.15	6.15
30907	1998	10	145.95	4.98
30909	1998	10	241.50	5.49
30911	1998	10	132.73	4.89
30912	1998	10	107.06	4.67
30913	1998	10	139.44	4.94
30914	1998	10	93.98	4.54
31003	1998	10	338.50	5.82
31005	1998	10	432.38	6.07
31007	1998	10	258.70	5.56
31009	1998	10	616.84	6.42
31104	1998	10	307.71	5.73
31105	1998	10	134.21	4.90
31107	1998	10	401.38	5.99
31109	1998	10	170.02	5.14
31111	1998	10	116.56	4.76
31112	1998	10	111.47	4.71
31113	1998	10	21.82	3.08
31114	1998	10	26.35	3.27
31202	1998	10	273.88	5.61
31203	1998	10	343.34	5.84
31205	1998	10	153.90	5.04
31207	1998	10	285.55	5.65
31209	1998	10	247.14	5.51
30703	1998	12	82.84	4.42
30705	1998	12	70.25	4.25
30707	1998	12	85.79	4.45
30709	1998	12	240.67	5.48
30801	1998	12	18.99	2.94
30803	1998	12	97.75	4.58
30805	1998	12	52.56	3.96
30807	1998	12	123.41	4.82
30809	1998	12	115.00	4.74
30901	1998	12	28.86	3.36
30903	1998	12	21.58	3.07
30905	1998	12	91.01	4.51
30907	1998	12	89.95	4.50
30909	1998	12	113.39	4.73
31003	1998	12	33.63	3.52
31005	1998	12	4.39	1.48
31007	1998	12	31.26	3.44
31009	1998	12	87.30	4.47
31105	1998	12	95.62	4.56
31107	1998	12	245.20	5.50
31109	1998	12	259.54	5.56
31203	1998	12	28.25	3.34
31205	1998	12	40.39	3.70
31207	1998	12	95.12	4.56
31209	1998	12	93.59	4.54
30703	1999	2	68.27	4.22
30705	1999	2	106.52	4.67
30707	1999	2	31.39	3.45
30709	1999	2	22.81	3.13
30801	1999	2	57.09	4.04
30803	1999	2	132.35	4.89
30805	1999	2	43.07	3.76
30807	1999	2	23.43	3.15
30809	1999	2	13.27	2.59
30901	1999	2	154.26	5.04
30903	1999	2	82.28	4.41
30905	1999	2	96.19	4.57
30907	1999	2	44.87	3.80
30909	1999	2	96.25	4.57
31003	1999	2	144.90	4.98
31005	1999	2	69.42	4.24
31007	1999	2	48.51	3.88
31009	1999	2	168.17	5.12
31105	1999	2	47.75	3.87
31107	1999	2	24.97	3.22
31109	1999	2	43.08	3.76

31203	1999	2	29.42	3.38
31205	1999	2	54.96	4.01
31207	1999	2	25.40	3.23
31209	1999	2	79.94	4.38
30703	1999	4	313.82	5.75
30705	1999	4	202.00	5.31
30707	1999	4	193.01	5.26
30709	1999	4	154.68	5.04
30801	1999	4	500.75	6.22
30803	1999	4	184.53	5.22
30805	1999	4	148.18	5.00
30807	1999	4	127.38	4.85
30809	1999	4	188.20	5.24
30901	1999	4	346.25	5.85
30903	1999	4	203.29	5.31
30905	1999	4	185.11	5.22
30907	1999	4	106.42	4.67
30909	1999	4	164.00	5.10
31003	1999	4	459.10	6.13
31005	1999	4	176.22	5.17
31007	1999	4	148.22	5.00
31009	1999	4	191.64	5.26
31105	1999	4	395.41	5.98
31107	1999	4	223.42	5.41
31109	1999	4	160.27	5.08
31203	1999	4	132.25	4.88
31205	1999	4	127.48	4.85
31207	1999	4	423.25	6.05
31209	1999	4	142.23	4.96
30703	1999	6	256.66	5.55
30705	1999	6	513.00	6.24
30707	1999	6	895.76	6.80
30709	1999	6	488.02	6.19
30801	1999	6	249.12	5.52
30803	1999	6	131.46	4.88
30805	1999	6	185.84	5.22
30807	1999	6	95.55	4.56
30809	1999	6	134.47	4.90
30901	1999	6	677.13	6.52
30903	1999	6	101.22	4.62
30905	1999	6	86.29	4.46
30907	1999	6	77.63	4.35
30909	1999	6	148.40	5.00
31003	1999	6	118.39	4.77
31005	1999	6	477.99	6.17
31007	1999	6	221.47	5.40
31009	1999	6	89.07	4.49
31105	1999	6	149.89	5.01
31107	1999	6	313.15	5.75
31109	1999	6	231.44	5.44
31203	1999	6	212.52	5.36
31205	1999	6	803.17	6.69
31207	1999	6	167.76	5.12
31209	1999	6	64.09	4.16
30703	1999	8	74.34	4.31
30705	1999	8	162.50	5.09
30707	1999	8	367.08	5.91
30709	1999	8	244.01	5.50
30801	1999	8	103.29	4.64
30803	1999	8	130.85	4.87
30805	1999	8	178.24	5.18
30807	1999	8	106.13	4.66
30809	1999	8	239.77	5.48
30901	1999	8	233.39	5.45
30903	1999	8	133.92	4.90
30905	1999	8	154.18	5.04
30907	1999	8	89.51	4.49
30909	1999	8	110.66	4.71
31003	1999	8	210.95	5.35
31005	1999	8	346.87	5.85
31007	1999	8	583.05	6.37
31009	1999	8	382.48	5.95
31105	1999	8	582.99	6.37
31107	1999	8	648.27	6.47
31109	1999	8	415.19	6.03
31203	1999	8	348.36	5.85
31205	1999	8	275.30	5.62
31207	1999	8	331.54	5.80
31209	1999	8	228.11	5.43
30703	1999	10	50.91	3.93
30705	1999	10	8.83	2.18

30707	1999	10	174.17	5.16
30709	1999	10	211.14	5.35
30801	1999	10	612.97	6.42
30803	1999	10	225.89	5.42
30805	1999	10	455.94	6.12
30807	1999	10	122.15	4.81
30809	1999	10	79.80	4.38
30901	1999	10	373.68	5.92
30903	1999	10	302.75	5.71
30905	1999	10	154.35	5.04
30907	1999	10	113.49	4.73
30909	1999	10	166.38	5.11
31003	1999	10	95.62	4.56
31005	1999	10	257.49	5.55
31007	1999	10	300.27	5.70
31009	1999	10	168.71	5.13
31105	1999	10	353.53	5.87
31107	1999	10	474.96	6.16
31109	1999	10	761.80	6.64
31203	1999	10	625.56	6.44
31205	1999	10	523.46	6.26
31207	1999	10	503.91	6.22
31209	1999	10	418.26	6.04
30703	1999	12	83.44	4.42
30705	1999	12	180.91	5.20
30707	1999	12	112.77	4.73
30709	1999	12	104.13	4.65
30901	1999	12	136.53	4.92
30903	1999	12	86.67	4.46
30905	1999	12	66.54	4.20
30907	1999	12	209.37	5.34
30909	1999	12	150.10	5.01
31105	1999	12	81.83	4.40
31203	1999	12	135.63	4.91
31205	1999	12	100.92	4.61
31207	1999	12	189.97	5.25
31209	1999	12	195.76	5.28
30703	2000	2	63.12	4.15
30705	2000	2	100.46	4.61
30707	2000	2	49.73	3.91
30709	2000	2	58.07	4.06
30801	2000	2	46.20	3.83
30803	2000	2	117.43	4.77
30805	2000	2	61.61	4.12
30807	2000	2	77.08	4.34
30809	2000	2	106.00	4.66
30901	2000	2	77.41	4.35
30903	2000	2	88.88	4.49
30905	2000	2	38.67	3.66
30907	2000	2	88.17	4.48
30909	2000	2	115.28	4.75
31003	2000	2	208.35	5.34
31005	2000	2	71.03	4.26
31007	2000	2	99.36	4.60
31009	2000	2	69.45	4.24
31105	2000	2	108.20	4.68
31107	2000	2	46.64	3.84
31109	2000	2	80.67	4.39
31203	2000	2	15.22	2.72
31205	2000	2	48.04	3.87
31207	2000	2	21.48	3.07
31209	2000	2	32.89	3.49
30703	2000	4	278.50	5.63
30705	2000	4	393.29	5.97
30707	2000	4	523.81	6.26
30709	2000	4	237.12	5.47
30801	2000	4	234.69	5.46
30803	2000	4	499.23	6.21
30805	2000	4	811.47	6.70
30807	2000	4	353.22	5.87
30809	2000	4	230.00	5.44
30901	2000	4	143.01	4.96
30903	2000	4	148.31	5.00
30905	2000	4	350.93	5.86
30907	2000	4	216.70	5.38
30909	2000	4	368.62	5.91
31003	2000	4	289.48	5.67
31005	2000	4	157.03	5.06
31007	2000	4	218.76	5.39
31009	2000	4	536.22	6.28
31105	2000	4	110.92	4.71

31107	2000	4	146.06	4.98
31109	2000	4	135.67	4.91
31203	2000	4	172.52	5.15
31205	2000	4	64.54	4.17
31207	2000	4	57.27	4.05
31209	2000	4	151.99	5.02
30703	2000	6	188.90	5.24
30705	2000	6	21.76	3.08
30707	2000	6	122.43	4.81
30709	2000	6	49.45	3.90
30801	2000	6	4464.95	8.40
30803	2000	6	130.85	4.87
30805	2000	6	309.88	5.74
30807	2000	6	123.19	4.81
30809	2000	6	95.35	4.56
30901	2000	6	344.05	5.84
30903	2000	6	64.17	4.16
30905	2000	6	29.68	3.39
30907	2000	6	180.57	5.20
30909	2000	6	269.31	5.60
31003	2000	6	560.80	6.33
31005	2000	6	330.03	5.80
31007	2000	6	207.13	5.33
31009	2000	6	280.14	5.64
31105	2000	6	340.07	5.83
31107	2000	6	121.62	4.80
31109	2000	6	294.53	5.69
31203	2000	6	386.16	5.96
31205	2000	6	259.62	5.56
31207	2000	6	285.91	5.66
31209	2000	6	156.46	5.05
30703	2000	8	91.26	4.51
30705	2000	8	117.50	4.77
30707	2000	8	188.21	5.24
30709	2000	8	121.66	4.80
30801	2000	8	71.30	4.27
30803	2000	8	69.73	4.24
30805	2000	8	335.97	5.82
30807	2000	8	282.37	5.64
30809	2000	8	158.02	5.06
30901	2000	8	60.77	4.11
30903	2000	8	158.28	5.06
30905	2000	8	140.91	4.95
30907	2000	8	113.10	4.73
30909	2000	8	454.13	6.12
31003	2000	8	168.27	5.13
31005	2000	8	96.46	4.57
31007	2000	8	184.12	5.22
31009	2000	8	157.68	5.06
31105	2000	8	101.52	4.62
31107	2000	8	164.90	5.11
31109	2000	8	714.41	6.57
31203	2000	8	49.18	3.90
31205	2000	8	314.99	5.75
31207	2000	8	249.63	5.52
31209	2000	8	295.09	5.69
30703	2000	10	457.44	6.13
30705	2000	10	794.09	6.68
30707	2000	10	416.03	6.03
30709	2000	10	196.38	5.28
30801	2000	10	1275.27	7.15
30803	2000	10	526.39	6.27
30805	2000	10	603.39	6.40
30807	2000	10	247.24	5.51
30809	2000	10	241.95	5.49
30901	2000	10	113.50	4.73
30903	2000	10	2637.10	7.88
30905	2000	10	658.32	6.49
30907	2000	10	749.73	6.62
30909	2000	10	412.75	6.02
31003	2000	10	206.34	5.33
31005	2000	10	371.98	5.92
31007	2000	10	841.84	6.74
31009	2000	10	67.97	4.22
31105	2000	10	736.12	6.60
31107	2000	10	519.36	6.25
31109	2000	10	247.38	5.51
31203	2000	10	305.89	5.72
31205	2000	10	373.30	5.92
31207	2000	10	199.27	5.29
31209	2000	10	672.78	6.51

30703	2000	12	121.72	4.80
30705	2000	12	288.04	5.66
30707	2000	12	116.09	4.75
30709	2000	12	192.05	5.26
30801	2000	12	44.79	3.80
30803	2000	12	47.64	3.86
30805	2000	12	62.91	4.14
30807	2000	12	138.23	4.93
30809	2000	12	164.19	5.10
30901	2000	12	70.46	4.26
30903	2000	12	33.85	3.52
30905	2000	12	304.76	5.72
30907	2000	12	345.55	5.85
30909	2000	12	743.53	6.61
31003	2000	12	142.42	4.96
31005	2000	12	356.83	5.88
31007	2000	12	263.64	5.57
31009	2000	12	307.82	5.73
31105	2000	12	192.59	5.26
31107	2000	12	245.59	5.50
31109	2000	12	508.24	6.23
31203	2000	12	122.89	4.81
31205	2000	12	95.83	4.56
31207	2000	12	263.97	5.58
31209	2000	12	198.73	5.29

Table 5. Abundance (inds./m^3) of four zooplankton assemblages from 1978 to 2000.

Station	Year	Month	Depth (m)	Copepods	Amphipods	Chaetognaths	Euphausiid
30703	1978	6	40	167.65	0.01	591.33	0.5
30705	1978	6	50	2.52	1.89	12.58	1.05
30707	1978	6	50	4.03	0.79	7.86	6.29
30709	1978	6	50	286.36	0.01	40.89	0.48
30801	1978	6	20	5.98	0	0	3.15
30803	1978	6	45	4.75	0	0	0.14
30805	1978	6	50	8.56	0	0	0.29
30807	1978	6	50	133.87	0.01	339.7	0.58
30809	1978	6	50	106.69	0.01	62.91	0
30901	1978	6	25	66.43	2.34	0.13	0
30903	1978	6	50	19.12	1.16	8.09	0.17
30905	1978	6	50	60.14	0.74	20.89	0.07
30907	1978	6	50	89.71	0.11	55.65	1.7
30909	1978	6	50	19.38	1.76	9.8	6.85
31003	1978	6	25	575.23	0.09	6.7	0.57
31005	1978	6	50	80.4	0.05	46.55	2.38
31007	1978	6	50	221.18	0.35	4.99	1.63
31009	1978	6	50	56.62	1.68	1.1	15.28
31104	1978	6	30	128.33	0.14	8.99	0.94
31105	1978	6	50	69.45	1.04	0.69	1.26
31107	1978	6	50	99.14	0.33	0.46	27.26
31109	1978	6	NaN	NaN	NaN	NaN	NaN
31203	1978	6	50	137.39	0.67	1.68	7.1
31205	1978	6	50	40.76	1.34	1.28	3.15
31207	1978	6	50	138.9	0.25	21.8	1.31
31209	1978	6	50	19	1.17	3.59	4.32
30703	1978	8	36	18.52	17.33	0.62	0
30705	1978	8	50	2.52	63.22	0.56	0
30707	1978	8	50	4.03	67.23	0.2	0
30709	1978	8	50	286.36	1.99	0.88	0.12
30801	1978	8	18	238.35	0.69	1.85	0
30803	1978	8	47	0.94	125.82	0.4	0
30805	1978	8	50	12.33	16.56	0.27	0
30807	1978	8	50	22.14	8.65	1.3	1.01
30809	1978	8	50	82.54	2.63	1.01	2.43
30901	1978	8	29	0.43	166.71	1.07	0
30903	1978	8	50	23.15	6.43	2.31	0
30905	1978	8	50	60.39	0.96	0.43	0
30907	1978	8	50	5.91	28.51	0.09	0
30909	1978	8	50	296.17	0.41	0	0
31003	1978	8	25	4.03	29.49	0	0
31005	1978	8	50	5.79	45.68	0	0
31007	1978	8	50	105.69	1.71	0.63	2.74
31009	1978	8	50	353.29	0.42	0.24	1.8
31104	1978	8	32	255.17	1.56	3.06	0.12
31105	1978	8	50	29.82	7.75	0.65	3.15
31107	1978	8	50	9.56	4.3	2.06	0.37
31109	1978	8	NaN	NaN	NaN	NaN	NaN
31203	1978	8	50	125.82	1.85	0.88	8.9
31205	1978	8	50	226.47	1	1.96	2.69
31207	1978	8	50	109.71	2.24	1.99	1.16
31209	1978	8	50	85.55	3.35	0.14	6.29
30703	1978	10	30	79.68	2.15	0.87	2.8
30705	1978	10	50	114.49	0.9	0.77	1.97
30709	1978	10	50	153.5	1.43	0.77	0.93
30801	1978	10	15	469.71	0.49	5.08	2.3
30803	1978	10	45	110.44	0.92	2.95	5.71
30805	1978	10	50	157.27	1.31	2.18	6.71
30807	1978	10	50	241.57	0.81	0.15	12.58
30809	1978	10	50	372.41	0.36	0.75	5.66
30901	1978	10	20	267.36	1.38	0.91	0.93
30903	1978	10	45	95.06	1.27	2.11	3.01
30905	1978	10	50	285.6	0.52	2.6	3.92
30907	1978	10	50	196.27	0.48	0.64	3.15
30909	1978	10	50	294.41	0.67	0.48	4.64
31003	1978	10	25	1502.24	0.32	0.76	0.34
31005	1978	10	50	290.63	0.94	0.62	5
31007	1978	10	50	148.46	0.38	2.13	1.83
31009	1978	10	50	223.95	0.54	3.1	1.66
31104	1978	10	30	1627.22	0.24	1.21	2.13
31105	1978	10	50	605.17	0.44	0.85	3.77
31107	1978	10	50	572.46	0.24	0.58	7.86
31109	1978	10	NaN	NaN	NaN	NaN	NaN
31203	1978	10	50	481.87	0.27	1.24	3.93
31205	1978	10	50	249.12	0.15	0.14	31.45
31207	1978	10	50	227.73	0.86	0.36	17.08
31209	1978	10	50	656.76	0.25	1.49	6.54
30703	1978	12	35	34.51	0.98	3.15	0.42

30705	1978	12	45	18.45	4.67	1.22	0
30707	1978	12	50	28.43	2.7	2.46	0.33
30709	1978	12	50	24.66	2.89	3.42	1.03
30801	1978	12	20	16.99	4.08	4.31	0
30803	1978	12	45	26.98	3.03	2.23	0.19
30805	1978	12	50	36.49	2.04	3.21	0.13
30807	1978	12	50	28.06	2.51	3.39	0
30809	1978	12	50	62.66	2.69	1.92	0.19
30901	1978	12	25	17.61	1.8	0.63	0
30903	1978	12	50	0.38	29.36	7.64	0
30905	1978	12	50	35.73	2.02	3.73	0.35
30907	1978	12	50	5.66	1.54	4.58	0
30909	1978	12	50	27.18	1.02	3.95	2
31003	1978	12	20	77.38	2.48	1.04	1.97
31005	1978	12	50	103.67	1.18	1.5	1.87
31007	1978	12	50	69.45	0.81	4.87	0.46
31009	1978	12	50	56.87	0.6	6	0.77
31104	1978	12	30	93.94	0.87	0.41	3.15
31105	1978	12	50	26.8	1.51	18.5	0
31107	1978	12	50	9.44	1.76	5.39	0
31203	1978	12	50	12.33	1.28	0.94	0
31205	1978	12	50	57.12	0.8	2.06	0
31207	1978	12	50	44.41	1.28	2.62	0
31209	1978	12	50	55.61	1.08	4.06	0.26
30703	1979	2	35	8.09	2.38	0	0
30705	1979	2	50	28.94	0.41	0	0
30707	1979	2	55	76.4	0.33	0	0
30709	1979	2	55	70.91	0.67	0.38	688.84
30801	1979	2	20	89.33	0.29	0	0
30803	1979	2	45	74.65	0.22	0.99	117.43
30805	1979	2	47	56.22	0.31	0	0
30807	1979	2	60	109.04	0.15	0.52	377.45
30809	1979	2	60	82.83	0.51	0.1	1195.25
30901	1979	2	29	28.2	0.1	0	0
30903	1979	2	45	68.78	0.37	0	0
30905	1979	2	50	39.63	0.44	0	0
30907	1979	2	70	69.02	0.09	0	0
30909	1979	2	65	75.97	0.24	0.84	86.5
31003	1979	2	25	173.63	0.18	0	0
31005	1979	2	60	2.41	0.55	3.15	37.74
31007	1979	2	70	43.14	0.64	0.26	141.54
31009	1979	2	75	77.17	0.38	0	0
31104	1979	2	70	20.85	0.14	3.77	37.74
31107	1979	2	75	26.84	1.16	0.11	251.63
31109	1979	2	85	20.13	1.27	0	0
31203	1979	2	70	39.09	0.3	0	0
31205	1979	2	70	73.69	0.1	0	0
31207	1979	2	75	41.1	0.76	0	0
31209	1979	2	85	23.68	1.53	0	0
30703	1979	4	30	51.17	0.36	0	0
30705	1979	4	40	67.94	0.16	0.57	12.58
30707	1979	4	50	156.01	0.07	0	0
30709	1979	4	60	64.59	0.04	28.31	15.03
30801	1979	4	20	130.85	0.26	0.37	50.33
30803	1979	4	45	109.6	0.02	8.39	72.34
30805	1979	4	50	128.84	0.04	0	0
30807	1979	4	60	436.37	0.05	2.52	144.16
30809	1979	4	75	252.97	0.03	5.5	56.17
30901	1979	4	25	281.83	0.05	0.7	37.74
30903	1979	4	50	135.88	0.01	0	0
30905	1979	4	60	123.3	0.02	11.01	103.35
30907	1979	4	60	192.92	0	0	0
30909	1979	4	75	69.28	0	0	0
31003	1979	4	25	165.07	0.12	4.84	3.77
31005	1979	4	65	136.07	0.04	0	0
31007	1979	4	75	130.51	0.04	0	0
31009	1979	4	80	138.4	0.03	0	0
31104	1979	4	70	53.92	0.09	0	0
31107	1979	4	80	36.49	0.12	0	0
31109	1979	4	80	33.03	0.03	0	0
31203	1979	4	70	26.24	0.13	0	0
31205	1979	4	90	43.34	0.01	0	0
31207	1979	4	85	39.67	0.07	0	0
31209	1979	4	85	87.03	0.07	0	0
30703	1979	6	30	88.07	0.04	0	0
30705	1979	6	30	121.62	0.1	0	0
30707	1979	6	55	38.89	0.11	2.1	188.72
30709	1979	6	55	41.18	0	0	0
30801	1979	6	20	40.26	1.38	0	0
30803	1979	6	40	106.94	0.21	0	0

30805	1979	6	50	148.46	0.03	0	0
30807	1979	6	60	152.03	0.15	0	0
30809	1979	6	70	79.98	0.14	0	0
30901	1979	6	25	8.05	4.91	0	0
30903	1979	6	50	120.78	0.44	0.38	114.81
30905	1979	6	60	144.69	0.08	1.05	88.07
30907	1979	6	60	159.37	0.1	1.09	81.78
30909	1979	6	70	131.57	0.15	1.11	100.65
31003	1979	6	20	236.53	0.09	0	0
31005	1979	6	60	603.92	0.23	0.18	218.08
31007	1979	6	75	57.04	0.7	0.5	91.22
31009	1979	6	80	56.62	1.64	0.2	144.69
31104	1979	6	65	228.4	0.33	0.61	119.53
31107	1979	6	85	218.33	0.14	2.35	56.87
31109	1979	6	90	99.25	0.7	1.03	31.45
31203	1979	6	70	150.08	0.17	1.12	143.9
31205	1979	6	90	95.06	0.18	4.3	47.42
31207	1979	6	90	75.07	0.2	2.96	51.11
31209	1979	6	85	76.97	0.18	0.63	553.59
30703	1979	8	35	NaN	NaN	NaN	NaN
30705	1979	8	45	1.4	173.63	0	0
30707	1979	8	55	1.72	98.98	0	0
30709	1979	8	60	7.86	25.58	0	0
30801	1979	8	20	1.89	89.12	0	0
30803	1979	8	45	30.2	10.02	0	0
30805	1979	8	50	3.9	92.54	0	0
30807	1979	8	60	9.96	22.38	0	0
30809	1979	8	65	12.29	16.64	0	0
30901	1979	8	25	4.53	45.78	3.03	4.59
30903	1979	8	50	5.41	40.09	0	0
30905	1979	8	60	28.52	5.32	0	0
30907	1979	8	65	3.29	28.31	0	0
30909	1979	8	75	2.26	42.87	0	0
31003	1979	8	25	38.5	2.38	0.22	0
31005	1979	8	70	43.14	3.93	0	0
31007	1979	8	65	50.33	3.48	0.17	13.37
31009	1979	8	85	2.15	15.4	0.53	9.44
31104	1979	8	NaN	NaN	NaN	NaN	NaN
31107	1979	8	75	25.92	3.99	0	0
31109	1979	8	80	34.6	1.57	0.11	490.68
31203	1979	8	75	103.17	1.2	0.51	18.21
31205	1979	8	80	34.36	4.4	0.08	84.93
31207	1979	8	85	104.35	1.35	0.29	55.27
31209	1979	8	80	88.7	0.93	0.15	372.73
30703	1979	10	30	4.19	18.56	0	0
30705	1979	10	40	0.79	312.02	0.2	6.29
30707	1979	10	50	0.13	3359.28	0	0
30709	1979	10	50	2.89	15.32	0	0
30801	1979	10	15	18.87	3.77	0	0
30803	1979	10	40	36.64	1.3	0	0
30805	1979	10	45	6.85	3.34	0	0
30807	1979	10	60	21.6	10.72	0	0
30809	1979	10	70	1.26	18.42	0	0
30901	1979	10	20	47.5	2.33	0	0
30903	1979	10	40	158.53	2.18	0	0
30905	1979	10	50	36.23	0.87	0	0
30907	1979	10	55	86.47	0.5	0	0
30909	1979	10	60	27.89	3.07	0	0
31003	1979	10	25	35.48	1.87	0	0
31005	1979	10	60	25.16	1.02	0	0
31007	1979	10	60	41.83	1.17	0	0
31009	1979	10	70	57.16	0.59	0	0
31104	1979	10	60	13.42	1.72	0	0
31107	1979	10	80	44.66	1.14	0	0
31109	1979	10	70	63.99	1.09	0.2	25.16
31203	1979	10	60	96.77	0.79	0	0
31205	1979	10	80	36.88	1.27	0	0
31207	1979	10	70	17.52	2.94	0.55	13.37
31209	1979	10	70	14.29	11.28	0.26	12.06
30703	1979	12	30	5.03	4.46	0	0
30705	1979	12	40	71.56	0.43	0	0
30707	1979	12	50	85.55	0.3	0	0
30709	1979	12	45	83.88	0.41	0	0
30801	1979	12	15	40.68	7.85	0	0
30803	1979	12	45	45.71	1.46	0	0
30805	1979	12	50	70.83	1.1	0	0
30807	1979	12	60	9.96	20.2	0	0
30809	1979	12	65	0.39	9.44	0	0
30901	1979	12	25	71.21	0.56	0	0
30903	1979	12	45	43.48	2.06	0.12	31.45

30905	1979	12	60	29.88	0.71	0	0
30907	1979	12	60	5.77	8.92	0	0
30909	1979	12	75	37.49	0.75	0	0
31003	1979	12	25	95.12	0.47	0	0
31005	1979	12	65	12.19	0.75	0	0
31007	1979	12	65	15.1	0.44	0	0
31009	1979	12	85	47.81	0.93	0	0
31104	1979	12	60	46.76	0.2	0	0
31107	1979	12	80	41.83	0.45	0	0
31109	1979	12	85	48.11	0.7	0	0
31203	1979	12	65	2.9	3.15	0	0
31205	1979	12	80	4.09	7.74	0.1	18.87
31207	1979	12	80	39	0.43	0	0
31209	1979	12	85	6.73	0.69	0	0
30703	1980	2	30	81.78	0.69	0	0
30705	1980	2	50	52.72	1.59	0	0
30707	1980	2	50	109.59	0.51	0	0
30709	1980	2	65	34.26	2.45	0	0
30801	1980	2	20	77.38	0.13	0	0
30803	1980	2	45	4.19	1.05	0	0
30805	1980	2	50	56.11	0.55	0	0
30807	1980	2	65	46.07	1.56	0	0
30809	1980	2	80	39.95	0.69	0	0
30901	1980	2	25	60.39	1.81	0	0
30903	1980	2	50	129.59	2.32	0	0
30905	1980	2	60	57.04	2.5	0.03	18.87
30907	1980	2	60	39.21	5.38	0.12	52.42
30909	1980	2	80	6.13	55	0	0
31003	1980	2	25	23.15	8.96	0.1	173
31005	1980	2	70	95.26	2.18	0.12	71.89
31007	1980	2	80	46	3.27	0.1	25.16
31009	1980	2	90	47.53	5.24	0.04	125.82
31104	1980	2	70	27.59	2.73	0.05	251.63
31107	1980	2	80	14.94	5.56	0	0
31109	1980	2	85	9.92	6.95	0	0
31203	1980	2	70	33.25	0.78	0	0
31205	1980	2	80	84.3	0.92	0	0
31207	1980	2	90	60.88	0.51	0	0
31209	1980	2	80	137.06	0.95	0.05	47.18
30703	1980	4	30	25.16	3.25	0	0
30705	1980	4	50	30.32	2.01	0.08	0
30707	1980	4	50	31.45	0.81	1.18	2.1
30709	1980	4	60	26.21	0.68	0.7	2.1
30801	1980	4	15	226.47	0.42	0	0
30803	1980	4	40	55.04	0.77	0.44	134.2
30805	1980	4	40	49.54	0.14	0	0
30807	1980	4	60	94.99	0.25	0.17	150.98
30809	1980	4	70	25.43	2.38	0	0
30901	1980	4	20	109.46	0.99	0.11	25.16
30903	1980	4	50	96.88	1.49	0.03	31.45
30905	1980	4	60	42.99	4.45	0.02	12.58
30907	1980	4	60	4.72	0.56	0	0
30909	1980	4	80	22.8	0.02	6.29	0
31003	1980	4	20	72.34	2.84	0.36	14.68
31005	1980	4	60	82.83	1.59	0.22	44.93
31007	1980	4	70	35.05	3.36	0.03	440.36
31009	1980	4	80	37.82	4.98	0.07	136.82
31104	1980	4	60	55.57	0	0	274.28
31107	1980	4	80	52.69	0	0	251.63
31109	1980	4	80	49.15	0	0	0
31203	1980	4	60	149.2	0.29	0.19	147.83
31205	1980	4	80	11.24	0.66	0	0
31207	1980	4	80	69.2	0.11	0.42	0
31209	1980	4	80	15.41	0.64	0	0
30703	1980	6	30	120.99	0.97	0	0
30705	1980	6	40	35.86	0.03	0	0
30707	1980	6	50	16.86	0	0	0
30709	1980	6	60	1153.31	0.08	0.13	943.62
30801	1980	6	10	52.84	0.15	0	0
30803	1980	6	40	475.58	0.05	0.26	3522.84
30805	1980	6	40	75.96	0.05	0	0
30807	1980	6	60	691.15	0.01	0.79	6139.81
30809	1980	6	70	413.39	0.04	0.98	125.82
30901	1980	6	20	0.94	0	0	0
30903	1980	6	40	29.72	0.07	0	0
30905	1980	6	60	345.99	0.01	4.19	157.27
30907	1980	6	60	689.47	0	0	0
30909	1980	6	70	359.47	0.01	3.93	125.82
31003	1980	6	20	235.9	0.01	830.38	0.05
31005	1980	6	60	110.4	0.06	55.36	0.71

31007	1980	6	NaN	NaN	NaN	NaN	NaN
31009	1980	6	80	192.5	0	0	0
31104	1980	6	60	93.84	0.41	1.07	31.45
31107	1980	6	80	66.84	0.62	0.52	130.31
31109	1980	6	70	85.38	1.32	0.63	57.88
31203	1980	6	60	62.91	0.25	0.52	1840.06
31205	1980	6	80	80.99	0.87	0.22	2868.6
31207	1980	6	80	229.69	0.58	0.12	654.24
31209	1980	6	80	15.88	6.29	0.44	350.49
30703	1980	8	30	1.68	111.66	0	0
30705	1980	8	50	25.92	8.18	0	0
30707	1980	8	50	19.12	16.72	0	0
30709	1980	8	60	183.27	2.61	0.14	11.8
30801	1980	8	15	11.74	16.63	0	0
30803	1980	8	40	14.47	1.16	0	0
30805	1980	8	40	61.34	2.03	0.25	27.68
30807	1980	8	60	145.53	1.89	0.11	13.48
30809	1980	8	70	192.68	0.86	0.15	57.52
30901	1980	8	20	41.83	12.72	0	0
30903	1980	8	50	157.02	0.3	0.31	0
30905	1980	8	60	75.91	1.15	0.14	58.71
30907	1980	8	60	32.08	4.32	0.06	3.15
30909	1980	8	70	5.3	1.17	0	0
31003	1980	8	20	52.84	2.77	0	0
31005	1980	8	60	124.14	0.74	0.04	132.11
31007	1980	8	70	10.07	11.57	0.12	9.44
31009	1980	8	80	22.33	1.33	0.42	6.29
31104	1980	8	70	14.11	4.73	0	0
31107	1980	8	80	47.5	1.46	1.08	7.34
31109	1980	8	70	19.59	8.48	0.06	4.19
31203	1980	8	60	47.81	6.29	0.03	9.44
31205	1980	8	80	13.84	6.29	0	0
31207	1980	8	80	43.41	6.29	0	0
31209	1980	8	80	61.96	6.29	0.03	12.58
30703	1980	10	30	4.19	15.73	0	0
30705	1980	10	50	9.31	10.46	0	0
30707	1980	10	50	16.48	7.3	0	0
30709	1980	10	60	3.77	18.7	0	0
30801	1980	10	15	26.42	7.79	0	0
30803	1980	10	40	17.77	9.02	0.04	169.85
30805	1980	10	45	18.03	8.1	0.04	125.82
30807	1980	10	60	10.8	6.11	0	0
30809	1980	10	75	3.52	4.64	0	0
30901	1980	10	20	3.77	37.74	0	0
30903	1980	10	50	17.74	6.29	0	0
30905	1980	10	60	13.94	3.03	0	0
30907	1980	10	60	188.72	3.8	0	0
30909	1980	10	75	2.6	10.35	0	0
31003	1980	10	20	76.12	4.99	0.07	31.45
31005	1980	10	60	153.71	3.02	0.01	188.72
31007	1980	10	75	21.89	2.6	0	0
31009	1980	10	80	39.79	2.04	0	0
31104	1980	10	70	1.35	10.9	0	0
31107	1980	10	85	36.56	6.95	0	0
31109	1980	10	75	42.36	2.39	0.03	220.18
31203	1980	10	60	25.27	3.73	0.26	8.39
31205	1980	10	80	7.16	1.87	4.66	0.31
31207	1980	10	80	2.52	7.67	0	0
31209	1980	10	80	20.05	1.8	0.09	12.58
30703	1980	12	30	15.52	13.01	0	0
30705	1980	12	50	8.05	50.52	0.07	35.65
30707	1980	12	50	22.9	9.26	0.14	4.19
30709	1980	12	60	1.57	8.81	0.3	37.74
30801	1980	12	15	0.84	15.73	0	0
30803	1980	12	40	8.96	6.73	0	0
30805	1980	12	40	7.08	2.66	0.33	69.2
30807	1980	12	60	17.72	2.38	0	0
30809	1980	12	NaN	NaN	NaN	NaN	NaN
30901	1980	12	20	0.31	144.69	0	0
30903	1980	12	50	3.77	5.24	0	0
30905	1980	12	60	1.47	5.39	0	0
30907	1980	12	60	0.94	6.29	0	0
30909	1980	12	70	0.18	84.93	0	0
31003	1980	12	20	38.06	5.1	0	0
31005	1980	12	60	5.56	8.55	0	0
31007	1980	12	70	6.92	8.25	0.37	16.78
31009	1980	12	80	1.73	3.43	0	0
31104	1980	12	70	12.85	6.03	0.18	6.29
31107	1980	12	80	8.73	1.53	1.16	2.52
31109	1980	12	80	29.09	4.45	0.02	44.04

31203	1980	12	60	7.44	2.13	0	0
31205	1980	12	80	4.88	1.12	0	0
31207	1980	12	80	12.9	15.23	0.03	40.89
31209	1980	12	80	29.17	6.49	0.03	31.45
30703	1981	2	30	6.5	9.74	0	0
30705	1981	2	50	4.4	8.63	0	0
30707	1981	2	50	16.48	14.5	0	0
30709	1981	2	60	17.93	8.5	0	0
30801	1981	2	15	5.87	81.33	0	0
30803	1981	2	40	1.1	65.6	0	0
30805	1981	2	40	4.56	15.4	0	0
30807	1981	2	NaN	NaN	NaN	NaN	NaN
30809	1981	2	70	7.55	13.03	0	0
30901	1981	2	20	2.83	41.94	0	0
30903	1981	2	50	4.4	24.62	0	0
30905	1981	2	NaN	NaN	NaN	NaN	NaN
30907	1981	2	NaN	NaN	NaN	NaN	NaN
30909	1981	2	70	30.56	3.22	0	0
31003	1981	2	NaN	NaN	NaN	NaN	NaN
31005	1981	2	60	7.76	14.03	0	0
31007	1981	2	70	11.77	7.44	0	0
31009	1981	2	80	7.16	16.11	0	0
31104	1981	2	75	4.78	1.1	0	0
31107	1981	2	90	12.86	1.71	0	0
31109	1981	2	89	8.76	0.96	0	0
31203	1981	2	73	39.12	0.15	0	0
31205	1981	2	92	6.43	1.07	0	0
31207	1981	2	91	16.59	0.26	0	0
31209	1981	2	86	7.97	0.4	0	0
30703	1981	4	30	16.15	6.05	0	0
30705	1981	4	40	66.05	2.73	0.07	6.29
30707	1981	4	50	25.41	2.55	0.15	47.18
30709	1981	4	50	70.46	0.04	34.6	3.43
30801	1981	4	15	7.97	3.64	0	0
30803	1981	4	40	70.77	1.65	0.43	4.72
30805	1981	4	40	29.41	4.81	0.26	3.15
30807	1981	4	60	167.75	1.2	1.35	1.16
30809	1981	4	70	37.03	1.4	0.75	5.72
30901	1981	4	20	110.09	0.97	0	0
30903	1981	4	40	70.77	0.84	0	0
30905	1981	4	60	89.75	0.57	0.81	30.2
30907	1981	4	60	97.72	4.64	0.05	37.74
30909	1981	4	70	84.48	2.7	0.39	11.07
31003	1981	4	20	132.11	0.87	0.65	8.39
31005	1981	4	60	78.63	0.25	0.42	169.85
31007	1981	4	70	67.4	0.75	1.4	11.01
31009	1981	4	80	25.16	1.45	0.77	4.19
31104	1981	4	80	9.44	0.26	0	0
31107	1981	4	90	39.14	0.09	1.57	53.47
31109	1981	4	87	47	0.15	0.84	69.2
31203	1981	4	80	114.02	0.02	3.15	6297.08
31205	1981	4	70	82.68	0.01	18.87	503.26
31207	1981	4	90	67.1	0.2	0.81	117.95
31209	1981	4	85	59.21	0.31	0	0
30703	1981	6	30	94.36	0.11	0	0
30705	1981	6	50	56.62	0	0	0
30707	1981	6	50	314.54	0	6.29	94.36
30709	1981	6	60	209.69	0	37.74	10.48
30801	1981	6	15	52	0.41	0	0
30803	1981	6	40	31.45	2.3	1.29	49.91
30805	1981	6	40	629.08	0.02	0	0
30807	1981	6	60	157.27	0.25	1.47	22.47
30809	1981	6	70	224.67	0.59	0.91	18.13
30901	1981	6	20	440.36	0.33	0	0
30903	1981	6	50	23.15	0.92	2.1	44.73
30905	1981	6	60	79.89	0.25	0	0
30907	1981	6	60	110.09	0.04	0	0
30909	1981	6	70	152.78	0.2	0.47	51.9
31003	1981	6	20	691.99	0.08	0	0
31005	1981	6	60	188.72	0.28	0.78	28.94
31007	1981	6	70	116.83	0.9	0.24	79.08
31009	1981	6	80	212.31	0.02	25.95	12.2
31104	1981	6	75	176.14	0.07	4.29	20.13
31107	1981	6	90	66.4	0.15	5.47	17.3
31109	1981	6	89	31.81	0.56	0.94	25.16
31203	1981	6	73	215.44	0.12	4.72	27.61
31205	1981	6	92	61.54	0.27	1.29	67.63
31207	1981	6	90	97.86	0.35	0.97	67.1
31209	1981	6	85	148.02	0.14	5.73	19.49
30703	1981	8	30	15.73	6.71	0	0

30705	1981	8	40	75.49	8.07	0.03	8.39
30707	1981	8	50	50.33	7.08	0	0
30709	1981	8	50	31.45	4.08	0.08	12.58
30801	1981	8	20	157.27	5.03	0	0
30803	1981	8	40	37.74	4.67	0	0
30805	1981	8	40	100.65	4.23	0.09	10.48
30807	1981	8	60	58.71	14.04	0.02	4.19
30809	1981	8	70	43.14	14.42	0.03	17.61
30901	1981	8	20	47.18	15.94	0	0
30903	1981	8	40	12.58	27.52	0	0
30905	1981	8	60	157.27	2.94	0.34	0.66
30907	1981	8	60	89.12	6.13	0	0
30909	1981	8	70	242.64	1.51	0.04	128.96
31003	1981	8	20	22.02	2.25	0.5	0
31005	1981	8	60	41.94	1.89	0.21	9.44
31007	1981	8	70	40.44	3.08	1.57	0.34
31009	1981	8	80	51.11	3.15	0.77	9.44
31104	1981	8	75	93.94	2.64	0.9	1.5
31107	1981	8	90	97.86	4.01	0.63	1.63
31109	1981	8	89	62.91	6.21	0.47	0.86
31203	1981	8	73	103.41	2.83	0.61	10.77
31205	1981	8	92	109.41	1.85	0.48	18.52
31207	1981	8	91	124.43	0	0	8.26
31209	1981	8	86	64.37	0.24	11.63	2.06
30703	1981	10	30	8.18	4.19	0	0
30705	1981	10	50	16.23	2.78	0	0
30707	1981	10	50	20.51	4.63	0	0
30709	1981	10	60	9.02	11.34	0.04	12.58
30801	1981	10	15	25.16	1.05	0	0
30803	1981	10	40	124.71	1.94	0.28	24.59
30805	1981	10	40	160.42	2.1	0.44	3.93
30807	1981	10	60	31.45	6.61	0.1	6.29
30809	1981	10	70	85.38	4.9	0.18	0.9
30901	1981	10	20	5.35	4.07	0.57	0
30903	1981	10	50	15.1	2.1	0.94	3.15
30905	1981	10	60	3.25	8.32	0.15	12.58
30907	1981	10	60	83.77	1.03	0.43	6.99
30909	1981	10	70	27.23	0.98	0.4	0
31003	1981	10	20	149.72	0.9	2.04	2
31005	1981	10	60	220.18	0.96	0.79	1.1
31007	1981	10	70	233.66	0.45	0.96	9.21
31009	1981	10	80	47.18	0.49	0	0
31104	1981	10	70	25.52	2.02	1.04	1.68
31107	1981	10	80	7.55	0.79	0.52	18.87
31109	1981	10	80	120.63	0.57	1.78	0.81
31203	1981	10	60	108.2	0.9	0.85	1.57
31205	1981	10	80	90.12	1.43	0.6	10.57
31207	1981	10	80	126.92	0.93	0.24	13.98
31209	1981	10	80	146.89	0.5	0.51	4.19
30703	1981	12	30	27.89	3.17	0	0
30705	1981	12	50	31.96	5.82	0.08	109.04
30707	1981	12	50	74.23	2.49	0	0
30709	1981	12	60	39.21	2.37	0.09	22.02
30801	1981	12	15	14.68	6.11	0	0
30803	1981	12	40	19.19	1.75	0	0
30805	1981	12	40	35.23	2.84	0.12	22.02
30807	1981	12	60	49.28	7.01	0.02	44.04
30809	1981	12	70	40.26	5.28	0	0
30901	1981	12	20	62.28	3.4	0	0
30903	1981	12	50	15.98	4.16	0	0
30905	1981	12	60	13.11	3.47	0	0
30907	1981	12	60	34.6	3.95	0	0
30909	1981	12	70	46.19	2.24	0.14	95.93
31003	1981	12	20	6.29	11.64	0	0
31005	1981	12	60	13.84	3.43	0	0
31007	1981	12	70	10.87	3.33	0.1	81.78
31009	1981	12	80	17.06	1.65	0.22	18.87
31104	1981	12	75	5.87	7.1	0.08	31.45
31107	1981	12	93	50.06	2.98	0.9	10.69
31109	1981	12	89	74.22	1.92	0.43	25.45
31203	1981	12	73	55.15	0.74	0.25	73.39
31205	1981	12	68	24.98	3.31	0.31	29.66
31207	1981	12	93	50.73	2.68	0.16	29.88
31209	1981	12	95	92.71	1.53	0.57	5.28
30703	1982	2	30	62.07	0.02	251.63	0
30705	1982	2	45	3.77	0.47	506.41	0
30707	1982	2	50	19.12	0	0	0
30709	1982	2	50	75.99	0	0	0
30801	1982	2	15	77.17	0	0	0
30803	1982	2	40	11.17	0	0	0.28

30805	1982	2	40	15.1	0	0	0
30807	1982	2	50	38	0.04	1107.18	0
30809	1982	2	70	8.36	0	0	0.26
30903	1982	2	40	66.68	0	0	1.64
30905	1982	2	50	31.71	0	0	0
30907	1982	2	50	54.86	0	0	0
30909	1982	2	70	63.27	0.01	2440.83	0
31003	1982	2	20	33.03	0	0	0
31005	1982	2	60	18.03	0.22	170.9	0
31007	1982	2	NaN	NaN	NaN	NaN	NaN
31009	1982	2	70	77.29	0.02	620.69	0
31104	1982	2	60	26.42	0.07	134.2	0
31107	1982	2	80	8.02	0.06	597.63	0.86
31109	1982	2	70	9.53	0	0	0.3
31203	1982	2	60	37.33	0.02	283.09	0
31205	1982	2	80	18.56	1.39	0	0
31207	1982	2	80	51.58	0.05	84.3	0
31209	1982	2	80	7.63	0	0	0
30703	1982	4	30	32.29	0	0	0
30705	1982	4	40	131.48	0.02	421.48	0.14
30707	1982	4	50	160.54	0.14	16.92	0
30709	1982	4	60	217.24	0.01	119.53	0
30801	1982	4	15	125.82	0.1	30.2	0
30803	1982	4	40	267.04	0	201.31	0
30805	1982	4	40	299.13	0.01	29.36	0
30807	1982	4	60	156.85	0	0	0
30809	1982	4	70	176.86	0.02	143.79	0.08
30901	1982	4	20	64.17	0	0	0
30903	1982	4	40	175.51	0.3	0	0
30905	1982	4	60	71.72	0.04	48.75	0
30907	1982	4	60	52.42	0.1	8.65	0
30909	1982	4	70	84.48	0	0	0
31003	1982	4	20	93.73	0	0	0.21
31005	1982	4	60	15.94	0	0	0.53
31007	1982	4	70	15.28	0.48	88.07	0.76
31009	1982	4	80	10.69	0	0	0
31104	1982	4	70	97.06	0.03	226.47	0
31107	1982	4	80	14.23	0.03	201.31	0.39
31109	1982	4	70	21.75	0	0	0
31203	1982	4	60	128.33	0.04	67.4	0
31205	1982	4	80	75.49	0.01	364.87	0.43
31207	1982	4	80	80.52	0.01	138.4	1.72
31209	1982	4	80	36.49	0	0	0.55
30703	1982	6	30	18.66	0	0	0
30705	1982	6	40	293.78	0	0	0
30707	1982	6	50	39.76	0.14	0	0
30709	1982	6	60	117.01	0	0	0
30801	1982	6	15	193.76	0	0	0
30803	1982	6	40	120.78	0	0	0
30805	1982	6	40	127.07	0	0	0
30807	1982	6	60	25.79	0	0	0
30809	1982	6	70	235.81	0	0	0.11
30901	1982	6	20	149.72	0	0	0
30903	1982	6	40	484.39	0	0	0
30905	1982	6	60	51.17	0	0	0
30907	1982	6	60	136.3	0	0	0
30909	1982	6	70	32.71	0	0	0
31003	1982	6	20	210.11	0.05	36.49	0.65
31005	1982	6	60	128.33	0.13	24.68	0.06
31007	1982	6	70	130.49	0.14	46.32	0.1
31009	1982	6	80	62.59	0.17	152.18	0.17
31104	1982	6	70	63.36	0	0	0
31107	1982	6	80	91.53	0.09	7.77	1.2
31109	1982	6	70	144.15	0.05	34.6	0.33
31203	1982	6	60	180.76	0	0	0
31205	1982	6	80	73.6	0	0	0
31207	1982	6	80	66.37	0	0	0
31209	1982	6	80	35.39	0.15	2.86	2.52
30703	1982	8	30	58.29	0.05	349.14	0
30705	1982	8	50	57.5	0.01	2541.48	0
30707	1982	8	50	20.13	0	0	0
30709	1982	8	60	41.1	0.22	581.45	0
30801	1982	8	15	94.78	0	0	0
30803	1982	8	40	96.25	0	0	0
30805	1982	8	40	91.85	0	0	0
30807	1982	8	60	68.15	0.04	1758.28	0
30809	1982	8	70	69.56	0.02	2132.58	0
30901	1982	8	20	9.44	4.19	106.94	0
30903	1982	8	50	59.51	0.08	489.63	0
30905	1982	8	60	232.44	0.19	56.71	0

30907	1982	8	60	19.29	0.07	1887.24	0
30909	1982	8	70	49.97	0	0	0
31003	1982	8	20	35.86	0	0	0
31005	1982	8	60	50.12	0	0	0
31007	1982	8	70	67.22	0	0	0
31009	1982	8	80	72.34	0.35	35.77	0
31104	1982	8	70	15.73	0.54	18.87	0
31107	1982	8	80	11.87	0.62	58.71	0
31109	1982	8	70	145.41	0.13	107.31	0.92
31203	1982	8	60	127.81	0.05	188.02	0
31205	1982	8	80	27.84	0.75	45.38	0
31207	1982	8	80	78.95	0.05	265	0.24
31209	1982	8	80	95.86	0.03	406.8	0.32
30703	1982	10	30	35.44	0	0	0
30705	1982	10	50	23.15	0.07	1346.23	0
30707	1982	10	50	30.45	0	0	0
30709	1982	10	60	36.07	0.04	811.51	0
30801	1982	10	15	49.07	0.05	578.75	0
30803	1982	10	40	17.77	0	0	0
30805	1982	10	40	19.5	0.05	1648.19	0
30807	1982	10	60	44.45	0.06	808.37	0
30809	1982	10	70	116.47	0.06	167.75	0.02
30901	1982	10	20	37.12	0	0	0
30903	1982	10	50	31.08	0	0	0
30905	1982	10	60	17.93	0	0	0
30907	1982	10	60	189.77	0.07	201.93	0
30909	1982	10	70	21.3	0.03	3359.28	0
31003	1982	10	20	27.68	0	0	0
31005	1982	10	60	111.98	0	0	0
31007	1982	10	70	454.02	0.02	143.12	0
31009	1982	10	80	273.65	0.14	20.97	0.13
31104	1982	10	70	49.79	0.1	106.24	0.33
31107	1982	10	80	108.36	0.51	16.01	0
31109	1982	10	80	26.03	1.29	54.95	0
31203	1982	10	60	18.24	0.18	218.92	0.4
31205	1982	10	80	25.87	0.4	98.56	0.23
31207	1982	10	80	36.49	1.44	27.54	0
31209	1982	10	80	30.04	1.96	20.19	0
30703	1982	12	30	20.97	0	0	0
30705	1982	12	50	25.79	0.06	336.56	0
30707	1982	12	50	48.94	0.03	393.17	0
30709	1982	12	60	17.51	0	0	0
30801	1982	12	15	179.92	0	0	0
30803	1982	12	40	21.7	0	0	0
30805	1982	12	40	51.27	0.02	591.33	0
30807	1982	12	60	88.28	0	0	0
30809	1982	12	70	14.38	0	0	0
30901	1982	12	20	37.12	0.05	163.56	0
30903	1982	12	50	31.2	0.03	434.06	0
30905	1982	12	60	5.77	0	0	0
30907	1982	12	60	78.74	0.02	339.7	0
30909	1982	12	70	42.42	0.03	188.72	0
31003	1982	12	20	56.3	0	0	0
31005	1982	12	60	32.71	0	0	0
31007	1982	12	70	61.2	0.02	166.71	0.71
31009	1982	12	80	47.26	0.02	349.14	0.06
31104	1982	12	70	8	0	0	0.3
31107	1982	12	80	48.52	0.04	195.01	0
31109	1982	12	80	9.12	0	0	0.22
31203	1982	12	60	15.41	0	0	0.17
31205	1982	12	80	32.71	0	0	0
31207	1982	12	80	19.58	0	0	0
31209	1982	12	80	9.28	0.11	355.43	0.11
30703	1983	2	30	10.48	0	0	0
30705	1983	2	50	13.59	0.06	541.01	0
30707	1983	2	50	18.24	0	0	0
30709	1983	2	60	28.62	0	0	1.84
30801	1983	2	15	15.1	0	0	0.57
30803	1983	2	40	23.91	0	0	0
30805	1983	2	40	2.2	0	0	0
30807	1983	2	60	5.66	0	0	0
30809	1983	2	70	21.66	0	0	0.09
30901	1983	2	20	32.4	0	0	0
30903	1983	2	50	10.32	0	0	0
30905	1983	2	50	54.73	0.03	66.05	0
30907	1983	2	60	24.43	0.08	178.24	0.15
30909	1983	2	70	15.28	0	0	0
31003	1983	2	20	29.25	0.07	163.56	2.66
31005	1983	2	60	14.68	0.13	411	0.03
31007	1983	2	70	21.39	0	0	0

31009	1983	2	80	10.22	0.19	94.36	1.47
31104	1983	2	70	37.3	0.03	179.29	0.33
31107	1983	2	80	10.3	0.05	679.41	0.35
31109	1983	2	80	19.89	0	0	0
31203	1983	2	60	14.68	0.09	135.25	0.88
31205	1983	2	80	7.78	0.06	220.18	0
31207	1983	2	80	13.21	0	0	0.21
31209	1983	2	80	9.28	0	0	0
30703	1983	4	30	33.76	0.08	88.07	0
30705	1983	4	50	338.95	0.01	84.93	0
30707	1983	4	50	44.66	0.04	88.07	0
30709	1983	4	60	18.24	0.11	31.45	0
30801	1983	4	15	151.4	0.03	37.74	0
30803	1983	4	40	229.14	0.02	9.44	2.1
30805	1983	4	40	61.49	0	0	0
30807	1983	4	60	68.78	0.07	63.81	0.18
30809	1983	4	70	60.66	0.21	65.1	0.19
30901	1983	4	20	78.01	0.03	31.45	0
30903	1983	4	50	10.32	0	0	0
30905	1983	4	60	11.11	0	0	0
30907	1983	4	60	16.25	0	0	0
30909	1983	4	70	5.66	0	0	0
31003	1983	4	20	29.57	0.07	0	0
31005	1983	4	60	7.86	0.17	6.29	6.29
31007	1983	4	70	18.87	0	0	3.49
31009	1983	4	80	21.15	0.12	37.74	4.4
31104	1983	4	70	24.62	0.18	20.45	0.97
31107	1983	4	80	40.18	0.04	67.1	0
31109	1983	4	80	119.37	0.12	25.61	1.32
31203	1983	4	60	46.03	0	0	0
31205	1983	4	80	77.46	0.01	22.02	9.89
31207	1983	4	80	55.75	0.01	25.16	0
31209	1983	4	80	45.37	0	0	5.03
30703	1983	6	30	58.92	0	0	0
30705	1983	6	50	32.84	0	0	0
30707	1983	6	50	42.9	0	0	0
30709	1983	6	60	71.72	0	0	0
30801	1983	6	15	101.49	0	0	0
30803	1983	6	40	152.24	0.01	12.58	0
30805	1983	6	40	261.23	0	0	0
30807	1983	6	60	102.85	0	0	0
30809	1983	6	70	183.33	0	0	0
30901	1983	6	20	44.98	0	0	0
30903	1983	6	50	28.56	0	0	0
30905	1983	6	60	51.37	0	0	0
30907	1983	6	60	166.29	0	0	0
30909	1983	6	70	86.45	0	0	0
31003	1983	6	20	679.72	0.01	50.33	0.79
31005	1983	6	60	106.31	0.03	27.68	0
31007	1983	6	70	133.99	0.01	97.51	0
31009	1983	6	80	80.13	0.01	44.04	1.8
31104	1983	6	70	138.13	0.03	10.22	2.42
31107	1983	6	80	117.64	0.03	11.53	0
31109	1983	6	80	106.86	0.01	53.47	0.74
31203	1983	6	60	130.22	0.05	6.29	3.49
31205	1983	6	80	144.06	0.05	6.29	5.84
31207	1983	6	80	122.59	0.03	6.29	0
31209	1983	6	80	76.28	0.01	6.29	0
30703	1983	8	30	31.03	0	0	0
30705	1983	8	50	30.82	0	0	0
30707	1983	8	50	36.23	0	0	0
30709	1983	8	60	198.16	0	2409.37	0
30801	1983	8	15	24.32	0.11	1421.72	0
30803	1983	8	40	29.72	0	0	0
30805	1983	8	40	63.69	0	0	0
30807	1983	8	60	9.44	0	0	0
30809	1983	8	70	19.05	0	0	0
30901	1983	8	20	89.01	0	0	0
30903	1983	8	50	23.65	0	0	0
30905	1983	8	60	55.67	0.15	105.98	0
30907	1983	8	60	180.86	0	0	0
30909	1983	8	70	223.77	0	0	0
31003	1983	8	NaN	NaN	NaN	NaN	NaN
31005	1983	8	60	146.79	0.01	1085.16	0.11
31007	1983	8	70	5.57	0.2	100.65	0
31009	1983	8	80	6.53	0	0	0
31104	1983	8	70	104.97	0.1	56.62	0
31107	1983	8	80	20.21	0	0	0
31109	1983	8	80	46.16	0.08	301.06	0
31203	1983	8	60	21.6	0	0	0

31205	1983	8	80	79.58	0.16	6.29	0
31207	1983	8	80	25.71	0	0	0
31209	1983	8	80	20.05	0	0	0
30703	1983	10	30	126.65	0	0	0
30705	1983	10	50	63.79	0	0	0
30707	1983	10	NaN	NaN	NaN	NaN	NaN
30709	1983	10	60	133.16	0	0	0
30801	1983	10	15	110.72	0	0	0
30803	1983	10	30	276.38	0	0	0.26
30805	1983	10	40	170.64	0	0	0
30807	1983	10	60	110.3	0	0	0
30809	1983	10	70	117.73	0	0	0
30901	1983	10	20	26.42	0	0	0
30903	1983	10	50	44.29	0	0	0
30905	1983	10	60	57.77	0.01	308.25	0
30907	1983	10	60	38.79	0	0	0
30909	1983	10	70	47.54	0	0	0.49
31003	1983	10	20	223.64	0.08	106.94	0.04
31005	1983	10	60	58.5	0.05	179.29	0
31007	1983	10	70	54.82	0.07	277.69	0.12
31009	1983	10	80	32.87	0.08	169.85	0.05
31104	1983	10	70	10.69	0	0	0
31107	1983	10	80	30.2	0.05	197.11	0
31109	1983	10	80	21.23	0	0	0
31203	1983	10	60	91.11	0	0	0.37
31205	1983	10	80	61.81	0	0	0.08
31207	1983	10	80	20.05	0	0	0.48
31209	1983	10	80	76.9	0	0	0.06
30703	1983	12	30	55.78	0	0	0
30705	1983	12	50	62.28	0.01	50.33	0
30707	1983	12	50	12.33	0	0	0
30709	1983	12	60	48.23	0	0	0
30801	1983	12	15	14.68	0	0	0
30803	1983	12	0	NaN	NaN	NaN	NaN
30805	1983	12	40	14.94	0	0	1.89
30807	1983	12	60	7.65	0	0	0
30809	1983	12	70	10.42	0	0	0
30901	1983	12	20	28.94	0	0	0
30903	1983	12	50	11.32	0	0	0
30905	1983	12	60	198.79	0.02	60.21	0
30907	1983	12	60	97.19	0.01	6.29	0
30909	1983	12	70	32.35	0	0	0
31003	1983	12	20	11.64	0	0	0
31005	1983	12	60	25.79	0.03	150.98	0
31007	1983	12	70	51.58	0.07	22.02	0
31009	1983	12	80	72.82	0.01	427.77	0
31104	1983	12	70	48.89	0.05	133.68	0.52
31107	1983	12	80	15.1	0.03	119.53	0
31109	1983	12	80	40.73	0.01	333.41	0
31203	1983	12	60	3.56	0	0	0
31205	1983	12	80	18.56	0	0	0
31207	1983	12	80	12.74	0	0	0
31209	1983	12	80	10.85	0	0	0
30703	1984	2	30	3.15	0	0	0
30705	1984	2	50	8.18	0	0	0
30707	1984	2	50	77.38	0.04	127.39	1.01
30709	1984	2	60	40.89	0	0	3.75
30801	1984	2	15	15.94	0	0	18.87
30803	1984	2	40	67.63	0.22	29.78	3.46
30805	1984	2	40	37.59	0	0	14.8
30807	1984	2	60	41.62	0.02	283.09	8.39
30809	1984	2	70	28.13	0	0	13.63
30901	1984	2	20	42.78	0	0	0
30903	1984	2	50	57.88	0	0	3.15
30905	1984	2	60	15.94	0	0	14.68
30907	1984	2	60	10.07	0	0	0
30909	1984	2	70	52.3	0.02	182.43	23.97
31003	1984	2	20	28.31	0	0	3.77
31005	1984	2	60	18.87	0	0	14.68
31007	1984	2	70	34.42	0	0	6.16
31104	1984	2	70	11.05	0	0	2.1
31107	1984	2	80	29.02	0.03	163.56	23.23
31109	1984	2	80	30.12	0	0	4.19
31203	1984	2	60	11.01	0.06	283.09	9.65
31205	1984	2	80	13.76	0	0	0.38
31207	1984	2	80	4.8	0	0	2.1
31209	1984	2	80	17.38	0	0	0.23
30703	1984	4	30	1.26	1.05	18.87	0
30705	1984	4	50	6.04	0	0	0
30707	1984	4	50	17.87	0	0	0

30709	1984	4	60	62.07	0.02	173	0
30801	1984	4	15	53.26	0	0	0
30803	1984	4	40	92.79	0.04	195.01	0.3
30805	1984	4	40	66.21	0.04	41.94	0.94
30807	1984	4	60	91.11	0.03	56.62	0.87
30809	1984	4	70	39.27	0.03	25.16	0.79
30901	1984	4	20	56.62	0.17	17.61	6.74
30903	1984	4	50	27.55	0	0	0
30905	1984	4	60	141.75	0.05	52.04	0
30907	1984	4	60	12.69	0	0	0
30909	1984	4	70	36.67	0	0	0
31003	1984	4	20	430.92	0	0	0
31005	1984	4	60	70.25	0	0	0
31007	1984	4	70	50.6	0.29	15.73	0
31009	1984	4	80	25.95	0.19	9.44	0
31104	1984	4	70	30.91	0	0	0
31107	1984	4	80	21.94	0	0	0
31109	1984	4	80	3.7	0	0	0
31203	1984	4	60	1.26	0	0	0
31205	1984	4	80	95.93	0.02	268.41	0.59
31207	1984	4	80	12.19	0	0	2.31
31209	1984	4	80	55.52	0.04	12.58	0
30703	1984	6	30	290.84	0	0	0
30705	1984	6	50	379.46	0	12.58	0
30707	1984	6	50	263.71	0	0	0
30709	1984	6	60	272.18	0	0	0
30801	1984	6	15	166.92	0	0	0
30803	1984	6	40	87.6	0	0	0
30805	1984	6	40	201.93	0	0	0
30807	1984	6	60	597.63	0	50.33	0
30809	1984	6	70	235.64	0	0	0
30901	1984	6	20	122.04	0	0	0
30903	1984	6	50	116.76	0	0	0
30905	1984	6	60	120.99	0	0	0
30907	1984	6	60	1035.04	0.01	27.26	0
30909	1984	6	70	1052.54	0.01	60.62	0.24
31003	1984	6	20	66.68	0	0	0
31005	1984	6	60	200.89	0.06	8.14	0
31007	1984	6	70	152.06	0.02	46.13	0
31009	1984	6	80	161.83	0	0	1.52
31104	1984	6	70	248.22	0.06	3.59	0
31107	1984	6	80	45.45	0.94	1.32	0
31109	1984	6	80	166.23	3.31	0.24	0
31203	1984	6	60	241.15	0.18	3.72	1.61
31205	1984	6	80	165.76	0.29	2.4	9.69
31207	1984	6	80	225.21	0.06	15.84	1.21
31209	1984	6	80	20.29	0.98	0.47	0
30703	1984	8	30	46.34	0	0	0
30705	1984	8	50	34.47	0	0	0
30707	1984	8	50	59.13	0.03	421.48	0.14
30709	1984	8	60	14.57	0	0	0
30801	1984	8	15	86.39	0	0	0
30803	1984	8	40	98.45	0	0	0
30805	1984	8	60	33.13	0	0	0
30807	1984	8	60	116.38	0.01	745.46	0.08
30809	1984	8	70	130.67	0.03	514.05	0.08
30901	1984	8	20	61.96	0.19	204.45	0
30903	1984	8	50	56.87	0	0	0
30905	1984	8	60	31.56	0.06	314.54	0
30907	1984	8	60	85.55	0.08	444.93	0
30909	1984	8	70	57.79	0.01	622.79	0
31003	1984	8	20	325.86	0.16	46.6	0
31005	1984	8	60	24.85	0.16	559.88	0
31007	1984	8	70	223.32	0.31	65.51	0
31009	1984	8	80	103.48	0.03	189.62	0.6
31104	1984	8	70	56.8	0.67	9.01	0
31107	1984	8	80	48.6	0.97	7.28	0
31109	1984	8	80	121.88	0.17	54.86	0
31203	1984	8	60	334.67	0.2	11.32	1.19
31205	1984	8	80	149.56	0.16	21.76	0
31207	1984	8	80	41.52	0.26	9.44	0
31209	1984	8	80	46	0	0	0
30703	1984	10	30	9.65	0	0	0
30705	1984	10	50	163.81	0	0	0
30707	1984	10	50	81.65	0.01	1251.87	0
30709	1984	10	60	133.89	0.01	704.57	0
30801	1984	10	15	54.52	0	0	0
30803	1984	10	40	78.16	0.01	1113.47	0
30805	1984	10	40	79.58	0	0	0
30807	1984	10	60	11.43	0.29	104.43	0

30809	1984	10	70	22.2	3.29	42.08	0
30901	1984	10	20	160.42	0	0	0
30903	1984	10	50	51.08	0	0	0
30905	1984	10	60	39.53	0	0	0
30907	1984	10	60	73.18	0	0	0
30909	1984	10	70	132.47	0	0	0
31003	1984	10	20	136.2	0	0	0
31005	1984	10	60	12.37	0	0	0
31007	1984	10	70	83.94	0	0	0.39
31009	1984	10	80	3.77	0	0	0
31104	1984	10	70	30.11	0.38	85.55	0
31107	1984	10	80	41.91	0	0	0
31109	1984	10	80	52.53	0.03	127.91	0
31203	1984	10	60	25.27	0.18	213.89	0
31205	1984	10	80	59.37	0.11	138.88	0.04
31207	1984	10	80	4.4	0	0	0
31209	1984	10	80	3.93	0	0	0
30703	1984	12	30	11.11	0	0	0
30705	1984	12	50	82.03	0	0	0
30707	1984	12	50	34.85	0	0	0
30709	1984	12	60	57.35	0	0	0
30801	1984	12	15	96.46	0	0	0
30803	1984	12	40	8.18	0	0	0
30805	1984	12	40	11.48	0	0	0
30807	1984	12	60	7.86	0	0	0
30809	1984	12	70	24.35	0	0	0.04
30901	1984	12	20	28.31	0	0	0
30903	1984	12	50	34.73	0	0	0
30905	1984	12	60	47.6	0	0	0
30907	1984	12	60	28.41	0	0	0.02
30909	1984	12	70	68.84	0	0	0
31003	1984	12	20	12.9	0	0	0
31005	1984	12	60	6.92	0.1	138.4	0
31007	1984	12	70	18.06	0.22	111.44	0.05
31009	1984	12	80	5.66	0	0	0.37
31104	1984	12	70	27.59	0.02	3007	0.04
31107	1984	12	80	9.83	0	0	0.2
31109	1984	12	80	32.71	0	0	0.08
31203	1984	12	60	26.74	0.05	899.58	0.24
31205	1984	12	80	22.65	0.07	660.53	0.1
31207	1984	12	80	6.05	0	0	0
31209	1984	12	80	21.78	0	0	0.09
30703	1985	2	30	10.48	0	0	0
30705	1985	2	50	19.25	0.04	2497.44	0.02
30707	1985	2	50	51.08	0.02	1887.24	0.52
30709	1985	2	60	35.75	0.06	434.06	2.86
30801	1985	2	15	5.03	0	0	0
30803	1985	2	40	6.29	0	0	2.52
30805	1985	2	40	54.26	0.09	388.77	1.59
30807	1985	2	60	14.36	0.05	339.7	2.21
30809	1985	2	70	36.04	0	0	2.27
30901	1985	2	20	33.97	0.06	496.97	1.51
30903	1985	2	50	15.22	0	0	10.62
30905	1985	2	60	24.74	0	0	15.73
30907	1985	2	60	39.32	0	0	2.14
30909	1985	2	70	44.4	0	0	1.98
31003	1985	2	20	94.05	0	0	8.44
31005	1985	2	60	4.09	0	0	11.23
31007	1985	2	70	49.7	0.01	811.51	7.85
31009	1985	2	80	40.5	0.05	59.76	16.22
31104	1985	2	70	9.62	0	0	3.96
31107	1985	2	80	6.37	0	0	0.8
31109	1985	2	80	4.56	0.11	251.63	0.31
31203	1985	2	60	3.77	0	0	0
31205	1985	2	80	1.02	0	0	0
31207	1985	2	80	21.39	0.07	771.67	0.05
31209	1985	2	80	7.86	0.06	660.53	0.48
30703	1985	4	30	15.73	0	0	0.18
30705	1985	4	50	57.37	0	0	1.16
30707	1985	4	50	20.63	0	0	0
30709	1985	4	60	43.62	0.26	21.83	9.49
30801	1985	4	20	37.12	0	0	4.19
30803	1985	4	50	153.24	0	0	11.85
30805	1985	4	60	182.85	0.02	41.52	13.34
30807	1985	4	60	29.46	0.31	32.35	5.07
30809	1985	4	70	77.56	0.42	25.38	6.32
30901	1985	4	20	53.47	0.04	415.19	1.53
30903	1985	4	50	43.66	0.04	0	0
30905	1985	4	60	2.41	0	0	0
30907	1985	4	60	144.69	0.03	19.77	25.45

30909	1985	4	70	1.89	0	0	6.29
31003	1985	4	20	82.41	0.43	77.94	6.32
31005	1985	4	60	39.95	0.07	138.4	1.86
31007	1985	4	70	82.77	0.25	59.41	3.31
31009	1985	4	80	49.15	0.43	26.19	8.68
31104	1985	4	70	62.46	0	0	0.55
31107	1985	4	80	30.35	0.05	551.49	13.11
31109	1985	4	80	6.92	0.21	109.04	6.77
31203	1985	4	60	9.86	0	0	0.35
31205	1985	4	80	8.02	0.25	144.69	0.48
31207	1985	4	80	14.31	0	0	0.79
31209	1985	4	80	26.58	0	0	0.42
30703	1985	6	30	264.63	0	0	0
30705	1985	6	50	4.4	0	0	0
30707	1985	6	50	67.44	0	0	0
30709	1985	6	60	129.17	0.01	0	0
30801	1985	6	15	42.36	0	0	0
30803	1985	6	40	453.25	0	0	23.59
30805	1985	6	40	326.49	0.02	5.03	4.72
30807	1985	6	60	185.37	0.01	16.78	20.45
30809	1985	6	70	367.74	0	88.07	8.54
30901	1985	6	20	18.87	0	0	2.52
30903	1985	6	50	177.9	0	0	8.81
30905	1985	6	60	191.03	0	0	0
30907	1985	6	60	119.73	0	0	12.58
30909	1985	6	70	570.48	0.01	7.86	5.66
31003	1985	6	20	101.91	0.04	176.14	1.8
31005	1985	6	60	21.6	0.06	18.87	3.15
31007	1985	6	70	106.22	0.06	148.36	0.24
31009	1985	6	80	25.95	0.29	59.13	0
31104	1985	6	70	138.58	0.01	10.48	6.29
31107	1985	6	80	83.98	0.15	11.32	4.05
31109	1985	6	80	94.52	0.12	38.84	1.02
31203	1985	6	60	119.73	0.1	5.94	3.7
31205	1985	6	80	59.92	0.04	67.94	5.36
31207	1985	6	80	154.12	0.01	88.07	6.14
31209	1985	6	80	67.86	0.27	36.21	1.59
30703	1985	8	30	42.99	0	0	0.63
30705	1985	8	50	2.01	0	0	0.28
30707	1985	8	50	15.22	0	0	0.2
30709	1985	8	60	16.99	0	0	0.68
30801	1985	8	15	50.75	0	0	0.69
30803	1985	8	40	22.8	0	0	0.91
30805	1985	8	40	6.45	0	0	0.33
30807	1985	8	60	25.69	0	0	1.09
30809	1985	8	70	25.88	0	0	0.18
30901	1985	8	20	102.54	0	0	0.91
30903	1985	8	50	6.04	0.26	66.05	0.9
30905	1985	8	60	38.79	0.05	1576.89	0.18
30907	1985	8	60	24.85	0.05	405.76	0.54
30909	1985	8	70	33.34	0.05	559.88	0.14
31003	1985	8	20	15.73	0.13	226.47	0.52
31005	1985	8	60	56.83	0.07	444.55	0.1
31007	1985	8	70	68.75	0.25	151.38	0.32
31009	1985	8	80	2.36	0	0	0
31104	1985	8	70	44.22	0.05	193.44	0.2
31107	1985	8	80	1.81	0	0	0.9
31109	1985	8	80	5.35	0	0	0
31203	1985	8	60	19.29	0.55	38.14	0.26
31205	1985	8	80	50.8	0.45	67.28	0.14
31207	1985	8	80	97.66	0.35	117.06	0.13
31209	1985	8	80	25.32	0.59	183.69	0.02
30703	1985	10	30	48.86	0.03	559.88	3.25
30705	1985	10	50	87.32	0.01	3170.56	0.17
30707	1985	10	50	19.63	0.04	446.65	0.35
30709	1985	10	60	48.44	0.35	194.53	0.53
30801	1985	10	15	25.16	0.1	207.6	0.95
30803	1985	10	40	52.06	0.19	269.25	0.44
30805	1985	10	40	102.23	0.2	184.53	0.35
30807	1985	10	60	21.39	0.37	212.84	0.25
30809	1985	10	70	44.57	0.06	227.73	0.45
30901	1985	10	20	203.19	0.03	304.05	0.17
30903	1985	10	50	31.45	0.05	1383.97	0.04
30905	1985	10	60	28.62	0.09	294.09	0.27
30907	1985	10	60	113.44	0.12	161.36	1.16
30909	1985	10	70	79.26	0.1	116.38	3.93
31003	1985	10	20	84.93	0	0	0.65
31005	1985	10	60	21.6	0.21	300.16	0.72
31007	1985	10	70	81.24	0.08	441.4	0.17
31009	1985	10	80	39.55	0.6	71.82	0.68

31104	1985	10	70	12.67	0.36	283.09	0.14
31107	1985	10	80	82.09	0.02	543.11	1.02
31109	1985	10	80	30.82	0.05	56.62	2.8
31203	1985	10	60	85.14	0.05	204.9	0.17
31205	1985	10	80	74.55	0.02	165.66	0.16
31207	1985	10	80	80.21	0	0	0
31209	1985	10	80	82.88	0.07	166.18	0.46
30703	1985	12	30	50.75	0.13	115.75	1.3
30705	1985	12	50	20.76	0.04	157.27	0.75
30707	1985	12	50	26.42	0.09	549.4	0.26
30709	1985	12	60	13.94	0.38	195.8	7.86
30801	1985	12	15	14.26	0.56	155.17	2.89
30803	1985	12	40	10.85	0.64	90.77	2.24
30805	1985	12	40	26.26	0.34	95.76	0.46
30807	1985	12	60	27.89	0.95	72.5	0.48
30809	1985	12	70	10.16	0	0	2.1
30901	1985	12	20	4.72	0.42	81.78	1.45
30903	1985	12	50	17.49	0.09	364.87	0.98
30905	1985	12	60	11.53	0.11	128.96	12.58
30907	1985	12	60	14.57	0.81	57.32	3.8
30909	1985	12	70	8.27	0.07	509.55	0.93
31003	1985	12	20	39.95	0	0	0.65
31005	1985	12	60	8.81	0	0	1.68
31007	1985	12	70	29.57	0	0	0.36
31009	1985	12	80	18.16	0	0	2.05
31104	1985	12	70	4.04	0.14	408.9	0.58
31107	1985	12	80	8.73	0	0	0.42
31109	1985	12	80	14.31	0.1	360.67	2.16
31203	1985	12	60	8.07	0	0	0.51
31205	1985	12	80	22.57	0.2	89.47	0
31207	1985	12	80	11.87	0.04	251.63	0.31
31209	1985	12	80	9.67	0.15	278.89	0.71
30703	1986	2	30	4.4	0	0	0
30705	1986	2	50	30.45	0.05	575.61	0.24
30707	1986	2	50	25.16	0	0	1.17
30709	1986	2	60	18.14	0	0	1.75
30801	1986	2	15	142.59	0	0	0.62
30803	1986	2	40	46.24	0.04	352.28	1.29
30805	1986	2	40	37.74	0	0	8.81
30807	1986	2	60	68.15	0.03	54.52	4.36
30809	1986	2	70	136.6	0.03	148.28	1.91
30901	1986	2	20	207.6	0.01	245.34	0.48
30903	1986	2	50	59.89	0.01	176.14	2.02
30905	1986	2	60	105.48	0	0	8.81
30907	1986	2	60	35.12	0	0	0.82
30909	1986	2	70	200.95	0.02	187.68	0
31003	1986	2	20	397.58	0.01	122.67	2.42
31005	1986	2	60	35.86	0.02	352.28	2.25
31007	1986	2	70	56.35	0	0	0
31009	1986	2	80	112.29	0	0	1.2
31104	1986	2	70	58.86	0.01	220.18	0.54
31107	1986	2	80	58.98	0.02	333.41	0.77
31109	1986	2	80	26.42	0.04	66.05	2.1
31203	1986	2	60	31.98	0	0	0
31205	1986	2	80	40.18	0.02	69.2	1.14
31207	1986	2	80	53.47	0.02	308.25	0.64
31209	1986	2	80	39.16	0	0	0.37
30703	1986	4	30	122.67	0	0	0.43
30705	1986	4	50	157.27	0	0	0.2
30707	1986	4	50	35.73	0	0	4.19
30709	1986	4	60	70.04	0	0	1.57
30801	1986	4	15	27.68	0	0	12.58
30803	1986	4	40	283.09	0.04	29.88	10.48
30805	1986	4	40	240.62	0	0	2.96
30807	1986	4	60	29.15	0	0	1.57
30809	1986	4	70	657.84	0.01	63.3	4.06
30901	1986	4	20	756.78	0	0	7.19
30903	1986	4	50	119.53	0	0	82.57
30905	1986	4	60	376.61	0	0	0
30907	1986	4	60	167.75	0	0	0
30909	1986	4	70	129.41	0	0	1.14
31003	1986	4	20	230.56	0.02	47.18	1.68
31005	1986	4	60	452.52	0.06	36.75	1.36
31007	1986	4	70	362.17	0.04	36.4	1.48
31009	1986	4	80	101.12	0.05	80.52	1.03
31104	1986	4	70	59.94	0.02	97.51	0
31107	1986	4	80	127.86	0.04	61.76	1.05
31109	1986	4	80	154.28	0.01	270.5	0.34
31203	1986	4	60	138.61	0	0	0.17
31205	1986	4	80	15.81	0	0	4.19

31207	1986	4	80	15.65	0	0	10.78
31209	1986	4	80	15.41	0	0	15.73
30703	1986	6	30	286.02	0	0	0
30705	1986	6	50	12.58	0	0	0
30707	1986	6	50	125.56	0	0	0
30709	1986	6	60	477.68	0	0	0.21
30801	1986	6	15	545.62	0	0	0
30803	1986	6	40	84.45	0	0	0
30805	1986	6	40	161.2	0	0	0
30807	1986	6	60	134.52	0	0	0
30809	1986	6	70	122.85	0	0	0
30901	1986	6	20	18.87	0	0	0
30903	1986	6	50	40.26	0	0	0
30905	1986	6	60	7.55	0	0	0
30907	1986	6	60	70.46	0	0	0
30909	1986	6	70	19.5	0	0	0
31003	1986	6	20	222.69	0	0	0
31005	1986	6	60	114.49	0	0	1.4
31007	1986	6	70	191.69	0.01	190.3	0.36
31009	1986	6	80	64.09	0	0	0.5
31104	1986	6	70	186.48	0.01	35.65	0
31107	1986	6	80	127.86	0.02	108.52	0.73
31109	1986	6	80	44.66	0	0	0
31203	1986	6	60	70.77	0.11	6.29	58.71
31205	1986	6	80	107.1	0.09	8.49	20.5
31207	1986	6	80	54.81	0.09	10.07	25.95
31209	1986	6	80	8.26	0	0	0
30703	1986	8	30	71.3	0	0	0.12
30705	1986	8	50	57.88	0	0	0.98
30707	1986	8	60	97.51	0	0	0
30709	1986	8	75	156.01	0	0	0.64
30801	1986	8	20	10.07	0	0	0
30803	1986	8	50	24.91	0.1	463.42	0
30805	1986	8	50	60.39	0	0	0
30807	1986	8	65	83.23	0.02	528.43	1.87
30809	1986	8	80	67.63	0	0	0
30901	1986	8	30	88.07	0	0	0
30903	1986	8	50	79.26	0	0	0.17
30905	1986	8	70	84.48	0.02	494.88	0.48
30907	1986	8	65	55.17	0.12	357.43	0.69
30909	1986	8	80	160.42	0.01	1421.72	0.86
31003	1986	8	20	15.73	0.13	144.69	0
31005	1986	8	60	188.72	0.08	59.48	0
31007	1986	8	70	10.78	0.68	62.42	0
31009	1986	8	80	117.09	0.01	676.26	0.06
31104	1986	8	70	187.56	0	0	0
31107	1986	8	80	77.69	0.07	57.76	5.79
31109	1986	8	80	1.57	0	0	1.4
31203	1986	8	60	139.34	0.05	83.04	1
31205	1986	8	80	98.61	0.18	21.84	0
31207	1986	8	80	37.12	0.01	100.65	1.18
31209	1986	8	80	46.63	0	0	2.9
30703	1986	10	30	29.78	0	0	0.5
30705	1986	10	50	66.05	0	0	0
30707	1986	10	50	44.66	0.07	536.29	0.02
30709	1986	10	70	148.28	0.16	122.6	0.08
30801	1986	10	30	181.17	0.6	9.47	0
30803	1986	10	45	103.45	0.02	408.9	0.19
30805	1986	10	50	46.3	0.07	357	0.47
30807	1986	10	60	102.75	0.03	889.52	0.47
30809	1986	10	70	88.07	0.02	939.42	0.2
30901	1986	10	30	186.63	0.02	83.88	0.16
30903	1986	10	50	123.3	0.02	444.55	0.53
30905	1986	10	60	173	0.05	290.42	0.61
30907	1986	10	60	152.03	0.05	120.1	0.09
30909	1986	10	70	206.7	0.07	90.43	0.42
31003	1986	10	20	77.06	0	0	1.18
31005	1986	10	60	193.97	0	0	0.15
31007	1986	10	70	6.92	0	0	0
31009	1986	10	80	33.58	0.6	20.56	1.03
31104	1986	10	70	58.77	0.03	134.2	1.38
31107	1986	10	80	68.88	0.09	41.62	8.7
31109	1986	10	80	11.64	0.51	16.25	4.26
31203	1986	10	60	65.84	0	0	5.45
31205	1986	10	80	33.73	0.03	226.47	2.27
31207	1986	10	80	41.44	0	0	6.06
31209	1986	10	80	26.5	0	0	0
30703	1986	12	40	55.04	0	0	0
30705	1986	12	50	72.97	0.18	121.38	0.06
30707	1986	12	45	202.7	0	0	0.32

30709	1986	12	60	67.1	0	0	2.23
30801	1986	12	20	144.69	0.14	98.77	0.24
30803	1986	12	45	117.43	0.13	89.18	0.05
30805	1986	12	50	231.5	0.02	235.46	0.17
30807	1986	12	60	255.83	0.01	603.92	1.25
30809	1986	12	80	177.71	0	0	0.25
30901	1986	12	30	58.71	0.04	254.78	0
30903	1986	12	50	93.1	0.02	547.3	0.04
30905	1986	12	60	310.35	0	0	0.3
30907	1986	12	60	155.17	0	0	2.02
30909	1986	12	80	58.19	0.09	514.7	0.45
31003	1986	12	20	10.07	0.2	157.27	1.01
31005	1986	12	60	32.71	0	0	0.29
31007	1986	12	70	41.34	0.01	339.7	0
31009	1986	12	80	32.63	0	0	2.61
31104	1986	12	70	25.79	0.02	150.98	2.1
31107	1986	12	80	4.48	0	0	0
31109	1986	12	80	85.87	0.05	297.24	0.5
31203	1986	12	60	5.77	0	0	3.49
31205	1986	12	80	80.21	0	0	0.39
31207	1986	12	80	10.54	0.09	688.84	0.11
31209	1986	12	80	37.82	0.01	264.21	0.45
30703	1987	2	37	37.4	0	0	0
30705	1987	2	50	47.56	0	0	0.03
30707	1987	2	50	64.17	0.04	215.98	1.34
30709	1987	2	60	131.06	0.01	1100.89	0.11
30801	1987	2	20	128.96	0	0	0
30803	1987	2	40	53.47	0.07	393.17	0
30805	1987	2	50	67.94	0.01	1421.72	0
30807	1987	2	60	68.15	0.04	412.05	0.41
30809	1987	2	80	201.31	0.02	245.34	0.44
30901	1987	2	30	155.17	0.01	905.87	0.74
30903	1987	2	50	156.01	0.02	121.62	0
30905	1987	2	60	251.63	0.06	10.12	0.17
30907	1987	2	60	173	0.06	37.74	1.68
30909	1987	2	80	81.78	0.15	43.25	0.61
31003	1987	2	20	37.74	0	0	0
31005	1987	2	60	22.02	0.06	128.96	1.99
31007	1987	2	70	38.19	0.04	92.26	0.43
31009	1987	2	80	26.89	0	0	1.67
31104	1987	2	70	20.4	0.06	173	0.34
31107	1987	2	80	27.29	0	0	0.45
31109	1987	2	80	23.43	0	0	0.09
31203	1987	2	60	10.27	0.06	125.82	0
31205	1987	2	80	6.76	0.07	226.47	0.17
31207	1987	2	80	20.45	0.02	780.06	0.71
31209	1987	2	80	6.05	0	0	0
30703	1987	4	38	324.47	0.01	124.24	0
30705	1987	4	50	459.23	0.01	223.32	0.09
30707	1987	4	60	300.91	0	751.75	0.05
30709	1987	4	65	232.28	0.03	82.41	0.1
30801	1987	4	20	767.48	0.02	44.04	0
30803	1987	4	50	452.94	0.01	151.88	0.15
30805	1987	4	50	541.01	0	12.58	0
30807	1987	4	70	215.68	0.01	79.68	0
30809	1987	4	80	110.09	0.04	220.96	0.07
30901	1987	4	25	956.2	0.02	72.34	0.09
30903	1987	4	50	1082.02	0	44.04	0
30905	1987	4	70	265.11	0	132.11	0
30907	1987	4	60	181.38	0.08	66.5	0.88
30909	1987	4	75	385.84	0	247.44	0.11
31003	1987	4	20	11.95	0	0	0
31005	1987	4	60	27.05	0	0	1.57
31007	1987	4	70	64.71	0	0	1.8
31009	1987	4	80	50.64	0	0	0
31104	1987	4	70	13.93	0	0	0.36
31107	1987	4	80	16.51	0.03	1207.83	2.1
31109	1987	4	80	7.08	0	0	0
31203	1987	4	60	33.97	0.04	150.98	0
31205	1987	4	80	54.81	0	0	2.9
31207	1987	4	80	60.71	0.01	496.97	1.43
31209	1987	4	80	29.09	0	0	1.05
30703	1987	6	40	707.71	0	12.58	0
30705	1987	6	50	352.28	0.01	2.1	0
30707	1987	6	50	427.77	0	0	0
30709	1987	6	65	406.48	0	31.45	0
30801	1987	6	20	75.49	0	0	0
30803	1987	6	50	289.38	0	0	0
30805	1987	6	50	264.21	0	0	0
30807	1987	6	60	304.05	0	0	0

30809	1987	6	70	386.43	0	0	6.29
30901	1987	6	30	46.13	0	0	0
30903	1987	6	50	289.38	0	113.23	0
30905	1987	6	65	454.87	0	3.15	0
30907	1987	6	65	609.72	0	22.02	0
30909	1987	6	75	587.14	0	0	0
31003	1987	6	20	226.47	0	0	0
31005	1987	6	60	400.09	0	1987.89	0.06
31007	1987	6	70	404.05	0.01	245.34	3.55
31009	1987	6	80	135.25	0	402.61	5.11
31104	1987	6	70	17.61	0	0	1.89
31107	1987	6	80	70.46	0	0	1.26
31109	1987	6	80	147.52	0	0	0.21
31203	1987	6	60	329.74	0.02	25.16	5.03
31205	1987	6	80	135.88	0.03	44.82	2.21
31207	1987	6	80	162.3	0.01	73.39	8.09
31209	1987	6	80	155.93	0	0	0
30703	1987	8	38	529.75	0	0	0
30705	1987	8	50	138.4	0	0	0
30707	1987	8	58	260.31	0.01	1500.35	0.01
30709	1987	8	69	154.99	0.01	1950.15	0
30801	1987	8	20	141.54	0	0	0
30803	1987	8	49	487.86	0	0	0
30805	1987	8	50	440.36	0	3774.48	0
30807	1987	8	65	435.52	0	3103.46	0
30809	1987	8	75	184.53	0	0	0
30901	1987	8	25	452.94	0.98	16.18	0
30903	1987	8	50	239.05	0.85	28.01	0
30905	1987	8	69	145.87	0.02	1226.7	0
30907	1987	8	66	266.88	0.03	605.71	0.06
30909	1987	8	79	111.48	0.01	2673.59	0.02
31003	1987	8	20	47.18	0	0	0
31005	1987	8	60	103.38	0.04	130.01	0
31007	1987	8	70	2.34	0	0	0
31009	1987	8	80	1.89	0	0	1.05
31104	1987	8	70	67.31	0	0	0
31107	1987	8	80	122.04	0.49	4.56	10.77
31109	1987	8	80	41.05	0	0	2.1
31203	1987	8	60	139.24	0.08	30.27	4.41
31205	1987	8	80	154.12	0.01	94.36	1.47
31207	1987	8	80	39	0.03	248.49	1.35
31209	1987	8	80	112.05	0.13	12.58	0.43
30703	1987	10	38	582.73	0	0	0
30705	1987	10	52	750.06	0.03	113.23	0
30707	1987	10	60	847.16	0.01	899.58	0
30709	1987	10	65	185.82	0.03	517.42	0
30801	1987	10	23	1323.8	0.01	327.12	0
30803	1987	10	49	523.8	0	4151.92	0
30805	1987	10	52	362.93	0.02	341.1	0
30807	1987	10	65	166.46	0.13	130.85	0
30809	1987	10	80	169.85	0.27	7.74	0
30901	1987	10	29	503.26	0	0	0
30903	1987	10	NaN	NaN	NaN	NaN	NaN
30905	1987	10	66	404.14	0.02	240.85	0
30907	1987	10	65	162.59	0.07	209.69	0
30909	1987	10	79	308.97	0.01	409.8	0
31003	1987	10	20	39.63	0	0	0
31005	1987	10	60	99.18	0.01	390.03	0.05
31007	1987	10	70	100.65	0	0	0.15
31009	1987	10	80	75.49	0.01	116.38	0
31104	1987	10	70	37.74	0.01	150.98	2.1
31107	1987	10	80	108.67	0	0	9.17
31109	1987	10	80	5.19	0	0	0
31203	1987	10	60	130.01	0	0	0.06
31205	1987	10	80	104.98	0.01	128.96	0
31207	1987	10	80	184.79	0.08	41.6	0
31209	1987	10	80	84.77	0.06	67.31	0
30703	1987	12	38	162.9	0	0	0
30705	1987	12	55	125.36	0	0	0
30707	1987	12	55	146.4	0	0	0.03
30709	1987	12	65	363.9	0.09	189.21	0
30801	1987	12	20	78.63	0.53	10.48	0
30803	1987	12	35	89.87	0.03	191.87	0
30805	1987	12	52	64.84	0.02	528.43	0
30807	1987	12	67	107.04	0.1	158.59	0.03
30809	1987	12	80	125.82	0.03	125.03	0
30901	1987	12	30	73.39	0	0	0
30903	1987	12	54	121.16	0.01	327.12	0
30905	1987	12	68	214.63	0.02	128.61	0
30907	1987	12	60	205.5	0.03	141.54	0

30909	1987	12	70	125.82	0	0	0
31003	1987	12	20	33.03	0	0	2.86
31005	1987	12	60	13	0.05	308.25	0.26
31007	1987	12	70	13.48	0	0	0
31009	1987	12	80	106.16	0.01	364.87	0.43
31104	1987	12	70	5.57	0	0	0
31107	1987	12	80	8.65	0	0	0.79
31109	1987	12	80	11.17	0	0	0.24
31203	1987	12	60	6.71	0	0	0
31205	1987	12	80	30.35	0	0	0.57
31207	1987	12	80	85.08	0.02	25.16	0.79
31209	1987	12	80	75.65	0.01	122.67	0.32
30703	1988	2	40	267.36	0	0	0
30705	1988	2	55	155.55	0	0	0
30707	1988	2	60	224.37	0.01	1324.21	0
30709	1988	2	65	140.33	0.01	248.49	0
30801	1988	2	20	276.79	0	0	0.52
30803	1988	2	45	128.61	0.01	88.07	0
30805	1988	2	50	266.73	0	0	0
30807	1988	2	25	322.09	0.01	578.75	0
30809	1988	2	25	186.21	0	0	0
30901	1988	2	30	119.53	0.03	180.34	0.15
30903	1988	2	55	526.14	0	0	0
30905	1988	2	70	467.32	0.01	50.33	0
30907	1988	2	70	64.71	0.21	35.12	0.05
30909	1988	2	80	191.87	0.01	67.94	0.12
31003	1988	2	25	46.8	0	0	0.37
31005	1988	2	70	28.4	0.08	31.45	5.35
31007	1988	2	80	27.52	0.04	144.69	6.02
31009	1988	2	90	3.7	0	0	10.48
31104	1988	2	70	8.36	0	0	27.26
31107	1988	2	80	21.7	0.05	163.56	17.9
31109	1988	2	80	75.8	0.01	44.04	46.73
31203	1988	2	70	51.58	0.04	84.93	3.26
31205	1988	2	90	53.4	0	0	3.87
31207	1988	2	90	32.29	0.05	34.6	13.15
31209	1988	2	80	9.12	0.05	6.29	100.65
30703	1988	4	40	103.8	0	0	0
30705	1988	4	55	251.63	0.03	70.91	0.25
30707	1988	4	60	528.43	0	192.92	0
30709	1988	4	65	590.37	0	314.54	0.25
30801	1988	4	50	35.98	0	0	0
30803	1988	4	50	136.38	0.01	66.05	0
30805	1988	4	55	189.87	0	50.33	0
30807	1988	4	60	92.26	0.02	106.94	0
30809	1988	4	85	24.57	0.04	66.05	0
30901	1988	4	30	654.24	0	182.43	1.08
30903	1988	4	50	93.1	0.06	212.09	0.11
30905	1988	4	60	25.16	0.1	40.89	0.24
30907	1988	4	60	608.11	0	46.13	0.29
30909	1988	4	80	231.97	0.01	58.19	1.19
31003	1988	4	25	11.32	0.28	6.29	3.15
31005	1988	4	60	16.88	0.43	0	0
31007	1988	4	70	24.53	0.09	3.15	3.15
31009	1988	4	80	22.1	0.07	0	0
31104	1988	4	70	46.91	0.08	32.35	2.97
31107	1988	4	80	28.23	0.07	42.46	5.13
31109	1988	4	80	165.76	0.05	44.82	7.5
31203	1988	4	60	36.8	0.02	25.16	11.01
31205	1988	4	80	24.53	0.04	15.73	10.07
31207	1988	4	80	13.13	0.11	6.29	16.78
31209	1988	4	80	32.87	0.09	12.58	12.06
30703	1988	6	40	89.64	0.02	3.15	0
30705	1988	6	50	1195.25	0	0	0
30707	1988	6	60	849.26	0	1824.33	0.04
30709	1988	6	70	1312.08	0	0	0
30801	1988	6	20	72.34	0	0	0
30803	1988	6	50	90.59	0.01	0	0
30805	1988	6	55	148.69	0	0	0
30807	1988	6	65	1529.15	0	69.2	0
30809	1988	6	80	739.17	0	0	0
30901	1988	6	35	134.8	0	0	0
30903	1988	6	50	80.52	0	0	0
30905	1988	6	70	880.71	0	301.96	0
30907	1988	6	65	1354.94	0	0	4.72
30909	1988	6	75	788.45	0.01	32.24	0.46
31003	1988	6	25	1143.41	0	0	0.12
31005	1988	6	65	125.62	0.01	119.53	4.97
31007	1988	6	80	570.57	0.01	87.28	4.08
31009	1988	6	90	9.65	0.27	20.97	6.29

31104	1988	6	70	167.69	0.05	20.67	2.32
31107	1988	6	80	86.66	0.14	17.3	2.57
31109	1988	6	80	338.76	0.04	35.65	0.56
31203	1988	6	70	274.91	0.04	6.29	20.97
31205	1988	6	90	24.95	0.04	12.58	4.72
31207	1988	6	80	380.59	0.08	5.5	14.38
31209	1988	6	80	158.53	0.02	9.44	31.45
30703	1988	8	40	150.98	0	0	0
30705	1988	8	45	39.14	0	0	0
30707	1988	8	55	20.59	0	0	0
30709	1988	8	65	71.62	0.05	607.06	0
30801	1988	8	20	NaN	NaN	NaN	NaN
30803	1988	8	50	32.71	0	0	0
30805	1988	8	50	52.84	0.03	956.2	0
30807	1988	8	65	154.85	0.11	129.5	0
30809	1988	8	80	416.76	0.03	192.01	0
30901	1988	8	30	58.71	0	0	0
30903	1988	8	50	120.78	0	0	0
30905	1988	8	65	52.26	0.16	304.65	0
30907	1988	8	65	54.2	0.09	470.24	0.02
30909	1988	8	75	162.72	0.24	78.42	0.01
31003	1988	8	25	4.03	0	0	0
31005	1988	8	70	51.05	0	0	0.32
31007	1988	8	80	15.96	0.25	23.59	0.21
31009	1988	8	90	359.55	0.07	51.23	0.55
31104	1988	8	70	34.15	0.03	603.92	0.07
31107	1988	8	85	75.49	0.02	629.08	0.13
31109	1988	8	85	62.76	0.03	144.69	0.14
31203	1988	8	70	294.77	0.07	72.69	0.42
31205	1988	8	90	6.15	0.07	88.07	0.45
31207	1988	8	80	15.65	0.13	15.73	5.66
31209	1988	8	80	36.01	0.19	20.67	3.28
30703	1988	10	35	129.41	0	0	0
30705	1988	10	45	202.7	0.19	34.31	0
30707	1988	10	55	69.77	0.02	229.61	0
30709	1988	10	65	167.43	0.21	64.23	0
30801	1988	10	20	154.12	0.03	141.54	0
30803	1988	10	45	167.75	0.03	163.56	0
30805	1988	10	50	65.42	0.45	71.41	0
30807	1988	10	60	71.3	0.48	46.09	0
30809	1988	10	80	90.43	0.03	186.63	0
30901	1988	10	30	102.75	0	0	0
30903	1988	10	50	178.66	0.09	49.7	0
30905	1988	10	65	232.28	0.06	94.93	0
30907	1988	10	65	107.43	0.21	45.57	0
30909	1988	10	70	150.98	0.1	53.12	0
31003	1988	10	25	31.71	0	0	0
31005	1988	10	60	71.92	0	0	1.75
31007	1988	10	80	184.32	0.01	339.7	1.75
31009	1988	10	90	162.44	0.04	116.38	2.38
31104	1988	10	70	58.59	0.04	97.51	1.22
31107	1988	10	80	86.5	0.02	226.47	0.52
31109	1988	10	80	2.91	0	0	3.15
31203	1988	10	70	63.27	0.04	144.69	3.28
31205	1988	10	90	62.35	0	0	0.99
31207	1988	10	80	85.55	0	0	0.57
31209	1988	10	80	51.9	0.08	176.14	2.58
30703	1988	12	40	53.79	0	0	0
30705	1988	12	45	68.5	0	0	0
30707	1988	12	50	164.82	0	182.43	0
30709	1988	12	60	127.91	0.05	23.77	0.19
30801	1988	12	20	20.45	0.19	69.2	0.29
30803	1988	12	45	103.45	0.03	229.61	0.34
30805	1988	12	50	78.01	0.07	135.7	0.21
30807	1988	12	60	63.96	0.06	18.87	0
30809	1988	12	80	26.11	0.19	70.46	0.34
30901	1988	12	25	24.66	0	0	0
30903	1988	12	50	18.49	0	0	0
30905	1988	12	65	139.37	0.09	29.88	0
30907	1988	12	65	120.98	0.05	127.91	0
30909	1988	12	70	61.11	0.1	41.18	0
31003	1988	12	20	1.89	0	0	0
31005	1988	12	60	3.46	0	0	0
31007	1988	12	70	95.98	0.12	129.59	1.89
31009	1988	12	80	1.73	0	0	0
31104	1988	12	60	89.33	0.03	176.14	1.35
31107	1988	12	80	31.93	0	0	2.56
31109	1988	12	80	4.01	0	0	4.19
31203	1988	12	60	23.07	0	0	1.18
31205	1988	12	80	24.22	0	0	0.61

31207	1988	12	80	19.34	0.05	88.07	1.8
31209	1988	12	80	14	0	0	0
30703	1989	2	30	7.13	0	0	0
30705	1989	2	50	231.5	0	0	0
30707	1989	2	50	20.13	0	0	0
30709	1989	2	60	32.71	0.28	10.78	4.19
30801	1989	2	15	112.4	0	0	0
30803	1989	2	45	13.56	0	0	0
30805	1989	2	50	15.1	0	0	0
30807	1989	2	60	46.97	0.17	60.81	2.17
30809	1989	2	80	7.16	0	0	0
30901	1989	2	25	30.7	0	0	0
30903	1989	2	50	75.99	0.04	31.45	0
30905	1989	2	65	19.84	0.09	2.1	18.87
30907	1989	2	60	7.34	0	0	0
30909	1989	2	80	9.44	0.05	31.45	3.77
31003	1989	2	25	243.58	0.62	0.26	31.45
31005	1989	2	65	229.18	0	0	2.25
31007	1989	2	80	4.4	0.11	0	0
31009	1989	2	90	3.7	0	0	0
31104	1989	2	70	96.7	0.02	308.25	0.77
31107	1989	2	80	15.88	0	0	0
31109	1989	2	80	16.67	0.09	14.68	0
31203	1989	2	70	0.36	0	0	0
31205	1989	2	90	33.69	0.03	62.91	0.63
31207	1989	2	85	17.24	0.08	31.45	0.42
31209	1989	2	80	32.71	0	0	0
30703	1989	4	35	NaN	NaN	NaN	NaN
30705	1989	4	45	89.47	0.2	1.89	48.23
30707	1989	4	55	173.85	0	0	0
30709	1989	4	60	181.38	0.02	0	0
30801	1989	4	20	47.81	0.12	2.1	25.16
30803	1989	4	45	176.14	0.06	7.34	21.57
30805	1989	4	50	208.85	0.02	3.15	46.13
30807	1989	4	60	71.3	0.11	1.57	37.74
30809	1989	4	80	13.53	0.04	0	0
30901	1989	4	30	28.94	0	0	0
30903	1989	4	50	95.62	0.01	0	0
30905	1989	4	60	327.12	0.01	0	0
30907	1989	4	60	119.53	0.57	0.24	283.09
30909	1989	4	75	45.29	0.84	0.26	197.11
31003	1989	4	20	374.93	0.02	31.45	1.26
31005	1989	4	50	303.97	0.01	132.11	2.4
31007	1989	4	70	55.9	0	0	0.79
31009	1989	4	80	56.93	0.03	31.45	1.89
31104	1989	4	60	74.23	0.04	40.89	2.9
31107	1989	4	80	27.52	0	0	0
31109	1989	4	75	69.11	0	0	0.15
31203	1989	4	60	74.23	0	0	0
31205	1989	4	80	52.37	0.08	12.58	0.79
31207	1989	4	80	50.48	0.12	5.24	2.52
31209	1989	4	70	21.66	0.13	5.03	7.86
30703	1989	6	40	2349.61	0.03	1.81	0.6
30705	1989	6	45	712.96	0	0	0
30707	1989	6	55	256.21	0.01	6.29	0
30709	1989	6	60	679.41	0	39.84	10.26
30801	1989	6	20	308.25	0.01	94.36	0
30803	1989	6	45	260.02	0.01	0	0
30805	1989	6	55	217.32	0.02	0.9	0
30807	1989	6	65	79.36	0	0	0
30809	1989	6	75	288.54	0	59.76	7.28
30901	1989	6	25	188.72	0.03	39.84	0
30903	1989	6	50	90.59	0	0	25.16
30905	1989	6	65	81.3	0	0	1.3
30907	1989	6	60	461.32	0	754.9	4.35
30909	1989	6	75	221.44	0.01	108.2	4.9
31003	1989	6	20	126.44	0.42	3.03	0
31005	1989	6	50	155.01	0	0	0
31007	1989	6	70	100.29	0	0	0
31009	1989	6	80	205.08	0	0	5.66
31104	1989	6	60	1007.78	0.02	6.29	13.63
31107	1989	6	80	255.41	0.01	88.07	1.8
31109	1989	6	75	217.41	0.01	6.29	18.87
31203	1989	6	60	91.85	0.24	5.18	5.84
31205	1989	6	80	116.22	0.26	3.25	2.36
31207	1989	6	80	190.77	0.11	5.39	4.54
31209	1989	6	70	72.97	0.19	11.53	0.29
30703	1989	8	30	142.59	0	0	0.03
30705	1989	8	40	30.82	0	0	0
30707	1989	8	50	111.98	0	0	0

30801	1989	8	20	91.22	0	0	0
30803	1989	8	49	16.43	0	0	0
30805	1989	8	40	113.23	0	0	0
30807	1989	8	60	155.17	0.04	433.37	0.1
30809	1989	8	75	78.84	0.06	292.17	0.05
30901	1989	8	25	5.28	0	0	0
30903	1989	8	50	5.66	0	0	0
30905	1989	8	60	119.53	0.01	1462.61	0.11
30907	1989	8	60	60.81	0.01	1962.73	0.02
30909	1989	8	70	28.76	0.06	406.8	0
31003	1989	8	20	550.44	0.01	69.2	0.57
31005	1989	8	60	483.13	0.2	8.74	0
31007	1989	8	70	278.59	0.18	17.16	1.15
31009	1989	8	80	119.21	0.1	27.26	0.97
31104	1989	8	65	502.49	0.13	30.97	0.88
31107	1989	8	80	530.31	0.02	58.71	2.92
31109	1989	8	80	344.74	0.13	15.44	4.43
31203	1989	8	60	273.44	0.83	1.61	1.72
31205	1989	8	80	178.66	0.28	34.47	0.55
31207	1989	8	80	125.03	0.03	265.79	0.11
31209	1989	8	75	169.94	0.01	157.27	0
30703	1989	10	35	62.91	0	0	0.23
30705	1989	10	45	47.53	0	0	0.15
30707	1989	10	50	36.49	0.02	1251.87	0.06
30709	1989	10	65	75.49	0	0	0.03
30801	1989	10	20	150.98	0	0	0.19
30803	1989	10	40	84.93	0.01	1226.7	0.23
30805	1989	10	40	275.22	0.01	1006.53	0.04
30807	1989	10	60	398.42	0	0	0.11
30809	1989	10	80	100.65	0.1	154.12	0.03
30901	1989	10	30	48.23	0	0	0
30903	1989	10	50	26.42	0.09	480.2	0
30905	1989	10	65	188.72	0	0	0.07
30907	1989	10	65	65.81	0.01	2233.23	0.3
30909	1989	10	75	93.1	0.01	594.48	0.03
31003	1989	10	20	6.92	0.29	18.87	12.58
31005	1989	10	60	15.94	0.08	314.54	0
31007	1989	10	70	111.08	0.14	48.53	0.12
31009	1989	10	80	53.79	0.07	61.34	0
31104	1989	10	65	129.3	0.01	754.9	0.1
31107	1989	10	80	178.66	0.02	339.7	0.41
31109	1989	10	80	161.36	0.04	190.82	0.41
31203	1989	10	60	167.96	0.01	459.23	0.26
31205	1989	10	80	104.11	0.02	103.8	1.72
31207	1989	10	80	292.52	0.05	73.13	0.07
31209	1989	10	75	104.68	0.06	345.42	0
30703	1990	2	35	133.01	0	0	0
30705	1990	2	45	39.7	0.07	94.36	1.12
30707	1990	2	50	80.52	0.02	81.78	0.97
30709	1990	2	60	153.08	0	333.41	1.31
30801	1990	2	15	96.46	0	0	0
30803	1990	2	45	90.87	0	0	0
30805	1990	2	50	82.03	0.02	40.89	0
30807	1990	2	60	146.79	0.1	7.38	4.43
30809	1990	2	70	28.76	0.14	48.53	2.21
30901	1990	2	30	60.6	0.02	12.58	0
30903	1990	2	50	143.43	0.01	6.29	0
30905	1990	2	60	163.56	0.04	6.99	5.03
30907	1990	2	60	102.75	0.02	138.4	2.76
30909	1990	2	70	86.27	0.03	42.46	0.7
31003	1990	2	20	147.83	0	0	0
31005	1990	2	50	107.45	0	0	0
31007	1990	2	70	205.98	0	0	0
31009	1990	2	80	119.84	0	0	0
31104	1990	2	65	20.71	0	0	0
31107	1990	2	80	107.57	0.02	157.27	4.28
31109	1990	2	80	182.43	0.08	17.08	0.66
31203	1990	2	60	54.52	0	0	0.79
31205	1990	2	80	42.46	0	0	0.65
31207	1990	2	80	89.96	0	0	1.57
31209	1990	2	75	111.05	0	0	0.52
30703	1990	4	35	115.03	0	0	0
30705	1990	4	45	341.1	0	0	0
30707	1990	4	50	641.66	0	0	222.27
30709	1990	4	60	985.56	0	0	503.26
30801	1990	4	20	330.27	0.01	44.04	25.16
30803	1990	4	40	55.04	0.04	37.74	0
30805	1990	4	50	717.15	0.01	17.97	29.57
30807	1990	4	60	922.65	0	9.44	96.46
30809	1990	4	70	23.37	0.22	57.32	3.22

30901	1990	4	30	49.49	0	0	0
30903	1990	4	50	33.97	0	0	0
30905	1990	4	60	14.68	0	0	0
30907	1990	4	60	440.36	0	6.29	616.5
30909	1990	4	75	377.45	0	0	15.28
31003	1990	4	20	296.93	0.05	18.87	2.1
31005	1990	4	60	884.07	0.01	15.49	0
31007	1990	4	70	336.47	0	0	6.29
31009	1990	4	80	111.98	0	0	0
31104	1990	4	65	228.02	0	0	1.8
31107	1990	4	80	193.13	0.03	10.07	3.15
31109	1990	4	80	756.15	0	0	0
31203	1990	4	60	113.23	0	0	0
31205	1990	4	80	73.6	0	0	0
31207	1990	4	80	245.34	0	0	0
31209	1990	4	75	78.51	0	0	0
30703	1990	6	35	2.52	0	0	0
30707	1990	6	50	0.75	6.29	9.44	0
30709	1990	6	60	0.42	1.57	37.74	0
30801	1990	6	20	232.76	0	0	1.57
30803	1990	6	40	503.26	0	0	25.16
30805	1990	6	45	894.69	0	0	25.16
30807	1990	6	65	251.63	0	0	0
30809	1990	6	70	161.76	0	0	0
30901	1990	6	25	956.2	0	0	0.97
30903	1990	6	45	587.14	0	0	0.15
30905	1990	6	60	230.66	0.01	3.15	12.58
30907	1990	6	60	702.47	0	295.67	2.01
30909	1990	6	70	233.66	0	0	0
31003	1990	6	20	130.85	0.26	0	0
31005	1990	6	60	35.65	0.02	0	0
31007	1990	6	70	276.08	0.03	12.58	9.68
31009	1990	6	80	408.9	0.09	1.49	17.76
31104	1990	6	65	29.62	0.06	0	0
31107	1990	6	80	402.61	0.06	2.62	5.03
31109	1990	6	80	50.48	0.02	18.87	4.19
31203	1990	6	60	563.65	0.12	5.32	4.58
31205	1990	6	80	194.39	0.11	2.43	7.4
31207	1990	6	80	72.34	0.03	2.52	0
31209	1990	6	75	832.48	0.07	0.48	1.57
30703	1990	8	30	113.23	0	0	0
30705	1990	8	45	16.78	0	0	0
30707	1990	8	60	25.16	0	0	0
30709	1990	8	70	75.49	0	0	0.04
30801	1990	8	20	11.64	0	0	0
30803	1990	8	45	9.23	0.1	3894	0
30805	1990	8	50	27.93	0	0	0
30807	1990	8	65	94.85	0	0	0
30809	1990	8	70	71	0.02	2277.27	0.03
30901	1990	8	25	4.28	0	0	0
30903	1990	8	50	16.1	0	0	0.02
30905	1990	8	65	60.97	0.02	2198.63	0.08
30907	1990	8	60	98.56	0.01	3286.94	0.02
30909	1990	8	70	113.23	0	0	0
31003	1990	8	20	347.25	1.25	0.09	4.19
31005	1990	8	60	234.86	1.44	0.16	8.71
31007	1990	8	70	253.07	1.68	0.07	6.29
31009	1990	8	80	171.74	0.78	0.16	0
31104	1990	8	65	156.01	2.58	0.05	5.03
31107	1990	8	80	381.85	1.81	0.32	3.06
31109	1990	8	80	195.01	0.55	0.35	20.97
31203	1990	8	60	338.86	1.04	0.14	9.96
31205	1990	8	80	729.73	0.98	0.14	81.17
31207	1990	8	80	168.91	0.33	0.22	0
31209	1990	8	75	67.1	0.53	0.37	0
30703	1990	10	40	70.77	0	0	0
30705	1990	10	45	86.67	0.04	368.01	0
30707	1990	10	50	98.14	0.03	226.47	0
30709	1990	10	60	205.08	0.03	397.02	0.24
30801	1990	10	20	30.51	0	0	0
30803	1990	10	45	109.04	0	0	0
30805	1990	10	50	150.98	0.03	538.49	0.21
30807	1990	10	60	146.79	0.01	1006.53	0.3
30809	1990	10	70	98.86	0.04	262.42	0.58
30901	1990	10	25	47.06	0	0	0
30903	1990	10	50	264.21	0	2120	0.45
30905	1990	10	65	222.6	0	0	0.17
30907	1990	10	60	230.66	0.01	1000.24	0.1
30909	1990	10	70	130.31	0.04	308.25	0.64
31003	1990	10	20	77.69	0	0	0.84

31005	1990	10	60	49.28	0	0	1.4
31007	1990	10	70	411.96	0	0	1.11
31009	1990	10	80	108.52	0	0	0.32
31104	1990	10	65	529.59	0.03	94.61	1.07
31107	1990	10	80	152.87	0.02	143.79	7.71
31109	1990	10	80	30.2	0	0	5.98
31203	1990	10	60	102.33	0	0	0.56
31205	1990	10	80	133.99	0	0	0.63
31207	1990	10	80	72.5	0	0	0.15
31209	1990	10	75	173.79	0	0	0.08
30703	1991	2	30	16.57	0	0	0
30705	1991	2	40	42.15	0	0	0
30707	1991	2	50	52.47	0	0	0
30709	1991	2	60	91.74	0	0	0.14
30801	1991	2	20	57.25	0	0	0
30803	1991	2	40	66.05	0	0	0.14
30805	1991	2	50	32.33	0	0	0
30807	1991	2	60	11.64	0.17	39.84	0.66
30809	1991	2	70	22.65	0	0	3.69
30901	1991	2	25	168.59	0	0	0
30903	1991	2	50	115.75	0	0	2.7
30905	1991	2	60	67.1	0	0	8.14
30907	1991	2	60	78.11	0	0	1.07
30909	1991	2	70	72.79	0	0	3.42
31003	1991	2	20	55.36	0	0	0
31005	1991	2	60	49.07	0	0	12.58
31007	1991	2	70	86.81	0	0	10.29
31009	1991	2	80	18.64	0	0	7.08
31104	1991	2	65	122.33	0	201.31	4.32
31107	1991	2	80	208.54	0	0	2.04
31109	1991	2	80	46.71	0	0	2.1
31203	1991	2	60	7.34	0	0	0
31205	1991	2	80	22.49	0	0	0.65
31207	1991	2	80	60.55	0	0	0.99
31209	1991	2	75	132.19	0	0	2.57
30703	1991	4	35	95.26	0	0	0
30705	1991	4	45	39.98	0	0	0
30707	1991	4	50	84.3	0	0	2.1
30709	1991	4	60	115.33	0	0	16.78
30801	1991	4	20	56.62	0.07	25.16	1.57
30803	1991	4	45	89.47	0.01	320.83	4.69
30805	1991	4	50	301.96	0	50.33	56.62
30807	1991	4	60	65	0.01	6.29	75.49
30809	1991	4	70	98.86	0	0	9.89
30901	1991	4	25	97.38	0	0	2.42
30903	1991	4	50	67.94	0.02	154.12	0.9
30905	1991	4	60	167.75	0.01	27.26	16.45
30907	1991	4	60	99.6	0.01	150.98	1.57
30909	1991	4	70	197.71	0.01	37.74	4.72
31003	1991	4	20	189.98	0.02	125.82	1.26
31005	1991	4	60	115.33	0	0	17.3
31007	1991	4	70	47.81	0	0	6.29
31009	1991	4	80	107.73	0	0	3.36
31104	1991	4	65	14.9	0	0	4.19
31107	1991	4	80	194.07	0	0	6.36
31109	1991	4	80	300.07	0	0	5.08
31203	1991	4	60	8.81	0	0	2.1
31205	1991	4	80	21	0	0	4.19
31207	1991	4	80	2.59	0	0	0
31209	1991	4	75	57.88	0	0	6.29
30703	1991	6	35	970.58	0	31.45	5.03
30705	1991	6	40	534.72	0	0	0
30707	1991	6	50	490.68	0	12.58	44.04
30709	1991	6	60	964.59	0	0	0
30801	1991	6	20	440.36	0	0	0.3
30803	1991	6	45	230.66	0	0	0
30805	1991	6	50	1509.79	0	0	0
30807	1991	6	60	1467.85	0	113.23	6.29
30809	1991	6	70	745.91	0	0	9.09
30901	1991	6	25	66.43	0	0	1.8
30903	1991	6	50	239.05	0	6.29	44.04
30905	1991	6	60	230.66	0	0	0
30907	1991	6	60	1363	0	25.16	1.57
30909	1991	6	70	772.87	0	0	22.17
31003	1991	6	20	554.85	0	0	0.09
31005	1991	6	60	306.15	0	578.75	0.55
31007	1991	6	70	278.23	0	352.28	6.29
31009	1991	6	80	156.64	0	150.98	23.07
31104	1991	6	65	88.07	0	0	9.44
31107	1991	6	80	36.49	0.01	37.74	8.39

31109	1991	6	80	164.82	0	0	6.86
31203	1991	6	60	222.69	0.16	8.85	0.99
31205	1991	6	80	113.71	0.19	9.72	1.3
31207	1991	6	80	170.17	0.11	8.16	1.57
31209	1991	6	75	102.5	0	0	0
30703	1991	8	35	120.42	0	0	0
30705	1991	8	45	4.47	0	0	0
30707	1991	8	50	61.65	0	0	0
30709	1991	8	60	37.74	0	0	0
30801	1991	8	20	70.77	0	0	0
30803	1991	8	40	188.72	0	0	0.04
30805	1991	8	50	93.1	0	0	0.33
30807	1991	8	60	38.58	0	0	0.51
30809	1991	8	70	104.25	0	0	0.31
30901	1991	8	25	63.41	1.02	26.85	0.11
30903	1991	8	50	176.14	0.05	181.38	0.4
30905	1991	8	60	183.48	0.03	518.99	0.31
30907	1991	8	60	56.62	0.06	262.96	0.42
30909	1991	8	70	78.19	0.01	5944.8	0.13
31003	1991	8	20	184.95	0.88	19.03	1.47
31005	1991	8	60	557.78	0.09	27.68	2
31007	1991	8	70	174.17	0.1	15.33	2.1
31009	1991	8	80	168.59	0.02	59.76	0.66
31104	1991	8	65	124.27	0.08	33.03	0.9
31107	1991	8	80	74.55	0.08	40.89	1.29
31109	1991	8	80	339.7	0.09	29.88	1.32
31203	1991	8	60	69.2	0.17	16.08	3.56
31205	1991	8	80	283.09	0.11	18.87	2.88
31207	1991	8	80	117.01	0.1	12.58	6.82
31209	1991	8	75	131.85	0.13	8.65	8.01
30703	1991	10	35	30.56	0	0	0
30705	1991	10	40	59.76	0	0	0
30707	1991	10	50	9.31	0.09	163.56	0
30709	1991	10	60	44.04	0	0	0
30801	1991	10	20	150.98	0.01	1421.72	0
30803	1991	10	40	119.53	0.04	352.28	0.4
30805	1991	10	50	93.1	0.07	211.53	0.61
30807	1991	10	60	56.62	0.02	720.3	0.3
30809	1991	10	70	82.68	0	0	0.06
30901	1991	10	25	241.57	0.03	589.76	0
30903	1991	10	50	31.45	0.05	679.41	0.58
30905	1991	10	60	67.1	0.04	333.41	0.36
30907	1991	10	60	93.31	0.04	479.15	0.8
30909	1991	10	70	84.48	0.08	133.68	0.3
31003	1991	10	20	79.89	0.05	44.04	7.19
31005	1991	10	60	39.42	0.07	103.8	2.29
31007	1991	10	70	62.55	0.05	94.36	4.33
31009	1991	10	80	304.47	0.03	132.11	7.49
31104	1991	10	65	119.04	0	0	1.36
31107	1991	10	80	102.85	0.02	301.96	1.25
31109	1991	10	80	66.21	0.01	968.78	0.98
31203	1991	10	60	137.56	0.03	348.09	1.29
31205	1991	10	80	45.77	0.09	111.66	1.15
31207	1991	10	80	103.48	0.05	216.4	0.95
31209	1991	10	75	57.04	0.11	150.98	1.18
30703	1992	2	35	39.54	0	0	0
30705	1992	2	45	36.35	0.02	459.23	0
30707	1992	2	50	22.02	0.07	248.49	0.08
30709	1992	2	60	22.02	0.03	465.52	1.28
30801	1992	2	15	46.97	0.22	44.04	0.45
30803	1992	2	45	109.04	0.01	37.74	10.48
30805	1992	2	45	111.84	0.02	125.82	1.1
30807	1992	2	60	82.83	0	0	2.79
30809	1992	2	70	37.74	0.03	591.33	1.31
30901	1992	2	25	80.52	0.02	836.68	0.19
30903	1992	2	50	41.52	0	0	7.14
30905	1992	2	60	8.81	0.15	119.53	0.17
30907	1992	2	60	60.39	0	0	0.17
30909	1992	2	65	15.49	0	0	0.15
31003	1992	2	20	333.41	0.01	88.07	0.9
31005	1992	2	60	41.52	0	0	0
31007	1992	2	70	154.57	0	0	0.26
31009	1992	2	80	315.17	0	0	0.11
31104	1992	2	65	220.66	0	0	0.17
31107	1992	2	80	158.84	0	0	0.11
31109	1992	2	80	61.02	0.06	40.89	0
31203	1992	2	60	30.2	0.02	150.98	0.79
31205	1992	2	80	30.82	0	0	1.66
31207	1992	2	80	8.34	0	0	0
31209	1992	2	75	19.29	0.03	12.58	3.15

30703	1992	4	35	215.68	0	0	0
30705	1992	4	40	103.8	0.05	7.55	0
30707	1992	4	50	193.76	0.02	167.34	0.24
30709	1992	4	60	75.49	0.04	2.52	3.15
30801	1992	4	20	242.2	0.05	12.58	0
30803	1992	4	45	137	0	0	1.94
30805	1992	4	45	251.63	0.06	29.01	0.38
30807	1992	4	60	125.82	0.01	116.38	7.31
30809	1992	4	70	70.1	0.05	116.38	5.16
30901	1992	4	25	168.59	0.02	44.04	0
30903	1992	4	50	176.14	0	0	37.74
30905	1992	4	60	87.02	0	0	75.49
30907	1992	4	60	57.67	0	0	8.95
30909	1992	4	70	66.5	0	0	2.1
31003	1992	4	20	190.61	0	0	0
31005	1992	4	60	261.7	0	0	0.7
31007	1992	4	70	60.21	0.02	6.29	0
31009	1992	4	80	152.24	0	0	0
31104	1992	4	65	138.98	0	62.91	0
31107	1992	4	80	68.88	0	0	0
31109	1992	4	80	536.6	0	213.89	0
31203	1992	4	60	131.27	0	0	0
31205	1992	4	80	282.77	0	6.29	0
31207	1992	4	80	25.63	0	0	0
31209	1992	4	75	143.26	0	31.45	0
30703	1992	6	35	934.63	0	27.26	0.48
30705	1992	6	45	1677.54	0	25.16	0
30707	1992	6	50	2113.71	0	9.44	4.19
30709	1992	6	65	1260.09	0	0	56.62
30801	1992	6	20	254.78	0.01	245.34	0
30803	1992	6	45	1118.36	0	0	0
30805	1992	6	50	1324.84	0	44.04	0.9
30807	1992	6	60	2726.01	0	0	0
30809	1992	6	70	1577.19	0	0	0
30901	1992	6	25	2731.46	0	0	0
30903	1992	6	50	2208.07	0	0	0.14
30905	1992	6	60	1301.67	0	0	0
30907	1992	6	60	1981.6	0	0	0
30909	1992	6	65	1111.05	0	0	4.69
31003	1992	6	20	417.71	0.01	75.49	0
31005	1992	6	60	260.02	0	0	0
31007	1992	6	70	1489.66	0	0	0
31009	1992	6	80	99.39	0	0	0
31104	1992	6	65	659.66	0.01	134.2	0
31107	1992	6	80	1524.89	0.02	53.92	0
31109	1992	6	80	38.22	0	0	0
31203	1992	6	60	169.85	0.01	138.4	0
31205	1992	6	80	659.27	0.02	109.04	0
31207	1992	6	80	669.34	0.01	150.98	0
31209	1992	6	75	840.11	0.01	134.2	0
30703	1992	8	35	193.04	0	0	0
30705	1992	8	40	102.23	0.07	560.78	0
30707	1992	8	50	79.26	0	0	0
30709	1992	8	60	313.49	0	0	1.53
30801	1992	8	20	10.38	0	0	0
30803	1992	8	40	25.79	0	0	0.17
30805	1992	8	45	391.43	0	0	0
30807	1992	8	60	238.53	0.01	276.79	0
30809	1992	8	70	251.63	0.02	192.32	1.44
30901	1992	8	25	15.6	0	0	0
30903	1992	8	45	377.45	0.01	184.01	0.75
30905	1992	8	60	719.25	0.01	102.45	0
30907	1992	8	60	749.65	0.01	107.52	0.97
30909	1992	8	65	159.21	0.01	500.12	1.27
31003	1992	8	20	10.07	0	0	0
31005	1992	8	60	29.36	0	0	0
31007	1992	8	70	1596.06	0	0	1.57
31009	1992	8	80	89.01	0	0	2.62
31104	1992	8	65	246.21	0	0	0.09
31107	1992	8	80	465.52	0	0	0.48
31109	1992	8	80	113.86	0	0	0
31203	1992	8	60	709.6	0	0	0.63
31205	1992	8	80	166.08	0	0	0
31207	1992	8	80	306.36	0	0	0
31209	1992	8	75	218.08	0	0	0
30703	1992	10	35	82.68	0	0	0
30705	1992	10	40	222.69	0	0	0
30707	1992	10	50	146.45	0	0	0.04
30709	1992	10	60	105.69	0	0	0
30801	1992	10	20	660.53	0	0	0

30803	1992	10	40	135.88	0.01	603.92	0
30805	1992	10	45	154.33	0.02	419.91	0
30807	1992	10	60	47.81	0	0	0.73
30809	1992	10	70	98.14	0	0	1.44
30901	1992	10	25	1268.22	0.01	18.87	0
30903	1992	10	45	102.33	0.02	478.1	0.66
30905	1992	10	60	188.72	0	0	0.68
30907	1992	10	60	232.76	0	0	1.76
30909	1992	10	65	102.2	0	0	5.83
31003	1992	10	20	26.42	0	0	0
31005	1992	10	60	11.74	0	0	0
31007	1992	10	70	1115.81	0	0	0
31009	1992	10	80	548.56	0.01	654.24	0
31104	1992	10	65	268.67	0	0	0
31107	1992	10	80	293.15	0	0	2.1
31109	1992	10	80	875.68	0	0	3.93
31203	1992	10	60	790.12	0	0	0.52
31205	1992	10	80	588.82	0	0	0
31207	1992	10	80	669.34	0	442.87	0
31209	1992	10	75	1022.63	0.01	377.45	0
30703	1993	2	35	48.53	0	0	0
30705	1993	2	40	81.78	0	0	0
30707	1993	2	50	45.8	0.02	176.14	0
30709	1993	2	60	19.5	0	0	0.42
30801	1993	2	20	25.48	0	0	0.52
30803	1993	2	40	66.05	0	0	0
30805	1993	2	45	50.33	0.03	122.67	1.13
30807	1993	2	70	37.74	0	0	0
30809	1993	2	70	55.72	0.04	89.64	1.43
30901	1993	2	25	42.78	0	0	0
30903	1993	2	54	46.02	0	0	2.62
30905	1993	2	60	44.04	0.01	25.16	6.29
30907	1993	2	60	14.68	0	0	4.19
30909	1993	2	70	21.57	0.05	150.98	0.92
31003	1993	2	20	48.44	0	0	0
31005	1993	2	60	14.26	0	0	0
31007	1993	2	70	75.13	0.02	81.78	0.97
31009	1993	2	80	80.68	0.01	176.14	1.8
31104	1993	2	80	117.95	0	0	0.9
31107	1993	2	80	333.1	0	0	1.57
31109	1993	2	80	122.36	0	0	0
31203	1993	2	60	72.55	0	0	1.57
31205	1993	2	80	11.8	0	0	2.1
31207	1993	2	80	54.42	0.01	201.31	0.79
31209	1993	2	75	75.99	0.01	69.2	3.43
30703	1993	4	35	129.41	0	0	0
30705	1993	4	40	122.67	0.15	12.23	0
30707	1993	4	50	483.13	0	0	31.45
30709	1993	4	60	616.5	0	0	16.58
30801	1993	4	20	14.78	0	0	1.57
30803	1993	4	40	75.49	0	0	2.36
30805	1993	4	45	268.41	0.01	185.58	9.38
30807	1993	4	50	558.62	0	0	0
30809	1993	4	70	291.17	0	0	144.69
30901	1993	4	25	27.68	0	0	0
30903	1993	4	50	393.8	0.01	40.89	5.65
30905	1993	4	60	427.77	0	0	62.91
30907	1993	4	60	723.44	0	308.25	19.26
30909	1993	4	70	404.41	0	0	105.37
31003	1993	4	20	195.01	0	0	0
31005	1993	4	60	67.94	0.02	6.29	0
31007	1993	4	70	41.16	0	0	0
31009	1993	4	80	257.29	0.01	18.87	4.19
31104	1993	4	80	207.6	0.01	44.04	2.25
31107	1993	4	80	72.03	0.01	25.16	3.15
31109	1993	4	80	187.15	0.01	31.45	3.77
31203	1993	4	60	49.07	0	0	4.19
31205	1993	4	80	48.28	0	0	9.44
31207	1993	4	80	26.26	0	0	0
31209	1993	4	75	43.95	0	0	4.19
30703	1993	6	30	1174.28	0	117.43	0.45
30705	1993	6	40	1604.15	0	157.27	0.13
30707	1993	6	50	780.06	0	0	21.07
30709	1993	6	60	1520.27	0	0	44.04
30801	1993	6	20	691.99	0	0	0
30803	1993	6	40	53.47	0	0	0
30805	1993	6	45	104.85	0	0	0
30807	1993	6	60	660.53	0	0	0
30809	1993	6	70	215.68	0	0	113.23
30901	1993	6	25	729.73	0	0	0

30903	1993	6	45	1761.42	0	427.77	1.11
30905	1993	6	60	1006.53	0	33.55	4.72
30907	1993	6	60	415.19	0	0	14.03
30909	1993	6	70	264.21	0	0	12.03
31003	1993	6	20	981.36	0	0	0.7
31005	1993	6	60	1289.4	0	0	0
31007	1993	6	70	859.32	0.01	17.3	2.86
31009	1993	6	80	77.38	0	0	0
31104	1993	6	65	271.76	0	0	0
31107	1993	6	80	136.82	0	0	0
31109	1993	6	80	379.81	0	0	0
31203	1993	6	60	22.02	0.06	12.58	0
31205	1993	6	80	535.03	0	88.07	7.19
31207	1993	6	80	239.84	0.01	37.74	0
31209	1993	6	75	168.43	0	0	0
30703	1993	8	35	82.68	0	0	0
30705	1993	8	45	81.08	0	0	0
30707	1993	8	50	226.47	0	0	0.01
30709	1993	8	60	100.65	0.1	127.78	1.24
30801	1993	8	20	154.12	0	0	0
30803	1993	8	45	95.06	0	0	0.48
30805	1993	8	45	201.31	0	0	0.49
30807	1993	8	60	90.17	0.07	167.75	0.68
30809	1993	8	70	166.26	0	1660.77	0
30901	1993	8	25	60.39	0	0	0.5
30903	1993	8	50	18.24	0.04	1396.56	0.31
30905	1993	8	60	39.84	0.02	2830.86	0
30907	1993	8	60	98.56	0	0	0.09
30909	1993	8	70	56.62	0.05	583.79	0.42
31003	1993	8	20	16.36	0	0	0
31005	1993	8	60	58.29	0.02	25.16	0
31007	1993	8	70	197.35	0	0	0.43
31009	1993	8	80	108.52	0	0	0.52
31104	1993	8	65	77.04	0	0	0.2
31107	1993	8	80	3.54	0	0	0
31109	1993	8	80	3.3	0	0	0
31203	1993	8	60	255.41	0.02	128.96	2.61
31205	1993	8	80	176.14	0.07	11.53	7.43
31207	1993	8	80	61.81	0.02	56.62	2.1
31209	1993	8	75	129.17	0.03	18.87	0.52
30703	1993	10	35	323.53	0	962.49	0
30705	1993	10	40	393.17	0	2359.05	0.1
30707	1993	10	50	440.36	0	0	0.33
30709	1993	10	60	140.49	0	0	0.22
30801	1993	10	15	96.46	0	0	0
30803	1993	10	45	363.47	0	0	0.04
30805	1993	10	45	384.44	0.01	78.63	0.88
30807	1993	10	60	262.12	0	459.23	0.34
30809	1993	10	70	202.2	0.01	72.97	0.54
30901	1993	10	25	176.14	0	0	0
30903	1993	10	50	105.69	0.01	226.47	0.52
30905	1993	10	60	272.6	0.01	188.72	0.49
30907	1993	10	60	117.43	0.05	68.5	0.58
30909	1993	10	75	47.81	0.04	190.3	0.52
31003	1993	10	20	115.75	0	0	0
31005	1993	10	60	36.28	0	0	0
31007	1993	10	70	56.08	0.14	10.78	2.1
31009	1993	10	80	31.45	0.06	6.29	3.15
31104	1993	10	65	40.45	0	0	3.15
31107	1993	10	80	58.98	0.03	22.02	9.89
31109	1993	10	80	82.72	0.05	3.15	6.29
31203	1993	10	60	177.82	0.06	25.16	2.36
31205	1993	10	80	105.69	0.04	22.02	0.9
31207	1993	10	80	170.79	0.05	22.02	2.7
31209	1993	10	75	106.36	0.02	94.36	0.84
30703	1993	12	35	103.53	0	0	0
30705	1993	12	45	167.75	0	0	0.08
30707	1993	12	50	42.78	0	0	1.93
30709	1993	12	60	50.33	0	0	0.19
30801	1993	12	20	90.59	0	0	0.17
30803	1993	12	45	57.32	0	0	0.14
30805	1993	12	45	53.68	0	0	0.27
30807	1993	12	60	40.26	0.07	108.52	4.29
30809	1993	12	70	88.25	0.11	67.72	2.23
30901	1993	12	25	72.47	0.04	103.8	0.38
30903	1993	12	50	201.31	0.02	190.3	3.02
30905	1993	12	60	272.6	0	522.14	1.06
30907	1993	12	60	345.99	0	0	0.97
30909	1993	12	70	287.58	0	0	1.12
31003	1993	12	20	78.63	0.03	12.58	0

31005	1993	12	60	178.24	0.01	114.81	0.52
31007	1993	12	70	206.7	0	0	0.95
31009	1993	12	80	31.45	0.02	100.65	2.36
31104	1993	12	65	12.97	0	0	3.15
31107	1993	12	80	5.58	0	0	0
31109	1993	12	80	165.13	0.01	54.52	1.21
31203	1993	12	60	20.97	0	0	0
31205	1993	12	80	39.32	0.01	138.4	0.57
31207	1993	12	80	62.91	0.02	60.81	2.39
31209	1993	12	75	134.2	0.01	88.07	0.9
30703	1994	2	35	86.27	0.01	132.11	0
30705	1994	2	45	187.88	0.01	262.12	0
30707	1994	2	50	108.7	0	0	0.08
30709	1994	2	60	372.41	0.01	17.3	15.16
30801	1994	2	20	270.5	0	0	1.19
30803	1994	2	45	107.36	0.01	723.44	0.38
30805	1994	2	45	335.51	0	503.26	0.86
30807	1994	2	60	352.28	0.01	13.48	5.87
30809	1994	2	70	189.8	0.02	24.26	5.36
30901	1994	2	25	144.94	0.01	207.6	0
30903	1994	2	45	281.83	0.03	26.88	1.74
30905	1994	2	60	442.87	0.02	1.72	0
30907	1994	2	60	342.22	0.03	1.8	28.31
30909	1994	2	70	232.94	0.04	15.94	2.81
31003	1994	2	25	217.41	0.01	113.23	0
31005	1994	2	65	120.78	0.01	150.98	0.26
31007	1994	2	75	64.42	0.01	245.34	1.13
31009	1994	2	85	42.63	0.01	69.2	4
31104	1994	2	65	353.06	0.02	108.88	0.36
31107	1994	2	80	113.23	0.03	85.97	2.69
31109	1994	2	80	173.63	0.02	39.84	4.47
31203	1994	2	65	204.4	0	597.63	1.39
31205	1994	2	85	127.89	0.01	449.79	0.7
31207	1994	2	85	120.78	0.03	117.73	1.68
31209	1994	2	80	67.94	0.01	308.25	0
30703	1994	4	35	86.27	0.01	132.11	0
30705	1994	4	45	187.88	0.01	262.12	0
30707	1994	4	50	108.7	0	0	0.08
30709	1994	4	60	372.41	0.01	17.3	15.16
30801	1994	4	20	270.5	0	0	1.19
30803	1994	4	45	107.36	0.01	723.44	0.38
30805	1994	4	45	335.51	0	503.26	0.86
30807	1994	4	60	352.28	0.01	13.48	5.87
30809	1994	4	70	189.8	0.02	24.26	5.36
30901	1994	4	25	144.94	0.01	207.6	0
30903	1994	4	45	281.83	0.03	26.88	1.74
30905	1994	4	60	442.87	0.02	1.72	0
30907	1994	4	60	342.22	0.03	1.8	28.31
30909	1994	4	70	232.94	0.04	15.94	2.81
31003	1994	4	25	217.41	0.01	113.23	0
31005	1994	4	65	120.78	0.01	150.98	0.26
31007	1994	4	75	64.42	0.01	245.34	1.13
31009	1994	4	85	42.63	0.01	69.2	4
31104	1994	4	65	353.06	0.02	108.88	0.36
31107	1994	4	80	113.23	0.03	85.97	2.69
31109	1994	4	80	173.63	0.02	39.84	4.47
31203	1994	4	65	204.4	0	597.63	1.39
31205	1994	4	85	127.89	0.01	449.79	0.7
31207	1994	4	85	120.78	0.03	117.73	1.68
31209	1994	4	80	67.94	0.01	308.25	0
30703	1994	6	35	2066.97	0	132.11	1.5
30705	1994	6	45	545.2	0	0	3.77
30707	1994	6	50	1446.88	0	11.32	0
30709	1994	6	60	555.69	0.01	2.1	138.4
30801	1994	6	20	1037.98	0	56.62	2.1
30803	1994	6	45	1202.24	0	0	0
30805	1994	6	45	1649.59	0	0	0.77
30807	1994	6	60	230.66	0	0	7.86
30809	1994	6	70	242.64	0	0	5.03
30901	1994	6	25	679.41	0	0	0
30903	1994	6	50	150.98	0	0	12.58
30905	1994	6	60	83.88	0.02	18.87	6.29
30907	1994	6	60	356.48	0.01	10.48	32.71
30909	1994	6	70	1294.11	0	50.33	73.92
31003	1994	6	25	553.59	0.02	42.46	0
31005	1994	6	65	348.41	0.02	9.09	20.81
31007	1994	6	75	452.94	0.03	12.58	27.35
31009	1994	6	85	458.86	0.04	11.75	29.86
31104	1994	6	70	485.29	0.07	2.4	35.12
31107	1994	6	80	739.17	0.01	14.38	20.64

31109	1994	6	80	731.3	0.08	3.81	76.36
31203	1994	6	65	270.99	0.22	3.08	14.15
31205	1994	6	85	251.63	0.03	8.74	4.03
31207	1994	6	85	288.64	0.03	33.9	16.73
31209	1994	6	80	503.26	0.12	1.67	155.94
30703	1994	8	35	33.07	0.92	90.87	0
30705	1994	8	45	163.28	0	0	0
30707	1994	8	50	503.26	0	3000.71	0
30709	1994	8	60	146.79	0.01	620.69	0
30801	1994	8	20	283.09	0	0	0
30803	1994	8	45	67.1	0	0	0
30805	1994	8	45	109.6	0.01	5076.67	0
30807	1994	8	60	408.9	0.03	262.72	0.01
30809	1994	8	70	107.84	0.5	82.83	0.08
30901	1994	8	25	2013.05	0	1075.73	0.04
30903	1994	8	50	188.72	0.01	2315.01	0.04
30905	1994	8	60	335.51	0.01	554.85	0.06
30907	1994	8	60	83.88	0.49	86.24	0.09
30909	1994	8	70	197.71	0.09	153.01	0.13
31003	1994	8	25	216.4	0	0	0.25
31005	1994	8	65	309.7	0.06	312.71	0.04
31007	1994	8	75	343.9	0.06	103.47	0.25
31009	1994	8	85	296.04	0.03	80.67	0
31104	1994	8	70	90.59	0.1	16.51	5.54
31107	1994	8	80	318.47	0.07	47.69	0.54
31109	1994	8	80	220.18	0.04	164.26	0.05
31203	1994	8	65	551.65	0.03	83.96	0.34
31205	1994	8	85	562.47	0.22	25.14	0.02
31207	1994	8	85	318.24	0.05	118.41	0
31209	1994	8	80	18.87	0.05	166.71	0
30703	1994	10	35	244.44	0	0	0
30705	1994	10	45	62.91	0.06	103.8	0
30707	1994	10	50	110.72	1.12	18.95	0
30709	1994	10	60	33.03	0.68	78.63	0
30801	1994	10	20	264.21	0.02	161.46	0
30803	1994	10	45	105.13	0.18	32.03	0.06
30805	1994	10	50	44.29	0.14	55.83	0
30807	1994	10	60	513.75	0.1	56.11	0.02
30809	1994	10	70	89.15	0.11	344.14	0
30901	1994	10	25	402.61	0.02	130.01	0
30903	1994	10	50	34.22	0.09	259.5	0.19
30905	1994	10	60	71.3	0.12	112.27	0.54
30907	1994	10	60	239.89	0	1044.27	0
30909	1994	10	70	117.91	0.08	132.5	0
31003	1994	10	25	450.92	0.04	47.18	1.54
31005	1994	10	65	329.06	0.06	29.42	1.19
31007	1994	10	75	310.35	0.14	13.7	2.48
31009	1994	10	85	347.84	0.06	65.54	0.44
31104	1994	10	70	104.97	0.05	45.43	2.03
31107	1994	10	80	29.57	0.28	5.92	8.26
31109	1994	10	80	173	0.34	28.47	0.98
31203	1994	10	65	416.16	0.08	12.7	4.37
31205	1994	10	85	651.28	0.03	20.31	1.91
31207	1994	10	85	429.25	0.25	3.27	24.96
31209	1994	10	80	424.63	0.02	81.48	0.6
30703	1994	12	35	120.42	0	9.35	0
30705	1994	12	45	93.94	0	9.65	0.7
30707	1994	12	50	191.24	4.15	15.98	0.38
30709	1994	12	60	171.95	0.1	20.76	0.63
30801	1994	12	20	193.76	0.63	12.9	0.31
30803	1994	12	45	64.87	1.96	10.62	0
30805	1994	12	50	127.83	0.88	13.97	1.13
30807	1994	12	60	534.72	0.73	27.36	1.47
30809	1994	12	65	213.5	1.26	24.78	3.77
30901	1994	12	25	82.54	0.75	9.31	0.75
30903	1994	12	50	142.93	1.26	15.35	0
30905	1994	12	60	110.72	5.45	17.09	5.87
30907	1994	12	60	189.56	0.73	13.94	2.1
30909	1994	12	70	166.08	0.09	28.76	1.17
31003	1994	12	25	14.09	0.25	5.03	0.25
31005	1994	12	65	40.26	0.39	9.29	0
31007	1994	12	75	67.77	2.68	13.76	3.52
31009	1994	12	85	15.39	0.22	3.7	2.29
31105	1994	12	70	133.72	0.72	26.78	1.8
31107	1994	12	80	201.78	0.31	45.37	6.29
31109	1994	12	80	39.63	0.08	6.13	2.28
31203	1994	12	65	18.58	0.19	7.84	0.87
31205	1994	12	85	2.59	0	0.07	0
31207	1994	12	85	68.09	1.55	15.25	3.77
31209	1994	12	80	61.65	0.24	6.76	0.79

30703	1995	2	35	149.54	0	0	0
30705	1995	2	45	161.04	0.01	1100.89	0
30707	1995	2	50	98.64	0.04	47.81	0
30709	1995	2	60	100.65	0.06	4.89	14.38
30801	1995	2	20	163.56	0.02	44.04	0
30803	1995	2	45	35.79	0.05	323.98	0.67
30805	1995	2	50	65.42	0.04	153.08	0.43
30807	1995	2	60	72.13	0.05	84.3	4.6
30809	1995	2	65	243.11	0.01	364.87	5.04
30901	1995	2	25	86.56	0.02	44.04	0
30903	1995	2	50	368.39	0	40.89	30.49
30905	1995	2	60	78.84	0.03	50.33	2.56
30907	1995	2	60	114.07	0.01	220.18	7.37
30909	1995	2	70	79.08	0	0	9.9
31003	1995	2	25	32.21	0.1	31.45	0
31005	1995	2	65	6.97	0.09	0	0
31007	1995	2	75	26.17	0.04	150.98	0.39
31009	1995	2	85	86.44	0.03	178.66	0.71
31104	1995	2	70	37.39	0.02	232.76	0.51
31107	1995	2	80	71.72	0.02	228.57	1.27
31109	1995	2	80	86.18	0.02	210.74	1.03
31203	1995	2	65	46.46	0.03	204.45	0.87
31205	1995	2	85	71.49	0.02	211.79	0.69
31207	1995	2	85	84.81	0.03	147.2	1.13
31209	1995	2	80	103.8	0.01	295.67	0.85
30703	1995	4	35	215.68	0.08	6.68	0.37
30705	1995	4	45	19.15	0.28	3.15	6.29
30707	1995	4	50	373.67	0.02	90.43	0.71
30709	1995	4	60	324.6	0	0	0
30801	1995	4	20	120.78	0.23	0.9	22.02
30803	1995	4	45	196.83	0.13	8.99	3.15
30805	1995	4	50	28.18	0.03	0	0
30807	1995	4	60	153.5	0	0	0
30809	1995	4	65	254.73	0.01	0	0
30901	1995	4	25	285.85	0.39	0.44	6.29
30903	1995	4	50	54.35	0.01	0	0
30905	1995	4	60	120.78	0.01	3.15	44.04
30907	1995	4	60	211.37	0.02	5.03	67.63
30909	1995	4	70	467.32	0	207.6	8.58
31003	1995	4	25	225.46	0.11	0.42	0
31005	1995	4	65	94.46	0.03	5.03	7.86
31007	1995	4	75	64.42	0.04	11.32	0
31009	1995	4	85	49.14	0.05	16.36	17.9
31104	1995	4	70	33.79	0.02	44.04	19.77
31107	1995	4	80	57.88	0.04	62.91	1.38
31109	1995	4	80	104.43	0.05	34.6	5.6
31203	1995	4	65	46.46	0.03	59.76	1.99
31205	1995	4	85	103.02	0.03	7.34	3.59
31207	1995	4	85	31.97	0.13	2.8	1.57
31209	1995	4	80	54.1	0.05	3.15	29.36
30703	1995	6	35	1905.21	0.01	4.03	3.15
30705	1995	6	45	852.75	0.01	0	0
30707	1995	6	50	50.33	0	0	0
30709	1995	6	60	566.17	0.01	1.8	56.62
30801	1995	6	20	356.69	0.01	176.14	0
30803	1995	6	45	601.12	0.01	66.68	0.12
30805	1995	6	50	339.7	0	44.04	0
30807	1995	6	60	975.07	0	7.55	15.73
30809	1995	6	65	445.19	0	12.58	330.27
30901	1995	6	25	427.77	0.02	106.94	0.12
30903	1995	6	50	141.54	0	0	2.86
30905	1995	6	60	214.94	0.01	6.29	66.05
30907	1995	6	60	120.57	0.02	0	0
30909	1995	6	70	161.76	0	0	305.1
31003	1995	6	25	515.84	0	610.21	0.06
31005	1995	6	65	11.32	0	0	0
31007	1995	6	75	43.62	0.1	83.35	9.97
31009	1995	6	85	188.72	0.03	26.13	21.32
31104	1995	6	70	257.02	0.03	17.42	16.43
31107	1995	6	80	133.68	0.01	31.45	1.26
31109	1995	6	80	54.26	0.03	18.87	10.48
31203	1995	6	65	59.04	0.17	15.73	8.96
31205	1995	6	85	362.65	0.11	5.39	14.68
31207	1995	6	85	77.71	0.02	18.87	47.53
31209	1995	6	80	114.81	0.04	18.17	56.62
30703	1995	8	35	181.17	0	0	0
30705	1995	8	45	7.27	0	0	0
30707	1995	8	50	42.27	0	0	0.01
30709	1995	8	60	440.36	0	3548.01	0.25
30801	1995	8	20	20.13	0	0	0

30803	1995	8	45	2.24	0.79	430.92	0
30805	1995	8	50	6.04	0	0	0.31
30807	1995	8	60	55.36	0	0	0
30809	1995	8	65	48	0	0	0
30901	1995	8	25	106.69	0	0	0
30903	1995	8	50	82.54	0	0	0
30905	1995	8	60	122.46	0.01	5359.75	0.03
30907	1995	8	60	123.3	0.03	496.97	0.31
30909	1995	8	70	53.92	0	0	0.34
31003	1995	8	25	566.17	0.01	342.85	0.06
31005	1995	8	65	1.65	0	0	0
31007	1995	8	75	28.18	0.07	92.79	0.53
31009	1995	8	85	75.19	0.04	76.39	0.67
31104	1995	8	70	55.36	0.02	122.67	0.81
31107	1995	8	80	57.88	0.01	591.33	0.13
31109	1995	8	80	526.85	0	113.23	0.49
31203	1995	8	65	0.97	0	0	0
31205	1995	8	85	70.46	0.02	48.23	0.82
31207	1995	8	85	10.07	0.09	28.31	0.7
31209	1995	8	80	11.32	0.17	99.08	0.7
30703	1995	10	35	32.53	0	0	0
30705	1995	10	45	226.47	0	0	0.01
30707	1995	10	50	123.8	0.07	105.23	0.51
30709	1995	10	60	154.75	0.11	130.41	0.29
30801	1995	10	20	234.65	0	0	0.06
30803	1995	10	45	40.26	0	0	0
30805	1995	10	50	35.48	0.07	312.44	0.42
30807	1995	10	60	26.42	0.07	207.6	0.38
30809	1995	10	65	78.97	0.08	153.5	0.41
30901	1995	10	25	188.72	0.02	339.7	0.06
30903	1995	10	50	123.8	0.08	111.14	2.58
30905	1995	10	60	113.86	0.03	310.77	0.51
30907	1995	10	60	231.5	0.01	442.45	1.76
30909	1995	10	70	100.29	0.08	130.01	0.3
31003	1995	10	25	34.73	0	0	0
31005	1995	10	65	81.3	0.07	27.05	2.05
31007	1995	10	75	156.51	0.06	48.23	1.6
31009	1995	10	85	100.36	0.04	40.89	7.26
31104	1995	10	70	21.03	0	0	0.37
31107	1995	10	80	116.07	0.08	44.73	0.93
31109	1995	10	80	116.54	0.02	89.64	4.08
31203	1995	10	65	164.92	0.08	27.45	1.38
31205	1995	10	85	64.83	0.02	142.59	2.5
31207	1995	10	85	56.4	0	0	0.47
31209	1995	10	80	88.23	0.1	94.01	0.28
30703	1995	12	35	29.48	0.23	17.82	0
30705	1995	12	45	70.46	0.04	415.19	0.25
30707	1995	12	50	83.04	0.23	84.4	0.16
30709	1995	12	60	335.51	0.01	234.02	0.91
30801	1995	12	20	286.86	0	0	0
30803	1995	12	45	89.75	0	0	0.54
30805	1995	12	50	156.01	0.03	98.14	2.1
30807	1995	12	60	234.86	0	893.29	5.05
30809	1995	12	65	315.89	0	2270.98	1.27
30901	1995	12	25	106.69	0	0	0
30903	1995	12	50	137.89	0.01	855.55	0.97
30905	1995	12	60	243.24	0	1006.53	5.7
30907	1995	12	60	100.65	0.01	229.61	7.76
30909	1995	12	70	196.99	0	0	9.48
31003	1995	12	25	120.78	0	0	0.47
31005	1995	12	65	16.07	0.04	88.07	0
31007	1995	12	75	10.74	0.05	31.45	2.52
31009	1995	12	85	331.56	0	0	4.91
31104	1995	12	70	488.88	0	770.62	0.46
31107	1995	12	80	165.45	0.01	189.98	0.62
31109	1995	12	80	196.27	0	541.01	0.66
31203	1995	12	65	24.39	0.02	37.74	3.15
31205	1995	12	85	108.35	0.02	70.46	0
31207	1995	12	85	145.5	0.02	124.92	0.36
31209	1995	12	80	79.26	0.04	63.96	0.62
30703	1996	2	75	147.62	0	578.75	0.07
30705	1996	2	45	232.62	0	981.36	0.44
30707	1996	2	50	265.72	0.01	41.94	1.89
30709	1996	2	70	142.35	0.06	119.08	1.23
30801	1996	2	20	495.71	0.02	56.62	0.17
30803	1996	2	45	369.06	0.01	574.56	0
30805	1996	2	55	430.06	0.02	33.55	0
30807	1996	2	70	176.14	0.05	46	0.16
30809	1996	2	75	248.28	0.06	33.63	0.81
30901	1996	2	25	130.85	0.01	132.11	0.6

30903	1996	2	50	463	0.03	7.4	1.26
30905	1996	2	60	150.98	0.02	33.03	8.69
30907	1996	2	75	70.46	0.06	98.29	6.84
30909	1996	2	80	260.44	0.01	150.98	1.83
31003	1996	2	25	85.05	0.04	34.6	0
31005	1996	2	75	205.33	0.02	158.32	9.08
31007	1996	2	80	143.43	0.03	62.91	3.7
31009	1996	2	80	235.28	0.01	102.45	0.72
31104	1996	2	80	150.98	0.03	58.98	6.96
31107	1996	2	90	66.54	0.03	130.53	3.11
31109	1996	2	80	48.44	0	0	0.46
31203	1996	2	80	78.63	0	0	3.15
31205	1996	2	75	61.73	0.01	289.38	0.82
31207	1996	2	90	42.36	0	0	1.86
31209	1996	2	80	64.17	0.01	94.36	4.19
30703	1996	4	60	796.83	0	327.12	0.04
30705	1996	4	50	442.87	0.04	23.4	0.41
30707	1996	4	55	823.52	0	0	1.75
30709	1996	4	70	350.49	0.01	168.28	10.41
30801	1996	4	20	296.93	0.01	75.49	1.05
30803	1996	4	45	643.06	0.03	56.29	1.26
30805	1996	4	60	681.5	0	218.08	0
30807	1996	4	70	620.09	0	185.58	7.25
30809	1996	4	80	589.76	0.03	31.05	1.4
30901	1996	4	30	120.78	0.04	26.74	0
30903	1996	4	50	237.54	0.03	20.76	2.1
30905	1996	4	65	396.8	0.01	59.76	3.97
30907	1996	4	80	275.22	0.01	53.47	5.67
30909	1996	4	85	488.46	0.03	44.04	0.99
31003	1996	4	30	880.71	0.04	17.24	0.85
31005	1996	4	75	654.24	0.02	10.01	3.95
31007	1996	4	85	259.03	0	685.7	1.44
31009	1996	4	85	214.63	0	257.92	2.07
31104	1996	4	80	290.95	0	150.98	2.23
31107	1996	4	90	153.77	0.02	48.23	8.07
31109	1996	4	85	281.24	0	75.49	0
31203	1996	4	75	181.85	0.01	31.45	9.65
31205	1996	4	75	260.02	0	0	2.1
31207	1996	4	90	468.31	0	88.07	4.94
31209	1996	4	85	97.1	0.05	20.02	131.39
30703	1996	6	55	2973.83	0.01	55.69	0.05
30705	1996	6	45	3494.88	0	20.13	5.9
30707	1996	6	50	2767.95	0	1.26	62.91
30709	1996	6	70	2156.84	0	11.18	13.56
30801	1996	6	20	597.63	0	18.87	2.1
30803	1996	6	45	1635.61	0	48.23	1.64
30805	1996	6	60	3711.57	0	0	0
30807	1996	6	70	1060.45	0	0	0
30809	1996	6	80	1376.11	0.01	11.53	75.68
30901	1996	6	35	139.48	0.01	18.87	0
30903	1996	6	55	720.58	0.01	6.92	0
30905	1996	6	65	2380.82	0	2.52	138.4
30907	1996	6	75	1887.24	0	220.18	22.11
30909	1996	6	80	872.85	0.01	23.2	26.98
31003	1996	6	20	2956.67	0.01	220.88	0.3
31005	1996	6	70	1410.93	0.02	15.73	49.87
31007	1996	6	80	990.8	0.01	18.05	31.64
31009	1996	6	80	581.9	0.02	12.08	47.71
31104	1996	6	75	159.37	0.06	6.29	0.99
31107	1996	6	90	733.93	0.01	6.29	131.84
31109	1996	6	80	581.9	0.01	6.29	272.6
31203	1996	6	80	581.9	0.07	7.76	0.86
31205	1996	6	80	448.22	0.05	11.08	3.11
31207	1996	6	95	496.64	0.02	9.44	39.38
31209	1996	6	80	747.03	0	40.89	55.81
30703	1996	8	50	855.55	0	0	0
30705	1996	8	50	1987.89	0	2038.22	0
30707	1996	8	55	1612.73	0	1541.24	0.14
30709	1996	8	70	557.18	0.02	124.14	0.49
30801	1996	8	17	1702.21	0	157.27	0
30803	1996	8	40	534.72	0.17	17.33	2.82
30805	1996	8	55	1120.9	0	111.14	8.78
30807	1996	8	70	1096.4	0.06	7.1	1.78
30809	1996	8	80	660.53	0.04	56.5	0.03
30901	1996	8	25	578.75	0	0	0
30903	1996	8	55	113.46	0	0	0.14
30905	1996	8	65	541.98	0.04	31.07	1.43
30907	1996	8	75	1056.85	0.05	7.5	0.1
30909	1996	8	80	542.58	0.14	15.45	0.07
31003	1996	8	25	2415.66	0	0	0.06

31005	1996	8	70	431.37	0	0	0
31007	1996	8	85	399.65	0.05	77.26	0.08
31009	1996	8	85	873.31	0.04	11.01	11.63
31104	1996	8	75	452.94	0.05	6.29	3.88
31107	1996	8	90	265.61	0.1	6.29	98.92
31109	1996	8	80	817.8	0.06	6.29	33.96
31203	1996	8	85	1332.17	0.01	31.79	18.68
31205	1996	8	75	469.71	0.03	101.1	0.07
31207	1996	8	90	601.12	0.04	12.47	3.82
31209	1996	8	85	473.66	0.03	27.73	3.7
30703	1996	10	67	356.79	0	0	0
30705	1996	10	45	768.87	0.08	60.46	0.01
30707	1996	10	50	402.61	0.54	22.75	0
30709	1996	10	70	557.18	0.25	27.11	0
30801	1996	10	20	1478.34	0	0	0
30803	1996	10	45	391.43	0.04	76.67	0
30805	1996	10	55	217.32	0.34	34.36	0.1
30807	1996	10	65	503.26	0.1	78.56	0.04
30809	1996	10	75	520.04	0.14	33.38	0.02
30901	1996	10	25	1862.07	0	465.52	0
30903	1996	10	50	553.59	0.02	61.43	0.11
30905	1996	10	65	445.19	0.15	49.45	0.13
30907	1996	10	75	318.73	0.17	17.39	0.02
30909	1996	10	80	251.63	0.13	15.16	0.2
31003	1996	10	20	1950.15	0	0	0.11
31005	1996	10	70	772.87	0.03	47.1	0.02
31007	1996	10	80	463.95	0.07	23.61	4.42
31009	1996	10	85	532.87	0.06	57.31	0.78
31104	1996	10	75	17.78	1.13	30.13	0.73
31107	1996	10	90	223.67	0.08	37.59	3.34
31109	1996	10	80	369.58	0.04	60.66	5.01
31203	1996	10	80	424.63	0.13	15.73	6.49
31205	1996	10	75	394.22	0.01	171.95	1.11
31207	1996	10	90	377.45	0.23	9.47	2.69
31209	1996	10	85	488.46	0.13	16.32	4.6
30703	1996	12	55	54.67	0	0	0
30705	1996	12	45	100.65	0.03	33.03	3.59
30707	1996	12	50	120.78	0.03	20.45	7.74
30709	1996	12	70	43.86	0.12	18.87	0.93
30801	1996	12	15	161.46	0	0	0
30803	1996	12	40	80.21	0	0	7.64
30805	1996	12	50	41.65	0.1	0	0
30807	1996	12	70	43.41	0	0	0
30809	1996	12	80	125.97	0.18	2.52	4.19
30901	1996	12	25	170.35	0.04	51.9	0
30903	1996	12	50	24.91	0	0	3.15
30905	1996	12	85	64.68	0.02	35.65	12.21
30907	1996	12	75	156.77	0.06	6.95	4.19
30909	1996	12	80	46	0	0	18.87
31003	1996	12	20	78.32	0.1	26.74	0
31005	1996	12	70	8	0	0	0
31007	1996	12	85	18.8	0.02	44.04	0
31009	1996	12	85	66.68	0.08	12.01	2.4
31104	1996	12	75	3.02	0	0	0
31107	1996	12	90	17.54	0	0	1.26
31109	1996	12	80	36.64	0.03	9.44	14.68
31203	1996	12	80	4.25	0	0	0
31205	1996	12	80	11.24	0	0	0
31207	1996	12	95	17.48	0	0	0.52
31209	1996	12	80	38.45	0	0	0
30703	1997	2	48	42.46	0	0	0
30705	1997	2	48	57.4	0.04	56.62	0
30707	1997	2	58	29.39	0.02	6.29	0
30709	1997	2	75	13.5	0.04	37.74	5.24
30801	1997	2	21	66.5	0	0	0
30803	1997	2	46	95.59	0	0	0.25
30805	1997	2	60	42.99	0.02	25.16	22.02
30807	1997	2	70	33.7	0.02	289.38	0.41
30809	1997	2	73	26.2	0.08	61.34	0.16
30901	1997	2	30	98.56	0	0	4.4
30903	1997	2	53	65.4	0	0	62.91
30905	1997	2	66	46.89	0.04	8.39	6.29
30907	1997	2	76	28.31	0.04	28.31	5.59
30909	1997	2	82	56.92	0.02	91.22	0
31003	1997	2	23	72.48	0	0	1.35
31005	1997	2	74	29.58	0.05	14.68	2.7
31007	1997	2	84	40.74	0.06	12.58	4.4
31009	1997	2	83	85.95	0.01	72.34	3.83
31104	1997	2	74	100.4	0.02	18.87	13.28
31107	1997	2	79	30.74	0.02	69.2	8.01

31109	1997	2	82	32.3	0.03	15.73	13.84
31203	1997	2	83	8.41	0	0	0
31205	1997	2	80	5.9	0.08	0	0
31207	1997	2	94	2.94	0	0	12.58
31209	1997	2	84	15.73	0.03	25.16	20.45
30801	1997	4	15	233.6	0	0	0
30803	1997	4	47	25.16	0.13	20.45	3.39
30805	1997	4	60	78.53	0	0	0
30807	1997	4	70	53.92	0	0	0
30809	1997	4	75	53.35	0.01	62.91	1.89
30901	1997	4	25	63.66	0	0	0
30903	1997	4	46	51.42	0.02	12.58	0
30905	1997	4	70	27.41	0	0	0
30907	1997	4	80	26.58	0.02	37.74	1.05
30909	1997	4	82	23.4	0.02	81.78	0
31003	1997	4	20	143.12	0	0	0
31005	1997	4	70	31.54	0	0	0
31007	1997	4	82	18.41	0	0	0
31009	1997	4	82	14.96	0.13	22.02	0
31104	1997	4	72	2.97	0	0	0
31107	1997	4	90	9.3	0.05	18.87	2.1
31109	1997	4	80	15.1	0	0	0
31203	1997	4	82	4.91	0.2	0	0
31205	1997	4	79	13.22	0	0	0
31207	1997	4	95	5.63	0	0	0
31209	1997	4	85	19.39	0	0	0
30801	1997	6	25	288.12	0	0	0
30803	1997	6	40	78.48	0	0	0
30805	1997	6	55	42.89	0.02	0	0
30807	1997	6	70	50.96	0	0	0
30809	1997	6	75	206.34	0	0	0
30901	1997	6	25	61.4	0	0	0
30903	1997	6	50	24.91	0	0	0
30905	1997	6	65	14.71	0	0	0
30907	1997	6	75	8.39	0.06	0	0
30909	1997	6	80	83.04	0	0	0
31003	1997	6	20	297.87	0	0	1.98
31005	1997	6	70	105.51	0	0	7.43
31007	1997	6	80	55.91	0.02	166.71	6.29
31009	1997	6	80	64.4	0.07	16.78	0
31104	1997	6	75	62.49	0	0	0
31107	1997	6	80	58.5	0.02	110.09	0
31109	1997	6	90	63.96	0.03	6.29	0
31203	1997	6	80	46.47	0.02	0	0
31205	1997	6	75	95.87	0	0	3.77
31207	1997	6	55	63.59	0.17	246.18	1.13
31209	1997	6	80	133.6	0.03	4.89	51.23
30705	1997	8	50	20	0	0	0
30707	1997	8	55	8.92	0.16	128.96	0
30709	1997	8	74	24.57	0.26	78.63	0.08
30801	1997	8	22	24.31	0	0	0
30803	1997	8	43	21.94	0.13	234.86	0
30805	1997	8	60	38.06	0.45	37.74	0
30807	1997	8	71	32.96	0.22	58.07	0
30809	1997	8	81	34.09	0.2	27.41	0
30901	1997	8	28	16.4	0	0	0
30903	1997	8	52	14.76	0.15	159.37	0
30905	1997	8	65	37.36	0.08	109.46	0
30907	1997	8	77	37.42	0.05	78.63	0
30909	1997	8	83	26.91	0.19	66.34	0
31003	1997	8	25	117.26	0	0	0
31005	1997	8	72	34.25	0.26	12.58	0.39
31007	1997	8	86	20.92	0.2	14.68	0
31009	1997	8	85	26.57	0.25	11.23	0
31107	1997	8	91	38.92	0.28	16.1	1.38
31109	1997	8	81	35.1	0.06	47.18	0.84
31203	1997	8	82	47.1	0.09	46.83	2.72
31205	1997	8	78	52.58	0	0	2.36
31207	1997	8	97	26.85	0.11	29.66	0.76
31209	1997	8	87	41.14	0.03	31.45	8.81
30703	1997	10	55	24.59	0	0	0.2
30705	1997	10	43	12	0	0	0
30707	1997	10	50	28.43	0.42	57.46	0.28
30709	1997	10	70	12.94	0.52	31.98	0
30801	1997	10	12	14.68	0.22	25.16	0
30803	1997	10	41	11.51	0	0	0
30805	1997	10	53	25.88	0.32	25.16	0
30807	1997	10	65	9.58	0.7	29.17	0.37
30809	1997	10	75	5.87	0.09	56.62	0
30901	1997	10	30	15.31	0	0	0

30903	1997	10	45	6.29	0.14	44.04	0
30905	1997	10	60	13.94	0.33	26.06	0
30907	1997	10	75	17.78	0.65	18.87	0
30909	1997	10	80	16.75	0.35	19.4	0.17
31003	1997	10	22	122.38	0	0	0
31005	1997	10	70	9.98	0.17	58.71	0
31007	1997	10	80	6.29	0.47	73.39	0.27
31009	1997	10	80	8.73	0.4	29.66	5.34
31104	1997	10	76	10.51	0.05	157.27	0
31107	1997	10	78	34.2	0.16	39.46	0.27
31109	1997	10	80	25.87	0.27	22.47	1.38
31203	1997	10	80	22.18	0	0	0.37
31205	1997	10	75	22.98	0.14	35.65	0.19
31207	1997	10	92	6.43	0.8	6.29	3.67
31209	1997	10	80	13.29	0.34	20.97	0.84
30703	1997	12	45	23.91	0	0	0
30705	1997	12	43	9.07	0.51	36.49	0
30707	1997	12	53	17.69	0.8	6.29	0
30709	1997	12	70	25.97	0.41	10.93	0.95
30801	1997	12	20	23.28	0	0	0
30803	1997	12	40	11.8	0.17	59.76	0
30805	1997	12	55	19.79	0.18	54.1	0
30807	1997	12	68	55.6	0.13	28.83	0.23
30809	1997	12	75	37.83	0.29	10.19	0
30901	1997	12	27	52.19	0.17	65	0
30903	1997	12	45	8.67	0.3	16.78	0
30905	1997	12	60	9.75	0.2	33.55	0
30907	1997	12	75	28.94	0.27	10.9	1.21
30909	1997	12	75	30.53	0.22	25.65	0
31003	1997	12	25	13.34	0	0	0
31005	1997	12	72	9.26	0.18	79.68	0
31007	1997	12	86	15.21	0.09	41.94	0
31009	1997	12	85	8.81	0.74	14.83	0.57
31104	1997	12	65	11.42	0	0	0
31107	1997	12	70	16.54	0.07	53.47	0
31109	1997	12	85	17.24	0.35	11.61	1.83
31203	1997	12	80	24.22	0	0	0
31205	1997	12	75	20.38	0	0	0
31207	1997	12	95	13.71	0	0	0
31209	1997	12	80	18.56	0.08	121.62	0
30703	1998	2	57	26.93	0	0	0.7
30705	1998	2	48	86.37	0	0	0
30707	1998	2	54	170.32	0	0	0
30709	1998	2	74	2.3	0	0	0
30801	1998	2	12	1041.65	0	0	0
30803	1998	2	42	98.26	0	0	0.57
30805	1998	2	60	110.82	0	0	8.39
30807	1998	2	74	2.13	0	0	0
30809	1998	2	80	14.7	0	0	12.58
30901	1998	2	22	152.41	0	0	13.34
30903	1998	2	50	58.13	0	0	0.48
30905	1998	2	65	33.78	0	0	0.1
30907	1998	2	75	27.68	0	0	0
30909	1998	2	82	17.49	0	0	0
31003	1998	2	25	45.55	0	0	0
31005	1998	2	74	11.39	0	0	0
31007	1998	2	93	12.18	0	0	6.29
31009	1998	2	93	16.5	0	0	7.55
31104	1998	2	75	NaN	NaN	NaN	NaN
31107	1998	2	75	9.23	0	0	0
31109	1998	2	82	17.26	0	0	3.15
31203	1998	2	82	3.22	0	0	4.72
31205	1998	2	80	3.7	0	0	2.29
31207	1998	2	95	6.09	0	0	15.73
31209	1998	2	85	6.88	0	0	4.94
30703	1998	4	55	222.69	0	0	0
30705	1998	4	48	91.74	0.08	0	0
30707	1998	4	55	56.39	0	0	0
30709	1998	4	72	159.72	0	0	0
30801	1998	4	15	639.98	0	0	0
30803	1998	4	42	66.2	0.1	0	0
30805	1998	4	60	59.66	0.17	0	0
30807	1998	4	70	63.09	0	0	141.78
30809	1998	4	75	92.43	0	0	19.37
30901	1998	4	40	368.64	0	0	19.57
30903	1998	4	50	137.77	0	0	0
30905	1998	4	70	75.4	0	0	30.2
30907	1998	4	77	63.72	0	0	5.5
30909	1998	4	80	184.4	0	0	6.29
31003	1998	4	22	85.21	0	0	6.29

31005	1998	4	72	34.42	0	0	0
31007	1998	4	82	92.6	0.03	12.58	6.29
31009	1998	4	82	83.85	0.09	4.72	4.19
31104	1998	4	75	6.88	0	0	0
31107	1998	4	80	49.23	0	0	0
31109	1998	4	82	133.79	0.01	69.2	4.58
31203	1998	4	80	13.05	0	0	0
31205	1998	4	77	37.66	0	0	429.35
31207	1998	4	85	40.34	0	0	9.23
31209	1998	4	85	25.98	0.09	18.87	6.29
30703	1998	6	50	92.6	0.01	50.33	18.87
30705	1998	6	45	160.62	0	0	0
30707	1998	6	52	100.89	0	0	0
30709	1998	6	72	104.15	0	0	0
30801	1998	6	20	241.88	0	0	0
30803	1998	6	44	81.21	0	0	70.77
30805	1998	6	60	55.46	0	0	37.74
30807	1998	6	68	312.78	0	0	44.04
30809	1998	6	78	146.95	0	0	0
30901	1998	6	19	NaN	NaN	NaN	NaN
30903	1998	6	50	16.61	0	0	0
30905	1998	6	65	70.75	0	0	0
30907	1998	6	75	76.92	0	0	27.68
30909	1998	6	80	138.08	0.01	53.47	5.55
31003	1998	6	20	277.74	0	0	6.29
31005	1998	6	77	125.33	0	0	0
31007	1998	6	85	102.72	0	0	0
31009	1998	6	84	102.38	0	0	3.77
31104	1998	6	75	68.7	0.02	41.94	2.52
31107	1998	6	75	51.5	0.03	12.58	82.83
31109	1998	6	84	58.04	0.07	2.8	40.89
31203	1998	6	80	27.13	0.04	40.89	16.45
31205	1998	6	75	36.4	0.07	6.29	18.87
31207	1998	6	95	1.46	16.3	0.22	31.45
31209	1998	6	85	0.74	27.05	0.73	0
30703	1998	8	48	40.76	0	0	0
30705	1998	8	45	23.49	0	0	0
30707	1998	8	52	23.11	0.1	115.33	1.14
30709	1998	8	71	32.07	0.33	33.77	3.39
30803	1998	8	30	33.97	0.08	169.85	1.86
30805	1998	8	60	9.96	0	0	1.35
30807	1998	8	70	60.93	0.04	173	0.74
30809	1998	8	78	38.15	0.09	13.48	1.68
30901	1998	8	20	74.86	0	0	0.24
30903	1998	8	48	1.7	0	0	6.29
30905	1998	8	60	3.15	0	0	0
30907	1998	8	75	14.26	0	0	1.31
30909	1998	8	80	23.28	0.15	58.41	0.39
31003	1998	8	20	8.18	0	0	0
31005	1998	8	72	14.68	0.22	31.45	1.68
31007	1998	8	83	23.65	0.42	7.19	1.05
31009	1998	8	80	14.47	0.1	69.2	5.72
31104	1998	8	73	15.6	0.14	33.03	4.49
31107	1998	8	75	49.57	0.03	132.11	1.7
31109	1998	8	80	40.89	0.02	122.67	2.42
31203	1998	8	84	173.52	0.17	12.28	3.89
31205	1998	8	78	26.05	0.08	42.46	3.73
31207	1998	8	95	23.04	0.04	144.69	3.01
31209	1998	8	85	42.78	0.16	16.36	5.81
30703	1998	10	50	474.58	0	0	0.23
30705	1998	10	45	830.8	0.01	251.63	0.82
30707	1998	10	50	1213.87	0.01	127.91	0
30803	1998	10	40	577.65	0	0	0
30805	1998	10	60	680.14	0.06	32.96	0
30807	1998	10	70	642.92	0	0	0.5
30809	1998	10	77	537.66	0	0	0
30901	1998	10	20	1506.96	0	0	0
30903	1998	10	48	514.67	0	0	0
30905	1998	10	65	NaN	NaN	NaN	NaN
30907	1998	10	75	185.2	0.02	169.85	0
30909	1998	10	80	88.86	0.06	36.03	0.5
31003	1998	10	22	NaN	NaN	NaN	NaN
31005	1998	10	70	179.83	0.13	60.08	0.99
31007	1998	10	80	556.74	0.01	188.09	0.21
31009	1998	10	80	215.7	0.07	52.88	0.8
31104	1998	10	74	NaN	NaN	NaN	NaN
31107	1998	10	80	430.05	0.02	116.38	0
31109	1998	10	80	200.13	0	0	0
31203	1998	10	85	130.11	0.06	31.45	0.63
31205	1998	10	70	NaN	NaN	NaN	NaN

31207	1998	10	95	0.53	11.8	0	0
31209	1998	10	84	NaN	NaN	NaN	NaN
30703	1998	12	50	74.11	0.15	56.62	0
30705	1998	12	45	307.97	0	0	0
30707	1998	12	55	375.16	0.03	43.64	0
30709	1998	12	74	134.83	0.43	15.67	0
30801	1998	12	12	474.95	0.35	25.29	0
30803	1998	12	40	301.8	0.19	9.49	0
30805	1998	12	57	128.35	0.08	45.38	0
30807	1998	12	70	210.56	0.14	31.22	0
30809	1998	12	78	168.24	0.33	29.05	0
30901	1998	12	18	263.86	0.22	18.87	0
30903	1998	12	55	108.54	0.07	18.3	0
30905	1998	12	65	246.41	0.08	31.26	0
30907	1998	12	75	314.2	0.07	29.6	0
30909	1998	12	80	304	0.12	10.02	0
31003	1998	12	22	44.61	0	NaN	0
31005	1998	12	70	3.59	3.77	10.48	0
31007	1998	12	78	2.9	12.76	3.1	0
31009	1998	12	82	7.52	7.64	5.18	0
31104	1998	12	73	80.66	0.05	62.91	0
31107	1998	12	70	61.56	0.34	23.97	0
31109	1998	12	85	134.99	0.14	8.34	0
31203	1998	12	80	41.76	0.17	9.44	0
31205	1998	12	77	36.36	0	0	0
31207	1998	12	95	1.72	0	0	0
31209	1998	12	84	0.9	0	0	0
30703	1999	2	50	41.65	0	0	0
30705	1999	2	50	21.77	0	0	0
30707	1999	2	55	34.66	0.04	84.93	0
30709	1999	2	75	4.28	0	0	0
30801	1999	2	14	186.48	0	0	0
30803	1999	2	40	74.86	0.08	47.18	0.14
30805	1999	2	60	25.27	0.05	28.31	0
30807	1999	2	70	16.45	0.07	50.33	0
30809	1999	2	75	4.03	0	0	0
30901	1999	2	20	238.74	0.07	58.19	0.09
30903	1999	2	50	84.42	0.03	79.68	0.17
30905	1999	2	65	45.49	0.07	12.58	0
30907	1999	2	75	18.79	0.2	19.77	0
30909	1999	2	80	54.1	0.1	18.87	0.19
31003	1999	2	20	293.15	0	0	0.63
31005	1999	2	70	34.06	0.03	34.6	0.57
31007	1999	2	80	24.93	0.02	106.94	0.37
31009	1999	2	80	50.25	0	0	0
31105	1999	2	78	5.65	0.18	9.44	2.1
31107	1999	2	74	22.36	0	0	0.79
31109	1999	2	80	26.34	0.04	56.62	0
31203	1999	2	80	6.45	0.31	3.15	3.15
31205	1999	2	80	10.14	0.1	15.73	2.52
31207	1999	2	95	6.49	0	0	0
31209	1999	2	85	23.46	0	0	1.57
30703	1999	4	50	171.99	0	0	0
30705	1999	4	50	50.7	0.09	12.58	0
30707	1999	4	55	59.82	0	0	0
30709	1999	4	75	17.03	0.06	37.74	0
30801	1999	4	15	87.65	0	0	0
30803	1999	4	45	35.23	0	0	0
30805	1999	4	65	39.97	0	0	0
30807	1999	4	70	13.57	0.21	18.87	0
30809	1999	4	80	18.48	0.13	39	0.61
30901	1999	4	25	50.07	0.35	0	0
30903	1999	4	50	37.37	0.06	0	0
30905	1999	4	65	63.88	0.02	6.29	6.29
30907	1999	4	75	11.32	0.14	20.97	1.26
30909	1999	4	80	7.23	0.27	37.74	0
31003	1999	4	20	142.8	0	0	0
31005	1999	4	70	70.1	0	0	0
31007	1999	4	85	11.62	0.08	122.67	0
31009	1999	4	85	7.55	0.25	26.74	20.72
31105	1999	4	75	12.67	0	0	6.29
31107	1999	4	80	9.99	0	0	11.32
31109	1999	4	85	7.25	0.06	75.49	9.96
31203	1999	4	80	10.77	0	0	11.01
31205	1999	4	80	11.87	0.08	0	0
31207	1999	4	95	14.44	0	0	0
31209	1999	4	85	13.54	0.03	56.62	4.19
30703	1999	6	55	117.35	0	0	0
30705	1999	6	45	1092.64	0	0	0
30707	1999	6	55	988.68	0	0	0

30709	1999	6	70	506.41	0	0	0
30801	1999	6	15	99.81	0	0	0
30803	1999	6	40	228.36	0	0	0
30805	1999	6	60	519.2	0.01	0	0
30807	1999	6	70	142.53	0	0	15.73
30809	1999	6	80	121.73	0.01	25.16	3.15
30901	1999	6	20	191.87	0	0	0
30903	1999	6	50	65.17	0	0	0
30905	1999	6	65	207.98	0	0	0
30907	1999	6	75	162.81	0.01	40.89	0
30909	1999	6	80	119.29	0.02	17.3	54.33
31003	1999	6	20	231.19	0	0	0
31005	1999	6	70	101.82	0.08	8.39	3.15
31007	1999	6	85	109.09	0.02	36.17	10.67
31009	1999	6	85	111.53	0.03	18.87	14.98
31105	1999	6	75	38.16	0.03	12.58	7.86
31107	1999	6	80	34.28	0.01	0	0
31109	1999	6	80	30.75	0.06	34.6	8.86
31203	1999	6	80	19.89	0.2	2.36	408.9
31205	1999	6	75	161.88	0.03	14.94	6.29
31207	1999	6	95	51.39	0.06	11.8	9.65
31209	1999	6	85	24.42	0.13	1.8	31.45
30703	1999	8	55	5.72	0	0	0
30705	1999	8	45	15.1	0.29	67.94	0
30707	1999	8	50	36.36	0.3	48.98	0
30709	1999	8	74	31.37	0.32	20.86	0
30801	1999	8	20	5.35	1.48	106.94	0
30803	1999	8	45	7.97	0.33	182.43	0
30805	1999	8	60	38.79	0.44	8.71	0
30807	1999	8	70	16.99	0.4	27.78	0
30809	1999	8	80	24.69	0.36	30.75	0.07
30901	1999	8	20	23.59	0	0	0
30903	1999	8	50	33.72	0.12	161.04	0
30905	1999	8	65	28.55	0.26	41.41	0.16
30907	1999	8	75	17.95	0.03	239.05	0.33
30909	1999	8	80	23.2	0.15	33.25	1.36
31003	1999	8	25	86.06	0	0	0.79
31005	1999	8	70	50.51	0.24	18.57	7.51
31007	1999	8	85	26.79	0.09	79.26	9.89
31009	1999	8	80	30.27	0.08	104.43	2.96
31105	1999	8	75	80.35	0	0	1.89
31107	1999	8	80	48.2	0.09	69.2	8.01
31109	1999	8	80	29.96	0.07	66.05	5.69
31203	1999	8	80	34.05	0.16	20.02	3.24
31205	1999	8	75	60.98	0.09	39	2.44
31207	1999	8	95	18.87	0.46	8.69	8.03
31209	1999	8	85	55.88	0.08	42.78	2.68
30703	1999	10	75	5.54	0	0	0
30705	1999	10	50	17.49	0	0	0
30707	1999	10	55	39	0.24	45.49	0
30709	1999	10	75	27.09	0.45	35.01	2.02
30801	1999	10	20	357	0	0	0
30803	1999	10	50	36.49	0.3	41.79	0
30805	1999	10	60	128.54	0.03	98.56	0
30807	1999	10	70	29.39	0.19	38.37	0
30809	1999	10	80	12.5	0.36	39.14	1.57
30901	1999	10	20	245.97	0	0	0
30903	1999	10	54	38.56	0	0	0
30905	1999	10	70	10.25	0.44	40.1	0
30907	1999	10	80	13.21	0.3	18.09	5.74
30909	1999	10	85	78.67	0	0	0.18
31003	1999	10	25	26.67	0.06	106.94	1.48
31005	1999	10	75	8.22	1.28	8.49	5.59
31007	1999	10	90	22.79	0.19	34.6	8.24
31009	1999	10	90	13.98	0.28	26.56	10.6
31105	1999	10	75	8.22	0.13	132.11	2.7
31107	1999	10	80	12.03	0.16	26.74	0
31109	1999	10	80	15.57	0.48	12.58	32.29
31203	1999	10	80	25.95	0.13	36.85	1.69
31205	1999	10	75	15.01	0.07	28.31	6.29
31207	1999	10	95	23.04	0.14	13.37	5.18
31209	1999	10	85	17.61	0.16	10.48	5.03
30703	1999	12	50	6.92	0	0	0.06
30705	1999	12	50	20.26	0	0	0.06
30707	1999	12	55	33.15	0.69	18.89	0.07
30709	1999	12	75	6.12	0.21	80.21	0.02
30901	1999	12	20	290.51	0.54	3.54	1.98
30903	1999	12	55	18.15	0.13	37.74	0.51
30905	1999	12	65	20.34	0.25	0	0
30907	1999	12	75	14.62	1.79	2.39	0

30909	1999	12	80	25.52	0.12	40.1	0.02
31105	1999	12	78	9.36	0	0	0.08
31203	1999	12	80	17.75	0	0	0.34
31205	1999	12	75	11.58	0	0	1.68
31207	1999	12	95	9.35	0	0	18.87
31209	1999	12	85	11.8	0	0	3.68
31203	2000	2	82	4.50	0.00	0.00	0.02
31205	2000	2	75	4.03	1.53	0.00	0.03
31207	2000	2	95	4.68	0.00	0.12	0.01
31209	2000	2	85	2.84	0.00	0.30	0.07
31203	2000	4	68	28.31	0.23	1.64	0.01
31205	2000	4	105	10.01	0.00	0.20	0.11
31207	2000	4	95	9.23	0.12	0.36	0.01
31209	2000	4	82	19.62	0.16	0.64	0.15
31203	2000	6	80	314.38	18.56	1.65	1.65
31205	2000	6	80	248.49	11.80	1.65	1.65
31207	2000	6	95	339.17	5.96	1.19	1.19
31209	2000	6	85	1301.01	56.91	2.96	5.99
31203	2000	8	81	69.63	0.00	2.31	0.00
31205	2000	8	78	53.27	0.00	4.88	1.56
31207	2000	8	98	33.03	0.17	1.52	0.25
31209	2000	8	85	48.64	0.00	2.52	0.55
31203	2000	10	80	30.76	0.00	3.55	0.09
31205	2000	10	77	54.55	1.09	1.46	0.08
31207	2000	10	94	25.10	0.25	0.98	0.03
31209	2000	10	82	32.27	1.10	4.96	0.87
31203	2000	12	85	4.97	0.00	0.00	3.10
31205	2000	12	83	11.49	0.00	0.61	5.72
31207	2000	12	95	15.32	0.12	1.05	15.00
31209	2000	12	85	33.16	0.44	1.90	12.42
31105	2000	2	80	7.78	0.00	0.84	0.78
31107	2000	2	90	5.07	0.00	1.20	0.31
31109	2000	2	85	10.63	0.00	1.35	0.05
31105	2000	4	74	19.95	0.00	1.18	0.03
31107	2000	4	91	15.55	0.39	0.78	0.18
31109	2000	4	82	31.05	0.64	1.13	0.04
31105	2000	6	76	483.15	5.63	5.63	11.26
31107	2000	6	90	893.36	57.46	8.04	21.39
31109	2000	6	82	1467.14	33.76	3.22	3.22
31105	2000	8	75	32.56	0.18	2.56	0.07
31107	2000	8	90	87.52	0.25	4.07	0.29
31109	2000	8	80	54.32	1.95	3.25	2.38
31105	2000	10	74	34.20	0.00	7.79	0.09
31107	2000	10	91	28.55	0.22	2.02	0.30
31109	2000	10	81	12.04	0.16	2.64	0.02
31105	2000	12	82	13.03	0.15	4.86	2.58
31107	2000	12	90	21.23	0.52	5.08	1.76
31109	2000	12	85	28.92	2.63	5.51	38.31
31003	2000	2	20	121.70	2.71	16.23	2.71
31005	2000	2	70	9.49	0.00	2.87	0.22
31007	2000	2	80	10.31	0.00	1.86	0.10
31009	2000	2	85	16.32	0.15	2.09	0.35
31003	2000	4	25	171.34	0.00	1.74	0.45
31005	2000	4	72	13.15	0.42	1.88	0.02
31007	2000	4	81	34.29	1.65	3.30	0.03
31009	2000	4	81	106.34	1.32	3.30	0.33
31003	2000	6	22	5654.28	89.50	223.61	22.30
31005	2000	6	70	732.88	22.11	8.81	26.51
31007	2000	6	83	1301.66	114.60	34.56	7.88
31009	2000	6	85	1067.44	31.45	29.97	10.51
31003	2000	8	23	288.77	2.98	16.47	0.00
31005	2000	8	72	33.52	1.65	4.21	0.00
31007	2000	8	82	78.07	0.00	5.35	0.08
31009	2000	8	83	29.92	0.89	2.94	0.25
31003	2000	10	20	154.75	2.48	19.97	0.00
31005	2000	10	70	63.17	0.00	4.48	0.00
31007	2000	10	82	36.30	1.36	5.42	0.68
31009	2000	10	82	32.34	0.48	5.95	0.06
31003	2000	12	25	55.71	0.00	15.20	0.00
31005	2000	12	72	30.71	3.14	7.51	11.94
31007	2000	12	83	13.94	2.14	3.68	0.00
31009	2000	12	85	28.92	2.63	5.51	38.31
30901	2000	2	21	58.86	0.00	4.91	0.00
30903	2000	2	50	34.18	0.43	1.30	0.00
30905	2000	2	65	8.96	0.51	1.79	0.25
30907	2000	2	75	7.11	0.39	1.73	0.00
30909	2000	2	80	35.66	0.34	0.84	0.34
30901	2000	4	18	113.51	0.00	0.00	0.00
30903	2000	4	50	85.67	0.43	0.43	0.87
30905	2000	4	76	94.58	2.06	0.74	0.20

30907	2000	4	77	40.50	1.27	0.92	0.37
30909	2000	4	79	95.15	0.87	1.56	1.04
30901	2000	6	22	536.43	0.00	22.30	0.00
30903	2000	6	50	523.52	4.28	8.68	0.00
30905	2000	6	64	261.46	5.31	2.65	0.00
30907	2000	6	75	1040.33	13.42	11.58	0.00
30909	2000	6	80	424.24	5.03	38.85	6.76
30901	2000	8	20	27.71	1.38	11.07	0.00
30903	2000	8	50	37.62	0.38	7.93	0.00
30905	2000	8	65	40.98	0.23	12.65	0.00
30907	2000	8	75	48.84	0.91	8.23	0.00
30909	2000	8	80	54.75	1.56	13.37	0.00
30901	2000	10	19	140.81	0.00	62.91	0.00
30903	2000	10	49	18.14	0.69	16.05	0.00
30905	2000	10	63	29.90	0.00	10.74	0.00
30907	2000	10	74	56.57	0.31	3.48	0.00
30909	2000	10	80	16.51	0.57	6.55	0.00
30901	2000	12	24	29.30	1.83	9.15	0.00
30903	2000	12	53	18.03	0.38	3.00	0.00
30905	2000	12	70	56.86	2.16	15.08	3.02
30907	2000	12	80	30.17	2.15	4.29	15.17
30909	2000	12	85	24.91	1.38	3.00	2.49
30801	2000	2	25	58.83	0.00	6.92	0.00
30803	2000	2	45	17.63	0.00	7.48	1.15
30805	2000	2	64	17.69	0.53	2.11	0.56
30807	2000	2	73	14.41	0.41	1.42	0.00
30809	2000	2	80	20.11	0.17	2.03	0.20
30801	2000	4	15	615.37	0.00	4.82	0.00
30803	2000	4	43	177.84	1.17	1.17	12.39
30805	2000	4	58	831.52	1.29	0.64	5.79
30807	2000	4	70	421.64	0.00	0.00	5.74
30809	2000	4	77	65.31	0.18	0.00	2.92
30801	2000	6	20	486.91	0.00	0.00	0.00
30803	2000	6	42	870.68	12.28	6.14	0.00
30805	2000	6	60	1400.23	5.98	9.02	12.06
30807	2000	6	70	1240.63	4.40	2.25	2.25
30809	2000	6	75	940.35	0.00	0.00	0.00
30801	2000	8	18	143.99	2.20	82.44	0.00
30803	2000	8	45	20.33	0.31	14.08	0.00
30805	2000	8	60	37.74	2.99	41.87	0.00
30807	2000	8	70	77.86	3.25	11.27	0.00
30809	2000	8	80	71.61	3.20	11.67	0.00
30801	2000	10	15	123.64	0.00	8.26	0.00
30803	2000	10	42	52.56	0.00	23.13	0.00
30805	2000	10	56	19.51	1.18	10.05	0.00
30807	2000	10	67	13.74	0.00	2.89	0.01
30809	2000	10	78	26.14	0.35	3.38	0.03
30801	2000	12	20	29.03	0.00	2.64	0.00
30803	2000	12	45	21.36	0.00	0.52	0.00
30805	2000	12	60	24.33	0.00	7.04	0.00
30807	2000	12	75	19.89	1.88	6.19	4.92
30809	2000	12	80	15.99	1.65	5.77	0.00
30703	2000	2	58	32.80	0.00	1.61	0.00
30705	2000	2	53	13.48	0.00	3.47	0.01
30707	2000	2	59	18.96	0.00	0.62	0.01
30709	2000	2	76	4.87	0.19	4.30	0.19
30703	2000	4	62	92.58	0.84	0.28	0.31
30705	2000	4	47	368.24	0.98	4.40	0.51
30707	2000	4	54	175.45	1.85	2.60	1.48
30709	2000	4	73	71.85	0.00	0.61	0.81
30703	2000	6	58	842.42	0.00	16.05	3.25
30705	2000	6	51	261.99	0.00	0.00	0.00
30707	2000	6	55	2524.55	7.21	0.00	0.00
30709	2000	6	75	688.46	1.93	0.00	0.00
30703	2000	8	45	7.19	0.00	4.04	0.00
30705	2000	8	47	18.63	1.43	28.67	0.00
30707	2000	8	54	25.61	1.50	9.04	0.00
30709	2000	8	75	23.98	0.68	9.45	0.00
30703	2000	10	66	77.47	0.43	17.88	0.00
30705	2000	10	45	35.30	1.06	9.62	0.00
30707	2000	10	51	47.00	0.42	15.80	0.00
30709	2000	10	72	22.11	0.84	6.47	0.00
30703	2000	12	54	26.06	0.00	1.08	0.98
30705	2000	12	51	13.38	0.00	16.64	2.07
30707	2000	12	59	25.46	0.00	6.67	0.00
30709	2000	12	75	8.63	0.00	15.20	19.70

ıeans "no sample".

The HABs data

Table 6. Total 70cases of HAB events in the Yellow Sea during 1984-2005.
data period : 1984 to 2005

Time		Area	Detail area	Scale/shape	HABs Species	Density (cells/ml)
1984	July-Aug.	Incheon	Incheon~Palmido	W: 20~30m, L: 100's m /belt shape	*Noctiluca scintillans*	
1986	July 6-10	Incheon	Incheon~Palmido, dealjeokdo west 30miles	radus 3 miles, W:1~3m/belt shape	*Noctiluca scintillans*	380~10,000
1987	July 6-9	Chungnum	Pyugtak	W: 1km, L: 8km	*Noctiluca scintillans*	
1988	Aug. 11-17	Incheon	Palmido	W: 1~2m, L:1km	*Noctiluca scintillans*	27,200~76,100
1988	Aug. 23-25	Incheon	Banwol Mean	W: 20~30m, L: 2~3m/belt shape	*Noctiluca scintillans*	36940~53880
1990	July 20-21	Incheon	Ongjin Kun	5~10ha	*Mesodinium rubrum*	
1990	July-Aug.	Incheon	Palmido	W: 2~4m, L:1km /sporadically	*Mesodinium rubrum*	
1990	July	Cungnam	Daecheon		*Mesodinium rubrum*	
1990	Aug. 16	Incheon	Wooldo-Sungakdo		*Noctiluca scintillans*	
1991	May-June	Incheon	Incheon 6, 7, 8 Port		*Noctiluca scintillans,*	8,000~10,000
1993	June 13-18	Cungnam	Chensooman	W:1~5m, L: 30~1500m	*Noctiluca scintillans, Dinophysis acuminata*	40~4,066, 60~100
1994	June 4-10	Cungnam	Checheomeon	small scale	*Mesodinium rubrum*	1,360~2,135
1994	July 6-15	Cungnam	Checheomeon		*Mesodinium rubrum*	5,975~49,000
1995	May-June	Cheonbuk	Kunsan		*Mesodinium rubrum*	6,950~8,650
1995	July 18-19	Cungnam	Chunsooman	radus 30~40m/belt shape	*Noctiluca scintillans*	50~300
1995	July-Aug.	Incheon	Incheon	W: 200~400m	*Mesodinium rubrum*	6,650~11,450
1995	Sep. 19-23	Incheon	Kyunggido		*Prorocentrum minimum*	20,000
1995	Sep.-Oct.	Incheon	Kyunggido deokjeokdo	partial	*Noctiluca scintillans*	3,150~4,100
1996	May 13-17	Cheonbuk	Kunsan	radus 1.5km	*Chroomonas salina*	2,000
1996	June 12-14	Cungnam	Seocheon	W 10~500m , belt shape	*Noctiluca scintillans*	1,500~2,500
1996	July 9-29	Cungnam	Chunsooman~Boryung	big scale	*Chroomonas salina, Skeletonema costatum, Noctiluca scintillans, Mesodinium rubrum*	1,900~17,750
1996	July 18-19	Cungnam	Seacheon	W: 50~200m, L: 3km, belt shpe		
1997	May 16-19	Cungnam	Boryung		*Noctiluca scintillans*	500~1,800
1997	June 16-17	Cungnam	Boryung		*Noctiluca scintillans*	500~1,500
1997	July-Aug.	Incheon	Incheon, Weolmido-Palmido		*Mesodinium rubrum*	5,770
1998	May 6-8	Cheonbuk	Kunsan	radus: 300~500m	*Noctiluca scintillans*	150~300
1998	June 8-12	Cungnam	boryung	L: 20~1,000m, W: 5~500m	*Noctiluca scintillans*	100~1,500
1998	July 3-10	Cungnam	Chunsooman and Boryung	500~1500m, oval shape	*Ceratium sp. Noctiluca scintillans*	100~1,500
1998	July 7-16	Cungnam	Chunsooman		*Skeletonema costatum*	
1998	Aug. 19-21	Cungnam	Chunsooman		*Skeletonema costatum, Chaetoceros sp.* 등	8,500~32,000
1998	Oct. 8-12	Cheonbuk	Kunsan Sangwangdungdo		*Noctiluca scintillans*	500~800
1998	Oct. 11-13	Cungnam	Taeangun waedo~naepasoodo		*Coscinodiscus gigas, Guinarda flaccida*	20~500
1998	Oct. 16-22	Cungnam	Beainman		*Microcystis sp.*	1,500~24,750
1998	Oct.-Nov.	Cheonbuk	Kunsan		***Skeletonema costatum, Cochlodinium polykrikoides***	5,000~8,000
1998	Nov. 1-5	Cungnam	Gayeedo and Anmeando		***Cochlodinium polykrikoides***	100~3,000
1999	May 1-4	Cheonbuk	Kunsan	radus 150m	*Mesodinium rubrum*	500~800
1999	June 1-5	Cheonbuk	Kunsan	radus 350m	*Heterosigma akashiwo, Heterocapsa triquetra*	18,000, 2,000
1999	July 5-7	Cheonnam	Pukseongpo	radus 5m	*Noctiluca scintillans*	420~1,100
1999	Aug. 8-10	Cungnam	Asanman	L: 2~3m, W: 500m	*Mesodinium rubrum*	4,496~4,537
1999	Aug. 11-13	Cungnam	Cheonsooman		*Chaetoceros* sp., *Thalassiosira decipiens, Skeletonema costatum*	2,500~25,000
1999	Sep. 14-27	Cheonbuk	Kunsan Sipyeedongpado~Kogusangundo	W: 100m belt shape	*Gyrodinium* sp.	1,000~2,500
1999	Aug.-Nov.	Cheonbuk	Kunsan	partially scattered	***Cochlodinium polykrikoides, Skeletonema costatum, Ceratium*** sp.	1,500~1,700
1999	Oct. -Nov.	Cungnam	Beinman, Gaeyado		***Cochlodinium polykrikoides, Skeletonema costatum, Ceratium*** sp.	200~3,500
2000	Mar. 1-3	Cheonbuk	Kunsan	radus 500m scatterd	*Skeletonema costatum, Pseudonitzschia pungens*	10,000~13,000, 3,000~4,000
2000	May 1-4	Cheonbuk	Kumgang estuary	partially scattered	*Eutrepticella gymnastica, Mesodinium rubrum*	2,000~75,000, 1,000~1,500
2000	June 21-23	Cheonbuk	Heekdo	Heokdo, radus about 3km	*Noctiluca scintillans*	5,000~10,000

2000	June-July	Cungnam	Cheonsooman	1~2km, band shape	*Prorocentrum minimum, Ceratium fusus*	2,500~3,000, 2,500~3,000
2000	July 3-10	Cungnam	Boryung	port	*Ceratium sp. Noctiluca scintillans, Dinophysis sp.*	300~600, 80~320, 160~440
2000	July 19-24	Cheonbuk	Kogunsangundo	Ganrido W: 30m, L: 200m band shape	*Noctiluca scintillans*	3,000~5,000
2000	Jyly 19-24	Incheon	Incheon	Muyeedo, radus 5~10km, band shape	*Mesodinium rubrum*	3,000~5,000
2000	Sep. 21-23	Cungnam	Bean man		*Thalassiosira sp. Skeletonema costatum*	950~7,700, 4,900~6,300
2000	Oct. 7-14	Incheon	Incheon	Myyeedo and Palmido, band shape	*Noctiluca scintillans*	
2001	May 21-22	Cheonbuk	Kumgang estuary	small scale	*Heterosigma akashiwo*	1,000~3,000
2001	July 6-10	Cungnam	Boryung		*Mesodinium rubrum*	1,500~12,500
2001	Sep. 1-3	Incheon	Deokjeokgundo	W: 30m L : 2miles	*Noctiluca scintillans*	320~400
2002	June 4-10	Cheonbuk	Kunsan		*Leptocylindrus danicus, Chroomonas salina*	20,000~30,000, 5,000~6,000
2003	July 9-13	Cungnam	Cheonsooman	partially scattered	*Prorocentrum micans*	1,900-10,000
2003	Sep. 16-23	Cungnam	Boryung	nearshore scattered	*Heterosigma akashiwo*	3,000-27,000
2004	Apr. 2	Cheonbuk	kunsan	small scale	*Noctiluca scintillans*	260
2004	June 14	Cheonbuk	Kunsan	radus 3 milese	*Noctiluca scintillans*	280
2004	June 25	Cungnam	Boryung	nearshore scattered	*Prorocentrum minimum*	18,000～31,000
2004	June 27	Incheon	Ansan		*Noctiluca scintillans,Prorocentrum triestium*	6,200
2004	June 27	Cheonbuk	Kunsan	W: 100m, L : 1 mile	*Noctiluca scintillans*	
2004	Aug. 9	Incheon	Incheon	W: 20~50m, L: 300~500m band shape	*Noctilica scintilans*	100~300
2004	Agu. 25	Cheonbuk	Yeondo	small scale	*Leptocylindrus danicus, Prorocentrum minimum,* other flagellates	42～376
2005	May 3-5	Cheonbuk	Kunsan harbor	nearshore scattered	*Noctiluca scintillans*	43
2005	May 14-16	Cheonbuk	Buangun	-	*Alexandrium* sp.	10,000
2005	May 16-26	Cheonbuk	Yeondo	-	*Noctiluca scintillans*	182
2005	June 14-20	Incheon	Kyungin nearshore	wide and band shape	*Nephroselmis* sp. *Thalassiosira* sp. *Skeletonema costatum, Gyrodinium* sp., *Mesodium rubrum*	3,000~30,000, 1,000~5,000, 1,500~3,000
2005	Aug. 22-27	Cheonbuk	Kunsan		*Thalassiosira decipiens, Skeletonema costatum, Eucamphia zodiacus, Coscinodisus gigas, Prorocentrum triestium, Prorocentrum dentatum, Gyrodinium* sp.	560, 720, 180, 380, 580, 280, 180, 940

Table 8. Numbers of species recorded for the phytoplankton classes observed in each transect line for the Sept. 1992 Yellow Sea cruise.

	TRANSECT					
CLASS	A	C	D	E	F	G
BACILLARIOPHYCEAE	124	114	110	136	122	132
DINOPHYCEAE	35	33	38	42	45	57
CHRYSOPHYCEAE	2	2	2	2	2	2
CYANOPHYCEAE	1	1	1	2	2	3
CHLOROPHYCEAE	1		1	1		1
KINETOPHRAGMINOPHORA	1	1	1	1		
SPECIES NUMBER	164	151	153	184	171	195

Table 9. Numbers of species recorded for the phytoplankton classes observed in each station of Transect line - A for the Sept. 1992 Yellow Sea cruise.

	STATION						
CLASS	A1	A2	A3	A4	A5	A6	A7
BACILLARIOPHYCEAE	99	81	71	60	13	13	22
DINOPHYCEAE	24	20	16	14	10	9	9
CHRYSOPHYCEAE	2	2	1				
CYANOPHYCEAE							
CHLOROPHYCEAE					1	1	1
KINETOPHRAGMINOPHORA	1	1					
SPECIES NUMBER	126	104	88	74	24	23	32

Table 10. Numbers of species recorded for the phytoplankton classes observed in each station of Transect line - C for the Sept. 1992 Yellow Sea cruise.

	STATION									
CLASS	C1	C2	C3	C4	C5	C6	C7	C8	C9	C10
BACILLARIOPHYCEAE	72	63	55	43	27	9	5	9	11	19
DINOPHYCEAE	15	10	14	13	7	6	8	5	7	11
CHRYSOPHYCEAE			2	1			1			
CYANOPHYCEAE	1									
CHLOROPHYCEAE						1	1	1	1	1
KINETOPHRAGMINOPHORA										
SPECIES NUMBER	88	73	71	57	34	16	15	15	19	31

Table 11. Numbers of species recorded for the phytoplankton classes observed in each station of Transect line - D for the Sept. 1992 Yellow Sea cruise.

	STATION									
CLASS	D1	D2	D3	D4	D5	D6	D7	D8	D9	D10
BACILLARIOPHYCEAE	53	48	35	13	7	15	12	10	17	30
DINOPHYCEAE	12	17	19	7	10	8	9	9	8	5
CHRYSOPHYCEAE										
CYANOPHYCEAE										
CHLOROPHYCEAE					1	1	1	1	1	
KINETOPHRAGMINOPHORA	1	1	1				1		1	1
SPECIES NUMBER	66	65	53	20	18	25	23	20	27	36

Table 12. Numbers of species recorded for the phytoplankton classes observed in each station of Transect line - E for the Sept. 1992 Yellow Sea cruise.

	STATION										
CLASS	E1	E2	E3	E4	E5	E6	E7	E8	E9	E10	E11
BACILLARIOPHYCEAE	55	56	48	30	20	13	22	22	33	43	37
DINOPHYCEAE	23	23	14	11	18	9	8	10	12	7	2
CHRYSOPHYCEAE	2	2	2	1	1	1	1				
CYANOPHYCEAE	2	2	2								
CHLOROPHYCEAE									1		
KINETOPHRAGMINOPHORA							1				
SPECIES NUMBER	82	83	66	42	38	22	31	32	47	51	40

Table 13. Numbers of species recorded for the phytoplankton classes observed in each station of Transect line - F for the Sept. 1992 Yellow Sea cruise.

	STATION							
CLASS	F3	F4	F5	F6	F7	F8	F9	F10
BACILLARIOPHYCEAE	27	27	26	20	24	55	37	55
DINOPHYCEAE	21	16	11	13	7	9	15	10
CHRYSOPHYCEAE								
CYANOPHYCEAE	1	1	1	1	1	2	2	2
CHLOROPHYCEAE								
KINETOPHRAGMINOPHORA								
SPECIES NUMBER	49	44	38	34	32	67	54	67

Table 15. List of species observed for each transect line for the September 1992 Yellow Sea cruise.

SPECIES \ TRANSECT	A	C	D	E	F	G
BACILLARIOPHYCEAE						
Achnanthes longipes		*				
Actinocyclus octonarius	*	*	*	*	*	*
A. octonarius v. *crassa*	*	*	*			*
A. octonarius v. *tenellus*	*			*	*	*
A. octonarius v. *ralfsii*	*	*	*	*	*	*
Actinocyclus sp.	*	*	*	*	*	*
Actinoptychus senarius	*	*	*	*	*	*
Actinoptychus splendens	*	*	*	*	*	
Amphora sp.	*	*	*	*	*	*
Asterolampra marylandica.					*	
Asterionella glacialis	*	*	*	*	*	
Asterionella kariana	*		*			
Asteromphalus cleveanus	*	*	*	*	*	*
Asteromphalus flabellatus	*	*	*	*	*	*
Asteromphalus heptactis	*	*	*	*	*	*
Asteromphalus pettersoni		*		*	*	*
Bacillaria paxillifer	*	*		*		
Bacteriastrum hyalinum	*		*	*	*	*
B. hyalinum v. *princeps*	*	*	*	*	*	*
Bacteriastrum minus	*	*	*	*	*	*
Bacteriastrum varians	*	*	*	*	*	*
Bacteriastrum sp.				*	*	*
Bellerochea holorogicalis	*	*	*	*	*	
Biddulphia longicruris	*	*	*	*		
Biddulphia reticulata	*	*	*	*		
Campyrosira cymbelliformis	*			*	*	
Cerataulina daemon				*	*	*
Cerataulina dentata	*					
Cerataulina pelagica		*		*	*	*
Chaetoceros affinis	*	*	*	*	*	*
Chaetoceros coarctatus			*	*	*	*
Chaetoceros compressus	*	*	*	*	*	*
Chaetoceros convolutus				*	*	*
Chaetoceros costatus				*	*	*
Chaetoceros curvisetus	*	*	*	*	*	*
Chaetoceros danicus	*	*	*	*	*	*
Chaetoceros debilis	*	*	*	*	*	*
Chaetoceros decipiense	*	*	*	*	*	*

Table 14. Numbers of species recorded for the phytoplankton classes observed in each station of Transect line – G for the Sept. 1992 Yellow Sea cruise.

CLASS	STATION							
	G1	G2	G3	G4	G5	G6	G7	G8
BACILLARIOPHYCEAE	50	28	26	44	51	77	72	81
DINOPHYCEAE	17	17	22	12	10	17	20	18
CHRYSOPHYCEAE	2	1	1	1	1	1	2	1
CYANOPHYCEAE	2	2	2	1	2	1	2	1
CHLOROPHYCEAE								
KINETOPHRAGMINOPHORA		1						
SPECIES NUMBER	71	49	51	58	64	96	96	101

Table 15. continued

SPECIES ╲ TRANSECT	A	C	D	E	F	G
C. decipiense f. *singularis*				*	*	*
Chaetoceros densus	*	*				
Chaetoceros denticulatus	*	*		*	*	*
Chaetoceros diversus			*	*	*	*
Chaetoceros eibenii	*			*		*
Chaetoceros laciniosus	*	*	*	*	*	*
Chaetoceros lauderi		*	*	*	*	*
Chaetoceros lorenzianus	*	*	*	*	*	*
Chaetoceros messanensis		*	*	*	*	
Chaetoceros pendulus					*	*
Chaetoceros peruvianus	*	*	*	*	*	
Chaetoceros protubulans	*	*	*	*	*	*
Chaetoceros pseudocurvisetus	*	*	*	*		*
Chaetoceros radicans						*
Chaetoceros rostratus	*		*			
Chaetoceros socialis	*	*				
Chaetoceros tortissimus	*	*	*			
Chaetoceros spp.	*	*	*	*	*	
Climacodium flauenfeldii						*
Climacosphenia moniligera				*	*	
Cocconeis sp.			*			
Corethron criophilum	*	*	*	*	*	*
Coscinodiscus asteromphalus	*	*	*	*	*	*
Coscinodiscus gigas	*	*	*	*	*	*
Coscinodiscus granii	*	*	*	*	*	*
Coscinodiscus jonesianus	*	*	*	*	*	*
Coscinodiscus oculus-iridis	*	*	*	*	*	
Coscinodiscus perforatus						
Coscinodiscus radiatus	*	*	*	*	*	*
Coscinodiscus rothii						*
Coscinodiscus stellaris						*
Coscinodiscus wailesii	*	*				
Coscinodiscus sp.	*				*	
Cyclotella stylorum	*	*	*	*	*	*
Cyclotella sp.	*	*	*	*	*	*
Cylindrotheca closterium	*		*	*		*
Cymatosira belgica	*					
Dactyliosolen mediterraneous	*	*		*	*	*
Delphineis surirella	*	*	*	*	*	*

Table 15. continued

SPECIES ╲ TRANSECT	A	C	D	E	F	G
Detonula pumila	*	*		*	*	*
Diploneis weissflogi	*	*	*	*	*	*
Diploneis sp.	*	*	*	*	*	*
Ditylum brightwelli	*	*	*	*	*	*
Ditylum sol	*	*	*	*	*	*
Entomoneis alata					*	*
Entomoneis sp.	*	*	*	*	*	*
Eucampia zodiacus	*	*	*		*	*
Eucampia cornuta				*		*
Guinardia flaccida	*	*	*	*	*	*
Gyrosigma balticum	*		*			
Gyrosigma sp.		*				
Haslea gigantea				*		*
Hemiaulus hauckii	*	*	*	*	*	*
Hemiaulus indicus				*		*
Hemiaulus membranaceous	*	*	*	*	*	*
Hemiaulus sinensis	*	*	*	*		*
Hemidiscus cuneiformis				*		*
Lauderia annulata	*	*			*	*
Leptocylindrus danicus	*	*	*	*	*	*
Mastogroia sp.						*
Navicula cancellata	*					
Navicula distans	*	*		*		
Navicula spp.	*	*	*	*	*	*
Nitzschia bicapitata		*		*	*	*
Nitzschia bifurcata			*	*	*	*
Nitzschia cicula v. *migrans*						*
Nitzschia delicatissima	*	*	*	*	*	*
Nitzschia hybrida			*			
Nitzschia longissima	*	*	*	*	*	*
N. majuscula v. *lineata*				*	*	
Nitzschia marina				*		
Nitzschia pungens	*	*	*	*	*	*
Nitzschia seriata			*	*		*
Nitzschia tubicola	*					
Nitzschia spp.	*	*	*	*	*	*
Odontella granulata	*					
Odontella mobiliensis	*	*	*	*	*	*
Odontella sinensis	*	*	*	*	*	*

Table 15. continued

SPECIES ╲ TRANSECT	A	C	D	E	F	G
Pachyneis gerlachii						
Palmeria hardmanniana						*
Paralia sulcata	*		*	*	*	*
Plagiogrammopsis vanheurckii	*					
Plagiolemma confusa	*	*	*	*	*	*
Pleurosigma angulatum	*	*	*	*	*	*
Pleurosigma delicatulum	*					
Pleurosigma directum				*		*
Pleurosigma naviculaceum	*	*				
Pleurosigma spp.	*	*	*	*	*	*
Podosira stelliger	*	*	*	*	*	*
Porosira sp.	*	*	*	*	*	*
Proboscia alata	*	*	*	*	*	*
Pseudoeunotia doliolus				?		
Pseudohimanthidium pacificum	*	*		*	*	
Rhizosolenia bergonii				*	*	*
Rhizosolenia calcar-avis	*	*		*	*	*
Rhizosolenia clevei				*	*	*
Rhizosolenia cylindrus						*
Rhizosolenia delicatula	*					
Rhizosolenia fragillisima	*	*	*	*	*	*
R. hebetata f. *hiemalis*		*		*		*
R. hebetata f. *semispina*			*	*	*	*
Rhizosolenia imbricata	*	*	*	*	*	*
Rhizosolenia robustus	*	*	*	*	*	*
Rhizosolenia setigera	*	*	*	*	*	*
R. imbricata v. *shrubsolei*	*	*	*	*	*	*
Rhizosolenia stolterfothii	*	*	*	*	*	*
R. styliformis v. *oceanica*				*	*	*
Rhoicosigma sp.			*		*	
Roperia s p.A	*	*	*	*	*	*
Roperia sp.B .				*	*	*
Skeletonema costatum	*	*	*	*	*	*
Stauropsis membranacea	*	*	*	*	*	*
Stephanopyxis palmeriana	*	*		*		*
Stephanopyxis turris	*	*	*	*		
Stigmaphora rostrata						
Streptotheca thamesis	*	*		*	*	*
Surirella fluminensis		*	*	*	*	*

Table 15. continued

SPECIES ＼ TRANSECT	A	C	D	E	F	G
Surirella marina	*	*				
Surirella ovata	*					
Synedra tabulata.				*		
Thalassionema flauenfeldii	*	*	*	*	*	*
Thalassionema nitzschioides	*	*	*	*	*	*
Thalassiosira bipartita	*	*	*	*	*	*
Thalassiosira decipiens	*	*	*	*	*	*
Thalassiosira diporocyclus				*	*	*
Thalassiosira eccentrica	*	*	*	*	*	*
Thalassiosira endoseriata	*	*	*		*	
Thalassiosira hendeyi			*	*	*	*
Thalassiosira mala						*
Thalassiosira nodulolineata			*			
T. oestrupii v. *venrikae*		*		*	*	*
Thalassiosira punctifera				*		
Thalassiosira punctigera	*	*	*	*	*	*
Thalassiosira rotula	*	*	*	*	*	*
Thalassiosira symmetrica						*
Thalassiosira tenera						*
Thalassiosira spp.	*	*	*		*	*
Thalassiothrix acuata.						*
Thalassiothrix gibberula			*	*		*
Thalassiothrix heteromorpha			*	*		*
T. heteromorpha v. *mediteranea*						
Thalassiothrix sp.	*	*	*	*	*	*
Trachyneis antillarum	*	*	*	*	*	*
Trachyneis aspera	*	*	*	*	*	*
Triceratium favus	*		*	*	*	
Tropidoneis lepidoptera	*	*		*	*	
Tropidoneis sp.	*	*	*			
Tryblioptychus cocconeiformis	*	*	*	*	*	*
DINOPHYCEAE						
Alexandrium sp.	*				*	*
Amphisolenia sp.						*
Ceratium arieticum		*		*		
Ceratium belone					*	*
Ceratium breve	*	*	*	*	*	*
Ceratium bucephalum			*		*	

Table 15. continued

SPECIES ╲ TRANSECT	A	C	D	E	F	G
Ceratium candellabrum			*	*	*	
Ceratium carriense						*
Ceratium extensum		*				
Ceratium furca	*	*	*	*	*	*
Ceratium fusus	*	*	*	*	*	*
Ceratium gibberum v. *sinistrum*					*	*
Ceratium kofoidii	*	*	*	*	*	*
Ceratium lineatum	*	*	*	*		
Ceratium macroceous	*	*	*	*	*	*
Ceratium massiliensis			*		*	*
Ceratium trichoceros						*
Ceratium tripos	*	*	*	*	*	*
Dinophysis acuminata						
Dinophysis caudata	*	*	*	*	*	*
Dinophysis forthii				*		*
Dinophysis mitra	*	*	*	*	*	
Dinophysis ovum				*		
Dinophysis rotundata	*	*	*	*	*	*
Dinophysis schuttii				*	*	*
Diplopsalosis asymetricum	*	*	*	*	*	*
Diplopsalosis grobula					*	*
Gonyaulax polygramma	*	*	*	*	*	*
Gonyaulax spinifera		*	*		*	
Gonyaulax turbynei				*	*	*
Gonyodema polyedrum				*		
Gymnodinium sp. *cf. mikimotoi*			*			
Gymnodinium spilare	*	*	*	*	*	*
Gymnodinium vestifici						*
Gymnodinium viridescens				*		
Gymnodinium spp.	*	*	*	*	*	*
Heteraulacus acuminatus						*
Heterocapsa triquetra						*
Noctiluca scintillans	*	*	*	*	*	*
Oxytoxum tesselatum			*			*
Oxytoxum sp.	*	*	*	*	*	*
Peridinium abei				*		
peridinium grobulus						
Peridinium spp.	*	*	*	*	*	*
Podolampas palmipes					*	*

Table 15. continued

SPECIES ╲ TRANSECT	A	C	D	E	F	G
Prorocentrum balticum	*	*	*	*	*	*
Prorocentrum compressum						*
Prorocentrum dentatum						*
Prorocentrum gracile					*	*
Prorocentrum micans		*	*	*	*	*
Prorocentrum minimum					*	*
Prorocentrum scutelum				*		
Prorocentrum triestinum			*	*	*	*
Protoperidinium angusticollis						*
Protoperidinium brochii	*					
Protoperidinium cerasus						
Protoperidinium claudicans	*	*	*			*
Protoperidinium conicum	*					
Protoperidinium crassipes			*			
Protoperidinium depressum	*	*	*	*	*	*
Protoperidinium grande					*	*
Protoperidinium grobulus	*			*	*	*
Protoperidinium leonis	*	*	*	*	*	*
Protoperidinium majus				*		*
Protoperidinium matzenauri	*	*	*			
Protoperidinium minusculum	*		*			
Protoperidinium oblongum		*			*	
Protoperidinium oceanicum				*	*	*
Protoperidinium pellucidum	*	*	*			
Protoperidinium pentagonum	*			*	*	*
Protoperidinium punctulatum	*		*			
Protoperidinium quanerensis		*	*	*	*	*
Protoperidinium rectum Kofoid						*
Protoperidinium sphaeroides	*	*		*	*	*
Protoperidinium sphaericum					*	*
Protoperidinium steinii				*		*
Protoperidinium subpyrifome						*
Protoperidinium thorianum	*					
Protoperidinium yonedai						*
Protoperidinium spp.	*					
Pyrocystis peudonotiluca		*	*	*	*	*
Pyrophacus fusiformis	*	*	*	*	*	*
Pyrophacus hologicum	*	*	*	*	*	*

Table 15. continued

SPECIES ╲ TRANSECT	A	C	D	E	F	G
CHRYSOPHYCEAE						
Dictyocha fibula	*	*	*	*	*	*
Distephanus speculus	*	*	*	*	*	*
CYANOPHYCEAE						
Tricodesmium erythraeum						*
Tricodesmium thiebautii				*	*	*
Richelia intracelluralis	*	*	*	*	*	*
KINETOPHRAGMINOPHORA						
Mesodinium rubrum	*		*	*		*
CHLOROPHYCEAE						
Unidenttified sp.A	*	*	*	*		
Total species number	164	150	153	184	171	195

Table 16. Surface phytoplankton cell abundances, chlorophyll *a* concentrations, and environmental parameters for each station in the Sept. 1992 Yellow Sea cruise.

Station	Latitude (°N)	Longitude (°E)	Region	Abundance (Cells L^{-1})	Surface water						
					Chl *a* (mg m^{-3})	Temp (°C)	Salinity (psu)	NO_3 (μM)	NH_4 (μM)	PO_4 (μM)	SiO_4 (μM)
A1	37°	126° 10'	KCW	112750	0.70	21.35	32.26	1.41	1.82	0.39	4.48
A2	37°	126°	KCW	103530	1.08	21.25	32.12	2.02	9.71	1.14	5.57
A3	37°	125° 30'	KCW	72030	0.65	20.65	32.41	0.67	6.74	0.57	4.66
A4	37°	125°	MYS	25000	0.19	20.85	32.42	0.08	5.07	0.22	2.48
A5	37°	124° 30'	MYS	14010	0.21	20.63	32.02	0.4	3.77	0.14	1.93
A6	37°	124°	MYS	5570	0.36	20.51	32.01	0.13	2.76	0.14	1.93
A7	37°	123° 30'	MYS	8590	0.34	20.2	31.94	0.35	4.28	0.19	1.02
C1	36°	126° 30'	KCW	142930	0.99	20.83	32.34	2.31	4.06	0.54	3
C2	36°	126°	KCW	36750	0.74	20.14	32.67	1.64	1.66	0.57	6.34
C3	36°	125° 30'	MYS	42340	0.62	20.51	32.4	0.04	1.32	0.22	3.97
C4	36°	125°	MYS	38740	0.56	21.04	32.13	0.03	0.97	0.22	4.23
C5	36°	124° 30'	MYS	13500	0.23	20.84	31.65	0.5	2.72	0.14	1.33
C6	36°	124°	MYS	12380	0.22	20.28	31.56	0.25	0.36	0.12	0.71
C7	36°	123° 30'	MYS	15050	0.20	20.36	31.54	0.59	4.52	0.14	0.36
C8	36°	123°	CCW	10210	0.37	20.7	31.41	0.29	2.68	0.14	0.53
C9	36°	122° 30'	CCW	20150	0.48	20.84	31.38	0.14	2.66	0.12	1.24
C10	36°	122°	CCW	21740	0.79	20.52	29.75	0.29	1.83	0.24	2.5
D1	35°	125° 45'	KCW	87720	0.63	20.32	31.93	3.18	3.71	0.51	4.67
D2	35°	125° 30'	KCW	51370	0.49	20.2	32.1	3.06	1.1	0.6	9.16
D3	35°	125°	MYS	31700	0.61	20.22	31.89	0.8	0.37	0.26	4.14
D4	35°	124° 30'	MYS	20150	0.37	21.3	31.58	0.36	1.96	0.2	1.41
D5	35°	124°	MYS	17220	0.35	20.48	31.62	0.28	1.55	0.13	0.35
D6	35°	123° 30'	MYS	21320	0.42	20.93	31.64	1.34	1.91	0.17	0.71
D7	35°	123°	MYS	43040	1.15	20.13	31.11	0.32	3.03	0.15	0.18
D8	35°	122° 30'	MYS	49330	0.91	19.76	31.18	1.6	2.6	0.29	1.59
D9	35°	122°	CCW	39220	0.68	20.34	31.15	1.13	2.05	0.08	1.24
D10	35°	121° 30'	CCW	30150	0.64	21.18	31.15	1.56	1.16	0.17	1.94
E1	34°	126° 30'	KCW	44640	0.61	22.62	32.09	0.5	2.58	0.2	3.75
E2	34°	126°	MYS	73970	0.66	20.41	32.36	1.36	1.54	0.36	3.94
E3	34°	125° 30'	MYS	81520	0.64	21.43	32.22	0.65	2.95	0.2	1.93
E4	34°	125°	MYS	33630	0.76	21.09	31.56	2.04	2.38	0.24	3.94
E5	34°	124° 30'	MYS	24640	0.49	21.46	30.95	2.14	1.32	0.33	3.94
E6	34°	124°	MYS	13680	0.40	22.37	31.19	0.24	0.68	0.11	1.75
E7	34°	123° 30'	MYS	24750	0.40	22.28	31.19	1.28	2.26	0.08	1.75
E8	34°	123°	MYS	22000	0.69	21.76	30.76	0.39	1.77	0.11	1.93
E9	34°	122° 30'	CCW	56720	0.98	20.5	31.18	2.83	1.42	0.26	0.84
E10	34°	122°	CCW	23100	0.72	21.23	31.13	0.67	0.59	0.29	3.75
E11	34°	121° 30'	CCW	39600	1.29	22.1	30.8	2.08	5.49	0.4	6.48
F3	33°	125° 30'	MYS	43500	0.39	24.53	30.8	0.4	1.49	0.22	4.03
F4	33°	125°	MYS	38440	0.61	23.74	30.89	0.11	0.56	0.17	3.66
F5	33°	124° 30'	MYS	84630	0.70	23.42	30.73	0.02	0.35	0.22	2.12
F6	33°	124°	CCW	48190	0.68	23.48	30.91	0.52	4.38	0.19	0.48
F7	33°	123° 30'	CCW	343400	3.00	23.43	30.89	0.26	1.12	0.09	0.84
F8	33°	123°	CCW	169290	0.91	23.53	31.02	5.17	4.05	0.59	9.4
F9	33°	122° 30'	CCW	26840	0.94	23.73	31.06	3.11	4.01	0.44	5.94
F10	33°	122°	CCW	78000	1.12	23.7	30.82	7.36	2.43	0.01	11.31
G1	32°	126° 30'	MYS	56940	0.26	24.79	31.64	0.11	2.44	0.17	3.26
G2	32°	126°	MYS	22050	0.74	24.31	31.01	0.23	2.12	0.24	5.94
G3	32°	125° 30'	MYS	22420	0.59	24.41	30.91	0.34	1.86	0.34	5.03
G4	32°	125°	CCW	93840	0.95	23.88	30.94	0.54	1.68	0.39	7.76
G5	32°	124° 30'	CCW	92110	2.31	23.7	30.93	0.92	5.49	0.32	5.03
G6	32°	124°	CCW	302080	1.10	25.48	33.2	0.99	2.24	0.29	1.57
G7	32°	123° 30'	CCW	184800	0.73	25.55	33.25	2.72	2.95	1.17	7.03
G8	32°	123°	CCW	66080	0.45	24.79	32.78	2.62	3.5	0.47	6.3

(sampling stations are indicated in Fig. 1)

Table 17. Cell- abundance distribution in April 1998.

Date	Station	Latitude (°N)	Longitude (°E)	Abundance (cells L^{-1})	Environmental factors				
					Temp (°C)	Salinity (psu)	NO_3 (μM)	PO_4 (μM)	SiO_4 (μM)
Apr.1998	307-03	36° 57'	126°	434,810	6.66	32.156	9.12	0.53	11.93
	307-05	36° 56'	125° 25'	107,347	8.83	32.725	6.56	0.52	7.17
	307-09	36° 56'	124° 35'	341,909	9.75	32.67	3.6	0.46	8.38
	308-01	36° 20'	126° 14'	46,770	8.31	32.621	1.23	0.18	2.56
	308-05	36° 20'	125° 25'	162,373	9.5	32.647	0.26	0.13	1.86
	308-09	36° 20'	124° 45'	276,494	7.61	33.04	0.27	0.05	0.91
	309-01	35° 51'	126° 15'	50,839	9.78	32.459	1.37	0.27	4.17
	309-05	35° 51'	125° 24'	310,228	9.9	32.716	0.68	0.24	8.78
	309-09	35° 51'	124° 35'	598,522	9.22	32.666	6.84	0.07	0.74
	310-03	35° 20'	125° 49'	22,715	8.76	32.853	3.92	0.18	5.36
	310-05	35° 20'	125° 24'	6,637	8.62	32.298	2.32	0.15	4.83
	310-09	35° 20'	124° 36'	43,715	8.97	32.975	1.68	0.13	4.34
	311-05	34° 43'	125° 32'	24,533	9.21	33.05	1.18	0.11	2.8
	311-09	34° 43'	124° 36'	63,429	9	32.101	3.27	0.14	2.56
	312-05	34° 03'	125° 30'	702,558	10.04	33.119	5.23	0.15	3.75
	312-09	34° 06'	124° 36'	53,397	10.66	33.148	3.58	0.2	6.97

(sampling stations are indicated in Fig. 2)

Table 18. Cell-abundance distribution in August 1998.

Date	Station	Latitude (°N)	Longitude (°E)	Abundance (cells L^{-1})	Environmental factors				
					Temp (°C)	Salinity (psu)	NO_3 (μM)	PO_4 (μM)	SiO_4 (μM)
Aug. 1998	307-03	36° 57'	126°	54,965	21.51	31.52	3.95	0.33	2.7
	307-05	36° 56'	125° 25'	88,037	23.63	31.75	1.24	0.04	0.79
	307-09	36° 56'	124° 35'	9,725	25.06	31.87	0.73	0.01	
	308-01	36° 20'	126° 14'	110,480	23.58	32.02	0.86	0.02	12.41
	308-05	36° 20'	125° 25'	6,890	25.23	31.95	0.61	0.02	2.25
	308-09	36° 20'	124° 45'	11,399	25.65	31.67	1.11	0.06	1.84
	309-01	35° 51'	126° 15'	2,707,085	25.46	28.72	0.77	0.03	0.54
	309-05	35° 51'	125° 24'	17,401	26.6	31.69	0.45	0.02	1.69
	309-09	35° 51'	124° 35'	12,406	26.98	31.36	1.73	0.04	3.52
	310-03	35° 20'	125° 49'	32,198	26.61	31.49	1.35	0.05	0.66
	310-05	35° 20'	125° 24'	32,020	25.75	31.07	0.75	0.08	1.92
	310-09	35° 20'	124° 36'	17,232	27.2	31.14	4.57	0.12	6.31
	311-05	34° 43'	125° 32'	190,998	24.19	31.65	0.9	0.04	3.05
	311-09	34° 43'	124° 36'	13,000	26.68	31.29	4.52	0.18	4.89
	312-02	33° 59'	126° 06'	61,795	22.59	32.29			
	312-05	34° 03'	125° 30'	95,283	23.06	32.09	6.27	0.5	5.31
	312-09	34° 06'	124° 36'	12,577	27.43	31.15	8.57	0.73	7.43

(sampling stations are indicated in Fig. 2)

Table 19. Cell-abundance distribution in October 1998.

Date	Station	Latitude (^oN)	Longitude (^oE)	Abundance (cells L^{-1})	Environmental factors				
					Temp (^oC)	Salinity (psu)	NO_3 (μM)	PO_4 (μM)	SiO_4 (μM)
Oct. 1998	307-03	36° 57'	126°	55,185	20.24	31.562	2.21	0.18	1.26
	307-05	36° 56'	125° 25'	303,813	19.25	32.127	0.65	0.23	2.7
	307-09	36° 56'	124° 35'	47,906	21.1	31.375	1.02	0.06	2.16
	308-01	36° 20'	126° 14'	33,276	18.99	31.663	1.43	0.33	2.86
	308-05	36° 20'	125° 25'	19,322	20.31	32.052	0.66	0.1	2.4
	308-09	36° 20'	124° 45'	18,360	21.1	31.966	0.42	0.06	2.37
	309-01	35° 51'	126° 15'	856,025	18.57	31.391	1.03	0.21	3.01
	309-05	35° 51'	125° 24'	46,582	18.88	31.931	0.53	0.09	2.54
	309-09	35° 51'	124° 35'	22,208	19.8	32.079	1.05	0.07	1.14
	310-03	35° 20'	125° 49'	25,101	19.49	31.306	5.19	0.48	3.53
	310-05	35° 20'	125° 24'	344,885	18.72	31.785	1.23	0.09	2.42
	310-09	35° 20'	124° 36'	40,240	19.69	31.775	0.58	0.03	2.38
	311-05	34° 43'	125° 32'	33,559	17.93	31.887	4.03	0.44	3.16
	311-09	34° 43'	124° 36'	228,048	20.63	31.879	1.28	0.02	2.1
	312-02	33° 59'	126° 06'	46,891	20.58	31.693			
	312-05	34° 03'	125° 30'	32,235	18.07	32.036	5.71	0.39	3.33
	312-09	34° 06'	124° 36'	17,564	20.21	31.656	1.03	0.01	2.65

(sampling stations are indicated in Fig. 2)

Table 20. Cell abundance of dominant species and degree of dominance for each station in the Transect line – A in September 1992.

Station	Latitude (^oN)	Longitude (^oE)	Species	Cells/L	Degree of Dominance(%)
A1	37^o	126^o 10'	Chaetoceros debilis	35130	31.16
			Chaetoceros danicus	15520	13.77
			Chaetoceros spp.	8170	7.25
			Thalassiosira sp.2	7350	6.52
			Skeletonema costatum	5720	5.07
A2	37^o	126^o	Chaetoceros spp.	27370	26.43
			Eucampia zodiacus	22680	21.90
			Chaetoceros debilis	9380	9.06
			Thalassiosira sp.2	9384	9.06
			Chaetoceros psuedocurvisectum	7820	7.55
A3	37^o	125^o 30'	Chaetoceros spp.	11390	15.82
			Peridinum sp.1	8760	12.17
			Chaetoceros debilis	7890	10.95
			Dinoflagellate group	7890	10.95
			Chaetoceros danicus	7010	9.73
A4	37^o	125^o	Chaetoceros spp.	7500	30.00
			Chaetoceros danicus	5000	20.00
			Dinoflagellate group	5000	20.00
A5	37^o	124^o 30'	Dinoflagellate group	9930	70.83
			Peridinum sp.2	2920	20.83
			E.zodiacus	580	4.17
A6	37^o	124^o	Dinoflagellate group	3880	68.42
A7	37^o	123^o 30'	Dinoflagellate group	2800	32.61
			Peridinum sp.1	2340	27.17
			Sp. A	1870	21.74

Table 21. Cell abundance of dominant species and degree of dominance for each station in the Transect line – C in September 1992.

Station	Latitude (^oN)	Longitude (^oE)	Species	Cells/L	Degree of Dominance(%)
C1	36^o	126^o 30'	Rhizosolenia fragillisima	46000	32.18
			Chaetoceros debilis	19170	13.41
			Eucampia zodiacus	16980	11.88
C2	36^o	126^o	Skeletonema costatum	7130	19.39
			Paralia sulcata	6380	17.35
			Rhizosolenia fragilissima	5250	14.29
			Cheatoceros debris	2630	7.14
			Eucampia zodiacus	2250	6.12
C3	36^o	125^o 30'	Dinoflagellate group	9660	22.83
			Chaetoceros spp.	7820	18.84
			Nitzschia pungens	6440	15.22
			Leptocylindrus danicus	3680	8.70
			Skeletonema costatum	3680	8.70
C4	36^o	125^o	Dinoflagellate group	26000	67.11
			Cheatoceros debris	2860	7.38
			Thalassiosira spp.	2600	6.71
C5	36^o	124^o 30'	Nitzschia spp.	5400	40.00
			Dinoflagellate group	4050	30.00
C6	36^o	124^o	Dinoflagellate group	4950	40.00
			Rhizosolenia alata	4700	38.00
			Sp.A	740	6.00
C7	36^o	123^o 30'	Dinoflagellate group	7280	48.39
			Rhizosolenia alata	5090	33.87
			Sp.A	1250	8.06
C8	36^o	123^o	Dinoflagellate group	2690	26.32
			Rhizosolenia alata	2418	23.68
C9	36^o	122^o 30'	Rhizosolenia alata	8800	43.65
			Dinoflagellate group	8600	42.22
C10	36^o	122^o	Dinoflagellate group	8110	37.31
			Chaetoceros spp.	3900	17.92
			Skeletonema costatum	1950	8.96

Table 22. Cell abundance of dominant species and degree of dominance for each station in the Transect line – D in September 1992.

Station	Latitude (^{o}N)	Longitude (^{o}E)	Species	Cells/L	Degree of Dominance(%)
D1	35^o	125^o 45'	Paralia sulcata	30700	35.0
			Skeletonema costatum	18520	21.0
			Nitzschia longissima	4230	5.0
			Bacilaria paxillifer	2120	2.0
D2	35^o	125^o 30'	Paralia sulcata	17470	34.0
			Dinoflagellate group	11230	22.0
			Thalassiosira spp.	3330	6.0
			Skeletonema costatum	2500	5.0
D3	35^o	125^o	Dinoflagellate group	26960	85.0
			Nitzschia delicatissima	1760	6.0
			Mesodinium rubrum	1170	4.0
D4	35^o	124^o 30'	Proboscia alata	6650	33.0
			Nitzschia longissima	950	5.0
D5	35^o	124^o	Dinoflagellate group	11890	69.0
			Sp.A	4950	29.0
D6	35^o	123^o 30'	Dinoflagellate group	13860	65.0
			Proboscia alata	5040	24.0
D7	35^o	123^o	Proboscia alata	21090	49.0
			Dinoflagellate group	13680	32.0
D8	35^o	122^o 30'	Proboscia alata	11960	49.0
			Dinoflagellate group	7800	32.0
D9	35^o	122^o	Dinoflagellate group	26280	67.0
D10	35^o	121^o 30'	Dinoflagellate group	10250	34.0
			Sp.A	6270	21.0
			Nitzschia longissima	3990	13.0
			Navicula sp.	2280	8.0

Table 23. Cell abundance of dominant species and degree of dominance for each station in the Transect line – E in September 1992.

Station	Latitude (°N)	Longitude (°E)	Species	Cells/L	Degree of Dominance(%)
E1	34°	126° 30'	Nitzschia delicatissima	11780	26.4
			Nitzschia longissima	6820	11.3
			Chaetoceros spp.	4960	11.1
			Dinoflagellate group	4340	9.7
E2	34°	126°	Nitzschia delicatissima	18360	24.8
			Dinoflagellate group	15660	21.2
			Thalassionema flauenfeldii	6480	8.8
			Chaetoceros spp.	5940	8.0
			Cylindrotheca closterium	4860	6.6
E3	34°	125° 30'	Dinoflagellate group	21660	26.6
			Nitzschia delicatissima	18240	22.4
			Nitzschia longissima	11400	14.0
			Cylindrotheca closterium	6270	7.7
E4	34°	125°	Dinoflagellate group	13680	40.7
			Nitzschia delicatissima	6270	18.6
			Cylindrotheca closterium	4560	13.6
			Nitzcshia longissima	3420	10.2
E5	34°	124° 30'	Dinoflagellate group	16800	68.2
			Nitzschia longissima	1680	6.8
E6	34°	124°	Proboscia alata	5700	41.7
			Dinoflagellate group	4560	33.3
E7	34°	123° 30'	Dinoflagellate group	11250	45.5
			Proboscia alata	6300	25.5
			Hemiaulus membranaceous	1350	5.5
			Guinardia flaccida	1350	5.5
E8	34°	123°	Dinoflagellate group	9680	44.0
			Proboscia alata	3960	18.0
			Nitzschia longissima	2200	10.0
E9	34°	122° 30'	Proboscia alata	18020	31.8
			Chaetoceros tortissimus	16960	29.9
			Dinoflagellate group	7420	13.1
			Sp.A	3710	6.5
E10	34°	122°	Dinoflagellate group	4950	21.4
			Bacteriastrum minus	3850	16.7
			Skeletonema costatum	2200	9.5
			Thalassionema nitzschioides	2200	9.5
			Proboscia alata	1650	7.1
E11	34°	121° 30'	Skeletonema costatum	8800	22.2
			Thalassionema nitzschioides	8800	22.2
			Dinoflagellate group	3300	8.3

Table 24. Cell abundance of dominant species and degree of dominance for each station in the Transect line – F in September 1992.

Station	Latitude (°N)	Longitude (°E)	Species	Cells/L	Degree of Dominance(%)
F3	33°	125° 30'	Dinoflagellate group	5800	38.5
			Thalassionema flauenfeldii	2900	19.2
			Rhizosolenia alata	1160	7.7
			Prorocentrum sp.	1160	7.7
F4	33°	125°	Dinoflagellate group	10540	27.4
			Rhizosolenia alata	9300	24.2
			Chaetoceros compressus	4340	11.3
			Rhizosolenia shrubsolei	2480	6.5
F5	33°	124° 30'	Rhizosolenia alata	45500	53.8
			Dinoflagellate group	18200	21.5
			Rhizosolenia shrubsolei	8190	9.7
F6	33°	124°	Rhizosolenia alata	23180	48.1
			Dinoflagellate group	7320	15.2
			Chaetoceros spp.	5490	11.4
			Prorocentrum balticum	4270	8.9
F7	33°	123° 30'	Chaetoceros laciniosus	102010	29.7
			Eucampia zodiacus	84840	24.7
			Chaetoceros spp.	37370	10.9
			Chaetoceros curvisetus	19190	5.6
F8	33°	123°	Chaetoceros curvisetus	59400	35.1
			Skeletonema costatum	50490	29.8
			Chaetoceros spp.	13860	8.2
F9	33°	122° 30'	Rhizosolenia alata	10370	38.6
			Skeletonema costatum	10980	23.1
			Paralia sulcata	5490	20.5
			Leptocylindrus danicus	4880	10.3
			Paralia sulcata	4270	9.0
F10	33°	122°	Rhizosolenia alata	21600	27.7
			Nitzschia longissima	10800	13.9
			Thalassiosira spp.	9600	12.3

Table 25. Cell abundance of dominant species and degree of dominance for each station in the Transect line – F in September 1992.

Station	Latitude (^oN)	Longitude (^oE)	Species	Cells/L	Degree of Dominance(%)
G1	32°	126° 30'	Bacteriastrum varians	21450	37.7
			Dinoflagellate group	7800	13.7
			Chaetoceros spp.	6630	11.6
G2	32°	126°	Dinoflagellate group	8550	38.8
			Bacteriastrum varians	5400	24.5
			Mesodinium rubrum	2250	10.2
G3	32°	125° 30'	Bacteriastrum varians	12540	55.9
			Dinoflagellate group	3040	13.6
			Chaetoceros lauderi	1140	5.1
			Nitzcshia longissima	1140	5.1
			Chaetoceros lauderi	1140	5.1
G4	32°	125°	Bacteriastrum varians	36570	39.0
			Chaetoceros spp.	15870	16.9
			Bacteriastrum minus	7590	8.1
			Nitzschia longissima	4830	5.2
			Dinoflagellate group	4830	5.2
G5	32°	124° 30'	Rhizosolenia alata	9150	9.9
			Chaetoceros spp.	7320	8.0
			Bacteriastrum varians	6710	7.3
			Nitzschia sp.	5490	6.0
			Chaetoceros lauderi	4880	5.3
			Rhizosolenia stoltheforthii	4270	4.6
			Guinardia flaccida	4270	4.6
G6	32°	124°	Skeletonema costatum	43520	14.4
			Chaetoceros debilis	30720	10.2
			Thalassionema nitzschioides	26240	8.7
			Nitzschia delicatissima	19840	6.6
			Bacteriastrum hyalinum	17920	5.9
			Bacteriastrum minus	16000	5.3
			Rhizosolenia stoltheforthii	16000	5.3
G7	32°	123° 30'	Thalassionema nitzschioides	50400	27.3
			Skeletonema costatum	30600	16.6
			Bacteriastrum minus	24600	13.3
			Nitzschia pungens	15000	8.1
G8	32°	123°	Thalassionema flauenfeldii	6490	9.8
			Leptocylindrus danicus	4720	7.1
			Nitzschia pungens	4720	7.1
			Rhizosolenia stoltheforthii	4720	7.1

Table 26. Cell abundance of dominant species and degree of dominance in April 1998.

Date	Station	Latitude (^oN)	Longitude (^oE)	Species	Cells/L	Degree of Dominance(%)
Apr.1998	307-03	36° 57'	126°	Paralia sulcata	115770	51.6
	307-05	36° 56'	125° 25'	Skeletonema costatum	47340	44.1
				Nitzschia delicatissin	19370	18.1
				Thalassiosira spp.	11830	11
				Alexandrium spp.	10760	10
	307-09	36° 56'	124° 35'	N. delicatissima	112830	33
				Thalassiosira spp.	69060	20.2
				Chaetoceros spp.	65170	19
	308-01	36° 20'	126° 14'	Paralia sulcata	22730	48.6
				Skeletonema costatum	12000	25.7
	308-05	36° 20'	125° 25'	Ciliates	51310	31.6
				N. delicatissima	46990	28.9
	308-09	36° 20'	124° 45'	Chaetoceros spp.	111980	40.5
				N. delicatissima	59160	21.4
	309-01	35° 51'	126° 15'	Alexandrium spp.	14540	28.6
				Ciliates	14540	28.6
	309-05	35° 51'	125° 24'	Skeletonema costatum	67940	21.9
				N. delicatissima	40110	12.9
				Chaetoceros spp.	31100	10
	309-09	35° 51'	124° 35'	Thalassiosira spp.	360310	60.2
				Alexandrium spp.	62810	10.5
				Skeletonema costatum	61150	10.2
	309-12	35° 51'	123° 24'	Skeletonema costatum	1139430	81.4
	309-14	35° 51'	122° 13'	Scripsiella trochoidea	48740	43.1
				Ciliates	27420	24.3
	310-03	35° 20'	125° 49'	Paralia sulcata	6860	30.2
				Protoperidinium spp.	2530	11.1
	310-05	35° 20'	125° 24'	Sc. Trochoidea	3020	45.5
				Ciliates	1810	27.3
	310-09	35° 20'	124° 36'	Ciliates	28240	64.6
				Fragilaria spp.	7600	17.4
	311-05	34° 43'	125° 32'	Scripsiella trochoidea	17320	70.6
	311-09	34° 43'	124° 36'	Ciliates	48840	77
	311-12	34° 43'	123° 24'	Ciliates	19960	78.7
	311-14	34° 43'	122° 13'	Skeletonema costatum	1276730	75.5
				Alexandrium spp.	218770	12.9
	312-02	33° 59'	126° 06'			
	312-05	34° 03'	125° 30'	Thalassiosira spp.	422940	60.2
				Skeletonema costatum	204960	29.2
	312-09	34° 06'	124° 36'	Ciliates	42130	78.9

Table 27. Cell abundance of dominant species and degree of dominance in August 1998.

Date	Station	Latitude (^oN)	Longitude (^oE)	Species	Cells/L	Degree of Dominance(%)
Aug. 1998	307-03	36° 57'	126°	Chaetoceros spp.	15500	28.2
				Guinardia delicatula	8520	15.5
	307-05	36° 56'	125° 25'	Ceratium fusus	28260	32.1
	307-09	36° 56'	124° 35'	Scrippsiella trochoidea	4950	50.9
	308-01	36° 20'	126° 14'	Dictyocha speculum	27620	25
				Ciliates	18410	16.7
				Skeletonema costatum	12280	11.1
	308-09	36° 20'	124° 45'	C. closterium	3260	28.6
				Gymnodinium spp.	1230	14.3
	309-01	35° 51'	126° 15'	Chaetoceros spp.	733620	27.1
				Thalassiosira decipiens	450650	16.7
				Skeletonema costatum	393010	14.5
	309-05	35° 51'	125° 24'	Navicula spp.	3950	22.7
				Ciliates	3950	22.7
				Gymnodinium spp.	3160	18.2
	309-09	35° 51'	124° 35'	Ciliates	3970	32
				Thalassiosira decipiens	2480	20
				Gymnodinium spp.	1490	12
				Scrippsiella trochoidea	1490	12
	309-12	35° 51'	123° 24'	Chaetoceros spp.	27790	66.7
				Chaetoceros decipiens	4630	11.1
				Gymnodinium spp.	4630	11
	309-14	35° 51'	122° 13'	Ciliates	6940	26
				Noctiluca scintillance	3740	14
	310-03	35° 20'	125° 49'	Chaetoceros spp.	8790	27.3
				G. flaccida	5860	18.2
				Protoperidinium spp.	5860	18.2
				Scrippsiella trochoidea	5860	18.2
	310-05	35° 20'	125° 24'	Ciliates	16010	50
				Chaetoceros affinis	4000	12.5
				Chaetoceros danicus	4000	12.5
	310-09	35° 20'	124° 36'	N. delicatissima	7220	41.9
	311-05	34° 43'	125° 32'	Chaetoceros spp.	110970	58.1
	311-09	34° 43'	124° 36'	Ciliates	6500	50
				Ceratium fusus	3250	25
	311-12	34° 43'	123° 24'	Ciliates	10300	50
				P. compressum	10300	50
	311-14	34° 43'	122° 13'	N. delicatissima	7080	40
				Chaetoceros spp.	6160	34.8
				G. flaccida	2100	11.9
	312-02	33° 59'	126° 06'	Chaetoceros spp.	36150	58.5
	312-05	34° 03'	125° 30'	Ciliates	25250	26.5
				N. delicatissima	15430	16.2
				Prorocentrum triestium	12630	13.2
				Scrippsiella trochoidea	9820	10.3
	312-09	34° 06'	124° 36'	Ciliates	4100	32.6
				C. pseudocrinitus	2190	17.4

Table 28. Cell abundance of dominant species and degree of dominance in October 1998.

Date	Station	Latitude (^oN)	Longitude (^oE)	Species	Cells/L	Degree of Dominance(%)
Oct. 1998	307-03	36^o 57'	126^o	Leptocylindrus danicus	14900	27
				Cylindrotheca closterium	8770	19.5
	307-05	36^o 56'	125^o 25'	Cochlodinium polykrikoides	276470	91
	307-09	36^o 56'	124^o 35'	Ciliates	19450	40.6
				Cochlodinium polykrikoides	6730	14.1
	308-01	36^o 20'	126^o 14'	Ciliates	11580	34.8
				Guinardia flaccida	4340	13
				Chaetoceros spp.	3620	10.9
	308-09	36^o 20'	124^o 45'	Ciliates	9180	50
				P. compressum	6120	33.3
				Nitzschia longissima	3060	16.7
	309-01	35^o 51'	126^o 15'	Cochlodinium polykrikoides	271360	31.7
				Thalassiosira subtilis	257020	30
				S. costatum	248830	29.1
	309-05	35^o 51'	125^o 24'	Chaetoceros deblis	21940	47.1
				Chaetoceros spp.	7320	15.7
				N.delicatissima	6400	13.7
	309-09	35^o 51'	124^o 35'	Chaetoceros spp.	8550	38.5
				Ciliates	8550	38.5
				Gymnodinium spp.	2280	10.3
				Nitzschia longissima	2280	10.3
	310-03	35^o 20'	125^o 49'	P. sulcata	8660	34.5
	310-05	35^o 20'	125^o 24'	Chaetoceros pseudocrinitus	149680	43.4
				Chaetoceros spp.	130660	37.9
	310-09	35^o 20'	124^o 36'	Rhizosolenia alata f. glacillima	16780	41.7
				Ciliates	13890	34.5
				Chaetoceros spp.	4340	10.8
	311-05	34^o 43'	125^o 32'	Ciliates	13860	41.3
				P. sulcata	5250	15.6
				Chaetoceros spp.	3780	11.2
	311-09	34^o 43'	124^o 36'	Rhizosolenia alata f. glacillima	207980	91.2
	312-02	33^o 59'	126^o 06'	Ciliates	41030	87.5
	312-05	34^o 03'	125^o 30'	P. sulcata	11250	34.9
				N. delicatissima	6210	19.3
				Ciliates	4267	13.3
	312-09	34^o 06'	124^o 36'	Ciliates	16370	93.2

Table 29. Primary production and environmental parameters for each station in the September 1992 Yellow Sea cruise.

Station	Latitude (^{o}N)	Longitude (^{o}E)	Region	PP (mg C m^{-2} d^{-1})	Surface water						
					Chl *a* (mg m^{-3})	Temp (^{o}C)	Salinity (psu)	NO_3 (μM)	NH_4 (μM)	PO_4 (μM)	SiO_4 (μM)
A1	37^o	126^o 10'	KCW	-	0.70	21.35	32.26	1.41	1.82	0.39	4.48
A2	37^o	126^o	KCW	-	1.08	21.25	32.12	2.02	9.71	1.14	5.57
A3	37^o	125^o 30'	KCW	-	0.65	20.65	32.41	0.67	6.74	0.57	4.66
A4	37^o	125^o	MYS	-	0.19	20.85	32.42	0.08	5.07	0.22	2.48
A5	37^o	124^o 30'	MYS	955	0.21	20.63	32.02	0.4	3.77	0.14	1.93
A6	37^o	124^o	MYS	555	0.36	20.51	32.01	0.13	2.76	0.14	1.93
A7	37^o	123^o 30'	MYS	-	0.34	20.2	31.94	0.35	4.28	0.19	1.02
C1	36^o	126^o 30'	KCW	292	0.99	20.83	32.34	2.31	4.06	0.54	3
C2	36^o	126^o	KCW	571	0.74	20.14	32.67	1.64	1.66	0.57	6.34
C3	36^o	125^o 30'	MYS	612	0.62	20.51	32.4	0.04	1.32	0.22	3.97
C4	36^o	125^o	MYS	325	0.56	21.04	32.13	0.03	0.97	0.22	4.23
C5	36^o	124^o 30'	MYS	233	0.23	20.84	31.65	0.5	2.72	0.14	1.33
C6	36^o	124^o	MYS	543	0.22	20.28	31.56	0.25	0.36	0.12	0.71
C7	36^o	123^o 30'	MYS	323	0.20	20.36	31.54	0.59	4.52	0.14	0.36
C8	36^o	123^o	CCW	-	0.37	20.7	31.41	0.29	2.68	0.14	0.53
C9	36^o	122^o 30'	CCW	854	0.48	20.84	31.38	0.14	2.66	0.12	1.24
C10	36^o	122^o	CCW	793	0.79	20.52	29.75	0.29	1.83	0.24	2.5
D1	35^o	125^o 45'	KCW	147	0.63	20.32	31.93	3.18	3.71	0.51	4.67
D2	35^o	125^o 30'	KCW	569	0.49	20.2	32.1	3.06	1.1	0.6	9.16
D3	35^o	125^o	MYS	-	0.61	20.22	31.89	0.8	0.37	0.26	4.14
D4	35^o	124^o 30'	MYS	739	0.37	21.3	31.58	0.36	1.96	0.2	1.41
D5	35^o	124^o	MYS	-	0.35	20.48	31.62	0.28	1.55	0.13	0.35
D6	35^o	123^o 30'	MYS	623	0.42	20.93	31.64	1.34	1.91	0.17	0.71
D7	35^o	123^o	MYS	-	1.15	20.13	31.11	0.32	3.03	0.15	0.18
D8	35^o	122^o 30'	MYS	1119	0.91	19.76	31.18	1.6	2.6	0.29	1.59
D9	35^o	122^o	CCW	-	0.68	20.34	31.15	1.13	2.05	0.08	1.24
D10	35^o	121^o 30'	CCW	287	0.64	21.18	31.15	1.56	1.16	0.17	1.94
E1	34^o	126^o 30'	KCW	1067	0.61	22.62	32.09	0.5	2.58	0.2	3.75
E2	34^o	126^o	MYS	1021	0.66	20.41	32.36	1.36	1.54	0.36	3.94
E3	34^o	125^o 30'	MYS	1088	0.64	21.43	32.22	0.65	2.95	0.2	1.93
E4	34^o	125^o	MYS	1281	0.76	21.09	31.56	2.04	2.38	0.24	3.94
E5	34^o	124^o 30'	MYS	1231	0.49	21.46	30.95	2.14	1.32	0.33	3.94
E6	34^o	124^o	MYS	601	0.40	22.37	31.19	0.24	0.68	0.11	1.75
E7	34^o	123^o 30'	MYS	-	0.40	22.28	31.19	1.28	2.26	0.08	1.75
E8	34^o	123^o	MYS	-	0.69	21.76	30.76	0.39	1.77	0.11	1.93
E9	34^o	122^o 30'	CCW	762	0.98	20.5	31.18	2.83	1.42	0.26	0.84
E10	34^o	122^o	CCW	-	0.72	21.23	31.13	0.67	0.59	0.29	3.75
E11	34^o	121^o 30'	CCW	178	1.29	22.1	30.8	2.08	5.49	0.4	6.48
F3	33^o	125^o 30'	MYS	585	0.39	24.53	30.8	0.4	1.49	0.22	4.03
F4	33^o	125^o	MYS	1117	0.61	23.74	30.89	0.11	0.56	0.17	3.66
F5	33^o	124^o 30'	MYS	483	0.70	23.42	30.73	0.02	0.35	0.22	2.12
F6	33^o	124^o	CCW	999	0.68	23.48	30.91	0.52	4.38	0.19	0.48
F7	33^o	123^o 30'	CCW	1694	3.00	23.43	30.89	0.26	1.12	0.09	0.84
F8	33^o	123^o	CCW	481	0.91	23.53	31.02	5.17	4.05	0.59	9.4
F9	33^o	122^o 30'	CCW	213	0.94	23.73	31.06	3.11	4.01	0.44	5.94
F10	33^o	122^o	CCW	169	1.12	23.7	30.82	7.36	2.43	0.01	11.31
G1	32^o	126^o 30'	MYS	898	0.26	24.79	31.64	0.11	2.44	0.17	3.26
G2	32^o	126^o	MYS	981	0.74	24.31	31.01	0.23	2.12	0.24	5.94
G3	32^o	125^o 30'	MYS	-	0.59	24.41	30.91	0.34	1.86	0.34	5.03
G4	32^o	125^o	CCW	851	0.95	23.88	30.94	0.54	1.68	0.39	7.76
G5	32^o	124^o 30'	CCW	1168	2.31	23.7	30.93	0.92	5.49	0.32	5.03
G6	32^o	124^o	CCW	1381	1.10	25.48	33.2	0.99	2.24	0.29	1.57
G7	32^o	123^o 30'	CCW	442	0.73	25.55	33.25	2.72	2.95	1.17	7.03
G8	32^o	123^o	CCW	415	0.45	24.79	32.78	2.62	3.5	0.47	6.3

(sampling stations are indicated in Fig. 1)

Table 30. Primary production of each station in April 1996.

Date	Station	Latitude (^oN)	Longitude (^oE)	Region	PP (mg C m^{-2} d^{-1})	Surface water		
						Chl *a* (mg m^{-3})	Temp (^oC)	Salinity (psu)
April, 1996	B08	36^o	123^o 30'		792.8	4.35	8.51	33.14
	B11	36^o	125^o		326.2	1.38	6.91	32.45
	B12	36^o	125^o30'		256.6	0.87	5.84	32.32
	B14	36^o	126^o		235.7	1.57	5.45	32.05
	D01	34^o	121^o 30'		97.4	1.41	8.17	32.14
	D06	34^o	123^o		2182.3	8.24	9.73	33.87
	D09a	34^o 01'	124^o 44'		3461.6	8.24	9.52	33.59
	D11	34^o	125^o 30'		96.4	0.74	8.41	33.09
	F01	31^o 47'	123^o		104.6	0.78	9.41	33.35
	F03	32^o	124^o		85.9	0.54	8.61	32.45
	F06	32^o	125^o		88.9	0.99	10.49	33.91
	F08	32^o 56'	125^o 30'		127.7	0.74	13.12	34.55
	P01	35^o	124^o 30'		451	1.56	8.50	32.90
	P03	35^o	125^o		1327.9	5.72	8.11	32.77
	P05	35^o	125^o 30'		51.2	0.39	6.46	32.04

Table 31. Primary production and environmental parameters for each station for February and April 1997.

Date	Station	Longitude (°E)	Latitude (°N)	Region	PP (mg C m^{-2} d^{-1})	Surface water					
						Chl *a* (mg m^{-3})	Temp (°C)	Salinity (psu)	NO_3 (μM)	PO_4 (μM)	SiO_4 (μM)
Feb, 1997	307-03	126°	36° 57'	KCW	13	2.22	2.9	31.9	4.0	1.3	3.1
	307-05	125° 25'	36° 56'	KCW	83	0.58	3.8	32.4	7.7	0.8	10.5
	307-07	125°	36° 56'	MYS	199	1.43	5.4	32.7	6.9	1.4	5.1
	307-09	124° 35'	36° 56'	MYS	160	0.85	6.0	32.7	2.7	0.6	5.6
	308-01	126° 14'	36° 20'	KCW	80	0.88	4.6	32.6	5.4	1.2	12.4
	308-05	125° 25'	36° 20'	MYS	335	0.67	5.2	32.7	2.3	0.7	2.3
	308-09	124° 45'	36° 20'	MYS	101	0.56	6.4	32.8	2.5	0.3	4.6
	309-01	126° 15'	35° 51'	KCW	48	1.31	5.2	32.6	3.5	0.4	4.7
	309-03	125° 49'	35° 51'	MYS	170	0.93	6.0	32.8	3.0	2.8	4.8
	309-05	125° 24'	35° 51'	MYS	147	1.11	6.1	32.9	2.7	0.9	2.7
	309-07	125°	35° 51'	MYS	137	0.63	6.9	33.0	2.6	0.8	5.4
	309-09	124° 35'	35° 51'	MYS	155	0.62	7.0	32.9	2.5	0.4	5.1
	310-03	125° 49'	35° 20'	MYS	32	1.03	4.3	32.8	2.4	1.5	8.8
	310-05	125° 24'	35° 20'	MYS	71	0.56	7.0	33.0	3.8	0.5	8.7
	310-07	125°	35° 20'	MYS	61	0.36	7.6	33.1	3.4	0.6	6.0
	311-04	125° 44'	34° 43'	KCW	11	1.20	5.0	33.2			
	311-05	125° 32'	34° 43'	KCW	41	0.93	6.3	33.0	3.8	0.9	3.3
	311-09	124° 36'	34° 43'	MYS	51	0.48	7.5	33.0	3.7	0.5	6.7
	312-05	125° 30'	34° 03'	MYS	29	0.42	8.1	33.3	3.2	0.5	7.7
	312-06	125° 18'	34° 04'	MYS	31						
	312-07	125°	34° 06'	MYS	45	0.32	9.0	33.5	3.4	0.4	6.8
Apr, 1997	307-03	126°	36° 57'	KCW	400	1.30	5.4	32.2	10.0	0.6	22.9
	307-05	125° 25'	36° 56'	KCW	420	1.03	6.1	32.3	7.6	0.4	13.9
	307-07	125°	36° 56'	MYS	914	1.97	7.4	32.3		0.2	5.7
	307-09	124° 35'	36° 56'	MYS	746	1.71	7.7	32.5	2.7	0.2	10.4
	308-03	125° 50'	36° 20'	MYS	348	1.09	7.0	32.4	3.8	0.6	7.0
	308-05	125° 25'	36° 20'	MYS	1431	2.77	7.5	32.6	0.2	0.4	2.3
	308-07	125°	36° 20'	MYS	474	0.98	8.2	32.6	0.2	0.2	1.7
	309-01	126° 15'	35° 51'	KCW	407	2.34	7.9	32.3	4.8	0.1	0.1
	309-03	125° 49'	35° 51'	MYS	488	0.75	7.2	32.6	2.5	0.3	7.4
	309-05	125° 24'	35° 51'	MYS	1405	0.76	7.9	32.8	0.7	0.3	4.7
	309-07	125°	35° 51'	MYS	687	1.20	8.5	32.8	1.3	0.2	
	309-09	124° 35'	35° 51'	MYS	1256		9.7	32.8	0.4	0.2	7.6
	309-12	123° 24'	35° 51'	MYS	771	3.05					
	309-14	122° 13'	35° 51'	MYS	1242	1.24					
	310-05	125° 24'	35° 20'	MYS	811	1.05	9.8	32.8	0.9	0.3	4.5
	310-07	125°	35° 20'	MYS	627	2.78	10.0	32.6	0.7	0.2	14.8
	310-14	122° 13'	35° 20'	MYS	2360	1.26					
	311-04	125° 44'	34° 43'	KCW	120	0.91	10.3	33.3	6.3	0.5	25.7
	311-05	125° 32'	34° 43'	KCW	134	1.35	9.1	33.1	6.2	0.5	22.1
	311-09	124° 36'	34° 43'	MYS	950	3.61	10.4	32.9	0.4	0.1	10.6
	311-12	123° 24'	34° 43'	MYS	1090	4.31					
	311-14	122° 13'	34° 43'	MYS	733	0.97					
	312-03	125° 54'	33° 60'	MYS	2051	3.90	11.2	33.2	0.8	0.2	10.9
	312-07	125°	34° 06'	MYS	1016	8.08	10.1	32.0	4.2	0.4	9.1
	312-09	124° 36'	34° 06'	MYS	921	11.85	11.0	32.6	1.8	0.1	1.9

(sampling stations are indicated in Fig. 2)

Table 32. Primary production and environmental parameters for each station for August, October and December 1997.

Date	Station	Latitude (°N)	Longitude (°E)	Region	PP (mg C m^{-2} d^{-1})	Surface water Chl *a* (mg m^{-3})	Temp (°C)	Salinity (psu)	NO_3 (μM)	PO_4 (μM)	SiO_4 (μM)
Aug, 1997	307-03	36° 57'	126°	KCW	863	3.19	22.2	32.7	1.61	0.13	3.89
	307-05	36° 56'	125° 25'	KCW	441	0.79	24.8	32.0	0.39	0.1	2.45
	307-09	36° 56'	124° 35'	MYS	1422	0.35	27.3	32.0	0.16	0.05	4.09
	308-01	36° 20'	126° 14'	KCW	783	2.31	25.8	30.3	0.17	0.08	5.97
	308-05	36° 20'	125° 25'	MYS	759	0.36	27.9	32.0	0.27	0.07	4.16
	308-09	36° 20'	124° 45'	MYS	1698	0.42	27.5	32.0	0.2	0.07	4.62
	309-01	35° 51'	126° 15'	KCW	2359	3.76	25.0	31.7	0.13	0.03	2.89
	309-03	35° 51'	125° 49'	MYS	540	0.40	26.5	32.4	0.21	0.03	6.11
	309-05	35° 51'	125° 24'	MYS	1303	0.40	27.4	32.3	0.23	0.03	5.26
	309-09	35° 51'	124° 35'	MYS	623	0.36	28.2	32.0	0.33	0.03	4.28
	309-12	35° 51'	123° 24'	MYS	509	0.33	28.8	33.1			
	309-14	35° 51'	122° 13'	MYS	669		27.3	31.5			
	310-03	35° 20'	125° 49'	MYS	336	0.74	25.0	32.4	0.64	0.02	7.56
	310-09	35° 20'	124° 36'	MYS	286	0.37	27.7	31.7	0.68	0.04	3.85
	310-13			MYS	954	0.50					
	311-05	34° 43'	125° 32'	KCW	1205	0.38	22.9	32.8	0.69	0.03	8.28
	311-14	34° 43'	124° 36'	MYS	1071	0.39	26.0	31.4			
	312-02	33° 59'	126° 06'	KCW	1422	0.57	24.7	31.5	0.88	0.02	7.01
	312-05	34° 03'	125° 30'	MYS	273	0.30	26.7	32.2	0.68	0.04	5.12
	312-09	34° 06'	124° 36'	MYS	356	0.60	27.2	30.5	0.36	0.04	3.52
Oct, 1997	307-03	36° 57'	126°	KCW	191	1.12	19.9	32.2	2.09	0.1	4.96
	307-05	36° 56'	125° 25'	KCW	453	0.50	19.5	32.6	0.52	0.01	3.64
	309-01	35° 51'	126° 15'	KCW	542		19.3	32.7	0.71	0.05	11.84
	309-03	35° 51'	125° 49'	MYS	1421	0.81	18.4	32.8	2.47	0.03	10.86
	309-05	35° 51'	125° 24'	MYS	855		18.7	32.8	0.57	0.11	5.06
	309-09	35° 51'	124° 35'	MYS	769	0.24	19.0	32.7	0.6	0.02	4.9
	310-03	35° 20'	125° 49'	MYS	203		19.1	32.7	3.3	0.07	16.87
	310-05	35° 20'	125° 24'	MYS	1239		18.7	32.6	0.26	0.03	5.15
	310-09	35° 20'	124° 36'	MYS	333	0.27	19.7	32.5	0.03	0.01	4.68
	311-04	34° 43'	125° 44'	KCW	81	1.03	17.3	32.6	5.42	0.05	11.23
	311-07	34° 43'	125°	MYS	605	0.68	20.5	34.5	1.68	0.03	5.95
	311-11	34° 43'	124°	MYS	1047		20.7	31.4			
	311-14	34° 43'	122° 13'	MYS	700	0.61	20.5	31.6			
	312-02	33° 59'	126° 06'	KCW	811	2.01	19.6	32.2	1.18	0.02	6.26
Dec, 1997	307-03	36° 57'	126°	KCW	48	1.12	9.4	31.8	4.02	0.12	9.13
	307-05	36° 56'	125° 25'	KCW	264	0.92	9.1	32.1	3	0.16	11.03
	307-09	36° 56'	124° 35'	MYS	369	0.76	9.5	32.2	1.18	0.11	8.48
	308-03	36° 20'	125°50'	MYS	62	0.85	10.6	32.6	1.96	0.07	6.98
	308-07	36° 20'	125°	MYS	414	0.80	9.2	32.4	1.13	0.03	4.91
	308-09	36° 20'	124° 35'	MYS	510	0.81	10.4	32.4	0.53	0.03	4.77
	309-03	35° 51'	125° 49'	MYS	312	0.86	11.2	32.5	2.42	0.05	8.03
	309-07	35° 51'	125°	MYS	380	0.58	10.5	32.5	1.04	0.07	8.44
	309-09	35° 51'	124° 35'	MYS	305	0.61	10.9	32.4	1.62	0.03	6.46
	310-03	35° 20'	125° 49'	MYS	47	1.20	11.1	32.6	2.89	0.07	12.46
	310-05	35° 20'	125° 24'	MYS	43	0.62	11.5	32.8	3.18	0.1	12.88
	310-09	35° 20'	124° 36'	MYS	405	1.23	11.2	32.7	1.92	0.07	8.2
	311-04	34° 43'	125° 44'	KCW	43		10.7	32.6	3.44	0.45	14.6
	311-05	34° 43'	125° 32'	KCW	59		11.0	32.7			
	311-07	34° 43'	125°	MYS	281	0.40	12.1	32.8	2.51	0.09	9.83
	311-09	34° 43'	124° 36'	MYS	508	0.81	11.5	32.8	1.85	0.13	7.36
	312-02	33° 59'	126° 06'	KCW	83	0.32	14.6	33.7	2.66	0.06	10.26
	312-05	34° 03'	125° 30'	MYS	105	0.50	13.1	33.0			
	312-07	34° 06'	125°	MYS	233	0.69	14.6	33.3	2.17	0.08	8.86
	312-09	34° 06'	124° 36'	MYS	235	0.42	13.6	33.0	1.85	0.06	8.15

(sampling stations are indicated in Fig. 2)

Table 33. Annual mean densities (inds./m^3) of major zooplankotn groups.

Year	Copepods	Amphipods	Chaetognaths	Euphausiids
1978	154.55	7.22	14.10	2.69
1979	69.50	31.14	0.67	44.72
1980	73.77	6.83	6.22	140.43
1981	76.74	4.71	1.39	61.79
1982	75.45	0.13	221.48	0.12
1983	66.03	0.03	79.83	0.42
1984	90.65	0.11	100.88	1.36
1985	57.47	0.11	193.35	2.79
1986	112.22	0.04	119.08	2.60
1987	203.79	0.04	266.93	0.65
1988	179.25	0.05	102.26	3.04
1989	165.01	0.07	137.94	7.17
1990	211.57	0.19	159.05	14.77
1991	178.80	0.04	137.99	4.57
1992	420.30	0.01	80.83	2.17
1993	219.74	0.01	106.94	5.10
1994	291.38	0.22	177.01	6.27
1995	164.15	0.04	189.00	9.20
1996	589.40	0.05	88.99	10.31
1997	41.09	0.12	30.63	2.17
1998	149.42	0.61	21.91	8.81
1999	74.57	0.14	26.61	5.97
2000	2018.85	44.27	65.38	28.59

Table 34. Seasonal mean densities (inds./m^3) of four zooplankton groups from 1978 to 2000.

Month	Copepoda	Amphipoda	Chaetognatha	Euphausiid
February	80.04	0.98	95.47	9.31
April	194.95	0.48	42.96	26.82
June	775.48	10.18	37.77	45.80
August	161.82	3.60	209.07	4.16
October	175.20	7.51	146.91	2.73
December	75.24	2.19	76.02	7.78

Table 7. Participants for Technical Review Meeting on the Data and Information Collection and Reports.

Name	Position	Organization	Remark
HEO Seung	Researcher	WSFRI	
KANG Youngshil	Researcher	WSFRI	
PARK Seungyun	Researcher	WSFRI	
SON Jaekyoung	Researcher	WSFRI	
PARK Junghyun	Researcher	WSFRI	
PARK Kyungsoo	Researcher	WSFRI	
KIM Hyungcheol	Researcher	WSFRI	
YOON Sungjin	Researcher	WSFRI	
YOON Sukkyung	Researcher	WSFRI	
YOO Shinjae	Researcher	KORDI	
NOH Jaehoon	Researcher	KORDI	
HONG Jaesang	Professor	Inha Univ.	
CHOI Jungkee	Professor	Inha Univ.	
YOON Keontak	Researcher	Inha Univ.	
IM weolye	Researcher	NFRDI	

Table 37. Locations and Ecological characteristics of macrobenthic communities in the Yellow Sea from the 1992 Korea-China Joint Research Cooperation Oceanographic Cruise.

Station	Longitude	Latitude	No. of species (No./0.3m^2)	Abundance (inds./m^2)	Biomass (g WWt/m^2)	Diversity index	Production (g AFDW/m^2/y)
A1	126.3	37.0	5	44	2.095	1.472	2.84
A2	126.0	37.0	18	208	11.024	2.625	5.07
A3	125.5	37.0	16	171	4.334	2.439	4.71
A4	125.0	37.0	22	643	27.406	1.647	3.18
A5	124.5	37.0	5	142	1.303	1.188	2.29
A6	124.0	37.0	14	80	4.047	2.400	4.63
A7	123.5	37.0	25	327	14.853	2.682	5.18
B1	126.3	36.0	45	956	79.437	2.963	5.72
B2	126.0	36.0	51	1,087	39.404	3.268	6.31
B3	125.5	36.0	10	356	50.585	1.321	2.55
B4	125.0	36.0	23	439	21.747	2.145	4.14
B5	124.5	36.0	8	46	6.352	1.949	3.76
B6	124.0	36.0	8	52	9.062	1.891	3.65
B7	123.5	36.0	9	88	10.947	1.831	3.53
B8	123.0	36.0	12	118	6.694	2.131	4.11
B9	122.5	36.0	10	89	11.917	1.952	3.77
B10	122.0	36.0	25	311	4.388	2.502	4.83
C2	125.5	35.0	49	1,133	25.757	2.942	5.68
C3	125.0	35.0	22	507	14.921	2.352	4.54
C4	124.5	35.0	9	58	0.939	2.141	4.13
C5	124.0	35.0	12	88	7.349	2.195	4.24
C6	123.5	35.0	11	69	6.039	2.200	4.25
C7	123.0	35.0	11	78	12.896	2.161	4.17
C8	122.5	35.0	15	126	4.889	1.993	3.85
C9	122.0	35.0	18	259	15.657	2.367	4.57
C10	121.5	35.0	42	1,912	12.026	1.760	3.40
D1	126.5	34.0	50	290	24.349	3.579	6.91
D2	126.0	34.0	48	476	7.253	3.427	6.62
D3	125.5	34.0	56	819	23.522	2.643	5.10
D4	125.0	34.0	55	489	19.639	3.558	6.87
D5	124.5	34.0	19	158	3.702	2.522	4.87
D6	124.0	34.0	9	74	7.713	1.716	3.31
D7	123.5	34.0	15	122	2.665	2.113	4.08
D8	123.0	34.0	24	323	6.301	2.758	5.32
E4	125.0	33.0	34	267	6.052	3.244	6.26
E5	124.5	33.0	32	393	22.846	2.829	5.46
E6	124.0	33.0	41	573	21.950	2.86	5.52
E7	123.5	33.0	44	580	19.026	2.394	4.62
E8	123.0	33.0	69	1,045	35.709	3.435	6.63

Station	Longitude	Latitude	No. of species (No./0.3m^2)	Abundance (inds./m^2)	Biomass (g WWt/m^2)	Diversity index	Production (g AFDW/m^2/y)
E9	122.5	33.0	37	638	24.087	2.696	5.20
E10	122.0	33.0	4	12	1.432	1.386	2.68
F1	126.5	32.0	7	28	2.804	1.873	3.62
F2	126.0	32.0	10	50	2.476	2.220	4.29
F3	125.5	32.0	17	121	2.540	2.581	4.98
F4	125.0	32.0	57	1,082	38.170	2.889	5.58
F5	124.5	32.0	71	1,667	28.037	3.260	6.29
F6	124.0	32.0	39	1,086	15.677	2.796	5.40
F7	123.5	32.0	78	2,956	46.584	3.219	6.21
F8	123.0	32.0	28	983	6.202	2.064	3.98
Total			384	23,619	774.804		228.90

Table 38. Macrobenthic species density, abundance, and productivity in the Yellow Sea from the 1992 cruise.

Community Parameters	**Mean Value**
Species density	27.32 species/0.3m^2
Abundance	482.02 ind./m^2
Biomass	15.812 gWWt/m^2
Productivity	4.671 gAFDW/m^2/y
Diversity Index	2.42

Table 39. Dominant species in terms of density (inds./m^2) by Le Bris Index (Le Bris, 1988) from the benthic sampling of 1992 Korea-China oceanographic cruise.

Rank	Tax	Species	Abundance	%	Dij	Fij	D'ij
1	MBi	*Thyasira tokunagai*	586	2.5%	5.902149	44.89796	26499.45
2	Apol	*Terebellides stroemii*	716	3.0%	4.2491	46.93878	19944.76
3	CCu	*Eudorella hwangaensis*	172	0.7%	3.353985	34.69388	11636.27
4	Apol	*Praxillella affinis*	401	1.7%	2.96521	38.77551	11497.75
5	Apol	*Ampharete arctica*	847	3.6%	2.510193	40.81633	10245.68
6	EOp	*Ophiura sarsi vadicola*	356	1.5%	3.647493	26.53061	9677.023
7	Apol	*Mediomastus californiensis*	1064	4.5%	1.943549	46.93878	9122.779
8	MBi	*Nucula nipponica*	218	0.9%	2.192318	40.81633	8948.236
9	Apol	*Spiophanes bombyx*	1970	8.3%	5.084932	16.32653	8301.931
10	Apol	*Leiochrides* sp.	559	2.4%	2.44918	28.57143	6997.658
11	Apol	*Tharyx* spp.	363	1.5%	1.228884	44.89796	5517.437
12	Apol	*Northria geofiliformis*	138	0.6%	2.138787	22.44898	4801.359
13	Apol	*Ammotryphane aulogaster*	106	0.4%	1.273675	34.69388	4418.874
14	Apol	*Euclymene oerstedi*	726	3.1%	1.718339	20.40816	3506.815
15	Apol	*Ninoe palmata*	138	0.6%	1.281315	26.53061	3399.408
16	EOp	*Amphioplus megapomus*	625	2.6%	1.471189	22.44898	3302.669
17	Apol	*Cistenides okudai*	250	1.1%	0.804688	36.73469	2955.998
18	MBi	*Raetellops pulchella*	234	1.0%	0.846401	24.4898	2072.819
19	Apol	*Goniada maculata*	198	0.8%	0.827665	24.4898	2026.935
20	CDM	*Leptochela gracilis*	179	0.8%	0.499017	30.61224	1527.602
21	MBi	*Cycladicama cumingii*	360	1.5%	0.92535	16.32653	1510.775
22	Apol	*Nereis longior*	100	0.4%	0.665364	22.44898	1493.673
23	Apol	*Haploscoloplos elongatus*	133	0.6%	0.562263	26.53061	1491.717
24	MBi	*Nuculana yokoyamai*	155	0.7%	1.013918	14.28571	1448.454
25	EOp	*Amphioplus ancistrotus*	90	0.4%	0.637711	22.44898	1431.596
26	Apol	*Sigambra tentaculata*	57	0.2%	0.566948	24.4898	1388.444
27	CAm	*Carangoliopsidae* sp.	184	0.8%	0.714346	18.36735	1312.065
28	Apol	*Glycinde gurjanovae*	114	0.5%	0.767941	16.32653	1253.781
29	Apol	*Lumbrineris* sp.	38	0.2%	0.650142	18.36735	1194.139
30	Apol	*Lumbrineris latreilli*	139	0.6%	0.528403	22.44898	1186.21
TOTAL			11216	47.5%			

*Note: Apol=Polychaeta, MBi=Bivalvia, CCu=Cumacea, EOp=Opiuroidea, CDM=Macrura, CAm=Amphipoda,

Table 40. Dominant species in terms of biomass (gWWt/m^2) by Le Bris Index (Le Bris, 1988) from the benthic sampling of 1992 Korea-China oceanographic cruise.

Rank	Tax	Species	Biomass	%	Dij	Fij	D'ij
1	Apol	*Terebellides stroemii*	11.979	1.5%	2.93286	46.93878	4987.163581
2	MBi	*Thyasira tokunagai*	12.022	1.6%	2.680388	44.89796	4757.83467
3	Apol	*Mediomastus californiensis*	2.041	0.3%	0.203516	46.93878	4714.229196
4	Apol	*Tharyx* spp.	2.144	0.3%	0.382883	44.89796	4528.084211
5	MBi	*Nucula nipponica*	14.044	1.8%	3.697487	40.81633	4451.381319
6	Apol	*Ampharete arctica*	4.701	0.6%	0.445143	40.81633	4126.14696
7	Apol	*Praxillella affinis*	9.164	1.2%	1.636337	38.77551	4041.184692
8	EOp	*Ophiura sarsi vadicola*	68.244	8.8%	12.21223	26.53061	3874.283827
9	Apol	*Cistenides okudai*	2.43	0.3%	0.284886	36.73469	3701.957949
10	Apol	*Ammotryphane aulogaster*	1.404	0.2%	0.377457	34.69388	3507.13344
11	CCu	*Eudorella hwangaensis*	0.297	0.0%	0.094498	34.69388	3478.837551
12	CDM	*Leptochela gracilis*	3.493	0.5%	0.553364	30.61224	3116.560894
13	Apol	*Leiochrides* sp.	3.59	0.5%	0.674742	28.57143	2924.617096
14	Apol	*Spiophanes kroeyeri*	1.063	0.1%	0.148043	28.57143	2871.947119
15	Apol	*Ninoe palmate*	1.978	0.3%	0.66144	26.53061	2719.205202
16	Apol	*Laonice cirrata*	2.635	0.3%	0.405002	26.53061	2693.561385
17	Apol	*Haploscoloplos elongatus*	1.827	0.2%	0.218794	26.53061	2674.94067
18	Apol	*Sternaspis scutata*	20.886	2.7%	1.795914	24.4898	2628.57095
19	EOp	*Amphioplus ancistrotus*	14.52	1.9%	3.100168	22.44898	2554.914729
20	MBi	*Raetellops pulchella*	1.651	0.2%	0.269226	24.4898	2475.902142
21	Apol	*Goniada maculate*	1.651	0.2%	0.208362	24.4898	2469.815761
22	Apol	*Sigambra tentaculata*	0.312	0.0%	0.109125	24.4898	2459.892091
23	Apol	*Northria geofiliformis*	4.568	0.6%	1.171473	22.44898	2362.045225
24	EOp	*Amphioplus megapomus*	13.86	1.8%	1.132024	22.44898	2358.100319
25	ONe	*Nemertinea spp.*	7.853	1.0%	0.705733	22.44898	2315.471213
26	Apol	*Nereis longior*	2.697	0.3%	0.594756	22.44898	2304.373599
27	Apol	*Glycera chirori*	9.272	1.2%	0.588594	22.44898	2303.757394
28	MBi	*Thracia* sp.	1.458	0.2%	0.309119	22.44898	2275.809845
29	Apol	*Lumbrineris latreilli*	0.918	0.1%	0.125584	22.44898	2257.4564
30	Apol	*Euclymene oerstedi*	27.699	3.6%	1.830599	20.40816	2223.876224
TOTAL			250.401	32.3%			

*Note: Apol=Polychaete, MBi=Bivalvia, CCu=Cumacea, EOp=Opiuroidea, CDM=Macrura, CAm=Amphipoda,

Table 41. The number of HAB events occurred in the Yellow Sea.

Year	Occurrence	Incheon	Chungnam	Cheonbuk
1984	1	1	0	0
1985	0	0	0	0
1986	1	1	0	0
1987	1	0	1	0
1988	2	2	0	0
1989	0	0	0	0
1990	4	3	1	0
1991	1	1	0	0
1992	0	0	0	0
1993	1	0	1	0
1994	2	0	2	0
1995	5	3	1	1
1996	4	0	3	1
1997	3	1	2	0
1998	10	0	7	3
1999	8	0	3	5
2000	9	2	3	4
2001	3	1	1	1
2002	1	0	0	1
2003	2	0	2	0
2004	7	2	1	4
2005	5	1	0	4
Total	70	18	28	24

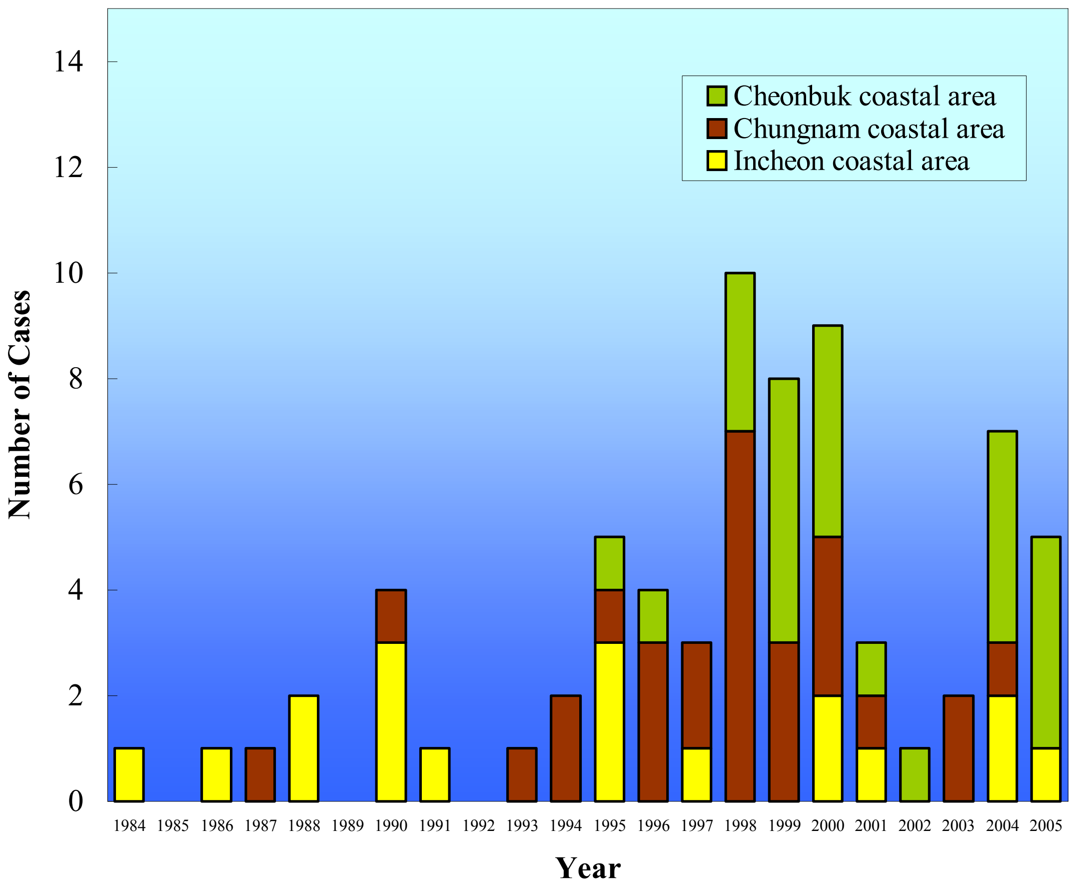

Fig. 48. Occurrences of HAB events in the Yellow Sea from 1984 to 2005.

Ecosystem Data and Information Collection of YSLME

Draft Final Report

Submitted to YSLME PMO and RWGE

Prepared by Mingyuan Zhu, Xuelei Zhang,
Shang Chen, Qixiang Wang

First Institute of Oceanography, SOA

First draft on April 25, 2006

Second draft on July 25, 2006

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I. Background of assignment

The Yellow Sea ecosystem has been facing several serious problems, e.g. 1) Degradation of biodiversity, 2) Loss of coastal habitats due to reclamation, 3) Deterioration of pelagic and benthic habitat quality due to land- and sea-based pollution, 4) Decline of commercial fisheries due to over-fishing, 5) Unsustainable mariculture (including mariculture pollution, disease spread), 6) Harmful effects of HAB on human health and marine ecosystem health. The UNDP/GEF Yellow Sea Project, "Reducing Environmental Stress in the Yellow Sea Large Marine Ecosystem," aims to solve these problems.

As one of activities funded by the UNDP/GEF Yellow Sea Project, the objective of this task is to gather necessary ecosystem-related data and information in China's waters of the Yellow Sea and to make a preliminary analysis of the perceived transboundary problems. The format and types of data and information to be collected have been agreed by the members of the RWG-E at its first meeting.

Geographic Scope: The Yellow Sea large marine ecosystem is defined as the body of water delineated at the south, by a line connecting the north bank of the mouth of the Changjiang (Yangtze River) to the south side of Cheju; at the east, by a line connecting Cheju Island to Jindo Island along the coast of the ROK; and to the north, a line connecting Dalian to Penglai (on the Shandong Peninsula). This latter line separates the Bohai Sea from the Yellow Sea and as a result is not included in this study.

II. Methods used to carry out assignment

FIO formed a team to carry out the task (Table 1). The team consisted of 6 scientists and 2 graduate students majoring in marine ecology.

The technical training meeting was held for the data and information collection on September 24, 2005. All project members participated in this meeting. Prof. Zhu introduced briefly YSLME project and overall requirement of the contract with focus on the objectives, necessary data and information， outcome and timetable. Prof. Zhang made the explanation about the data format and input. Prof. Li gave an introduction about the data and information we have, and the gaps.

Participants agreed that the data collection process should include internet searches, telephone interviews, library research and visits. Internet searches and oral information may give us the some important clue to guide the further activities of data and information collection, but the quality of data and information on internet and from personal communication must be strictly checked.

All the participants agreed to collected as much as possible data and information for the project with the same format and input style, although there were some difficulties to meet the exact format. At last, Prof. ZHU assigned the tasks to the person, please see the Table 2.

Table 1: Participants for technical training meeting

Name	Title	Specialty	Affiliation
ZHU Mingyuan	Research Professor	Marine Ecology	FIO,SOA
ZHANG Xuelei	Research Professor	Marine Ecology	FIO,SOA
LI Ruixiang	Research Professor	Marine Biology	FIO,SOA
ZHANG Zhaohui	Associate Research Professor	Marine Fishery	FIO,SOA
GAO Chunlei	Associate Research Professor	Marine Ecology	FIO,SOA
LIU Ping	Research Assistant	Marine Ecology	FIO,SOA
XU Zongjun	Research Assistant	Marine Ecology	FIO,SOA
TIAN Hua	Research Assistant	Marine Ecology	FIO,SOA

Table 2: Assignment of data and information collection tasks

Name	Tasks
ZHU Mingyuan	In charge generally, and responsible for the contacts.
ZHANG Xuelei	Responsible for the data and info from Liaoning and Shangdong Provinces
LI Ruixiang	Responsible for the data and info from Jiangsu Province and Tianjin Municipality
ZHANG Zhaohui	Responsible for raw data processing, and developing a data set
GAO Chunlei	Responsible for data analysis, including the data gap analysis and causal chain analysis, which will be the topic for the next meeting
LIU Ping	Responsible for the biological data input
XU Zongjun	Responsible for the environmental data input
TIAN Hua	Responsible for the HABs data input, and other related information input

On October 12, 2005, a meeting was held to analyze and review all the data and information we collected. All project members (Table 1) attended the meeting. Professors Zhu, Zhang, and Li reviewed all the data, including the survey stations, survey years, data’s quality and reliability. The arrangement of the detailed data analysis activities was assigned to each responsible member. During the meeting, the data gaps were fully discussed and Prof. Zhu gave the instruction to put as much effort as possible, to the needed data.

The project members visited:

- Oceanic and Fishery Department of Liaoning
- State Oceanic Administration in Beijing
- National Marine Information Center in Tianjin
- Oceanic and Fishery Department of Shandong in Ji’nan
- Oceanic and Fishery Bureau of Qingdao
- North China Sea Branch in Shandong
- Oceanic and Fishery Department of Jiangsu.

We also visited Libraries of FIO, Institute of Oceanology, Yellow Sea Fisheries Research Institute and Ocean University of China and found some required data and information, including phytoplankton, zooplankton, macrobenthos and HAB etc. The detailed information will be given in the below parts of this report.

The preliminary causal chain analysis (CCA) and governance analysis of ecosystem problems were conducted.

One desktop computer and three sets of software (MS OFFICE XP, PRIMERWIN and MEHA) were bought for the data analysis and future project activities (service of surveyed data, analysis of long-term trend and spatial pattern, and drafting map and report etc) of the ecosystem component. PRIMERWIN is for statistic analysis of spatial pattern of plankton and benthos while MEHA is for assessment of marine ecosystem health status considering four indexes of structure, function, ecological stress and habitat quality of marine ecosystem.

We have already finished all project activities required by the contract, including:

- Activity 1: Meeting of working group for ecosystem
- Activity 2: Collecting data and information
- Activity 3: Process raw data
- Activity 4: Data analysis and review meeting
- Activity 5: Identify gaps in data and information
- Activity 6: Causal chain analysis (CCA)
- Activity 7: Governance analysis (GA)
- Activity 8: Quality assurance and quality control (QA/AC) analysis
- Activity 9: Carrying capacity analysis
- Activity 10: Prepare reports to be submitted to the regional working group for ecosystem

III. Ecosystem problems and priorities

Based on the agreements of 2nd RWGE meeting and Statement of Work of ecosystem data collection activity, the main perceived ecosystem problems in the Yellow Sea ecosystem are from three aspects: 1) change in ecosystem structure, 2) change in ecosystem productivity, and 3) habitat modification. Among the three ecosystem problems, the change in ecosystem structure ranks top priority and needs more concern. The Yellow Sea ecosystem structure is the foundation of ecosystem productivity; moreover it is very vulnerable to habitat modification.

The ecosystem structure of the Yellow Sea has changed in each trophic level:

1) at low trophic level, the primary production and phytoplankton abundance have been decreasing (Table 3). From the periods of 1983-1986 and 1996-1998, annual mean Chl-a of Yellow Sea decreased from 0.68 $ug.dm^{-3}$ to 0.22 $ug.dm^{-3}$. The abundance of phytoplankton decreased from $106*10^4$ $cell.m^{-3}$ to $3.3*10^4$ $cell.m^{-3}$. Moreover the dominant group shifted from diatom to dinoflagellate.

2) at high trophic level, the standing stock of many fish species has been declining and the dominant species have shifted from high valuable species (e.g. Spanish Mackerel) to low valuable species (e.g. Japanese Anchovy), Shannon diversity of fish community decreased from 2.80 to 1.95, the number of fish species declined from 93 to 73 (Table 4).

3) at the benthic level, polychaetes became more dominant and economical valuable species decreased. Comparing 1984-85 with 1998-00, the density of Polychaeta increased from 90.1 to 121.7 ind/m^2, while the density of Crustacean decreased from 64.3 to 45.2 ind/m^2 (Figure 1); the percentage of Polychaeta in total macrobenthic density increased to 58% while Crustacean declined to 21% (Fig 2).

Table 3.

Comparison of chlorophyll *a*, primary production and phytoplankton abundance[a] in the Yellow Sea (unit: μg dm^{-3}, mgC m^{-2} d^{-1} and $\times 10^4$ cell m^{-3}, respectively) between two periods[b]

Parameter	1983–1986					1996–1998				
	Spring	Summer	Autumn	Winter	Mean	Spring	Summer	Autumn	Winter	Mean
Chlorophyll *a*	0.84	0.75	0.70	0.44	0.68	0.27	0.31	0.20	0.11	0.22
Primary production	595	565	426	115	425	221	103	29.6	7.6	90.3
Phytoplankton abundance	11	248	132	32	106	2.2		4.1	3.5	3.3
Bacillariophyta	5.6					1.6				
Pyrrophyta	0.7					0.7				
Coscinodiscus	0.3					0.8				
Chaetoceros	2.3					[c]				
Bacillariophyta (%)[d]	88.9					69.5				
Pyrrophyta (%)[d]	11.1					30.5				

[a] The phytoplankton was sampled by using plankton net with a mesh size of 76 μm.
[b] The data were taken from Zhang et al. (1991), Zhu et al. (1993), Wang (2000, 2001, 2003) and Wang et al. (1999).
[c] Very few.
[d] Percentage in total phytoplankton biomass (%).

(From Lin 2005)

Table 4. (From Lin 2005)

Percentage (%) of dominant fish species in total fish biomass and some ecological indexes in the Yellow Sea during 1985–2000[a]

Dominant species and ecological index	1985		2000	
	Center[b]	Yellow Sea	Center[b]	Yellow Sea
Horse-scad mackerel (*Trachurus japonicus*)		15.4		38.2
Chub mackerel (*Pneumatophorus japonicus*)		7.2		22.5
Japanese anchovy (*Engraulis japonicus*)	19.7	12.1	36.6	9.6
Seasnail (*Liparis tanakai*)	23.9	20.1	33.7	12.9
Spanish mackerel (*Scombermorrus niphonius*)	8.1	6.9	NDS[c]	NDS[c]
Plaice (*Cleisthenes herzernsteini*)	8.5		3.0	
Eel-pout (*Enchelyopus elongates*)	8.9		NDS[c]	
Small yellow croaker (*Pseudosciaena polyactis*)	NDS[c]	NDS[c]	6.9	3.7
Pomfret (*Stromateus argenteus*)	NDS[c]		4.9	
Number of species	93		73	
Richness	7.81		5.62	
Diversity	2.80		1.95	
Eveness	0.62		0.45	

[a] The data are after Xu et al. (2003).
[b] Center means the central region of the Yellow Sea, the Transect H is crossover there.
[c] Nondominant species.

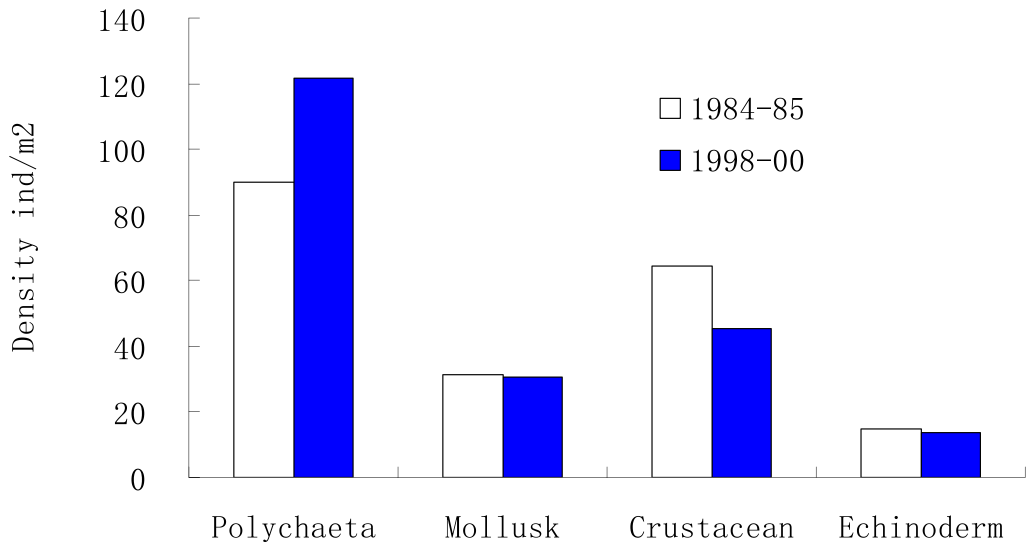

Figure 1. Annual mean density of macrobenthos in the Yellow Sea.

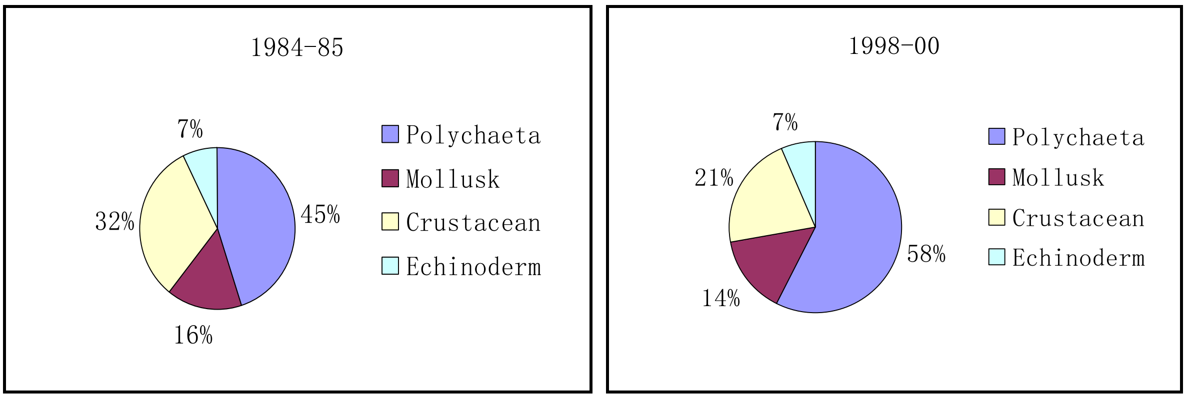

Figure 2. Percentage of four groups of macrobenthos in the Yellow Sea.

IV. Preliminary causal chain analysis and governance analysis

The preliminary causal chain analysis (CCA) and governance analysis (GA) for each ecosystem problem have been made by RWGE at its 2nd meeting. Here we improved the CCA and GA based on our and some Chinese experts' knowledge and experiences, see Table 5for detailed modification. We also removed the items that should be conducted by RWGB, RWGP and RWGF. In addition, the complete will be conducted by ecosystem regional data consultant and TDA consultant, while the complete GA will be conducted by China and Korea GA contractors.

Table 5. Preliminary Causal Chain Analysis and Governance Analysis.

Problem	Environmental Impacts	Socio-economic impacts	Immediate causes (technical)	Underlying causes	Root causes	Governance analysis
Change in ecosystem structure	Reduction in of commercial fishery resources	Loss in fisherman's income	Over harvesting	illegal fishing activities, Increasing demand for seafood	Lifestyle changes and sea food becoming food of choice, Rapidly growing population	weak enforcement of laws and regulations, Poor laws and regulations, Inadequate knowledge
			Change of Oceanographic conditions, e.g. Ecological regime shift	Regional climate system	Climate change	
	Changes in benthic resources	Loss of aesthetic and recreational value for tourism, Loss in fisherman's income	Over harvesting,	illegal fishing activities, Increasing demand for seafood,	Lifestyle changes and sea food becoming food of choice, Rapidly growing population	weak enforcement of laws and regulations, Poor laws and regulations, Inadequate knowledge,
			Polluted habitat	Waste discharge	Fast economic development	Development-oriented policies
	Increased vulnerability to harmful marine organisms (increasing HAB events)	Threats to human health	Eutrophication	Discharge of Nitrogen and Phoshphate into coastal waters	Fast economic development	Development-oriented policies
Change in ecosystem productivity	Deteriorating water quality	Increased management costs	Waste discharge over environmental carrying capacity of coastal waters	Very low fine for illegal waste discharge	Fast development of economic	Weak enforcement of laws and regulations, Poor laws and regulations, inadequate knowledge

		Loss of aesthetic and recreational value for tourism	Increased sediment input	Change in land use, construction	Increased demand for land	Lack of appropriate development plans
	Source and sink capacity	Vulnerability to natural disasters	Atmospheric deposition	Natural and anthropogenic sources	Urbanization, desertification	Lack of appropriate understanding of processes, insufficient investment
			Change in nutrient availability and freshwater input	Construction, damming, diversion	Economic expansion	Inappropriate investment plans
		Loss of employment	Oceanographic conditions	Regional climate system	Climate change	Inadequate capacity in prediction and preparedness
Habitat modification	Change in coastal landscape	Loss of cultural resources	Change in sediment input	Damming, diversion, construction activities on land	Population, economic expansion	Lack of appropriate development plans
	Loss of spawning and nursery grounds	Loss in fisherman's income	Sand extraction	Increase in demand for construction materials	Population, economic expansion	weak enforcement of laws and regulations, inappropriate management
	Biodiversity	Loss of aesthetic and recreational value for tourism	Bottom trawling	Increased demand for demersal fish	Lifestyle changed and food favorite to sea food, Rapidly growing population	weak enforcement of laws and regulations
		Loss of potential value of biological resources	Coastal development (reclamation)	Increased land demand	Population, urbanization, economic expansion	Lack of appropriate development plans

V. Location of data & information and access to each site by the public

Most data and information are kept in the libraries of several oceanographic institutes focusing on basic research, such as, First Institute of Oceanography of SOA, Institute of Oceanography of CAS and Ocean University of China. Some reports on Yellow Sea.?? Many collected data and information are kept in the library of First Institute of Oceanography, SOA. Some information is collected from governments' websites, such as SOA. Some are from individual scientists. Most data are still stored in paper hard copies, no meta database is currently available. Although most information is accessible by the public with a cheap payment, but this service is not daily available.

VI. Data and information table provided

A. Phytoplankton:
   1984-1985: From FIO's library. See Annex 3.1
   1992: From Inha Univ. & IOCAS edited, 1998. Yellow Sea Atlas. See Annex 3.2
   2000, 2001: From Tang Qisheng, edited,2004, Atlas of resources and enviropnment of East China Sea and Yellow Sea. See Annex 3.3
B. Zooplankton:
   1959: From FIO's library, See Annex 4.1
   1984-1985: From FIO's library, See Annex 4.2
   2000, 2001: From Tang Qisheng, edited, 2004, Atlas of resources and enviropnment of East China Sea and Yellow Sea. See Annex 4.3
C. Macrobenthos:
   1984-1985: From FIO's library See Annex 5.1
   1998-2000: From Li Rongguan's report See Annex 5.2
   2000, 2001: From Tang Qisheng, edited, 2004, Atlas of resources and enviropnment of East China Sea and Yellow Sea. See Annex 5.3
D. HAB:
   1972-2005: From FIO's library See Annex 6.1
E. Chl-a:
   1992: From Inha Univ. & IOCAS edited, 1998. Yellow Sea Atlas. See Annex 7.1
   2000,2001: From Tang Qisheng, edited, 2004, Atlas of resources and environment of East China Sea and Yellow Sea. See Annex 7.2
F. Primary Productivity:
   1992: From Inha Univ. & IOCAS edited, 1998. Yellow Sea Atlas. See Annex 8.1
   1998: From Ceng Jisheng's report (2004) See Annex 8.2

VII. Remarks on raw data

The raw and secondary data we collected mainly cover the west side of the Yellow Sea. Each type of data has different spatial coverage. For detailed information please see the data files.

VIII. QA/QC

China national standard, "Specifications for Oceanographic Survey" (GB/T 12763, updated version) only states some general rules for QA/QC of marine raw data. While "Specifications for Marine Monitoring" (GB 17378.2-1998) focuses on the QA/QC of marine chemical data, no guidelines target the QA/QC of marine secondary data and biological data.

All raw data were checked by the responsible scientists before we collected them. After we inputted them in EXCEL file we checked again to avoid the wrong typewriting and deleted the outliers. We checked the collected secondary data (mostly in figure format) based on our and other experts' knowledge and experiences.

IX. Stresses to the ecosystem

The scientific results show that phosphorus and silicate limitation (Lin 2004) and overfishing (Xu 2003), at large spatial scale, are the main stresses on plankton, nekton and benthic communities in the Yellow Sea. With the strengthening nutrient limitation, chlorophyll a, primary production and phytoplankton abundance have been decreasing (Lin 2005), succession of dominant phytoplankton species from diatoms to non-diatoms, the fish community structure shifted from high valuable species to low valuable species (Xu 2003).

However in some local coastal waters, landed-based pollution (SOA 2005), coastal reclamation and mariculture (Zhu 2000) are the more serious stresses on the ecosystem structure and function.

X. Data and information gaps

The collected data and information on plankton (including HAB events) and benthos are important for TDA. However they are not enough to describe the ecosystem status and to address the Yellow Sea ecosystem problems, especially the current data are short and necessary to discover the current status of the Yellow Sea ecosystem. Therefore the joint field survey at basin scale is necessary to obtain new data for TDA.

XI. Preliminary analysis and estimate of carrying capacity of lower trophic level

The lower trophic level in marine ecosystem consists mainly of phytoplankton, zooplankton and bacteria. The carrying capacity of lower trophic level depends mainly on primary productivity of phytoplankton which fixes solar energy through photosynthetic process and produces organic energy to support marine ecosystem. The collected data on primary productivity in the middle waters of the Yellow Sea show a higher level in September than in May 1992. The primary productivity ranged from 50 to 250 mgC.d.m^2 in May 1992 while it changed from 100 to 1000 mgC.d.m^2 in September 1992. The production of organic carbon by phytoplankton in the whole Yellow Sea ranged from 21.9 million tons to 80.3 million tons organic carbon in 1992 based on the average primary productivity of May and September 1992. The annual mean organic carbon production by phytoplankton was about 50 million tons in the whole Yellow Sea (estimated area: 380,000km^2)

During 1996–1998, the primary productivity averaged 90.3 mgC.m^2.d^1 in the Yellow Sea (Lin 2005). Total annual production of organic carbon by phytoplankton in the whole Yellow Sea was about 12.5 million tons which is lower than1992.

Annex 1 Visited Institutions & Websites

State Oceanic Administration (SOA) system:

1. Environmental Protection Department, SOA (Visiting Mr. Bin Wang)
2. North China Sea Branch, SOA (Visiting Mr. Jiangqian Yang, Mr. Wenling Cui)
3. National Oceanic Information Center(visiting Prof Zhihua Ma, Xuyue Luo et.al.)
4. National Marine Environment Monitoring Center(visiting Prof Yubo Liang, Mr. Dewen Ding, Mr. Peiying Li et.al.)
5. Oceanic and Fisheries Department of Liaoning(visiting Mr. Laizhao Chen)
6. Oceanic and Fisheries Department of Shandong(visiting Mr. Jinmao Sun, Mr. Ennian Xie, Ms. Yi Wei)
7. Oceanic and Fisheries Department of Jiangsu(visiting Mr. Yi Shen)
8. Oceanic and Fisheries Bureau of Dalian(visiting Mr. Yantao Dong)
9. Oceanic and Fisheries Bureau of Qingdao(visiting Mr. Lianshen Wang, Sulian Wang)
10. Information Center(i.e. Library),First Institute of Oceanography, State Oceanic Administration(visiting Ms. Ming Lu)

Chinese Academy of Sciences (CAS) system:

11. Information Center(i.e. Library), Institute of Oceanology, CAS

Ministry of Agriculture (MOA) system:

12. Information Center(i.e. Library), Yellow Sea Fisheries Research Institute, Chinese Academy of Fishery Sciences
13. Oceanic and Fisheries Department of Liaoning
14. Oceanic and Fisheries Department of Shandong
15. Oceanic and Fisheries Department of Jiangsu
16. Oceanic and Fisheries Bureau of Dalian
17. Oceanic and Fisheries Bureau of Qingdao

Ministry of Education (MOE) system:

18. Information Center(i.e. Library), Ocean University of China

Visited Websites

1、http://www.soa.gov.cn
2、http://www.coi.gov.cn
3、http://www.sepa.gov.cn

Annex 2 References

1. Chen Zeshi.1991.Coastal Bays of China. Vol 1. Beijing: Ocean Press.
2. Chen Zeshi. Coastal Bays of China. Vol 3. 1991. Beijing: Ocean Press.
3. Lee Yongchul, Yunsan Qun, Ruiyu Liu edited. 1998. Yellow Sea Atlas.
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6. SOA. 1999.National Report of Yellow Sea Large Marine Ecosystem PDF-B
7. Wang Wenhai. 1993. Coastal Bays of China. Vol 4. Beijing: Ocean Press.
8. Xu, B., Jin, X., Liang, Z.. 2003. Changes in benthic fish community structure in autumn in the Yellow Sea. Fishery Science of China, 10 (2): 148-154.
9. Zhang Jinbiao et.al. edited. 1991. Marine atlas of Bohai Sea, Yellow Sea and East China Sea. Beijing: Ocean Press.
10. Zhu Mingyuan, Xuelei Zhang, Ruixiang Li, Shang Chen. 2000. Effect of shellfish mariculture on coastal ecosystem. Journal of Ocean University of Qingdao, 30 (2) II, 53-57
11. SOA. 2005. Bulletin of Marine Environment of China.

Annex 3.1 Phytoplankton 1984-1985

Table 1 Total cell density of phytoplankton data in Aug 1984

Unit: cells/m^3

Net mesh size 77um

	Stn#	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**
	Latitude（N）	38.90	38.40	37.97	37.50	37.75	36.72	36.72	36.72	36.72	36.00	36.00	36.00
	Longitude（E）	123.35	123.00	122.85	123.25	123.75	123.00	123.50	124.00	124.25	121.50	122.00	122.50
	Total cell density	1636080	128618	220692	43824	652836	1094529	68400	156865	740750	635938	95684	195608
Dominant species	**Phylum**												
Ceratium intermedium	Pyrrophyta	890360	47600			416418							
Ceratium fusus	Pyrrophyta			151846			891000	31829	51757				78549
Pyrophacus horologicum	Pyrrophyta												
Coscinodiscus subtilis	Bacillariophyta												
Rhizosolenia alata f. indica	Bacillariophyta												
Bacteriastrum hyalinum	Bacillariophyta												
Rhizosolenia stolterforthii	Bacillariophyta												
Melosira sulcata	Bacillariophyta				14794								
Hemiaulus sinensis	Bacillariophyta												
Bacteriastrum delicatulum	Bacillariophyta									211445			
Chaetoceros compressus	Bacillariophyta										96188	18211	
Rhizosolenia setigera	Bacillariophyta												

Note: Only the dominant species are shown.
Blank cells = data not available

Continued

	Stn#	**13**	**14**	**15**	**16**	**17**	**18**	**19**	**20**	**21**	**22**	**23**	**24**	**25**
	Latitude（N）	36.00	36.00	36.00	35.75	35.00	35.00	35.00	35.00	35.00	35.00	35.00	35.00	34.75
	Longitude(E）	123.00	123.50	124.00	124.50	120.50	121.00	121.50	122.00	122.50	123.00	123.50	124.00	124.50
	Total cell density	633477	264371	425028	149570	503133	515375	1661772	296652	550900	52308	36343	46961	35741
Dominant species	**Phylum**													
Ceratium intermedium	Pyrrophyta									295433				
Ceratium fusus	Pyrrophyta										14400		20364	
Pyrophacus horologicum	Pyrrophyta											9857		
Coscinodiscus subtilis	Bacillariophyta						175188							
Rhizosolenia alata f. indica	Bacillariophyta								150739					
Bacteriastrum hyalinum	Bacillariophyta			160750	39873									
Rhizosolenia stolterforthii	Bacillariophyta		63086											
Melosira sulcata	Bacillariophyta													9035
Hemiaulus sinensis	Bacillariophyta					168867								
Bacteriastrum delicatulum	Bacillariophyta													
Chaetoceros compressus	Bacillariophyta	179939												
Rhizosolenia setigera	Bacillariophyta							672629						

Table 2 Phytoplankton data in Nov 1984

Unit: cells/m^3

Net mesh size 77um

	Stn#	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**
	Latitude（N）	38.90	38.40	37.97	37.50	37.75	36.72	36.72	36.72	36.72	36.00	36.00	36.00
	Longitude（E）	123.35	123.00	122.85	123.25	123.75	123.00	123.50	124.00	124.25	121.50	122.00	122.50
	Total cell density	1298583	104509	87154	62794	324862	527355	2094000	2532432	4445128	92097	297820	1688545
Dominant species	**Phylum**												
Chaetoceros pseudocurvisetus	Bacillariophyta	552000											
Coscinodiscus spp.	Bacillariophyta												
Melosira sulcata	Bacillariophyta			22308	17302						68065		
Nitzschia paradoxa	Bacillariophyta											156949	
Nitzschia pungens	Bacillariophyta		28327										
Rhizosolenia alata f. gracillima	Bacillariophyta						341936	1741143	2119324	3395897			1618909
Ceratium fusus	Pyrrophyta					62215							
Ceratium intermedium	Pyrrophyta												

Continued

	Stn#	13	14	15	16	17	18	19	20	21	22	23	24	25
	Latitude（N）	36.00	36.00	36.00	35.75	35.00	35.00	35.00	35.00	35.00	35.00	35.00	35.00	34.75
	Longitude（E）	123.00	123.50	124.00	124.50	120.50	121.00	121.50	122.00	122.50	123.00	123.50	124.00	124.50
	Total cell density	20791	720563	4320712	3664675	6655	37629	124143	81102	25935	16638	6863	2891039	42494
Dominant species	**Phylum**													
Chaetoceros pseudocurvisetus	Bacillariophyta													
Coscinodiscus spp.	Bacillariophyta	5836									3536			
Melosira sulcata	Bacillariophyta													
Nitzschia paradoxa	Bacillariophyta													
Nitzschia pungens	Bacillariophyta													
Rhizosolenia alata f. gracillima	Bacillariophyta		650366	4056986	3338182	2034	20886	75314	54327			3397	2633766	9129
Ceratium fusus	Pyrrophyta													
Ceratium intermedium	Pyrrophyta									10839				

Table 3 Phytoplankton data in Feb 1985

Unit: cells/m^3

Net mesh size 77um

	Stn#	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**10**	**11**	**12**	**17**	**18**	**19**	**20**
	Latitude（N）	38.90	38.40	37.97	37.50	37.75	36.72	36.72	36.72	36.72	36.00	36.00	36.00	36.00	36.00	36.00
	Longitude（E）	123.35	123.00	122.85	123.25	123.75	123.00	123.50	124.00	124.25	121.50	122.00	122.50	123.00	123.50	124.00
	Total cell density	1553167	4432945	44208	238867	4598896	81032	872123	301686	441000	1040000	1345	24144616	5215333	80480	50958
Dominant species	**Phylum**															
Chaetoceros castracanei	Bacillariophyta													2127333		
Chaetoceros densus	Bacillariophyta									200600					39820	
Coscinodiscus spp.	Bacillariophyta						24968				542316	473				
Grammatophora marina	Bacillariophyta															15208
Melosira sulcata	Bacillariophyta	802125	3445200	18083		3576090										
Nitzschia delicatissima	Bacillariophyta							149169	150029							
Skeletonema costatum	Bacillariophyta				56100											
Thalassionema nitzschioides	Bacillariophyta												6978462			

Table 4 Phytoplankton data in May 1985

Unit: cells/m^3

Net mesh size 77um

	Stn#	**1**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**
	Latitude（N）	38.90	37.75	36.72	36.72	36.72	36.72	36.00	36.00	36.00	36.00
	Longitude（E）	123.35	123.75	123.00	123.50	124.00	124.25	121.50	122.00	122.50	123.00
	Total cell density	125909	79600	659354	100571	1631000	198453	279253	374743	208200	65607
Dominant species	**Phylum**										
Bacteriastrum hyalinum	Bacillariophyta					1360143					
Chaetoceros castracanei	Bacillariophyta				26500			122427			
Chaetoceros compressus	Bacillariophyta										
Chaetoceros densus	Bacillariophyta	67061							97714		12571
Coscinodiscus sp.	Bacillariophyta									186950	
Melosira sulcata	Bacillariophyta			544031							
Rhizosolenia hebetata f. semispina	Bacillariophyta										
Rhizosolenia stolterforthii	Bacillariophyta										
Ceratium intermedium	Pyrrophyta						38827				
Peridinium depressum	Pyrrophyta		14246								

Continued

	Stn#	13	14	15	16	17	19	20	21	22	23	25
	Latitude（N）	36.00	36.00	35.75	35.00	35.00	35.00	35.00	35.00	35.00	35.00	34.75
	Longitude（E）	123.50	124.00	124.50	120.50	121.00	122.00	122.50	123.00	123.50	124.00	124.50
	Total cell density	130545	38730	99432	427875	414933	401030	40980	26300	30600	6880	51850
Dominant species	**Phylum**											
Bacteriastrum hyalinum	Bacillariophyta											
Chaetoceros castracanei	Bacillariophyta	27000									1333	
Chaetoceros compressus	Bacillariophyta						223030					
Chaetoceros densus	Bacillariophyta			19000								
Coscinodiscus sp.	Bacillariophyta											
Melosira sulcata	Bacillariophyta		13054		113725			20041	8233	7114		
Rhizosolenia hebetata f. semispina	Bacillariophyta											17425
Rhizosolenia stolterforthii	Bacillariophyta					150800						
Ceratium intermedium	Pyrrophyta											
Peridinium depressum	Pyrrophyta											

Annex 3.2 Phytoplankton 1992

Fig 1

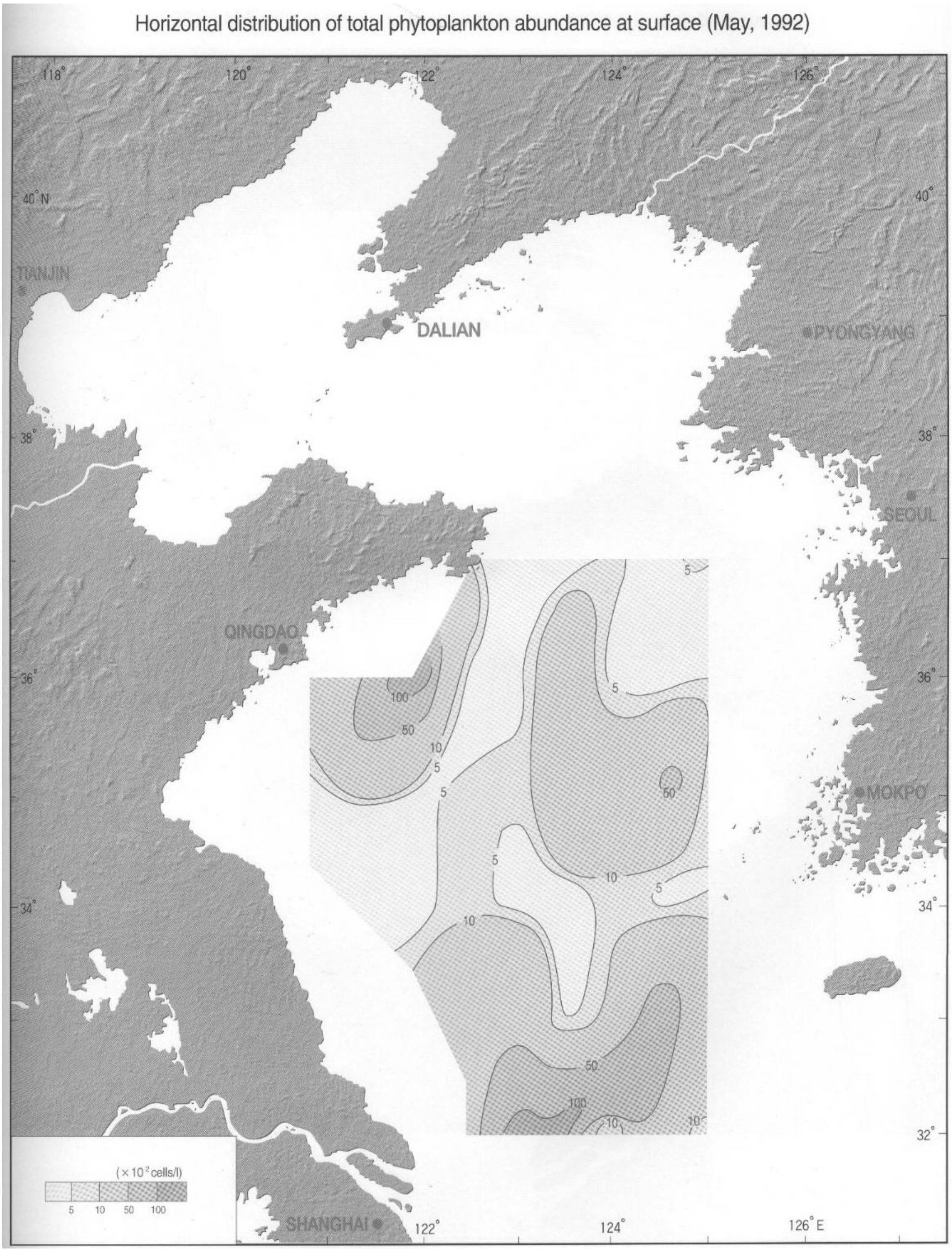


Fig 2

Horizontal distribution of total phytoplankton abundance at surface (September, 1992)

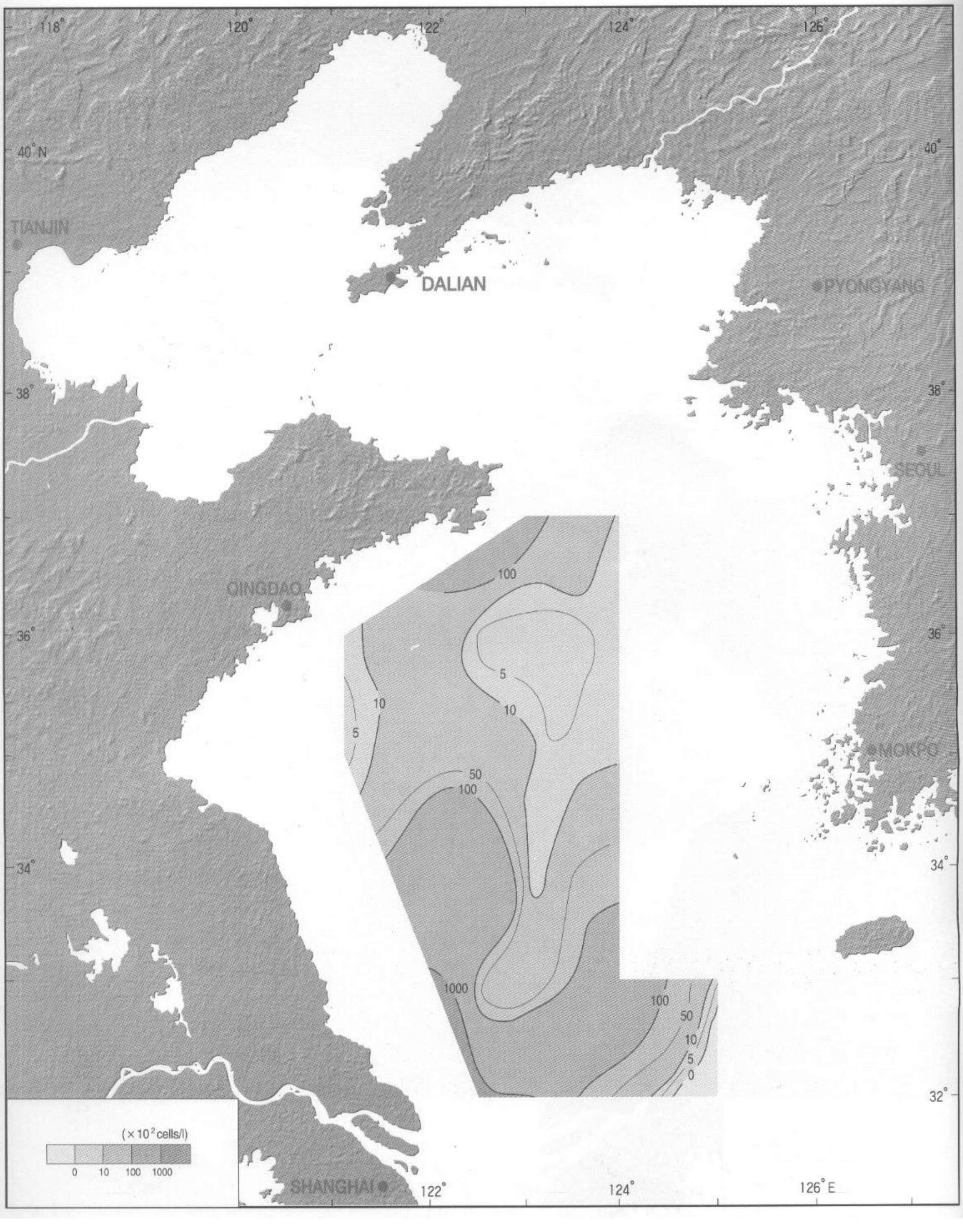


Fig 3

Horizontal distribution of total phytoplankton abundance at 10m (May, 1992)

Fig 4

Horizontal distribution of total phytoplankton abundance at 10m (September, 1992)

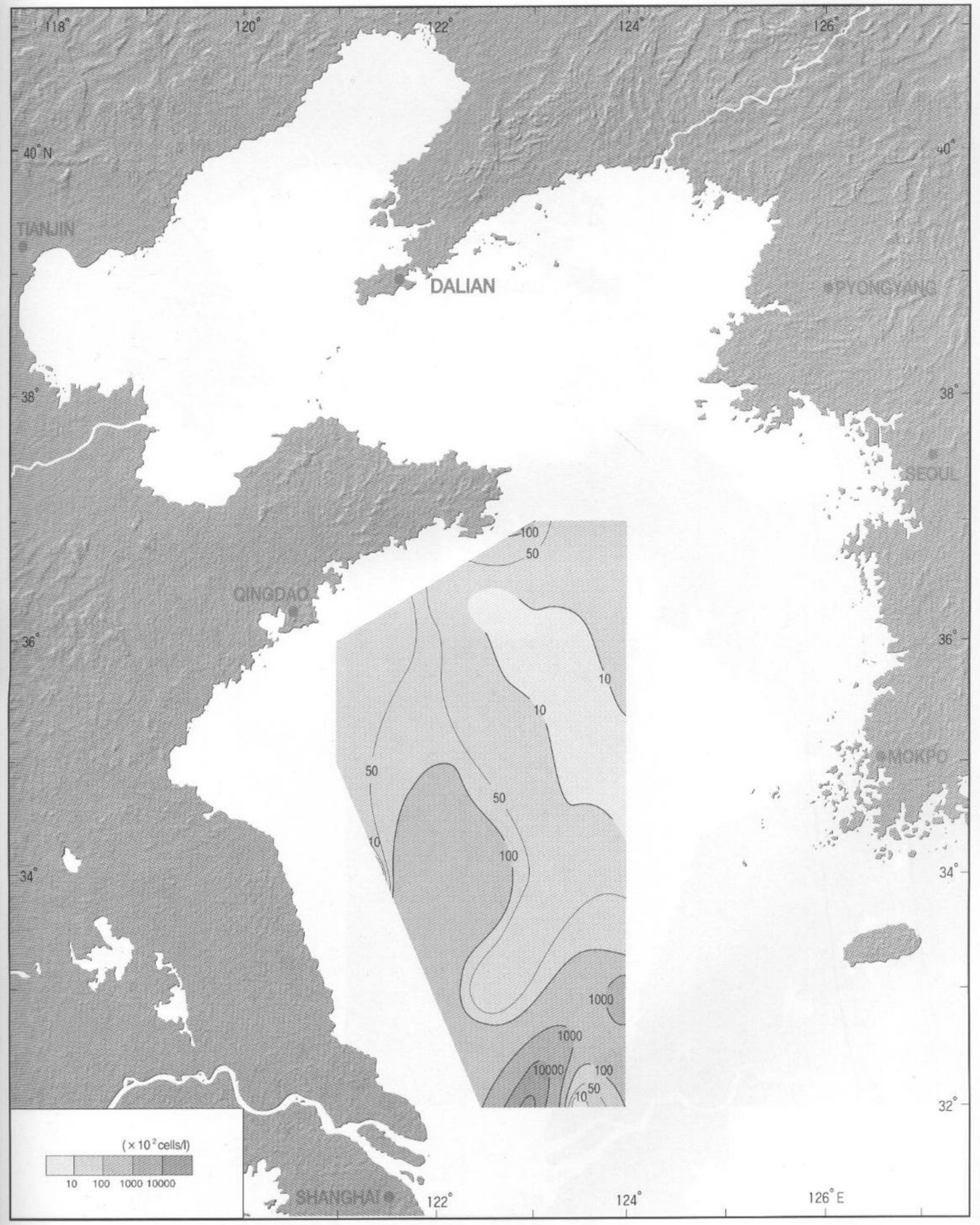


Fig 5

Horizontal distribution of total phytoplankton abundance at 30m (May, 1992)

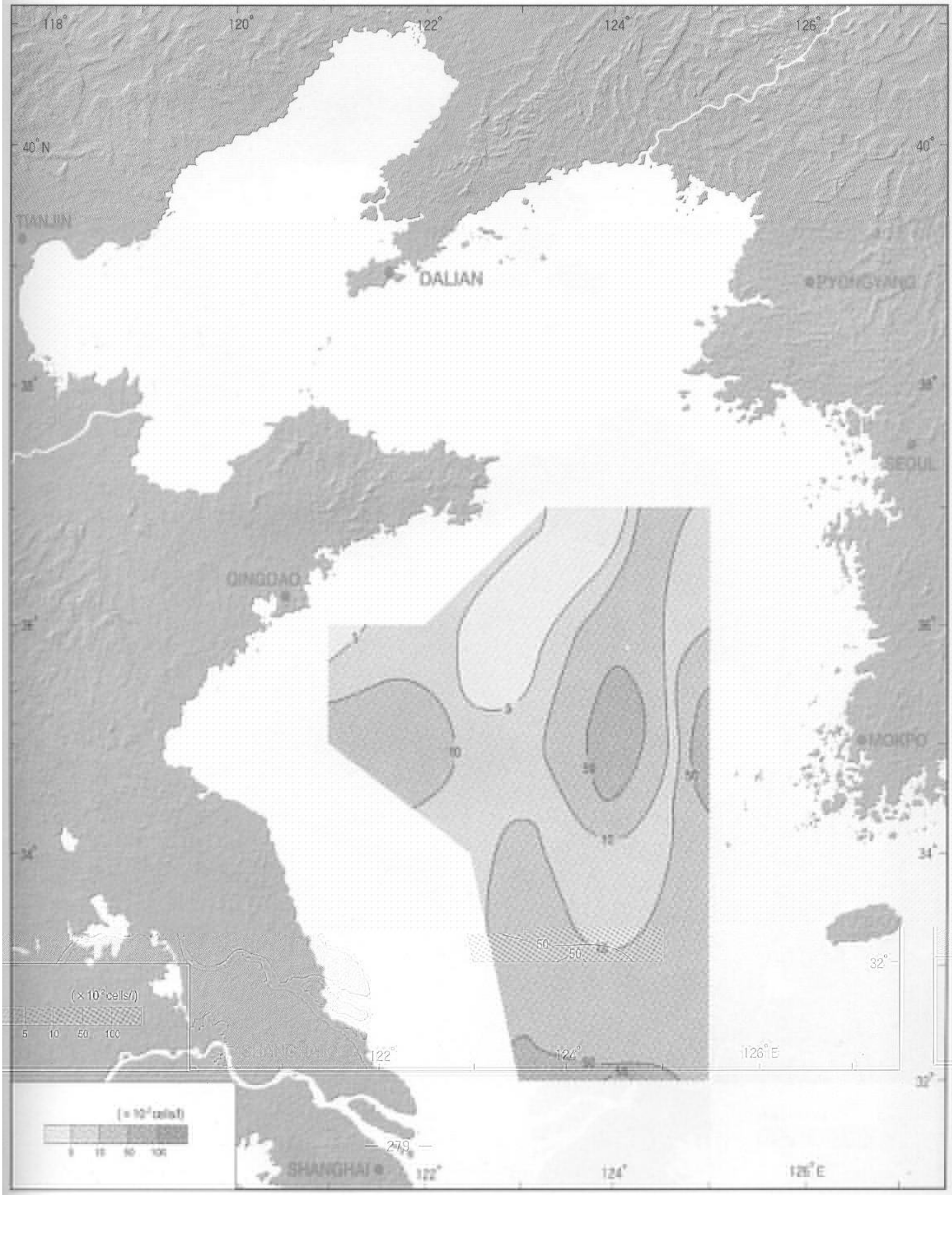
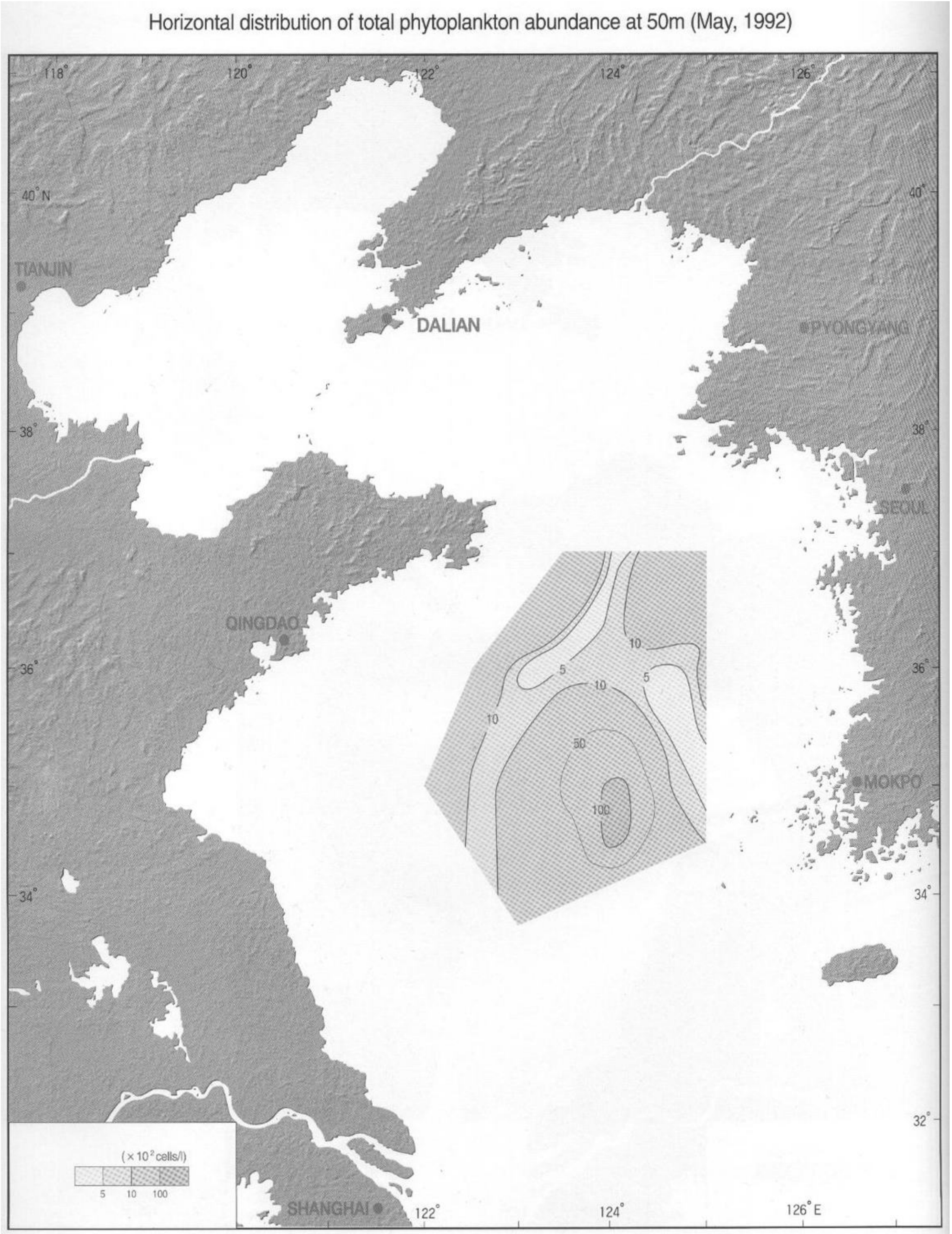


Fig 6



Horizontal distribution of total phytoplankton abundance at 50m (May, 1992)
118°
120°
122°
124°
126°
40° N
40°
TIANJIN
DALIAN
PYONGYANG
38°
38°
SEOUL
QINGDAO
36°
36°
10
5
10
5
10
50
100
MOKPO
34°
34°
32°
(×10² cells/l)
5
10
100
SHANGHAI
122°
124°
126° E

Fig 7

Horizontal distribution of total phytoplankton abundance on the bottom (May, 1992)

Annex 3.3 Phytoplankton 2000-2001

Fig 8

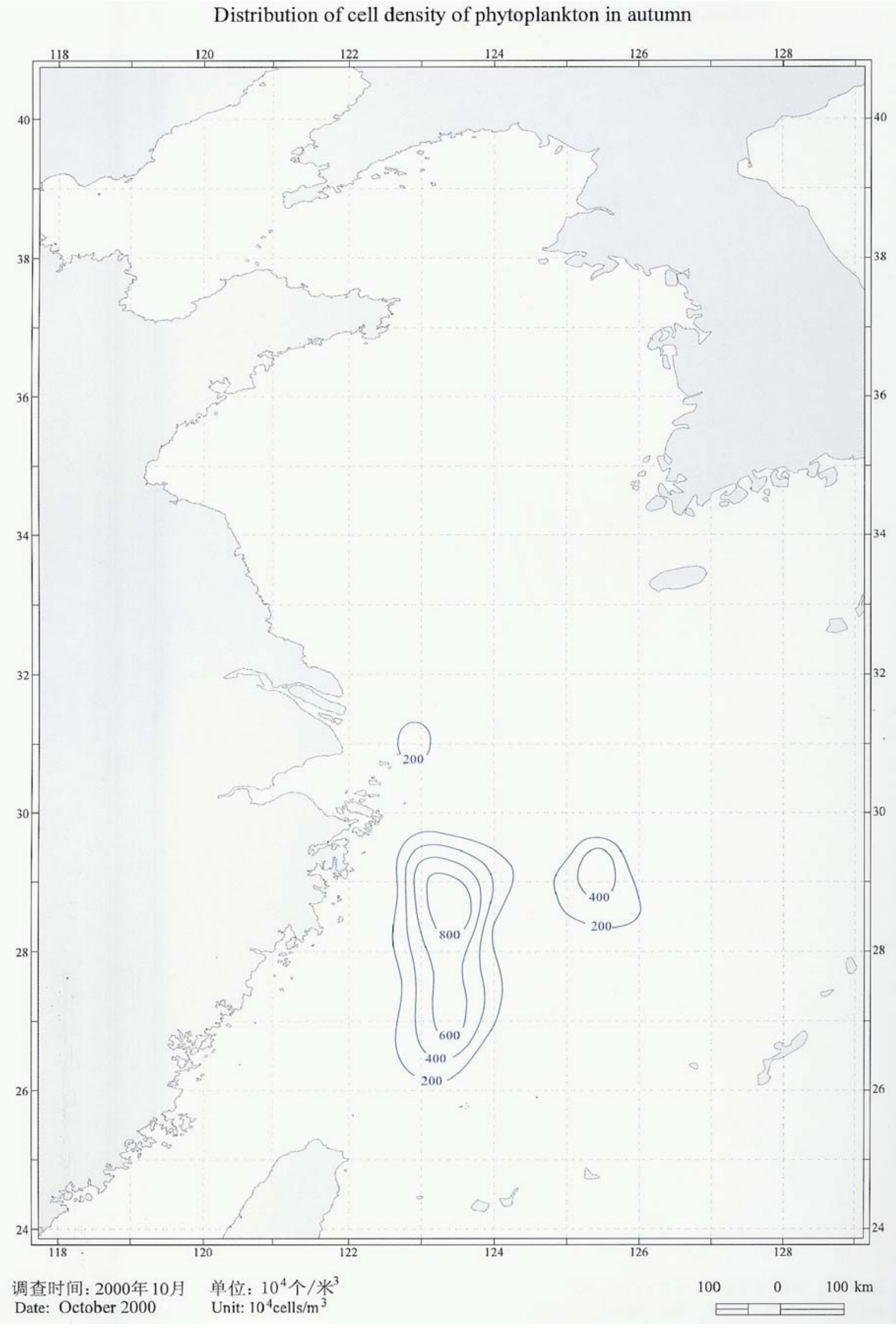
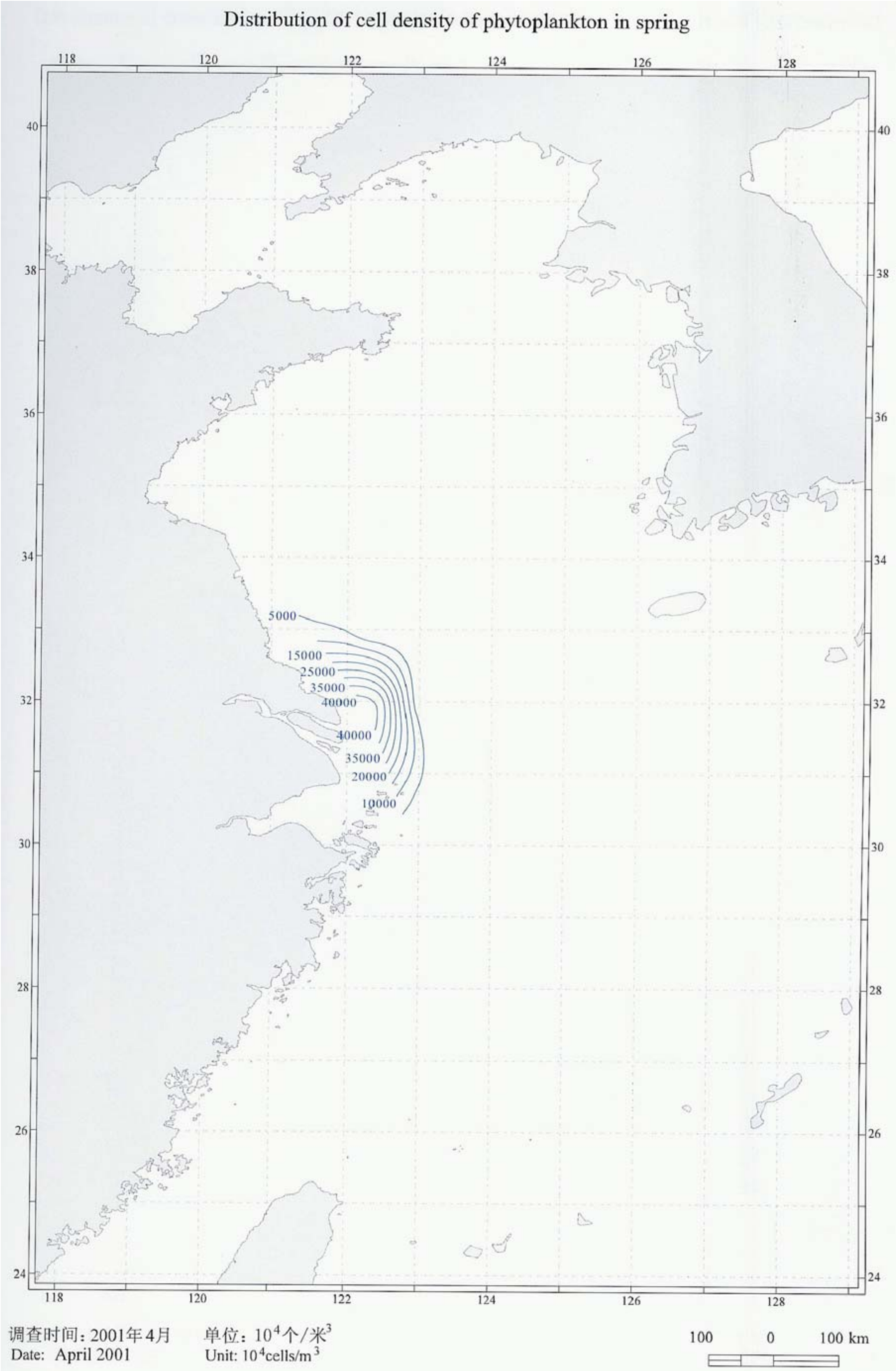


Fig 9



Distribution of cell density of phytoplankton in spring
118
120
122
124
126
128
40
38
36
34
32
30
28
26
24
5000
15000
25000
35000
40000
40000
35000
20000
10000
调查时间：2001年4月
Date: April 2001
单位：10⁴个/米³
Unit: 10⁴cells/m³
100
0
100 km

Annex 4.1 Zooplankton data, 1959

Fig 10

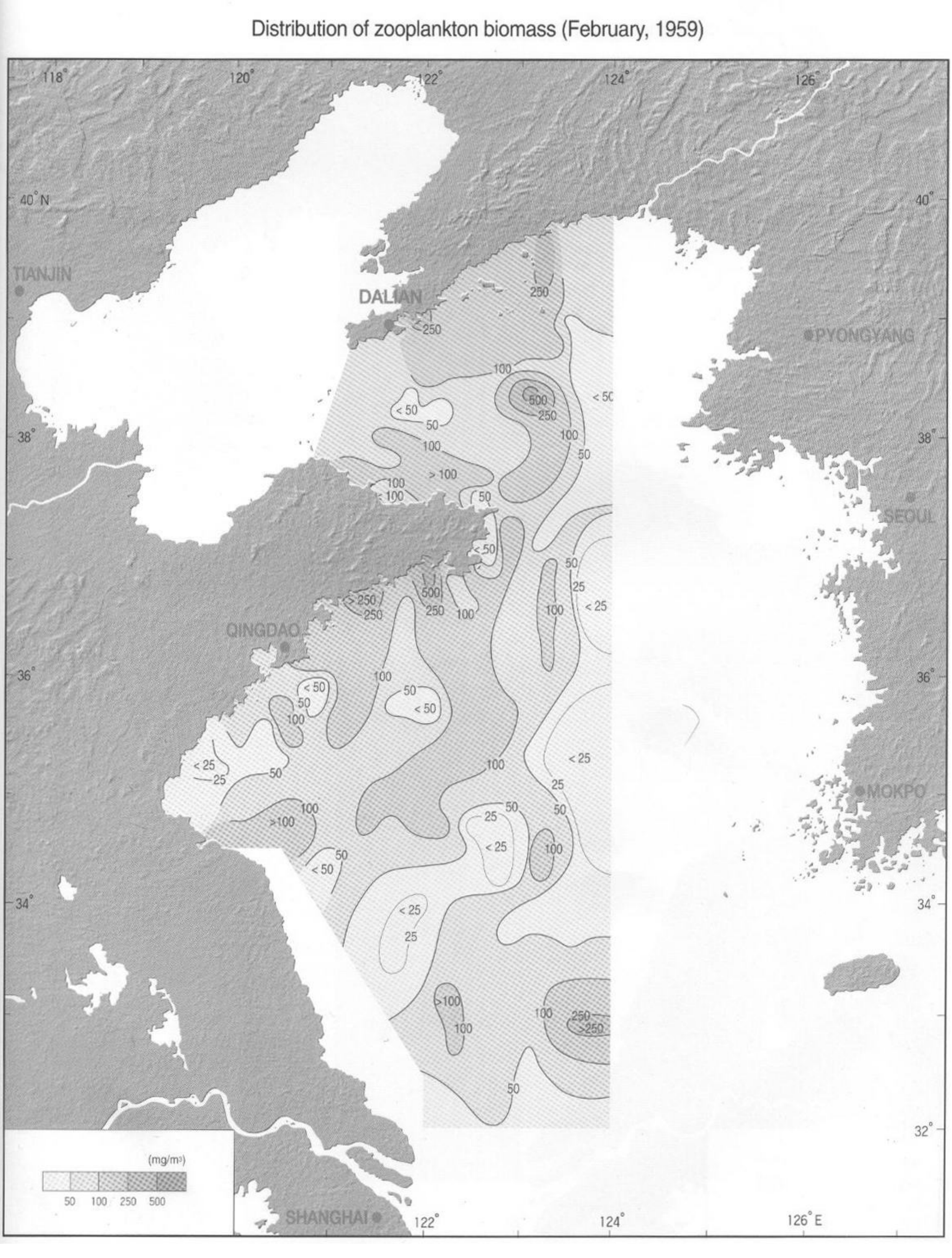


Fig 11

Distribution of zooplankton biomass (May, 1959)

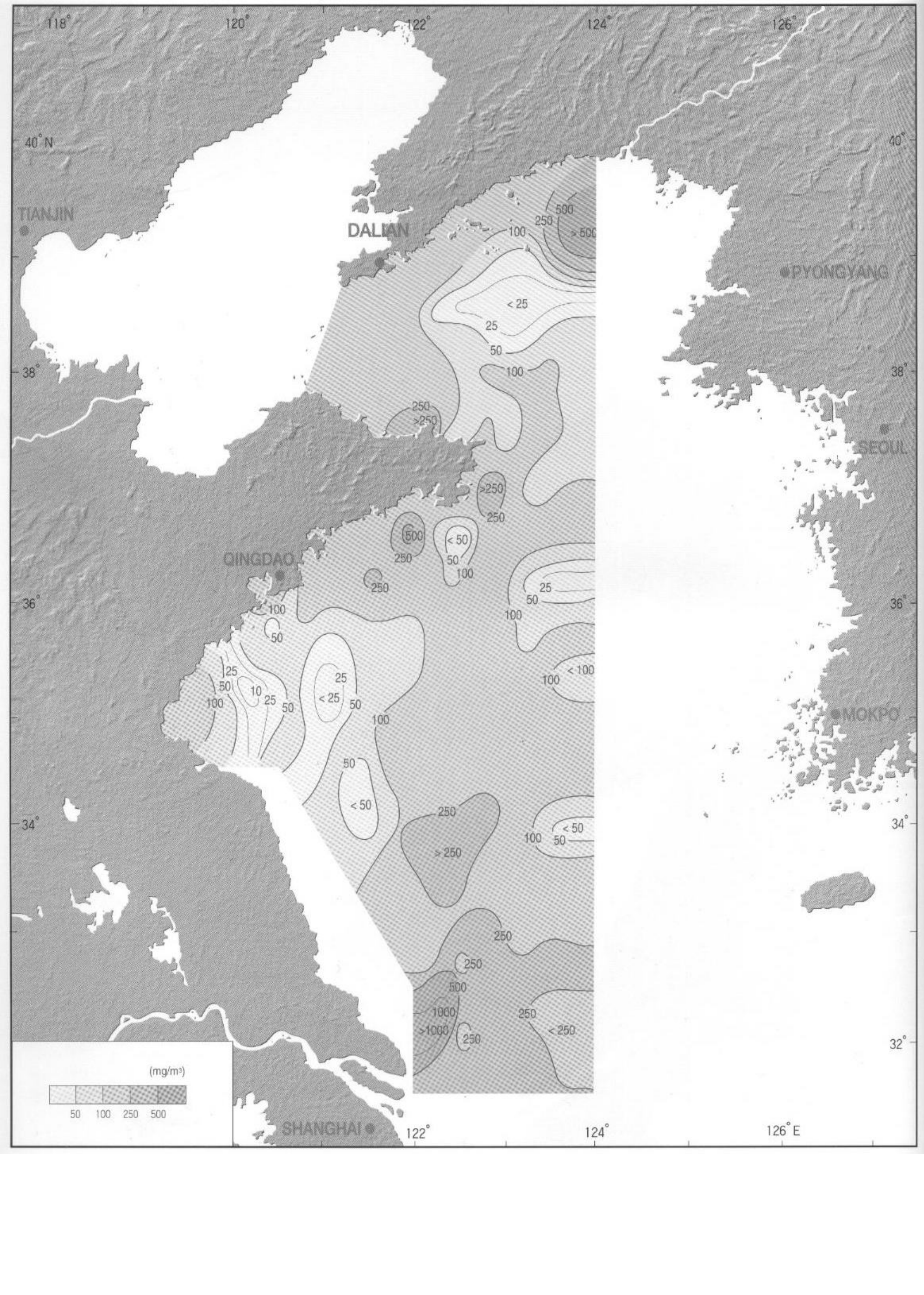
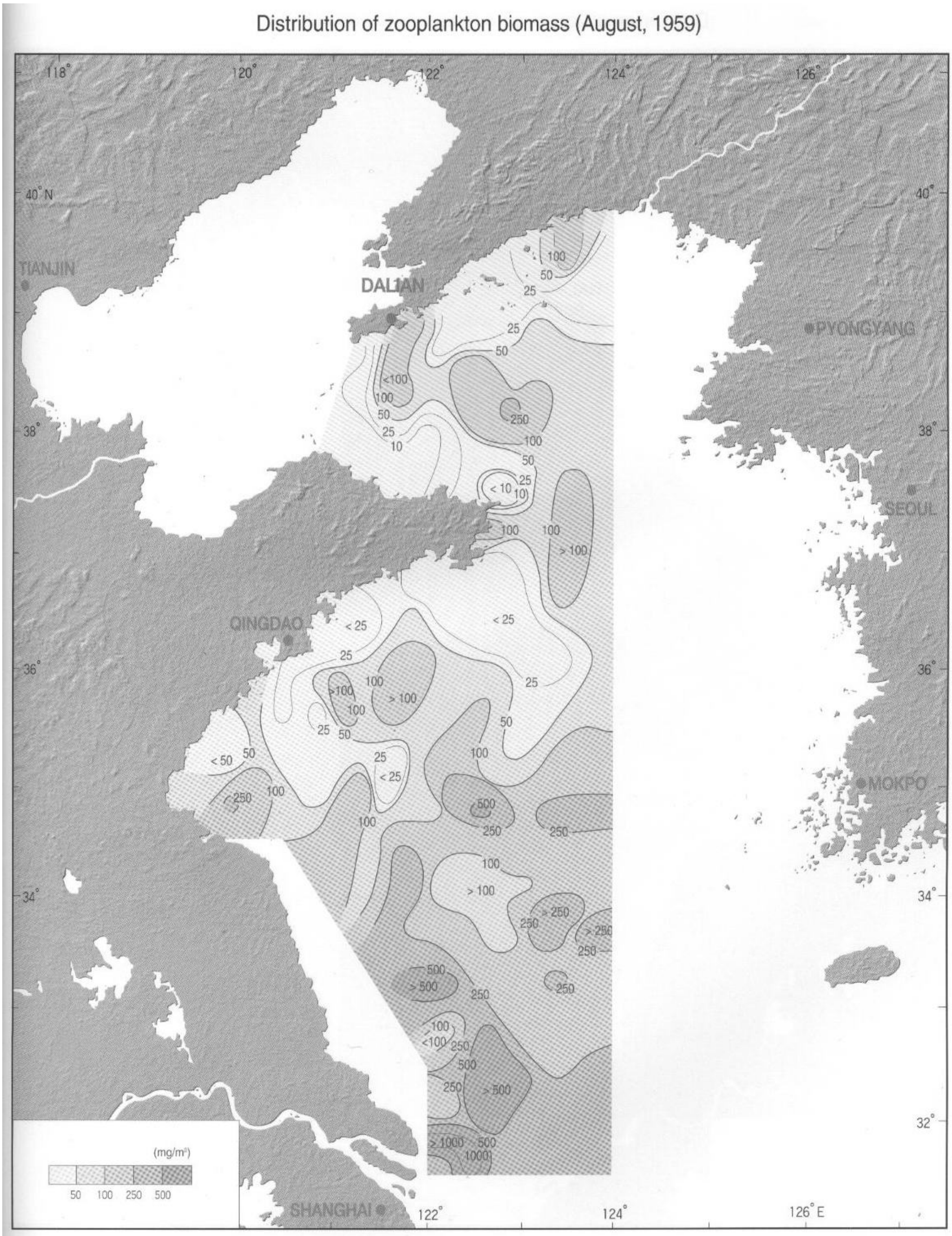


Fig 12


Distribution of zooplankton biomass (August, 1959)
118°
120°
122°
124°
126°
40°N
38°
36°
34°
32°
126° E
TIANJIN
DALIAN
QINGDAO
SHANGHAI
PYONGYANG
SEOUL
MOKPO
(mg/m³)
50
100
250
500

Annex 4.2 Zooplankton 1984-85

Table 5 Total Biomass of Zooplankton in the Yellow Sea (mg/m^3)

Vertical sampling from bottom to the surface
Net mesh size: 505um.

Stn #	N/deg	E/deg	Spring-85	Summer-84	Autumn-84	Winter-85
1	38.90	123.35	<10	37.5	10	<100
2	38.40	123.00	25	25	17.5	<100
3	37.97	122.85	37.5	100	50	<100
4	37.50	123.25	>100	100	37.5	50
5	37.75	123.75	>100	25	25	75
6	36.72	123.00	100	25	25	<25
7	36.72	123.50	50	37.5	37.5	37.5
8	36.72	124.00	50	50	25	100
9	36.72	124.25	37.5	75	<25	100
10	36.00	121.50	>100	37.5	50	>100
11	36.00	122.00	100	37.5	75	>100
12	36.00	122.50	>100	50	100	>100
13	36.00	123.00	>100	37.5	75	>100
14	36.00	123.50	75	37.5	75	>100
15	36.00	124.00	37.5	50	25	100
16	35.75	124.50	37.5	37.5	<25	<50
17	35.00	120.50	>100	<25	75	75
18	35.00	121.00	75	<25	100	>100
19	35.00	121.50	50	<25	>100	<50
20	35.00	122.00	75	37.5	100	50
21	35.00	122.50	75	50	75	<50
22	35.00	123.00	>100	50	75	25
23	35.00	123.50	<100	50	50	25
24	35.00	124.00	100	100	25	37.5
25	34.75	124.50	75	37.5	25	37.5

Table 6 Density of *Liriope tetraphylla* in the Yellow Sea (ind./m^3)

Stn #	N/deg	E/deg	Spring-85	Summer-84	Autumn-84	Winter-85
1	38.90	123.35	<1	<1	<1	<1
2	38.40	123.00	<1	<1	<1	<1
3	37.97	122.85	<1	<1	<1	<1
4	37.50	123.25	<1	<1	<1	<1
5	37.75	123.75	<1	<1	<1	<1
6	36.72	123.00	<1	<1	<1	<1
7	36.72	123.50	<1	<1	<1	<1
8	36.72	124.00	<1	<1	<1	<1
9	36.72	124.25	<1	<1	<1	<1
10	36.00	121.50	<1	<1	1	<1
11	36.00	122.00	<1	<1	1	<1
12	36.00	122.50	<1	<1	1	<1
13	36.00	123.00	<1	<1	1	<1
14	36.00	123.50	<1	<1	1	<1
15	36.00	124.00	<1	<1	1	<1
16	35.75	124.50	<1	<1	1	<1
17	35.00	120.50	<1	<1	1	<1
18	35.00	121.00	<1	<1	1	<1
19	35.00	121.50	<1	<1	1	<1
20	35.00	122.00	<1	<1	1	<1
21	35.00	122.50	<1	<1	1	<1
22	35.00	123.00	<1	<1	1	<1
23	35.00	123.50	<1	<1	1	<1
24	35.00	124.00	<1	<1	1	<1
25	34.75	124.50	<1	<1	<1	<1

Table 7 Density of *Lensia subtiloides* in the Yellow Sea (ind./m^3)

Stn #	N/deg	E/deg	Spring-85	Summer-84	Autumn-84	Winter-85
1	38.90	123.35	<1	<1	<1	<1
2	38.40	123.00	<1	<1	<1	<1
3	37.97	122.85	<1	<1	<1	<1
4	37.50	123.25	<1	<1	<1	<1
5	37.75	123.75	<1	<1	<1	<1
6	36.72	123.00	<1	<1	<1	<1
7	36.72	123.50	<1	<1	<1	<1
8	36.72	124.00	<1	<1	<1	<1
9	36.72	124.25	<1	<1	<1	<1
10	36.00	121.50	<1	<1	<1	<1
11	36.00	122.00	<1	<1	<1	<1
12	36.00	122.50	<1	<1	<1	<1
13	36.00	123.00	<1	<1	<1	<1
14	36.00	123.50	<1	<1	1	<1
15	36.00	124.00	<1	<1	1	<1
16	35.75	124.50	<1	<1	>1	<1
17	35.00	120.50	<1	<1	<1	<1
18	35.00	121.00	<1	<1	<1	<1
19	35.00	121.50	<1	<1	1	<1
20	35.00	122.00	<1	<1	>1	<1
21	35.00	122.50	<1	<1	>1	<1
22	35.00	123.00	<1	<1	>1	<1
23	35.00	123.50	<1	<1	>1	<1
24	35.00	124.00	<1	<1	1	<1
25	34.75	124.50	<1	<1	<1	<1

Table 8 **Density of *Muggiaea atlantica* in the Yellow Sea (ind./m^3)**

Stn #	N/deg	E/deg	Spring-85	Summer-84	Autumn-84	Winter-85
1	38.90	123.35	<1	<1	<5	<1
2	38.40	123.00	<1	<1	<5	<1
3	37.97	122.85	<1	<1	<5	<1
4	37.50	123.25	<1	<1	<5	<1
5	37.75	123.75	<1	<1	<5	<1
6	36.72	123.00	<1	<1	<5	<1
7	36.72	123.50	<1	<1	<5	<1
8	36.72	124.00	<1	<1	<5	<1
9	36.72	124.25	<1	5	<5	<1
10	36.00	121.50	<1	<1	10	<1
11	36.00	122.00	<1	<1	<5	<1
12	36.00	122.50	<1	<1	<5	<1
13	36.00	123.00	<1	<1	<5	<1
14	36.00	123.50	<1	5	<5	<1
15	36.00	124.00	<1	25	<5	<1
16	35.75	124.50	<1	37.5	<5	<1
17	35.00	120.50	<1	<1	<5	<1
18	35.00	121.00	<1	<1	<5	<1
19	35.00	121.50	<1	<1	<5	<1
20	35.00	122.00	<1	<1	<5	<1
21	35.00	122.50	<1	5	<5	<1
22	35.00	123.00	<1	50	<5	<1
23	35.00	123.50	<1	>50	5	<1
24	35.00	124.00	<1	25	<5	<1
25	34.75	124.50	<1	5	<1	<1

Table 9 Density of *Sagitta nagae* in the Yellow Sea (ind./m^3)

Stn #	N/deg	E/deg	Spring-85	Summer-84	Autumn-84	Winter-85
1	38.90	123.35	<1	<1	<1	<1
2	38.40	123.00	<1	<1	<1	<1
3	37.97	122.85	<1	<1	<1	<1
4	37.50	123.25	<1	<1	<1	<1
5	37.75	123.75	<1	<1	<1	<1
6	36.72	123.00	<1	<1	<1	<1
7	36.72	123.50	<1	<1	<1	<1
8	36.72	124.00	<1	<1	<1	<1
9	36.72	124.25	<1	<1	<1	<1
10	36.00	121.50	<1	<1	<1	<1
11	36.00	122.00	<1	<1	<1	<1
12	36.00	122.50	<1	<1	<1	<1
13	36.00	123.00	<1	<1	<1	<1
14	36.00	123.50	<1	<1	<1	<1
15	36.00	124.00	<1	<1	<1	<1
16	35.75	124.50	<1	<1	<1	<1
17	35.00	120.50	<1	<1	>1	<1
18	35.00	121.00	<1	<1	>1	<1
19	35.00	121.50	<1	<1	>1	<1
20	35.00	122.00	<1	<1	>1	<1
21	35.00	122.50	<1	<1	>1	<1
22	35.00	123.00	<1	<1	>1	<1
23	35.00	123.50	<1	<1	>1	<1
24	35.00	124.00	<1	<1	>1	<1
25	34.75	124.50	<1	1	>1	<1

Table 10 **Density of *Sagitta enflata* in the Yellow Sea (ind./m^3)**

Stn #	N/deg	E/deg	Spring-85	Summer-84	Autumn-84	Winter-85
1	38.90	123.35	<1	<1	<1	<1
2	38.40	123.00	<1	<1	<1	<1
3	37.97	122.85	<1	<1	<1	<1
4	37.50	123.25	<1	<1	<1	<1
5	37.75	123.75	<1	<1	<1	<1
6	36.72	123.00	<1	<1	5	<1
7	36.72	123.50	<1	<1	<1	<1
8	36.72	124.00	<1	<1	<1	<1
9	36.72	124.25	<1	<1	<1	<1
10	36.00	121.50	<1	<1	<1	<1
11	36.00	122.00	<1	<1	1	<1
12	36.00	122.50	<1	<1	17.5	<1
13	36.00	123.00	<1	<1	10	<1
14	36.00	123.50	<1	<1	25	<1
15	36.00	124.00	<1	<1	25	<1
16	35.75	124.50	<1	<1	1	<1
17	35.00	120.50	<1	<1	5	<1
18	35.00	121.00	<1	<1	17.5	<1
19	35.00	121.50	<1	<1	>25	<1
20	35.00	122.00	<1	<1	25	<1
21	35.00	122.50	<1	<1	25	<1
22	35.00	123.00	<1	<1	50	<1
23	35.00	123.50	<1	<1	17.5	<1
24	35.00	124.00	<1	<1	10	<1
25	34.75	124.50	<1	<1	1	<1

Table 11 **Density of *Sagitta crassa* in the Yellow Sea (ind./m^3)**

Stn #	N/deg	E/deg	Spring-85	Summer-84	Autumn-84	Winter-85
1	38.90	123.35	5	>50	10	25
2	38.40	123.00	7.5	25	10	37.5
3	37.97	122.85	10	50	25	10
4	37.50	123.25	>10	37.5	37.5	17.5
5	37.75	123.75	25	50	25	50
6	36.72	123.00	>10	37.5	<25	10
7	36.72	123.50	5	25	37.5	10
8	36.72	124.00	1	25	37.5	25
9	36.72	124.25	1	25	37.5	17.5
10	36.00	121.50	17.5	50	100	50
11	36.00	122.00	25	50	75	50
12	36.00	122.50	17.5	37.5	50	100
13	36.00	123.00	10	37.5	37.5	50
14	36.00	123.50	1	37.5	>50	37.5
15	36.00	124.00	5	37.5	<50	25
16	35.75	124.50	5	37.5	<50	1
17	35.00	120.50	10	37.5	>50	50
18	35.00	121.00	10	37.5	50	100
19	35.00	121.50	5	100	75	25
20	35.00	122.00	10	50	37.5	17.5
21	35.00	122.50	5	37.5	37.5	10
22	35.00	123.00	10	50	>50	5
23	35.00	123.50	>10	37.5	50	1
24	35.00	124.00	>10	37.5	50	<1
25	34.75	124.50	>10	5	37.5	<1

Table 12 Density of *Calanus sinicus* in the Yellow Sea (ind./m^3)

Stn #	N/deg	E/deg	Spring-85	Summer-84	Autumn-84	Winter-85
1	38.90	123.35	17.5	37.5	10	37.5
2	38.40	123.00	>25	17.5	10	25
3	37.97	122.85	>25	75	25	17.5
4	37.50	123.25	50	>100	10	17.5
5	37.75	123.75	100	25	10	25
6	36.72	123.00	>100	10	5	17.5
7	36.72	123.50	75	10	10	50
8	36.72	124.00	50	50	10	100
9	36.72	124.25	25	50	10	100
10	36.00	121.50	75	5	25	25
11	36.00	122.00	100	25	25	37.5
12	36.00	122.50	>100	50	25	50
13	36.00	123.00	>100	37.5	25	50
14	36.00	123.50	100	37.5	25	37.5
15	36.00	124.00	50	50	10	37.5
16	35.75	124.50	75	37.5	10	25
17	35.00	120.50	250	<1	10	10
18	35.00	121.00	100	<1	50	25
19	35.00	121.50	50	3	25	37.5
20	35.00	122.00	75	17.5	25	25
21	35.00	122.50	100	75	50	10
22	35.00	123.00	>100	100	25	7.5
23	35.00	123.50	100	50	17.5	7.5
24	35.00	124.00	75	75	10	10
25	34.75	124.50	50	25	10	17.5

Table 13 Density of *Undinula vulgaris* in the Yellow Sea (ind./m^3)

Stn #	N/deg	E/deg	Spring-85	Summer-84	Autumn-84	Winter-85
1	38.90	123.35	<1	<1	<1	<1
2	38.40	123.00	<1	<1	<1	<1
3	37.97	122.85	<1	<1	<1	<1
4	37.50	123.25	<1	<1	<1	<1
5	37.75	123.75	<1	<1	<1	<1
6	36.72	123.00	<1	<1	<1	<1
7	36.72	123.50	<1	<1	<1	<1
8	36.72	124.00	<1	<1	<1	<1
9	36.72	124.25	<1	<1	<1	<1
10	36.00	121.50	<1	<1	<1	<1
11	36.00	122.00	<1	<1	<1	<1
12	36.00	122.50	<1	<1	<1	<1
13	36.00	123.00	<1	<1	<1	<1
14	36.00	123.50	<1	<1	<1	<1
15	36.00	124.00	<1	<1	<1	<1
16	35.75	124.50	<1	<1	<1	<1
17	35.00	120.50	<1	<1	<1	<1
18	35.00	121.00	<1	<1	<1	<1
19	35.00	121.50	<1	<1	<1	<1
20	35.00	122.00	<1	<1	<1	<1
21	35.00	122.50	<1	<1	<1	<1
22	35.00	123.00	<1	<1	<1	<1
23	35.00	123.50	<1	<1	<1	<1
24	35.00	124.00	<1	<1	<1	<1
25	34.75	124.50	<1	<1	<1	<1

Table 14 Density of *Euchaeta plana* in the Yellow Sea (ind./m^3)

Stn #	N/deg	E/deg	Spring-85	Summer-84	Autumn-84	Winter-85
1	38.90	123.35	<1	<1	<1	<1
2	38.40	123.00	<1	<1	<1	<1
3	37.97	122.85	<1	<1	<1	<1
4	37.50	123.25	<1	<1	<1	<1
5	37.75	123.75	<1	<1	<1	<1
6	36.72	123.00	<1	<1	<1	<1
7	36.72	123.50	<1	<1	<1	<1
8	36.72	124.00	<1	<1	<1	<1
9	36.72	124.25	<1	<1	<1	<1
10	36.00	121.50	<1	<1	<1	<1
11	36.00	122.00	<1	<1	<1	<1
12	36.00	122.50	<1	<1	<1	<1
13	36.00	123.00	<1	<1	<1	<1
14	36.00	123.50	<1	<1	<1	<1
15	36.00	124.00	<1	<1	<1	<1
16	35.75	124.50	<1	<1	<1	<1
17	35.00	120.50	<1	<1	<1	<1
18	35.00	121.00	<1	<1	<1	<1
19	35.00	121.50	<1	<1	<1	<1
20	35.00	122.00	<1	<1	<1	<1
21	35.00	122.50	<1	<1	<1	<1
22	35.00	123.00	<1	<1	<1	<1
23	35.00	123.50	<1	<1	<1	<1
24	35.00	124.00	<1	<1	<1	<1
25	34.75	124.50	<1	<1	<1	<1

Table 15 **Density of *Labidocera euchaeta* in the Yellow Sea (ind./m^3)**

Stn #	N/deg	E/deg	Spring-85	Summer-84	Autumn-84	Winter-85
1	38.90	123.35	<1	<1	<1	<1
2	38.40	123.00	<1	<1	<1	<1
3	37.97	122.85	<1	<1	<1	<1
4	37.50	123.25	<1	<1	<1	<1
5	37.75	123.75	<1	<1	<1	<1
6	36.72	123.00	<1	<1	<1	3
7	36.72	123.50	<1	<1	<1	3
8	36.72	124.00	<1	<1	<1	<1
9	36.72	124.25	<1	<1	<1	<1
10	36.00	121.50	<1	<1	<1	<1
11	36.00	122.00	<1	<1	<1	<1
12	36.00	122.50	<1	<1	<1	<1
13	36.00	123.00	<1	<1	<1	<1
14	36.00	123.50	<1	<1	<1	<1
15	36.00	124.00	<1	<1	<1	<1
16	35.75	124.50	<1	<1	<1	<1
17	35.00	120.50	1	3	<25	3
18	35.00	121.00	<1	3	<1	<1
19	35.00	121.50	<1	1	<1	<1
20	35.00	122.00	<1	<1	<1	<1
21	35.00	122.50	<1	<1	<1	<1
22	35.00	123.00	<1	<1	<1	<1
23	35.00	123.50	<1	<1	<1	<1
24	35.00	124.00	<1	<1	<1	<1
25	34.75	124.50	<1	<1	<1	<1

Table 16 Density of *Themisto gracilipes* in the Yellow Sea (ind./m^3)

Stn #	N/deg	E/deg	Spring-85	Summer-84	Autumn-84	Winter-85
1	38.90	123.35	<1	<1	<1	<1
2	38.40	123.00	<1	<1	<1	<1
3	37.97	122.85	<1	<1	<1	<1
4	37.50	123.25	<1	<1	<1	<1
5	37.75	123.75	<1	<1	<1	<1
6	36.72	123.00	>10	<1	<1	<1
7	36.72	123.50	<1	<1	<1	<1
8	36.72	124.00	<1	<1	<1	<1
9	36.72	124.25	<1	<1	<1	<1
10	36.00	121.50	3	<1	<1	<1
11	36.00	122.00	>10	<1	<1	<1
12	36.00	122.50	>10	<1	<1	<1
13	36.00	123.00	1	<1	<1	<1
14	36.00	123.50	<1	<1	<1	<1
15	36.00	124.00	<1	<1	<1	<1
16	35.75	124.50	<1	<1	<1	<1
17	35.00	120.50	3	<1	<1	<1
18	35.00	121.00	3	<1	<1	<1
19	35.00	121.50	3	<1	<1	<1
20	35.00	122.00	3	<1	<1	<1
21	35.00	122.50	3	<1	<1	<1
22	35.00	123.00	<1	<1	<1	<1
23	35.00	123.50	<1	<1	<1	<1
24	35.00	124.00	<1	<1	<1	<1
25	34.75	124.50	<1	<1	<1	<1

Table 17 Density of *Pseudeuphausia sinica* in the Yellow Sea (ind./m^3)

Stn #	N/deg	E/deg	Spring-85	Summer-84	Autumn-84	Winter-85
1	38.90	123.35	<1	<1	<1	<1
2	38.40	123.00	<1	<1	<1	<1
3	37.97	122.85	<1	<1	<1	<1
4	37.50	123.25	<1	<1	<1	<1
5	37.75	123.75	<1	<1	<1	<1
6	36.72	123.00	<1	<1	3	<1
7	36.72	123.50	<1	<1	3	<1
8	36.72	124.00	<1	<1	<1	<1
9	36.72	124.25	<1	<1	1	<1
10	36.00	121.50	<1	<1	3	<1
11	36.00	122.00	<1	<1	3	<1
12	36.00	122.50	<1	<1	3	<1
13	36.00	123.00	<1	<1	3	<1
14	36.00	123.50	<1	<1	3	<1
15	36.00	124.00	<1	<1	3	<1
16	35.75	124.50	<1	<1	3	<1
17	35.00	120.50	<1	<1	50	<1
18	35.00	121.00	<1	<1	5	<1
19	35.00	121.50	<1	1	3	<1
20	35.00	122.00	<1	1	5	<1
21	35.00	122.50	<1	<1	>5	<1
22	35.00	123.00	<1	<1	5	<1
23	35.00	123.50	<1	<1	3	<1
24	35.00	124.00	<1	<1	<1	<1
25	34.75	124.50	<1	<1	<1	<1

Table 18 **Density of *Euphausia nana* in the Yellow Sea (ind./m^3)**

Stn #	N/deg	E/deg	Spring-85	Summer-84	Autumn-84	Winter-85
1	38.90	123.35	<1	<1	<1	<1
2	38.40	123.00	<1	<1	<1	<1
3	37.97	122.85	<1	<1	<1	<1
4	37.50	123.25	<1	<1	<1	<1
5	37.75	123.75	<1	<1	<1	<1
6	36.72	123.00	<1	<1	<1	<1
7	36.72	123.50	<1	<1	<1	<1
8	36.72	124.00	<1	<1	<1	<1
9	36.72	124.25	<1	<1	<1	<1
10	36.00	121.50	<1	<1	<1	<1
11	36.00	122.00	<1	<1	<1	<1
12	36.00	122.50	<1	<1	<1	<1
13	36.00	123.00	<1	<1	<1	<1
14	36.00	123.50	<1	<1	<1	<1
15	36.00	124.00	<1	<1	<1	<1
16	35.75	124.50	<1	<1	<1	<1
17	35.00	120.50	<1	<1	<1	<1
18	35.00	121.00	<1	<1	<1	<1
19	35.00	121.50	<1	<1	<1	<1
20	35.00	122.00	<1	<1	<1	<1
21	35.00	122.50	<1	<1	<1	<1
22	35.00	123.00	<1	<1	<1	<1
23	35.00	123.50	<1	<1	<1	<1
24	35.00	124.00	<1	<1	<1	<1
25	34.75	124.50	<1	<1	<1	<1

Table 19 **Density of *Lucifer intermedius* in the Yellow Sea (ind./m^3)**

Stn #	N/deg	E/deg	Spring-85	Summer-84	Autumn-84	Winter-85
1	38.90	123.35	<1	<1	<1	<1
2	38.40	123.00	<1	<1	<1	<1
3	37.97	122.85	<1	<1	<1	<1
4	37.50	123.25	<1	<1	<1	<1
5	37.75	123.75	<1	<1	<1	<1
6	36.72	123.00	<1	<1	<1	<1
7	36.72	123.50	<1	<1	<1	<1
8	36.72	124.00	<1	<1	<1	<1
9	36.72	124.25	<1	<1	<1	<1
10	36.00	121.50	<1	<1	<1	<1
11	36.00	122.00	<1	<1	<1	<1
12	36.00	122.50	<1	<1	<1	<1
13	36.00	123.00	<1	<1	<1	<1
14	36.00	123.50	<1	<1	<1	<1
15	36.00	124.00	<1	<1	<1	<1
16	35.75	124.50	<1	<1	<1	<1
17	35.00	120.50	<1	<1	<1	<1
18	35.00	121.00	<1	<1	<1	<1
19	35.00	121.50	<1	<1	<1	<1
20	35.00	122.00	<1	<1	<1	<1
21	35.00	122.50	<1	<1	<1	<1
22	35.00	123.00	<1	<1	<1	<1
23	35.00	123.50	<1	<1	<1	<1
24	35.00	124.00	<1	<1	<1	<1
25	34.75	124.50	<1	<1	<1	<1

Table 20 Density of *Thalia democratica* in the Yellow Sea (ind./m^3)

Stn #	N/deg	E/deg	Spring-85	Summer-84	Autumn-84	Winter-85
1	38.90	123.35	<1	<1	<1	<1
2	38.40	123.00	<1	<1	<1	<1
3	37.97	122.85	<1	<1	<1	<1
4	37.50	123.25	<1	<1	<1	<1
5	37.75	123.75	<1	<1	<1	<1
6	36.72	123.00	<1	<1	<1	<1
7	36.72	123.50	<1	<1	<1	<1
8	36.72	124.00	<1	<1	<1	<1
9	36.72	124.25	<1	<1	<1	<1
10	36.00	121.50	<1	<1	<1	<1
11	36.00	122.00	<1	<1	<1	<1
12	36.00	122.50	<1	<1	<1	<1
13	36.00	123.00	<1	<1	<1	<1
14	36.00	123.50	<1	<1	<1	<1
15	36.00	124.00	<1	<1	<1	<1
16	35.75	124.50	<1	<1	<1	<1
17	35.00	120.50	<1	<1	<1	<1
18	35.00	121.00	<1	<1	<1	<1
19	35.00	121.50	<1	<1	<1	<1
20	35.00	122.00	<1	<1	<1	<1
21	35.00	122.50	<1	<1	<1	<1
22	35.00	123.00	<1	<1	<1	<1
23	35.00	123.50	<1	<1	<1	<1
24	35.00	124.00	<1	<1	<1	<1
25	34.75	124.50	<1	<1	<1	<1

Annex 4.3 Zooplankton 2000-01

Fig 13

Distribution of *Calanus sinicus* in spring

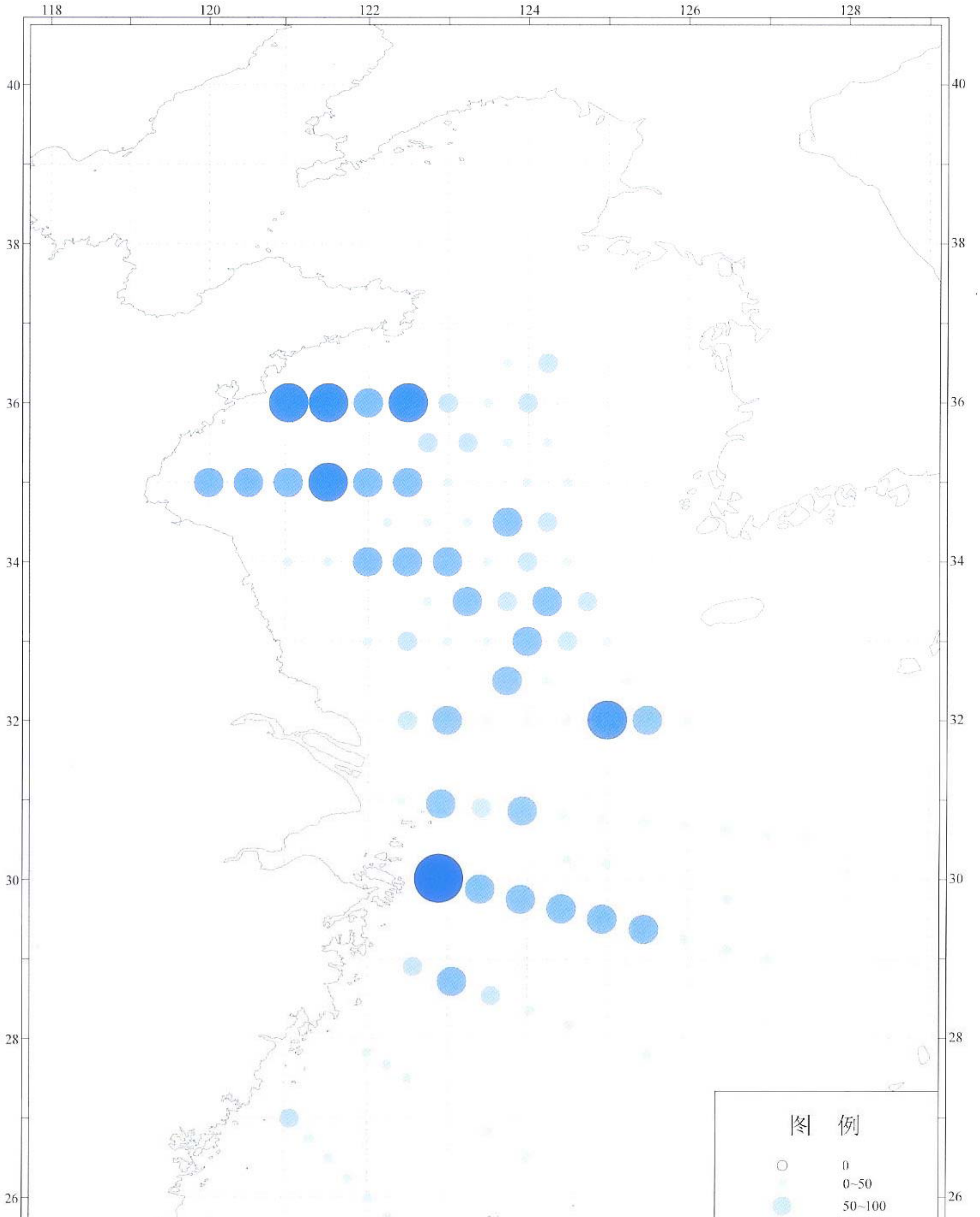


Fig 14

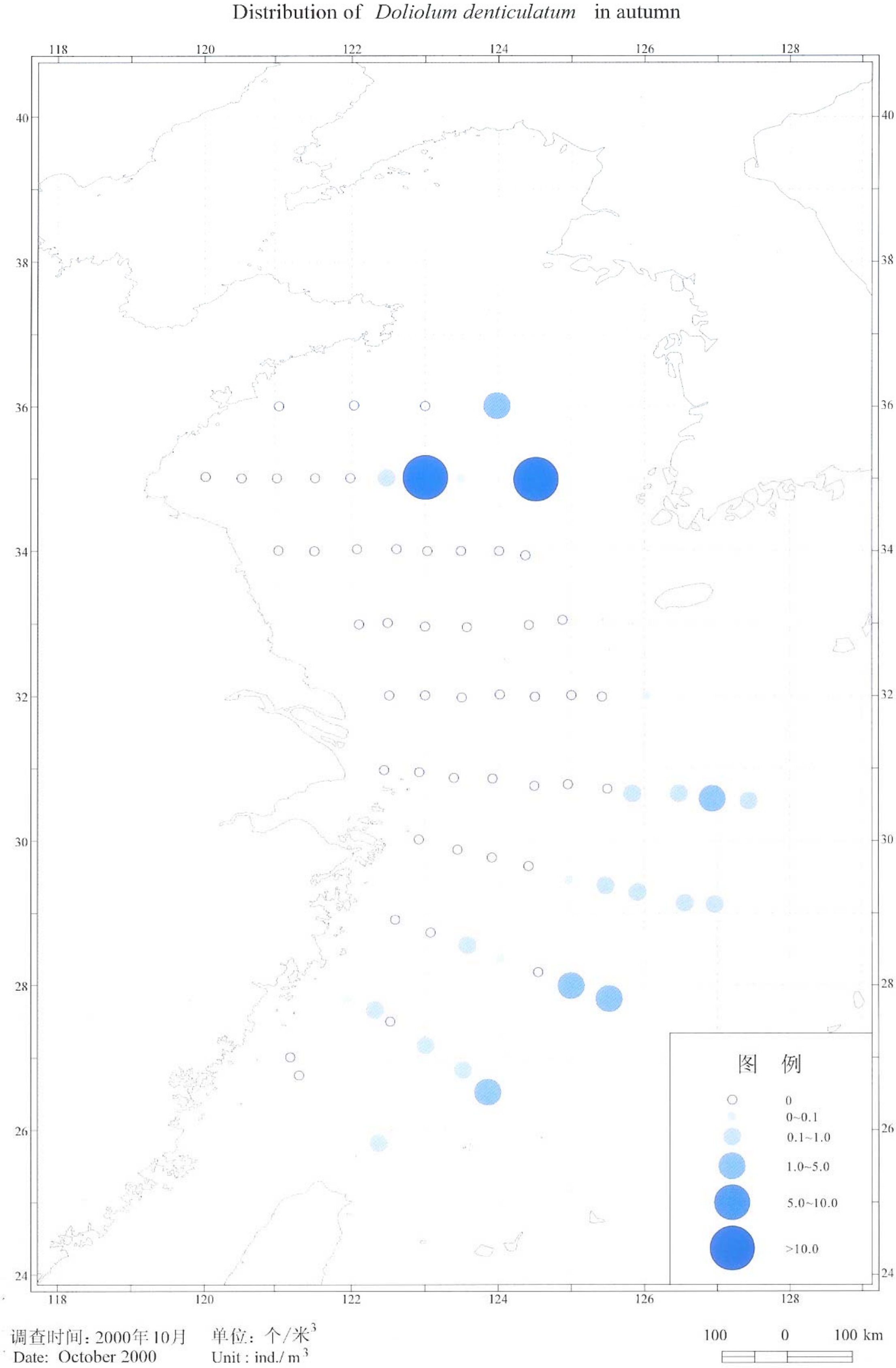

Distribution of *Doliolum denticulatum* in autumn
118
120
122
124
126
128
40
38
36
34
32
30
28
26
24
图 例
0
0~0.1
0.1~1.0
1.0~5.0
5.0~10.0
>10.0
调查时间：2000年10月
Date: October 2000
单位：个/米3
Unit : ind./ m3
100
0
100 km

Fig 15

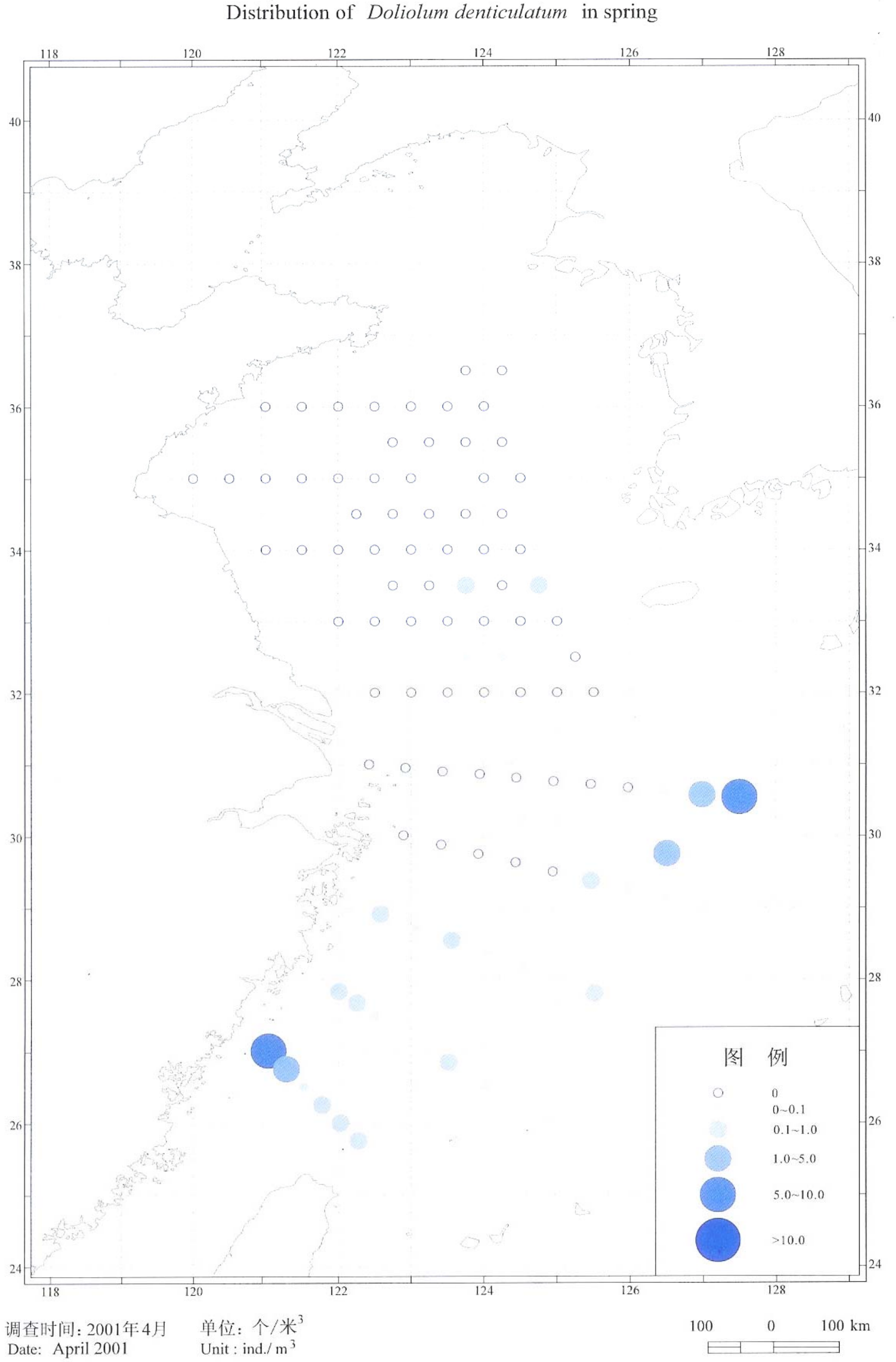

Distribution of *Doliolum denticulatum* in spring
118
120
122
124
126
128
40
38
36
34
32
30
28
26
24
图 例
0
0~0.1
0.1~1.0
1.0~5.0
5.0~10.0
>10.0
调查时间：2001年4月
Date: April 2001
单位：个/米3
Unit : ind./ m3
100 0 100 km

Fig 16

Distribution of *Euchaeta concinna* in autumn

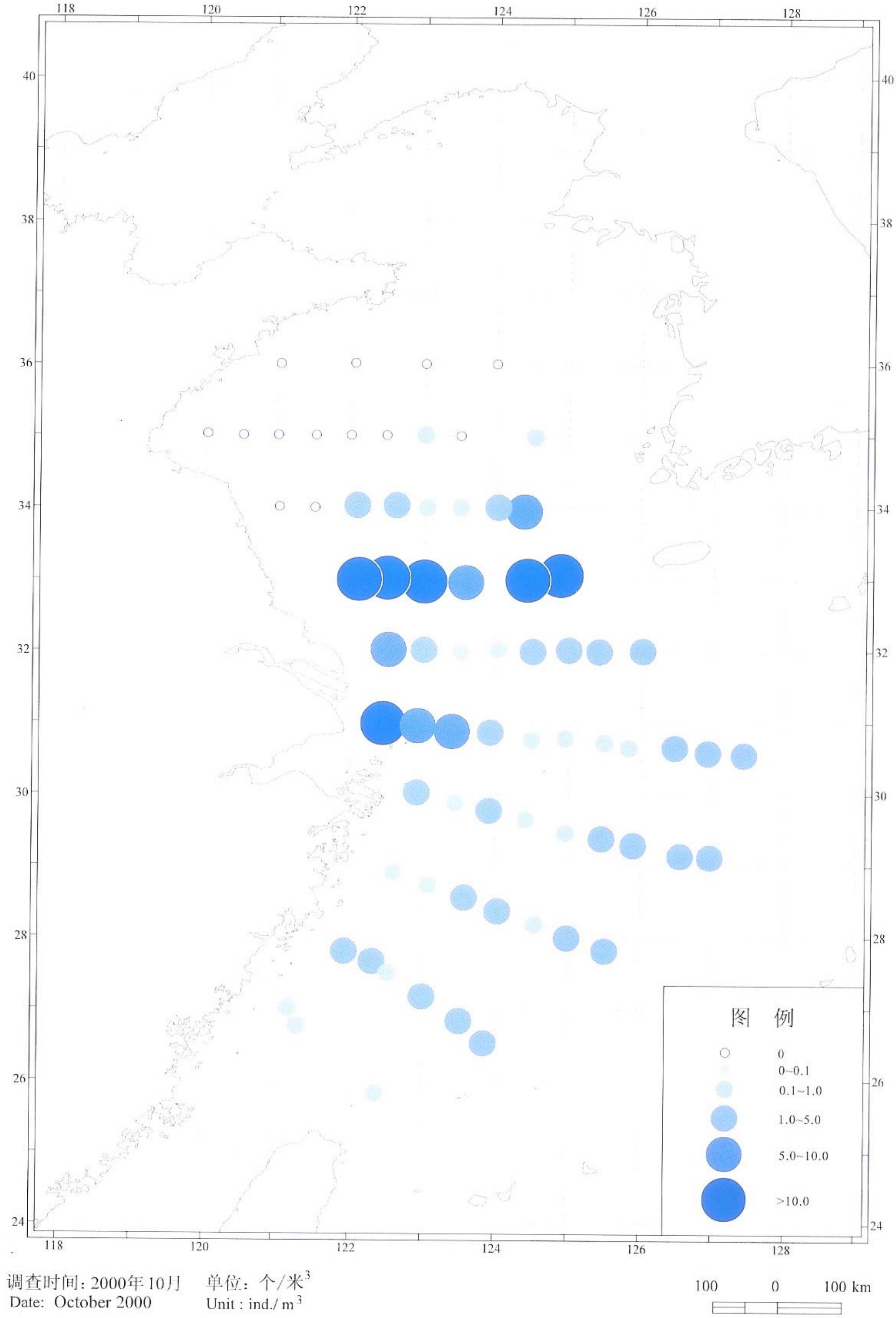
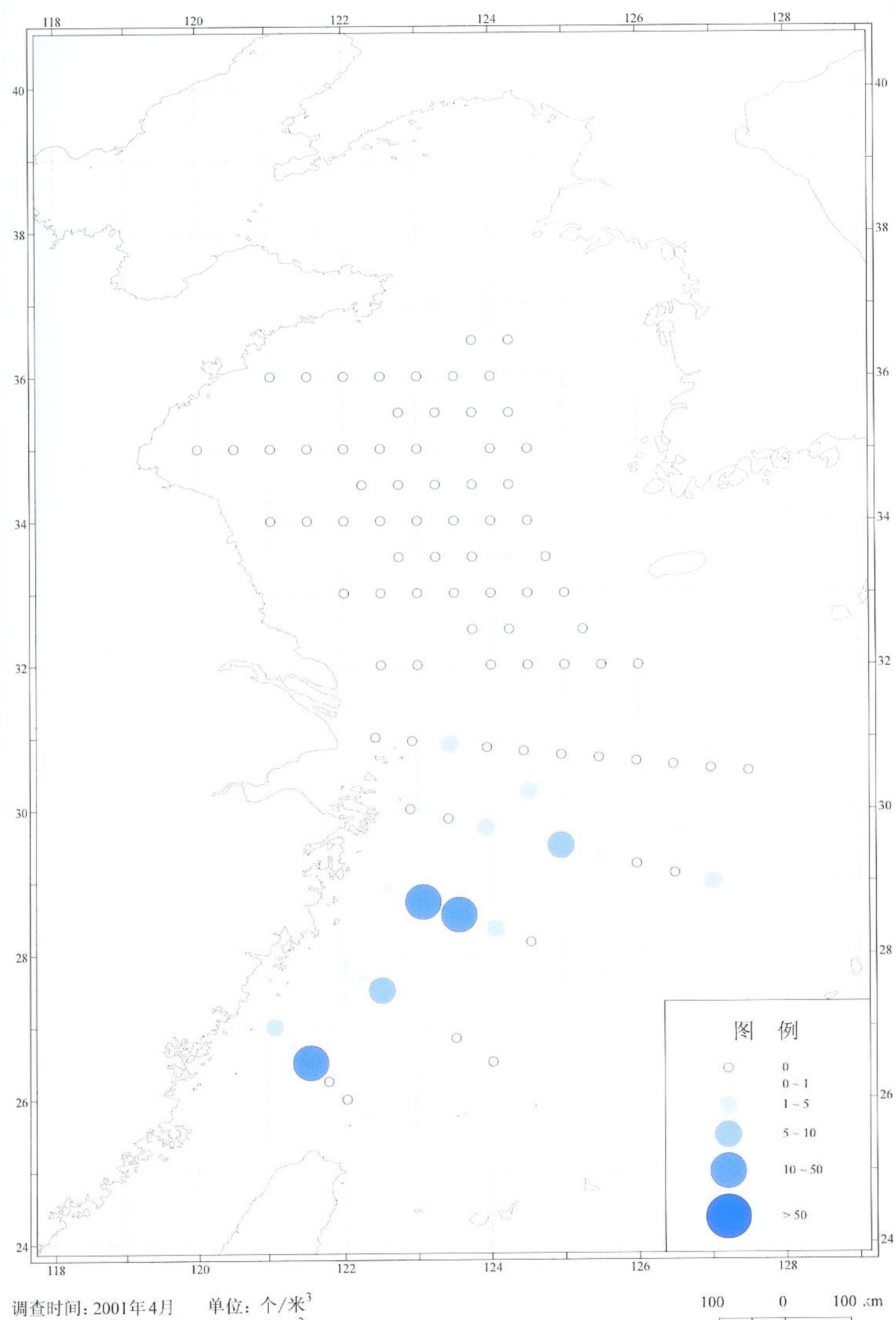


Fig 17

Distribution of *Euchaeta concinna* in spring

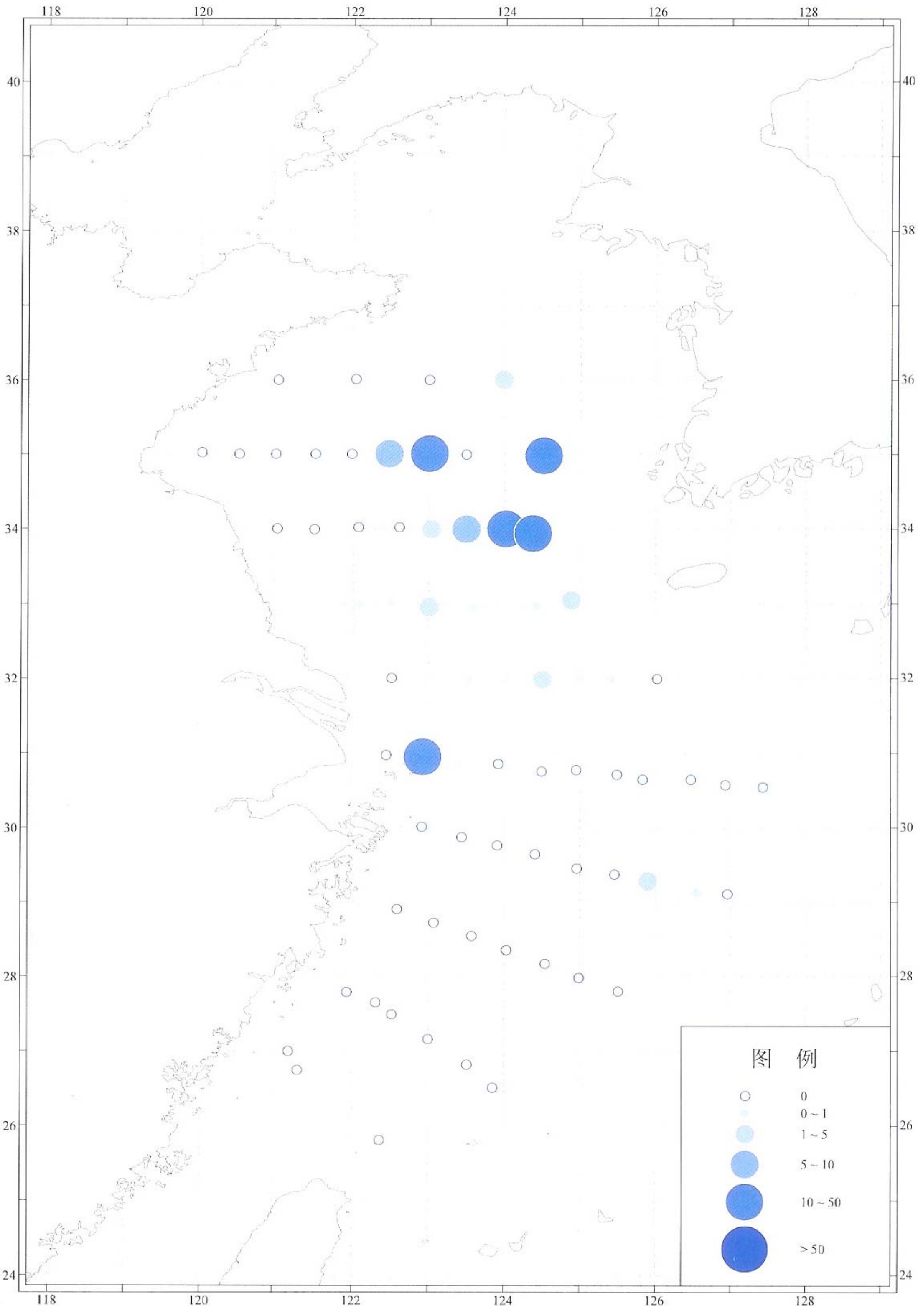


调查时间：2001年4月 单位：个/米^3
Date: April 2001 Unit : ind./ m^3

100 0 100 km

Fig 18

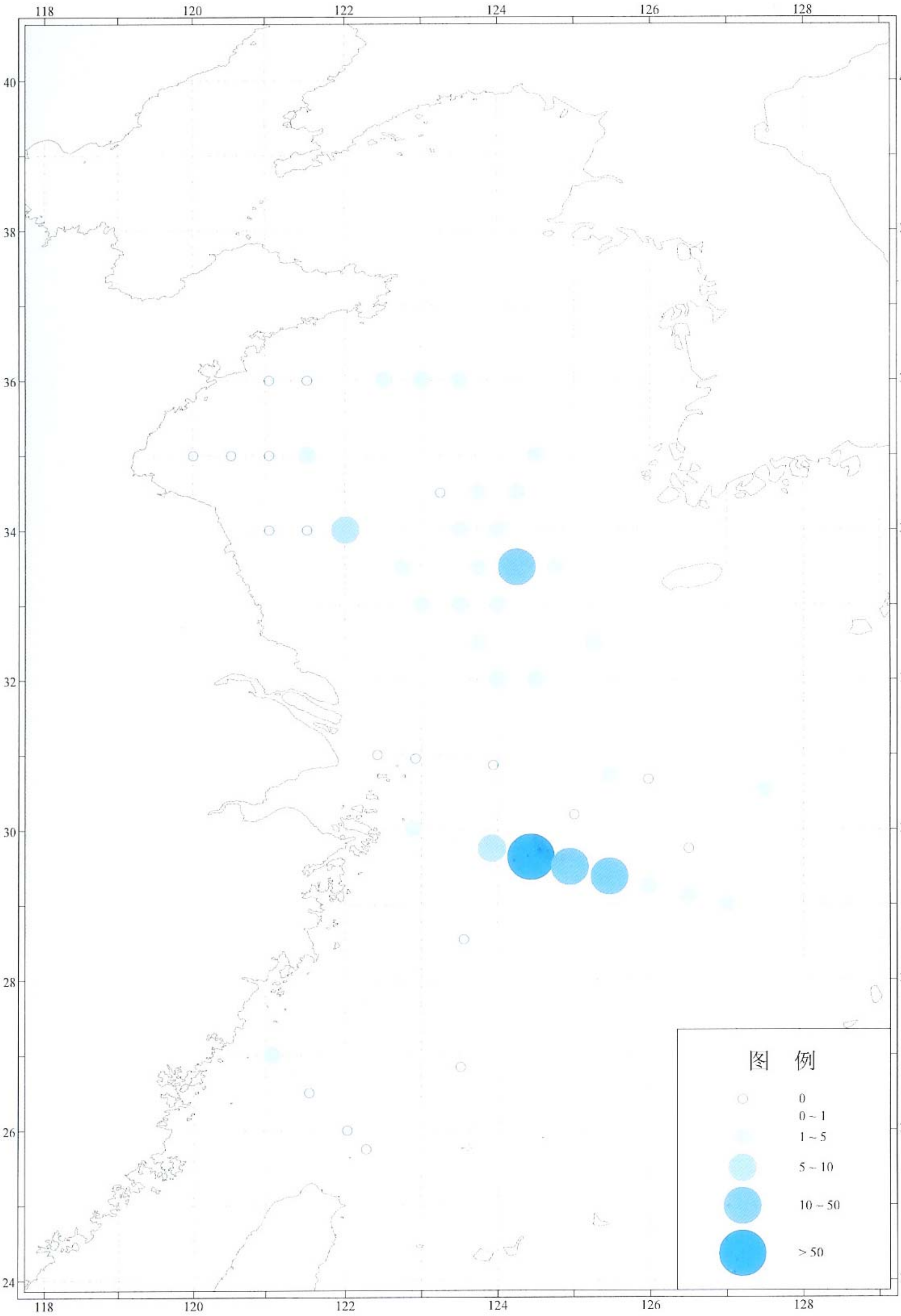
Distribution of *Euphausia pacifica* in autumn



调查时间：2000年10月 单位：个/米^3
Date: October 2000 Unit : ind./ m^3

Fig 19

Distribution of *Euphausia pacifica* in spring

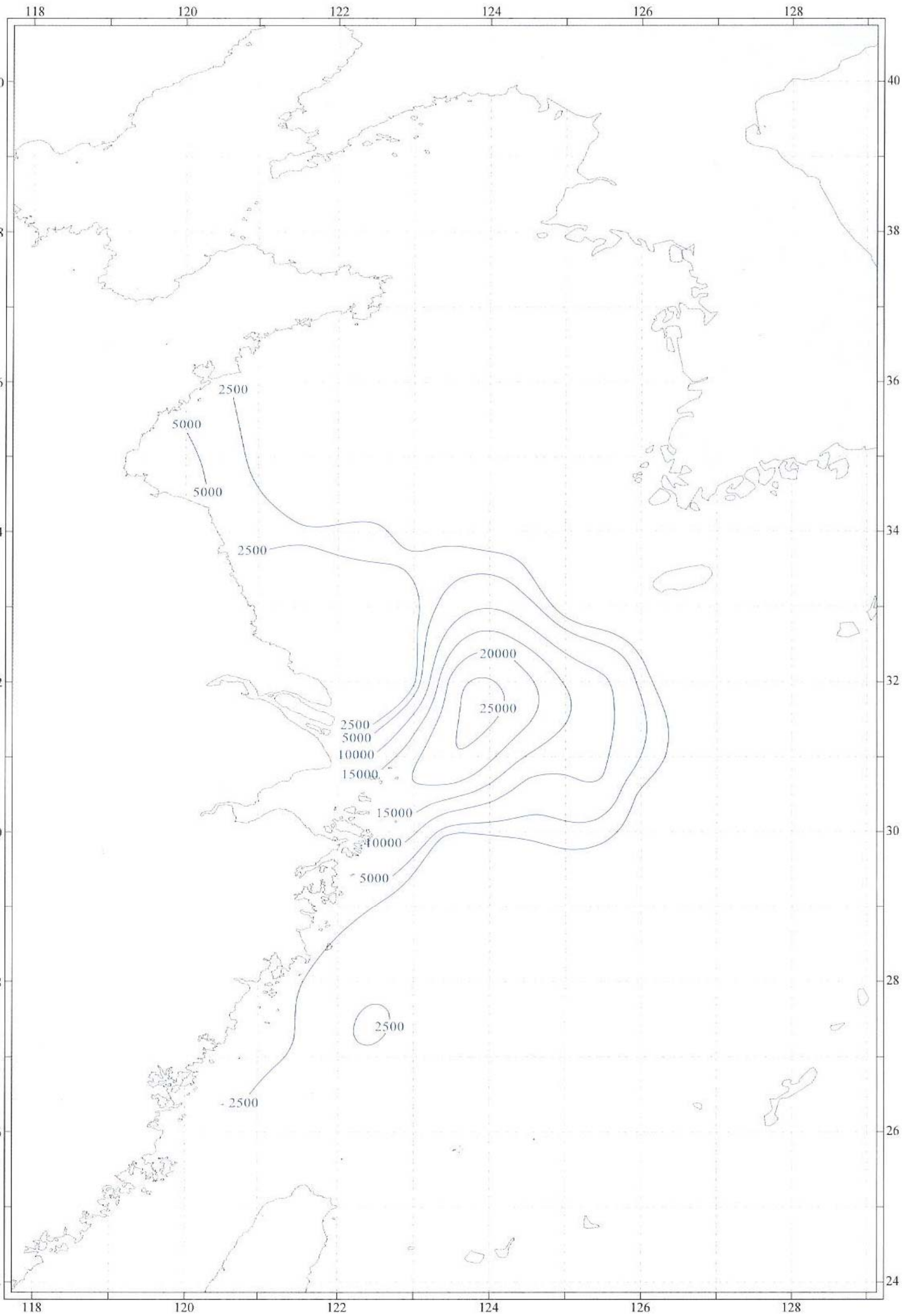


调查时间: 2001年4月 单位：个/米^3
Date: April 2001 Unit : ind./ m^3

100 0 100 km

Fig 20

Distribution of flagellate abundance in surface water in autumn



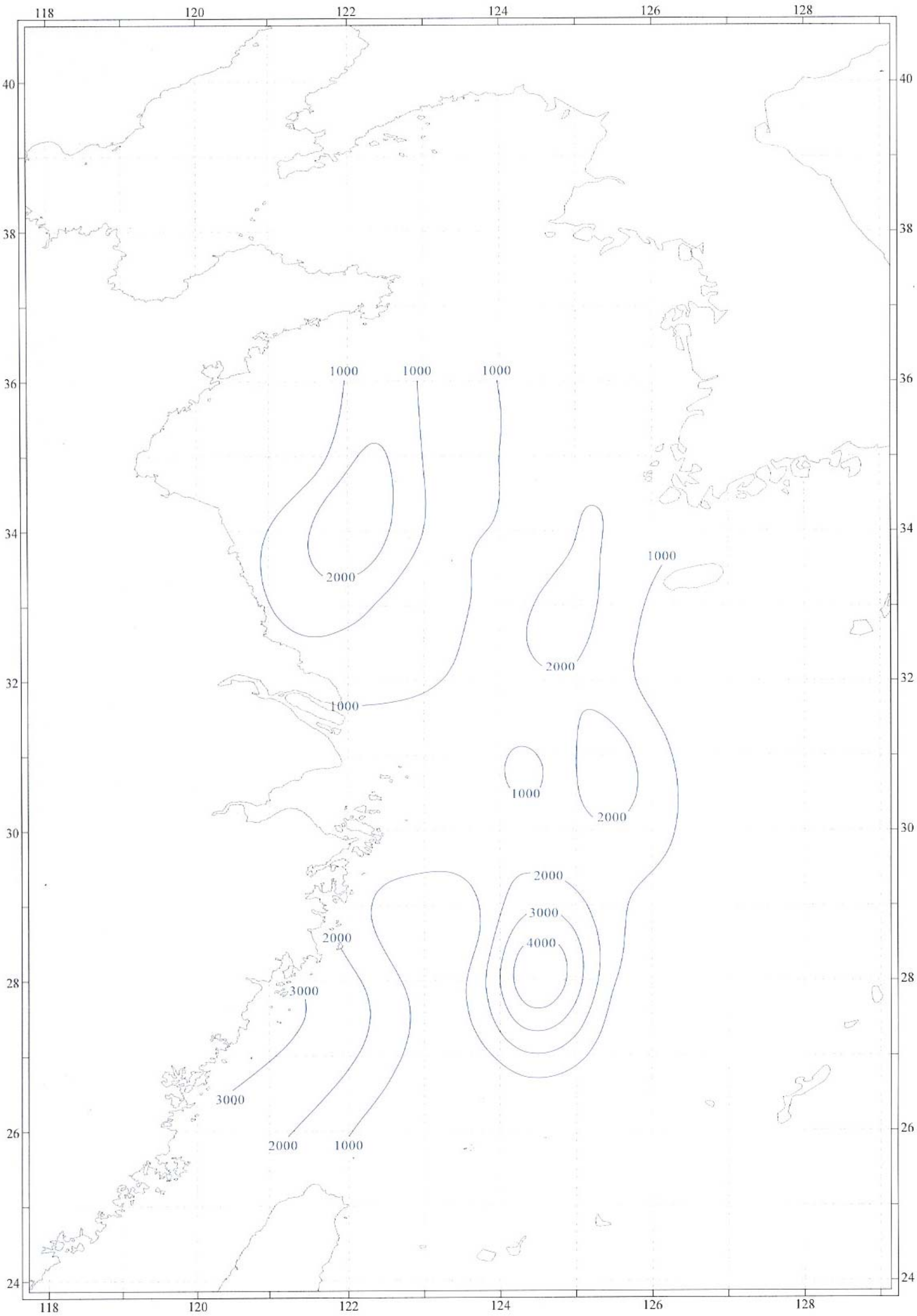
调查时间：2000年10月 单位：个/毫升

Date: October 2000 Unit : ind./ ml

100 0 100 km

Fig 21

Distribution of flagellate abundance in surface water in spring



调查时间：2001年4月　单位：个/毫升
Date: April 2001　Unit : ind./ml

100 0 100 km

Fig 22

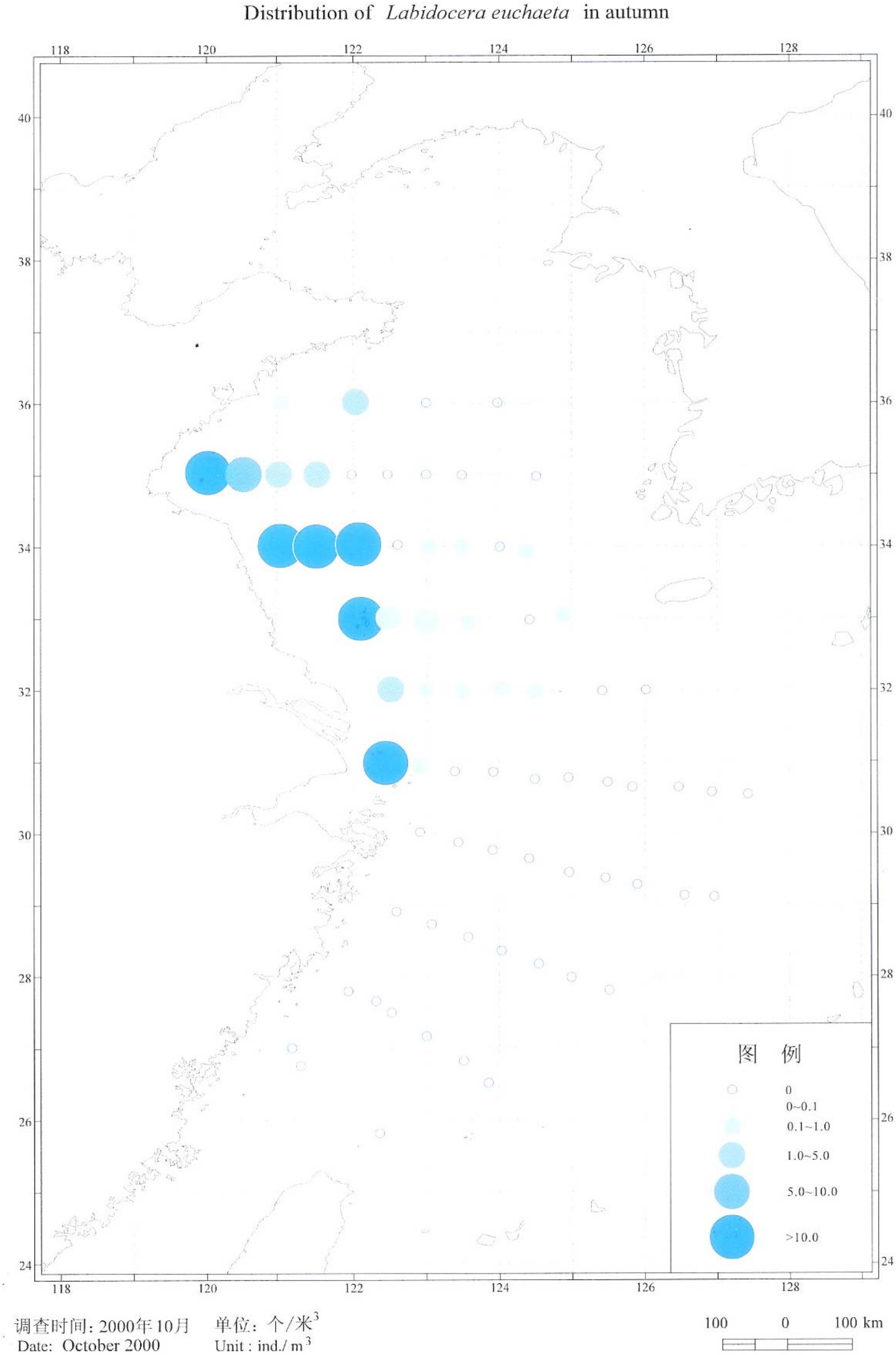
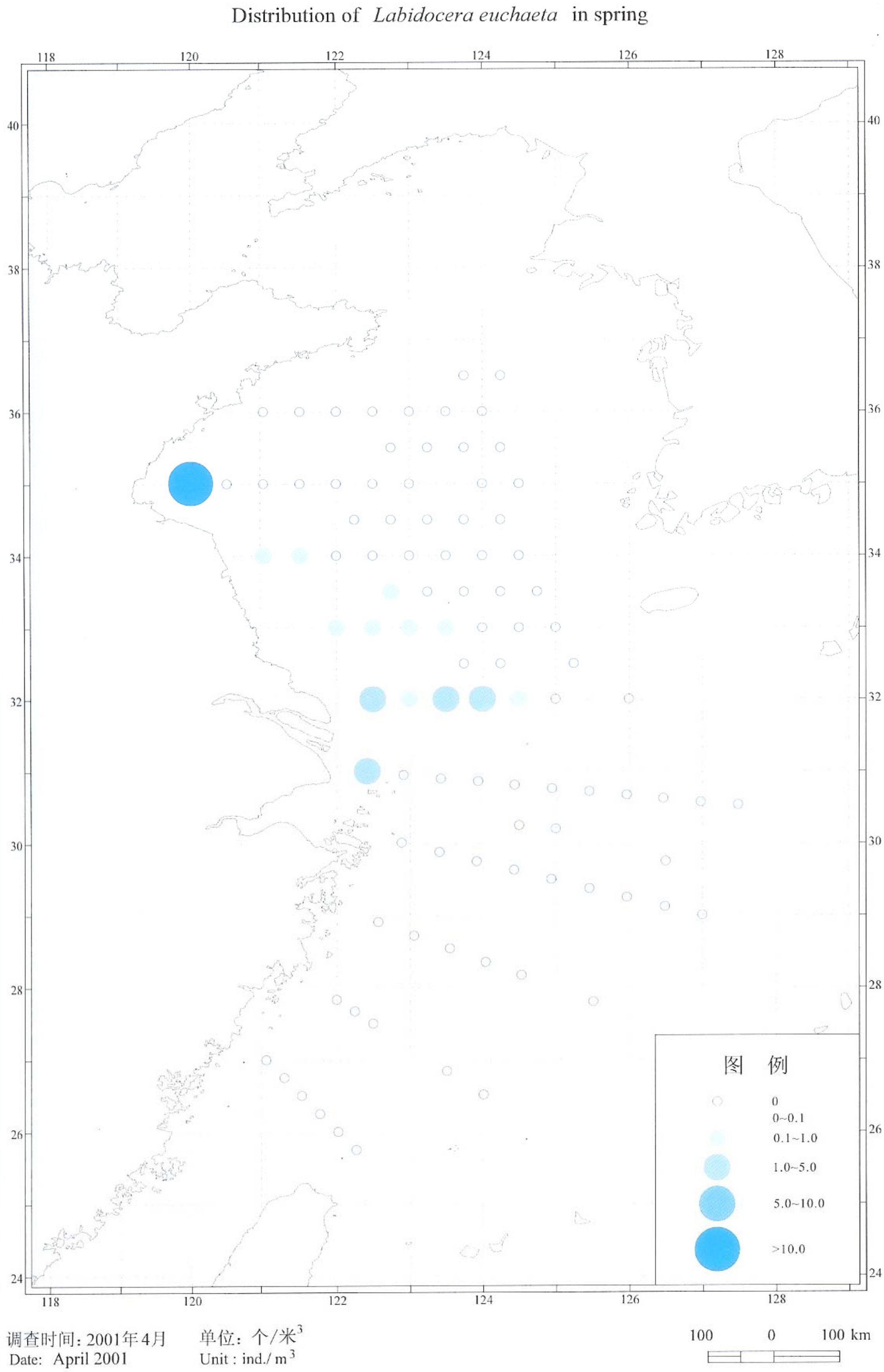

Distribution of *Labidocera euchaeta* in autumn
118
120
122
124
126
128
40
38
36
34
32
30
28
26
24
图 例
0
0~0.1
0.1~1.0
1.0~5.0
5.0~10.0
>10.0
调查时间：2000年10月 单位：个/米^3
Date: October 2000 Unit : ind./ m^3
100 0 100 km

Fig 23



Distribution of *Labidocera euchaeta* in spring
118
120
122
124
126
128
40
38
36
34
32
30
28
26
24
图 例
0
0~0.1
0.1~1.0
1.0~5.0
5.0~10.0
>10.0
调查时间: 2001年4月
Date: April 2001
单位: 个/米³
Unit : ind./ m³
100
0
100 km

Fig 24

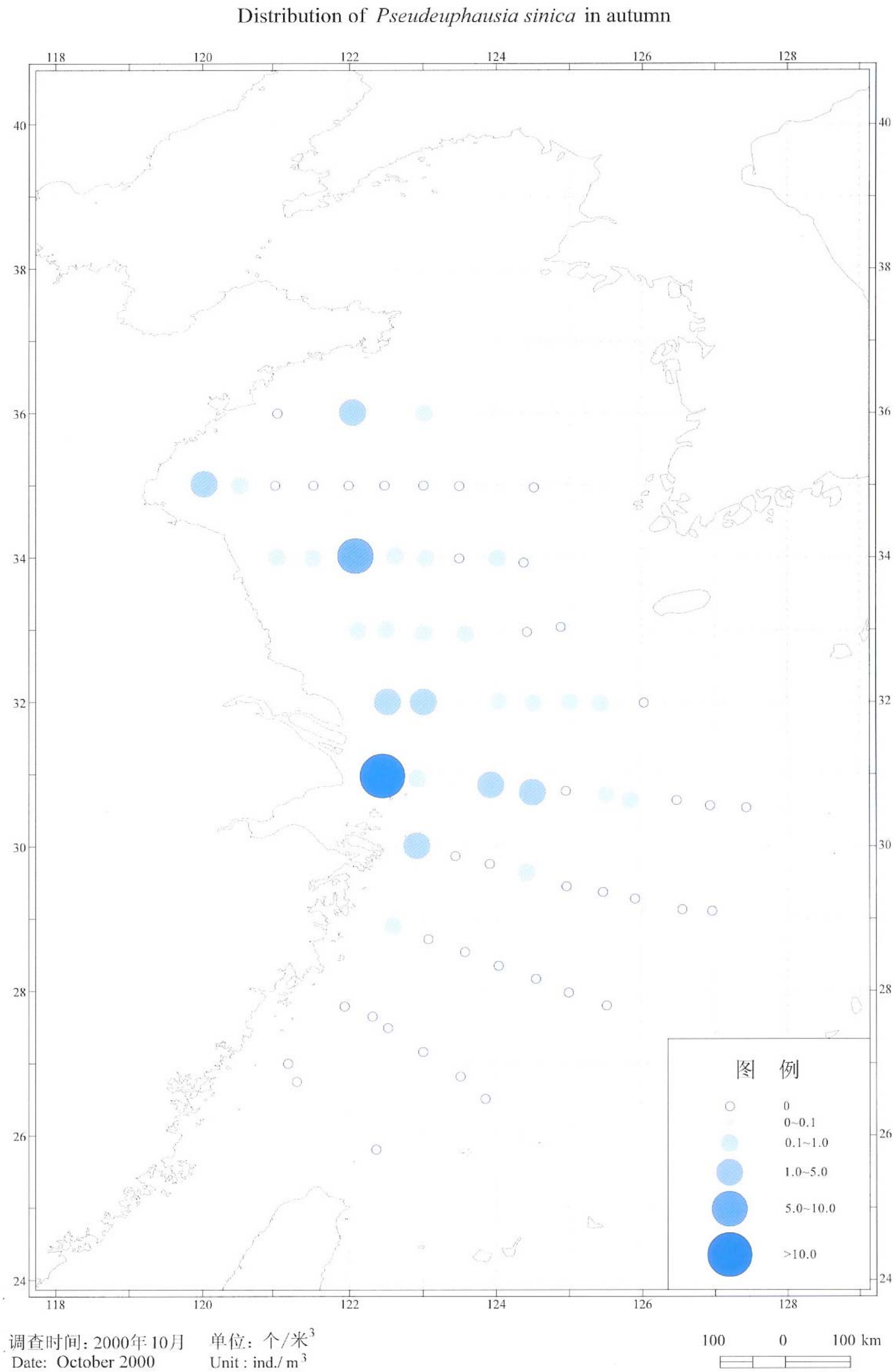
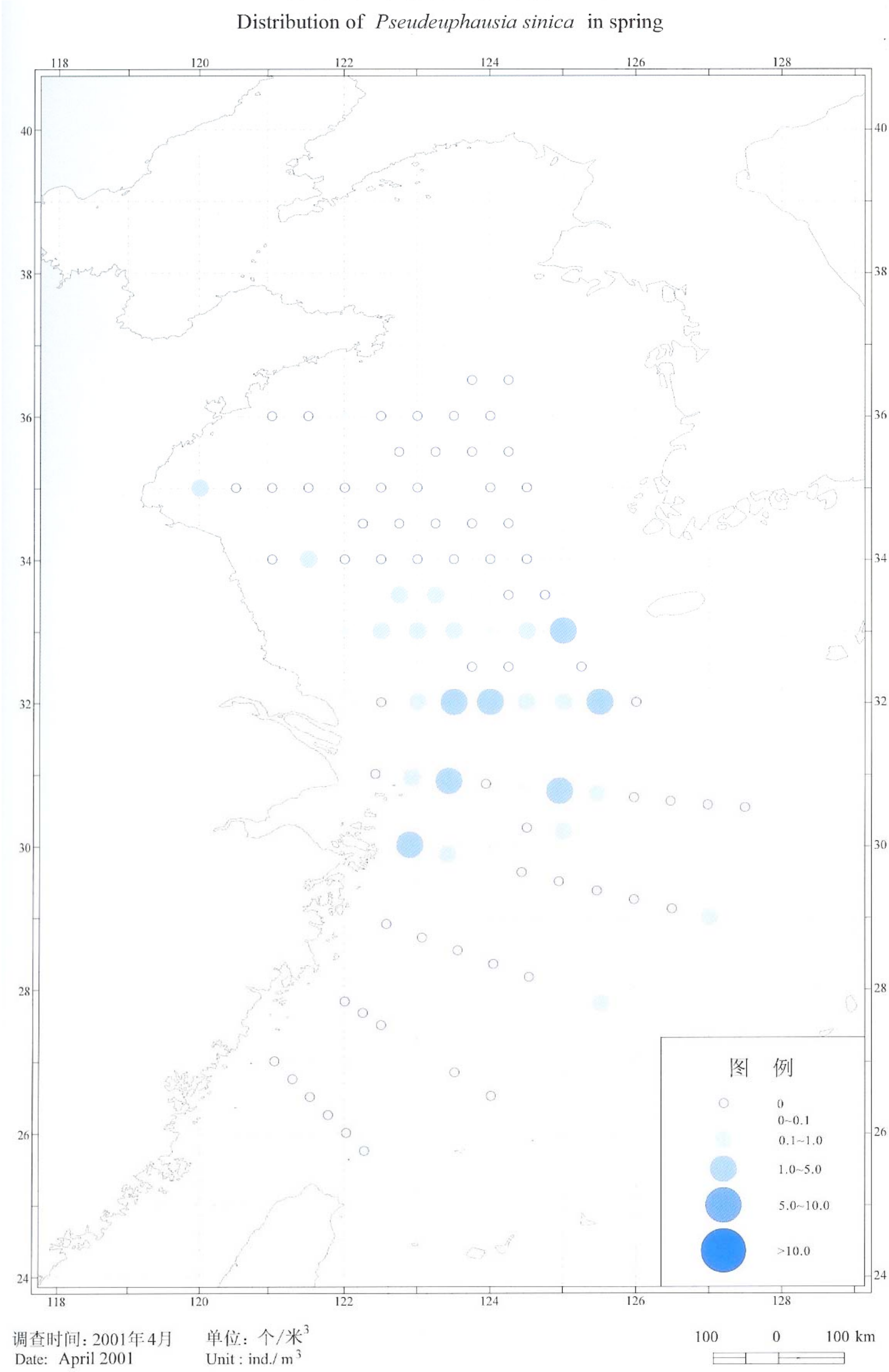

Distribution of *Pseudeuphausia sinica* in autumn
118
120
122
124
126
128
40
38
36
34
32
30
28
26
24
图 例
0
0~0.1
0.1~1.0
1.0~5.0
5.0~10.0
>10.0
调查时间：2000年10月
Date: October 2000
单位：个/米³
Unit : ind./ m³
100
0
100 km

Fig 25



Distribution of *Pseudeuphausia sinica* in spring
118
120
122
124
126
128
40
38
36
34
32
30
28
26
24
图　例
0
0~0.1
0.1~1.0
1.0~5.0
5.0~10.0
>10.0
调查时间：2001年4月
Date: April 2001
单位：个/米³
Unit : ind./ m³
100
0
100 km

Annex 5.1 Macrobenthos 1984-85

Table 21 Total Biomass of Macrobenthos in the Yellow Sea

Unit: g/m^2

				May-85	Aug-84	Nov-84	Feb-85
Stn#	**N/deg**	**E/deg**	**Annual average**	**Spring**	**Summer**	**Autumn**	**Winter**
1	38.90	123.35	5	1	1	7.5	<1
2	38.40	123.00	37.5	10	17.5	10	100
3	37.97	122.85	25	17.5		37.5	50
4	37.50	123.25	17.5	25	37.5	17.5	37.5
5	37.75	123.75	7.5	10	10	7.5	5
6	36.72	123.00	>50	17.5	>100	50	>100
7	36.72	123.50	37.5	37.5	37.5	25	37.5
8	36.72	124.00	17.5	17.5	17.5	7.5	10
9	36.72	124.25	17.5	17.5	7.5	25	7.5
10	36.00	121.50	17.5	7.5	25	17.5	17.5
11	36.00	122.00	7.5	7.5	17.5	7.5	17.5
12	36.00	122.50	17.5	25	10	17.5	17.5
13	36.00	123.00	25	37.5	37.5	17.5	37.5
14	36.00	123.50	37.5	37.5	17.5	7.5	17.5
15	36.00	124.00	37.5	37.5	37.5	7.5	37.5
16	35.75	124.50	10	<25	17.5	17.5	17.5
17	35.00	120.50	37.5	75	10	7.5	7.5
18	35.00	121.00	10	7.5	7.5	5	7.5
19	35.00	121.50	7.5	7.5	3	3	3
20	35.00	122.00	17.5	37.5	10	7.5	10
21	35.00	122.50	17.5	50	17.5	7.5	17.5
22	35.00	123.00	<10	25	5	0.5	5
23	35.00	123.50	17.5	17.5	17.5	17.5	17.5
24	35.00	124.00	17.5	37.5	17.5	17.5	17.5
25	34.75	124.50	25	37.5	17.5	17.5	17.5
		Average	20.3	25.0	17.2	14.5	22.3

Table 22 Polychaeta Biomass in the Yellow Sea

Unit: g/m^2

		May-85	Aug-84	Nov-84	Feb-85
Stn#	**Annual average**	**Spring**	**Summer**	**Autumn**	**Winter**
1	<1	<1	0.5	3	1
2	<1	<1	5	3	5
3	7.5	<1	7.5	5	1
4	<1	<1	5	3	0.5
5	<1	<1	<1	3	5
6	<1	<1	3	3	5
7	7.5	7.5	<1	3	10
8	5	3	3	3	>10
9	5	3	3	10	7.5
10	<1	3	7.5	5	<1
11	<1	3	7.5	3	3
12	10	25	7.5	7.5	3
13	7.5	17.5	7.5	7.5	3
14	>10	17.5	7.5	1	5
15	>10	17.5	17.5	3	7.5
16	5	3	7.5	1	3
17	<5	3	3	<1	5
18	<5	3	3	1	<1
19	<5	>5	3	3	<1
20	<5	5	7.5	5	3
21	10	>25	3	3	1
22	5	17.5	3	<1	<1
23	3	17.5	3	>1	3
24	3	5	3	>1	3
25	1	3	0.5	>1	3
Average	5.8	9.1	5.2	3.8	3.9

Table 23 Mollusca Biomass in the Yellow Sea

Unit: g/m²

		May-85	Aug-84	Nov-84	Feb-85
Stn#	**Annual average**	**Spring**	**Summer**	**Autumn**	**Winter**
1	<1	0.5	<1	<1	<1
2	>25	>5	75	<1	7.5
3	10	5	25	3	3
4	1	<1	7.5	3	<1
5	0.5	0.5	<1	0.5	3
6	>10	10	10	25	10
7	10	3	>10	0.5	25
8	7.5	1	5	<1	17.5
9	5	3	<1	<1	1
10	5	1	3	0.5	<1
11	3	<1	1	<1	<1
12	3	3	3	3	1
13	7.5	>10	7.5	7.5	<5
14	10	>10	>10	0.5	<5
15	5	1	10	1	<5
16	3	3	3	7.5	<5
17	5	0.5	3	10	0.5
18	3	>1	3	<1	0.5
19	5	5	0.5	3	>10
20	7.5	>10	0.5	<1	10
21	7.5	>10	>10	0.5	<5
22	5	10	1	<1	5
23	7.5	7.5	>10	5	>5
24	>10	>10	>10	7.5	<5
25	7.5	7.5	>10	7.5	<5
Average	5.6	3.8	9.9	5.0	7.0

Table 24 Crustacea Biomass in the Yellow Sea

Unit: g/m^2

		May-85	Aug-84	Nov-84	Feb-85
Stn#	**Annual average**	**Spring**	**Summer**	**Autumn**	**Winter**
1	<1	<1	<1	<1	<1
2	<1	<1	<1	<1	<1
3	<1	<1	<1	<1	<1
4	<1	<1	<1	<1	<1
5	<1	<1	<1	<1	<1
6	<1	<1	<1	10	0.5
7	<1	<1	<1	<1	<1
8	<1	<1	<1	<1	0.5
9	<1	<1	<1	<1	<1
10	<1	<1	<1	1	<1
11	<1	<1	<1	<1	<1
12	<1	<1	<1	1	<1
13	<1	<1	>1	0.5	<1
14	<1	<1	1	<1	<1
15	<1	<1	<1	<1	<1
16	<1	<1	<1	<1	<1
17	<1	<1	<1	>5	<1
18	<1	<1	<1	<1	<1
19	<1	<1	<1	3	<1
20	<1	<1	<1	<1	<1
21	<1	<1	<1	<1	<1
22	<1	<1	<1	<1	<1
23	<1	>1	<1	<1	<1
24	<1	<1	<1	<1	<1
25	<1	<1	<1	<1	<1

Table 25 Echinodermata Biomass in the Yellow Sea

Unit: g/m^2

Stn#	Annual average	Spring-85	Summer-84	Autumn-84	Winter-85
1	0.5	<1	<1	<1	<1
2	3	<1	3	3	3
3	5	0.5	5	10	7.5
4	7.5	3	1	3	10
5	3	5	<1	7.5	3
6	>25	3	>100	3	3
7	7.5	>10	<1	10	5
8	3	7.5	3	10	3
9	3	3	3	7.5	17.5
10	1	<1	<1	<1	1
11	5	<1	<1	<1	<1
12	3	<1	<1	3	3
13	5	7.5	10	5	<1
14	3	7.5	<1	<1	3
15	5	10	3	5	3
16	<1	5	<1	<1	3
17	3	>1	<1	<1	3
18	3	<1	3	3	<1
19	>5	<1	<1	<1	<1
20	3	5	3	<1	<1
21	3	7.5	<1	5	3
22	3	7.5	<1	<1	3
23	3	7.5	<1	5	3
24	>5<5	7.5	<1	1	3
25	>10	25	>10	7.5	3
Average	3.6	7.0	3.8	5.5	4.4

Table 26 Total Density of Macrobenthos in the Yellow Sea

Unit: ind./m^2

		May-85	Aug-84	Nov-84	Feb-85
Stn#	**Annual average**	**Spring**	**Summer**	**Autumn**	**Winter**
1	50	<25	50	>100	75
2	175	250	375	>100	175
3	175	175	375	175	100
4	75	75	100	100	75
5	75	37.5	50	100	75
6	375	>250	250	>500	>250
7	175	75	175	175	250
8	175	175	175	175	75
9	175	175	175	175	75
10	175	75	175	375	75
11	175	75	175	250	100
12	375	175	375	250	100
13	375	>250	500	>500	100
14	375	>250	>500	250	75
15	250	175	500	175	75
16	175	50	375	>250	75
17	175	75	175	175	>100
18	>250	>500	175	75	75
19	75	75	75	50	25
20	175	175	375	175	100
21	175	175	375	375	50
22	175	175	100	175	<50
23	250	>250	375	175	75
24	175	75	375	175	75
25	175	75	175	175	75
Average	196.9	123.0	251.0	187.5	89.8

Table 27 Density of Polychaeta in the Yellow Sea

Unit: ind./m^2

		May-85	Aug-84	Nov-84	Feb-85
Stn#	**Annual average**	**Spring**	**Summer**	**Autumn**	**Winter**
1	50	<25	50	<50	37.5
2	175	25	175	75	>100
3	75	75	175	175	50
4	37.5	25	50	50	17.5
5	37.5	17.5	<25	75	25
6	250	100	175	250	100
7	75	37.5	75	75	37.5
8	75	37.5	50	75	17.5
9	75	37.5	100	100	17.5
10	175	>50	175	175	37.5
11	100	37.5	100	175	37.5
12	175	>100	100	175	75
13	75	75	175	175	50
14	75	75	75	50	17.5
15	75	75	75	50	17.5
16	75	37.5	>100	>100	17.5
17	50	17.5	75	50	37.5
18	37.5	17.5	75	37.5	37.5
19	75	17.5	75	37.5	25
20	175	25	>250	175	75
21	75	37.5	75	75	50
22	37.5	37.5	50	37.5	10
23	37.5	37.5	75	37.5	37.5
24	75	37.5	75	37.5	17.5
25	<50	37.5	37.5	50	17.5
Average	90.1	41.8	94.9	96.2	35.9

Table 28 Density of Mollusca in the Yellow Sea

Unit: ind./m^2

Stn#	Annual average	Spring-85	Summer-84	Autumn-84	Winter-85
1	5	<5	<5	<5	7.5
2	50	>100	100	<5	>25
3	>50	37.5	75	25	>25
4	37.5	10	75	37.5	7.5
5	<5	5	5	<5	5
6	50	175	7.5	<5	17.5
7	17.5	7.5	75	<5	25
8	50	>100	37.5	<5	10
9	17.5	50	10	7.5	5
10	7.5	7.5	37.5	<5	<5
11	7.5	<5	7.5	5	<5
12	17.5	37.5	7.5	17.5	17.5
13	75	250	37.5	17.5	17.5
14	100	250	37.5	<5	10
15	10	25	5	10	5
16	17.5	17.5	25	37.5	<5
17	17.5	17.5	37.5	<5	<5
18	17.5	50	7.5	<5	5
19	5	5	<5	7.5	7.5
20	50	>100	<5	<5	>25
21	37.5	>100	37.5	7.5	17.5
22	25	37.5	7.5	10	17.5
23	37.5	75	37.5	37.5	10
24	37.5	37.5	37.5	37.5	<5
25	>50	17.5	>100	>25	<5
Average	31.4	58.6	33.7	19.8	11.6

Table 29 Density of Crustacea in the Yellow Sea

Unit: ind./m^2

Stn#	Annual average	Spring-85	Summer-84	Autumn-84	Winter-85
1	<10	<5	17.5	10	<5
2	25	<5	75	5	17.5
3	75	<5	>100	7.5	10
4	17.5	<5	50	17.5	17.5
5	17.5	<5	25	<5	>25
6	75	7.5	25	75	75
7	17.5	<5	37.5	25	25
8	17.5	<5	37.5	<5	7.5
9	17.5	7.5	37.5	17.5	7.5
10	17.5	25	37.5	17.5	17.5
11	25	37.5	50	37.5	17.5
12	50	7.5	175	25	17.5
13	>250	<5	375	>250	10
14	>250	<5	>1000	175	7.5
15	250	75	250	100	7.5
16	75	<5	175	175	7.5
17	75	10	100	75	17.5
18	250	1000	50	7.5	<5
19	17.5	50	<25	7.5	<5
20	37.5	5	75	17.5	<5
21	50	<5	75	175	<5
22	37.5	<5	175	100	7.5
23	175	175	175	50	7.5
24	75	7.5	175	75	7.5
25	17.5	<5	17.5	37.5	7.5
Average	64.3	117.3	100.5	56.0	15.4

Table 30 Density of Echinodermata in the Yellow Sea

Unit: ind./m^2

		Mar-May-85	Jun-Aug-84	Sep-Nov-84	Dec-Feb-85
Stn#	**Annual average**	**Spring**	**Summer**	**Autumn**	**Winter**
1	<5	5	<5	<5	<5
2	17.5	10	17.5	<5	5
3	17.5	17.5	17.5	10	17.5
4	25	37.5	7.5	17.5	50
5	17.5	37.5	<5	17.5	7.5
6	17.5	25	25	17.5	5
7	37.5	37.5	10	>25	7.5
8	17.5	17.5	25	17.5	17.5
9	17.5	17.5	5	10	17.5
10	5	<5	7.5	5	5
11	<5	<5	<5	<5	<5
12	5	<5	<5	<5	<5
13	17.5	10	25	10	<5
14	17.5	17.5	17.5	10	<5
15	17.5	17.5	17.5	<5	<5
16	5	5	<5	<5	<5
17	7.5	>5	<5	<5	<5
18	17.5	>5	37.5	17.5	<5
19	<5	<5	5	<5	<5
20	<5	7.5	<5	5	<5
21	7.5	7.5	<5	17.5	<5
22	7.5	7.5	7.5	5	7.5
23	7.5	7.5	<5	17.5	<5
24	7.5	17.5	<5	5	<5
25	17.5	>25	17.5	10	<5
Average	14.6	16.8	16.2	12.0	14.0

Annex 5.2　Macrobenthos 1998-2000

Table 31　Density of Macrobenthos in the Yellow Sea in May 1998（ind./㎡）

Station no.	Longitude（E）	Latitude（N）	Total	Poly-chaeta	Mollusk	Crust-acean	Echi-Noderm
1	123.47	38.98	168	120	24	20	4
2	123.97	39.27	124	28	12	8	56
3	124.26	39.03	76	12	16	20	28
4	122.93	38.53	1616	248	656	656	52
5	123.98	38.50	364	212	32	116	0
6	123.46	37.97	272	136	20	64	52
7	123.85	37.56	468	108	8	28	324
8	123.49	37.00	216	156	4	12	36
9	122.98	36.58	152	88	60	0	4
10	123.98	36.52	120	84	36	0	0
11	122.50	36.00	124	44	28	40	12
12	123.47	36.00	476	208	0	232	8
13	121.88	35.60	528	396	20	104	0
14	123.01	35.50	40	36	0	4	0
15	124.03	35.55	316	60	208	40	8
16	121.49	35.02	196	80	96	4	16
17	122.48	35.02	124	56	24	40	4
18	122.48	35.02	244	108	64	60	12
19	124.49	35.00	372	116	184	56	0
20	122.01	34.48	580	372	164	40	0
21	123.00	34.50	40	32	0	0	8
22	123.98	34.52	204	120	32	44	8
23	121.57	34.00	152	80	28	12	28
24	122.45	34.00	396	276	56	60	0
25	123.45	34.03	256	136	12	56	0
26	124.51	34.00	460	260	96	80	24
27	123.03	33.47	120	72	4	8	28
28	123.98	33.47	72	56	8	0	4
29	125.03	33.53	276	232	0	36	0
30	122.63	32.97	544	376	4	136	12
31	123.48	33.00	276	228	0	48	0
32	124.48	33.03	552	428	8	116	0
33	125.02	33.00	408	316	12	68	0
34	124.47	37.06	992	604	0	304	84
35	124.99	36.50	396	336	8	28	24
36	124.53	36.03	508	312	12	168	16
37	125.00	35.50	204	160	8	32	4

Table 32 Macrobenthic biomass in the Yellow Sea in May 1998 (g WW/㎡)

Station no.	Longitude （E）	Latitude （N）	Total	Poly-chaeta	Mollusk	Crust-acean	Echi-noderm
1	123.47	38.98	29.92	3.44	26.12	0.32	0.04
2	123.97	39.27	75.60	0.20	0.04	0.12	74.64
3	124.26	39.03	280.92	0.52	0.08	0.08	280.24
4	122.93	38.53	55.72	24.52	19.68	0.36	7.96
5	123.98	38.50	4.76	3.40	0.68	0.36	0.00
6	123.46	37.97	30.20	13.48	0.08	0.08	16.56
7	123.85	37.56	130.96	7.44	24.76	0.32	98.44
8	123.49	37.00	73.16	54.64	3.20	0.08	11.88
9	122.98	36.58	8.32	1.12	3.64	0.00	3.56
10	123.98	36.52	40.82	27.62	13.20	0.00	0.00
11	122.50	36.00	14.40	1.12	5.60	0.12	7.56
12	123.47	36.00	28.68	8.08	0.00	0.20	0.04
13	121.88	35.60	114.92	16.36	0.36	98.20	0.00
14	123.01	35.50	0.56	0.52	0.00	0.04	0.00
15	124.03	35.55	21.54	1.52	13.20	0.02	6.80
16	121.49	35.02	74.64	0.84	21.64	0.04	52.12
17	122.48	35.02	48.20	45.24	1.88	0.04	1.04
18	122.48	35.02	30.98	15.76	13.46	0.12	1.64
19	124.49	35.00	51.84	10.52	6.96	0.08	0.00
20	122.01	34.48	23.90	12.96	8.04	0.30	0.00
21	123.00	34.50	2.08	0.68	0.00	0.00	1.40
22	123.98	34.52	11.60	5.80	2.24	0.08	3.48
23	121.57	34.00	14.56	5.00	1.04	3.32	4.76
24	122.45	34.00	32.88	20.40	5.44	0.52	0.00
25	123.45	34.03	127.48	1.48	0.28	0.16	0.00
26	124.51	34.00	18.76	5.68	0.68	0.20	8.72
27	123.03	33.47	84.58	2.12	0.28	0.58	11.04
28	123.98	33.47	18.64	6.64	0.40	0.00	4.32
29	125.03	33.53	4.72	3.64	0.00	0.48	0.00
30	122.63	32.97	73.70	9.04	0.16	45.90	17.44
31	123.48	33.00	8.80	8.24	0.00	0.56	0.00
32	124.48	33.03	3.92	3.20	0.20	0.52	0.00
33	125.02	33.00	56.60	7.64	0.16	0.92	0.00
34	124.47	37.06	30.56	3.88	0.00	0.16	26.52
35	124.99	36.50	159.04	11.24	131.40	0.12	16.28
36	124.53	36.03	19.92	14.12	1.32	0.12	4.36
37	125.00	35.50	9.20	7.84	0.20	0.04	1.12

Table 33 Density of Macrobenthic in the Yellow Sea in Aug-2000（ind./㎡ ）

Station no.	Longitude （E）	Latitude （N）	Total	Poly-chaeta	Mollusk	Crust-acean	Echi-noderm
1	123.4683	39.0000	36	24	4	0	8
2	124.0050	39.3333	104	16	0	4	84
3	124.3033	39.0233	32	8	0	24	0
4	123.0050	38.4983	240	124	100	16	0
5	123.4583	37.9866	56	44	0	0	12
6	124.0200	37.4933	24	20	0	4	0
7	123.4800	37.0000	476	424	16	4	20
8	123.0050	36.5000	72	52	12	8	0
9	124.0000	36.4966	40	20	20	0	0
10	122.4633	36.0000	44	20	0	24	0
11	123.4433	36.0000	152	100	4	44	0
12	122.0616	35.0000	440	324	60	56	0
13	122.0066	35.5033	96	52	24	20	0
14	124.1383	35.6233	144	44	0	92	8
15	121.5150	35.0533	560	248	40	272	0
16	122.4966	35.0416	72	40	12	16	4
17	123.5216	35.0533	140	72	48	20	0
18	122.0216	34.5033	288	228	1	56	0
19	122.9983	34.4950	88	36	0	52	0
20	124.0633	34.5500	104	24	0	76	4
21	121.5116	34.0266	292	60	76	148	8
22	122.0350	33.5616	316	164	12	140	0
23	122.5216	34.0050	296	208	24	60	4
24	123.3183	34.0333	176	112	12	48	0
25	123.0350	33.5033	116	92	4	12	8
26	123.9800	33.5766	100	20	0	80	0
27	124.9366	33.5833	188	56	12	80	8
28	123.4300	32.9300	52	12	24	0	8
29	124.5033	33.0016	244	48	8	176	12
30	124.4883	37.0466	24	12	0	0	8
31	124.4933	36.0466	108	48	0	52	8
32	124.9800	35.5100	400	196	0	204	0
33	124.4900	35.0000	140	76	16	40	0
34	124.5166	34.0116	60	24	16	16	0

Table 34 Macrobenthic biomass in the Yellow Sea in Aug-2000 (g WW/㎡)

Station no.	Longitude（E）	Latitude（N）	Total	Poly-chaeta	Mollusk	Crust-acean	Echi-noderm
1	123.4683	39.0000	204.28	0.32	3.96	0.00	200.00
2	124.0050	39.3333	217.44	0.32	0.12	217.00	0.00
3	124.3033	39.0233	0.56	0.20	0.00	0.20	0.00
4	123.0050	38.4983	7.56	4.28	3.12	0.16	0.00
5	123.4583	37.9866	5.04	1.32	0.00	0.00	3.72
6	124.0200	37.4933	1.88	1.84	0.00	0.04	0.00
7	123.4800	37.0000	232.80	160.00	14.00	0.04	9.48
8	123.0050	36.5000	13.56	5.08	8.40	0.04	0.00
9	124.0000	36.4966	2.44	1.72	0.72	0.00	0.00
10	122.4633	36.0000	0.24	0.12	0.00	0.12	0.00
11	123.4433	36.0000	5.68	5.28	0.12	0.20	0.00
12	122.0616	35.0000	40.44	12.60	2.40	25.44	0.00
13	122.0066	35.5033	5.84	2.04	3.76	0.04	0.00
14	124.1383	35.6233	15.24	10.04	0.00	0.16	5.04
15	121.5150	35.0533	13.52	8.40	4.00	1.12	0.00
16	122.4966	35.0416	12.84	8.56	3.16	0.04	1.08
17	123.5216	35.0533	3.68	1.20	2.44	0.04	0.00
18	122.0216	34.5033	6.28	4.04	0.04	2.20	0.00
19	122.9983	34.4950	0.28	0.12	0.00	0.16	0.00
20	124.0633	34.5500	2.40	0.84	0.00	0.32	1.24
21	121.5116	34.0266	31.00	0.52	22.64	4.96	2.88
22	122.0350	33.5616	24.12	19.48	2.36	2.28	0.00
23	122.5216	34.0050	9.08	4.76	0.72	0.36	3.24
24	123.3183	34.0333	95.12	8.68	3.16	0.20	0.00
25	123.0350	33.5033	7.00	6.04	0.12	0.76	0.08
26	123.9800	33.5766	48.92	48.76	0.00	0.12	0.00
27	124.9366	33.5833	74.28	17.32	1.12	0.20	2.20
28	123.4300	32.9300	27.92	0.64	15.76	0.00	0.52
29	124.5033	33.0016	34.84	22.76	1.32	0.92	9.84
30	124.4883	37.0466	24.72	1.40	0.00	0.00	6.32
31	124.4933	36.0466	11.40	3.32	0.00	0.16	7.92
32	124.9800	35.5100	7.56	7.28	0.00	0.28	0.00
33	124.4900	35.0000	13.40	0.72	0.84	0.12	0.00
34	124.5166	34.0116	40.44	6.12	17.76	0.12	0.00

Table 35 Density of Macrobenthic in the Yellow Sea in Sep-2000（inds/㎡）

Station no.	Longitude（E）	Latitude（N）	Total	Poly-chaeta	Mollusk	Crust-acean	Echi-noderm
1	123.5016	39.0083	224	208	4	12	0
2	123.9533	39.3083	1584	1460	20	72	32
3	124.3200	38.9850	112	48	0	44	16
4	123.0300	38.5583	432	348	60	8	8
5	123.9750	38.5183	60	40	0	16	0
6	123.4933	38.0050	68	24	20	0	24
7	124.0283	37.4800	72	44	0	0	28
8	123.4866	37.0016	80	60	12	0	8
9	123.0100	36.5000	48	28	16	0	4
10	124.0033	36.5050	68	40	20	4	4
11	122.5333	35.9966	0	0	0	0	0
12	123.4983	35.9950	88	60	12	0	4
13	122.0050	35.4950	216	160	32	24	0
14	123.0233	35.4966	20	12	8	0	0
15	124.0800	35.5583	84	80	4	0	0
16	121.4866	34.9933	380	168	32	152	4
17	122.4950	35.0000	20	20	0	0	0
18	123.4950	34.9983	64	52	0	8	4
19	122.0183	34.4983	152	136	0	8	4
20	122.9883	34.5083	144	104	8	24	4
21	124.0616	34.5716	28	16	0	4	8
22	121.4850	34.0016	192	156	4	16	8
23	122.4650	33.9750	52	36	0	16	0
24	123.5033	33.9883	176	160	0	8	8
25	122.0966	33.5283	24	8	0	16	0
26	122.9933	33.5016	24	16	0	4	4
27	123.9600	33.5533	36	32	0	0	4
28	124.9716	33.5566	36	28	0	0	4
29	122.5050	33.0133	468	304	0	8	140
30	123.4016	33.0100	28	12	0	4	0
31	124.4833	32.9966	236	168	12	40	12
32	124.5000	37.0116	72	64	0	0	8
33	124.4650	35.9900	72	68	0	0	4
34	124.4900	35.0000	32	28	0	0	0
35	124.4866	33.9983	204	164	8	24	4

Table 36 Macrobenthic biomass in the Yellow Sea in Sep-2000 **(g WW/㎡)**

Station no.	Longitude （E）	Latitude （N）	Total	Poly-chaeta	Mollusk	Crust-acean	Echi-noderm
1	123.5016	39.0083	5.52	5.40	0.08	0.04	0.00
2	123.9533	39.3083	71.32	30.80	0.32	0.56	39.64
3	124.3200	38.9850	245.24	1.64	0.00	0.24	242.48
4	123.0300	38.5583	44.96	34.64	1.00	0.04	5.80
5	123.9750	38.5183	10.56	1.52	0.00	0.08	0.00
6	123.4933	38.0050	23.04	7.12	6.20	0.00	9.72
7	124.0283	37.4800	11.52	3.04	0.00	0.00	8.48
8	123.4866	37.0016	13.36	7.24	1.00	0.00	5.12
9	123.0100	36.5000	18.76	14.08	1.28	0.00	3.40
10	124.0033	36.5050	87.08	24.16	21.08	0.28	41.56
11	122.5333	35.9966	0.00	0.00	0.00	0.00	0.00
12	123.4983	35.9950	27.88	14.16	2.76	0.00	2.08
13	122.0050	35.4950	80.92	3.92	7.64	69.36	0.00
14	123.0233	35.4966	53.52	52.08	1.44	0.00	0.00
15	124.0800	35.5583	3.56	0.56	3.00	0.00	0.00
16	121.4866	34.9933	47.28	13.32	3.72	4.24	2.00
17	122.4950	35.0000	0.16	0.16	0.00	0.00	0.00
18	123.4950	34.9983	8.52	5.96	0.00	0.04	2.52
19	122.0183	34.4983	10.72	6.72	0.00	0.40	1.20
20	122.9883	34.5083	30.00	22.52	0.92	0.12	0.32
21	124.0616	34.5716	10.96	7.72	0.00	0.12	3.12
22	121.4850	34.0016	12.56	5.00	0.08	4.52	2.32
23	122.4650	33.9750	0.32	0.24	0.00	0.08	0.00
24	123.5033	33.9883	18.56	13.32	0.00	0.08	5.16
25	122.0966	33.5283	0.16	0.08	0.00	0.08	0.00
26	122.9933	33.5016	5.28	2.12	0.00	0.16	3.00
27	123.9600	33.5533	10.04	2.24	0.00	0.00	7.80
28	124.9716	33.5566	4.76	4.20	0.00	0.00	0.32
29	122.5050	33.0133	55.44	13.40	0.00	21.72	8.88
30	123.4016	33.0100	155.88	5.96	0.00	0.52	0.00
31	124.4833	32.9966	27.04	9.52	13.60	1.80	1.80
32	124.5000	37.0116	42.52	9.20	0.00	0.00	33.32
33	124.4650	35.9900	20.68	15.52	0.00	0.00	5.16
34	124.4900	35.0000	3.76	0.48	0.00	0.00	0.00
35	124.4866	33.9983	21.12	5.60	6.32	0.16	3.44

Table 37 Density of Macrobenthic in the Yellow Sea in Dec-1999（ind./㎡ ）

Station no.	Longitude（E）	Latitude（N）	Total	Poly-chaeta	Mollusk	Crust-acean	Echi-noderm
1	123.9916	38.9950	76	44	8	0	24
2	123.5433	38.4750	36	16	0	16	0
3	123.0250	38.0000	116	64	8	36	8
4	123.5583	36.5366	436	104	40	8	4
5	122.0466	36.0466	228	120	28	80	0
6	123.0216	35.9950	128	28	56	0	44
7	124.0550	36.0016	164	44	28	80	8
8	122.5033	35.5233	52	32	20	0	0
9	123.4616	35.4583	100	84	12	4	0
10	121.5150	35.0000	376	216	24	120	0
11	122.5083	34.9616	88	60	8	20	0
12	123.5050	35.9983	132	88	20	20	4
13	121.9950	34.5183	496	388	32	44	4
14	122.9816	34.4933	148	132	0	8	8
15	121.4916	33.9916	752	28	4	12	0
16	122.4650	34.0133	524	276	56	104	0
17	123.4583	34.0033	60	16	20	16	0
18	122.5000	33.5033	100	88	12	0	0
19	123.4800	33.4966	160	128	0	28	4
20	124.4933	33.4866	84	60	0	8	12
21	122.9750	33.0016	388	280	12	56	20
22	124.0116	32.9950	292	236	4	32	4
23	124.9750	33.0066	120	76	0	32	4
24	124.4933	36.5100	348	132	148	4	12
25	124.9683	36.0000	132	72	16	4	40
26	124.4866	35.5116	328	68	72	80	16
27	124.5100	34.9633	104	56	24	20	0
28	124.5083	33.9916	760	424	44	276	4

Table 38 Macrobenthic biomass in the Yellow Sea in Dec-1999 (g WW/㎡)

Station no.	Longitude （E）	Latitude （N）	Total	Poly-chaeta	Mollusk	Crust-acean	Echi-noderm
1	123.9916	38.9950	175.20	0.64	0.08	0.00	174.48
2	123.5433	38.4750	8.72	0.16	0.00	0.20	0.00
3	123.0250	38.0000	16.48	1.00	0.24	0.16	15.08
4	123.5583	36.5366	52.20	12.12	17.32	0.04	14.40
5	122.0466	36.0466	19.40	1.88	12.84	4.68	0.00
6	123.0216	35.9950	5.48	0.88	1.40	0.00	3.20
7	124.0550	36.0016	9.36	2.24	0.80	3.12	2.36
8	122.5033	35.5233	0.52	0.08	0.44	0.00	0.00
9	123.4616	35.4583	2.28	1.12	1.12	0.04	0.00
10	121.5150	35.0000	39.12	3.60	2.08	3.76	0.00
11	122.5083	34.9616	5.80	5.12	0.32	0.36	0.00
12	123.5050	35.9983	6.96	4.92	0.44	0.20	1.40
13	121.9950	34.5183	22.84	2.36	2.96	0.16	0.40
14	122.9816	34.4933	13.72	1.64	0.00	10.00	2.08
15	121.4916	33.9916	63.36	0.56	0.12	0.72	0.00
16	122.4650	34.0133	21.80	2.84	6.44	2.32	0.00
17	123.4583	34.0033	36.12	6.36	27.08	0.08	0.00
18	122.5000	33.5033	2.04	1.76	0.28	0.00	0.00
19	123.4800	33.4966	2.68	1.88	0.00	0.08	0.72
20	124.4933	33.4866	64.68	2.84	0.00	0.04	46.60
21	122.9750	33.0016	45.44	39.12	0.16	0.72	5.16
22	124.0116	32.9950	19.52	14.32	0.04	0.08	0.08
23	124.9750	33.0066	8.36	6.00	0.00	0.12	0.16
24	124.4933	36.5100	52.68	16.60	4.76	0.04	4.52
25	124.9683	36.0000	38.36	5.96	3.76	15.12	13.52
26	124.4866	35.5116	46.04	4.32	9.08	6.52	11.28
27	124.5100	34.9633	21.56	9.96	6.96	0.12	0.00
28	124.5083	33.9916	17.72	15.00	0.08	0.44	2.16

Annex 5.3 Macrobenthos 2000-01

Fig 26

Biomass distribution of crustacea in autumn

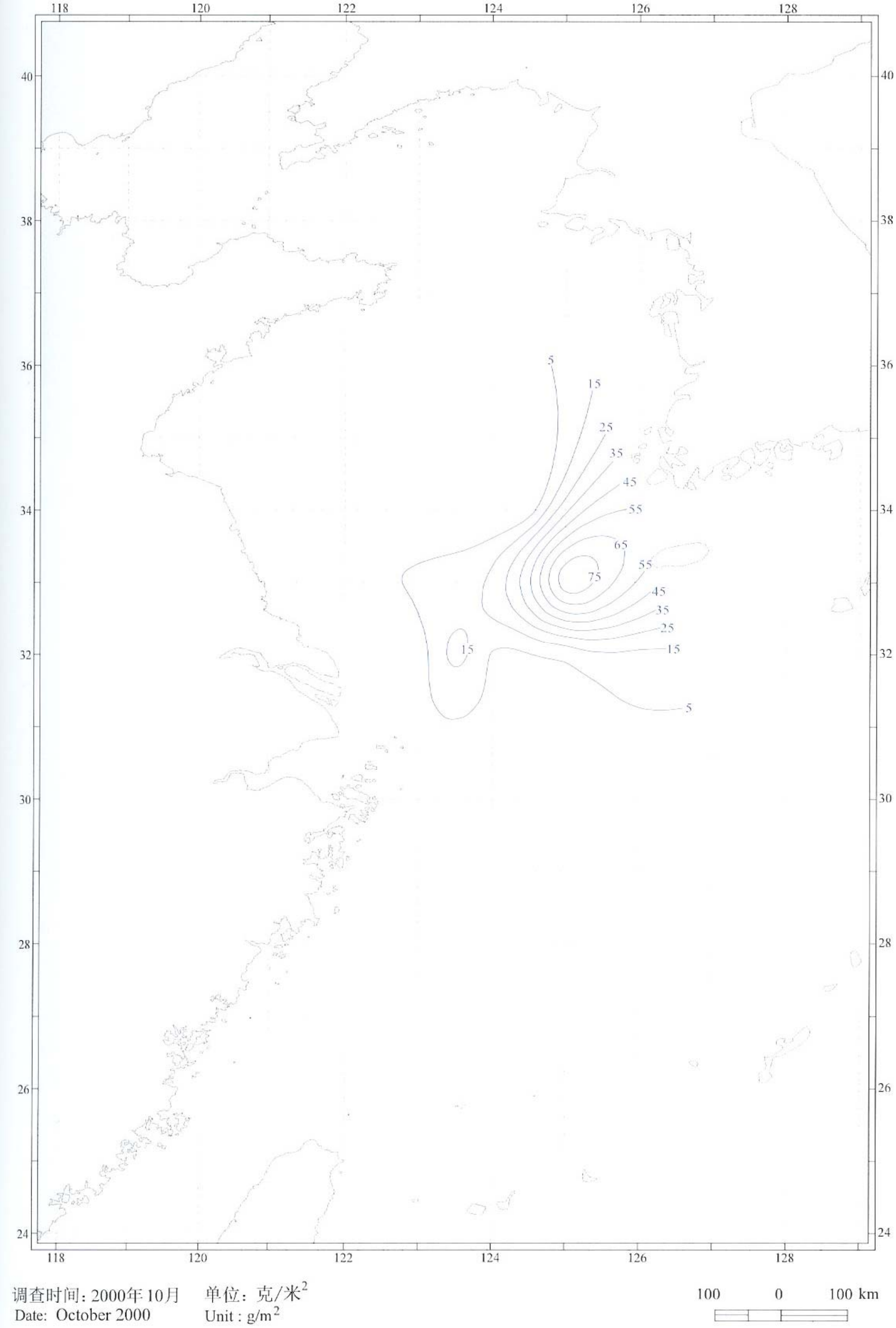


Fig 27

Biomass distribution of crustacea in spring

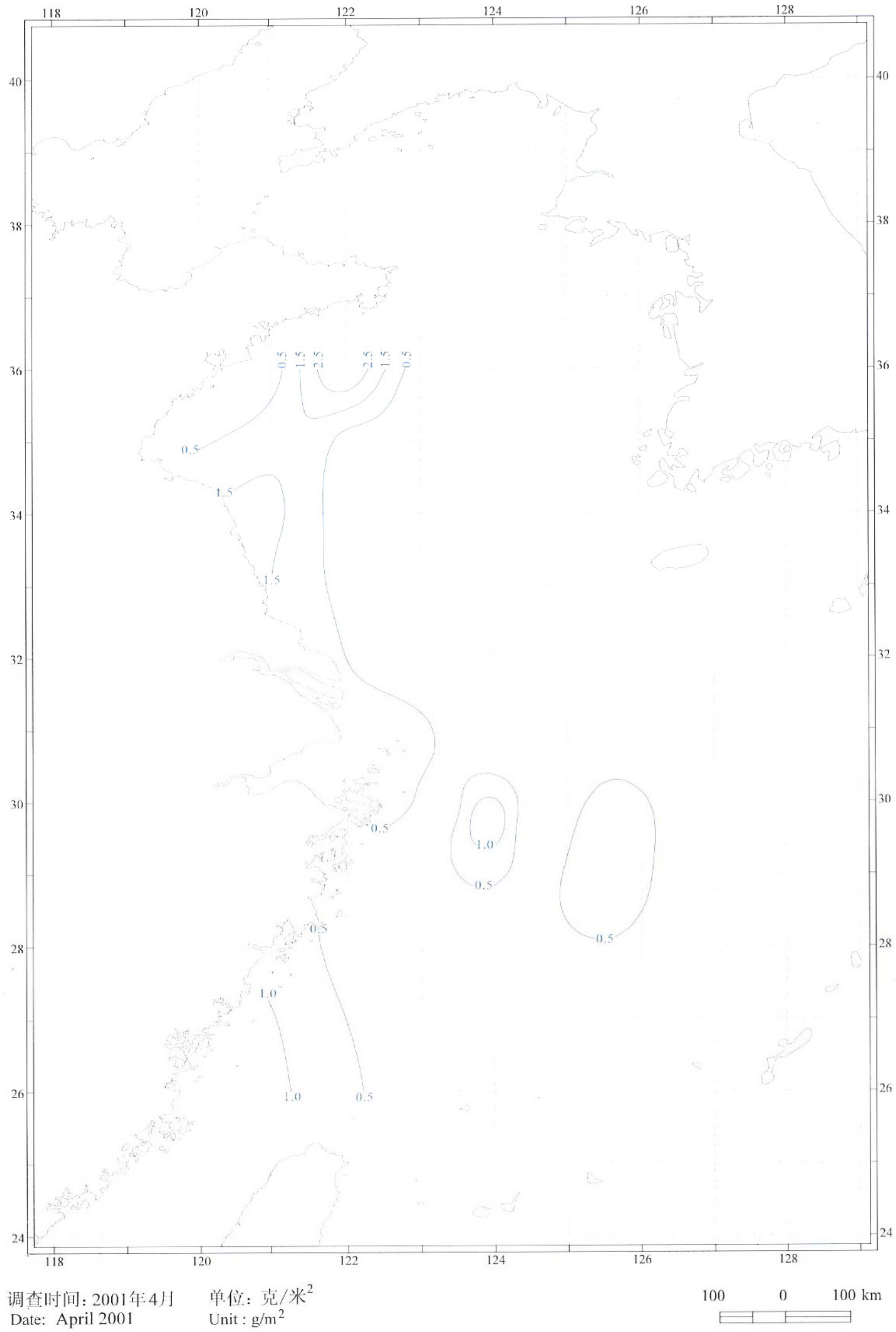


Fig 28

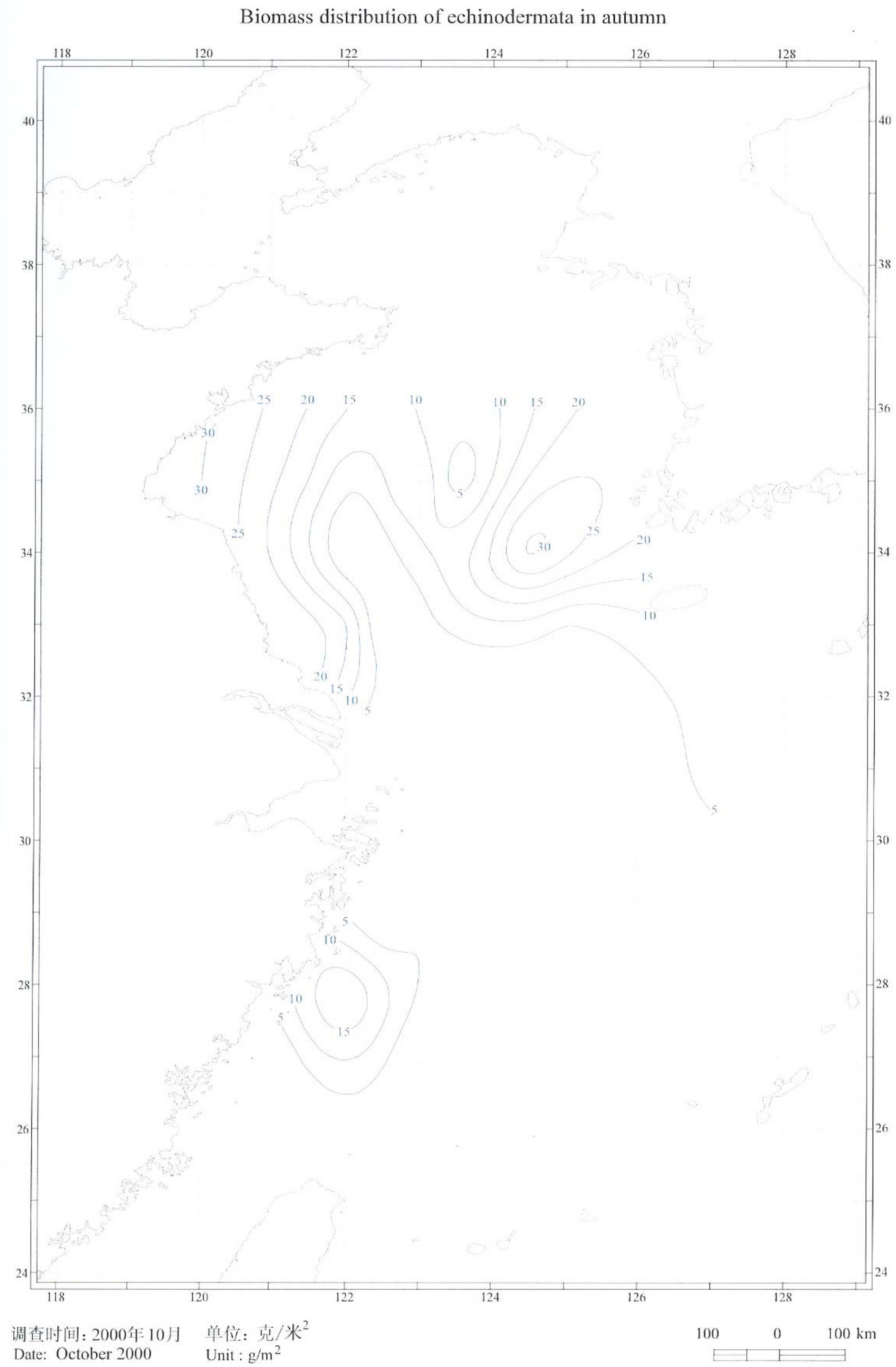
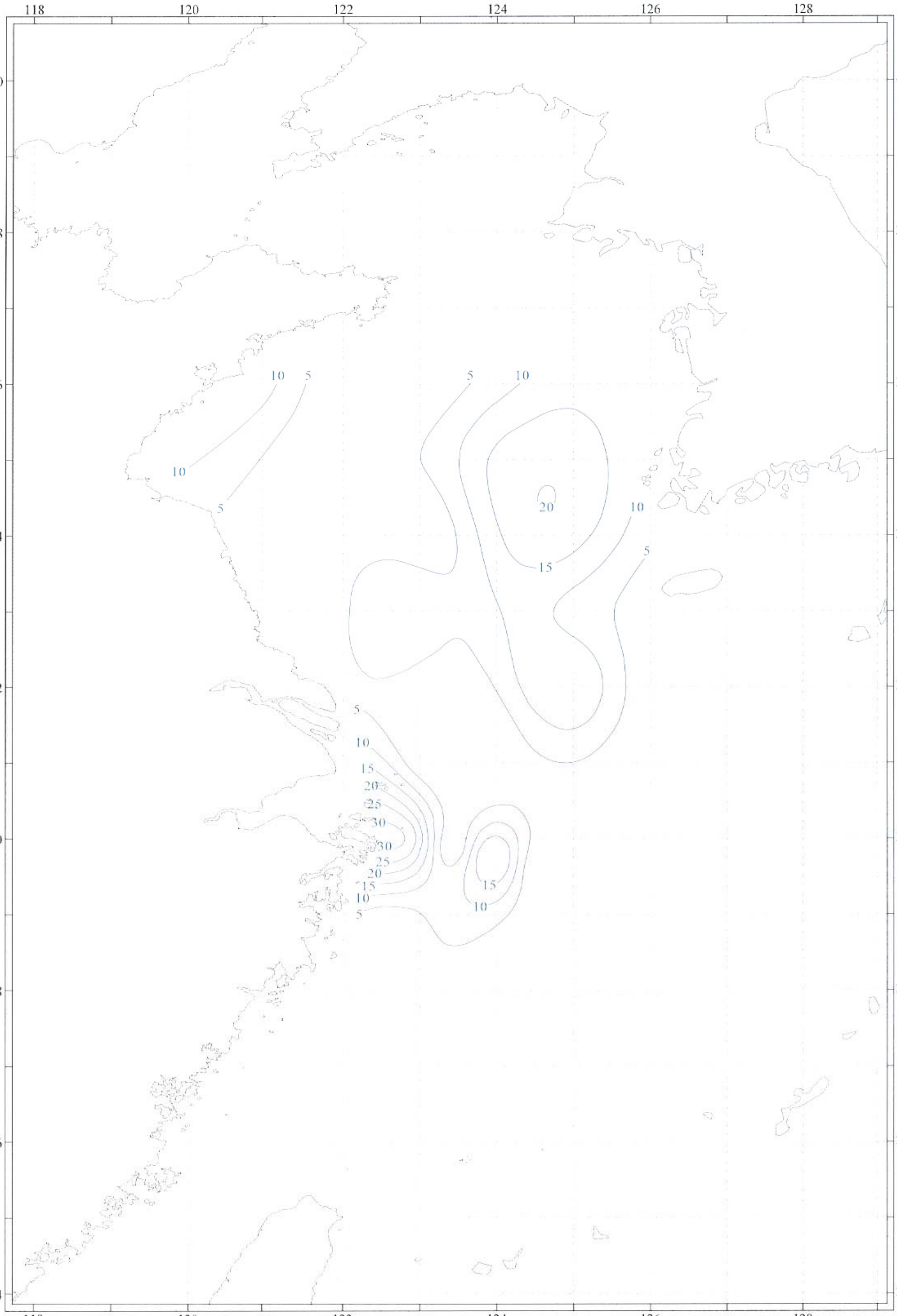

Biomass distribution of echinodermata in autumn
118
120
122
124
126
128
40
38
36
34
32
30
28
26
24
调查时间：2000年10月
Date: October 2000
单位：克/米2
Unit : g/m2
100
0
100 km

Fig 29

Biomass distribution of echinodermata in spring



调查时间：2001年4月
Date: April 2001

单位：克/米^2
Unit : g/m^2

100 0 100 km

Fig 30

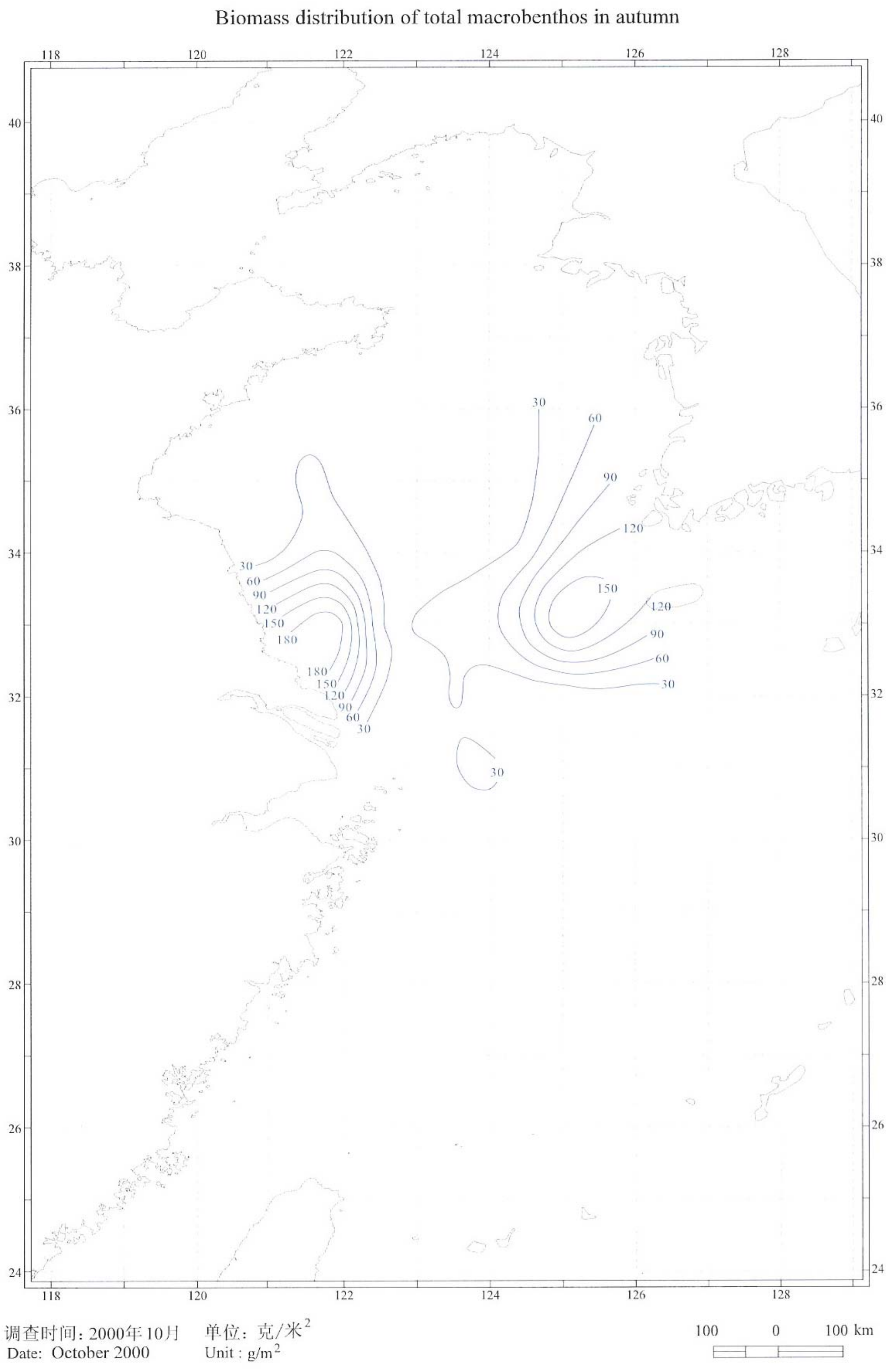

Biomass distribution of total macrobenthos in autumn
118
120
122
124
126
128
40
38
36
34
32
30
28
26
24
30
60
90
120
150
180
調查时间：2000年10月
Date: October 2000
单位：克/米²
Unit : g/m²
100
0
100 km

Fig 31

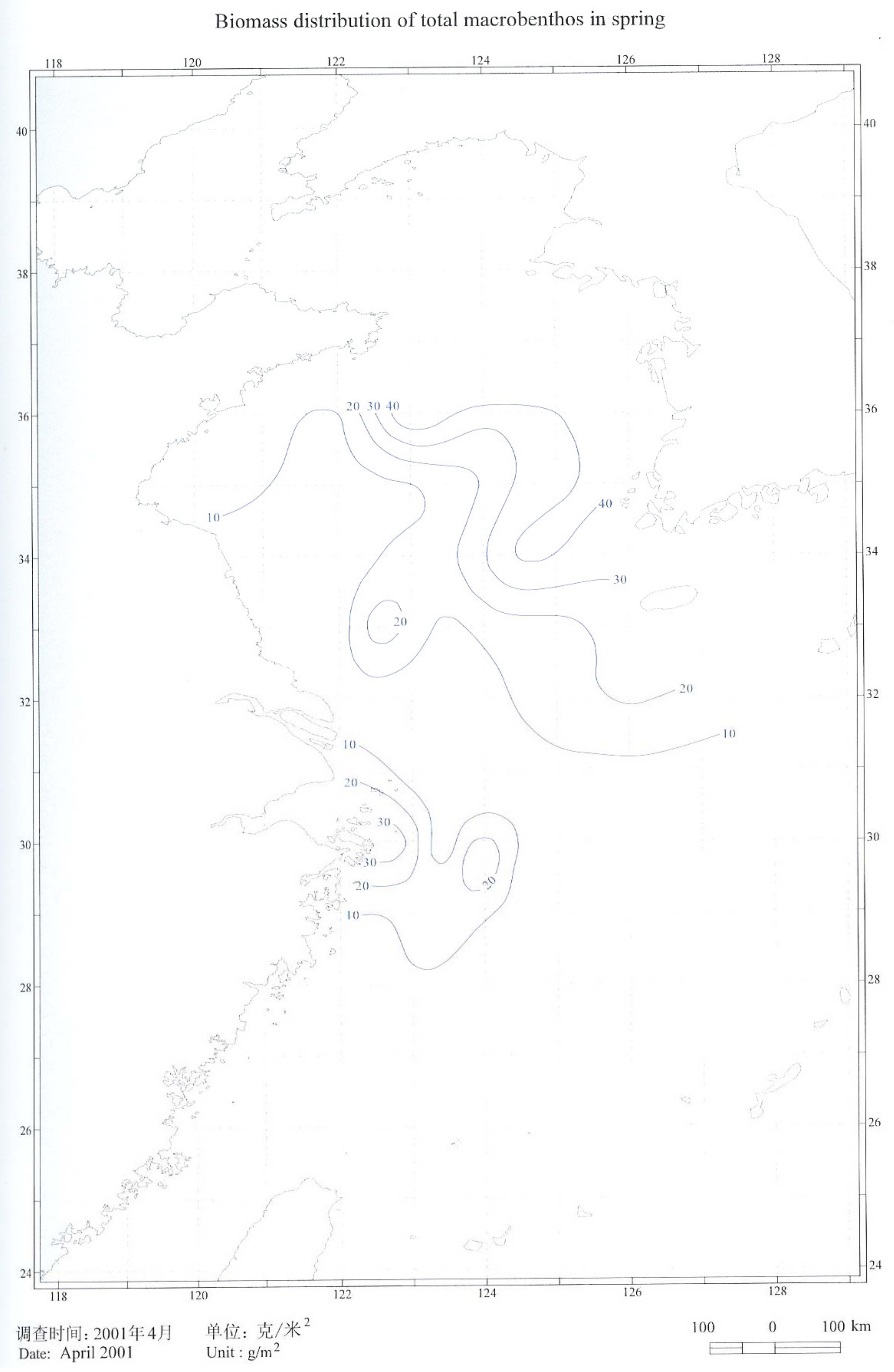

Biomass distribution of total macrobenthos in spring
118
120
122
124
126
128
40
38
36
34
32
30
28
26
24
20 30 40
10
40
30
20
20
10
10
20
30
30
20
20
10
调查时间: 2001年4月
Date: April 2001
单位: 克/米2
Unit : g/m2
100 0 100 km

Fig 32

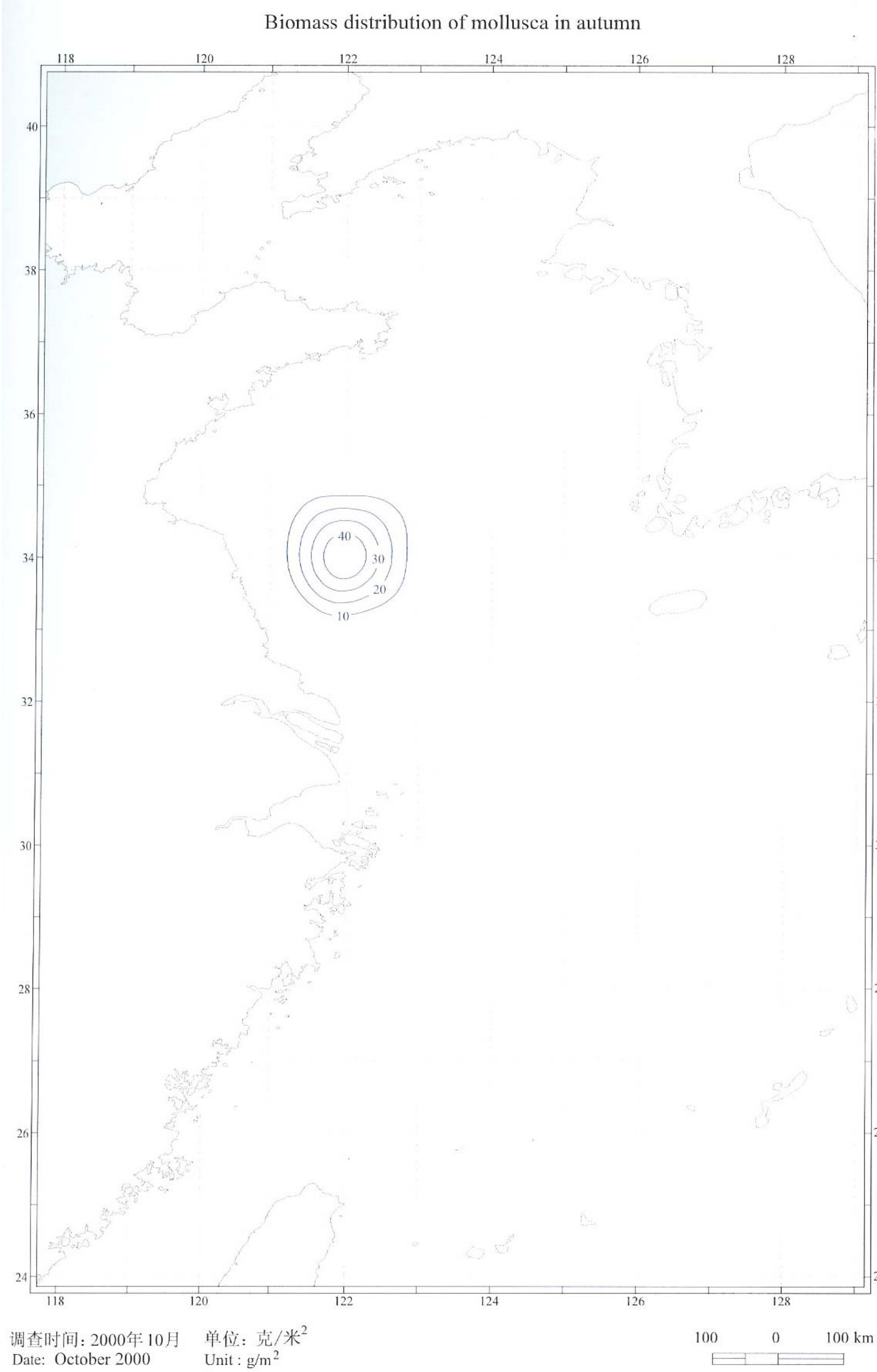
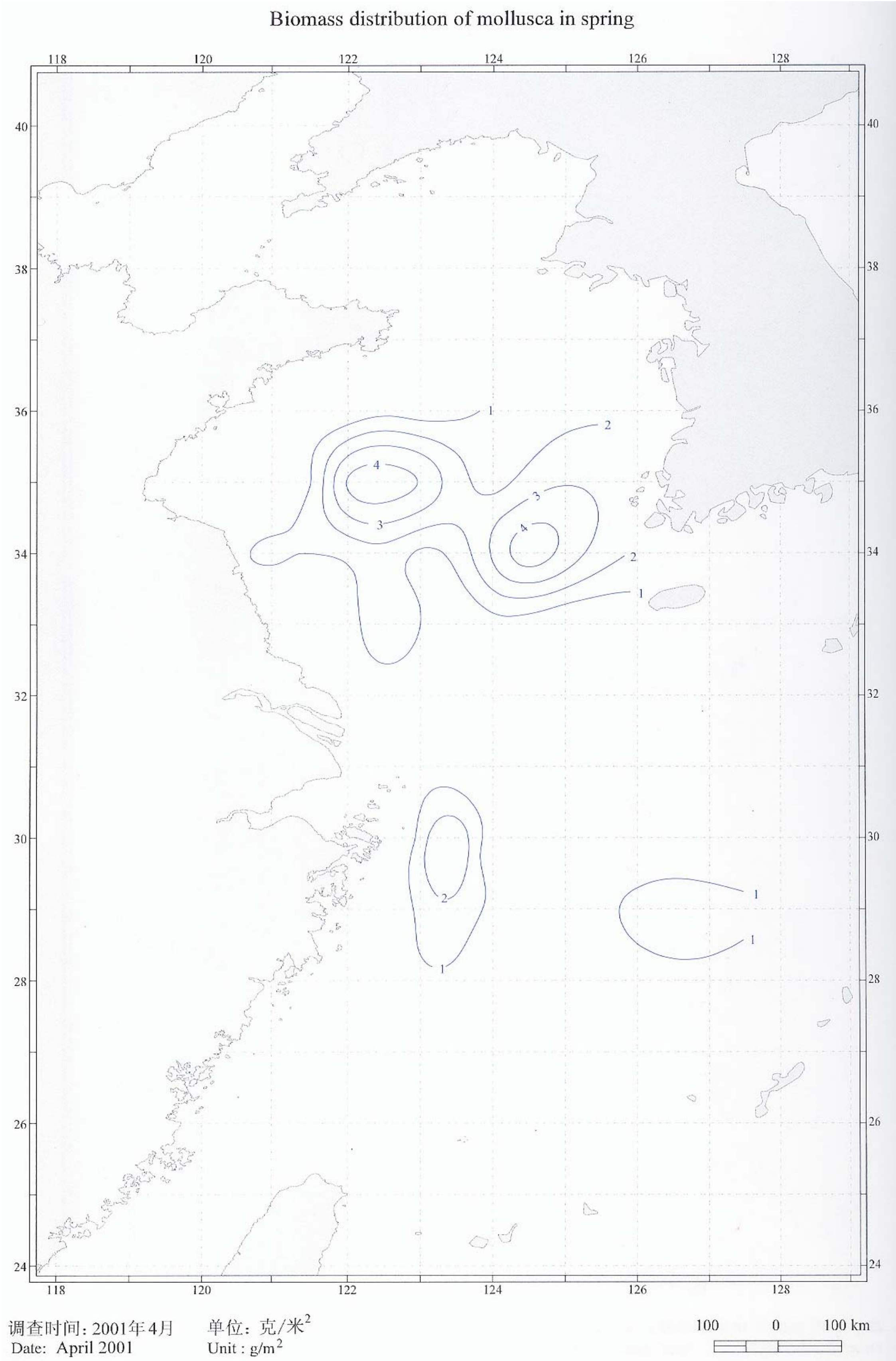

Biomass distribution of mollusca in autumn
118
120
122
124
126
128
40
38
36
34
32
30
28
26
24
40
30
20
10
调查时间：2000年10月
Date: October 2000
单位：克/米2
Unit : g/m2
100
0
100 km

Fig 33



Biomass distribution of mollusca in spring
118
120
122
124
126
128
40
38
36
34
32
30
28
26
24
1
2
3
4
调查时间：2001年4月
Date: April 2001
单位：克/米2
Unit : g/m2
100
0
100 km

Fig 34

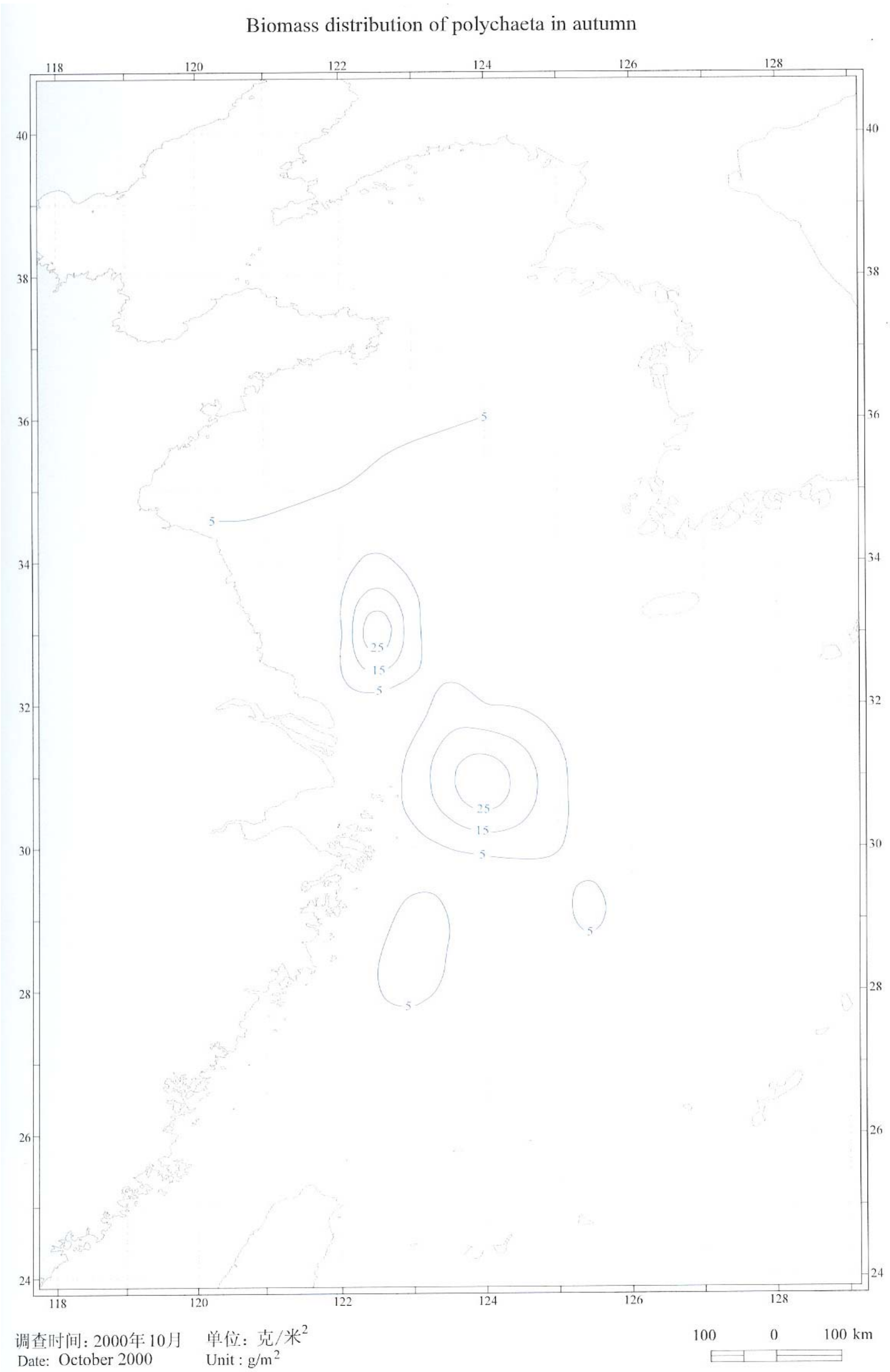

Biomass distribution of polychaeta in autumn
118
120
122
124
126
128
40
38
36
34
32
30
28
26
24
5
25
15
调查时间：2000年10月
Date: October 2000
单位：克/米2
Unit : g/m2
100
0
100 km

Fig 35

Biomass distribution of polychaeta in spring

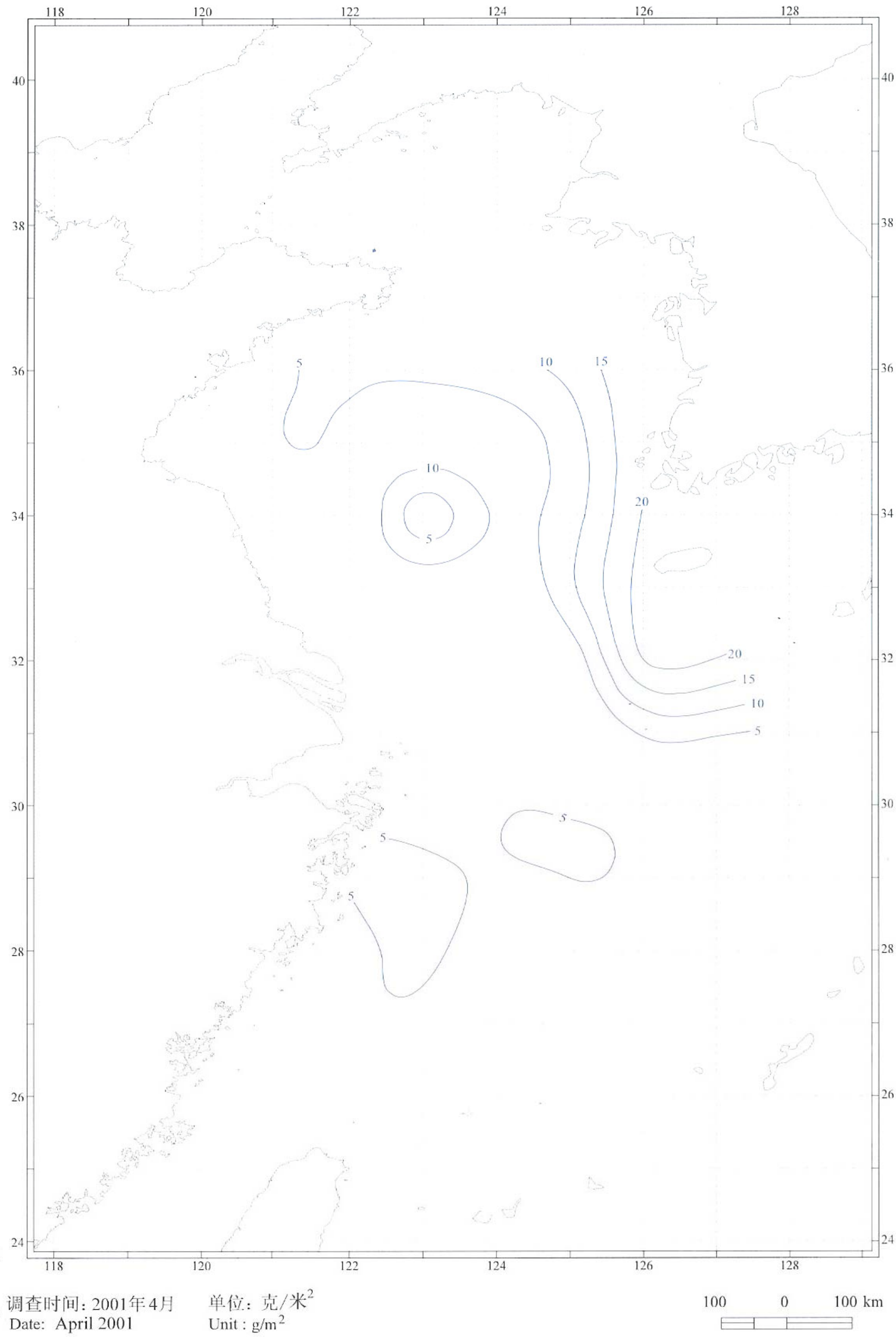


Fig 36

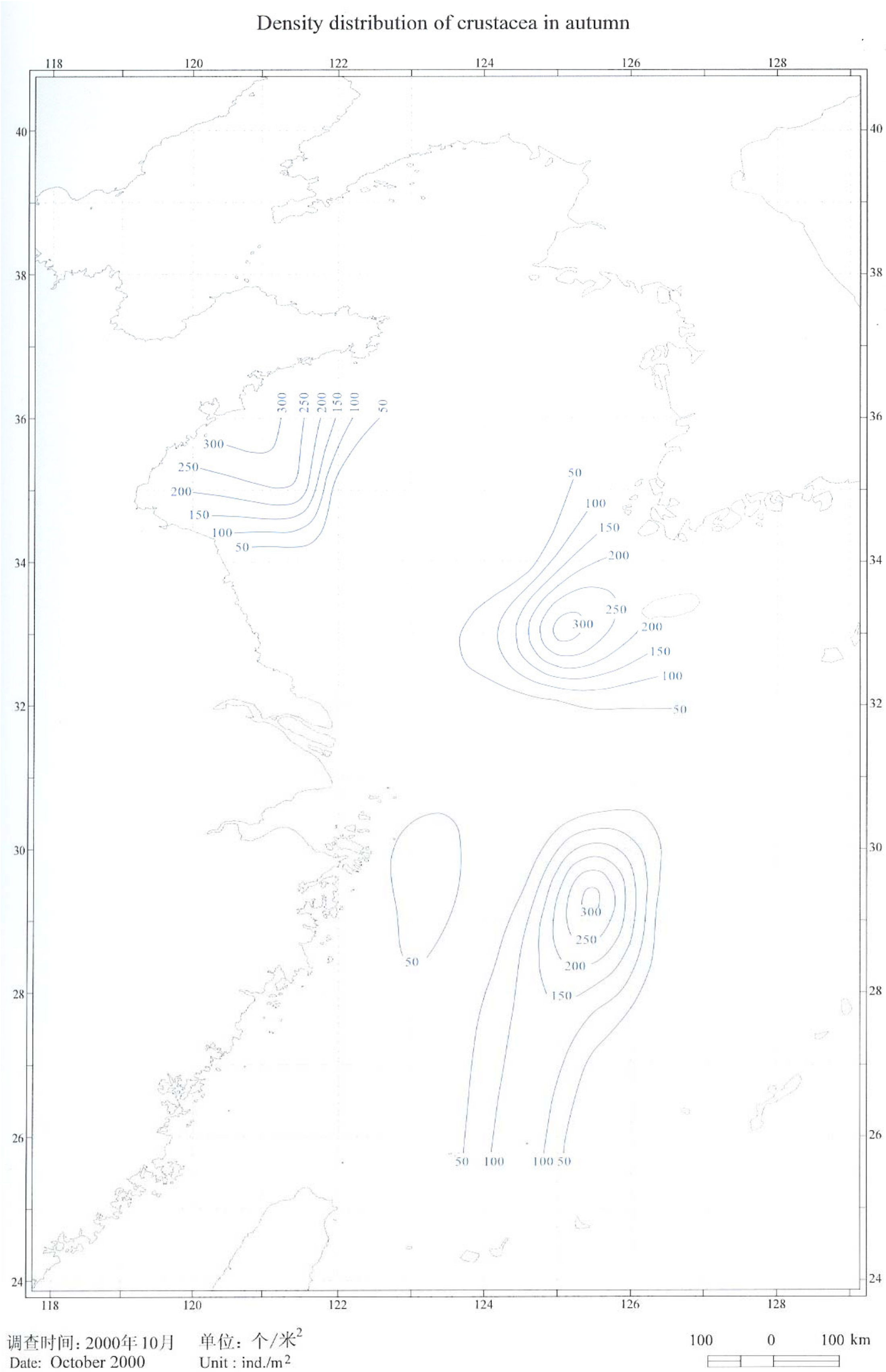

Density distribution of crustacea in autumn
118
120
122
124
126
128
40
38
36
34
32
30
28
26
24
300
250
200
150
100
50
300
250
200
150
100
50
50
100
150
200
250
300
200
150
100
50
50
300
250
200
150
50 100 100 50
调查时间: 2000年10月 单位: 个/米2
Date: October 2000 Unit : ind./m2
100 0 100 km

Fig 37

Density distribution of crustacea in spring

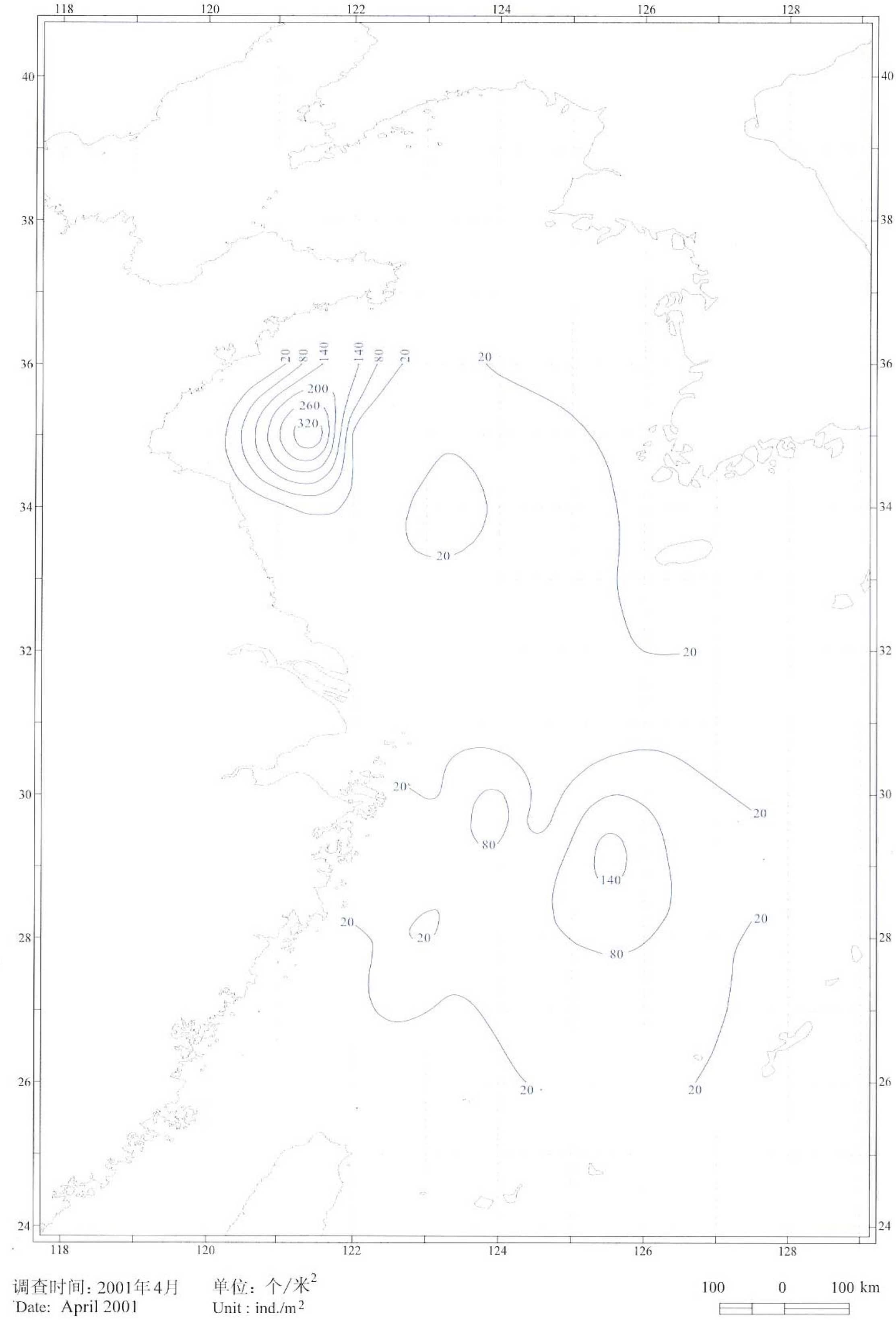
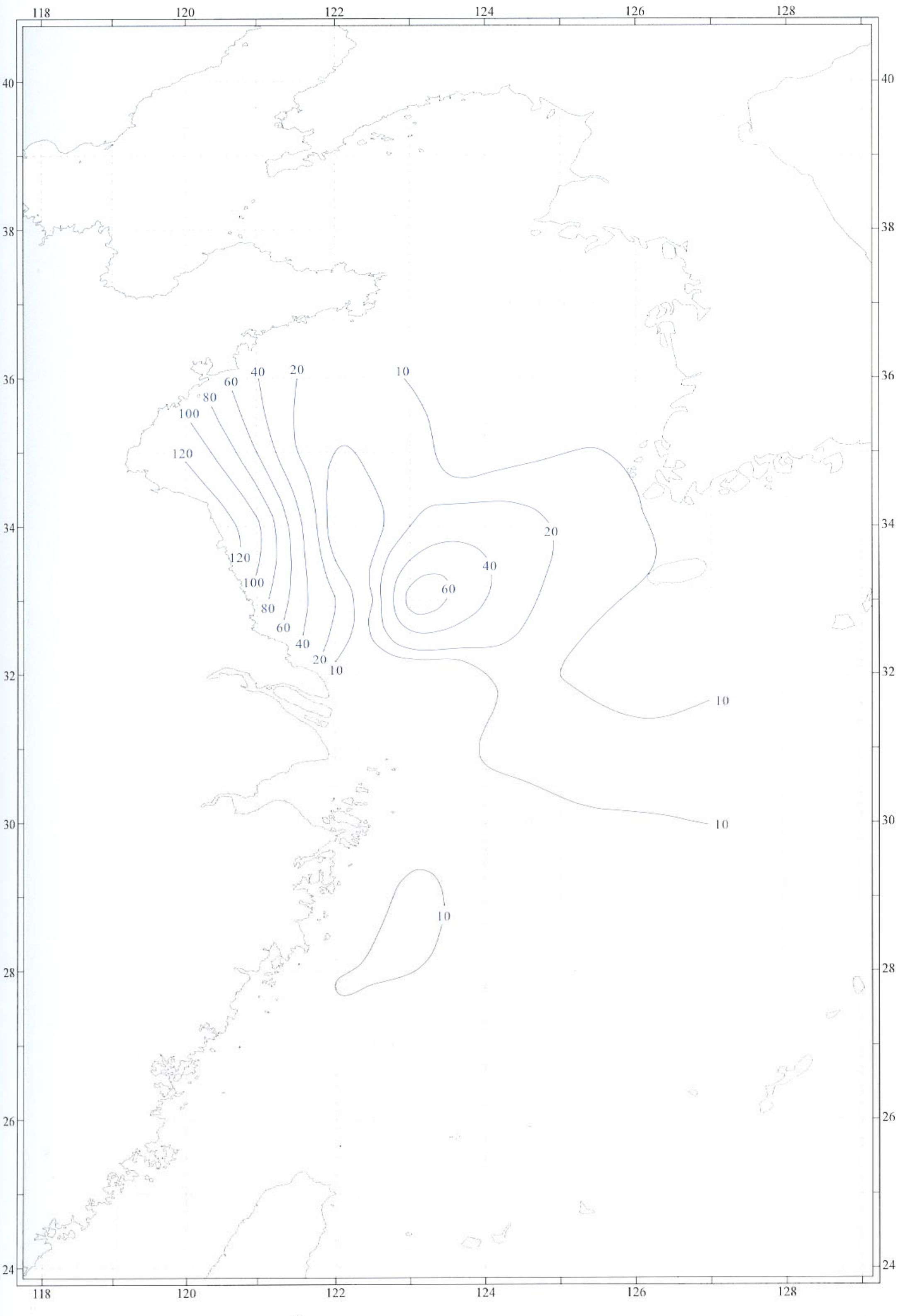


Fig 38

Density distribution of echinodermata in autumn

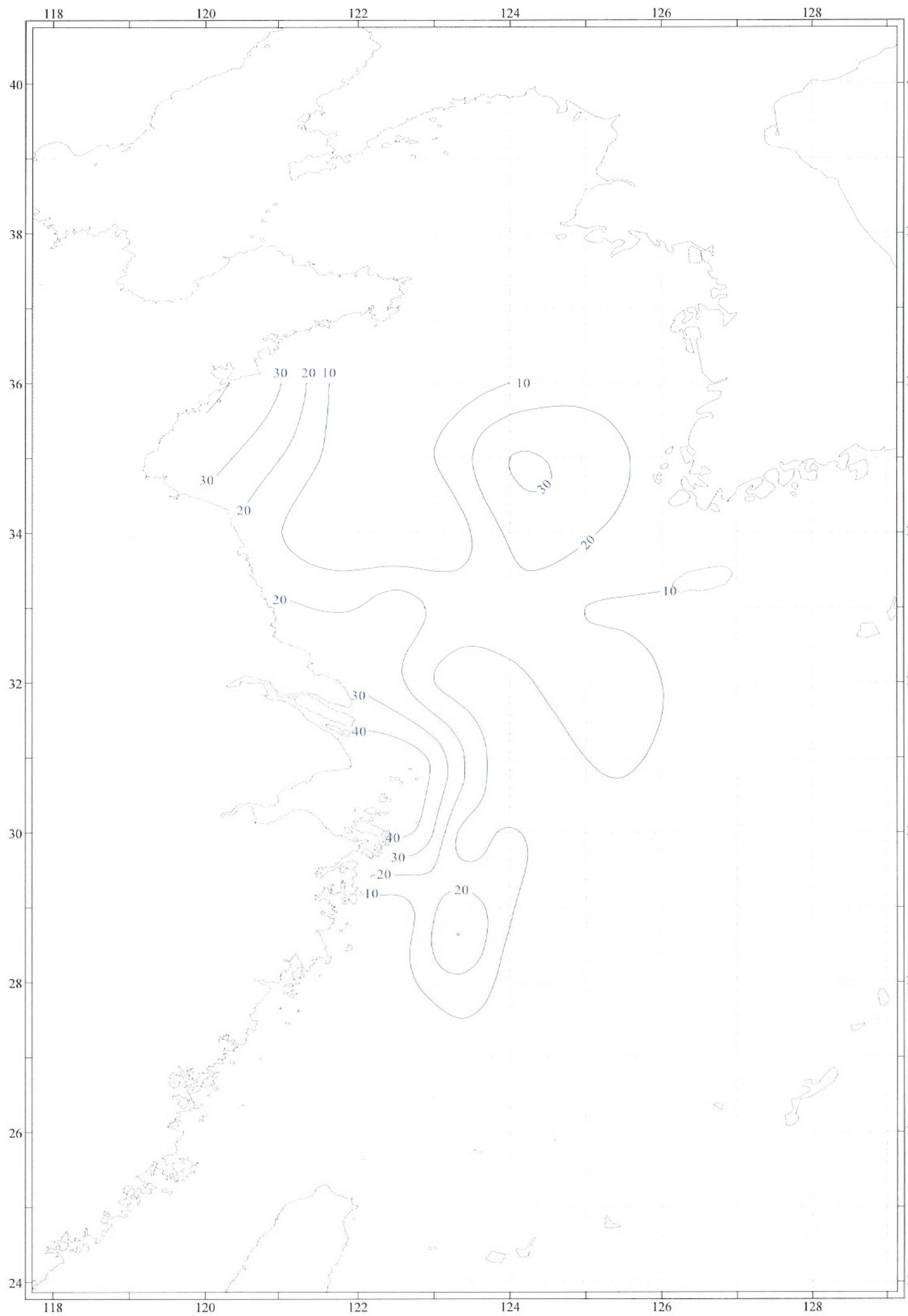


调查时间：2000年10月　单位：个/米^2
Date: October 2000　Unit : ind./m^2

100　0　100 km

Fig 39

Density distribution of echinodermata in spring

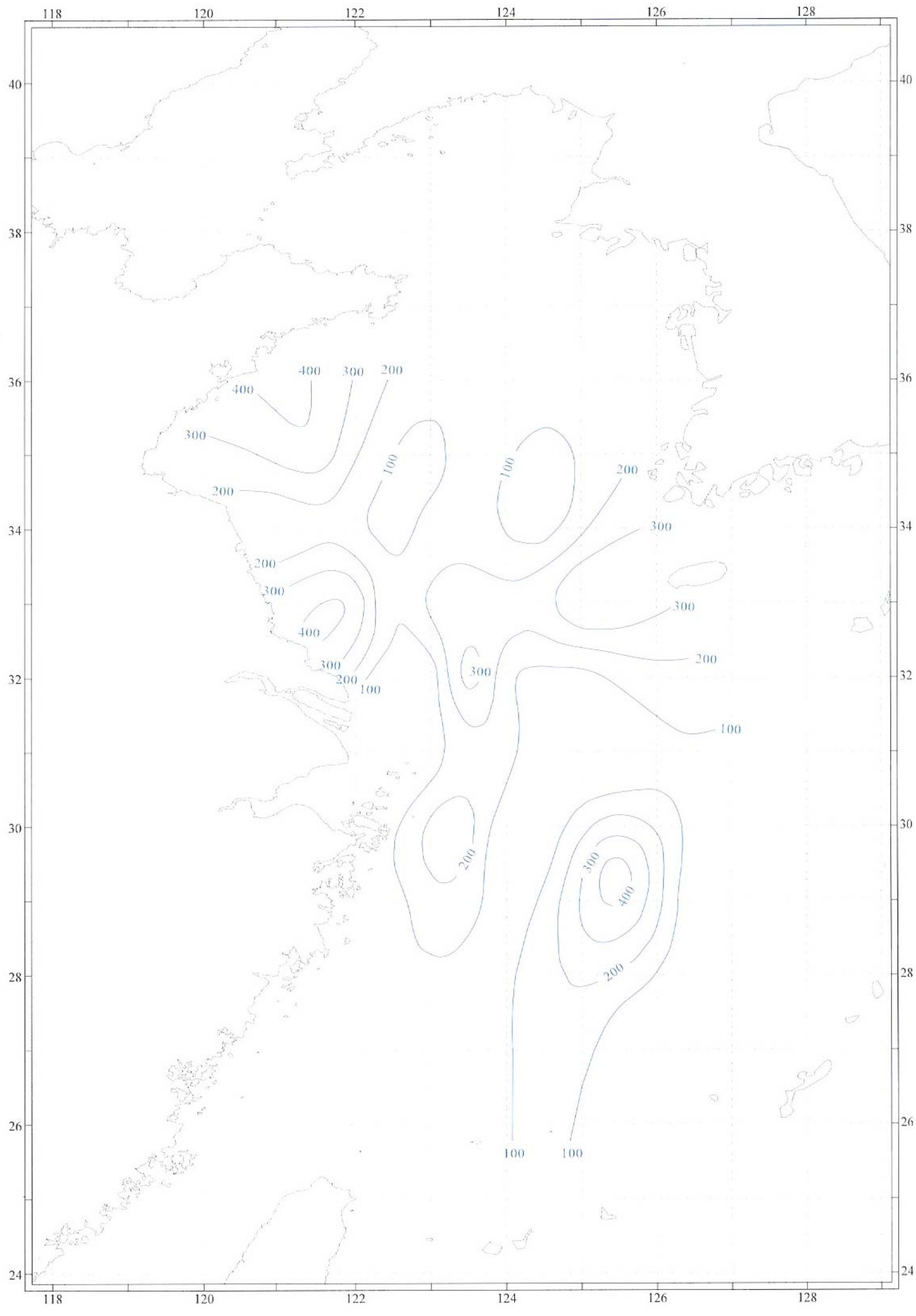


调查时间：2001年4月　单位：个/米²
Date: April 2001　Unit : ind./m²

100　0　100 km

Fig 40

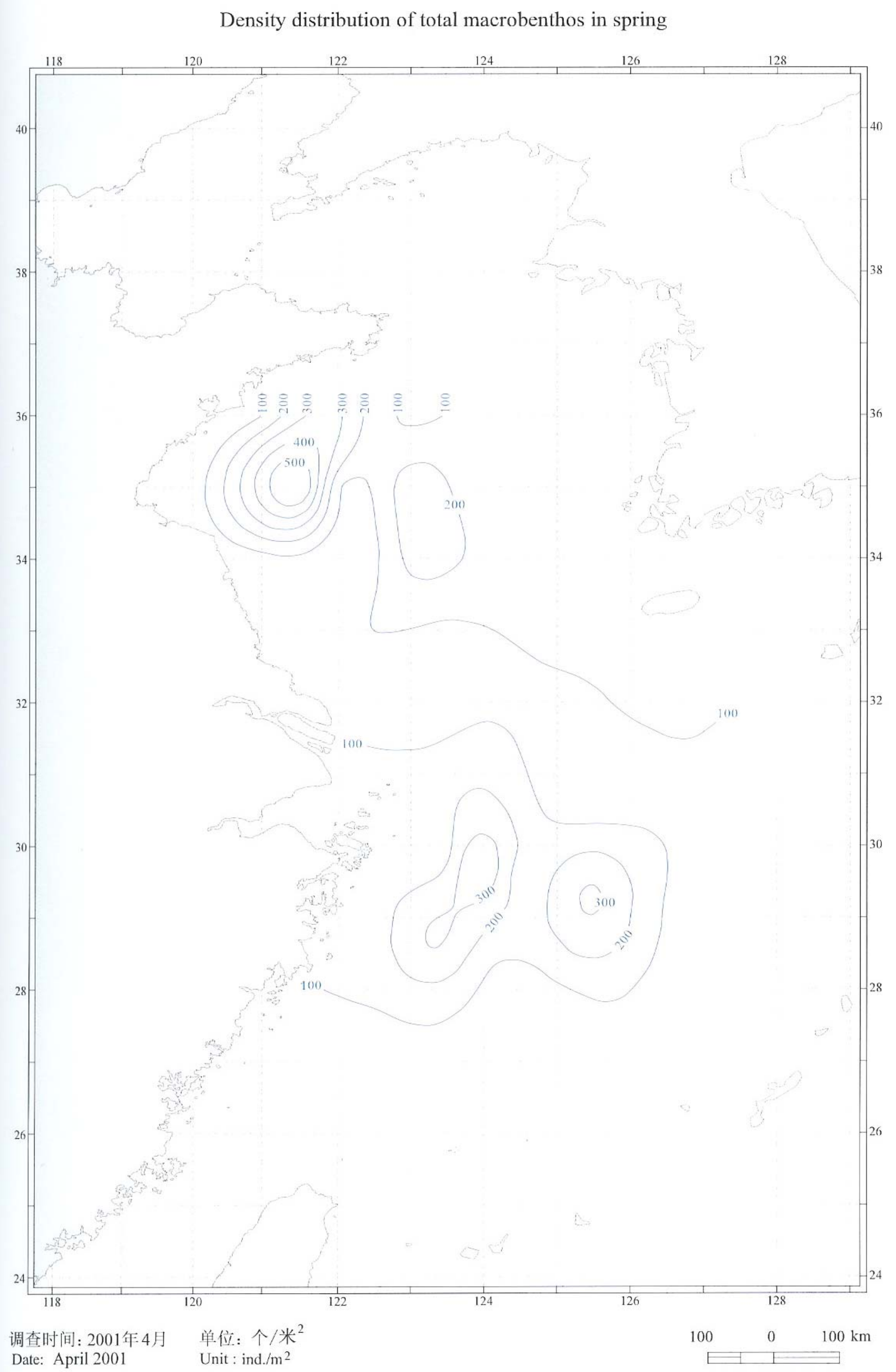
Density distribution of total macrobenthos in autumn



调查时间：2000年10月　单位：个/米²
Date: October 2000　Unit : ind./m²

100　0　100 km

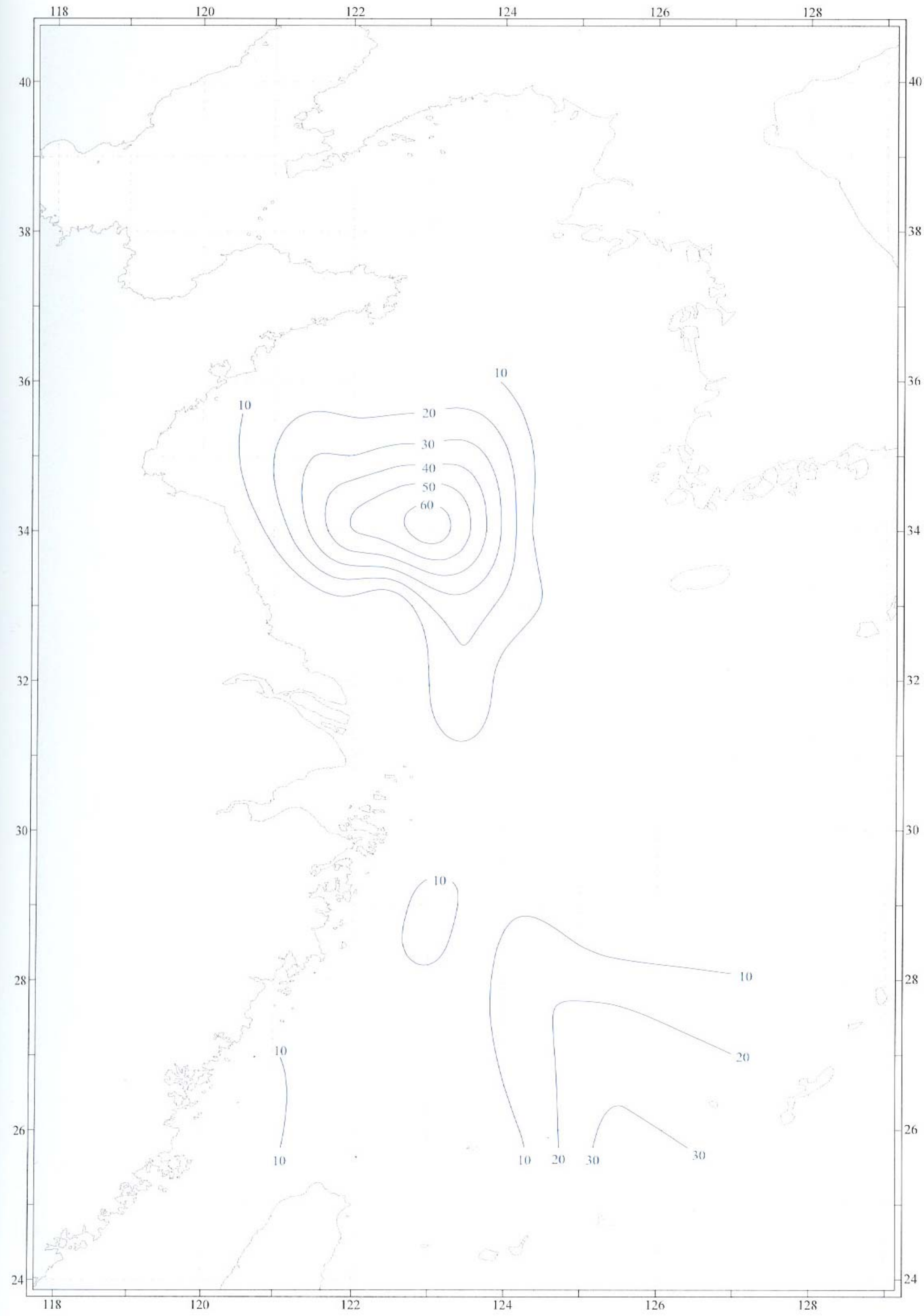
Fig 41



Density distribution of total macrobenthos in spring
118
120
122
124
126
128
40
38
36
34
32
30
28
26
24
100
200
300
400
500
调查时间：2001年4月
Date: April 2001
单位：个/米²
Unit : ind./m²
100 0 100 km

Fig 42

Density distribution of mollusca in autumn

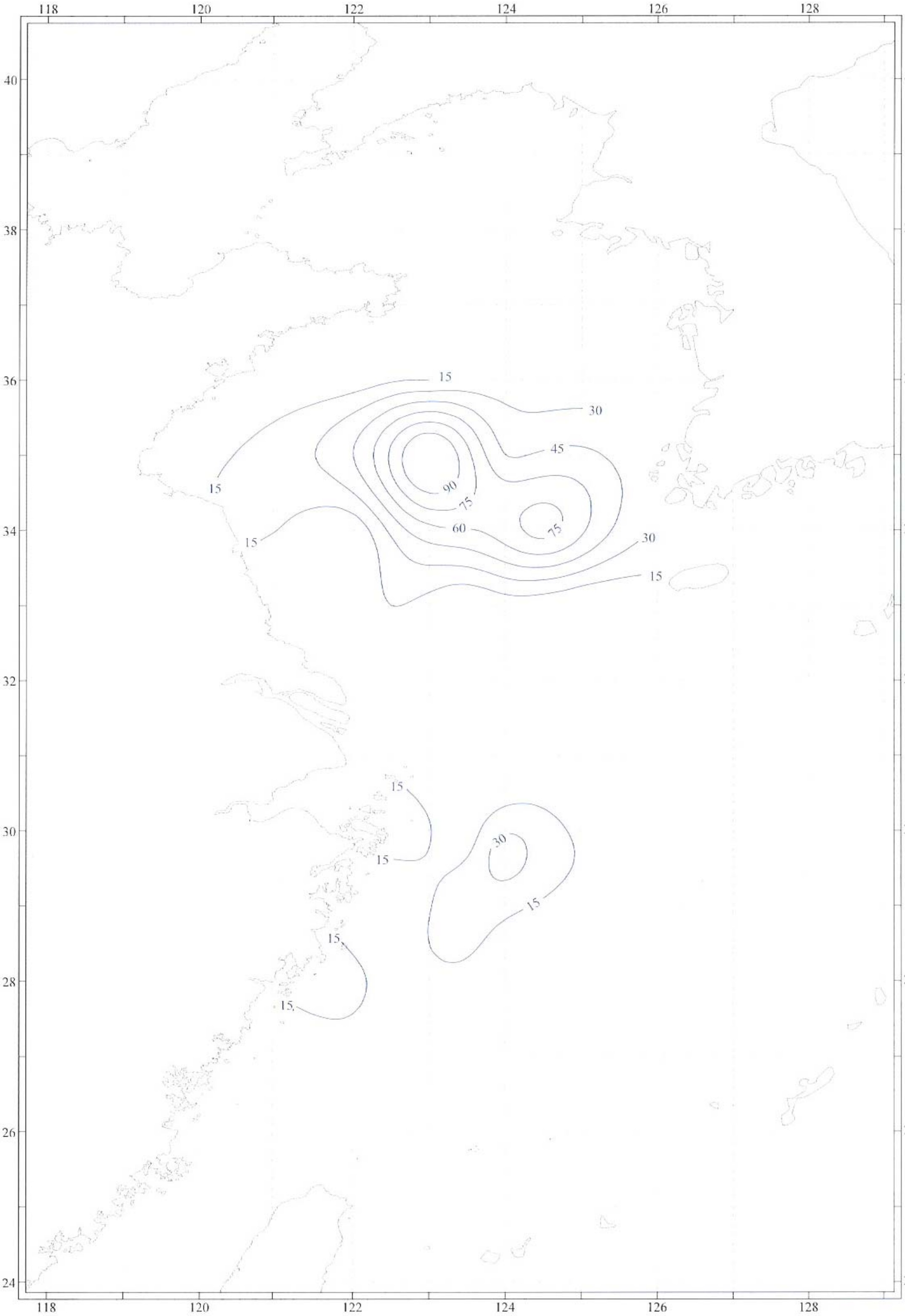


调查时间: 2000年10月　单位: 个/米^2
Date: October 2000　Unit : ind./m^2

100　0　100 km

Fig 43

Density distribution of mollusca in spring

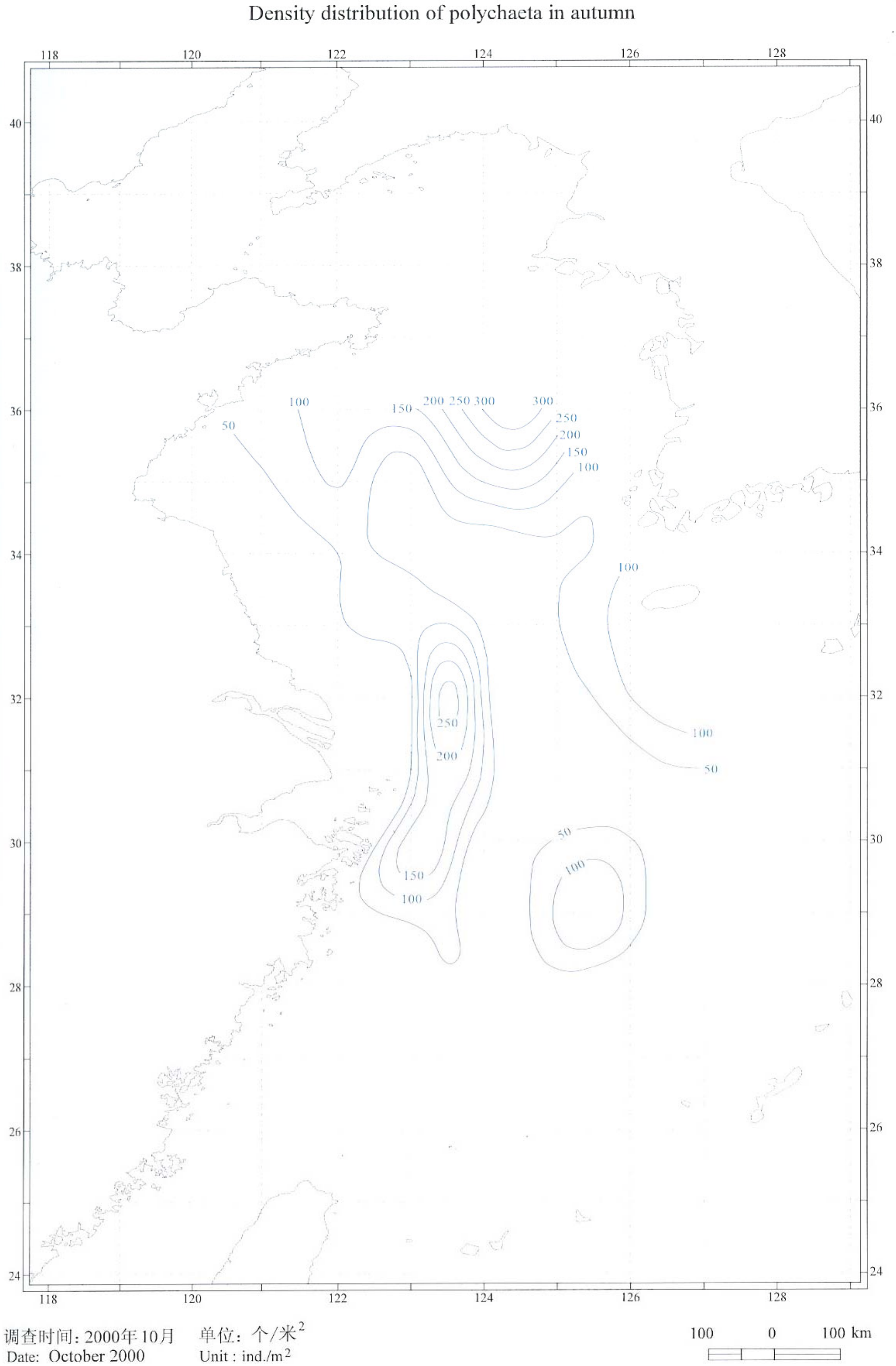


调查时间：2001年4月　单位：个/米²

Date: April 2001　Unit : ind./m^2

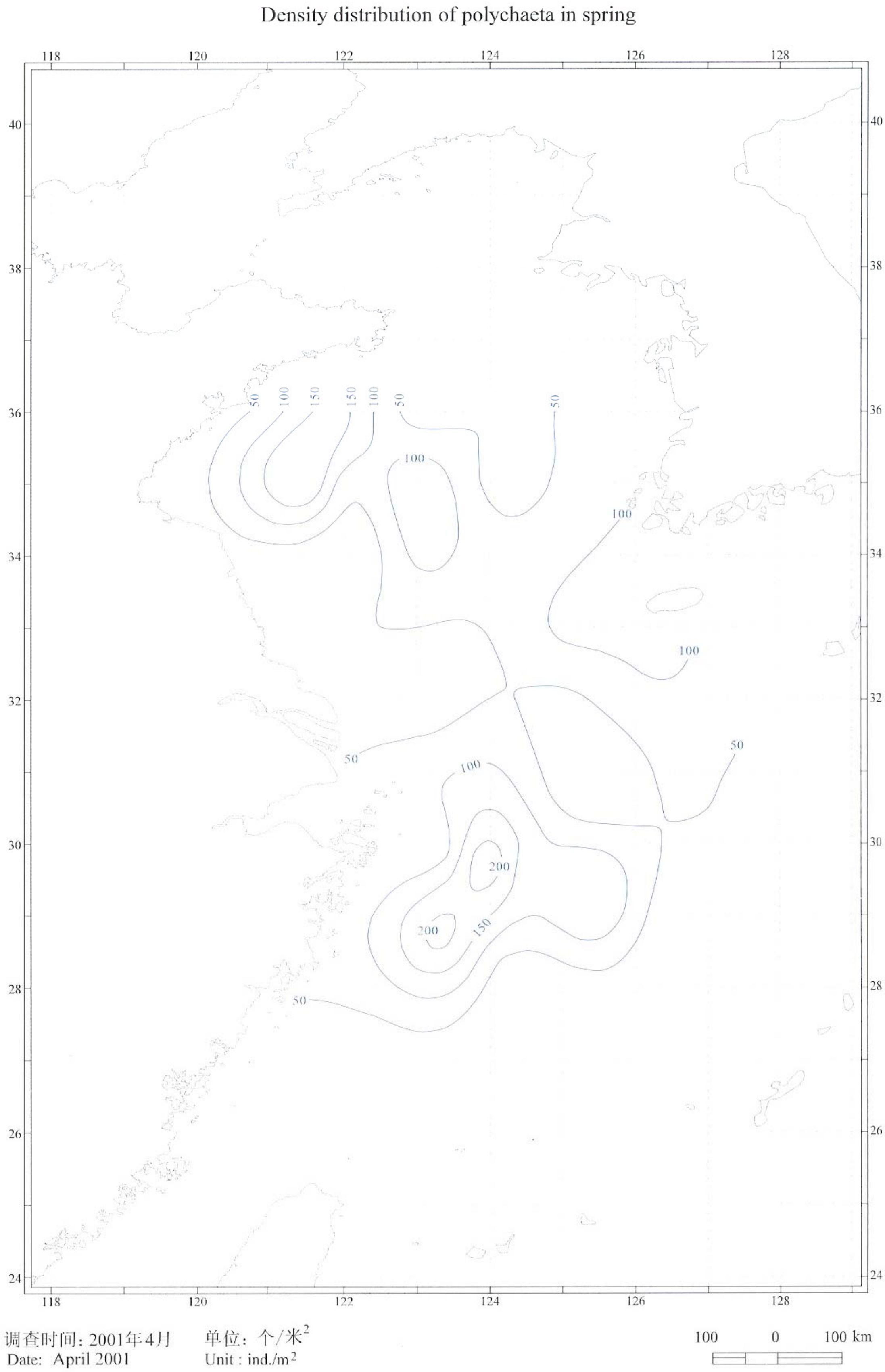
100　0　100 km

Fig 44



Density distribution of polychaeta in autumn
118
120
122
124
126
128
40
38
36
34
32
30
28
26
24
100
50
150
200
250
300
300
250
200
150
100
100
250
200
150
100
100
50
50
100
调查时间：2000年10月
Date: October 2000
单位：个/米²
Unit : ind./m²
100
0
100 km

Fig 45



Density distribution of polychaeta in spring
118
120
122
124
126
128
40
38
36
34
32
30
28
26
24
50
100
150
200
调查时间：2001年4月
Date: April 2001
单位：个/米2
Unit : ind./m2
100
0
100 km

Annex 6.1 HAB statistics, 1972-2005

Table 39 Red tide events in Yellow Sea: Statistics from China side

Found date	Occurrence date	Decline date	Continuance period	Occurrence Waters	Area	HAB Species	HAB cell density *1000cells/ml	Water Colour	Notes
1972.8	1972.8	No data available	No data available	Dalian Bay	20-30 km^2	Skeletonema Grev.	No data available	Red	
1973.8	1973.8	No data available	No data available	Xianglujiao, Dalian Bay	20 km^2	Skeletonema Grev.	4.6	Dust	
1977.5	1977.5	No data available	No data available	Hongtuduizi Bay, Liaoning	No data available	No data available	No data available	Red	
1978.10.4	1978.10.4	1978.10.7	4days	Dalian Port-West of Monk Island	30-100 km^2	Mesodinium rubrum	3200	Red	
1979.5-8	1979.5	1979.8	4months	Dalian Bay	No data available	Skeletonema Grev.	No data available	No data available	
1981.8	1981.8	No data available	No data available	Dalian Bay	100km2	Dinoflagellate, Skeletonema Grev.	No data available	No data available	
1984.6.9	1984.6.9	No data available	No data available	Zhuanghe waters, Liaoning	No data available	No data available	No data available	Red	
1984.7.8	No data available	No data available	No data available	Dalian Bay	70 km^2	Dinoflagellate, Skeletonema Grev.	100	Red & Brown	
1985.7.12	1985.7.12	1985.7.17	6days	Tianshuitao, Dalian Bay	40 km^2	Heterosigma akashiwo	32	Red	
1985.8.28	No data available	No data available	No data available	Tianshuitao, Dalian Bay	40 km^2	Skeletonema	10	Dust	
1986.4.23	1986.4.23	1986.4.26	4days	Dalian Bay	2-4km^2	Thalassiosira nordenskioldi	1.7	Tea Brown	
1986.6.18	1986.6.18	1986.6.20	3days	Tianshuitao, Dalian Bay	30km^2	Skeletonema Grev.	23	Tea Brown	
1986.7.8-13	1986.7.8	1986.7.13	6days	Dalian Bay	50-70 km^2	Heterosigma akashiwo	97	Red	

Found date	Occurrence date	Decline date	Continuance period	Occurrence Waters	Area	HAB Species	HAB cell density *1000cells/ml	Water Colour	Notes
1986.7.22	1986.7.22	1986.7.24	3days	Mianhua Island & Haimao Island, Dalian Bay	$10km^2$	Skeletonema Grev.	6.8	Dust	
1987.6.18	1987.6.18	1987.6.20	3days	Dalian Bay	$30\ km^2$	Heterosigma akashiwo Hada	100	Red	
1987.7.20	1987.7.20	1987.7.23	4days	Dalian Bay	$20\ km^2$	Skeletonema Grev.	25	Dust	
1989.4.1	No data available	No data available	No data available	Choushuitao,Dalian	$3\text{-}5km^2$	Thalassiosira nordenskioldi	1.4	Brown	
1989.7.1	No data available	No data available	No data available	Choushuitao,Dalian	No data available	Heterosigma akashiwo Hada	23	Brown	
1989.8.28	1989.8.28	No data available	No data available	Jinguang, Dalian bay	No data available	Skeletonema Grev.	4.3	Brown	
1990.6.24	No data available	No data available	No data available	Jiaozhou Bay	$80km^2$	Mesodinium rubrum	20000	No data available	
1990.7.1	No data available	No data available	No data available	Malanhe & Xinghai beach,Dalian		Mesodinium rubrum、Noctiluca scientillans	20000, 300	No data available	
1990.7.5	1990.7.5	1990.7.9	5days	Tianshuitao,Choushuitao, Dalian	$5\text{-}6km^2$	Heterosigma akashiwo Hada, Skeletonema Grev.	4.6	Brown	
1990.7.8	1990.7.8	1990.7.10	3days	Hongtuduizi Bay,Dalian	$3\text{-}4km^2$	Heterosigma akashiwo Hada	36	Red Brown	
1990.8.1	No data available	No data available	No data available	Changhai County, Dachangshan & Ganjingzi, Liaoning	No data available	No data available	No data available	No data available	
1990.8.31	No data available	No data available	No data available	Aquaculture area, Bihaishanzhuang ,Liaoning	$6\text{-}10km^2$	Pyrrophyta	25	Red Brown	

Found date	Occurrence date	Decline date	Continuance period	Occurrence Waters	Area	HAB Species	HAB cell density *1000cells/ml	Water Colour	Notes
1991.7.1	No data available	No data available	No data available	Fujiazhuang, Malanhe & Xinghai beach, Dalian	No data available	Skeletonema Grev., Euglenophyta, Thalassiosira nordenskioldi	No data available	Yellow Brown、Tea Brown	
1991.8.1	No data available	No data available	No data available	Xinghai Bay & Lingshuihe waters, Dalian	No data available	Skeletonema Grev., Heterosigma akashiwo Hada	No data available	Yelow Brown、Dust	
1992.4.1	No data available	No data available	No data available	South Shandong waters	Length3.5 km, width30m		No data available	Red Brown	
1992.4.1	No data available	No data available	No data available	South Shandong waters	No data available	Noctiluca scientillans	No data available	Red	
1992.5.1	No data available	No data available	No data available	South Shandong waters	Length120 km、width2-3km	Noctiluca scientillans	No data available	Dark Red	
1992.7.1	No data available	No data available	No data available	Malan River & Xinghai,Dalian	No data available	Skeletonema Grev.	No data available	Dust	
1992.7.1	No data available	No data available	No data available	Xinghai Park, Dalian	No data available	Skeletonema Grev.、Heterosigma akashiwo Hada	No data available	Tea Brown	
1993.8.15	No data available	No data available	No data available	Dalian Bay	Length120 km、width30m	Phaeocystis, Skeletonema costatum	248000 , 40000	Brown	
1993.8.19	No data available	No data available	No data available	Dalian Bay to Donggoudalu Island	No data available	Pyrrophyta	No data available	Brown	
1994.5.1	No data available	No data available	No data available	Changshan Island,Liaoning	Length 7 km	Noctiluca scientillans	No data available	Red	
1994.8.1	No data available	No data available	No data available	Muping,Shandong	No data available	Chaetoceros	No data available	Dark Brown	
1995.8.15	No data available	No data available	No data available	Zhuanghe, Liaoning	No data available	Chattonella marina	300000-1170000	Brown	
1996.5.8	No data available	No data available	No data available	North of Yantai	$0.96km^2$	No data available	No data available	No data available	

Found date	Occurrence date	Decline date	Continuance period	Occurrence Waters	Area	HAB Species	HAB cell density *1000cells/ml	Water Colour	Notes
1997.4.13	1997.4.13	1997.4.14	2days	Penglai Port	No data available	Noctiluca scientillans	No data available	Red	
1998.7.3	1998.7.3	1998.7.8	6days	Jiaozhou Bay	No data available	Skeletonema costatum, Biddulphia aurita	No data available	No data available	
1998.8.15	1998.8.15	1998.9.10	27days	Yantai	No data available	Gymnodinium Stein	No data available	Red	
1999.7.18	No data available	No data available	No data available	Lushun-Fujiazhuang, Dalian	Length30.4 km	No data available	No data available	Red	
1999.7.18	1999.7.18	1999.7.21	4days	Fujiazhuang, Dalian	No data available	Noctiluca scientillans	No data available	Red	
1999.7.24	No data available	No data available	No data available	Jiaozhou Bay	No data available	Skeletonema Grev., Eucampia zoodiacus	No data available	No data available	
1999.7.26	No data available	No data available	No data available	Xiaomai Island to Shazikou, Qingdao	No data available	Mesodinium rubrum	20200	Brown Red、Brown	
1999.7.26	1999.7.26	1999.7.27	2days	Xiaomai Island to Shazikou, Qingdao	No data available	Mesodinium rubrum	6000	Brown Red、Brown	
1999.8.6-7	1999.8.6	1999.8.7	2days	Stone Island, Weihai	No data available	No data available	No data available	Purple	
2000.7.20	2000.7.20	2000.7.23	4days	Jiaozhou Bay	$2km^2$	Noctiluca scientillans	14.62	Brown	
2000.8.2	No data available	No data available	No data available	East of Zhuanghe to West of Dalu Island east port, Dalian	$827km^2$	No data available	No data available	Red BrownRed Green	
2000.8.2	No data available	No data available	No data available	Shicheng Island, Liaoning	small	No data available	No data available	No data available	
2000.8.2	No data available	No data available	No data available	Dalian Bay	small	No data available	No data available	No data available	

Found date	Occurrence date	Decline date	Continuance period	Occurrence Waters	Area	HAB Species	HAB cell density *1000cells/ml	Water Colour	Notes
2001.4.4	No data available	No data available	No data available	Coast, Qingdao	$1km^2$	Noctiluca scientillans	725	Red	
2001.5.21	No data available	No data available	No data available	Dalu Island, Liaoning	$1.2km^2$	Noctiluca scientillans	No data available	Red	
2001.5.17	2001.5.17	2001.6.20	several events	Coastal waters, Jiangsu	$20\text{-}1000km^2$	Skeletonema costatum	No data available	No data available	
2001.7.11	No data available	No data available	No data available	Tuan Isoland, Yellow Island	$9.8km^2$	Mesodinium rubrum	No data available	Brown	
2001.7.12	No data available	No data available	No data available	Jiaozhou Bay	$4km^2$	Mesodinium rubrum	No data available	Brown	
2001.8.24	2001.8.24	2001.9.14	22days	Yalu River-Dayang estuary, Liaoning	$1100km^2$	Eucampia zoodiacus, Chaetoceros socialis Lauder	No data available	Brown & Yellow Green	
Two events in 2002	No data available	No data available	No data available	Coastal waters, Weihai & Qingdao	less 100km2	Mesodinium rubrum, dinoflagellate	No data available	No data available	Shandong Marine Bulletin 2002
Late June 2003	No data available	No data available	No data available	Dongang, Liaoning	$30km^2$	Noctiluca scintillans	No data available	No data available	Liaoning Marine Bulletin 2003
Early July 2003	No data available	No data available	No data available	Dalian Bay	$15km^2$	Heterosigma akashiwo	No data available	No data available	Liaoning Marine Bulletin 2003
2004.8.20	2004.8.20	2004.8.22	3days	Dalian Bay	80km2	Noctiluca scintillans	No data available	No data available	Dalian Marine Bulletin 2004

Found date	Occurrence date	Decline date	Continuance period	Occurrence Waters	Area	HAB Species	HAB cell density *1000cells/ml	Water Colour	Notes
2004.9.25	2004.9.25	2004.10.4	10days	Dalian Bay	172km2	Alexandrium catenella	No data available	No data available	Dalian Marine Bulletin 2004
2004.10.4	2004.10.4	2004.10.11	7days	Dalian Bay	2km2	Alexandrium catenella	No data available	No data available	Dalian Marine Bulletin 2004
Four events in 2004	No data available	No data available	No data available	coastal waters near Yantai	No data available	Noctiluca scintillans	No data available	No data available	Shandong Marine Bulletin 2004
2004.5.23	No data available	No data available	No data available	Haizhou Bay, Jiangsu	No data available	No data available	No data available	No data available	Jiangsu Marine Bulletin 2004
2004.9.20	No data available	No data available	No data available	Haizhou Bay, Jiangsu	No data available	No data available	No data available	No data available	Jiangsu Marine Bulletin 2004
2004.5.3	2004.5.3	2004.5.10	7days	Shishili bay, Yantai	25.7km2	Noctiluca scintillans	No data available	No data available	Shandong Marine Bulletin 2004
2005.8.23	No data available	No data available	No data available	Shishili bay, Yantai	50km2	Skeletonema costatum,Gymnodinium sanguineum	No data available	Brown	Shandong Marine Bulletin 2004

Found date	Occurrence date	Decline date	Continuance period	Occurrence Waters	Area	HAB Species	HAB cell density *1000cells/ml	Water Colour	Notes
2005.8.26	2005.8.26	2005.9.2	8days	Coastal waters of Zhuanghe, Dalian	16km2	Chaetoceros affinis	No data available	No data available	Dalian Marine Bulletin 2005
2005.8.29	2005.8.29	2005.8.2	5days	Coastal waters of Zhuanghe, Dalian	16km2	Chaetoceros affinis	No data available	No data available	Dalian Marine Bulletin 2005
2005.9.12	No data available	No data available	No data available	Shishili bay, Yantai	45km^2	Gymnodinium sanguineum	No data available	Brown	Qingdao Marine Bulletin 2005
2005.9.24	2005.9.24	2005.9.28	5days	Shishili bay, Yantai	60km2	Gymnodinium sanguineum,Prorocentrum spp.	No data available	Dark-read	Qingdao Marine Bulletin 2005
2005.9.23	2005.9.23	2005.9.27	4days	Haizhou Bay, Jiangsu	1000km^2	Skeletonema costatum	No data available	No data available	Jiangsu Marine Bulletin 2005
2005.10.6	2005.10.6	2005.10.9	4days	Haizhou Bay, Jiangsu	20km2	Skeletonema costatum	No data available	No data available	Jiangsu Marine Bulletin 2005
2005.10.21	2005.10.21	2005.10.23	4days	Haizhou Bay, Jiangsu	55km^2	Gymnodinium catenatum	No data available	No data available	Jiangsu Marine Bulletin 2005

Found date	Occurrence date	Decline date	Continuance period	Occurrence Waters	Area	HAB Species	HAB cell density *1000cells/ml	Water Colour	Notes
2005.10.29	2005.10.29	2005.10.31	3days	Haizhou Bay, Jiangsu	200km^2	Gymnodinium catenatum	No data available	No data available	Jiangsu Marine Bulletin 2005

Annex 7.1 Chl-a 1992

Fig 46

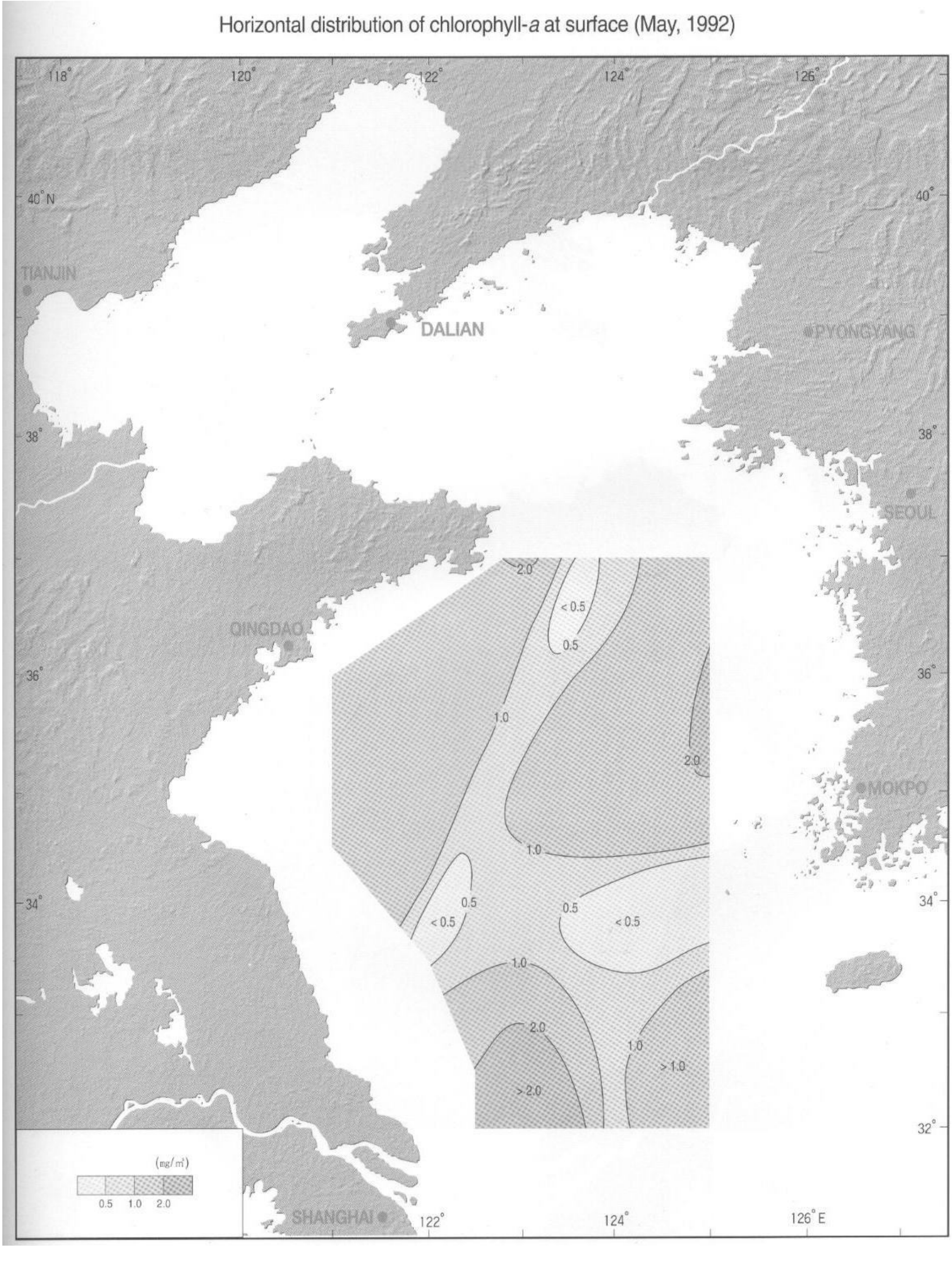


Fig 47

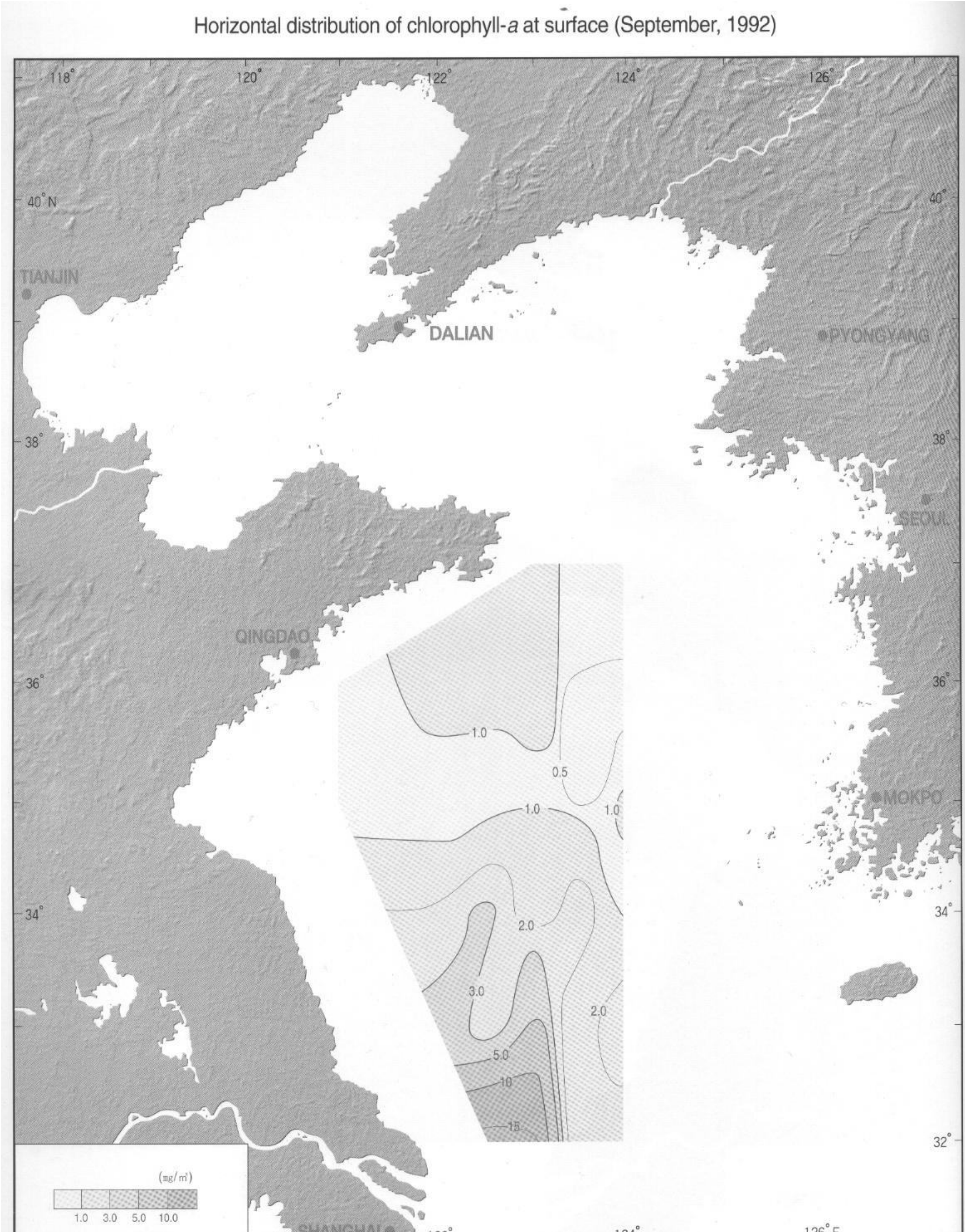
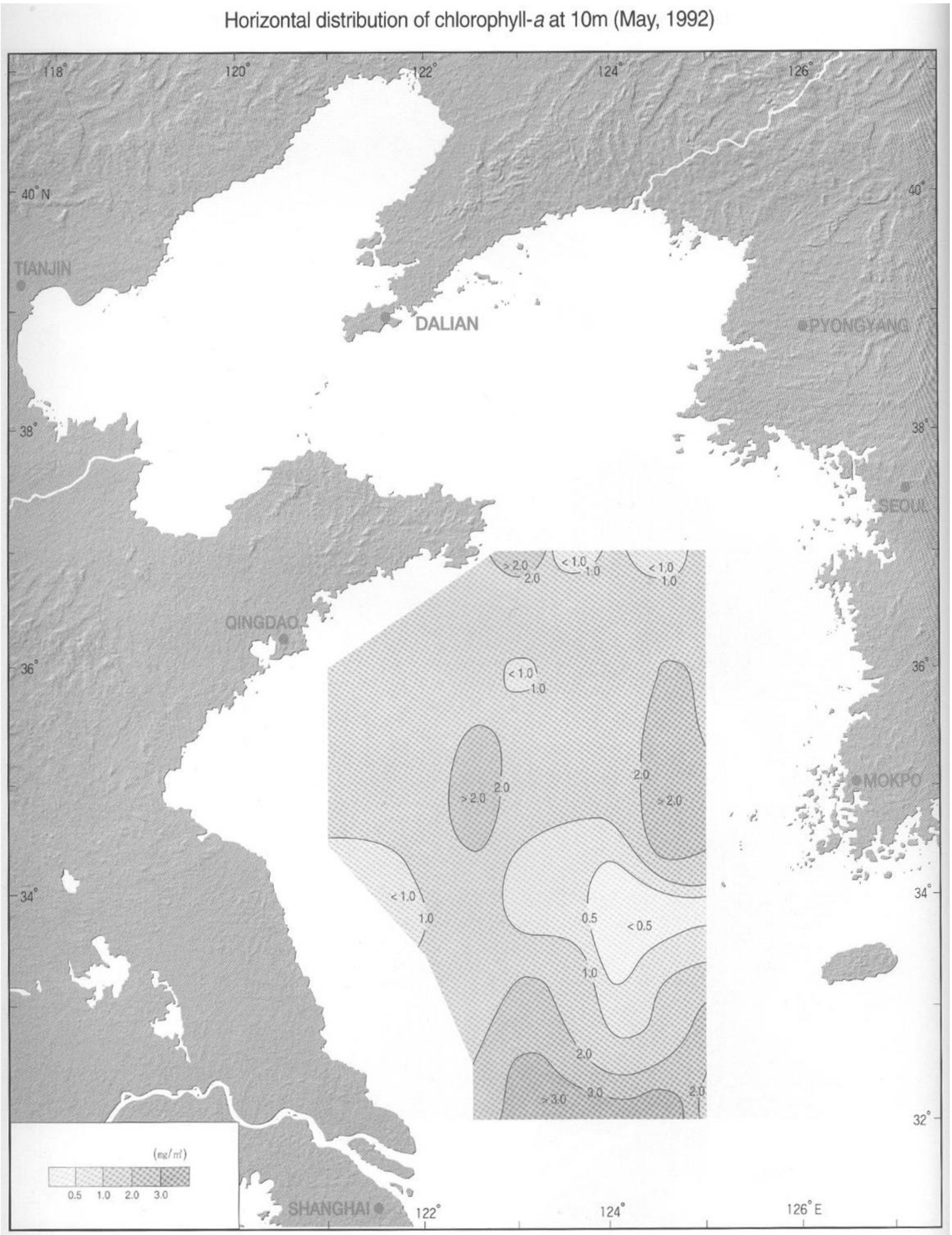

Horizontal distribution of chlorophyll-a at surface (September, 1992)
118°
120°
122°
124°
126°
40° N
40°
TIANJIN
DALIAN
PYONGYANG
38°
38°
SEOUL
QINGDAO
36°
36°
1.0
0.5
1.0
1.0
MOKPO
34°
34°
2.0
3.0
2.0
5.0
10
15
32°
(mg/m³)
1.0 3.0 5.0 10.0
SHANGHAI
122°
124°
126° E

Fig 48



Horizontal distribution of chlorophyll-a at 10m (May, 1992)
118°
120°
122°
124°
126°
40°N
40°
38°
38°
36°
36°
34°
34°
32°
122°
124°
126°E
TIANJIN
DALIAN
PYONGYANG
SEOUL
QINGDAO
MOKPO
SHANGHAI
> 2.0
2.0
< 1.0
1.0
< 1.0
1.0
< 1.0
1.0
> 2.0
2.0
2.0
> 2.0
< 1.0
1.0
0.5
< 0.5
1.0
2.0
> 3.0
3.0
2.0
(mg/m³)
0.5 1.0 2.0 3.0

Fig 49

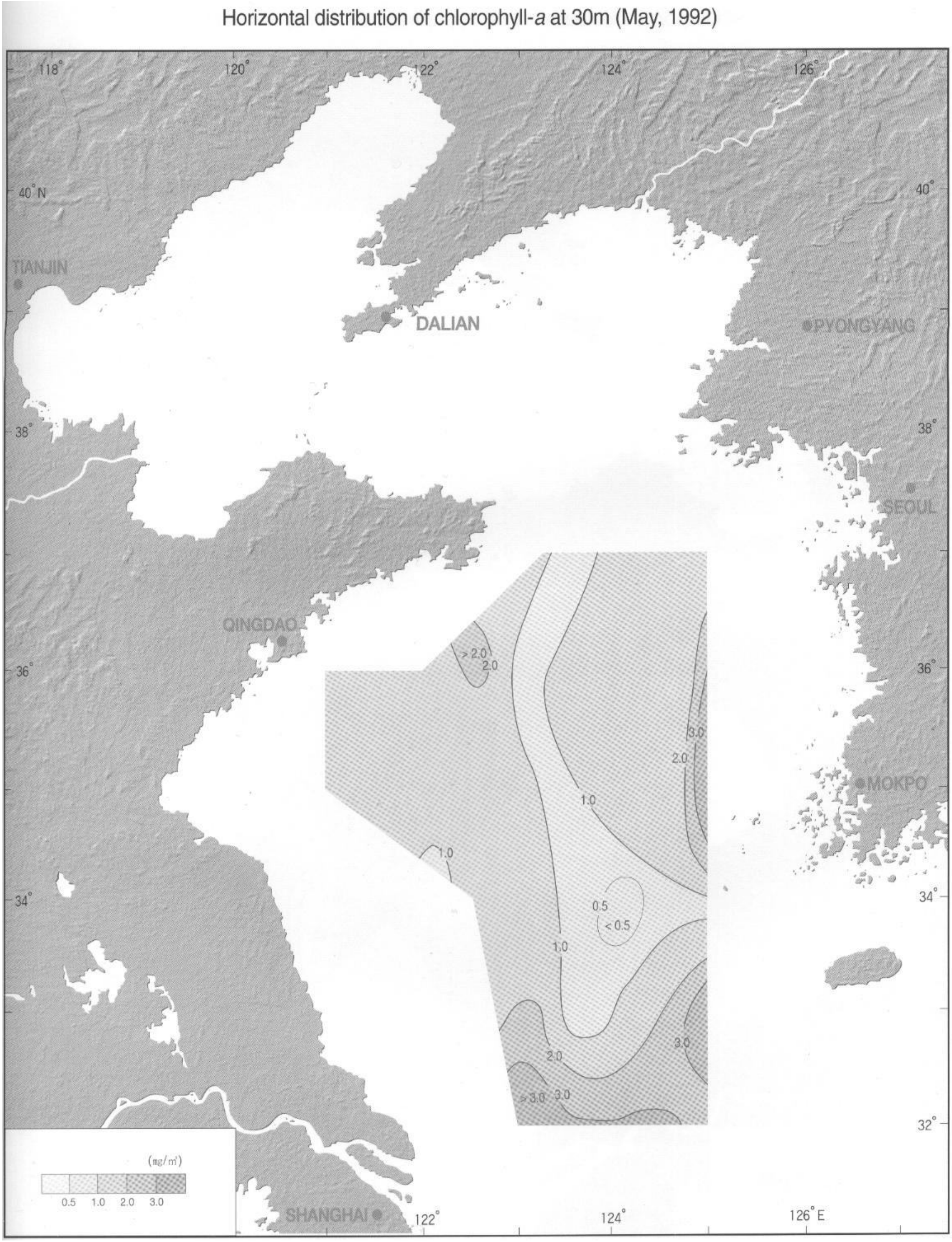
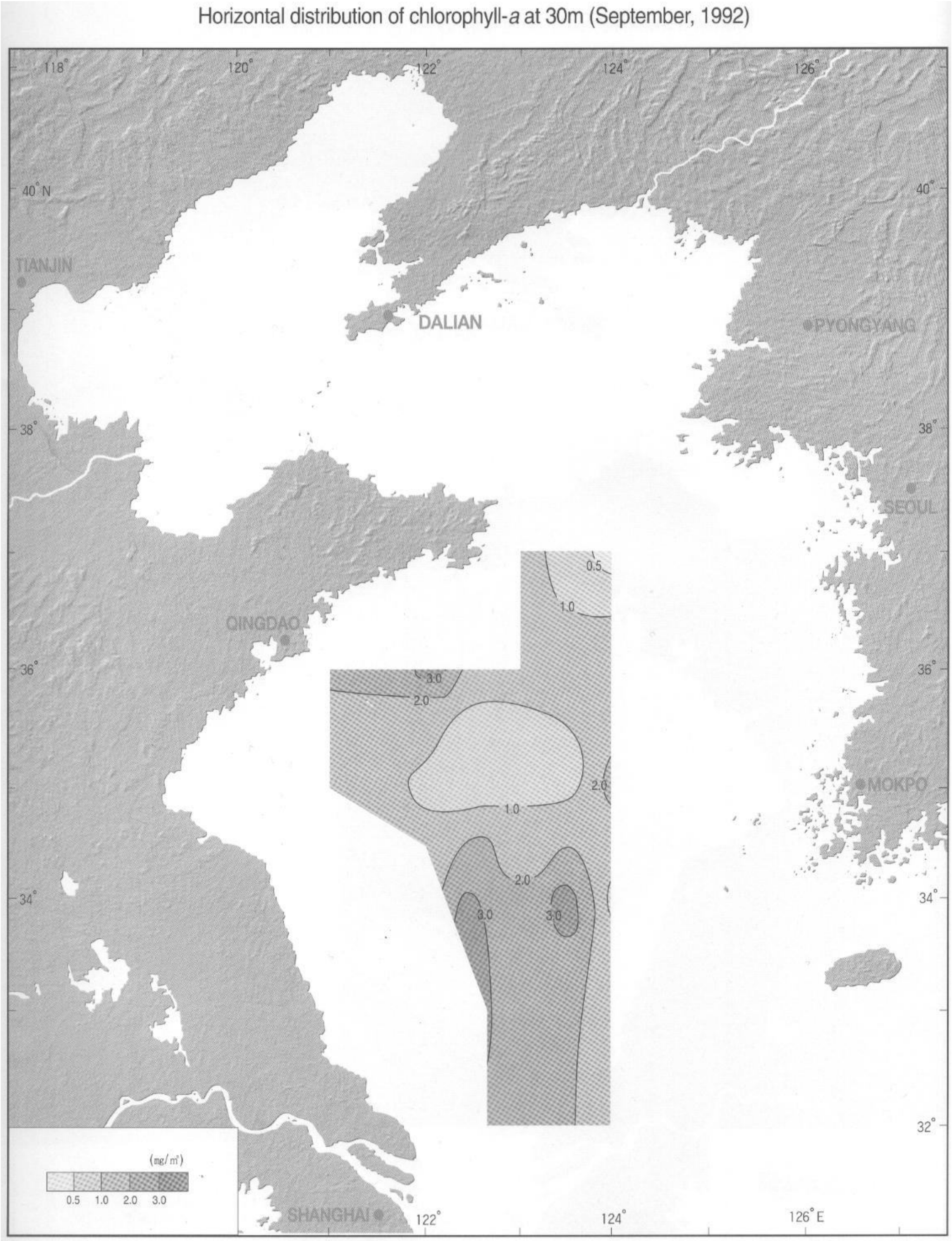

Horizontal distribution of chlorophyll-a at 30m (May, 1992)
118°
120°
122°
124°
126°
40° N
40°
38°
38°
36°
36°
34°
34°
32°
TIANJIN
DALIAN
PYONGYANG
SEOUL
QINGDAO
MOKPO
SHANGHAI
> 2.0
2.0
3.0
2.0
1.0
1.0
0.5
< 0.5
1.0
2.0
3.0
> 3.0
3.0
(mg/m³)
0.5
1.0
2.0
3.0
122°
124°
126° E

Fig 50



Horizontal distribution of chlorophyll-a at 30m (September, 1992)
118°
120°
122°
124°
126°
40° N
40°
38°
36°
34°
32°
TIANJIN
DALIAN
PYONGYANG
SEOUL
QINGDAO
MOKPO
SHANGHAI
0.5
1.0
2.0
3.0
(mg/m³)
0.5 1.0 2.0 3.0
122°
124°
126° E

Fig 51

Horizontal distribution of chlorophyll-*a* on the bottom (May, 1992)

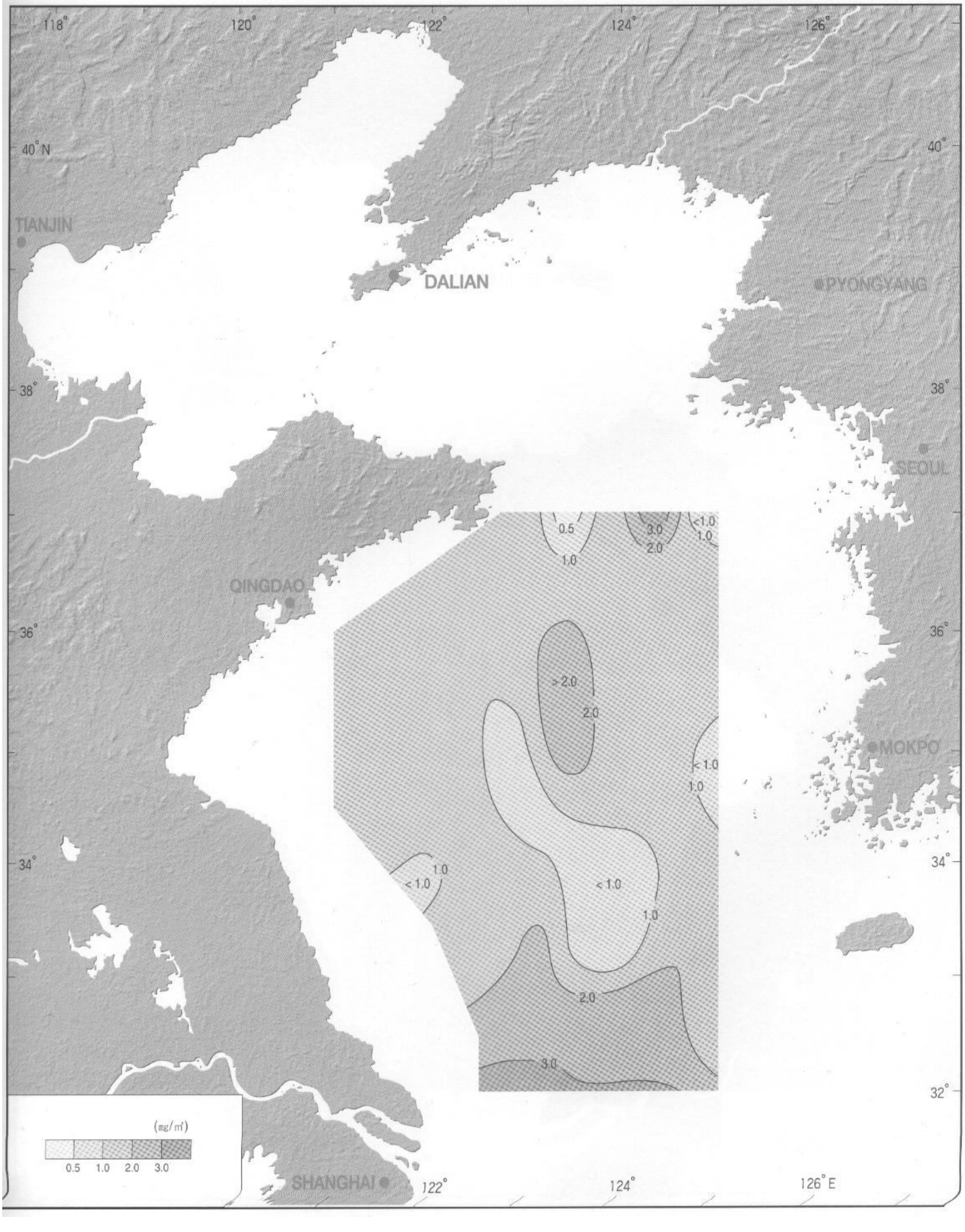
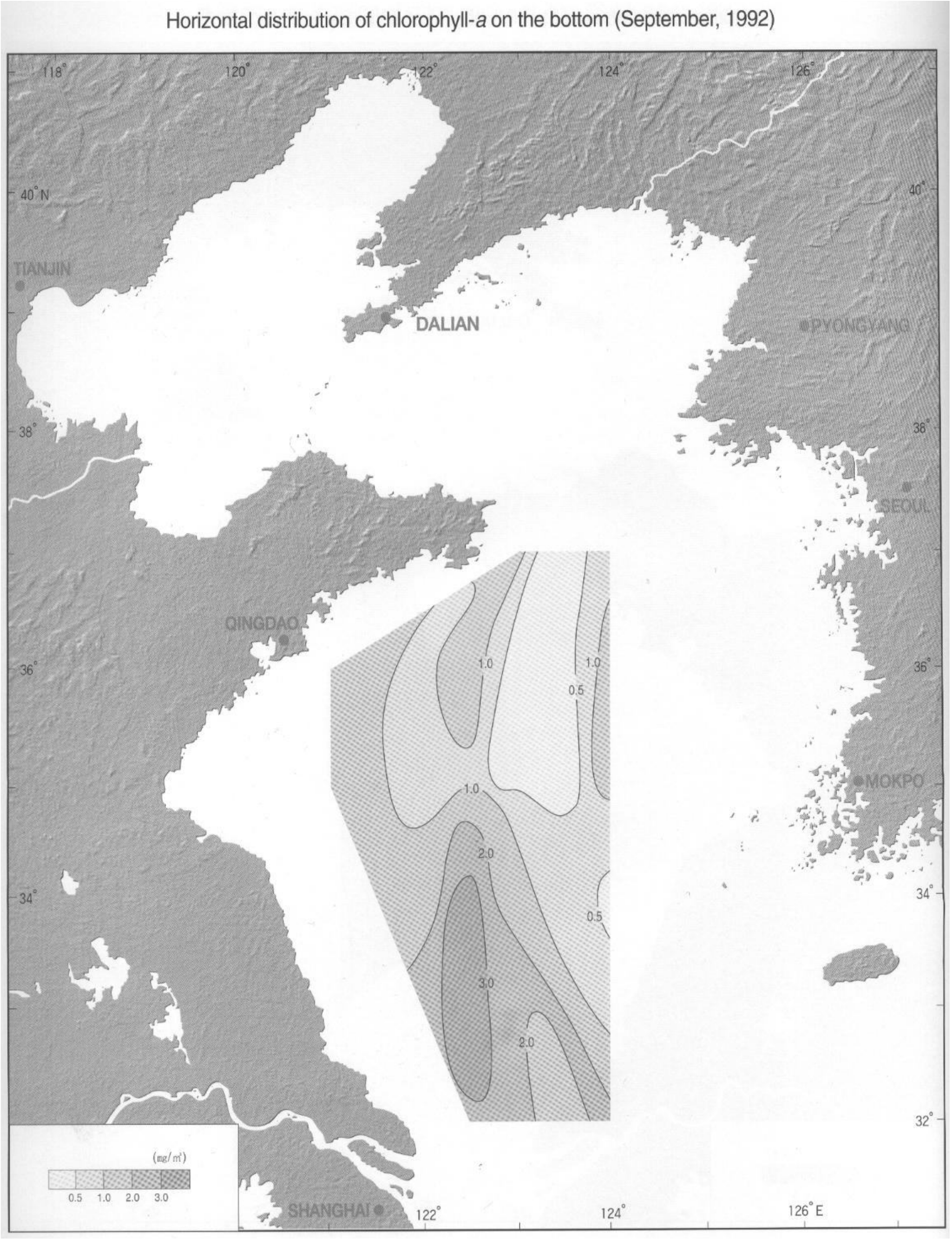


Fig 52



Horizontal distribution of chlorophyll-a on the bottom (September, 1992)
118°
120°
122°
124°
126°
40° N
40°
TIANJIN
DALIAN
PYONGYANG
38°
38°
SEOUL
QINGDAO
36°
36°
MOKPO
34°
34°
32°
1.0
1.0
0.5
1.0
2.0
0.5
3.0
2.0
(mg/m³)
0.5
1.0
2.0
3.0
SHANGHAI
122°
124°
126° E

Annex 7.2 Chl-a 2000-01

Fig 53

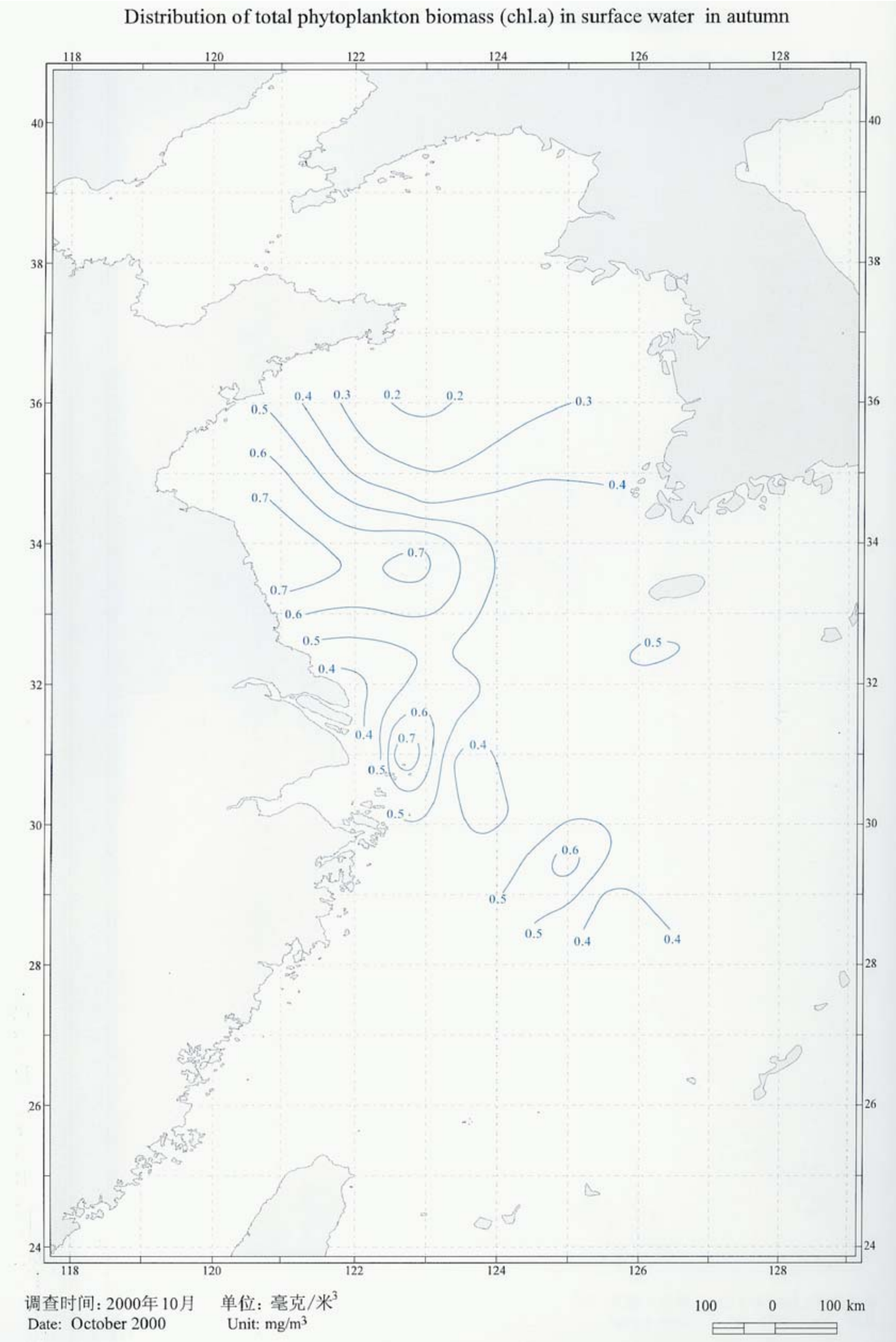


Fig 54

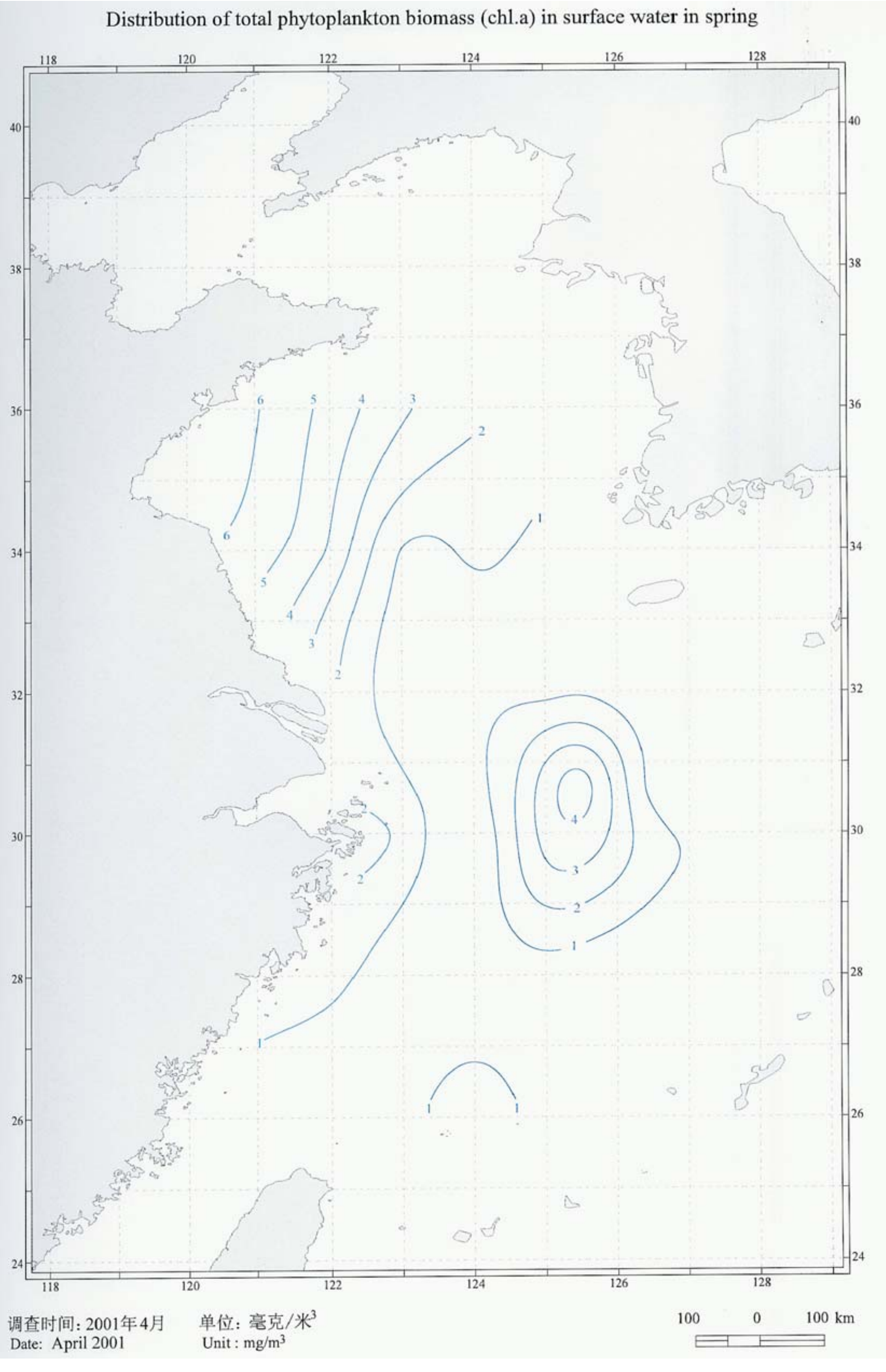

Distribution of total phytoplankton biomass (chl.a) in surface water in spring
118
120
122
124
126
128
40
38
36
34
32
30
28
26
24
6
5
4
3
2
1
调查时间：2001年4月
Date: April 2001
单位：毫克/米3
Unit : mg/m3
100
0
100 km

Fig 55

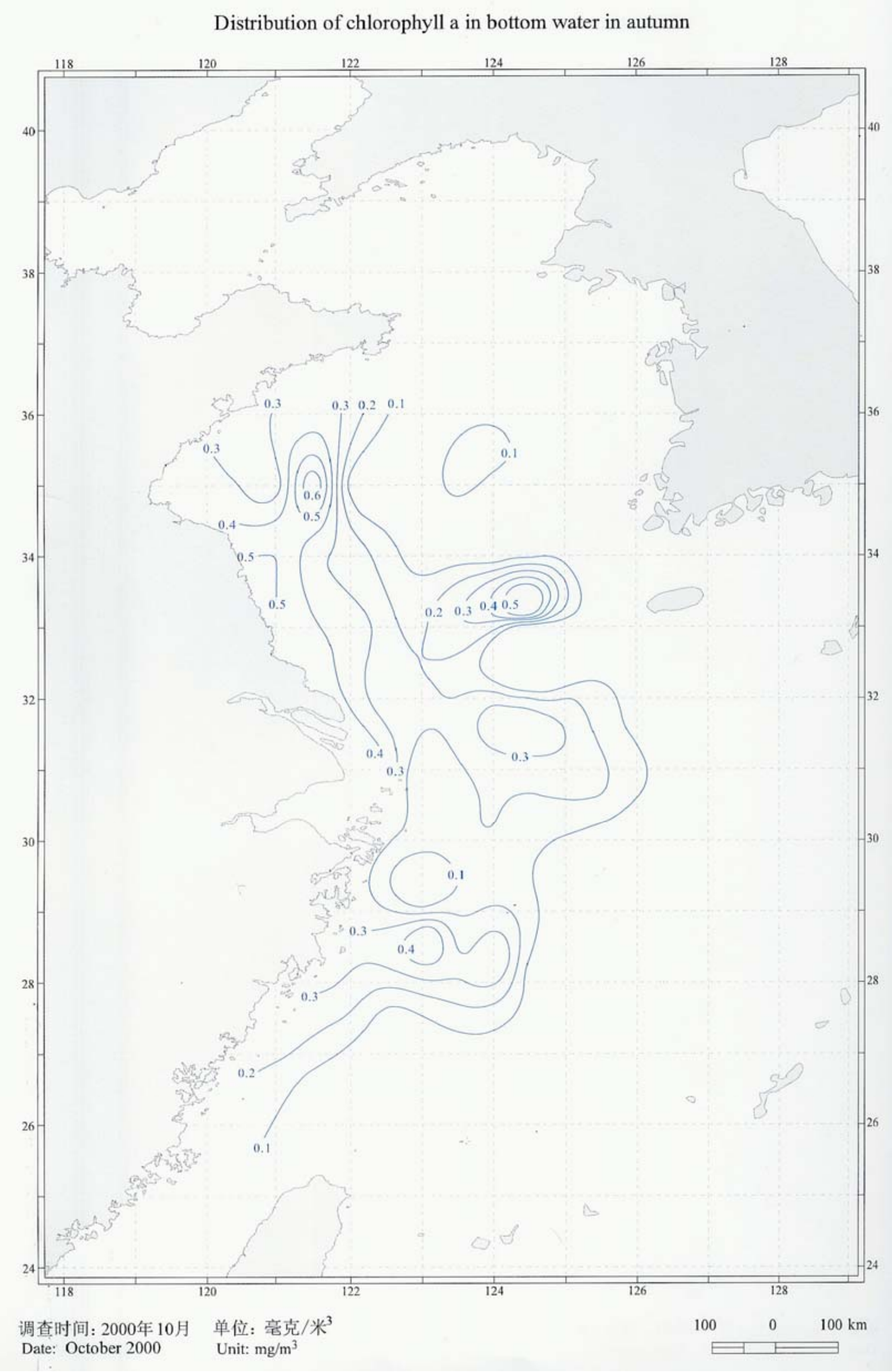
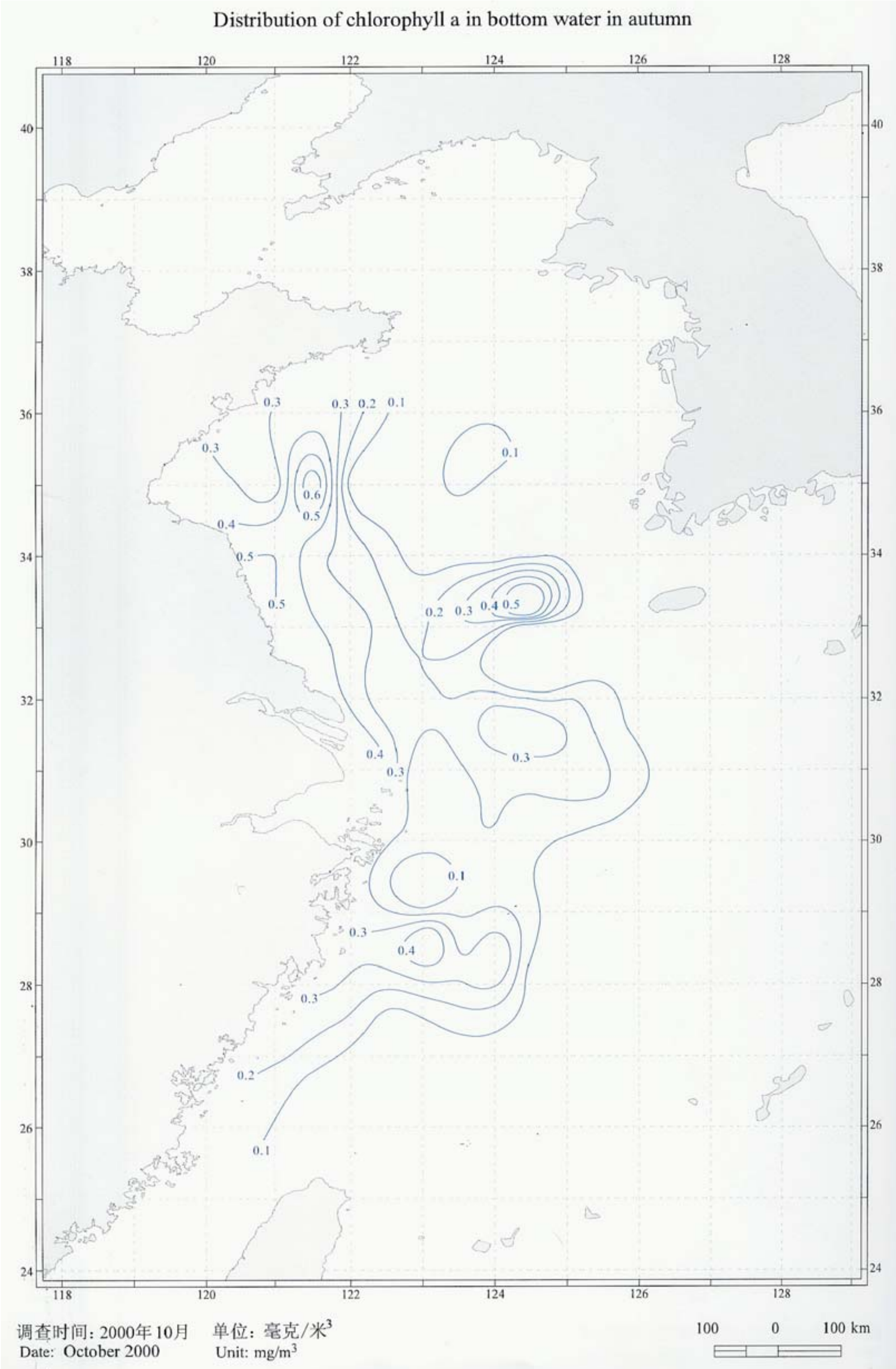

Distribution of chlorophyll a in bottom water in autumn
118
120
122
124
126
128
40
38
36
34
32
30
28
26
24
0.3
0.3
0.2
0.1
0.3
0.1
0.6
0.5
0.4
0.5
0.5
0.2
0.3
0.4
0.5
0.4
0.3
0.3
0.1
0.3
0.4
0.3
0.2
0.1
调查时间: 2000年10月
Date: October 2000
单位: 毫克/米³
Unit: mg/m³
100
0
100 km

Fig. 56



Distribution of chlorophyll a in bottom water in autumn
118
120
122
124
126
128
40
38
36
34
32
30
28
26
24
0.3
0.3
0.2
0.1
0.3
0.1
0.6
0.5
0.4
0.5
0.5
0.2
0.3
0.4
0.5
0.4
0.3
0.3
0.1
0.3
0.4
0.3
0.2
0.1
调查时间：2000年10月
Date: October 2000
单位：毫克/米3
Unit: mg/m3
100
0
100 km

Annex 8.1 Primary Productivity 1992

Fig 57

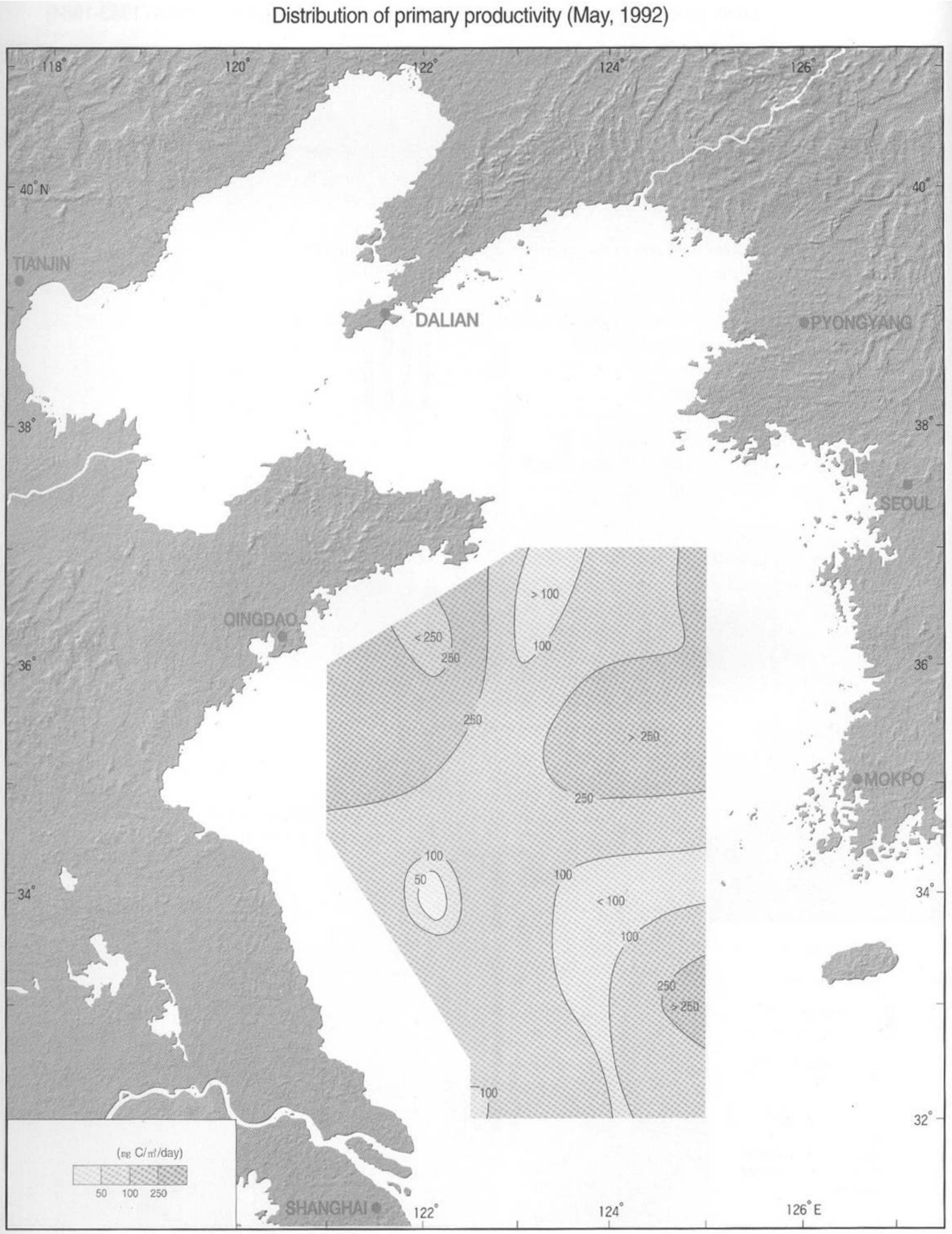


Fig 58


Distribution of primary productivity (September, 1992)
118°
120°
122°
124°
126°
40° N
40°
TIANJIN
DALIAN
PYONGYANG
38°
38°
SEOUL
QINGDAO
36°
36°
< 250
250
MOKPO
250
< 100
100
34°
34°
250
500
1000
32°
(mg C/m²/day)
100
250
500
1000
SHANGHAI
122°
124°
126° E

Annex 8.2   Primary Productivity 1998

Fig 59 Distribution of Primary Production in Coastal Water of North Yellow Sea (June, 1998)

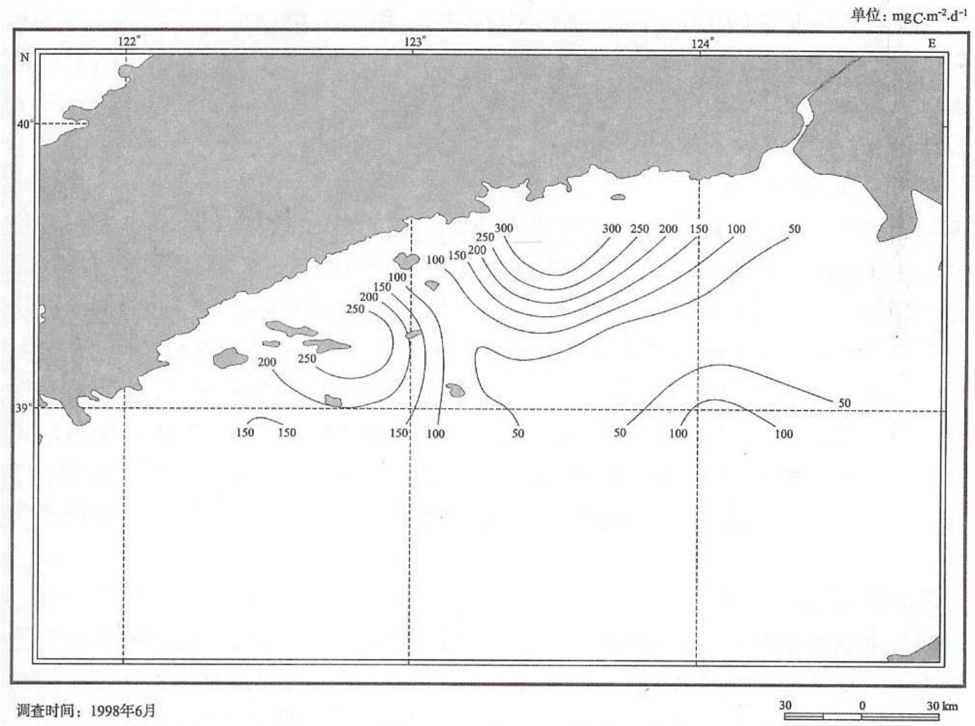


Fig 60 Distribution of Primary Production in Coastal Water of North Yellow Sea (September, 1998)