#### INTERGOVERNMENTAL OCEANOGRAPHIC COMMISSION (of UNESCO)

Sixteenth Session of the IOC Committee on International Oceanographic Data and Information Exchange (IODE), Lisbon, Portugal, 30 October – 9 November 2000

# **NODC Report: JAPAN**

**1.** Name of Data Centre: Japan Oceanographic Data Center (JODC)

### 2. National IODE Co-ordinator:

Name	: Toshio NAGAI (Mr.)
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	Japan Coast Guard
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- E-mail : <u>mail@jodc.jhd.go.jp</u>
- 3. Data Centre Address (if different from 1): Same as item 1
- 4. Data Centre URL: <u>http://www.jodc.jhd.go.jp/</u>
- 5. **IODE Data Centre Designation Date:** 1<sup>st</sup> April 1965

#### 6. Data Centre Description:

JODC was established within the Hydrographic Department, the Japanese Maritime Safety Agency (JMSA).

JODC is operated by 20 personnel below.

- -Director
- -Deputy Director

-Personnel in charge of information planning (2)

-Principal Oceanographic Data and Information Research Officer (1)

-Senior Oceanographic Data and Information Research Officer (2)

-Oceanographic Data and Information Research Officer and

Assistant Oceanographic Data and Information Research Officer (13) Number in parentheses indicates the number of personnel assigned.

JODC positively participates in international projects, such as WOCE, JGOFS, NEAR-GOOS, PICES, TOPEX/Poseidon, JRK and KER as well as fulfilling a role as NODC services including collection and management of domestic oceanographic data and information.

# 7. Brief History:

JODC was established in April 1965 within the Hydrographic Department, JMSA in accordance with the resolution of the Intergovernmental Oceanographic Commission (IOC) of UNESCO in 1961.

The name of our organization was changed from JMSA to the Japan Coast Guard (JCG) in April 2000, but the primary objectives and roles of the organization have not been changed.

JODC has collected and managed important and useful oceanographic data obtained by marine research organizations in Japan and fulfilled duties of providing services for domestic users as sole the synthetic oceanographic data bank of Japan and international data and information exchange since the establishment of the organization.

# 8. Roles and Responsibilities of the Data Centre:

JODC is responsible for the following services and performs its role.

Collecting of information related to the National Oceanographic Program (NOP) and the Cruise Summary Report (CSR) and reporting to the secretariat of IOC and the World Data Centers (WDCs).

Collecting of domestic oceanographic data, standardization and quality control. Provision of archived data to domestic users and submission of such data to WDC and RNODC.

### 9. Data Centre Projects and Activities during the Intersessional Period:

1. Dispatch of Experts

JODC has dispatched one officer to the Coastal Offshore Engineering Institute, Universiti Teknologi Malaysia as a Japan International Cooperation Agency (JICA) expert in November 1995 to support the establishment of NODC in the country where NODC has not been established.

2. Establishment of New Organization

The Marine Information Research Center (MIRC: http://www.mirc.jha.or.jp) was established within the Japan Hydrographic Association in 1997.

MIRC has objectives of supporting the services of JODC in three major programs of executing:

- i) high quality data management, development and provision of products;
- ii) promoting researches on data management;
- iii) promoting to enlighten and popularize oceanographic knowledge, and international cooperation.

# **10.** Data Centre Products and Services Developed and/or Made Available during the Intersessional Period:

1. Development and Operation of JODC - Data Online Service System (J-DOSS)

JODC developed an online data service system using the Internet to rapidly and efficiently provide archived data and information and started services in October 1995 (see Annex 1 for performance service of J-DOSS).

Through J-DOSS, it is possible to search and download oceanographic data, such as sounding data, biological data, NOP and CSR as well as water temperature, salinity and ocean current (see Annex 2 for addresses and data set of various pages).

The access right for download is given preferentially to those who have exchanged data with JODC.

#### 2. Publications

NOP and CSR information are collected, published and distributed every year to related agencies.

Such information are also available online from J-DOSS. At present, a new online registration system is being constructed to enable online registration of NOP and CSR information through the Internet on schedule to start services within 2000.

### 3. Data set

Ocean current observation data set of GEK, ADCP and Ship Drift were collected by JODC from related agencies in Japan and overseas countries for the period from 1900 to 1993, contained in CD-ROM in ASCII format, and published in March 1996.

NOPACCS data set containing various data, including T, S, DO and Nutrients observed for the period from 1992 to 1995 under the Northwest Pacific Carbon Cycle Study Project (Japanese project) was published in CD-ROM in March 1999 in collaboration with the agencies participating in project.

(Annex 1) Number of agencies downloaded data and data downloaded using J-DOSS



Figure of 1995 indicates total number of download since the commencement of service. The "Number of Agencies" is the total number of users other than the Hydrographic Department that actually down loaded data via J-DOSS, summarized from the number of domain names.



(Annex 2)	
Dataset and Page Addresses Provided	Online

	Dataset				
[ Data Centre URL ] http://www.jodc.jhd.go.jp/					
[ Oceanographic Data ] http://www.jodc.jhd.go.jp/online_hydro.html					
	Serial Station Data	Water samplers, STD, CTD : Serial Station Data Format			
	CTD Data				
Temperature and	BT Data	MBT, DBT, XBT, AXBT			
Salinity	Statistics of Temperature in 1 Degree Mesh				
	Statistics of Salinity in 1 Degree Mesh				
	Ocean Surface Current Data	GEK, Ship Drift, ADCP			
Ocean Current	Shipboard ADCP Data				
	Statistics of Ocean Current in 1 Degree Mesh				
Tide (Cap Laval)	Sea Level Data	Hourly Height			
The (Sea Level)	Statistics of Sea Level Data				
Moored Current	Moored Current Data				
[ Bathymetry and Marine Geophysics ] http://www.jodc.jhd.go.jp/online_bathymetry.html					
	Sea Depth in Mesh				
[ Marine Biology ] http://www.jodc.jhd.go.jp/online_biology.html					
	Marine Organisms Data	Mainly Plankton			
[ Information ] http://www.jodc.jhd.go.jp/online_information.html					
	National Oceanographic Programmes (NOP)	Cruise Plan			
	Cruise Summary Report (CSR)				
	A catalog of the IOC publications				
	Ocean Abbreviation Dictionary				



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Marine Information Research Center (MIRC) was established in May 1997 in Japan hydrographic Association by using the funds defrayed by Nippon Foundation. The task of MIRC is to support the activities of Japan Oceanographic Data Center (JODC) through various researches on data management and through development of quality control technique. Also, MIRC would produce high quality data products according to requests form various data users. MIRC will contribute on international cooperative works including data and information exchange businesses. Popularization of oceanographic knowledge by utilizing data products is another task of MIRC.

MIRC is conducting its research works by following the five-year plan, which was set up just at the beginning of MIRC. Besides routine businesses such as database improvement, metadata setup etc., three steps of data management works are applied for three years on each item, namely (1) to design quality control software, (2) to conduct quality check by using that software and to make new database, and (3) to produce data products including statistical tables and figures. In the first year, we picked up physical quantities such as temperature, salinity and density. Management of bathymetric data was started at the second year, and that of oceanic current data (mainly ADCP data) at the third year. It this forth year, we start to analyze tides and tidal current data

As to the physical quantities, three years working schedule was completed. Considerable efforts had been paid for archiving the data obtained taken by Prefectural Fisheries Experimental Stations, and for making quality check on them. Except their old data before 1970, these data had not been archived in JODC database. Quality control software developed by MIRC is designed so that it can be easily used in these experimental stations (see Fig. 1). Main purpose of this software is to improve quality of the data flowing into Japan Fisheries Agency and into JODC. The data, which had been collected in Japan Fisheries Agency, were checked by MIRC by using the MIRC quality control software, and error flags were attached for questionable data. Resulted data were arranged in the data formats of Japan Fisheries Agency and JODC, and



Figure 1. One of the display windows of MIRC quality-control software. Land-sea check, ship-speed check etc. are easily conducted in this window.

were sent for these agencies. However, if no ship name is available, research cruises cannot be defined, and powerful tools of quality checks, "Ship Speed Check" and so on, cannot be applied. The status of expanded database for which high quality data check was applied by MIRC is shown in Fig. 2. As seen in these figures, the number of observation points in JODC database was almost doubled. Collection of oceanographic data itself is the duty of JODC, and not the main duty of MIRC. However, this data archiving work would be one of the big contributions of MIRC in oceanographic data management in Japan.

An example of the MIRC data products is shown in Fig. 3. By using improved database, MIRC is constructing detailed atlas of temperature, salinity and density distributions in the seas in vicinity of Japan. Yearly, seasonally and monthly means and their standard deviations are given for each standard depths. However, monthly mean fields are not useful in the sea to the south of Japan, the Kuroshio has two stable paths, straight path and meandering path, and the oceanic structure exhibits large change according to the change of the Kuroshio path. This change is much larger than seasonal variations, and statistics should be made for each Kuroshio path. Fortunately, the separation of the Kuroshio from the tip of the Kii Peninsula can be monitored by sea level difference between Kushimoto and Uragami tide gauge stations, which are located to the west and to the east of the peninsula, respectively. Also the northern shift and southern shift of the Kuroshio on the Izu Ridge can be monitored by the sea levels at the Hachijo Island and Miyake Island. By using these sea level data, we classified the oceanic status into 4 cases. The distributions of temperature in 200m depth are shown in Fig. 3 for each

case. The resulted patterns appear to indicate four typical flows in the sea under consideration.



Figure 2. Yearly number of observation stations had archived in JODC serial-observation database before the end of 1998 (upper figure), and after that MIRC archived the data taken by Prefectural Fisheries Experimental Stations (lower figure).



Figure 3. Mean temperature fields in 200 m depth to the south of Honshu, Japan. Observation data are classified into four cases by using the sea level data of four tide gauge stations: nML means that the Kuroshio has non-meandering (or straight) path, ML that the Kuroshio has meandering path, N that the Kuroshio shifts northwards on the Izu Ridge, and S that the Kuroshio shifts southward on the Izu Ridge.

Data management business on basic physical quantities terminated nominally at the end of 1999 fiscal year according to MIRC working plan. However, quality control and data rescue businesses require almost endless works. By using our own fund or by utilizing other available funds, we shall continue further efforts

MIRC also designed quality control software for Multi-Beam Echo-Sounder data in 1998 fiscal year, and it has been applied firstly the data obtained by Hydrographic Department, MSA. Then, quality check was continued also in 1999 and 2000, and resulted data were sent to JODC. Besides, we are developing two kinds of display software to illustrate bathymetry information in 2000 fiscal year. We receive many requests for bathymetry information, but, as ocean bottom is covered with opaque seawater, it is hard to have intuitive images in general. Popularization of marine knowledge is one of the main duties of MIRC. One of the software is to produce various bird-eye pictures of sea bottom configuration. Its viewpoint and view-angle will flexibly be changed. Another software is a kind of "walk-through animation". People would get a moving picture, as if he is looking outside on a submarine, which navigates along a prescribed course. Of course, we assume that seawater is transparent, and that we can see articles far away. In future, we shall design teaching materials for middle or high school students by using this technique. IOC/IODE-XVI/7.27 Page 10

Other quality control items such as oceanic current data and tidal data are underway. As one of the international cooperation activities of MIRC, English version of the MIRC quality-control software was produced according to the request from the chairman of IODE, Mr. Ben Searle. This software has been already presented to NODCs of China, Vietnam, and Philippines, and to Pacific Oceanographic Institution at Vladivostok, Russia.

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