



Intergovernmental  
Oceanographic  
Commission

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# **IODE Handbook**

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**Committee on International  
Oceanographic Data  
and Information Exchange**

1994 UNESCO



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**INTERGOVERNMENTAL OCEANOGRAPHIC COMMISSION**  
(of UNESCO)

**COMMITTEE ON INTERNATIONAL OCEANOGRAPHIC DATA  
AND INFORMATION EXCHANGE**

**IODE HANDBOOK**  
(Revised edition, 1994)

This document is an up-dated version of the IODE Handbook published in 1991 as IOC/INF-834. This publication is issued every two-three years and lists information on the composition of the International Oceanographic Data and Information Exchange System.

It also contains practical information relating to the C/IODE and its subsidiary bodies. Member States participating or wishing to participate in IODE activities are invited to keep the Secretariat of IOC informed of all changes in the Handbook's content, particularly in so far as IODE National Co-ordinators and members of the C/IODE Subsidiary Bodies are concerned. Amendments will be published, if available, every six months.

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## SECTION I

### A. HISTORICAL BACKGROUND AND TERMS OF REFERENCE OF THE COMMITTEE ON INTERNATIONAL OCEANOGRAPHIC DATA AND INFORMATION EXCHANGE

During the Intergovernmental Conference on Oceanographic Research, 1960, at which the setting up of an Intergovernmental Oceanographic Commission was recommended, certain initial tasks for the new Commission were outlined and amongst these was included the requirement for a structure to co-ordinate international oceanographic data exchange. The first formal establishment of a Working Group on Exchange of Oceanographic Data was made by IOC Resolution I-9 adopted at the First Session of the Commission in October 1961, which also prescribed that:

*"The mission of this Working Group shall be the facilitating of exchange of oceanographic data, the standardization of forms for reporting and coding data, the encouragement of the preparation of data catalogues, and the assistance of development of national oceanographic data centres."*

The Commission authorized the continuation of the Working Group at its Second Session (September 1962).

At its Fifth Session (September 1967) the Commission (Resolution V-20A) amended the Terms of Reference of the Working Group by adding the following:

- "(a) to review and re-appraise the whole international oceanographic data exchange system as recommended by Section 8 of the report 'International Ocean Affairs' (IOC/V-INF.111), and as re-affirmed by Recommendation IX of the summary of the recommendations of the Working Group meeting in the Hague in September 1967 (IOC/V-4);*
- (b) to continue and encourage the present work leading towards format standardization for use with automated techniques for data input, storage, retrieval, dissemination and exchange, but recognizing the considerable financial implications inherent in such automation;*
- (c) to continue the development of means whereby geological, geophysical, biological, special air-sea interaction data and data from 'continuously recording' sensors are incorporated into the international oceanographic data exchange system."*

The Eighth Session of the IOC Assembly decided that the Working Group for International Oceanographic Data Exchange be renamed Working Committee (Resolution VIII-31) and it also amended its Terms of Reference (Report of the Eighth Session of the IOC Assembly, Document SC/MD/39, Annex V, page 8, Item II).

#### Terms of Reference

The Working Committee on International Oceanographic Data Exchange shall:

- (i) facilitate exchange of oceanographic data, the standardization of forms for reporting and coding data, the encouragement of the preparation of data catalogues and the assistance of development of national oceanographic data centres;
- (ii) facilitate exchange of, and access and referral to, information resulting from, or relating to marine programmes emanating from related activities (ASFIS, MEDI, UNISIST, UNEP, IRS, CODATA, etc.);
- (iii) review and re-appraise the whole international oceanographic data exchange system, recommending changes to the Commission, as appropriate;
- (iv) continue and encourage format standardization for use with automated techniques for data input, storage, retrieval dissemination and exchange;
- (v) continue the development of means whereby geological-geophysical, biological, special air-sea interaction, marine pollution data and data from "continuously recording" and remote sensors are incorporated into the international oceanographic data exchange system;

- (vi) take action as necessary to give effect to the Commission's policy decisions, within its prescribed Terms of Reference;
- (vii) make recommendations to the Commission on policy matters within its Terms of Reference and on the need for Consultants and/or temporary Groups of Experts to deal with special scientific and technical matters connected with the Commission's programmes;
- (viii) report regularly and make recommendations to the Commission of the work accomplished and on future action required and prepare with the assistance of the Secretary, a draft two-year programme of the work and financial requirements for submission to each Assembly;
- (ix) maintain close collaboration with World, National, Regional and Responsible Data Centres, with the other Working Committees, with the International Co-ordination Groups for the Co-operative Investigations, and with international organizations, within its Terms of Reference;
- (x) have the right to form *ad hoc* task teams to carry out specific parts of the work of the Committee during intersessional periods provided no costs fall on the Commission;
- (xi) make recommendations to the Assembly and the Executive Council regarding the provision of technical guidance and for the formulation and execution of the marine science programmes of UNESCO relating to marine data and information management, and, when appropriate, to facilitate co-ordination with related programmes of other ICSPRO agencies.

The Fourteenth Session of the IOC Assembly (Paris, 17 March - 1 April 1987) "*noting the increasing interest in marine scientific information ... recalling also the decision of the Executive Council at its Nineteenth Session, on the Guidelines for the Structure and Responsibilities of the Subsidiary Bodies of the Commission*", changed the name of the Technical Committee on International Oceanographic Data Exchange to the Committee on Oceanographic Data and Information Exchange, retaining the acronym IODE.

## **B. IODE STATEMENT ON DATA MANAGEMENT POLICY FOR GLOBAL OCEAN PROGRAMMES**

The overall purpose of this policy statement is to facilitate full and open access to quality ocean data for global ocean research programmes. The Global Ocean Programme to be carried out under GOOS requires an early and continuing commitment to the establishment, maintenance, validation, description, accessibility and distribution of high-quality, long-term datasets.

- (i) Full and open sharing of a wide spectrum of global international data sets for all ocean programmes is a fundamental objective.
- (ii) Data submitted for international exchange should be provided at the lowest possible cost to global ocean researchers in the interest of full and open access to data. This cost should, as a first principle, be no more than the marginal cost of processing, copying and shipping to fill a specific user request.
- (iii) Preferably, all data should be made available in the public domain of IODE data centers within one year of collection (chemical, biological and geological data may require longer intervals). For those global ocean programmes in which selected principal investigators have initial periods of exclusive data use, data should be made available as soon as they become widely useful or at the maximum two years after data collection.
- (iv) Preservation of data needed for long-term global ocean programmes is required. For each and every global ocean data parameter, there should be at least one explicitly designated archive.
- (v) International data archives must include easily accessible information about the data holdings, including quality assessments, supporting auxiliary information, and guidance and aids for locating and obtaining the data.
- (vi) National and international standards should be used to the greatest extent possible for media and for processing and communication of global oceanographic datasets.

**C. GUIDELINES FOR THE STRUCTURE AND RESPONSIBILITIES OF THE SUBSIDIARY BODIES OF THE COMMISSION**

The Guidelines for the Structure and Responsibilities of the Subsidiary Bodies of the Commission are presented in the IOC Manual, Part I, Section 5 and the general Terms of Reference of the IOC Subsidiary Bodies and their membership, in the IOC Manual, Part II, of December 1985.

**D. CHAIRMAN AND VICE-CHAIRMAN OF THE COMMITTEE ON IODE**

At the Fourteenth Session of the Committee on IODE (December 1992) Dr. J.R. Wilson (Canada) was elected Chairman and Dr. V. Smirnov (Russian Federation) was re-elected Vice-Chairman of the Committee on IODE. Their addresses are:

Dr. J.R. Wilson  
Director, Marine Environmental Data Service  
Dept. of Fisheries & Oceans  
200, Kent Street  
Ottawa, Ontario K1A 0E6  
CANADA  
Tel: (1) (613) 990 02 64  
Fax: (1) (613) 990 55 10  
E-mail: R.WILSON.MEDS (Omnet)

Dr. V.I. Smirnov  
Deputy-Director  
All Russia Research Institute of Hydrometeorological Information (RNIIGMI)  
World Data Centre B (Oceanography)  
6, Koroleva street, Kaluga district  
Obninsk 249020  
RUSSIAN FEDERATION  
Tel: (7) (084) 392 59 25  
Fax: (7) (095) 255 22 25  
Tlx: 412633 INFOR SU



**E. LIST OF SESSIONS OF THE IOC COMMITTEE ON INTERNATIONAL OCEANOGRAPHIC DATA AND INFORMATION EXCHANGE (IODE)**

Session	Date	Year	Place	Chairman	Country
1 <sup>st</sup>	07 - 10 Aug	1962	Washington	Dr. W.C. Jacobs	USA
2 <sup>nd</sup>	27 - 30 Jan	1964	Paris	Mr. Ch. Sauer	Canada
3 <sup>rd</sup>	31 Mar - 2 Apr	1966	Copenhagen	Mr. Ch. Sauer	Canada
4 <sup>th</sup>	23 - 26 Sep	1968	Paris	Dr. T.S. Austin	USA
5 <sup>th</sup>	21 - 25 Sep	1970	Geneva	Dr. T.S. Austin	USA
6 <sup>th</sup>	20 - 24 Sep	1971	Rome	Dr. T.S. Austin	USA
7 <sup>th</sup>	09 - 13 Jul	1973	New York	Dr. T.S. Austin	USA
8 <sup>th</sup>	12 - 17 May	1975	Rome	Dr. T.S. Austin	USA
9 <sup>th</sup>	15 - 19 Jan	1979	New York	Mr. T. Winterfeld	USA
10 <sup>th</sup>	05 - 13 Aug	1981	Hamburg	Mr. T. Winterfeld	USA
11 <sup>th</sup>	09 - 18 Jan	1984	New York	Mr. D. Kohnke	FRG
12 <sup>th</sup>	10 - 17 Dec	1986	Moscow	Mr. D. Kohnke	FRG
13 <sup>th</sup>	17 - 24 Jan	1990	New York	Dr. N. Flemming	UK
14 <sup>th</sup>	1 - 9 Dec	1992	Paris	Dr. N. Flemming	UK

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<sup>1</sup> 15<sup>th</sup> (planned for January 1996 in Athens, Greece).

## SECTION II

### A. NATIONAL CO-ORDINATORS FOR INTERNATIONAL OCEANOGRAPHIC DATA AND INFORMATION EXCHANGE & OCEANOGRAPHIC DATA CENTRES

Name & Address	NODC or DNA	Date when Founded	Special Responsibilities
<p>Dr. A.J. Gil Villanueva Director, Centro Argentino de Datos Oceanograficos (CEADO) Avenida Mont�s de Oca 2124 1271 Buenos Aires ARGENTINA Tel: &lt;54&gt; (1) 303 22 40/21 00 61/67 Ext. 4013 Fax: &lt;54&gt; (1) 303 22 99 Tlx: 27054 RACEL AR (Attn. SIHN) Email: postmaster@ceado.edu.ar (Internet)</p>	NODC	1974	RNODC-SOC
<p>Mr. B. Searle Head, Australian Oceanographic Data Centre (AODC) Level 2, MHQ Annex Wylde St, Potts Point N.S.W. 2011 AUSTRALIA Tel: &lt;61&gt; (2) 563 48 01 Fax: &lt;61&gt; (2) 563 48 20 Email: ben@aodc.gov.au</p>	NODC	1964	
<p>Ms. J. Romaguera Trotte Departamento do Banco Nacional de Dados Oceanograficos Directoria de Hidrografia e Navegacao Rua Barao de Jaceguay, S/N� CEP - 24048-900-Ponta da Armacao Niteroi, Rio de Janeiro BRAZIL Tel: &lt;55&gt; (21) 719 26 26 Ext. 170 Fax: &lt;55&gt; (21) 718 79 41</p>	NODC	1971	
<p>Mr. V. Trifonov Head, National Oceanographic Data Centre Institute of Meteorology &amp; Hydrology 66, bd. Tsarigradsko chaussee Sofia 1184 BULGARIA Tel: &lt;359&gt; (2) 72 22 71/75 Ext. 359 Fax: &lt;359&gt; (2) 88 03 80</p>	NODC	1985	
<p>Marine Environmental Data Service Dept. of Fisheries &amp; Oceans 200, Kent St. Ottawa, Ontario K1A OE6 CANADA Tel: &lt;1&gt; (613) 990 02 64 Fax: &lt;1&gt; (613) 990 55 10 Email: R.WILSON.MEDS</p>	NODC		RNODC for Drifting Buoy Data

Name & Address	NODC or DNA	Date when Founded	Special Responsibilities
<p>Lcdr. A. Cabezas Chief, Centro Nacional de Datos Oceanograficos de Chile (CENDOC) Servicio Hidrografico y Oceanografico de la Armada Casilla 324, Valparaíso CHILE Tel: &lt;56&gt; (32) 28 26 97 Fax: &lt;56&gt; (32) 28 35 37 Tlx: 230362 HIDRO CL Email: TOGA.CHILE</p>	NODC	1968	
<p>Prof. Hou Wefeng National Marine Data &amp; Information Service State Oceanic Administration (SOA) 93, Liuwei Rd, Hedong district Tianjin 300171 PEOPLE'S REPUBLIC OF CHINA Tel: &lt;86&gt; (22) 24 41 62 Tlx: 23138 NODC CN</p>	NODC	1979	
<p>Secretario General Comision Colombiano de Oceanografia Calle 41 N° 46-20, Piso 4° CAN Apartado Aereo 28466 Santafe de Bogota COLOMBIA Tel: &lt;57&gt; (1) 222 04 49/36/21 Fax: &lt;57&gt; (1) 222 04 16</p>	NODC	1969	
<p>Dr. L.M. Murillo Bolanos Centro de Investigaciones en Ciencias del Mar y Limnologia (CIMAR) Universidad de Costa Rica COSTA RICA Tel: &lt;506&gt; 24 36 60 Fax: &lt;506&gt; 25 58 22</p>			
<p>Mr. V. Dadic Institute of Oceanography &amp; Fisheries P.O. Box 500 58000 Split REPUBLIC OF CROATIA Tel: &lt;385&gt; (58) 46 688 Fax: &lt;385&gt; (58) 46 593</p>			
<p>The Royal Danish Hydrographic Office Esplanaden 19 1263 Copenhagen K DENMARK</p>			

Name & Address	NODC or DNA	Date when Founded	Special Responsibilities
<p>The Director Instituto Oceanografico de la Armada (INOCAR) Casilla 5940 Guayaquil ECUADOR Tel: &lt;593&gt; (4) 44 36 52 Fax: &lt;593&gt; (4) 44 21 51 Tlx: 43572 ED</p>	NODC	1972	
<p>Institute of Oceanography &amp; Fisheries 101, Kasr 21 - Ainy St. Cairo ARAB REPUBLIC OF EGYPT</p>	NODC	1971	
<p>Ms. R. Olsonen Institute of Marine Research P.O. Box 33 FIN - 00931 Helsinki FINLAND Tel: &lt;358&gt; (0) 33 10 44 Fax: &lt;358&gt; (0) 33 13 76 Email: FIMR.HELSINKI (Attn. R. Olsonen)</p>	DNA	1960	
<p>Dr. C. Maillard Interface Scientifique Systèmes d'Informational Scientifiques pour la Mer ISISMER) Institut Français de Recherche pour l'Exploitation de la Mer (IFREMER) Centre de Brest, B.P. 70 29280 - Plouzane FRANCE Tel: &lt;33&gt; 98 22 42 79 Fax: &lt;33&gt; 98 22 45 46 Tlx: 940627</p>	NODC	1971	
<p>Dr. F. Nast Deutsches Ozeanographisches Datenzentrum (DOD) Bundesamt fuer Seeschifffahrt und Hydrographie (BSH) P.O. Box 301220 D-20305 Hamburg GERMANY Tel: &lt;49&gt; (40) 31 90 35 30 Fax: &lt;49&gt; (40) 31 90 50 00 Tlx: 211138 BSHHH D Email: nast@m5.hamburg.bsh.d400.de</p>	NODC	1967	
<p>Mr. M.A. Mensah Fishery Research Unit United Nations Development Programme, FAO P.O. Box B 62, Community 2 Tema GHANA</p>	DNA		

Name & Address	NODC or DNA	Date when Founded	Special Responsibilities
<p>Dr. E. Balopoulos Head, Greek National Oceanographic Data Centre National Centre for Marine Research GR-16604 Hellenikon GREECE Tel: &lt;30&gt; (1) 981 57 03 Fax: &lt;30&gt; (1) 983 30 95 Tlx: 224135 NCMR GR</p>	NODC	1986	
<p>Chief, Section of Hydrography Institute of National Geography Guatemala GUATEMALA</p>	NODC	1949	
<p>Dr. S. Cisse Chef de la Division Gestion de l'Information Centre de Recherche Scientifiques de Conakry (CERESCOR) B.P. 561 Conakry REPUBLIC OF GUINEA Tel: &lt;224&gt; 46 59 51/46 36 50 Tlx: 22331 MDEC GE</p>	NODC	1990	
<p>The Director Marine Research Institute Skulagata 4 Reykjavik ICELAND Tel: &lt;354&gt; (1) 62 02 40 Fax: &lt;354&gt; (1) 62 37 90 Email: MRI.ICELAND.LIBRARY</p>	NODC		
<p>Mr. J.S. Sarupria National Institute of Oceanography Dona Paula Goa 403004 INDIA Tel: &lt;91&gt; (62) 53 56/59 88 Fax: &lt;91&gt; (62) 08 32/46 12 Tlx: 194216 NIO IN/194 316 MGG IN Cbl: OCEANOLOGY, PANAJI</p>	NODC	1964	
<p>Dr. M.M. Abdul-Hussein Basrah University Marine Science Centre Basrah IRAQ Tlx: 7025 UNEVRSTY IK</p>			

Name & Address	NODC or DNA	Date when Founded	Special Responsibilities
<p>Mr. J. Wallace ISMARE, Irish Marine Data Centre 80, Harcourt St. Dublin 2 IRELAND Tel: &lt;353&gt; (1) 475 71 00 Fax: &lt;353&gt; (1) 475 71 04</p>	NODC	1993	
<p>Dr. S. Brenner National Institute of Oceanography Oceanographic &amp; Limnological Research P.O. Box 8030 Haifa 31080 ISRAEL Tel: &lt;972&gt; (4) 51 52 02 Fax: &lt;972&gt; (4) 51 19 11</p>			
<p>Centro Nazionale per la Raccolta di Dati Oceanografici Consiglio Nazionale delle Ricerche 7, Piazzale delle Scienze Rome ITALY</p>	NODC	1965	
<p>Dr. Y. Kubo Director, Japan Oceanographic Data Centre (JODC) Hydrographic Dept., Maritime Safety Agency 5-3-1 Tsukiji Chuo-ku Tokyo 104 JAPAN Tel: &lt;81&gt; (3) 3541 3811 Fax: &lt;81&gt; (3) 3545 2885 Tlx: 2522452 HD JODC J Email: T.MORI</p>	NODC	1965	<p>RNODC/IGOSS RNODC for MARPOLMON (for WESTPAC region) RNODC WESTPAC RNODC-ADCP</p>
<p>Dr. E. Okemwa Director Kenya Marine &amp; Fisheries Institute P.O.Box 81651 Mombasa KENYA Tel: &lt;254-11&gt; 47 51 57 Fax: &lt;254-11&gt; 47 22 15</p>			
<p>Mr. Kim Gi Hwan Korean National Oceanographic Data Centre (KNODC) P.O.Box 100 Pyongyang KOREA, PEOPLE'S DEMOCRATIC REPUBLIC OF</p>	NODC	1987	
<p>Head, Korea Oceanographic Data Centre National Fisheries Research &amp; Development Agency Shirang-Ri, Kijang-Up, Yangsan-Gun Kyungsangnam-Do 626-900 KOREA, REPUBLIC OF Tel: &lt;82&gt; (51) 465 00 91/(523) 361 38 61 Fax: &lt;82&gt; (523) 361 80 76/362 09 02</p>	NODC	1974	

Name & Address	NODC or DNA	Date when Founded	Special Responsibilities
Dr. S. Lakkis National Council for Scientific Research P.O. Box 8281 Beirut LEBANON			
Centre National de la Recherche Oceanographique B.P. 68 Nosy Be MADAGASCAR			
Cmdr. Z. bin Aziz Hydrographic Dept. Oceanographic Data Centre Royal Malaysian Navy Ministry of Defence Jalan Padang Tembak 50634 Kuala Lumpur MALAYSIA Tel: (60 3) 235 33 70 Fax: (60 3) 298 79 72	DNA	1994	
Mr. A. Drago Council for Science & Technology 112, West St. Valetta MALTA Tel: <356> 24 11 76 Fax: <356> 24 11 77			
Mr. J.L. Frias Salazar Jefe del Departamento de Oceanografia INEGI-SPP Insurgentes Sur 795 - 4°. Piso Col. Napoles, C.P. 03810 Mexico, D.F. MEXICO	NODC		
Institut des Peches Maritimes Office National des Peches Rue du Chevalier Bayard Casablanca MOROCCO	NODC		
Dr. J.H. Stel Netherlands Marine Research Foundation Laan van N.O. Indie 131 P.O. Box 93120 2509 AB Den Haag NETHERLANDS Tel: <31> (70) 344 07 80 Fax: <31> (70) 383 21 73	NODC	1972	

Name & Address	NODC or DNA	Date when Founded	Special Responsibilities
<p>Mr. J.G. Tobor Director, Nigerian Institute of Oceanography &amp; Marine Research P.M.B. 12729 Victoria Island Lagos NIGERIA Tel: &lt;234&gt; (1) 61 73 85 Cbl: OCEANOGRAPH</p>	NODC	1990	
<p>Mr. H. Loenig Norsk Oseanografisk Datasenter Institute of Marine Research P.O. Box 1870/72, Nordnes 5024 Bergen NORWAY Tel: &lt;47&gt; (5) 523 85 00 Fax: &lt;47&gt; (5) 523 85 84 Tlx: 42297 OCEAN N Email: NODS.NORWAY &amp; haraldl@imr.no Cbl: METEOCEAN</p>	NODC	1972	
<p>National Oceanographic Data Centre National Institute of Oceanography 37-K, Block 6, PECHS Karachi 29 PAKISTAN Tel: &lt;92&gt; (21) 43 43 08 Tlx: 24681 NIO PK</p>	NODC	1962	
<p>Vice-Almirante D. Mariscal Galiano Predidente del Consejo Director del Instituto del Mar del Peru (IMARPE) SN Gamarra y General Valle Apartado 3734 Lima PERU Tel: &lt;51&gt; (14) 29 76 30</p>	NODC	1984	
<p>Cmdr. R.B. Feir Director, Philippine Oceanographic Data Centre Coast &amp; Geodetic Survey Dept. National Mapping &amp; Resource Information Authority P.O. Box 1620 421, Barraca St., Binondo PHILIPPINES Tel: &lt;63&gt; (2) 47 96 11/14</p>	NODC		
<p>Dr. K. Rozdzyński Institute of Meteorology &amp; Water Economy Maritime Branch ul. Waszyngtona 42 81-342 Gdynia POLAND</p>	NODC		



Name & Address	NODC or DNA	Date when Founded	Special Responsibilities
<p>The Director Instituto Hidrografico Rua das Trinas, 49 P-1296 Lisboa Codex PORTUGAL Tel: &lt;351&gt; (1) 60 11 91/60 11 96 Fax: &lt;351&gt; (1) 66 05 15 Tlx: 65990 HIDROG P</p>	DNA	1986	
<p>Co-ordinator for IODE Dept. of Marine Sciences, Faculty of Science University of Qatar P.O. Box 2713 Doha QATAR Tel: &lt;974&gt; 89 21 Tlx: 4630 UNVSTY DH</p>			
<p>Ing. G. Serpoianu Institutul Roman de Cercetari Marine Bd. Lenin 300 Constantza ROMANIA</p>	DNA	1970	
<p>Mr. N.N. Michailov Director, National Oceanographic Data Centre All Russian Research Institute of Hydrometeorological Information (RIHMI) 6, Koroleva Str., Kaluga District Obninsk 249020 RUSSIAN FEDERATION Tel: &lt;7&gt; (8439) 25907 Fax: &lt;7&gt; (095) 255 22 25 Tlx: 412633 INFOR SU Email: wdcblm@sovamsu.sovusa.com</p>	NODC	1964	RNODC/IGOSS RNODC for MARPOLMON
<p>Dr. J. Demetrio de Armas Director del Centro Espanol de Datos Oceanograficos Instituto Espanol de Oceanografia Avenida de Brazil, 31 28020 Madrid SPAIN Tel: &lt;34-1&gt; 597 44 43 Fax: &lt;34-1&gt; 597 47 70/555 19 54</p>	NODC	1968	
<p>Mr. J. Szaron Swedish Meteorological &amp; Hydrological Institute Oceanographical Laboratory Byggnad 31 Nya Varvet S42671 Vastra Frolunda SWEDEN Tel: &lt;46&gt; (31) 69 65 32 Fax: &lt;46&gt; (31) 69 04 18</p>	DNA	1971	

Name & Address	NODC or DNA	Date when Founded	Special Responsibilities
Dr. C.L. Hottinger Geologisches Institut Universitat Basel Bernoullistr. 32 4056 Basel SWITZERLAND			
Marine Science Dept. Faculty of Science Chulalongkorn University Bangkok 5 THAILAND			
Mr. A. Duncan Chief Information Officer Institute of Marine Affairs Hilltop Lane, Chaguaramas P.O. Box 3160 Carenage Post Office TRINIDAD & TOBAGO, W.I. Tel: <1809> 634 42 92/429 42 94 Email: IMA.TRINIDAD.LIBRARY	DNA		
Eng. Capt. H. Yuce Dept. of Navigation, Hydrography & Oceanography Seyir, ve Ocinoğrafi Hidroğrafi Daire si Baskanligi 81647 Cubuklu-Istanbul TURKEY Tel: <90> (1) 331 17 98 Fax: <90> (1) 331 05 25 Tlx: 29783 DKSH TR	NODC	1993	
Dr. A.M. Suvorov Chief, Dept. of Marine Information Systems & Technologies Marine Hydrophysical Institute 2, Kapitanskaya Str. 335000 Sevastopol UKRAINE Tel: <7> (692) 52 52 76 Fax: <7> (692) 44 42 53 Tlx: 187115 SWSWO SU Email: MHI.SEVASTOPOL	DNA	1993	
Dr. M.T. Jones British Oceanographic Data Centre Proudman Oceanographic Laboratory Bidston Observatory Birkenhead, Merseyside L43 7RA UNITED KINGDOM Tel: <44> (51) 653 86 33 Fax: <44> (51) 653 62 69 Tlx: 628591 OCEANSB G Email: BODC.UK	NODC	1968	RNODC for instrumented & Remote- Sensed wave data RNODC-JASIN

Name & Address	NODC or DNA	Date when Founded	Special Responsibilities
<p>The Principal Secretary Ministry of Natural Resources &amp; Tourism P.O. Box 9372 Dar-es-Salem UNITED REPUBLIC OF TANZANIA</p>	DNA	1971	
<p>Mr. G. Withee Deputy Assistant Administrator for Environmental Information Services National Oceanic &amp; Atmospheric Administration (NOAA), Code Ex. 2 1825 Connecticut Av., NW Washington DC, 20235 U.S.A. Tel: &lt;1&gt; (202) 606 40 89 Fax: &lt;1&gt; (202) 673 55 86 Tlx: 7401815 Email: G.WITHEE</p>	NODC	1961	RNODC/GOSS RNODC/ CARIPOL
<p>Sr. J. Cigliutti Director, Centro Nacional de Datos Oceanograficos (CENDO) Capurro 980 Casilla de Correo 1381 Montevideo URUGUAY</p>	NODC	1986	
<p>The Director Direccion de Hidrografia y Navegacion de la Armada Observatorio Naval Cajigal 23 de Enero, la Planicie A.P. 6745, Carmelitas Caracas VENEZUELA Tlx: 21168 DCOTE ATT. DIHN</p>	NODC	1985	
<p>Dr. Pham Van Ninh Director Vietnam National Oceanographic Data Centre Vien Khoa Hoc Viet Nam, Nghiado, Tuliem Hanoi VIETNAM Tel: &lt;84&gt; (4) 58333/515 Tlx: 411525 NCSR VT</p>	NODC	1990	
<p>WDC-A (Oceanography) Dr. S. Levitus, Director National Oceanic &amp; Atmospheric Administration (NOAA) 1825, Connecticut Av., NW Washington DC, 20235 U.S.A. Tel: &lt;1&gt; (202) 606 45 07 Fax: &lt;1&gt; (202) 606 45 86 Email: S.LEVITUS</p>			

Name & Address	NODC or DNA	Date when Founded	Special Responsibilities
<p>The Director Direccion de Hidrografia y Navegacion de la Armada Observatorio Naval Cajigal 23 de Enero, la Planicie A.P. 6745, Carmelitas Caracas VENEZUELA Tlx: 21168 DCOTE ATT. DIHN</p>	NODC	1985	
<p>Dr. Pham Van Ninh Director Vietnam National Oceanographic Data Centre Vien Khoa Hoc Viet Nam, Nghiado, Tuliem Hanoi VIETNAM Tel: &lt;84&gt; (4) 58333/515 Tlx: 411525 NCSR VT</p>	NODC	1990	
<p>WDC-A (Oceanography) Dr. S. Levitus, Director National Oceanic &amp; Atmospheric Administration (NOAA) 1825, Connecticut Av., NW Washington DC, 20235 U.S.A. Tel: &lt;1&gt; (202) 606 45 07 Fax: &lt;1&gt; (202) 606 45 86 Email: S.LEVITUS</p>			
<p>WDC-B1 (Oceanography) Dr. V.I Smirnov, Deputy-Director All Russian Research Institute of the Hydrometeorological Information (RIHMI) 6, Koroleva Str., Kaluga District Obrinsk 249020 RUSSIAN FEDERATION Tel: &lt;7&gt; (08439) 25925 Fax: &lt;7&gt; (095) 255 22 25 Tlx: 412633 INFOR SU Email: wdcblm@sovamsu.sovusa.com</p>			
<p>World Data Centre D (Oceanography) National Marine Data &amp; Information Service State Oceanic Administration (SOA) P.O. Box 74 93, Liu Wei Rd, Hedong district Tianjin 300171 PEOPLE'S REPUBLIC OF CHINA Tel: &lt;86&gt; (22) 24 41 64 Fax: &lt;86&gt; (22) 31 44 08 Tlx: 23138 NODC CN CHINAPAC: 04602-24100104</p>			

## **B. MISSION OF OCEANOGRAPHIC DATA CENTRES OF THE IODE SYSTEM**

### NODC/DNA

National Oceanographic Data Centre (NODC) is a centralized facility for providing on a continuing basis ocean data/information in a usable form to a wide user community. This facility acquires, processes, quality controls, inventories, archives and disseminates data in accordance with national responsibilities. In addition to disseminating data and data products nationally, NODCs are normally charged with the responsibility for conducting international exchange.

Some Member States, that have not established an NODC, have instead officially assigned the responsibility of international exchange of oceanographic data and information to some other agency within the Member State. These agencies are referred to as Designated National Agencies (DNAs).

With regard to international exchange the most fundamental responsibility of the NODC/DNA within the IODE is to actively seek and acquire from national sources those data which are exchangeable internationally, and to process and quality control the data and submit them in a timely fashion to the appropriate WDC for Oceanography or RNODC.

In return, the NODC can request and receive from the WDCs for Oceanography or RNODCs similar data or inventory information which they need for their own requirements.

### RNODC

Responsible National Oceanographic Data Centre (RNODC) is a national centre which, at national expense, takes on the responsibility of assisting the World Data Centres. This assistance may be provided directly to the WDCs for Oceanography in support of their mission or it may be provided directly to other Member States to assist them with their particular requirements for getting data into or from the exchange system. It may be provided directly to an international scientific programme on behalf of WDCs for Oceanography. Usually a RNODC will provide services which can be viewed as a combination of two or more of the above.

The RNODC scheme was developed to enable the international exchange system to cope with the increasing variety and volume of oceanographic data being collected.

### WDCs for Oceanography

World Data Centres for Oceanography (WDCs), which constitute a part of the ICSU WDCs System, receive oceanographic data and inventories from NODCs, RNODCs, marine science organizations, and individual scientists. These data are collected and submitted voluntarily from national programmes, or arise from international co-operative ventures.

In general, the exchange of internationally significant data holdings and data inventory information between WDCs for Oceanography and their counterparts is expected to take place on a regular basis without charge in order to keep the data holdings of the Centres identical.

On request, the WDCs provide copies of data, inventories and publications to NODCs/DNAs, to RNODCs and to international co-operative programmes, as appropriate, in exchange, or with a charge not to exceed the cost of providing the service.

Another major responsibility of the WDCs for Oceanography is to monitor the performance of the international data exchange system and report their findings to the IOC Secretariat and the C-IODE. The Committee can use this information to take appropriate action to correct deficiencies in the international exchange system.

## C. GEOGRAPHICAL DISTRIBUTION OF OCEANOGRAPHIC DATA CENTERS

### EUROPE

Bulgaria	NODC
Finland	DNA
France	NODC
Germany	NODC
Greece	NODC
Iceland	NODC
Ireland	NODC
Italy	NODC
Netherlands	NODC
Norway	NODC
Poland	NODC
Romania	DNA
Russian Federation	NODC
Spain	NODC
Sweden	DNA
Turkey	NODC
Ukraine	DNA
United Kingdom	NODC

### ASIA

China, People's Republic of	NODC
India	NODC
Japan	NODC
Korea, People's Democratic Republic of	NODC
Korea, Republic of	NODC
Malaysia	DNA
Pakistan	NODC
Philippines	NODC
Vietnam	NODC

### NORTH AMERICA

Canada	NODC
USA	NODC

### CENTRAL AMERICA

Guatemala	NODC
Mexico	NODC
Trinidad & Tobago	DNA

### SOUTH AMERICA

Argentina	NODC
Brazil	NODC
Chile	NODC
Colombia	NODC
Ecuador	NODC
Peru	NODC
Uruguay	NODC
Venezuela	NODC

### AFRICA

Arab Republic of Egypt	NODC
Ghana	DNA
Guinea, Republic of	NODC
Morocco	NODC
Tanzania, United Republic of	DNA
Nigeria	NODC

### AUSTRALIA

Australia	NODC
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#### **D. EXISTING RNODCs AND THEIR TERMS OF REFERENCE**

**RNODC - SOC:** Operated by NODC of Argentina (28 August 1987; terms of reference as modified in 1992)

- receive, control the quality and store in standard format the physical and chemical data obtained by the international scientific community from cruises and research programmes carried out in the Southern Oceans, and distribute on request the information contained in such files;
- co-operate closely with WDCs-Oceanography, sending regular shipments (at least once a year) free of charge of complete sets of physical and chemical data stored on magnetic tape and in GF3, inventories, data summaries and other data products related to the physical and chemical data from the Southern Oceans;
- assist the World Data Centres by sending copies to them of any ROSCOP forms submitted to the RNODC-SOC.

At present, the responsibility of the Center is not limited to a particular geographical area or data types within the Southern Oceans. However, if new offers are submitted to the Committee by other appropriate National Oceanographic Data Centres willing to act as RNODC-SOC for specific geographical areas or data types, the Committee may examine such offers to determine whether they would be compatible with responsibilities of the RNODC-SOC in Argentina.

**RNODC for Drifting Buoys Data:** Operated by MEDS, Canada (1 January 1986)

- Data from the GTS are accumulated for one week when they are processed, quality controlled and updated in the archival database;
- As soon as an agreement is reached with Service Argos, data from Service Argos will be acquired on a regular basis and archived in its original form;
- Data received from Service Argos will be available from MEDS archives within 30 days of reception. The archive base will be a 2000-database with special MEDS-written software for data input and output products;
- Data inventories and format information, as well as information on processing algorithms and quality control will be shipped within 7 days of receipt of request, free of charge;
- Data will be shipped, on IBM standard magnetic tape in GF3 subset format, within 30 days of receipt of a request. Every data shipment will be accompanied by sufficient documentation to enable the user to read the tape. The requestor will be asked to acknowledge receipt within 15 days of receiving the data;
- Accumulated data will be submitted each year to a World Data Centre within 3 calendar months of the end of the year. The data will be forwarded in GF3 format, on magnetic tape. All other aspects of data forwarding to the WDCs will be in accordance with IOC Manuals and Guides No. 9;
- Capability to produce data products from the data in the archive will be gradually developed. As these products are developed, they will be made available to users on request;
- Report regularly on its activities to the Group of Experts on RNODCs and to the WC/IODE.

**RNODCs for IGOSS (BATHY and TESAC):** Operated by NODCs of Japan, the USA and the Russian Federation

- acquire BATHY, TESAC data sets and sub-surface temperature data from drifting and moored buoys from IGOSS Specialized Oceanographic Center (SOC) for area of responsibility;
- apply supplementary quality control to acquired data and provide services to users after 30 days from receipt of that data;
- archive, and make available to users, selected data products from SOC and analysis centres;

- acquire non-operational BATHY, TESAC and sub-surface temperature data from drifting and moored buoys and/or data sets for area of responsibility;
- apply quality control of non-operational data, prepare integrated data sets and provide services to users;
- provide for exchange of IGOSS data in GF-3 format with other RNODCs or to other users as requested;
- maintain a database and inventories for areas of responsibility;
- prepare products based on operational and non-operational IGOSS data, as appropriate;
- transmit to the WDCs annually data sets in GF-3 format, inventories and selected data products;
- prepare summary and BATHY, TESAC and sub-surface temperature from drifting and moored buoys database plots and transmit to the IOC Secretariat every 15 August and 15 February for data received during the previous 6 months;
- participate in efforts to monitor data flow;
- participate as feasible in IOC training programmes;
- provide for exchange of documentation and software regarding quality control and processing procedures, with other RNODCs, as possible.

**RNODCs for MARPOLMON:** Operated by NODCs of Japan, the USA and the Russian Federation (3 May 1987)

Bearing in mind the Recommendations of the IOC Scientific Committee for the Global Investigation of Pollution in the Marine Environment, adopted at its Sixth Session (Paris, 25 September - 1 October 1986), on the regional relevance to marine pollution management activities, RNODC-MARPOLMON have been established in Japan, for the WESTPAC region, in the USA for the Caribbean region and in the Russian Federation for the Atlantic, Mediterranean and Baltic Seas, with the following terms of reference.

A. Referral

The RNODC-MARPOLMON will;

- Provide a referral capacity to worldwide holdings of marine pollution data.

B. Access

The RNODC-MARPOLMON will be expected to demonstrate:

- a capability and willingness to perform automated data processing functions for marine pollution data;
- a willingness to accept marine pollution data which may not be received in automated form, and to convert them to such a form;
- a capability for performing quality control (format checks and/or environmental);
- a capability to work with discipline-oriented codes (biological and chemical);
- a capability for converting marine pollution data to GF3 format or other internationally recognized format.

C. Products

The RNODC-MARPOLMON will:

- provide copies of processed data to World Data Centres A and B (Oceanography);
- provide machine listings and simple statistics of marine pollution data;
- produce graphics of marine pollution data, for the use of concerned Member States.



#### D. Training

The RNODC-MARPOLMON will conduct formal or informal training sessions for data centre personnel involved in the programme and who actively submit marine pollution data. Expenses of trainees will not however, be borne by the RNODC concerned. Selection of trainees will be jointly arranged by IOC and the RNODC.

#### **RNODC - WESTPAC:** Operated by NODC of Japan (24 February 1979)

- Produce a work plan to define: i) the procedures of JODC in acquiring, processing, reformatting and archiving, distribution of data and inventory of research cruises in the WESTPAC region with reference to the WDC system, and ii) the implementation of this work plan;
- Provide a mechanism for registration of WESTPAC cruises with RNODC-WESTPAC;
- Work closely with National Co-ordinators for IODE and any other national contact points for data management within WESTPAC who might be appointed by Member States;
- Publish a guide for WESTPAC data management for distribution to Member States through national contact points.

#### **RNODC - Waves:** Operated by BODC, UK

- Compile comprehensive inventories of instrumented wave data, using a standard reporting form and a worldwide community national co-ordinators for wave data.
- Bank wave data values for remote-sensed satellite altimeter wave data and produce data products at level-2 and above.
- Assist the WDCs, Oceanography through production of a world catalogue of instrumental wave data and forward data to the WDCs where these are held.
- Provide services to users which include advice on wave data management, on wave data products, and on specialized data products derived from Remote Sensed data; sales of the world data catalogue.
- Prepare a report and work closely with the Technical Committee on IODE, through its Group of Experts on RNODCs and Climate Data Services highlighting new developments and ensuring the provision of expert knowledge on instrumented and Remote Sensed satellite wave data to the data centres, PIANC, subsidiary bodies and other international organizations.

#### **RNODC- JASIN:** Operated by BODC, UK (17 October 1985)

The JASIN project was an intensive study, conducted during 2 months in 1978 in the North Rockall Trough, of the atmospheric and ocean boundary layer to observe the structure of the layer and its interaction with the large scale motions of the sea and air. More than 50 teams of investigators from 9 countries participated, using 14 ships and 3 aircraft, and deploying 35 mooring systems. Approximately, 20 different types of oceanographic and meteorological data make up the 44 data sets planned for inclusion in the project archive. These include wave spectra, moored and drifting current meter data, vertical current profiles, temperature data (atmosphere and sea surface), thermistor chain data, data from conductivity/temperature/depth type instruments (for example, CTDs, XBTs, water bottles, towed thermistors), meteorological data from surface ship/buoys, tethered balloons, aircraft and radio sondes and heat and moisture flux data.

The importance now attached to a more complete scientific understanding of the large scale processes controlling the global circulations of the oceans and atmosphere systems gives a particular value to detailed observations of air-sea interaction processes such as those in the JASIN project. The intensive observation period of the project also lay within the brief active observing life of the pioneering SEASAT microwave ocean observation satellite. The use of the 2 data sets in combination has proved extremely fruitful.

In order to establish the JASIN project archive, the RNODC is established to acquire copies of the data sets, to screen them for corruption or major errors, collating the necessary data documentation, and to convert them into the IOC GF-3 format for international oceanographic data exchange. Once the preparation of the archive is complete, an inventory will be produced describing its contents.

The RNODC will provide copies of project data sets in GF-3 format in response to inquiries received through the IODE system. A number of the data sets are already available; others will be made available as and when their archival is completed.

**RNODC - Formats:** Operated by the Service Hydrographique of ICES (since 1984, terms of reference as modified in 1992)

- act as a Referral centre for international/project oriented oceanographic data formats, maintaining a full set of documentation on all such formats and on supporting software;
- act as a Referral Centre for parameter and other code tables used in oceanographic data formats;
- assist (in co-operation with BODC, UK) in the management and administration of GF3 format, in particular, the servicing of requests for GF3 supporting documentation and software;
- report on its activities to the IOC Committee on IODE and its Groups of Experts on RNODCs and Global Programmes and on the Technical Aspects of Data Exchange.

**RNODC - ADCP:** Operated by NODC of Japan (since 1992)

- compile, evaluate and keep updated information on existing datasets held by Member States already active in ADCP measurements;
- produce and keep updated a catalogue of ADCP users which will include information about ADCP instruments, related instrumentation (GSP, Loran, measurement of ship motion, etc.), procedures for averaging and sampling (temporal and spatial, vertical and horizontal), quality control methods, formats and product;
- in consultation with other NODCs, ICES and SCOR, establish and maintain standards and procedures for the reduction, quality control, archiving and exchange of ADCP data;
- assemble an archive of ADCP data received from other Member States so as to assess the effectiveness of the proposed standards and procedures;
- prepare guidelines concerning different performance characteristics and data documentation relevant to each instrument type in order to formulate adequate data documentation and quality control procedures;
- report on the progress of RNODC ADCP to the Group of Experts on RNODCs and Global programmes and to the IOC Committee on IODE.

### SECTION III

#### A. COMPOSITION OF THE IODE COMMITTEE

**Chairman:** Dr. J. R. Wilson (Canada)

**Vice-Chairman:** Dr. V. I. Smirnov (Russia)

##### Groups of experts on:

- |                                      |                           |
|--------------------------------------|---------------------------|
| - RNODCs and Global Programmes       | Dr. J.-P. Rebert (France) |
| - Technical Aspects of Data Exchange | Mr J. R. Keeley (Canada)  |
| - Marine Information Management      | Mrs P. Simpson (UK)       |

**Joint IOC/WMO Steering Group on Global Temperature - Salinity Pilot Project (GTSP)-** Dr. J.R. Wilson (Canada)

**Task Team on Oceanographic Data Quality Control -** Dr. A.A. Vorontsov (Russia)

##### *Ad hoc* Groups of Rapporteurs on:

- |                                     |                      |
|-------------------------------------|----------------------|
| - Marine Biological Data Management | .....                |
| - Chemical Carbon Dioxide Data      | Dr. S. Levitus (USA) |

##### Projects on:

- |            |                                     |
|------------|-------------------------------------|
| GODAR -    | Project Leader Dr. S. Levitus (USA) |
| Ocean PC - | Project Leader Dr. McLain (USA)     |

**B. GROUP OF EXPERTS ON RNODCs AND GLOBAL PROGRAMMES**

**Chairman:** Dr. J.-P. Rebert (France)

Date of Establishment: May 1975

Rec. IODE-VIII.12  
Res. IX-28  
Res. IODE-X.2  
Res. IODE-XII.1  
Rec. IODE-XIV.1

Terms of Reference (modified by IODE-XIV, December 1992):

- Identify RNODCs needed to meet IODE responsibilities in accordance with the guidelines specified in the IOC Guide on RNODCs (IOC Manuals & Guides No. 9, Annex II).
- Review the activities and progress of RNODCs.
- Recommend activities to meet the ocean data needs of climate and global change research and monitoring activities: GOOS, GCOS and scientific programmes such as TOGA, WOCE, JGOFS and IGBP.
- Serve as a link between the ocean data needs of the research and monitoring programmes and RNODCs.
- Identify regional and global data sets of specific parameters needed by the global programmes and recommend projects like GTSP that might be established or enhanced to produce them.

**COMPOSITION OF THE GROUP OF EXPERTS ON RNODCs  
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### **GROUPS OF EXPERTS ON TECHNICAL ASPECTS OF DATA EXCHANGE**

(former names of the Group - 'Group on Format Development; Group on Operations and Technical Applications)

**Chairman:** Mr. J. R. Keeley (Canada)

Date of Establishment: January 1979  
Rec. IODE-IX.6  
Res.XI-20

Terms of Reference (modified by IODE-XIV in 1992 and adopted by IOC-XVII in March 1993):

- Evaluate and support the demands on IODE for new technical solutions for oceanographic data exchange, particularly with reference to the needs expressed by the Ocean Climate Data Workshop;
- Collaborate with IGOSS GE/OTA and the data management groups of other international bodies and scientific programmes in the development of technical solutions to support the management and exchange of oceanographic data;
- Keep under review the formatting systems being used in the exchange of oceanographic data and ensure the proper development of such systems in support of the needs of IODE, of scientific programmes and for the developments of GOOS;
- Provide advice and guidance on the use of the GF3 formatting system, maintain and develop the system including its code tables, documentation and supporting software;
- Continually review the impacts of new technologies which increase capabilities in data collection and the integration and co-management of both data and information in these collections, to identify opportunities and propose solutions for the evolution of the IODE system in light of these developments;
- Compile and maintain an inventory of software and expertise available from members of the IODE system which may be freely exchanged and which may be used by other members of the system to enhance their products and services capabilities.

**COMPOSITION OF THE GROUP OF EXPERTS  
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## **GROUP OF EXPERTS ON MARINE INFORMATION MANAGEMENT**

**Chairperson:** Mrs. Pauline SIMPSON (UK)

**Date of Establishment:** January 1984  
Rec. IODE-XI.4  
Res. EC-XVII.5

Terms of Reference (Modified by GEMIM-III in April 1992 and approved by IOC-XVII in March 1993):

- Advise the IOC Committee on IODE on the policy, development and enhancement (or improvement) of information infrastructure that is essential for Marine Information access and exchange, including communication and telecommunication, to meet the needs of the marine community, both in developing and developed countries.
- Encourage the implementation and/or development of standards and formats, suggesting and/or undertaking actions that can be applied nationally, internationally or regionally, to improve the access and exchange of scientific and technical Marine Information.
- Identify Policy, technical and financial problems involved in the development and implementation of Marine Information Management systems and make recommendations towards solutions of these problems.
- Develop programmes to improve the ability of Member States, particularly developing countries, to benefit from, and participate in, Marine Information Management systems and keep Member States informed on how they might best gain access to such systems.
- Advise Secretary IOC and through the IOC Secretariat, other international agencies and programmes, on technical aspects of Marine Information Management.
- Develop strategies and projects for international dissemination of information on marine scientists, programmes and projects.

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**C. JOINT IOC/WMO STEERING GROUP ON GLOBAL TEMPERATURE - SALINITY PILOT PROJECT (GTSP)**

**Chairman:** Dr. J. R. Wilson (Canada)

Date of Establishment: January 1990  
Rec. IODE-XIII.4  
Res. EC-XXIII.6

Terms of Reference (adopted by IODE-XIII in 1990):

- Meet regularly at the expense of the participating countries to review the status of implementation and further development of the GTSP.
- Actively promote the GTSP and provide information to the users of GTSP services, such as the planners of international Science Programmes.
- Provide scientific and technical guidance to GTSP participants in the implementation and further development of the scientific and data management aspects of the GTSP elements including:
  - near real-time data acquisition
  - non real-time data acquisition
  - communications infrastructures
  - quality control procedures
  - continuously managed database
  - GTSP data and information products
- Prepare, maintain and distribute documentation relevant to operation of the project.
- Report after each meeting and as otherwise necessary to keep all IODE and IGOSS contacts, as well as the representatives of the science programmes, informed on the status of implementation of the GTSP.
- Submit status reports on the GTSP to the sessions of the Committee on IODE and the JC-IGOSS.
- Prepare and submit to the sessions of the Committee on IODE and the JC-IGOSS a report on the status of IGOSS-IODE data flow.

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#### **D. TASK TEAM ON OCEANOGRAPHIC DATA QUALITY CONTROL**

**Chairman:** Dr. A. A. Vorontzov (Russian Federation)

Date of Establishment: December 1986  
Res. IODE-XII.9  
Res. IODE-XIV.5

Terms of Reference (modified by IODE-XIV, December 1992):

- support the publication and distribution, of the IOC/CEC Manual on Quality Control Procedures for Validation of Oceanographic Data, and undertake revision, addition, or publication of further volumes as required;
- collaborate with organizations and bodies directly concerned with handling different data types so as to obtain from them published quality control procedures, with permission to reproduce and publish the documents on behalf of IOC;
- identify published quality control procedures for oceanographic data types which have been agreed by international or multinational bodies and which have been used and proven through experience and testing;
- maintain collaboration with the CEC-DG/XII MAST Programme so as to ensure that IOC procedures identified as important by IODE are consistent, if possible, with those used by the Member States of the EC and in MAST research programmes;
- submit a report to IODE-XV identifying OC publications which could be included in a future issue of the Manual and its updates, with recommendations concerning possible co-sponsors for their publication and recommendations concerning provision of QC material in machine readable form;
- interact with and support data quality control requirements of GOOS.

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**E. *AD HOC* GROUPS OF RAPORTEURS ON MARINE BIOLOGICAL DATA MANAGEMENT AND ON CHEMICAL AND CARBON DIOXIDE DATA**

***AD HOC* GROUP OF RAPORTEURS ON MARINE BIOLOGICAL DATA MANAGEMENT**

**Chairman:**

Date of Establishment: December 1992  
Res. IODE-XIV.3

Terms of Reference (adopted by IODE-XIV, December 1992):

- identify and list the relevant data sets together with any appropriate meta data;
- give information about a cross-checked Taxonomic Code List;
- give information on inter-calibration exercises for marine biological research and monitoring for which marine biological stations are asked to take responsibility;
- communicate with the relevant groups in GOOS and support the related needs for biological data management in GOOS;
- prepare a progress report to be submitted to IODE-XV.

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**Chairman:** Dr. S. Levitus (USA)

Date of Establishment: December 1992  
Res. IODE-XIV.4

Terms of Reference (adopted by IODE-XIV, December 1992).

To work with the CCCO/JGOFS CO<sub>2</sub> Panel to:

- identify the chemical variables for which collecting and processing standards and user needs support development of global databases;
- co-ordinate the development of common processing and archiving procedures, with special emphasis on CO<sub>2</sub> and chlorophyll data;
- identify the meta data required to document the data to ensure its usefulness to secondary users;
- identify jointly with the IOC Committee for GIPME the need for an RNODC for chemical carbon dioxide, and/or chlorophyll data;
- work with the Group of Experts on RNODCs and Global Programmes and the Committee for GIPME to establish Terms of Reference for such a RNODC(s) and seek a volunteer centre.

**COMPOSITION OF AN *AD HOC* GROUP OF RAPPORTEURS  
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## F. PROJECTS ON GODAR AND OCEAN-PC

### GLOBAL OCEAN DATA ARCHAEOLOGY AND RESCUE PROJECT (GODAR)

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Date of Establishment: March 1993

Project Description (Annex to Recommendation IODE-XIV.3 abbreviated version):

Recognizing that oceanography is an observational science and that the world ocean is a major component of the earth's climate system it is suggested that the IOC sponsor activities that will result in more complete global oceanographic databases. These activities should be viewed as an enhancement of existing IODE activities. The new and enhanced oceanographic databases will be available without restriction to the international science community. We call this effort the "*Global Oceanographic Data Archaeology and Rescue Project*" (GODAR). To do the most thorough job possible this project must have a lifetime of 5 to 10 years. Funds to support the activities of this project will be obtained through as many sources independent of IOC as possible, including foundations.

"Data Archaeology" is the term used to describe the process of seeking out, restoring, evaluating, correcting and interpreting historical datasets.

"Rescue" refers to the effort to save data at risk from being lost to the science community.

Physical, chemical, and biological oceanographic data as well as surface marine meteorological observations are the specific types of data this project will focus on. These are the data types of greatest concern to IODE and climate research activities. Advances in computer technology both hardware and software (e.g., Relational Database technology) now allow for the construction of integrated global oceanographic data bases that include widely disparate types of oceanographic data from different oceanographic disciplines.

The data gathered as a result of this project will be of particular benefit to developing countries. The international availability of comprehensive global oceanographic datasets represent a policy of both information sharing as well as knowledge and technology transfer since the data can be used to study regional environmental oceanographic problems.

#### Rationale

Many oceanographic data are at risk of being lost to future use because of media degradation, hence the need for a "data rescue" effort in conjunction with the data archaeology effort. Sole copies of manuscript data are easily lost due to environmental damage or catastrophe such as fire. In addition manuscript data are of minimal use to researchers who require data in digital form with all pertinent meta-data in order to perform the most comprehensive studies possible. It is the international scientific community which must advise national and international bodies on such issues as climate change. Thus the most complete well-documented databases possible must be available to the international community. Data archaeology and rescue activities at WDC-A, Washington; WDC-B, Obninsk; WDC-D, Tianjin; ICES, Denmark; the Japanese Oceanographic Data Center, and other institutions all have identified major oceanographic databases that exist only in manuscript form. Efforts sponsored by these institutions have resulted in digitization of some of these data and further digitization ("data rescue") is planned. For example the US NODC has located 150,000 MBT profiles in manuscript form and is contracting to have these data digitized. All the above institutions are already closely cooperating on archaeology and rescue activities to avoid duplication of effort and to maximize their resources.

### **Purpose**

To facilitate the creation of global oceanographic databases for use by the international research community for the study of the role of the world ocean as part of the earth's climate system.

### **Main Emphasis**

Specifically the project will emphasize:

- (i) Digitization of data now known to exist only in manuscript and/or analog form. This effort will have highest priority of all activities.
- (ii) Ensuring that all oceanographic data available for international exchange is archived at two or more international data centers in digital form.
- (iii) Preparing catalogues (inventories) of :
  - a) Data now available only in manuscript form;
  - b) Data now available only in analog form;
  - c) Digital data not presently available to the international scientific community.
- (iv) Making all data accessible on various media including CD-ROM's as well as standard magnetic tape.

This effort represents implicit acknowledgement of the value of the ICSU-IOC International Oceanographic Data and Exchange (IODE) system but also recognizes the need to enhance and expand the existing scope and efforts of this system as well as other international exchange mechanisms such as bilateral agreements. In fact this International Data Archaeology and Rescue Programme will build on existing data archaeology programs at WDC-A, WDC-B, and ICES.

The enhanced data bases will be made available as ASCII files on CD-ROM disks as this is the technology that represents the least expensive and most efficient means of distribution of large datasets.

The World Data Center-A for Oceanography (WDC-A) volunteers its services for these activities. WDC-A will work with data centers and research institutions around the world to compile the most complete oceanographic data bases possible and will arrange for the production and distribution of the resulting databases on CD-ROM's and magnetic tapes.

## OCEAN PERSONAL COMPUTER PROJECT (OCEAN PC)

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Date of Establishment: March 1991

### Project Description:

"OceanPC" is a project to assemble and link available IMB compatible software for processing of oceanographic data. The software will support: 1) entry of various types of ocean observations. 2) merging of entered data with historical data from other ships and nations, 3) analysis and display of the merged data, and 4) international data exchange.

OceanPC is a system of programs and "tools" which accommodate the wide diversity of data types, formats, and applications associated with oceanographic stations. Since many ocean programs and data sets use different data formats, OceanPC emphasized access to data of different formats such as those now available on inexpensive compact optical discs (CD-ROM's).

To start development of OceanPC, IOC has assembled a "shoebox" of available marine related computer programs and CD-ROMs of marine data sets. The shoebox of software and data sets was announced in April 1992 and contains computer programs for the display and analysis of marine data. Other programs are being added to the set as they become available and a revised version is envisioned in late 1993. Some of the shoebox programs and data sets have already been used in IOC training courses.

OceanPC is designed to support:

1. Generation and retrieval of IODE oceanographic cruise information using digital ROSCOP files.
2. Key entry, merging, sorting and other processing of oceanographic data.
3. Access to data sets with additional reference information such as climatological atlas data, global coastlines, bathymetric information, etc, including CD-ROM's.
4. Format conversion utilities for import and export of ocean data from and to "Standard" ocean data formats, including ICES Format; Blueprint'86; NODC SD1/2, JPL TOGA CD-ROM; as well as comma-separated "flat files" to be used with spreadsheet programs.
5. Marine science related utilities such as quality control of water bottle data, XBT and CTD profiles, and visualization of derived oceanographic parameters.
6. General graphic utilities for display of oceanographic data, including distribution charts, scatter diagrams, and contouring gridded data sets.

**G. IODE REPRESENTATIVES IN DATA MANAGEMENT GROUPS OF OTHER SCIENTIFIC AND MONITORING PROGRAMMES**

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GCOS	- Mr. J. Withrow, Senior Assistant Secretary IOC
WOCE	- Mr. Shin Tani, Member of an <i>ad hoc</i> Group of Rapporteurs on Marine Biological Data Management
TOGA	- Dr. J.-P. Rebert, Chairman of the IODE Group of Experts on RNODCs & Global Programmes
CEC/MAST	- Dr. J.-P. Rebert, Chairman of the IODE Group of Experts on RNODCs & Global Programmes Dr. I. Oliounine, Senior Assistant Secretary of IOC
ICSU WDC's Panel	- Dr. J.R. Wilson, Chairman of the Committee on IODE
JGOFS	- Dr. R. Lowry, UK, BODC
IGBP-DIS	- Mr. J. Withrow, Senior Assistant Secretary IOC
PICES	- Dr. J.R. Wilson, Chairman of the Committee on IODE



## SECTION IV

### A. LIST OF IOC PUBLICATIONS RELEVANT TO THE IODE ACTIVITIES

- Guide to IGOSS Data Archives and Exchange (BATHY and TESAC), Second Revised Edition. IOC Manuals and Guides N° 1, UNESCO, 1993.
- International Catalogue of Ocean Data Stations. IOC Manuals and Guides N° 2, UNESCO, 1975.
- Guide to Operational Procedures for the Collection and Exchange of Oceanographic Data (BATHY and TESAC) Revised Edition. IOC Manuals and Guides N° 3, UNESCO, 1984.
- Guide for Establishing a National Oceanographic Data Centre. IOC Manuals and Guides N° 5, UNESCO, 1975 (now under revision).
- IOC/ICSU Manual on International Oceanographic Data Exchange (Fourth Edition). IOC Manuals and Guides N° 9, UNESCO, 1991.
- Guide for Responsible National Oceanographic Data Centres. IOC Manuals and Guides N° 9, Annex II, UNESCO, 1982.
- Marine Environmental Data Information Referral Catalogue. Third Edition. IOC Manuals and Guides N° 16, UNESCO, 1993.
- Description of GF3, A General Formatting System for Geo-Referenced Data.

#### IOC Manuals and Guides N° 17.

- Vol. 1, Introductory Guide to the GF3 Formatting System, UNESCO, 1993
- Vol. 2, Technical Description of GF3 Format and Code Tables, UNESCO, 1987.
- Vol. 3, Standard Subsets of GF3 (in preparation)
- Vol. 4, User's Guide to the GF3-Proc Software, UNESCO, 1989.
- Vol. 5, Reference Manual for the GF3-Proc Software, UNESCO, 1992
- Vol. 6, Quick Reference Sheets for GF3 and GF3-Proc, UNESCO, 1989.
- User Guide for the Exchange of Measured Wave Data. IOC Manuals and Guides N° 18, UNESCO, 1987.
- Cruise Summary Report (ROSCOP), Third Edition, UNESCO, 1990.
- Global Temperature Salinity Pilot Project (GTSP) Quality Control Manual, IOC Manual and Guides N° 22, UNESCO, 1990.
- IOC/CEC Manual of Quality Control Procedures for Validation of Oceanographic Data. Manuals and Guides N° 26, UNESCO, 1993.
- OceanPC Manual. Software for Management and International Exchange of Oceanographic Data, UNESCO, 1993.
- Report on Diagnostic Procedures and a Definition of Minimum Requirements for Providing Information Services on a National and/or Regional Level. IOC Manuals and Guides N° 30, MIM Publication Series, Vol. 1, UNESCO, 1994.
- Information networking: The Development of National or Regional Scientific Information Exchange. IOC Manuals and Guides N° 30, MIM Publication Series, Vol. 2, UNESCO, 1994.
- Standard Directory Record Structure for Organization, Individuals and their Research Interests. IOC Manuals and Guides N° 30, MIM Publication Series, Vol. 3, UNESCO, 1994.