



Darwin Initiative for the Survival of Species

Final Report

Data rescue and compilation (CD-ROM) for assessment of plankton biodiversity and biovariability in the Indian and Atlantic Oceans.

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Final Report

1. Darwin Project Information

<i>Project title</i>	Data rescue and compilation (CD-ROM) for assessment of plankton biodiversity and biovariability in the Indian and Atlantic Oceans.
<i>Country(ies)</i>	UK, Ukraine, Kenya, Panama
<i>Contractor</i>	Plymouth Marine Laboratory, UK
<i>Project Reference No.</i>	162/8/251
<i>Grant Value</i>	£160,992
<i>Start/Finishing dates</i>	1 April 1999 – March 2002

2. Project Background/Rationale

The leading oceanographic Institutes of Ukraine, Panama and Kenya hold extensive and very valuable information on species diversity and spatial-temporal variability of the physical, chemical and biological characteristics of various oceans of the world. To date, this information (of about 2000 oceanographic stations) has been practically inaccessible to scientists outside Ukraine, Panama and Kenya.

These archived materials could be made available through establishment of scientific links between Western Europe and developing countries in order to develop an oceanographic database for the Indian and Atlantic Oceans. This will enable these data to be evaluated, jointly analysed and made available to the international oceanographic scientific community.

The value and need to disseminate this information was identified by scientists from the Institute of Biology of the Southern Seas (National Academy of Science of the Ukraine) and Plymouth Marine Laboratory

The importance of the proposed studies is related to global change, environment protection problem and involvement in training and education in new information technology. The reduction of biodiversity in the major ecosystems of the world, caused by anthropogenic impact, is responsible for many international efforts to conserve global biodiversity. Research into the basic properties of biodiversity patterns in different regions and ecosystems has become a major aim in many international and national programmes.

3. Project Summary

A co-operation between Institutes, which are widely acknowledged as the leading oceanographic centres of their respective countries in long-term studies of the tropical ocean, to rescue and compile the oceanographic data sets and release them on CD-ROM. The CD-ROM will be made widely available to scientists all over the world.

The processing and analysis of the above data should focus international attention to investigate biodiversity and biovariability of the tropical zones of the world's oceans.

To provide assistance (i.e. institutional capacity building) to local Institutes which need support because of insufficient financial resources (MHI & IBSS, Ukraine) and because of a lack of expertise (STRI, Panama & KMFRI, Kenya).

To provide training in Britain (on-the-job training and workshops) for scientists from participating Institutes.

To improve the information base at the genus and species levels in the Indian and Atlantic Oceans, and to focus on providing data from the archives in Ukraine, Panama and Kenya for evaluation, modern analysis and for long term study which may have wider impact.

New tools will be developed for historical information presentation, analysis and dissemination (CD-ROM, Internet).

The original objectives were not modified but the timing of the operational plan was changed due to problems with the Authorities in the Ukraine. The Darwin Secretariat was kept fully informed through all of these difficulties.

All project objectives were fully realised and the CD-ROM will now be circulated throughout the marine scientific community.

The project addressed mainly Article 17 (Exchange of Information) of the Convention on Biological Diversity (**Appendix 1**).

4. Scientific, Training and Technical Assessment

Selection and rescue of archived data, from the three countries, was achieved in the first year of the programme.

All these data were transferred to computer format by May 2000 and the construction of the data inventories and database on CD-ROM were completed by March 2001. The design and development of the web site and tools for online data dissemination were started late in 2000 and a pilot web site established at Plymouth Marine Laboratory (<http://www.pml.ac.uk/diocean>).

The construction of the pilot web site and the draft version of the database involved collating all data from participants, checking and evaluating contributions through a constant flow of e-mails between UK, Ukraine, Kenya and Panama.

Re-drafts of the CD-ROM were made in August 2001, October 2001, March 2002 and a final corrected CD in June 2002.

The contents of the CD 'Plankton Biodiversity and Biovariability in the Indian and Atlantic Oceans' are;

**Introduction, Objectives, Participants, Task team,
OceanBase, CD-ROM Contents, Photo gallery,
Working materials.**

CD-ROM CONTENTS



Data Data prepared in framework of the Project



Description files with descriptions of methods of measurements



Kenya data files with data and descriptions of methods of measurements



Makupa Greek



Nyali Beach



Shirazi Bay



Panama data files with data and descriptions of methods of measurements



Ukraine data



Atlantic files with chemical and physical data, zooplankton data in the Atlantic Ocean, descriptions of parameters and measurements



Indian files with chemical and physical data, phytoplankton and zooplankton data in the Indian Ocean, descriptions of parameters and measurements



HTML HTML-source files



Install Installation files of the Project database



OceanBase Project database with OceanBase system (version 2.02 Plankton)

Papers Selected scientific papers



**US-CIS, Arabian Sea Workshop "Biochemical Processes in the Arabian Sea",
September 20-25, 1993, Sevastopol, Ukraine. MHI, UNAS, 1994**



The biology and resources of the purpleback flying squid (*Sthenoteuthis oualaniensis*) in the Arabian Sea (G.V.Zuev, V.N.Nikolsky, M.V.Chesalin, IBSS, Ukraine). PDF file, 280Kb.



Reproduction of marine pelagic copepods in planktonic communities of the Arabian Sea (L.I.Sazhina, IBSS, Ukraine). PDF file, 300Kb.



Phytoplankton, primary production and chlorophyll concentration in the Arabian Sea (L.V.Kuzmenko, IBSS, Ukraine). PDF file, 240Kb.



Myctophids of the sound scattering layer and their place in pelagic food webs (S.A. Tsarin, IBSS, Ukraine). PDF file, 130Kb.



Panama



Coastal Oceanographic Conditions Affecting Coral Reefs on both sides of the Isthmus of Panama (By L. D'Croz and D.R. Robertson). PDF file, 3.1Mb.



General information on the monitoring of water and plankton from the Bay of Panama, eastern Pacific Ocean (1984-1996). PDF file, 112Kb.



Upwelling and phytoplankton in the Bay of Panama (By L. D'Croz, J. B. Del Rosario and J.A. Gomez). PDF file, 4.0Mb.



Cross-Shelf Distribution of nutrient, plankton, and fish larvae in the San Blas Archipelago, Caribbean Panama (By L. D'Croz, D.R.Robertson, & J. A.Martinez). PDF file, 3.9Mb.



Ukraine



Methods of sampling and sample processing used in the Atlantic and Indian Oceans by the Institute of Biology of the Southern Seas. PDF file, 120Kb.



Zooplankton transfer through the Gibraltar Strait and peculiarities of its taxonomic composition and distribution in adjacent areas (V.N.Greze, A.V.Kovalev, E.P.Baldina, O.K.Bileva and A.A.Shmeleva). PDF file, 300Kb.



Biogeographical basis of the large marine ecosystems studies: the macroscale gyre of the South Atlantic Ocean (A. V. Kovalev & S. A. Piontkovski, IBSS, Ukraine). PDF file, 266Kb.



Species diversity index (IBSS, Ukraine). PDF file, 7Kb.



Bibliography of the IBSS and MHI publications related to the Indian Ocean (IBSS, MHI, Ukraine). PDF file, 361Kb.



Multiscale variability of tropical ocean zooplankton biomass (S. A. Piontkovski, and R. Williams). PDF file, 602Kb.



Biodiversity of Copepoda behavior. Review (In Russian, by S.A.Seregin & S. A. Piontkovski), PDF file, 0.7Mb.



Spatial and temporal variations of the South Atlantic mesozooplankton ecological diversity (By V. Skryabin, IBSS, Ukraine). PDF file, 400Kb.



Structural-functional relationships in the pelagic community of the eastern tropical Atlantic Ocean (Submitted by S.Piontkovski, R.Williams, S.Ignatyev, A.Boltachev, and M.Chesalin). PDF file, 550Kb.

Planktonic fields of the tropical Atlantic Ocean: spatial heterogeneity and physical-biological coupling (By S.Piontkovski, R.Williams, Yu.Tokarev, A.Mishonov, and Z.Finenko). TOS-2001, Miami, Florida. Abstract, PDF file, 80Kb. Poster, PPT file, 2.5Mb.

Plankton Communities of the Macroscale Anticyclonic Gyre of the South Atlantic Ocean (By S.Piontkovski, Z.Finenko, A.Kovalev, R.Williams, C.Gallienne, A.Mishonov, V.Skryabin, Yu.Tokarev, and V.Nikolsky). EGS XXVII General Assembly, Nice, France. Poster, PPT file 2.5Mb.

Zooplankton Abundance, Species Diversity and Climate Change in the Tropical Atlantic Ocean in Comparison to Northern Latitudes (By S.Piontkovski, R.Williams). TOS-2001, Miami, Florida. Abstract, PDF file, 80Kb.

The structure of the epipelagic ecosystem of the Arabian sea on the synoptic scale (In preparation by K.Banse and S.Piontkovski, eds). Review, PDF file, 120Kb

Working materials maps (prepared by V. Nikolsky, IBSS, Ukraine).

Further papers in preparation or submitted

a. Paper to be given at the GLOBEC meeting "Zooplankton and climate variability in the Atlantic Ocean: tropical versus northern latitudes". Qingdao, P.R. China, November 2002.

b. Paper to be given; S.Piontkovski and R.Williams, Biodiversity database and database management systems for the World's Ocean; Experience and outputs from five International projects. Flanders Marine Institute (VLIZ), The Colour of Ocean Data Victorialaan 3, B-8400 Oostende, (November 25-27, 2002).

c. S.A. Piontkovski, Z.Z. Finenko, A.V. Kovalev, R. Williams, C. P. Gallienne³, A. Mishonov, V.N. Skryabin, Yu.N. Tokarev, and V.N.Nikolsky. 2002. (submitted). Plankton Communities of the Macroscale Anticyclonic Gyre of the South Atlantic Ocean. Acta Oceanol (see **Appendix 5**)

Methods of sampling, sample processing and file formats of physical, chemical and biological data in the CD-ROM and measures taken for quality assurance are given in **Appendix 2** as "Description of file formats of the Darwin Initiative Project". "Additional information on descriptions of the physical and chemical data (Marine Hydrophysical Institute), "Methods of sampling and sample processing used in the Atlantic and Indian Oceans by IBSS, Sevastopol, Ukraine.

Methods of sampling and sample processing used by the Smithsonian Tropical Research Institute, Panama are given in **Appendix 2** as; "General information on the monitoring of water and plankton from the Bay of Panama, eastern Pacific Ocean".

The staff involved in the compilation of this CD-ROM are given below with contacts given in **Appendix 6**.

Plymouth Marine Laboratory (PML), United Kingdom

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Phone: (44) 1752 633 433 Fax: (44) 1752 633 101

The PI of the project: **Robert Williams**

Co-PI of the project:

Dr. Sergei Piontkovski (IBSS, Ukraine)
Co-PI of the project:
Dr. Alexey Mishonov (MHI, Ukraine)

**Institute of Biology of the Southern Seas (IBSS), National Academy of Sciences,
Ukraine**

2, Nakhimov Ave.,
Sevastopol, 99011, Crimea, Ukraine

Responsible person: Dr. Sergei Piontkovski;

Project participants:

Dr. Alexander Kovalev	Elena Popova
Dr. Valery Skryabin	Tatyana Melnik
Dr. Juliya Zagorodnaya	Galina Piontkovskaya
Dr. Sergej Seregin	Irina Prusova
Dr. Alexander Boltachev	Victor Nikolsky

Marine Hydrophysical Institute (MHI), National Academy of Sciences, Ukraine

2, Kapitanskaya St.,
Sevastopol, 99011, Crimea, **Ukraine**

2 554 253

Responsible person: Vladyslav Lyubartsev

Project participants: Lyudmila Galkovska, Volodymyr Myiroshnychenko

Smithsonian Tropical Research Institute (STRI),

Panama P.O.Box 2072, Balboa, Panama

Phone: (507) 227 6022

Fax: (507) 232 5978

"<http://www.stri.org/index.shtml>"

Responsible person: Prof. Luis D'Croz

Project participants: Dr. Juan A.Gomez

Juan Del Rosario, Plinio Gondola, Yehudi Rodriguez

Kenya Marine and Fisheries Research Institute (KMRFI),

Kenya P.O.Box 81651, Mombasa, Kenya

Phone: (254) 11 472 245

Fax: (254) 11 472 215

"<http://www.recoscix.com/toc1.htm>"

Responsible person: Melckzedeck Osore Project participants: Melckzedeck Osore

The majority of data in this CD comes from the Ukraine and the stations for the 2 Oceans are given below as examples.

Presented are biological, physical and chemical data for the Atlantic and Indian Oceans during 45 scientific cruises for the period 1963-1990 taken from the CD-ROM.

Atlantic Ocean

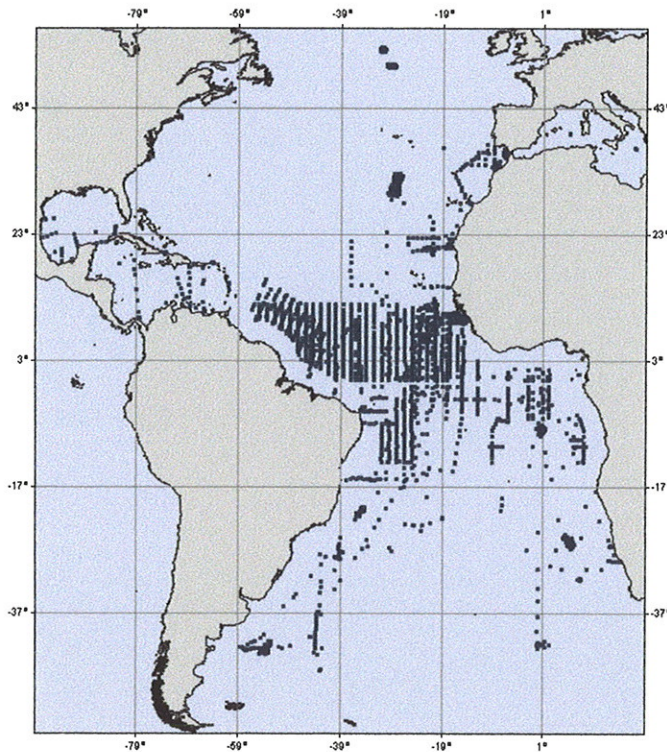
N/N	Ship Name, Cruise Number, Year	Parameters	Map, Info
1	Mikhail Lomonosov_13, 1963	temperature, salinity, oxygen, silicate, nitrites, pH, phosphate, zooplankton	../Atl_cruise_txt/n
2	Mikhail Lomonosov_14, 1963	temperature, salinity, oxygen, silicate, nitrates, nitrites, pH, phosphate, zooplankton	../Atl_cruise_txt/n
3	Mikhail Lomonosov_15, 1964	temperature, salinity, oxygen, silicate, nitrates, pH, phosphate, total alkalinity, zooplankton	../Atl_cruise_txt/n
4	Academician Kovalevsky_7_1, 1964	zooplankton	../Atl_cruise_txt/a
5	Academician Kovalevsky_7_2, 1964	zooplankton	../Atl_cruise_txt/a
6	Academician Kovalevsky_7_3, 1964	zooplankton	../Atl_cruise_txt/a
7	Academician Kovalevsky_7_4, 1965	zooplankton	../Atl_cruise_txt/a
8	Academician Kovalevsky_7_5, 1965	zooplankton	../Atl_cruise_txt/a
9	Mikhail Lomonosov_24, 1970	temperature, salinity, oxygen, pH, phosphate, zooplankton	../Atl_cruise_txt/n
10	Mikhail Lomonosov_25, 1970	temperature, salinity, oxygen, phosphate, zooplankton	../Atl_cruise_txt/n
11	Academician Vernadsky_03, 1971	temperature, salinity, oxygen, pH, phosphate, zooplankton	../Atl_cruise_txt/a
12	Mikhail Lomonosov_27, 1973	temperature, salinity, oxygen, silicate, phosphate, zooplankton (Juday net), zooplankton (Juday oceanic model net)	../Atl_cruise_txt/n ../Atl_cruise_txt/n
13	Academician Vernadsky_09, 1974	temperature, salinity, oxygen, pH, phosphate, zooplankton	../Atl_cruise_txt/a
14	Mikhail Lomonosov_30, 1976	temperature, salinity, oxygen, silicate, nitrates, nitrites, pH, phosphate, total alkalinity, zooplankton (Juday net), zooplankton (Juday oceanic model net)	../Atl_cruise_txt/n ../Atl_cruise_txt/n
15	Mikhail Lomonosov_32, 1977	temperature, salinity, oxygen, silicate, nitrites, phosphate, zooplankton (Juday net), zooplankton (Juday oceanic model net)	../Atl_cruise_txt/n ../Atl_cruise_txt/n
16	Professor Vodyanitsky	temperature, salinity, zooplankton (Juday net), zooplankton (Juday oceanic	../Atl_cruise_txt/p

	_05, 1979	model net)	../Atl_cruise_txt/p
17	Professor Vodyanitsky _07, 1980	<u>temperature, chlorophyll-a, particulate organic carbon, phosphate, primary production, attenuation coefficient</u>	../Atl_cruise_txt/p
18	Mikhail Lomonosov_38, 1980	<u>chlorophyll-a, particulate organic carbon, phosphate, oxygen, attenuation coefficient</u>	../Atl_cruise_txt/n
19	Mikhail Lomonosov_40, 1980	<u>temperature, chlorophyll-a, particulate organic carbon, phosphate, particulate organic nitrogen, attenuation coefficient</u>	../Atl_cruise_txt/n
20	Professor Vodyanitsky _11, 1982	<u>temperature, salinity, chlorophyll-a, oxygen, phosphate, phaeopigments, zooplankton biomass, zooplankton</u>	../Atl_cruise_txt/p
21	Professor Vodyanitsky _13, 1982	<u>temperature, salinity, chlorophyll-a, oxygen, phosphate, primary production, nitrates, nitrites, zooplankton biomass, zooplankton</u>	../Atl_cruise_txt/p
22	Professor Vodyanitsky _18, 1985	<u>temperature, salinity, zooplankton</u>	../Atl_cruise_txt/p
23	Academician Vernadskyy_32, 1985	<u>temperature, salinity, chlorophyll-a</u>	../Atl_cruise_txt/a
24	Professor Vodyanitsky _20, 1986	<u>temperature, salinity, chlorophyll-a, oxygen, phosphate, phaeopigments, nitrates, zooplankton</u>	../Atl_cruise_txt/p
25	Mikhail Lomonosov_47, 1986	<u>chlorophyll-a</u>	../Atl_cruise_txt/n
26	Academician Vernadsky_34, 1986	<u>temperature, salinity, chlorophyll-a</u>	../Atl_cruise_txt/a
27	Professor Vodyanitsky _21, 1986	<u>temperature, salinity, chlorophyll-a, phosphate, phaeopigments, nitrates, nitrites, zooplankton biomass, zooplankton</u>	../Atl_cruise_txt/p
28	Academician Vernadsky_36, 1987	<u>temperature, salinity, chlorophyll-a</u>	../Atl_cruise_txt/a
29	Mikhail Lomonosov_48, 1987	<u>temperature, salinity</u>	../Atl_cruise_txt/n
30	Professor Vodyanitsky _24, 1987	<u>temperature, chlorophyll-a, primary production, phaeopigments, secchi disk depth, zooplankton biomass, zooplankton</u>	../Atl_cruise_txt/p
31	Professor Vodyanitsky _29, 1989	<u>temperature, salinity, chlorophyll-a, primary production, phaeopigments, oxygen, phosphate, nitrates, nitrites, zooplankton biomass, zooplankton</u>	../Atl_cruise_txt/p

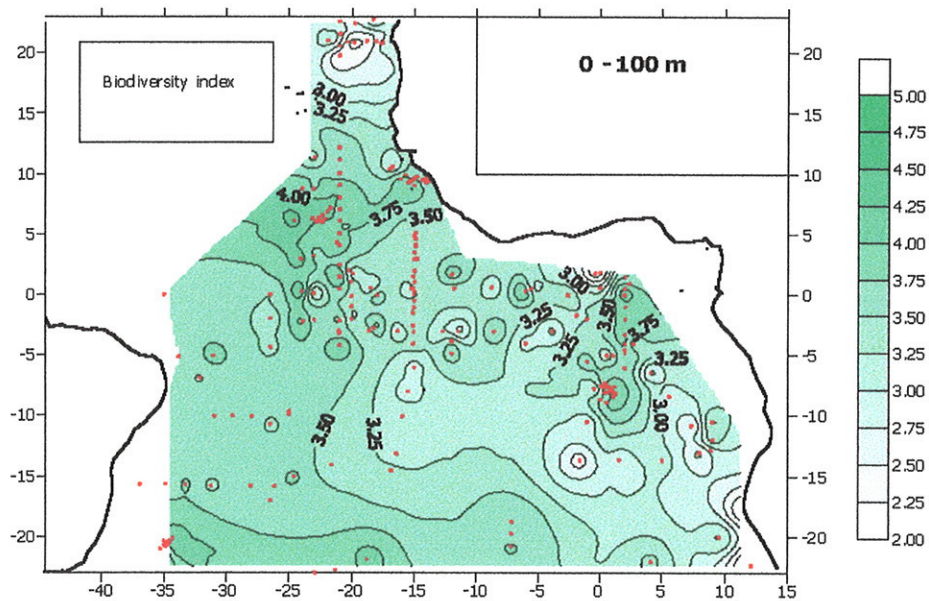
Zooplankton was sampled by open-closing JUDAY net with a 0.36 m ring diameter and mesh size of 125 mkm. Additionally, the JUDAY oceanic model JOM with 300 mkm mesh size and 0.8 m ring diameter was used.

Atlantic Ocean Sampling Sites

Over 685 species, developmental stages and other taxonomic categories were identified for the Atlantic Ocean. Example of the zooplankton species identified, from the analyses of the Atlantic Ocean samples, is given in **Appendix 3**.



Biodiversity Indices of Zooplankton from the Central Atlantic Ocean, see CD-ROM



Indian Ocean

N/N

Ship Name, Cruise Number, Year Parameters

1

Mikhail Lomonosov_19, 1966

temperature, salinity, secchi disk, oxygen, alkalinity, phosphate, pH

../Ind_cruise_txt/

2

Academician Vernadsky_05, 1972

temperature, salinity, oxygen, phosphate, phytoplankton

../Ind_cruise_txt/

3

Academician Vernadsky_10, 1975

temperature, salinity, secchi disk, oxygen, nitrate, phosphate, silicate

../Ind_cruise_txt/

4

Academician Vernadsky_11, 1975

temperature, salinity, secchi disk, oxygen, nitrate, phosphate, silicate

../Ind_cruise_txt/

5

Professor Vodyanitsky_04, 1978 phytoplankton

../Ind_cruise_txt/

6

Academician Vernadsky_19, 1979

temperature, salinity, oxygen, phosphate, silicate

../Ind_cruise_txt/

7

Academician Vernadsky_21, 1979

temperature, salinity, transparency, secchi disk, oxygen, phosphate, silicate

../Ind_cruise_txt/

8

Academician Vernadsky_22, 1980

temperature, salinity, transparency, secchi disk, oxygen, phosphate, silicate, pH, nitrite, primary production, chlorophyll, phytoplankton, zooplankton biomass

../Ind_cruise_txt/

9

Professor Vodyanitsky_08, 1980

temperature, salinity, oxygen, oxygen saturation, nitrate, phosphate, carbon particle org. matter, phosphorus suspended, primary production, chlorophyll, phytoplankton, microzooplankton, zooplankton biomass

../Ind_cruise_txt/

10

Mikhail Lomonosov_39, 1980

temperature, salinity, transparency, secchi disk, oxygen, phosphate, silicate

../Ind_cruise_txt/

11

Academician Vernadsky_24, 1981

temperature, salinity, transparency, secchi disk, oxygen, phosphate, silicate, phytoplankton

../Ind_cruise_txt/

12

Professor Vodyanitsky_14, 1983

Professor Vodyanitsky_14, 1983
temperature, salinity, oxygen, phosphate, nitrates, nitrites, suspended matter, chlorophyll-a, primary production, zooplankton

../Ind_cruise_txt/|

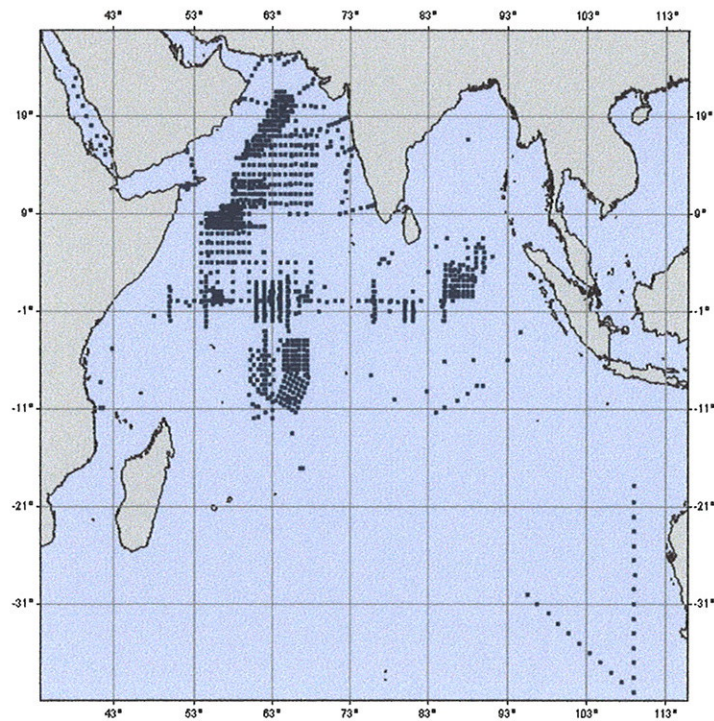
3
Professor Vodyanitsky_23, 1987
temperature, density, phosphate, particle organic carbon, chlorophyll-a, pheophytin, primary production, phytoplankton, zooplankton

../Ind_cruise_txt/|

14
Professor Vodyanitsky_30, 1990
temperature, salinity, oxygen, oxygen saturation, phosphate, nitrite, nitrate, primary production, chlorophyll-a, pheophytin, phytoplankton, microzooplankton, bacteria, zooplankton, phytoplankton

Indian Ocean Sampling Sites

There were 652 zooplankton species, genera and 558 phytoplankton species, genera, order and other taxonomic entities identified from the Indian Ocean plankton samples.



Training and capacity building activities

- Two scientists from MHI and IBSS(Ukraine) were stationed in UK for the whole period of the project.
- Training for scientist from participating countries in a one week training programme in web design and content at PML, UK in April 2001. Persons attending; R. Williams (PML, UK), Dr Alexey Mishonov (MHI, Ukraine), Dr V. Myroschenko (MHI, Ukraine) and M. Osore (KMFRI, Kenya).
The meeting concerned methodology of web design, construction and data content, quality, quality assurance for the continuing development of the CD-ROM.
- The meeting/training scheduled for KMFRI, Kenya for a period of 7 days, in the first year, was initially postponed and then deleted from the project. This was the outcome of the problems we had in Ukraine with the 'Authorities'.

5. Project Impacts

The production of the CD_ROM for dissemination to the wider scientific world will advertise these unknown data, which when integrated into the databases in the National Ocean Data Centres will contribute to the better understanding of species distribution, abundance and diversity in the Atlantic and Indian Oceans.

The production of this CD has helped Ukraine, Kenya and Panama meet its obligations under the Biodiversity Convention (CBD) by increasing the flow of information between countries concerning biovariability and biodiversity in the Oceans. This will encourage Panama and Kenya to extend its involvement and participation in such projects and, in the case of Kenya (KMFRI), new developed skills in database production and data manipulation will help in further international co-operation. Further funding has been achieved to extend this work.

6. Project Outputs

The Darwin Initiative Standard Output Measures for Project 162/8/251 are given in **Appendix 4**.

Measurable outputs (Code number):

- a) CD-ROM (with Darwin Initiative logo) manufactured for the dissemination among scientists and Institutes through the world.
- Final CD-ROM March 2002.
- b) Series of joint scientific papers and Conference presentations with the analysis of biodiversity and biovariability patterns evaluated from the created data bank.
- Ms prepared for publication and five Conference submissions prepared.
- c) Prepare Web site for Darwin Initiative activities, placed on PML Web-server
- Web site prepared and placed on server.
- d) Established data dissemination network between UK, Ukraine, Kenya and Panama (17A – 3).
- Successfully achieved.
- e) Enhanced/extended data dissemination network between UK and Ukraine (17B – 1).

- Successfully achieved with transfer of all data to create CD-ROM.
- f) Proposed TV, radio and newspaper interviews planned for UK, Ukraine, Kenya and Panama (18C-3, 18D-1, 19C-3, 19D-1).
 - Radio/newspaper/scientific newspapers all published articles about the DI consortium. No TV interviews
- g) Transfer of capital items, software and expertise to host countries (20 - £4,000).
 - Achieved.
- h) Matching funds and contributions in kind from participating Institutes for extra overheads, computer facilities, and extra staff costs, plus supporting initiatives (23 – £190,008).
 - Matching funds put in place.

Actual outputs agreed in the initial 'Project Implementation Timetable' and the 'Project Outputs Schedule' were achieved with the exception of the cancellation of the visits to Kenya and Panama.

Publications

The web site will remain active and the CD-ROM will be disseminated in the latter part of the year 2002.

Further funding has already been obtained from INTAS to extend the objectives of the project for a further 2 years.

Publications and material given in the CD-ROM are freely available (see **Appendix 5**). There will be a continued legacy with the project with 2 papers in press, others in writing and a further 2 papers to be given at Colour Ocean Data Symposium (November, Brussels, Belgium) and GLOBEC Open Science Meeting, China, 15-18 October 2002

Funding for these continued activities will come from allocated funding under the Darwin Initiative and from contracts which have supported Project.

7. Project Expenditure

Darwin Grant: Expenditure Details - Total Grant £ 160,992

Expenditure details	1999/2000	2000/2001	2001/2002	Total	Actual
Rent, rates, heating lighting and cleaning					
Postage, telephone, stationary					
Travel and Subsistence					
Printing					
Conferences, seminars, training					
Capital items					
Other					
Salaries					

* Contain £1150 for 2 audits, which were not programmed in the expenditure, the final one is scheduled in September of 2002.

‘ The under spend primarily results from the postponing of the visit to KMFRI, Kenya for 1 week training and data assembly and visits to STRI, Panama..

+ The overspend in ‘Other’ category resulted from the large number of bank charges for overseas payments.

8. Project Operation and Partnerships:

The partnerships, which were formed to set up this project, were maintained over the three years. The main efforts in the project planning and implementation came from the Ukraine laboratories. This is not surprising because these Laboratories held the larger proportion of the data used in setting up the database and contributed the majority of the manpower. The Institutes involved are given in Appendix 6 the personnel on pages 6 and 7 of this Report.

During the project lifetime, other biovariability and biodiversity projects were continued or started, see **section 12**.

- Collaboration between UK and host country partner(s) over the last year was very effective through e-mail, training periods and visits and established partnerships will continue for years to come.
- The major difficulty over the first and second years was the problems encountered in Ukraine when our Ukrainian PI (Dr S. A. Piontkovski) was charged initially with sending classified data to the West and then with currency irregularities (New Scientist, 15 April 2000, pp. 30- 33).
- On February 11, 2000, the (EU) INTAS commission visited Ukraine and discussed with the Prosecutor in Sevastopol the case of Dr Piontkovski and others and clarified the situation. It finally transpired that Dr Piontkovski has acted correctly within the framework of current rules. It was only the final intervention of INTAS, which resolved this situation.
- The problems outlined above delayed and finally cancelled the visits by Dr Piontkovski to KMFRI and STRI, Panama and our colleague’s visit to PML from Kenya was postponed until April 2001.
- There were still residual problems and difficulties with the UK FCO over entry of Dr Piontkovski (IBSS, Sevastopol, Ukraine, presently residing in USA) into the UK. Even though I discussed the problems with the Secretariat and with the UK Embassy in Kiev (sent a number of faxes to Ambassador Roland Smith) he was refused entry into UK by default. The Embassy in Kiev kept on asking him to wait and return to the Embassy for a decision prior to receiving a visa. (I mention this in the light of the discussions held at the Darwin Initiative Seminar, 10 May 2001, with the Rt. Hon Michael Meacher MP where he stated that the Embassies abroad would attempt to assist all participants of the DI to fulfil their commitments). This delay went on for about 10 days, after which Dr Piontkovski left Ukraine (Kiev) for the USA, after successful application for an entry visa, within 24hrs to the US Embassy.
- To continue our work together, he applied for a visa for 6 month entry into the country on 10 Oct., 2000 but the UK Embassy in New York requested further information from him concerning his duties and project schedule. All requested information was mailed on the 24 Oct. I kept DETR informed about these problems and sought their assistance to resolve this situation.
- These unforeseen difficulties arose from problems concerning the implication of the DI Project in Ukraine.

- A number of visits to and from UK were postponed or cancelled but these have not impacted on the objectives of the project.
- The project has been linked with two INTAS projects, one in the Indian Ocean and the other in the Caspian, Aral and Mediterranean Seas and with the NATO Black Sea Ecosystem Processes and Forecasting/Operational Database Management System (SfP-ODBMS Black Sea). <http://sfpl.ims.metu.edu.tr/>.

9. Monitoring and Evaluation, Lesson learning

All participants initially agreed the work plan and timetable and the progress was monitored closely by the PI.

A constant dialogue was kept up throughout the 3 years using e-mail to all co-ordinators in the three countries covered by the project. The established targets outlined in the programme were monitored and reports were sent in to the project leader. The web site was established by Dr Mishonov (Ukraine) and inputs to the site were co-ordinated by the Ukrainian Leader Dr Piontkovski. Inputs from Panama, Kenya and Ukraine were first checked and corrected (an ongoing project) prior to mounting on the web site.

Targets were set for the whole 3 year schedule see Grant Application.

- These were;
- Selection of data
 - Digitising selected data
 - Organising the data
 - Creation of a computerised database on CD-ROM
 - Training, Meetings and publications
 - Preparation of web-site and online dissemination of data

The project fulfilled all its stated results;

- 1) CD-ROM disks manufactured for the dissemination among scientists and Institutes throughout the world.
- 2) Series of joint scientific papers with the analysis of biodiversity and biovariability patterns evaluated from the created data bank.
- 3) Preparation of web site.

Lesson to be learned

Prior to the commencement of data transfer protocols were observed and '**CO-OPERATION AGREEMENTS**' were signed between PML and IBSS, Ukraine by the respective Directors. The agreement reached was;

1. To co-operate in the field of fundamental and applied marine biology research through exchange of specialists, (including long term visits), joint scientific publications (including joint monographs) development of joint oceanographic databases (with their release in the form of CD and web sites) and teaching.
2. To submit for international funding and to implement the funded joint research projects. To discuss the details of joint research in the framework of acting research projects on the level of Principal Investigators and Co-ordinators of the appropriate projects.
3. To publish results of joint research on the basis of acting national legislation.

Unfortunately, although signed protocols were exchanged they did not prevent serious problems arising due to the transfer of money from UK and of data to UK.

Our major difficulty over the first and second reporting years was the problems encountered in Ukraine when our Ukrainian PI (Dr S. A. Piontkovski) was charged initially with sending classified data to the West and then with currency irregularities (New Scientist, 15 April 2000, pp. 30- 33).

There are certainly lessons to be learned.

- After the problems with our Ukrainian colleagues, in the first and second year of this project, concerning the sensitivity of movement of data from the country of origin certain guide lines needed to be set out.
- The Ukrainian Authorities now require an Act of Expertise for the CD-ROM, which must be signed by a special commission prior to release. This will involve a board of 6 persons to ascertain that the CD (or any other product mailed abroad) does not contain information restricted by the Ukrainian Authorities for dissemination, which can cause harm to the state.
- As project leader, I have had to supply proof and certify that all materials used to create the CD have been already disseminated, previously published or legally received from all sources. This, I assume, should apply to all FSU countries and for all international research programmes and this process should be built into all future projects.

10. Darwin Identity:

- The Darwin logo and name was used in the CD-ROM label, CD-ROM jewel-case label, in the Project's web pages and in all posters and platform talks given in Conferences during the tenure of the Project.
- Acknowledgement was made to the DI in all published work.
- The Darwin Identity was used effectively to promote funding.
- I believe it was the first time that the Darwin Initiative had sponsored a project with Ukraine and Panama where the project had a clear identity. Certainly the awareness is now in the 2 main marine research Institutes in Ukraine and the aims of the Darwin Initiative are known. This led to a further project submission from Ukraine in the last round.

11. Leverage

Additional funds were attracted to biodiversity work associated with the project, which has helped our partners in the FSU to stabilise their Departments.
(see below **12.**)

12. Sustainability and Legacy

- The database in the CD-ROM constructed under the Project will provide an invaluable source for reference into biovariability in the Atlantic and Indian Oceans. This in it self will provide a lasting and positive contribution from the Darwin Initiative.

- The partners have secured additional funding to carry on this research for a further 2 years and have added to the numbers of personnel involved in the project to more >40. That in it self provides a positive legacy in assisting FSU scientists to remain within science in their countries.
- The Darwin project was supported by the INTAS Project No. 95-UA-80 "Dissemination of data on environmental characteristics using innovative (CD-ROM) Data Management; Tools for protection of biodiversity in the endangered areas of the World's Tropical Ocean", completed in August 2000 and by the new INTAS Project No 59 (2001-2003, 120,000 Euro) (co-ordinator R. Williams) "Dissemination of data on environmental characteristics using a CD-ROM based data management system for the Atlantic Ocean and the enclosed seas (Mediterranean Sea, Caspian Sea and the Aral Sea". A total of 28 persons from the FSU are working on these data. The results from these two INTAS project will enhance the database built under the Darwin Initiative.
- Further support (13,600 Euro) for the above initiative has been given by NATO under a Collaborative Linkage Grant EST CLG 978843 for 2001-2003. To enable further work to be done on the database and additional data to be added from the Mediterranean, Caspian and Aral Seas
- Further support (120,000 US \$) came in March 2002 from the Office of Naval Research, USA to provide a bioluminescence database for the World's Ocean. Again these additional funds will keep the FSU group together with the additional colleagues from Azerbaijan and Kazakstan working under the INTAS project
- A few of the team members in Ukraine are involved in the development of the UNDP Caspian Environment Programme and in the NATO Black Sea Ecosystem Processes and Forecasting/Operational Database Management System (SfP-ODBMS Black Sea) <http://sfpl.ims.metu.edu.tr/>.

13. Value for money

To save and transfer physical, chemical and biological data from 45 major oceanographic cruises by Ukraine, 4 major surveys off the coast of Kenya and data from monitoring, 1984 to 1996, from the Bay of Panama and the eastern Pacific Ocean for international dissemination, and evaluation is exceptional value for the money funded under the Darwin Initiative.

If it were not for funding under this Initiative then many of these data would have been lost to the National and International communities.

Author/Date

30 June 2002.



Appendices

Darwin Initiative for the Survival of Species

Final Report

Data rescue and compilation (CD-ROM) for assessment of plankton biodiversity and biovariability in the Indian and Atlantic Oceans.

- 1. Project Contribution to Articles under the Convention on Biological Diversity (CBD)**
- 2. a) Description of file formats of the Darwin Initiative Project
 b) Additional information on descriptions of the physical and chemical data (Marine Hydrophysical Institute)
 c) Methods of sampling and sample processing used in the Atlantic and Indian Oceans by IBSS, Sevastopol, Ukraine
 d) General information on the monitoring of water and plankton from the Bay of Panama, eastern Pacific Ocean**
- 3. Zooplankton from the analyses of the Atlantic Ocean samples taken from the CD-ROM**
- 4. Standard Output Measures for Project**
- 5. Publications**
- 6. Darwin Contacts**

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