COUNTRY / PROGRAMME: UKRAINE

Project Title:
Ukraine GLOBEC

Source of Information:
http://www.ibss.iuf.net/links/globec/globec.html

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Duration:
1997 - 2002

1) Dissemination of data on environmental characteristics, using innovative electronic (CD-ROM) data management: **Tools for the protection of biodiversity in the endangered areas of the World's Tropical Ocean**

The leading oceanographic institutes of Ukraine and Russia hold extensive and very valuable information on the species diversity and spatial-temporal variability of physical, chemical and biological characteristics from the World's Tropical Ocean. Some of the regions like the Arabian Sea were acknowledged as the priority research area of current international programmes (GLOBEC, JGOFS, WOCE). Up to now, this Former Soviet Union information has been practically inaccessible to scientists outside the FSU. Participants of the project have suggested that the archived material can be made available through the establishment of scientific links between western Europe and FSU countries, which will enable data to be evaluated, jointly analysed and made available to the international oceanographic scientific community. In 1997, a joint research project was funded by the International Association for the Promotion of Cooperation with Scientists from the Independent States of the Former Soviet Union (INTAS) in the frame of the project UA-95-80.

Participating Institutions:
Institute of Biology of the Southern Seas, Ukraine
Marine Hydrophysical Institute, Ukraine
Institute of Oceanology, Russia
Expert Center for Taxonomic Identification, University of Amsterdam
Plymouth Marine Laboratory, UK

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Objectives:
The importance of the proposed studies is related to global change, the problem of environmental protection and involvement in training and education in new electronic technology.
Our knowledge on biovariabilty at different scaled is still far from complete. The macroscale variability (thousands of km, several months) and the synoptic variability (hundreds of km,

several weeks) of the ocean are the most poorly studied ranges in the ecological continuum of scales. Publications dealing with the open ocean are extremely scarce as expensive and numerous field surveys are required. However, many datasets already exist in institutes and museums and are available for analysis. What is not known by the majority of western scientists is the number of extremely detailed surveys done in the World's Ocean by the Former Soviet Union (1960-1995). The evaluation and modern analysis of these data can fill the gap of our knowledge on biovariability required for the macroscale and the synoptic scale. The collected information remains within the archives in Ukraine and Russia. Some of data are published in little known Russian/Ukrainian journals or monographs. The above data also form a basis to become combined with those obtained by USA, UK and The Netherlands during recent expeditions to the Indian Ocean.

The proposed project concerns a co-operation between Institutes to digitise the basic oceanographic datasets and release them on CD-ROM. The CD-ROM will be made widely available to scientists all over the world. The above Institutes are widely acknowledged as the leading oceanographic centres of their respective countries in the long-term studies of the tropical ocean.
In this project, the attention was mainly devoted to data from Ukrainian expeditions. The unique benefits of this data were:

- Numerous physical and biological measurements cover huge area of the World's Ocean (see the CD-ROM inventory map).
- The majority of the environmental parameters were measured simultaneously. Research vessels (40-80 scientists on board) made mesoscale sample grids for different field of studies simultaneously.
- The majority of biological samples are already treated and large numbers of organisms have been identified by specialists.
- Data from many cruises represent field surveys conducted in a form of numerous regular grids of oceanographic stations, which is unique for the open ocean regions.

This first results of these efforts will be presented in two forms:

i. CD-ROM disks manufactured for the dissemination
ii. joint scientific papers with the analysis of biodiversity and biovariability patterns evaluated from the created data bank.

Research Activities:
At the start of the project, data existed as printed archive reports, notes and some partly digitised (i.e. computerised) units. Data from the Indian Ocean were used to produce the CD-ROM data base. The available archive reports included expeditions of Ukrainian and Russian research vessels to the Indian Ocean. The collected plankton and trawl samples were treated to the level of genus and part of them to the species level. The sampling procedure included the studies of vertical profiles, trawls, horizontal plankton continuous records and net catches (the upper 200m layer mainly).

The major parameters suggested for the INTAS project database were as follows:

Physical

- Temperature
- Salinity

Chemical

- Dissolved oxygen (O2)
- Phosphate (PO4)
- Nitrate (NO3)
- Nitrite (NO2)

Biological

- Chlorophyll-a,
- Primary productivity (based on the 14C method).
- Bacterioplankton: Total abundance, total biomass and production.
- Phytoplankton: Total abundance, and total biomass

- Microzooplankton: Total abundance, and total biomass
- Mesozooplankton: Total abundance, total biomass, taxonomic composition, and size composition.
- Micronekton (Myctophidae): Total abundance, total biomass, species composition, and size composition.
- Nekton (Epipelagic squids): Relative abundance, and size composition.

Four types of archived data were presented:

i. Physical and chemical data sets from archives of the MHI Database Laboratory. They are digitised, cleaned (i.e. quality-controlled) and included in various oceanographic databases.
ii. Physical, chemical, and biological data from the database archive. These data were digitised since the beginning 1990-91 and hitherto they were kept in different formats ("as is").
iii. Physical, chemical, and biological data from the IBSS Scientific Archive available in paper form only
iv. Biological untreated samples.

Funding Agency:
INTAS, DETR Darwin Initiative

2) Plankton Biodiversity and Biovariability in the Indian and Atlantic Oceans

This Project is a collaborative project involving local Institutes (two in Ukraine, one in Panama and one in Kenya) and the host country (UK) and focusing on work to implement the Biodiversity Convention of 1992.

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Participating Institutions:
Plymouth Marine Laboratory, UK
Institute of Biology of the Southern Seas, Ukraine
Marine Hydrophysical Institute, Ukraine
Smithsonian Tropical Research Institute, Panama
Marine and Fisheries Research Institute, Kenya

Objectives:
The macro-scale variability of biodiversity (thousands of km, several months) and the synoptic variability of biodiversity (hundreds of km, several weeks) of the ocean are the most poorly studied ranges in the ecological continuum of spatial-temporal scales. There is a need to understand and quantify changes of biodiversity in marine ecosystems, throughout a wide range of spatial-temporal scales.

The project will set up co-operation between the 5 institutes to rescue and compile oceanographic data sets and release them on CD ROM; to focus international attention on the biodiversity and biovariability of the tropical zones of the world's oceans; to provide assistance to the institutes which lack financial and/or expertise resources; to provide training in the UK for scientists from the institutes; to improve the information base at the genus and species levels and to focus on providing archival data for further analysis where it may have wider impact; to develop new tools for presentation, analysis and dissemination.

Duration:

April 1999 for 3 years.

3) The Database on the Bioluminescence Field of the World's Ocean

The data base from the vertical profiles and horizontal continuous records of bioluminescence, chlorophyll a, zooplankton, and CTDs obtained by the Former Soviet Union (FSU) expeditions to the World's ocean during the previous 30 years in the Atlantic, Pacific, Indian and Antarctic Oceans and the Mediterranean Sea basin will be assembled on PCs. A CD-ROM version of the database will be released and will be based on two types of the software:

- The Inventory software (InvBase), which enables viewing, on a PC, of the cruise tracks, sampling positions of all stations and full cruise information together with all sampled parameters.
- These data entered into the MHI Oceanographic Data Management System (CruBase and Oceanbase), which allows full data preparation, multi-parametric and cross-parametric data queries, data checking system for 'experts' data control, data visualization (depth-parameter plots) and a complete full hypertext context sensitive help system.

The database will be used to investigate the quantitative relationship between the hydrological parameters, chlorophyll "a", zooplankton concentration and bio-luminescence intensity over regions.

The following vertical profiles of parameters will be used to create the database and assess linkages between bioluminescence and associated parameters:

- Bioluminescence intensity;
- Chlorophyll "a" concentration;
- Zooplankton abundance and (or) biomass;
- Temperature- salinity- water density (CTD casts).

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Objectives:

i. To assemble a comprehensive database on the plankton bioluminescence and associated parameters measured by the Former Soviet Union expeditions to the World's Ocean.
ii. To quantify the relationships between bioluminescence intensity, chlorophyl "a", and zooplankton.
iii. To document and characterize the spatial-temporal variability of the bioluminescent field on regional and global scales and to determine the physical and biological factors causing this variability.

Systems Types Studied:

Studied regions with bioluminescent casts and associated parameters will be represented by:
The Atlantic Ocean;
The Pacific Ocean, tropical and subtropical zones;
The Indian Ocean, tropical and subtropical zones;
The Mediterranean Sea basin;
The Norwegian and Barents Seas;
The Southern Ocean.

Processes Examined:

Potentially, the whole data bank of FSU archives will include approximately 15000 bioluminescence profiles obtained in the upper 100m layer:
4150 bioluminescent profiles from the Atlantic Ocean;

5200 bioluminescent profiles from the Pacific Ocean;
850 bioluminescent profiles from the Indian Ocean;
3800 bioluminescent profiles from the Mediterranean Sea basin
1000 bioluminescent profiles from the Norwegian and Barents Seas

Expected results:

i. The release of the CD-ROM version of bioluminescent database of the world's ocean bioluminescence.
ii. The averaged annual map of bioluminescent field of the tropical and subtropical regions of the Atlantic, Pacific, Indian Oceans and the Mediterranean basin.
iii. Material publications and dissemination
iv. We plan to prepare a series of publications on the project materials and a book on spatial-temporal variability of plankton communities of the open ocean.

Ukraine GLOBEC is also carrying out research on themes that are relevant to both SPACC and Southern Ocean GLOBEC. For more information please see the Ukraine GLOBEC website: http://www.ibss.iuf.net/links/globec/globec.html

Ukrainian National Research program in Antarctic Region in 2001 – 2010

Alexander R. Boltachev, Deputy Director of Institute of Biology of the Southern Seas (IBSS),

These projects are a continuation of former Ukranian research projects in the Antarctic Region, within the framework of the National program co-ordinated by the Ukrainian Antarctic Centre of the Ministry of Sciences and Education.
The purpose of the research is the determination of the theoretical fundamentals for a perspective forecast of Antarctic krill and fish stocks and the structure of the pelagic community in the Atlantic part of the Antarctic Region and the regular issue of recommendations on krill and fish fishing in the region, on the basis of complex monitoring.

This work is not included in the SO GLOBEC section as it is not formally a part of the International SO GLOBEC effort but part of the general Ukrainian GLOBEC Activities.

The functional structure of antarctic krill species range
E.Z. Samyshev, Institute of Biology of the Southern Seas

The Bioenergetic Characteristics of Krill
E. Z. Samyshev, Institute of Biology of the Southern Seas (IBSS)

The relative evaluation of the assimilation of Primary production by krill, salps and bacterioplankton in the Atlantic Sector of AntarcticA (ÀSA) under the conditions of mass development of Gelatinous animals
E.Z. Samyshev, N.I. Minkina, V.D. Chmyr, S.A. Seryogin, Institute of Biology of the Southern Seas (IBSS)

The Functional Role of Antarctic Plankton Main Components
E.Z. Samyshev, Institute of Biology of the Southern Seas (IBSS)

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