



April 2000 - No. 9

ARGO STAYS ON COURSE

" **Without** question Argo is the most ambitious and complex *in situ* ocean observation concept ever attempted. The stark reality of that statement hits home with greater clarity as planners confront the enormity of the effort needed to integrate all the components into a smoothly functioning system. They are willing to accept the challenge because Argo will deliver a system that represents a quantum leap in our ability to describe the state of the ocean. The World Ocean Circulation Experiment (WOCE) gave us a large-scale composite picture of the world ocean from top to bottom that took more than seven years to complete. Argo will provide observations for an updated global estimate of the ocean state at 3° by 3° resolution from the surface down to 2000 metres every two weeks! The very boldness of this venture is attracting intrepid, top-caliber scientists from around the world. The vast improvement it promises for predicting climate and extreme weather is engendering a burgeoning interest in governments to participate in its realization. The time-lines for implementation are daunting; they are set to match launch dates for satellites for the Global Ocean Data Assimilation Experiment (GODAE) of which Argo is the central *in situ* element.

(continued on page 2)

ARGO REGIONAL IMPLEMENTATION

" **Six** countries (Australia, Canada, France, Japan, Republic of Korea and United States) held an International Implementation Planning Meeting for Argo Floats in the Pacific Ocean and Adjacent Regions, in Tokyo, on April 13-14, 2000. Two intergovernmental organizations (the IOC and WMO, co-sponsors of the meeting), and two regional organizations (PICES and SOPAC) also attended.

In the "Tokyo Statement" at the end of the meeting, the participants agreed that:

"The global environment is experiencing regional and global impacts through anomalous climate events and other extreme conditions. It is essential to implement observing systems and undertake research to understand the mechanisms that lead to such conditions and to provide a capacity for predicting extreme events and climate variability. Such capacity will allow the Pacific Ocean countries and adjacent regions to adapt to, and take advantage of, climate and environmental change.

The Argo programme, in which profiling floats will be deployed in the global ocean to routinely and consistently observe the state of the upper ocean, will contribute to research and prediction of seasonal to decadal climate variability and climate change, and to significant improvements in environmental prediction.

(continued on page 3)

In this issue, you will find:

- 1 Argo Stays on Course, *by Arthur Alexiou*
- 1 Argo Regional Implementation, *by W. Stanley Wilson*
- 3 Pacific Islands Conference on Climate Change, Climate Variability & Sea-level Rise, *by Bill Erb*
- 4 HOTO and Indicators of Ocean and Human Health, *by Anthony Knap*
- 6 Coastal GOOS Panel Meetings, *by Thorkild Aarup*
- 6 PICES and GOOS, *by Ned Cyr*
- 6 South Asia Node of the Global Coraf Reef Monitoring Network, *by Ned Cyr*
- 7 GOOS LMR-II and III, *by Ned Cyr*
- 7 GLOSS Group of Experts Meeting, *by Thorkild Aarup*
- 8 GLOSS Training Course in Sea-Level Measurements and Data Analysis, *by Thorkild Aarup*
- 8 The Ship-of-Opportunity Programme, *by Yves Tréglos*
- 9 JCOMM, *by Peter Dexter*
- 11 POGO Meeting, *by Lisa Shaffer*

ARGO STAYS ON COURSE

(continued)

Cognizant of all the developments in float design, communications, ocean modelling, data management, etc., that must mesh in the next few years, the Argo Science Team met in Southampton, United Kingdom, 7-9 March 2000, to review national plans and assess progress. Reports were presented by the "club" of countries already committed to contributing floats, i.e., Australia, Canada, European Union, France, Germany, Japan, Korea, UK and USA. New Zealand is among other nations expecting to join the "club" soon. The numbers of floats were not yet firm as proposals are awaiting funding decisions in several countries. Nevertheless, there was reason for optimism that the target number of 3000 would be reached. Argo Science Team Chairman, Dean Roemmich, hopes to have 1500 floats globally

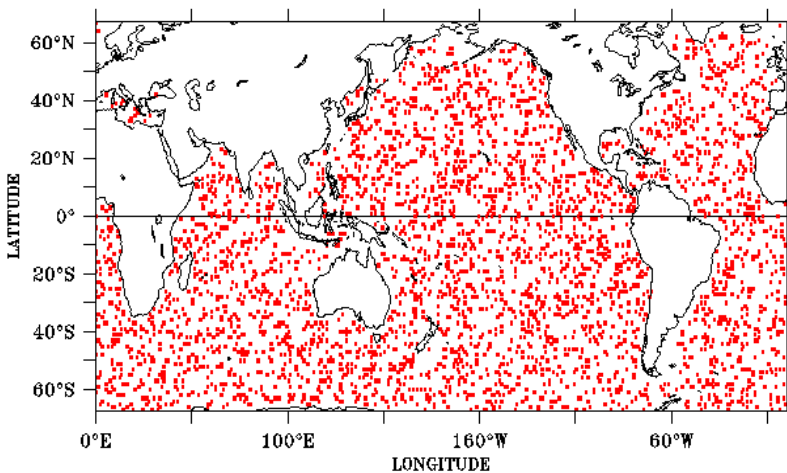
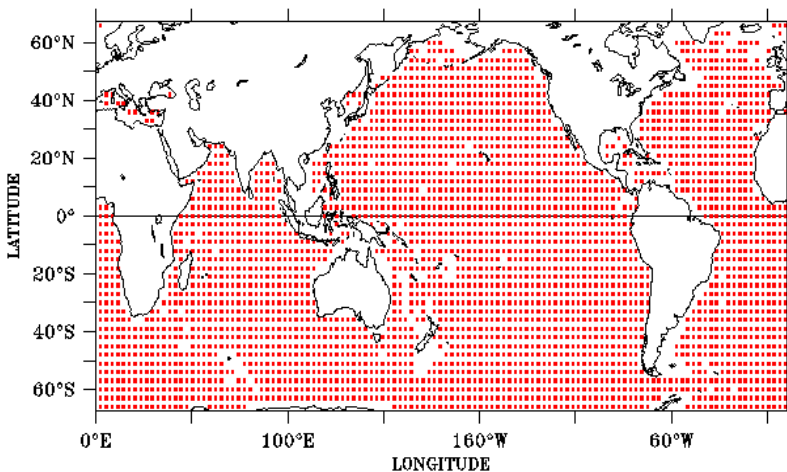
distributed in the water by 2003 and the full 3000 by 2005.

To ensure that the data system is in place for floats to be deployed in the near future, data management prototypes were examined of those countries having begun work on an Argo Data System; the purpose: to determine the degree to which they will meet the requirements for quality controlled real-time and delayed mode temperature and salinity data streams. The Argo data system must be country-to-country compatible to facilitate easy exchange and maximum usefulness.

Evolving technical capabilities of floats able to satisfy user requirements were assessed and the very latest news is heartening.

The most recent extended experience with the conductivity sensors on recovered floats showed no drift for up to 3 years. This was a real confidence booster as maintaining conductivity accuracy over the long term has been a major concern. Sensor performance standards based on realistic experience will be established soon to ensure consistency of an Argo array composed of intermingled floats from multiple float providers.

The meeting unveiled a proposal for the establishment of an Argo Information Centre (AIC) within the secretariat for the Data Buoy Co-ordination Panel in Toulouse. The AIC is needed to maintain a regularly updated Argo web site for float monitoring to alert member states on the status of floats with a potential for entering their EEZ. The Centre will also act as a clearing house for information on all aspects of float use (e.g., how to access data). Resources for operating the AIC are now being identified. Joint support for the Centre has been requested by the IOC from all countries providing floats. The USA and the UK have already given informal indication they will contribute their proportionate share. This matter will also be brought up at the IOC Executive Council, 20-30 June 2000.—



Upper panel - a regular array with 3,300 locations at 3° by 3° spacing with depth greater than 2000 m. Lower panel - a random array of 3,300 locations.

Arthur Alexiou
GOOS Project Office
e-mail: a.alexiou@unesco.org

ARGO REGIONAL IMPLEMENTATION

(continued)

The participants from the six countries shared a common vision on the socio-economic importance of climate issues and environmental prediction. The six countries also shared the view that co-operation and collaboration were essential for the successful implementation and continued support of Argo initiative. It was noted that some of the participating countries, including Japan and the United States, have secured new budgets to implement the Argo programme, and that proposals for additional resources are pending in the participating countries. These additional resources are vital to the success of Argo and its global objectives.

The participants from the six countries noted the importance of a global implementation strategy for Argo and its associated programmes and expressed the intention to co-operate in this strategy. The participants in the meeting also noted the importance of broad regional participation in the implementation and support of Argo, particularly for deployment of floats. The Meeting welcomed the expressions of interest from regional organizations such as PICES, SOPAC, etc. and shared the view that Argo should work with these organizations to ensure an effective deployment strategy and data management system, and wide use and exploitation of Argo data.

The participants from the six countries expressed their expectation that international organizations concerned, such as IOC, WMO, PICES and SOPAC, will render their support to the promotion of the ARGO programme."

The Japanese Minister of Transport and three Diet Members attended the formal reception associated with the meeting. One of the Diet Members was the chairman for the meeting, and the other two were members of the "Group for the Promotion of Weather and Climate Services," a 40-Diet-Member, Japanese equivalent to a US Congressional Caucus. All spoke highly of Argo. The opening session was attended by senior Japanese officials, including: Kaname Ikeda, Director-General of the Research and Development Bureau of the Science and Technology Agency; Yuso Takigawa, Director-General of the Japanese Meteorological Agency of the Ministry of Transport (MoT); Jiro Hanyu, Director-General of Transport Policy Bureau, MoT; and Yasuhiro Ganeko, Director-General of the Coast Guard (formerly the Maritime Safety Agency), MoT.

It is proposed to hold further regional Argo Implementation meetings, starting with one for the Atlantic that will be held in France on July 10-11, 2000.—

W. Stanley Wilson
Deputy Chief Scientist, NOAA
e-mail: Stan.Wilson@hdq.noaa.gov

PACIFIC ISLANDS CONFERENCE ON CLIMATE CHANGE, CLIMATE VARIABILITY AND SEA-LEVEL RISE

" The Fourth Pacific Islands Conference on Climate Change, Climate Variability and Sea-level Rise was convened in Rarotonga, Cook Islands, during 3-7 April 2000. (The Cook Islands are located about 3,000 km northeast of New Zealand and east of Fiji by about the same distance.) The primary objective of the conference was to develop a regional framework for climate change, climate variability and sea level rise. In this context it sought a link between science and policy. Its primary sponsors were the South Pacific Regional Environment Programme (SPREP), the World Meteorological Organization (WMO) and the National Tidal Facility (NTF) at Flinders University of Australia.

The presence of Professor G.O.P. Obasi, Secretary-General of WMO, was welcomed by the almost 200 participants.

The previous conference launched the Pacific Islands Climate Change Assistance Programme (PICCAP), which was funded by the Global Environment Facility, executed by UNDP, and implemented by the SPREP Secretariat and Pacific Island member countries. Sponsors are hopeful that the framework developed at this conference will serve as a basis for the continuity of the programme. It identifies priorities under the major headings: capacity building, understanding the climate system and sea-level rise, impacts and vulnerability, response measures and linkages between science and policy.

The framework specifically identifies priorities of interest to IOC and GOOS such as increased climate monitoring, better utilization of satellites and new technology (specifically Argo floats), coupling of observational studies with GCM and ocean forecasting systems, improved understanding of the Inter-tropical Convergence Zone, South Pacific Convergence Zone and Inter-decadal Pacific

Oscillation, calibration of satellite/remote sensing with *in situ* monitoring and fostering the CLIVAR/GOOS/GCOS partnerships.

Low-lying Pacific Island countries such as Kiribati were particularly concerned about sea-level rise in spite of the advice from scientists present. At present, observations show a rise in global sea level of the order of 1 to 2 mm per year over the twentieth century. There is insufficient data available, however, to state categorically that the average observed sea-level rise in the region is different from the global average. Nor is there sufficient scientific data to show that there has been an increase in the average rate of sea level rise during the twentieth century.

Bill Erb, Head of the IOC Perth Regional Programme Office, attended the conference on behalf of IOC and of its Executive Secretary, Dr Patricio Bernal. He provided a keynote address highlighting the Ocean Theme recently prepared by a working group of the Partners for an Integrated Global Observing Strategy (IGOS). Emphasis was given to the importance of co-operation amongst the various observing system partners (ocean, climate and terrestrial). Bill Erb also stressed how Argo would result in a better understanding of climate change and variations. An overview of GOOS, particularly PacificGOOS, was discussed along with plans for the IOC-SOPAC coastal GOOS workshop scheduled for August 14-15, 2000, in Tonga.—

William Erb
 Head, IOC Perth Regional Programme Office
 e-mail: iocperth@bigpond.com

HOTO AND INDICATORS OF OCEAN AND HUMAN HEALTH

" The International Year of the Ocean in 1998 focused considerable attention on the important links between healthy oceans and healthy humans. From Monsoons to Microbes, a report released by the US National Academy of Sciences (NAS) in 1999, drew further attention to this important link. The issues included in the NAS report highlighted the need for development of a specific international research agenda.

The International Centre for Ocean and Human Health, founded by the Bermuda Biological Station for Research (BBSR) in 1998, hosted a meeting on indicators of ocean and human health, which served as a vehicle to develop an international research and training agenda on this very important topic. The

meeting, held from November 16 to 19, 1999 in Bermuda, was jointly sponsored by the US National Institute of Environmental Health Sciences (NIEHS) and the Intergovernmental Oceanographic Commission of UNESCO. It was organized by the HOTO (Health of the Oceans) Chairman, Dr Anthony Knap (BBSR), Dr Eric Dewailly (Laval University), Dr Timothy Ford (Harvard School of Public Health) and Dr William Suk (NIEHS).

The aim of the meeting was threefold:

- < review the current state-of-the-art science on the use of indicators to link environmental changes, their effects on marine organisms and ultimately their effects on human health
- < identify research gaps in the use of indicators of ocean and human health
- < establish collaborations between national and international governmental and private sector groups.

Detailed results of the workshop will be published in the scientific literature. Conclusions and recommendations for further activities include the following.

- T The interaction between humans and the ocean is important and requires more detailed study on an international basis. The world's oceans provide great health benefits to humans in the way of food and nutritional resources, recreational opportunities and new cures for human disease. Migration of humans to the coastal zone and the resulting increase in human populations in these areas will stress the ocean/land interface. Coastal degradation, climate variability and increased industrialization will likely increase the risk of mobilization of anthropogenically-derived and natural toxic agents resulting in increased potential for the transfer of these compounds to the oceans and subsequently to humans.
- T Studies of these interactions need to be focussed at the point of entry to humans: ingestion, dermal contact and inhalation. From an international perspective, of all the modes of entry, the main concern is the ingestion of contaminated seafood and the determination of risk to humans who ingest large quantities of seafood. However, pathogen and marine toxin outbreaks provide an acute and significant health risk, and is also a priority issue. The group determined that the main threats are POPs (persistent organic pollutants such as DDT and PCBs); metals (such as methyl mercury and cadmium); algal toxins; cholera and other pathogens; pharmaceuticals; and possibly genetically modified organisms.

T A monitoring system needs to be developed to provide for the early detection of contaminants in order to prevent human exposure. The system needs to include rapid assessment of contaminants in the ecosystem with appropriate internationally distributed GIS-type (geographic information system) data bases. Only in this integrated manner will early detection lead to prevention of human illness. Since analysis of contaminants is expensive and time-consuming, appropriate markers and indicators need to be used, new ones developed, and all need to be validated. Parts of such a system are being developed by the HOTO Panel of GOOS.

T Priorities should be focussed on the transfer of technology and training from developed to developing nations in order to mitigate health threats in these areas. The workshop participants agreed to organize a major international meeting within the next 18 months in order to advance this important need.

Within the United States, and specifically with regard to NIEHS, the participants recommended that research on ocean and human health be organized using a models-based approach to develop a programme focussed on the critical themes and attributes of marine environmental and public health risks. Given the interdisciplinary and global nature of the ocean and human health issues, a programme that networks across geographic and disciplinary boundaries is essential. Establishing Centres of Excellence, a programme structure used by the National Institutes of Health, would provide a mechanism that would meet these objectives. Specifically, the overall goals of this proposed Centres programme would be the early detection of potential marine-based contaminants, the prevention of associated human illness, and the development of products to enhance human well-being.

Such a programme would be composed of four components: a basic research models component; a biomarkers developmental resource component; an informatics component; and a training component. Within this context, research problems can be proposed and carried out. Biomarker assessment can be modified, expanded, and refined to fit these situations and new paradigms, and new ocean and human health interactions can be addressed. As the research themes are explored, a training component is integrated into the programme which will result in the production of the next generation of ocean and human health scientists. Informatics would be continually developed, providing essential feedback and information to a broad range of stakeholders, including those in the international community.

The proposed model-based approach would initially focus on the following five areas as prototypes for studying human exposure resulting from interaction with the ocean:

- < Polar Regions/Native Peoples Foodborne Risk Exposure;
- < Marine Toxin Aerosols and Human Health;
- < Urban Harbors and Exposure;
- < Seafood Consumption and Health Benefits and Risks;
- < Tropical Coastal Areas and Small Island States.

This suite of studies will allow the research community to evaluate and compare the sources and the effects of anthropogenic and natural contaminants on humans by oral, dermal, and inhalation exposures. They will also allow an assessment of such critical factors as chronic versus acute exposures, local versus distance sourcing of contaminant risks, and the degree to which each individual risk is reversible or irreversible. A diverse models-based approach to oceans and human health such as this will allow for an extrapolation of the results and techniques to different environments.

A specific research resource essential to success of the proposed centre is a comprehensive biomarkers core resource. This core resource would identify, acquire, develop where needed, validate and refine biomarkers within an ocean and human health context. The core resource would further function to translate existing biomarkers into biomarkers which are easy and cheap, reliable and internationally available. Use of the biomarkers would enhance our abilities to predict, measure, and assess both ecosystemic stresses and potential human exposure/effects.

By using a universal set of biomarkers, we will provide the ability to develop an informatics database. This database should be designed to translate internationally and contribute directly to both domestic and international decisions concerning environmental contributions to human health risks and benefits. They should be designed to enhance scientific communication, community based information and education, and decision making.

Training is envisioned in several forms, each would be integrated so as to enhance the overall success of the programme. Scientific master's level training would be a component of all aspects of the programme in a fully interdisciplinary fashion. Community-based training will enhance capacity building in potentially affected domestic and international communities.—

Anthony Knap
Chairman, HOTO
e-mail: knap@bbsr.edu

COASTAL GOOS PANEL MEETINGS

" The third and fourth meetings of the Coastal Panel of GOOS (C-GOOS-III and C-GOOS-IV) took place in Accra, Ghana, from April 12-15, 1999, and Tianjin, China, from November 2-5, 1999, respectively. C-GOOS III was hosted by the Science and Technology Policy Research Institute, thanks to Dr Kwame Koranteng, while C-GOOS-IV was held at the National Marine Data and Information Centre (NMDIS), thanks to Dr Wang Hong.

Both meetings started with a one day Stakeholder's workshop. These workshops were each attended by local scientists, representatives of marine industry, coastal planners and decision makers. The meetings helped to raise awareness of Coastal GOOS and to facilitate linkage to regional GOOS groups and to potential users of GOOS/C-GOOS products. The Stakeholders meetings also enabled the panel to learn about regional/local coastal issues, and Stakeholders to express their requirements for consideration in the C-GOOS design.

The C-GOOS panel meetings were devoted to development and refinement of the C-GOOS design plan. At the core of it would be an evolving global system of infrastructure (the global network) supporting a core measurement suite. Nested into the global network would be pilot projects and coastal subsystems enhanced to accommodate special needs (regional enhancements). The elements of the initial global network are envisaged to be:

- < satellite remote sensing,
- < an enhanced global network of tide gauges (GLOSS +),
- < enhanced arrays of instrumented moorings and fixed platforms,
- < voluntary observing ships (e.g. ferries), and
- < a network of coastal observation laboratories ranging from environmental groups/high schools to harbor/water authorities/industry to scientific research institutes.

The C-GOOS design plans will be completed at the fifth and final C-GOOS meeting at the Technical University of Gdansk, Poland, from May 2-6, 2000.

Information about C-GOOS and the C-GOOS meeting reports are available at:

<http://ioc.unesco.org/goos/cozo.htm>.—

Thorkild Aarup
GOOS Project Office
e-mail: t.aarup@unesco.org

PICES AND GOOS

" **PICES** (the North Pacific Marine Science Organization) held its annual meeting 8-14 October 1999, in Vladivostok, Russia. The meeting included a one-day workshop, convened by the Monitor Task Team of the PICES Climate Change and Carrying Capacity (CCCC) Programme, on the role of PICES in GOOS. Workshop participants expressed significant interest in PICES playing a more active role in GOOS, and it was decided that the CCCC Monitor task team would pursue this by:

- < identifying existing ocean observations in the PICES area which are relevant and could contribute to GOOS; and
- < developing a plan to identify and transition relevant North Pacific research to routine observations and ultimately data products.

In addition, PICES will consider developing an overall "PICES GOOS" for the North Pacific.—

Ned Cyr
GOOS Project Office
e-mail: n.cyr@unesco.org

SOUTH ASIA NODE OF THE GLOBAL CORAL REEF MONITORING NETWORK

" **Biophysical** monitoring of coral reefs, and socio-economic monitoring of reef-dependent communities in India, Sri Lanka and the Maldives is the focus of the GCRMN's South Asia Node. Supported through the UK Department for International Development's project "Sustaining Livelihoods Dependent on Coral Reefs in South Asia through Regional Implementation of the GCRMN", the GCRMN South Asia node is currently establishing demonstration monitoring sites in each of the five main coral reef areas in South Asia (Maldives, Sri Lanka, Andaman Islands, Lakshadweep and Gulf of Mannar). To provide qualified personnel, the project conducts regional training workshops on coral reef survey sampling design, socioeconomic data survey design and data analysis. The project also is developing a regional database programme for coral reef monitoring data. The project is directed by Ms. Emma Whittingham (a DFID secondee to the IOC) from an office in Colombo, Sri Lanka. —

Ned Cyr
GOOS Project Office
e-mail: n.cyr@unesco.org

GOOS LMR-II AND III

" The Living Marine Resources (LMR) Panel held two meetings in 1999 - March, in Montpellier, France, and December, in Talcahuano, Chile. These meetings have brought the Panel nearer to completion of a strategic design plan. A generic operational monitoring system has been identified, as have potential products that could be derived from that system. The Panel is in the process of developing regional examples of the generic system for the Scotian Shelf, Gulf of Guinea, Yellow Sea/East China Sea and coastal upwelling systems. In addition, the Panel is developing an open ocean LMR monitoring system.

Several pilot projects have been proposed in order to demonstrate the concept of monitoring from a living marine resource perspective. These include Continuous Plankton Recorder (CPR) tows in the Northeast Pacific, the BENEFIT (Benguela Environment Fisheries Interaction and Training) Programme/Benguela Current Large Marine Ecosystem Programme and a project on Biological Action Centres (BACs). In addition, the Panel has recommended the inclusion of nine on-going monitoring systems to the GOOS Initial Observing System:

- < the SAHFOS CPR survey;
- < the ICES International Bottom Trawl Survey;
- < the CCAMLR Ecosystem Monitoring Programme; the CalCOFI programme;
- < the Alg@line system in the Baltic Sea;
- < Canada's Ocean Station P/Line P;
- < Chile's Ecofish programme;
- < ongoing Japanese ecosystem monitoring systems; and
- < ongoing Korean ecosystem monitoring systems.

The panel's fourth and final meeting will be held 1-4 May 2000, in Honolulu, Hawaii, USA.—

Ned Cyr
GOOS Project Office
e-mail: n.cyr@unesco.org

GLOSS GROUP OF EXPERTS MEETING

" The sixth meeting of the GLOSS Group of Experts took place from May 10-14, 1999, at the Observatoire du Midi-Pyrénées, Toulouse, France, thanks to Dr Christian Le Provost.

Prior to the meeting, the following workshops took place:

- T Ocean Circulation Science derived from the Atlantic, Indian and Arctic sea-level networks, organized by Dr Gary Mitchum;
- T GPS at tide gauge benchmarks for long-term sea-level change studies and for altimeter calibration, organized by Dr Mike Bevis; and
- T EOSS Work package 1 (European GPS), organized by Dr Bernd Richter.

The GE6 meeting reviewed progress in the GLOSS Implementation Plan (<http://www.pol.ac.uk/psmsl/gip97/gip.html>) since 1997. Of the 287 sites in the GLOSS Core Network, only 42 are claimed to be non-operational. 85 GLOSS stations report to the WOCE "Fast Delivery " Data Acquisition Centre in Hawaii. Regional and national status reports on sea-level measuring activities were presented by the participants (available at: <http://www.pol.ac.uk/psmsl/gb7/edit.html>). IOC Manuals and Guides on methods for operating gauges will be re-written and updated over the next year.

Several GLOSS-related CD-ROMs have been produced over the last few years and data products continue to be made available via the web.

Dr E. Marone, Vice-Chairman of C-GOOS, gave a presentation on the emerging C-GOOS design plans. It is envisaged that C-GOOS will depend heavily on the GLOSS network of stations for the implementation of the C-GOOS design and that additional sea-level stations may be needed. Dr Marone suggested that there could be areas where collaboration between C-GOOS and GLOSS would be possible, for instance with respect to sharing of stations, data collection and joint training courses.

During the GE6 meeting, the Group endorsed the *ex officio* right to membership of the GE by the Directors of PSMSL, UHSLC, NTF, WOCE Centres, IAPSO/CMSLT, IGS and other future appropriate bodies, although it was emphasised that this list was not exclusive or exhaustive. This extension of the GE could have the benefit of increasing the number of people well-briefed about GLOSS who will be able to represent the programme at international meetings. The Group also endorsed a proposal that a sub-group of the GE be formed as a source of scientific advice, especially for climate, with the sub-group potentially a joint committee with (at present) OOPC, CLIVAR/UOP and IAPSO/CMSLT.

More information on GLOSS can be found at:
<http://www.pol.ac.uk/psmsl/gloss.info.html>
and the GE6 report is available at:
http://ioc.unesco.org/goos/GLOSS-VI_rpt.pdf.—

Thorkild Aarup
GOOS Project Office
e-mail: t.aarup@unesco.org

GLOSS TRAINING COURSE IN SEA-LEVEL MEASUREMENTS AND DATA ANALYSIS

" A GLOSS Training Course took place at the Instituto Oceanográfico da Universidade de São Paulo, University of Sao Paulo, Brazil, under the leadership of Professor Afranio Rubens de Mesquita, from August 30 - September 25, 1999. The course was primarily intended for Spanish and Portuguese speaking students from South America and Africa. 15 students from 8 countries participated.

The first two weeks of the course were dedicated to standard GLOSS training course topics such as theory of tides, sea-level measurements, operation of a tide gauge station, hands on training, and tidal analysis software. The last two weeks were dedicated to more advanced subjects such as satellite altimetry and numerical modelling. (This second part was a supplementary offer not covered by IOC funding. However, most of the students managed to find funds to also participate in this part).—

Thorkild Aarup
GOOS Project Office
e-mail: t.aarup@unesco.org

THE SHIP-OF-OPPORTUNITY PROGRAMME

" **The Ship-of-Opportunity Programme (SOOP)** was originally established by the Integrated Global Ocean Services System (IGOSS) as a follow up of the network of ships-of-opportunity that was a part of the TOGA and WOCE observing system. The SOOP Implementation Panel (SOOPIP) will henceforth report to the newly established Joint WMO-IOC Technical Commission for Oceanography and Marine Meteorology (JCOMM). SOOP is now an integral part of the GOOS Initial Observing System (IOS). Information about SOOP is available on the new SOOP Web site: <http://www.brest.ird.fr/soopip>.

Since April 1999, SOOP has been served by a technical co-ordinator, Mr Etienne Charpentier (who also serves as technical co-ordinator of the Data Buoy Co-operation Panel). Based on input from SOOP operators and data users, the co-ordinator evaluates available global programme resources and real-time data flow, and, to some extent, data quality. This provides SOOP operators with information enabling them to improve co-ordination and overall network efficiency.

A few figures will describe what SOOP does achieve. Some 14,000 XBT profiles were made during the first six months of 1999 by SOOP operators from Australia, France, Germany, India, Japan and USA, including about 8,500 profiles in the Pacific Ocean, 3,200 in the Indian Ocean, and 2300 in the Atlantic Ocean. The Equatorial and North Atlantic Ocean is well covered while the South Atlantic is under-sampled. The Indian Ocean is adequately sampled except in the south. The Pacific Ocean is relatively well sampled, except in the south. The Southern Ocean is under-sampled.

With the advent of Argo (*see page 1*), the SOOP operators recognize there is a need to review their sampling strategy, since the observation strategy within the upper part of the ocean will change dramatically. As a first step, an Upper Ocean Thermal Review was conducted and a dedicated workshop held in Melbourne, in August 1999, under the sponsorship of the NOAA Office of Global Programmes and the Australian Bureau of Meteorology. A paper, summarising the contributions and results from the workshop, entitled "The Role of XBT Sampling in the Ocean Thermal Network", was presented at the OceanObs99 Conference in St Raphaël, France, October 1999. The paper is available via the SOOP web site.

At its third session (La Jolla, March 2000), the SOOPIP reviewed the paper, as well as a proposal for the development of an Upper Ocean Salinity Programme. It agreed that the review provided a good scientific guide for the future, for use by operators and funders, and also provided priorities for line maintenance in an operational programme. The review also provided scientific guidance for transitioning the XBT network over a period of some 5 years, which is the approximate transition period to full operational status for Argo. At the same time, it was made clear that individual operators may have other priorities than those addressed in the review, which focuses on an operational network for climate, and that in any case it represented only the first iteration in an ongoing process.

SOOPIP-III further reviewed in detail the present and projected array status, on the basis of the updated 1999 semestrial resources survey. Specifically, it examined the lines which would transform to Frequently Repeated (FRX) or High Density (HDX) lines in the network to be maintained after full Argo implementation. This led to the design of a revised operational SOOP network, to be implemented progressively over the next five years, in line with resources availability and Argo implementation.

Even though this topic was considered of utmost importance within the agenda of SOOPIII, the panel also addressed other important topics. A core agenda item for the session was a detailed review of the co-ordination and monitoring of the overall programme. The work of the SOOP co-ordinator was reviewed and highly appreciated. Questions relating to information exchange and metadata requirements were considered in depth. With regard to monitoring issues, it could not be over-emphasized that they are crucial for a programme such as SOOP. The numerous technical questions raised under this item demonstrated the complexity of the task (for instance, there are already 7 different monitoring reports produced regularly by SOOP on various time frames and with various contents; one cannot determine from the reports how well or bad the programme is actually running).

The question of data management and quality control was also reviewed in depth. The basic principle of data management is that the real-time flow of data should be progressively replaced in the data base by the delayed-mode data, which encompass more in-depth and scientific quality controls and therefore the constitution of a high-quality data set. One of the most difficult problems encountered is that of the identification of "duplicates" (the real-time data flow may encompass the submission of the same data from different "telecommunication routes"; when delayed-mode data are submitted, it is often difficult to determine which real-time data they are supposed to replace; etc.).

The session was supplemented with a number of technical presentations by manufacturers and users of the various measuring devices, either presently in operational use or at the stage of development and testing.—

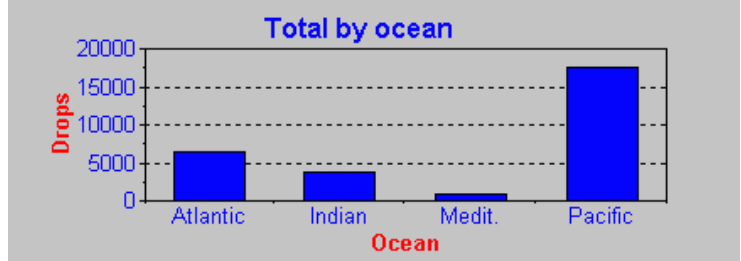
Yves Tréglos
 GOOS Project Office
 e-mail: y.treglos@unesco.org

JCOMM

Establishment of JCOMM

" **Based** on a joint consultants report, documentation on the establishment of a Joint WMO-IOC Technical Commission for Oceanography and Marine Meteorology (JCOMM) was prepared for the sessions of the Executive Councils of both WMO and IOC in 1998 (WMO/EC-L, June and IOC/EC-XXXI,

Country	Operator	Ocean	Drops
Australia	BOM	Indian	1 108.00
Australia	BOM	Pacific	304.00
Australia	CSIRO	Indian	728.00
Australia	CSIRO	Pacific	715.00
France	IRD_BREST	Atlantic	1 093.00
France	IRD_BREST	Indian	133.00
France	IRD_NOUMEA	Atlantic	201.00
France	IRD_NOUMEA	Indian	366.00
France	IRD_NOUMEA	Pacific	2 077.00
Germany	AWI	Atlantic	45.00
Germany	BFAFi	Atlantic	76.00
Germany	BSH	Atlantic	794.00
India	NIO	Indian	353.00
Japan	JMA	Indian	345.00
Japan	JMA	Pacific	1 099.00
Japan/USA	JMA/NOAA	Pacific	199.00
MFSPP	MFSPP	Medit.	982.00
USA	NOAA	Atlantic	3 266.00
USA	NOAA	Indian	795.00
USA	NOAA	Pacific	8 465.00
USA	SIO	Atlantic	861.00
USA	SIO	Pacific	4 616.00



SOOP XBT Yearly Report for 1999

November), containing a formal proposal for the establishment of the joint technical commission through the merger of CMM and IGOSS. At the same time, very strong support for the concept of this joint body was expressed by the JSC for the WCRP as well as the Steering Committees for GOOS and GCOS.

Both Executive Councils strongly endorsed the proposal, and recommended its approval to 13th WMO Congress (May 1999) and 20th IOC Assembly (June-July 1999). In addition, the ECs agreed that the new body could be called the Joint WMO/IOC Technical Commission for Oceanography and Marine Meteorology (JCOMM), without creating either statutory or semantic problems for either Organization. Subsequently, WMO Congress and the IOC Assembly enthusiastically approved the proposal.

JCOMM is therefore a reality, with its terms of reference as given in the Congress and Assembly resolutions. It will operate as a WMO technical commission as defined in the WMO General Regulations, and as a major IOC subsidiary body as defined in the IOC Statutes. Much work nevertheless remains to be done before JCOMM can be regarded as fully functional in practical terms.

The Transition

To initiate the transition from CMM/IGOSS to JCOMM, and to plan a coherent work plan over the two years remaining until the first session of the new body in June 2001, a first Transition Planning Meeting for JCOMM took place in St Petersburg, Russia, 19-23 July 1999. The work plan will encompass the ongoing work of CMM/IGOSS, the activities of those bodies which will now report to JCOMM, and the urgent new tasks to be addressed, in particular relating to GOOS/GCOS implementation. In addition to the work plan, all issues relating to membership, structure, meetings, working arrangements, etc. for JCOMM were also addressed during the meeting.

As agreed by Congress and the Assembly, JCOMM is to provide the institutional umbrella and coordinating/integrating mechanism for all existing and future operational marine-related activities of WMO and IOC. The challenge in the transition process for JCOMM is to find the right way of getting from the existing, multi-faceted approach to the management of operational oceanography, to a fully integrated, coordinated structure, while at the same time preserving existing successes and maintaining the involvement and enthusiasm of individuals and institutions.

To begin this process, the St Petersburg meeting agreed on a basic programme area (PA) approach to the future JCOMM structure. It has also begun the process of structuring the immediate JCOMM work programme into PAs, rather than based on specific bodies and groups as at present. It has established an *ad hoc* group on JCOMM structure to prepare detailed proposals on structure and work programme, based on these outline agreements. These will be reviewed and hopefully agreed by a second meeting of the interim JCOMM Management Committee during the first half of 2000.

In this context, and as part of the integration process, the meeting supported the concept of integrating as much as possible all ship-based observation programmes, specifically the traditional meteorological Voluntary Observing Ship Programme (VOS), Ship-of-Opportunity Programme (SOOP) and Automatic Shipboard Aerological Programme (ASAP). The new concept would involve a full integration on matters of common concern in ship operations (ship recruitment and servicing, communications, metadata, etc.), with specialist technical subgroups to deal with measurement-specific questions. The ASAP Panel, the Ship-of-Opportunity Programme Implementation Panel (SOOPIP) and the VOS Sub-group have agreed provisionally to the proposal, and it is planned that the Ship Observations Group (SOG) should meet first during the first quarter of 2002.

Other significant agreements and decisions reached at the St Petersburg meeting included:

- T Rapid establishment of a new, multi-disciplinary membership for JCOMM, the distribution of information to these members, and their entrainment into the transition process;
- T Development of procedures and responsibilities for operational data management, together with the Committee for International Oceanographic Data and Information Exchange (IODE) and the Commission for Basic Systems (CBS);
- T Establishment of interim co-presidents and Management Committee for JCOMM;
- T Establishment of liaison mechanisms with GOOS and GCOS;
- T Involvement in CBS Rolling Requirements Review process and in the work of the Global Observing Systems Space Panel (GOSSP);
- T Establishment of an outline draft agenda for JCOMM-I;
- T Establishment of an *ad hoc* group to develop a JCOMM capacity building strategy.

Subsequent Actions

The WMO Executive Council in May 2000 and the IOC Executive Council in June 2000 are being requested to approve the interim arrangements for JCOMM (co-presidents, Management Committee, etc.) as well as the proposal that JCOMM-I should be organized and conducted by WMO, under WMO rules, pending the eventual establishment of a formal agreement between WMO and IOC on JCOMM functioning and financing. This formal agreement is now under preparation by the Secretariats, and will eventually include common rules for the future conduct of JCOMM and other possible future joint technical commissions. The common rules will be submitted to next Congress and IOC Assembly for approval.

The *ad hoc* group on structure has prepared a proposal on a sub-structure for JCOMM, which is being circulated for review and comment. The revised proposal will be considered by the second transition planning meeting, which will take place in Paris, 14-16 June 2000. This meeting will also review a draft capacity building strategy, for eventual presentation to JCOMM-I. —

Peter Dexter
 World Meteorological Organization
 e-mail: dexter@www.wmo.ch

POGO MEETING

" The first formal meeting of the Partnership for Observation of the Global Oceans (POGO) was held in early December 1999 at Scripps Institution of Oceanography. This inaugural meeting included senior officials from 17 institutions in 12 countries (Australia, Brazil, China, France, Germany, India, Japan, Korea, Norway, Russia, UK and USA); as well as representatives of the IOC, the Global Ocean Observing System Project Office, the Scientific Committee for Oceanic Research of the International Council for Science (ICSU), the Committee on Earth Observation Satellites (CEOS) and several international scientific programmes.

At this meeting, there was agreement on an initial work programme, including development of an advocacy plan for observing systems; appropriate

participation in a "commitments process" to secure governmental commitments to fund and deploy high priority *in situ* ocean observing systems; a data interchange demonstration pilot project; and establishment of a clearinghouse for information exchange among POGO members, as well as the broader community. The clearinghouse would cover education and training programmes of each institution; technology inventory (what equipment is available to lend or share); specific plans for research ship cruises that could possibly take additional crew or make additional measurements while en route to the primary locations; and possibly other topics.

Complete information is available on the POGO website: www.sio.ucsd.edu/pogo.html.—

Lisa Shaffer
Scripps Institution of Oceanography
e-mail: lshaffer@ucsd.edu

GOOS Project Office 2000 calendar of events

as of April 2000

7th Session of the PIRATA Steering Group	Natal, Brazil	Apr 11-13
1st Session of the CLIVAR Atlantic Panel	Natal, Brazil	Apr 14-15
GLOSS Training	Jeddah	Apr 15-20
LMR-GOOS-HOTO Merger Pre-implementation Meeting	Washington, DC	Apr 17-18
Expert Group Meeting on Protection of the Marine Environment from Land-based Activities	The Hague	Apr 26-28
LMR Panel IV	Honolulu	May 1-4
CLIVAR SSG	Honolulu	May 1-5
Coastal GOOS-V	Gdansk	May 2-5
3rd Session of the GOOS Steering Committee	Paris	May 10-12
IOC Oceanographic Data Exchange Policy Meeting	Paris	May 15-17
GODAE-IV Meeting	Southampton	May 15-19
MedGLOSS meeting	Haifa	May 15-17
WMO Executive Council	Geneva	May 16-26
G3OS Sponsors and IGOS Meeting	Geneva	Jun 6-7
JCOMM 2nd Transition Meeting	Paris	Jun 14-16
OOPC-V Meeting	Bergen	Jun 20-23
PacificGOOS Workshop	Tonga	Aug 14-15
PIRATA Western Expansion Meeting	Fortaleza, Brazil	Sep 11-15
9th Session of the GCOS Steering Committee	China	Sep 12-14
HOTO-V (subset) Meeting for Implementation Planning	Paris	Sep
IOC-WMO-CPPS Joint Working Group on the Investigations of "El Niño"	Lima	Sep/Oct
DBCP-XVI	Victoria, Canada	Oct 16-20
JTA-XX	Victoria, Canada	Oct 23-25
ICES-IOC Steering Group for GOOS Meeting	Southampton	Oct 23-25
WOCE SSG	Fukuoka	Oct 24-31
3rd Global Meeting of Regional Seas Conventions & Action Plans	Monaco	Nov 6-10
POGO Meeting	São Paulo	Nov 7-9
Perth Indian Ocean Meeting	Perth	Nov 13-15
TAO-IX Meeting	Perth	Nov 16-17
2nd Meeting of IOCARIBE-GOOS Advisory Group	Havana	Nov 29-Dec 1
MARCUBA 2000	Havana	Dec 4-8
Arctic GOOS-JCOMM Meeting	Geneva	Dec 6-9

GOOS News Order Form

The GOOS Project Office offers a variety of information materials. If you wish to be on our mailing list for this and next issues, please fill in this coupon and mail back to the address mentioned at the foot of this page to receive a free subscription:

Title, name and initials:

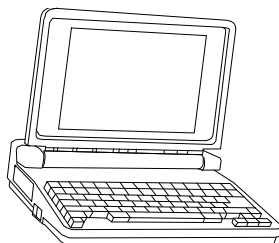
Organization:

Postal address:

.....

.....

Country:



Latest issues of GOOS News are now available
on-line on Internet at URL:

<http://ioc.unesco.org/goos/goos.htm>

This allows the reader to be informed more rapidly,
weeks before he receives the newsletter by mail.

GOOS

The Global Ocean Observing System (GOOS) is an initiative of the Intergovernmental Oceanographic Commission (IOC) of UNESCO, in co-operation with the World Meteorological Organization (WMO), the United Nations Environment Programme (UNEP) and the International Council of Scientific Unions (ICSU).

Any comments on the contents of this periodic informal letter may be addressed to:

Editor: Justin Ahanhanzo
e-mail: j.ahanhanzo@unesco.org
tel: +33 1 45 68 36 41

Producer: Irène Gazagne
e-mail: i.gazagne@unesco.org
tel: +33 1 45 68 40 24

GOOS Project Office, IOC
UNESCO - 1, rue Miollis F-75732 Paris Cédex 15 France
fax: +33 1 45 68 58 13
URL: <http://ioc.unesco.org/goos>