



**Intergovernmental Oceanographic Commission**

*Reports of Meetings of Experts and Equivalent Bodies*

## **Meeting for Establishing the GOOS Regional Alliance for the Southeast Pacific (GRASP)**

Cartagena, Colombia, 30-31 May 2003

**GOOS Report No. 134**

**UNESCO**

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**Abstract**

The Meeting for Establishing the GOOS Regional Alliance for the Southeast Pacific (GRASP) was held in Cartagena, Colombia, from 30 to 31 May 2003. It was attended by 28 participants from 6 IOC Member States from the Southeast Pacific region and from outside the region. The CPPS, IOC and UNESCO were also represented at the Meeting. To address the variability of the Southeast Pacific Region complex system and its relation to “El Niño” and based on positive experiences and results obtained from other GOOS Regional Alliances, the establishment of a GOOS Regional Alliance (GRASP) for the Southeast Pacific Region was proposed. The purpose of the Alliance is to (i) regionally coordinate and optimize an adequate use of resources; (ii) to study the Eastern Boundary Current System in an integrated way from a regional perspective; (iii) exchange data and make it available to users; (iv) to be able to do operational oceanography as operational meteorology, and (v) to improve access to international projects (like Argo); (vi) facilitate access to research from the coastal seas of the region; and (vii) study ocean variability operating on 20-40 day scale. During the Meeting two Working Groups were established to work on the establishment of the GOOS Regional Alliance for the Southeast Pacific Region (GRASP). Working Group I worked on the preparation of a Letter of Intent for the Establishment of GRASP. Working Group II defined two key policy related themes to form the basis of major demonstration projects having significant societal benefits: (i) to improve the accuracy of weather and climate forecasts, (ii) to improve the information required to manage the fisheries more effectively. The main purpose of the Letter of Intent is the development of regional cooperation within the Global Ocean Observing System (GOOS) framework. It was jointly decided to: (i) establish an Ad-Hoc Group of Experts to elaborate a proposal for the strategic plan to the development of an integrated global ocean observing and monitoring system for the Southeast Pacific Region; (ii) contribute to the work of the Ad-Hoc Group by providing necessary information for the preparation of the Strategic Plan; (iii) develop activities to promote operational oceanography based on existing infrastructure and programmes in the Southeast Pacific Region; (iv) promote capacity building and exchange of knowledge among the members of the Regional Alliance; (v) promote studies to evaluate potential economical and social benefits generated by the operational oceanography in the Southeast Pacific Region; and (vi) cooperate with involved organizations on the evaluation of climatic change, research of the marine environment and impact of climatic variability. The Meeting reviewed the Terms of Reference for the Ad-Hoc Group.



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## 1. OPENING

The Meeting for Establishing the Global Ocean Observing System (GOOS) Regional Alliance for the Southeast Pacific (GRASP) was opened at 09:00 hrs at the ARCOS Meeting Room of the Hotel Caribe in Cartagena de Indias. Mr. Rodrigo Nuñez, I-GOOS Vice-Chairman, welcomed the participants to the Meeting in his capacity as Chair of the Session. Participants are listed in Annex II.

Mr. Colin Summerhayes, Director of the GOOS Project Office welcomed the participants on behalf of Dr. Patricio Bernal, Executive Secretary of the Intergovernmental Oceanographic Commission (IOC). He gave a brief overview of the development of GOOS. He recalled that GOOS was established in 1991 by the General Assembly of the IOC; GOOS was recognized as essential for sustainable development at the UN Conference on Environment and Development Conference in 1992 in Rio, in Agenda 21, and was formally implemented in 1998. The World Summit for Sustainable Development (WSSD), held in Johannesburg, South Africa in September 2002 reinforced Agenda 21 and the need for Ocean Observations to support sustainable development.

GOOS is the ocean component of Global Climate Observing System (GCOS), which reports to the Annual Conference of the Parties of the UN Framework Convention on Climate Change (UNFCCC).

IOC encouraged groups of countries to work jointly to establish regional GOOS bodies now known as GOOS Regional Alliances (GRAs). The first of these were GOOS for Europe and NEAR-GOOS for the Northeast Asian Region. More recently we have the Mediterranean and the Pacific Islands countries GOOS Alliances and others for the Caribbean, Black Sea, Africa and Indian Ocean.

Member States are encouraged to invest in ocean observations. Dialog between appropriate Ministries at the national level would help to create national consensus on what to observe and for what purpose.

During the 1997 Meeting of the Assembly the IOC approved Resolution XX-10 to explore the involvement of the Permanent Southeast Pacific Commission (CPPS) and the countries of the Southeast Pacific Region in GOOS development. This proposal has been incorporated into a new Memorandum of Understanding (MoU) between the Permanent Commission for the Southeast Pacific (CPPS) and IOC that will be presented to the XXII IOC General Assembly in June 2003 for approval. This MoU aims to increase cooperation in oceanographic and meteorological research on the marine climate in the Southeast Pacific with emphasis on its fluctuations, such as El Niño and La Niña phenomena, and to increase co-operation between IOC and CPPS, particularly within the scope of the GOOS programme, through the development of a regional Southeast Pacific observing system based on the GOOS design and following GOOS principles. The MoU also aimed to increase co-operation between IOC and CPPS with regard to ocean data and information exchange, with special emphasis on institutional networking at national, regional and global scales, and on the development of data and information services and products that benefit multiple user groups.

The complete text of this MoU is included in Annex IV.

Dr. Cesar Toro, IOC Secretary for IOC's Sub-Commission for the Caribbean and Adjacent Regions (IOCARIBE-UNESCO) welcomed the participants to the meeting and to the city of Cartagena. Dr. Toro referred to the many activities already taking place throughout the region, which were leading to the development of ocean observing systems nationally and that could be joined to provide a comprehensive observing system for the region. We are not starting from zero. Many potential benefits will grow from combining efforts in a GOOS Regional Alliance.

## **2. ADMINISTRATIVE ARRANGEMENTS**

### **2.1 ADOPTION OF THE AGENDA**

The Chairman presented the Meeting with the proposed Agenda, previously distributed to the participants (Doc. GRASP-I/1 Prov.). It was proposed to add point 5.1.3 to develop a draft proposal for a Letter of Intent for the potential participants in the GOOS Regional Alliance for the Southeast Pacific (GRASP). The Agenda was adopted with the proposed changes. The adopted Agenda is included in Annex I.

### **2.2 DESIGNATION OF RAPPORTEUR FOR THE SESSION**

The Chairman proposed Mr. Colin Summerhayes, Director of the IOC-GOOS Project Office, and Dr. Cesar Toro, IOC Secretary for IOCARIBE-UNESCO, as Rapporteurs for the Meeting. The Meeting approved this proposal.

### **2.3 CONDUCT OF THE SESSION, TIMETABLE AND DOCUMENTATION**

The Chairman introduced the Provisional Timetable for the Session (Doc. GRASP-I/1 Prov. Add.) and the Provisional List of Documents (Doc. GRASP-I/4 Prov.), which included the IOCARIBE-GOOS Strategic Plan, and mentioned that all documents are available in the CD ROM included in the document folders. General information on services available, and some details of local arrangements for the Session, was provided in the Document Information & Guidelines for Participants (Doc. GRASP-I/Inf. 1).

It was agreed that the Meeting would work in Plenary as far as possible. To develop items 5.1, Establishing a GOOS Regional Alliance for the Southeast Pacific, and 5.2, Defining Projects and Capacity Building needs for the Southeast Pacific GOOS, two working groups were established.

## **3. OVERVIEW AND BACKGROUND INFORMATION**

Mr. Colin Summerhayes, Director of GOOS Project Office, introduced this Agenda Item. He provided a brief description of the GOOS project and its developments in other regions of the world. He explained that the main purpose of GOOS is to facilitate making sustained observations of the oceans, in support of sustainable development.

GOOS: A sustained, coordinated international system for gathering data about the oceans and seas of the world; a system for processing the data to enable the generation of beneficial products and services; and the research and the development upon which such



products and services depend for their improvement. Research is essential as the means of enhancing GOOS through time.

GOOS is systematic observational oceanography at the global scale. Operational oceanography uses high tech instrumentation, satellites, buoys, coastal stations, ships of opportunity for monitoring the environment and transmitting data to land stations where it can be transformed into products useful to decisions and policy makers, industry and the public.

The observations are sustained, routine, and user-driven. The system is end-to-end, meaning that the chain from observation to product is transparent. The system involves data processing and analysis, data communication and modeling, which lead to different products tailored to the requirements of different users.

Observational needs for the open ocean are summarized in the document "Observing the Oceans in the 21<sup>st</sup> Century". The long-term goal is to establish a comprehensive operational system for observing the ocean using GLOSS stations, ships of opportunity, surface-drifting floats, and buoys. These provide information feeding El Niño and the forecasting models. Gap in the Southeast Pacific should be filled to improve forecasts.

Mr. Summerhayes referred to the establishment of the Joint WMO/IOC Technical Committee for Oceanography and Marine Meteorology (JCOMM) created in June 1991 in Iceland. JCOMM is the implementation mechanism for global GOOS, and needs strong regional interactions and support.

GOOS is developing a ten year plan for in-situ observations. By the end of 2003 it is expected to reach near 44% of execution, and by 2009, 100%.

Plans have also been published for coastal seas. GOOS is not only about physics but also about chemistry and biology. Satellite information is extremely useful for fisheries management.

To improve the value of the information from space it is necessary to fill enormous data gaps in the ocean sub-surface. Argo floats are being deployed to fill in these gaps. It is expected to have 3000 profiling floats operating in the ocean by 2003-2005.

Mr. Summerhayes also referred to the Global Ocean Data Assimilation Experiment (GODAE) aimed at a practical demonstration of real time, global ocean data assimilation for operational oceanography. GODAE would develop the numerical models needed for ocean forecasts and would capitalize on Argo and other data.

Finally, he pointed out that long period oscillations like El Niño Southern Oscillation (ENSO) interact with others like the North Atlantic Oscillation and the Pacific Decadal Oscillation, which affect the regional climate of the Southeast Pacific and the Caribbean Sea by their interaction.

#### **4. PRESENT STATE OF GLOBAL OCEAN OBSERVING SYSTEM (GOOS) IN THE SOUTHEAST PACIFIC REGION**

##### **4.1 WHY SOUTHEAST PACIFIC GOOS? IS THERE A NEED FOR A REGIONAL GOOS FOR THE SOUTHEAST PACIFIC REGION?**

Mr. Rodrigo Nuñez, I-GOOS Vice-Chairman and Chairman of the Session introduced this agenda item.

The Southeast Pacific Region has a common element in the Humboldt Current, variations in which affect weather, climate and fishing. To address the variability in this complex system, and its relation to El Niño, it is proposed that there should be a coordinated set of activities for the region, in a GOOS Regional Alliance (GRA) for the Southeast Pacific (GRASP).

Among on-going activities are the Peru Naylamp and Ecuador buoy Projects, Chile coastal stations and buoys, and Colombia and Ecuador coastal stations.

Many of these stations deliver the data in real time nationally. Many of the data are in the public domain. Ideally, these data should be available to all through data exchange.

Chile is monitoring Kelvin waves along the coast. A buoy shared with Woods Hole Oceanographic Institution is measuring CO<sub>2</sub>.

Peru's Naylamp buoys have been moved seawards to avoid damage by vandalism.

Other important initiatives exist regionally on which GRASP can build. These include the annual CPPS regional ENSO monitoring cruises. The Peruvian Navy and Chilean Navy undertake similar cruises annually as well.

There is a need to find mechanisms for sharing the vast amount of regional fisheries data, and to obtain and share satellite data. In addition, there is a need to ensure the effective operation of GLOSS stations in the region, and faster reporting of their data for widespread use.

The IOC's ODINCARSA Project will build an Ocean Data and Information Network (ODIN) for the Caribbean and South America (CARSA).

The CPPS's Regional Study of the "El Niño" Phenomenon (ERFEN) project has a Climate Bulletin product, which helps nations regionally to understand, forecast and investigate the effects of "El Niño".

The IOC's Harmful Algal Bloom (HAB) Programme contributes to creating the potential to forecasting HAB occurrences, which should be part of GRASP.

Wave forecasts for ports are an important potential product from the observing system.

Universities can also contribute to GRASP, for example through appropriate research, training and education, and by releasing data.

Finally, there is a Tsunami Network, which also can make a significant contribution to GRASP.

Mr. Nuñez explained the purpose of creating GRASP, and spelled out the GOOS Regional Policy. The way to increase knowledge and understanding of the present state of development of the region is to cooperate, collaborate and work together to add value.

A GRASP should follow GOOS principles and IOC/WMO/UNEP policies and practices.

Why do we need a Regional Alliance?

- 1- to coordinate at regional level and optimize the use of resources
- 2- to study the Eastern Boundary Current System in an integrated way from a regional perspective
- 3- to exchange data and make all available data to users
- 4- to better coordinate local, national and regional research and development operational activities
- 5- to be able to do operational oceanography just as we already do operational meteorology
- 6- build capacity to improve access to international research projects (like Argo)
- 7- to facilitate access to research from the coastal seas of the region
- 8- to study ocean variability operating on 20-40 day scale

In conclusion, it was agreed that governments need to understand that benefits will include more efficient use of resources. There is a need to show what the benefits are in relation to costs.

It was noted that the ERFEN scientific committee would benefit from intensified observations of the Humboldt Current. Also ERFEN has indicated that a strategic approach to the region is needed, which could be met by GRASP.

Mr. Ulises Munaylla, observer from CPPS, explained that CPPS was working with UNEP's Regional Seas Programme through the Lima Convention for the protection of the marine environment from marine pollution, which also connects to the Conventions on Biodiversity and Climate. CPPS believes it is important to develop GOOS as a mechanism to facilitate achieving the goals of the regional conventions.

Mr. Francisco Chavez, Senior Scientist from MBARI, USA, reminded participants that not all observing systems were operating in real-time (e.g. biology). For biology, researchers very well study the area. It would be desirable to integrate the data from these prior activities to create climatologies for biological and chemical phenomena..

Mrs. Maria Concepción Donoso, Specialist from UNESCO – ORCYT, Montevideo, suggested also capitalizing on the regional programmes like HYCOS for complementary land observations and the HYDRONET system on the New Hampshire Server.

## 4.2 GOOS BENEFITS

This Agenda Item was introduced by Mr. Colin Summerhayes. What are the benefits that we can provide as a GOOS Regional Alliance? First, improved observations lead to improvements in weather, climate, and ocean forecasts. In the energy industry climate forecasts could be used for energy load forecasting. For transportation, weather forecast help ship route optimization and planning. In the finance industry, climate forecasts assist risk rating for compliance, weather derivatives for trading futures, and hedging. The challenge is to convert environmental forecasts into business forecasts. This will lead to increased demand from users.

Mr. Summerhayes gave some examples of specific benefits. Preparations based on ENSO forecasts helped to reduce California storm losses in the 1997 – 1998 “El Niño” by up to \$1.1 vis-a-vis \$2.2 billions in the 1982 – 1983 “El Niño” event. Adequate decisions in the agriculture sector saved important losses (e.g. in the U.S. \$200/\$300 million/year and in Mexico up to \$10 to \$25 millions per year). Worldwide the agriculture benefits can amount to at least \$450 to per \$550 millions per year.

He advised participants to consult publications by Rodney Weiher, the NOAA Economist that focus in local cost-benefit analysis. The publications are available under costs-benefit on the GOOS Web Site <http://ioc.unesco.org/goos>.

Support for investment in ocean observations would depend on their operational benefits.

Economics can help justify investments. In order to calculate the National Return on Investment, IOC is encouraging operational communities to work together with national economical institutions and industries to transform environmental forecasts into business forecasts.

In addition, to achieve a greater impact and get more attention from industry and other users we should develop products that meet the particular needs of each user.

## 4.3 ASSESSMENT OF NEEDS AND REQUIREMENTS

This Agenda Item was introduced by Eduardo Lazo from Peru.

There are basic networks in all countries, but there is limited research and development. There are good networks for meteorology and hydrology, for which topics there are adequate training and education programmes. However, there are not enough postgraduate opportunities or regional networks for oceanography.

We have experienced personnel but not enough technical personnel for the maintenance of equipment, or for data and information management.

Every country needs satellite capture systems and satellite data management systems. There is a need for training so as to convert these data into useful products.

Peru’s ability for forecasting improved after 1997-98 when the World Bank provided support for scientific observations. The project cost around US\$ 10 millions. It was used to

upgrade oceanographic meteorological and hydrological stations, to provide a complete ocean-land observation network supported by trained activities. This involved an extensive training activity with 6 month long cruises. Skills included numerical modeling in support of forecasting.

The project created a valuable database for waves and trends, combined with numerical modeling and associated data assimilation in support of forecasts. Outputs are freely available.

There has been some problem with vandalism of buoys that delayed the full implementation and increased the cost of the project.

Products are being widely used by fishermen, by ships and port managers.

#### 4.4 TERMS OF REFERENCE OF THE JOINT IOC-WMO-CPPS WORKING GROUP ON THE INVESTIGATIONS OF “EL NIÑO” AND ITS INVOLVEMENT WITH GOOS ACTIVITIES IN THE SOUTHEAST PACIFIC REGION

Mr. Rodney Martinez, ODINCARSA Coordinator and member of Ecuador Delegation, introduced this Agenda Item. He explained the Terms of Reference of the Joint IOC-WMO-CPPS Joint Working Group on the Investigations of “El Niño”, which is charged with promoting activities in support of ERFEN. One new approach is to relate ERFEN and GRASP, although GRASP covers more than just El Niño.

The Terms of Reference also call for capacity building in the content of GOOS and JCOMM.

ERFEN is a regional programme underpinned by a legally binding instrument (Protocol) that may assist GRASP implementation.

The Terms of Reference also call for the development of cost-benefit studies of the observing system. An example of what can be achieved is the Greek POSEIDON Project, whose web site gets 25,000 visits per day; a demonstration of benefit.

We need to demonstrate the benefits that will arise from improved forecasting.

Mr. Martinez also drew attention to the Action Plan.

- 1- institutional strengthening will include capacity building in use of remotely sensed data. These data are also critical for the success of GRASP
- 2- there is need for comprehensive observing system to undertake marine climate surveillance and forecasting. This calls for data collection and transfer in real time. There is a need for countries to contribute to JCOMM activities to fill important data gaps.
- 3- recommend increased use of numerical models in forecasting. Need to ensure that we do not duplicate activities by doing the same things in each country. Encourage the regional approach of GRASP
- 4- recommend efforts are made to encourage investment in the observing system.

The Chairman noted that for having a buoy network within GRASP a possibility could be to negotiate with NOAA for Atlas buoys, which may be obtained at much lower cost than commercial systems.

## **5. ORGANIZATION OF WORKING GROUPS**

Two Working Groups were established to work on the establishment of the GOOS Regional Alliance for the Southeast Pacific Region (GRASP). This will cover Agenda items from 5.1 to 5.2.4.

### **5.1 ESTABLISHING A GOOS REGIONAL ALLIANCE FOR THE SOUTHEAST PACIFIC REGION (GRASP)**

Working Group I worked on the preparation of a Letter of Intent for the Establishment of the GOOS Regional Alliance for the Southeast Pacific (GRASP). The main purpose of the letter is the establishment of an Ad-Hoc Group of Experts to work on the developing of an integrated ocean observing system for the Southeast Pacific Region. This system will be a regional component of the Global Ocean Observing System (GOOS). The work of the group should be planned following established Terms of Reference for the Group.

The complete text of the Letter of Intent including Terms of Reference for the Ad-Hoc Group of Experts is included in Annex IV.

### **5.2 DEFINING PROJECTS AND CAPACITY BUILDING NEEDS FOR THE SOUTHEAST PACIFIC GOOS**

Working Group II defined two key policy related themes that should form the basis of major demonstration projects having significant societal benefits:

1. to improve the accuracy of weather and climate forecasts,
2. to improve the information required to manage the fisheries more effectively

***Weather and climate forecasts:*** mid term forecasts rely heavily on SST data from buoys and satellites, and the Wider Pacific SST has a profound effect on the coastal climate. To improve the medium term forecasts, more observation points (buoys, floats or gliders) are needed for subsurface data and to improve calibration of the satellite data. In addition, in future the numerical forecasting models will be improved by the incorporation of subsurface temperature data, which requires the collection of such data from floats, gliders and/or buoys.

These requirements suggest the need for a comprehensive buoy or instrumental network along the coast, involving both surface and subsurface observations, with an observing system simulation experiment being used to decide on how many buoys are needed, and where to put them.

In addition, it is evident that improved coastal forecasts of weather conditions require the deployment of a network of atmospheric profiling devices.

Given these technological requirements it is clear that for the observing system to be effective, training will be required in its different subsystems e.g. in making the observations (e.g. in deploying and building buoys), in communicating the data from buoy to shore, in managing the data, and in transforming it into products via numerical models.

***Fisheries Management:*** here the challenge is first to determine which geographic areas will likely be most effected by substantial changes in the ecosystem caused by climate change, and these areas should be the focus of observational effort. A set of key indicators needs to be devised that can be used to identify and forecast significant changes.

In coastal areas specific indicators should be developed to use in warning of potential dangers caused by harmful algal blooms to coastal aquaculture and others.

### **General Comments:**

As a first step in evaluating the capacity for these and other projects it would be advisable to determine:

How is the work being done at present, and by whom?

Are local models being used, or imported ones?

What is the input to those models, and how could it be improved?

How does the data flow through the system and how could that be improved?

What do we need to improve the underlying observing system (e.g. different technologies, filling of data gaps?).

Certain generic capacity building requirements could be identified that would apply to any project. These can be usefully grouped under headings such as:

- Human resources
- Organisational and institutional capacity
- Networks
- Extra-regional sources of assistance.

Training can take two or more forms, for instance training courses on site given by local or external experts, or training overseas in specialized centres with specific capabilities. External experts can be used for instance on long-term assignments to transfer technology at an institutional level.

Specific requirements identified included the following:

Access to and training in the use of remotely sensed data.

Access to and training in the use of a variety of numerical models.

Access to and training in the use of data and information management techniques, e.g. through ODINCARSA.

Technological requirements included, for instance:

Importing blueprints of existing technologies such as Atlas buoys or Argo floats, and using the originators to train local staff in construction, so as to save on the costs of purchase, and to build indigenous capacity to continue a buoy or float programme independently.

Infrastructure suggestions included making the most of existing institutions that offer regional training and educational possibilities, such as the University of Concepción.

Intra-regional cooperation offers many potential opportunities for synergy and developing capacities.

A first useful step would be to create an inventory of present human, technological and infrastructure capabilities as the basis for ascertaining how matters might be improved. It is clear that there is a lack of professionals in oceanography.

## **6. CREATION OF AN AD-HOC ADVISORY GROUP FOR THE SOUTHEAST PACIFIC GOOS**

### **6.1 TERMS OF REFERENCE**

The Chairman Mr. Rodrigo Nuñez introduced this Agenda item. He recalled that this issue was previously discussed under Agenda item 5.1.3. A Letter of Intent for the establishment of the GOOS Regional Alliance for the Southeast Pacific Region was approved and signed by attending delegations. The main purpose of this Letter of Intent is the creation of an Ad-Hoc Group of Experts for the preparation of a Strategic Plan intended for 10 years.

### **6.2 COMPOSITION OF THE AD HOC ADVISORY GROUP**

The Chairman informed the meeting that the Terms of Reference for the Ad-Hoc Working Group for GRASP and its main objectives were also included in the Letter of Intent.

The complete text of the Letter of Intent for the Establishment of GRASP, and documents to be elaborated by the Ad-Hoc Group are included in Annex IV.

## **7. FOLLOW-UP OF ASSIGNED TASKS**

1. Elaborate a GRASP Strategic Plan for the Development of an Integral Ocean Observing System for the Southeast Pacific Region with an intended period of 10 years.
2. Prepare a detailed inventory of activities carried out in the region in observing, monitoring, evaluation, modeling, evaluation, protection and forecast techniques in time and space dimensions, as well as, the way the behavior of the ocean and the atmosphere is measured in the region.
3. Evaluate member states needs for a proper implementation of the Regional GOOS in the Southeast Pacific Region.
4. Develop necessary support links with concerned organizations, projects and programmes at the regional and global scale.



5. Consider adequate mechanisms for the gradual implementation of pilot projects aimed to filling existing gaps and to identify, as well, possible funding sources.
6. Elaborate and distribute guides for improving the participation of national institutions in the activities of the Regional Alliance – GOOS.
7. Present the Strategic Plan to the GRASP Steering Committee for approval.
8. Coordinate with Regional, National and Local Institutions of the region the development and implementation of GRASP.
9. Participate in the biannual Meeting of the Regional Forum of GOOS and deliver progress reports and development plans of GRASP to the Intergovernmental GOOS Group and the Comisión Permanente del Pacífico Sur (CPPS).

## **8. OTHER MATTERS**

No other matters were raised.

## **9. ADOPTION OF THE REPORT**

The IOCARIBE-UNESCO Secretariat was charged with the finalization of the Summary Report, which would be circulated electronically for final approval. The final version will be produced as a GOOS Report in the IOC Series Reports of Meetings and Equivalent Bodies.

## **10. DATES AND PLACE FOR THE NEXT MEETING**

It was agreed that GRASP should initially meet annually, with the date and venue of the next meeting to be negotiated by the Secretary of IOCARIBE-GOOS.

## **11. CLOSURE**

The Chairman thanked the local organizing committee for the facilities and collaboration during the Meeting. The Chair closed the GRASP Meeting at 12:30 on 31 May 2003.



## **ANNEX I**

### **AGENDA**

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- 10. DATES AND PLACE FOR THE NEXT MEETING**
- 11. CLOSURE**



ANNEX II

LIST OF PARTICIPANTS

1. EXPERTS FROM MEMBER STATES

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## ANNEX III

### **TERMS OF REFERENCE COOPERATION AGREEMENT BETWEEN THE PERMANENT COMMISSION FOR THE SOUTH PACIFIC (CPPS) AND THE INTERGOVERNMENTAL OCEANOGRAPHIC COMMISSION (IOC) (Updated in June 2003 and covering the next decade)**

#### **Purpose**

Strengthen the co-operation between the Permanent Commission for the South Pacific (CPPS) and the Intergovernmental Oceanographic Commission (IOC).

#### **Aims**

- Increase co-operation on oceanographic and meteorological research of the marine climate in the Southeast Pacific, with emphasis on its fluctuations such as the El Niño and La Niña phenomena;
- Increase co-operation between IOC and CPPS particularly within the scope of the GOOS programme, aimed to the development of a regional Southeast Pacific observing system based on the GOOS design and following GOOS principles;
- Increase co-operation between IOC and CPPS with regard to ocean data and information exchange, with special emphasis on institutional networking at national, regional and global scale, and on development of data and information services and products that benefit multiple user groups;
- Increased cooperation on Integrated Coastal Area Management (ICAM) programmes, addressed to reinforce ICAM capabilities of the IOC and CPPS regional Member States
- Strengthen the oceanographic research capabilities of the member countries of CPPS, standardizing analytic methodologies, interpreting the results and efficiently disseminating the results;
- Organise, as appropriate, joint activities on issues that are of mutual interest, such as training workshops and courses on themes specially concerning evaluation of the ocean weather and climate and climate change;
- Increase co-operation between IOC and CPPS on issues related to oceanography and monitoring surveys in the Southeast Pacific Region, including the compilation, analysis and assessment of data, and information management to consolidate meteorological, climatological and coastal observations in the Southeast Pacific Region.
- Exchange of information in their respective fields of responsibility, including information on the implementation and effectiveness of the programmes carried out in the Southeast Pacific Region.

## **Contributions**

### **1. From CPPS**

- Research programmes on the marine climate and climate change: Regional Study of the Phenomenon known as “El Niño” (ERFEN);
- Programme of annual regional oceanographic observation cruises in the south-east Pacific;
- Climate Alert Bulletin for the southeast Pacific.

In coordination with the member countries, the following facilities may be provided:

- Coastal stations for observation of oceanographic and meteorological conditions (Chile, Colombia, Ecuador and Peru), in agreement with member countries
- Seasonal oceanographic cruises in agreement with member countries;
- Annual fishing statistics for the south-east Pacific (1990-2001);
- Specialized library on marine subjects (4,000 volumes).

### **2. From IOC**

- Development, promotion and facilitation of international oceanographic research programmes with a view to improving our understanding of regional and global ocean processes and their relationship to the sustainable development of our oceans;
- Planning, establishment and coordination of a global oceanographic observing system together the information needed for oceanic and atmospheric forecasts for oceans and seas worldwide;
- International leadership in training, education and technical assistance programmes for systematic observation of the global ocean and its coastal zones;
- International leadership in training, education and technical assistance programmes for Integrated Coastal Area Management (ICAM);
- Efficient use and broad availability of oceanic and atmospheric data obtained through research, observation and monitoring;
- Relevant products and training opportunities from the Ocean Data and Information Network for the Caribbean and South America Regions (ODINCARSA).

## **Information**

### **(A) CPPS**

<b>Status:</b>	Intergovernmental organization
<b>Members:</b>	Chile, Colombia, Ecuador and Peru
<b>Established:</b>	18 August 1952
<b>Principal focus:</b>	Maritime affairs
<b>Areas:</b>	Political, legal, scientific and economic
<b>Headquarters:</b>	Guayaquil, Ecuador

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## **(B) IOC**

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**Members:** 129 Member States worldwide  
**Established:** 1960  
**Principal focus:** Promotion of marine scientific research and related ocean services  
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ANNEX IV

**LETTER OF INTENT**

**REGIONAL ALLIANCE OF THE GLOBAL OCEAN OBSERVING SYSTEM FOR  
THE SOUTHEAST PACIFIC**

**GOOS REGIONAL ALLIANCE FOR THE SOUTHEAST PACIFIC  
(GRASP)**

Agreement for the establishment of a Research Institutions Association to promote the Operational Oceanography in the Southeast Pacific Region, called from now on GRASP whose members will search for the development of regional cooperation within the framework of the Global Ocean Observing System (GOOS).

In Cartagena de Indias, Colombia, on 31 of May 2003, the representatives of the signatories Institutions find below expressed their interest in establishing a Regional Alliance for the Global Ocean Observing System (GOOS) for the Southeast Pacific region (GRASP) and jointly decided to:

1. Establish an AD HOC Group of Experts to elaborate a proposal for the Strategic Plan to the development of an Integrated Global Ocean Observing and Monitoring System for the Southeast Pacific Region. This system will be part of the regional component of the Global Ocean Observing System. The Ad hoc Group should perform its duties following the Terms of Reference included in Annex "A".
2. Contribute to the work of the Ad hoc Group by providing necessary information for the preparation of the Strategic Plan.
3. Develop activities to promote operational oceanography based on existing infrastructure and programmes in the Southeast Pacific Region.
4. Promote capacity building and exchange of knowledge among the members of the Regional Alliance.
5. Promote studies to evaluate potential economical and social benefits generated by the operational oceanography in the Southeast Pacific Region.
6. Cooperate with involved organizations on the evaluation of climatic change, research of the marine environment and impact of climatic variability.

ANNEX “A”

**TERMS OF REFERENCE FOR THE AD HOC WORKING GROUP IN CHARGE  
OF ELABORATING BASIC DOCUMENTATION FOR THE GOOS REGIONAL  
GOOS ALLIANCE FOR THE SOUTHEAST PACIFIC (GRASP)**

With the purpose of elaborating fundamental documentation for the Regional Alliance of the Global Ocean Observing System for the Southeast Pacific Region (GRASP), the signatories Institutions of the *Letter of Intent*, which formalized the establishment of this Alliance decided to form an Ad hoc Group of Experts of no more than 14 members to work based on the following terms of reference:

1. Elaborate a GRASP Strategic Plan for the Development of an Integral Ocean Observing System for the Southeast Pacific Region with an intended period of 10 years.
2. Prepare a detailed inventory of activities carried out in the region in observing, monitoring, evaluation, modeling, evaluation, protection and forecast techniques, as well as, the way the behavior of the ocean and the atmosphere is measured in the region.
3. Evaluate member states needs for a proper implementation of the Regional GOOS in the Southeast Pacific Region.
4. Develop necessary support links with concerned organizations, projects and programmes at the regional and global scale.
5. Consider adequate mechanisms for the gradual implementation of pilot projects aimed to filling existing gaps and to identify, as well, possible funding sources.
6. Elaborate and distribute guides for improving the participation of national institutions in the activities of the Regional Alliance – GOOS.
7. Present the Strategic Plan to the GRASP Steering Committee for approval.
8. Coordinate with Regional, National and Local Institutions of the region the development and implementation of GRASP.
9. Participate in the biannual Meeting of the Regional Forum of GOOS and deliver progress reports and development plans of GRASP to the Intergovernmental GOOS Group and the Permanent Commission for the South Pacific (CPPS).

The objectives of the Regional System should be the same as the Global System modified with a specific objectives to meet fundamental needs and priorities for the sustainable development of the countries of the region. Priority areas for the overall concept and implementation of GRASP will be:

<b>Tourism</b>	<b>Fisheries</b>	<b>Agriculture</b>	<b>Acuiculture</b>
Integrated Management of Coastal Zones	Maritime Security	Marine Pollution	Marine Biodiversity
Data Exchange	Meteorological Forecasts	Capacity Building	Tsunamis
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ANNEX V

**LIST OF ACRONYMS AND ABBREVIATIONS**

<b>Argo</b>	Global Array of Profiling Floats
<b>CPPS</b>	Permanent Commission for the South Pacific
<b>ERFEN</b>	Regional Study of the El Niño Phenomenon
<b>ENSO</b>	El Niño Southern Oscillation
<b>EUROGOOS</b>	European GOOS
<b>GCOS</b>	Global Climate Observing System
<b>GLOSS</b>	Global Sea-Level Observing System
<b>GODAE</b>	Global Ocean Data Assimilation Experiment
<b>GOOS</b>	Global Ocean Observing System
<b>GRASP</b>	Regional Alliance for the Southeast Pacific
<b>HAB</b>	Harmful Algal Blooms
<b>I-GOOS</b>	Intergovernmental Committee for GOOS
<b>IOC</b>	Intergovernmental Oceanographic Commission
<b>IOCARIBE</b>	IOC Sub-Commission for the Caribbean and Adjacent Regions
<b>JCOMM</b>	Joint WMO/IOC Technical Commission for Oceanography and Marine Meteorology
<b>MoU</b>	Memorandum of Understanding
<b>NEARGOOS</b>	N.E. Asian Region GOOS
<b>NOAA</b>	National Oceanic and Atmospheric Administration (USA)
<b>ODINCARSA</b>	Ocean Data and Information Network for the Caribbean and South America
<b>SST</b>	Sea Surface Temperature
<b>UNCED</b>	United Nations Conference on Environment and Development
<b>UNEP</b>	United Nations Environment Programme
<b>UNESCO</b>	United Nations Educational, Scientific and Cultural Organization
<b>WMO</b>	World Meteorological Organization
<b>WSSD</b>	World Summit for Sustainable Development