

**INTERGOVERNMENTAL OCEANOGRAPHIC COMMISSION  
(of UNESCO)**  
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Data and Information Exchange (IODE-XXI)**  
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**GOSUD report for 2009-2010**

**Loïc Petit de la Villéon. Gosud chairman**

*In June 2010, Robert Keeley stepped down as GOSUD co-chairman. The GOSUD partners and contributors thank Robert Keeley very much for his highly significant contribution to the project. GOSUD was set up in 2001 following a recommendation from IODE XVI, establishing the Underway Sea Surface Salinity Archiving Pilot Project. Since the beginning of the Project, in 2001, Robert Keeley led the project as chairman from the outset, seconded by Thierry Delcroix as co-chairman. We are actively looking for a candidate to co-chair GOSUD.*

*The 2 main events that highlight the intersessional period are:*

- *GOSUD workshop which was held in Oostende at the Unesco/IOC Project Office for IODE on 4-5 May 2010*
- *The evolution of the GOSUD data flow allowing the delayed mode dataset production.*

## **1. INTRODUCTION**

The Global Ocean Surface Underway data (GOSUD) Project is an Intergovernmental Oceanographic Commission (IOC) programme designed as an end to end system for data collected by ships at sea. The goal of the GOSUD Project is to develop and implement a data system for surface ocean data, to acquire and manage these data. The data concerned are those collected when a platform is underway and from the ocean surface down to about 15 m depth. All information relative to the project is available from the web site (<http://www.gosud.org>) hosted by Ifremer.

The aims of the project are to organize the surface underway data that are collected, to work with data collectors to improve practices to meet the benchmarks of spatial and temporal sampling and data accuracy set forth by GOOS. More precisely the following goals are targeted:

- Building comprehensive archives for surface underway ocean data. This encompasses data collected by any instrumentation at any time. It will contain sufficient meta-data that users will have clear information about accuracy, instrumentation, sampling, etc
- Adding value to the archives by refining and standardizing existing quality assessment procedures carried out in near real-time and in

- delayed mode data and documenting both
- Providing users with easy and efficient access to data and information. At any time after data collection, a user should be able to access the highest quality and the latest release. Users should be able to distinguish levels of quality in the archives. Users will be able to use the data and easily combine them with data from other sources.
- Working with data providers to improve the data acquisition systems and to return information to data collectors about the data they provide.
- Working with scientific organizations interested in surface data to provide products to a broader community.

## **2. REPORT ON ACTIVITIES CARRIED OUT DURING THE INTER-SESSIONAL PERIOD**

### 1.1 Status of the Project

Since it began, the GOSUD partners have focused their efforts on assembling together data that have been collected by various agencies around the world. Some have been regular data contributors such as ORE SSS (France), NOAA (USA) and Coriolis (France). Some others have been simply occasional (UK, Australia, Belgium, Australia, Japan and Germany). The contributions may be related to regular merchant ship lines (ORE) or to research vessel surveys. Some contributions reach the GDAC –Global Data Centre- directly or may reach it by way of the GTS.

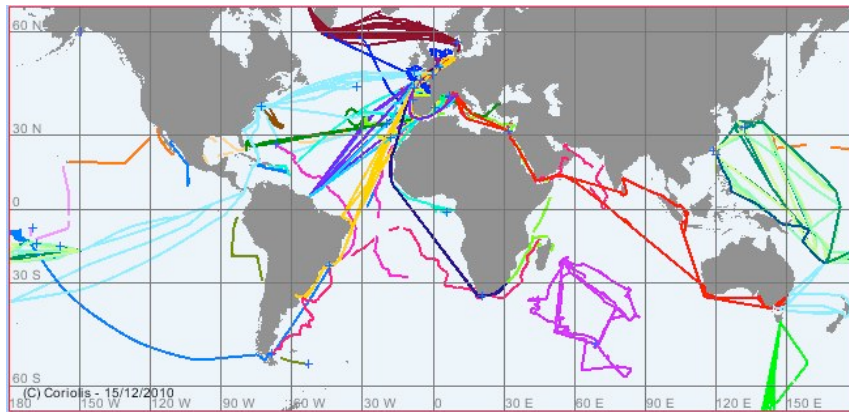
The GDAC is operated by the Coriolis data Centre (Ifremer, France). A daily back up of the data is performed by the US –NODC (Silver Spring, USA).

The quality of the data differs from one contributor to another. The data that reach the GDAC through the GTS could be of a lower quality because of reduced precision or content of the real-time transmissions.

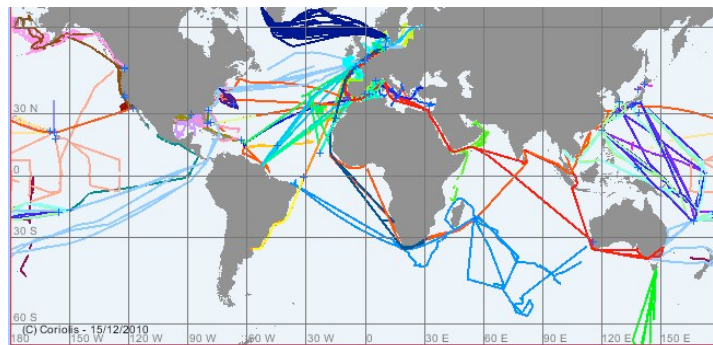
One of the recommendations of the Oostende workshop was that, each time it is possible, direct submission to the Gosud GDAC is preferred. However, when possible data submission through the GTS must be maintained for some near real-time users. A direct submission would also allow us to have better meta-data information. Finally, direct submission allows to identify the data collectors and also enables the DAC to provide a feedback on the quality of the data to the persons in charge of the data collection.

#### 1.1.1 Network status

During the inter-sessionnal period, efforts have been carried out to look for new data contributors.



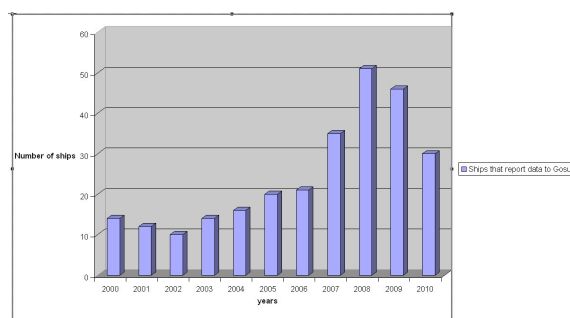
30 vessels have transmitted TSG data in 2010



47 vessels have transmitted TSG data in 2009

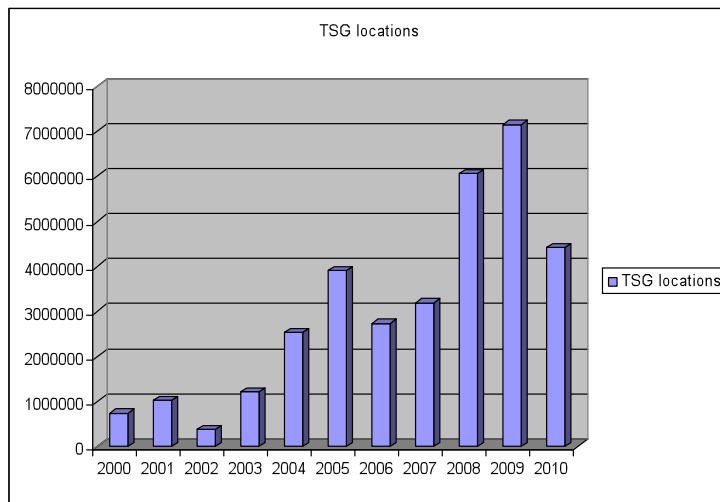
The number of vessels that have transmitted data has decreased from 2009 to 2010. This is due to the fact that the link between NOAA and the GDAC is out of action since March 2010.

Here is a spreadsheet with the evolution of the number of vessels during the 10 last years.



Number of ships that have reported TSG data to Gosud

Here is a spreadsheet with the evolution of the number of sampled data during the 10 last years



Until now, most of the data that have been submitted to the Project have been collected on board the research vessels and the ships of opportunity. During 2010, new contributors approached the Project and proposed that data could be collected on cruise or sailing ships and this could be of scientific interest. However, the equipment that are used most of the time on merchant ships or research vessels are too “heavy” for being used on small ships. A French initiative (Canoe) aims to develop instruments, derived from sensors that are currently used on fishing trawl.

It is stated that first priority must be put on regular contributions rather than pinpoint contributions.

#### 1.1.2 Work carried out during the intersessional period

- During the intersessional period a new NetCDF format has been developed. It enables to hold in a single file both data in near real time, delayed mode data, meta data (depth of intake, serial numbers of the instruments, calibration coefficients, ...) and ancillary data (data that have been used to process the delayed mode dataset ie Argo collocated data, water samples analysis,...)
- The data distribution system has been adapted to take into account the new format. The GOSUD TSG data are distributed using 3 different ways:
  - Real time data. Data are distributed through a ftp site which is updated on a daily basis. The files do not hold delayed mode data
  - Near real time data. Data are distributed through a ftp site which is updated every month. The files do not contain any delayed mode data. This has been developed to fulfill the SMOS satellite data needs for validation.
  - Delayed mode data. Data are distributed on a ftp site which is updated each time the data from one cruise have been processed. Those files are considered as the reference data set and of the highest quality. Those delayed mode datasets are processed using the software CVTSG developed by IRD -France- (see below)
- Quality control software. CVTSG is the software developed by IRD. It applies the

method developed by IRD. Using the data received in near real-time or when the ship arrives in the port and with the help of the salinity samples taken with bottles or / and data collected by neighboring instruments such as Argo, it is possible to evaluate the drift of the conductivity sensor and to propose salinity values adjustments that could fit the water samples analysis results and that take into account the calibration coefficients of the instruments. This software has been developed using Matlab and is available on request.

### 1.1.3 Summary of the Oostende workshop

On 4-5 May 2010, the Unesco / COI project office for IODE situated in Oostende (Belgium) hosted the GOSUD workshop. The objective of the workshop was to address a comprehensive review of the project. The number of participants was restricted to direct contributors that could assess the project and adapt the strategic plan for the coming years.

The following items were addressed:

- a. clarify the data stream
- b. enlarge the network of contributors
- c. document the quality control procedures, share them within the project and distribute the QC tools to a wider community
- d. increase the data quality level of the global dataset by focusing on vessels where the acquisition procedures are well known and documented

It was noticed that we were less successful on standardized quality control procedures although work has been done, by individual laboratories mainly situated in France and in the USA, to improve this.

It was also noticed that a large percentage of the data reaching the project (almost 50%) comes from the Global Telecommunications System (GTS). While the reporting of the data is timely, there is a severe lack of metadata which limits the long-term value of the data that arrive from the GTS. It was agreed that the project must focus on data coming from the networks (ie merchant ships networks) whose leaders are identified or from very well known and documented vessels or platforms (ie research vessels). This will allow more attention to be paid to data acquired with well maintained instruments, with good calibration and with ancillary data (ie water samples).

Status of the data exchanges has been evaluated during the workshop. Also, the new NetCDF format and the QC and delayed mode data processing software was presented during the workshop.

## **3. PROPOSED WORK PLAN AND TIME TABLE FOR THE NEXT INTER-SESSIONAL PERIOD**

**Delayed mode datasets.** Major work has been performed on methods to elaborate the delayed mode dataset. The effort will be pursued during the next intersessional period. In particular, the software developed by IRD (France) will continue to be distributed on request to Gosud partners that are interested and to a wider community.

**Reinforce the role of science centre.** Since software, that enables to QC data and to process a delayed mode dataset, is available, it becomes easier to have a common approach on data processing and data control. Using common tools and procedures and taking into account the local or regional expertise of the partners, it is suitable to re-start the data centre activities. The objective should be that no Gosud dataset should be distributed without a minimum of scientific.

**Enlarge the network.** In order to equip cruise or racing sailing boats with light equipment that collect surface data, initiatives have been taken during the reporting period. Gosud will contribute by proposing a hosting structure for the data collected in this frame.

**Gosud information and web site.** The Gosud web site must be updated on a more regular basis. Action has been undertaken to transfer the existing site to a Content Management System (CMS) which will allow identified partners to directly update the web site. This must be finalized.

### **3. REQUESTED FUNDING FOR THE NEXT INTER-SESSIONAL PERIOD**

No funds requested.

### **4. TEXT FOR THE ACTION PAPER**

Mr Loïc Petit de la Villéon will introduce this Agenda Item by referring to Document IOC/IODE-XXI/xx (Gosud report for 2009-2010).

1. During the reporting period major work has been done on tools and methods that enable production of delayed mode datasets of a higher quality and to visualize existing (near real time datasets). The Gosud project is looking for scientists or data managers that could help on data assessment. Using their regional expertise and with the help of the tools developed within the project. They could be direct partners of the project or contribute from outside the project.
2. As highlighted in the GCOS implementation plan, there is an important need of surface data and sea surface salinity data. GOSUD has proven the feasibility of data collection, quality control maintaining a global archive of Sea Surface Salinity. Robustness of the project is effective. However, most of the partners joined the Project since it began. The partnership of the project must be enlarged. The objective of the 2 coming years is to recruit research vessels that could transmit SSS data either in near real time or after the ship reached the port. This could be either non quality controlled data or processed in delayed mode data. The GOSUD project requires that IODE national representatives support the project by providing SSS data to the project either by opening their archives or by providing recent data.  
First priority must be put on research vessels or on merchant ships that operate on regular lines.

Draft recommendation: IODE recommend that National representatives support the project by distributing this report in their country and to identify potential contributors either by providing data to the project or by providing scientific or data management expertise that could enhance the quality of the Gosud dataset and /or enlarge the network. First priority must be put on research vessels or on merchant ships that operate on regular lines.

[end]