Intergovernmental Oceanographic Commission
Reports of Meetings of Experts and Equivalent Bodies

IODE Steering Group for Global Ocean Surface Underway Data Pilot Project (SG-GOSUD)

Third Session
Monterey, USA, 3-4 November 2003

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Abstract
The Third Session of the IODE Steering Group for Global Ocean Surface Underway Data (GOSUD) Pilot Project was held in Monterey, USA, from 3-4 November 2003. During this session the Steering Group reviewed the activities of the intersessional period and the accomplishments to date. The GOSUD Global Data Assembly Centre (GDAC) has been established at Coriolis, France, who will build the ftp structure to provide access to the underway data. It is also expected that http access will be developed. The Group also reviewed the tasks identified in the Project Plan and assigned leaders for the uncompleted tasks and established target dates. The project will seek to raise its profile within the scientific community during the next year.

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1. Introduction

The Session was opened on Monday, 3 November 2003 at 0900 by Bob Keeley, co-chair of GOSUD, who welcomed the participants to the meeting. He outlined the aim of the meeting, which is to identify leaders for the various tasks included in the Project Plan. It is important to demonstrate concrete results so that the Project shows progress.

2. Satellite Missions

John Gunn provided an overview of the two ocean salinity satellite missions. The Aquarius/SAC-D is a joint USA-Argentina partnership involving NASA and CONAE (Argentina Space Agency). The mission objectives are (i) understanding the response of the ocean to the global water cycle and climate, (ii) monitoring land use, environmental changes, and natural hazards, and (iii) monitoring atmospheric parameters and studying characteristics of space debris. Aquarius/SAC-D will launch in Fall 2008 and will have a 6am/6pm sun synchronous orbit with a 9-day global repeat coverage and a 60-90 km footprint. The Soil Moisture Ocean Salinity (SMOS) is an ESA mission that will launch in mid 2007 and will have a 6am/6pm sun synchronous orbit with a 3-day global coverage and a 40-60 km footprint. Aquarius and SMOS will work together to produce the most accurate and highly resolved global surface salinity measurement possible. This will be achieved with (i) integrated science teams, (ii) merged datasets and cross-validation, (iii) coordinated and shared validation data, (iv) coordinated field campaigns, and (v) joint science workshops.

The *in-situ* surface validation measurements will make use of operational real-time data in partnership with NOAA and the ongoing international Global Ocean Observing System (GOOS) including Argo drifters, subtropical Atlantic drifters, NE Pacific drifters, the TAO, TRITON and PIRATA moorings, ship thermosalinographs, and others. A joint Aquarius/SAC-D/SMOS Science Meeting will be held from 19-23 April 2004 and hosted by NOAA/AOML, Miami. The theme of the meeting will be "Beginning the Implementation" and will focus on (i) coupling satellite and *in situ* salinity observing systems, (ii) validation and data requirements, (iii) links to CLIVAR, GOOS, GCOS, and (iv) links to other satellite measurements such as rain, SSH, winds, and SST. Science themes will include (i) water cycle, ocean circulation and climate links, (ii) soil moisture, and (iii) sea ice.

3. Review of Activities

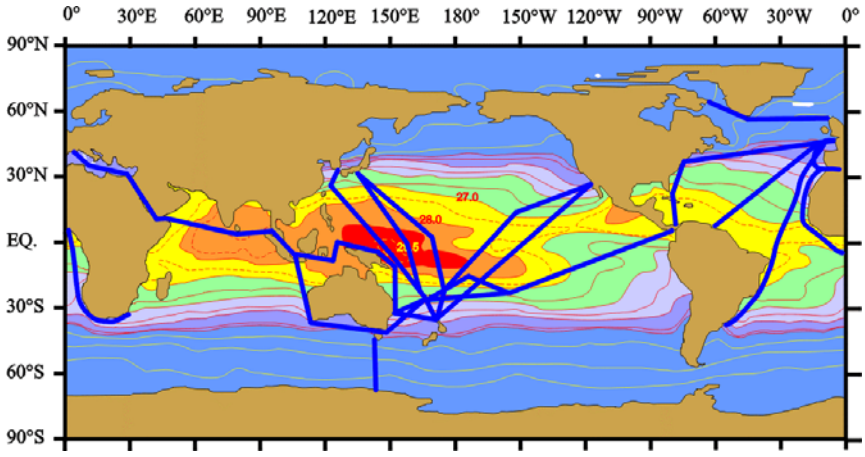
Bob Keeley reported on the GOSUD Project Plan. The Plan was prepared and presented at the 17th Session of IODE in March 2003. The IODE Committee endorsed the GOSUD Project Plan and invited Member States to actively participate in the project. The IODE has distributed a circular letter (IOC-CL 2083) inviting active participation in the project. The co-president of JCOMM informed the IODE Committee that JCOMM considers GOSUD as an important initiative that should be further supported. The project brochure was prepared and distributed at IODE-XVII.

Greg Reed made a presentation on the International Ocean Carbon Coordination Project (IOCCP). IOCCP is a joint pilot project of the IGBP-IHDP-WCRP Global Carbon Project and the SCOR – IOC Advisory Panel on Ocean CO_2. The IOCCP was developed in response to scientific and societal interest in understanding and quantifying global reservoirs and fluxes of ocean carbon, with particular attention to its interactions with the terrestrial and atmospheric carbon cycles. IOCCP is working with national, regional and international programs and data centres to provide a global view of ocean carbon by developing a compilation and synthesis of ocean carbon activities and plans, working with international research programs to fully integrate carbon studies into planning activities, standardizing methods, quality control (QC) procedures, data formats, and use of certified reference materials, and supporting regional synthesis groups and creating regional databases. The IOCCP web site is at http://www.ioccp.org. The IOCCP is organizing a workshop on Ocean Surface pCO_2, Data Integration and Database Development to be held in Tsukuba, Japan from 14-17 January 2004. The IOCCP has expressed interest in collaboration with GOSUD, chiefly in the areas of data formats and metadata systems. IOCCP would like to invite a member of GOSUD to attend the Tsukuba workshop.

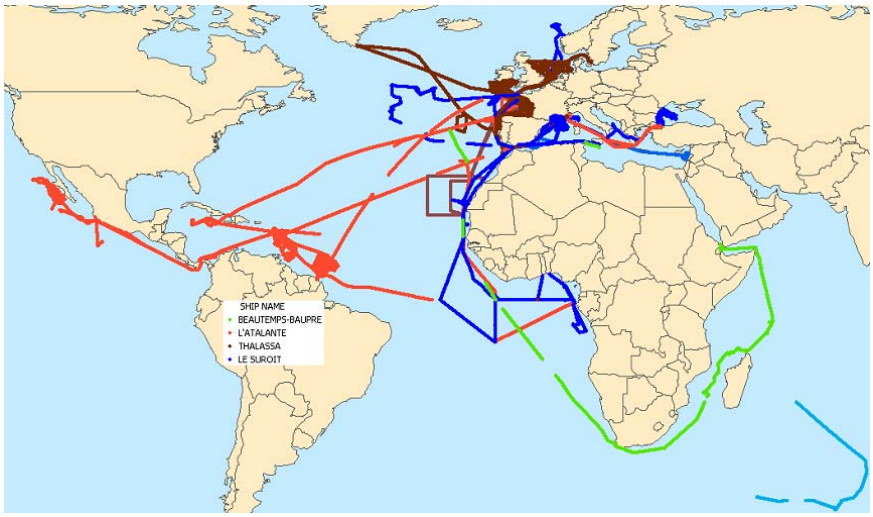
Steven Rutz discussed the new US NODC ocean data archive management system, in which over 20,000 data submissions are maintained. One component of this system, a public search and retrieval interface to the NODC archive is available at http://www.nodc.noaa.gov/Archive/Search. NOAA ship underway data from the last 5 years are in the archive and a subset of these data are in the NODC Shipboard Sensor Database (see http://www.nodc.noaa.gov/ssd). Also, the World Data Center for Oceanography, Silver Spring, which is operated by NODC, will contribute to GOSUD the 1.8 million historical surface observations that are in the World Ocean Database 2001.

4. Accomplishments to date

France. Thierry Delcroix discussed the French contribution to GOSUD via the *Observatoire de Recherche pour l'Environnement* (ORE-SSS). 13 merchant ships plus 6 research vessels collect TSG data in the tropical Pacific Ocean, North Atlantic Ocean, tropical Indian Ocean, Southern Ocean and tropical Atlantic Ocean. The merchant ship lines, as shown on the following figure, are IX10, IX1, IX31, IX30, PX51, PX5, PX4, PX31 (in collaboration with NOAA), PX12, PX17, AX1, AX20, AX15, AX11, with some routes dating back to 1969 Real-time data are gathered at LEGOS in Toulouse and made available via ftp, and delayed mode data in three DACs (IRD/Brest, IRD/Noumea, and LEGOS/Toulouse) and made available via http and/or on request (see http://www.obs-mip.fr/omp/umr5566/francais/obs/sss/index.htm). The aim is to have all SSS data centralized and made available at Coriolis in 2004.



Thierry Carval reported on TSG data collected from oceanographic vessels in 2002-2003. 240,000 temperature and salinity measurements were collected from 6 research vessel in real-time.



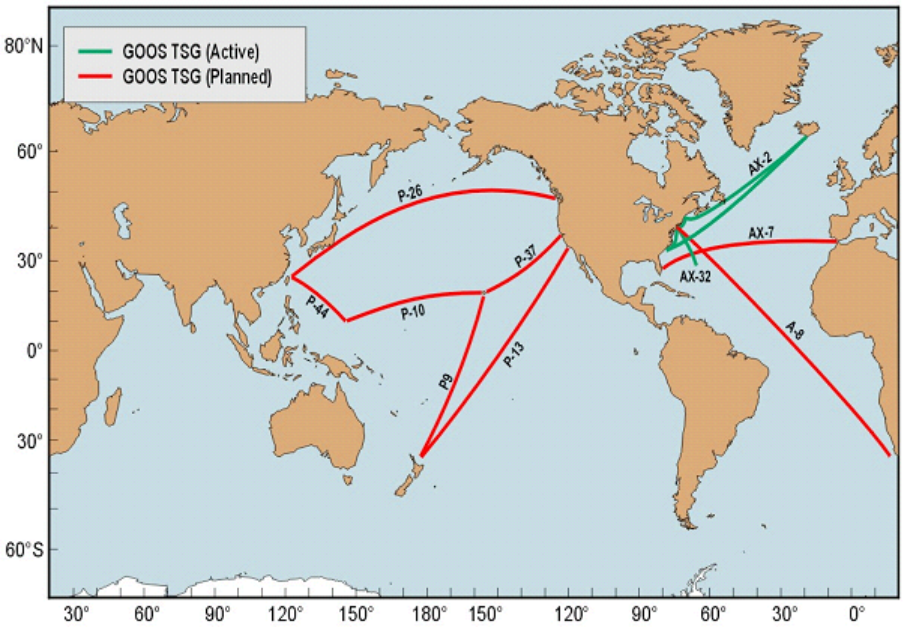
Coriolis TSG is collected from 5 research vessels. Data are distributed on the GTS, ftp distribution is under consideration for the end of 2003 and web access is expected for 2004. IFREMER recovers

historical underway TSG data. SISMER processes the historical data that have been archived for 10 years. GTS TRACKOB data have been collected since the beginning of 2003 and processing of this dataset may start in the beginning of 2004.

TSG real-time quality control tests performed are: Test 1: platform identification, Test 2: impossible date, Test 3: impossible location, Test 4: on-land location, Test 5: impossible speed, Test 6: global ranges, Test 7: regional range, Test 8: spikes, Test 9: gradient, Test 10: climatology, Test 11: instrument comparisons. Real-time quality control is followed by visual QC.

USA. WHOI – Robert Millard outlined the underway TSG data regularly collected on research cruises. These data are logged, written to CD, and archived at WHOI. No QC is performed on non-oceanographic cruises and the data are not released. All data are delayed mode at 1-minute interval. The data may never be used.

AOML – Bob Molinari discussed the initial steps towards a NOAA global water pCO2 observation system. In collaboration with national and international partners NOAA will add autonomous carbon dioxide sampling to the moored arrays and the VOS fleet to analyze the seasonal variability in carbon exchange between the ocean and atmosphere. Through a combined implementation and data management scheme, air-sea carbon fluxes will be determined on seasonal time scale for each major ocean basin. The initial focus will be the North Atlantic and North Pacific to complement the terrestrial programs. Automated pCO_2 systems have been used over the past decade on research ships. Improvements in design make it possible to place systems on commercial ships such as cruise ships and in engine rooms of cargo vessels. A prototype of a fully automated system that can run fully unattended for a month and includes telemetry options has been developed. Operational issues discussed include (i) minimal support from ship's crew places constraints on instrumentation, (ii) pCO_2 system needs to be compact, automated, easily re-bootable, (iii) coordination with high density XBT lines will ensure technical support onboard VOS for at least 4 times/year, (iv) frequent routing changes should be expected. The following map illustrates the present and proposed AOML TSG network:



TSG data are being collected concurrently with the pCO2 observations with the objective of developing algorithms for estimating pCO2 properties from the surface temperature and salinity data. In addition, AOML is working with the NOAA fleet to provide TSG data even if no carbon dioxide observations are being collected. These data will be used at present to initiate global climate models and in the future to provide pCO2 characteristics. The present and planned NOAA TSG fleet along VOS transects is shown in the Figure.

AOML will be responsible for real-time data flow that will be automatically quality controlled and inserted on the GTS. Delayed mode data will be scientifically quality controlled and archived by GOSUD.

UK. Lesley Rickards described current activities in the UK. Delayed mode data are available for research cruises from the last 10 years. The parameters include TSG. Data may have been quality controlled before submission to BODC.

The FerryBox project, a research project supported by the European Commission under the Fifth Framework Programme, involves 11 research institutions, 8 European countries, 9 ferry routes and will concentrate on areas relevant to issues of water quality, ecosystem dynamics and ocean climate variability and change. The ferry routes included in the FerryBox project are Baltic Sea, Skagerrak, North Sea, North Sea, Wadden Sea, Irish Sea, English Channel, Bay of Biscay and Aegean Sea. Parameters collected include temperature, salinity, fluorescence, nutrients, turbidity, ADCP, dissolved oxygen. The group agreed that GOSUD could benefit from data collected by this project.

These reviews generated some discussions and suggested actions. These include the following.

- The question was raised about coastal data versus deep ocean data (assuming that coastal data include those collected on continental plateau). Although GOSUD is a global project, it should not reject any coastal data submission.
- The situation described by Bob Millard of data collected but not passed to archive centres is not unusual. Because of the many institutions in the US it was suggested that the chairs contact Ocean.US offices to see what help they might be in organizing data flow.
- ICES wished to remind the meeting of the importance of the historical data. The main challenges in dealing with these data are the unknown or undocumented characteristics (such as quality, instruments, etc.).
- MEDS noted that it has been collecting TRACKOB for 13 years and could take the real-time tests described by France and pass all of these data through and then send them on to Coriolis. It was suggested that Canada and France discuss this further to work out how they could cooperate.
- France should prepare a document that describes their real-time QC procedures and this will be the starting point for the GOSUD. The document should be included on the GOSUD web site in a documents section.
- Lesley Rickards offered to contact the appropriate representative of the FerryBox programme to make them aware of GOSUD and to initiate contacts.

5. Further Implementation

The group reviewed the tasks identified in the Project Plan and assigned leaders for the uncompleted tasks and established target dates.

1. Ensure the SG has an appropriate mix of expertise (scientific, data management, data collection aspects). It was agreed that the project requires a good mix of expertise and this should be represented in the steering group. It would be useful to also include members from other projects such as CLIVAR and IOCCP. A list of possible members of the SG should be submitted by participants to the co-chairs (Target date: 6 months).

2. Identify participating science centres. Science centres will add value to data, particularly in delayed mode. Two science centres have been identified: AOML and Coriolis. The group discussed possible geographic divisions for the participating science centres. This could be by ocean basin/sub basin or by tropical/high latitude regions. It was agreed that there is a need to identify other countries that are interested in joining the project, such as Australia, Japan, and Germany. The co-chairs and Steve Cook will make contact and respond (Target date: 6 months).

3. Document space and time sampling requirements. Thierry Delcroix introduced a paper in preparation, based on a collection of 4.3 million SSS observations, whose aim is to evaluate the time/space scales of SSS variability, and to assess the ability of the present in-situ (and future remote) measurements to adequately resolve the variability of interest. These points will help in assessing how well sparse sampling and averaging techniques could affect interpretation of the results, and so in determining sampling requirements in the tropics. The paper will be submitted for publication in the next 2-3 months. He also mentioned that a complementary study, focussing on the Atlantic ocean, is underway (Reverdin et al.).

Thierry Carval reminded the meeting that median values derived from 3-4 minutes of sampling should be the standard for real-time sampling data collection to ensure the same sampling resolution for both real-time and delayed mode data. In delivering data to the GOSUD GDAC, participants should adhere to the desired 3-4 minute sampling. If data are to be sent on the GTS, such high frequency sampling can attract large costs. It is expected that transmission of median value over 1 hour or more is probably enough in this case.

Task is complete.

4. Prepare and distribute project plan. This task has been completed and the Project Plan was submitted to IODE-XVII in March 2003. Co-chairs and T. Carval will review to ensure that results of this meeting are properly reflected.

5. Develop products to advertise the project. The first version of the brochure was completed and was distributed at IODE-XVII in March 2003. The group discussed other possible products that could be used to advertise the project. Coriolis is developing an integrated daily objective analysis using integrated dataset from TSG, Argo, XBT, CTD, buoy and mooring data. AOML is developing seasonal SSS anomaly maps (from TSG and Argo float data). Both of these products could be recognised as GOSUD products. These products can be either linked from, or can reside on, the GOSUD web site. IFREMER will upgrade the GOSUD web site and provide a data selection tool to access data and download from an ftp site. IOC will investigate providing funds for the GOSUD web site upgrade. Action: Loïc Petit de la Villeon, Greg Reed. (Target date: 6 months).

6. Establish links to WDCs for data transfer. It was agreed that the GOSUD GDAC should hold the complete dataset. The WDC-A will serve as a long-term archive. Bob Keeley will discuss the question of inclusion of historical data in the GDAC with Syd Levitus. Underway data collected by ICES countries are submitted to ICES. Bob Keeley will discuss the ICES collected data with Harry Dooley to determine which countries are submitting data and how to interact between ICES and GOSUD. Action: Bob Keeley. (Target date: 3 months).

7. Establish information content of format including versions control, QC flags, process tracking, unique identifier. Thierry Carval discussed the proposed formats for GOSUD. Two formats have been suggested: (i) ASCII/XML format was proposed but no comments were received and this format may not be relevant, (ii) a format based on Argo trajectory format. The WOCE v3 trajectory format was also mentioned, however this format differs from Argo format. The Argo format is still under discussion and the approved format is expected to be agreed at the next Argo DM meeting (following this GOSUD meeting). The group agreed that the Argo trajectory netCDF format be used for GOSUD. Some netCDF utilities were discussed: ncgen (ascii→binary), ncdump (binary→ascii).

Those organizations with examples of underway data should attempt to convert their current underway data to the Argo format. The need for a template (or sample data file) to allow users to write data files was recognized. MEDS will convert some TRACKOB data to netCDF format that can be the basis of a template. WHOI will convert some of their data using the template to be provided by MEDS. NODC will also convert some NOAA cruise data within the next 3 months. IFREMER will also convert some data. Loïc Petit de la Villeon will coordinate and place the sample files and structure on the GOSUD ftp site. Examples of current underway data will be converted to the Argo netDCF format within the next 3-6 months. Any recommend changes necessary for

underway data will be addressed and a stable version of the format should to be adopted at the next meeting. All correspondence related to formats should go to the GOSUD format mailing list (gosud-format@ifremer.fr). It was noted that Argo metadata are different from GOSUD metadata. GOSUD will require additional fields. This is not well defined at present, but will be highlighted as sample data files are prepared. More work is required to define the metadata requirements.

8. Define and document the exchange format (include in task 7 above)

9. Develop a process to notify contributors when problems are detected. A problem reporting facility will be provided at the GDAC. The need for an easy way to verify format and report problems was recognised, however it was decided to leave this item as pending at this stage.

10. Develop an appropriate product(s) to show the nature of errors detected. It was agreed to leave this as a pending issue until more experience is gained in moving data.

11. Define and document QC procedures. A document describing the real-time automated QC tests (based on the Argo real-time QC procedures) was introduced by Thierry Carval (GOSUD Real-time QC, Version 0.9). It is requested that the national centres would pass data through QC procedures then pass the data on to the GDAC. Thierry Carval will provide the QC documents (in French and English) on the GOSUD web site (Target date: 3 months). Thierry Delcroix will define the limits for unrealistic data (spikes) (Target date: 6 months).

12. Establish contacts with other groups interested in underway data as appropriate. A number of contacts have been made with other groups. An invitation to IOCCP meeting (January 2004) in Japan has been received, the CLIVAR Science Conference will be held in June 2004, contact will be made with the FerryBox project (Lesley Rickards), the Aquarius/SAC-D/SMOS Joint Science meeting will be held in Miami in April 2004, the JCOMM Electronic Products Bulletin (J-EPB) meeting will be held in 2004. It was agreed that any member of the steering group could represent the group at these, or other relevant, meetings. The chairs will contact members of the Steering Group to try to ensure GOSUD representation at these meetings. Thierry Carval will attend the IOCCP. Bob Molinari will attend the Aquarius/SAC-D/SMOS meeting. Thierry Delcroix is attending the CLIVAR meeting.

13. Make contact with IOCCP to determine interest of Carbon community in participation. Task completed. See section 3 for follow on activities.

14. Establish GDAC. Coriolis has agreed to host the GDAC and all data will be sent to the GDAC. It was agreed that there should be an additional GDAC to act as a backup system that would provide an ftp directory facility with a backup of the data. US NODC will investigate the possibility of providing the second GDAC though perhaps with more limited functionality. Action Steven Rutz (Target date: 6-12 months).

15. Set conditions for verifying incoming data, and conditions for update, change of records, merging of records. The group discussed the best way to organise data. The possible options were (i) data per year, (ii) data per vessel, or (iii) data per DAC. A directory organised by vessels per year, stored in an ftp directory, was preferred. Ftp access will be available initially and web access will also be required. The formats group will decide the initial structures, both ftp structure and index inventory structure, by next meeting. Action SG (Target date: 12 months).

16. Define duplicates identification and management procedures including how and when to assign unique identifiers. Bob Keeley is preparing a paper addressing duplicates identification and unique identifiers. This paper will be distributed by the end of the year. Action Bob Keeley (Target date: 3 months).

17. Propose role of JCOMMOPS and contact them for assistance. JCOMMOPS is supported by IOC/WMO in support of DBCP, SOOP and Argo with member states contributing to support staff at JCOMMOPS. It was agreed that JCOMMOPS could be used to promote the GOSUD web site. Steve

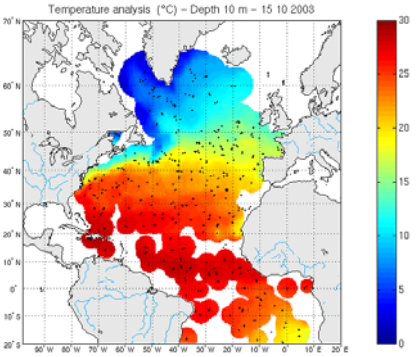
Cook will contact Etienne Charpentier to see what might be done that would not significantly impact resources provided for other work (Target date: 6 months).

18. Compile a list of publications that discuss analyses of data collected by the Project. Thierry Delcroix has circulated a list of publications. If anyone is aware of missing publications that discuss using TSG data or GOSUD in general they should inform Thierry Carval and Loïc Petit de la Villeon who will post on the GOSUD web site.

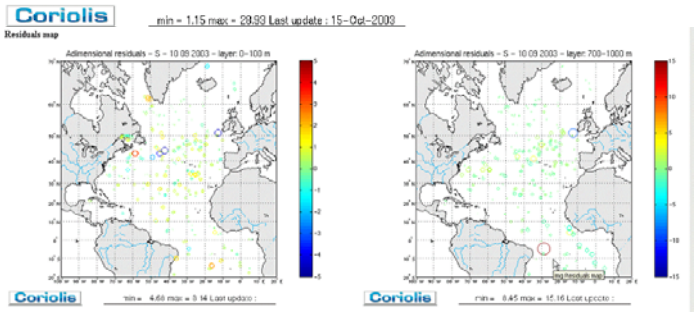
19. Develop products to show scientific results. The group agreed that a connection to the JCOMM Electronic Products Bulletin (J-EPB) would raise the profile of the project. A J-EPB meeting is planned for 2004 (to be held in Toulouse) and GOSUD should be represented at this meeting.

Coriolis is developing some products for SST that could be done for SSS, e.g.:

- Daily objective analysis on integrated datasets



- Residuals analysis map to detect anomalies



AOML has developed a delayed mode seasonal product. The group agreed that the project would contribute data to these two products. IRD/Noumea web site offers gridded fields of SSS for the tropical Pacific. LEGOS/Toulouse is developing a web page showing real time locations and measured SSS values for all selected ORE-SSS VOS. If anyone knows of other products, these products (or links to the products) should be sent to Loïc Petit de la Villeon for inclusion on the GOSUD web site.

20. Develop data access procedures. Ftp, http connection and index inventory files will be provided by the GDAC (see 15 above) There will be progress by next meeting (ftp access within next 6 months, http access will take longer). The group agreed that there will be no restriction on access to data and all data on the GDAC will be open to the public for Science and Education.

21. Prepare Annual Reports. Bob Keeley presented the first GOSUD Annual Report (2 pages) at the JCOMM-SOT meeting in July 2003. The next Annual Report will be coordinated by Bob Keeley and be presented at next SOT meeting in 2004. (Target date: 9 months).

22. Develop products to show project performance. A number of products were discussed: volume of data received, overall data quality, timeliness of data (an example is the MEDS TRACKOB maps showing distribution). It would be useful to record number of downloads from the ftp site. Each country may want to create individual products and these can be linked to the GOSUD web page. No action can be taken until more data are received.

23. Contribute as appropriate to the review of the EPB of JCOMM. A member of the SG should attend the J-EPB meeting in 2004. (see Task 19 above).

24. Create Project web site. The project web site was launched in March 2003 and is hosted by IFREMER (http://www.ifremer.fr/sismer/program/gosud). Loïc Petit de la Villeon is responsible for the GOSUD web site. It was agreed that web site should be upgraded and a request will be made to IOC to provide funds for further development of the website. Greg Reed will investigate the possibility of providing funds from IOC for the website. Loïc Petit de la Villeon will investigate registering the www.gosud.org domain name. (Target date: 6 months)

25. Monitor GTS traffic to compare to data received at GDAC and notify countries of differences in a regular report. MEDS volunteered. MEDS and Coriolis will discuss how to best report traffic on the GTS. Thierry Carval raised the question whether other data on GTS, which are not part of GOSUD project, be included in GDAC. MEDS and Coriolis will develop a proposal and the SG can make comments (Timeframe: 6 months).

Bob Keeley summarized the proposed GOSUD data system and the summarised tasks:

- The SG will start to look at the Argo trajectory format, start to write data into that format, and identify weaknesses. By the time of the next meeting there will be a version 1 of the format. Data should be sent to the GDAC at Coriolis.
- Coriolis will build the ftp structure that will provide access to the data. Also http access will be developed, if possible. It is expected that the NODC will provide some measure of mirroring (content and functionality).
- Establish links between GDAC and the WDCs (continue discussions with Coriolis, NODC and the WDC, Silver Spring).
- The GOSUD web site will be rebuilt to reflect the available products (or links to other products). The web site will include publications and outputs relevant to the project.
- Talk with JCOMMOPS to provide link to project.
- Initial QC procedures will be posted to web site. Data providers will document QC procedures and what is done with the data.
- It is intended to have a presence at other relevant meetings such as IOCCP, CLIVAR, JCOMM EPB (Electronic Products Bulletin), Aquarius/SAC-D/SMOS Joint Science meeting, the FerryBox project.

The project should be able to show real progress in moving data by the time of the next meeting.

6. Project Visibility

Ways of raising the project visibility were discussed. These include (i) posting reports and products to the GOSUD web site, (ii) requesting links from the JCOMM Electronic Products Bulletin and from the JCOMMOPS web sites to the GOSUD web site, (iii) linking to the client community, such as IOCCP and CLIVAR. Thierry Delcroix will contact Katy Hill at CLIVAR to request a link from the CLIVAR web site. The new internet domain name - GOSUD.org - will also provide increased visibility.

7. Other Business

- Representation on SG. The importance of representation of science community on Steering Group is considered to be important. It is also important that the data collection community be represented on SG.
- Documentation. Instructions on how to set-up TSG on ships are available on the IRD (Noumea) website. A reference to the document should be made from the GOSUD website (Action: Loïc Petit de la Villeon). A review of the ICES MDM guidelines on collection of underway data is required (Action: Co-chairs).

- Aquarius/SAC-D want validation data – GOSUD GDAC could provide.

8. Closure

Bob Keeley thanked all participants for their contribution to the third session of the Steering Group. It was agreed that the next session of the Steering Group should be held in conjunction with the next Argo Data Management Team meeting. Loïc Petit de la Villeon noted that more countries were represented at the previous GOSUD meeting and asked why are they not represented at this meeting. The group agreed that personal contact is required to encourage others to attend especially those countries that have collection progammes. It was also agreed that Bob Keeley and Thierry Delcroix, would continue in the role of the Steering Group co-chairs. The meeting closed at 1230 on 4 November.

ANNEX I

AGENDA

1. Introduction
   1.1 Welcome
   1.2 Local Arrangements
2. Satellite Missions
3. Review of Activities
4. Accomplishments to date
5. Further Implementation
6. Project Visibility
7. Other Business
8. Time and place of next meeting
9. Closure

ANNEX II

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ANNEX III

2003-2004 TASK LIST

The following is a summary of the tasks identified at the SG meeting.

Item	Task	Responsibility	Target Date
1	Contact Ocean.US for possible help in organizing data flow in the US	Co-chairs	May, 2004
2	France, Canada to discuss cooperation on TRACKOB data flow	B. Keeley, T. Carval	May, 2004
3	Ensure the SG has an appropriate mix of expertise	Co-chairs, SG	May 2004
4	Identify participating Science Centres	Co-chairs, Steve Cook	May 2004
5	Verify that published Project Plan is consistent with results of this meeting	Co-chairs, T. Carval	May, 2004.
6	Web site to be upgraded to include links to or products using data from GOSUD, QC document, etc.	Loïc Petit de la Villeon	May 2004
7	Establish links to WDCs for data transfer	Bob Keeley	January 2004
8	Establish information content of format including versions control, QC flags, process tracking, unique identifier	Loïc Petit de la Villeon, MEDS, NODC, WHOI	January 2004 (template) May 2004
9	Develop a process to notify contributors when problems are detected		Pending
10	Develop an appropriate product(s) to show the nature of errors detected		Pending
11	Define and document QC procedures	Thierry Carval, Thierry Delcroix	January 2004 May 2004
12	Establish contacts with other groups interested in underway data as appropriate	Lesley Rickards, SG	Ongoing
13	Establish GDAC	Steven Rutz, Co-chairs	November 2004
14	Set conditions for verifying incoming data, and conditions for update, change of records, merging of records	GDAC Formats Group	November 2004
15	Define duplicates identification and management procedures including how and when to assign unique identifiers	Bob Keeley	December 2003
16	Propose role of JCOMMOPS and contact them for assistance	Steve Cook	May 2004
17	Compile a list of publications that discuss analyses of data collected by the Project	SG	Ongoing
18	Develop products to show scientific results	SG, Loïc Petit de la Villeon	Ongoing
19	Develop data access procedures	GDAC	November 2004
20	Prepare 2004 Annual Report	Bob Keeley	July 2004
21	Develop products to show project performance		Pending
22	Contribute as appropriate to the review of the EPB of JCOMM	SG	July 2004
23	Maintain Project web site	Loïc Petit de la Villeon, Greg Reed	Ongoing
24	Monitor GTS traffic to compare to data received at GDAC and notify countries of differences in a regular report	MEDS, Coriolis	May 2004
25	Review ICES MDM guidelines on collection	Co-chairs	May 2004

	of underway data is required		
26	Reference instructions on how to set-up TSG on ships from the GOSUD web site.	Loïc Petit de la Villeon	May 2004
27	Cooperation with CLIVAR. GOSUD to offer to operate as an SSS DAC for CLIVAR	Thierry Delcroix	May 2004