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Reports of Meetings of Experts and Equivalent Bodies

IODE Steering Group for Underway Sea Surface Salinity Data Pilot Project

First Session

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Abstract

The IODE Steering Group for Underway Sea Surface Salinity Data Pilot Project was established during IODE-XVI. The objective of the project is to organise surface salinity data that are currently collected and to work with data collectors to improve data collection to meet the benchmarks of spatial and temporal sampling and data accuracies set out by the Ocean Observations Panel for Climate (OOPC). During its First Session the Steering Group reviewed the current status of collection of in-situ surface salinity data using the thermosalinograph and addressed each of the functions of the data management process for underway sea surface salinity data – Collection, Transfer, Processing, Archiving and Products.

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ANNEXES

INTRODUCTION

The Session was opened on Thursday, 15 November 2001 at 08:30 at the Salon de l'Ocean, Centre IFREMER de Brest, Brest, France by Gérard Riou, Director of the Technology and Marine Information of IFREMER. As host of the meeting, Catherine Maillard, SISMER, welcomed the participants to the meeting. The text of the welcoming address is contained in Annex 3.

Bob Keeley agreed to chair the meeting of the Steering Group. He presented the background to the Underway Sea Surface Salinity Data Archive pilot project and outlined the objectives of the meeting.

Background. The Ocean Observations Panel for Climate, OOPC, and its predecessors examined the usefulness of surface salinity data in the context of climate change detection. They state that:

"At high latitude, sea surface salinity is known to be critical for decadal and longer time scale variations associated with deep-ocean over turning and the hydrological cycle. In the tropics, and in particular in the western Pacific, and Indonesian Seas, and in upwelling zones salinity is also believed to be important."

They quote the benchmark sampling strategy to be one sample per 200 km square every 10 days and with an accuracy of 0.1 PSU. They also state that the tropical western Pacific and Indian Oceans and high latitudes should receive the highest priority.

CLIVAR planners have stated what they think are the attributes of a successful data and information management system. In the Proceedings of the International CLIVAR Conference held in Paris in 1998, one attendee stated that the following points are likely to be prominent.

- Swift assembly and distribution of data, ready availability and free access.
- Data sets and products are comprehensive in terms of the variables
- Encourage exploration of historical and paleo data sets.
- Encourage processing methods that eliminate or minimize the production of spurious signals.
- Ensure that adequate and timely data are available for the initialisation and validation of climate forecast systems.
- Maximize the utility of the sustained observing system for various process or intensive studies.
- Work with GOOS/GCOS, World Weather Watch and Global Atmosphere Watch in development and implementation of the strategy.

During the Sixteenth Session of the IOC Committee on International Oceanographic Data and Information Exchange (IODE) in Lisbon, Portugal, 31 October – 8 November 2000, the Committee adopted Recommendation IODE-XVI.10, establishing the Underway Sea Surface Salinity Data Archive Pilot Project and its Steering Group (Annex III). The document submitted by Bob Keeley at IODE XVI titled *Project Proposal for IODE: The Surface Salinity Project* (Doc IOC/IODE-XVI/32) was used as the basis for discussion fo the meeting.

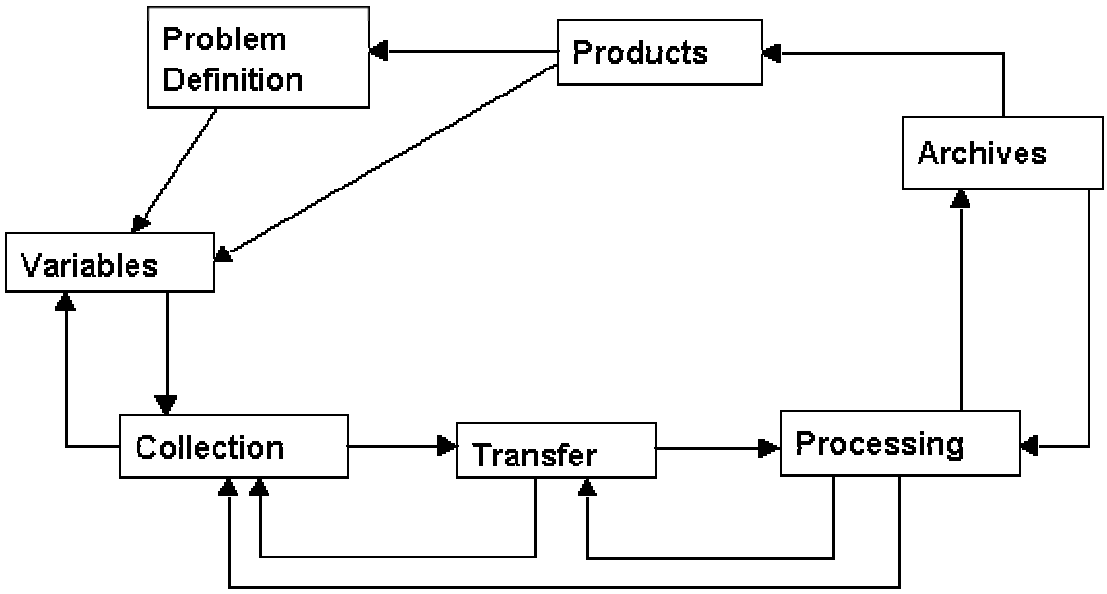
Project Objective. The objective of the project is to organise surface salinity data that are currently collected and to work with data collectors to improve data collection to meet the benchmarks of spatial and temporal sampling and data accuracies set out by the OOPC. The goals of the project are to:

- Improve data acquisition systems and provide feedback to data collectors

- Build comprehensive archive for surface salinity data. This will include data collected by any instrumentation at any time.
- Refine and standardise quality control procedures
- Provide data and information to users in a timely way

Meeting Objective: This was the first meeting of interested parties to such a project. The objective of the meeting was to discuss various aspects of the project, and to raise concerns and highlight issues that were considered important. The next stage of development is to write a Project plan and to constitute a Steering Group and find a chairman. If any elements of the project were sufficiently clear, development could start immediately. Finally, it was recognized that other documentation describing the Project may need to be developed to serve to raise the general awareness of the broader ocean community to the Project and to gain their support.

The meeting addressed each of the functions of the data management process – Collection, Transfer, Processing, Archiving and Products - as outlined in the following diagram.



DATA COLLECTION

The data collection process includes the mechanisms and instrumentation, the agencies involved and the timeliness constraints.

Background. The primary instrumentation that can provide in-situ surface salinity data in anything like the quantities needed and at the accuracies required is the thermosalinograph (TSG). This instrument is capable of measuring temperature to accuracies of 0.01 degrees and salinities to 0.02 PSU. These are clearly better than the accuracies given in the scientific justification. However, in order to achieve this level of accuracy, care must be taken in both the installation and maintenance of the TSG. A manual has been prepared by the French in Noumea that provides detailed instructions on the installation and maintenance of TSGs so that the highest possible quality of data is returned. This is available through the SOOP home page (http://www.ifremer.fr/ird/soopip/publications.html).

JCOMM have also asked for inclusion of meteorological parameters and the method for addition of such data should be considered. It was agreed that the temporal and spatial scale of sampling should be determined. The question of funding for TSG equipment was raised and it was agreed that the existence of an international project would stimulate funding.

Discussion. Current data collection activities from the represented countries were discussed and these are outlined in Appendix V.

In the course of discussions it was noted that data collection issues that need to be addressed include:

- Need to identify potential data sources.
- Need to address the issue of protocols for measurement (sampling, averaging, in-situ calibrations, characterization of the errors, etc.) - ICES Working Group on Marine Data Management (MDM) could contribute because they have produced and made available guidelines for Underway type data (see, http://www.ices.dk/committe/occ/mdm/guidelines/). IRD has produced a guide to the installation and maintenance of TSGs. This document is available through the SOOP web site.
- Need to address the metadata to be recorded (such as the location of the water intake, location of the temperature and conductivity measurement).
- Need to consider how other kinds of measurements that are made may be included (e.g. SST, oxygen, fluorescence, meteorological, currents, nutrients, CO_2)
- Need to consider how to deal with the historical data (much having been collected with buckets). Are these data of any use considering the uncertainty in measurement techniques and poor calibrations?
- Consider a definition of “surface” and "underway".

To answer these questions and to draft relevant sections of the Project Plan, a small working group was formed. Members are listed in the Recommendations section below.

TRANSFER

The transfer component is concerned with data formats and file contents, the transfer mechanisms themselves and, monitoring the speed and reliability of data transfers.

Background. For real-time transfers of data, there is the existing TRACKOB code form used on the GTS. This was developed a number of years ago, but its use has grown only in the past few years. The TRACKOB code form provides for only a minimum of metadata to accompany the measurements. TRACKOB provides simply the averaging period used when reporting data, as well as the position and time information.

The ICES MDM guidelines may contribute by describing what information should accompany surface observations. It is likely that there are a number of different formats that have been developed by each agency and/or country for their own purposes. There is, as yet, no internationally agreed standard for delayed mode data.

Discussion. The discussion was opened with a series of questions and recommendations regarding the data transfer function:

1. Data Rates. The data system will need standards for temporal and spatial scales of the data. Presently real-time data reported as TRACKOBs are typically reported as hourly values. A cursory review finds other sources reported as 5-minute averages. The TSG instrumentation itself may sample at rates as high as a few seconds. We need to

determine an appropriate sampling rate or spatial scale (or multiple rates) to propose for the data system (See the Data Collection section for how this will be resolved).

2. Exchange Formats. Appropriate formats are needed for multiple aspects of the data system. Formats to serve real-time and delayed-mode collection, exchange between data system components, and for providing data/products to users, need to be considered. This does not mean these formats need be different, but they serve different purposes and have different constraints.
3. Real-time data collection, over the GTS, using BUFR is a possibility. The present ASCII TRACKOB format cannot be changed and developing BUFR descriptors would allow the system to accommodate parameters, metadata, and QC flags not allowed in the present TRACKOB. Concern was expressed that oceanographers already have limited access to the GTS and that sending data in BUFR, a format that requires a greater degree of sophistication to deal with, would be more limiting. It was felt that some intermediary would need to acquire the data from the GTS and do the necessary decoding to make the data widely available.
4. The Argo data system has taken another approach, relying on the existing TESAC format for real-time transmission over the GTS but instituting a parallel collection and distribution format in netCDF that operates over the Internet and does not require GTS access. This could also be a strategy for this Project.
5. Delayed-mode collection. There is a need to consider allowing providers to submit data in various formats. Past experience has shown that if the data system demands contributors to send data strictly in one format it will discourage submissions. The need is to specify mandatory and recommended content, but allow flexibility in formats that contributors can use (MDM guidelines again may assist in specifying the content). However, the data system should create a recommended format for delayed-mode submissions and encourage but not demand its use.
6. For data exchange within the data system, the concern is what format can different data centres use to move data between them. For example, in GTSPP, the science centres and the data centres exchange in MEDS-ASCII format. An alternative is to consider direct access to a single database. Data records could be updated directly by the various centres and hence no exchange format is needed. Some members were concerned about how this could work because we have little experience with such international arrangements. Though technically possible, there was some doubt that it could be made to work in a smooth manner. As well, a distributed data system implies access to fast and reliable connections to international networks, which are not readily available in many countries yet. In the end, the meeting seemed to favour a distributed data system; i.e. one that distributes processing and archiving. Appropriate steps will be needed to ensure that such a system does not create duplications.
7. The data system must consider formats for providing data to users. The group expressed interest in trying a distributed data system using the DODS technology to allow users a single interface into the distributed holdings. Such a system offers the opportunity to allow users to select from multiple format options. Questions arose regarding the options that the data system should provide, and what content should be included regardless of format option. There was also the recognition that more than one format would be needed to provide data to users. A suggestion was that the Project should also consider the French Coriolis system for providing access to data.
8. Metadata is another aspect of the format decisions. The data system needs to develop specific requirements for metadata content and how to include it in the formats. For example, intake depth is very important to understanding underway data. But are there other such metadata issues? There is an overlap on this question with the considerations under Data Collection. It will be left to the people drafting the sections on data collection in the Project Plan to specify the relevant metadata, and the

sections dealing in the processing system will ensure the data structures of the Project preserve the metadata.

9. There are three additional aspects of the data system that need consideration. One is the recommendation to retain a 'processing history' with the data. The Argo and GTSPP systems provide examples. Another is the concept of a unique data tag carried with each data set throughout its life. The idea is to provide the ability to quickly identify duplicate data sets as they move about the community of users and data managers. The challenge is to develop a tagging scheme appropriate to these data sets. The third aspect is a proposal to attached 'data state indicators' to data sets. A scheme for these indicators has been included in the Argo data system and can be considered for application in this Project.

PROCESSING

The data processing components includes descriptions of how duplicates will be identified, data quality assessment procedures, the timeliness of these functions as well as monitoring reports to provide to data collectors to improve the collection process.

Background. MEDS acquires real-time data from the GTS, passes the data through simple range checking software and archives everything including time received and GTS bulletin information. These data are available on request. IRD carries out calibrations, quality control and archiving of data collected by their international network of vessels. Data are freely available on the internet or on request. IFREMER has a centralised archive in Brest (with available quality control procedure, however not performed systematically) for the main research vessels. There is a facility for data distribution on request. The US has processing and quality control capabilities developed a few years ago, but the work was discontinued because of lack of funding. There are known to be some national processing facilities, but the information about these is lacking.

Discussion. The two components of quality control processing were discussed: real-time QC and delayed mode QC. Timeliness of data processing is important. If the modelers want the profile data from projects such as Argo within 24 hours, then presumably they would also want SSS data in 24 hours. It was noted that no modelers are requesting real-time SSS for assimilation at this time. This may be because there is no capability to deliver these data, or because they do not yet know how to use such measurements.

There was discussion of the attributes of the QC system that should be employed. It was stated that for the real-time data, the testing should tend to be less strict in what was allowed in order that there would not be substantial delays in data being distributed. It was felt that users of these data in the 2 hour time frame would largely be modelers and they would have checks within their assimilation routines to screen out problem data.

The delayed mode QC system needs to be consistently applied if this function is distributed. This means someone needs to write a Manual of Project QC procedures that are applied for both real-time and delayed mode data. Participants agreed that co-locating QC and data collection was desirable, though for practical reasons this was not always possible. There was some discussion about using climatologies in the QC process. Caution was voiced since good climatologies, especially on global scales do not really exist.

The meeting agreed that original data should be kept, even when the values fail QC testing. This is consistent with practices employed by other programs and guards against the deletion of unusual but real observed values. It was also noted that the Project should keep a "best copy" of the data as well. This would be the version that would be recommended to users.

The question of whether or not to provide clients with the QC flags was raised. If the flags are to be provided then we must use BUFR for GTS distribution, or some other format if distribution is available other than on the GTS. If TRACKOB is used then we provide only the good data. Users should have the ability to accept or reject data based on the flag level. Flags need to be clear and usable to the clients.

There should be a unique identifier for each cruise to assist in checking for duplicates and for comparisons of real-time and delayed mode data. However, it was noted that some cruise identifiers currently used (such as ship call signs in real-time) are changed and this makes back tracking very difficult. Solutions to ensure a unique identifier could include call sign or the IOC ship number but more would be required. The same issue was discussed at the GTSPP meeting and work will be undertaken by that group to address this problem. The SSS Project should collaborate with GTSPP on this work.

Part of the processing system could have a feedback mechanism to get information back to the collectors to correct problems seen in the collected data. Part of the processing system has to deal with version control of the data. The differences in the real-time vs. delayed mode time frames need to be clearly defined. It was noted that in France, the delayed mode data time frame is around 7 months. Again, this project should consider following the lead of Argo and attempt to deliver delayed mode data within 5-6 months after collection.

The meeting recognized that it will be necessary to develop data tracking and tools for gauging the performance of the data system. Other programs have such tools and this Project should learn from their experiences.

ARCHIVES

The data archiving component deals with the nature of the archives, security of holdings, data provision and historical data acquisition.

Background. Surface salinity data are collected by a variety of instruments and techniques. Although TSGs can acquire a considerable volume of data, there are existing programs that also have surface salinity measurements. The UOT/GTSPP/SOOP program deals in temperature and salinity profiles in an end-to-end system. Some surface drifters and moored platforms report salinity both at the surface and in profiles. These data come to the RNODC for drifting buoys and also make their way into the GTSPP archives. Profiling floats are expected to make substantial contributions to salinity profile measurements. Tide gauges make surface salinity measurements as well. Surface salinity data is currently collected by a number of institutions:

1. ICES has substantial amount of surface salinity data in its "underway" data files going back to the 1900s covering the North Atlantic.
2. MEDS operates a global archive for TRACKOB data starting in 1989. They carry out very simple data quality checks only.
3. There are databases in Noumea, Brest and Toulouse, that manage surface salinity data from ships maintained by the french (IRD,IFREMER, CNRS).NOAA places some TSG data on an ftp server in Miami.

Discussion. The archive should be the place where people place the data and go to get data. The US NODC provided 1.8 million surface observations to the original WOA CDROM. More data are in the NODC archives however it is not known at this stage how much is there. Mining for old data is a separate activity within this broader project and priority should be given to existing archives in data centres. ROSCOP, for example, shows about 2000 cruises over the last 20 years with underway data. There will be a need to find out who has got what data, and also ask about the quality or care that was taken in collecting the

data. It was also suggested that the EDMED directory should be searched to determine what holdings were recorded there. The meeting agreed that a comprehensive list of what archives existed was important.

Having determined the scope of the collections available, it would be necessary to define the focus variables for the Project. It was noted, though, that whatever was built, it should be expandable to handle other variables that are collected in combination with those variables.

The archive function can be split into two parts. The first would deal with the historical data; the second with data collected from this time forward. Because of the varying quality of historical data, the varying information available about the measurements, the varying error characteristics of the historical measurements among other factors, the meeting considered it important to form a science team. This team would recommend how best to deal with the various historical measurements, and help place a priority on their inclusion in a Project archive.

The archive format was discussed as was whether it should be centralized or distributed, whether to follow something like a WDC model or Argo, or some other strategy. As noted above, the strategy of choice seemed to favour a more centralized one, but there was some interest to exercise the use of a truly distributed archive and access system. It was suggested that a subgroup could carry out tests of such a strategy. Coriolis offered to be the first archive for the data, since they were already working towards including French TSG data into their archives.

It was noted that in the US, it is easier to get money to fund new projects rather than reworking old data sets. However, considering the interest in climate change, there may be an opportunity to assemble historical data sets. It was recommended that the Project work with various initiatives (e.g. CLIVAR, GODAE, GOOS) to be sure their requirements were met.

Because the aspects of data transfer, processing and archiving were intimately linked, it was decided to form a working group that would address all of these concerns in the preparation of he Project Plan. Members of the group are reported in the action plan below.

PRODUCTS

The products component encompasses both the provision of data to users and scientific analysis products. It also addresses project documentation, such as project plans and brochures, to increase the visibility of the project.

Background. MEDS places on its web site monthly maps of where TRACKOB data received were collected. ICES has maps of underway data collected since the early 1900s. There may also be other products at other sites.

Discussion. There are three basic questions in regard to products:

1. What products are needed?
2. Who will generate them?
3. How are they to be disseminated?

Three types of products are:

1. Data related (e.g. distribution maps, temporal coverage, timeliness)
2. Network related (e.g. adequacy of coverage in space and time)
3. Science related (e.g. surface salinity maps, anomalies)

Products can be distributed on the web, ftp and CDROMs. Clients will probably want integration of data sources at some stage. Products that will interest scientists should be generated in order to get early interest in the project. Salinity anomalies are one product that could create interest. Error estimates could be another possible product. COADS could be used as a model for product generation. As data managers, we need to get people interested and wanting to contribute.

A product should be developed to help generate this interest. Products generated by the project should be advertised widely. JCOMM should be informed and asked to include a reference from their web site. The IODE web site could also be used to advertise the Project. It was also considered necessary that the Project Plan describe how less developed nations could contribute to the Project.

It was recognized that not all products will be generated by a single centre. With different contributors to the Project, there will be some centres better placed to create network products, for example, and others to do the science products. Questions were raised about combining data from different instruments into a single product. Here caution is required as we must first understand the error characteristics of these data compared to those of other instruments.

The science team that was recommended to help with the prioritizing the acquisition of historical data will also be of help here. They can be asked to provide a reliable estimate of the error characteristics of the various surface measurements considered by the Project and this would contribute to science products. In addition, it is expected that regional products will be of interest and these, too, can be recommended from the science team.

The generation of products is a common issue with Argo as well as other programs. Since there are common members between this group and the Argo Data Management Team, and products being worked on by them, cooperation with the Argo DMT was advised.

RECOMMENDATIONS

The group recommended the preparation of a Project Plan. Three sub-groups were formed to provide input to the Project Plan:

Data Collection Sub-group (no sub-group leader at this stage)

Fabienne Gaillard
Gilles Reverdin
Anthony Isenor
Thierry Delcroix
Robert Millard (WHOI)

Transfer, Processing, Archiving Sub-group

Thierry Carval
Alexander Kuznetzov
Kurt Schnebele (sub-group leader)
Jean Paul Rebert (or Alain Dessier)
Lesley Rickards

Products Sub-group

Catherine Maillard (sub-group leader)
Bob Molinari
Bob Keeley

Gerard Eldin

It was agreed that special attention should be placed on the Transfer, Processing, Archiving Sub-group that will establish a QC procedure for real time data.

The members of the sub-groups were asked to work together to write sections relevant to a Project Plan. The acting chair agreed to coordinate their activities to develop a draft plan in time for the next meeting. In the mean time, members were asked to consider whom they would wish to be the first chair of the Project, since Bob Keeley would not be able to do this. This person should be confirmed as soon as possible, but certainly by the next meeting.

It was agreed that the second session of the Steering Group would be held in September 2002 and issues to be discussed to include:

1. Finalisation of the Project Plan that would include the proposals made by the 3 Sub-groups and the feedback received by the scientific community;

2. Review the first version of the exchange format and QC methodology from the Transfer, Processing, Archiving Sub-group;

3. Review of the first SSSAL data products published in RT and DM

4. Proposed new actions to improve in quality and quantity the collection and timely delivery of SSSAL data.

CLOSURE

The Chairman thanked everybody for contributing to the first session of the Steering Group. He especially thanked this session's host, Catherine Maillard for the excellent arrangements for the meeting. It was agreed that the next session of the working group would be held in September 2002 in Ottawa. The First Session of the IODE Steering Group for Underway Sea Surface Salinity Data Pilot Project was closed on Friday 16 November at 14:00.

ANNEX I

AGENDA

1. INTRODUCTION AND PROJECT OBJECTIVES
2. DATA COLLECTION
3. TRANSFER
4. PROCESSING
5. ARCHIVES
6. PRODUCTS
7. ACTION PLAN AND TIME SCHEDULE
8. CLOSURE

ANNEX II

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ANNEX III

WELCOME ADDRESS

Gérard Riou, Director of the Technology and Marine Information of IFREMER

On behalf of myself and Ifremer I would like to welcome you to this sea surface salinity workshop.

It remembers me that I attended many years ago such a meeting discussing data management within the framework of a scientific program. Some of you I am please to see in this room attended the same meeting. So has something changed since that time? Or is this workshop the continuation of a long routine punctuated by meetings to exchange experience and point of view?

Among the changes I would underline 3 points. First of all the progress in the ocean data assimilation and modelling, second the increase of size of the area of which data are requested, and third the strong request of the stakeholders for prediction. As a result pilot programs are becoming permanent and the construction of the operational oceanography is on the way.

They all increase the need for global data set which can only be obtained within the framework of international cooperation. Assembling high quality global data sets rely on common practice for the quality control and standardisation is needed to facilitate the transfers.

The observation of salinity is now recognized as a high priority for the global observing system. The Ocean Observations panel for Climate underlined the usefulness of surface salinity data for climate change detection. This will be done by the improvement of measurement devices and data management network. This conclusion was endorsed by the sixteenth conference of the UNESCO/IOC/IODE, which recommended an underway sea surface salinity data archiving project. The JCOMM-1 meeting supported such a project urging that integration with other data collected at the same time be considered.

The present workshop is focused on one approach: in situ measurements from thermosalinograph carried out on research or opportunity vessels.

Ifremer is involved in surface salinity data collection and data management, and supports the sea surface salinity project. This data are currently collected on board of Ifremer research vessels Atalante, Thalassa, Suroit and Europe. From two of them Thalassa and Suroit they are already transferred in near real time and it will be soon done from Atalante.

Ifremer also collects data from coastal monitoring network and will be involved in the calibration program of the new satellite salinity sensor SMOS.

During the meeting you will review the TRACKOB document written by Bob Keeley. Reading this position paper and the comments exchanged by mail I am sure we will build an effective international project.

I wish you a very good and fruitful meeting. Thank you.

ANNEX IV

Recommendation IODE-XVI.10

UNDERWAY SEA SURFACE SALINITY DATA ARCHIVING PILOT PROJECT

The IOC Committee on International Oceanographic Data and Information Exchange,

Noting that the Ocean Observations Panel for Climate (OOPC) considers sea surface salinity data as critical for the study of the decadal and longer timescale variations associated with deep ocean overturning,

Further noting that the number of countries collecting underway sea surface salinity data and the volume of data collected within coastal and open ocean monitoring programmes are rapidly growing,

Recognizing that presently there is little international co-operation in the exchange and management of these data,

Acknowledging the need to build effective international management of these data in cooperation with data providers and users to meet the requirements for temporal and spatial sampling resolution and measurement accuracies set forth by the OOPC,

Recommends the establishment of a Pilot Project for the management of these data with the Terms of Reference as attached in the Annex to this recommendation,

Invites the IOC Executive Secretary, in consultation with the Chairmen of IODE and OOPC, to establish a Steering Group to implement and monitor progress of the Pilot Project.

Invites the IODE Member States and other interested countries collecting underway sea surface salinity data to participate in the activities of the Steering Group.

Annex to Recommendation IODE-XVI.10

Terms of Reference of the Underway Sea Surface Salinity Data Archiving Pilot Project

Objectives of the Pilot Project:

(i) To acquire, quality control, store in standard format, and disseminate the collected underway sea surface salinity data

(ii) To establish close co-operation with relevant data centres to build a database and develop data management procedures and standards

(iii) To build a comprehensive archive for USSSAL data including appropriate metadata

(iv) To develop and implement procedures for quality assessment of real time and delayed mode data based on the GTSPP experience

(v) To provide data and information on line to users in a timely fashion

(vi) To ensure safeguarding of high resolution delayed mode data

(vii) To co-operate with data collectors to improve the data acquisition systems and to provide information on the data they provide

(viii) To maintain close links with other data collection and management programmes such as JCOMM and SOOP

(ix) To prepare proposals for the archiving of all potentially available underway data types

The Participants in the Pilot Project:

The Pilot Project will be carried out by a Steering Group composed of, inter alia, IFREMER / IRD / SISMER (France), MEDS (Canada), BSH (Germany), BODC (UK), ICES (Denmark), NCMR / HNODC (Greece), WDC for Oceanography - Silver Spring (USA).

Work Plan and Timing:

The Steering Group will work by correspondence (e-mail). The Group will report to the IODE Officers and to the IODE Committee.

ANNEX V

DATA COLLECTION ACTIVITIES FROM REPRESENTED COUNTRIES

ICES. Data archived starts in 1892. These are obtained from bucket measurements and continue through the 1960s. There was a drop in data input from the mid 1980s. The spatial coverage is the Atlantic Ocean. All data are transferred to WDC.

Greece. TSGs are being installed on Research Vessels and arrangements underway to have data transferred to data centres. Calibration is carried out with CTD values only. Most of their data are from the eastern Mediterranean. There is no general TSG collection on the Mediterranean but the future MEDAR projects could consider the compilation of such an archive. Data have not been transferred to WDCs.

UK-BODC. Pump and TSG data are available from its project databases. The pump data are made available to ICES. Datasets are fully documented and published on CD-ROM. Surface salinity measurements are also collected along ferry routes from 1960s to 1980s. They have experience in documenting characteristics of the data collection systems on ships. Only some of the data have been sent to WDCs.

Japan. No underway surface salinity data are available from Japanese sources. There is no delayed mode data stream. They have experience in handling data in TRACKOB form only.

France-IFREMER research vessels routinely collect real time surface salinity. They consider the most appropriate sampling granularity to be 1-5 minutes, with a preference for 2 minutes. The delayed mode processing software and archive of TSG data is not developed but some work is underway. CTDs are used for calibration purposes. Generally, the data have not been sent to the WDCs

France-IRD maintains a network of SOOPs from several different nationalities through the 3 oceans, with a TSG sampling rate of 5mn. Additional support from CNRS is provided in the North Atlantic. Several ships send hourly real-time data through the GTS. Delayed-mode data are processed in Noumea in Brest, including regular sensor calibrations and comparisons with their own (1972-1992) bucket data climatology. In addition, 2 IRD-owned research vessels also collect SSS data. Data from the IRD operated network are freely available on the internet. A large part of these data has been sent to international data centers like ICES and the Pacific network data were published on a Cd-Rom.

Russia. Underway datasets are collected with various sensor types. Some data are on the GTS but they do not use TRACKOB. They plan to acquire TRACKOB next year. Various Russian institutes make underway measurements.

Canada-MEDS. All data are available from TRACKOB received at MEDS. Some of these data are provided to France but MEDS does not look at the quality. Various Research Vessels make measurements in waters around Canada. These data are not sent to MEDS yet although it is expected that such data will soon start arriving.

Canada-Bedford Institute. Some research ship measurements are made from engine cooling intake, with probably 10-30 cruise datasets. Quebec region and West Coast have ferry installations, Newfoundland may have some open ocean data from the Atlantic Zonal Monitoring program (but this is only a few years old). No standard calibrations are

performed as datasets originate from biologists who are looking for local fluorescence maxima. Some calibrated data has been provided to WOCE.

AOML. They had started to develop a real-time program a few years ago, but this was not properly funded and so ceased operation. The emphasis was on developing an operational activity for salinity data. Real time QC was done against Levitus climatology and reported back to the ship if any problems were noticed. An unfinished goal was to automate the procedures. Delayed mode calibration checks were also done. It is the intention to re-apply for funding to carry out this work, and join the programme if funding is secured.

Australia. No data of this nature collected by AODC but Roscop shows a significant collection of this nature from research vessels.

US NODC. Datasets are mostly received from ICES and IFREMER. There is no surface product right now. There are fairly extensive data sets at 30 sec. intervals potentially available from NOAA and academic ships. They recognised the need for a standard protocol but a substantial dataset is gradually building up and this is regarded as an extension to GODAR.