5th OceanSITES Data Management Team Meeting

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Location: La Jolla, California USA
Authors: Thierry Carval, Matthias Lankhorst, Maureen Pagnani, Kelly Stroker, and Jing Zhou
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Welcome, Introductions, Review of Agenda

Uwe Send welcomed everybody to the meeting, noting that Bill Burnett (Data Management Team Co-Chair) was unable to attend. The Data Management Team (DMT) had not met since March, 2010. During that time OceanSITES had been without a project office for over 1 year but the Data Management Team continued to be active via teleconferences. The project office position has been instantiated and the monthly teleconferences should be continued. Uwe then welcomed all participates to introduce themselves and thanked everyone for coming to La Jolla.

The meeting of the DMT was held over 2 days with a very full agenda. The main agenda items were:

- **Global Data Assembly Center (GDAC) Status**
- **Carbon Parameter Names – Andrew Dickson (Facilitator)**
- **Documentation Supporting Discovery and Use – David Neufeld (Facilitator)**
- **UDDC Current Adoption and Examples – Jing Zhou (Facilitator)**
- **Website Responsibility and modifications**
- **Data Submission**
- **OceanSITES User's Manual**

The Data Management team was informed that both of the Co-Chairs will be stepping down. Dr. Bill Burnett has taken a new position and will be leaving NDBC in January, 2012. The DMT thanks Dr. Burnett for his hard work over the years as Co-Chair of the DMT and wishes him much success in future endeavors. Dr. Sylvie Pouliquen will also be stepping down due to other commitments. Dr.Pouliquen will continue to be involved as time permits.

1. Global Data Assembly Center (GDAC) Status

1.1. Review of OceanSITES Data Management Structure

Matthias Lankhorst reviewed the current set up of the data system and reviewed responsibilities for PIs, DACs and GDACs for new members (Figure 1). The responsibilities of each participant are documented fully in the User Manual and the Data Management Handbook.

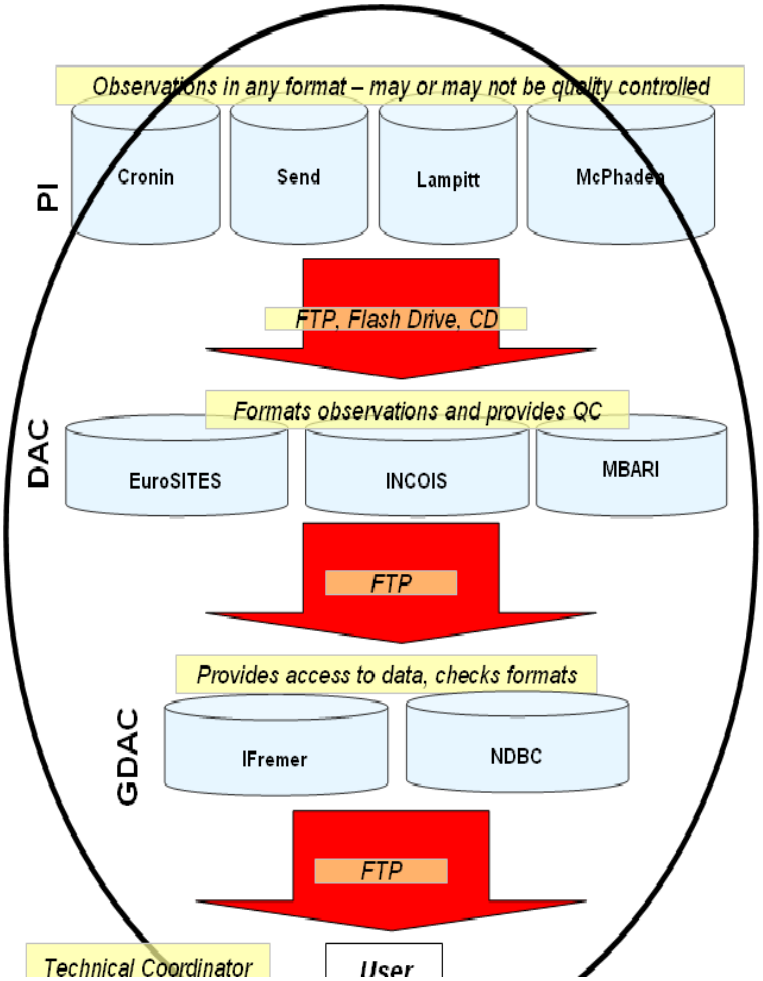

Figure 1: Current Architecture of GDAC, DAC and Data Providers. The PI and DAC organizations listed are only a few examples from a larger set of PIs and DACs. The Technical Coordinator supports the entire operation.

1.2. Review of Action Items from Virtual meetings

Since the previous meeting in Paris, March 2010, Bill Burnett had arranged virtual (WebEX) meetings each month, to discuss specific technical issues. These meetings were held:

- August 2011
- March 2011
- January 2011
- September 2010
- June 2010

The meetings were well attended with around 10-15 members on each call. This method proved to be successful during the "off-months" and will continue to be used in the future (starting again in December 2011) to coordinate data management requirements and decision making.

1.3. Data Management Team Goals

The Data Management Team has been very successful over the years as getting things done. The team was recognized for their hard work. The DMT needs to work with the data providers on naming issues related to site and platform name to ensure consistency. This requires that there needs to be more overlap between the data management and the scientists.

Uwe Send discussed the role of the DMT and the 3 major challenges that the team is tasked with.

a. Bring as many sites on line as possible. Invite data managers to share data
    i. Site operators need to be willing to work with OceanSITES
b. Include more biogeochemical and ecosystem sites
    i. How do we include all of these? There is a need to broaden disciplinary coverage in the data holdings
c. Ensure that people are using the data.
    i. Reach out to users to 'market' OceanSITES. Use data in models

1.4. File uploads and updates at GDAC

1.4.1. File naming convention

Jing Zhou reviewed the file naming conventions used at the GDACs. The format was adopted in 2009 and finalized during one of the virtual meetings. The current data file naming convention is:

OS_XXX_YYY_T_PARTX.nc

- OS - OceanSITES prefix
- XXX - Platform code from the OceanSITES catalogue
- YYY - Deployment code (unique code for deployment - date or number)
- T - Data Mode
  - R: real-time data
  - P : provisional data
  - D: delayed mode
  - M: mixed delayed mode and real-time.
- <_PARTX> - An optional user defined field for identification of data

It was discussed that the R for real-time means data coming from a remote station through a telecommunication channel without physical access to the instruments. This does not imply that the data comes in at real-time. The 'R' here should be modified to be remote and remove any mention of a time. The 'P' and the 'R' also need to have some definition or description of quality control procedures. Action – DMT revise document to change definition of 'R' in file naming convention and add information on quality control of 'P' and 'R'.

1.4.2. Uploading Files to GDACs

The team discussed the procedure to upload files from the DACs to the GDACs. The procedures to upload a file are not explained clearly in the manual. Some questions that were asked were in regards to a zero length data file. What happens if I upload the wrong datafile. You upload a zero length data file and it gets deleted. Discuss where this goes. Is this wording in some document?

The upload procedures should be better explained in the document.

ACTION – Create a DAC Manual (Thierry, Jing, Steve D.)

1.4.3. Index File

The index file is at the highest level on the GDACs. This index file is generated automatically from the inventory on the GDACs. The team would like to use this file as the basis for doing some discovery into the data that is at the GDACs. Action – Build a simple search interface on top of the GDAC file directory: Thierry and Jing.

1.5. Data Synchronization

Jing Zhou discussed the process of synchronization at Ifremer and NDBC. OceanSITES data is available online via ftp and OPeNDAP, from the Global Data Assembly Centers:

- IFREMER Coriolis (FTP): ftp://ftp.ifremer.fr/ifremer/oceansites/
- US NDBC (FTP): ftp://data.ndbc.noaa.gov/data/oceansites/
- US NDBC (OPeNDAP): http://dods.ndbc.noaa.gov/thredds/catalog.html
- IFREMER OPeNDAP: (under development)

For those new to OceanSITES, an overview was given of the directory structure at the GDACs. The particular directory structure that was defined enables mirrored data sharing. For details on the structure, see the user's manual.

1.6. Creating NetCDF Data Files

At the 4th Data Management Team meeting, the team officially agreed on the file naming convention and NetCDF formats. The discussion at this meeting was around the creation of NetCDF Files. The team discussed the various ways that these were being generated at the DACs. Ralf Goericke reminded the team that not everyone knows or uses NetCDF. The group has adopted this convention and that is not up for modification at this time. However, the team discussed how to make the use of the different tools that are used to generate the files available. Matthias will post the code he uses to generate the files and perhaps others could adopt this as a standard.

It was brought up that the GDAC might be able to assist those DACs that do not have resources to generate NetCDF files. The GDACs and DACs need to work together to ensure that all data is being delivered in the proper formats.

1.7. Data Management Catalog

The OCEANSITES data management catalog is currently stored as an excel spreadsheet. The format for this spreadsheet was adopted by the team at a previous face to face meeting. The fields in this file were reviewed. Due to the lack of project office support for the past 14 months, this file has not been updated. This is a priority task for the project office and a new file will be generated as soon as possible. The fields were reviewed and the definitions of each field should be described in the user's manual. The current version is downloaded from the OceanSITES website.

The file is a static excel spreadsheet. The project office is tasked with storing this information in a database and making this more dynamic. Then users could download a spreadsheet if they wish or have access to a webservice to plot and display the data. A few errors were identified in the spreadsheet that need to be investigated. One was at line 154 – this field is blank. The second is to investigate the addition of Antares Site. This is on the GDAC, but not fully approved with metadata. Action – project office.

1.8. Upcoming Datasets from PIs

1.8.1. Pangea, Ingo Schewe

Ingo Schewe discussed the Pangea stations and some questions:

- Can he have assistance to convert data from Pangea format to NetCDf OceanSITES format?
- What kind of data is really useful for OceanSITES?

1.8.2. Marty Hidas, Australia IMOS

Marty Hidas was representing IMOS. He discussed that they are already using NetCDF format and CF conventions. Early in 2012, there will be some data available.

1.8.3. CalCOFI

Dr. Ralf Goericke talked about CalCOFI stations. What parameters are most important for OceanSITES?

2. Carbon Parameter Names

Andrew Dickson facilitated the discussion on the carbon parameter names. The recent version of Carbon Parameter Name is included in Appendix II with SeaDataNet Mapping. There were some concerns on the SeaDataNet vocabulary that the terms were not carefully constructed. The team discussed the methods to get names into the SeaData Net Vocabulary. It sounded like a fairly straight forward approval process. Andrew proposed the situations for us: there could be different 'raw' measurements from slightly different methodologies which lead to slightly different derived parameters in general. One of his basic question (to team) is are we going to be 'prescriptive' or 'descriptive'. I heard the team discussion was leaning to be descriptive - we are to take all available raw measurements from a given data source. Is that correct understanding?

OceanSITES needs to publish a CF standard name list, plus a pending name list (being discussed and to be approved). Also related is the refresh of the OceanSITES parameter name list (the short names). Earlier we have some resolutions on those subject, earlier people can start construct actual data files. Nan

3. Documentation of Data Supporting Data Discovery and Use

David Neufeld gave a presentation on documenting data in proper formats to enable better discovery. His discussion began with a presentation that highlighted the different layers of metadata:

- Program
- Network
- Platform
- Deployment
- Sensor

The presentation showed what OceanSITES should consider:

1. Generating ISO metadata from NetCDF and THREDDS (ncISO) – a website with examples from NOAA's NGDC was shown to illustrate the power of aligning with ISO core elements
2. Better align with Unidata's discovery portal
3. Remapping of attributes into other conventions – moving information into ISO and making them available through Geoportal: wwwdemo.ngdc.noaa.gov/geoportal
4. Taking advantage of quality reports and quality control metrics. Lineage and provenance.
5. A mapping of the discovery attributes to the user manual and netcdf iso conventions

Dave also talked about the challenges with current metadata structure in NetCDF. For example,

1. The representation of contacts. At present, contacts do not have a defined role. In the ISO standard, contacts can be associated with a role. E.g. Meghan Cronin, Principle Investigator
2. It is not possible at present to tagging objects and types
3. Flexibility in metadata catalogues. Only 1 vocabulary catalog for NetCDF. (HDF5 – new NetCDF format)

The Data Management Team thought the system that Dave showed was very promising. We will continue to work with Dave and NGDC to move forward.

4. UDDC Current Adoption and Examples

Jing Zhou gave a presentation on the Unidata Data Discovery Convention (UDDC) also known as the NetCDF Attribute Convention for Dataset Discovery. During the presentation, Jing highlighted areas within the OceanSITES metadata where UDDC recommendations could be accepted, established guidance or requirements for new or existing attributes, and discussed examples.

Jing addressed the main questions asked when exploring data: WHAT, WHERE, WHEN, WHO, and HOW.

4.1. **WHAT:**

In addition to the existing requirements in OceanSITES, consider new mandatory attributes:

- ***title*** (to provide short answers to what are the data in it)
- ***Conventions*** (to enforce the CF standards)
- ***naming_authority*** and
- ***id*** (to make this dataset unique)
- ***keywords*** (to support text searches)
- ***keywords_vocabulary*** (optional search vocabulary)

4.2. WHERE and WHEN

In addition to the existing requirements in OceanSITES, consider new mandatory attributes:

- ***geospatial_vertical_min***
- ***geospatial_vertical_max*** (as OceanSITES care about depth)
- ***time_coverage_start*** **and** ***time_coverage_end*** (highly desired)

Consider new optional attribute:

- ***geospatial_vertical_positive*** (optional for files using 'up' positive)

4.3. WHO

UDDC suggest the use of ***creator_name***, ***creator_email***, ***creator_url,*** and ***publisher_name***, ***publisher_email***, ***publisher_url***. **OceanSITES** currently use ***author*** for the name of the person responsible for the creation of the datasets, and ***contact*** for contact person's email. Is the ***author*** responsible for files or observation data or both***?*** What about the ***creator***? Who is the ***publisher***?

Consider new mandatory attributes:

- ***principal_investigator_name*** (to replace pi_name)
- ***institution_references*** (highly desired)
- ***institution***

4.4. HOW

OceanSITES recommended attributes:

- *distribution_statement* (highly recommended)
- *citation*

UDDC suggest the use of *license*. Do we need to provide license statement?

OceanSITES recommended attributes:

- *quality_control_indicator* level of quality control applied to data
- *quality_index* a quality code for the whole dataset (A, B, C)

UDDC suggest the use of *processing_level* – a description of quality control of the data. Are there any chances to reconcile those terms?

5. Discussion Topics

5.1. Efficient monitoring of GDAC files to ensure compliance with User's Manual 1.2

The GDAC's gave an update on the status of monitoring at the respective centers; Thierry Carval from Ifremer and Jing Zhou from NDBC. Thierry discussed the File Checker which has been in place for 2 years. At present there is no documentation on this. Other improvements discussed could be:

- File that is produced that provides information on what metadata is missing and providing the file more regular checking
- latitude and longitude warnings
- Compare file description with the actual data file.
- Quality control checking

ACTION – automate running of the format checker to generate monthly reports and notifications. Including quality control checking.
ACTION – review this file checker and make improvements and modifications for version 1.2. In addition, make documentation for this file checker.

5.2. Data Submission by PI's

The group discussed how we can improve data submission or delivery by the Principle Investigators and we can ensure that the data submitted has been quality controlled. Since there were several PI's in the room, the room was polled to see what obstacles they face and how we can help resolve them.

5.2.1. Getting the Data

- Ruth's suggestion is to have some sort of training. Perhaps web based.
- What pieces of information are really needed to be gathered prior to attempting to become an OceanSITES. Prior preparation for scientists
- Cookbook for PI (as in a cookbook for data submission)
- To determine what are the compelling reasons to become an OceanSITES site? How will contributions be made and used? For example, contributing enables the data to be reused
- Additional statistics would be helpful in promoting data tracking to scientists

ACTION - We should review the website that makes it really tuned to scientists so that is it clear for them on how to add data to OceanSITES. Eg. Link from the inventory. 'like what you see here? Want to be part of it?' Add text 'do you need help? Please call the project office.

ACTION – Add a paragraph that PIs can use in their NSF proposals about how OceanSITES works and the availability of data and accessability of that data. For example: http://bcodmo.org/resources

5.2.2. Quality Control of the Data

Once the data has been received, how can we ensure the quality is up to the standards of the community? A developed set of recommendations given to the Science Team (All the activities and decisions needed for quality control procedures: real-time, post-recovery, physical and biogeochemical)

- Data format requires some assessment of data quality. E.g global assessment of file or point by point qc.
- Do we know whether all the data in OceanSITES has undergone some quality control?
- Associate a qc manual with the data to describe what quality control would be used. Currently the quality control manuals are a URL.
- Quality manual is currently a global attribute. There is really a manual for each variable.
- Attributes currently in the data files: Uncertainty value – field uncertainty and lab uncertainty. An example was the degrading of the instruments over time
- ACTION – obtain URLs of all qc documents. This URL should be replicated on the OceanSITES website.

5.3. Updating the User's Manual – Version 2.0

This topic was to develop timelines for publishing new manual.
Par t of the earlier discussion was on Carbon Parameters and the UDDC discussion. Some of the new variables will have to be added and new metadata fields. One suggestion is to generate a table that is linked to from the user's manual that contains the most recent variables. Make this a dynamic piece of the manual.

What are the new variables to add, and what concrete steps to get there? There was a lenghtly discussion on the list of variables and funding. Technically, there is no technical limit to taking 200 variables however, there is a funding limit. The topic went to the Steering committee to determine what scientific usefulness would come from providing more variable. What is decided could be added to the user's manual.

Along this topic the team also discussed what are shortcomings of data format 1.2.

- Multiple axis for coordinate variables as per CF
- New feature types "trajectory" (gliders), "timeSeriesProfile" (profilers)
- Calibration documentation
- Data provenance capturing- the route currently is to contact the data provider
- Data Archive – contact NODC for data archive as is ARGO. Charles Sun (NODC)

5.4. Formal Document Repository and Action Tracker Item

The team has agreed to adopt the following software for document tracking and action tracking

- Document tracker – alfresco: https://share.ifremer.fr
- Action tracker – mantis: https://forge.ifremer.fr/mantis/view_all_bug_page.php

5.5. Archiving Products

- It was discussed to create a Product directory at the GDACs in order to serve any products that an OceanSITES PI would like to volunteer. These could be anything from gridded or derived data, model outputs, to time-series plots. The Product data files are not necessarily compliant with OceanSITES standards and contributed by PIs on a voluntary basis. Product data files will be placed in an 'oceansites/PRODUCTS' directory on the GDAC (while standard data files are in 'oceansites/DATA' directory). In particular, the following are potential products:sea water volume transports from the MOVE, RAPID, Florida cable arrays

- interpolated, multi-deployment fields from PAPA and KEO buoys

OceanSITES Website

The OceanSITES Website has been maintained at WHOI in the past. There was a decision to migrate this to the Project Office held at JCOMMOPS. This decision was approved and the content of the site has been passed to the Project Office. There were a lot of discussions over ways that the website could be improved.

1. A graphical front end
    a. Thierry said that it should be not costly to place a search on top of the netcdf file.
2. Database for Catalog – Action
3. User feedback on download of data. E.g. provide name, email and use.
4. Improved maps and images
5. Improved text – 'Why should I submit to OceanSITES', 'What is an OceanSITE'?, etc.

6. Next meeting:

Regarding face-to-face meetings, there will likely be a one held in 2012 with the same format alongside a SC meeting.

7. APPENDIX I: Attendees

Thierry CARVAL
Global Data Manager
French Institute for the Exploitation of the Sea, IFREMER Centre de Brest
IFREMER (French Institute for Sea Research and Exploitation) Centre de Brest, BP70 29280 Plouzané, France
France
Email: Thierry.Carval@ifremer.fr

Dr. Francisco CHAVEZ
Associate Scientist Upper Water Column
Group Coord. Institution: MONTEREY BAY A
Monterey Bay Aquarium Research Institute
7700 Sandholdt Road
Moss Landing California CA 95039
United States
Tel: (408) 775-1700
Fax: (408) 775-1620
Email: chfr@mbari.org

Dr Meghan CRONIN
NOAA Pacific Marine Environmental Laboratory
7600 Sand Point Way NE
Seattle WA 98115
United States
Email: Meghan.F.Cronin@noaa.gov

Ruth CURRY
Senior Research Specialist, Physical Oceangraphy
Woods Hole Oceanographic Institution
MS #21
Woods Hole MA 02543
United States
Email: rcurry@whoi.edu

Mr Taco DE BRUIN
Scientific Data Manager
Royal Netherlands Institute for Sea Research
NIOZ Royal Netherlands Institute for Sea Research
Landsdiep 4 t'Horntje
Postbus 59
1790 AB Den Burg, Texel
Noord Holland
Netherlands
Tel: +31 (0)222-369479
Fax: +31 (0)222-319674
Email: taco.de.bruin@nioz.nl

Laura DE STEUR
researcher
Royal Netherlands Institute for Sea Research
P.O. box 59
1790 AB Den Burg
Netherlands
Tel: +31 (0) 222 369 411
Email: Laura.de.Steur@nioz.nl

Prof. Andrew DICKSON
Professor of Marine Chemistry
University of California, San Diego
9500 Gilman Drive
Mail Code 0244
La Jolla CA 92093-0244
United States
Tel: (1)[858]822 2990
Fax: (1)[858]822 2919
Email: adickson@ucsd.edu

Stephen DIGGS
Data Manager, CLIVAR Hydrography
University of San Diego, Scripps Institution of Oceanography
UCSD/SIO 9500 Gilman Drive MailCode 0214
La Jolla CA 92093-0214
United States
Tel: +1-858-534-1108
Fax: +1-801-650-8623
Email: sdiggs@ucsd.edu

Dr. Ralf GOERICKE
Assistant Research Oceanographer (MLRG)
University of San Diego, Scripps Institution of Oceanography
United States
Tel: [8] (858) 534-2230
Fax: [8] (858) 534-2230
Email: rgoericke@ucsd.edu

Dr Melchor GONZALEZ DAVILA
Universidad de Las Palmas de Gran Canaria, Departamento de Biología
Edificio de Ciencias Básicas
Campus Universitario de Tafira
35017 Las Palmas de Gran Canaria
Spain
Tel: +928 452914
Email: mgonzalez@dqui.ulpgc.es

John GRAYBEAL
Product Manager, OOI Cyberinfrastructure
University of California, San Diego
9500 Gilman Drive
Mail Code 0244

La Jolla CA 92093-0244
United States
Tel: 858-534-2162
Email: jgraybeal@ucsd.edu

Mr. Gigab HA
Marketing Director
Korea Environmental Science & Technology Institute
Room 421, Byucksan Digital Valley II, Gasandong 481-10
Seoul 153-783
Korea Rep
Email: ggha@kesti.co.kr

Ted HABERMANN (via telecon)
Group Leader, Enterprise Data Systems Group
National Geophysical Data Center, National Oceanic and Atmospheric Administration, U. S. Department of Commerce
E/GC 325 Broadway
Boulder Colorado 80305-3328
United States
Tel: 303-497-6472
Email: ted.habermann@noaa.gov

Dr Marton HIDAS
Project Officer / Data Scientist
Integrated Marine Observing System, eMarine Information Infrastructure
University of Tasmania
Private Bag 21
Hobart Tasmania 7001
Australia
Tel: +61 (03) 6226 2904
Email: Marty.Hidas@utas.edu.au

Rod JOHNSON
United States
Email: rod.johnson@bios.edu

Kuh KIM
Korea Rep
Email: kuhkim@gmail.com

Mr. Alex KOZYR
Oceanographic Data Analyst
Oak Rigde National Laboratory, cdiac
Oak Rigde National Laboratory, CDIAC
Building 1509, Mail Stop 6335
Oak Ridge Tennessee 37831-6335
United States
Tel: +1-865-576-8449
Fax: +1-865-574-2232
Email: kozyra@ornl.gov

Dr. Matthias LANKHORST
University of San Diego, Scripps Institution of Oceanography
Scripps Institution of Oceanography
9500 Gilman Drive
Mail Code 0230
La Jolla CA 92093-0230
United States
Tel: +1 858 822 5013
Email: mlankhorst@ucsd.edu

Prof. Roger LUKAS
University of Hawaii at Manoa, Department of Oceanography
United States
Tel: (1 808) 956 7896
Fax: (1 808) 956 9222
Email: rlukas@soest.hawaii.edu

Dr. Vsn MURTY
Scientist-in-Charge
National Institute of Oceanography, Goa
National Institute of Oceanography Regional Centre,
176, Lawsons Bay Colony
Visakhapatnam
VISAKHAPATNAM 530017
ANDHARA PRADESH
India
Tel: +91-891-2784570
Fax: +91-891-2543595
Email: vsnmurty@nio.org

David NEUFELD
Associate Scientist
National Geophysical Data Center, National Oceanic and Atmospheric Administration, U. S. Department of Commerce
E/GC 325 Broadway
Boulder Colorado 80305-3328
United States
Tel: 303-497-6507
Email: david.neufeld@noaa.gov

Svein OSTERHUS
prof
Bjerknes Centre for Climate Research
Bjerknes Centre for Climate Research
Alegata 70
5007 Bergen
Norway
Email: svein.osterhus@uni.no

Maureen PAGNANI
Data Manager
National Oceanography Centre
Southampton
Hampshire
SO14 3ZH
United Kingdom
Tel: +44 (0)2380 596255
Email: m.pagnani@bodc.ac.uk

Mr. E. RAMA RAO
Scientist 'E' & Head
Ocean Valley,
Pragathi Nagar (BO), Nizampet (SO)
HYDERABAD 500090
Andhra Pradesh
India
Tel: +91-40-23895008
Fax: +91-40-23892001
Email: pattabhi@incois.gov.in

Dr. Ingo SCHEWE
Alfred Wegener Institute for Polar and Marine Research, Bremerhaven
Am Handelshafen 12
P.O. Box 12 01 61
27515 Bremerhaven
Germany
Tel: +49 (0)471 4831 1737
Fax: -1776
Email: ingo.schewe@awi.de

Prof Uwe SEND (Co-Chair)
Professor
University of San Diego, Scripps Institution of Oceanography
Scripps Institution of Oceanography, Mail Code 0230 University of California, San Diego
La Jolla CA 92093-0230
United States
Tel: +1 858 822-6710
Fax: +1 858 534-9820
Email: usend@ucsd.edu

Diane STANITSKI
Physical Scientist
National Oceanic & Atmospheric Administration, Silver Spring
NOAA Climate Observation Division
1100 Wayne Ave, Suite 1202
Silver Spring MD 20910
United States
Email: diane.stanitski@noaa.gov

Kelly STROKER
Technical Coordinator, DBCP & OceanSITEs
JCOMM in situ Observing Platform Support Centre, JCOMMOPS
8-10 rue Hermès
Parc Technologique du Canal
31520 Ramonville St Agne
France
Tel: +33 5 61 39 47 82
Fax: +33 5 61 75 10 14
Email: kstroker@jcommops.org

Mr Andy SYBRANDY
Pacific Gyre Inc.
3740 Oeanic Way, Suite 302
Oceanside CA 92056
United States
Tel: +1 760 433 6300
Fax: +1 413 375 0914
Email: asybrandy@pacificgyre.com

Dr. Domingos URBANO
Researcher
Instituto Nacional de Pesquisas Espaciais (National Institute for Space Research)
Av dos Astronautas,
1.758 Jd. Granja
São José dos Campos
CEP: 12227-010
São Paulo
Brazil
Email: domingos.urbano@cptec.inpe.br

Dr. Robert WELLER (Co-Chair)
Senior Scientist
Woods Hole Oceanographic Institution
WHOI
Clark 204a MS 29
Woods Hole MA 02543
United States
Tel: +1 508 289-2508
Fax: +1 508 457-2163
Email: rweller@whoi.edu

Emma WESTON
United States
Email: emma.weston@noaa.gov

James WILKINSON
Programmer/Analyst CalCOFI Technical Group
SIO
9500 Gilman Dr, Dept 0218
La Jolla CA 92093-0218
United States
jwilkinson@ucsd.edu

Jing ZHOU
Developer
NOAA National Data Buoy Center
Building 3203 Room 309
Stennis Space Center MS 39529
United States
Tel: 1-985-710-2009
Email: Jing.Zhou@noaa.gov

8. APPENDIX II: Action Items

N°	topic	priority	description	who	when
	action tracking		Transform action items in mantis		
	Site Catalog		Follow up with PMEL on Pirata and RAMA data. Will they continue providing product data or provide individual data files.	Jing, Thierry, Domingos, Kelly	31-Jan
	Site Catalog		Complete review of the Site Catalog and follow up with Pis. Keeping an eye on deployment names so that they are understandable	Project Office	31-Mar
	Data Formatting		Cookbook for data formatting, uploading, WMO IDs. Include possibly Matlab code examples for creating NetCDF files	Steve, Jing, Project Office	31-Mar
	NetCDF Naming		Come up with proposal on short name conventions to be added to user manual. E.g. TEMP vs. TEMP_2. Update user manual	Thierry	31-Jan
	User Manual		Add a new sentence is added to the user manual to allow for more flex in update interval. Accepting the ISO standard for period.Provide examples	Matthias	31-Jan
	Data Products		Investigate aggregation of data files. Entire time series aggregated or selectable and download by date. Use lessons learned from TAO group and what Ifremer is doing	Steering Team	
	website		Create a database for Site Catalog	Project Office	30-Apr
	website		Better User Interface for downloading data. Investigate prototype websites and currently existing tools	Meghan, Taco, Thierry	31-Mar
			Work with IOCCP to develop a best practice and instrument user guide for carbon data	Alex, Melchor, Andrew	30-Apr
			General PI best practices and qc guidelines available on website. Link to existing documentation	All	ongoing
			Create a file with the most recent proposed and approved CF names for OceanSITES. Perhaps on ftp site with a link from the main website.	Kelly, Matthias	31-Dec
	User Manual		Revise real-time parameter in manual should be modified to be ‘R’ for remote. Remove the ‘real-time’ wording from this and stay away from any mention of a time. And add a sentence for	Thierry, Matthias	31-Dec

			quality control procedures for 'P' and 'R'. Addition to draft manual		
	GDAC FTP		Cookbook: DAC and GDAC manual on pushing and pulling data	Steve, Jing, Thierry	29-Feb
	website		Create a simple way to package data files based on the index file.	Thierry	30-Apr
	GDAC FTP		Review the file checker and make improvements and modifications for version 1.2. In addition, make documentation for this file checker.	Thierry	30-Apr
	GDAC FTP		Automate running of the format checker to generate monthly reports and notifications. Including quality control checking.	Thierry	30-Jun
			Generate a paragraph that is for PIs in their NSF proposals about how OceanSITES works and the availability of data, the broader impacts of data, and accessability of that data. For example: http://bcodmo.org/resources	Roger	31-Jan
	GDAC FTP		Statistics on ftp server downloads	Thierry, Jing	31-Jan
			Feedback on download of data. E.g. provide name, email and use.	Steering Team	
			Check on JCOMMOPS data sharing policy and this would in turn be used to help update the citation aspect of the NetCDF File.	Kelly, Diane, Taco	31-Dec
			Create a group on website revisions comprised of data management and steering team and review website	Roger, Ruth, Matthias, Kelly, Meghan	31-Jan
			Document tracking tool: implement alfresco	Thierry, Kelly	31-Jan
			Action item tracking tool: 'mantis'	Thierry, Kelly	31-Jan
			OceanSITES products are on ftp server. Pis would be responsible for creating these products	Steering Team	
			Contact NODC for data archive of OceanSITES data similar to the archive of ARGO data. Contact: Charles Sun (NODC)	Bill, Thierry	31-Jan
			Ifremer (GDAC) to work with Pangea to define the conversion and flow of data through to OceanSITES	Thierry, Ingo	31-Mar
			Contact Val Swail for wave data observations	Bob Weller	31-Dec
			Obtain bottle data from Steve Diggs (HOT and BATS)	Steve Diggs	31-Jan
			TAO CO2 data from Alex	Alex	31-Jan
			ASOF Data	Ruth, Johannes, Taco	31-Jan
			Met and Current Meter data from INCOIS	Pattabhi	30-Apr

			CalCOFI data	Wilkinson	31-Jan
			How to bring PIES and sediment trap data into OceanSITES	Matthias	
			Tropical Moorings in OceanSITES	Jing	
			Migration to BUFR format. Investigate conversion tools	Jing	
			Visualization of data holding status	Kelly, GDACs, others	ongoing
			Review every site code and platform code in the spreadsheet and ensure that they are synchronized with what appear on GDACs. For examples, Meghan requested to change her site code and platform code (to KEO). Also there are newly sites names, such as all TAO sites.	Kelly, GDACs	
			Update IMOS metadata	Marty	31-Jan