NDBC OceanSITES GDAC

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1. Project Summary

The international community sponsors a coordination project called OceanSITES, a global network of ocean timeseries (or reference) sites located around the world's oceans. The NOAA/National Data Buoy Center (NDBC) and OceanSITES have agreed to make the NDBC a Global Data Assembly Center (GDAC), providing a shared and more secure capability together with the Ifremer/Coriolis GDAC in France. These GDACs provide quality assurance/quality control, provide virtual access to the data, maintain a global timeseries dataset and synchronize catalogues on a regular basis.

OceanSITES is the international project working towards the coordination and implementation of a global system of sustained multi-disciplinary timeseries observatories. Timeseries fill a unique gap in the sampling provided by other elements of the global ocean observing system, enabling co-located observations of many variables and processes in strategic or representative locations over long periods of time, with high temporal resolution, from (and including) the ocean surface to the seafloor. More information can be found at www.oceansites.org.

The scientific applications of such data are to monitor, detect, understand, and predict changes and related processes in the physical climate state of the ocean, the carbon cycle, and the ecosystem. Operational applications include detection of events, initialization and validation of assimilation products, delivery of constraints or reference data for forecasts (especially biogeochemical and ecosystem relevant ones). In addition there are a variety of technical applications, such as calibration and validation of data and products from other observing system elements.

OceanSITES, through its international steering team, has developed a rationale for timeseries observations and for needing a coordinated global network, and has defined a pilot project consistent with the needs and expectations of the sponsoring bodies GOOS, CLIVAR, and POGO. A major requirement for sites in the project is an open data policy. A global timeseries

data management system is under construction via a subgroup of the OceanSITES steering team, including a data format coherent with other past and present efforts.

The in situ, time series-based OceanSITES program represents the logical next step in completing the Global Ocean Observing System. As such, the program now is an official component of the global system organized under JCOMM, and is also one of its action groups under DBCP. Much of the technology is available and many elements are in place already. The main challenge is coordination and assuring sustainability of the system, via common advocacy, recruiting a user base, and sharing the operation among communities and countries.

Starting in 2000, NDBC began obtaining and distributing observations from "partners." These partners are designated as U.S. Integrated Ocean Observing System (IOOS) data providers. NDBC receives these marine meteorological, oceanographic (physical) and water quality observations in real-time, quality controls the observations and distributes the data via the Global Telecommunications System (GTS)/web services. NDBC also serves as the Mission Control Center (MCC) for the Tropical Atmosphere Ocean (TAO) Pacific array and the tsunameter array which covers the Pacific and Atlantic Oceans, and the Gulf of Mexico. NDBC also quality controls and maintains data from oil and gas platforms located in the Gulf of Mexico. Thus, NDBC has become one of the major data providers to the GDAC, as well as a technology service provider for OceanSITES user communities.

NDBC supports these platforms by collecting, quality controlling and disseminating the observations in real-time to the Global Telecommunications System (GTS), Observing System Monitoring Center (OSMC), OPeNDAP servers and ftp site. NDBC will act as a DAC for physical observations (marine weather and oceanographic – and possibly for biogeochemical variables) for a number of PIs in the United States. NDBC serves as one of the OceanSITES GDACs and synchronize their OceanSITES files with Coriolis.

2. Scientific and Observing System Accomplishments

NDBC serves as an OceanSITES DAC, handling observations from "provider" platforms such as JAMSTEC, Woods Hole, Scripps, MBARI, and TAO platforms.

The OceanSITES DAC responsibilities include:

- Sets up the OceanSITES "local" server according to the specifications approved by OceanSITES data management group.
- Guarantees data availability from the provider platforms,
- Complies with the agreed upon OceanSITES format,
- Quality Controls real-time data according to OceanSITES agreed procedures,
- Provides the observations via the Global Telecommunications System (if requested by the provider),
- Provides the data on a FTP server for access by the GDACs, and
- Organizes the data processing, formatting, data transfer and update with the partner.

NDBC also serves as a Global Data Assembly Center (GDAC) with France's Ifremer /Coriolis (who is also a GDAC for the Argo floats). The GDAC responsibilities include:

- Provides a virtual or centralized access to the data that are served by the DACs,
- Checks all files daily using the "File Checker" software,
- Maintains the OceanSITES catalogue, and
- Synchronizes the catalogues with the second GDAC (Coriolos) daily.

The NDBC data are available at the following URLs:

- ftp://data.ndbc.noaa.gov/data/oceansites
- http://dods.ndbc.noaa.gov/thredds/catalog/data/oceansites/catalog.html

PERFORMANCE METRICS

Number of files managed by OceanSITES GDAC on 1 October 2012: ~1600
Number of files managed by OceanSITES GDAC on 1 October 2013: ~8300

NDBC has experieinced a big increase in number of files served by the NDBC GDAC during FY13. NDBC supported Scripps Institution of Oceanography and introduced significant number of CTD profile data files to the OceanSITES GDACs. NDBC also supported the University of Hawaii and Columbia University. Their datasets were evaluated and the presence of their datasets were established at the GDACs. NDBC monitored and maintained the synchronization status for all OceanSITES catalogues and datasets. NDBC and IFREMER are now successfully synchronizing OceanSITES observations via GDAC on a daily basis. During FY13, both FTP and THREDDS Data Server were used to support the OceanSITES GDAC operations.

NDBC continued to participate in the monthly OceanSITES Data Management Team's tele-conferences.

NDBC participated in the DMT's development of the draft OceanSITES Users Manual 1.3. One of the proposed key enhancements was the adoption of the NetCDF Attribute Convention for Dataset Discovery in the OceanSITES's NetCDF global attributes. However, there have been concerns with definitions and usage among different organizations. Therefore, additional discussions are required to finalize the draft.

NDBC attended the OceanSITES Seoul meetings in May 2013 to discus OceanSITES new initiatives and future development plans. In particular, the GDAC How-to Cookbook was reviewed and updated during the meeting. In addition discussions were had in regards to future data archival concepts and recommended studies.

After the Seoul meetings, detailed studies of the NDBC TAO delayed mode data processing and resulted quality controlled data were conducted. Coordinating with NODC, NDBC developed an

updated TAO data archival approach that utilize the OceanSITES formartting requirements to construct the final data files for both NDBC and OceanSITES GDACs.

Maintenance and Operations

- Operated the FTP OceanSITES server to host partner observations (GDAC),
- Obtained observations from JAMSTEC, USSD, MBARI, Woods Hole and Scripps and converting the observations into OceanSITES format (DAC),
- Operated the OceanSITES OPeNDAP/Thredds server and providing OceanSITES observations through the server (GDAC),
  - http://dods.ndbc.noaa.gov/thredds/catalog/data/oceansites/catalog.html

3. Outreach and Education

The NDBC outreach and education effort during this reporting period was limited to working with the OceanSITES team and PI within the regions of our responsibility to make them aware of OceanSITES requirements.

In addition, NDBC participated in the OceanSITES Conference in Seoul Korea during May 2013.

4. Publications and Reports

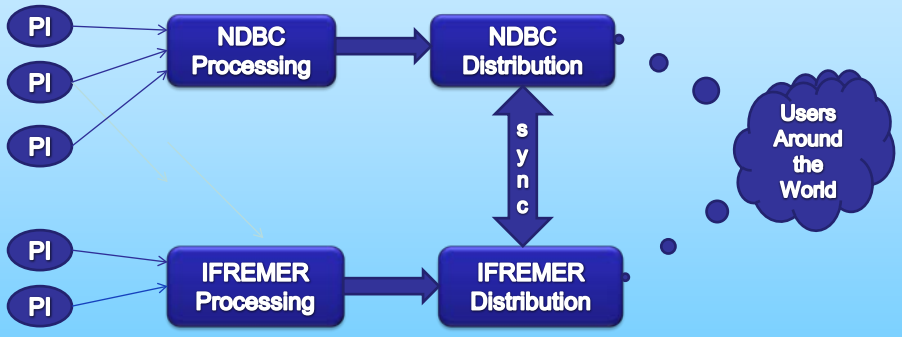
4.1. Publications by Principal Investigator

The NDBC Principal Investigator did not publish during this reporting period.

4.2. Other Relevant Publications

NDBC is not aware of any publications by other authors that used the OceanSITES data.

GDAC Operational Data Flows



Each of PIs representing a DAC submit data to the corresponding GDAC. Each of GDACs process the data and put them onto data distribution channels, which are synchronized with the other GDAC on daily basis.

OceanSITES in Google Ocean