EX1006: Transit from Hawaii to US West Coast

Data Management Plan

I. Document Purpose

This document outlines a plan for managing data from the *Okeanos Explorer* EX1006 transit from Hawaii to Alameda, CA on the U.S. West Coast.

II. Expedition Abstract

The *Okeanos Explorer* (EX) will transit from Honolulu, HI to a still-to-be-determined port on the U.S. West Coast for the winter inport and drydock period. During the transit, the EX will perform 24-hour multibeam survey, deploy XBT casts every six hours, and test a sub-bottom profiling instrument. A two-part project, CAMEO: Trans-Pacific Plankton Comparison 2010, through Survey of Opportunity Requests has been accepted to be performed during the transit. For the first part, the EX will tow a Continuous Plankton Recorder (CPR) to collect phytoplankton and zooplankton samples across a long transect to describe species composition and evaluate diversity gradients, and to estimate species occurrence at the surface. For the second part, the science team will deploy a Manta net and scoop a bucket (for tiny particles) approximately four times a day to sample the surface layer for marine debris typically seen in this area of the Pacific for enumeration and chemical analyses.

III. Data Management Points of Contact

POC	Affiliation	Expedition Role	Email Address
Kelley Elliott	OER	Expedition Coordinator	kelley.elliott@noaa.gov
Michael Ford	NMFS	Principal Investigator	Michael.ford@noaa.gov
Meme Lobecker	OER	Mapping Survey Lead	Elizabeth.Lobecker@noaa.gov
Susan Gottfried	NCDDC	Data Management Coordinator	Susan.Gottfried@noaa.gov

IV. Data Management Plan

A. Overview

The data collected and/or recorded and products generated as a result of the EX1006 mission will be managed by an Integrated Product Team (IPT) charged with managing data and products for NOAA's Office of Ocean Exploration and Research (OER). The IPT is comprised of personnel from OER, the NOAA Data Centers, and other extramural partners.

In a new exploration paradigm, data recorded, products generated, and reported discoveries made during an *Okeanos Explorer* mission will be made discoverable and accessible to the general public in as close to real-time as possible.

Discoverability and accessibility to these data will be made available through a variety of access points, including metadata search engines, public access websites, and geospatial applications called Digital Atlas and Okeanos Atlas.

Several types of metadata records are generated for each expedition. The highest-level record is called a collection-level metadata record and contains the most basic header information about the expedition – title, vessel, chief scientist, mission abstract, dates, geographic region, data inventory summary, and keywords or phrases that enhance discovery of the metadata. More detailed metadata records document the raw data sets recorded, samples collected, multimedia images or video recorded, and products generated as a result of the expedition. The collection-level metadata record enables the archive centers to prepare their systems to receive associated data sets that are their responsibility to archive (see Appendix B). The National Oceanographic Data Center (NODC) Marine Data Stewardship Division (MDSD) archives oceanographic, biological, chemical, and environmental data sets. The National Geophysical Data Center (NGDC) archives geological and geophysical data sets. The NOAA Central Library (NCL) archives physical multimedia, digital multimedia files (such as video highlights and highlight images), and paper and digital products (such as reports, journal articles, publications, etc).

B. *Data Collection Activities*

The OER Data Manager's main objective is to capture the metadata for data collection activities during the mission which will produce data to be eventually archived. The EX1006 cruise plan document has informed the following list of data and information that may be archived as a result of this mission.

Data Source	Data Description
NOAA Ship Okeanos Explorer	Raw multibeam and supporting data files
	SCS monitored navigation and meteorological and oceanographic (METOC) sensor data
	Sub-Bottom Profiler data
	XBT Cast data
Science Team (Mapping and Plankton/Plastics research)	Sample logs and analyses for net tow, CPR tow and water samples
	Multibeam Mapping Survey report
	Highlight Video Clips with captions/credits
	Highlight Digital Still images with captions/credits
	Quick Look Report (form to be supplied)
	Expedition Summary reports
	Publications, Journal Articles, etc.

C. *Metadata Generation*

Metadata, the "data about data," is a required element to accompany data to the NOAA archives. Metadata is also the body of information that Internet searches access when locating data for the interested party. The current Federal mandate states that the metadata must conform to the FGDC standard. CIMS was conceptualized to assist researchers with complying with this tedious task. CIMS has a user interface designed to assist the user in capturing the minimum required metadata fields necessary to produce an FGDC compliant metadata record. There are several types of metadata records that CIMS will generate:

- *collection* or *cruise-level* for an overarching record for the mission,
- *multimedia* for physical video units, individual highlight video clips, and image folders

- *raw data* for raw data collections for a data producing instrument (e.g. multibeam, CTD, METOC sensor group)
- *sample* for biological, geological, water, and archaeological specimens
- *product* for processed data products, summaries, reports, publications, etc

a. Granularity

Granularity describes the level of data collection that should be represented by one metadata record. The following table is a recommendation for the level of granularity for this mission.

Instrument/ Producer	Data Collection	Format	Metadata Granularity	Archive Center
EX Scientific Computing System (SCS) METOC Sensors (incl XBT)	SCS exported METOC data files from SCS	ASCII	1 meta rec for the collection	NODC/MDSD
EX SCS Navigation	SCS exported navigational data from SCS	ASCII	1 meta rec for the collection	NODC/MDSD
EX Multibeam	Raw multibeam	Proprietary format for MBSystem	1 meta rec for each file	NGDC
Science Team	Sample Analysis	Excel, ASCII	1 meta rec for each collection type (CPR, Manta, Bucket)	NODC/ MDSD
Principal Investigator	Highlight Video Clips with Caption/Credit	.mov, m4v, Excel or .csv	1 meta rec per clip	NODC/ NCL
Principal Investigator	Highlight Images with Caption/Credit	.jpg, Excel or .csv	1 meta rec per folder of images	NODC/ NCL
Principal Investigator	Quick Look Report	.pdf, .doc	1 meta rec	NODC/NCL
Expedition Coordinator	Final Mission Summary Report	.pdf, .doc	1 meta rec	NODC/NCL
Mapping Lead Scientist	Final Mapping Survey Summary Report	.pdf, .doc	1 meta rec	NODC/NCL and NGDC
Project Principals	Peer-reviewed journal article	.pdf, .doc	1 meta rec per each	NODC/NCL
Project Principals	Publication	.pdf, .doc	1 meta rec per each	NODC/NCL

b. <u>Sample Custodian Information for Metadata</u>

Metadata Contact Info	CPR	Manta Tow (1-3)	Manta Tow (4)	Bucket
POC Org	Polish Plankton Sorting Center	Scripps Institute of Oceanography	NMFS NWFSC Seattle Laboratory	Scripps Institute of Oceanography
POC Name		Mark Ohman		Mark Ohman
Mailing Address				
Physical Address				
City, State, Zip				
Country				
Phone				
FAX				
Email				

| Metadata Default Values	CPR	Manta Tow (1-3)	Manta Tow (4)	Bucket
Storage Location				
Storage Method		Frozen in 37% formaldehyde	Frozen without Preservative	Frozen without Preservative(?)
Storage Temperature		-20 to -80 degrees F	-20 to -80 degrees F	-20 to -80 degrees F
Processing Method				
Processing POC	Stephanie Oakes			

Searchable Metadata Keywords

Internet search engines frequently use "keywords" to find and return results. The use of standard vocabularies for these keywords facilitates interoperability between data sets. The FGDC Content Standard for Digital Geospatial Metadata (CGDSM) uses standard vocabularies (i.e. International Standards Organization (ISO), and Global Change Master Directory (GCMD)) and non-standard user-defined words or phrases provided by the data originator. For this mission, the following table identifies some keywords that may be helpful in discovering the data related to this mission. The project principals are encouraged to provide additional keywords that will be included in all metadata records generated for this mission.

Vocabulary Source	Keyword or Phrase
GCMD	Oceans -> Marine Environment Monitoring
GCMD	Ocean -> Pacific Ocean -> North Pacific Ocean
ISO Topic	Oceans, Biota, Environment
NODC Sea Names	North Pacific
NODC Data Types	Phytoplankton, Zooplankton, Debris, Bathymetry
NODC Observation Types	Biological, Chemical, Continuous, Laboratory Analyses, Manual Sample Collection, Phytoplankton Abundance Tows – Plankton Tows, Underway – Surface, Survey – Biological, Survey - Geophysical
NODC Instrument Types	Bathythermograph – XBT, Continuous Plankton Recorder, Bucket, Manta Tow, Multibeam Sonar
NODC Platforms	Okeanos Explorer
User-defined	
User-defined	
User-defined	
User-defined	
User-defined	
User-defined	
User-defined	
User-defined	
User-defined	
User-defined	

Additional resources for metadata keywords can be found at the following location:
http://www.ncddc.noaa.gov/metadata-references

D. *Data for OER Products and Education / Outreach Purposes*

The OER Digital Atlas
(http://explore.noaa.gov/DigitalAtlas) and the
EX specific Okeanos Atlas
(http://explore.noaa.gov/OkeanosAtlas)
provide a central point of access to data and
information associated with OER's exploration
missions. The interactive map user interface
displays the full complement of expeditions,
color coded by year. Search filters based on
year, expedition theme, and a user-defined text
search assist the user in narrowing the search
criteria. User selection of any cruise leads to a
range of information, dependent upon the
status of data processing, archival, and
publication.
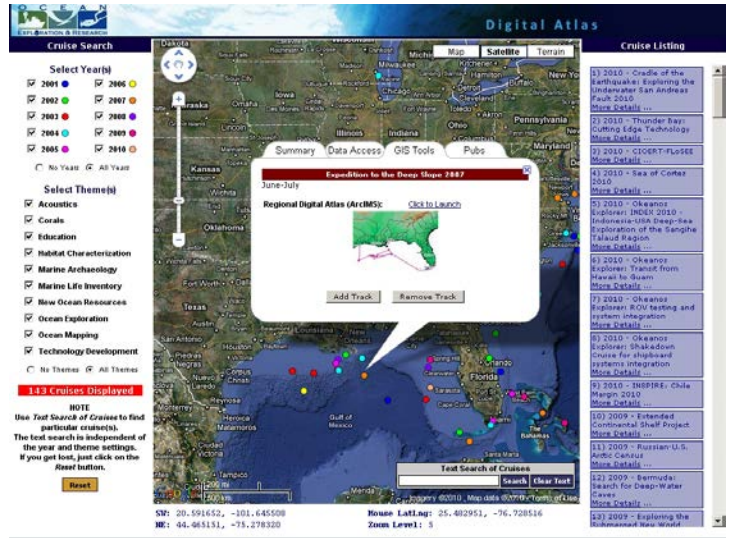
Through the Digital Atlas, users may access some or all of the distributed information resources listed
below.

Tab	Purpose
Summary	Provides access to the OER Education and Outreach web site (oceanexplorer.noaa.gov)
Data Access	Provides direct links to data archives and educational materials: - The Video Data Management System (VDMS): online links to images, video highlights and clips and documents (note that preservation of physical media and limited access to this media is also available); - The NODC Ocean Archive System (OAS): online links to oceanographic, meteorological and navigation data; - The NGDC GEOphysical DAta System (GEODAS) : online links to multibeam bathymetry and other geophysical and geological data - Links to the OER-developed Expedition Education Modules (EEM) and other educational resource materials.
GIS Tools	Allows users to view the expedition's ship track, and launches an online map application where expedition data can be viewed with other, ancillary data to evaluate the expedition information in a geospatial context.
Pubs	Links users to the bibliography of peer-reviewed publications associated with the research conducted on a given expedition.

E. *Archive Submission Plan*

The following table outlines the proposed data submission for the NOAA Data Centers, the requested format for data submission, the targeted archive center and the proposed availability date for public release. The data and its availability date are negotiable. Changes to the proposed date should be communicated to the OER Data Management Coordinator prior to the end of the cruise.

Data Class	Instrument	Data Type	Delivery Media	Archive Center	Availability Date for Archive
MET	EX SCS METOC Sensors	Hull-mounted and offboard oceanographic/ meteorological sensors	Hard-drive	NODC/MD SD	Post-mission
NAV	EX SCS Navigation	Ship-track, Speed over ground, Course over ground	Hard-drive	NODC/MD SD	Post-mission
GEO	EX Multibeam	Raw multibeam and supporting data; post-processed data; data products	Hard-drive	NGDC	Post-mission after post-processing at UNH/CCOM
SAM	Science Team	Sample Analysis	DVD/CD	NODC/ NCL	Post-mission from Science team
PRD	Principal Investigator	Highlight Video Clips with Caption/Credit	DVD	NODC/ NCL	Post-mission
PRD	Principal Investigator	Highlight Images with Caption/Credit	DVD	NODC/ NCL	Post-mission
PRD	Principal Investigator	Quick Look Report	DVD/CD /email	NODC/ NCL	Immediately post-mission
PRD	Principal Investigator	Final Mission Summary Report	email	NODC/ NCL	Within six months post-mission
PRD	Mapping Lead Scientist	Final Mapping Survey Summary Report	email		Within three months post-mission
PRD	Project Principals	Peer-reviewed journal article	DVD/CD	NODC/ NCL	When available
PRD	Project Principals	Publication	DVD/CD /hard copy	NODC/ NCL	When available

F. Operational Reporting

Daily operational reports, called Situation Reports or SitReps, are generated through the CIMS software system. The operations, events, and activities being monitored by the OER Data Manager and captured within CIMS are itemized, along with the ship's current position and an on-board personnel record.   The most important component, however, is a brief operational commentary from the Data Manager, or preferably the Chief Scientist or designee, about the day's events. This document is emailed regularly (usually daily) to the OER Expedition Coordinator and to others specified by the cruise principals. This document is for operational use only and will not be distributed publicly or archived. An example of a Situation Report is shown in Appendix C.

Situation Report Recipient	Recipient Email Address
John McDonough, Deputy Director	John.McDonough@noaa.gov
Craig Russell, EX Program Manager	Craig.Russell@noaa.gov

Appendix A: Data Management Guidance

NOAA's Office of Ocean Exploration & Research (OER) is in accord with the 2000 President's Panel on Ocean Exploration call for a Federal program that promotes data management and dissemination to ensure that discoveries can have maximum impacts in the research, commercial, regulatory, and educational realms. OER advocates open scientific communication and expects significant findings from supported research and educational activities to be promptly submitted for publication with authorship that accurately reflects the contributions of those involved. It expects PIs to share with other researchers, at no more than incremental cost and within a reasonable time, the data, samples, physical collections and other supporting materials created or gathered in the course of the work. It also encourages grantees to share software and inventions, once appropriate protection for them has been secured, and otherwise act to make the innovations they embody widely useful and usable. OER will put these principles into practice, in ways appropriate to field and circumstances, through the proposal review process; through award negotiations and conditions; and through appropriate support and incentives for data cleanup, documentation, dissemination, storage and the like. Adjustments and, where essential, exceptions may be allowed to safeguard the rights of individuals and subjects, the validity of results and the integrity of collections, or to accommodate legitimate interests of investigators.

Each applicant should articulate his/her willingness to comply with these principles. The proposal Project Description should outline the plans for preservation, documentation, and sharing of data, samples, physical collections, curricula materials and other related research and education products. Plans for handling of data and other products will be considered in the review process.

Grant recipients are responsible for archiving all acquired data sets and associated products in the appropriate NOAA archive (i.e., National Oceanographic Data Center, National Geophysical Data Center, National Coastal Data Development Center, National Climate Data Center, and the NOAA Central Library) as soon as practical and, in no case, later than two years following the completion of the expedition. Within 60 days of completion of the expedition/field work/etc, grant recipients should provide a collection level metadata record (e.g., number & type of data, and description of the data collected) to the OER Data Manager for submission to the National Data Clearinghouse. This record should be created in compliance with the Federal Geographic Data Committee Content Standards for Digital Geospatial Metadata (FGDC-STD-001-1998) in accordance with Executive Order 12906, Co-ordinating Geographic Data Acquisition and Access: The National Spatial Data Infrastructure dated April 1994 http://www.fgdc.gov/policyandplanning/executive_order.

For continuing observations, data inventories should be submitted periodically if there is a significant change in location, type or frequency of such observations. Archiving of any specific archaeological site information that is considered sensitive material under Section 304 of the National Historic Preservation Act of 1966 (as amended) will not be required to be in compliance with these requirements.

For a subset of funded expeditions, OER will facilitate data collection, management and archival by providing the in-field services of an OER Data Manager. The OER Data Manager will be responsible for documenting all expedition activities (e.g., science, education and outreach, transits, shuttles) in the OER Cruise Information Management System (CIMS). The metadata records contained in the CIMS

will be provided to the Science Team for inclusion in required reports, and will be distributed to the appropriate NOAA archive.

To aid in the Census of Marine Life (CoML; http://www.coml.org) goal of determining the distribution, abundance and diversity of marine life, all projects are encouraged to maintain their biological species information on-line and linked (either directly or via a Federal data center) to the CoML database, the Ocean Biogeographic Information System (OBIS) (http://www.iobis.org). A statement to this effect should be included in the proposal. Biological samples should be registered with the Census of Marine Life's OBIS database (http://www.iobis.org) or a Federal database that is linked to OBIS.

Other data or data products may also be requested at the discretion of the OER Director for administrative, scientific, or educational use. All such product requests will be considered in full collaboration with the applicant, and any data sensitivity issues will be handled appropriately. PIs and their institutions are responsible for meeting all legal requirements for submission of data and research results that are imposed by foreign governments as a condition of that government's granting research clearances. Each PI and institution must determine their legal obligations in this respect, with the assistance of the Department of State and NOAA, as necessary.

The applicant is encouraged to consider budgeting appropriate resources for any anticipated costs to comply with these data management principles. This generally includes budgeting for the following types of activities: reports, reprints, page charges or other journal costs (except costs for prior or early publication); necessary illustrations; cleanup, documentation, storage and indexing of data and databases; development, documentation and debugging of software; and storage, preservation, documentation, indexing, etc., of physical specimens, collections or fabricated items. The OER Data Manager, when not otherwise specifically designated in each Grant or Contract award, will be the NOAA National Coastal Data Development Center's OER Liaison Officer (228-688-2936 or toll free 1-866-732-2382).

Appendix B: NOAA Office of Ocean Exploration and Research (OER) Expedition Data Submission Instructions

In preparation for your expedition, OER would like to discuss how we may assist you with archiving your expedition data at NOAA, generating associated metadata, and protecting your proprietary and intellectual rights to the data and data products. Archiving the data and publishing the associated metadata will enable OER to be in compliance with government mandates for data management, and we believe it will provide you advantages as well:

- Published metadata will ensure that your research will be discoverable through internet searches and that it always will be accredited to you.
- Published metadata will never expose the actual data unless that is something that you authorize.
- Archived data will be withheld from public access for a minimum of two years and will be preserved for the long term.
- Archived data that have been made publicly accessible will benefit future research.

OER offers science parties three levels of data management support related to their expeditions:
1. An OER designee accompanies the expedition and performs data management duties using the CIMS.[1]
2. OER provides CIMS and trains a science party member as a data manager.[1]
3. If CIMS is not used in association with an expedition, OER works with the science party to ensure that a subset of the data and information is archived in the appropriate NOAA data centers.[2]

[1] When CIMS is used during an expedition, post-cruise procedures provide a metadata generation utility that will programmatically generate FGDC compliant metadata from the information entered into the system. These metadata records are then owned and controlled by the chief scientist through NCDDC's Metadata Enterprise Resource Management Aid (MERMAid).

[2] When the CIMS is not utilized, a science party metadata contact must be identified for the expedition. This contact will be given access to the MERMAid in order to create and manage metadata for archived datasets. Metadata and archive staff will be assigned to work with that contact to ensure that metadata requirements are understood and that the metadata is compliant with the appropriate standards.

Regardless of the support level, OER is committed to the process of efficiently and effectively managing data and information derived from all funded projects. In our upcoming pre-cruise data management conference call, we would like to accomplish several goals:

1. Identify the data sets that you will acquire and the subset of NOAA-relevant data sets that you would be willing to archive at the appropriate NOAA data centers.
2. Decide on which level of data management support will be required for your expedition and discuss the next steps.
3. Discuss proprietary and intellectual rights associated with the data and metadata, time frames for submitting the data and metadata to the IPT, and time frames for making the data available to the public.
4. Introduce the CIMS tool for documenting data collection activities during the expedition.

5. Introduce the MERMAid tool for metadata creation and publishing and describe how it can be utilized in the process.
6. Introduce the Digital Atlas, an interactive GIS application, through which your expedition may be discoverable in a geospatial environment with other related NOAA and non-NOAA data sets.
7. Introduce the Video Data Management System (VDMS), the NOAA Central Library's application for cataloguing copies of video from your expedition, which can be protected in the library in a climate-controlled, state-of-the-art video archive.
8. Introduce NODC's Ocean Archive System and describe its capabilities and recommended archival data formats.
9. Introduce NGDC's Archive System and describe its capabilities and recommended archival data formats.
10. Discuss any concerns regarding specific archaeological site information that is considered sensitive material under Section 304 of the National Historic Preservation Act of 1966 (as amended) or other concerns about limiting access to sensitive information (e.g., location and type of endangered biological resources).

By the end of our conference call, OER expects a shared understanding of all our data management goals and an agreement between OER and the science party as to the process for data management.

NOAA Central Library (NCL)
Video Data Management System (VDMS) and
Library Online Catalog (NOAALINC)

Overview:

The NOAA Central Library, located in Silver Spring, Maryland, provides information and research support to NOAA staff and the public. The library also networks with over 30 NOAA libraries across the nation. Disciplines covered include weather and atmospheric sciences, oceanography, ocean engineering, nautical charting, marine ecology, marine resources, ecosystems, coastal studies, aeronomy, geodesy, cartography, mathematics and statistics.

The NCL is interested in archival the following types of data sets.

Check if Included	Proprietary Period	Data	Preferred Formats
		Copies of the original dive video	MiniDV, DVD or DVCAM
		Video Annotations (spreadsheet of video tape details)	Microsoft Excel, Comma delimited, or Text file format on CD-ROM, DVD, or online file for grab
		Video Highlights	MiniDV, DVD or DVCAM (highlight video clips selected by PI; approx. 10-30 min. runtime)
		Digital Image Highlights	HR resolution still images in JPEG **and** TIFF formats on CD-ROM, DVD, or zip file online for grab (20-30 images selected by PI)
		Digital Images Collections	HR resolution still images in JPEG **and** TIFF formats organized into albums/folders on CD-ROM, DVD, or zip file online for grab
		Digital Image Collections/Digital Image Highlights annotations	Microsoft Excel, Word, or PDF document; Photo and Video Catpions and Credits information for the highlights and the entire image collection on CD-ROM, DVD, or online file for grab
		Reports (Cruise Summary, Quick Look Report, Dive Summaries, etc.)	Microsoft Excel, Word, or PDF document on CD-ROM, DVD, or online file for grab
		Educational lesson plans	Web applications, such as HTML, Word, PDF, etc.
		Promotional post-expedition products	CD-ROM, DVD, video tapes, Websites, brochures, posters, etc.

Additional considerations: _____

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NOAA National Geophysical Data Center (NGDC) Geophysical Data System (GEODAS)

Overview:
NGDC provides archival service for relevant geologic, seismic, magnetic, gravitational, and/or bathymetric data collected and products generated in association with OER-sponsored expeditions. Metadata accompanying these data are required in order to effectively provide discovery of these data and products to diverse user communities.

NGDC is interested in archival the following types of data sets.

Check if Included	Proprietary Period	Data
		Multibeam Bathymetric Raw Data[1]
		Image Files[2]
		Grid Files[3]
		Gravity, Magnetic, Seismic, or single beam bathymetric data[4]
		Geology Grain Size Analysis
		Core descriptions & analyses

If data sets are identified for archival, a more detailed discussion regarding appropriate formatting will follow. An overview regarding currently supported formats by data type is below.

[1]NGDC currently accepts raw geophysical data in a variety of formats readable by MBSystem software. At present, formats associated with the following sonars are supported.

- Sea Beam "classic" multibeam sonar
- Hydrosweep DS multibeam sonar
- Hydrosweep DS2 multibeam sonar
- Hydrosweep MD multibeam sonar
- Sea Beam 2000 multibeam sonar
- Sea Beam 2112 and 2136 multibeam sonars
- Sea Beam 2120 multibeam sonars
- Simrad EM12, EM121, EM950, and EM1000 multibeam sonars
- Simrad EM120, EM300, and EM3000 multibeam sonars
- Simrad EM122, EM302, EM710, and EM3002 multibeam sonars
- Simrad Mesotech SM2000 multibeam sonar
- Hawaii MR-1 shallow tow interferometric sonar
- ELAC Bottomchart and Bottomchart MkII shallow water multibeam sonars
- Reson Seabat multibeam sonars (e.g. 9001, 8081, 7125)
- WHOI DSL AMS-120 deep tow interferometric sonar
- Sea Scan sidescan sonar
- Furuno HS-1 multibeam sonar
- Edgetech sidescan and subbottom profiler sonars
- Imagenex DeltaT multibeam sonars
- Odom ES3 multibeam sonar

See http://www.ldeo.columbia.edu/res/pi/MB-System/html/mbsystem_formats.html for more details.

[2]Preferred formats are Tagged Image File Format (tiff) and/or Graphic Interchange Format (gif)

[3]Preferred format is Network Common Data Form (NetCDF). Additional information about NetCDF can be found at http://www.unidata.ucar.edu/software/netcdf.

[4]Preferred formats are the Marine Geophysical Data (MGD-2000) formats, MGD77, HYD93, ARO88, GRD98, VCT00, and XYZ03. Details about these formats can be found at http://www.ngdc.noaa.gov/mgg/gdas/hg_mgd2000.Html).

Quality Information:

A dataset must include parameters for depth, latitude, and longitude.

Depth should be within the range of 0-11,000 meters and should contain only one sign. The method used to derive depth (sound velocities or 1500 m/sec) should be indicated and if sound velocity profiles exist, they should accompany the data. If tide corrections are applied to the data, these data should also accompany the data.

Latitude and longitude points should be located over areas of water or within the boundaries of a particular body of water. The datums used to determine position should be indicated.

Additional considerations: _____
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NOAA National Oceanographic Data Center (NODC) Ocean Archive System (OAS)

Overview:

NODC provides archival service for global oceanographic data in order to preserve a historical record of the Earth's changing environment. These archival data may be used for operational applications and ocean climate research. In a collaborative effort with NOAA's Office of Ocean Exploration and Research (OER), NODC archives relevant oceanographic, biological, chemical, environmental, and meteorological data and products generated in association with OER-sponsored expeditions. Metadata accompanying these data are required in order to effectively enable discovery of these data and products to diverse user communities.

NODC is interested in archiving the following types of data.

Check if Included	Proprietary Period	Data Type	Preferred Formats	Acceptable Formats	Unacceptable Formats
		Physical Oceanographic Data[1]	comma delimited ASCII, netCDF, HDF5	MS Excel	[6]
		Chemical Oceanographic Data[2]	comma delimited ASCII, netCDF, HDF5	MS Excel	[6]
		Biological Oceanographic Data[3]	Comma Delimited ASCII, netCDF, HDF5	MS Excel	[6]
		Data Products[4]	native GIS (.e00), PDF/A, JPEG, mov	PDF, MS Word	[6]
		Cruise Products[5]	PDF/A	PDF, MS Word	[6]

[1] The NODC acquires physical oceanographic data of value for a broad spectrum of secondary users. These include measured values of temperature, salinity, ocean currents, winds and wave spectra, pressure, light transmission, fluorescence, sea level, etc. These measurements are taken from a variety of instruments (e.g. XBT, CTD, and ADCP), sensors (e.g., thermistor, transmissometer, inverted echo sounder), and platforms (e.g., moored current meters, drifting buoys, subsurface floats, tide stations, and earth orbiting satellites).

[2] The NODC acquires data on naturally-occurring and anthropogenic chemical substances. These data include observations from the water column, biota, and interstitial waters of marine sediments.

Principal data parameters of interest include dissolved gases, pH, alkalinity, nutrients, dissolved organic and inorganic matter, particulate organic and inorganic matter, trace metals, and marine pollutants.

[3]The NODC archives a diverse range of biological data, including geographic and temporal distribution of all groups of marine plant and animal biota, primary organic production, plant pigment concentrations and distributions, and metabolic products in seawater (e.g. ATP and urea). Other parameters of interest include identity, geographic/temporal/vertical distribution, abundance and biomass of marine organisms (all taxonomic groups from virus particles to marine mammals) and population, community and ecosystem surveys and monitoring program collections.

Except when required by special NOAA program interest, NODC does not acquire biological data that are not directly related to ecosystem dynamics (e.g., cell and molecular biology, physiology, fisheries statistics, embryology and development, and morphometry). Data on substratum characteristics are acquired and archived by NODC only when they are included as habitat descriptors of benthic communities or as part of water column related studies.

[4] The NODC acquires products in many diverse formats that are wholly dependent on the product type. Internationally- or industry-recognized standards are always preferred over locally-created formats. Recommended formats for still and moving image files, GIS maps, and other product types should be discussed in pre-cruise planning meetings to ensure timely inclusion in NODC archival collections.

[5] The NODC acquires summary products produced as a result of the expedition (e.g. Cruise Summary reports, Dive Summary reports, journal articles, and publications). Summary products should use internationally- or industry-recognized standards, such as Adobe Acrobat PDF/A for documents.

[6] NODC does not accept many formats that are readable only by proprietary software (e.g., Seabird CTD hex format). Contact NODC.DataOfficer@noaa.gov for more information.

Quality Information:

Data quality and detailed documentation of quality assessment techniques is critical for long-term preservation of irreplaceable observation data. Quality assessment techniques can be documented using MERMAid tools, in external publications that are archived with data holdings, or other mechanisms discussed during pre-cruise planning meetings.

Additional considerations: _____
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NOAA National Coastal Data Development Center (NCDDC) Geospatial Data Discovery, Visualization, Integration and Analysis Tools

Overview:

A key goal of the OER data management initiative is to integrate exploration data with other NOAA and non-NOAA data to meet NOAA's mission goals. NCDDC hosts a geospatial data base of coastal and ocean data, and has developed applications to make this data available to the public through geo-web services. Using both Google and ESRI ArcServer technology, NCDDC has developed the Digital Atlas Portal, a map-based index for OER explorations. This data discovery tool is backed by a series of Regional Atlases that offer web-based GIS tools for data visualization, data integration and analysis.

Geospatial data provided to NCDDC will be hosted in the geospatial data base and made accessible to the public through one or more Regional Atlases. In addition, related, geo-referenced data products may be linked to the GIS display. For example, images may be linked to a location on the dive track; similarly, static products such as water column profiles, charts, dive reports and so on may be linked to specific map locations.

NCDDC can assist users in archiving their geospatial data products at the appropriate NOAA Data Center. The NCDDC geo-database is archived periodically at NODC.

NCDDC is interested in hosting the following types of data.

Check if Included	Proprietary Period	Data Type	Preferred Formats	Acceptable Formats	Unacceptable Formats
		Vessel and submersible navigational data	shapefiles, KML	comma delimited ASCII, MS Excel, *.e00, netCDF, HDF5	
		Data Products[1]	shapefiles, KML, PDF, JPEG, GeoTiff, png	MS Word	
		Cruise Products[2]	PDF/A	MS Word	

[1] The NCDDC acquires products in many diverse formats that are wholly dependent on the product type. Internationally- or industry-recognized standards are always preferred over locally-created formats. Recommended formats for still and moving image files, GIS maps, and other product types (e.g. geo-referenced charts, plots, etc) should be discussed in pre-cruise planning meetings to ensure timely inclusion in NCDDC archival collections.

[2] The NCDDC acquires summary products produced as a result of the expedition (e.g. Cruise Summary reports, Dive Summary reports, journal articles, and publications). Summary products

should use internationally- or industry-recognized standards, such as Adobe Acrobat PDF/A for documents.

Additional considerations:
1. Organizations that host their own web accessible GIS tools have the option of providing a link to their web site or maps. This information will be referenced from the OER Digital Atlas GIS Tools link.
2. Organizations that use ESRI ArcServer technology have the option of integrating remotely hosted data directly into a Regional Atlas.
3. FGDC metadata is required for geospatial data (e.g. shapefiles) but is not necessarily required for information products (e.g. dive reports, charts, etc)

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