Data Management Plan Overview

The data collected and/or recorded and products generated as a result of cruises aboard the *Okeanos Explorer* 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 a Digital Atlas, Exploration Command Centers (ECC), metadata search engines, websites, and online geospatial applications.

Data Management Objectives

For the first 2010 mission, the *EX-10-01 Ship Shakedown/Ship Engineering* cruise, certain data collected and/or recorded and specified products generated will be archived at the NOAA National Data Centers and made available through several host applications. However, the main data management objectives of this cruise are generated through the software team responsible for the systems that ensure the timely and efficient delivery of these data. These objectives are:

- Install latest code updates to the customized Cruise Information Management System (CIMS) At-Sea Data Collection Module and the CIMS Broker which interfaces with the ship's Scientific Computer System (SCS).
- Test updates installed by NOAA's Office of Marine and Aviation Operations (OMAO) to the SCS that directly affect the data exchange between CIMS and SCS.
- Test CIMS Broker email notification capability.
- Test and refine the data flow pipelines from the ship into the National Coastal Data Development Center (NCDDC) at the John C. Stennis Space Center near Bay St. Louis, MS.

Expedition Principals for Data Management

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Elizabeth "Meme" Lobecker, UNH CCOM/JHC, OER Expedition Coordinator
Mashkoor Malik, UNH CCOM/JHC, Mapping Survey Lead Scientist
Susan Gottfried, NCDDC, OER Data Management Coordinator

Anticipated Data for Archive:

- Meteorological sensor data
- Oceanographic sensor data
- Navigational data

6 March 2015

Data Pipelines:

For the 2010 *Okeanos Explorer* field season, NCDDC will be responsible to ensure that the data and products from the ship are bundled with accompanying standard metadata and delivered to the appropriate archive center. NCDDC will also ensure that targeted data and products will be incorporated into various geospatial applications and websites which showcase the ship, its data capabilities, and provide discoverability and access to the data and products that result from the mission.

Hull-mounted and off-board meteorological and oceanographic (METOC) sensors monitored through the ship's Scientific Computer System (SCS) will be archived at the National Oceanographic Data Center (NODC) Marine Data Stewardship Division (MDSD) in Silver Spring, MD. A collection level metadata record describing the data inventory to be archived at the NODC/MDSD will be included with the data submission.

Planning and scientific reports and iconographic data products will be archived at the NOAA Central Library (NCL) in Silver Spring, MD, a division of NODC.

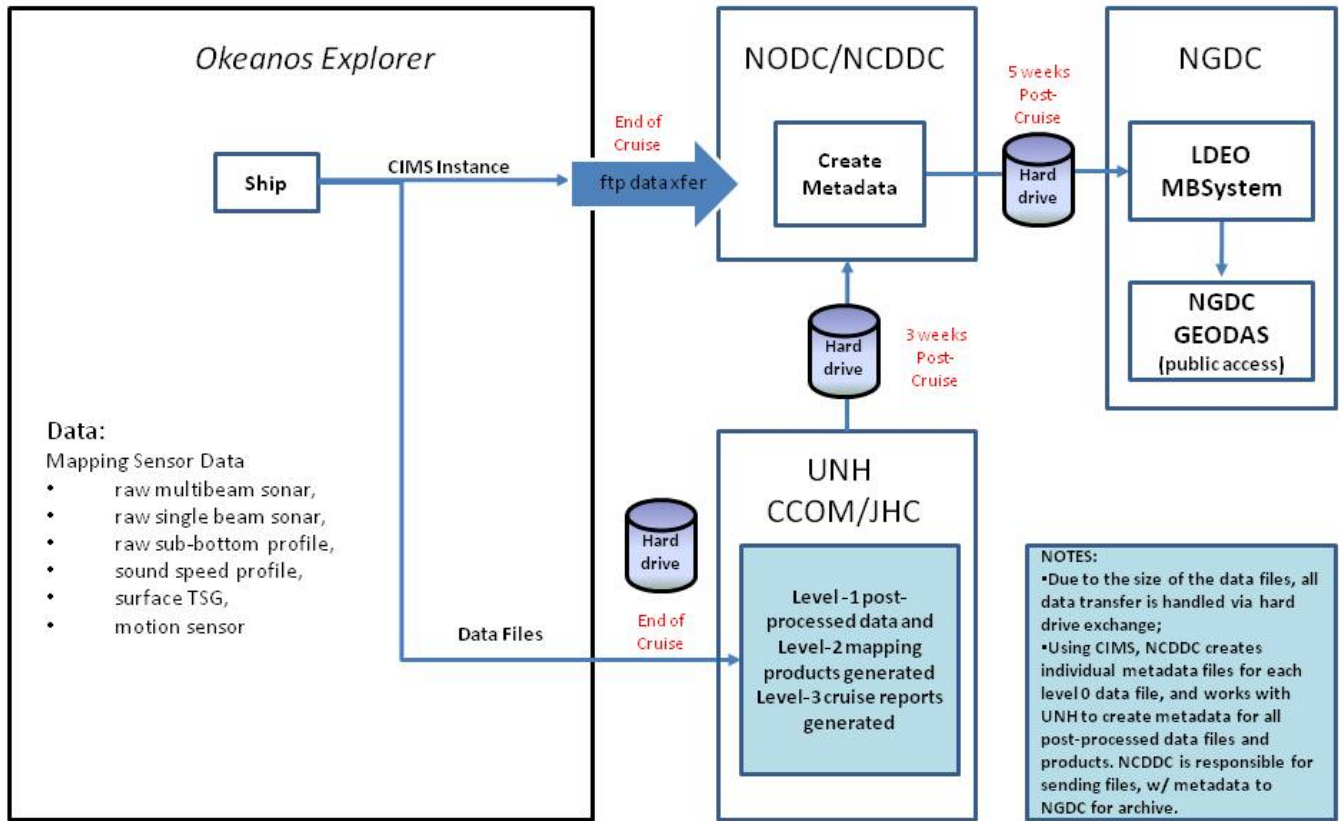Oceanographic / Navigational / Meteorological Data Pipeline for EX-10-01 (February 7-19, 2010)
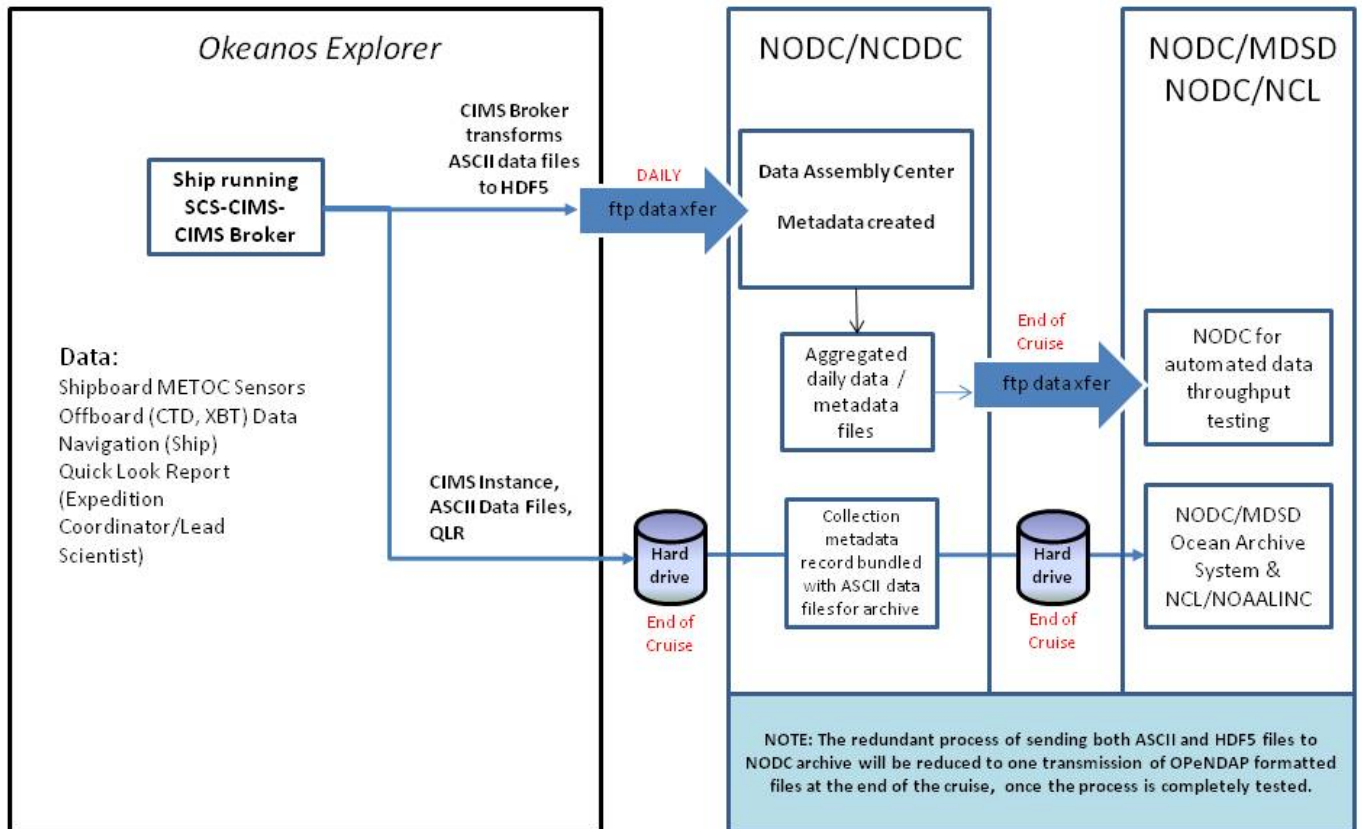
Metadata Generation Instructions:

Data Class	Instrument	Data Type	Format	Metadata Granularity	Archive Center
MET	RM Young 61202V	Barometric Pressure (mB)	.raw (ASCII)	1 meta rec = baro*.raw files in SCS_Data/Met folder	NODC/MDSD
MET	RM Young 41382VC	Air Temperature (deg C)	.raw (ASCII)	1 meta rec = met*.raw files in SCS_Data/Met folder	NODC/MDSD
MET	RM Young 41003P	Relative Humidity (Pct)	.raw (ASCII)	1 meta rec = met*.raw files in SCS_Data/Met folder	NODC/MDSD
MET	RM Young 05106/RM Young 05306B	Relative Wind Speed (knots)/Relative Wind Direction (degrees)	.raw (ASCII)	1 meta rec = Wind*.raw files in SCS_Data/Met and SCS_Data/Wind folder	NODC/MDSD
MET	Derived	True Wind Speed (knots)/True Wind Direction (degrees)	.raw (ASCII)	1 meta rec = SCS_Data/TWind folder	NODC/MDSD
MET	Epply PSP and PIR	Solar Radiation (kWh/m2)	.raw (ASCII)	1 meta rec = met*.raw files in SCS_Data/Met folder	NODC/MDSD
NAV	Applanix POS/MV 320	Location, Heading, Attitude (Decimal degrees, degrees, degrees)	.raw (ASCII)	1 meta rec = SCS_Data/POSMV folder	NODC/MDSD
NAV	CNAV DGPS/C-NAV 2000	Global Position (Decimal degrees)	.raw (ASCII)	1 meta rec = SCS_Data/CNAV and SCS_Data/DGPS	NODC/MDSD
NAV	Gyro Compass	Compass Readings	.raw (ASCII)	1 meta rec	
OCN	SeaBird SBE-9plus	Conductivity, Temperature, Depth	.raw (ASCII)	1 meta rec = SCS_Data/CTD folder and Profile_Data/CTD folder	NODC/MDSD
OCN	SeaBird SBE-45 Micro	Temperature, Salinity, Sound Velocity (deg C, psu, m/s)	.raw (ASCII)	1 meta rec = SCS_Data/SciSwSys folder	NODC/MDSD
OCN	Sippican MK-21 eXpendable BathyThermograph (XBT)	Temperature, Depth, Sound Velocity (deg C, meters, m/s)	.edf (ASCII)	1 meta rec = Profile_Data/XBT folder	NODC/MDSD
OCN	Calculated	Sound Velocity (m/s)	.asvp (ASCII)	1 meta rec = Profile_Data/SVP or Profile_Data/ASVP	NODC/MDSD

For EX-10-01, the multibeam data collected will be from patch tests in areas that are well-mapped. If the mapping survey extends beyond a well-mapped region, the data collected and products generated by bottom-looking sensors and complementary sensors will be archived at the National Geophysical Data Center (NGDC) in Boulder, CO. These data will be accompanied with a collection level metadata record for the NGDC. In addition, the submission to NGDC will include the following:

- raw (level-0) mapping survey data,
- post-processed, quality assured, and edited (level-1) data,
- specific data products (level-2) including GeoTIF images and gridded bathymetric files, and
- comprehensive mapping survey data cruise summary (level-3) report.

Bathymetric / Geophysical Data Pipeline for EX-10-01 (February 7-19, 2010)

Metadata Generation Instructions:

Data Class	Instrument	Data Type	Format	Metadata Granularity	Archive Center
GEO	Kongsberg Simrad EM-302 (30 kHz)	Multibeam Bathymetry, Bottom Backscatter, Water Column Backscatter (proprietary format read into MBSystem)	.all, .wcd (proprietary)	1 meta rec per .all file in Multibeam Data folder and subfolders	NGDC
GEO	Kongsberg EA600 (12 kHz)	Singlebeam (x,y,depth)	.txt, .xyz (ASCII), .dg, .out, .raw (proprietary)	1 meta rec = SingleBeam Raw Data folder	NGDC
GEO	Knudsen CHIRP 3260 (3.5 kHz)	Sub-bottom profile	.sgy, .kea, .keb (proprietary) .	1 meta rec = Subbottom Profile Data folder	NGDC
OCN	Calculated	Sound Velocity (m/s)	.asvp (ASCII)	1 meta rec = Profile_Data/SVP or Profile_Data/ASVP	NGDC

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Anticipated Products for Archive:
- Quick Look Report
- Final Cruise Plan report
- Final Cruise Summary report
- Final Mapping Survey Data Summary report, if applicable.
- Mapping Survey Products from edited data, if applicable.

Product	Release?	Archive?	Format/Size	Archive Center	Originator
Daily Situation Report	No	No	.doc/ <500K	n/a	Lead Scientist
Quick Look Report	Yes	Yes	.pdf/	NCL	Lead Scientist
Final Cruise Plan	Yes	Yes	.pdf	NCL	Expedition Coordinator
Final Cruise Summary Report*	Yes	Yes	.pdf	NCL	Expedition Coordinator, Lead Scientist
Final Cruise Mapping Data Report*	Yes	Yes	.pdf	NCL, NGDC	Mapping Survey Lead Scientist
Mapping Data Products*	Yes	Yes	GeoTIFF (.tif), xyz grids (.txt), IVS objects (.dtm, .sd, .shade, .geo), screen shots (.bmp)	NCL, NGDC	Mapping Survey Lead Scientist
Bottom Mosaics*	Yes	Yes	GeoTIFF (.tif)	NCL, NGDC	Mapping Survey Lead Scientist

*Approval Process required before publishing

The approval process for publishing final cruise products is yet to be determined.

Geographic Information Systems:

Links to these archived data sets and products will be discoverable through the Digital Atlas, a Geographic Information System (GIS) application developed and maintained at NCDDC, a division of NODC. NCDDC also maintains a Google based application called "Okeanos Explorer Atlas," which will display the ship's hourly track and an hourly snapshot of selected METOC sensors along the track. Some time after the cruise's end, the hourly track will be thinned to a daily track that will be displayed from a geospatial data base. The following lists the geospatial layers that will represent the cruise in the GIS.

Layer	Spatial Data Source	GIS format	Additional Data, if available
Cruise Track	SCS	Line	Daily snapshot of METOC sensor readings
CTD Casts	SCS	Point	CTD Profile
XBT Casts	SCS	Point	XBT Profile
Final Cruise Summary Report*	n/a	n/a	
Final Cruise Mapping Data Report**	n/a	n/a	
Mapping Data Products**	n/a	n/a	
Bottom Mosaics	Georeferenced image from mapping survey team	Image Overlay	

*Not geospatially tagged.
**If available, and if so, not geospatially tagged.