

“Rolling Deck to Repository”

Technical Overview

Suzanne Carbotte, Vicki Ferrini, Robert Arko (LDEO)

Stephen Miller, Karen Stocks (SIO)

Cynthia Chandler, Andrew Maffei (WHOI)



Design Principles

- work directly with operators
– create a “fleet portal”
- accommodate full range of vessels and classes
- preserve raw/original data
- maximize efficiency for ~500 cruises/year
- synchronize with scheduling and inspection databases
- routinize submission to the national data centers



Routine Underway Data Types

(draft inventory - still in progress)

Instrument Type	Data - Description	# Systems (by RV Class)				Archive
		Global/Ocean (10)*	Inter/Regional (8)	Coastal/Local (7)	TOTAL	
"Navigation" ★	<i>(date/time, position, motion – GPS-INS, compass, speed log, etc.)</i>	51	41	23	= 115	R2R
Gravimeter		9	1	0	= 10	NGDC
Magnetometer		8	1	0	= 9	NGDC
Echosounder	<i>(high/fixed freq. single/split beam)</i>	7	5	6	= 18	NGDC
Multibeam	<i>(hull-mounted swath + sea surface sound velocimeter)</i>	11	0	2	= 13	NGDC
Subbottom	<i>(low/swept freq. – profile images)</i>	12	10	5	= 27	NGDC
ADCP ★	<i>(acoustic doppler current profiler)</i>	16	13	9	= 38	NODC
Met. Station ★	<i>(temperature, pressure, humidity, wind speed/direction, precipitation, radiation, etc.)</i>	10	8	7	= 25	NODC
CTD ★	<i>(lowered – temperature, salinity, depth, dissolved oxygen, pH, PAR, transmissivity, etc.)</i>	11	9	8	= 28	NODC
TSG	<i>(surface – temperature, salinity)</i>	8	3	5	= 16	NODC
Fluorometer	<i>(fluorescence, turbidity, absorbance)</i>	6	4	2	= 12	NODC
pCO2	<i>(partial pressure of CO2)</i>	4	0	0	= 4	NODC
Exp. Probe	<i>(temperature, salinity, depth, sound speed – XBT, XCTD, XSV, etc.)</i>	10	4	2	= 16	NODC
Winch/Wire	<i>(tension, speed, payout, etc.)</i>	10	8	7	= 25	R2R

**(includes Healy, Palmer, Gould)*

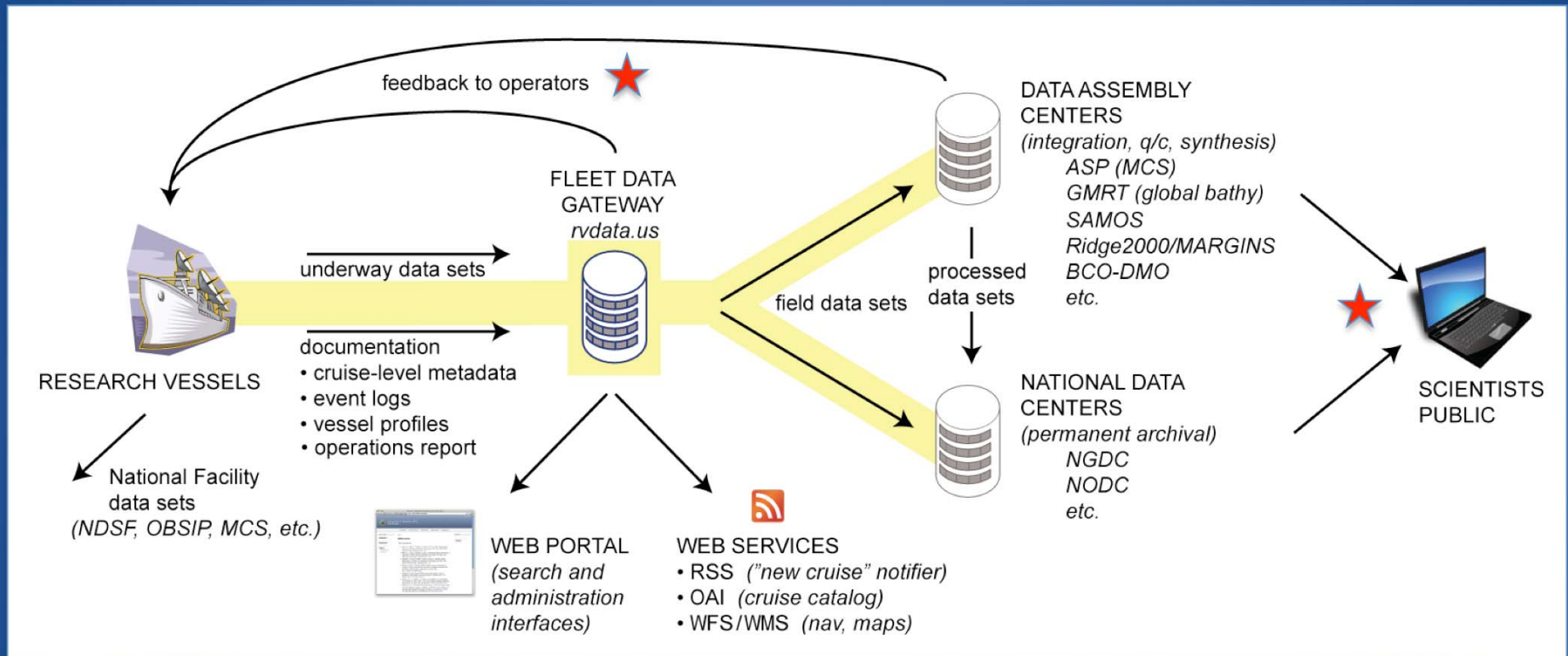
★ every vessel

<http://www.rvdata.us/references/vessels>

TOTAL = 356



Data Stewardship



★ - metrics of success




Standard Deliverables

Products:

- cruise metadata
- navigation (1-min. clean track + control point geometry)
- event log
- operation report

Services:

- catalog service – publish official cruise ids and references to funding awards
- “dvd rescue” service – provide replacement copies of original field media
- clearance service – support Dept. of State in preparing data deliveries to foreign nations
-  “cruise update” service – lightweight Web feed to update operator on data progress (delivery, documentation, dissemination)
- training guides – publish community best practices for data acquisition and reduction
- mapping service – publish navigation products and track maps as Web services



Pilot Project

Work to date:

- establish Web / database infrastructure
- establish data submission from pilot vessels
- establish data flow to national archive
- prototype Event Log
- community engagement and feedback



- Sep. 2008 – LOE Workshop (*Palisades*)
- Oct. 2008 – UNOLS RVTEC (*Tallahassee*)
- Nov. 2008 – OOSI Workshop (*Boulder*)
- Dec. 2008 – AGU Meeting (*San Francisco*)
- Jan. 2009 – NSF MG&G Advisory (*Palisades*)
- Feb. 2009 – R2R Workshop (*La Jolla*)
- Mar. 2009 – UNOLS Council (*Moss Landing*)
- Apr. 2009 – FEMME Conference (*Lisbon*)
- May 2009 – NSF Meeting (*Arlington*)



Cruise Metadata

- ISO schema based on UNOLS Data Committee + POGO
- shared/interoperable controlled vocabularies with –
 - primary schedulers *e.g. UNOLS port codes*
 - related major programs *e.g. MMI device ontology*
 - funding agencies *e.g. NSF award #s*
 - international programs *e.g. ICES ship codes*
 - national data centers *e.g. ISO country codes*
- R2R is authoritative for cruise ids (*rvdata.us* namespace)



<http://ocean-partners.org/>



Cruise Metadata - Workflow

Pre-cruise:

1. R2R initializes record from scheduling database
2. operator login at *rvdata.us* to review record and add science party, project details, award list

Post-cruise:

3. R2R creates auto inventory from data shipment
4. both operator + chief scientist login at *rvdata.us* to review record and “sign off” after cruise
5. R2R publishes record to inter/national catalogs



Event Log

- record of scientific sampling events with timestamps + unique identifiers
- **proposed implementation:**
 1. operator installs application onboard
 2. science party maintains log underway
 3. results loaded in *rvdata.us* database
- extensible to e.g. operator maintenance logs?

Event ID	Datetime (GMT)	Latitude (dd)	Longitude (dd)	Station	Cast
OC525_0007	2008-11-12 06:18:03	20.13638	043.45721		

Investigator	Initials	Notes
	DDD	Look. More dolphins.

Locked. Someone else is editing this entry.

Event ID	Datetime (GMT)	Latitude (dd)	Longitude (dd)	Station	Cast
OC525_0008	2008-11-13 18:57:13	19.18234	042.42345	5	1

Event Type	Bottom Depth (m)	Core Length (m)	Finger?
Gravity Core	2350	2.8	No

Investigator	Initials	Notes
Muddy Waters	WTS	

Event ID	Datetime (GMT)	Latitude (dd)	Longitude (dd)	Station	Cast
OC525_0009	2008-11-14 12:03:48	18.12341	042.00023		

Make a new entry:

CTD General Gravity Core Hobo Cast

MOCNESS

Make new template...

Search the log

Search results

search results will appear here

Actions

*prototype
application –
Alex Dorsk
(WHOI)*



Pilot Vessels

Data shipments:

- Healy
- Kilo Moana ★
- Knorr
- Langseth
- Melville
- Oceanus
- Revelle
- Sharp ★
- Thompson

Cruise Catalog: Kilo Moana | Rolling Deck to Repository (R2R) Pilot Project

http://www.rvdata.us/catalog/Kilo_Moana

NSF Rolling Deck to Repository (R2R) Pilot Project

Overview Pilot Team Cruise Catalog References Contact Us

Search

User login

USERNAME: *

PASSWORD: *

Log in

Request new password

Home

Cruise Catalog: Kilo Moana

Cruise ID	Start Date	Start Port	End Date	End Port
Details				
KM0517 Inventory	2005-10-06	Honolulu	2005-10-11	Honolulu
Project: Hawaii Ocean Timeseries (HOT-174) Chief: Gregory, Thomas (UH)				
KM0516 Inventory	2005-09-15	Honolulu	2005-10-02	Honolulu
Project: MAKAI'05 - Pacific Missile Range Facility (PMRF) Chief: Porter, Michael (ONR)				
KM0515 Inventory	2005-09-08	Honolulu	2005-09-12	Honolulu
Project: Hawaii Ocean Timeseries (HOT-173) Chief: Santiago-Mandujano, Fernando (UH)				
KM0514 Inventory	2005-06-24	Honolulu	2005-09-01	Honolulu
Project: U.S. Law of the Sea Mapping-Gulf of Alaska Chief: Armstrong, Andrew (CCOM)				
KM0513 Inventory	2005-06-13	Honolulu	2005-06-17	Honolulu
Project: Hawaii Ocean Timeseries (HOT-170) Chief: Santiago-Mandujano, Fernando (UH)				
KM0512	2005-06-02	Honolulu	2005-06-10	Honolulu

(159 cruises)

http://www.rvdata.us/catalog/Kilo_Moana



National Data Centers

- documentation
- archival
- dissemination

Inventory	Date	Location	Start	End
HLY05TE	2005-10-06	Tromso	2005-10-09	Dublin
Project: Transit				
DATA SETS				
HLY0503	2005-08-05	Dutch Harbor	2005-09-30	Tromso
Project: Healy-Oden Trans-Arctic Expedition 2005 (HOTRAX'05), Leg 2				
Chief: Darby, Dennis (ODU)				
DATA SETS				
HLY05TD	2005-07-26	Barrow	2005-07-31	Dutch Harbor
Project: Transit				
DATA SETS				
HLY0502	2005-06-27	Barrow	2005-07-26	Barrow
Project: The Hidden Ocean - Arctic 2005				
Chief: Gradinger, Rolf (UAF)				
DATA SETS				
System	Vendor-Model	Repository		
Multibeam	L-3/SeaBeam 2112	NGDC	Download	
HLY0501	2005-06-12	Barrow	2005-06-26	Barrow
Project: Healy-Oden Trans-Arctic Expedition 2005 (HOTRAX'05), Leg 1				
Chief: Darby, Dennis (ODU)				
DATA SETS				
HLY05TC	2005-06-01	Seattle	2005-06-11	Barrow
Project: Transit				
DATA SETS				

HLY0502 Data File List

These data are not to be used for navigation.

Downloads may take a long time, depending on file size and data transfer rates.

[Download All Files](#) | [Click here to package and download all files listed below](#)

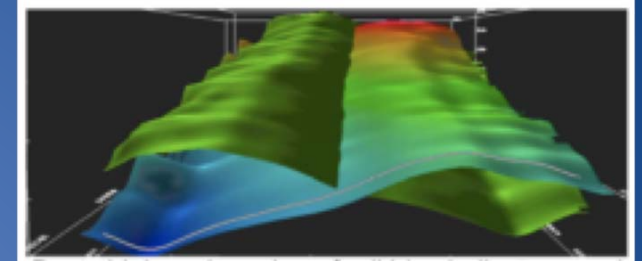
File Name (click to view/download)	File Size	Description
Multibeam Files ---- MBSYSTEM Cruise Summary		
Version 1 Full Resolution----		
sb20051762200.mb41	0.1 MB	SeaBeam 2100 series vender format
sb20051771400.mb41	15.7 MB	SeaBeam 2100 series vender format
sb20051771500.mb41	21.6 MB	SeaBeam 2100 series vender format
sb20051771600.mb41	21.9 MB	SeaBeam 2100 series vender format
sb20051771700.mb41	21.9 MB	SeaBeam 2100 series vender format
sb20051771800.mb41	22.1 MB	SeaBeam 2100 series vender format
sb20051771900.mb41	22.1 MB	SeaBeam 2100 series vender format
sb20051772000.mb41	21.3 MB	SeaBeam 2100 series vender format
sb20051772100.mb41	22.0 MB	SeaBeam 2100 series vender format
sb20051772200.mb41	22.3 MB	SeaBeam 2100 series vender format
sb20051772300.mb41	22.6 MB	SeaBeam 2100 series vender format
sb20051780000.mb41	22.4 MB	SeaBeam 2100 series vender format
sb20051780100.mb41	22.4 MB	SeaBeam 2100 series vender format
sb20051780200.mb41	22.4 MB	SeaBeam 2100 series vender format
sb20051780300.mb41	22.0 MB	SeaBeam 2100 series vender format
sb20051780400.mb41	22.0 MB	SeaBeam 2100 series vender format
sb20051780500.mb41	22.1 MB	SeaBeam 2100 series vender format
sb20051780600.mb41	22.5 MB	SeaBeam 2100 series vender format
sb20051780700.mb41	22.3 MB	SeaBeam 2100 series vender format
sb20051780800.mb41	22.1 MB	SeaBeam 2100 series vender format
sb20051780900.mb41	21.6 MB	SeaBeam 2100 series vender format
sb20051781000.mb41	21.5 MB	SeaBeam 2100 series vender format

Multibeam data: R2R > NGDC

<http://www.rvdata.us/catalog/Healy>



Data Quality



- develop routine, automated procedures to assess new data
- publish results as object-level metadata
- provide rapid feedback to operators
- partner with existing projects where possible (e.g. SAMOS)
- publish procedures as community guides

Example: Multibeam data

Quality assessment:

1. document sound velocities, archive profiles
2. build global catalog of patch test sites and results
3. flag+fix bad navigation (time and speed outliers)
4. generate daily plots of raw swath track



Pilot Project

Next Steps:

- continue cataloging cruise data
- prototype cruise metadata workflow
- test Event Log at sea
- prototype quality assessment for Multibeam data
- prototype Navigation products



Thank you.



(Photo: Michael Moore, WHOI)

