R2R Update

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Overview

Mission:
Stewardship of routinely-acquired environmental sensor data from U.S. academic research vessels

Support:
NSF + NOAA, ONR, SOI

Services:
• Publish master cruise catalog
• Organize, archive, and disseminate original field data+documents
• Assess data quality
• Create post-field data products
• Support at-sea event logging
2016 Notes

New R/Vs joined
  • Neil Armstrong
  • Sally Ride

Data rescue
New 1-year project for ~500 older cruises from 5 vessels, based on external requests

Advisory Panel
  @SIO
  April 5-6, 2016

Infrastructure
Major storage /network upgrades + begin strategic move to commercial Cloud
Quality Assessment

- GNSS/INS
- METOC
- Multibeam
- Gravity
- Magnetics
- Subbottom $^\text{New}$
- CTD $^\text{New}$
- ADCP $^\text{New}$
- Flowthru $^{(2017)}$
Advisory Panel

April 5-6, 2016 @SIO

Bill Drennan, Miami
Joaquim Goes, LDEO
Trish Gregg, UIUC
Matt Howard, TAMU
Jules Hummon, Hawaii
Jenn Jencks, NCEI
Gabi Laske, SIO
Craig Nosse, Hawaii
Chris Paver, NCEI
Janet Sprintall, SIO
Masako Tominaga, TAMU
Ben Van Mooy, WHOI
Mike Vardaro, Rutgers
Jim Holik, NSF
Alice Doyle, UNOLS
Advisory Panel (cont.)

Feedback - Highlights

• Change license on datasets to CC0 (public domain)

• Review new Web Search page

• Develop guidance to PIs on where to deposit post-cruise data, and how to use “Cruise DOIs”
  http://www.rvdata.us/repositories

• Identify target for Quality Assessment of flow-thru data

• Promote Event Logger

• Strengthen Cruise Summary Reports submitted to POGO, esp. specialized instruments and sampling program

• Meet longer and/or more often
Quality Assessment: Subbottom

Only original KEB files evaluated

Typical Tests:

- \% NonZeroLengthFiles
- \% ValidFormatFiles
- \% RecordsWithoutErrorCodes
- \% RecordsWithValidDepth
- \% RecordsWithValidTime
- \% RecordsWithValidPosition
- \% RecordsWithValidPositionFormatFlag
- \% RecordsWithoutOutliers
- \% FilesWithSoundVelocity
- \% FilesWithSubbottom
- HasRequiredMetadata

Edited bathy profile created where possible.
(Example: MGL1211)
Quality Assessment: CTD

Only original HEX/DAT, CON, HDR files evaluated

Typical Tests:
- All Files present for Cast
- Has Lat+Lon
- Min Cast Depth
- Min/Max Sensor Values (per Vendor Spec)
- Gaps
- Spikes
- Constant Values
- Gradients
- Outliers
- Dual Sensor Presence (T+C)
- Dual Sensor Diff (T+C)
Quality Assessment: ADCP

Use UHDAS/CODAS to generate standard summary report + thumbnail plots.

http://adcp.rvdata.us/reports/
Quality Assessment: Flow-thru

2017 start developing QA process for

- Real-time sea temperature, salinity, and one additional parameter
- Post-cruise fluorometry
Cruise Catalog

- Vessel ID
- Cruise ID+Title
- Trackmap
- Program,Campaign
- Dates+Ports
- Science Party
- File Manifest
- Instruments and Datasets
- Standard Products
- Funding
- Related Cruises
- Related Data

New

Operator: University of Rhode Island
Vessel: Endeavor
Cruise DOI: 10.7284/904058
Cruise Search

- Vessel
- Cruise ID
- Dates
- Program
- Campaign
- WESN
- Institution
- Person

http://www.rvdata.us/search
NavManager Tool

Open-source software package:
- Convert original GNSS/INS data to a common format
- Perform quality assessment
- Produce suite of down-sampled quality-controlled files

http://github.com/rvdata/NavManager

Questions: cjolson@ucsd.edu
Vessel Profiler

Web-based tool to view+edit instrument list and data directory mapping

Linked to UNOLS Inventory

http://tech.rvdata.us/
Event Logger

Recent deployments
Jun. 2015-May 2016:

Armstrong
AR1-01    Shakedown
AR1-03    Trials
AR1-06    Corbett
AR1-07    Lin
AR3       Shank
AR4B,C    Plueddemann

Atlantis
AT31      Plueddemann
AT31B,C   Plueddemann
AT32      Behrenfeld
AT33-02   Equip. Test
AT33-03   Kurz
AT34      Behrenfeld

Revelle
RR1508    Harris
RR1601    Appelgate
RR1603    McDonald
RR1604    Barbero

Sikuliaq
SKQ201512S Thompson

Thompson
TN326     Kelley
TN342     Fram

(DreamPlug™)
NG Microserver

Test unit deployed to *Langseth* for Tréhu cruise 2016.

Goals:

- Support both R2R Event Logger and science apps eg. GeoMapApp (demand from science parties)
- Inexpensive, easy to maintain
- Able to swap portable data drives from shore
SAMOS Data Assembly Center

- Produce quality-controlled METOC data in near-real-time
- 31 research vessels participating in FY2016
- ~30-40K 1-min. observations per month per vessel

(SAMOS data coverage: Oct 1, 2015 - Sep 30, 2016)
Web Traffic

- Trending upward since R2R site launch
- Averaging ~1,000 sessions/month
- 40% of visitors return at least once
Data Downloads

- Currently averaging ~1.5 TB/month of multibeam file downloads

(Note, filtered for crawlers.)
Partnerships

Growing number of DataONE nodes that hold marine data:

- NCEI
- BCO-DMO (Biological & Chemical Oceanography Data Management Office)
- LTER Sites
- AOOS (Alaska Ocean Observing System)
- IARC
- R2R

NSF - Supported Federation of Data Repositories
Partnerships (cont.)

SeaView project: Create thematic data collections, organized+formatted.

Collaborators
CCHDO
BCO-DMO
* R2R
OOI
OBIS

K. Stocks @ SIO
Lead

http://seaviewdata.ucsd.edu/
Data Citation

- Identifiers for Cruises + Datasets
- Identifiers for Researchers
- Identifiers for Articles + Awards
- Identifiers for Samples + Features

DataCite
ORCID
IGSN
Crossref
Cruise DOIs

- Best practices for using DOIs in journal articles are still evolving.

Current R2R Guidance:
- We are working with other facilities (eg. OOI) to ensure they use our Cruise DOIs.
- We are working with other facilities to ensure their Datasets are linked to our Cruise DOIs.
- Include your Cruise DOI in your NSF Final Report.
- Get a ORCID (Researcher ID).
- We do not recommend that Cruise DOIs be cited directly in journal articles.

- R2R continues to participate in RDA/WDS, Scholix, COPDESS, etc.
Data Syntheses

Global Multi-Resolution Topography (GMRT) Synthesis

Above: Shiptracks for Multibeam data contributed by R2R (202 cruises as of June 2016).

GMRT produced by the Interdisciplinary Earth Data Alliance (IEDA)
Data Syntheses

International Comprehensive Ocean-Atmosphere Data Set (ICOADS)

Above: METOC data contributed by SAMOS in partnership with R2R (as of ICOADS v 3.0).

# UNOLS Ships: 10
# SAMOS Records: 278,1014
# Ship Days: 11,792

Shipboard Automated Meteorological and Oceanographic System (SAMOS)
Data Syntheses (cont.)

Next target: Contribute processed CTD to World Ocean Database.