Rolling Deck to Repository (R2R)
Overview

"Transforming the fleet into an integrated global observing system"

Vicki Ferrini

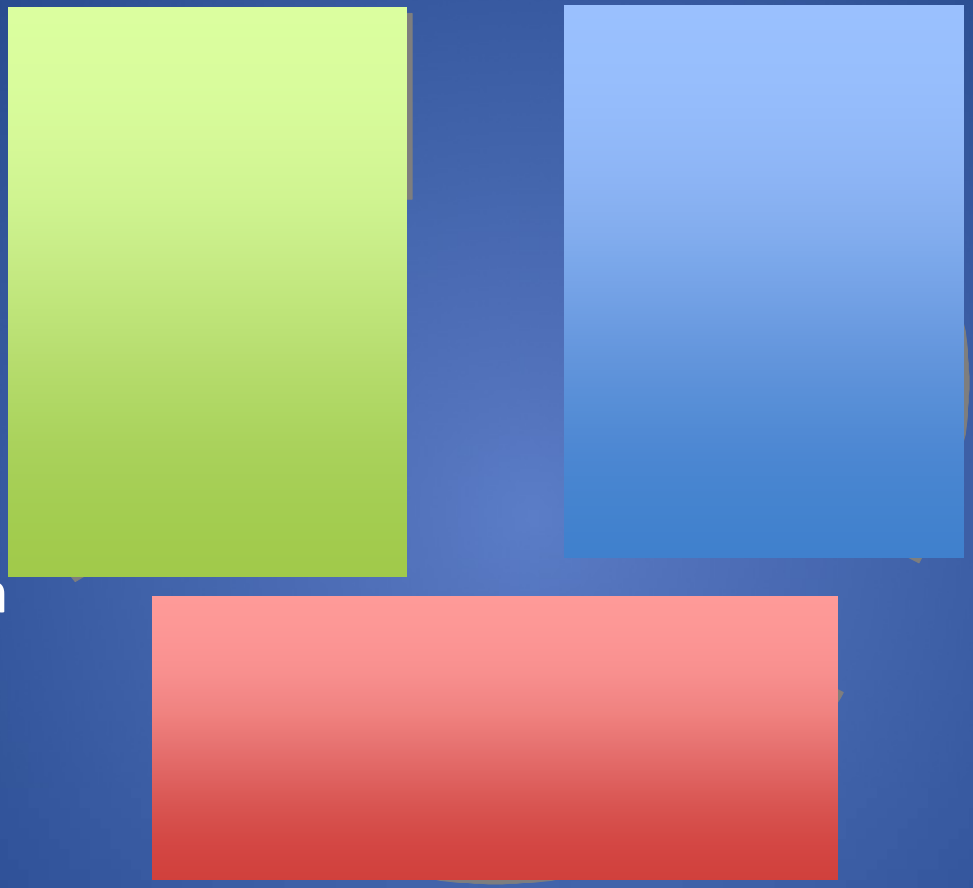
and the R2R Team

http://www.rvdata.us

Infrastructure for ocean science

UNOLS Fleet

- Mobile platforms
- Short term obs
- Global range
- Ocean exploration



OOI

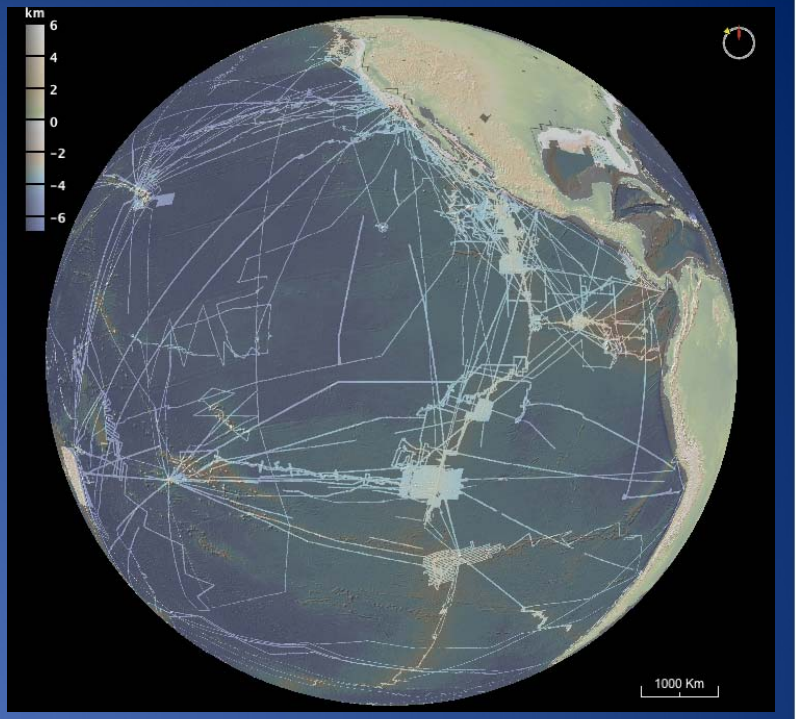
- ~Stationary platforms
- Long-term obs
- Regional/Local range

IODP

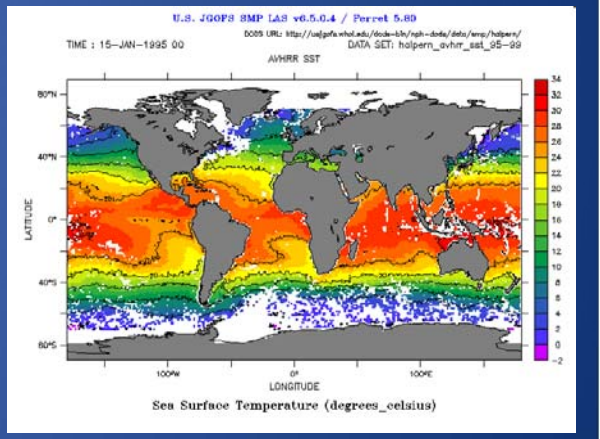
- Sampling
- Deep time

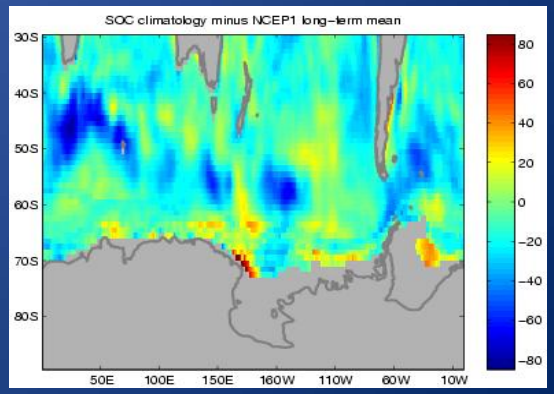
The Objective:

Well-documented high-quality publicly available data



- Support the published literature
- Enable global syntheses
- Provide ground-truth for a variety of scientific applications
- Enable data reuse and new discovery
- Make publicly-funded data available to the public
- Enable informed policy decision making





The Challenge

- All underway data are of high value for preservation
- Research cruises are staffed by multiple investigators and yield heterogeneous data sets

- Data documentation difficult and/or sparse
- Little routine QA/QC is routinely conducted and has varied historically depending on operator priorities/capability

- Data are not systematically archived at National Data Centers

Shipboard Data

Research expeditions involve a variety of data collection activities:

- Operational/Underway (e.g. bathymetry, MET, ADCP, subbottom etc)
- National Facility (e.g. NDSF, Seismic, OBSIP)
- Science party instrumentation (e.g. current meter, sediment traps, chemical/physical probes etc)

Key Components of the R2R Data Stewardship Plan

- Community Engagement (Operators, Scientists)
- Accommodate full range of vessels and classes
- Data documentation
- Data quality
- Data preservation and dissemination
- Centralized fleet data gateway
- Maximize efficiency (~500 cruises/year)
- Interoperability (NDCs, DACs)

R2R Deliverables & Services

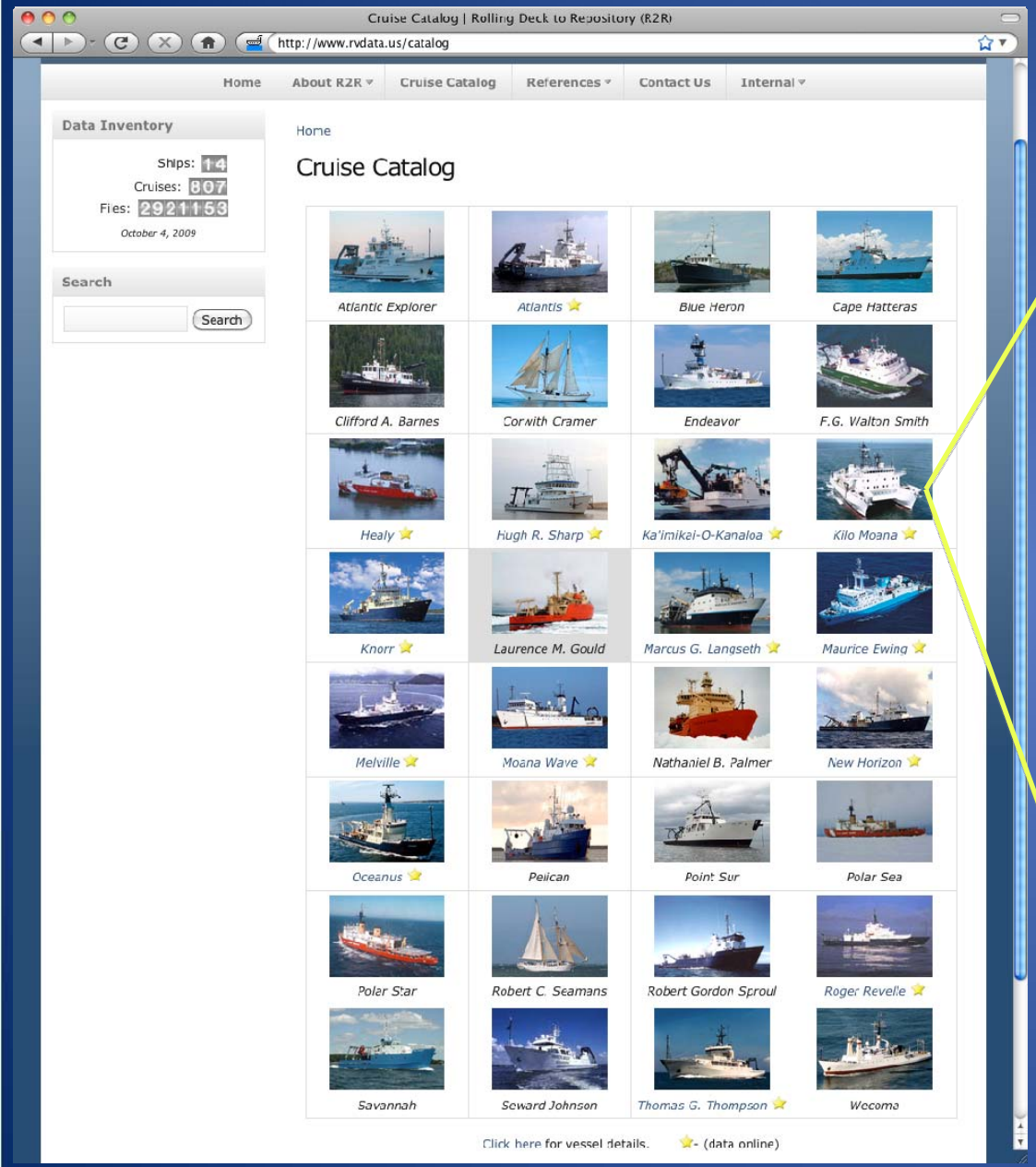
- *Basic Cruise Metadata*
  - Projects, ports, personnel, dates
  - Scientific Sampling Event Log (extensible)
  - Quality Controlled Ship Track (downloadable files and Web Services)
  - Data Catalog (dataset, and file level metadata)
  - Operations Report (formatted document with standard products + appendices)
- *Data Documentation and Delivery*
  - Realtime Quality Controlled MET and TSG data
  - Routine and consistent data delivery to NDCs
  - Routine and consistent data accessibility to DACs
  - Quality Assessment
    - feedback to Operators
    - accompany data delivered to NDCs

http://www.rvdata.us/about/products

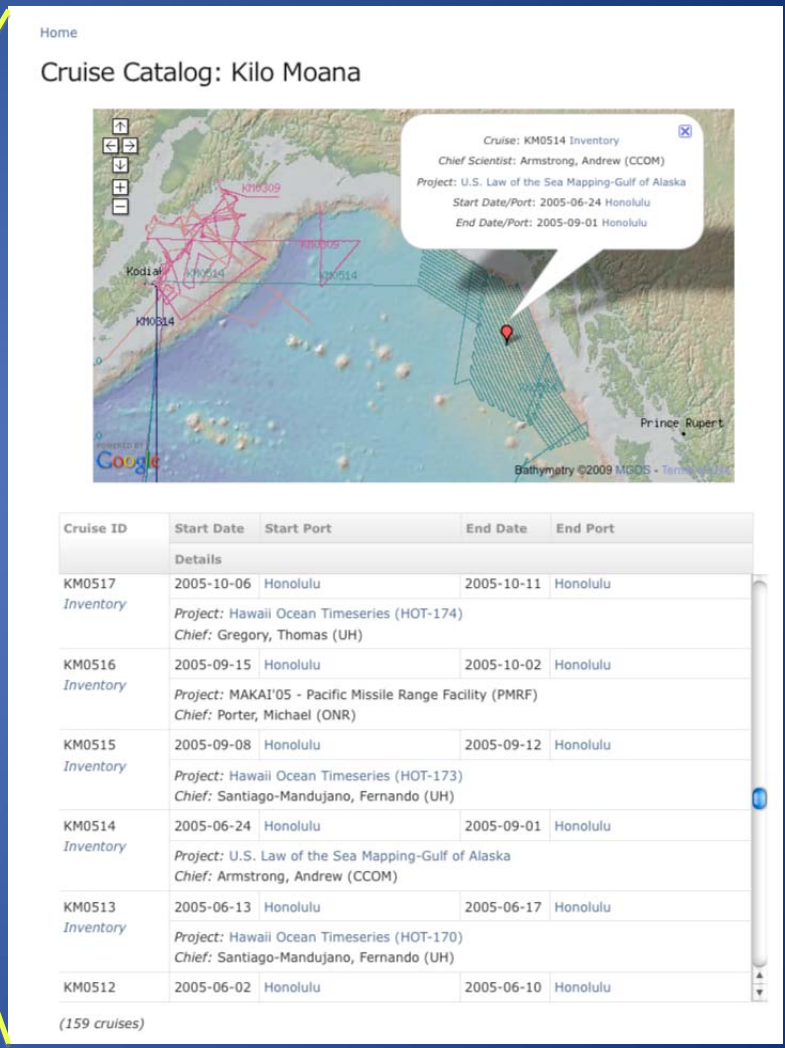
Additional R2R Services

- *Training Guides* – publish community best practices for data acquisition/reduction
- *Data Recovery* – original field data distribution
- *Clearance* – support preparation of data to foreign nations

Pilot Project Progress



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



14 ships, 831 cruises
(*as of 10/12/09*)

Next Steps…

- Expand Community Engagement
  - Invite the Fleet to join R2R by routinely submitting data
  - Presentations at AGU & Ocean Sciences
  - Operator community input for implementation
  - Science community for development of QA protocols
  - Operator/Chief Scientist Login
  - Mail list & RSS Feeds

- Continue Developing Technical Infrastructure
  - Realtime data transmission (MET/TSG)
  - Data set documentation
  - Data delivery to NDCs
  - Event Logger
  - Automated QA procedures

Letter to UNOLS Council

The Rolling Deck to Repository (R2R) Program is ready to accept underway data from all vessels in the UNOLS fleet. R2R builds upon conclusions and recommendations from the UNOLS Data Management Best Practices Committee, and completion of a successful one-year pilot program. A fundamental goal of R2R is to improve community-wide data stewardship practices. Please visit the R2R website (www.rvdata.us) for detailed information on R2R services and to view progress made to date.

While the number and complexity of shipboard sensors deployed aboard UNOLS vessels has increased steadily over time, the requisite infrastructure to support data management has not. In addition to addressing the need for management of shipboard data, the NSF-funded R2R initiative brings the community one step closer to realizing the potential for the UNOLS fleet to operate as a distributed but integrated network of mobile ocean observing platforms.

Letter to UNOLS Council

Effective immediately, Operators are invited to send a copy of the full cruise data distribution to R2R for cataloging and archival. Once received, the cruise data will be securely archived and a catalog record will be posted online with a file listing and track map. Individual data sets will then be assembled and delivered to the National Geophysical Data Center (NGDC) or National Oceanographic Data Center (NODC) for public dissemination, once proprietary holds are cleared with the Chief Scientist. No data will be released to the National Data Centers prior to the funding agency's allowed proprietary period without the concurrence of the Chief Scientist.

Letter to UNOLS Council

Upon receipt of these data by R2R:

- All Chief Scientist requests for duplicate copies of data distributions can be referred to R2R.

- The PI will no longer be responsible for providing these data distributions to long-term National Data Centers, as this will be done routinely through R2R.

All data collected by any of the ship's permanent equipment (equipment that produces digital data, and is routinely operated by the ship's technicians) should be provided to R2R. In most cases, a copy of the shipboard data supplied to the Chief Scientist should be provided to R2R, but if there are routine 'underway' data that were not given to the Chief Scientist it is important for these data to be provided to R2R as well as a supplement to the Chief Scientist's copy.

Letter to UNOLS Council

Underway data includes, but are not limited to:

- Navigation (date/time, position, motion. VRU, IMU, GPS, etc)
- Meteorological Data (temperature, pressure, humidity, wind speed/direction, precipitation, etc.)
- Echosounder depth
- Multibeam
- Subbottom
- ADCP
- CTD (digital data only)
- TSG
- Magnetics
- Gravity
- Fluorometer
- SSV
- pCO2
- Winch/Wire Data (tension, speed, payout, etc)
- Expendable Probe (XBT, XCTD, XSV, etc)

Letter to UNOLS Council

Data distributions may be uploaded to R2R via direct network transfer, or may be submitted on most common digital media including portable hard drive, flash drive, tape cartridge (4mm, 8mm, S/DLT), or optical disc. Please contact Bob Arko (arko@ldeo.columbia.edu) with questions, or to obtain shipping instructions or a network login.

It is essential, at minimum, that the following information be delivered with the cruise distribution for each cruise:

- Vessel Name
- Operating Institution Name
- Cruise Identifier (cruise identifiers are unique within the R2R system - typically each vessel uses a unique prefix)
- Start/End Ports and Dates
- Chief Scientist Name and Affiliation
- Project Title (if available)
- Recommended Navigation Source (clearly identified GPS data set to be used by R2R for creating standard navigational products)

Please contact R2R (www.rvdata.us/contact) with any questions. R2R team members look forward to working with you to ensure that shipboard data from UNOLS vessels are permanently archived in our National Data Centers.