Rolling Deck to Repository (R2R)
Overview

"Transforming the fleet into an integrated global observing system"

Vicki Ferrini

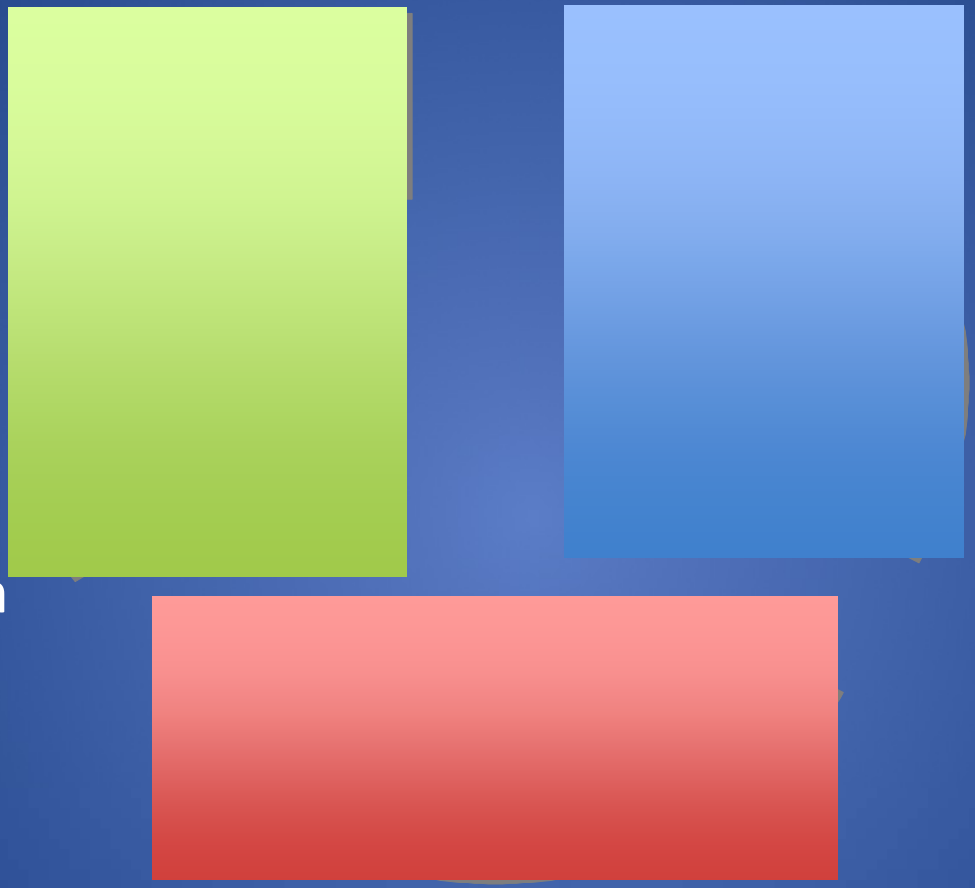
and the R2R Team

http://www.rvdata.us

Infrastructure for ocean science

UNOLS Fleet

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



OOI

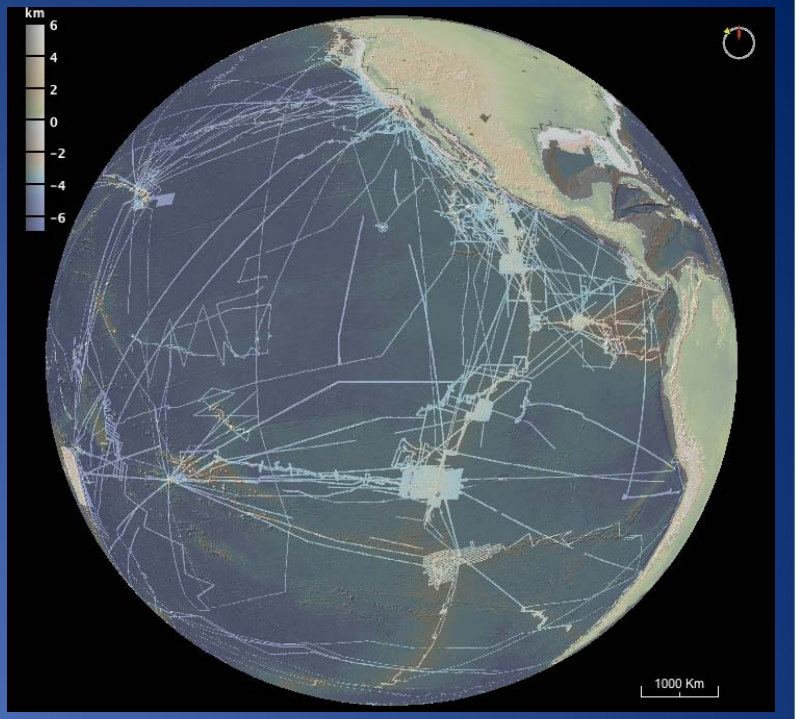
- ~Stationary platforms
- Long-term obs
- Regional/Local range

IODP

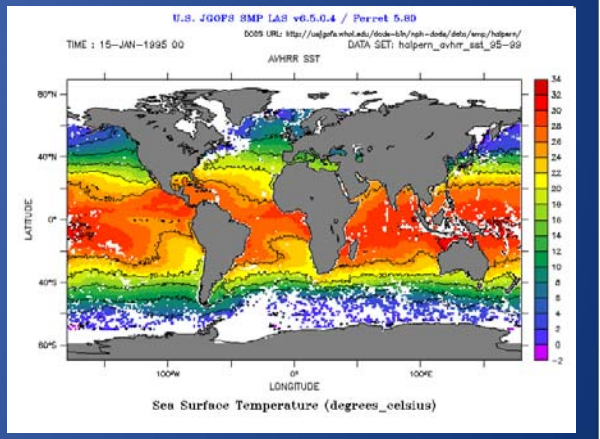
- Sampling
- Deep time

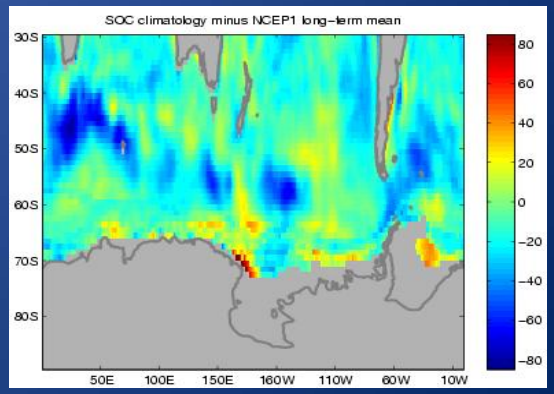
The Objective:

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





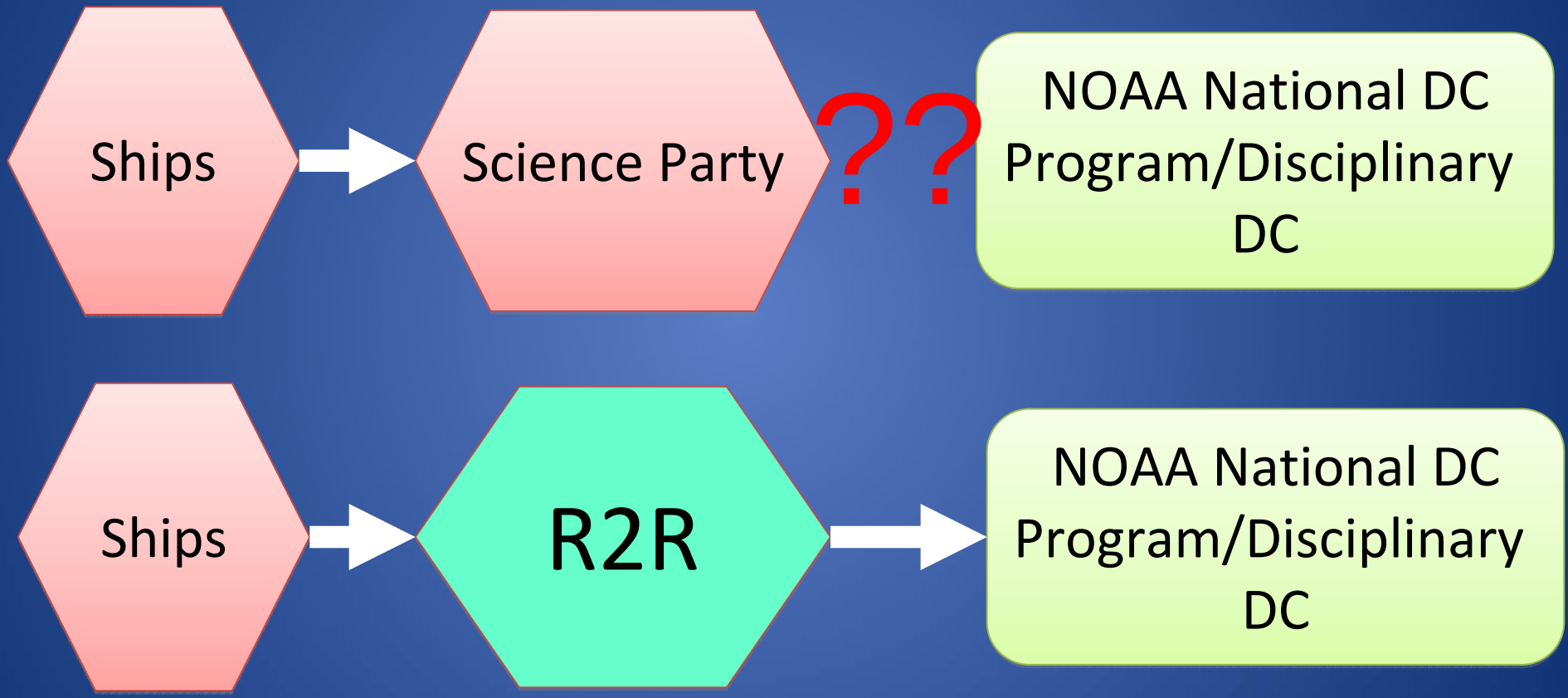
The Challenge

- 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

R2R Gateway for Underway Data



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

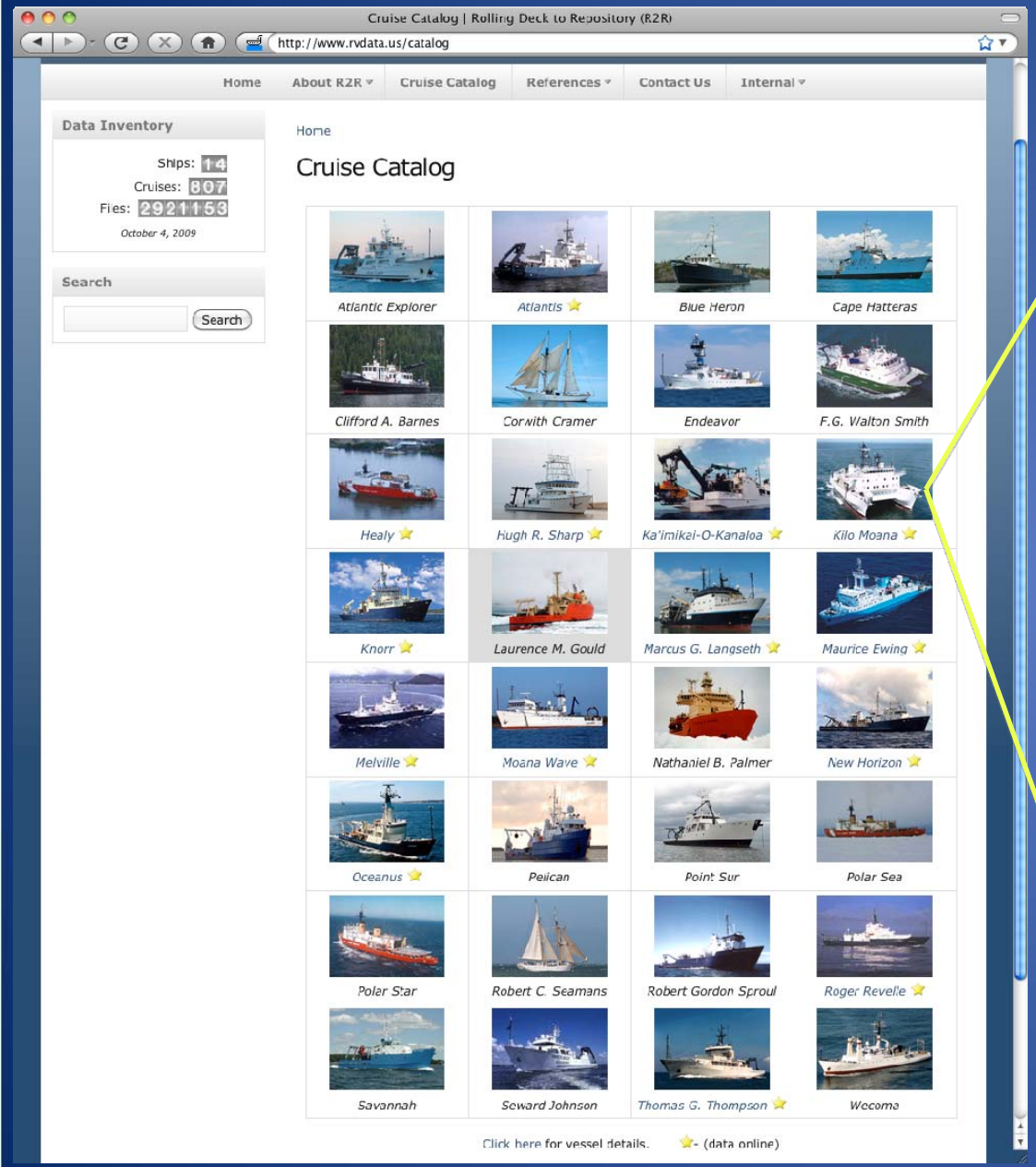
- *Training Guides* – publish community best practices for data acquisition/reduction
- *Data Recovery* – original field data distribution
- *Clearance* – support preparation of data to foreign nations

R2R Community Engagement

- Operator Community
  - Surveys
  - Feedback from Operators
  - QA Feedback to Operators
  - Meetings (e.g. RVTEC)
  - Ship Visits
  - Operator Login – Verification Process
- Science Community
  - Chief Scientist Login – Verification Process
  - Development of QA Tools and Procedures

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

Pilot Project Progress



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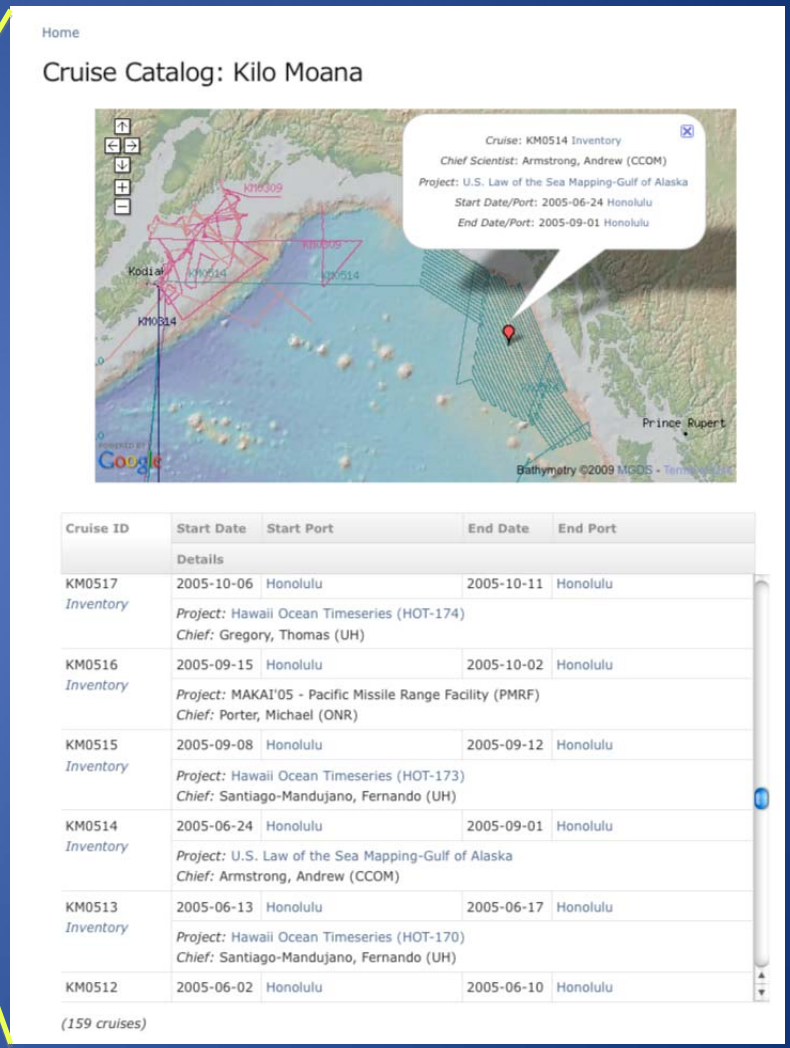


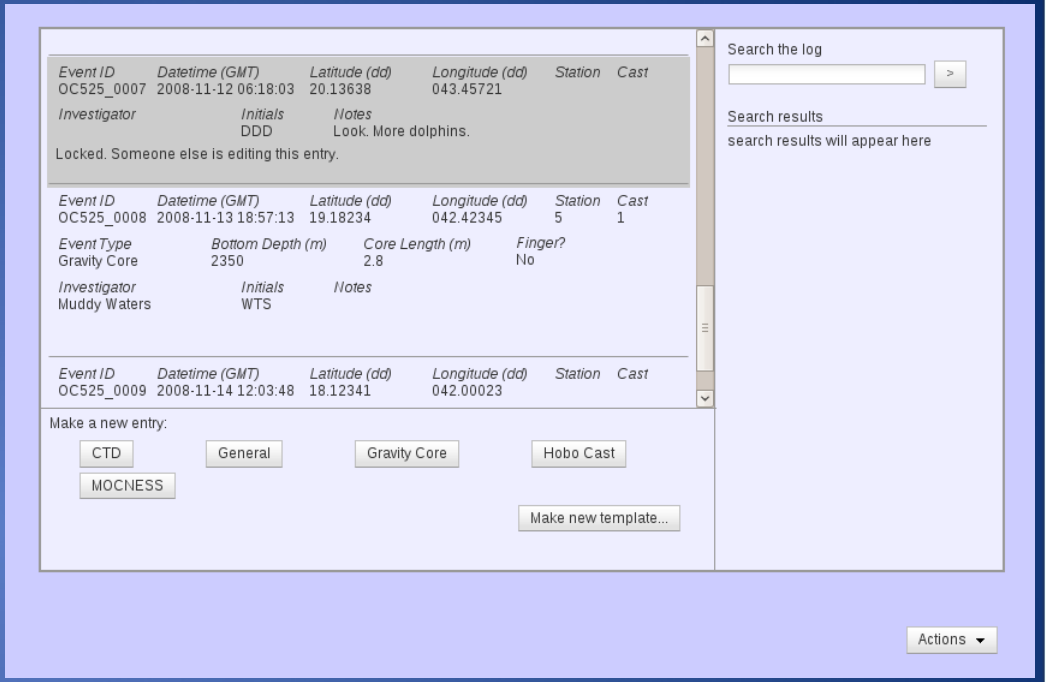
14 ships, 831 cruises
(*as of 10/12/09*)

Operator Survey conducted during Pilot Project

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

http://www.rvdata.us/references/instruments (as of Sept.2009)

Event Logger: Development & Testing

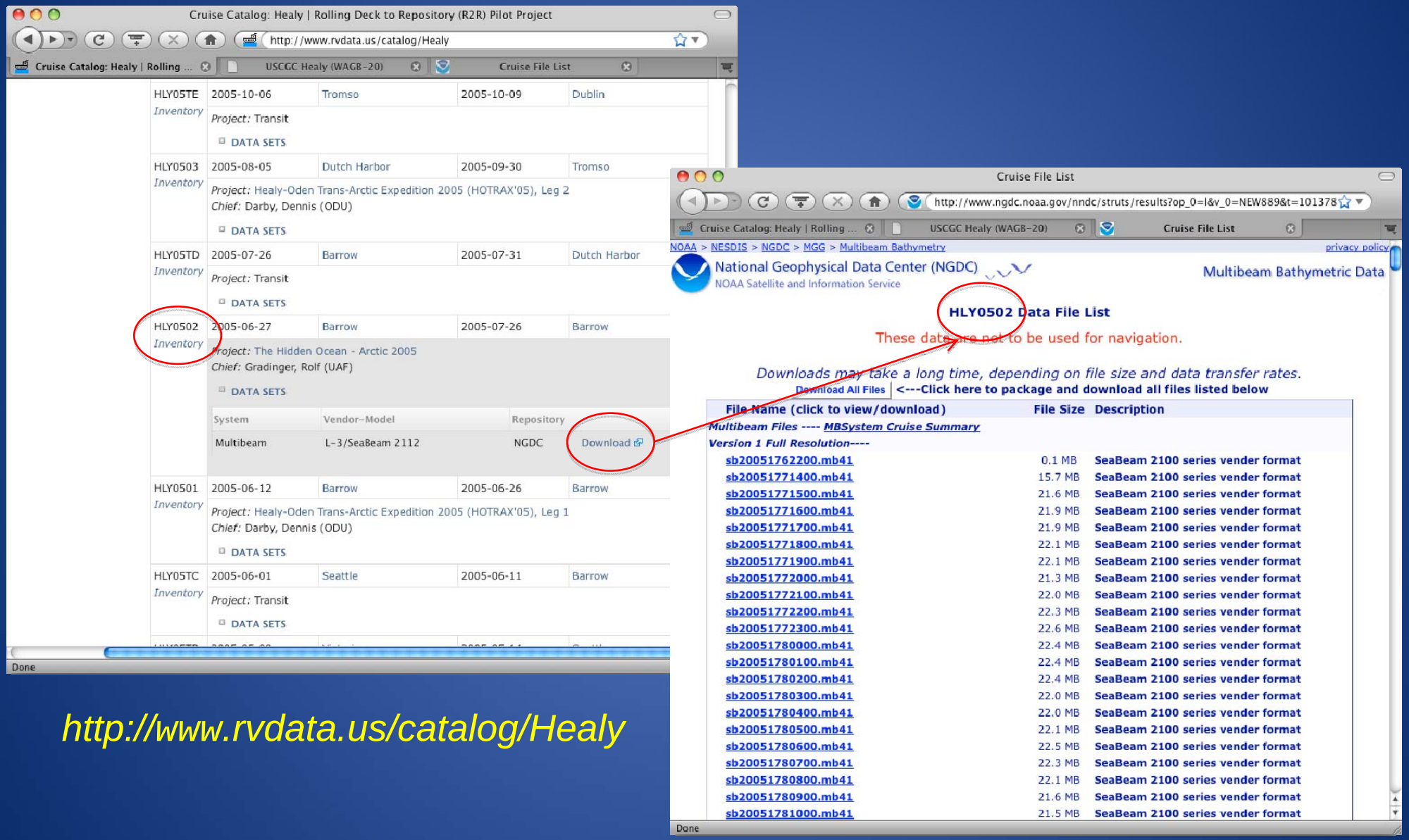


- Prototype Application
  - Community Input (*Operators, Scientists, Data Managers*)
- Tested on several cruises
- Implementation plan
  - •operator installs application onboard
  - •science party maintains log underway
  - •results loaded in *rvdata.us* database for dissemination

Alex Dorsk (WHOI)

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

Data Delivered to National Data Centers



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

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
  - Real-time data transmission (MET/TSG)
  - Data set documentation
  - Data delivery to NDCs
  - Event Logger
  - Automated QA procedures