

# Rolling Deck to Repository (R2R)

## Current Status and New Developments

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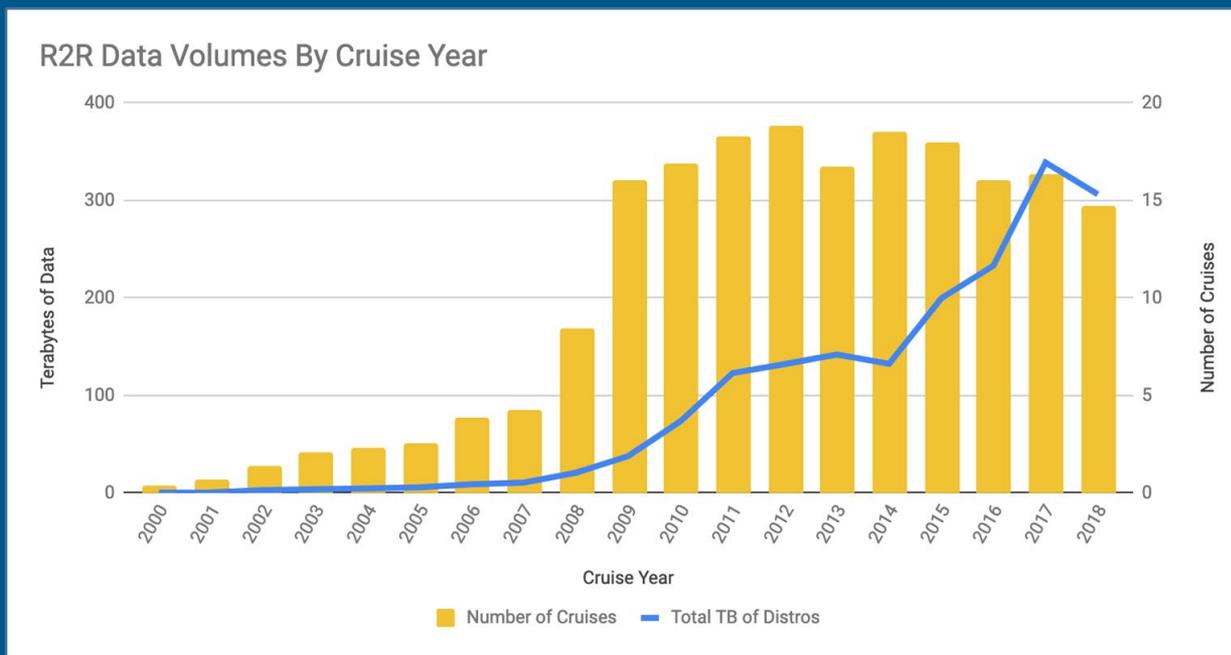
# R2R Services

- Publish master cruise catalog
- Organize, archive, and disseminate original underway data and documents
- Assess data quality
- Create post-field data products
- Support at-sea event logging

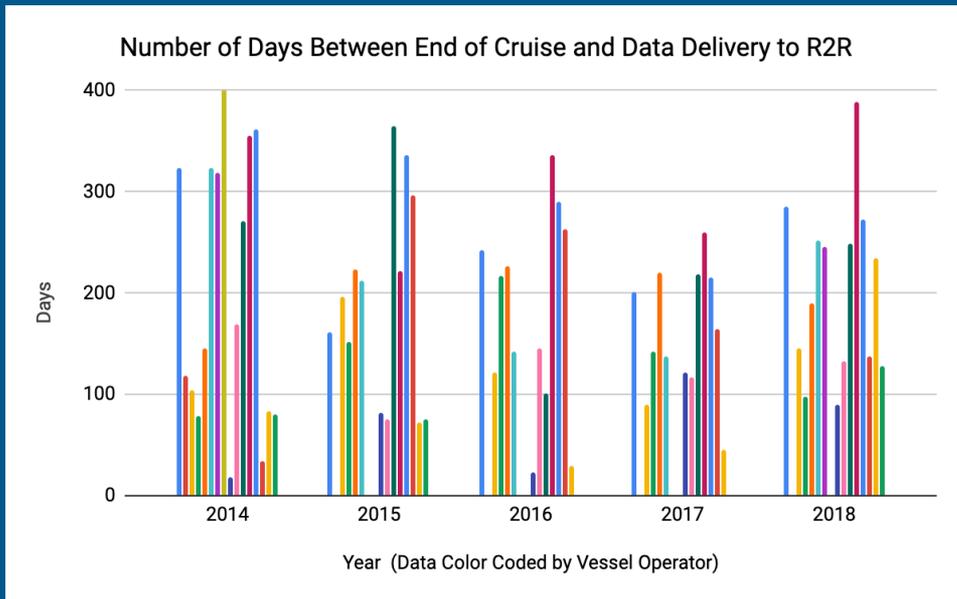


# R2R - Cruises & Data Volumes

Number of cruises vary by year, but totals have increased significantly over time.



# Cruise Data Arriving at R2R



R2R will process, archive to NCEI and distribute your data to the public. Don't leave your data sitting on the ship.

We can help you send data and metadata faster and easier.  
Just ask.

Don't delay sending cruise data until the end of the year!

# R2R Gets Your Data to the Public

## Geophysics:

- Echosounder\* - 1,669
- Gravimeter\* - 937
- Magnetometer\* - 222
- Multibeam - 1,821

## Meteorology#:

- Anemometer - 609
- Barometer - 263
- Hygrometer - 320
- Radiometer - 1,228
- Rain Gauge - 307.

R2R extracts, quality assesses, generates products for and delivers to the NCEI archive underway data collected onboard the US Research Fleet.

## Oceanography:

- ADCP - 2,774
- CTD\* - 2,167
- Fluorometer - 973
- Oxygen - 20
- pCO2 - 104
- Sound speed - 288
- Temperature \* - 610
- Transmissometer - 250
- TSG \* - 1,691
- XBT/XCTD - 637

## Complex Logging systems:

- Acquisition Systems - 942
- Meteorological Stations - 1,839

## Navigation:

- GNSS/INS\* - 5,835
- Gyrocompass\* - 1,1901
- Speed Log\* - 411

## Engineering:

- Winch - 907
- Timeserver - 77
- Flowmeter - 131

Underlined - QA performed

\* - product generated

**Data** - sent to NCEI

# - near realtime data handled by SAMOS

# R2R Quality Assessment of Logged Data

Device Type	QAed
Navigation	3590
CTD	1816
gravimeter	469
magnetometer	118
multibeam	1425
singlebeam	702

QA helps operators and data users review the health of a data set.

QA verifies that data:

- is in the correct format
- has necessary metadata
- is within expected spatial and temporal range
- and more...

DEVICE TYPE	MAKE-MODEL [LOCATION]	DOI	DATA
ADCP	<a href="#">Hawaii UHDAS</a>	<a href="#">10.7284/110409</a>	☰ ⚙
CTD	<a href="#">Sea-Bird SBE-911+</a>	<a href="#">10.7284/110419</a>	☰ ⚙ 🚫
Expendable Probe	<a href="#">Turo Quoll</a>	<a href="#">10.7284/110562</a>	☰ ⚙
GNSS	<a href="#">Furuno GP-150</a>	<a href="#">10.7284/110411</a>	☰ ⚙ 🟢
GNSS	<a href="#">Ashtech ADU2</a>	<a href="#">10.7284/110414</a>	☰ ⚙ 🟢
Gravimeter	<a href="#">Bell BGM-3</a>	<a href="#">10.7284/110416</a>	☰ ⬇️ 🟢
Gyrocompass	<a href="#">iXSea Hydrins</a>	<a href="#">10.7284/110413</a>	☰ ⬇️
HDSS	<a href="#">SIO HDSS</a>		☰ 🚫
Magnetometer	<a href="#">Marine Magnetics SeaSPY</a>	<a href="#">10.7284/110417</a>	☰ ⬇️ 🟡
Met Station	<a href="#">SIO MET-System</a>	<a href="#">10.7284/110447</a>	☰ ⬇️
Multibeam Sonar	<a href="#">Kongsberg EM122</a>	<a href="#">10.7284/110410</a>	☰ ⚙ 🚫
Singlebeam Sonar	<a href="#">Knudsen 3260</a>	<a href="#">10.7284/110412</a>	☰ ⚙ 🟡
Singlebeam Sonar	<a href="#">Knudsen 320B/R</a>		☰ 🚫 🚫

The overall QA rating for a file set is displayed on the website. Users can click the QA icon for additional information.

# R2R Generated Data Products

R2R creates evaluation quality data products from raw, underway data.

These products, along with supporting documentation, are downloadable from the website.

The products allow a larger community to benefit from the data collected by the US Research fleet.

Data Type	Products Generated
Navigation	3282
CTD	1824
Singlebeam Bathymetry	552
Gravity	417
Elog	182
Magnetics	81

The screenshot displays the R2R data product interface. At the top, there is a header for 'R2R POST-FIELD PROCESSING PRODUCTS'. Below this, a table lists various data products with columns for DATA TYPE, DEVICE TYPE(S), and FORMAT. A red circle highlights the 'Bathymetry' row, which shows 'singlebeam (Knudsen 3260), singlebeam (Knudsen 320B/R)' as device types and 'r2zbathy\_geocsv' as the format. Below the products table, there is a section for 'UNDERWAY DATA SETS' with columns for DEVICE TYPE, MAKE-MODEL (LOCATION), DOI, and DATA. A red arrow points to the 'CTD' row in this section, which shows 'Sea-Bird SBE-911+' as the device type and '10.7284/110410' as the DOI.

Users download data products and supporting documentation

# R2R ELOG Records Underway Metadata

R2R ELOG is used by technicians and scientists to capture device metadata during a cruise. This information can be invaluable when data is re-used.

2019/07/07 12:35:02	Attune Flowcytometer	end	NaN	NaN	NaN	39.799803	-70.829629		tCrockford1	fixing leak in pump
2019/07/07 12:35:55	underway science seawater diaphragm	service	NaN	NaN	NaN	39.797496	-70.829631		tCrockford1	stop to fix leak at pump
2019/07/07 13:01:13	Attune Flowcytometer	start	NaN	NaN	NaN	39.750731	-70.829584		tCrockford1	
2019/07/07 13:01:53	underway science seawater diaphragm	start	NaN	NaN	NaN	39.750707	-70.829548		tCrockford1	

Interested in ELOG for your vessel?  
Talk to R2R or email [elog@rvdata.us](mailto:elog@rvdata.us)

Comments can explain gaps in data,  
provide installation information or  
new calibration values and more....

# R2R Manages Device Metadata

The vessel profiler allows operators to keep device information up to date

R2R ID	Device Type	Main Model	Time source	Flasht count	Total
100016	acpops	Hawaii LINDAS		0	0
100014	adcp	RDI OS-150		0	0
100012	adcp	RDI OS-30		0	0
100010	adcp	RDI VM-300		0	0
100018	ctd	Sea-Bird SBE-911plus		0	0
100013	expendedprobe	Turo Quoff		0	0
100015	gras	Trimble R2082		0	0
100060	gravimeter	Bell BGM-3		0	0
100066	gyrocompass	JOSea Hydrys		0	0
100070	gyrocompass	Sperry NAVICAT X Mk.1		0	0
100018	gyrocompass	JOSea Hydrys		0	0
100010	ins (Shimadzu)	Kongsberg Deepath 330+		0	0
100040	magnetometer	Navine Magnetics SeaSPY		0	0
100076	metatation	SD MET-System		0	0
100042	anemometer	RM Young 86106		0	0
100010	barometer	RM Young 91302		0	0
100017	barometer	SeaMetric SPV-038-D1		0	0
100011	multibeam	Kongsberg EM122		0	0

**Manage Device: 100742**  
Please check and complete the information for the device, and save any changes you make. If the information is complete and accurate, please click the Approve button to indicate you've confirmed it.  
Refresh edit

Vessel: Sally Ride  
Type: multibeam  
Make: Kongsberg Underwater Technology, Inc.  
Model: EM122  
R2R ID: 100742  
Device ID:  
User: dclark  
Updated on:

Save a quick note  
Notes: Any relevant information about the devi  
Install Date: YYYY-MM-DD This can be approximat  
Remove Date: YYYY-MM-DD If this device no longer  
Serial Number: The serial number of the device if know  
Location: If two of the same model (ex: port or star)

Save changes or Approve

To retire a device, enter the Removal date. To add a new device, please use the LINDAS device inventory.

**Data Details:**  
File type: data  
Directory: The directory where R2R would find  
File naming: Example file name for this device  
Notes: Please enter any other useful inform  
R2R mapping: multibeam\_EM122@rawdata\_1@f  
Save Data Details

Device information is provided to users when viewing or downloading data

CRUISE ID	SUMMARY	START DATE	START PORT	END DATE	END PORT
100016	Project Coastal Experiment from 100016 to 100016 Characterize Ridge Earthquakes (COCE)	2017-01-18	Volgastua, Ohio	2017-02-18	Volgastua, Ohio

DATA TYPE	DEVICE (PROCESS)	FORMAT	DATA
Bathymetry	singlebeam (Acoustic L100)	CSV/JSON	▶
Gravity	gravimeter (Bell BGM-3)	CSV/JSON	▶
Magnetics	magnetometer (SeaMetric C-802)	CSV/JSON	▶
Navigation	gps (GARMIN 180)	CSV/JSON	▶

UNDERWAY DATA SETS	DEVICE TYPE	MAKE MODEL (LOCATION)	DOI	LINK
ADCP	Shimadzu LINDAS		10.26907/20180801	▶
Expendable Probe	SeaMetric SPV1		10.26907/20180801	▶
CHS	SeaMetric SPV1		10.26907/20180801	▶
Gravimeter	Bell BGM-3		10.26907/20180801	▶
Gyrocompass	SeaMetric SPV1		10.26907/20180801	▶
INS	Shimadzu Deepath 330		10.26907/20180801	▶
Magnetometer	SeaMetric C-802		10.26907/20180801	▶
Multibeam Sonar	Kongsberg EM122		10.26907/20180801	▶
POC2	USOP POC2		10.26907/20180801	▶

R2R is working with other organizations to exchange device information.

Contact us to join the conversation

<http://tech.rvdata.us/>

# R2R Helps Gets Your Data Out to the World

## Global Data Repositories and Collections Include:

- ADCP: NOAA Global Ocean Currents Database
- TSG: NOAA Global Thermosalinograph Database:
- CTD & XBT: NOAA World Ocean Database
- NSF IEDA Global Multi-Resolution Topography (GMRT) synthesis
- IHO Data Center for Digital Bathymetry via NCEI
- Real-time MET (SAMOS): International Comprehensive Ocean-Atmosphere Data Set (ICOADS)



# Creating Transmissometer Best Practices

In 2018 R2R organized a best practices working group focusing on underway, C-Star type Transmissometers in the UNOLS community

## Best practices identify:

- Data to record and provide to users
- Basic C-Star Calculations
- Metadata to document devices
- Cleaning and in-situ calibration
- Installation of systems
- Storage of data between cruises



## Goals:

- Encourage adoption of best practices within UNOLS
- Submit completed document to International Ocean Data Exchange best practices repository

Help design future best practices!

Contact [srsmith@fsu.edu](mailto:srsmith@fsu.edu) by 2019/11/30  
with feedback or comments.

Draft document accessible from <https://www.rvdata.us/community/ship-operators>

# R2R - Looking Forward

- Creating new web services and website search functionality
- Creating Operator Dashboard to show status of cruise ingestion
- Extracting & serving instrument documentation from cruise distros
- Working with RVTEC to develop additional device best practices
- Exploring better ways to exchange device metadata
- Exploring near-realtime data streams
- ??



# Want to Join R2R ?

LDEO is looking for a new hire to work within the Geoinformatics Research Group.

Responsibilities include curation of data arriving at R2R from the US Academic Research Fleet and preparation of multibeam bathymetry data for inclusion in GMRT

Ask me for more  
information



# Questions, Comments, Suggestions?



## Contact us:

- In person during RVTEC
- Email [info@rvdata.us](mailto:info@rvdata.us)
- Visit [www.rvdata.us](http://www.rvdata.us)
-  [@R2RData](https://twitter.com/R2RData)

# Acknowledgements

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SCRIPPS INSTITUTION OF  
OCEANOGRAPHY

Providing access to and ensuring  
the preservation of national  
oceanographic research data.

