



UNOLS RVTEC MEETING

Next Up
Coriolix – Chris Romsos



RCRV CORIOLIX Update

Regional Class Research Vessel Program- Oregon State University

November 3rd, 2022





RCRV – Datapresence & Engineering Support Center Staff



Jasmine Nahorniak
Assistant Datapresence Systems Engineer

Joined the project: 2015
Lead CORIOLIX developer
Wide ranging skill set - from data management to UI design



Chris Romsos
Datapresence Systems Engineer

Joined the project: 2015
Lead for Datapresence and RCRV Cyberinfrastructure
Background – marine geology, fisheries, geographic info systems



James Caison
Design Specialist

Joined the project: 2022
Leading Video and other systems integrations
Background – Marine & Technical Services



Katie Watkins-Brandt
Previous Sensor Systems Engineer

Joined the project in 2011 and graduated in 2022!
Recently embarked on a new adventure with NOAA
Instrumental in fostering the CORIOIX collaborations!



CORIOLIX Project Goals



SMART Goals

(specific, measurable, attainable, relevant, time-based)

- Unlock underway observations – send data to shore → External (off vessel) processing now possible
- Enable remote participation – offer new access modes → New communities become engaged
- Reduce “time to science” – support real-time services → Adaptive operations & real-time workflows possible
- Standardization in class – outfit and configure similarly → Interoperability in RCRV class

Intended Outcomes

Stretch Goals

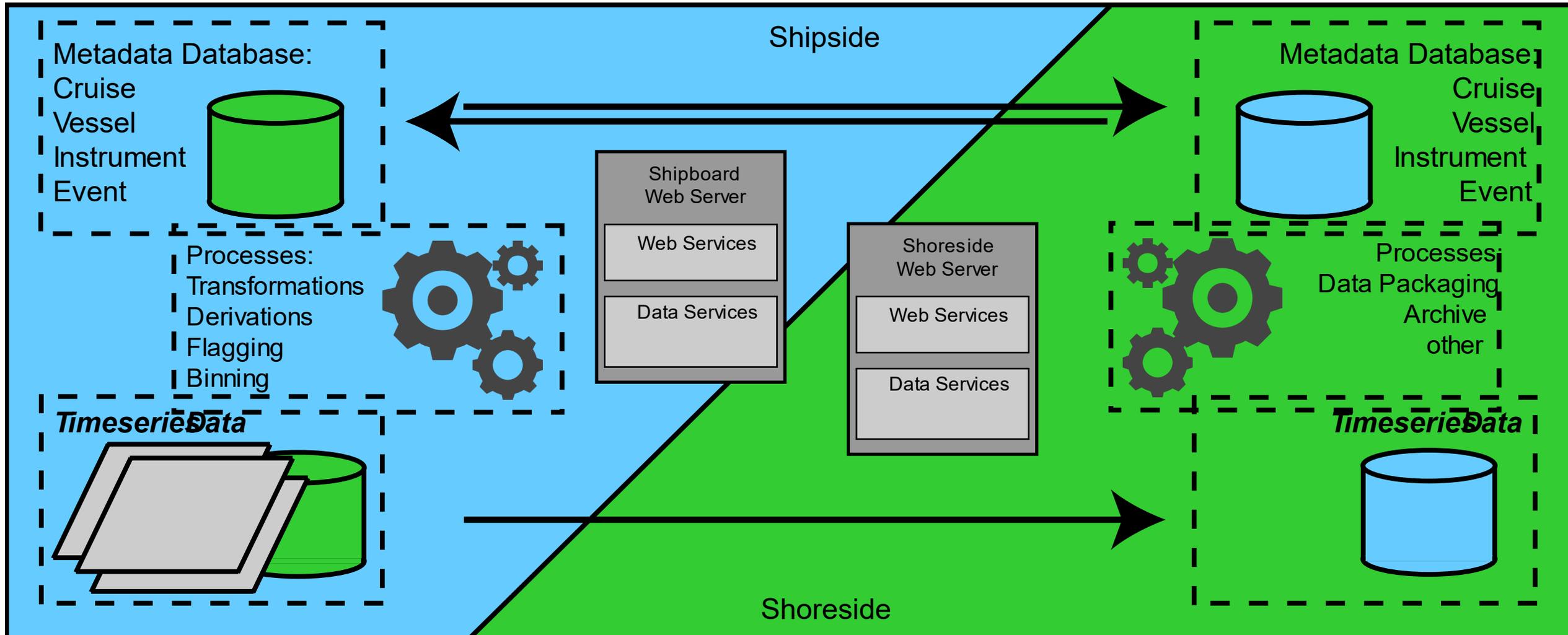
(novel, challenging, ambitious, transformative)

- Normalize ship to shore scientific data transfer
- Provide remote QA/QC for operations
- Develop instrument SOPs & apply OBPs

Possible Outcomes

- Continuous observation, Reliable data services
- Identify problems early, Provide problem solutions
- Improve quality and useability of underway data

CORIOLIX? What is it?





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Logout

Cruise Tools ▾

Cruise Chart

Sensor Plots ▾

Status ▾

Sensors ▾

Data ▾

Documents

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THIS IS A DEVELOPMENT SITE

CORIOLIX *RV Endeavor - shore*

~ ATTENTION: YOU ARE VIEWING A DEMONSTRATION SITE FOR THE RCRV CORIOLIX SYSTEM ~
[more info](#)

Sensor Status

Ocean Sensors			
Fluorescence - SeaCAT	0.2 V	Sound Velocity - SeaCAT	81.0 m/s
Water Temperature - SeaCAT	20.1 °C	SST - SeaCAT	20.0 °C

Navigation Sensors			
Latitude	37.0228° N	Longitude	-74.2588° E
Vessel Heading - Gyro	202° from North	Water Depth - Echosounder	0.0 m

Meteorological Sensors			
Longwave Radiation	418.2 W/m2	Shortwave Radiation	-1.4 W/m2
True Wind Direction - max PS	68°	True Wind Direction - NWS	59°
Air Temperature - NWS	22.1 °C	Air Relative Humidity - Pilot House Roof	81 %RH
Air Pressure - Aft Main Lab	1017 hPa	Air Pressure - Bow	1016 hPa

For more information, please contact the R-DESC (RCRV Datapreence and Engineering Support Center). This project was funded by the National Science Foundation.

CORIOLIX *RV Endeavor - shore*

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[more info](#)

Flowthrough System

Time Interval (minutes): 45

Legend: THERMOSALINOGRAPH SALINITY, SOUND VELOCITY, THERMOSALINOGRAPH CONDUCTIVITY, FLUORESCENCE

Legend: SEA SURFACE TEMPERATURE, THERMOSALINOGRAPH TEMPERATURE, HULL THERMOMETER TEMPERATURE

Current Time
Sun Oct 25 2020 23:26:21 UTC

Last Data Received
Sun Oct 25 2020 23:26:20 UTC
37.02601° N, -74.25730° E
Depth 0.0 m

Mouse Pointer:
Lat: 38.6308
Lng: -72.5757

maintenance and event logs
quality controlled data

Feedback



CORIOLIX Capabilities

META

- **Catalogs Scientific Instrumentation** – maintains a comprehensive source-of-truth for instrumentation metadata
- **Inherits Pre-Cruise Plans** – integrates with MFP to streamline onboarding of cruise participants and plans
- **Metadata Synchronization** – this information is synchronized bi-directionally

DATA

- **Orchestrates Data Acquisition** – configures data acquisition and controls acquisition system state
- **Data Replication** – Observational data created on ship and replicated to shore
- **Processes Raw Data** (*the 3rd rail of Tech Services!*) – transforms data from engineering units to SI units
- **Produces Derivative Products** – like True Winds

OTHER

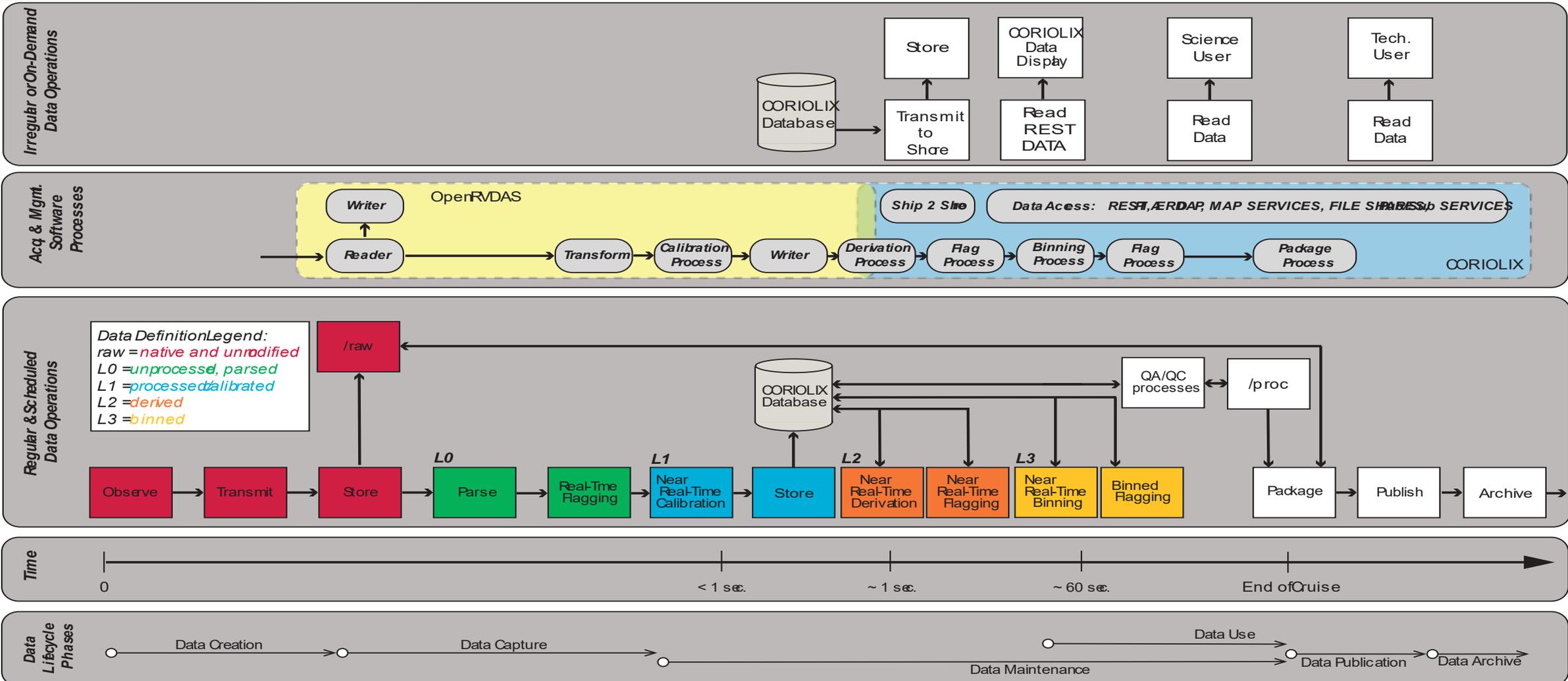
- **Multi-User** – supports managing access to system functionality and data for users and user classes
- **Automated Monitoring** – for system state and for/of scientific data streams – conditional monitoring
- **Alert and Notification** – User configurable alerts and notification + Global alerts and notifications
- **Data Management** – archives raw, conditionally processes products, flags problems and synchronizes with shoreside
- **Data Visualization** – standard and custom plots (*for dummies*) & map application (*for non-cartographers*)
- **Multi-Modal Data Access** – from download all, over the bridge of APIs (REST, ERDDAP), to grams’s house of pub/sub
- **User Focused Tools** – Event logging, waypoint and/or route planning, data query and filter, data binning and indexing



CORIOLIX: Data Lifecycle



RCRV Data Lifecycle Diagram (October 2022)



CORIOLIX Design Collaborations:



Rolling Deck To Repository & SAMOS & NOAA

- 3 Virtual Workshops (May 2020, May 2021, September 2022)
 - Device Types, Data Lifecycle, Data Distribution, Best Practices, Controlled Vocabularies
 - Trials Planning, and Instrument Placement review



SAMOS

- Coordination on vessel configuration, instrument deployment, true winds and other combinatory operations



Ci Compass

- Summer Fellow (remote), Shobana Chadrasekaran, and RCRV graduate student Ian Black developed a new API using the OpenAPI specification



OSU Smile Program

- RCRV supported 2 graduate projects focused on data accessibility for educators and public. Working to integrate their recommendations into improved O&E functionality for CORIOLIX.



CORIOLIX Testing Collaborations:

Oceanus – Hosted first prototype – Retired

- **Objectives** - Needed a low-risk place to work on the distributed ship to shore part of the system.
- **Results** – it wasn't always pretty, but Brandon, Emily (& others) were very supportive.

Point Sur – Hosts V1.0

- **Objectives** – future user familiarization
- **Results** – Moderate usage, repeat customers are asking for it which caused some friction during maintenance.

Endeavor - Hosts V1.0

- **Objectives** – future user familiarization
- **Results** – Moderate to low usage comparatively, but Lynne Butler has provided valuable feedback

Sikuliaq – Currently hosts a V1.0 metadata only deployment

- **Objectives** – Useability & metadata management focus
- **Results** – Feedback used to significantly change (improve) data entry and data presentation in the UI.



CORIOLIX: The Road Ahead



Development Milestones

- Wrap up in-progress feature additions and bug fixes by launch of Taani (March 2023)
- Open the CORIOLIX GitHub repo by Taani Delivery (September 2023)

Outfitting Milestones

- We're almost finished onboarding all the owner furnished scientific instrumentation for all three vessels
 - Ensuring we have a digital metadata record and logs that begin with equipment purchase.
- CORIOLIX for Taani is deployed in the lab now and will be cloned for Narragansett Dawn and Mason.
- CI and CORIOLIX training – December 13-15, 2022 @ R-DESC in Corvallis, OR.

Transition Milestones

- Science Trials – test operation modes & characterize system performance

Datapresence Student Employees

Shivani Wanjara
Sean Marty
Matthew Zakrevsky
Jack Stevenson

Datapresence Student partners

Hanna Hadai
Shobana Chandrasekaran

Datapresence Contractors

Steve Foley
Webb Pinner
David Pablo Cohn

OSU CEOAS

OSU Ship Operations
Research Computing Support
Reimers Lab at CEOAS
Martechs:

Jonah Winters
Kristin Beem
Brandon D'Andrea
Alex Wick
Emily Shimada
Kate Kouba

OSU

Kyle Cole (SMILE)
Renee O'Neill (SMILE)
Adam Talamantes (SMILE)
Tracy Crews (Oregon Sea Grant)

Facilities & Support Partners

OOI @ OSU
Trusted CI
CI Compass

R2R/SAMOS

Suzanne Carbotte (R2R)
Dru Clark (R2R)
Rebecca (Becca) Hudak (R2R)
Suzanne O'Hara (R2R)
Chris Olson (Scripps)
Karen Stocks (R2R)
Laura Stolp (R2R)
Shawn Smith (SAMOS)
Kristen Briggs (SAMOS)
Mark Bourassa (SAMOS)
Ethan Wright (SAMOS - student)

HiSeasNet

John Meyer
Thomas Lockwood

ARF & Other External Collaborators

RVTEC community
Julia Hummon (UHDAS)
Toby Martin (UHDAS)
Steven Hartz (UAF)
John Haverlack (UAF)
Steve Roberts (UAF)
Ethan Roth (UAF)
Vicki Ferrini (LDEO)
Dwight Coleman (URI ISC)
Derek Sutcliffe (URI ISC)
Rachael Simon (URI ISC)

RCRV OIs

Lynne Butler (ECOC, URI)
William Fanning (ECOC URI, RCRV SOC)
Erich Gruebel (ECOC URI)
Gabe Matthias (Tech Pool)
Bonny Clarke (ECOC URI)
Alex Hamm (GCOC Point Sur)
Alex Ren (GCOC LUMCON)

Vessels & Crew

Oceanus, Endeavor, Point Sur, Sikuliaq



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