PROJECT UPDATE
Regional Class Research Vessels

Presented to FIC by Clare Reimers 11/15/2022

3 Vessel Build under NSF MREFC Funding

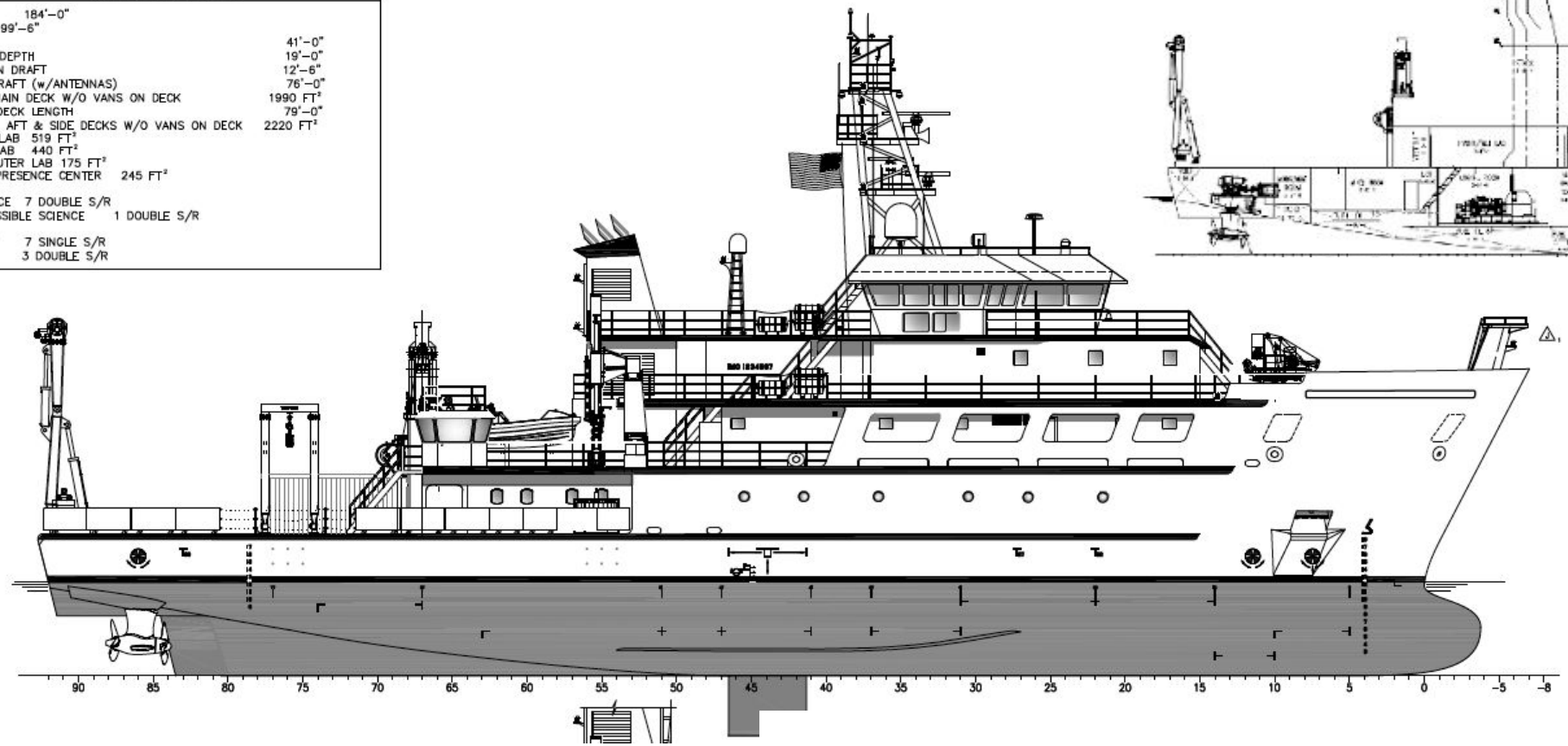
R/V *Taani*

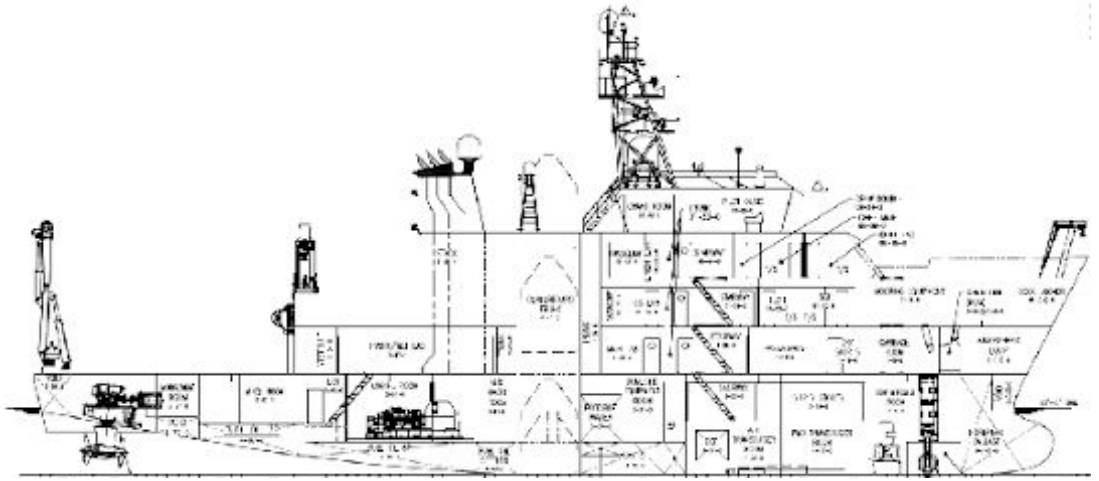
R/V *Narragansett Dawn*

R/V *Gilbert R Mason*

Design –Glosten Associates and OSU team

VESSEL PARTICULARS	
LWL	184'–0"
LOA	199'–6"
BEAM	41'–0"
HULL DEPTH	19'–0"
DESIGN DRAFT	12'–6"
AIR DRAFT (w/ANTENNAS)	76'–0"
AFT MAIN DECK W/O VANS ON DECK	1990 FT²
SIDE DECK LENGTH	79'–0"
TOTAL AFT & SIDE DECKS W/O VANS ON DECK	2220 FT²
MAIN LAB	519 FT²
WET LAB	440 FT²
COMPUTER LAB	175 FT²
DATAPRESENCE CENTER	245 FT²
SCIENCE	7 DOUBLE S/R
ACCESSIBLE SCIENCE	1 DOUBLE S/R
CREW	7 SINGLE S/R
	3 DOUBLE S/R





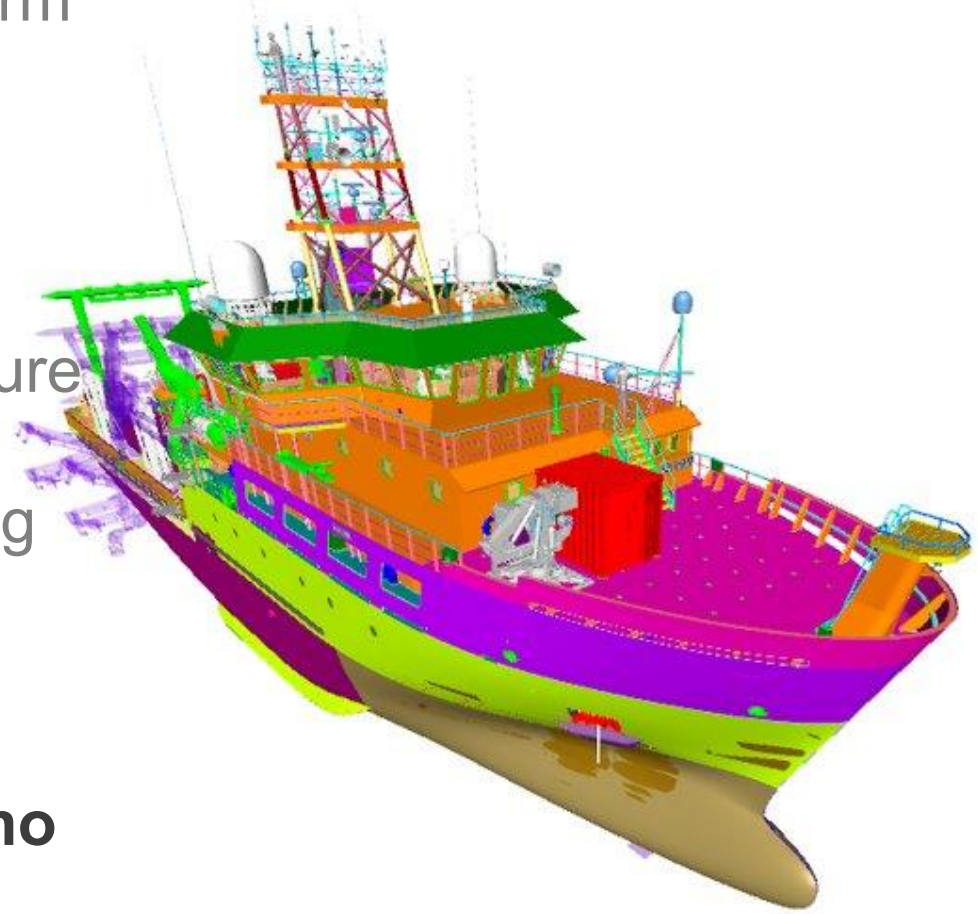
RCRV PARTICULARS

- Length overall .....199 ft
- Beam ..... 41 ft
- Draft @ amidships .....12.5 ft
- Regulatory Tonnage ...1549 GT
- Cruise speed .....11 kt
- Max speed .....13 kt
- Range .....5400 nm @ 12 kt
- Endurance .....21 days min.
- Dynamic Positioning.....ABS DP-1
- Science/Tech Berths 16
- Crew Berths 13
- Retractable Centerboard (drop keel)
- A-frame dimensions ....25'H x 20'W
- Multibeam SONAR....EM304, 2040
- Number winches 3
- Ice Class .....ABS C0

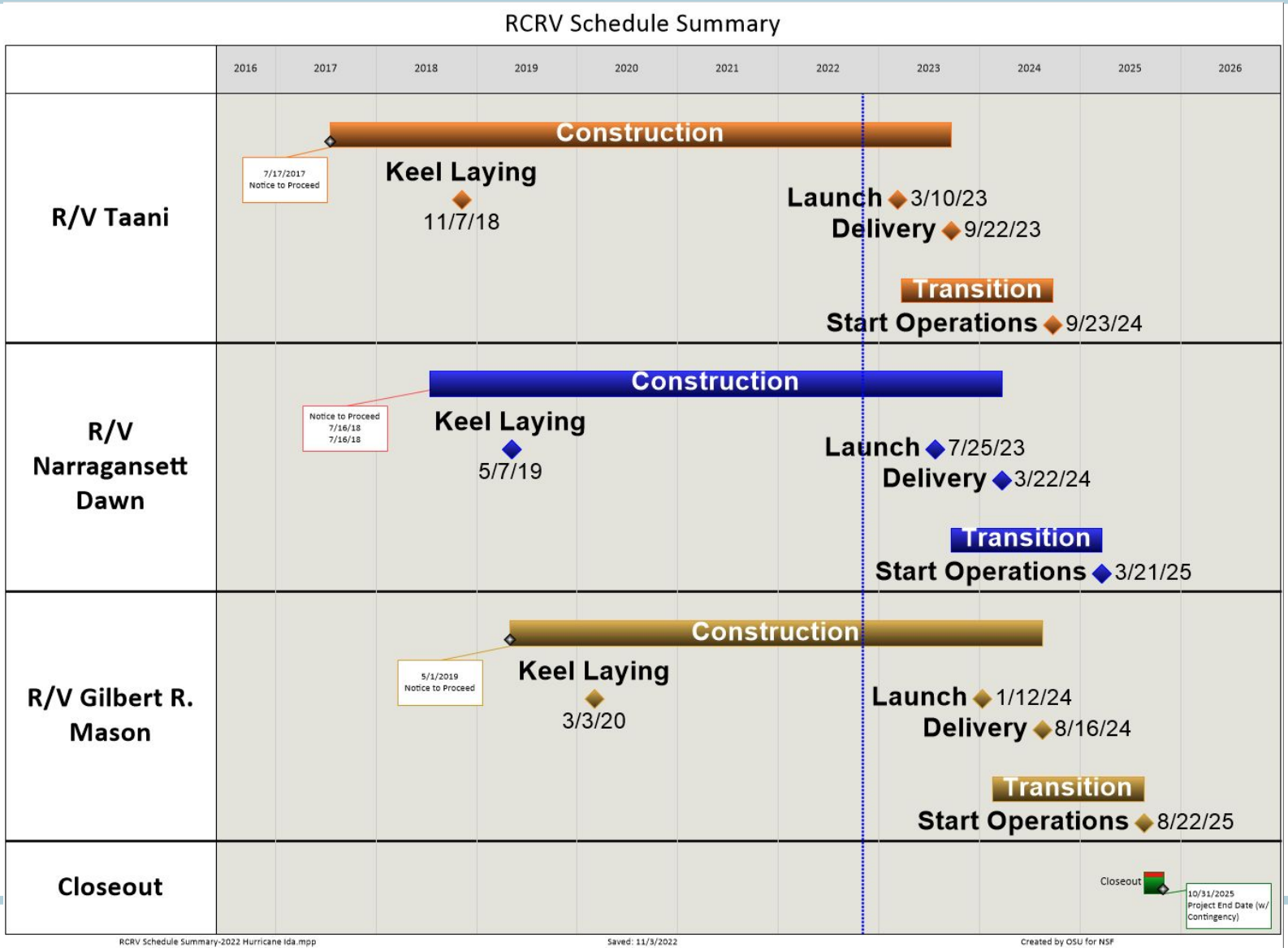
"Phenomenal cosmic powers ... Itty bitty living space."

Major Challenges since start of Construction

- Engineering & Modeling: Original engineering firm left early in project
- Shipyard Capacity / Performance: Original shipyard (Gulf Island) had little experience with gov't contract requirements
- 7 Hurricanes in 2020: multiple small force majeure events
- COVID 19: High absentee rates and engineering inefficiencies
- SY Acquisition by Bollinger in early 2021: progress delayed before during & after
- **Hurricane Ida in 2021: led to 6 months with no progress on the critical path - latest change order with cost and schedule extension**



3 Ship Schedule with Ida Delays



News: No launch/christening ceremonies will occur at shipyard

Transition to Operations

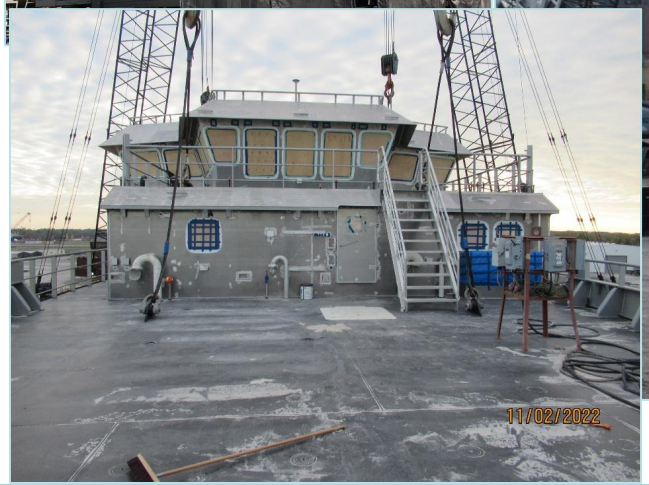
- 18 mo. plans tied to delivery dates
- Crew hiring, training and familiarization
- Builder's trails (18 days, ship crewed by SY)
- Post delivery: full OI crew and technicians at SY for outfitting & start of science trials (40 days)
- Transit to home port for local outfitting, ceremonies
- Local science trials (85 days)
- Warranty haul out at local SY
- NSF Inspection and Acceptance as UNOLS vessel

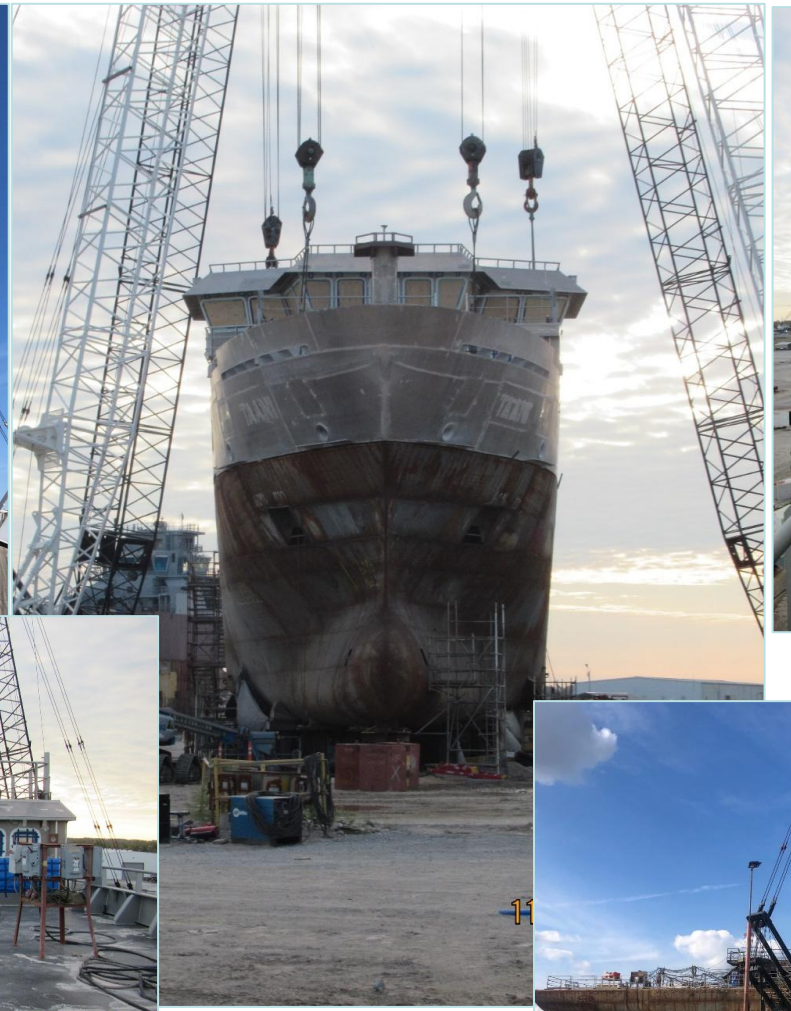
Bollinger Houma Shipyard – Post IDA

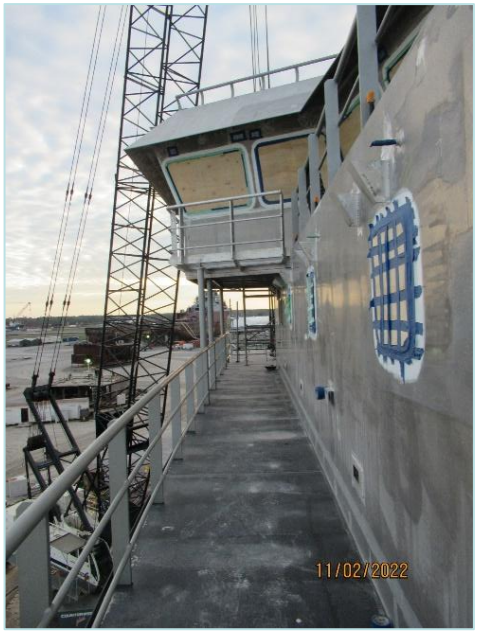
- Have improved storage, added painting facility, crew office and shop
- Made upgrades to drainage and flood protection - more to come
- Labor force has grown with BHS recruiting (and project pay incentives)

OSU Project Field Office

R/V *Taani* Construction Photos







Aluminum superstructure erected onto hull Super Module 10/31/22.


Main Mast & Stack


Engine Room


Bridge Console

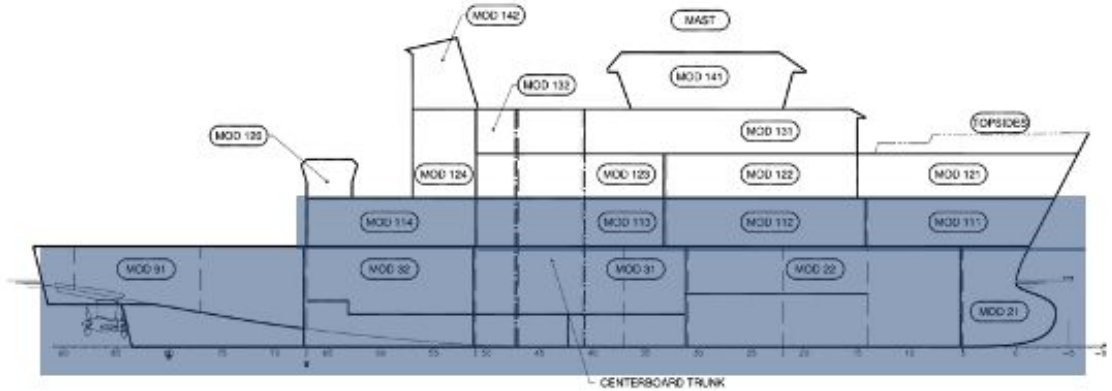

TAANI
NEWPORT OR
Z-Drive Wells


Main Lab looking forward
11/02/2022


Wet Lab
11/02/2022

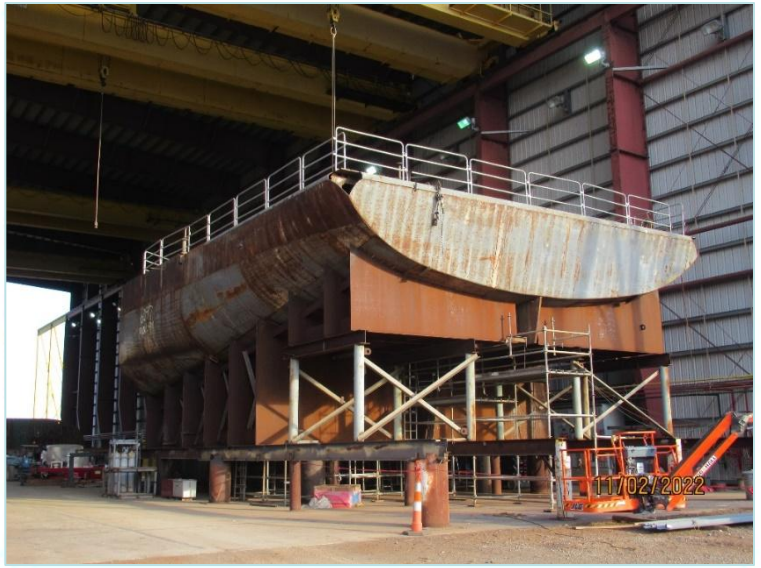
R/V Narragansett Dawn Progress

- **STEEL AND PIPING CONSTRUCTION STATUS:**
  - Super Module(Mods 21,22, and 31): 84% Complete
  - Module 32: 73% Complete
  - Module 91: 50% Complete
  - Module 111/112: 59% Complete
  - Module 113: 60% Complete
  - Module 114: 27% Complete
  - Sonar Flat Boxes: Finishing Fabrication, then to machining



Al

Steel



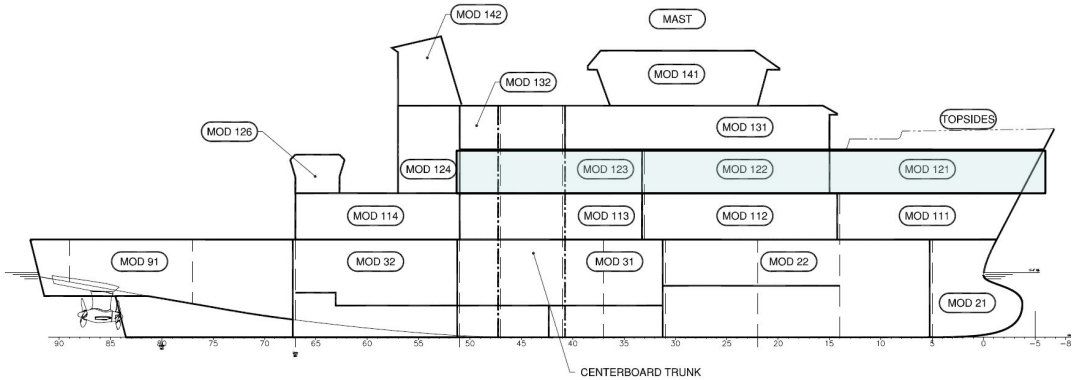
Super Module (21,22,31)

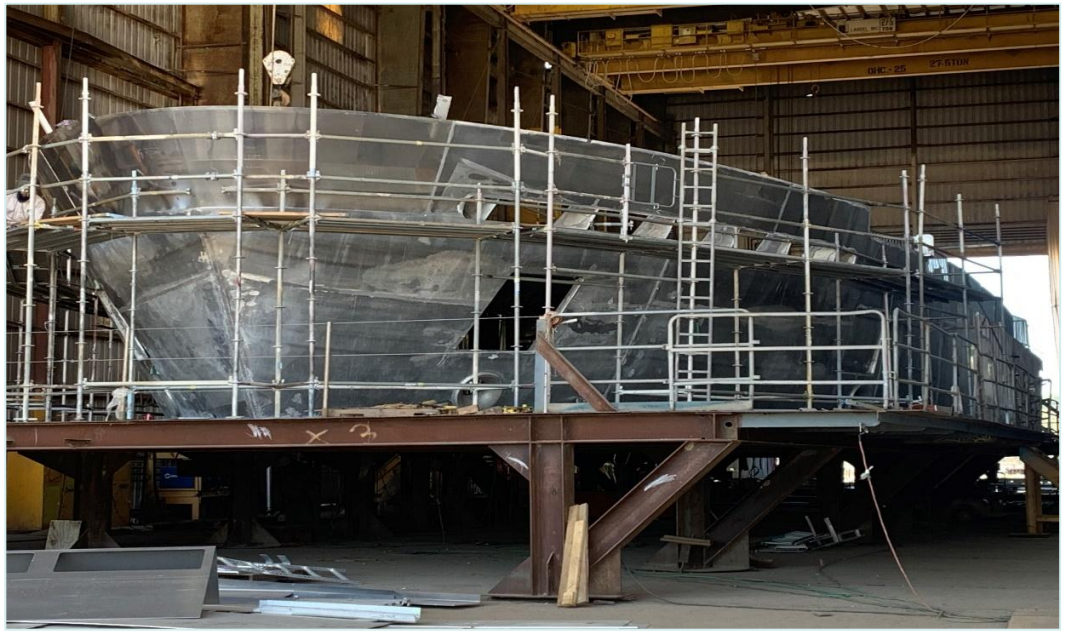
Module 32

Module 91

N. Dawn: Aluminum superstructure

Mod 121 Bow: Amelia Yard





R/V *Gilbert R. Mason –first modules*

Module 21 adding shell plate

Module 22 inner bottom

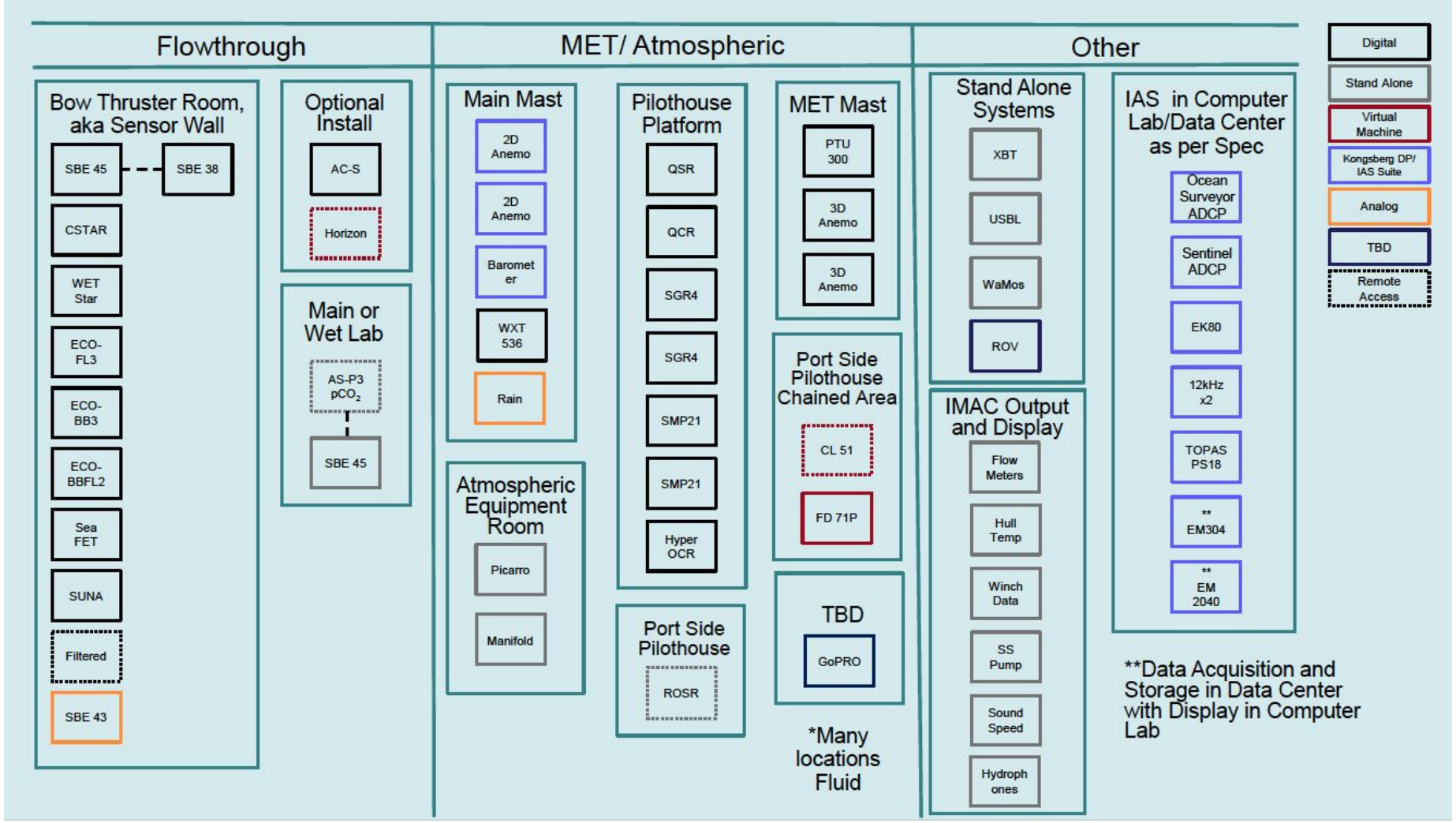
Review of Scientific Sensors and Systems

OSU's R-DESC

(RCRV-Datapresence Engineering Support Center)

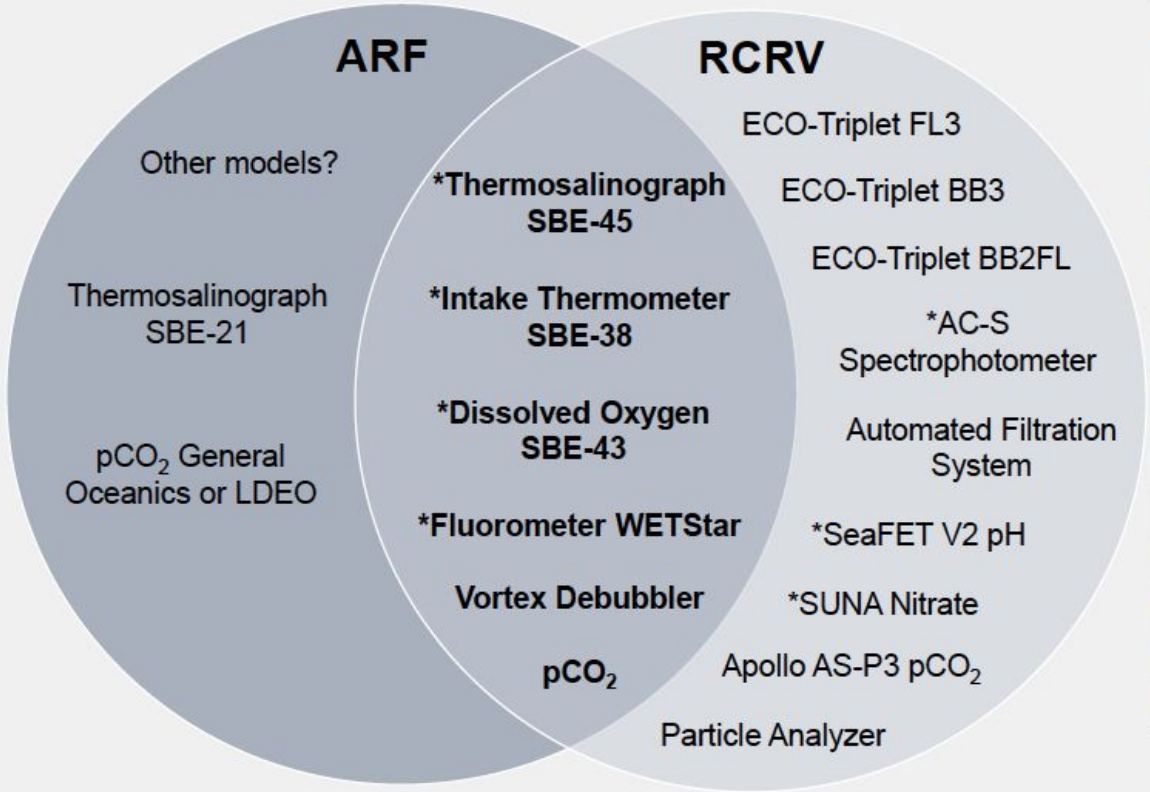
Overseeing SENSOR-

- Procurement
- Testing
- Calibration
- Placement
- Integration
- SOPs, Best Practices
- Dataproducts
- Collaboration with UNOLS/ARF working groups, e.g., R2R, SAMOS
- Verification during trials
- Maintenance



Both Common and New Sensors

Flowthrough System

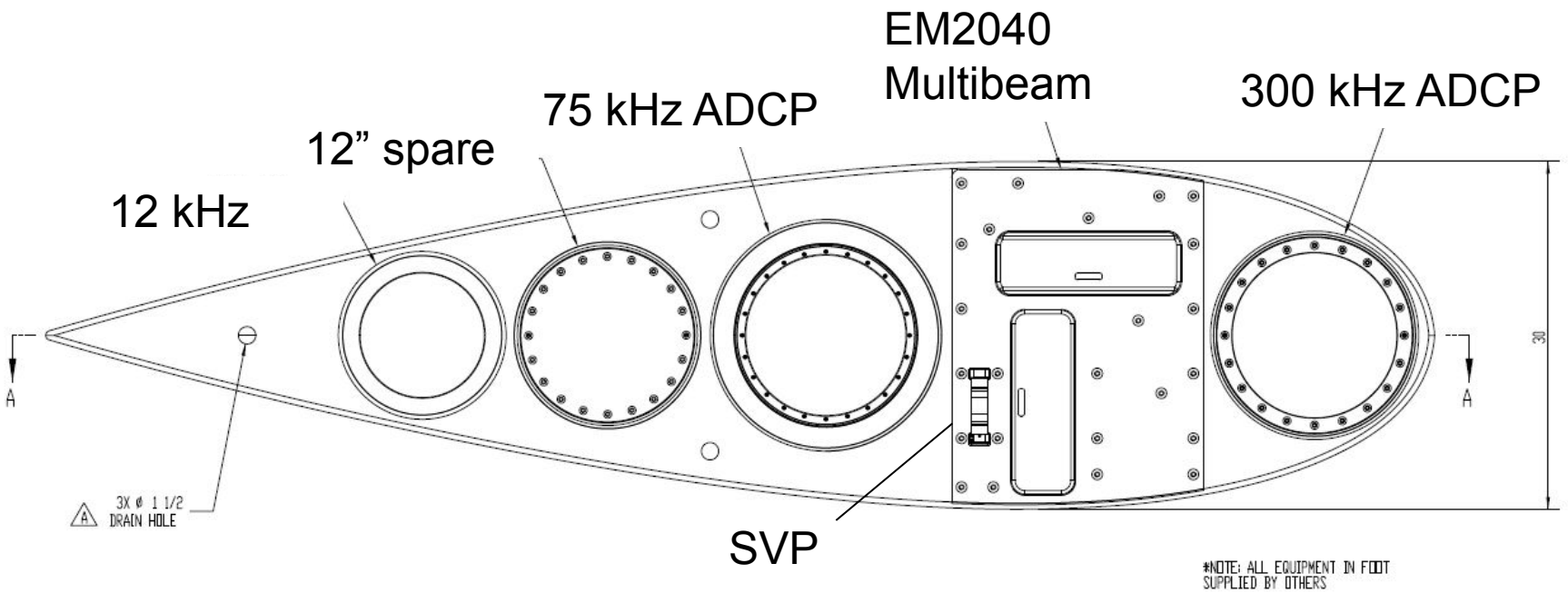


Sensor	Model
Thermosalinograph	SBE-45
Intake Thermometer	SBE-38
Dissolved Oxygen	SBE-43
Fluorometer	WetStar
Vortex Debubbler	NA
Apollo SciTech pCO_2	*AS-P3*
ECO-Triplet FL3	FL3
ECO-Triplet BB3	BB3
ECO-Triplet BB2FL	BB2FL
Spectrophotometer	AC-S
Automated Filtration System	Custom
pH	SeaFET V2
Nitrate	SUNA V2
Particle Analyzer	HORIZON

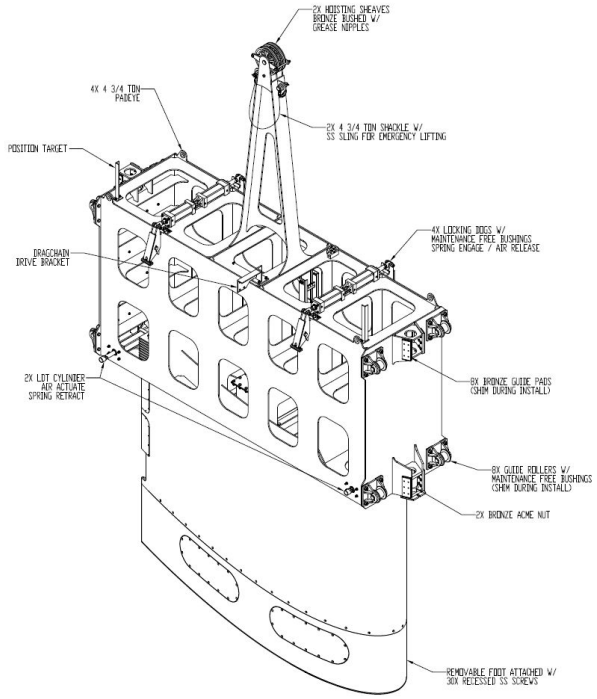
Common sensor, different model
* Draft SOP currently exists

Sensor	Model
ADCP- 75Hz	*Sentinel V*
ADCP- 300Hz	RDI Ocean Surveyor
Single Beam Echosounder	Simrad EK-80
Shallow Multibeam	Kongsberg EM2040
Deep Multibeam	Kongsberg EM304
Sub-bottom Profiler	Kongsberg PS-18
WaMoS Wave Radar	Sigma S6 WaMoS II
Echosounder	Airmar CS229/ Knudsen 3260

Centerboard Sonars



View looking up at bottom of foot



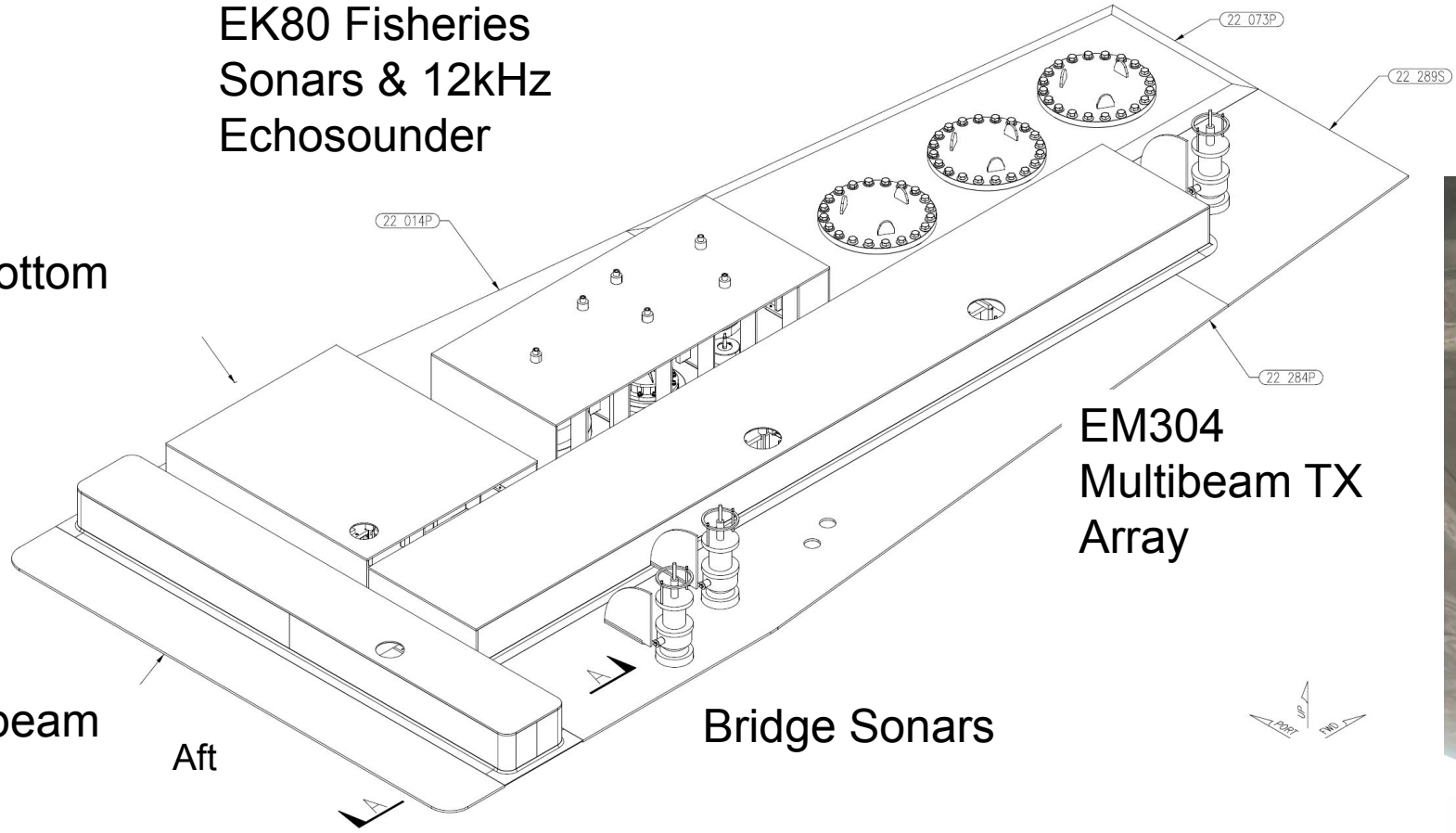
Transducer Flat

19” Spares

Forward

EK80 Fisheries Sonars & 12kHz Echosounder

TOPAS Sub-bottom Profiler



EM304 Multibeam TX Array

EM304 Multibeam RX Array

Aft

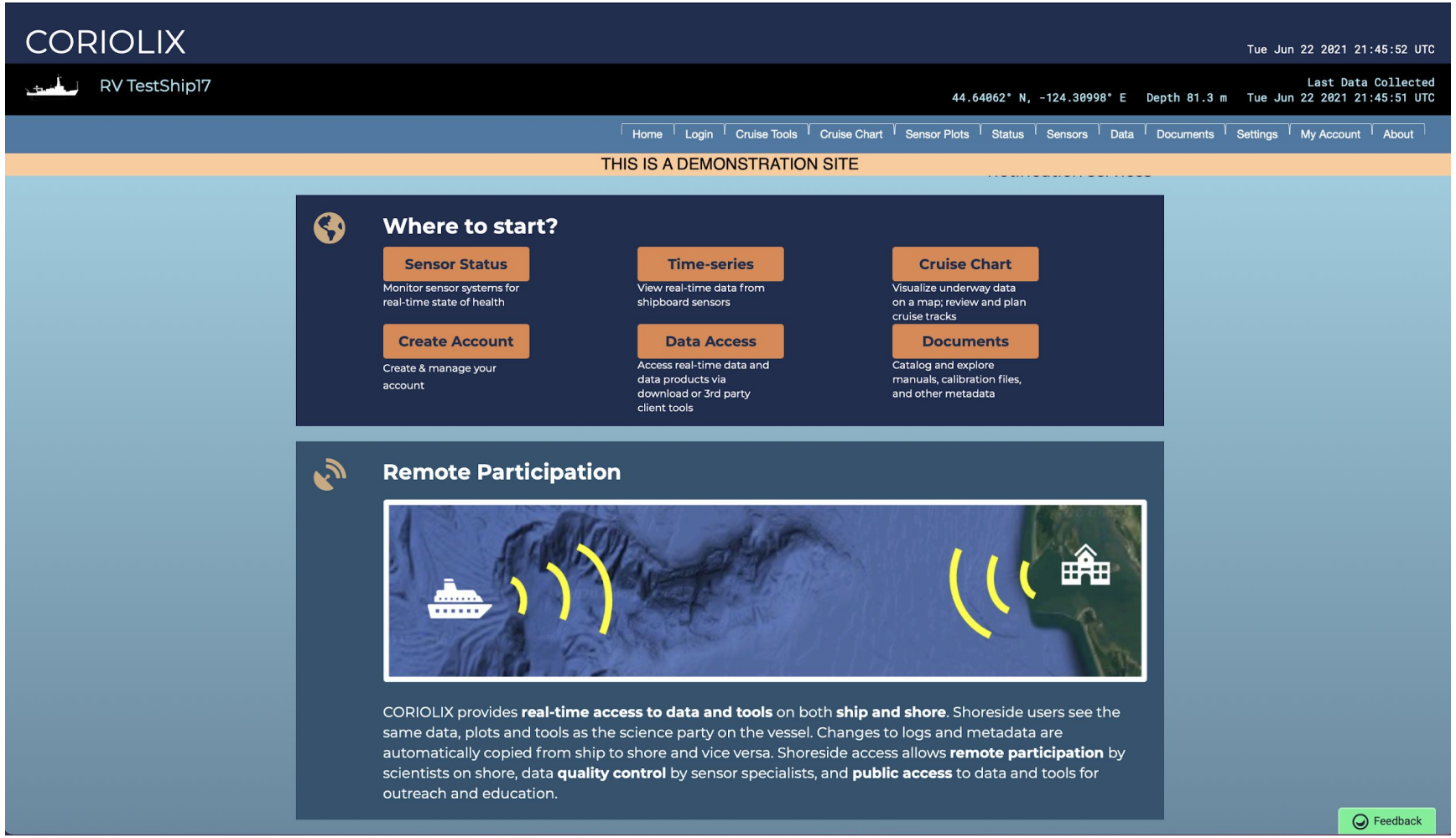
Bridge Sonars

Access to Observational Data- “Datapresence”

Cruise Observation and Real-time Interface for Open, Live Information eXchange

- CORIOLIX = R-DESC development
- Provides continuous observational data, cruise planning tools, charting
- Provides QA/QC and conditional flags
- Shore-based participation
- Education and outreach platform

Operational on R/Vs *Endeavor* and *Pt Sur*



OSU's R-DESC is also

- the RCRV spares storage and outfitting center
- overseeing RFPs for special items
  - Custom CTD frames
  - Accommodation Vans
  - Piston Coring Deployment and Recovery System
  - Hazmat Locker
- populating a *Marine CFO* Computerized Maintenance Management System (CMMS)
- establishing service contracts

- How R-DESC will support operations is TBD





Science Sea Verification Plans

WORKSHOP March 2023

Trials Matrix -

- Item Test
  - Anemometer
- System Test
  - Atmospheric Sensors
- Test Procedure
- Prerequisite
- Test Phase
- Duration
  - Single
  - System
- Location
- Conditions
- Expert Support
- Vendor/Tech
- Acceptance Criteria
- Support
  - Equipment
  - Supplies
- Documentation

Scientific Equipment Test and Verification

First Entry in Blue: Definition- Example

Work Breakdown Structure- 01.02.01.04	Relevant System- Flowthrough Sensors	Associated Sensor or Subsystem- WETStar Fluorometer	What factors are being tested- Performance and Data Quality	Are there any systems required to be in place prior to test/ verification- CORIOLIX	What Phase will testing/ verification occur- II, III	How long is required for a single test- 1 hour	How long is required for full integration (hrs)- 72 hours in transit	Location Needed- Coastal and oligotrophic waters	What testing conditions are needed- productive and blue waters	Day, Night, Both, NA- Both	Suggested Experts for test/verification- Contact Name, ex: Keimers	Is a vendor or manufacturer te rep needed - Va
WBS	System	Subsystem / Sensor	Test	Prerequisite	Test Phase (I,II,III)	Required Single Test Duration (hrs.)	Required Integration Test Duration (hrs.)	Location Needed	Environmental Conditions Needed	Day or Night Needed	Suggested Supporting Experts	Tech Rep
C1.02.01.04	Atmospheric Sensors	Biospherical PAR Sensor QSR	Performance and Data Quality	CORIOLIX	II, III					Day	Kathy Lentz (NOAA)	
C1.02.01.04	Atmospheric Sensors	Biospherical PAR Sensor QCR	Performance and Data Quality	CORIOLIX	II, III					Day	Kathy Lentz (NOAA)	
C1.02.01.04	Atmospheric Sensors	Vaisala PTU330 MET Station	Performance and Data Quality	CORIOLIX	II, III						SAMOS	
C1.02.01.04	Atmospheric Sensors	Vaisala WXT536 MET Station	Performance and Data Quality	CORIOLIX	II, III						SAMOS	
C1.02.01.04	Atmospheric Sensors	Ship-supplied RM Young 61302 Barometer	Performance and Data Quality	IMACS to CORIOLIX	I, II, III						SAMOS	
C1.02.01.04	Atmospheric Sensors	Kipp and Zonen Pyranometer SMP-21 w/CVF-4 Ventilation Fan Port	Performance and Data Quality	CORIOLIX	II, III					Day	Laura Riihimaki (CIRES, NOAA GML G-RAD)	
C1.02.01.04	Atmospheric Sensors	Kipp and Zonen Pyranometer SMP-21 w/CVF-4 Ventilation Fan Starboard	Performance and Data Quality	CORIOLIX	II, III					Day	Laura Riihimaki (CIRES, NOAA GML G-RAD)	
C1.02.01.04	Atmospheric Sensors	Kipp and Zonen Pyrgeometer SGR-4 w/CVF-4 Ventilation Fan Port	Performance and Data Quality	CORIOLIX	II, III					Day	Laura Riihimaki (CIRES, NOAA GML G-RAD)	
C1.02.01.04	Atmospheric Sensors	Kipp and Zonen Pyrgeometer SGR-4 w/CVF-4 Ventilation Fan Starboard	Performance and Data Quality	CORIOLIX	II, III					Day	Laura Riihimaki (CIRES, NOAA GML G-RAD)	
C1.02.01.04	Atmospheric Sensors	Vaisala Present Weather FD71P	Performance and Data Quality	CORIOLIX	II, III						SAMOS	
C1.02.01.04	Atmospheric Sensors	RM Young Rain Gauge 50202	Performance and Data Quality	CORIOLIX	II, III						SAMOS	
C1.02.01.04	Atmospheric Sensors	Ship-supplied Gill 2D Ultrasonic Anemometer Port	Performance and Data Quality	IMACS to CORIOLIX	I, II, III						SAMOS	
C1.02.01.04	Atmospheric Sensors	Ship-supplied Gill 2D Ultrasonic Anemometer Starboard	Performance and Data Quality	IMACS to CORIOLIX	I, II, III						SAMOS	
C1.02.01.04	Atmospheric Sensors	Ship-supplied RM Young 56000 2D Ultrasonic Anemometer	Performance and Data Quality	IMACS to CORIOLIX	I, II, III						SAMOS	
C1.02.01.04	Atmospheric Sensors	Gill 3D Ultrasonic Anemometer Main Mast	Performance and Data Quality	CORIOLIX	II, III						SAMOS	
C1.02.01.04	Atmospheric Sensors	Gill 3D Ultrasonic Anemometer MET Mast	Performance and Data Quality	CORIOLIX	II, III						SAMOS	
C1.02.01.04	Atmospheric Sensors	Sky-view Camera Radiometer Mast	Performance and Data Quality	CORIOLIX	II, III					Day	SAMOS, Ian Black	
C1.02.01.04	Atmospheric Sensors	Sky-view Camera Main Mast	Performance and Data Quality	CORIOLIX	II, III					Day	SAMOS, Ian Black	
C1.02.01.04	Atmospheric Sensors	Delta SPN-1	Performance and Data Quality	CORIOLIX	II, III					Day	Laura Riihimaki (CIRES, NOAA GML G-RAD)	
C1.02.01.04	Atmospheric Sensors	Vaisala CL51 Ceilometer	Performance and Data Quality	CORIOLIX	II, III						SAMOS, Chris Fairall, Elizabeth Thompson	
C1.02.01.04	Atmospheric Sensors	Picarro G2401 Atmospheric Gases	Performance and Data Quality	CORIOLIX	II, III						Dave Munro (NOAA)	
C1.02.01.04	Atmospheric Sensors	HyperOCR ICSA Hyperspectral	Performance and	CORIOLIX	II, III					Day	Andrew Barnard	


NSF
For RCRV outreach videos visit:
https://www.youtube.com/watch?v=bgiAU_b4RfY
Webcams: https://webcam.oregonstate.edu/rcrv7