

The R/V Revelle will operate as a Process Ship, sampling and conducting experiments at multiple stations while the survey ship (R/V Sally Ride) provides the larger spatial context for these measurements.

The Revelle will carry out an eight-day experiment/sampling plan to be repeated three times throughout the cruise. Each 8-day station will represent distinct environmental states or conditions that together provide a broader range of parameters and rates to be evaluated in relation to carbon export.

Deployment of sediment traps and wire-walker(s) will be performed on Day 1 and recovery of traps will occur on Day 3, 4 and 5 and the wire-walker(s) on Day 8. Experiments are planned to begin at dawn and require large volumes of trace metal clean (TMC) water to be collected pre-dawn. TMC water sampling logistics are in review and ultimately depend on the results of NSF funding decisions for 'export' related proposals that may impact space, sampling, and general operations on the Revelle. Currently planned experiments for the NASA EXPORTS efforts consist of whole or diluted seawater in polycarbonate bottles placed into on-deck incubators located on the aft deck with flowing seawater to maintain sea surface temperature.

Following TMC water collection, daily plans include zooplankton net tows, MOCNESS tows, deployment/recovery of marine snow catchers, noon-time deployment of optics packages, and multiple CTD casts. Continuous and semi-continuous optical, biological, and chemical measurements and water collection using a flow-through seawater system and an optical sensor (HyperSAS) mounted on the bow will also be performed.

The main operations on the Revelle are:

- Over the side:
 - Initial deployment and later recovery of sediment traps (surface tethered and neutrally buoyant) and wire-walker(s)
 - Deploy on Day 1 of station occupation with recoveries on Days 3, 4 and 5 for sediment traps and Day 8 for wire-walker
 - Pre-dawn TMC sampling for experiment water – logistics dependent on NSF funding of proposals that would be included on Revelle operations.
 - Zooplankton net tows
 - MOCNESS tows to 1000 m
 - Marine snow catchers
 - Noon time optics deployments: 1) hand deployed C-OPS floating radiometer and 2) HyperPro and 3) “free-falling” hand-lowered IOP package (with ship assisted deployment and recovery)
- Continuous measurements
 - Ship's pumped uncontaminated seawater for optics and mass spectrometer measurements

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- HyperSAS measurement of sea surface optical reflectance, mounted forward on bow (location TBD)
- Deck activities
 - Flowing seawater incubators (5 or more)
 - 3 research vans (1 TMC van on aft main deck, 2 vans on 01 deck to include standard research van and one isotope van)
- Acoustics
 - Will rely largely on R/V Ride acoustics but may take advantage of Revelle's; too
 - MOCNESS will have portable self-recording ADCP

CTD/Rosette:

- Request freshly calibrated O2 sensor
- Need to add PI supplied UVP-5 and LISSTDeep, PAR, FLNTU, transmissometer
- Routine casts to 1000 m

Seawater Flow-through System:

- Science provided diaphragm pump for seawater flow-through critical for mission success.