

Halsey Team

Instruments/Equipment:

1. PTR-MS (~ 300 lbs): dimensions: 60 x 91 x 80 cm (WHD) Power supply: 100-230V max. 1500 W
2. Incubation refrigerator (90 x 90 x 90 cm)

Requirements:

1. RAD VAN with a refrigerator, scintillation counter, and fume hood, connected via intercom to ship PA systems.
2. The PTR-MS for VOC measurements should be exhausted to the outside.
3. Work space of about 6 linear feet in a dry-lab

HAZMAT

1. Radioisotopes: ¹⁴C-bicarbonate: ~ 5mCi.

Menden-Deuer Team

1. 4 onboard incubators, to be mounted on deck with access to running seawater and full sun exposure to simulate in situ conditions
2. coulter counter (dry lab)
3. Turner AU 10 (dry lab, darkenable)
4. Flow cam (dry lab)
5. Chl a filtration rack (semi wet lab)
6. tangential filtration rack

Bidle Team

Equipment/Instrumentation

1. 2 flow-thru, on-deck incubators (4'x4'x18") to be mounted on deck with access to running seawater.
2. Fluorescence Induction Relaxation (FIRe) flurometer (dry lab; ~48" bench)
3. TFF filtration unit (Pall Corporation, Centramate system) with sandwich/cartridge filters) with peristaltic pump (semi-wet lab; ~48" bench)
4. 2 x 3-place vacuum filtration manifolds with vacuum pumps, towers & trap (semi wet lab; ~55" bench space)

5. Accuri C6 Flow Cytometer with autosampler (dry lab; ~48" bench space)
6. 2 Liquid Nitrogen Dewars/Dry-shippers

Chemicals

1. Lugols
2. Ethanol
3. Alcian Blue
4. Paraformaldehyde, glutaraldehyde
5. A few diagnostic stains [SYTOX, DC-FDA (2',7' -dichlorofluorescein diacetate (DCFDA), DAF-FM (4-Amino-5-Methylamino-2',7'-Difluorofluorescein)]
6. FeCl₃

Matrai Team

Instruments

1. Gas Chromatograph – (Dry Lab)
2. Small filtration rig – (Dry lab): needs to be close to GC
3. Fluorometer – (flexible): CTC discrete samples
4. Fluorometer – (flexible): Chlorophyll – to be shared if needed
5. Coriolis cyclonic micro air aerosol samplers (2) – (TBD): may tap into shared aerosol line
6. fog water collector – (railing)
7. regular filtration rig – (wet lab): carboh; shared with Carlson
8. microscope – (dry lab)
9. titrator – (dry lab)
10. 96 well plate fluorometer – (dry lab)
11. pH meter – (dry lab)
12. small flow through incubator – (on deck): if no other is already available

Chemical Hazmat

1. HCl
2. DMS
3. propanol
4. DMSP
5. NaCl
6. NaOH (10 N)
7. NaCN
8. Chlorotetracycline
9. EDTA
10. NH₄Cl
11. Red Nile
12. pH Standards

13. H₂SO₄ (50%)
14. Liquid N₂

Flammable Gases

1. Two H₂ Cylinders
2. Two air Cylinders
3. Two N₂ Cylinders

UCSB Team (Nelson / Siegel)

Main Lab:

1. Sink adjacent bench, 4':
2. aspirator pump
3. Benchtop filtration rig (large, 8-place, 20" tall)
4. Desk for C-OPS profiling radiometer system control computer & deckbox
5. ultrapure water system
6. table in main lab for spectrophotometer system (4'-6')
7. table in main lab for chlorophyll fluorometer (4'-6')

Main deck aft, probably port side:

1. Lashdown spot for C-OPS and deployment cable (roughly a trash can size/shape) with cable run from there to main lab

05 deck or other place not shaded or subject to stack gases: (possibly met mast?)

2. Short mounting pole for surface radiometer /shadowband system - with cable run to main lab

Hazmat

1. Methanol (ca. 4L)
2. HCl (ca. 1L)
3. Acetone (ca 6L) if we do chlorophyll at sea

Over the side deployments:

1. Biospherical C-OPS spectroradiometer package - Hand deployed and recovered, no winch required, port quarter rail is usual deployment spot on Global class ships

UMaine Team (Karp-Boss / Boss)

In-line system:

1. WETLabs ac-s
2. McLane IFCB

3. WETLabs bb3 in a casket
4. automated switch
5. 0.2um filter rack
6. WETLabs ALFA.
7. Satlantic Hyper-pro hyper-spectral radiometer system (either as profiler or as a tethered radiometer buoy).

On CTD rosette:

1. Hydroptic UVP camera system.

Overboard deployments:

1. five profiling floats in wooden box.

Carlson Team

1. DOM prep and collection:

3 linear feet of bench space for prepping DOM cartridges and bottles for CTD work. This could be in a dry lab or could be combined with the experimental space listed next.

2. Microcosms experiments:

1. 6- 8 linear feet in a wet lab type area for setting up and sampling. This is basically for mixing seawater dilution cultures and filtration. Some of the filtration work could be conducted in a CTD garage or some semi enclosed area outside. If dry lab space is limited, this could be combined with DOM/ CTD sampling efforts
2. I will need to load 2 upright incubators. These are two, 20 Cu ft refrigerator type incubators that we will send and load at WHOI. They are 110v with no special requirements.

4. Bulk DOM and carbohydrates:

1. These samples can not analyze on board and must be stored frozen and shipped back to UCSB after the cruise. We typically use a chest freezer at -20 (typically supplied by ship) or walk in -20 room, if available on ship. We plan to collect about 1500 samples per cruise from CTD and experimental work. That load typically fits into a 22 cu ft chest freezer. This would be a dedicated freezer for DOM (NOTE, no volatile organics, fixative etc can be in this freezer!). If ship can't supply it, we could bring our own.

5. Other requirements/comments:

1. Our sample bottles and other lab supplies are contained in large coolers which we need to regularly access over the course of the cruise. We typically have one cooler at a time stored under a bench in one of the main labs. The other coolers can be stored in the hold until we need them, as long as we can get access to them.

2. we have no special power needs beyond normal ship clean power for computers and pumps etc.
3. Access to a hood for filtration and adding fixatives.
4. Small amount of "dead" freezer / refrigerator space for storage of fixed samples (until processing), reagents and processed microscopy slides.
5. Daily CTD/rosette sampling to ~2000 m

Brooks Team

A number of my measurement requirements are included in the description provided for the aerosol van soon. Beyond those, I will also require:

1. Space for 1 nitrogen gas cylinder.
2. I like to collect surface samples (1 hand-line bucket cast/station). These samples will be filtered for size separation (< 1000 amu to 0.2 - 2 μm), re-aerosolized, and sent to our CCN instrument for a comparison to the ambient CCN measurements and also offline chemical analysis.

Behrenfeld Team

Instruments

Location

1. BD-Influx Flow cytometer (30" wide x 40" deep, ~225 lbs) +2 computers and accessory equipment	Bio/Analytical Lab - requires a large continuous space (~90" x 40") as close to the center line of ship as possible (<i>see note below **</i>)
2. Compressor for Influx	Near but isolated from Influx (can be noisy when active in a small room)
3. FRR + laptop	Near inline optics set-up (optimal), access to flow-through clean seawater system (required)
4. Coulter Counter	Main Lab
5. Filtration Rig (2X)	Hydro or Main Lab
6. LN Dewar (2X)	No preference or with Influx

**** Note:** *best guess for location of Influx is the bio/analytical lab on the long bench nearest the center of the ship. This lab will be the cleanest and should be lower traffic than the main or hydro lab.*

Chemicals

1. Paraformaldehyde (~10 mls)
2. Liquid nitrogen – filled into dewars prior to cruise (~20 L)

Meskhidze Team

Shipboard Equipment

1. Two Differential Mobility Analyzers (DMAs) TSI model 3080
2. Two Condensation Particle Counters (CPCs) TSI model 3772
3. Two thermodenuders MTI Furnace Heating Module GSL-1100X-S
4. Cloud Condensation Nuclei (CCN) counter, DMT model CCN-100
5. 3-D sonic anemometer, CSAT3 Campbell Sci.
6. Soft X-ray neutralizer (<9,5 KeV), TSI model 3088

NOTE ON Specialized Deck Equipment

1. **IF** there is enough space in the portable aerosol van, the flow sampling inlets will be mounted at the met tower at the front of the ship. All equipment will go into the van.
2. If there is **NOT** enough space in the portable van, the requirement will be for sampling lines to go on the top of the mast and all equipment located in the lab on the 3rd deck.

Additional Information

*Power Usage for System

1. Oven:
 - a. Sitting without ramping- 2.5 Watts
 - b. Initial ramping- 1300 Watts
2. HTDMA Rack:
 - a. Top Power Strip- 11 Watts
 - b. Computer Booting- 90 Watts
 - c. Computer With LabView- 80 Watts
 - d. Both Power Strips- 370 Watts
 - e. With LabView running- 420 Watts
3. CPC/Pump/Solenoid Box:
 - a. All Three- 280 Watts
 - b. All Three with Julia II Rack- 455 Watts
 - c. Julia I Estimate- 185 Watts
 - d. Solenoid Box- 6 Watts
 - e. CPC/Pump- 274 Watts
4. Particle Generation Rack: 350 Watts

Total Estimated Power Usage with everything running:

- 1 Particle Generation Rack: 350 Watts
- 2 CPC/Pump Sets: 2 X 274 Watts
- Julia I Rack: 185 Watts

- Julia II Rack:	185 Watts
- Solenoid Box:	6 Watts
- Nina Rack & Computer:	420 Watts
- 2 Ovens:	2 X 1300 Watts
Total Est. Usage:	4294 Watts == <u>4.3 KW</u> *
	1699 Watts == <u>1.7 KW</u> **

*This is a maximum estimate if the entire system is running and BOTH ovens are ramping at the same time.

**This is an estimate if the entire system is running and the ovens are sitting at a constant temperature.

Giovannoni Team

Requirements:

1. 6-8 linear feet of bench space for an eight-channel peristaltic pump, 16 four liter carboys, and associated plumbing. This is the system we will use to collect cells and DOM samples.
2. 4-8 cubic feet of space in a -20 freezer (NOTE: -80 is preferable). If this much freezer space is not available on board, we'll need to know ahead of time so we can bring our own freezer. Most of our samples cannot be analyzed on board, so shipment home of frozen samples is critical.

Scripps / UCSC Team

Requirements:

1. Requirements for forward aerosol vans are described in cruise planning questionnaire.
2. A small lab bench (4') in the aerosol van provided by UNOLS is requested
3. Desk space is also desired in one of the dry labs.
4. UCSC instrument power requirements are: 25 amps of conditioned power plus 14.1 amps of dirty power + 11 amps of conditioned power and 11 amps of dirty power for seawater mass spectrometer (which also requires ~2 m bench space and can be in either the van or in a wet lab – this system needs to have close access to the ship's science seawater system). Power requests assume 110VAC.

HAZMAT:

1. The seawater and atmospheric chemical ionisation mass specs contain radioactive beta emitting foils as the ionisation source (Nickel-63, activity = 15mCi). These are sealed sources.
2. A few compressed gas cylinders - need to be mounted inside the lab.