

## Ocean Class SMR Input Labs, Storage & Deck Area

Robert Knox - SIO

1 Physical Oceanography

Ocean circulation - But I'm going to use this form mainly to insert some overall observations or workshop discussion items into the mill, based on my reading of inputs thus far (7/1/02)

### **Laboratories**

First-order things to settle are total area, numbers and types of labs (one large space vs. several smaller ones), positioning of some or all labs in relation to weather deck and science storage, and certain design-driving utility needs - fume hoods or at least the ducting for them, any separate HVAC systems, and temp/humidity constraints, etc. A -80C freezer seems to be a common need. We'll have to quantify the "lots of clean (UPS?) power" expressed by several folks, and this may influence the electrical plant design/size. MANY other lab features matter greatly but do not drive initial design so hard - first-rate networking, furniture particulars, utility drops, sinks (except that these do influence drain arrangements). One might want to revisit the split-level deck separation scheme a la Knorr/Melville - get higher overheads in lab areas, but don't make the entire ship unnecessarily tall/topheavy.

### **Science Storage**

First-order matters are overall size, placement vis a vis labs (same-deck arrangement like AGORs has some advantages), and easy access for loading and for working between storage and active areas (labs, weather deck) while at sea. We MUST also design enough useful room for various kinds of ship storage. Many hassles over "encroachment" into science space stem from inadequate initial provision for ship requirements. If Ocean Class vessels take on more of the future work involving multiple legs away from home or nearby ports, this kind of storage/spares provision will increase in urgency.

### **Deck Area**

We ought to be able to settle raw deck area with the inputs given and the experience of existing ships, whether suitable or unsuitable. Again, at least one input (M. McCartney) points toward Knorr/global class size in this item. Trickier perhaps is the question of deck area with clear view of sky, for incubators, etc. How much (several "bathtub size" per B. Ward?), how clear? Seems unlikely that the incubator deck can be uppermost - if it were it would receive stack gases and particulates, not to mention blocking various science/nav antennas. How much obstruction is too much? Provision of utilities (power, water, network, drainage, etc.) to decks is not a driver of basic deck size, but certainly needs careful thought in detailing.

### **Vans**

Need to settle some numbers/sizes - and to consider weight, loaded or empty, vis a vis ship's crane (see #15). Arrangement issues include deck fittings, mating to ship, and utility connections. Van outfitting (freezers, furniture) is important but separate - except perhaps for hoods and thus proper/safe venting. Is current UNOLS van spec (<http://www.unols.org/rvoc/vanspec.html>) OK? If not, what's needed?

## Ocean Class SMR Input Labs, Storage & Deck Area

Ed Carpenter - SFSU

Biology

phytoplankton ecology, nutrient cycling

### **Laboratories**

Wet lab ca 15 x 20 ft with raw seawater piped to it, large deep sinks.  
Dry lab should be ca 20 x 30 ft for instrumentation with clean power for computers etc.  
Need low bench space in a separate room which can be darkened for epifluorescence microscopy and for some molecular biology research.

### **Science Storage**

Definitely need storage in a hold and either winch or elevator capability to get there.

### **Deck Area**

We need open deck area for flowing seawater incubators to incubate bottles in open sunlight. Also for launch & rcovery of MOCNESS. Space for Rad Van & clean van.

### **Vans**

Rad Van, Clean Van, Storage Vans if space in hold is inadequate.

Anthony Michaels - USC

Biology

Role of biological community structure in the cycling of biogenic elements in the ocean.

### **Laboratories**

basic labs are generally fine. Nice to have separate areas for maintaining defined conditions (e.g. trace metals, trace organics, temp control). Some really wet space, some modestly wet space, some electronics space. Rad use segregated into dedicated vans in comfortable locations on deck with easy access to rest of labs.

### **Science Storage**

Some below deck holding space and the capability to attach 20 ft vans on deck without limiting science needs. Definitely need the ability to stage 2-3 consecutive missions on one loading and hold the gear for the non-active missions in a way that does not compromise the active one.

### **Deck Area**

Current AGORS are fine

### **Vans**

2-3, 20 ft storage vans (see above for staging issues), 2-3 specialized science vans (e.g. trace metals, rad vans)

## Ocean Class SMR Input Labs, Storage & Deck Area

Mary-Lynn Dickson - URI

Biology

Plankton ecology (primary and community production and respiration rate measurements)

### **Laboratories**

Wet and dry labs, environmental chambers, capability to place instruments as close to seawater intake as possible, need LOTS of electrical outlets for all the computers and instruments that are now onboard. More sinks in the labs are needed and there should be more than one Milli-Q system available.

### **Science Storage**

HAZMAT storage, regular and -80 degree freezers.

### **Deck Area**

Would be nice to have an area dedicated to incubators - in the sun and where the seawater flow from the incubators is contained and not all over the deck.

### **Vans**

Certainly for radio-isotope use. Would also be ideal for work being done using noxious chemicals that fume hoods just cannot seem to handle onboard.

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Grace Klein-MacPhee - URI

Biology

Fishery Science

### **Laboratories**

Wet lab, dry lab, computer lab

### **Science Storage**

Walk in freezer and refrigerator, dry storage for preserved samples and gear

### **Deck Area**

### **Vans**

2 Vans

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## Ocean Class SMR Input Labs, Storage & Deck Area

Edward Durbin - URI

Biology

Zooplankton

### **Laboratories**

Large dry lab. Flexible benches which can be adjusted to different heights (microscope sitting or standing). Room for refrigerator-type incubators. Large wet lab with large fume hood for processing net samples and benches for setting up live experiments. Clean hot and cold water. Clean SW.

### **Science Storage**

-80 freezer. Regular freezer.

### **Deck Area**

Plenty. Need protected, but unobstructed to sunlight, space for large deck incubators.

### **Vans**

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Joan Bernhard - South Carolina

Biology

Benthic ecology and physiology of meiofauna and microorganisms. This necessitates collection and maintenance of live material (i.e., temperature sensitive).

### **Laboratories**

Cold room WITH fume hood (environmental room that maintains to 4-5oC, that does not exceed 9oC during defrost!), including benches that are 36" high.  
Lab space with more sinks and more fume hoods, plus built in drawers as well as low and high benches (for sitting -- microscopy, require knee holes-- and standing).

### **Science Storage**

Every ship should have two refrigerators and freezers, one each dedicated to live and dead specimens (one for non-toxic chemicals, the other for toxic chemicals). The ships' crew typically usurp much scientific refrigerator and freezer space for various items (food, fish, paint, etc). this is extremely irritating for people who have temperature sensitive materials and can't wait for these refrigerators / freezers to be cleaned out (or else told to find other accommodations).  
As noted above, more built in cabinets so large shipping crates can be stowed.

### **Deck Area**

Enough space to move various pieces of equipment for deployment off the A frame without wasting too much time.

### **Vans**

If environmental rooms are not built into the ship, then new cold vans (environmental vans) must be built. This is especially necessary for Scripps, which has an aging reefer isotope van (the layout of this van is fabulous; it has a fume hood which is a huge plus for my work), and for Duke, which has a tiny new van that does not hold temperature in the heat of the southern summer where their ship typically works. It should be realized that high traffic flow occurs in/out of vans and that they typically are required to maintain 5oC in hot, humid regions. I heard that two new vans are being planned but I hope this does not preclude their integrated inclusion in ships. Having two reefer vans for the entire fleet is not nearly enough (obviously scheduling will be horrendous).

## Ocean Class SMR Input Labs, Storage & Deck Area

Bob Campbell - URI

Biology

Zooplankton Ecology

### **Laboratories**

Large open Main lab (approx. 1000 sq ft), Wet lab (200 sq ft), Hydro lab, Electronics/computer lab, and smaller separate lab spaces where e.g. light conditions can be controlled for certain types of analysis. Climate control chamber (100 sq ft) is a must for studying biological rate processes. A large walk-in freezer and large -80 C freezer are necessary for sample storage. □ Lab spaces should be flexible with ability to add/remove benches/shelves. Benches/shelves able to accommodate heavy scientific analytical equipment. Easy access to clean power throughout labs. □ A large permanent fume hood with large sink supplied with fresh and uncontaminated seawater should be installed in the wet lab. □ Other labs should have provision for temporary installation of fume hoods as well as sinks with both fresh and uncontaminated seawater.

### **Science Storage**

Large storage area to accommodate several missions. Direct access to both weatherdeck hatches with cranes and Main lab with elevator. Hold should be equipped with shelves and racks for tying down equipment as well as have a large open area .

### **Deck Area**

1500 - 2000 sq ft

### **Vans**

Carry 2+ standard deck vans with all necessary hookups. Should have direct access to ship's interior that is protected from heavy seas.

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Bess Ward - Princeton University

Biology

microbial ecology/ biogeochemistry

### **Laboratories**

wet lab for extensive filtering capabilities, milliQ type water availability, clean power, clean seawater outlet, areas that can be partitioned off for superclean manipulations

### **Science Storage**

shipping crates, the usual

### **Deck Area**

large enough for several bathtub sized incubators with running seawater

### **Vans**

radioactivity use is required -- with enough room to filter, etc.

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**Ocean Class SMR Input  
Labs, Storage & Deck Area**

Jeremy Collie - URI

Biology

Fish Population Dynamics and Benthic Ecology

**Laboratories**

wet lab with fume hood, dry lab, computer lab

**Science Storage**

-80 freezer, regular freezer

**Deck Area**

Outdoor workspace, out of the weather, for sorting and preserving samples

**Vans**

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Richard Barber - UNC/Duke

Biology

primary productivity regulation

**Laboratories**

labs with plenty of UPS power

**Science Storage**

scientific hold should be large enough to maintain a complete leg's equipment

**Deck Area**

moderately large fantail

**Vans**

ability to mate van to main lab is important

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## Ocean Class SMR Input Labs, Storage & Deck Area

William Cochlan - SFSU

Biology

Phytoplankton and bacterial productivity, nitrogenous nutrition

### **Laboratories**

Need one main lab with both secure and movable work benches all equipped with drawers and secure shelving either above or below the benches (or both). Smaller separate labs (3-4) dedicated for wet work (located nearest CTD/rosette launch area), dry computer lab and a cleaner, labs for chemical and/or trace metal analyses. Latter labs should have air circulation system separate from normal ship,s system to avoid contamination from other working/living spaces. Labs will require 2-3 chemical fume hoods with at least one built-in, but the others could be portable (to save space when not needed) with the necessary ventilation ports accessible. Labs need at least two refrigerators (one for toxic chemicals, one dedicated for live and non-toxics). Walk-in freezers would be a good idea (walk-in coolers would be nice too). ^80 C freezers always onboard. Labs need lots of clean power and lots of sinks. Clean water supply (Milli-Q or Nanopure) located near a clean (plastic) sink area. Prefiltration of ship's evap water through de-ionization columns prior to Milli-Q system.

### **Science Storage**

Enough storage so that equipment/supplies for 2-3 cruises can be loaded at one time and stored such that on-going operations are not compromised. It would be ideal to have at least some science storage areas on same deck level as main lab for more 'ready-use' storage

### **Deck Area**

enough space for 2 (maybe 3) vans dedicated for radiosotopes, trace-metal, etc oriented fore-and-aft.☐shade-free space for plexiglas incubators not too many decks up.☐Ability to light up small deck areas independently, and not compromise bridge nighttime visability requirements.

### **Vans**

dedicated radioisotope van with climate control (heat and air conditioning), fume hood and sink (with 'hot' storage tank).☐All vans with clean power and rad van should come equipped with a automated liquid scintillation counter.

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Sharon Smith - RSMAS

Biology

zooplankton ecology

### **Laboratories**

as present Thomas Thompson

### **Science Storage**

as present Thomas Thompson

### **Deck Area**

as present Thomas Thompson

### **Vans**

isotope, control temperature

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## Ocean Class SMR Input Labs, Storage & Deck Area

Elizabeth Venrick - SIO

Biology; Chemical

Physics, chemistry and biology of the California Current with emphasis on fishery oceanography, planktonic ecosystem structure and function and climate-ocean interactions

### **Laboratories**

We are maxed out at 1,300 sq ft. Need at least one hood (for formalin work); autosal needs some temperature constancy and humidity control. Flexibility is the key.

### **Science Storage**

### **Deck Area**

sufficient space to stage and deploy CTD/rosette package, various nets (bongo, manta, MOCNESS) and multicorer or box cores. Standardized docking space for up to 4 full and half-sized vans. Room for various incubators, special use winch.

### **Vans**

need docking space for 3-4 special purpose vans (generally supplied by investigators).

James Meehan - NMFS

Biology/Other

Living Marine Resources life histories, population structures, and stock assessments. Ecology and dynamics of Large Marine Ecosystems. Identification and description of Essential Fish Habitats and endangered species Critical Habitats

### **Laboratories**

Wet lab - 600 sq. ft. w/sinks, hot and cold potable water, seawater; Dry lab - 250 sq. ft. ; Hydrographic lab - 200 sq. ft. CTD/water sampler, Fluorometer, Salinometer; Chem/Ecological lab - 350 sq. ft. sink, fume hood, gas, air, hot & cold potable water; Technology center - 300 sq. ft. Scientific Computer System, Sounder and Sonar servers and screens.

### **Science Storage**

10,000 sq. ft.

### **Deck Area**

2,000 sq. ft. on aft working deck & 450 sq. ft. at the side sampling station

### **Vans**

One on a trawling cruise, Two on a non-trawling cruise

## Ocean Class SMR Input Labs, Storage & Deck Area

Frank Sansone - Hawaii

Chemical Oceanography

Hydrothermal plume biogeochemistry; trace gas biogeochemistry

### **Laboratories**

CLEAN POWER!! Clean room with laminar flow hoods; constant-temperature room. A greater number of smaller labs (with hoods) is preferable to a fewer number of larger labs. Outfitting - good dionized water system; walk-in referigerator and freezer. Total space needed is ~3500 sq ft

### **Science Storage**

Like on the Melville (475 sq ft with a VERY high ceiling)

### **Deck Area**

Sufficient area to deploy/recover floats and attached sample arrays (300-400 ft. sq.)

### **Vans**

2 vans

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Dennis Hansell - RSMAS

Chemical Oceanography

biogeochemistry of carbon and other major elements

### **Laboratories**

Large, multi-use common lab as found on AGORs is useful. Separate, moderate sized analytical labs for clean techniques.

### **Science Storage**

### **Deck Area**

1500-2000 sq ft aft

### **Vans**

Space for 2 standardized UNOLS vans.

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## Ocean Class SMR Input Labs, Storage & Deck Area

John Christensen - Bigelow Laboratory

Chemical Oceanography

Nutrient and hydrographic distributions in shelf and slope areas, benthic rates of metabolism and release.

### **Laboratories**

We bring modern and complex laboratory analytical instruments including gas chromatographs, mass spectrometers, etc. These require moderate space and ability to have gas cylinders, liquid N<sub>2</sub>, and other items.

### **Science Storage**

In the eastern seaboard where ports are numerous, we meet the ship at the start of the cruise and leave at the end requiring no long-term storage. On other cruises, storage is required for different legs of the cruises. We bring 1-2 tons of gear amounting to a Uhaul truck of large size.

### **Deck Area**

Largest area is for deployment and recovery of benthic landers where these were deployed with a surface float. Here the benthic lander line is hauled out via the a-frame commonly using a capstan. Area needed for laying out of line, floats, etc.

### **Vans**

Have none

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Craig McNeil - URI

Chemical Oceanography

Dissolved gases, biogeochemical cycling

### **Laboratories**

Wet-lab off of CTD station for water sampling/analysis

### **Science Storage**

Walk in cooler for sample storage

### **Deck Area**

large, well lit

### **Vans**

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## Ocean Class SMR Input Labs, Storage & Deck Area

Bob Collier - OSU

Chemical Oceanography

Marine Biogeochemistry, Trace Element Chemistry, Hydrothermal Systems

### **Laboratories**

>2000 ft<sup>2</sup>, several broken up spaces. most can be outfitted for dry and or wet (lab) use. hoods. overhead space higher than AGOR (for setup of portable lab gear).

### **Science Storage**

Forward area (like new AGORs easily connect to the working labs).

### **Deck Area**

>2500 ft<sup>2</sup>, 0x100 contiguous area on starboard side (coring and vehicle deployment/recovery). space and intermediate cranes to handle at least 4, full ocean depth instrument moorings.

### **Vans**

Ability to place and provide utilities for lab use of 2 vans. Place up to 2 more for storage

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Mark Altabet - Massachusetts

Chemical Oceanography

marine biogeochemistry; oceanic nitrogen cycling, N and C isotope biogeochemistry

### **Laboratories**

300 sq ft. wet lab with easy access to CTD/Rosette staging area and dedicated space for uncontaminated, underway seawater access and data collection; 200 sq. ft trace chemistry lab with DIW system, non-metallic fume hoods, hepa filter hood, explosion proof chemical lockers, access to waste chemical storage, and non-metallic benches with high quality surfaces; general purpose lab area with modular bench space; electronics lab with computational facilities (PC's) and CTD/rosette control with view window to CTD deployment area.

### **Science Storage**

>200 cu. ft below deck with elevator access

### **Deck Area**

### **Vans**

none

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## Ocean Class SMR Input Labs, Storage & Deck Area

Stephen Miller - SIO

G & G

mid-ocean ridges  
seafloor mapping  
databases and archives

### **Laboratories**

space for plotters and map viewing with light tables & facilities for workstations and scientists laptops

### **Science Storage**

dredge samples

### **Deck Area**

dredge, rov

### **Vans**

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James Cochran - LDEO

G & G

lithospheric/crustal creation and evolution, rifting processes - both at mid-ocean ridges and continental rifts

### **Laboratories**

need slightly more lab space than presently available on Atlantis or Ewing. Needs to be adaptable to different types of activities in terms of both size and use. Main lab needs include adequate map and light table space, large scale plotters, printers, work stations and network facilities with sufficient jacks for science party work stations and laptops. Clean power is a necessity.

### **Science Storage**

Be able to store/deploy 50-70 OBSs

### **Deck Area**

### **Vans**

minimum of two, preferably more. Two with power and intranet connections

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## Ocean Class SMR Input Labs, Storage & Deck Area

Carey Steven - URI

G & G

volcanology and volcanoclastic sedimentation

### **Laboratories**

facilities to allow onboard splitting of sediment cores and description. Also petrographic inspection of geological samples

### **Science Storage**

Refrigerated space for core storage

### **Deck Area**

suitable for launch and recovery of coring and dredging equipment

### **Vans**

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Robert Pockalny - URI

G & G

Seafloor Mapping and Underway Geophysics

### **Laboratories**

### **Science Storage**

Space for dredge samples

### **Deck Area**

some potential trailer space with adequate winches

### **Vans**

space for vans

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## Ocean Class SMR Input Labs, Storage & Deck Area

Daniel Fornari - WHOI

G & G

Mid-Ocean Ridge, oceanic transform, and seamount research, including hydrothermal vents, basalt geochemistry, submarine volcanology, seafloor mapping

### **Laboratories**

area similar to Revelle, Atlantis etc.

### **Science Storage**

equivalent to Atlantis with 2 storage vans on upper decks

### **Deck Area**

similar to Agor 24 class

### **Vans**

capabilities for 4-6 vans (20' shipping containers) of various types

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John Collins - WHOI

G & G

Seismology

### **Laboratories**

3,000 sq. ft. lab. □ Additional computer lab. (room for 10 workstations). □ Room for 2 laboratory vans on the maindeck

### **Science Storage**

2 vans plus 500 sq. ft below-deck storage for computer boxes, electronic boxes, Zarges boxes, etc. □ □

### **Deck Area**

4,000 square feet

### **Vans**

At least 2 x 20' laboratory vans on main deck. □ Vans must have power and ethernet. □ Room for an additional 2 vans for storage on other decks.

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## Ocean Class SMR Input Labs, Storage & Deck Area

Fred Spiess - SIO

G & G

seafloor deformation measurement, seafloor work systems, plate tectonics, etc.

### **Laboratories**

work space for assembling equipment convenient to aft deck, electronic repair and maintenance space.

### **Science Storage**

whatever caan reasonably be incorporated

### **Deck Area**

as much as reasonable

### **Vans**

2

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Peter Lonsdale - SIO

G & G

structure and geomorphology of oceanic crust, defined by geophysical surveys

### **Laboratories**

modest.

### **Science Storage**

room for a pair of large air-compressors and a seismic streamer on a reel

### **Deck Area**

modest

### **Vans**

air compressors if not permanently installed

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**Ocean Class SMR Input  
Labs, Storage & Deck Area**

Robert Ballard - URI

G & G; Other

Deepwater Archaeology

**Laboratories**

wetlab for the processing of artifacts, piston coring

**Science Storage**

storage of artifacts and supplies

**Deck Area**

multi-vehicles and 3-4 vans

**Vans**

3-4 16 foot vans

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John Orcutt - Scripps Institution of Oceanography

G & G; other

Marine seismology

**Laboratories**

Working space for handling and testing equipment such as seafloor seismometers and electrometers. Sufficient room for data management and playback.

**Science Storage**

Minimal - lab and deck space highest priorities.

**Deck Area**

Working area on deck is a higher priority, to me, than internal lab space and facilities.

**Vans**

1-2 20' vans

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## Ocean Class SMR Input Labs, Storage & Deck Area

Sean Wiggins - SIO

G & G; other

Marine Geophysics & Oceanographic Instrumentation

### **Laboratories**

dry lab for instrument maintenance, large enclosed area for vehicles like AUV's and ROV's

### **Science Storage**

### **Deck Area**

large

### **Vans**

2 x 20ft

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John Bash - URI

Other

Research Vessel Management

### **Laboratories**

### **Science Storage**

### **Deck Area**

1,500 sq. ft. stern

### **Vans**

Two standard vans, one to mate with lab.

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Joe Coburn - WHOI

Other

Research Vessel Management

### **Laboratories**

~3000 sq. ft. total, with wet lab, analytical lab with precise temp control, good access to decks. Maintain at least 7' headroom clearance BELOW all cable trays, etc.

### **Science Storage**

10,000 cu ft., with hoist(s).

### **Deck Area**

3000 Sq. Ft. 1200 psf deck loading, bolt down pattern on 2' centers

### **Vans**

Room & service to support 2 lab vans, for example radioisotope vans. Room for 2 more storage vans desirable.

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## Ocean Class SMR Input Labs, Storage & Deck Area

Marc Willis - OSU

Other

N/A

### **Laboratories**

Wet lab(s) and Dry Lab(s), minimum 900 sq. ft. each.  Wet labs should be configurable as dry space if necessary.  Clean seawater available throughout in sufficient volume and pressure.  Vertical unistrut on bulkheads on 2 ft centers, overhead unistrut on 2 ft centers.  Hinged access panels in overhead to valves, cable ways, pipe ways.  More power outlets than you think you'll need.  Over-power labs like crazy.  Centralized UPS system (?)

### **Science Storage**

Science Hold of at least 1500 cu. ft. with tiedown system - loading hatch easily accessible from cranes, access from inside vessel.

### **Deck Area**

2ft. bolt-down pattern

### **Vans**

up to 3 sea container-sized areas with (removable) Peck and Hale fittings for rad vans, reefers, storage vans, project vans.  Account for deck loading for stacked vans

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Steve Poulos - Hawaii

Other

Instrumentation

### **Laboratories**

All labs should have a video feed of CCTVs and real time data, both in terms of raw data coming from anywhere on ship and also logged real-time data for those who want access to logged data. Difference is that some instrumentation require a raw NMEA string (i.e. GPS) as part of its input, while some users just want the decoded/logged data (fix info).

### **Science Storage**

### **Deck Area**

In whatever space - 2ft tie downs on any working deck interior or exterior

### **Vans**

Where ever vans are placed - have Seawater drop, comms drop, video drop, basically same as other lab requirements.

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**Ocean Class SMR Input  
Labs, Storage & Deck Area**

Richard Pittenger - WHOI

Other

NA

**Laboratories**

Analytic, wet, dark microbiology, convertible main lab, computer lab. Total 2500 sq. ft.

**Science Storage**

10,000 cubic feet.

**Deck Area**

2000-2500 square feet. 5 to 100 feet clear deck on one side for long cores.

**Vans**

Four 8'x20', berthing van compatible to head shower/interior of ship.

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Paul Junggren - LDEO

Other

Marine Operations

**Laboratories**

Main lab- flexible in terms of layout  
Analytical lab- 2 fume hoods  
Wet lab- direct access to exterior of vessel  
Computer/electronics lab  
General comments- need clean power, good environmental control, labs should not be laid out so that they become passageways, uncontaminated seawater.

**Science Storage**

**Deck Area**

2500 square feet

**Vans**

Capable of handling 2 twenty foot containers. Services to be provided include- fresh water, electric, compressed air, internal communications, deck drains, sea water(uncontaminated),

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## Ocean Class SMR Input Labs, Storage & Deck Area

Terrence Joyce - WHOI

Physical Oceanography

Ocean general circulation, mesoscale variability

### **Laboratories**

large, configurable main lab; wet lab near hydrographic boom, climate controlled room

### **Science Storage**

20'x20'x6' storage with access to main deck via waterproof hatch

### **Deck Area**

min 500 sqft area for winches, mooring hardware, not to intrude on space for large CTD/rosette [WOCE-type] operations

### **Vans**

must carry 1 20' science van [on O1 deck] and at least one science storage van

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James Ledwell - WHOI

Physical Oceanography

Tracer release experiments

### **Laboratories**

Seward Johnson lab space or more

### **Science Storage**

Places for at least 4 x 20-ft containers on deck for storage or labs

### **Deck Area**

Oceanus or larger

### **Vans**

allow space for 4 20 foot vans at least.

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## Ocean Class SMR Input Labs, Storage & Deck Area

Dave Hebert - URI

Physical Oceanography

Mixing processes

### **Laboratories**

Main lab - easily configurable and with easy access to deck area for carrying long (2-m) fragile instruments. Size - slightly bigger than Oceanus Class  
Wet Lab - As large as that on the Wecoma  
CTD launch/recovery facility such as that on the Wecoma

### **Science Storage**

### **Deck Area**

Slightly larger than the Oceanus Class ships

### **Vans**

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Bill Johns - RSMAS

Physical Oceanography

Large-scale Ocean Circulation, Western Boundary Currents and Mesoscale Processes

### **Laboratories**

### **Science Storage**

### **Deck Area**

large aft deck, w/ linear dimension along centerline from aft A-frame to superstructure of minimum distance 40 ft and clear width 15 ft.

### **Vans**

temperature controlled van for water sample analysis

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Tetsu Hara - URI

Physical Oceanography

Air-sea interaction

### **Laboratories**

Equal to or larger than the Oceanus class ships

### **Science Storage**

### **Deck Area**

Equal to or larger than the Oceanus class ships

### **Vans**

**Ocean Class SMR Input  
Labs, Storage & Deck Area**

David Farmer - URI

Physical Oceanography

Upper Ocean Physics, Internal Waves, Coastal Processes

**Laboratories**

Dry lab similar in size to Ocean class vessels

**Science Storage**

Deck storage usually sufficient in my case

**Deck Area**

Similar to present Ocean class vessels

**Vans**

Do not use van.

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Mark Wimbush - URI

Physical Oceanography

Western Boundary Currents, esp. Kuroshio

**Laboratories**

normal

**Science Storage**

Enough to store equipment for up to 6 tall moorings, including anchors, 30 current meters, 6 releases, and (on or below decks) associated floatation.

**Deck Area**

1000-1200 sq ft

**Vans**

none

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## Ocean Class SMR Input Labs, Storage & Deck Area

Jack Barth - OSU

Physical Oceanography

coastal physical oceanography especially fronts and jets

### **Laboratories**

Dry lab with plenty of bench space for extensive computer network. Dry lab for towed vehicle operations. □ Room for 15-20 computers.

### **Science Storage**

minimal

### **Deck Area**

fantail to accomodate towed equipment and 3-6 coastal size moorings

### **Vans**

minimal

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Mark Prater - URI

Physical Oceanography

mesoscale dynamics, Lagrangian (RAFOS) floats

### **Laboratories**

main science lab, 2 secondary science labs, wet lab, enclosed hanger space for equipment storage and preparation.

### **Science Storage**

### **Deck Area**

Fantail large enough for tall mooring operations - 5-6 moorings

### **Vans**

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## Ocean Class SMR Input Labs, Storage & Deck Area

John Toole - WHOI

Physical Oceanography

observational physical oceanography

### **Laboratories**

Between Oceanus and Knorr

### **Science Storage**

nominal

### **Deck Area**

between Oceanus and Knorr

### **Vans**

2-4 per leg

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Michael McCartney - WHOI

Physical Oceanography

Abyssal circulation, thermocline ventilation, convection, and climate change

### **Laboratories**

Space for a portable hydrographic support van  
Hanger opening aft  
wet lab somewhat bigger than the Knorr's -- which is a tad too small to be useful  
NO usage of lab space for ships stores (e.g., the large freezer in the Oceanus)

### **Science Storage**

Van capacity similar to Knorr class

### **Deck Area**

I do large current meter arrays which require a deck working area (including anchor and glass ball storage (or syntatic foam spheres storage) so require equivalent of KNORR class deck area.

### **Vans**

capacity at least that of knorr -- not necessarily for my specific program but to make expeditionary planning easier.

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## Ocean Class SMR Input Labs, Storage & Deck Area

Brian Guest - WHOI

Physical Oceanography

Neutrally Buoyant floats and subsurface moorings

### **Laboratories**

Clean power, water and air should be within easy reach of all lab areas.

### **Science Storage**

1280 cubic ft (20x8x8)

### **Deck Area**

A Frame on stern that can pass a tall buoy of round source under (14-20 ft). Ample places to tie in gear with 2ft on center bolt pattern. Deck locker near main work area.

Quarterdeck area to handle large CTD packages with a clear view to winch operator. More attention to safe launch and recovery of CTD packages. Wet lab for sampling CTD in foul weather.

All winch drivers and the bridge should have a clear view of working areas and hands free communications to those areas.

### **Vans**

ability to store multiple vans and place on deck or ashore without the need for shoreside crane.

Charles Flagg - BNL

Physical Oceanography

Continental Shelf Processes, Shelf-ocean exchange, fronts

### **Laboratories**

A large open area that can be sub-divided as needed would be ideal. Provision for sinks and hoods should be flexible to allow for a variable balance of scientific tasks. In addition, there is a need for a wet lab with adequate drains where large quantities of water may be spilled and where samples can be prepared. I don't see the need for a separate computer lab for the use of oncoming scientific parties but the ship's data networking system does need some permanent and adequate space of its own.

### **Science Storage**

Hard to put into numbers. The below-deck scientific storage space on the Oceanus class ships is barely adequate and inconvenient to use. There also needs to be a way of loading and unloading the storage area that does not require carrying items through long passage ways or through hatches that are open to the weather.

### **Deck Area**

Mooring work should be possible which requires more deck storage area than working area. Deck area should be no smaller than that of the Oceanus.

### **Vans**

Unknown as I've never used a van but clearly there is a need at least for radiologically clean vans or other special needs vans. Whatever van is used, there needs to be adequate provision for safe/comfortable access as well as power and plumbing.

## Ocean Class SMR Input Labs, Storage & Deck Area

Craig Lee - UW

Physical Oceanography

upper ocean and mesoscale dynamics

### **Laboratories**

- Large, reconfigurable main laboratory.
- Protected high bay or hanger with large entrance to the fantail
- Wet lab adjoining highbay

### **Science Storage**

- Ability to handle a 20' van on deck.

### **Deck Area**

Ample fantail space, working deck along much of one side of the ship.

### **Vans**

- As mentioned above, 1 or 2 20' vans

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Ruth Curry - WHOI

Physical Oceanography

Water mass properties and ocean circulation in the context of global and regional climate

### **Laboratories**

CTD acquisition and processing / water sample analyses / mooring work bench / float storage and work benches

### **Science Storage**

### **Deck Area**

Room for 5-10 full depth moorings plus winch and 2 vans. □ Area for CTD deployment/recovery plus sheltered area for drawing water samples from rosette package.

### **Vans**

We bring our own.

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**Ocean Class SMR Input  
Labs, Storage & Deck Area**

Al Plueddemann - WHOI

Physical Oceanography

air-sea interaction and upper ocean dynamics

**Laboratories**

main lab, wet lab

**Science Storage**

science hold

**Deck Area**

open fantail with A-frame, one or more cranes, access to stbd and port rails

**Vans**

1-2 20' vans accessible by crane

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John Whitehead - WHOI

Physical Oceanography

Ocean Circulation and dynamics

**Laboratories**

Wet lab, ctd work, instrument repair, water, elect.

**Science Storage**

3 vans

**Deck Area**

50x50 feel

**Vans**

power

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## Ocean Class SMR Input Labs, Storage & Deck Area

Randy Watts - URI

Physical Oceanography

dynamics of large scale current systems

### **Laboratories**

wet lab; flexible large main lab -- don't chop it up; perhaps a clean-lab annex;

### **Science Storage**

Seek guidance from Endeavor/ Oceanus/ Wecoma operators regarding how well-utilized their holds are, and whether anything larger would help.

### **Deck Area**

Endeavor sized or slightly larger seems good; plan space for up to two 20-ft containers/ vans

### **Vans**

one or two 20-ft containers; not for sleeping, perhaps one as a lab and one for extra storage, such as bulky glass-ball floatation for moorings

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