

# National Association of Marine Laboratories (NAML)

*Annual Public Policy Meeting, March 2, 2015*

Rick Murray

*Division Director, Ocean Sciences*



# Personnel

*Division Director* Rick Murray, IPA (Boston University)  
Marine biogeochemistry / paleocean.  
Smooth transition with D. Bronk

*Section Heads* Bob Hautman (Integrative Programs)  
Mete Uz (Interim, BO and PO)  
Don Rice (Interim, MGG and CO)

*Program Officers* Dan Thornhill (Bio. Ocean.)  
Bill Miller (Chem. Ocean.)  
Additional ongoing searches



# Decadal Survey of Ocean Sciences, 2015-2025

*NRC/NAS, Released Jan. 23, 2015*



2013: David Conover, Div. Dir.

2014: Deborah Bronk, Div. Dir.

2015 - : Digestion, Planning,  
& Implementation



# Decadal Survey of Ocean Sciences, 2015-2025

*NRC/NAS, Released Jan. 23, 2015*

PREPUBLICATION COPY

## SEA CHANGE

2015-2025  
Decadal Survey of  
Ocean Sciences

NATIONAL RESEARCH COUNCIL  
OF THE NATIONAL ACADEMIES

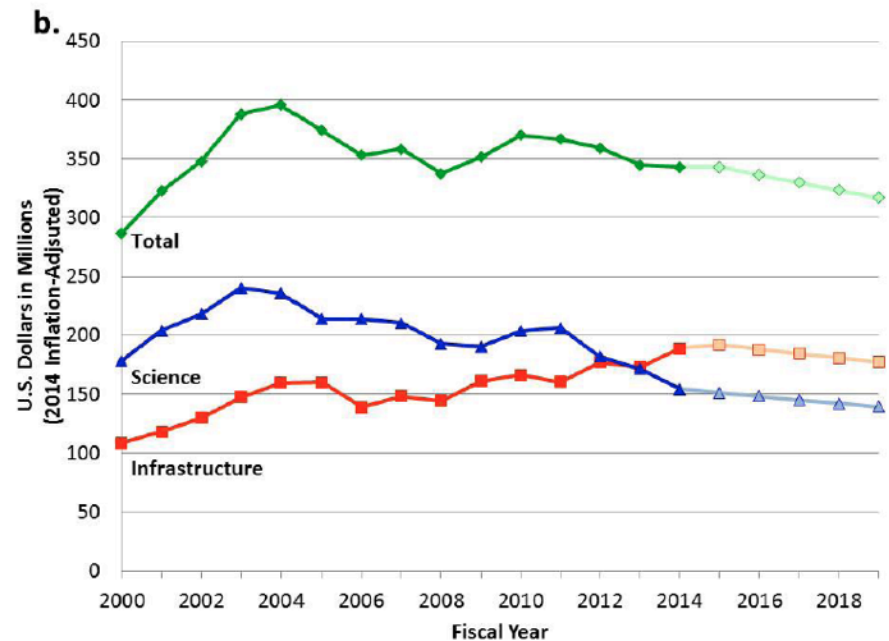
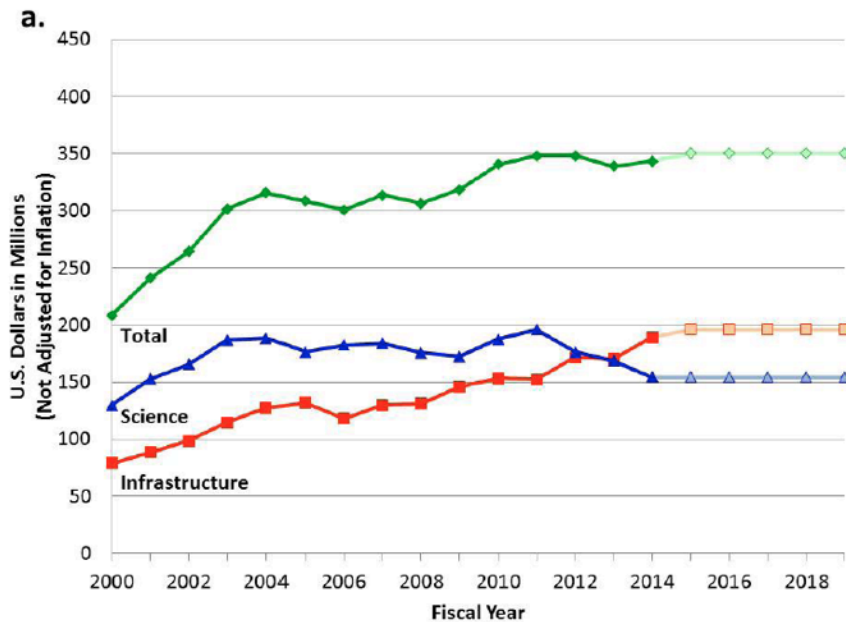
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# Decadal Survey of Ocean Sciences, 2015-2025



# Decadal Survey of Ocean Sciences

## Comment #1

*This is indeed a "Sea Change" report that is...*

- *Carefully crafted and well presented,*
- *Hits the "big picture" accurately,*
- *Offers opportunities for NSF OCE to reassess and reorient for the near-, medium-, and long-term future, and...*
- *We (the community, including NSF) are indebted to the committee members, NRC staff, reviewers, etc., for their effort and their product.*



# Decadal Survey of Ocean Sciences

## Statement of Task

1. A review of the *current state of knowledge...*
2. A concise set of compelling *high level scientific questions...*
3. An analysis of *research infrastructure needed to address priority research...*
4. An analysis of the current portfolio of investments... *with recommendations to align to #2.*
5. An identification of *opportunities to complement...other federal agencies.*



# Decadal Survey of Ocean Sciences

## Science Priorities

1. Rates, mechanisms, impacts, etc....sea level rise?
2. Coastal, estuarine ecosystems and linkages.
3. Ocean biogeochemistry & physics...and climate.
4. Biodiversity & resilience of ecosystems, & changes.
5. Marine food webs in the coming century.
6. Formation and evolution of ocean basins.
7. Geohazards (quakes, tsunamis, landslides, volc.).
8. Subseafloor biosphere; biogeochem. cycles & life.





# Decadal Survey of Ocean Sciences

## Comment #2

- *As noted by the report, these are **not prioritized**.*
- *"Rather, they are ordered from the ocean surface, through the water column, to the seafloor."*

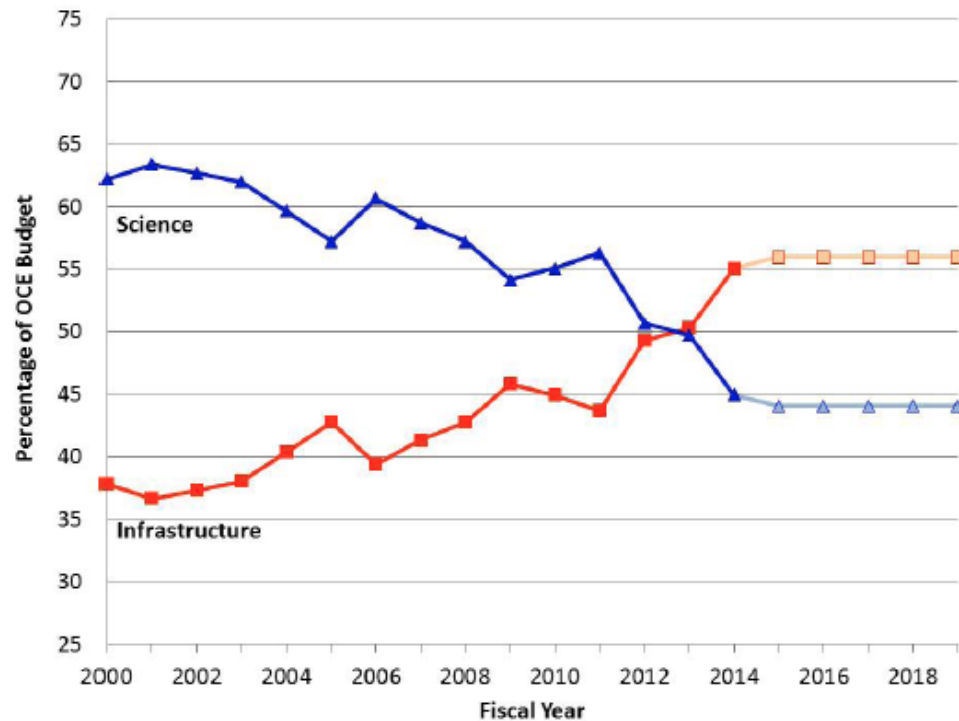
*...AND...*

- *NSF has in the past, and will continue in the future, fund excellent ocean science regardless of topic, maintaining the highest standards of external and internal review.*



# Decadal Survey of Ocean Sciences

## Mapping of Science and Infrastructure



**Figure 3-2** NSF investments in core ocean science (blue) and infrastructure (orange) since 2000, as a percentage of the total OCE budget. These percentages were calculated based on OCE data presented in the following chapter (Figure 4-1). FY2015-2019 projections assume flat budgets with no inflationary increases. OCE defines “infrastructure” as the academic research fleet, OOI, IODP, field stations and marine laboratories, the accelerator mass spectrometer facility, and miscellaneous smaller facilities. Facilities held in the core programs (shown in Table 3-1) are included in core science, not in infrastructure. Data from NSF, December 2014.

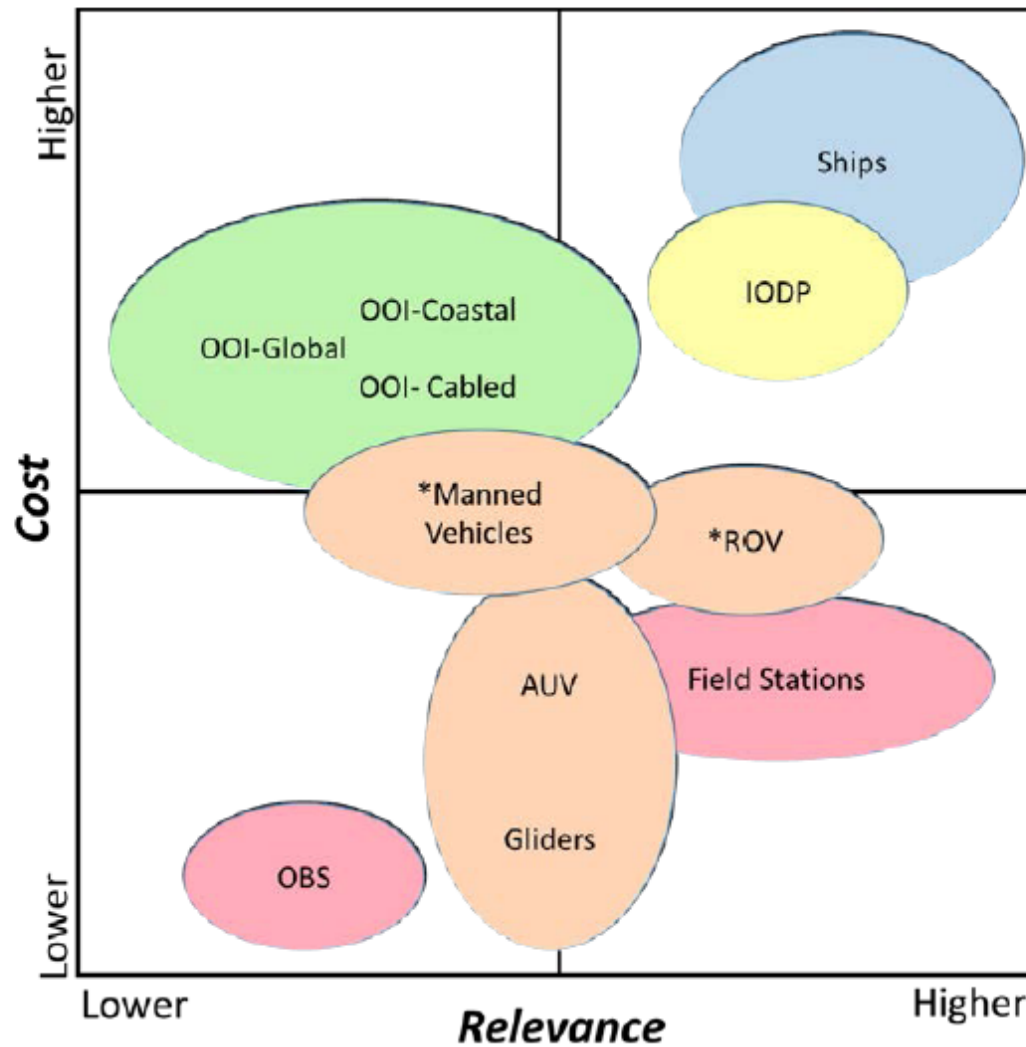


# Mapping of Science and Infrastructure

**Table 3-2** Alignment of current NSF-funded ocean research infrastructure to the eight decadal science priorities. A “C” indicates a critical asset, while “I” indicates an important asset. The approach taken to reach this alignment is discussed in the text. A list of other critical or important infrastructure is also included.

		1. Sea level change	2. Coastal and estuarine oceans	3. Ocean and climate variability	4. Biodiversity and marine ecosystems	5. Marine food webs	6. Ocean basins	7. Geohazards	8. Subseafloor environment
Fleet and Other Ships	Global/Ocean	C	I	C	C/I	C/I	C	C	C
	Regional/Coastal	I	C	C/I	C	C			
	3-D Seismic Ship						C/I	C	I
	Ice-Capable	C/I	I	C	C/I	C/I	I		
IODP	<i>JOIDES Resolution</i>	I		I			C	C	C
OOI	Coastal	I	I	I					
	Global			I					
	Cabled						I	I	I
Vehicles	<i>Alvin</i>				I	I			I
	ROVs						I	I	C
	AUVs		I		I	I	I		
	Gliders	I	I	I	I				
Other	OBSs						I	C	
	Field Stations / Marine Labs	I	C	I	C	C/I			
Other Critical or Important Infrastructure Assets		Argo, tide gauges, satellites, ice-ocean models, coring facilities and core repositories, mission-specific drilling platforms (MSPs)	River gauges, hydrologic models, satellites, coring facilities and core repositories	Argo, modeling, surface weather analyses, satellites, coring facilities and core repositories, acoustic tomography, MSPs	Fisheries surveys and vessels, sequencing facilities, manned/unmanned vehicles, satellites	Fisheries surveys and vessels, taxonomy, isotope facilities, manned/unmanned vehicles, satellites	global seismograph arrays, magnetotellurics, manned/unmanned vehicles, <i>Chikyu</i> , MSPs	Interferometric synthetic aperture radar, seafloor geodesy, satellites, magnetotellurics, coring, manned/unmanned vehicles, <i>Chikyu</i> , MSPs	Sequencing facilities, manned/unmanned vehicles, <i>Chikyu</i> , MSPs

# Mapping of Science and Infrastructure



**Figure 3-9** Relative cost versus relevance of the infrastructure presented in Table 3-2 (colors are keyed to the same infrastructure). Ships are clustered into one group for this figure. The asterisk next to manned vehicles and ROVs indicates that costs increase if the costs of necessary support vessels are included.

# Mapping of Science and Infrastructure

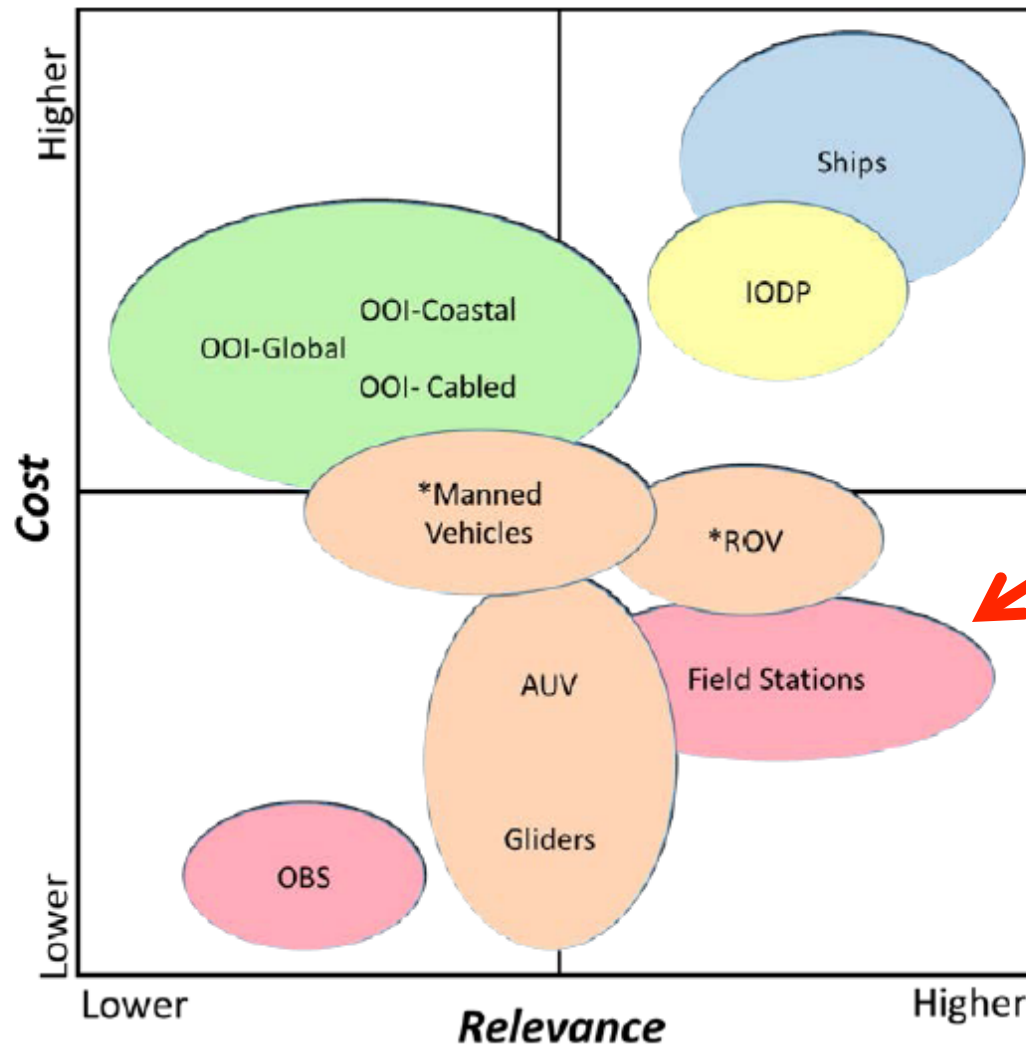
## Comment #3

Message to the community....

- *Do not over-interpret smaller details.*
- *Large-scale assessment is most important.*



# Mapping of Science and Infrastructure



**Figure 3-9** Relative cost versus relevance of the infrastructure presented in Table 3-2 (colors are keyed to the same infrastructure). Ships are clustered into one group for this figure. The asterisk next to manned vehicles and ROVs indicates that costs increase if the costs of necessary support vessels are included.

# Decadal Survey of Ocean Sciences

## Other Facilities & Infrastructure

### Field Stations and Marine Laboratories

*(p. 90-91)*

*"...are valuable research platforms..."*

*"...provide vital baseline data..."*

*"...vital role in decadal priority science themes..."*

*"...enhance the quality of scientific research and engagement..."*



# Decadal Survey of Ocean Sciences

## Recommendations

### *Chapter 4*

*“The Path Forward: Maintaining Ocean Science in a  
Constrained Budget Environment”*





## Decadal Survey Recommendations

1. *Maintain balance b/w infrastructure & core research.*
2. *Reduce O & M, increase core; Infrastruct.  $\leq$  40-50%.*
3. *Immediate 10% reduction in infrastructure, plus further 10-20% over next 5 years.*
4. *Weighted Cuts. OOI  $\sim$ 20%, IODP  $\sim$ 10%, Fleet  $\sim$ 5%.*
5. *Regional Class Research Vessels (RCRV). Two, not 3.*
6. *Infrastructure reviews every 3-5 years with a 10-yr outlook. Exit strategies, etc.*
7. *Initiate high-level standing infrastructure oversight committee.*
8. *Expand partnerships: Other agencies, international, other sectors.*



## Comment #4

1. *Maintain balance b/w infrastructure & core research.*
2. *Reduce O & M, increase core; **Infrastruct.  $\leq$  40-50%.***
3. *Immediate **10% reduction in infrastructure, plus further 10-20% over next 5 years.***
4. ***Weighted Cuts. OOI  $\sim$ 20%, IODP  $\sim$ 10%, Fleet  $\sim$ 5%.***
5. ***Regional Class Research Vessels (RCRV). Two, not 3.***
6. *Infrastructure reviews every 3-5 years with a 10-yr outlook. Exit strategies, etc.*
7. *Initiate high-level standing infrastructure oversight committee.*
8. *Expand partnerships: Other agencies, international, other sectors.*



# Decadal Survey Recommendations

## Comment #5

- *Staying focused on science.*
- *Will strive to maintain, or ideally enhance, science goals via the “return of funds to core”.*
- *How can we, as a community, do things differently now than we could in the past?*



# Where Do We Stand As of Now?

## Comment #6

- *No decisions finalized. Establishing baseline and determining metrics.*
- *Goal: Majority of plan in place by late spring.*
- *Other aspects...*
  - *Cyberinfrastructure throughout OCE.*
  - *Governance & community engagement of OOI.*
  - *Technology and development.*
  - *Partnerships (interagency, private, etc.)*



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