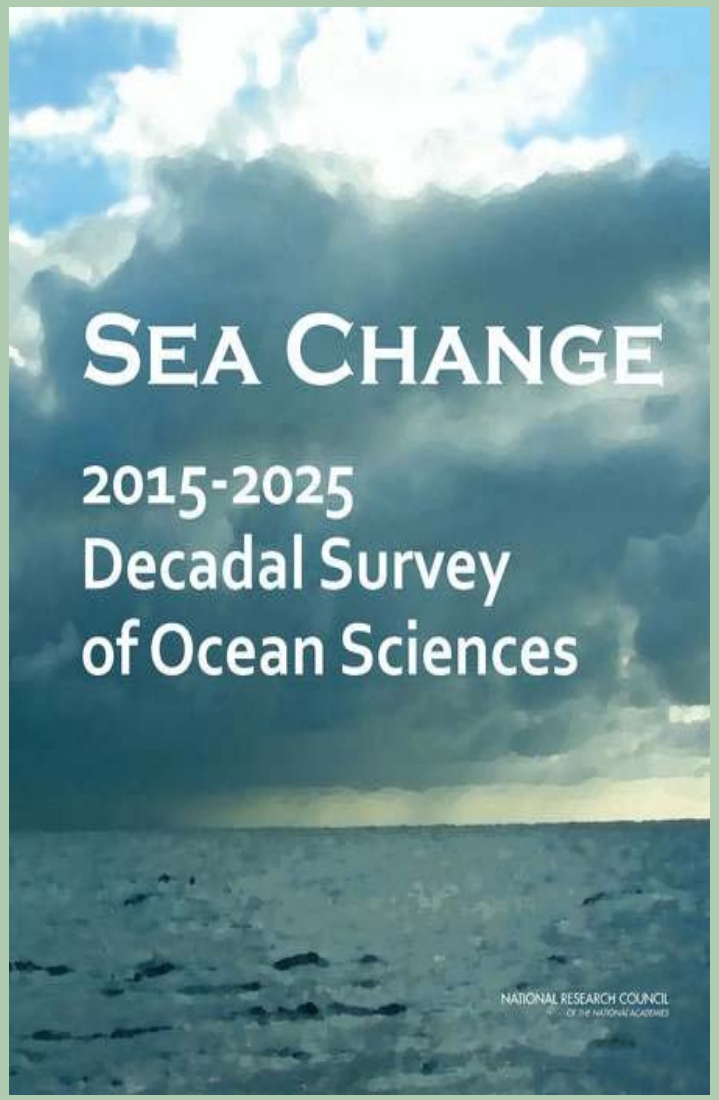
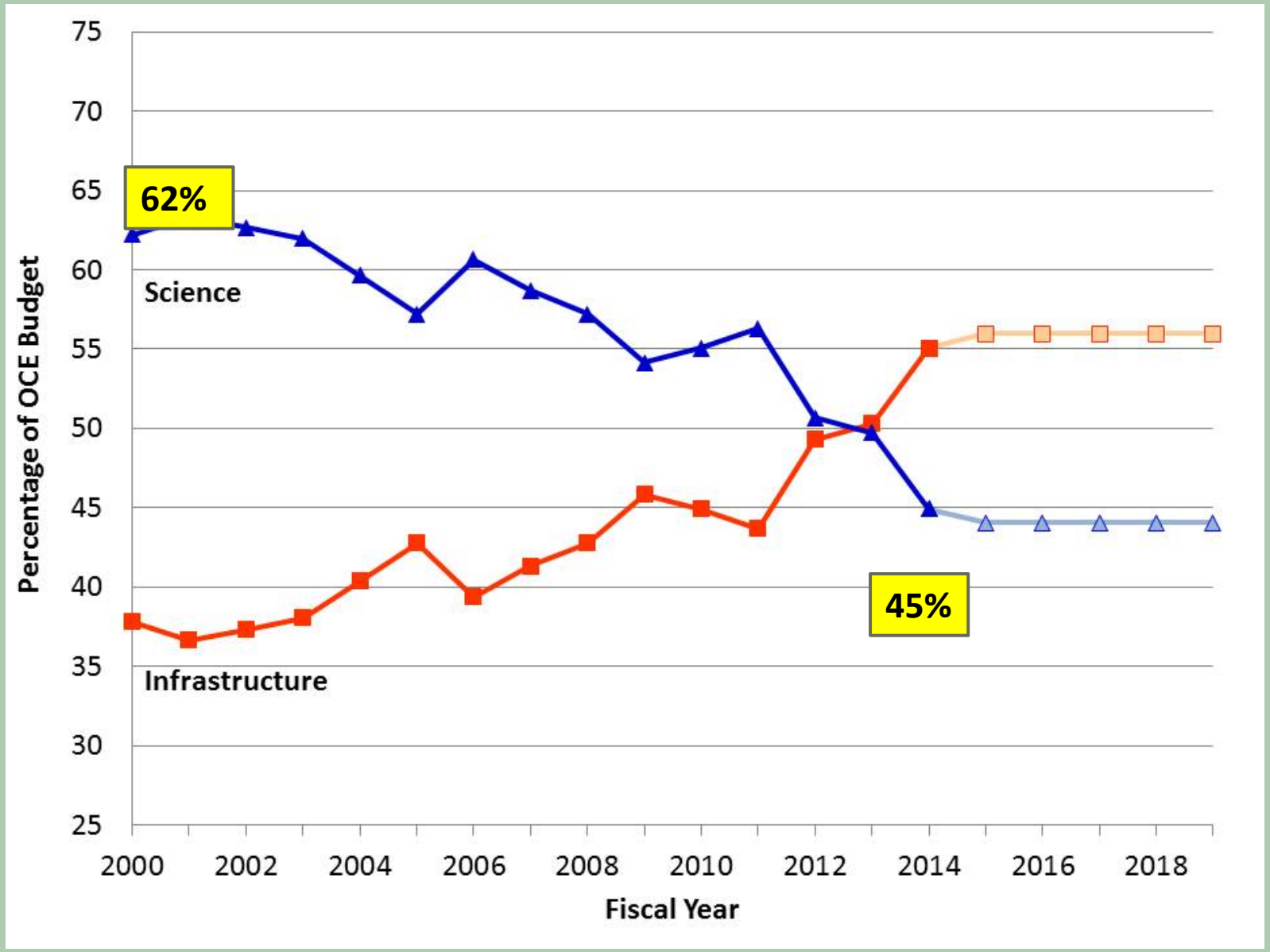


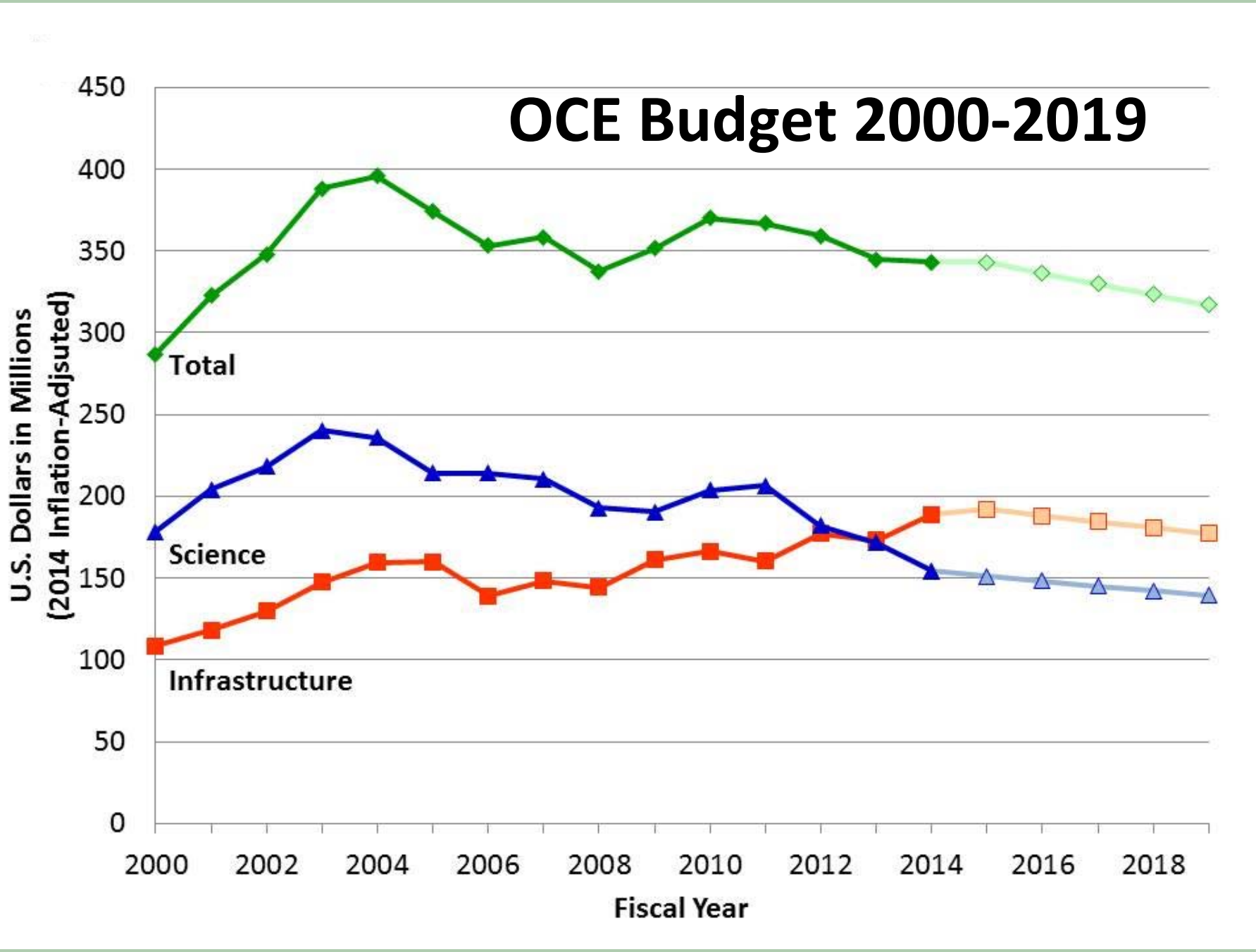
Recommendation 1: In order to sustain a robust ocean science community, holistic fiscal planning is necessary to maintain a balance of investments between core research programs and infrastructure. To maintain a resolute focus on sustaining core research programs during flat or declining budgets, **infrastructure expenses should not be allowed to escalate at the expense of core research programs.**

Recommendation 2: OCE should strive to reduce the O&M costs of its major infrastructure (OOI, IODP, and the academic research fleet) and restore funding to core science and OTIC within the next 5 years. If budgets remain flat or have only inflationary increases, **OCE should adjust its major infrastructure programs to comprise no more than 40-50% of the total annual program budget.**

Recommendation 3 & 4 : To implement Recommendation 2, OCE should initiate **an immediate 10% reduction in major infrastructure costs in its next budget, followed by an additional 10-20% decrease over the following 5 years…**The immediate initial 10% cost reduction in major infrastructure should be distributed, with the greatest reduction applied to OOI, a moderate reduction to IODP (2013-2018), and the smallest reduction to the academic research fleet. **A suggested weighting is to initially and immediately reduce OOI by 20%, IODP by 10%, and the University-National Oceanographic Laboratory System fleet by 5%.** Cost savings should be applied directly to strengthening the core science programs…

Current OCE Budget




OCE Budget 2000-2019
U.S. Dollars in Millions (2014 Inflation-Adjsuted)
450
400
350
300
250
200
150
100
50
0
Total
Science
Infrastructure
2000
2002
2004
2006
2008
2010
2012
2014
2016
2018
Fiscal Year

Sea Change Report Recommendations

The Academic Research Fleet

Immediate Cuts

As part of the overall strategy to reduce infrastructure costs, an initial cut of approximately $3 million would be needed, representing a ~4% reduction in FY2014 UNOLS operating costs. **Given the magnitude of the immediate cut and the uneven utilization rates (sea days per vessel) by various classes of vessels, the committee explored the option of laying up one of the 19 vessels in the fleet.** This strategy is complicated by the spatial distribution of the current fleet and by the presence of purpose-built assets versus general purpose ships. Three separate options for a fleet lay-up were considered, each of which would meet the requirement for an approximate $3 million savings in the near term.

1. **Immediate lay-up of the R/V *Langseth*.** *Langseth* is operated less and has a higher day rate than the other general-purpose Global class vessels and *Atlantis.* ***Consequences*: This option would lead to a reduced capability for sub-seafloor research due to the loss of access to specialized seismic tools**. It would also lead to the loss of a Global class vessel, although its use as a general-purpose platform is questionable. **Commercial seismic ships could be chartered as an alternative, which would require an analysis of charter rates and mission requirements.**

NSF Response to Sea Change Report

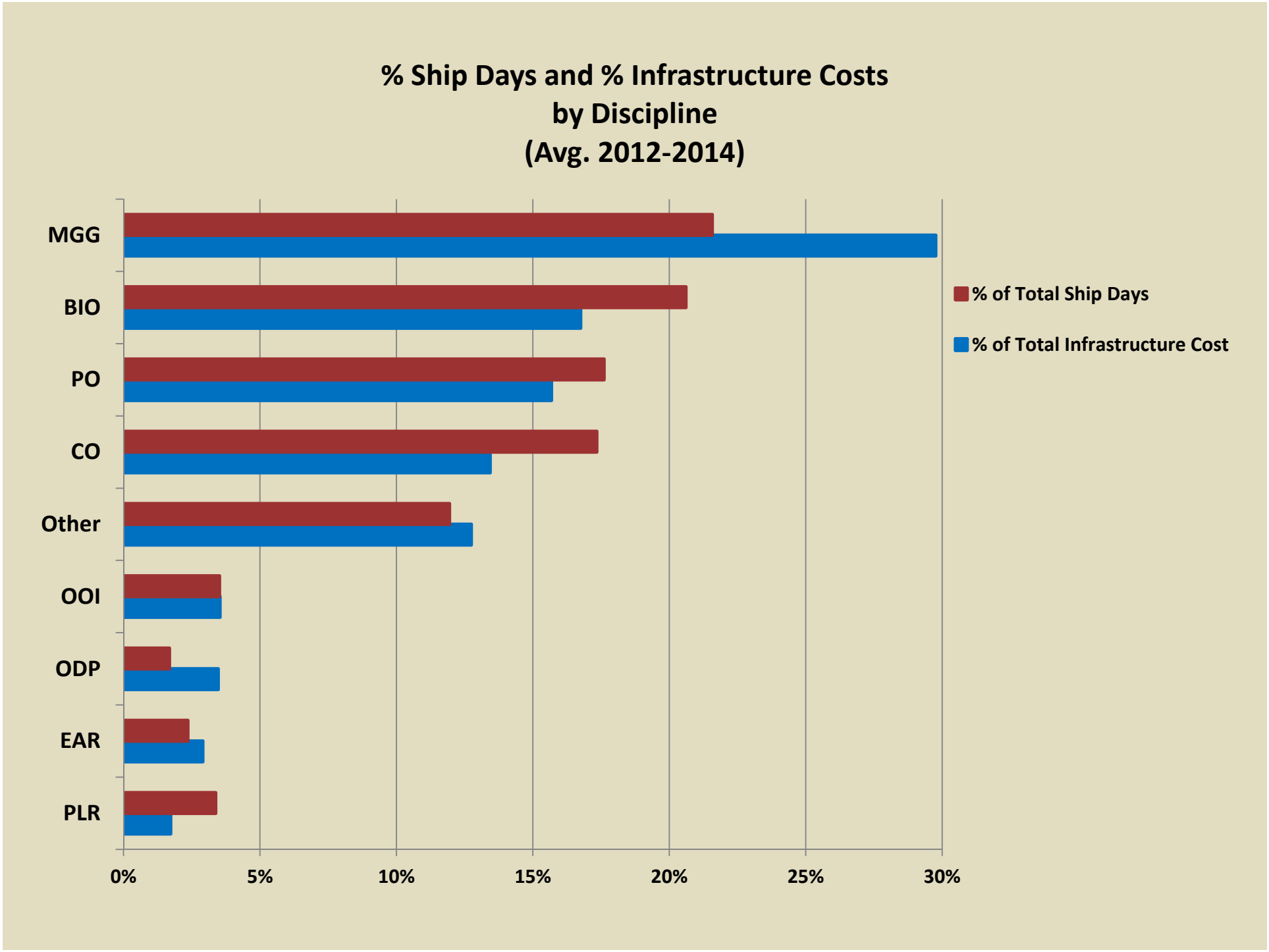
<u>Marine Seismic Research</u>: NSF will continue to support the capability to perform both 2-Dimensional (2D) and 3-Dimensional (3D) seismic research of high national interest. Many large-scale scientific research questions such as understanding sea level rise, probing the structure of the deep crust, and assessing Geohazards such as earthquakes and explosive volcanism, require specialized seismic infrastructure capable of operating throughout the global ocean.

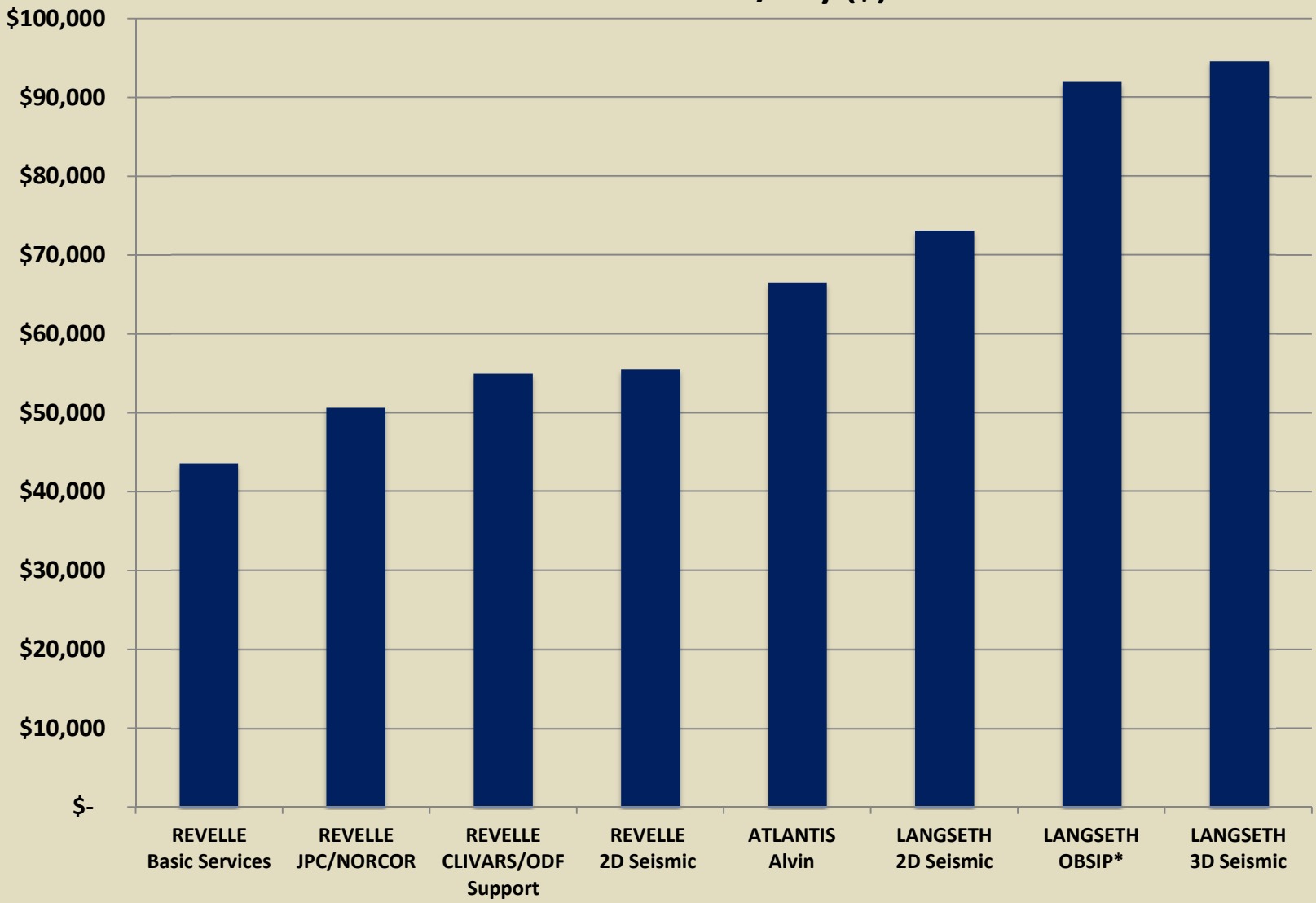
Current contractual obligations and commitments to funded seismic projects during FY2015-16 will continue to move forward using the R/V *Langseth*. **Beyond that time frame, NSF is exploring ways to ensure the continued capability to support marine seismic research.**

First, **NSF is considering investing in portable components, complete with a modular streamer with top-side electronics and cable-leveling devices configurable for 2D and 3D arrays** that will enable academic researchers to perform high quality seismic research using other UNOLS vessels... If long-offset, top quality source components are feasible with this portable approach, then ~75% of the U.S. academic marine seismic need could be achieved, as determined by a self-study of the number of proposals received requiring seismic capability over the past 5 years.

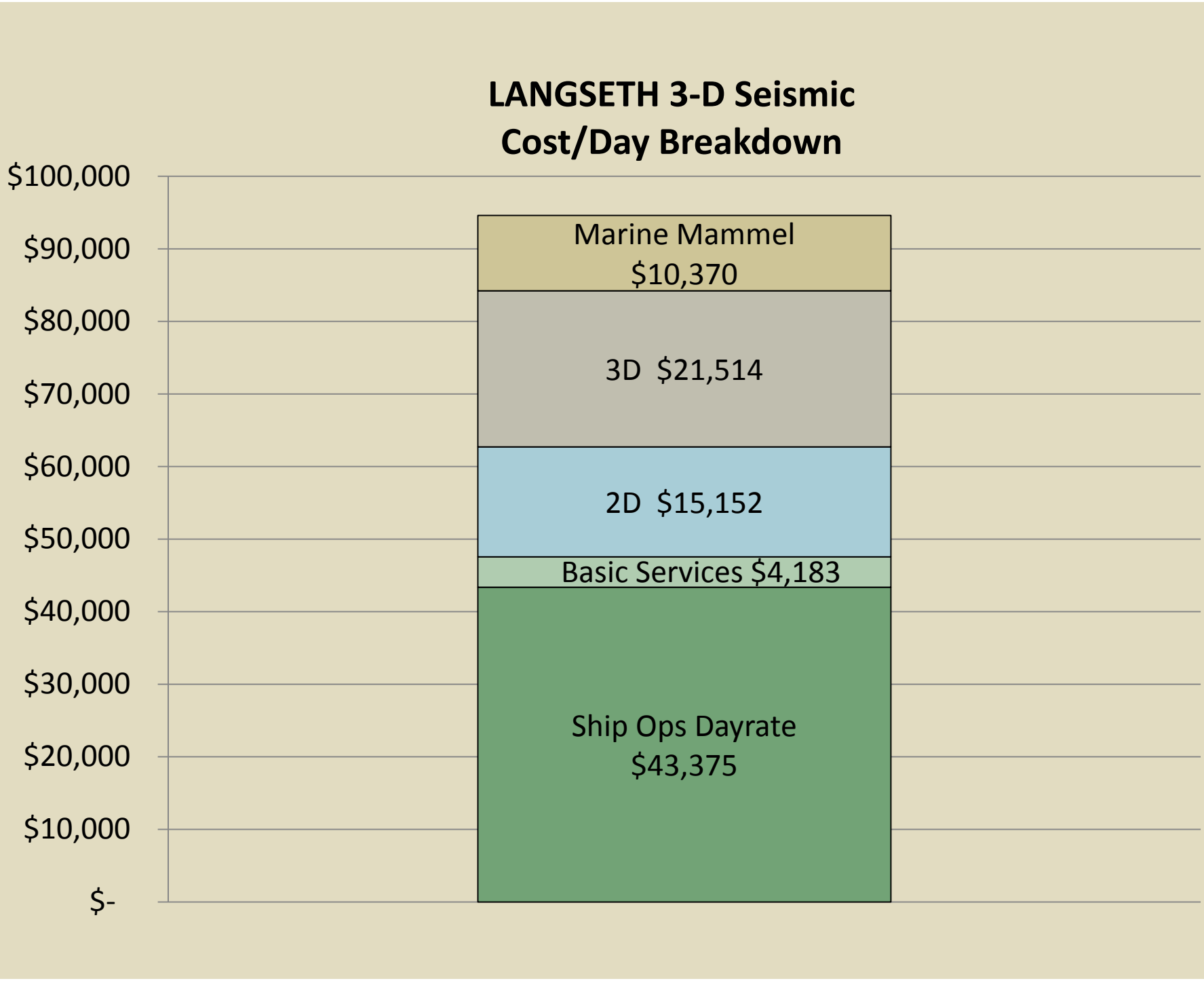
Second, NSF will pursue conducting an open solicitation for ownership of the R/V *Langseth* that would provide NSF with a to-be-determined number of days at sea per year to serve the U.S. academic research community with state-of-the-art source, long offset 2D, and a baseline 3D capability. If NSF, as a federal agency, no longer owns the vessel, the remaining R/V *Langseth* time would be available to support the business model of the new owner.

Third, in order to further enhance efficiency of marine seismic research requiring deep crustal imaging, including 3D, **NSF intends to strategically schedule these operations via regional planning over a period of several years.** This research capability could potentially be supported by R/V *Langseth* through a new ownership model, by international partners, and/or through strategic contractual arrangements with industry.


% Ship Days and % Infrastructure Costs
by Discipline
(Avg. 2012-2014)
MGG
BIO
PO
CO
Other
OOI
ODP
EAR
PLR
0%
5%
10%
15%
20%
25%
30%
% of Total Ship Days
% of Total Infrastructure Cost



*Avg cost of OBSIP/ship day


LANGSETH 3-D Seismic
Cost/Day Breakdown
$100,000
$90,000
$80,000
$70,000
$60,000
$50,000
$40,000
$30,000
$20,000
$10,000
$-
Marine Mammel
$10,370
3D $21,514
2D $15,152
Basic Services $4,183
Ship Ops Dayrate
$43,375

Why are we here?

What does NSF expect from this workshop?

1) A report that informs NSF about the feasibility of “portable systems” and the use of Commercial/Industry contractors.
2) Addresses the following questions:
    - In the absence of Langseth, what is the most capable system that can be put on another ‘global’ vessel, say Revelle?
    - What are the limitations i.e. what science can/cannot be addressed?
    - What are the cost and operational considerations of these models?
3) “Portable” does not mean:
    - 1,200m high-res system supported by SIO
    - P-cable
4) This is a Facilities workshop and the findings will directly impact how NSF operates the National Seismic Facility. We encourage the science talks to focus on how the facility impacts their ability to do their science.