



University-National Oceanographic Laboratory System

***UNOLS Report
to the
Deep Submergence Science Committee***

**Peter H. Wiebe
UNOLS Chair**

**May 24, 2006
Woods Hole Oceanographic Institution
Woods Hole, MA**



Outline of Presentation

University-National Oceanographic Laboratory System

- I. Budget Shortfalls and Impact on Future Fleet Operations
 - A. Utilization and Cost Trends
 - B. 2006 Fleet Utilization
 - C. 2007 Fleet Projections
 - D. UNOLS Subcommittee Formed

- II. Academic Fleet Renewal

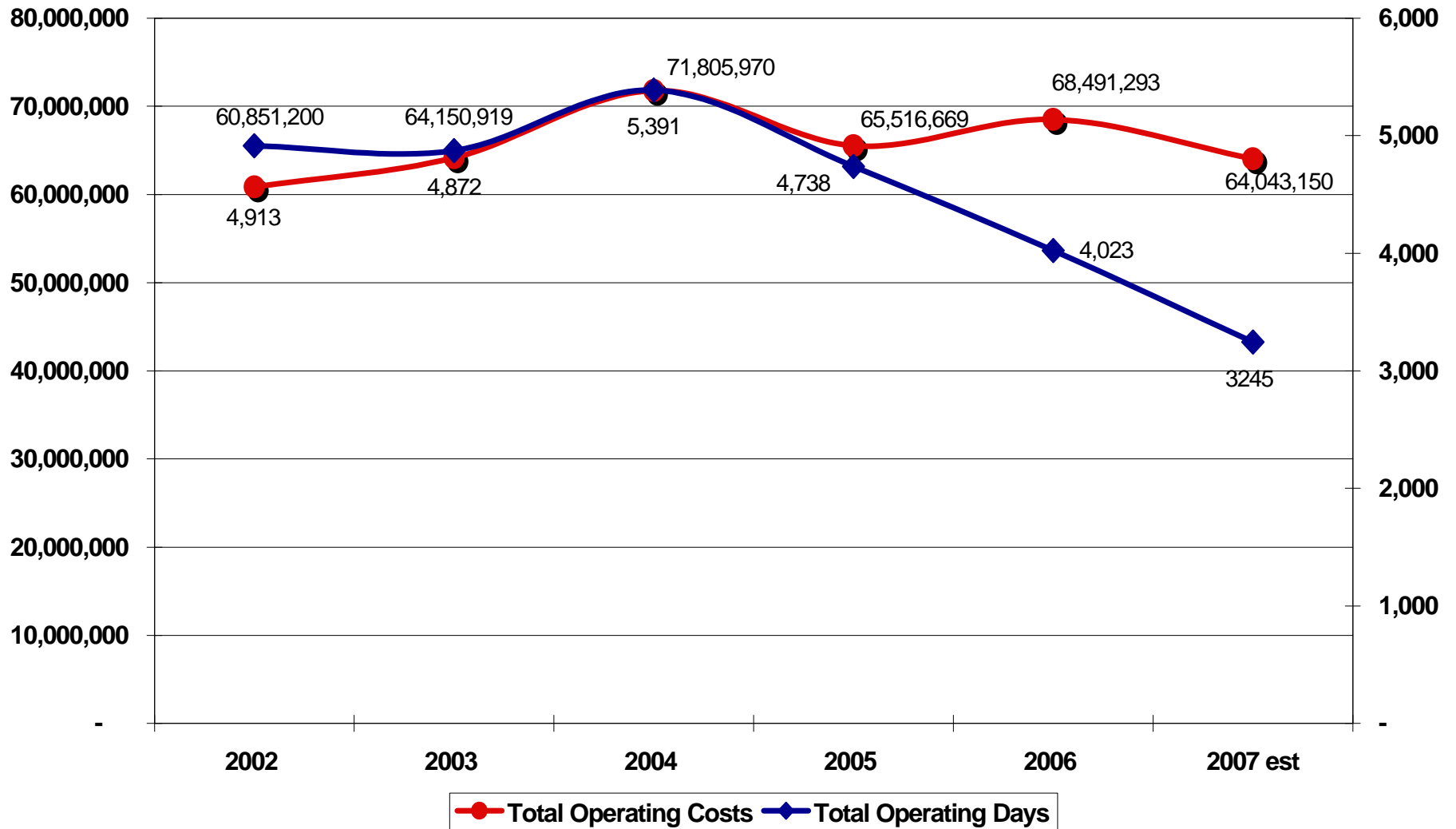
- III. Other UNOLS Activities

- IV. UNOLS Committee Activities



2002 – 2007 UNOLS Fleet Operating Days and Costs

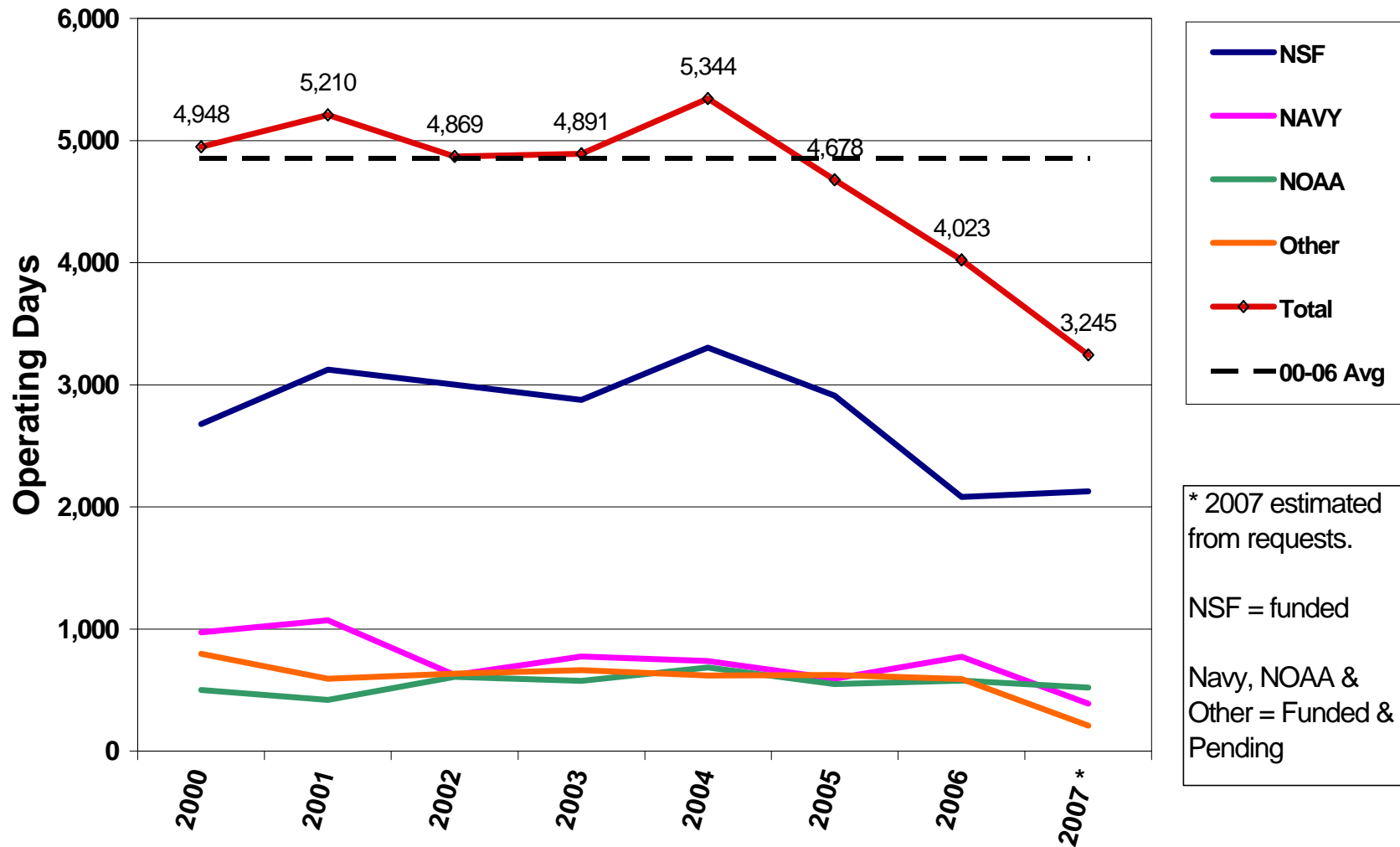
University-National Oceanographic Laboratory System





Fleet Utilization by Federal Agency

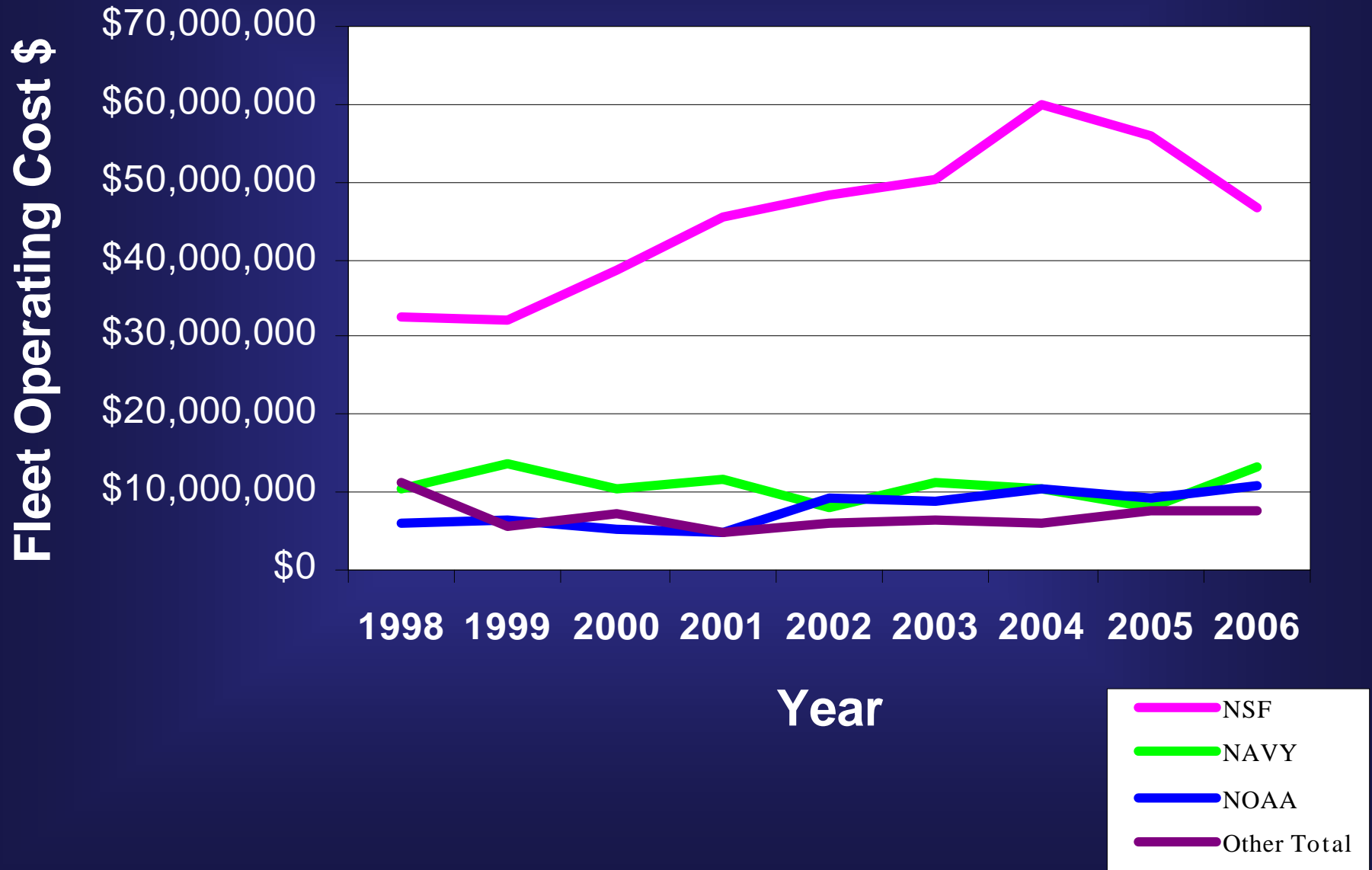
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Fleet Costs by Federal Agency

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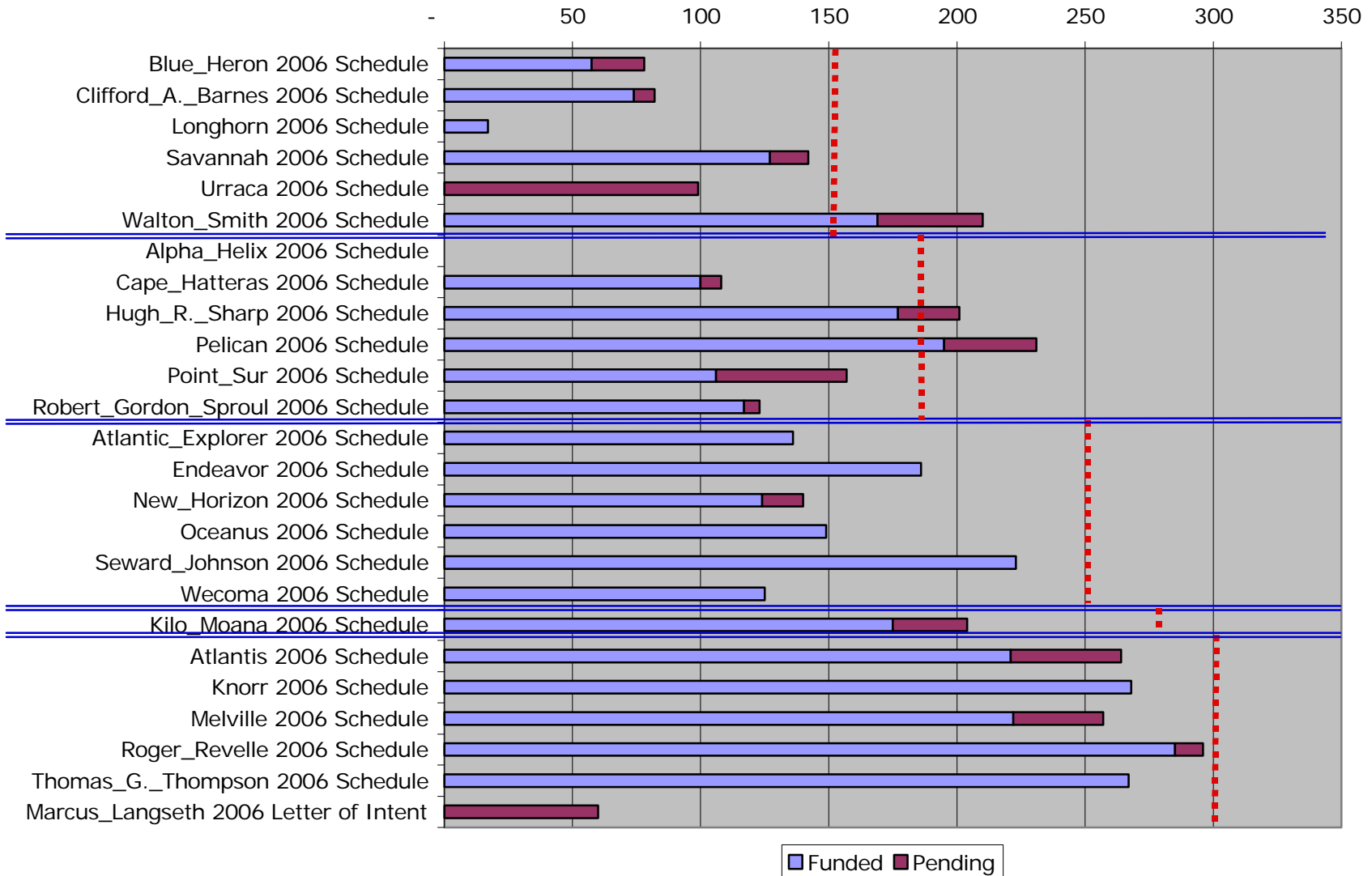




2006 Scheduled Ship Time

University-National Oceanographic Laboratory System

2006 UNOLS Operating Days

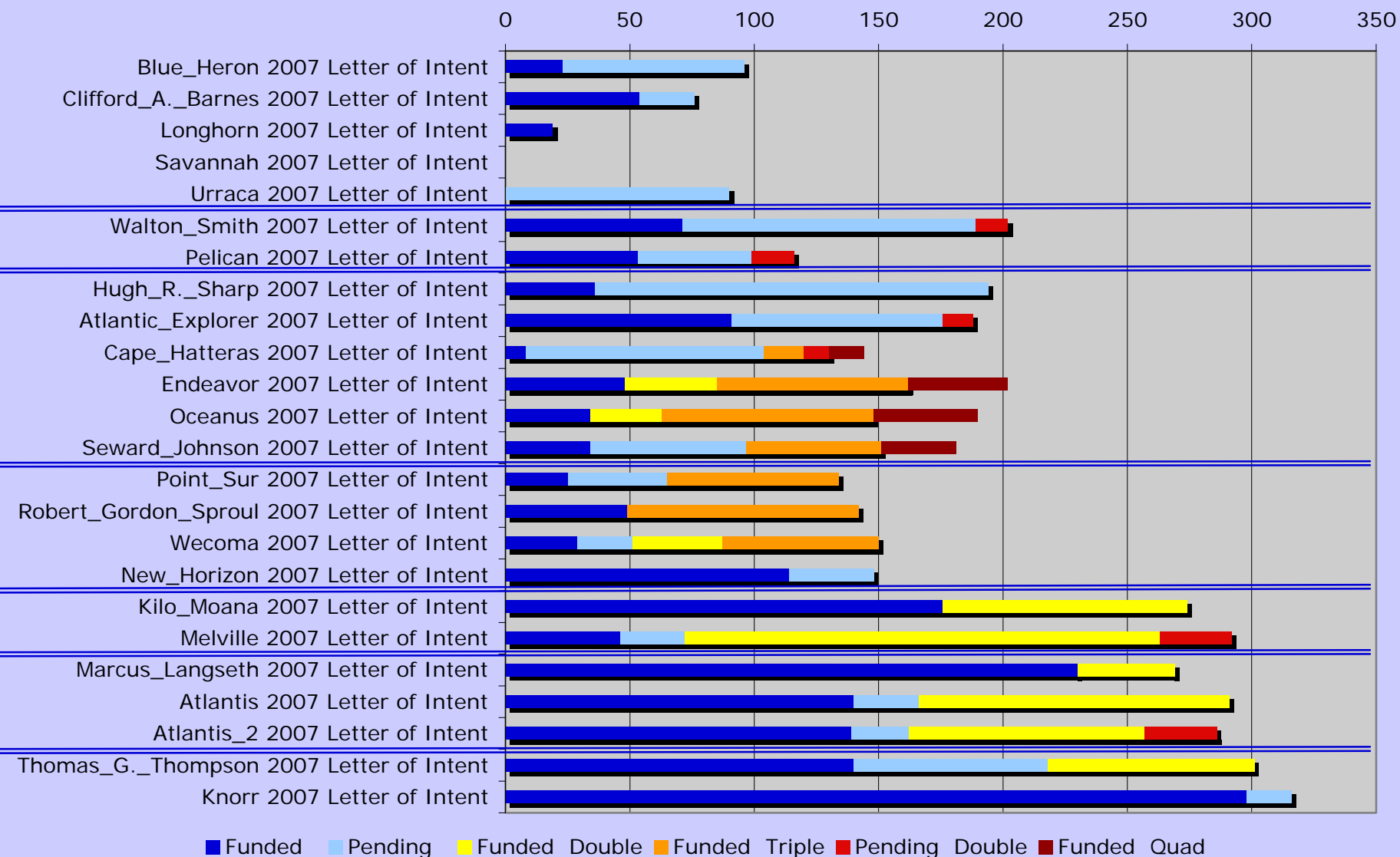




2007 Ship Time

University-National Oceanographic Laboratory System

2007 Schedules - Showing Double, Triple & Quadruple Bookings





UNOLS Subcommittee Formed

University-National Oceanographic Laboratory System

- March 2006 – Council forms subcommittee to prepare guidelines that would be used by the Council to make recommendations regarding ship lay-ups or retirements from the Fleet
- Subcommittee:
 - Marcia McNutt (MBARI), Chair
 - Wilf Gardner (TAMU)
 - Peter Ortner (U. Miami)
 - Curt Collins (NPS)
- Subcommittee Charge: Develop a short white paper to focus UNOLS Council discussion and agreement upon an equitable and defensible process to be followed by UNOLS to arrive upon a recommendation by July 2006 as to which UNOLS vessels would be laid up in 2007 or beyond or retired.



Subcommittee Questions to Operators

University-National Oceanographic Laboratory System

1. Is there any difference in the operations or maintenance costs of the older Global-class ships (*Melville* and *Knorr*) versus the younger ones (*Thompson*, *Revelle*, and *Atlantis*)? Is there any difference in the science that can be accommodated on the older ones versus the younger ones?
2. Can the special purpose ships, such as the *Atlantis* and the *Langseth*, conduct in a cost effective manner the same programs that are usually put on the other global class ships? Or is there a major penalty paid by "filling out their schedules" with general purpose work?
3. Are there any arguments for maintaining a geographic distribution of global class ships, or is the home port immaterial in terms of meeting the community's needs?



Subcommittee Questions to Operators

University-National Oceanographic Laboratory System

4. What are the tradeoffs, financial and otherwise, of having many versus fewer ship operators? e.g., Is there any indication that multi-ship operations are most cost effective? Does having more operators bring in more state and other funding to the fleet?
5. What are the nominal retirement dates for each of the Intermediate class ships and how many of them are likely to be replaced?
6. Are there other values or criteria that should be used as factors in recommending lay-ups or retirements?



Outline of Presentation

University-National Oceanographic Laboratory System

I. Budget Shortfalls and Impact on Future Fleet Operations

II. Academic Fleet Renewal

- A. Regional Class
- B. Ocean Class
- C. Alaska Region Research Vessel
- D. New Construction/Conversions
- E. Global Science Mission Requirements
- F. Fleet Improvement Plan

III. Other UNOLS Activities

IV. UNOLS Committee Activities



Regional Class Acquisition Status

University-National Oceanographic Laboratory System

- April 27, 2006 - Contract awards for Phase I of the Regional Class Research Vessel (RCRV) program:
 - Dakota Creek Industries, Anacortes, WA
 - Nichols Brothers Shipbuilders, Freeland, WA
- Phase I is preliminary/contract design - twelve month period and a firm fixed price of ~ \$1 Million each.
- Phase II is detail design and construction.
- Based on proposals submitted by the two Phase I Contractors, a single Phase II contract for detailed design and construction is anticipated to be awarded at the end of Phase I (second quarter CY2007). The Phase II contract will be for a lead ship with options for up to two more.



Ocean Class - Timeline

University-National Oceanographic Laboratory System

- 7/2002** Ocean Class SMR Community Workshop
- 3/2003** Ocean Class Science Mission Requirements (SMRs) finalized
- 4/04-7/04** Ocean Class Concept Definition Task
- 10/04-3/05** Hull Evaluation (Monohull, SWATH, X-Craft)
- 3/05** UNOLS provides hull recommendation to Navy (monohull)
- FY2006** Funds Appropriated for Ocean Class Design
- Spring 06** Navy forms Naval Research Advisory Committee to provide recommendation regarding Navy's role in acquisition of Ocean Class

Alaska Region Research Vessel (ARRV)

Length 236 feet

Beam 48 feet

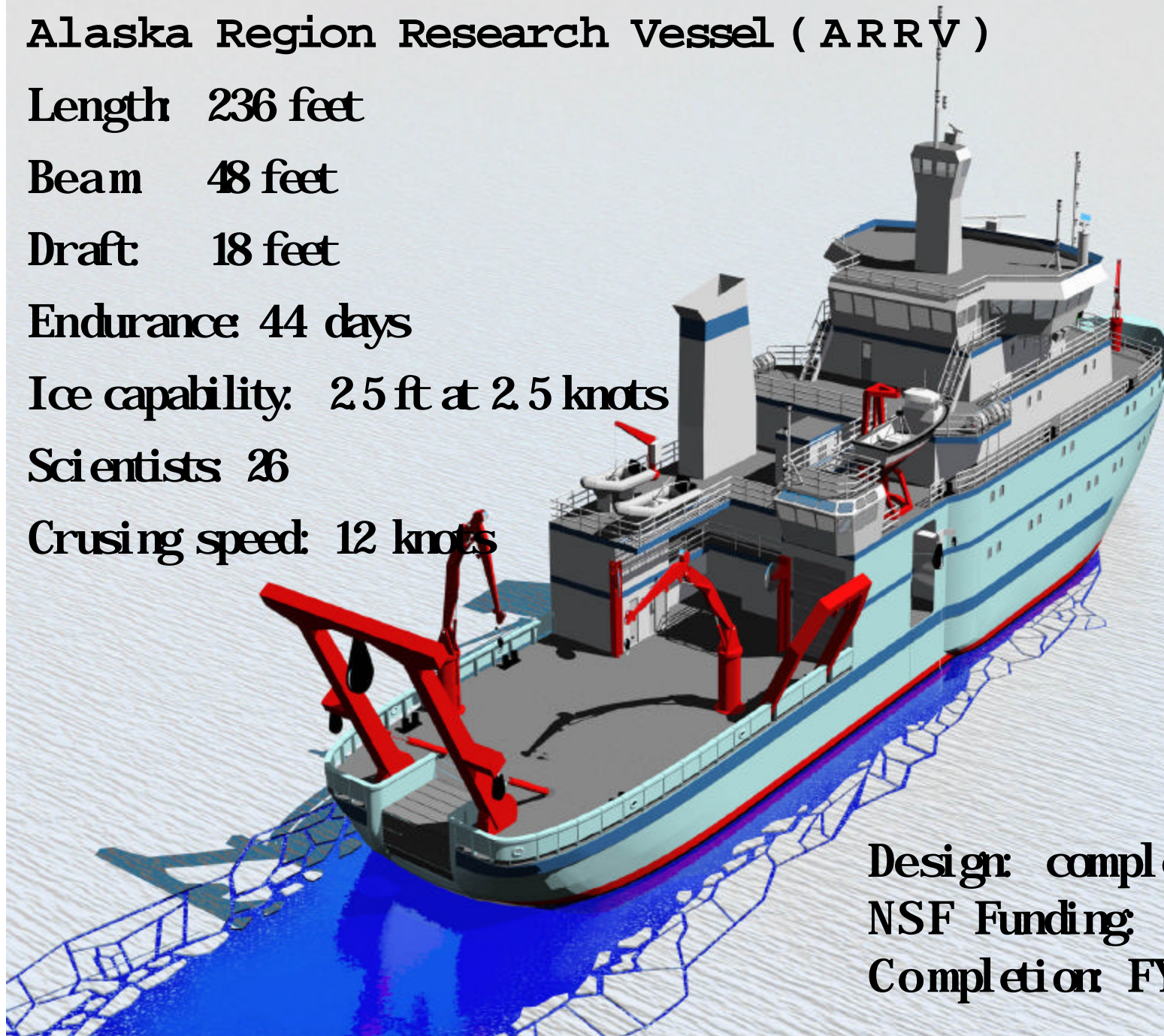
Draft 18 feet

Endurance 44 days

Ice capability: 2.5 ft at 2.5 knots

Scientists 26

Cruising speed: 12 knots



Design: complete
NSF Funding: FY07?
Completion: FY09+



Global Class SMRs and Mid-Life Considerations

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2006 - *THOMPSON*

- Steering Committee formed to update Global Vessel General Purpose SMRs.
- Incorporate Heavy Lift considerations to address ocean observatory and long coring needs.
- Community On-line Survey regarding science needs – coming soon.



2011 – *REVELLE*



2012 – *ATLANTIS*



New Ships Recently Constructed or Converted

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R/V Marcus Langseth (LDEO)

- Owner = NSF
- Length = 235 feet
- Ready for Service in late 2006.
- Will operate Globally in support of seismic operations and general purpose research.
- Geophysical capabilities include a sound source array towed in four "strings" that can be configured either as a single, 2D source or dual, alternating 3D source arrays.

R/V Hugh R Sharp (U. Delaware)

- Owner – U. Delaware
- March 2006 – entered UNOLS Fleet
- Length = 146 feet
- Modular design to enhance flexibility of use.
- Design also may allow for testing and fitting to incorporate new fuel-cell technologies.
- Designed for quiet operation.





Ship Transfer and Retirements University-National Oceanographic Laboratory System

R/V Atlantic Explorer begins operations at Bermuda Biological Station for Research

- BBSR acquired *R/V Seward Johnson II* from HBOI in October 2005.
- The ship underwent a modification and maintenance period
- April 2006 – *Atlantic Explorer* began operations from BBSR.



Ships Retired from UNOLS Fleet:

Gyre – August 2005

Cape Henlopen – October 2005

Weatherbird II – December 2005



UNOLS Fleet Improvement Plan Outline

University-National Oceanographic Laboratory System

- **Executive Summary / Intro**
- **Identify Future Science Initiatives** – includes Major Science Disciplines, Education/Outreach, and Cross cutting initiatives.
- **Current Fleet Composition and Utilization Trends** - includes updated vessel retirement dates and SLEP estimates.
- **Future Fleet Projections**
 - Evaluate other future facility projections (Ocean observatory, Event Response, etc)
 - Other Facilities – aircraft, deep submergence facilities
 - Define Future Fleet Composition
- **Fleet Budget Projections and Requirements**
- **Recommendations**

Final Draft – Fall 2006



Outline of Presentation

University-National Oceanographic Laboratory System

I. Budget Shortfalls and Impact on Future Fleet Operations

II. Academic Fleet Renewal

III. Other UNOLS Activities

A. ADA Committee

B. UNOLS Briefing Package

C. HOV Safety Standards

IV. UNOLS Committee Activities



ADA Guidelines for RVs

University-National Oceanographic Laboratory System

Americans with Disabilities Act (ADA) Guidelines for Research Vessels

Background:

- NSF has indicated the need for new ship construction and ship conversion efforts to address ADA requirements.
- Vessels that support Federally funded academic research should be equipped and arranged as feasible to accommodate persons with disabilities.
- In turn, procedural guidelines to carry out shipboard operations by persons with disabilities are needed.



ADA Guidelines for RVs

University-National Oceanographic Laboratory System

Membership :

- FIC Member - Terry Whitledge (UAF) [Chair]
- Risk Manager - Dennis Nixon (URI)
- Marine Superintendent & FIC – Al Suchy (WHOI)
- *Langseth* Conversion Rep & FIC – Jim Cochran (LDEO)
- RVTEC Representative – Joe Ustach (Duke)
- Seagoing scientists with disabilities – Amy Bower (WHOI) and Terry Glover (contributing member)
- Ship Master – Eric Buck (SIO)
- UNOLS Safety Committee Rep – Matt Hawkins (UDel)
- David Chapman (UDel)
- Ex-officio members – agency reps



ADA Guidelines for RVs

University-National Oceanographic Laboratory System

Tasks:

- Draft Preliminary ADA Guidelines for the Regional Class Acquisition effort. (Need ASAP)
- Convene a Workshop (if needed) to define shipboard and procedural guidelines required to accommodate sea-going scientists with disabilities.
- Establish General ADA Guidelines for new ship construction/conversion.
- Draft procedural guidelines for at-sea research operations by seagoing scientists with disabilities.



UNOLS Briefing Package

University-National Oceanographic Laboratory System

- 1) What is UNOLS? Description of UNOLS. Committee structure and tasks. Ships descriptions, distribution, and utilization.
- 2) Status of the UNOLS fleet today and challenges in terms of:
 - 1) Funding shortfalls and consequences
 - 2) Future oceanographic scientific community needs: OOI and IOOS etc.
- 3) Fleet Renewal – Plans and Status
- 4) Discussion topics:
 - 1) How to stay on top of the planning process

annually (Figure 3). It has also resulted in funded projects being deferred by months to years. This has serious implications for the maintenance of a healthy and vigorous ocean research and training program.

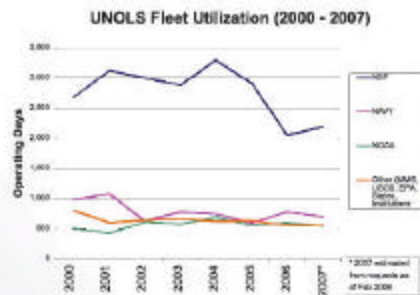


Figure 3: UNOLS Fleet Utilization

The Aging Fleet and Renewal Prospects

Regional Class vessels will soon be constructed with NSF funds to replace the aging vessels in this class (Figure 4).

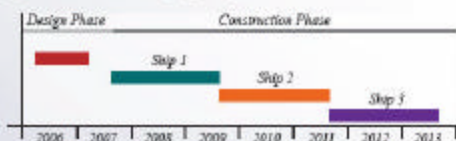


Figure 4: Nominal timeline for Regional Class Construction.

The science Mission Requirements for new Ocean Class vessels to replace the aging Intermediate Class ships have been developed. Navy funds to construct the ships are yet to be appropriated.

The Alaska Region Research Vessel (ARRV), an ice strengthened ship for use in Arctic research has been designed and funds to build it are requested by NSF for FY07.



Conceptual drawing of the ARRV by The Glavest Associates, Inc.

Some general-purpose Global Class research vessels are approaching mid-life and will need refitting in the next five to ten years.

In addition to updating for general use, some consideration must be given to incorporating a heavy lift capability to address ocean observatory and long coring needs.

The deep submergence community will benefit by the replacement of *DSRV Alvin* with a new submersible having a depth range of 6500 m and by the construction of a hybrid ROV with a depth capability of 11,000 m.



Conceptual drawing of the deep-diving human occupied vehicle under design as a replacement HOV. Illustration by E. Paul Oberlander, Woods Hole Oceanographic Institution.

UNOLS Chair: Peter H. Wiebe (WHOI)

UNOLS Chair Elect: Marcia McNutt (MBARI)

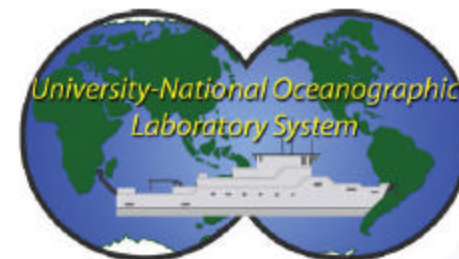
UNOLS Past Chair: Tim Cowles (OSU)

UNOLS Office Personnel:

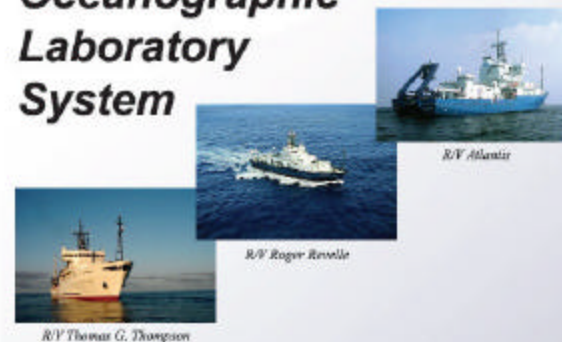
Mike Prince - Executive Secretary
 Annette DeSilva - Assistant Executive Secretary
 Kate Sawyers - Administrative Assistant
 Dennis Nixon - UNOLS Risk Manager/Legal advisor
 Laura Dippold - Webmaster/Project Assistant

UNOLS Office

Moss Landing Marine Laboratories
 8272 Moss Landing Road
 Moss Landing, CA 95039
 Phone: 831-771-4410
 Fax: 831-632-4413
 Email: office@unols.org
 Web: <http://www.unols.org>



University-National Oceanographic Laboratory System



UNOLS, a union of 61 academic institutions and national laboratories involved in oceanographic research, is a unique organization within the marine community. It coordinates and reviews the access to and utilization of facilities for academic oceanographic research. For the community of users, it reviews the current match of facilities to the needs of academic oceanographic programs and makes appropriate recommendations of priorities for replacing, modifying or improving the numbers and mix of facilities, especially research vessels. It works to foster federal and other support for academic oceanography, thereby continuing and enhancing the excellence of this nation's oceanographic program.

UNOLS consists of an elected Council and eight standing committees. All Council and Committee members are volunteers.

The UNOLS Council consists of 18 members that represent and act on behalf of the UNOLS membership as the operating and governing body of UNOLS. It gives attention to the effective use of available oceanographic facilities and it evaluates the need for replacement and additional facilities, and assesses whether facilities are outmoded or in excess of current needs. It makes recommendations to funding agencies regarding the needs for specialized facilities or new concepts in facilities and the balance between facilities and funded research programs. The council accepts charges from funding agencies for special studies and reviews, and it assists funding agencies in efforts to obtain adequate and uniform financial data and post-cruise reporting of ship operations.

The Fleet Improvement Committee (FIC) works to assure the continuing excellence of the UNOLS fleet, to improve the capability and effectiveness of individual ships, and to assure that the number, mix, and overall capability of ships in the UNOLS fleet match the science requirements of academic oceanography in the U.S.

The DEep Submergence Science Committee (DESSC) provides oversight responsibilities in the use of *Alvin* and the Remotely Operated Vehicle (ROV) assets of the National Deep Submergence Facility, is an ombudsman for the deep submergence community, insuring maximum participation in the utilization of these deep submergence assets. It promotes new technology for *Alvin* and the ROVs to maintain cutting edge capability for the National Facility. DESSC works with the user community, federal sponsors, and the deep submergence national facility operator to encourage deep submergence research in traditional areas and remote geographic regions and international collaboration.



DESP Alvin

The newly formed Marcus Langseth Science Oversight Committee (MLSOC) will provide community input and will oversee the scientific operation of the *R/V Marcus Langseth* as a National Oceanographic Seismic Facility.

The Research Vessel Operator's Committee (RVOC) promotes fleet standards, marine safety, efficiency, and quality of service among marine science research and educational institutions through cooperation and an open forum of research vessel operators.

The Research Vessel Technical Enhancement Committee (RVTEC) promotes the scientific productivity of research programs that make use of research vessels and oceanographic facilities and fosters activities that enhance technical support for sea-going scientific programs.

The Arctic Icebreaker Coordinating Committee (AICC) is charged with providing oversight and advice to the U.S. Coast Guard for the purpose of enhancing facilities and science operations aboard their icebreaker fleet and to facilitate communications between Arctic scientists, funding agencies, and facility providers.



USCGC Healy

The Ship Scheduling Committee (SSC) develops and coordinates ship schedules in order to assure the most effective, efficient, and economic utilization of UNOLS ships and associated facilities.

The Scientific Committee for Oceanographic Aircraft Research (SCOAR) provides advice and recommendations to aircraft facility managers and supporting federal agencies on aspects of operations, sensor development, fleet composition, utilization, and data services as appropriate and promotes collaborations and cooperation between facility operators, funding agencies, and the scientific community to improve the availability, capabilities and quality of aircraft facilities supporting the ocean sciences.



EP-1B Stearman

Vessel	Operator	Length (ft)	Year Built / Refit	Retirement Date
Global Class				
MELVILLE	(UCSD)	279	1999 / 1991	2014
KNORR	(WHOI)	279	1970 / 1989	2015
THOMAS G. THOMPSON	(UW)	274	1991	2021
ROGER REYNOLDS	(UCSD)	274	1996	2026
ATLANTIS	(WHOI)	274	1977	2027
MARCUS LANGSETH	(LDSU)	235	1999 / 2000	2025
Ocean & Intermediate Classes				
ELO MOANA	(UW/UCR)	186	1992	2022
SERGEY JOHNSON	(IBRO)	204	1985	2015
PECOSKA	(ORU)	185	1976	2010
ANDRAGOR	(ORU)	185	1976	2008
OCEANUS	(WHOI)	177	1976	2009
NEW JERSEY	(UCSD)	170	1978	2016
SERGEY JOHNSON II	(IBRO)	168	1982	2012
Regional Class				
HUGH A. STARR	(U Delaware)	116	2002	2025
CAPE RATONNAS	(UNC/UNC)	115	1981	2010
POINT STAR	(SUNY)	115	1981	2011
ALPHA HULLY	(U Alaska)	113	1996	2008
ROBERT G. SPROUL	(UCSD)	125	1981	2015
WELCAN	(UMCON)	118	1985	2013
LONGSPORN	(UTexas)	103	1971	2011
Local Class				
URRACA	(STR)	96	1986	2016
E.G. WILSON SMITH	(UMinn)	96	2000	2021
SAVANNAH	(Skidaway)	92	2001	2032
NIIZE WERON	(UMN)	86	1985	2015
CLIFFORD A. BAENEIS	(UW)	66	1966	2007

Table 1: The UNOLS Fleet

The UNOLS fleet consists of 25 research vessels including six in the Global Class, seven in the Ocean/Intermediate Class, six in the Regional Class, and six in the Local Class. The global ships are highly capable and are able to work worldwide in ice-free waters. The Ocean and Intermediate Classes are smaller in size than the global ships and are ocean-going, but will not operate globally. The Regional Class ships are designed for operations in the inner shelf and coastal environments of the U.S. Local Class ships are those smallest in size, but play an important role in supporting research in the waters surrounding their homeports. Many of these vessels are approaching their 30-year mark when service is expected to end (Table 1).

The current UNOLS fleet is supported by funds principally from the National Science Foundation (NSF), Navy, and National Oceanic & Atmospheric Administration (NOAA) (Figure 1). Other federal agencies, states, and private institutions also contribute to operations and technical services costs.

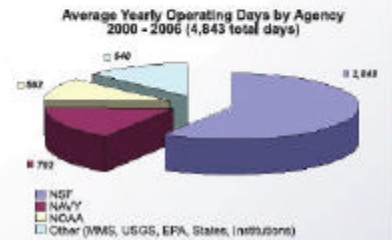
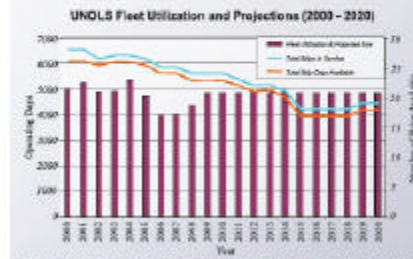


Figure 1: Average Annual Operating Days by Agency

Prior to 2006, ship use has been just under 5000 days per year and is projected to rise over the next decade when the global, regional, and coastal observatories are installed, used, and maintained. During this same period, many of the current vessels will reach the end of their service life. Fleet renewal plans call for three new Regional Class ships, an Alaska Region Research Vessel, and four new Ocean Class ships. Yet, even with the addition of these new ships, by the year 2020 there will be fewer ships to support science than is currently available (Figure 2).



The total ships in service is based on construction of all planned ships: 1 Regional Class vessel, ARRV, 4 Ocean Class vessels, and Local vessels are replaced as they retire.

Figure 2: UNOLS Fleet Utilization and Projections

Recent cuts in the funding to operate the fleet and rising costs due to the increased cost of fuel, health insurance, and maintenance costs have resulted in a decline in ship time that can be supported.



Outline of Presentation

University-National Oceanographic Laboratory System

I. Budget Shortfalls and Impact on Future Fleet Operations

II. Academic Fleet Renewal

III. Other UNOLS Activities

IV. UNOLS Committee Activities

I. RVOC

II. RVTEC

III. AICC

IV. SCOAR

V. MLSOC

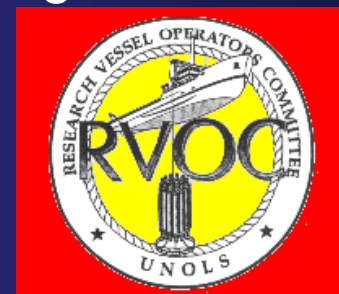


RVOC and RVTEC

University-National Oceanographic Laboratory System

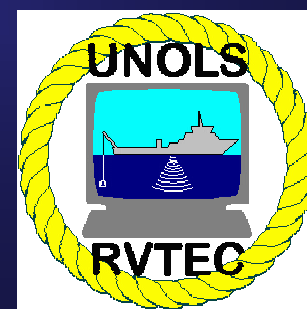
Research Vessel Operators' Committee

- Annual Meeting – April, 25-27, 2006 at U. Washington (Deb Kelley guest speaker)
- Issues addressed and activities:
 - Update of Research Vessel Safety Standards
 - Security plans, Safety, and ISM
 - Uniformity for port and EEZ fees (who pays for what – science v.s. operator)
- Alcohol, Drugs, and Sexual Harassment Policies



Research Vessel Technical Enhancement Committee

- Annual Meeting and INMARTECH 2006 – October 16-19, 2006, WHOI
 - Includes session on Advanced Instrumentation and Vehicle Systems.





Arctic Icebreaker Coordinating Committee University-National Oceanographic Laboratory System

Arctic Icebreaker Coordinating Committee

- Meeting held at NSF on April 18 & 19
 - Reviewed de-briefs from last seasons cruises and generated a list of recommendations.
 - Reviewed requirements for future upgrades and improvements for science outfitting.
- *Healy* is underway for this summer's field season with two NSF and two NOAA funded cruises.



Scientific Committee for Oceanographic Aircraft Research

University-National Oceanographic Laboratory System

May 23-25, 2006 - A joint meeting of the UNOLS Scientific Committee for Oceanographic Aircraft Research (SCOAR) and the Interagency Coordinating Committee for Airborne Geosciences Research and Applications (ICCAGRA)

May 24-25, 2006 - Airborne Ocean Science Conference - posters and presentations (10+) on the use of aircraft in marine science research field programs.





Marcus Langseth Science Oversight Committee **University-National Oceanographic Laboratory System**

- **New UNOLS Standing Committee – Formed in October 2005**
- **Membership:**
 - Dr. Steven Holbrook, U of Wyoming (MLSOC Chair)
 - Dr. Michael Enachescu, Memorial University of Newfoundland
 - Dr. Graham Kent, Scripps Institution of Oceanography, UCSD
 - Dr. Nancy Grindlay, University of North Carolina at Wilmington
 - Dr. Mitch Lyle, Boise State University
 - Dr. Ray Schmitt, Woods Hole Oceanographic Institution
 - Dr. Peter Tyack, Woods Hole Oceanographic Institution
 - Dr. H. Paul Johnson, University of Washington
 - Dr. Peter Littlewood, Shell International Exploration & Production, Inc
 - Dr. Tom Shipley, University of Texas IG
- **First Meeting - 31 May and 1 June at the Shelburne Nova Scotia shipyard. (Joint with ERROC)**



UNOLS Annual Meeting

University-National Oceanographic Laboratory System

The 2006 UNOLS Annual Meeting

Friday, October 6, 2006

at

The National Science Foundation

The keynote speaker will be

Former California Congressman and White House Chief of Staff

The Honorable Leon E. Panetta

Council Elections will be Held for the following positions:

- **Chair-Elect**
- **One At-large Position**
- **One Operator Position**
- **One Non-Operator Position**

Nominations for the slate may be submitted by anyone affiliated with a UNOLS institution by May 31, 2006

