



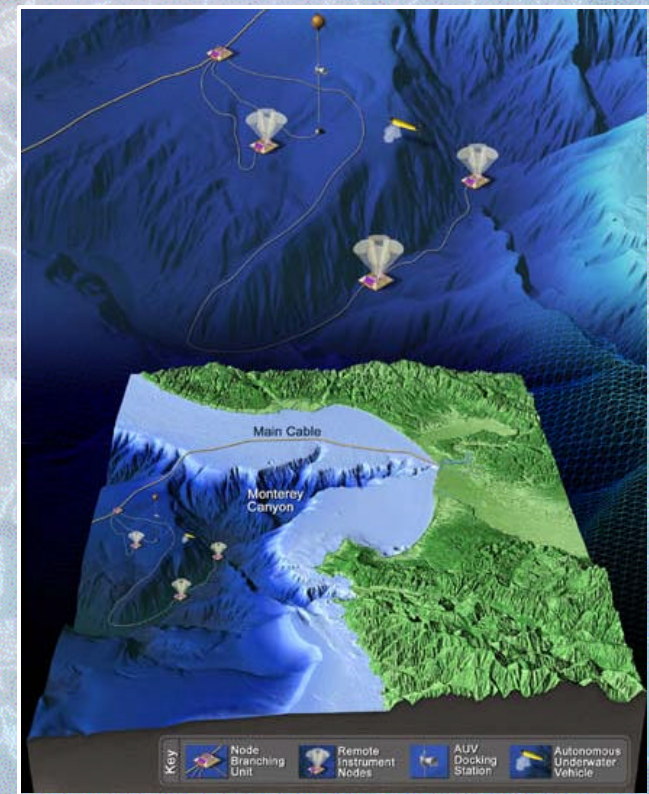
Ocean Observatories Initiative

Ocean Research Interactive
Observatories Network (ORION)

Ocean Observatories Initiative

Infrastructure for making sustained observations and providing real time access to data for research in the oceans

- Ocean's Role in Climate Change
- Biogeochemical Cycling
- Fluids and Life in Ocean Crust
- Dynamics of Lithosphere and Imaging the Earth's Interior
- Coastal Ocean Processes
- Turbulent Mixing and Biophysical Interactions
- Ecosystem Dynamics and Biodiversity



Ocean Observatories Initiative

Three primary components:

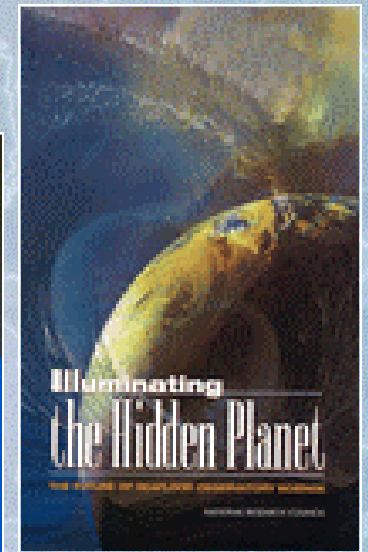
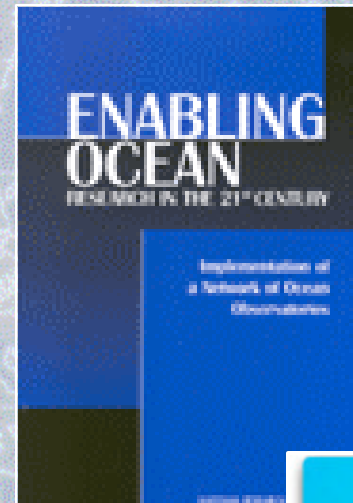
Global-scale moored buoy observatories

Regional-scale seafloor fiber optic cabled observatory

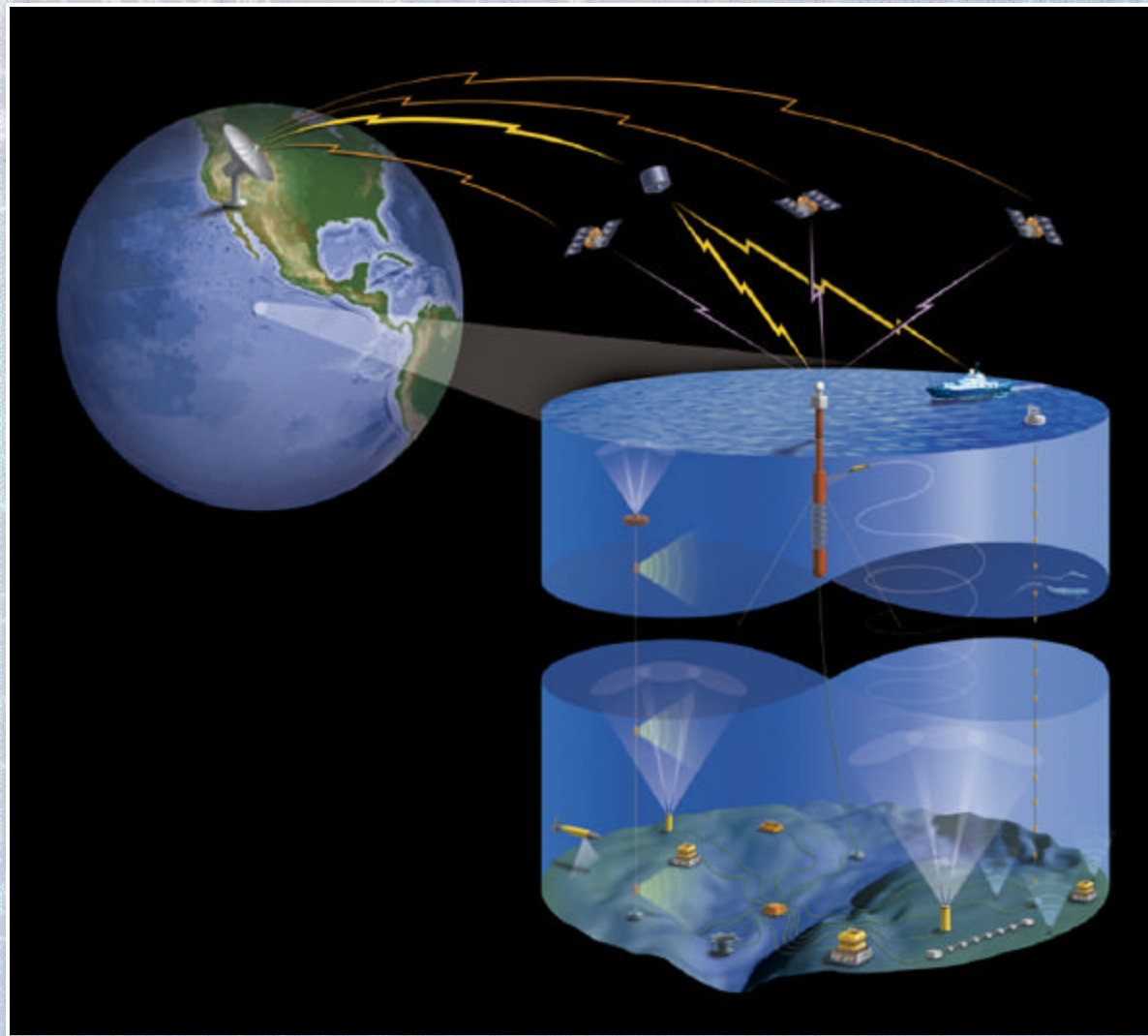
Coastal observatories

Cyberinfrastructure will allow users to remotely control their instruments, perform *in-situ* experiments, construct virtual observatories, and access data in near-real-time

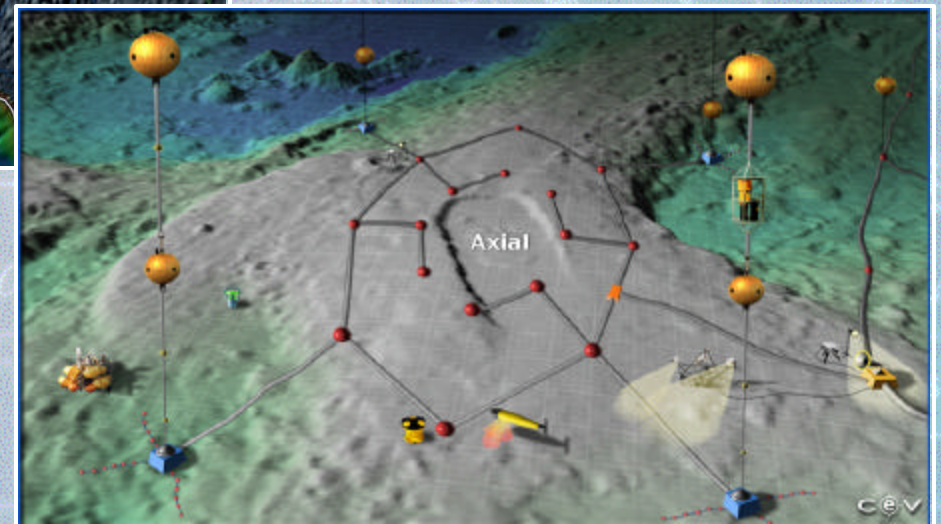
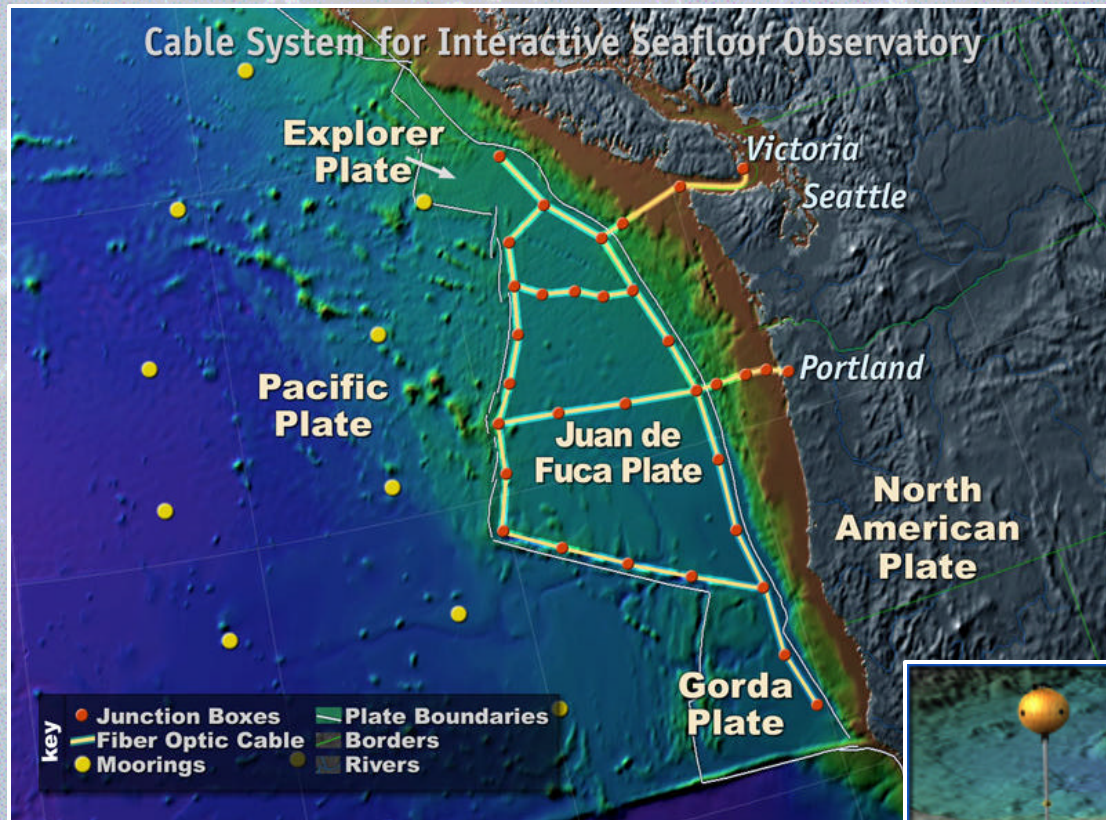
Builds on the recommendations from over 30 workshop reports, NRC studies and meetings over the past 15 years . . .



Global Array



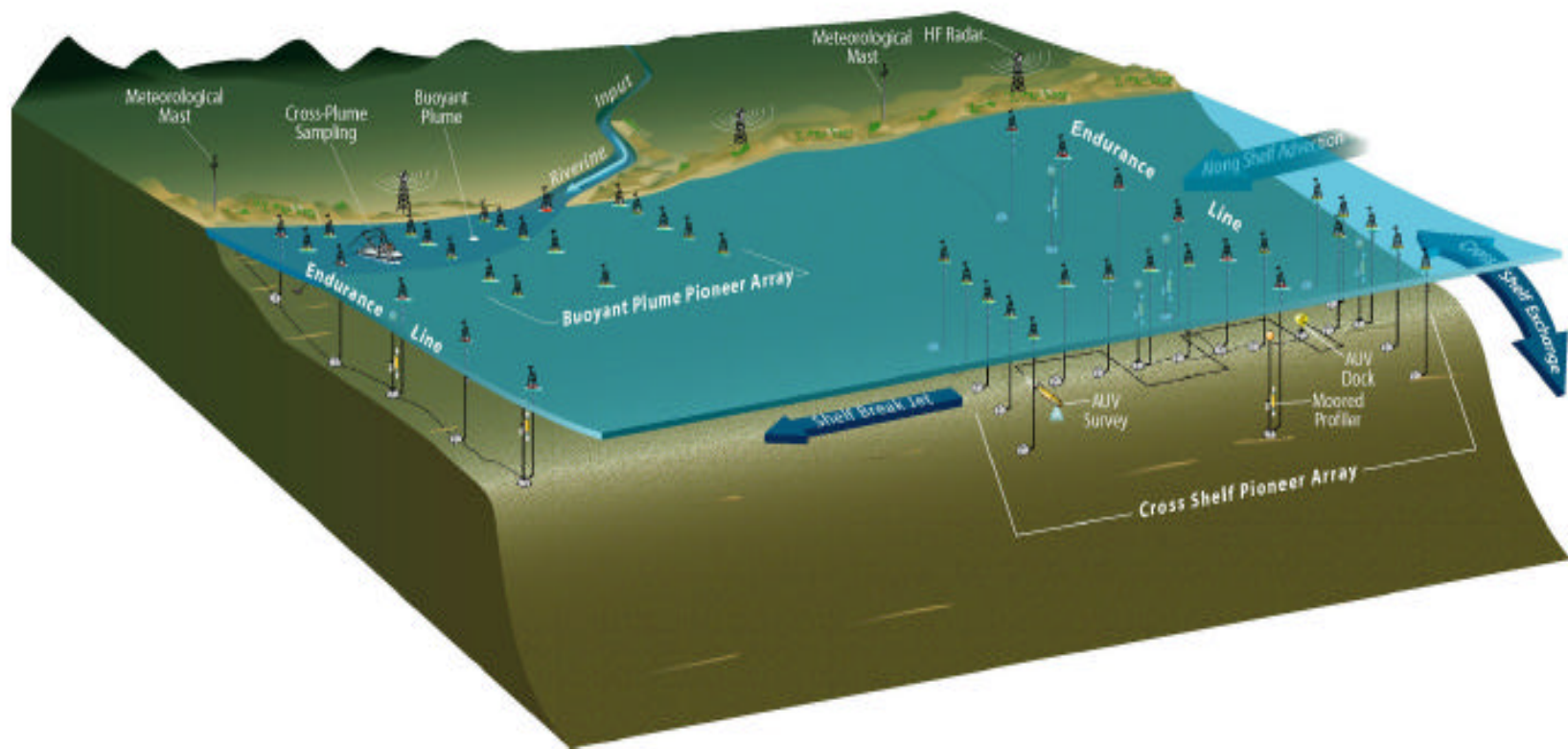
Regional Cabled Observatory



Coastal Array

Endurance Arrays – Fixed, permanent observing array arranged as cross-shelf lines and individual moorings

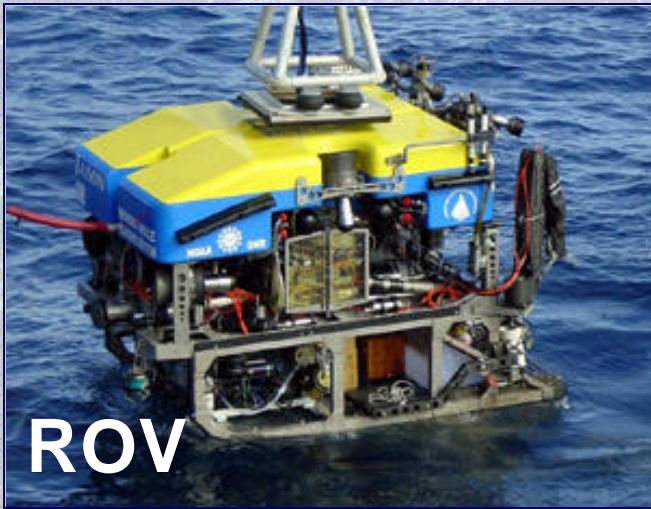
Pioneer Arrays – Relocatable arrays for process-oriented studies



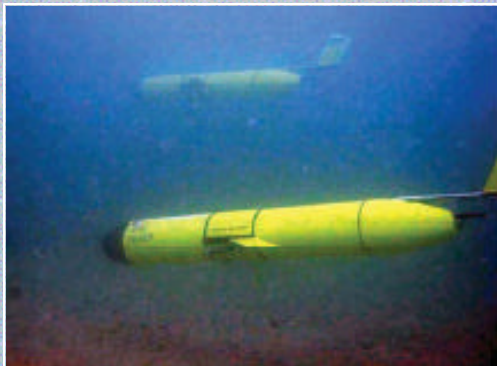
ORION – OOI Relationship



Expanding the Footprint



Gliders



Ocean Observatories Initiative

NSF MREFC Account

- **Agency-wide capital asset account**
- **Funding for major science and engineering infrastructure (10's-100's of M\$)**
- **Established in FY 1995**

Lifecycle of an MREFC Request

- ✓ **Project proposed**
- ✓ **Director's approval and the MREFC Panel**
- ✓ **National Science Board approval**
- ✓ **Placed in a NSF budget request to OMB (fall)**
- ✓ **President's Budget
Appropriation Approval**

NSF FY06 Budget

MREFC Account¹ (Dollars in Millions)

	FY 2005						
	FY 2004 Actual	Current Plan	FY 2006 Request	FY 2007 Estimate	FY 2008 Estimate	FY 2009 Estimate	FY 2010 Estimate
Ongoing Projects							
ALMA Construction	50.70	49.30	49.24	47.89	46.49	37.37	20.91
EarthScope	43.24	46.97	50.62	26.80			
HIAPER	12.54						
IceCube Neutrino Observatory	38.36	47.62	50.45	28.65	21.78	11.33	0.95
National Ecological Observatory Network				12.00	12.00	20.00	
Network for Earthquake Engineering Simulation	8.05						
Rare Symmetry Violating Processes		14.88	41.78	48.00	30.75	15.00	8.00
Scientific Ocean Drilling Vessel		14.88	57.92	42.20			
South Pole Station	21.03						
Terascale Computing Systems	10.05						
New Starts							
Ocean Observatories Initiative				13.50	42.00	65.50	66.90
Alaska Region Research Vessel				49.32	32.88		
Advanced LIGO					28.48	42.81	46.31
Totals	\$183.96	\$173.65	\$250.01	\$268.36	\$214.38	\$192.01	\$143.07

Totals may not add due to rounding.

Estimates for 2007 and beyond do not reflect policy decisions and are presented for planning purposes only.

¹The FY 2005 total includes \$37.13 million carried forward from previous years. This includes \$29.87 million for the South Pole Station Modernization project, \$115,000 for Polar Support Aircraft upgrades, \$34,418 for the South Pole Safety project, and \$7.11 million for IceCube.

Ocean Observatories Initiative

Timetable

OOI Science Plan

- OSP published in May 2005

OOI Science Advisory Structure

- Committees in place by August 2005

OOI Request for Assistance (RFA)

- Request for Assistance issued: 1st week of Feb. 2005
- Letter of Intent due: Mar. 14th, 2005
- Submission deadline: May 23rd, 2005
- Mail review period: May 23 - July 15, 2005
- Panel meeting(s): August, 2005

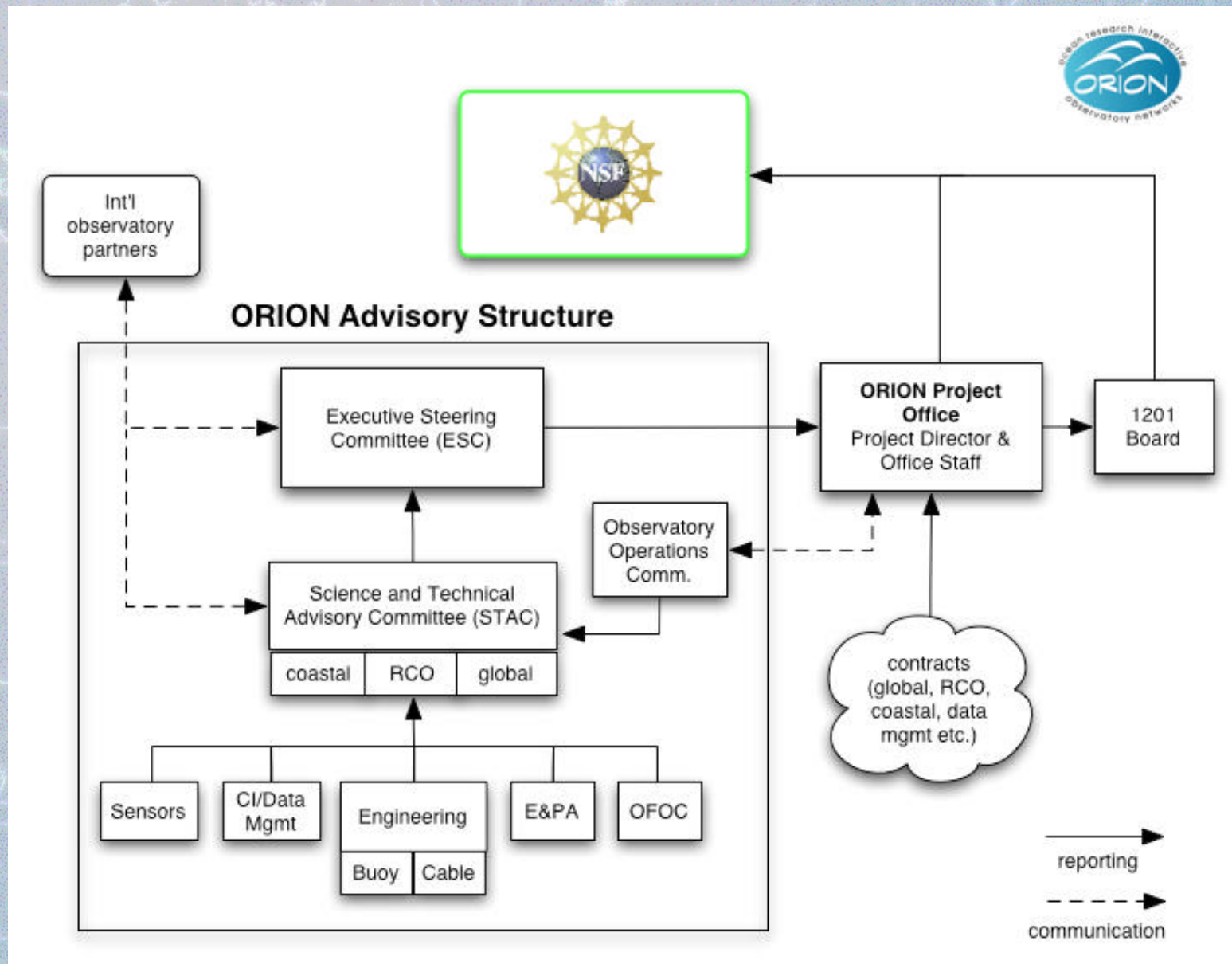
OOI Project Execution Plan (PEP)

- Preliminary PEP due: Nov. 2005
- Approval of Preliminary PEP: Jan. 2006
- Refined Preliminary PEP due: July 2006
- Baseline external review of PEP: Sept. 2006

OOI Science Plan



ORION Advisory Structure



Request for Assistance

Conceptual Science Experiments for the Establishment of the Ocean Observatories Initiative Infrastructure

TARGET DATES:

Letters of Intent (optional): March 14th 2005

Full Proposals: May 23rd 2005

- Successful detailed conceptual proposals will be used to further refine science and engineering designs for the OOI and to specify the initial experimental and instrumentation needs of the user community for the OOI.
- Present innovative, high-quality scientific objectives and experimental plans that require the use of OOI infrastructure.
- Focus on scientific advances that cannot be achieved solely with traditional expeditionary approaches possible with NSF's current field facilities.

Infrastructure requirements identified as necessary for executing these projects will strongly guide implementation plans for the OOI.

Proposed experiments should take advantage of the realtime, continuous data stream, high bandwidth, and power provided by platforms of the OOI

Request for Assistance (RFA)

Submission Statistics (as of 6/12/05)

- 48 conceptual proposals submitted to date involving 526 unique PIs and proponents from 135 different academic institutions, government labs, and industry from 33 states, and three other countries (Canada, Japan, France)
- 54% coastal (26)
- 29% RCO (14)
- 17% global (8)

OOI Project Execution Plan

GOVERNANCE AND ORGANIZATION

- Organizational Structure
- Work Breakdown Structure
- Configuration Management and Change Control
- Quality Assurance and Quality Control
- Safety, Environment and Health
- System Integration, Commissioning, Testing and Acceptance

IMPLEMENTATION PLAN (Baseline Project Definition)

FISCAL MANAGEMENT

Contingency Management

Financial and Business Operations Controls

RISK MANAGEMENT

TRANSITION TO OPERATIONS

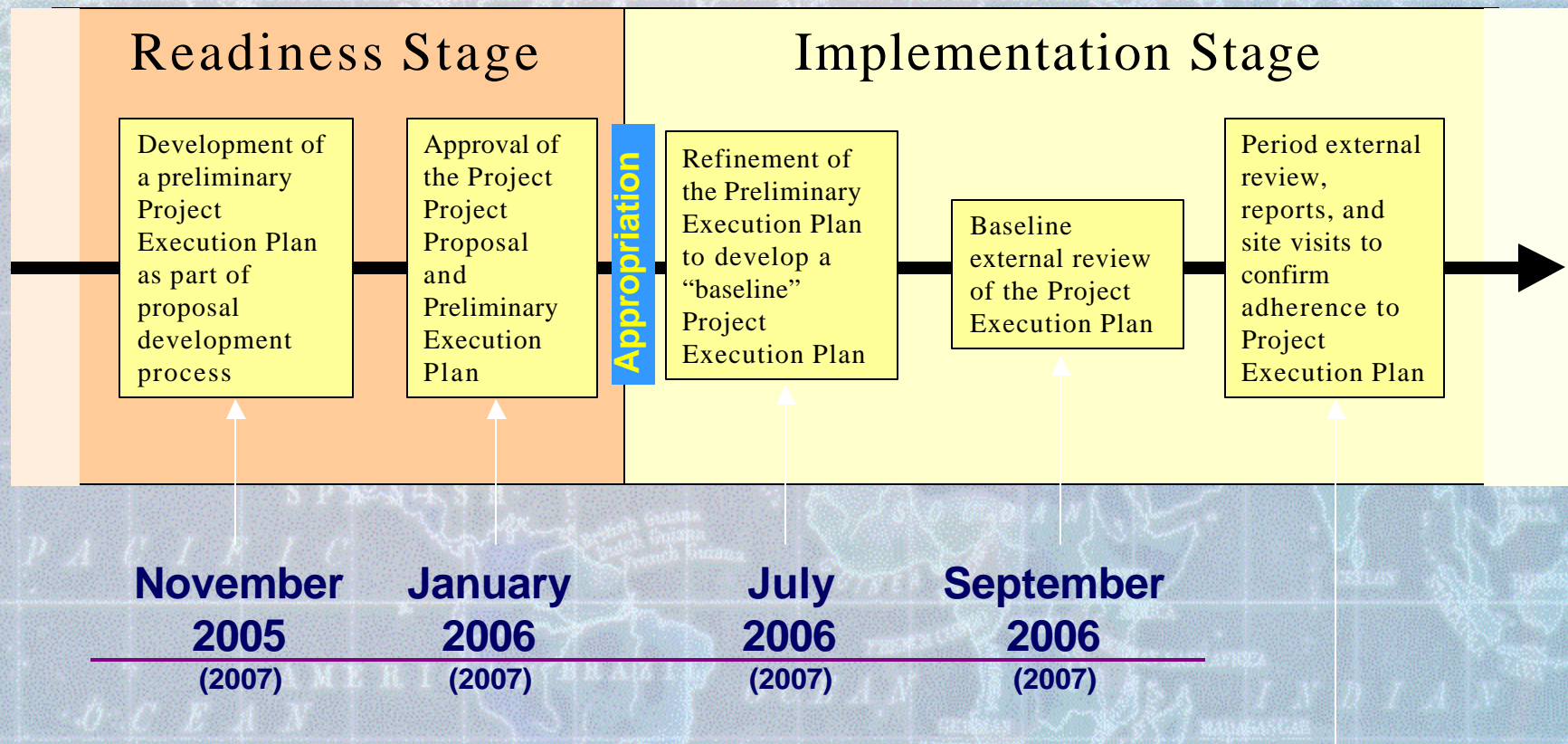
Highest priority

Required but changeable

Conceptual

OOI Project Execution Plan

Timeline for Project Execution Plan development



Baseline reviews according to established schedule

NSF FY06 Budget

OOI Funding Profile

(Dollars in Millions)

	Concept/ Development		Implementation		Operations & Maintenance		Totals		Grand Total
	R&RA	MREFC	R&RA	MREFC	R&RA	MREFC	R&RA	MREFC	
FY 2003 & Earlier	15.50						\$15.50	\$0.00	15.50
FY 2004	3.00						\$3.00	\$0.00	3.00
FY 2005 Current Plan	4.00						\$4.00	\$0.00	4.00
FY 2006 Request	4.00						\$4.00	\$0.00	4.00
FY 2007 Estimate	4.00			13.50	3.00		\$7.00	\$13.50	20.50
FY 2008 Estimate				42.00	7.00		\$7.00	\$42.00	49.00
FY 2009 Estimate				65.50	12.00		\$12.00	\$65.50	77.50
FY 2010 Estimate				66.90	20.00		\$20.00	\$66.90	86.90
FY 2011 Estimate				46.20	30.00		\$30.00	\$46.20	76.20
FY 2012 Estimate				35.00	50.00		\$50.00	\$35.00	85.00
FY 2013 Estimate					50.00		\$50.00	\$0.00	50.00
Subtotal, R&RA	\$30.50		\$0.00		\$172.00		\$202.50		
Subtotal, MREFC		\$0.00		\$269.10		\$0.00		\$269.10	
Total, Each Stage	\$30.50		\$269.10		\$172.00				\$471.60

NOTE: A steady state of about \$50.0 million in operations support is expected to occur in or about FY 2012. The expected operational lifespan of this project is 30 years, beginning in FY 2011. Operations estimates for FY 2008 and beyond are developed strictly for planning purposes and are based on current cost profiles. They will be updated as new information becomes available.

More Information: <http://www.orionprogram.org/>



The screenshot shows a web browser window titled "ORION" with the address bar displaying "http://www.orionprogram.org/". The browser's menu bar includes "Apple", "Search Tools", "Personal", "WHOI", "Other Institutions", "Journals", "Research", "Research (computer)", "Finance", "News", and "Shopping". The website header features the ORION logo and the text "Ocean Research Interactive Observatory Networks". A left-hand navigation menu lists: "What is the OOI?", "Office Information", "OOI Capabilities", "News & Announcements", "Documents & Glossary", "Links", "San Juan Workshop", "Request for Assistance", and "Contact Us". The main content area has a "Welcome" section with a paragraph about the ORION program and a photograph of a cabled network of sensors. Below this is a "News & Announcements" section with a post from Jan. 31, 2005, titled "ORION Project Office RFA" and a "More about the OOI Science RFA..." link. The ORION logo is also present in the bottom right corner of the page content.

ORION

http://www.orionprogram.org/

ORION Program

Apple Search Tools Personal WHOI Other Institutions Journals Research Research (computer) Finance News Shopping

ORION Ocean Research Interactive Observatory Networks

- What is the OOI?
- Office Information
- OOI Capabilities
- News & Announcements
- Documents & Glossary
- Links
- San Juan Workshop
- Request for Assistance
- Contact Us

Welcome

The Ocean Research Interactive Observatory Networks (ORION) is a program that focuses the science, technology, education and outreach of an emerging network of science driven ocean observing systems. Building on the heritage of the ship-based expeditionary era of the last century, oceanography is commencing a new phase in which research scientists increasingly seek continuous interaction with the ocean environment to adaptively observe the earth-ocean-atmosphere system. Such approaches are crucial to resolving the full range of episodicity and temporal change central to so many ocean processes that directly impact human society, our climate and the incredible range of natural phenomena found in the largest ecosystem of the planet.



One element of the ocean observatories actively being planned for is a cabled network of linked sensors and submersibles spread out over the sea floor.

The ORION initiative is managed through an award made by the National Science Foundation to the 1201 Group LLC, an entity jointly owned by Joint Oceanographic Institutions (JOI) and the Consortium for Oceanographic Research and Education (CORE) on behalf of their member universities and academic organizations.

News & Announcements

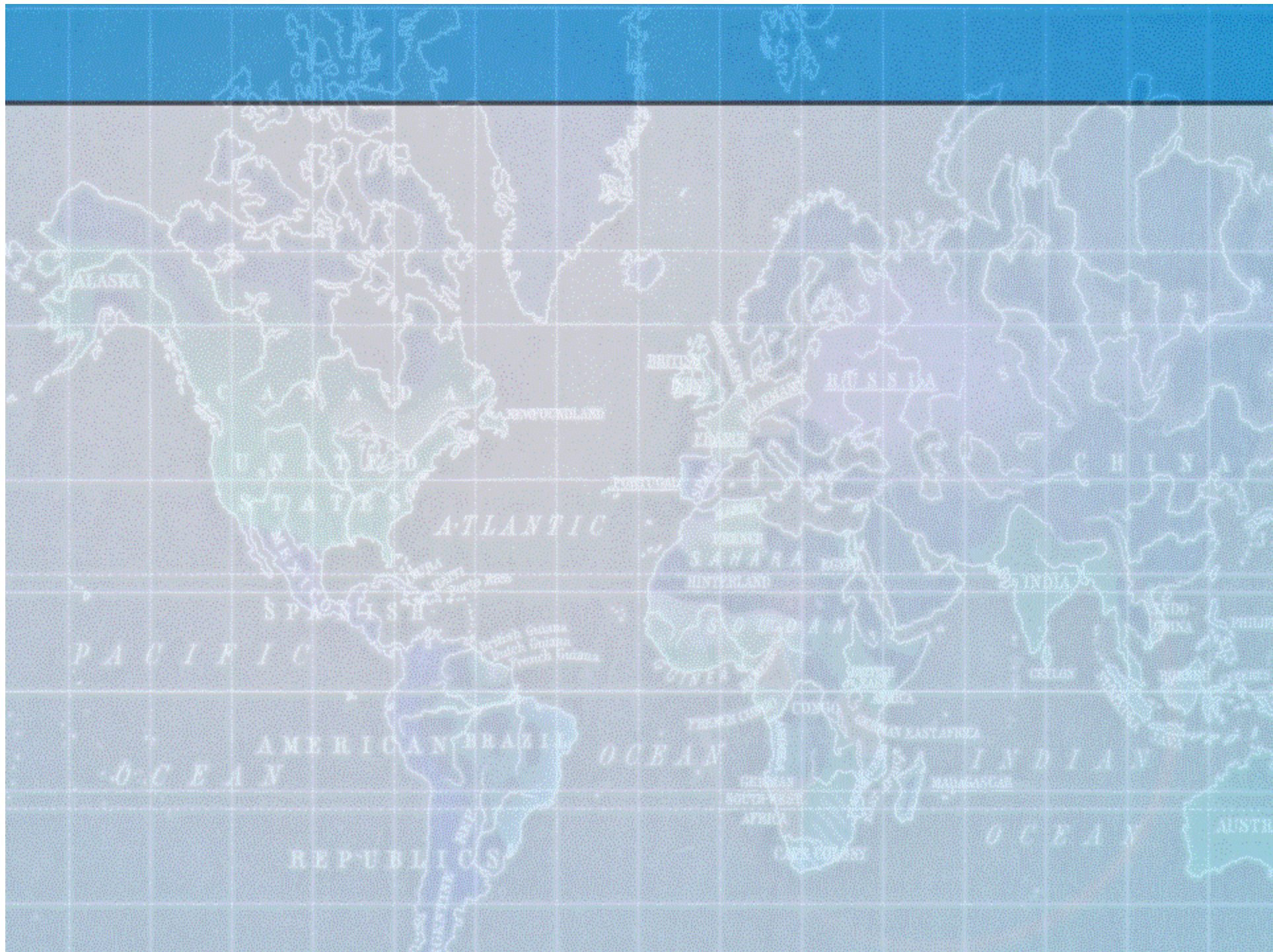
Posted: Jan. 31, 2005

ORION Project Office RFA

The ORION Project Office announces a Request for Assistance in the form of a call for proposals in support of Conceptual Science Experiments of the OOI Infrastructure. The RFA may be downloaded [here](#) (PDF, 178 KB). Persons interested in this RFA are asked to check the RFA web pages periodically for additional information

More about the OOI Science RFA...

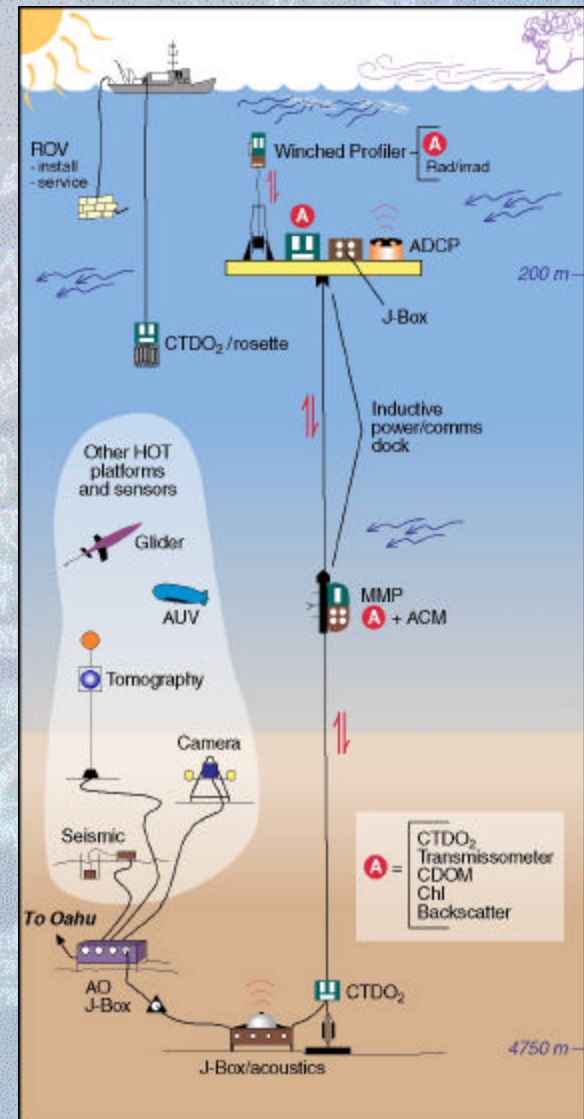




Regional Cabled Observatory

A schematic ocean mooring for physical and biogeochemical (optical) measurements, for use on a cabled ocean observatory

Extending the power and communications capabilities throughout the water column



Coastal Array - possible sites



OOI-IOOS-International Links

The research-driven OOI is part of a broader national and international effort to establish a global ocean observing system, both for conducting basic research and for operational oceanographic needs.

- **OOI** will provide the key enabling research for IOOS, fundamental advances in observatory platforms and sensor technology, and a basic understanding of ocean processes. Enable IOOS to meet its long-term operational goals.
- **IOOS** will provide a larger framework of observations and background data necessary for interpreting the process-oriented experiments of the OOI.

Academic researchers will play pivotal roles in both systems.

- Both IOOS and OOI are essential components of a broader national and international effort to establish a global Earth observing system: Global Earth Observation System of Systems (GEOSS)

NSF FY06 Budget

(Dollars in Millions)

NSF Accounts	FY 2004 Actual	FY 2005 Current Plan	FY 2006 Request	FY 2006 Request			
				Change over FY 2004 Actual		Change over FY 2005 Current Plan	
				\$	%	\$	%
FY 2004 Actual	\$5,652.01						
FY 2005 Request		\$5,472.82					
BIO	\$587.05	\$576.61	\$581.79	-5.26	-0.9%	5.18	0.9%
CISE	605.35	613.72	620.56	15.21	2.5%	6.84	1.1%
ENG (less SBIR/STTR)	461.99	458.54	475.35	13.36	2.9%	16.81	3.7%
SBIR/STTR	103.58	102.76	105.33	1.75	1.7%	2.57	2.5%
GEO	713.41	694.16	709.10	-4.31	-0.6%	14.94	2.2%
MPS	1,091.59	1,069.86	1,086.23	-5.36	-0.5%	16.37	1.5%
SBE	184.30	196.90	198.79	14.49	7.9%	1.89	1.0%
OISE ^{1/}	40.83	33.73	34.51	-6.32	-15.5%	0.78	2.3%
OPP	341.72	344.36	386.93	45.21	13.2%	42.57	12.4%
IA	163.52	129.91	134.90	-28.62	-17.5%	4.99	3.8%
Research & Related Activities	\$4,293.34	\$4,220.55	\$4,333.49	\$40.15	0.9%	\$112.94	2.7%
Education & Human Resources^{2/}	\$944.10	\$841.42	\$737.00	-\$207.10	-21.9%	-\$104.42	-12.4%
Major Research Equipment & Facilities Construction	\$183.96	\$173.65	\$250.01	\$66.05	35.9%	\$76.36	44.0%
Salaries & Expenses	\$218.92	\$223.20	\$269.00	\$50.08	22.9%	\$45.80	20.5%
National Science Board	\$2.22	\$3.97	\$4.00	\$1.78	80.4%	\$0.03	0.8%
Office of Inspector General	\$9.47	\$10.03	\$11.50	\$2.03	21.4%	\$1.47	14.7%
Total, National Science Foundation	\$5,652.01	\$5,472.82	\$5,605.00	-\$47.01	-0.8%	\$132.18	2.4%
<i>H-1B Visa</i>	\$57.28	\$100.00	\$100.00				
Total NSF, Including H-1B Visa	\$5,709.29	\$5,572.82	\$5,705.00	-\$4.29	-0.1%	\$132.18	2.4%
Percent Increase over Prior Year, excluding H-1B							

PEP Baseline Reviews and OOI Phasing

Baseline reviews

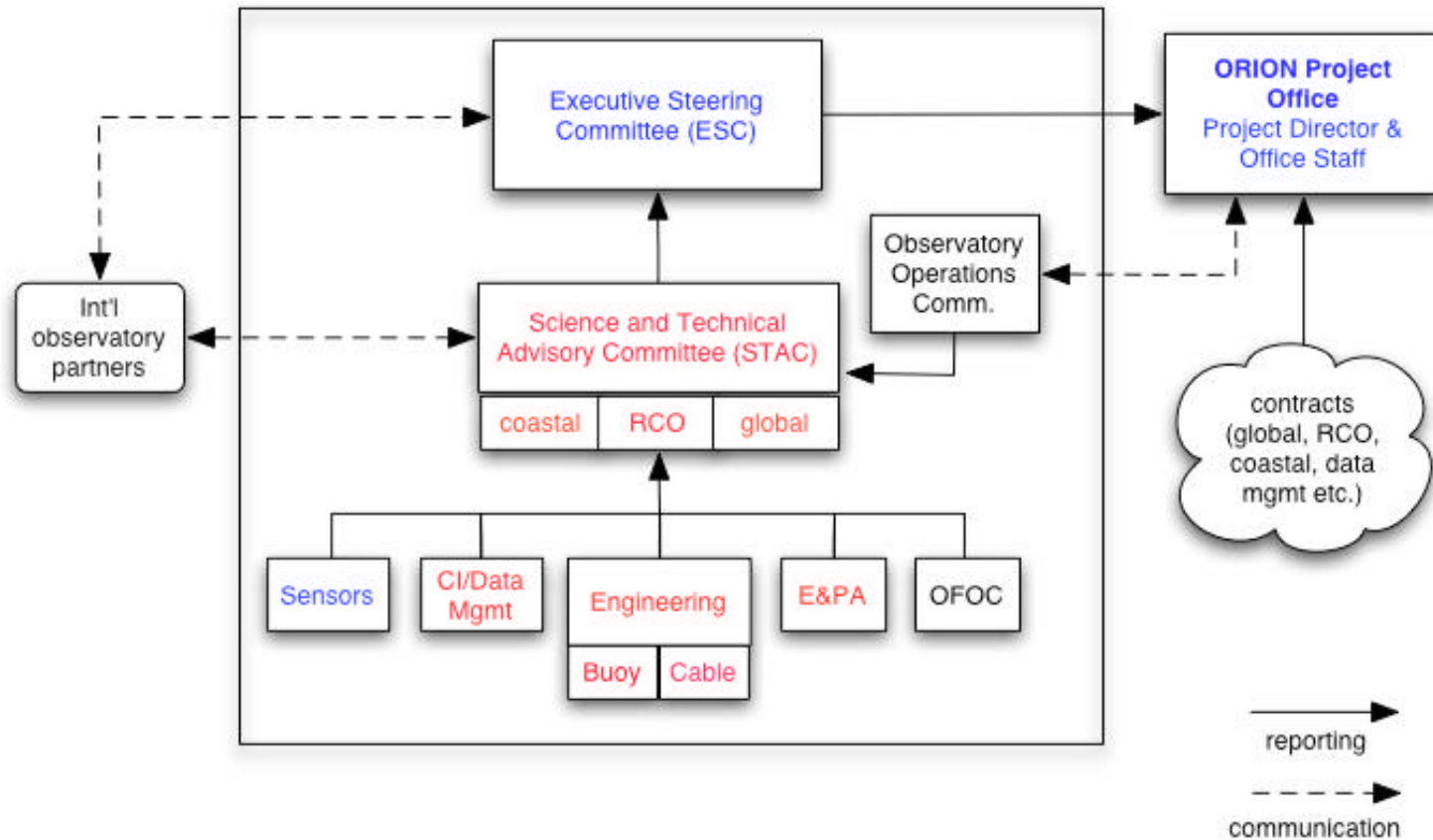
	FY07	FY08	FY09	FY10	FY11	FY12
Proj. Office	\$3.00	\$3.50	\$4.00	\$4.00	\$4.00	\$4.00
CI/Data M	\$2.00	\$2.00	\$2.00	\$2.00	\$2.00	\$2.00
Global	\$1.00	\$8.00	\$7.50	\$7.40	\$10.10	\$17.40
Coastal	\$6.50	\$20.50	\$7.00	\$7.50	\$10.60	\$7.50
Regional	\$1.00	\$8.00	\$45.00	\$46.00	\$19.50	\$4.10
Total	\$13.50	\$42.00	\$65.50	\$66.90	\$46.20	\$35.00

PROJECT BASELINE – Firm definition of the project’s technical scope, budget, requirements, execution schedule, management plan, and risk assessment. Provides a reference level for change.

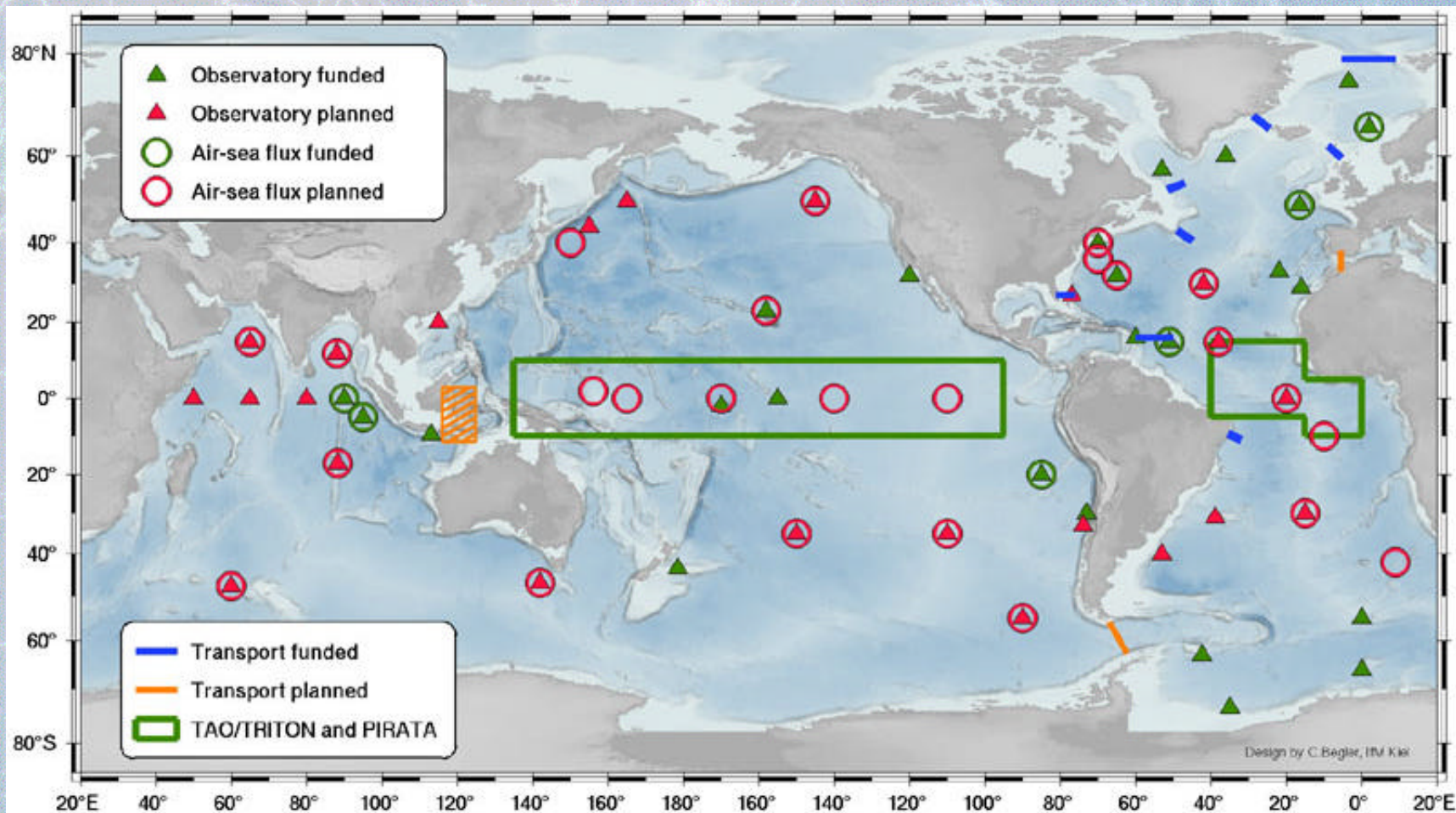
ORION Advisory Structure



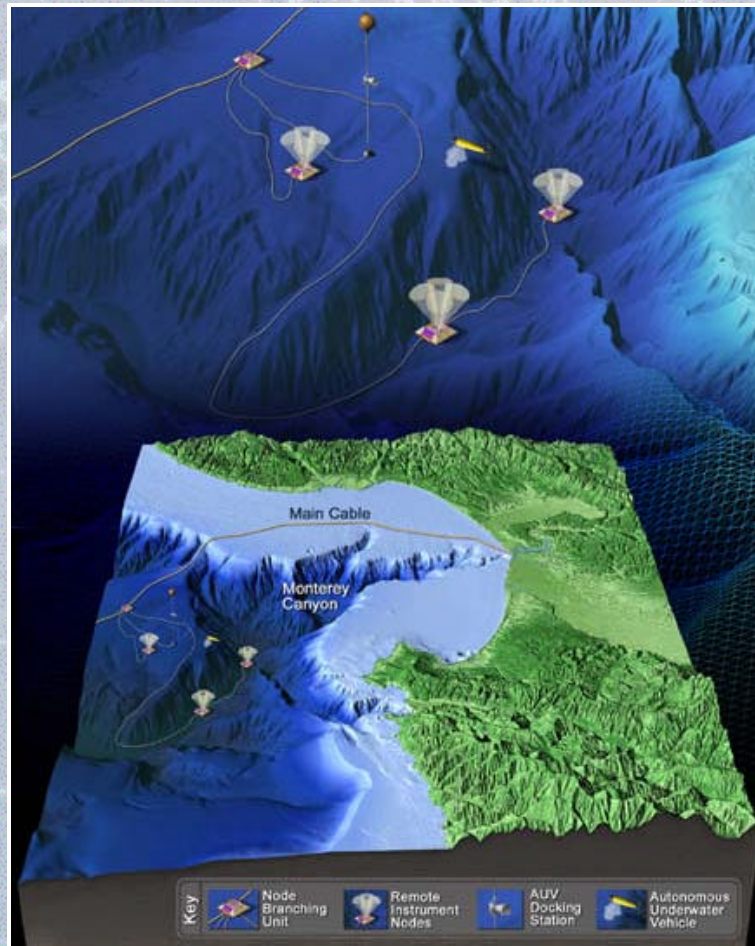
ORION Advisory Structure



Global Array - possible sites



MARS Cabled Observatory Testbed



- a platform for scientists and engineers to experiment with components of a cabled observing system,
- an environment for testing new types of seafloor sensors
- the infrastructure to test and develop educational tools,
- management testbed, and
- real-time access to data using the internet for observation and study of the marine environment.