

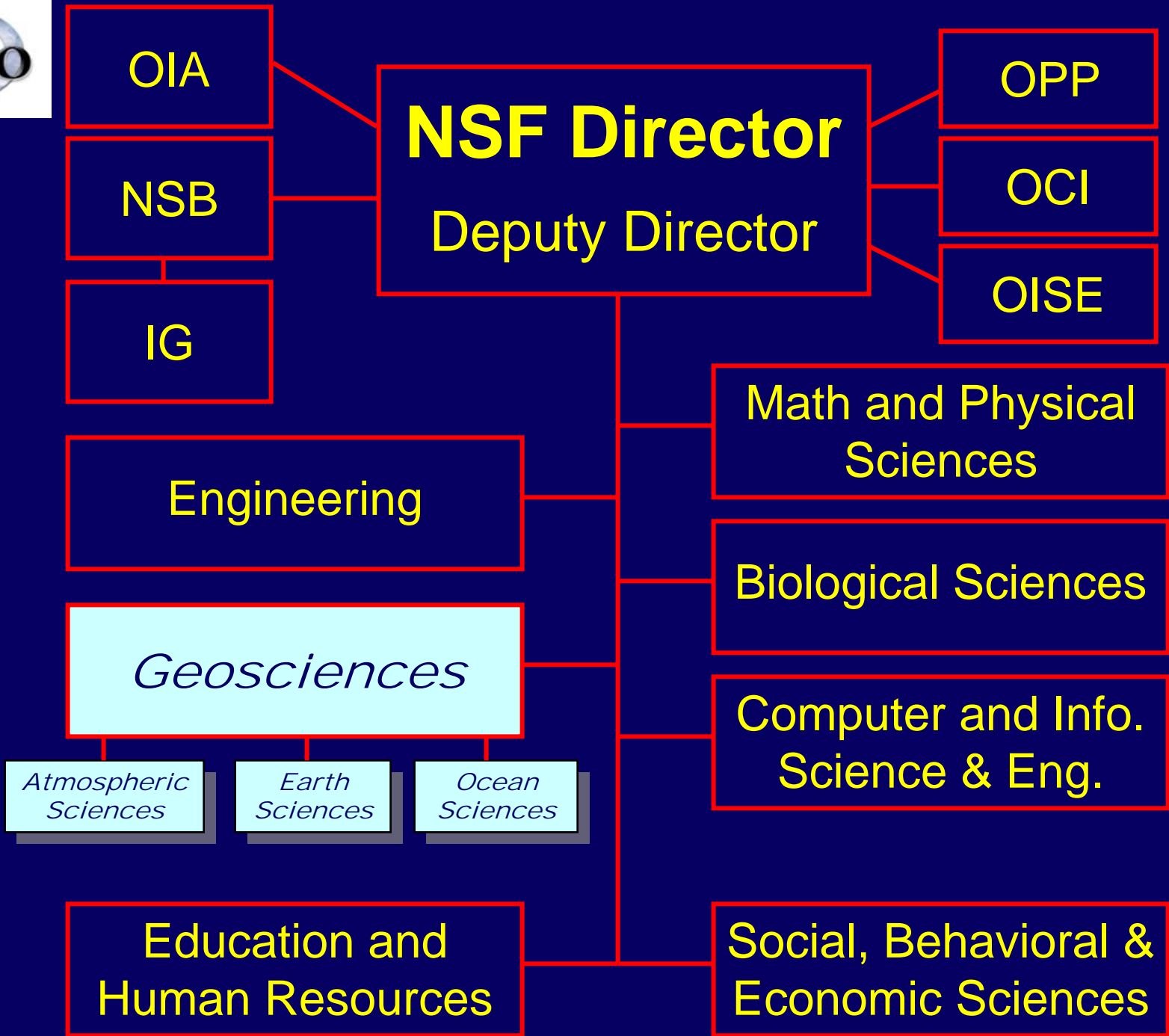


# Directorate for Geosciences



**Ajit Subramaniam**

**Program Director, Biological Oceanography  
Division of Ocean Sciences**





# NSF GEO On the World Wide Web

The screenshot shows a Microsoft Internet Explorer browser window displaying the NSF GEO website. The address bar shows the URL <http://www.nsf.gov/dir/index.jsp?org=GEO>. The website header includes navigation links for HOME, FUNDING, AWARDS, DISCOVERIES, NEWS, PUBLICATIONS, STATISTICS, ABOUT, and FastLane. The main content area features the NSF logo and the text "National Science Foundation Directorate for Geosciences (GEO)". Below this is a search bar and a navigation menu with links for GEO Home, GEO Funding, GEO Awards, GEO Discoveries, GEO News, and About GEO. A large banner image shows a landscape with mountains and a river, with the text "Advancing scientific knowledge of Earth's environment". The main content is organized into several columns: "GEO Organizations" (listing Atmospheric Sciences (ATM), Earth Sciences (EAR), and Ocean Sciences (OCE)), "About GEO" (with links for staff directory and general information), "Recently Announced Funding Opportunities" (listing several programs with dates), "Upcoming Due Dates", "Publications" (with a "See All" link), and "Other Site Features" (including special reports, research overviews, and multimedia gallery). The browser's status bar at the bottom shows the URL <http://www.nsf.gov/index.jsp> and a "Local intranet" icon.

[www.nsf.gov/dir/index.jsp?org=GEO](http://www.nsf.gov/dir/index.jsp?org=GEO)

## Atmospheric Sciences

- Meteorology
- Climate Dynamics and Paleoclimate
- Atmospheric Chemistry
- Aeronomy
- Magnetospheric Physics
- Solar-Terrestrial Physics
- Major Facilities (NCAR, Incoherent Scatter Radars, etc.)

## Ocean Sciences

- Physical Oceanography
- Biological Oceanography
- Chemical Oceanography
- Marine Geology and Geophysics
- Oceanographic Technology
- Ocean Drilling Program
- Major Facilities (Ships, ALVIN, etc.)

## Earth Sciences

- Geophysics
- Petrology & Geochemistry
- Tectonics & Continental Dynamics
- Hydrologic Sciences & Geomorphology
- Sedimentary Geology & Paleobiology
- Geobiology & Low T Geochemistry
- EarthScope Facility and Science Program
- Major Facilities



## GEO MISSION

# GEOSCIENCES DIRECTORATE MISSION

- Support research in:  
Atmospheric Sciences  
Earth Sciences  
Ocean Sciences
- Address the nation's need to understand, predict, and respond to environmental events and changes in order to use the Earth's resources wisely



# The Directorate for Geosciences

- invites unsolicited proposals from all scientists with interests in the geosciences
- sponsors special competitions, often interdisciplinary, in areas identified by the community as deserving special attention
- provides long-term support for shared resources
- seeks to promote collaborations with scientists in other disciplines, funding agencies, and nations
- seeks to promote the integration of research and education



## Directorate for Geosciences Supports

- individual investigator-initiated research projects
- investigator-initiated collaborative research programs
- shared resources
  - observational platforms
  - analytic facilities
  - computational facilities
- projects that foster the education and training of the next generation of geoscientists



## *NSF Geosciences Beyond 2000*

The Directorate for Geosciences, with input from the Advisory Committee for Geosciences and the broader research community, prepares long-range plans.

- *NSF Geosciences Beyond 2000: Understanding and Predicting Earth's Environment and Habitability* can be found at <http://www.nsf.gov/geo/adgeo/geo2000.jsp>
- *Facilities to Empower Geosciences Discovery 2004-2008* can be found at <http://www.nsf.gov/geo/facilities/>
- In late 2006, AC-GEO formed the GEOVison Working Group and charged it with developing a plan for the Geosciences Directorate. The plan is intended to provide a comprehensive view of the geosciences that will serve the Directorate as it interacts with NSF management, other government agencies, and the research and education communities. <http://www.nsf.gov/geo/acgeo/geovision/start.jsp>





## Division of Atmospheric Sciences (ATM)

- furthers understanding of weather, climate and the solar-terrestrial system by expanding the fundamental knowledge of the composition and dynamics of the Earth's atmosphere and geospace environment, including
  - studies of the physics, chemistry, and dynamics of earth's upper and lower atmosphere and its space environment
  - research on climate processes and variations
  - studies to understand the natural global cycles of gases and particles in earth's atmosphere
- supports large, complex facilities required for research in the atmospheric and solar-terrestrial sciences



# Division of Atmospheric Sciences (ATM)

## Lower Atmosphere Research Section

Phone: (703) 292-8523

- Atmospheric Chemistry (703) 292-8522
- Climate and Large-scale Dynamics (703) 292-8527
- Physical and Dynamic Meteorology (703) 292-8524
- Paleoclimate (703) 292-8527

## UCAR and Lower Atmospheric Facilities Section

Phone: (703) 292-8521

## Upper Atmosphere Research Section

Phone: (703) 292-8518

- Aeronomy (703) 292-8519
- Magnetospheric Physics (703) 292-8519
- Solar Terrestrial Research (703) 292-8519
- Upper Atmospheric Facilities (703) 292-8529



# Division of Earth Sciences (EAR)

- improves the understanding of the structure, composition, and evolution of the Earth and the processes that govern the formation and behavior of the solid Earth, including
  - research to gain a better understanding of the Earth's changing environments, and the natural distribution of its mineral, water, and energy resources
  - methods for predicting and mitigating the effects of geologic hazards such as earthquakes, volcanic eruptions, floods, and landslides
  - dynamic modeling of earth system processes
- supports theoretical, computational, laboratories and field stations and state-of-the-art scientific infrastructure



# Division of Earth Sciences (EAR)

## Surface Earth Processes Section

Phone (703) 292-8553

- Sedimentary Geology and Paleobiology (703) 292-8551
- Geobiology and Environmental Geochemistry (703) 292-8551
- Geomorphology and Land Use Dynamics (703) 292-8551
- Hydrological Sciences (703) 292-8549
- Education and Human Resources (703) 292-8557

## Deep Earth Processes Section

Phone (703) 292-8553

- Geophysics (703) 292-8556
- Petrology and Geochemistry (703) 292-8554
- Tectonics (703) 292-8552
- EarthScope (703) 292-8556
- Instrumentation and Facilities (703) 292-8558
- Continental Dynamics (703) 292-8559



## Division of Ocean Sciences (OCE)

- enhances understanding of all aspects of the global oceans and their interactions with the solid earth and the atmosphere, including
  - biological, chemical and physical processes that characterize both coastal seas and deep ocean basins
  - geological and geophysical processes that shape the continental shelves and deep sea floor
  - resource and hazard assessment and the health of the oceans' complex and diverse ecological systems
- supports major shared-use oceanographic facilities including research vessels and manned deep diving submersibles



# Division of Ocean Sciences (OCE)

## **Integrative Programs Section**

Phone (703) 292-8583

- Ship Operations
- Oceanographic Instrumentation and Technical Services
- Oceanographic Technology and Interdisciplinary Coordination
- Ocean Education
- Ship Facilities and Support

## **Marine Geosciences Section**

Phone (703) 292-8581

- Marine Geology and Geophysics
- Ocean Drilling Program

## **Ocean Section**

Phone (703) 292-8582

- Biological Oceanography
- Physical Oceanography
- Chemical Oceanography

# NSF Budget Request by Directorate



**2009**  
BUDGET  
REQUEST

## Research and Related Activities

(Dollars in Millions)

	FY 2007 Actual	FY 2008 Estimate	FY 2009 Request	Change over	
				FY 2008 Estimate Amount	Percent
Biological Sciences	\$608.54	\$612.02	\$675.06	\$63.04	10.3%
Computer and Information Science and Engineering	526.68	534.53	638.76	104.23	19.5%
Engineering	629.99	636.87	759.33	122.46	19.2%
<b>Geosciences</b>	<b>745.85</b>	<b>752.66</b>	<b>848.67</b>	<b>96.01</b>	<b>12.8%</b>
Mathematical and Physical Sciences	1,150.73	1,167.31	1,402.67	235.36	20.2%
Social, Behavioral and Economic Sciences	214.54	215.13	233.48	18.35	8.5%
Office of Cyberinfrastructure	182.42	185.33	220.08	34.75	18.8%
Office of International Science and Engineering <sup>1</sup>	40.36	41.34	47.44	6.10	14.8%
Office of Polar Programs	438.43	442.54	490.97	48.43	10.9%
Integrative Activities <sup>2</sup>	219.45	232.27	276.00	43.73	18.8%
U.S. Arctic Research Commission	1.45	1.47	1.53	0.06	4.1%
<b>Total, Research and Related Activities</b>	<b>\$4,758.44</b>	<b>\$4,821.47</b>	<b>\$5,593.99</b>	<b>\$772.52</b>	<b>16.0%</b>

# Budget Request by GEO Division



Appropriations Account	FY 2007 Actual	FY 2008 Estimate	FY 2009 Request	Change Over FY 2008 Estimate	
				Amount	Percent
Atmospheric Sciences	227.44	229.30	260.58	31.28	13.6%
Earth Science	152.83	156.08	177.73	21.65	13.9%
Innovative & Collaborative Education & Research	56.82	56.82	56.82	--	--
Ocean Sciences	308.76	310.46	353.54	43.08	13.9%
<b>TOTAL, GEO</b>	<b>\$745.85</b>	<b>\$752.66</b>	<b>\$848.67</b>	<b>\$96.01</b>	<b>12.8%</b>





# NSF 2009 Budget Prospects

NSF Request, R & RA: \$5,594M

Senate Mark, R&RA: \$5,594M

House Mark, R&RA: \$5,544M

GEO: \$96M increase in request

*Expectation: Continuing Resolution (CR)*



## Recent & Ongoing Major Facility Investments

- HIAPER: Construction complete, initial operations began in 2005 (~80M\$ construction)
- AMISR: Construction nearing completion, operations ramping up (~40M\$ construction)
- EarthScope: Construction continues through 2008, currently on time and on budget, (~197M\$ construction)
- Scientific Ocean Drilling Vessel: FY 2007 funds complete construction, operations to start in 2008 (~115M\$ constr.)

## New MREFC Investments

- Ocean Observatories Initiative: \$5.99 million appropriated in 2008
- Alaska Region Research Vessel: \$9.49 million appropriated in 2007 with an additional \$42.0 million in 2008

Both projects undergoing design and cost reviews prior to start of major construction and continuation of funding.



## NSF Information Related to the American Recovery and Reinvestment Act of 2009

### OVERVIEW OF THE AMERICAN RECOVERY AND REINVESTMENT ACT OF 2009 (RECOVERY ACT)

The American Recovery and Reinvestment Act of 2009 (Recovery Act) was signed into law by President Obama on February 17th, 2009. It is an unprecedented effort to jumpstart our economy, create or save millions of jobs, and put a down payment on addressing long-neglected challenges so our country can thrive in the 21st century. The Act is an extraordinary response to a crisis unlike any since the Great Depression, and includes measures to modernize our nation's infrastructure, enhance energy independence, expand educational opportunities, preserve and improve affordable health care, provide tax relief, and protect those in greatest need.

### IMPLEMENTING THE AMERICAN RECOVERY AND REINVESTMENT ACT OF 2009 (RECOVERY ACT)

[Important Notice 131, American Recovery and Reinvestment Act of 2009](#)

Posted March 18, 2009

[Statement by Arden L. Bement, Jr., Director, National Science Foundation, on the American Recovery & Reinvestment Act of 2009](#)

Posted February 24, 2009

[National Science Board to Discuss Spending and Oversight of NSF's \\$3 Billion Stimulus to Invest in America's Scientific Enterprise](#)

Posted February 20, 2009

### AGENCY PLANS AND REPORTS

#### Weekly Reports

[March 24, 2009 - Report for Week Ending March 20, 2009](#) (Excel, 57K)

[March 10, 2009 - Report for Week Ending March 6, 2009](#) (Excel, 21K)

[March 3, 2009 - Report for Week Ending February 27, 2009](#) (Excel, 46K)

### LEARN MORE ABOUT OUR PROGRAMS

#### Broadband Technologies Opportunities Program

CISE invites researchers and educators to learn more about the Broadband Technologies Opportunities Program (BTOP), jointly funded by the National Telecommunications and Information Administration (at the Department of Commerce) and the Department of Agriculture as a result of appropriations in the American Recovery and Reinvestment Act of 2009. [More](#)

### LEARN MORE ABOUT THE AMERICAN RECOVERY AND REINVESTMENT ACT OF 2009 (RECOVERY ACT)

[Recovery.gov](#)

[Memorandum-for-the-Heads-of-Executive-Departments-and-Agencies-3-20-09 RE: Ensuring Responsible Spending of Recovery Act Funds](#)

[Final American Recovery and Reinvestment Act of 2009 \(Recovery Act\) legislation.](#)

### HOW TO APPLY

Funding opportunities: [Grants.gov](#), [FastLane](#), [Research.gov](#)

Contracting opportunities: [FedBizOpps](#)

### CONTACTS

[NSF Inspector General](#)

RECOVERY.GOV

# HIAPER

HIAPER is the High-performance Instrumented Airborne Platform for Environmental Research, a Gulfstream V jet modified to serve the NSF environmental research needs for the next several decades. HIAPER is maintained and operated for the NSF by the National Center for Atmospheric Research in Boulder, Colorado.

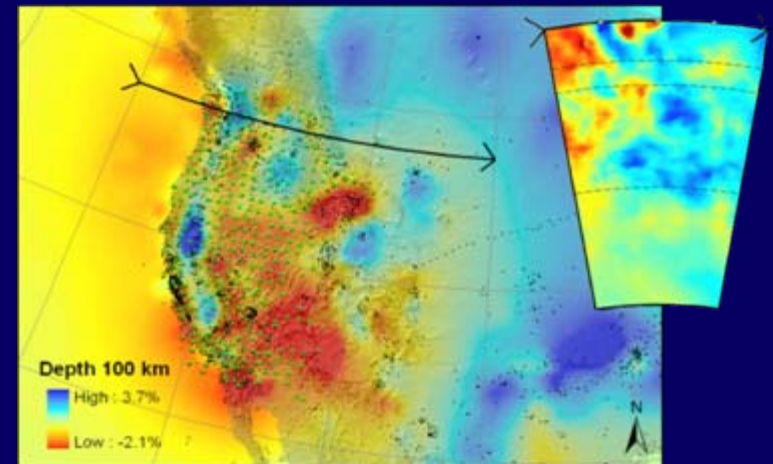
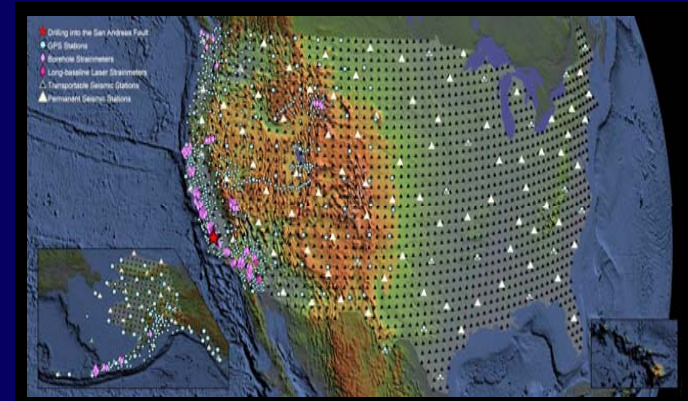


NSF's Gulfstream V jet made its first flights during T-Rex (Terrain-induced Rotor Experiment) in Spring 2006.

# EarthScope

The EarthScope Facility is a distributed, multi-purpose geophysical instrument array of geodetic, seismic, magnetotelluric, and strain instrumentation. It is designed to study earthquakes & seismic hazards, magmatic systems & volcanic hazards, lithospheric dynamics, regional tectonics, and fluids in the crust.

- Plate Boundary Observatory (PBO) – GPS receivers & strainmeters
- San Andreas Fault Observatory at Depth (SAFOD) – deep borehole into the SA fault
- USArray – network of fixed and transportable seismic stations



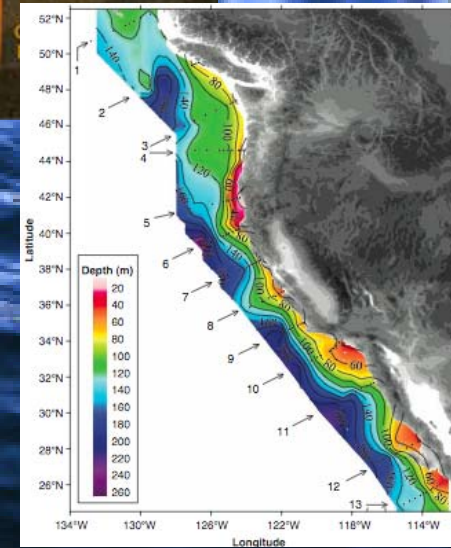
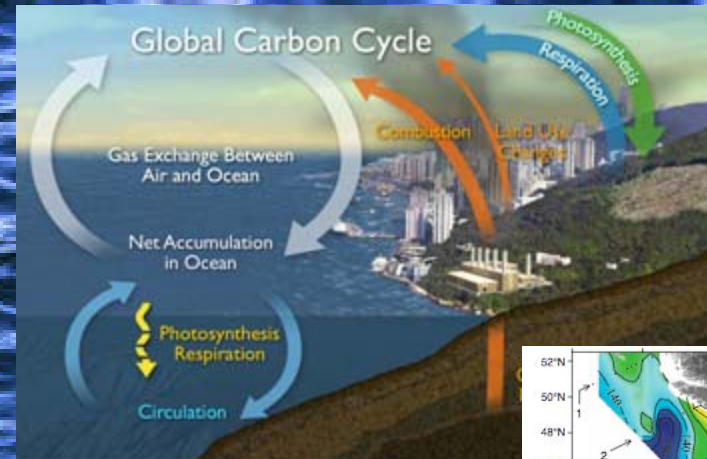
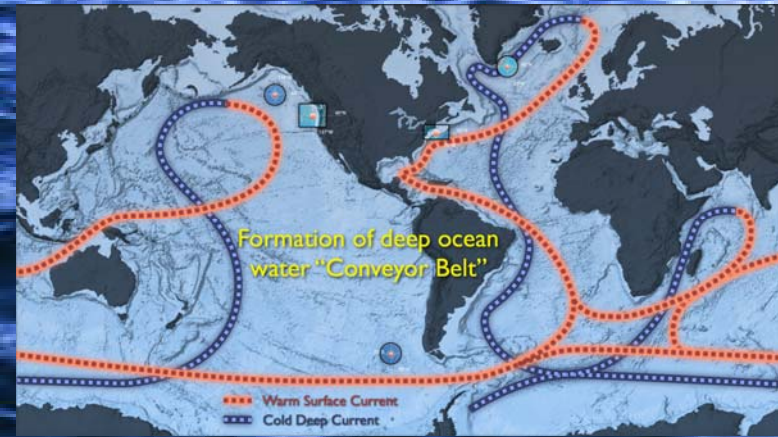
# Ocean Observatories Initiative (OOI)

- Constructed over 5 years with expected 25-30 year lifetime
- Complementary to operational observing systems
- Multi-scale network- global, regional, coastal
- Expanded power and bandwidth to the seafloor
- Interactive capabilities
- Reconfigurable and adaptive network components
- Open data policy
- New way to provide access to the ocean for science, education, and public engagement



Long time-series across many spatial scales \* Ability to investigate short-term episodic events \* Multi-disciplinary approach to study complex natural systems and non-linear processes \* Enable complex models for analysis and prediction

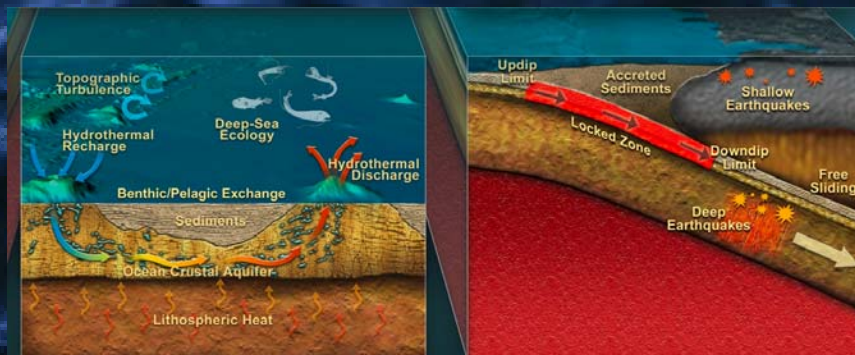
# OOI - Motivated by Research Needs



Ability to investigate: ocean circulation, water mass formation & mixing; air-sea exchange

Ability to examine: ocean acidification; ocean's role in global carbon cycle; climate change, human activity & coastal ecosystem health

Ability to assess: methane hydrate flux and connectivity to global carbon cycle; sub-seafloor fluid flow; earthquake formation, transmission & impacts





# Education Investments



2009  
BUDGET  
REQUEST

GEO has built a robust portfolio of education and diversity investments. In FY 2009, support for these programs is maintained.

- Opportunities for Enhancement of Diversity in the Geosciences
  - \$4.6 million
- Geoscience Education (2009 solicitation expected)
  - \$2.5 million including \$1 million to foster linkages with LSAMPP
- GEO Teach (Re-evaluating how to serve k-12 teaching community-Expired solicitation)
  - \$3.0 million
- Global Learning and Observations to Benefit the Environment (GLOBE)
  - \$1.1 million (NASA Partnership, expired, possible 2010 deadline)
- Centers for Ocean Science Education Excellence (COSEE)
  - \$5.55 million (expired)

In addition, most facilities, centers, and many individual investigator awards include strong education and outreach programs.



## Opportunities for Enhancing Diversity in the Geosciences (OEDG)

Primary goal is to increase participation in geoscience education and research by students from groups currently underrepresented in science, technology, engineering, and mathematics (NSF 08-605).

- About \$9 M per competition; held biennially
- Track 1 & 2 deadline has passed
- Revised Solicitation and Competition 2010
- Planning Grants: May 1, Nov 3 2009 deadlines



# FY 2009: Education & Diversity Investments

GEO has built a robust portfolio of education and diversity investments. In FY 2009, support for these programs is maintained.

- Opportunities for Enhancement of Diversity in the Geosciences
  - \$4.6 million
- Geoscience Education
  - \$2.5 million including \$1 million to foster linkages with LSAMP
- GEO Teach
  - \$3.0 million
- Global Learning and Observations to Benefit the Environment (GLOBE)
  - \$1.1 million
- Centers for Ocean Science Education Excellence
  - \$5.55 million

In addition, most facilities, centers, and many individual investigator awards include strong education and outreach programs.



# Geoscience Education (GeoEd)

- Current structure: initiate innovative GeoEd activities
  - Track 1: pilot projects: Innovative education activities, maximum award \$150K
  - Track 2: Integrative collaborations- integrate with LSAMP, AGEP or similar projects, max award \$500K
  - All educational levels
  - Dissemination and evaluation plans required
- Revised solicitation may modify this structure
  - Deadline: Expected in Fall 2009
  - Funds available: about \$1.5 million



# GEO Education

- Division of Atmospheric Sciences  
Contact: Walt Robinson      [wrobinso@nsf.gov](mailto:wrobinso@nsf.gov)
- Division of Earth Sciences  
Contact: Lina Patino      [lpatino@nsf.gov](mailto:lpatino@nsf.gov)
- Division of Ocean Sciences  
including Centers for Ocean Science Education Excellence (COSEE)  
Contact: Lisa Rom      [erom@nsf.gov](mailto:erom@nsf.gov)  
             Don Elthon      [delthon@nsf.gov](mailto:delthon@nsf.gov)

GEO has a Directorate-wide program to fund formal (K-16) and informal geoscience education activities.

Contact: Jill Karsten      [jkarsten@nsf.gov](mailto:jkarsten@nsf.gov)



# Cross-Cutting Activities in GEO

- Emerging Topics in Biogeochemical Cycles
- Environment, Society, and the Economy
- Multi-scale Modeling
- Paleo Perspectives on Climate Change
- Geoscience Education & Diversity
- Collaborations in Mathematical Geosciences (CMG)  
next deadline January 22, 2010
- Cyber-enabled Discovery and Innovation (CDI)



# Emerging Topics in Biogeochemical Cycles

- Dear Colleague Letter issued February 2009
- The Directorate for Geosciences (GEO) and the Directorate for Biological Sciences (BIO) are enhancing support for interdisciplinary research which bridges across the biological, atmospheric, geological, oceanographic and hydrological sciences, in the area of biogeochemical cycles and processes.
- Quantitative or mechanistic understanding of biogeochemical cycles that integrate physical-chemical-biological processes over the range of temporal and/or spatial scales and/or various levels of biological organization.
- Proposals must cross at least one program in the BIO Directorate and at least one Program in the GEO Directorate. Proposals involving programs in two different divisions in GEO are also (e.g. ATM, EAR, OCE).
- *Not a special competition* or new program. Relevant proposals are to be submitted to an existing GEO program according to the program's regular target or deadline dates.

## GEO Contacts:

Ajit Subramaniam (OCE), Enriqueta Barrera (EAR), Eric Hintsä (ATM)



# Environment, Society, and the Economy

- Dear Colleague Letter issued February 2009
- The Directorate for Geosciences (GEO) and the Directorate for Social, Behavioral, and Economic Sciences (SBE) are enhancing support for interdisciplinary research related to Environment, Society, and the Economy. Prospective topics of interest include, but are not limited to, the following:
  - \* Decision-making strategies related to ongoing or predicted global, regional, and local environmental changes;
  - \* Economic and geosciences evaluation of technology and practices linked to climate change;
  - \* Impacts and adaptation of economic systems;
  - \* Pathways to successful application of geoscience research findings;
  - \* Development and implementation of mitigation strategies within political and economic constraints;
  - \* Interplay of environmental change and inequality of income, access to resources, etc.;
  - \* Role of incentives in human behavior;
  - \* Politics and economics of resource agreements;
  - \* Environmental change and its impact on the evolution of human behavior; and
  - \* Capacity building.
- Proposals must cross at least one program in the SBE Directorate and at least one Program in the GEO Directorate.
- *Not a special competition* or new program. Relevant proposals are to be submitted to an existing GEO program according to the program's regular target or deadline dates.

## GEO Contacts:

C. Susan Weiler





# Multi-scale Modeling (MSM)

- Dear Colleague Letter issued February 2009
- The Directorate for Geosciences (GEO) and the Directorate for Biological Sciences (BIO) are enhancing support for interdisciplinary research which bridges from the biological to the earth system sciences in the area of multi-scale modeling
- The development and/or integration of environmental models that link local, regional and global scales. Competitive projects should address key problems linking biological and Earth system processes over a variety of spatial and temporal scales.
- Proposals must cross at least one program in the BIO Directorate and at least one Program in the GEO Directorate. Proposals involving programs in two different divisions in GEO are also (e.g. ATM, EAR, OCE).
- *Not a special competition* or new program. Relevant proposals are to be submitted to an existing GEO program according to the program's regular target or deadline dates.

## GEO Contacts:

Barbara Ransom (OCE), Richard Cuenca (EAR), Liming Zhou (ATM)



# Paleo Perspectives on Climate Change (P2C2)

- Solicitation issued in Fall 2007
- Next Deadline: October 15, 2009
- Replaced 'Earth System History' solicitation

## GEO Contacts:

David Verardo

[dverardo@nsf.gov](mailto:dverardo@nsf.gov)

Candace Major

[cmajor@nsf.gov](mailto:cmajor@nsf.gov)

Paul Filmer

[pfilmer@nsf.gov](mailto:pfilmer@nsf.gov)



# Critical Zone Observatories (CZO)

Critical Zone Observatories operate at the watershed scale and will significantly advance our understanding of the integration and coupling of Earth surface processes as mediated by the presence and flux of fresh water.

Observatories include field and analytical research methods, as well as theoretical techniques, each providing the impetus for advances in the other, as well as substantial and novel plans for education, outreach and broader impacts.

**Sierra Nevada --- Front Range, Rockies --- Appalachian Uplands**





## FY 2009: Research Activities

- Meeting with Transition Team
- Climate Change Science
- Dynamics of Water Processes in the Environment
  - Initial GEO funding will focus on defining frontier research opportunities and advancing activities in foundational water systems research.
- Near-term priorities of the Ocean Research Priorities Program
- Cyber-enabled Discovery and Innovation
  - GEO investments in CDI will focus on enhancing our ability to study natural phenomena involving large numbers of interacting elements, non-linear interactions, and emergent phenomenon observed at diverse spatial and temporal scales in order to improve both predictive and deductive capabilities for a better understanding of the complex world in which we live.



# NSF-wide Activities

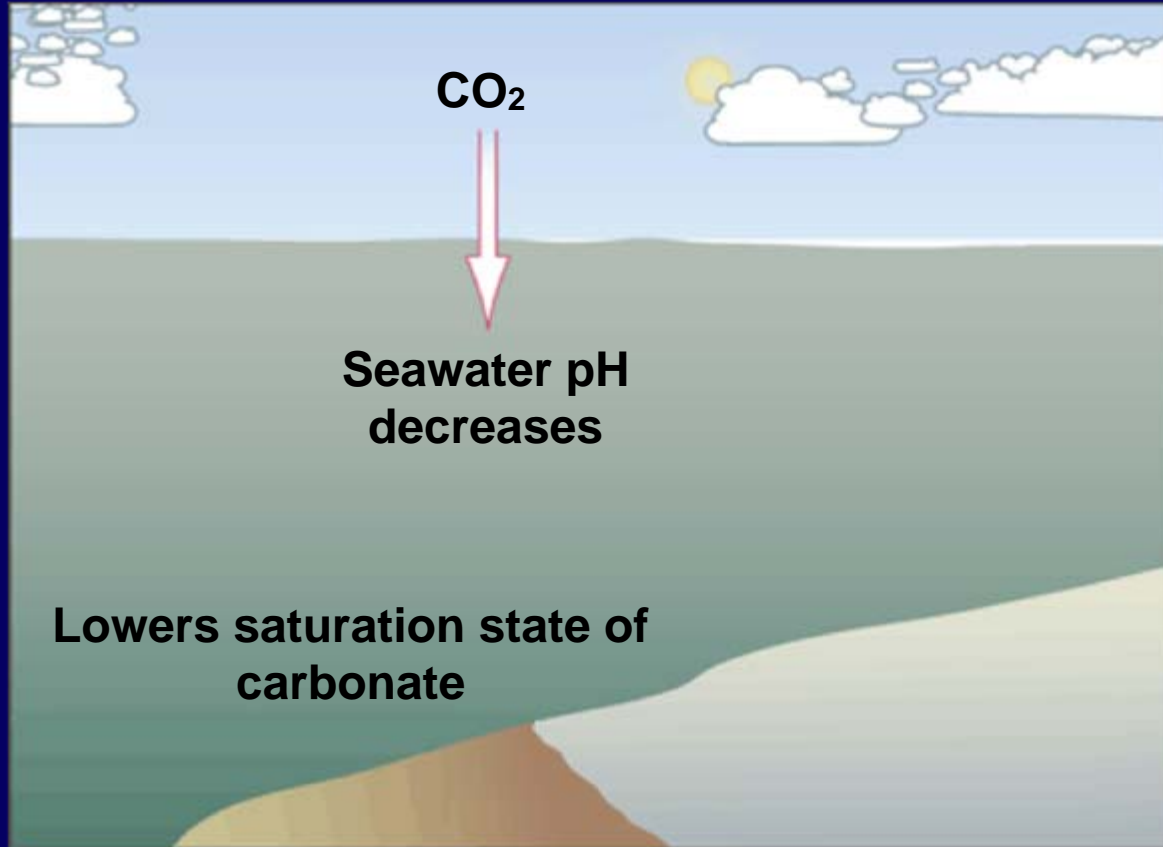
- CAREER
- Major Research Instrumentation (MRI)
  - Awards for instrumentation will range from \$100,000 to \$2 million. Proposals requesting less than \$100,000 will be considered only from non-Ph.D. granting organizations or from the disciplines of mathematical science or social, behavioral, and economic science at any eligible organization.
- Research in Undergraduate Institutions (RUI)
- Research Experiences for Undergraduates (REU)
- Improvements in Facilities, Communications, and Equipment at Biological Field Stations and Marine Laboratories (FSML)
- Small Grants for Exploratory Research (SGER)



# Some Current Challenges in Geosciences Research

- Ocean Acidification
- Deep Earth Processes
- Water Dynamics in the Environment
- Coupled Natural and Human Systems

# Ocean Acidification: The "Other" CO<sub>2</sub> Problem



# Threats to Ecosystems: Dissolution of $\text{CaCO}_3$ in High $\text{CO}_2$ World

Calcareous  
Phytoplankton



Coral Reefs

Pteropods



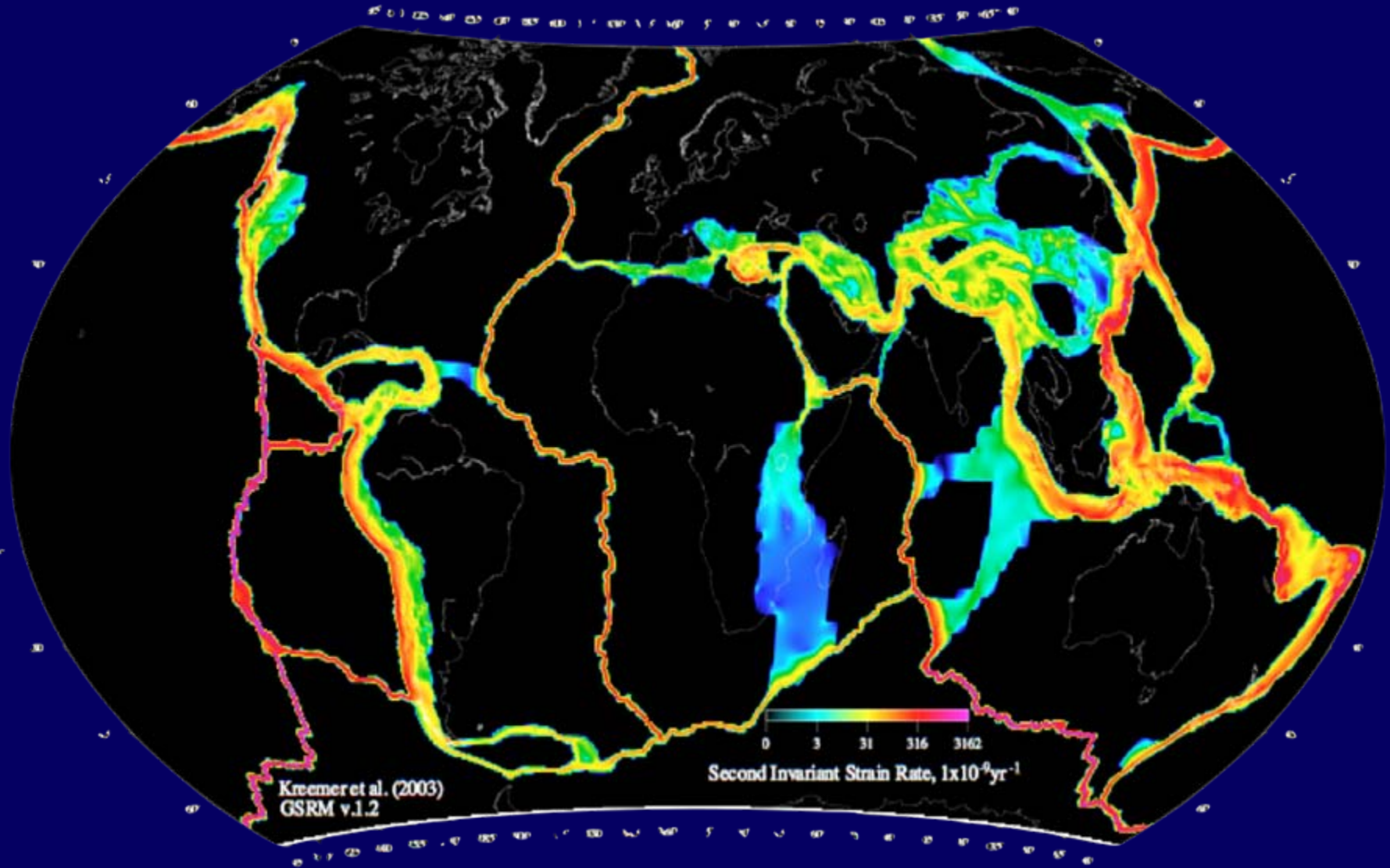


# Deep Earth Processes



- What happened in the earliest part of the Earth's planetary history?
- What drives and defines Earth's deformation?
- What are the characteristics of the Earth's deep interior?
- How does Earth's inner activity influence natural hazards?

# Deformation of the Earth *moving beyond plate tectonics*





# Water Dynamics in the Environment

- Enhance our understanding of complex hydrological processes and predict water availability and quality at local and regional scales
- FY09 Budget Request
  - \$10 million
  - Targeted at detailed planning and pilot projects
  - Enables coordination with other agencies

# New and Urgent Challenges

- Water is a critical resource for
  - Economic Vitality
  - Energy Independence
  - National Security
- Water management needs to be adaptive and account for effects of climate change and variability
- Changing water patterns are increasing the stress on ecosystems
- Water availability and quality are key factors in land use and energy





# NSF Proposal Statistics FY 2007

	NSF	GEO
Competitive Proposal Actions	44,593	4,373
Competitive Awards	11,484	1,347
Funding Rate	15%	21%
Average Research Award Duration (Years)	2.48	2.52
Average Annual Research Award Size	\$148,189	\$156,110
Individual Panel Reviews	146,984	6,645
Panel Summaries	43,241	4,171
Mail Reviews	68,055	19,575



# Proposal Preparation

## Resources

- Proposal and Award Policies and Procedures  
[http://www.nsf.gov/publications/pub\\_summ.jsp?ods\\_key=papp](http://www.nsf.gov/publications/pub_summ.jsp?ods_key=papp)
- NSF HomePage -- Guide to Programs
- Program Solicitations – eligibility, goals, special requirements
- Program Officers – current or former rotators
- NSF Custom News Service – what's new



## A Good Proposal

- is a good idea, well expressed, with a clear indication of methods for pursuing the idea, evaluating the findings, and making them known to all who need to know
- includes realistic and well justified budgets that are in line with program guidelines



# NSF Merit Review

## NSF Review Criteria

- Intellectual Merit
- Broader Impacts

Programs can also have additional review criteria  
– read the Program Solicitation!

Merit Review is conducted through ad hoc peer review and/or panel review





## Words of Wisdom

- Talk to your Program Directors  
Ask us early, ask us often!!
- Learn the culture – each Division and Directorate has a different *modus operandi*
- Volunteer to be a reviewer
- Don't forget to address "Broader Impacts"

