NSF Regional Grants Conference
Salt Lake City, Utah

Directorate for Geosciences

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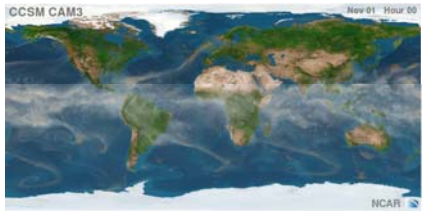
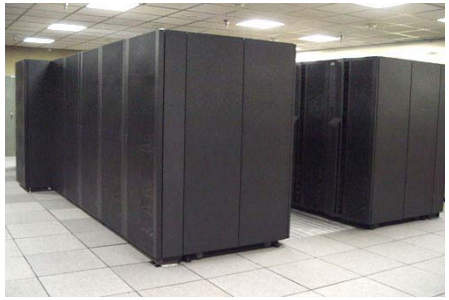
The Mission of the Directorate for Geosciences

- Support research in the atmospheric, earth and 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



Division of Atmospheric and Geospace Sciences (AGS)

- 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
- Supports large, complex facilities required for research in the atmospheric and solar-terrestrial sciences



Division of Atmospheric and Geospace Sciences

UCAR & Lower Atmospheric Facilities Oversight Section

Lower Atmosphere Research Section

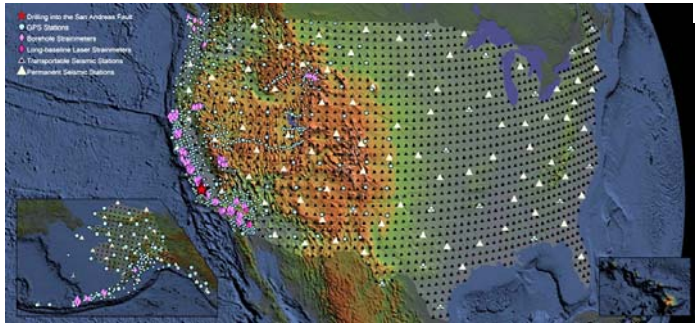
- Atmospheric Research Program
- Cross-Disciplinary Activities Program
- Physical & Dynamic Meteorology Program
- Climate & Large-Scale Dynamics Program
- Paleoclimate Program

Upper Atmosphere Research Section

- Aeronomy Program
- Magnetospheric Physics Program
- Solar Terrestrial Research Program
- Upper Atmospheric Facilities
- Major Research Instrumentation Program

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
- Supports theoretical, computational, laboratories and field stations and state-of-the-art scientific infrastructure



Division of Earth Sciences

Surface Earth Processes Section

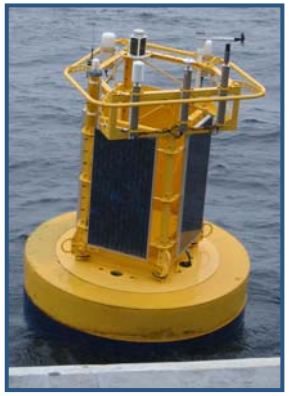
- Education & Human Resources
- Hydrologic Sciences
- Geomorphology & Land Use Dynamics
- Sedimentary Geology & Paleobiology
- Geobiology & Environmental Geochemistry

Deep Earth Processes Section

- Instrumentation & Facilities
- Continental Dynamics
- EarthScope
- Geophysics
- Petrology & Geochemistry
- Tectonics

Division of Ocean Sciences (OCE)

- Enhances understanding of all aspects of the global oceans and their interactions with the solid earth and the atmosphere
- Supports major shared-use oceanographic facilities including research vessels and manned deep diving submersibles



Division of Ocean Sciences

Marine Geosciences Section

- Ocean Drilling Program
- Marine Geology and Geophysics Program

Integrative Programs Section

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

Ocean Section

- Biological Oceanography Program
- Physical Oceanography Program
- Chemical Oceanography Program

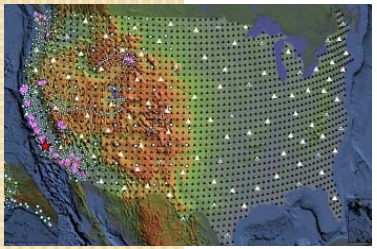
Modes of support

- unsolicited proposals from all scientists with interests in the geosciences
  - collaborative and individual proposals
- special competitions, often interdisciplinary
- promote collaborations with scientists in other disciplines, funding agencies, and nations
- promote the integration of research and education

Long-term support for shared resources

- Observational platforms
- Analytic facilities
- Computational facilities
- Data archiving
- Experimental facilities

Recent and Ongoing Major Facility Investments



- HIAPER: Operations began in 2005
- AMISR: Poker Flat, AK: operational; Resolute Bay, Canada: under construction.
- EarthScope: Operational
- Scientific Ocean Drilling Vessel: Operational
- Ocean Observatories Investment: under construction
- R/V Sikiliaq (formerly Alaska Regional Research Vessel): under construction

Cross-Cutting Activities in GEO

- Paleo Perspectives on Climate Change (P2C2)
- Geoscience Education (GeoEd)
- Opportunities for Enhancing Diversity in the Geosciences (OEDG)
- Frontiers in Earth System Dynamics (FESD)
- Water, Sustainability and Climate (WSC)

Paleo Perspectives on Climate Change (P2C2)

- Program Solicitation 10-574
- Annual deadlines for 2010-2012: October 18th

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OPP Contact:

William Wiseman	wwiseman@nsf.gov

GEO Education (GEO Ed)

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

- Directorate for Geosciences
  Contact: Jill Karsten jkarsten@nsf.gov
- Division of Atmospheric and Geospace Sciences
  Contact: Sue Weiler cweiler@nsf.gov
- Division of Earth Sciences
  Contact: Lina Patino lpatino@nsf.gov
- Division of Ocean Sciences (including the Centers for Ocean Science Education Excellence--COSEE)
  Contact: Lisa Rom erom@nsf.gov

Opportunities for Enhancing Diversity in the Geosciences (OEDG)

- Designed to address the fact that certain groups are underrepresented in the geosciences relative to their proportions in the general population.
- Program Solicitation: 10-500
- Deadlines: November 10, 2011 and October 5, 2011
- GEO Contact:

  Jill Karsten jkarsten@nsf.gov

Frontiers in Earth System Dynamics (FESD)

Old Program Solicitation NSF 10-577

- GEO-wide program involving AGS, EAR and/or OCE
- Intra- or Inter- Divisional scope, but beyond purview of a single discipline
- Complements science funded through GEO's core programs;
- Provides support for 'mid-sized' activities that fall between core program and STC/MREFC scales
- Where appropriate, capitalizes on major facility investments NSF is already making;
- Promotes interdisciplinary study of interactive dynamics within the Earth system over a wide range of space and time scales
- Program budget: Planning for $28M per competition
- 3 competitions FY11, FY13, FY15

Water Sustainability and Climate (WSC)

- Old Program Solicitation (NSF 10-524)
- The goal of the Water Sustainability and Climate (WSC) solicitation is to understand and predict the interactions between the water system and climate change, land use, the built environment, and ecosystem function and services through place-based research and integrative models.
- GEO, BIO, ENG cross disciplinary collaborations
- Successful proposals expected to study water systems to enable a new interdisciplinary paradigm in water research.

Earth Sciences Post-Doctoral Fellowships (EAR-PF)

- Integrated program of independent research and education that address scientific questions within the scope of EAR disciplines.
- Fellowship program may be conducted at any appropriate U.S. or foreign host institution
- 2 year long fellowships, $170k/2years
- Eligibility within 3 years of PhD
- Fellowships are awards to individuals, not institutions, and are administered by the Fellows.
- 2 months parental leave can be requested

NSF 10-500 *** Deadline: July 1 annually

Other NSF Activities of Interest "Crosscutting and NSF-wide"

- CAREER
- Research in Undergraduate Institutions (RUI)
- Research Experiences for Undergraduates (REU)
- Early Concept Grants for Exploratory Research (EAGER)
- Grants for Rapid Response Research (RAPID)
- ADVANCE: Increasing the Participation and Advancement of Women in Academic Science and Engineering Careers
- CNH: Dynamics of Coupled Natural and Human Systems

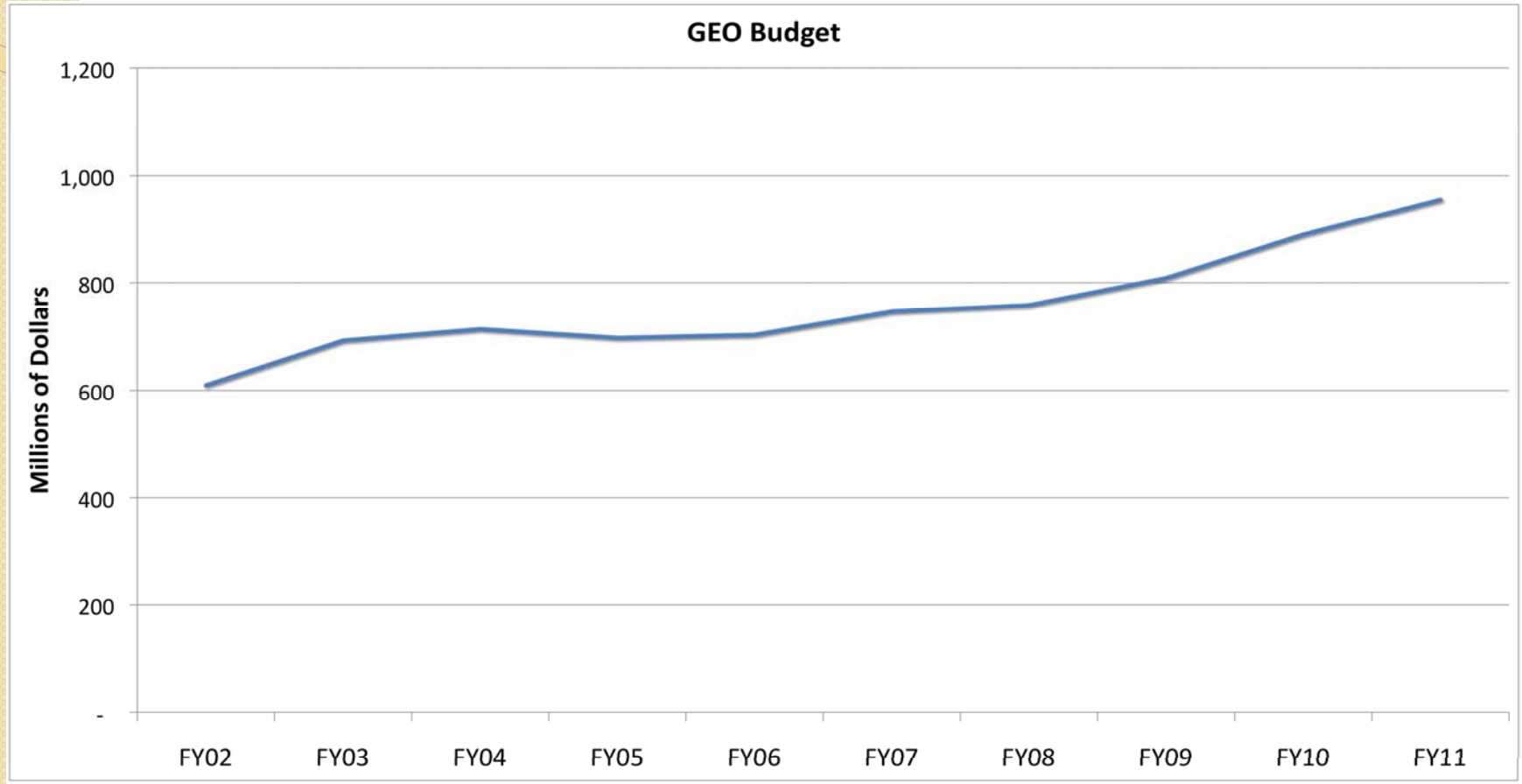
Other NSF Activities of Interest: Instrumentation and Facilities

- Major Research Instrumentation (MRI and MRI-R2) $100,000 to $6M -- 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.
- Improvements in Facilities, Communications, and Equipment at Biological Field Stations and Marine Laboratories (FSML)
- EPSCoR Research Infrastructure Improvement Program: Inter-Campus and Intra-Campus Cyber Connectivity (RII C2)
- Earth Sciences: Instrumentation and Facilities (EAR/IF)

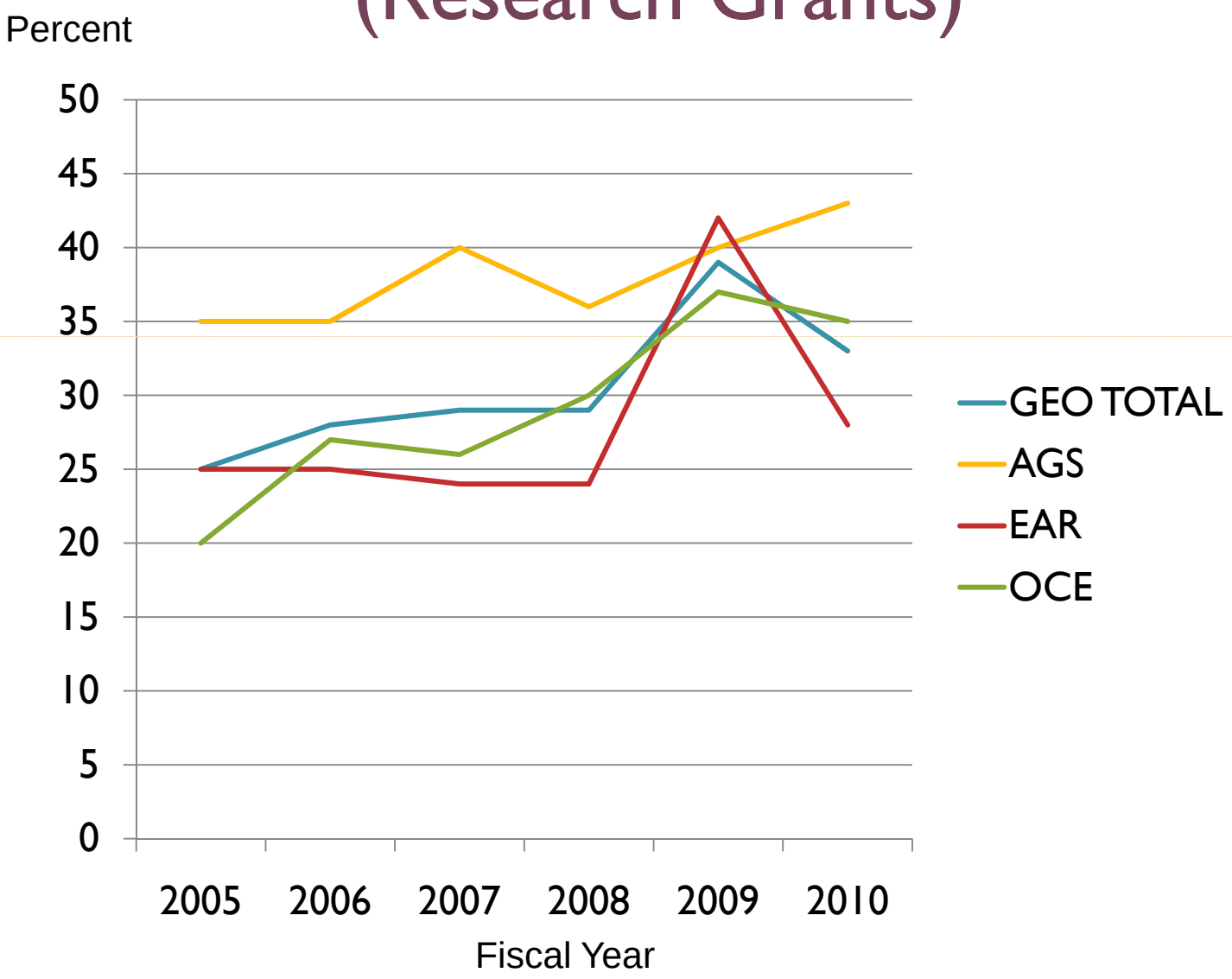
GEO Budgets

- FY 09: $808M (+$50/FY 08)
- FY 09 ARRA (American Reinvestment & Recovery Act) : $601M (~20% of NSF funds) ($347M for Research and Education grants and $254M for MREFC projects)
- FY 10 estimated: $890M (+$82/FY 09)
- FY 11 request: $955M (+$65M/FY 10)

GEO Yearly Budget History



GEO Funding Rates (Research Grants)



Budget by Division and Area

GEO Funding
(Dollars in Millions)

	FY 2009 Omnibus Actual	FY 2009 ARRA Actual	FY 2010 Estimate	FY 2011 Request	Change Over FY 2010 Estimate Amount	Percent
Atmospheric and Geospace Sciences (AGS)	$245.54	$68.20	$259.80	$280.80	$21.00	8.1%
Earth Sciences (EAR)	171.01	85.22	183.00	199.00	16.00	8.7%
Integrative and Collaborative Education & Research (ICER)	61.47	79.58	97.92	97.60	-0.32	-0.3%
Ocean Sciences (OCE)	330.51	114.00	348.92	377.89	28.97	8.3%
Total, GEO	**$808.53**	**$347.00**	**$889.64**	**$955.29**	**$65.65**	**7.4%**
Research	389.11	224.69	464.12	505.17	41.05	8.8%
Education	31.82	35.98	41.40	44.68	3.28	7.9%
Infrastructure	374.10	86.34	367.79	387.60	19.81	5.4%
Stewardship	13.51	-	16.33	17.84	1.51	9.2%

Totals may not add due to rounding.

2011 Budget

The 2011 Request represents an exciting opportunity for GEO to make advances on several important fronts:

- Research: new thrusts
- Infrastructure: advancement and renewal
- Education: expansion of programs

2011 Research Themes

- Science, Engineering, and Education for Sustainability (SEES +$35M to $230M)
  - Follow-on to 2010 Climate Research activity
  - In 2011, GEO will support research to study regions that are highly susceptible to the impacts of environmental changes, such as:
    - Coastal areas subject to sea-level rise
    - The Arctic, where warming temperatures and waning ice cover challenges communities and ecosystems

Science, Engineering, and Education for Sustainability

SEES will generate the discoveries in climate and energy science needed to inform societal actions for environmental and economic sustainability.

- Emergence of new areas of research that help close key gaps in the knowledge base.
- Development of new models for research, specifically employing integrative, systemic approaches.
- Generation of new integrated understanding of the interplay of environment, energy, and the economy.
- SEES portfolio totals $765.5 million in 2011.

2011 Infrastructure Investments

- OOI Operations and Management – 2011 brings a ramp-up in O&M support for the OOI
- Regional Class Research Vessels – 2011 will see continued planning for the construction of up to three Regional Class Research Vessels starting in 2012.
- NCAR-Wyoming Supercomputer Center – 2011 sees the continuation of support for the construction of a new community supercomputer center.

2011 Education & Diversity Themes

- Graduate Research Fellowships are increasing to $2.74 million from $1 million.
- GEO contribution to ADVANCE is increasing to $4.28 million from $3.46 million (fostering women in science).
- GEOEd: About 100 proposals received
- Diversity: new strategic planning effort and Opportunities for Diversity in the Geosciences

Questions ??