NSF Regional Conference
Arizona State University

Biological Sciences Directorate

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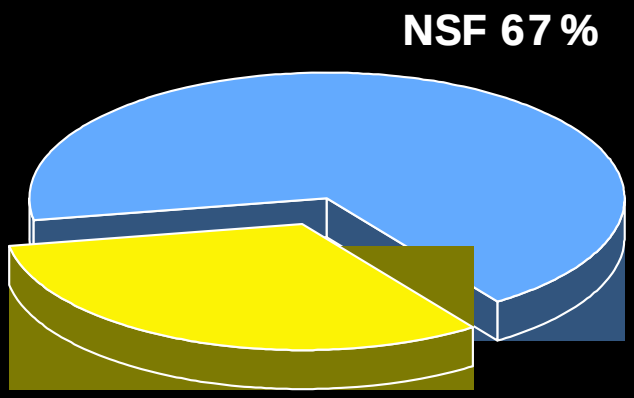
Biological Sciences Directorate

Vision - *Inspiring research and education at the frontiers of the life sciences*

Mission - *To enable the discoveries for understanding life*

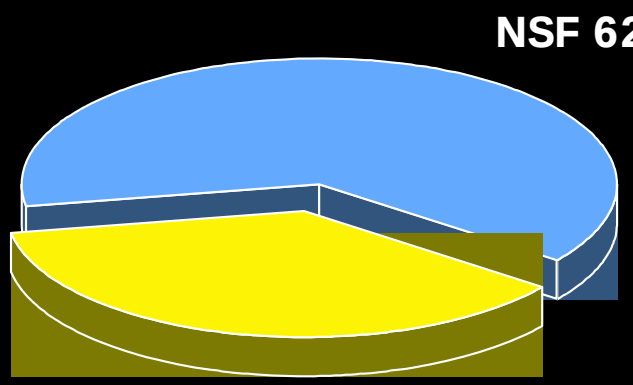
BIO Support for Basic Research

Federal Support for Basic Research in Non-Medical Biological Sciences at Academic Institutions



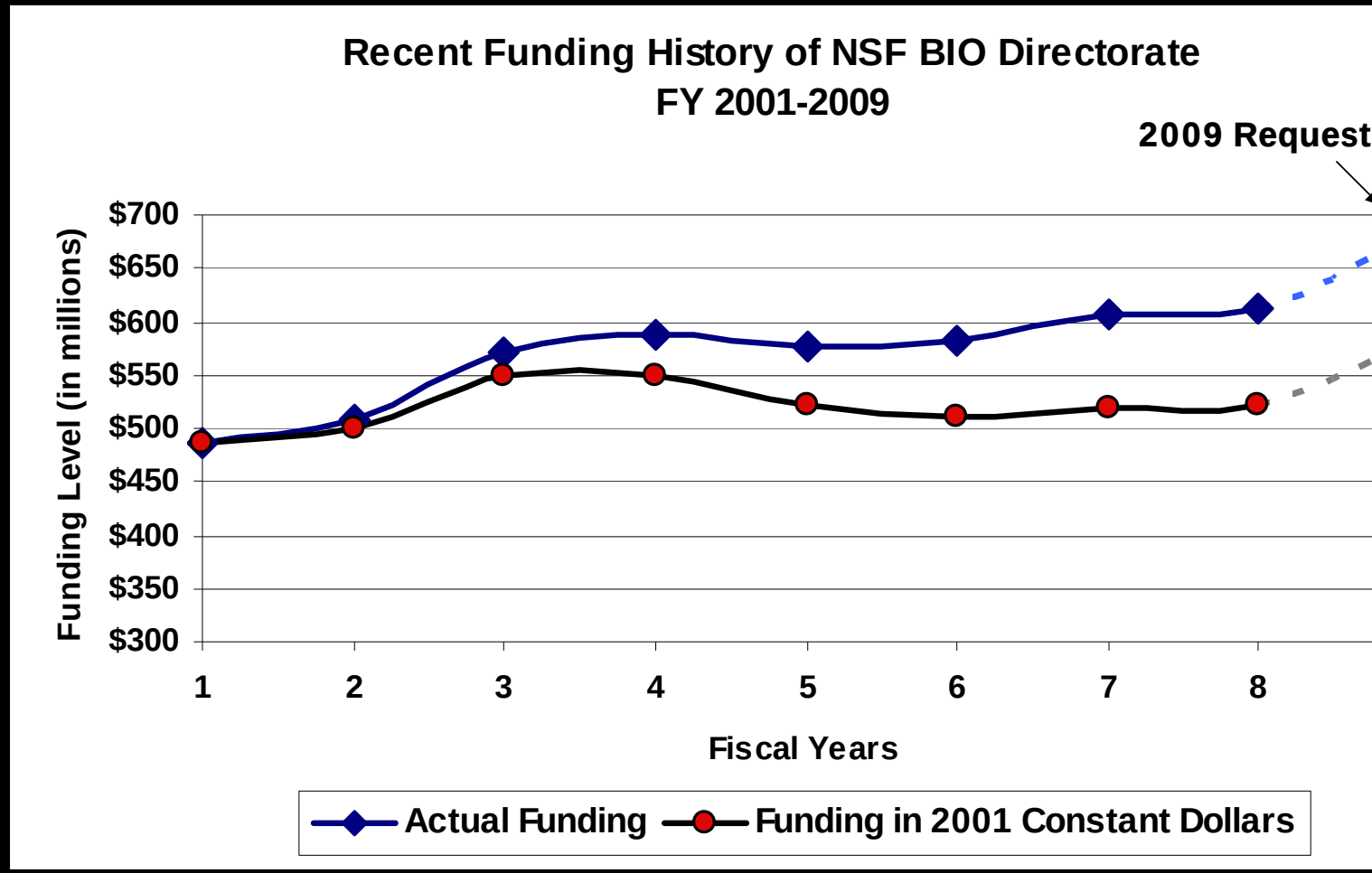
Other federal spending 33%

Federal Support for Basic Research in Environmental Biology at Academic Institutions

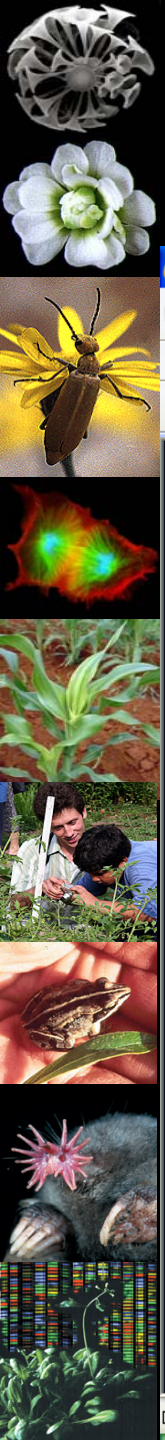


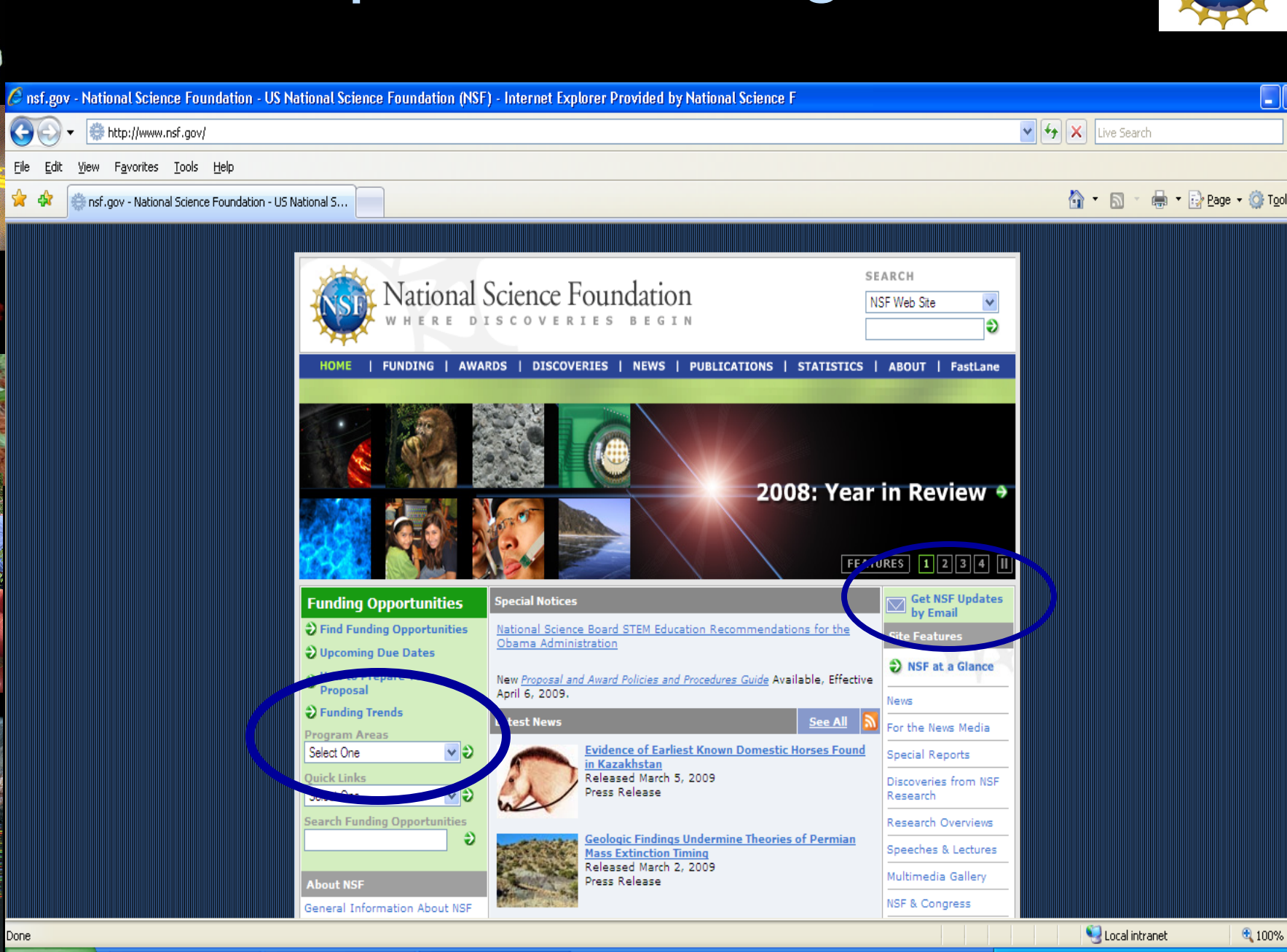
Other federal spending 38%

Realities


Recent Funding History of NSF BIO Directorate
FY 2001-2009
2009 Request
Funding Level (in millions)
$700
$650
$600
$550
$500
$450
$400
$350
$300
1
2
3
4
5
6
7
8
9
Fiscal Years
Actual Funding
Funding in 2001 Constant Dollars

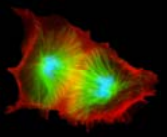
http://www.nsf.gov



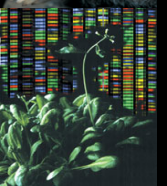


Directorate for Biological Sciences



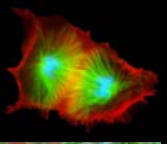


Division of Biological Infrastructure (DBI)	Division of Environmental Biology (DEB)	Integrative Organismal Systems (IOS)	Molecular & Cellular Biosciences (MCB)
Human Resources	Ecological Biology	Behavioral Systems	Biomolecular Systems
Research Resources	Ecosystem Science	Developmental Systems	Cellular Systems
	Population & Evolutionary Processes	Neural Systems	Genes & Genome Systems
	Systematic Biology & Biodiversity Inventories	Physiological & Structural Systems	

Division of Biological Infrastructure






Empowering biological discovery

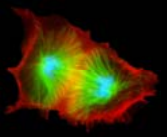
Human Resources

Research Experiences for Undergraduates (Sites); Postdoctoral Research Fellowships

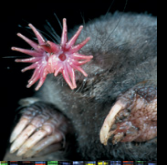
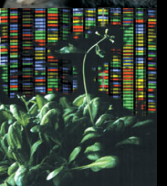
Research Resources

Biological databases and informatics; biological research collections; instrumentation and instrument development; improvements in field stations and marine laboratories





Division of Environmental Biology

Fundamental research on populations, species, communities, and ecosystems

Ecological Biology

Natural and managed ecological systems; ecology

Ecosystem Science

Natural, managed, and disturbed ecosystems; ecosystem studies; Long-Term Ecological Research (LTER)

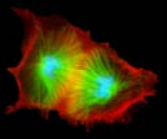
Population & Evolutionary Processes

Evolutionary ecology; population dynamics; evolutionary genetics; molecular population biology

Systematic Biology & Biodiversity Inventories

Discovery, description, inventory of species diversity






Integrative Organismal Systems

Fundamental research on integrative understanding of organisms structure and function

Behavioral Systems

Development, function, mechanisms and evolutionary history of behavior

Developmental Systems

Interacting developmental processes shared by all organisms and those that produce diversity

Neural Systems

Complex function of the nervous system; information extraction and integration; adaptive behavior; learning

Physiological & Structural Systems

Interacting physiological and structural systems within environmental and evolutionary contexts

Molecular and Cellular Biosciences

Fundamental understanding of life processes at the molecular, subcellular and cellular levels

Biomolecular Systems

Structure, function, dynamics, interactions, and interconversions of biological molecules

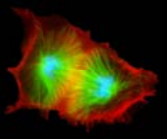
Cellular Systems

Structure, function, and regulation of plant, animal and microbial cells, and their interactions with the environment and with one another

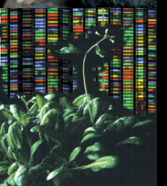
Genes and Genome Systems

Genomes and genetic mechanisms in all organisms, whether prokaryote, eukaryote, phage, or virus





BIO-wide Opportunities

Plant Genome Research Program

- Structure, organization and function of plant genomes
- Accelerate acquisition and utilization of new knowledge and innovative technologies
- Focus on plants of economic importance and plant processes of potential economic value

National Ecological Observatory Network

Biosphere, Geosphere, Atmosphere

- Continental-scale questions (*Will changing climate increase or decrease the biological carbon uptake or emission of the US and by how much?*)
  - Drivers (*climate, biological processes, land use change*)
  - Phenomena (CO_2 *uptake or emission*)
- Forecast effects of climate change, land use change, and invasive species

Research Coordination Networks

- Encourage and foster new interactions
- Promote new research direction or advance a field
- Support communication/coordination across disciplinary, organizational, institutional and geographical boundaries
- $50 to $100 K per year for up to 5 years

Research & Teaching Coordination Networks

- Parallel to RCN
- Focus on enhancing undergraduate education in biology

Assembling the Tree of Life

- Constructing a universal Tree of Life for all 1.7 million named species of organisms on earth
- Capitalizes on new computational and genomic technologies
- Encompasses all microbes, fungi, protists, animals and plants

Multidisciplinary Activities

- Dynamics of Coupled Natural and Human Systems (BIO, GEO, SBE and USFS)
- Interdisciplinary Training for Undergraduates in Biological and Mathematical Sciences (BIO,EHR,MPS)
- Ecology of Infectious Disease (BIO, GEO, SBE and NIH)

BIO-Funded Centers

- National Center for Ecological Analysis and Synthesis
- National Evolutionary Synthesis Center
- iPlant Collaborative
- National Institute for Mathematical & Biological Synthesis
- Centers for Environmental Implications of Nanotechnology

Undergraduates in Biological and Mathematical Sciences

- Intersection of the biological and mathematical sciences
- Interdisciplinary teams of undergraduates in genuine research projects
- Strengthen research and education capacity, infrastructure, and culture of the institution

Doctoral Dissertation Improvement Grants

- DEB and IOS
- Must pass candidacy by the deadline
- Funds research-related costs only
  - Upper limit is $12,000
  - May include travel to meetings

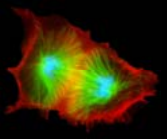
Graduate Research Fellowships

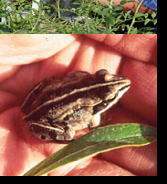
- Graduate study leading to research-based masters or doctoral degrees
- Science, mathematics, and engineering
- Intended for students at or near the beginning of their graduate study
- Handled through EHR Div of Graduate Education
- $30,000 per yr for 3 years

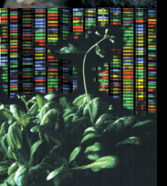
BIO Supplementary Funding

- Research Opportunity Awards
- Research Experiences for Teachers
- Research Experiences for Undergraduates





Life in Transition

Biology is the narrative of life on Earth and the story of the unexpected…

Origins – *How did the biological complexity of life emerge from pre-biotic chemistry and geochemistry?*

- Self-contained, self-sustaining, self-replicating, evolving

Energy – *How is energy obtained and used by living systems to sustain life?*

- Development of BIO-based technologies
- Sustainable, renewable, efficient energy

Adaptation – *What will survive, and how?*

- Reduce uncertainties about the future
- Response to global climate change

Summary Points

- New opportunities – www.nsf.gov
- BIO Program Directors
- Program Solicitations / Dear Colleague Letters
- Proposal & Award Policies & Procedures Guide

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