



Conference on Personnel Trends, Education Policy, and Evolving Roles of Federal and State Natural Resource Agencies

American Association for the Advancement of Science

October 28 – 29, 2003

How Are Federal and State Agencies Responding to the Trends ?



Robert W. Ridky
National Education Coordinator
Office of the Director
U.S. Geological Survey

USGS Mission

Providing the
Nation with
reliable
scientific
information
and analysis.



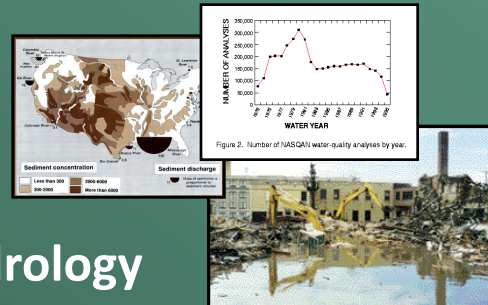
Geography



Geology



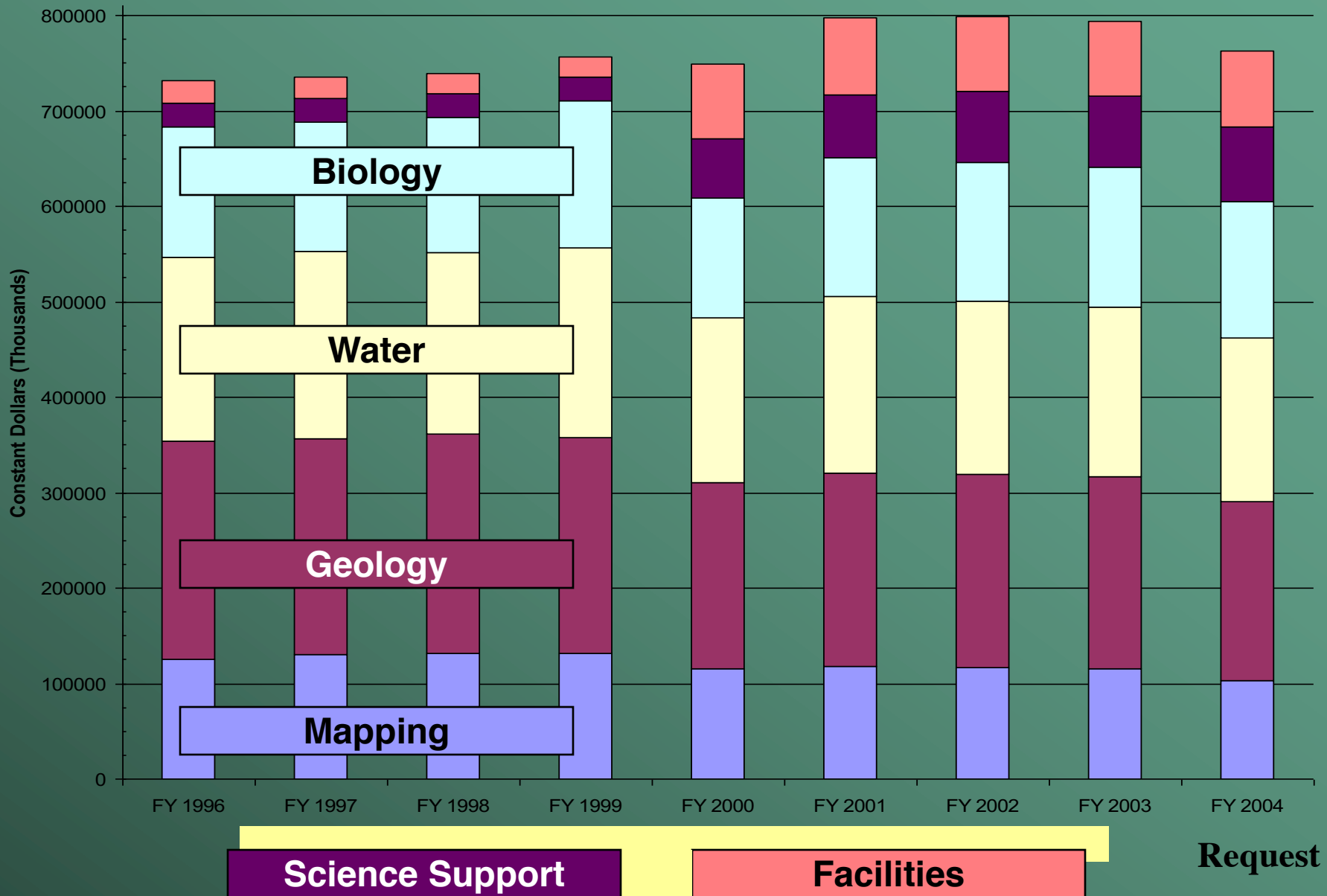
Biology



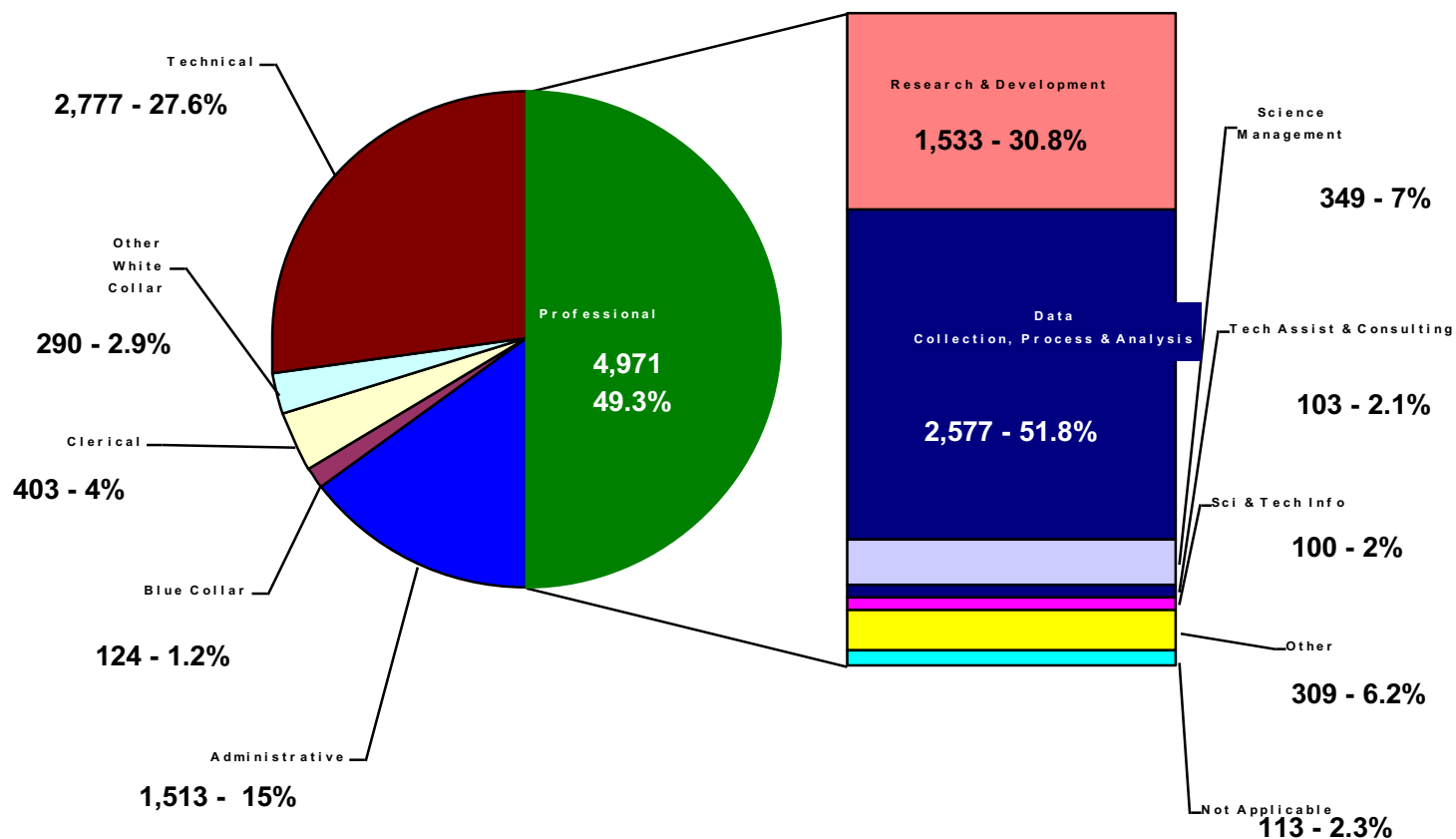
Hydrology

USGS Funding in Constant Dollars

FY 1996 to FY 2004



Occupational Categories (PATCO) with Professional Science/Engineering Functional Classifications



Employment in the U.S. Geological Survey By F.Y.

	Count of Active Employees	% Change from Yr
FY1990	10,480	-1.05%
FY1991	10,845	3.37%
FY1992	10,956	1.01%
FY1993	10,788	-1.56%
FY1994	9,888	-9.10%
FY1995	9,220	-7.25%
FY1996 *	10,624	13.22%
FY1997	10,682	0.54%
FY1998	10,485	-1.88%
FY1999	9,952	-5.36%
FY2000	11,193	11.09%
FY2001	10,279	-8.89%
FY2002	10,441	1.55%
10 Year Average	10,355	-0.76%

Data from Federal Personnel and Payroll System (FPPS).

* Addition of Bureau of Mines and National Biological Survey



Retirements

Currently, 10.7% of all USGS employees are eligible for optional/voluntary retirement in FY 2003.

Number of employees eligible to retire will rise from FY 2003 to FY 2008:

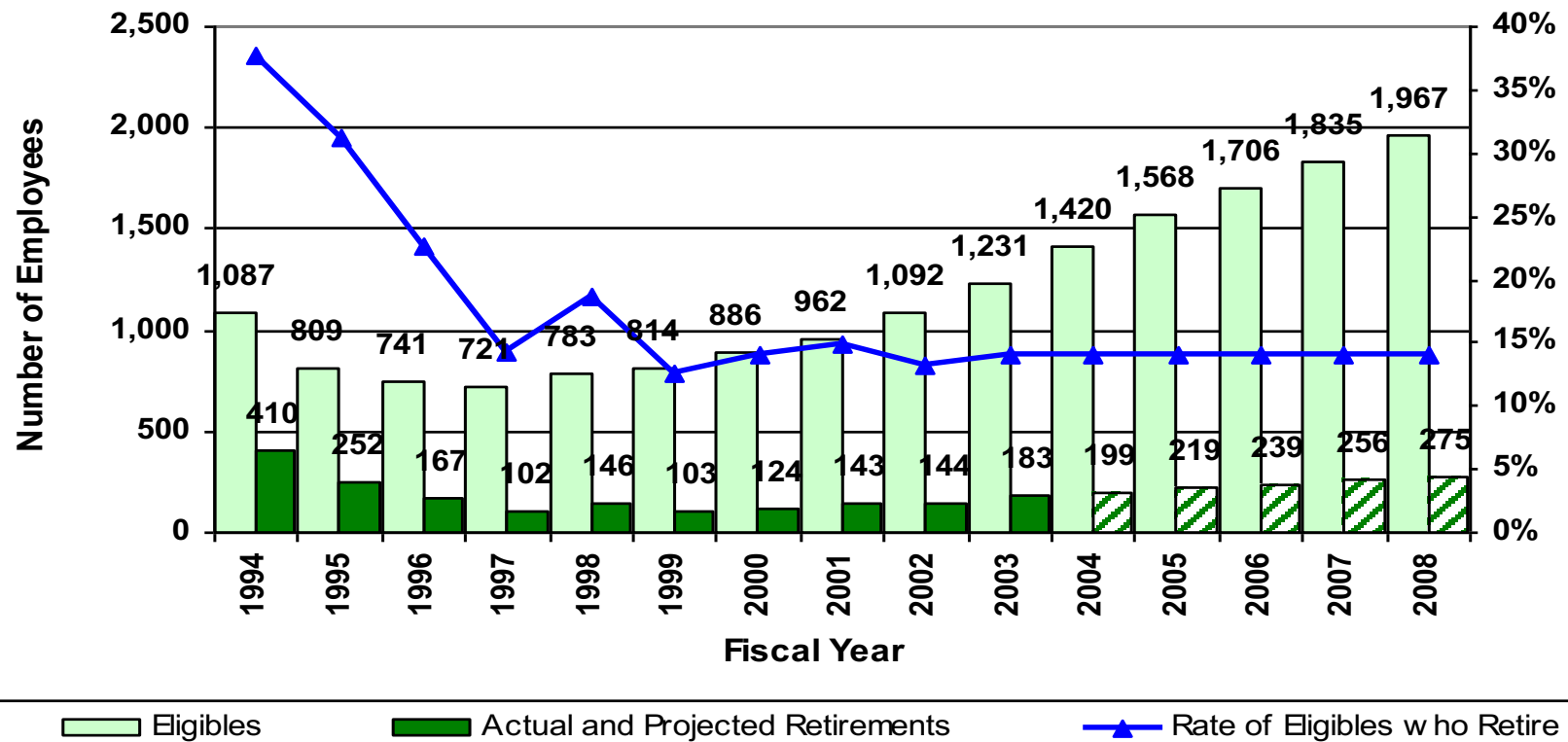
- **Science staff: 11.9% to 20.6%**
- **Science Technical staff: 8.2% to 15.7%**
- **Administrative staff: 12.7% to 23.6%**
- **Information Technology Staff: 8.7% to 17.8%**

Actual Retirements as Percent of Eligibles in the U.S. Geological Survey

	All	Research	Development	Science Managers
AVERAGE RATE Last 2 FY	13.97%	10.82%	10.42%	20.13%

Long Term Retirement Projections

Optional-Voluntary Retirement in the USGS
Eligibles, Actuals, & Projected - by Fiscal Year



Factors Working Against Developing the Scientific Workforce

- Weak national literacy base in the discipline
- Cultural emphasis; cost-benefit of grad education in STEM
- Strong Foreign Student Presence in STEM Departments
- Diminishing Government focus on Earth and Environmental R&D

Table 292.—Earned degrees in chemistry, geology, and physics conferred by degree-granting institutions,

	CHEMISTRY			GEOLOGY			PHYSICS		
	Bachelor's	Master's	Doctor's	Bachelor's	Master's	Doctor's	Bachelor's	Master's	Doctor's
1970–71	11,063	2,275	2,159	2,414	651	324	5,071	2,188	1,482
1975–76	11,022	1,783	1,621	3,358	1,003	313	3,544	1,451	997
1980–81	11,347	1,654	1,622	5,202	1,396	294	3,441	1,294	866
1985–86	10,116	1,754	1,908	4,974	1,767	271	4,180	1,501	1,010
1990–91	8,321	1,665	2,238	1,784	1,089	446	4,236	1,725	1,209
1995–96	10,415	2,254	2,287	3,190	991	372	3,679	1,678	1,462
1998–99	10,120	2,037	2,191	2,837	936	367	3,213	1,309	1,252
2000–01	9,526	1,985	2,121	2,814	933	314	3,418	1,365	1,169

NOTE: Geology includes geology, geochemistry, and geophysics and seismology. Beginning in 1982–83, also includes other geological sciences. This table prepared Sept.'02

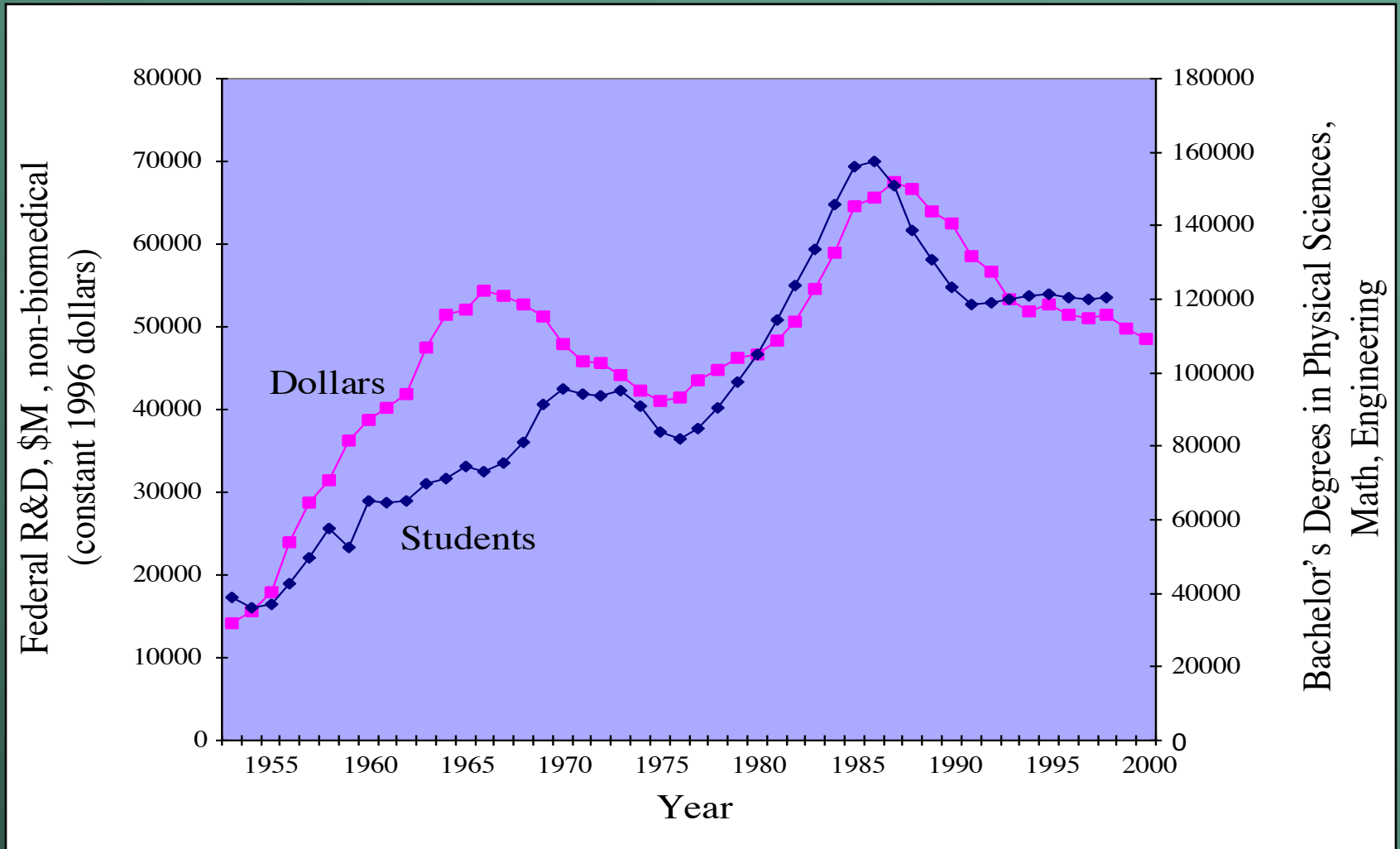
Source: National Center for Education Statistics Pubs.# 2003168

Table 172: Total fall enrollments, 1970 - 2003

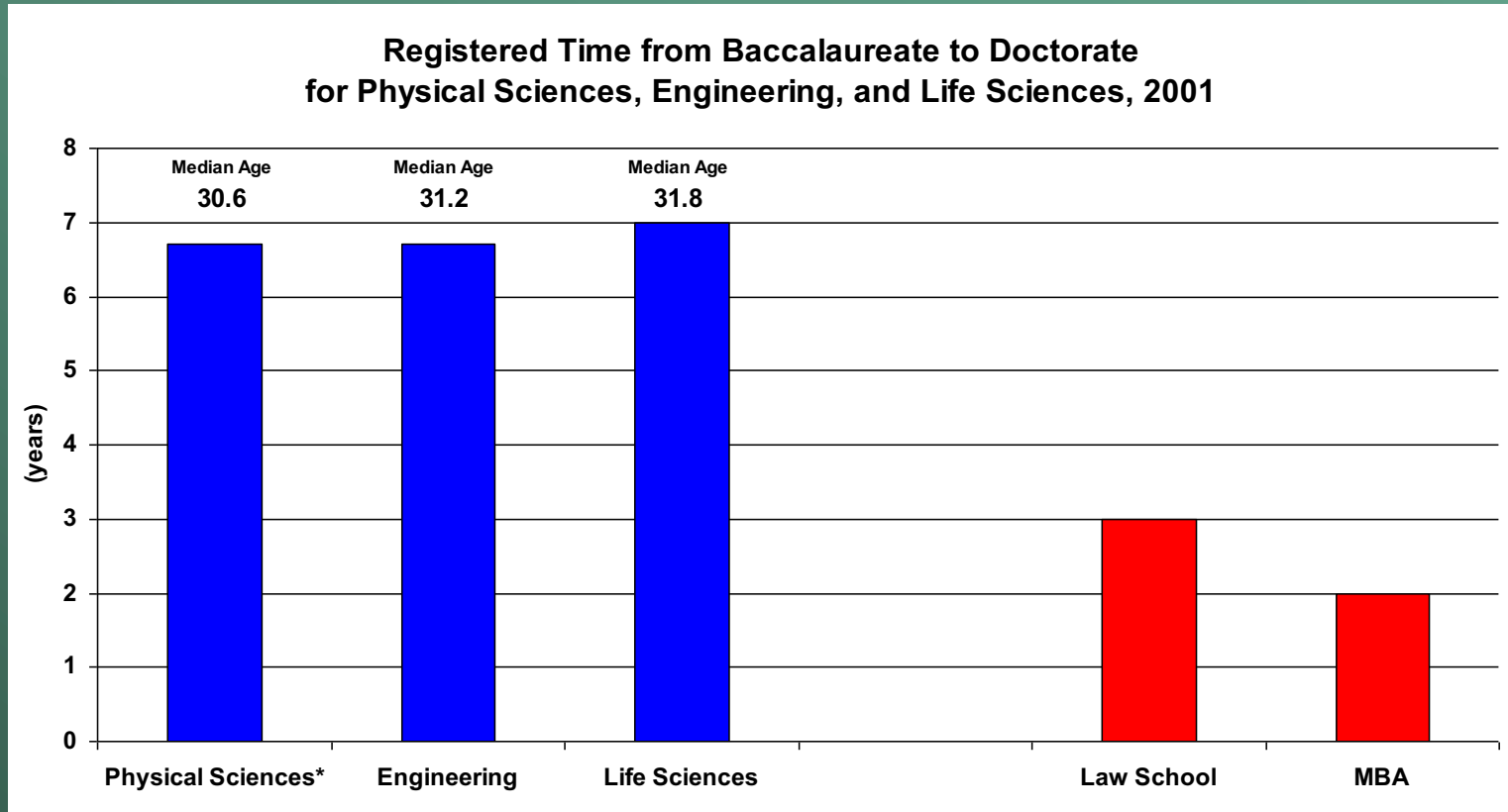
1970	8,580,887
1975	11,184,859
1980	12,096,895
1985	12,247,055
1990	13,818,637
1995	15,312,289
2003	15,756,000

Source: NCES Digest of Educational Statistics, pub 2003

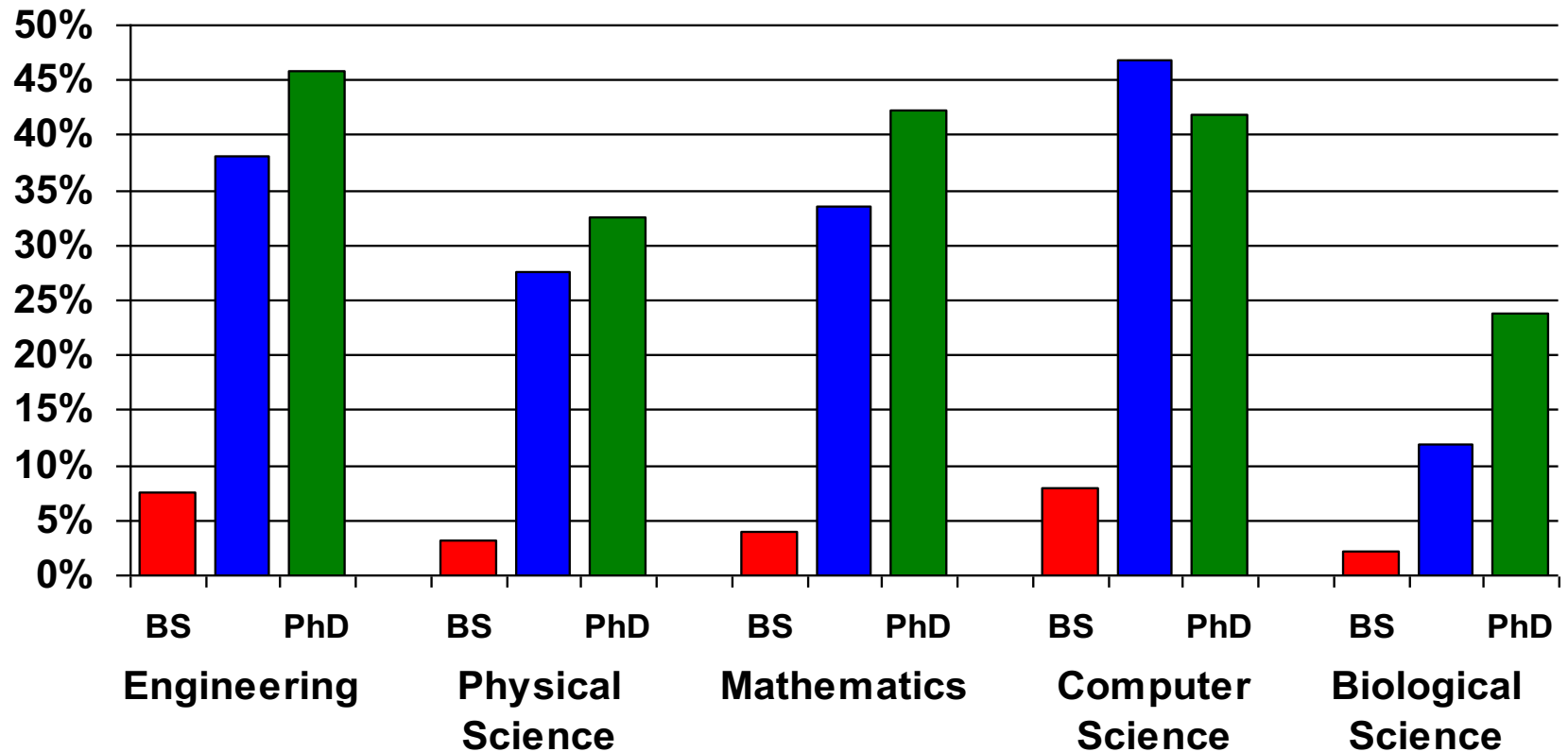
High correlation btw. Federal R&D investments and STEM Bachelor Degree production



Cost-Benefit factor working against growing science workforce



Share of U.S. Degrees Earned By Non-Resident Aliens in 2000, by Degree Level



Source: NCES



June 5, 2003

From: Director, John H. Marburger, III
To: Heads of Executive Departments and Agencies
Subject: FY 2005 Research and Development Priorities

In general, the Administration will favor investments in Federal R&D programs that:

- strengthen science, mathematics, and engineering education by enhancing access and broad availability of excellent educational programs, establishing and encouraging best educational practices, and integrating research and education.

Mission and Strategic Goals of the USGS

“Education and research are always in the public service and therefore are inextricably bound at all levels”





National Science Board

TASK FORCE ON NATIONAL WORKFORCE POLICIES FOR SCIENCE & ENGINEERING

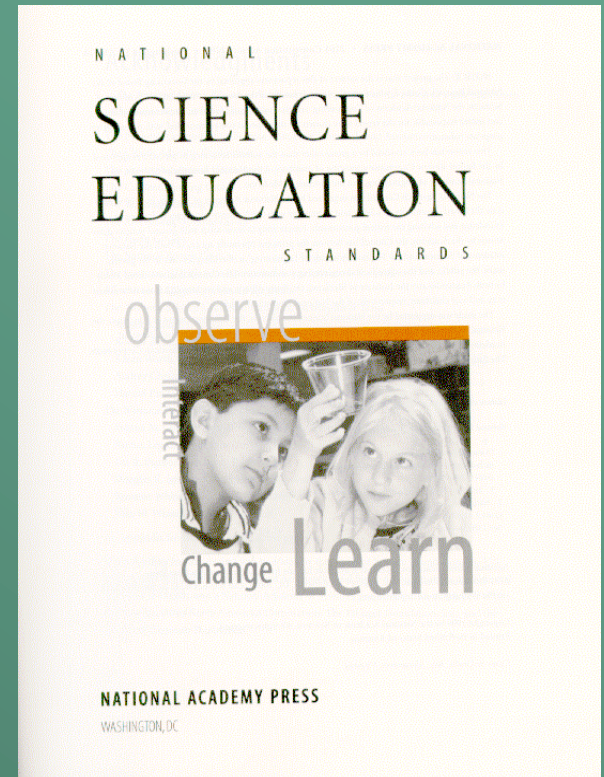
(Draft Approved for public comment May 22, 2003)

RECOMMENDATION: In partnership with other stakeholders, the Federal Government should act now to attract and retain an adequate cadre of well-qualified precollege teachers of mathematics, science and technology.

National Research Council



**National Science Standards:
“what students should
know and be able to do ”**



Earth Science

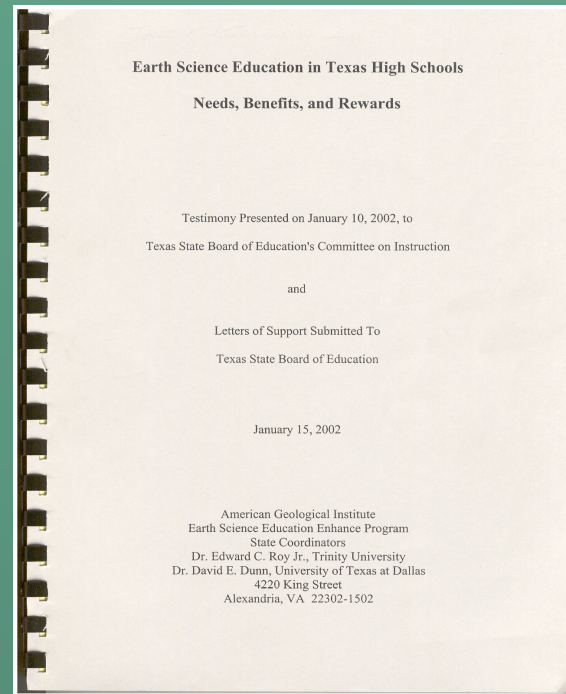
Physical Science

Life Science



(No) Earth Science in Texas

Edward C. Roy Jr.



Geoscientists Defend Earth Science in Texas

And from the California School Board...

- *California Science Framework for K-12 Public Schools* -- implementation guidelines failed to live up to standards' treatment of earth science



- AGU, GSA & SSA sent alerts to their California members.
- AGI alert sent to California department chairs, local geoscience society presidents & member society leadership.

The K-12 Consumer Market...

- School districts - **14,571**
- Schools - **92,012**
- K-12 Enrollment - **46.9 million**
- 9-12 Enrollment - **13.1 million**
- K-12 Teachers - **2.9 million**
- 7-12 Teachers - **1.03 million**



Geotimes

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Returning Earth Science to the Classroom

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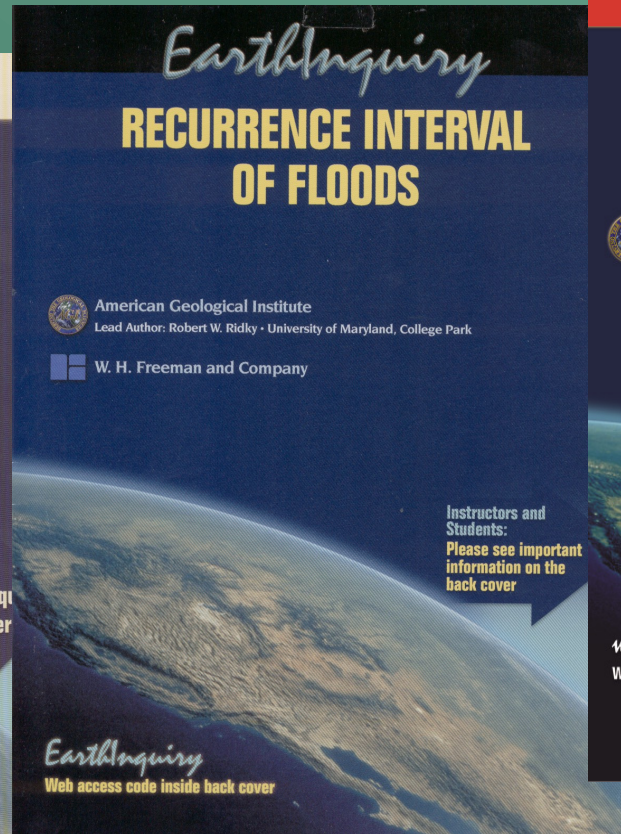
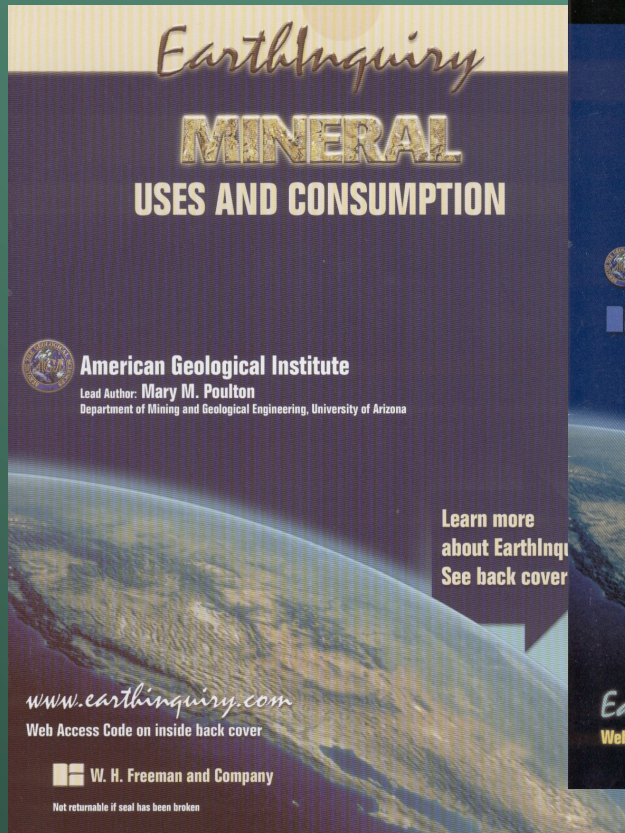
San Diego State University

Michigan Tech

University of Maryland



Work with universities, professional organizations to more effectively deliver our science.



Vision:

USGS is a world leader in its ability to integrate its educational activities with its ongoing research programs.

