noaa research

from the bottom of the ocean to the surface of the sun

David L. Evans
Assistant Administrator, NOAA Research

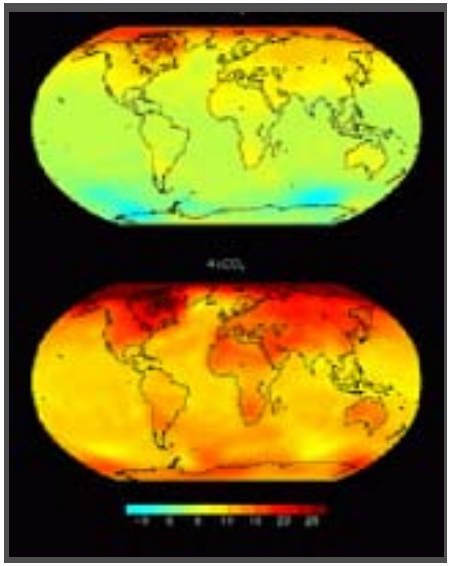
Overview

- Research & Development
- Behind the Research
- Research Partnerships
- Current Issues
- Financial Overview

noaaresearch

Research & Development

Office of Oceanic and Atmospheric Research

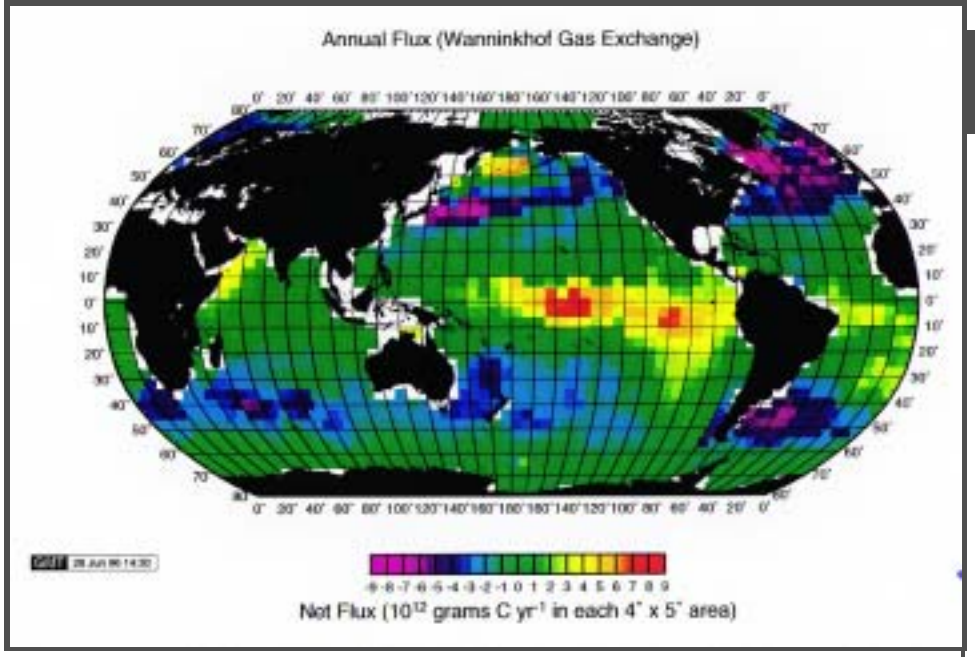


- Climate
- Atmosphere
- Ocean, Coastal, & Great Lakes Resources

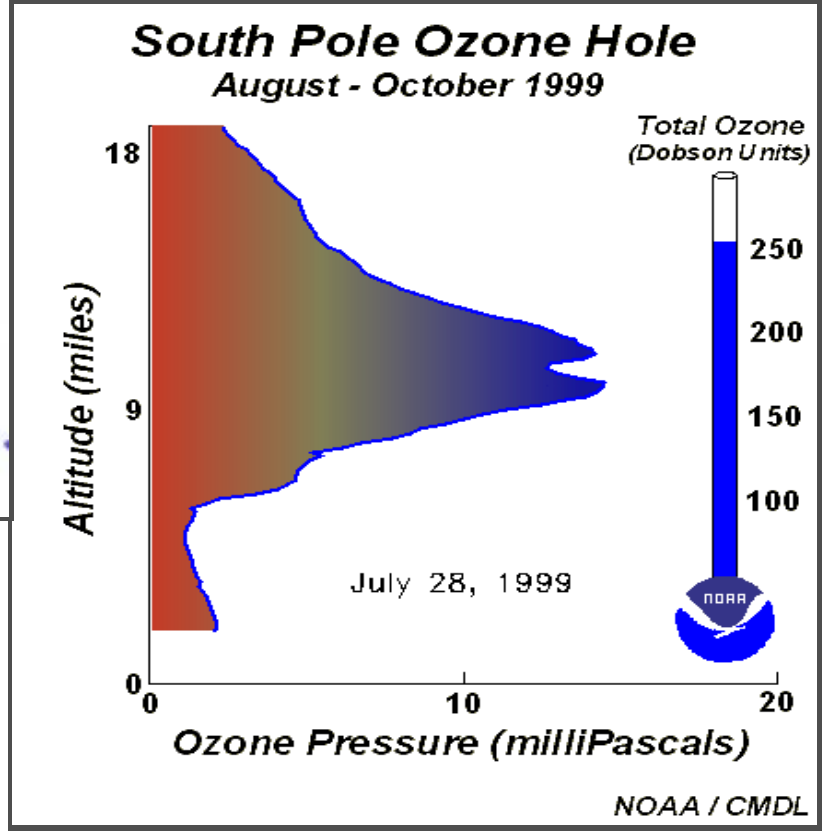
noaaresearch

Climate Research

Interannual & Seasonal Climate

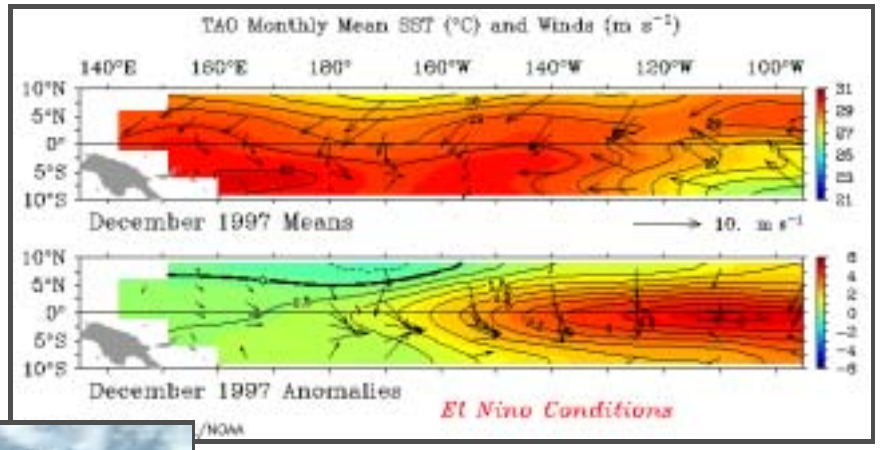


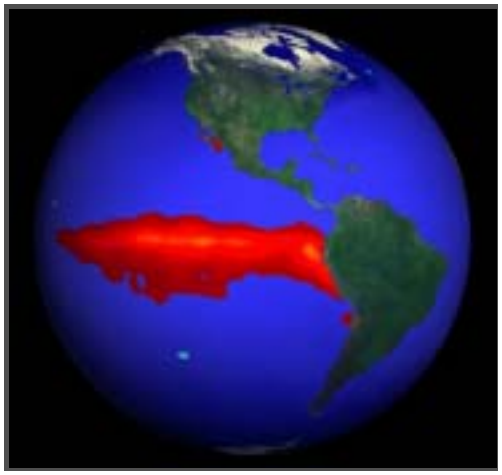
Long-Term Climate Change



noaaresearch

El Niño / La Niña Predictions

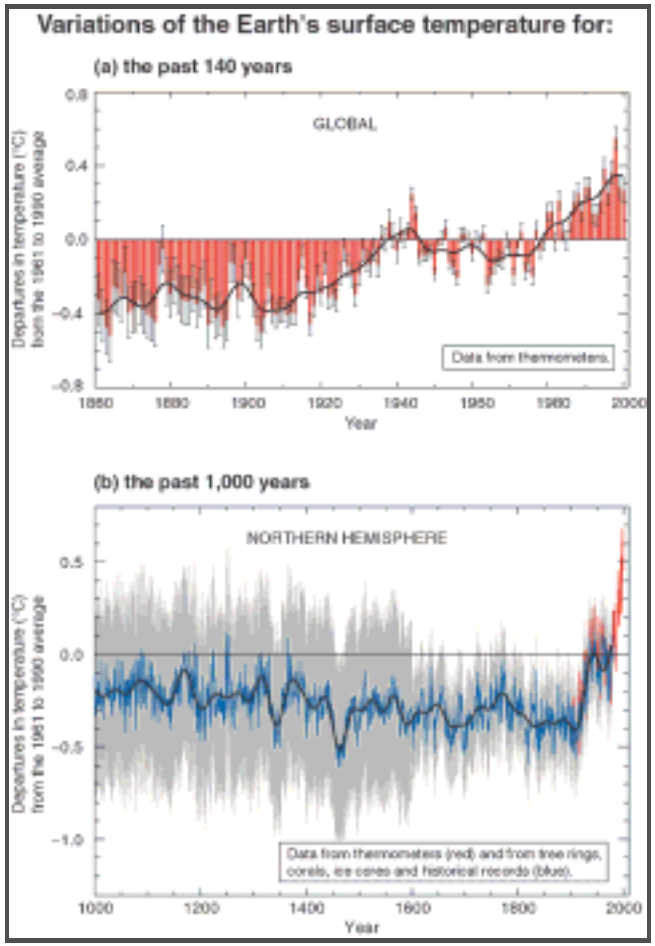




Seasonal forecasts used to increase planning and mitigation

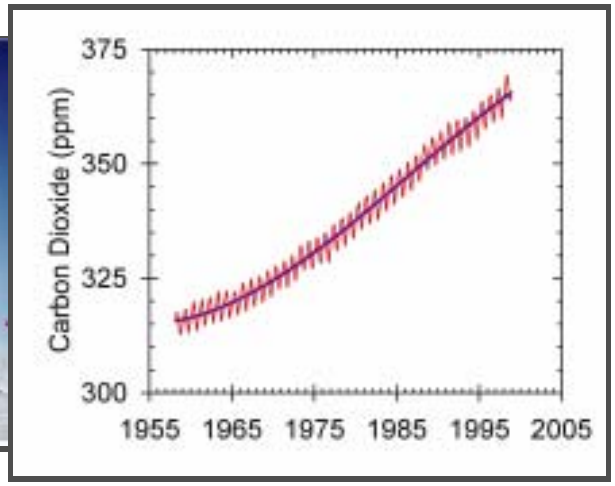
Climate Assessments

- IPCC 2001 Report
- Scientific Assessments of Ozone Depletion



Long-Term Climate Records

Sustained long-term measurements of key atmospheric species



Current Climate Research

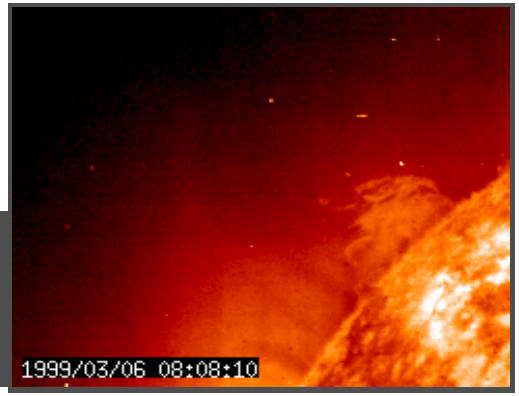
Carbon-cycle science

Climate diagnostics

Atmospheric Research

Weather

Air Quality

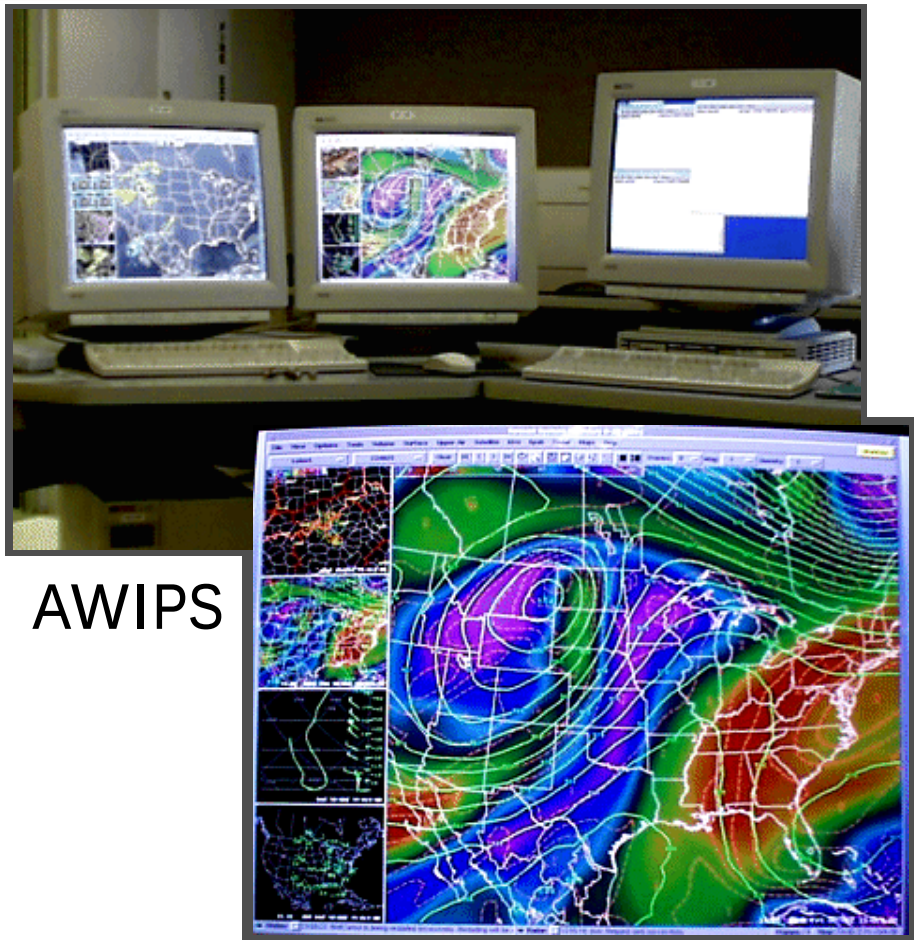


Space Weather

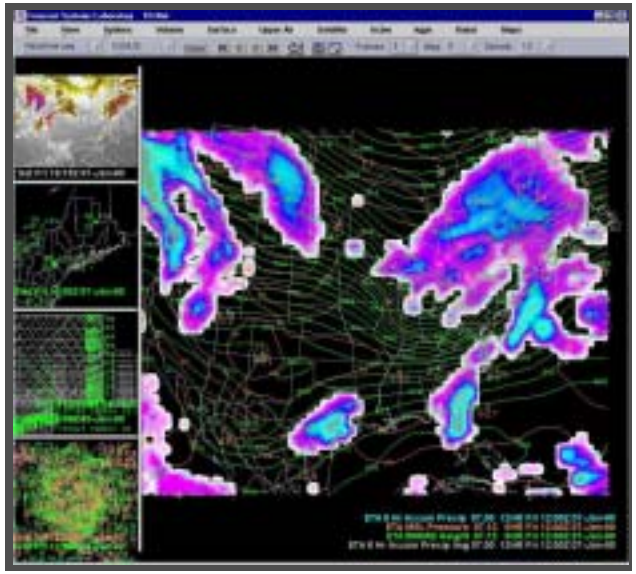
noaaresearch

Operational Software

- AWIPS
- FX-Net
- W^4

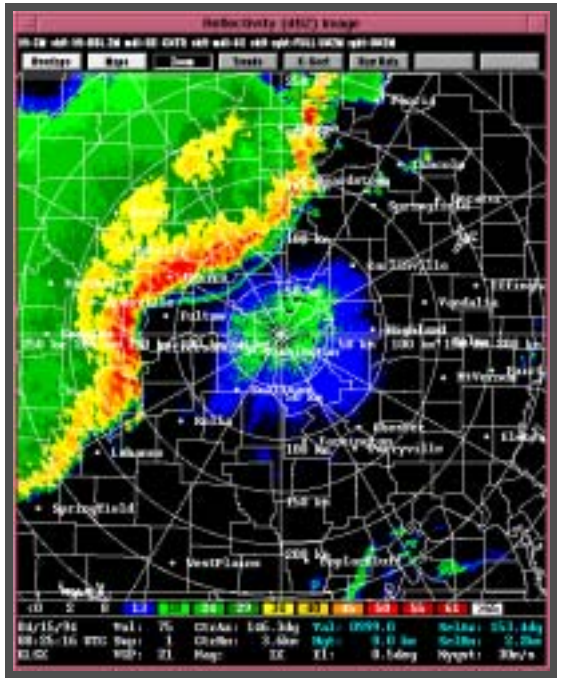


AWIPS

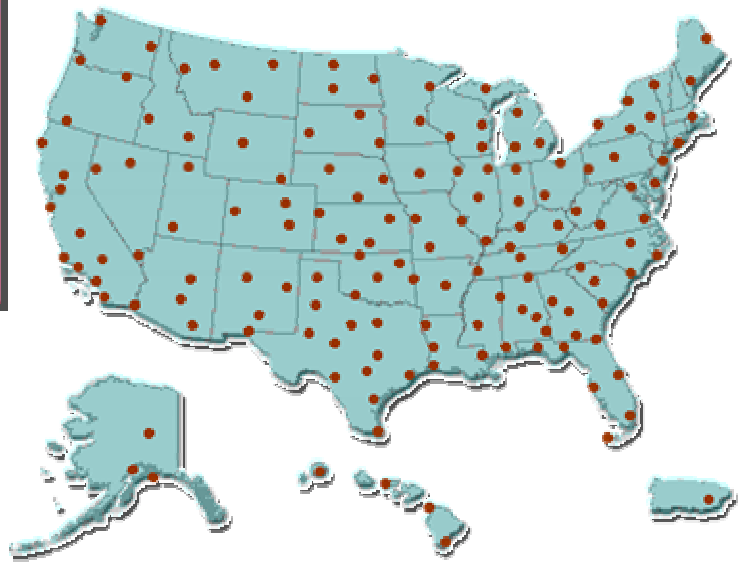


Fx-Net

Real-time Radar Data

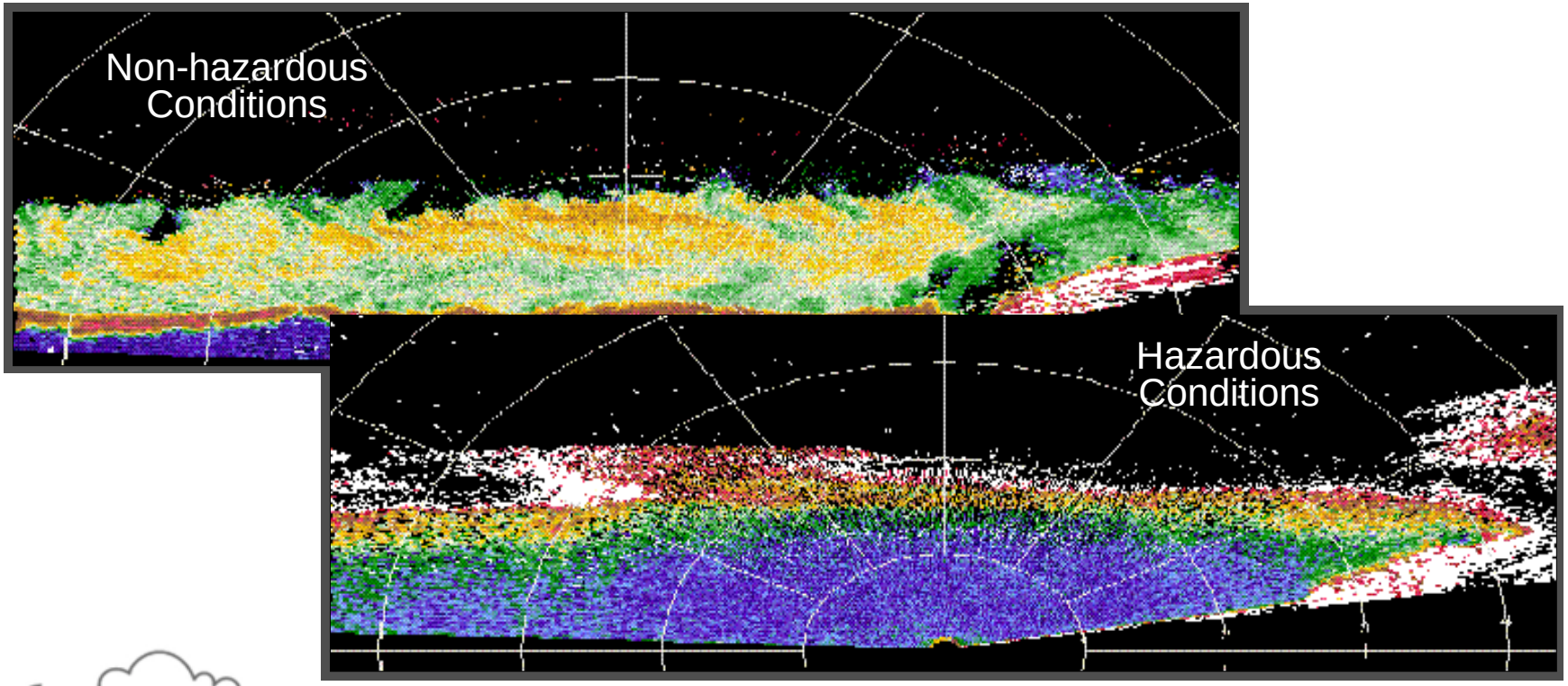


Improving severe weather and flood warnings lead time

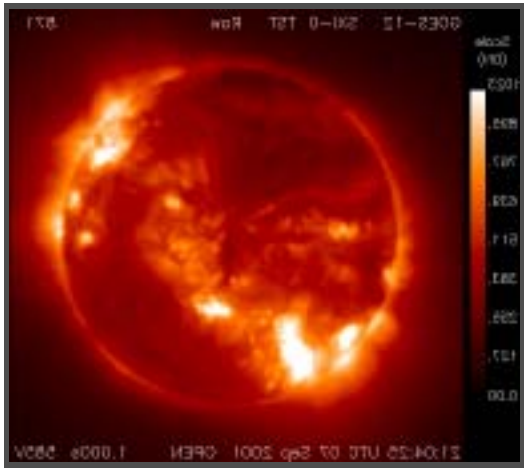


Aircraft Icing Hazard Detection

Identifying hazardous conditions for aircraft

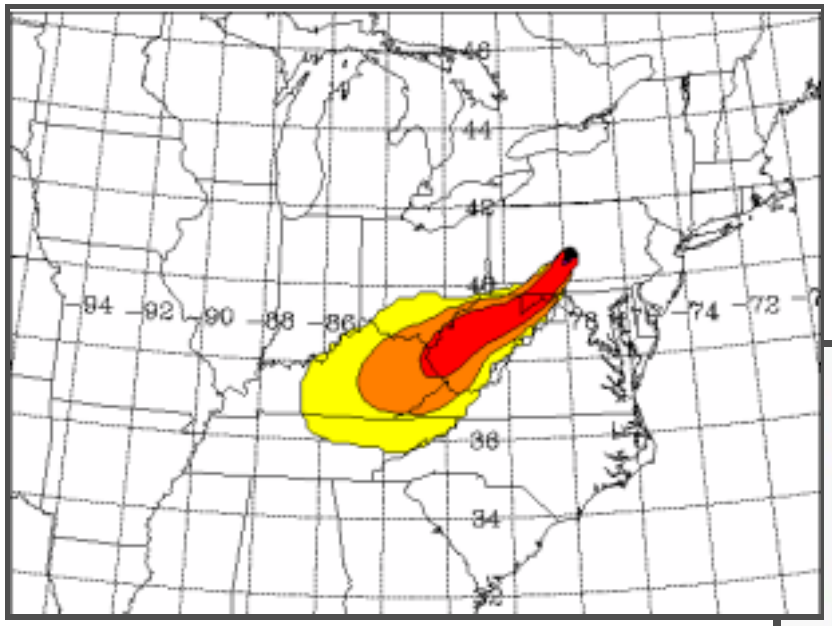


Space Weather Warnings and Forecasts



Real-time space weather data and alerts

Interactive Dispersion Forecasts

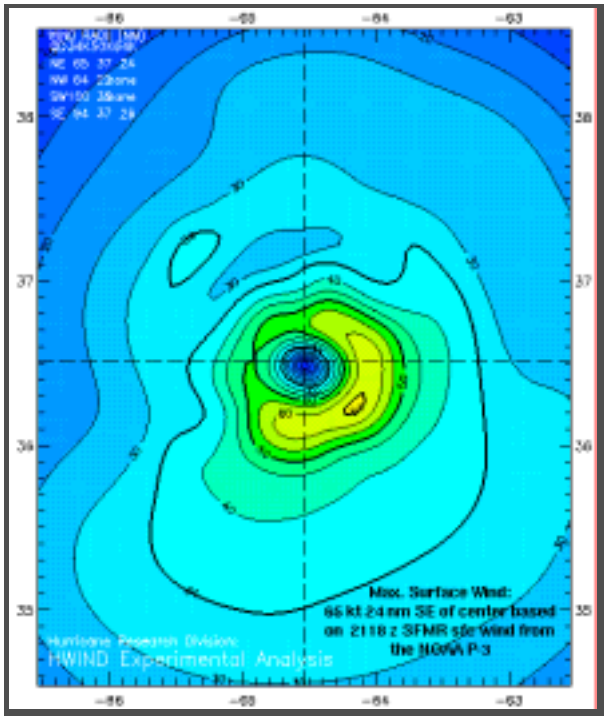


Trajectories and concentrations of particulates

Current Atmospheric Research

Phased Array Radar

Hurricane Testbed

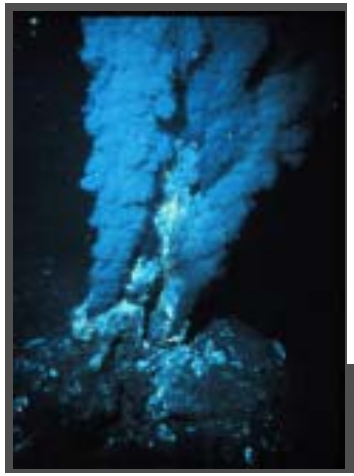


Ocean, Coastal, & Great Lakes Resources Research

Sustainable Coastal Development

Oceans and Climate

Fisheries Sustainability

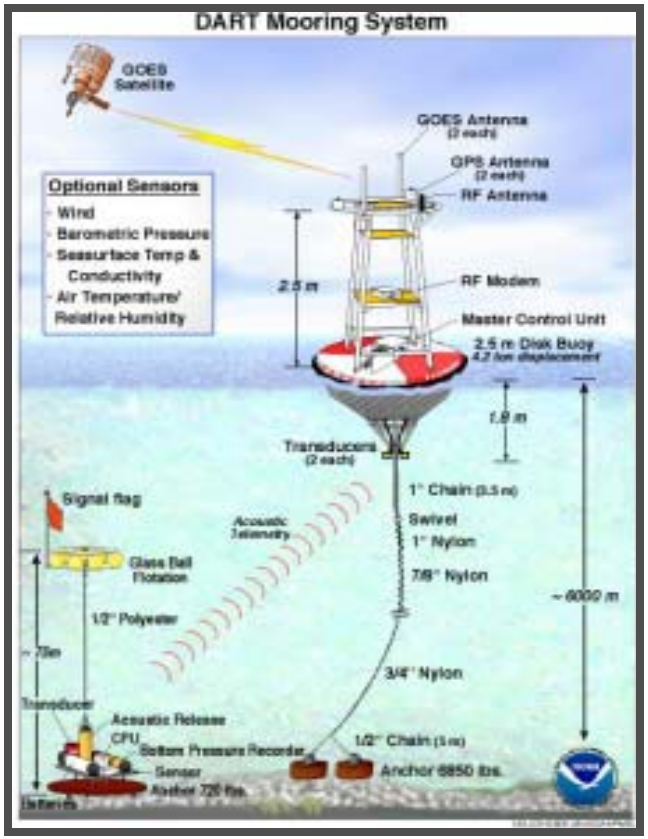


Ocean Exploration

Invasive Species

noaaresearch

Tsunami Mitigation



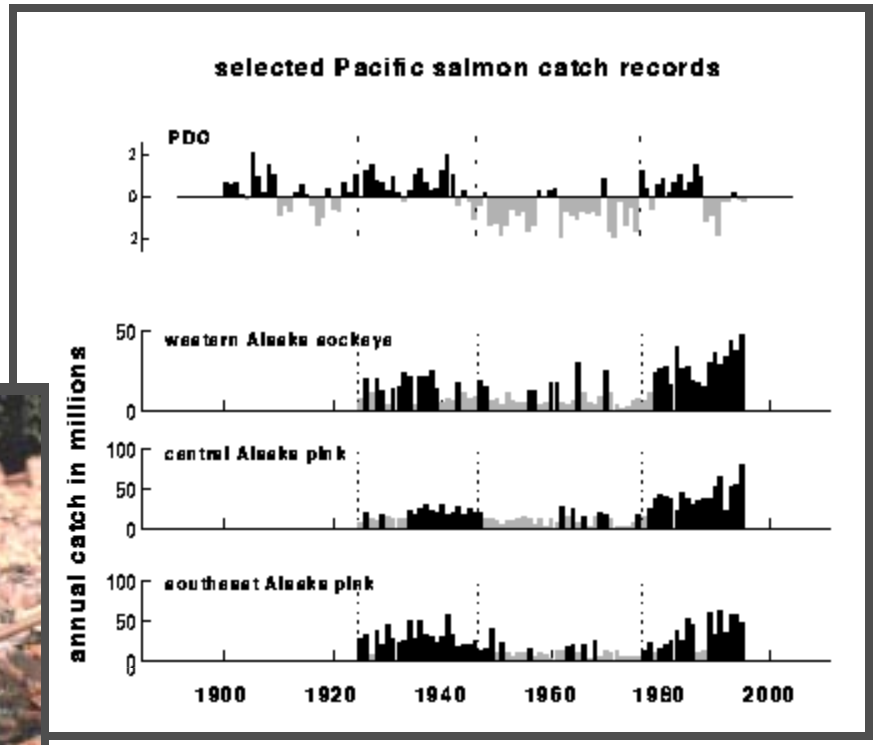
Reduction of tsunami impacts to U.S. coastal areas

HAACP Training

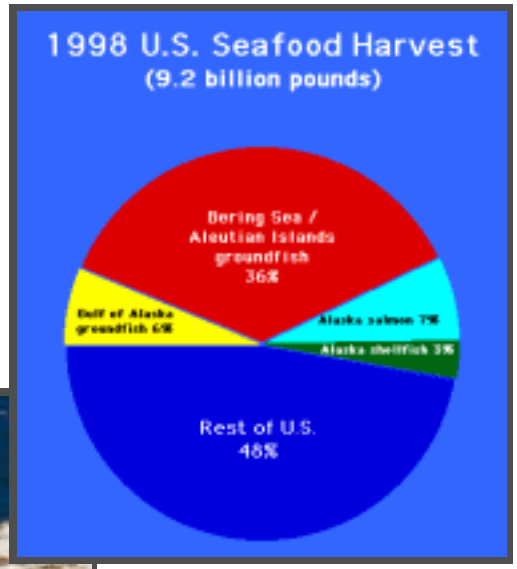
Ensuring the safety and quality of seafood consumed in the United States

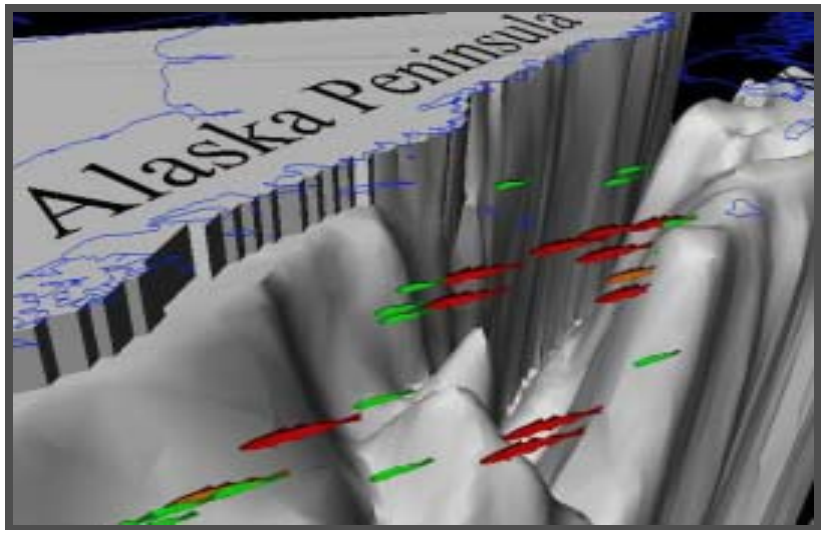
Climate Impacts on Salmon Production

Many populations of Pacific salmon strongly influenced by marine climate variability



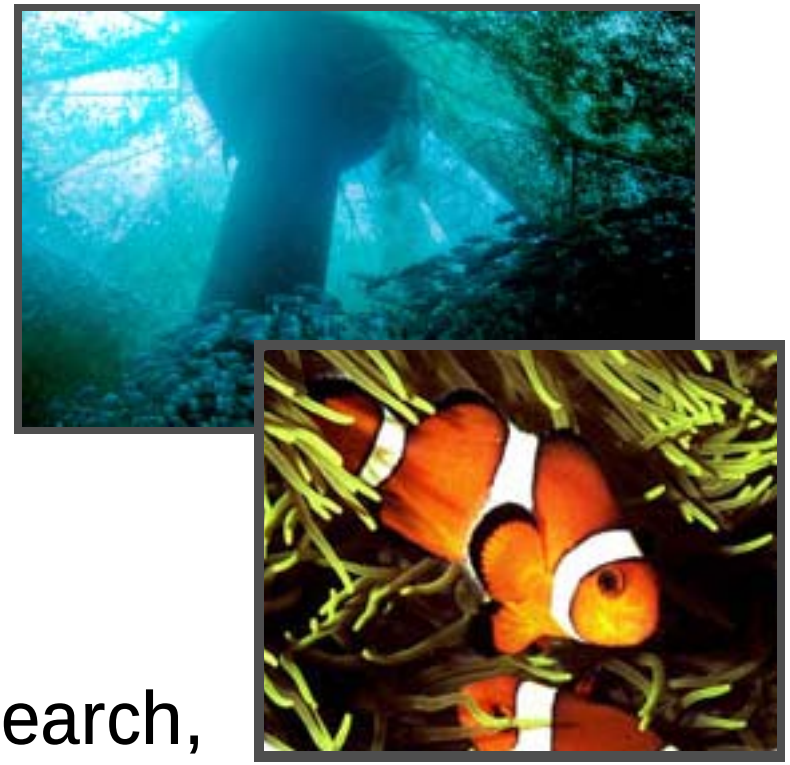
Pollock Recruitment Forecasts





Annual Pollock recruitment forecast only guidance available

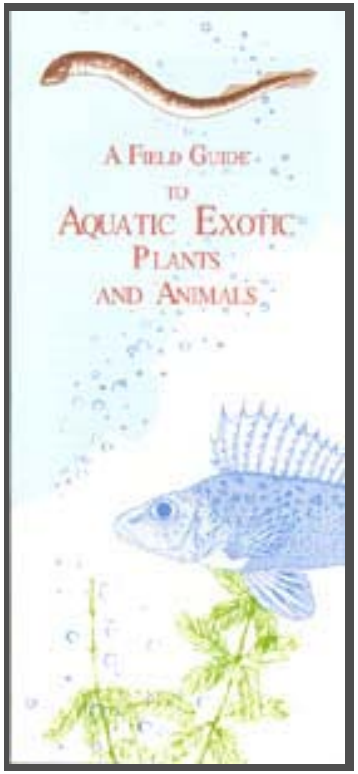
Environmentally Responsible Technologies

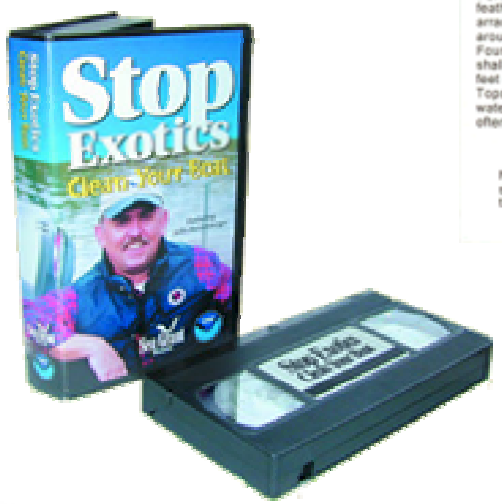


An integrated program of research, education, and technology transfer

Extension

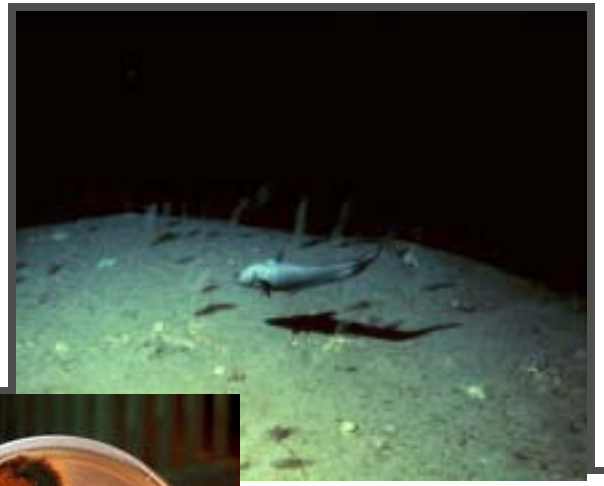
Slowing the spread of aquatic nuisance species





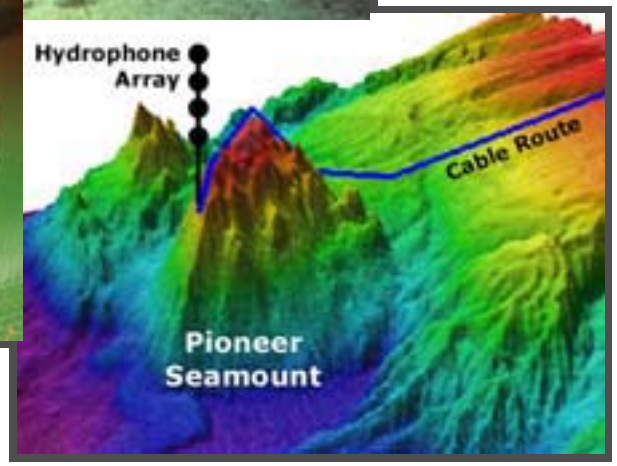
Current Ocean, Coastal, and Great Lakes Research

Ocean Exploration



Marine Biotechnology

Acoustics



noaaresearch

Transfer of Code

NOAA Research code used by NWS/NCEP

1990 1991 1992 1993 1994 1995 1996 1997 1998 1999 2000 2001

- GFDL LW radiation code in the Medium Range Forecast (MRF) model since '90

- GFDL hurricane forecast system (Coupled ocean model added 6/01)

- GFDL Ocean Data Assimilation System running in tropical Pacific domain since '97 as part of experimental seasonal climate forecast system (global in '02)
- GFDL Modular Ocean Model Version MOM1 over Pacific since '97 as part of experimental seasonal climate forecast system (Version MOM3 over a global domain in '02)

- FSL Rapid Update Cycle (RUC). Latest version since '98. Work on upgrade currently proceeding

- ARL's VAFTAD and HYSPLIT dispersion models currently being integrated into operationally-run Eta model for Homeland Defense North American forecasts

noaaresearch

Recent Publications

- **Hall, A. and R.J. Stouffer.** An abrupt climate event in a coupled ocean-atmosphere simulation without external forcing, *Nature*, 409(6817): 171-174, 2001.
- **Ryerson, T.B. et al.** Observations of ozone formation in power plant plumes and implications for ozone control strategies, *Science*, 292(5517), 719-723, 2001.
- **Enfield, D.B., A.M. Mestas-Nunez, and P.J. Trimble.** The Atlantic multidecadal oscillation and its relation to rainfall and river flows in the continental U.S., *Geophysical Research Letters*, 28(10): 2077-2080, 2001.
- **Goldenberg, S.B., et al.** The recent increase in Atlantic hurricane activity: Causes and implications, *Science*, 293(5529): 381-560, 2001.
- **Fox, C.G., W.W. Chadwick, Jr., and R.W. Embley.** Direct observation of a submarine volcanic eruption from a sea-floor instrument caught in a lava flow, *Nature*, 412: 727–729, 2001.
- **D. W. Fahey, et al.** The detection of large HNO3-containing particles in the winter Arctic stratosphere, *Science*, 291(5506): 1026-1031, 2001.
- **Nalepa, T.F. et al.** First finding of the amphipod *Echinogammarus ischnus* and the mussel *Dreissena bugensis* in Lake Michigan, J. Great Lakes Res., 27(3):384-391, 2001.

noaaresearch

Recent Publications

Lab / Program	Peer-Reviewed	Other
AL	62	34
AOML	43	124
ARL	56	70
CDC	37	16
CMDL	22	2
ETL	86	83
FSL	20	49
GFDL	91	4

Lab / Program	Peer-Reviewed	Other
GLERL	37	13
NSSL	48	81
PMEL	53	39
SEC	33	10
OGP	>400	>400
Sea Grant	354	404
NURP	64	18
JI	667	705

TOTALS	Peer-Reviewed	>2073	Other	>2052

noaaresearch

Behind the Research

- Laboratories & Centers
- Facilities
- Programs

noaaresearch

Organizational Structure

Partnerships	Programs	Laboratories

noaaresearch

Organizational Structure

Assistant Administrator
David Evans

Deputy Assistant Administrator
Louisa Koch

Senior Research Council
Chief Information Officer
International Activities
Science Advisory Board Staff

Office of Research & Program Development
Ronald Baird, Assoc. Dir., Ocean & Coastal Resources Research
David Rogers, Assoc. Dir., Atmospheric Research
J. Michael Hall, Assoc. Dir., Climate Research

Office of Scientific Support
Russell Callender

Office of Management & Information
Mary Langlais

Joint Research Institutes

Sea Grant Colleges

National Undersea Research Centers

Office of Global Programs
J. Michael Hall

National Sea Grant College Program
Ronald Baird

National Undersea Research Program
Barbara Moore

Office of Weather and Air Quality
David Rogers

Ocean Exploration Program
Craig McLean

Arctic Research Office
John Calder

Climate Observations & Services Program
David Goodrich

Aeronomy Laboratory
Daniel L. Albritton

Air Resources Laboratory
Bruce Hicks

Atlantic Oceanographic & Meteorological Laboratory
Kristine Katsaros

Climate Diagnostics Center
Randall Dole

Climate Monitoring & Diagnostics Laboratory
Dave Hofmann

Environmental Technology Laboratory
William Neff, Acting

Forecast Systems Laboratory
Alexander E. MacDonald

Geophysical Fluid Dynamics Laboratory
Arts Leetmaa

Great Lakes Environmental Research Laboratory
Stephen Brandt

National Severe Storms Laboratory
James Kimpel

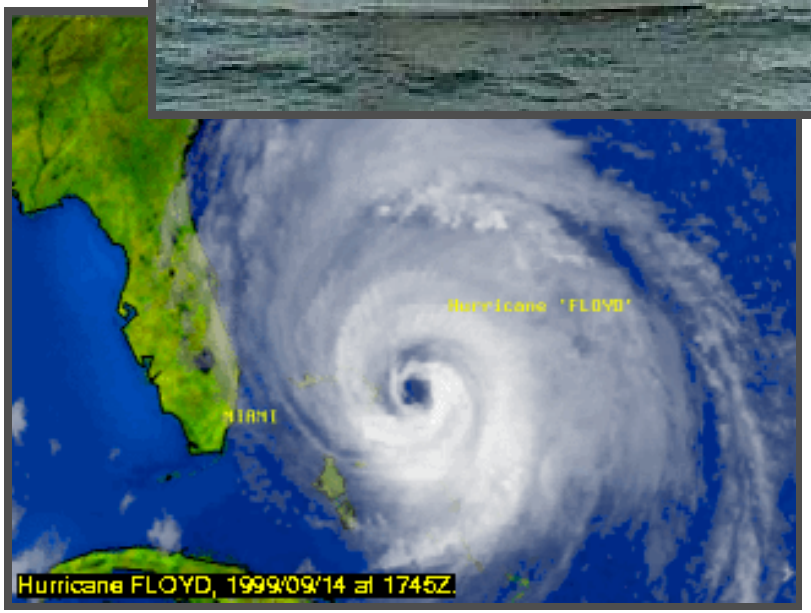
Pacific Marine Environmental Laboratory
Eddie N. Bernard

Space Environment Center
Ernest G. Hildner

noaaresearch

Research Laboratories

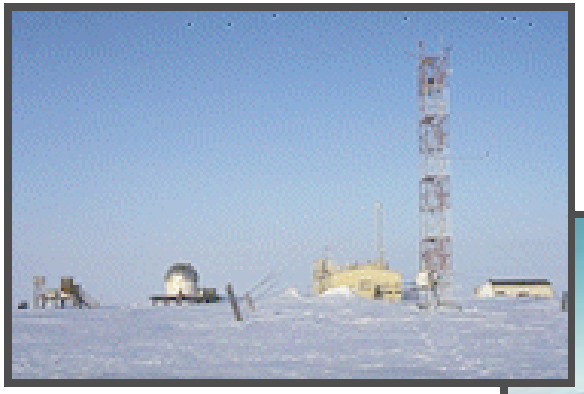
An integrated program of basic and applied research



noaaresearch

Facilities

- Global Field Stations
- Baseline Observatories
- Aquarius
- New Millennium Observatory



noaaresearch

Programs

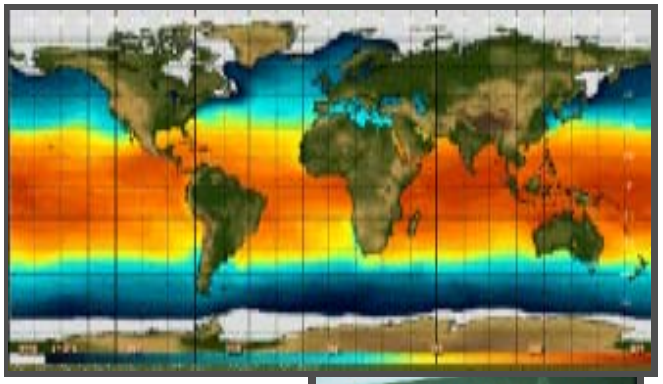
- Office of Global Programs
- National Sea Grant College Program
- National Undersea Research Program
- Other Programs

noaaresearch

The Office of Global Programs (OGP)

The Office supports research to:

- Increase understanding of climate change, predictability, and variability
- Improve predictions and impact evaluations of climate variability

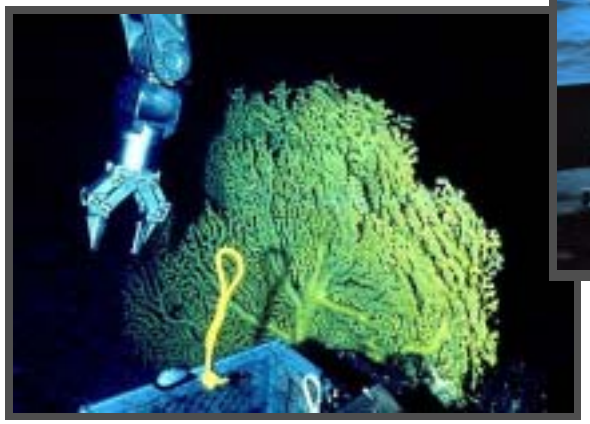


The National Sea Grant College Program

Thirty state Sea Grant Programs promote:

- Scientific discovery
- Technology transfer
- Economic growth
- Public education

The National Undersea Research Program (NURP)



A network of six regional centers provides:

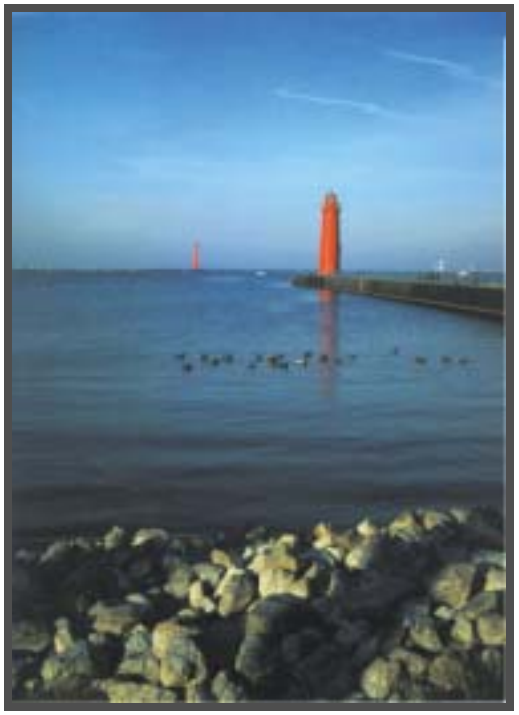
- Access to facilities and technology for undersea research projects

noaaresearch

Other Programs

- Office of Weather and Air Quality
- Arctic Research Office
- Climate Observations and Services Program
- Ocean Exploration Program

Research Partnerships

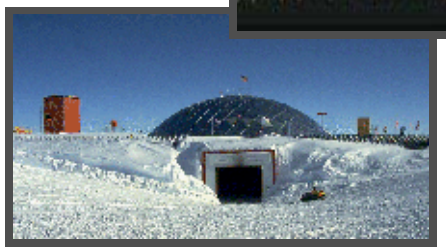


- Interagency Activities
- Cross Line Office Programs
- University Affiliations
- Joint Institutes
- Constituent Relationships
- Education

noaaresearch

Interagency Activities

- U.S. Global Change Research Program (USGCRP)
- U.S. Weather Research Program (USWRP)
- National Acid Precipitation Assessment Program (NAPAP)
- National Ocean Partnership Program (NOPP), e.g. OCEAN.US
- North American Observing System (NAOS)
- National Tsunami Hazard Mitigation Program
- Arctic Research
- Other partnerships with EPA, DOE and DOD supporting many ongoing research projects, e.g. Phased Array Radar

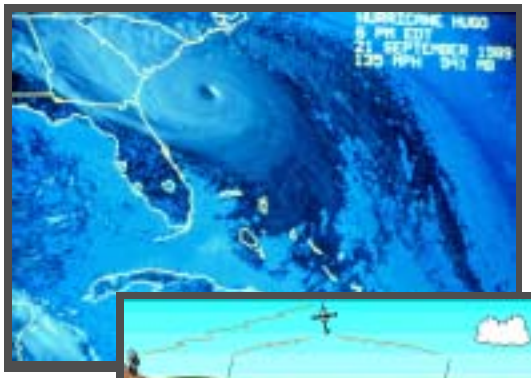


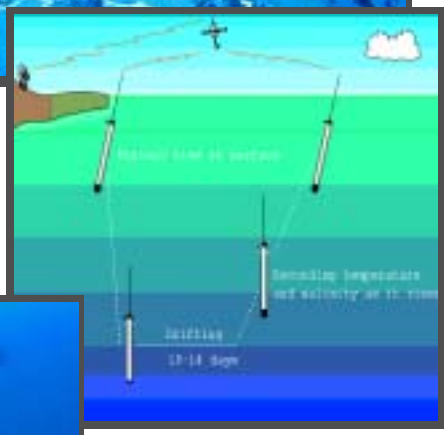
noaaresearch

Joining Forces: Leading Cross Line Office Programs

NOAA Research plays a leadership role in a variety of intra-agency programs, e.g.:

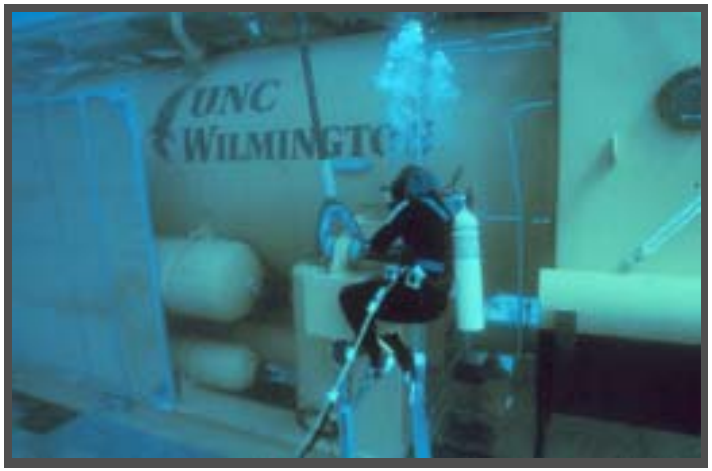
- USWRP
- Climate Observations and Services
- Ocean Exploration
- Energy Initiative
- Science Advisory Board





noaaresearch

Strong University Affiliations



- Joint Institutes
- Sea Grant Colleges
- NURP Centers
- Ocean Exploration
- Office of Global Programs
- USWRP
- Competitive and other grant processes

noaaresearch

Joint Institutes

Long-term collaborations between NOAA, universities, and non-profit research institutions fostering major research initiatives

noaaresearch

Constituent Relationships

- Five constituent roundtable discussions in FY 2001 on Climate, Ocean Exploration, Air Quality, and Aquaculture
- Energy CEO Roundtable
- Sea Grant Extension
- Tsunami Symposium

noaaresearch

Education

- Teachers at Sea
- National Science Teachers Association
- National Ocean Sciences Bowl
- Minority Serving Institutions

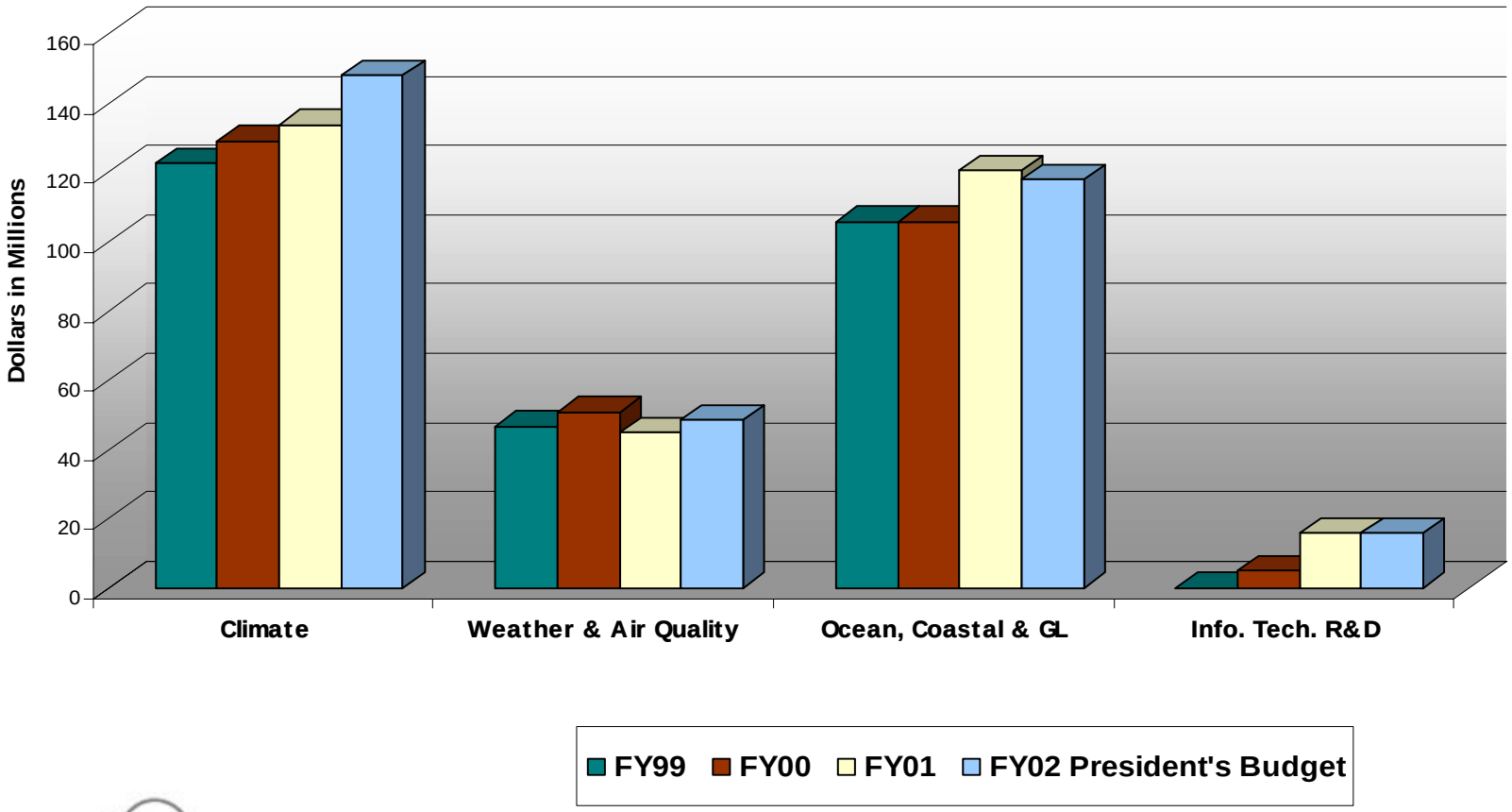
noaaresearch

Current Issues

- Future of Laboratories
  - Role of Federal Laboratories
  - 501(c)(3)
- Emerging Climate Services
- Sea Grant/Coastal Ocean Program/ National Ocean Service
- New Budget Structure

noaaresearch

Financial Overview



noaaresearch

Financial Overview

	FY01 Enacted	FY02 President's Request	House Mark	Senate Mark
Climate Research	$133.7 M	$148.0 M	$147.5 M	$151.5 M
Weather & Air Quality Research	$44.8 M	$48.4 M	$46.9 M	$60.7 M
Ocean, Coastal, and Great Lakes Research	$120.4 M	$117.9 M	$107.8 M	$143.0 M
Information Technology R&D	$15.7 M	$15.9 M	$15.3 M	$12.8 M
Totals	**$314.6 M**	**$330.2 M**	**$317.5 M**	**$368.0 M**

noaaresearch