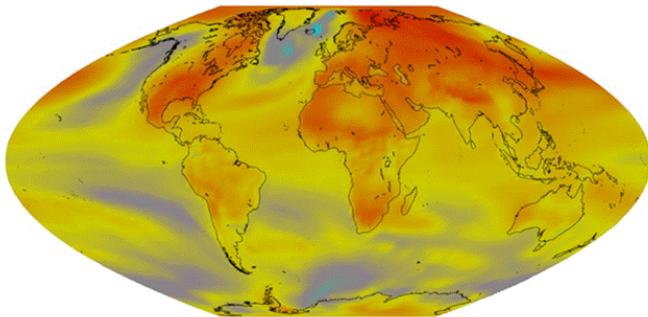




# Office of Oceanic & Atmospheric Research (OAR)

The National Oceanic & Atmospheric Administration's (NOAA) research, conducted through the Office of Oceanic and Atmospheric Research (OAR), is the driving force behind NOAA environmental products and services that protect life and property and promote sustainable economic growth. Each year NOAA services touch at least \$3 trillion of America's economy. That's about 30 percent of our Nation's Gross Domestic Product.



*Surface air temperature anomalies simulated in one of the OAR Geophysical Fluid Dynamics Lab's CM2.1 model projections for the 21st century. The annual mean temperature differences shown are for year 2100; the simulated global mean warming is 5.0° F. The GFDL global model was used for by Working Group 1 of the Intergovernmental Panel on Climate Change for its 4th Assessment Report and was independently judged one of the most credible models in the world.*

## VALUE TO SOCIETY

From remote sensing to climate research and ocean exploration – our world-class scientists conduct research that contributes to public safety, healthy ecosystems, and a robust economy. The average citizen benefits through earlier warnings of threatening weather, healthier coasts and fisheries, and improved environmental literacy. The private sector uses NOAA data as well as technology developed and transferred by NOAA. NOAA research provides federal, state and local officials with a sound scientific basis for crucial policy decisions.

Today, NOAA's research team works with partners in a culture of transparency to build concepts for Earth-system modeling that will help answer some of our most pressing questions about the planet. Accomplishments include:

- Designed Deep-ocean Assessment & Reporting of Tsunamis (DART<sup>®</sup>) buoys critical for reducing the loss of life and property through improved tsunami detection and warning.
- Enabled a six-month warning of El Niño, giving city

planners precious time to prepare, through Ocean observations, analysis, & climate modeling.

- Developed models that significantly improved hurricane track forecasts, allowing emergency managers to better target evacuations and prepare communities.
- Improved climate models to detect the effect of increased carbon dioxide on climate to understand & predict the impacts for global climate change.
- Played a key role in understanding the cause of the Antarctic ozone hole & continues long-term monitoring, modeling, & analysis needed by policy makers.
- Developed a ground-based remote sensing system to detect hazardous icing from clouds, reducing the threat of aviation accidents caused by in-flight icing.
- Found new methods to extract toxins generated by microcystis, a form of blue-green algae, from drinking water in Lake Erie, improving public health.
- Set a new precedent in ocean exploration using "telepresence technology" to connect real-time images from the sea floor and from research vessels to Science Command Centers.

## FUTURE OUTLOOK

OAR strives to balance its near-term responsibility to address the needs of its primary customers both inside and outside of NOAA with its long-term commitment to conduct visionary research critical for managing future environmental and societal threats. This dual responsibility requires us to perform research that leads to the transfer of information and new technologies, as well as to explore the unknown and develop important new concepts. Through increased dialogue with our constituents, we are working to be more responsible to our customers' and partners' needs as we set new directions for preeminent research.

## LEADERSHIP



*Dr. Richard Spinrad*

Dr. Richard W. Spinrad, CMar Sci., NOAA's Assistant Administrator for Oceanic & Atmospheric Research also serves as a Co-Chair of the Joint Subcommittee on Ocean Science & Technology. Craig McLean is the OAR Deputy Assistant Administrator (DAA) for Programs & Administration, and Dr. Alexander MacDonald is the OAR DAA for Laboratories & Cooperative Institutes.

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## PREEMINENT RESEARCH

**Oceans, Coasts, & Great Lakes:** Knowledge of the oceans, their resources, and relationship to human activities is vital to our society — and to our planet's existence. OAR, through its labs and Ocean Exploration and Research Program, works with partners to explore and investigate ocean habitats and resources. OAR looks for changes in the oceans due to natural and human activities, and provides scientific results to help manage and understand fisheries, conserve and protect our coasts, and build a stronger economy through marine products and businesses.

**Climate:** OAR's labs, Climate Program Office, and extramural research partners, conduct a wide range of research into complex climate systems and how they work. These scientists want to improve the ability to predict climate variation in both the shorter term, i.e. cold spells or periods of drought, and over the longer term, i.e. centuries and beyond.



*Researchers studying changes over the past decade in the chemical make-up of the ocean come nose to nose with an Antarctic iceberg floating in the Indian Ocean*

NOAA researchers monitor of the Earth's atmosphere to uncover clues about long-term changes in the global climate. The data collected worldwide by NOAA researchers aids our understanding of, and ability to forecast changes in, complex climatic systems. Using ever more powerful and sophisticated computer systems, NOAA researchers are working on modeling of climate systems that will help improve the accuracy of climate forecasts.

**Weather & Air Quality:** Every day, NOAA scientists and partners expand the atmospheric body of knowledge, shedding new light on processes that contribute to the world's weather and develop new prediction tools that help save lives and property.

OAR's atmospheric research findings form the basis for NOAA's contributions to major national and international environmental programs and agreements. Technologies under development in our laboratories today ends up in NOAA's Weather Forecast Offices tomorrow. Today's National Weather Service relies on technologies developed by OAR such as Doppler radar, numerical modeling, and advanced computer processing systems to improve severe weather forecasts and warnings. Other research programs focus on observation and study of the chemical and physical processes of the atmosphere, detecting the effects of pollution on those processes and monitoring and forecasting phenomena affecting the Sun-Earth environment. A new air quality program is helping citizens in the eastern part of the country make better decisions to protect their health. NOAA research leads the way for new forecasting services in the public health arena.

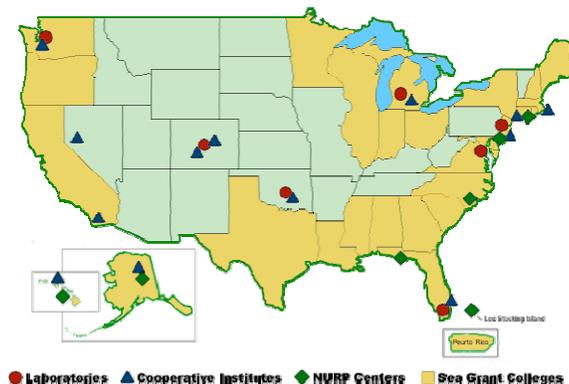
## WHERE WE WORK

### OAR Laboratories & Programs

- Atlantic Oceanographic & Meteorological Laboratory, Miami, FL
- Air Resource Laboratory, Silver Spring, MD
- Climate Program Office, Silver Spring, MD
- Earth Systems Research Laboratory, Boulder, CO
- Geophysical Fluid Dynamics Laboratory, Princeton, NJ
- Great Lakes Environmental Research Laboratory, Ann Arbor, MI
- National Severe Storms Laboratory, Norman, OK
- Ocean Exploration & Research, Silver Spring, MD
- Pacific Marine Environmental Laboratory, Seattle, WA
- Sea Grant Program, Silver Spring, MD

### Extramural Research Partners

- 13 Cooperative Institutes in 12 states
- 30 Sea Grant Colleges & Institutional Programs
- Six Regional NOAA Undersea Research Centers and a National Institute for Undersea Science & Technology



**To Learn More, Visit our Website:** <http://www.research.noaa.gov/>

**To Work or Study at OAR, Visit These Sites:**

NOAA Careers: <http://www.careers.noaa.gov>

Hollings Scholarships: <http://www.orau.gov/noaa/HollingsScholarship/>

Knauss Fellowships: <http://www.seagrant.noaa.gov/knauss/>

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*OAR's mission is to conduct research, develop products, provide scientific understanding and leadership and to conduct outreach towards fostering NOAA's evolving environmental and economic mission. In 2007, NOAA celebrates 200 years of science and service to the nation, starting with the establishment of the U.S. Coast and Geodetic Survey in 1807 by Thomas Jefferson.*