In Depth

Backgrounders, feature stories, and brochures provide an in-depth look at some of our key research endeavors. All information was accurate as of publication date. If you are a journalist and need updated information, please contact David Hosansky.

For Journalists

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Backgrounders

Backgrounders provide a quick feel for the science, people, and issues involved in major weather and climate topics researched at NCAR & UCAR.

Hurricanes, Typhoons, and Cyclones

Nitrogen in the Earth System

From Pineapple Express to Southern Oscillation: Persistent Patterns

Thunderstorm Glossary

Wildfires and Fire Weather

Understanding Climate Change - Feature Story

Following on new reports in 2007 from the Intergovernmental Panel on Climate Change, find out what we know and what we're still learning about global warming and the state of Earth's climate future. (Winter-Spring 2007)

more Feature Stories >

Hazardous Weather Fact Sheets

These fact sheets on the most common hazardous weather events likely to occur in the United States were prepared for online and classroom training of community managers and emergency responders by UCAR's COMET Program. Hazards addressed: thunderstorms, tornadoes, flash floods, riverine floods, coastal floods, tropical cyclones, extratropical cyclones, tsunamis, winter storms, excessive cold, excessive heat, fog, duststorms, windstorms, and fire weather. Each fact sheet includes:

- A definition of the hazard event
- Characteristics common to the event, including contributing factors, stages of development, types, and associated hazards
- Examples of related products, such as outlooks, watches, advisories, and warnings,

provided by the National Weather Service. (These are examples only and may not represent the most current products available from the NWS.)

Hazardous Weather Fact Sheets (UCAR) | Current U.S. Hazards Assessment (NOAA/NWS Climate Prediction Center)

Topical Brochures

Air quality, including aerosols, air pollution

Air quality research (NCAR Science Update, Winter 2006) Download as
Using computer models and specialized observing instruments, NCAR scientists are making new discoveries about air pollutants and their movements worldwide. This update highlights research that may help society take steps to improve air quality as well as work to unravel the subtle interactions between air pollution and climate. Also see Our Research: Pollution & Air Quality.

Climate change, including global warming

Climate change research (NCAR Science Update, 2004)
Scientists use sophisticated computer models and datasets to investigate how climate is shaped by such factors as emissions of carbon dioxide and other greenhouse gases, solar activity, and volcanic eruptions. This update highlights some of NCAR's ongoing climate change research, including global warming. Also see Our Research: Our Changing Climate.

Climate change impacts (NCAR Science Update, 2004)
Once scientists simulate the likelihood that various regions will undergo significant climate changes in coming decades, they then examine the resulting implications such changes, including global warming, may have on crops, forests, air quality, and fragile ecosystems. This update highlights some of NCAR's ongoing research on the impacts of climate change. Also see Our Research: Weather, Climate, and Society.

NCAR science in service to society (NCAR Science Update, 2002)
NCAR programs have always addressed societal as well as theoretical problems, and NCAR technologies continue to be put to practical use. This update samples efforts to safeguard the nation's environment, health, safety, and prosperity. Also see Our Research: Impacts on Society.

Climate modeling

Picturing Climate's Complexity: The Community Climate System Model (2004)
Get an inside look at this NCAR-based climate model, including its components, research highlights, and challenges for the future. Also see Our Research: Computer Models.

International collaboration

Partnerships Around the World: Advancing Our Understanding of Earth's Atmosphere (2005)
UCAR and NCAR work with universities and research centers across the globe to learn more about the atmosphere and its interactions with the Sun, oceans, biosphere, and human society. This publication highlights our collaborations with researchers on every continent.

Research tools

New Heights in Environmental Research: HIAPER (2004)
A research aircraft with exceptional capabilities will soon take to the skies: the High-performance Instrumented Airborne Platform for Environmental Research. Also see Our Research: Aircraft.

Solar research, including space weather and Sun-Earth connections

Solar research (NCAR Science Update, Spring 2005) Download as
Scientists at NCAR's High Altitude Observatory are sharpening our view of the vast forces shaping solar magnetism. Their work may point the way to better predictions of solar storms and other events with impacts on Earth's atmosphere, such as the solar cycle. The effect of the Sun on Earth's climate is another focus of NCAR research. Also see Our Research: The Sun and Space Weather.

Also check out

Tip Sheets

NCAR Research

Weather & Climate Basics for students and educators

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