



CLIMATE PROGRAM OFFICE

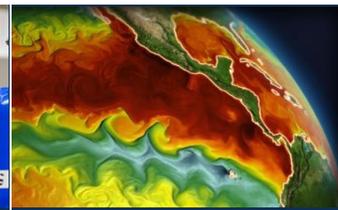
PEOPLE, BUSINESSES, AND THE ENVIRONMENT
THRIVING IN THE FACE OF CLIMATE IMPACTS



OBSERVING & MONITORING



UNDERSTANDING



PREDICTION

EARTH SYSTEM SCIENCE & MODELING

SUPPORTING RESEARCH TO ADVANCE UNDERSTANDING OF THE EARTH SYSTEM | CPO.NOAA.GOV/ESSM

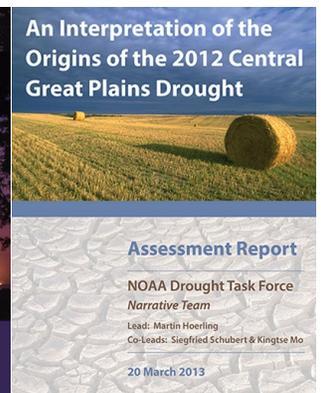
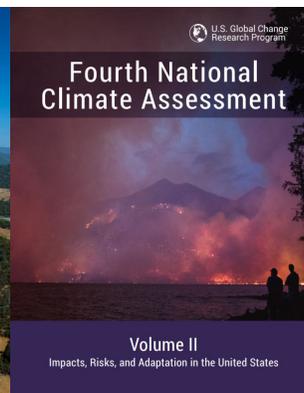
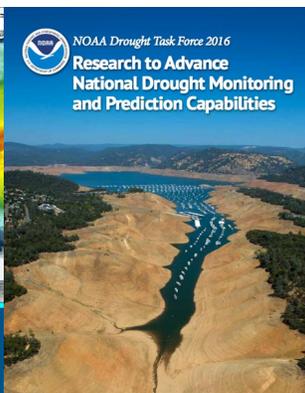
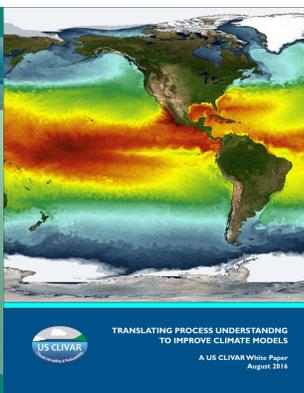
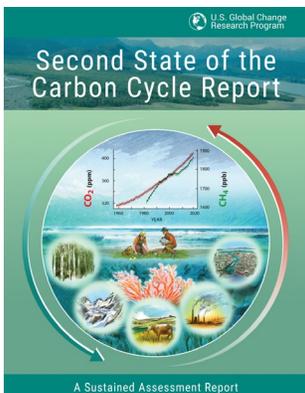
To understand and predict changes in climate, weather, oceans, and coasts—so people can protect themselves and their property—we need to understand global patterns, climate variability and change. And to help manage and conserve coastal resources and marine ecosystems, we need to understand and monitor our oceans and coasts.

The Earth System Science and Modeling program in the NOAA Climate Program Office is actively building the global and regional scale understanding needed to improve predictions. The program coordinates an array of researchers from federal agencies, national labs, and universities, focusing them on the most pressing climate research necessary to advance NOAA’s prediction and other services and applications.



▲ Changing climate conditions and natural variability patterns such as El Niño can lead to extreme events including severe storms, floods, heat waves, cold snaps, droughts, and wildfires.

ESSM foundational research is essential to understanding climate impacts



AMERICANS RELY ON NOAA'S EARTH SYSTEM SCIENCE & MODELING CAPABILITIES FOR ●●●



National Security



Billion-Dollar Markets

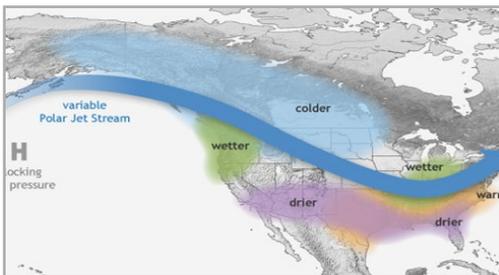


Risk Management



Health

ESSM supports competitive research via the following programs:



CLIMATE VARIABILITY & PREDICTABILITY (CVP)

Researchers in this program study interactions among the atmosphere, ocean, and land, and how they work together to make weather and climate events. This vital knowledge is needed to improve climate models and predictions so that scientists and society can better anticipate the impacts of future climate variability and change.



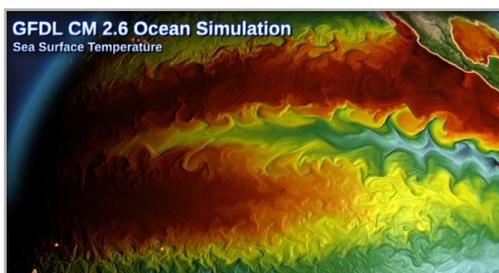
ATMOSPHERIC CHEMISTRY, CARBON CYCLE, & CLIMATE (AC4)

Research under this program refines our understanding of chemical processes in the climate system, including emissions, chemistry and deposition of atmospheric trace gases and aerosols. Atmospheric composition and its impacts are studied using various measurement platforms and numerical models.



CLIMATE OBSERVATION AND MONITORING (COM)

The Climate Monitoring program supports projects that develop data sets needed to understand the climate system and makes these data sets accessible to the research community. Researchers transform observational data into authoritative products that are used worldwide to assess variability and change, forecast future conditions, and manage risk.



MODELING, ANALYSIS, PREDICTIONS & PROJECTIONS (MAPP)

This program advances climate and Earth system modeling to improve our ability to predict climate variability. Program outcomes include better simulations of climate conditions on various timescales, improvements in long-term projections of future climate, and improvements in NOAA's climate modeling capabilities.