

# June 28, 2007 - NOAA Releases Nation-Wide Study of Earth Science Standards

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### Climate, Weather, and Ocean Missing from Many State Standards

A review of science education standards for all 50 states revealed that few states have thoroughly integrated climate, weather and oceans studies into their curriculum, according to a study released today. The study analyzed K-12 Earth science standards to determine how well each state addresses key Earth-science content, concepts and skills.

*Revolutionizing Earth System Science Education for the 21st Century* was conducted by TERC and funded by the National Oceanic and Atmospheric Administration (NOAA). It is the first detailed national picture of how effectively modern Earth-science perspectives are incorporated into state standards. The study assessed the state of Earth-science education following the recommendation from educators, scientists and policy leaders to transform and modernize the field.

"To maintain our global competitiveness, the U.S. needs workers knowledgeable about the entire scope of Earth science, including emerging disciplines," said retired Navy Vice Admiral Conrad Lautenbacher, Ph.D., undersecretary of commerce for oceans and atmosphere and NOAA administrator. "On a basic level, citizens must be versed in Earth science to make informed decisions on issues ranging from energy use and community development to resource management and emergency preparedness."

Earth science integrates oceanography, meteorology, geology, biology, chemistry, physics and other disciplines to understand Earth's processes as an integrated system. In addition to practical applications in a variety of fields, Earth science also addresses environmental challenges such as climate change, hurricanes, and ocean issues. The report shows a great variation in the states' Earth science education standards.

"Earth science is essential to reaffirming America's strength in science and education, and our survey is a report card documenting that we must make improvements in our schools," said Daniel Barstow, director of the Center for Earth and Space Science Education at TERC. "Because of standardized testing, a topic will be taught to students only if it's in the standards. Educators, scientists, policy makers, and business leaders are working hard to make the revolution in Earth science real in our classrooms. We must engage students at an early age, empowering them with the knowledge and skills to pursue Earth science careers and help shape the future."

"From NOAA's perspective, Earth science education is an essential part of preparing the next generation of scientists, farmers, business leaders, construction engineers and government officials," said Louisa Koch, NOAA director of education. "We requested this study to understand the landscape at the state level and to ensure NOAA's educational programs and partnerships complement the educational goals of those states."

The report shows a great variation in the states' Earth science education standards. The states' incorporation of Earth as a dynamic system of multiple components and processes, the dominant paradigm in Earth science research, earned a collective national grade of B+. Only 18 states feature 21st century technology such as satellite imagery and computer visualizations for exploring Earth, garnering a national grade of C-. Ocean literacy principles and concepts, formulated in 2005, were lacking in most standards. Even the traditionally covered subject areas of atmosphere, weather, and climate earned the states a national grade of only C+.

NOAA supports Earth science education through a variety of professional development programs for K-12 teachers as well as through informal education and outreach to all ages.

Download a PDF of the [full report](#).