NOAA Earth System Research Laboratory

Global Systems Division

2017 Research Stories

Full stories: https://esrl.noaa.gov/gsd/learn/hotitems/

January, 2018

The NOAA Earth System Research Laboratory Global Systems Division (GSD) does the research to provide the National Weather Service (NWS) and the public with rapidly-updating environmental models, state-of-the-art decision support tools, innovative visualization systems, and high-performance computing technology to support commerce and a Weather-Ready Nation.

YouTube: Bite-Sized Science - Making Forecasts Better

December 21, 2017 - "Making Forecasts Better" is a new video in NOAA's Bite-Sized Science series that shows how GSD research supports NOAA National Weather Service (NWS) forecasters by making day-to-day operations more efficient resulting in better forecasts.

Forecasters from the NWS Denver/Boulder office NWS talk about how GSD developed workstations, models, and tools to support all phases of producing forecasts for the public. The video has been released on the @NOAAESRL YouTube channel. https://www.youtube.com/watch?v=xrm-wOYPb5eY&t=8s

Using high-res forecasts could benefit the power grid

November 30 2017 - High-resolution wind, temperature, and solar flux forecasts could help utilities operate more efficiently and cost-effectively by increasing the amount of electricity that transmission lines can safely carry. Researchers evaluated the accuracy of NOAA's High Resolution Rapid Refresh (HRRR) forecasts against observations of temperature, wind speed and direction, and solar flux from 45 weather stations in southern Idaho. They also calculated the additional electric current a conductor could safely carry in different weather conditions. Results can be found here: https://www.esrl.noaa.gov/gsd/learn/hotitems/2017/powergrid.html

NOAA's Science On a Sphere® marks its 150th installation

November 15, 2017 - The Raman Science Centre in Nagpur, India is home to the 150th installation of NOAA Science On a Sphere® (SOS) and is expected to draw more than a million visitors each year. This is the sixth SOS installation in India. https://www.esrl.noaa.gov/gsd/learn/hotitems/2017/sos150th.html

GSD tools provide heads-up to potential aviation trouble spots and streamlines the forecast process

August 14, 2017 - GSD's INtegrated Support for air Traffic Environments (INSITE) tool combines current and historical air traffic with real-time and forecast convective weather to generate a "heat map," or an overview of areas where thunderstorms could limit air traffic flow. Forecasters worked with this and other GSD-developed tools in the Aviation Weather Testbed this past summer. https://www.esrl.noaa.gov/gsd/learn/hotitems/2017/awt.html

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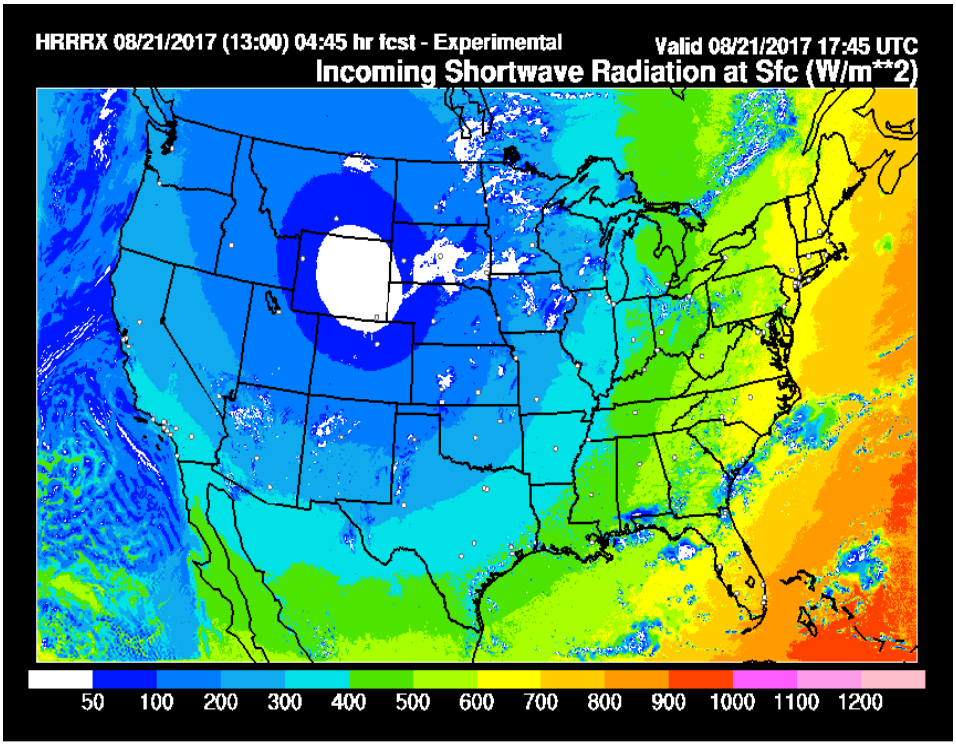

Experimental model predicts the effect of the 2017 eclipse on weather

August 15, 2017 - GSD and CIRES researchers adapted an eclipse algorithm to use with their experimental version of the 3-km High-Resolution Rapid Refresh (HRRR) model.

The algorithm, developed externally, computes the degree of obscuration of the solar disk at each model grid point. Based on this calculation, the model modifies the incoming solar radiation, which impacts the heating of the earth and, subsequently, the weather. https://www.esrl.noaa.gov/gsd/learn/hotitems/2017/eclipse2017-hrrr.html

MADIS coordinates with WMO's Global Data Centre for Aircraft-Based Observations

July 19, 2017 - GSD developed the Meteorological Assimilation Data Ingest System (MADIS) global weather database and delivery system, and continues to work with the World Meteorological Organization (WMO) on further requirements and improvements. This coordinated operational global program will benefit WMO and aviation end-users and be helpful for poorer nations lacking the funds to build this infrastructure on their own. https://www.esrl.noaa.gov/gsd/learn/hotitems/2017/madis.html

Reality Goes Virtual on SOS Explorer

June 13, 2017 - GSD's Science On a Sphere® team released new software for SOS Explorer™ (SOSx) that uses Oculus Rift virtual reality technology to immerse viewers in 3D datasets that entertain as well as promote scientific literacy. With the Rift headset, users can explore the rings of Saturn or the Hubble telescope orbit, and view a 3D rendering of the Aurora Borealis as it might look from the International Space Station. SOSx is a portable, flat-screen virtual globe based on NOAA's 6-foot diameter Science On a Sphere® display system. Through the new headset, users can select SOSx datasets, move the globe in any direction, and toggle between different views with virtual fingers. https://www.esrl.noaa.gov/gsd/learn/hotitems/2017/sosx-june2017.html

The Wind Forecast Improvement Project wraps up

May 3, 2017 - On March 31, 2017, the Wind Forecast Improvement Project 2 (WFIP-2) wrapped up 18 months of collecting atmospheric observations in the Columbia River Gorge that will be used to improve wind forecasts in areas of complex terrain. The project successfully leveraged resources, instruments, and researchers across all Earth System Research Laboratory (ESRL) Divisions, the Air Resources Laboratory Field Research Division, other federal agencies, private companies, and universities to collect an unprecedented and valuable dataset that will pay off for years to come. https://www.esrl.noaa.gov/gsd/learn/hotitems/2017/wfip2.html

Real-time demo for GSD prototype severe weather forecast system

April 25, 2017 - GSD researchers demonstrated a prototype prediction system that produces a range of probabilities of potentially hazardous weather. The High-Resolution Rapid Refresh Ensemble (HRRRE) incorporates radar, aircraft, and other weather data in real-time to generate hourly snapshot forecasts of potential low-level rotation in supercell thunderstorms, thunderstorm winds, damaging large hail, and flash flooding. https://www.esrl.noaa.gov/gsd/learn/hotitems/2017/hrrre.html

Forecasters test app that moves away from yes/no severe weather warnings

March 23, 2017 - Current severe weather watches and warnings are made from pre-determined thresholds applied to binary decision-making. The new Hazard Services-Probabilistic Hazard Information application produces rapidly-updating probabilistic hazard grids so forecasters can track areas, probabilities, and limits of predictability of threats such as hail, wind, and tornadoes. This opens the door for new products and services that could include low-probability, and longer lead-time warnings for high-risk users who can set their own threat threshold based on their specific needs. https://www.esrl.noaa.gov/gsd/learn/hotitems/2017/hs-phi.html