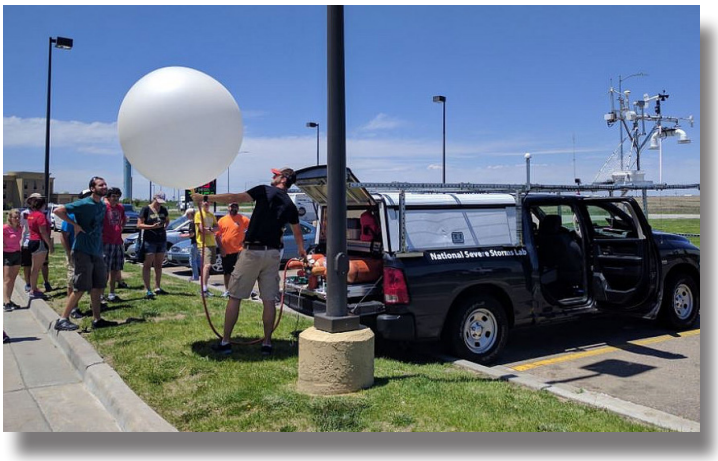
NOAA National Severe Storms Laboratory

The NOAA National Severe Storms Laboratory is a federal research laboratory in Norman, Oklahoma, within NOAA's Office of Oceanic and Atmospheric Research

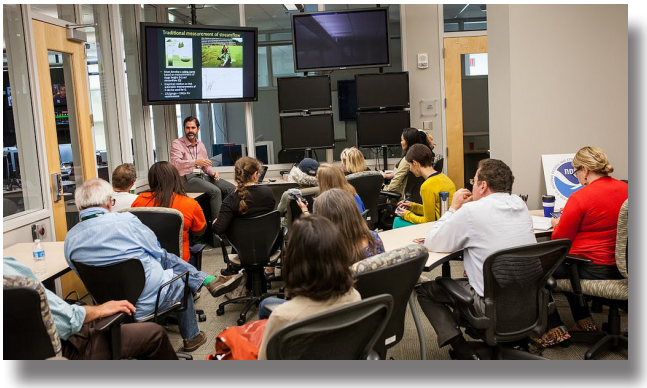
NOAA National Severe Storms Laboratory enhances NOAA's capabilities to provide information for more accurate and timely forecasts and warnings of hazardous weather events to save lives, protect property and enhance economic viability. NSSL supports NOAA National Weather Service by conducting research to advance understanding of weather processes and improve forecasting and warning tools used by forecasters. Severe weather is NSSL's passion.

NSSL has a responsibility to continue making discoveries about severe storms just like it did in 1973 when an NSSL team discovered the Tornado Vortex Signature, which led to the deployment of Doppler radars. NSSL has provided Doppler radar improvements, hazardous weather prediction applications and much more to the NWS. NSSL's basic and applied research focuses on understanding severe weather processes. In 2003, the Thunderstorm Electrification and Lightning Experiment succeeded in flying 14 weather balloons with radiosondes into severe storms to learn about lightning generation processes.

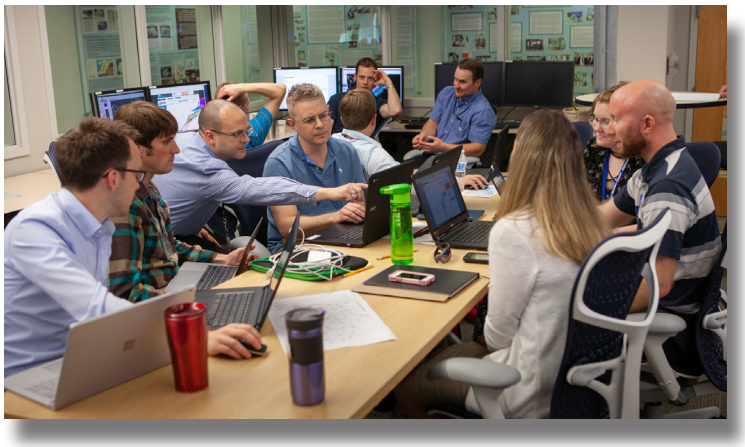
NSSL partners with universities and the private sector enterprise, allowing scientists to collaborate on areas of mutual interest and to facilitate the participation of students and visiting scientists. Meteorologists, hydrologists, physicists, engineers, computer specialists and social scientists — all have a place at NSSL.



A crowd of public onlookers gathers as NSSL Researcher Sean Waugh inflates a weather balloon before attaching sondes to it to study a convective storm in Kansas.
(Photo by Kiel Ortega/OU CIMMS)



Above: NSSL Research Scientist Jonathan J. Gourley discusses his research on flash flooding and the dangers presented by such during a lab visit from the Society of Environmental Journalists.



Left: Before products are implemented into NOAA National Weather Service operations, products are tested in the NOAA Hazardous Weather Testbed. Experimental products are tested and evaluated by forecasters, emergency managers, researchers and broadcast meteorologists. During spring 2018, researchers tested numerical prediction models to improve predictions of hazardous weather events from a few hours to a week in advance. (Photos by James Murnan/ NOAA)

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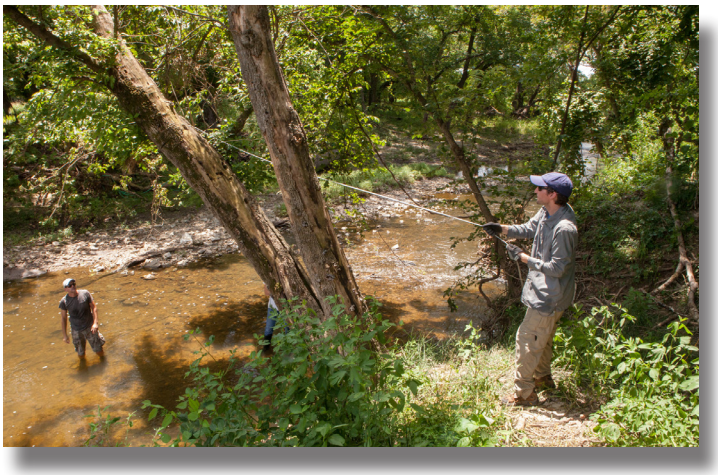
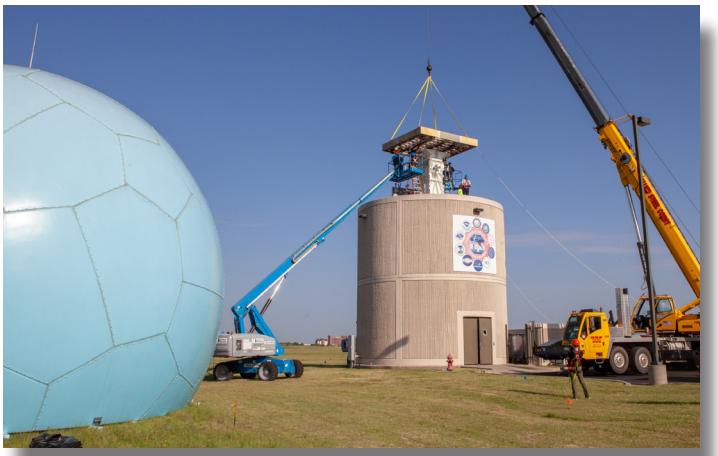
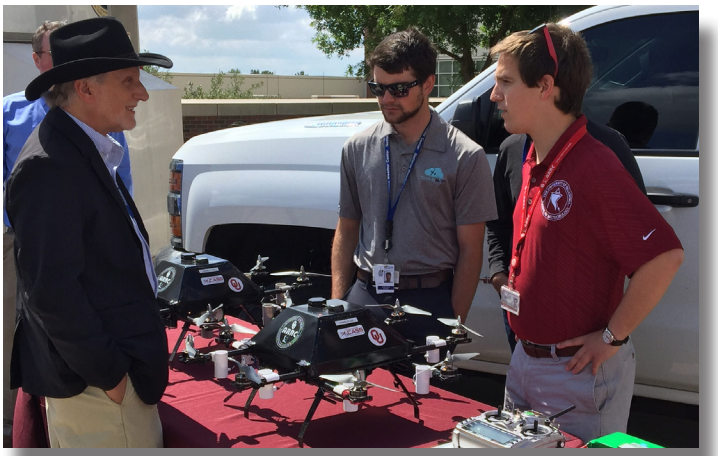
Research & Involvement

Below: Engineers install the newest radar addition to NSSL — the Advanced Technology Demonstrator. The ATD is the first full-scale, S-band, dual-polarization phased array radar designed specifically for use as a weather radar. The 76-panel radar will be fully operational in 2019. Results from the ATD may determine if a phased array radar can provide weather data to meet the needs of the NOAA National Weather Service.

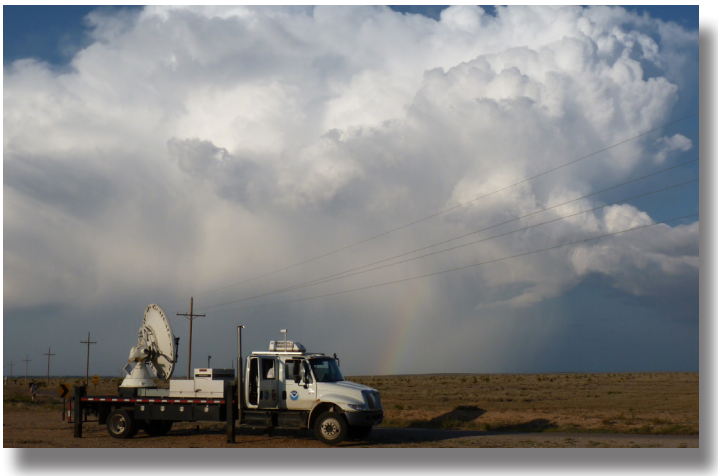


Left: NOAA NSSL engineer Danny Wasielewski adjusts the mounting of a streamflow radar. This instrument is part of a suite of remote sensors being evaluated or developed by NSSL to measure stream stage, velocity, and cross-section to improve flood forecasting.
(All photos by James Murnan/ NOAA)





Right: NSSL collaborated with other entities to build the first-ever mobile Doppler radar. Since 2008, NSSL has operated a dual-polarized X-Band mobile radar, known as NOXP. The NOXP has traveled all over the United States and parts of the world to study tornado formation, winter and dust storms, flooding and more. NSSL's mobile radars supported the 2010 Winter Olympic Games through winter nowcasting in Vancouver.



Above: NSSL Director Steve Koch speaks with University of Oklahoma students regarding a collaborative project using unmanned aerial systems. The project, led by NSSL, used UAS and mobile observing systems to evaluate the value of such tools for observing the lower atmosphere during rapidly evolving severe weather. Researchers discovered previously unseen factors important to the formation of thunderstorms.

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