

# Q&As on Upgrade to Dual Polarization Radar

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**Q: What is dual polarization technology and how is it better than conventional Doppler radar?**

**A:** Dual polarization technology is the most significant enhancement to the nation's weather radar network since Doppler was installed in the early 1990s. It provides weather forecasters with new information so they can more accurately track, assess, and warn the public of high-impact weather.

**Q: How does dual polarization technology work?**

**A:** Conventional Doppler radars send out a horizontal pulse that gives forecasters a one-dimensional picture of whatever is in the air, precipitation or non-precipitation. It can see precipitation, but can't tell the difference between rain, snow, or hail. Dual-pol radar sends and receives both horizontal and vertical pulses, providing a much more informative two-dimensional picture of whatever is out there. This information helps forecasters clearly identify rain, hail, snow or ice pellets, and other flying objects, improving forecasts for all types of weather.

**Q: Does dual polarization technology improve what forecasters understand?**

**A:** This is the greatest benefit that dual polarization radar provides. Forecasters have a clearer understanding of differing weather types (snow vs. rain vs. hail) and non-weather features (smoke from wildfires), both of which impact public safety. A clearer understanding leads to better communication of conditions to NWS Weather Enterprise partners and the public.

**Q: How does dual polarization technology improve flood forecasts?**

**A:** Better information about the size and shape of precipitation helps forecasters more accurately estimate the amount of rain reaching the ground and identify areas of heavy rainfall. This information is expected to help forecasters issue more timely and accurate flood and flash flood warnings.

**Q: How does dual polarization technology improve winter weather forecasts?**

**A:** Conventional Doppler radar doesn't distinguish between rain, snow, sleet and mixes of each in a storm. With dual-pol radar, forecasters can identify precipitation types, monitor the transitions such as from snow to sleet and freezing rain, and provide more accurate forecasts to emergency managers, motorists and the public.

**Q: Will dual polarization technology improve tornado warnings?**

**A:** Dual-pol radar can detect and identify flying tornado debris, giving forecasters a high degree of confidence that a damaging tornado is on the ground and can track its path. This is especially helpful at night when tornadoes are difficult to see.

**Q: Will the radar upgrade help forecast tornadoes in advance?**

**A:** While dual-pol radar provides specific information about the location of a tornado, it does not provide additional information about where or when a tornado will form ahead of time.

**Q: Will dual polarization technology improve hail forecasts?**

**A:** Using dual-pol radar, forecasters have the ability to pinpoint where in the storm hail is falling and identify the relative size of the hail.

**Q: In locations where it's already installed, has dual-pol radar made a difference?**

**A:** Yes. For example, NWS forecasters in Seattle and New York used dual-pol to identify and track the precise location of the freezing rain to snow transition zone during major winter storms. This spring in Alabama and Missouri, forecasters spotted debris on the radar, giving them greater confidence as they issued warnings to communities in the tornadoes' paths.

**Q: Does dual polarization technology improve what forecasters see?**

**A:** Yes. Dual-pol radar provides efficient ways to improve data quality on radar displays. Forecasters now can easily tell the difference between radar echoes that are precipitation and those that are birds, insects, bats or other non-weather objects, allowing them to focus solely on the weather.

**Q: Did the NWS develop new products using dual-pol data?**

**A:** The National Weather Service has developed 14 new radar products that are beneficial to the many life-saving warnings forecasters issue. With a better eye on the storm, meteorologists have more information and confidence to accurately assess weather events.

**Q: Who developed dual polarization radar technology?**

**A:** Researchers at the NOAA National Severe Storms Laboratory in Norman, Okla., spent nearly 30 years researching and developing the technology. Engineers at the Radar Operations Center designed and tested the systems, and the National Weather Service Warning Decision Training Branch provided timely and relevant training.

**Q: When will my radar be upgraded and how much does the project cost?**

**A:** Dual-pol radar will be installed in 160 sites -- 122 at local weather forecast offices and 38 at NOAA centers and military and aviation sites. The upgrade will be completed in mid-2013 and costs \$50 million, about \$225,000 per site. In July, Congress reprogrammed \$9.4 million dollars to finish the deployment of dual-pol.

**Q: What is the economic benefit of this dual-pol upgrade?**

**A:** Researchers estimate the new technology could save the nation about 700 million dollars annually by reducing weather-related damages.

**Q: Is there information explaining dual polarization technology that is brief and simple to understand?**

**A:** NOAA produced a short video that explains the basic benefits of dual-pol radar for the general public, [http://www.youtube.com/watch?v=tX6LH\\_I3P3Y](http://www.youtube.com/watch?v=tX6LH_I3P3Y).

**Q: Is the dual polarization radar upgrade part of the Weather-Ready Nation initiative?**

**A:** Ultimately, this upgrade is one more step in our efforts to build a Weather-Ready Nation and another example of the critical service NOAA provides to this country. Enhanced confidence in weather forecasts will improve public response to weather warnings and improve readiness.