All hail the backyard weather watchers

By Patrick O'Driscoll, USA TODAY

BENNETT, Colo. — The Brigham family is using a $25 rain gauge, their home computer and cheap squares of foil-covered Styrofoam to help weather scientists better understand hailstorms that hit the Great Plains this time of year.

Researcher Nolan Doesken can examine a 'hail pad' to determine the size and density of hail.

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The Brighams — Jay and Marianne, and their children Jacob, 13, and Sarah, 11 — are part of a fast-growing network of more than 2,300 backyard weather observers in the nation's "hail belt" east of the Rockies, where some of the most frequent and intense hailstorms occur.

The volunteer observers take daily measurements of rain — snowfall in winter — and record the amounts in an online database. During major storms, they post more frequent readings so that forecasters and emergency managers can update storm alerts with data from places where there are no weather stations.

In spring and summer, they set out homemade "hail pads" of plastic foam wrapped in aluminum foil to record hailstorms. Hailstones leave pockmarks on the 12-inch squares, which scientists "read" to determine the size and density of the hail and the direction it fell.

"It is giving us something we previously didn't have," says Colorado State University research meteorologist Nolan Doesken, who started the project in 1997. He says the pads could help scientists learn whether "there truly are places more prone to hail" and how the size and spread of hailstones differ from place to place.

The volunteer project, called the Community Collaborative Rain, Hail & Snow Network, includes volunteers in Colorado, Wyoming, Nebraska, Kansas, New Mexico and part of Texas. As weather buffs see maps and other data on the Web site (www.cocorahs.org), inquiries are coming from as far as California and Tennessee.

Residents' involvement is a tradition in weather reporting. The National Weather Service first recruited "cooperative observers" in 1890 and now has 11,700 volunteers who provide daily reports of temperature, rain and weather conditions. Private weather companies also link thousands of weather buffs and schools in their own cooperatives.

Data from Doesken's network are used by federal agencies, such as the Agriculture Department and the Bureau of Reclamation, which operate dams and reservoirs across the West. Agencies that control mosquitoes used the rainfall reports two years ago as they worked to stem an outbreak of West Nile virus in Colorado that killed 63 people and infected about 2,900 others. In Kansas, some county extension offices check the data to plot where crop diseases might result from wetness.

Doesken says researchers at the National Weather Service and Colorado State University use data from the hail pads to check that their radar equipment can distinguish hail from heavy rain.

Ultimately, the hail-pad data might help forecasters issue warnings similar to tornado alerts. "If you're a farmer, it's not going to save your crop," Doesken says. "But it will allow you to get yourself and your family and animals to safety."

Even NASA is interested. The space agency designed its own high-tech monitors to warn of potential hailstorms that could damage the space shuttle and its fuel tanks. NASA scientist John Lane came to Colorado last month to install two of the agency's monitors next to the low-tech pads.

NASA already has several of its monitors — aluminum plates shaped like miniature rooftops that record hail based on how loudly it strikes — around the launch pad in Florida. Lane says comparing his readings to the dents on a hail pad can help refine the accuracy of the NASA instruments.

Insurance companies and federal agricultural agencies also want the data to help verify hail loss claims. Average annual damage by hailstorms in the USA exceeds $5 billion, according to California-based Risk Management Solutions, which models natural catastrophes.

Network members throw periodic "hail-pad parties" to make hundreds of the foil-clad squares at a cost of about 40 cents apiece. "It's kind of like wrapping Christmas presents," Doesken says. A grant from the National Science Foundation pays for most of the rain gauges and supplies.

The network also has lessons online for science teachers.

Marianne Brigham says they became volunteers because "we thought it would be fun for the kids." Her children help take the daily readings. Her son uses the weather project in his science and math studies.

Their home near here, 35 miles east of Denver, sits in a hot spot for watching the weather, with a view of the Rockies from Pikes Peak to Wyoming. The area is known for converging winds that can spawn tornadoes — and hailstorms.