AMERICAN METEOROLOGICAL SOCIETY
NEWS RELEASE
Headquarters
45 Beacon Street
Boston, MA 02108-3693

1120 G Street, N.W., Suite 800
Washington, DC 20005-6115

Media Contact(s):
Stephanie Kenitzer
(425) 432-2192
Kenitzer@dc.ametsoc.org

Nick Houtman, Dept. of Public Affairs, 207-581-3777, houtman@maine.edu

Research Contact:
Gregory A. Zielinski, Institute for Quaternary and Climate Studies, University of Maine, 207-581-3341, gzielinski@maine.edu

FOR IMMEDIATE RELEASE
7 January 2002

UMAINE PROFESSOR DEVELOPS CLASSIFICATION SYSTEM FOR EASTERN AND CENTRAL U.S. WINTER STORMS

ORONO, Maine -- Predicting the impact of a winter storm in the eastern and central U.S. can be as treacherous as the weather. How quickly it strengthens, where it goes and how fast it travels can mean the difference between shoveling a few inches of snow and being stuck for days in the driveway.

Gregory A. Zielinski, Maine state climatologist and an associate research professor in the University of Maine Institute for Quaternary and Climate Studies, has developed a way to help weather forecasters and the public understand the likely impacts of winter storms. He describes the basis for his system in the cover story of the January issue of the Bulletin of the American Meteorological Society (BAMS).

Zielinski applies his analysis principally to two types of storms: nor'easters that often intensify in the mid-Atlantic region and move up the coast into New England; and storms that originate just east of the Rocky Mountains and move through the Great Lakes region or up the Ohio River valley. Intense storms of the latter variety are often called the Witches of November and have been responsible for shipwrecks on the Great Lakes. One of the most famous was the sinking of the Edmund Fitzgerald that was immortalized in a Gordon Lightfoot song.

"My classification scheme allows forecasters and meteorologists to easily summarize the intensity of a winter storm by giving it an intensity index and placing it into its appropriate category on a 1-5 scale," says Zielinski. "The potential impact of the storm can then be passed on to public service officials so they may make plans for precipitation amounts, particularly snow, snowfall rates, wind speeds, drifting potential and overall impact on schools, businesses, travelers and coastal communities."

"As far as a single type of weather event, nor'easters may have more impact on the East Coast than any other type of event," says Zielinski, who lives in Bangor, Maine. "Obviously, a hurricane can have more impact in a single storm, but collectively, nor'easters have more impact over a long period of time."

"We have classification schemes for tornadoes and hurricanes," he says. "Why not for winter storms? If you look at the category and predicted path of a developing

storm, you can go to the past and find that we had a similar storm so many years ago and that this was how it developed. Such a direct comparison might be helpful for the general public."

Zielinski's approach uses two features of a storm: air pressure and forward speed. On the basis of calculations to determine different characteristics of the first, which reflects storm strength, he places the storm into a category between one and five.

Forward speed is also important because even moderately intense storms can have a large impact if they move slowly. For example, a 1969 storm that stalled over Cape Cod for two days dumped more than eight feet on top of Mount Washington. Conversely, the cumulative impact of strong storms may be lessened if they move through an area quickly. That was the case in New England with the March, 1993 "Storm of the Century."

"If you want to address the impact of these storms, intensity is important, but how long it is sitting around is just as important," Zielinski says.

In Zielinski's classification system, a second number reflecting forward speed is used together with the first number that is based on intensity. The second number also ranges between one and five. A five would be the slowest moving and thus longest duration storm. A storm's category might be 2.4 or 4.3, reflecting intensity with the first digit and duration with the second.

Applying his approach to past storms, Zielinski has already found some surprises. For example, he points to a January, 2000 storm in the Gulf of Maine that became what weather specialists refer to as a "meteorological bomb." That occurs when the air pressure in a storm center drops rapidly by at least one millibar of pressure per hour on average over a 24-hour period.

"A very intense bomb occurs when you drop three millibars over a three hour period. This storm dropped 40 millibars over 24 hours. The rate that it dropped was over half again as much as any that I looked at. It just exploded into this huge storm.

On Zielinski's scale, this storm was in category 5, the most intense. By comparison, the air pressure was close to a category 4 hurricane on the commonly used Saffir-Simpson scale.

Altogether, Zielinski used his system to classify more than 70 past storms. Some of those storms were composed of secondary and primary systems. He made a total of over 550 individual classifications. For example, he looked at the March, 1993 "Storm of the Century," the Great Arctic Outbreak of 1899, the Blizzard of 1888 and other storms that are part of U.S. weather lore. The 1888 event is considered a hallmark for the New York and New England region. It dumped 55 inches of snow on Troy, New York and 45 inches on New Haven, Connecticut.

A mid-December 2000 storm was the most intense that Zielinski found in his study. It organized in Colorado and moved through the Great Lakes and up the St. Lawrence River valley. It produced near hurricane force winds along the southern Maine coast. The January 2000 nor'easter was the second most powerful storm.

Before he came to UMaine in 2000, Zielinski began studying New England's weather with support from a research endowment at the University of New Hampshire. It became apparent, he says, that it would be useful to find a way to compare storms and look for patterns in the more than 100 years of scientific weather records.

"I'm hoping this approach will be picked up by weather forecasters on TV, radio, the Weather Channel and so on. It makes it very easy to inform people about the potential impact of a storm. One number saying this is category 4 or 5 storm should, in itself, be an alarm to people that it could have a major impact on us," he says.

Meanwhile, Zielinski plans to continue using his scale in a historical investigation of New England's climate.

The American Meteorological Society is the nation's leading professional society for scientists in the atmospheric and related sciences.

Note to Editors: PDF or faxed copies of the paper are available to journalists from Stephanie Kenitzer, AMS press office (425-432-2192) or Kenitzer@dc.ametsoc.org. A photo of Gregory Zielinski is available from Nick Houtman, Department of Public Affairs at the University of Maine (207-581-3777) or houtman@maine.edu.

Headquarters: 45 Beacon Street, Boston, MA 02108-3693
Email: amsinfo@ametsoc.org
Phone: 617-227-2425; Fax: 617-742-8718