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New research shows that the frequency and intensity of storms in Northern Europe have increased over the past century and a half.

news shorts

Warming temperatures clear Arctic air

New research suggests that as the Arctic warms, the air may become cleaner, courtesy of "wet scavenging." Previous research had shown that Arctic air is cleaner in the summer than in the winter, because summer seasonal precipitation removes pollutants such as carbon monoxide from the atmosphere. New data indicate that the seasonal precipitation also removes light-absorbing pollutants, such as black carbon, from the atmosphere, and that this above-freezing precipitation (and thus wet scavenging) will be more frequent as Arctic temperatures increase.

Garrett et al., Geophysical Research Letters, Aug. 24, 2011.

EXTREME WEATHER MORE FREQUENT IN NORTHERN EUROPE

Northern Europe may have gotten stormier since the late Victorian Era. Looking at a fresh analysis of old atmospheric pressure data, researchers found that the annual number of windy days may have risen by one to five days per century in parts of northern Europe, and the intensity of such storms may have grown too.

Markus Donat, a climate modeler at the University of New South Wales in Australia, and his colleagues wanted to calculate the frequency and intensity of wind storms across Europe to search for trends lasting longer than a decade, something several research groups are pursuing. Donat and his team used the 20th-Century Reanalysis, a global model released earlier this year that incorporates pressure readings from 1871 to 2008.

In a reanalysis model, researchers take a weather model and mix in real-world observations to try to reconstruct historic weather patterns. The way they incorporate the real-world observations can make a difference in the outcome of their reconstructions though, because each type of weather observation requires customized corrections that may introduce incompatible errors.

The errors in the 20th-Century Reanalysis model are easier to understand than in other reanalysis models, Donat says, because it only uses one type of weather observation: pressure readings. Most reanalyses use several kinds of weather measurements, such as those taken by weather balloons and satellites. Furthermore, the 20th-Century Reanalysis model takes into account a longer time period than most such models, he says, which gives the new study "better sensitivity" than other studies that have looked for such trends over shorter time periods.

Donat and his colleagues used the pressure values from the reanalysis model to predict daily wind speeds throughout Europe over the duration of the reanalysis. Then they searched the predicted wind speeds for long-term trends and found an increase in maximum wind speeds and in the frequency of extra-windy days, as they reported in Geophysical Research Letters.

The study appears to show a small trend above natural decadal variability, says climate modeler Len Shaffrey of the University of Reading in England. But identifying trends, or the hints of trends, is one thing; explaining them is another. "Although they've characterized these trends, the reason why the trends are there is uncertain," Shaffrey says.

Part of the uncertainty arises because there were fewer pressure observations early in the period covered by the 20th-Century Reanalysis, so assumptions made in integrating the data with the meteorological model may distort the weather reconstructions, says meteorologist Kevin Hodges of the University of Reading. "I'm not sure if you can get more [data] going back to 1871," Hodges says, "but it motivates the need to try to improve the data record."

Gilbert Compo of the University of Colorado at Boulder, one of the creators of the 20th-Century Reanalysis, says that this is "the sort of study we hoped would get done" with the data. But he also notes that he would be more convinced of the trend Donat and colleagues found if there were an independent comparison covering the same time period, such as ground wind speeds. "Not that that's an easy thing to do," he adds, "because you have to account for ground drag and all kinds of other effects."

Donat says that "a very important next step would be an attribution of mechanisms," and he and his colleagues will next look for connections between this trend and changes in the other regional climate patterns such as the North Atlantic Oscillation or the El Niño/Southern Oscillation.

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