CLIMATE TALK

Extreme Rainfall and Climate Change

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"PAN-PAN, PAN-PAN, PAN-PAN" Wow! I'd just finished wiring up the new radio on my boat and the first transmission it received was a "pay attention now" warning from the US Coast Guard. It was early morning, July 12, 2016, and the message told of dozens of boats drifting in Lake Superior near Saxon Harbor. I thought that maybe a fleet of dinghies stored too close to the shore had been blown out into the lake by last night's storm. In the hours and days to come, however, we all learned of the tremendous damage and loss of life the storm had wrought.

The storm of late July 11 and into July 12 dumped up to 12 inches of rain in some locations over just a few hours. Saxon Harbor was destroyed, with nearly all of its 90 some boats damaged, destroyed, or lost completely. Highways made impassable included US 2 and WIS 13, 77, 122, 137, and 169, along with some 30 town roads. Three deaths were ascribed to the storm. Estimates now put the damage at over $26 million dollars.

The storm was an example of extreme precipitation, both in an everyday sense and in more formal scientific and engineering definitions. The scientific consensus is now quite strong that global warming is increasing the damage we sustain from extreme—that is, uncommon—events such as heat waves and heavy rainfall. As we release ever greater amounts of greenhouse gases we increase the heat-trapping ability of the Earth's atmosphere. This raises air temperatures, increasing the amount of water vapor the atmosphere can hold, and so the amount of rain and snow that will fall. The small, slow changes in average temperature and precipitation caused by climate change so far are causing clear damage now in only certain parts of the world, such as the Arctic. Here in the Midwest these are scarcely noticeable. But it isn't "average" weather that causes damage and death in our part of the world, it is extreme weather—floods, heat waves, drought.

Extreme precipitation events are often described by how frequently we should expect a given amount of rain within some time interval (like over 1 hour, 24 hours, or 5 days). For Ashland, a 12-hour, 100-year rainfall is 7.3 inches. The rainfall that struck Saxon Harbor was of the 1000-year sort. Technically "100-year" means that there is a 1% chance of such a storm occurring in any given year, leading to the idea that occurrences should only come along about every 100 years over the long haul. Climatologists are quick to point out that there are no guarantees here—we could see a "100-year" storm two years in a row. It is a roll of the dice each year.

Climate scientists say we are "loading the dice" toward more extreme events. So a deluge once considered a 100-year storm (say 7.3 inches in 12 hours) will become a 50-year storm, that is twice as frequent. Governments, businesses, and citizens will be forced to spend more on repairing damage and building more robust roads, bridges, and buildings. And the human costs of extreme weather—heat-related deaths and drownings—will increase.

Mariners the world over know to pay attention when they hear from their radio “PAN-PAN, PAN-PAN, PAN-PAN,” because it means property and lives are potentially in danger. Climate change is exactly this kind of situation—pay attention now to limit loss of property and life. Without action on climate change we will experience increasing numbers of weather-related “MAYDAY, MAYDAY, MAYDAY” situations—lost of property and life is imminent—and we will be powerless to reduce their frequency. Let’s be prudent by acting on the warnings that climate science is giving us, to reduce future cost and pain.

Bill Bland retired from the University of Wisconsin-Madison, where he was a professor of soil science. He moved to Bayfield with sailboat in tow, and is now working to reduce the C footprint of his 1910 Bayfield home.