

Changing Hurricane Activity & Forest Risk

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In this bulletin, we summarize recent hurricane activity and how it is projected to change, with implications for forest health and timber value.

Recipe for a Hurricane

Hurricanes are more generally known as tropical cyclones. The two most important factors in their development and intensification are (1) warm ocean waters and (2) wind shear (changes in wind direction and/or speed with height). These work in opposing ways—warm water provides energy, while wind shear puts on the brakes by tearing storms apart. Determining how climate change might affect hurricane activity involves figuring out how these factors will change. Warming ocean waters alone will not increase the number of hurricanes, but it will mean more fuel when they do form.

How is hurricane activity or risk changing, in terms of...

...FREQUENCY?

Globally, there has been no increase in the number of hurricanes since the 1800's; general consensus is the total number of hurricanes will stay about the same or perhaps decrease by up to a third.

...INTENSITY?

There are already more strong storms, especially in the North Atlantic where the strongest are getting stronger. Research suggests an overall increase in tropical cyclone intensity and a greater number of category 4/5 storms in a warmer world.

...RAINFALL?

These storms will bring more rainfall in the future—on the order of +10-20% by end of century.

...STORM SURGE?

Rising sea levels will increase the height of hurricane storm surges.

...WHERE THEY PEAK?

Hurricanes reach maximum strength 200 miles farther from the equator compared to 30 years ago, changing the geography of storm risk.

...HOW FAST THEY MOVE?

Tropical cyclones are moving slower, leading to large increases in storm-related rainfall rates.

Forest Impacts

It is estimated that, on average, hurricanes affect ~3 million acres of forest and cost around \$700 million dollars each year in the U.S. We expect to have stronger, slower-moving storms in the future that drop more rain, so it is reasonable to expect that the risk to timber resources may change, including loss of value and forest carbon stocks. Beyond immediate decreases in merchantable timber value, hurricanes can also result in growth declines that persist for several years and longer-term impacts from increased vulnerability to pests and wildfire following storm damage.

Things to Do

The most important action items are:

- (1) building windfirmness in forest stands (see previous bulletins on this topic, [Part 1](#) & [Part 2](#)),
- (2) maintaining access
- (3) having systems in place to carry out rapid assessments of forest damage post-storm (via field surveys and/or aerial/satellite imagery)
- (4) considering insurance to hedge against catastrophic timber loss due to extreme wind events

Click on the sub-headings to go directly to the corresponding section of the full bulletin, or read the complete bulletin online at: <http://climatesmartnetwork.org/2018/11/changing-hurricane-activity-forest-risk/>