

Hurricane Helene's Rapid Intensification Fits Ominous Trend

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[Hurricane Helene](#) began the day Thursday as a Category 1 hurricane, and quickly transformed into one of the largest, most powerful Gulf storms on record, with maximum sustained winds of 140 mph at landfall.

Why it matters: Rapidly intensifying hurricanes can catch residents off guard and unable to flee a suddenly stronger storm as it bears down on them.

- Studies show climate change is one major factor behind the trends shown by Helene, [Category 5 Hurricane Michael](#), [Hurricane Laura](#) and other similar storms.

Zoom in: Until about 2017, Gulf of Mexico hurricanes rarely intensified all the way to landfall in the northern Gulf, due mainly to cooler waters near the shoreline and less hospitable conditions in the atmosphere.

- Yet since then, rapidly intensifying storms have seemingly become the norm there.
- It is no coincidence that Helene's intensification coincided with the storm's travel over the [Loop Current](#), which is part of the ocean current that becomes the Gulf Stream.
- Water temperatures in this region are about 88°F, and bathtub-like temps extend far beneath the surface.
- This gave the storm a deep reservoir of heat to tap into for energy, and it is here that it overcame dry air that had been holding back its intensification rate.

The intrigue: The Loop Current also supercharged Hurricane Katrina in 2005, before that storm weakened on its approach to land, making landfall as a Category 3 storm (with the surge heights of a stronger storm, however).

- This year, the current is a sizzling spot within an already [record-hot body of water](#), with ocean temperatures and [heat content](#) at or near all-time highs in the Gulf of Mexico.
- These elevated water temperatures have been linked to climate change. The research group Climate Central found that the waters the storm traversed were 200 to 500 times more likely today's environment of higher greenhouse gases, when compared to the preindustrial era.
- The record warm waters of the Gulf of Mexico are also helping to give Helene and its remnants record high amounts of water vapor, which is leading to record rainfall and "[catastrophic flooding](#)" in the southern Appalachians.

By the numbers: Helene goes down in the record books as one of [eight landfalling storms in the U.S.](#) that have rapidly intensified by at least 35 mph in the 24 hours prior to landfall since 2017.

- Between 1982-2016 [only six storms](#) had displayed such a ramp up in intensity before a U.S. landfall, according to meteorologist Kieran Bhatia.

Between the lines: Due largely to climate change, [more storms now undergo rapid intensification](#), and there is an amplification of the [intensification rates](#) in the Atlantic Ocean Basin.

- More storms are [intensifying rapidly near the coast](#), as well, a recent study found.
- These and others studies are consistent with how quickly and significantly Hurricane Helene intensified on its way to making landfall.
- Remarkably, though, at least with this storm, the NHC was able to anticipate the burst of rapid intensification, and explicitly forecast it.
- Many previous instances have been forecast misses.

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