How a supercomputer is helping AT&T prepare for extreme weather

AT&T has a new climate change risk-assessment tool, developed with the help of Argonne National Laboratory's scientists and supercomputing power, *CNBC* reports. The telecommunications company hopes to protect its infrastructure from the flooding and extreme weather events that are projected to increase as climate change continues.

A few years ago, AT&T started thinking about the long-term risks that climate change posed to its equipment. For example, the company has cell towers and sites across the country that are vulnerable to flooding and might need to be lifted above encroaching waters. In other places, services rely on above-ground copper wires that can blow down in large storms, and which might be safer buried underground as weather patterns shift. "We just essentially did a deep dive: What was our long term planning, and how was that linked to climate change?" , director of environmental sustainability at AT&T, tells *The Verge.*

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So they turned to the scientists at Argonne National Laboratory, like Rao Kotamarthi, chief climate scientist in the environmental sciences division. He and his colleagues used millions of hours of supercomputing time to analyze how wind and flood risk could change in a warmer future. But for the data to be useful, they had to use a much smaller scale than usual. "Basically, you have to model at the scale where this infrastructure exists," Kotamarthi tells *The Verge*. "The

most interesting questions people are asking are at those scales."

Most climate models work at the 100-kilometer (62-mile) scale, which means the data covers 100-kilometer square chunks of North America. That gives you the big picture, but not finer-grained details like what's happening on a particular block. The Argonne team managed to get their regional climate models down to the 12-kilometer (7.5 mile) scale – and for the flooding data, down to 200 meters (656 feet). That's key for the kind of planning AT&T wants to use that information for. "It's all about the resolution – how close of a view can you get," AT&T's Carroll says.

Analyzing climate data on such a small scale takes a lot of time and computing power, which makes it expensive. "The struggle is to get to those scales as much as possible but to still have some useful information," Kotamarthi says. "How far you can go is a good question to ask." All told, he estimates that crunching the numbers took around 80 million hours on parallel processors at Argonne National Laboratory's supercomputer.

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The Argonne scientists shrunk that information down and gave it to AT&T, which mixed the data with its own mapping tools that show key infrastructure like cell towers and fiber cable. "You can see the potential impacts of climate change overlaid on that visually," Carroll says. Right now, the company is starting small and the map only covers the southeastern United States. "They've been hit extremely hard the last few years with severe weather events, and we have significant infrastructure there as well," Carroll says.

Ultimately, the goal is to manage the company's risks as it looks toward the future, Carroll says. "We're a company that's been around for over 100 years, and we plan to be around at

least another 100 years," he says. Knowing where to place cell towers, for example, to avoid flooding or extreme winds could mean having to shell out less money for repairs in the future. "We believe that there are long term financial benefits to doing this."

Correction: Rao Kotamarthi is the chief climate scientist in the environmental sciences division, not the chief scientist of the environmental sciences division.

https://www.theverge.com/2019/3/28/18286111/supercomputer-at-t-extreme-weather-climate-change