



# Norman firm forecasts flooding locations for clients nationwide



*How high's the water, mama?  
Three feet high and risin'  
How high's the water, papa?  
Three feet high and risin'*

— "Five Feet High and Rising" by Johnny Cash

**NORMAN** — When it comes to flooding, nature reminds us that it can exceed expectations, as it did during recent holiday flooding across the South and Midwest. Even in a prolonged drought, record rainfall inundated Austin, Texas, and surrounding communities last spring and again in the fall.

Much of Austin, with more than 900,000 residents, is endangered by flooding. So much of Austin lies in flood-prone areas and deadly rainfall events are so common that the city of Austin website calls itself "Flash Flood Alley."

Texas' capital city devotes a lot of resources to protecting residents during heavy rainfall events, employing a system of stream and rainfall sensors deployed throughout the area and a special website to warn of imminent flooding and roads closures.

Austin public safety officials are supported in their life-saving decisions by a Norman-based engineering firm, Vieux & Associates Inc.

Founded in 1992, the company is operated by the husband-and-wife team of Baxter and Jean Vieux, and employs a team of 10 professionals. Vieux's offices are on the University of Oklahoma's South Research campus.

The Vieux co-founders recently sat down with me and talked about their business. They cited the 2015 Austin floods as a prime example of how it serves clients that are scattered throughout the country.

"Austin wants to protect its citizens, and there is surprisingly little lead time during which they have to make critical decisions," said Jean Vieux, who serves as president and CEO of the company. "What we do is take sensor systems and hydrologic information, precipitation intensity and runoff depth, and project that into the future. The time between the warning and the arrival of the flood is the lead time. That is a time-sensitive period when proactive measures can be taken."



Jean and Baxter Vieux. She is the president and CEO of Vieux & Associates Inc.; he is the chief science officer of the flood-forecast company on the University of Oklahoma's south research campus. [PHOTO PROVIDED]

Vieux uses complex algorithms that combine weather radar, gauges, geographic information systems, and hydrologic modeling to predict future flooding locations for clients while storm events are happening or forecast to occur.

Depending on the size of the basin Vieux is assessing, the response time can be more than six hours or as little as 15 minutes, said Baxter Vieux, Ph.D., the company's chief technology officer who developed many of the complex algorithms used to estimate rainfall and predict water runoff.

Vieux not only serves municipalities to alert them of potential flooding, it also provides predictive information for water management districts, sanitary sewage system operators, hydroelectric power generators and others who need to know how much and where water will flow.

"All of that requires very detailed information about the rainfall if you are going to offer anything of value to the client," Baxter said. "We've capitalized on enhanced radar capabilities and added modeling using special algorithms we've developed, along with delivery of information and quality control to serve the various sectors."

Baxter Vieux spent his academic career at OU's School of Civil Engineering and Environmental Science, teaching courses in GIS, hydrology, environmental modeling and engineering surveying. He is now a professor emeritus.

Early in the company's history, a pair of grants from the Oklahoma Center for the Advancement of Science and Technology (OCAST) funded the company's research and development into sanitary sewer

overflow and hydrologic modeling, Baxter said. The first commercially available physics-based hydrologic model is a major company achievement.

Many of Vieux's clients have depended on the company's predictive models — and post-event analysis — for more than a decade. Word-of-mouth marketing from current customers is their most effective sales tool, Jean Vieux said.

Vieux distributes the critical rainfall and runoff information in a variety of ways, although "text notification and mobile access are key benefits to users," Jean Vieux said.

"Our new app extends data display, analysis and notification to any type of mobile device or browser. We offer detailed information to our clients any time and any place."

In December, Jean Vieux flew to Washington, D.C., to participate in a National Oceanic and Atmospheric Administration working group. Meanwhile, Baxter toured central Texas to assess the topography that surrounds Austin.

"I call it calibrating the hydrologist," he said with a laugh.

It all factors into a timely and accurate predictive model of how much and where water runoff is going to flow when it rains.

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*Well, the rails are washed out north  
of town  
We gotta head for higher ground  
We can't come back till the water  
comes down,  
Five feet high and risin'*

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