Predicting flood locations, depths, is aim of new computer simulation

Sara Sneath, nola.com, June 6, 2017

When a big rain is forecast, south Louisiana braces for flooding. But exactly where the flooding will occur is harder to predict.

Now, however, a team of researchers has developed a model that can help forecast -- days before a storm -- where floodwater will move. The model produces realistic-looking imagery of neighborhoods with the predicted flood depths down to the street level.

"You can give [an] advisory to people that likely your neighborhood, likely your house, will be flooded," said Ehab Meselhe, vice president of science and engineering at The Water Institute of the Gulf in Baton Rouge. "It will reduce the damage, and it will definitely move people to safety."

The tool was developed by The Water Institute with Deltares, a research center in the Netherlands, while the institute was working on a way to help coastal managers predict how water would move in Louisiana wetland restoration projects, such as large-scale Mississippi River diversions planned in Plaquemines Parish.

The model uses real-time weather forecast information from the National Weather Service and other agencies as well as infrastructure information, such as the height of roads and bridges. The model can also be used to figure out how new structures will affect flooding in communities.

"It's the same engine that's used to solve your own drainage problems," Meselhe said. "You can use it to give you forecasts.

"But the key is to keep it updated," he said. If new structures are not added to the model, it becomes inaccurate. Adding structures as they're built will require maintenance of the model.

The Water Institute is in talks with parish-level drainage officials to use the model. Meselhe estimates it will take five months to create a model for a given parish.

But ideally, the model would be used to forecast flooding in a complete watershed. "Parish boundaries are not helpful," Meselhe said. "You can't cut off a watershed just because that's the parish boundary. So ultimately, as we grow bigger and if people are interested in this, it might include multiple parishes that share that watershed. And they can all collectively benefit from it."

Calcasieu Parish hopes soon to begin a pilot program using the model. Public Works Director Allen Wainwright said the model combines tools that the parish was previously using to take flood forecasting "to the next level."

"It's the level of engineering typically done post-event, and it combines that with weather reporting," he said. "It's really going to provide people with a tool to protect themselves."

Read the full story here.