UF devising new model to test hurricane's effects on utilities statewide

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(PhysOrg.com) -- A new kind of computer forecast could save Florida residents and the state millions of dollars in hurricane damages to the fragile web of utilities that carries electrical power across the state, says a University of Florida energy researcher.

The path of a hurricane is notoriously difficult to predict, but the computerized model will estimate damage to utility systems based on hundreds of factors including the strength of winds, level of storm surge and amount of flooding, said Ted Kury, director of energy studies at UF's Public Utility Research Center. PURC is developing the model in conjunction with a consortium of Florida electric utilities in an agreement with the Florida Public Service Commission.

With this knowledge in hand, utilities can take steps to soften the blow from the tropical cyclones, Kury said.

"When storms knock down utility poles and burn out transformers, utilities have to pay the costs to replace them, which are then passed on to the customers," he said. "And when the power goes out, people suffer in other ways. They lose food to spoilage. Even if they have their own generator, it costs money to run it."

Installing underground wires and using different building materials to strengthen power poles are among the ways to upgrade equipment, and the model also estimates the costs of making various improvements, Kury said.

“There really isn’t anything out there like this that addresses these kinds of issues,” he said.

Sometimes spending money to make the system more secure can actually have the opposite effect, Kury said. For instance, transferring overhead wires underground makes them less vulnerable to wind damage but can make them more susceptible to storm surge, he said.

“That is where having the model is useful,” he said. “Otherwise the utility could spend an awful lot of money — which would have to be recovered from the rate payers — and actually make the equipment less secure in the event of severe weather.”

The model breaks the state into four parts — the Panhandle, the Gulf Coast, southeast Florida and northeast Florida — and uses historical data on how often hurricanes have hit each region to base predictions for future damage, Kury said.

“Hurricanes are more likely to hit the southeast coast and the Panhandle, and we see many more hurricanes that are category one than category four or five,” he said.

After the 2004 and 2005 hurricane seasons, which caused an estimated $28 billion in property damage, the Florida Public Service Commission directed each electric utility to put together a storm preparedness program that addressed 10 initiatives. The utilities asked PURC to coordinate the collaborative research initiative, which would offer cooperative benefits to the state’s different types of utilities, including not only ones that are investor-owned and but those operated by cities and co-operatives Kury said.

The model, which is scheduled to be completed in March, is similar to one used by Federal Emergency Management Agency to assess damages

to residential and business property, he said.

In addition to the model, which estimates the costs of making utility systems more resistant to storms, PURC has worked with the utilities to construct a database of equipment damage from storm events, and a central system for tracking this damage, Kury said. Other than tracking overall damage from storms, it is difficult for utilities to collect detailed information themselves because their main job is restoring power, he said.

“When a storm hits, utility workers are not going to stand around looking at poles and wires and taking notes about how everything happened,” he said. “What we’ve done for them here at PURC is try to set up a system that is as seamless as possible for them to track some of this data on a very granular level.”
Ultimately, the state’s utilities, their customers and the Public Utilities Commission will decide which, if any, specific changes to make and how widely to implement them, Kury said.

“We’re just trying to help them to understand the costs and benefits of their decisions,” he said.

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