Stormwater model to inform regulators on future development projects

July 19 2010

North Carolina State University researchers have developed a computer model that will accurately predict stormwater pollution impacts from proposed real-estate developments - allowing regulators to make informed decisions about which development projects can be approved without endangering water quality. The model could serve as a blueprint for similar efforts across the country.

"The model is designed to evaluate the amount of nitrogen and phosphorus found in stormwater runoff from residential and commercial developments - particularly runoff from a completed project, not a site that is under construction," says Dr. Bill Hunt, an associate professor and extension specialist of biological and agricultural engineering at NC State who helped develop the model. "To comply with regional water-quality regulations, cities and counties have to account for nutrient loads," Hunt says, "but the existing tools are antiquated and aren't giving us sufficiently accurate data."

The researchers developed the model using chemical, physical and land-use data specific to North Carolina and surrounding states. This allowed them to account for regional conditions, which will improve the model's accuracy. "Because the model uses regional data, it could be modified easily for use east of the Blue Ridge Mountains in North Carolina and adjoining states," Hunt says.

The model could also serve as a blueprint for similar efforts nationally. "The primary obstacle to applying this model outside North Carolina - in

Florida or Colorado, for example - would be collecting relevant data from those areas and incorporating it into the model's framework," Hunt says. "The actual model itself would be fairly easy to modify."

State and local government officials, as well as developers, can plug proposed development plans into the model and get an accurate estimate of the level of nutrients that would likely be included in stormwater runoff from the completed development site. This would give officials key data that they can use to determine whether a proposed development project should be allowed to move forward or require additional stormwater treatment.

The model was designed in response to state regulations limiting the amount of nutrients that can flow into Jordan Lake in central North Carolina. The regulations affect a host of North Carolina municipalities, including Durham, Greensboro, Chapel Hill, Cary and Chatham County.

In addition to its long-term applications elsewhere, the model will likely be used to help implement forthcoming stormwater treatment requirements for North Carolina's Falls Lake Watershed.

Provided by North Carolina State University