

Geospatial work identifies high-risk flooding areas

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UT Dallas researchers and their colleagues have developed geospatial science methods to help the Egyptian government determine how to avoid flooding in a coastal mountain region.

The government wants to develop the area for tourism, but flash flooding and associated hazards have hampered efforts, said Dr. May Yuan, Ashbel Smith Professor of Geospatial Information Sciences.

"We developed methods in geospatial information sciences (GIS) to combine all the [environmental factors](#) associated with flash flooding and created a model to identify the high- and low-risk areas," she said.

Yuan conducted the research, published in the *Journal of Arid Environments*, with co-authors from other universities in the United States and Egypt. The study focused on Nuweiba, a town on the east coast of Egypt's Sinai Peninsula, and its surrounding area where flooding threatens economic growth. The region is hot and dry during the summer, and gets heavy rain in the winter.

Researchers analyzed satellite imagery, conducted fieldwork and used other tools to determine a variety of factors that affect flooding, including rainfall and runoff patterns, flooding history, soil types, geology, vegetation, erosion, the steepness of the mountains and land elevation. By layering all the features on one map of the region, the scientists developed a GIS model to identify the most vulnerable areas.

The assessment could be used to help officials make decisions regarding flood prevention and land use, Yuan said. The researchers recommended that the government focus on flood mitigation near a highway that runs along the Wadi Watir valley and two intersections.

The project is an example of how UT Dallas researchers are using GIS to help solve problems across the globe, said Dr. Denis Dean, dean of the School of Economic, Political and Policy Sciences.

"GIScience is a wonderfully broad field, and a study such as this demonstrates how it can integrate diverse disciplines such as economics, geology, hydrology, and so forth," Dean said. "Since real-world problems are almost always interdisciplinary, GIScience is exceptionally well-suited to address these issues."

More information: Sara Abuzied et al. Geospatial risk assessment of flash floods in Nuweiba area, Egypt, *Journal of Arid Environments* (2016). [DOI: 10.1016/j.jaridenv.2016.06.004](https://doi.org/10.1016/j.jaridenv.2016.06.004)

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