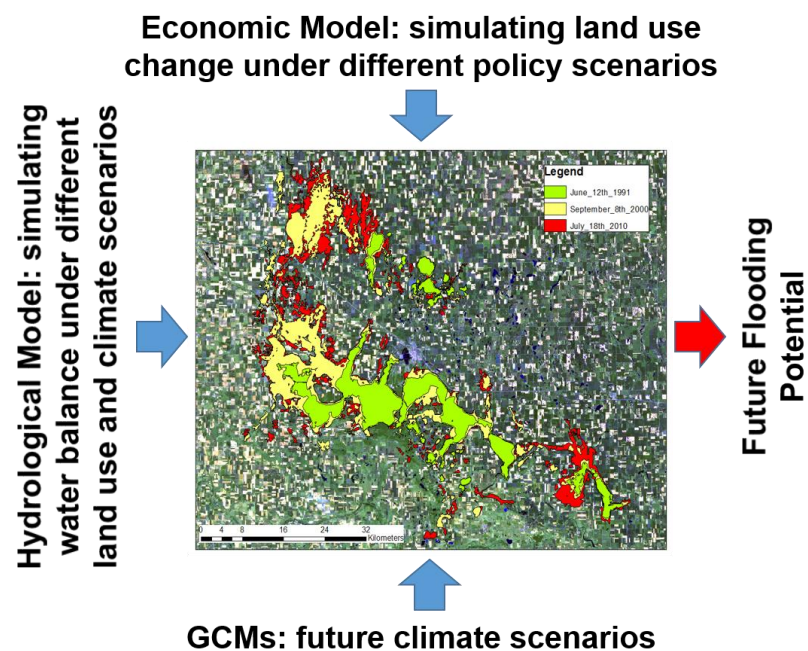


CENTER FOR REGIONAL CLIMATE STUDIES (CRCS) develops integrated modeling systems to evaluate land use changes for flood mitigation

Outcome: Researchers at the University of North Dakota and North Dakota State University have developed new cross-disciplinary modeling systems that have been used to predict the combined impacts of climate and land use changes on the flooding potential and water quality of Devils Lake.

Impact/Benefits: The new modeling systems provide more accurate predictions of water flows that govern lake levels and water quality within the Devils Lake Basin. An estimated \$1.5 billion has already been spent in flood mitigation for the Devils Lake basin. Levels have risen over 30 feet in the past 25 years, removing thousands of acres of farmland, but creating a vibrant fishing and tourism spot. New model predictions are an important tool for understanding and managing changing water levels in the future, for both Devils Lake and other closed drainage watersheds around the world.

Explanation: CRCS researchers coupled hydrological models, global climate model predictions, water quality models, and economic and land use modeling tools. They developed four land use alternatives driven by market and policy conditions and investigated their effects on Devils Lake hydrology and overspill probability under historic and potential future climate scenarios. Land use changes are shown to contribute to water level changes, indicating the potential for land use policies as an element of Devils Lake flood mitigations strategies.



Cross-disciplinary modeling system couples hydrology and economic models, driven by GCM outputs.