



# University of Mississippi

## Computational Tools for Water Security



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Prevent, Protect, Respond, Recover

### Homeland Security Challenge:

Disastrous incidents, natural/man-made, in Water Resources Systems and/or Water Infrastructures, are so complex that new, advanced methodologies and tools are in urgent needs for controlling, mitigating and managing these incidents as well as for designing more resilient systems and developing Emergency Management Plans.

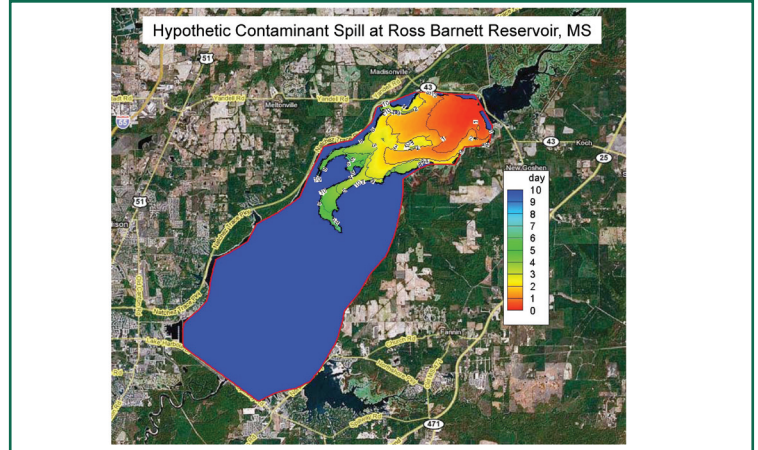
### Research Project Solution:

The National Center for Computational Hydroscience and Engineering (NCCHE) at University of Mississippi has developed a comprehensive set of computational models for simulation of surface flows, contaminant transport with reacting and fate processes, water quality, etc. With support from SERRI, these newly developed technologies at the cutting edge of the state of the art have been rigorously verified and validated, and then, applied successfully to model a hypothetical chemical spill incident at Ross Barnett Reservoir (Mississippi) as an example of solving a potential regional problem.

### National Implications:

The newly developed technology base can be applied to the following problems nationwide:

- Development of Emergency Management Plans for each of our nation's critical infrastructures such as various water supply systems, manufacturing industries involving toxic chemicals, etc.
- Local and national emergency management agencies to select the best compromised decisions in managing and mitigating toxic chemical spill incidents.
- Other applications of similar nature.



An outcome of a what-if chemical spill in a reservoir simulated by a NCCHE model for validating a required Emergency Management Plan.



The photo of a toxic chemical spill incident at a chemical plant by the Delaware River.

[www.serri.org](http://www.serri.org)

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SERRI is managed by the Department of Energy's Oak Ridge National Laboratory for the U.S. Department of Homeland Security