Eyes On The Gulf: Deepwater Horizon Oil Spill Visualization

Abstract

The northern Gulf of Mexico was threatened by an oil spill from the Deep Water Horizon drilling platform in 2010. While oil was flowing into the gulf, researchers at the University of Texas at Austin, and their collaborators, were simulating where oil would travel in the event of a hurricane. Simulations were run daily using initial oil positions from NOAA and the coastal circulation and storm surge model, ADCIRC. The ADCIRC model depicts interactions between weather, currents, oil, and land, including the specific topography of the coast and its marshes and wetlands. The simulation modeled day-to-day movements of the oil spill to predict the spill's movements up to three days into the future; since the model was run daily, this produced large amounts of data that included water elevation, wind velocity, and oil positions daily. Due to the need to see how the oil would travel when close to the coast and estuaries, seeing the data in its geographic context was crucial. Therefore, loading large, high-resolution aerial and satellite imagery, in addition to the model's output, was needed. The images and animations show TACC's visualization solution for the oil spill modeling using open source geo-spatial software and Longhorn, a 256-node visualization cluster, at the Texas Advanced Computing Center (TACC). Additionally, the software can be run on Stallion, TACC's 307 mega-pixel tiled-display.

Authors

Field Researchers:

Rick Luettich, Institute of Marine Sciences, University of North Carolina at Chapel Hill.

Clint Dawson, Institute for Computational Sciences and Engineering, The University of Texas at Austin.

Joannes Westerink, Computational Hydraulics Laboratory, University of Notre Dame.

Visualization by Adam Kubach and Karla Vega, Texas Advanced Computing Center, The University of Texas at Austin.

Web Link:

<http://tacc->

[web.austin.utexas.edu/staff/home/vega/public_html/SC2011/VisShowcase/kubach_vega_SC11.mov](http://tacc-web.austin.utexas.edu/staff/home/vega/public_html/SC2011/VisShowcase/kubach_vega_SC11.mov)

<http://tacc->

[web.austin.utexas.edu/staff/home/vega/public_html/SC2011/VisShowcase/EyesOnTheGulfv2.mov](http://tacc-web.austin.utexas.edu/staff/home/vega/public_html/SC2011/VisShowcase/EyesOnTheGulfv2.mov)