

Near Realtime Visualization of Coastal Modeling Results with WMS and Google Maps



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Introduction

The SCOOP project promotes the effective and rapid fusion of observed oceanographic data with numerical models and facilitates the rapid dissemination of information from across the United States and Canada; a heterogeneous workflow amongst many universities in the southeastern United States based on distributed computational Grids has been built to visualize and integrate hydrodynamic model results and observational data of tropical and subtropical cyclones in the Atlantic and the Gulf of Mexico.

Model Workflow

The CCT SCOOP data archive at LSU is used to aggregate observational data and model results from different sites and is used for simulations which can be computed preemptively across supercomputers depending on the urgency. Using ADCIRC, a coastal circulation and storm surge model, the surge and wind data of an approaching cyclone can be computed. Visualization of this information may support decisions in situations if it is delivered in near realtime. We describe a flexible method of data visualization based on the WMS and Google Maps technologies.

Visualization

Our visualization workflow aims to provide:

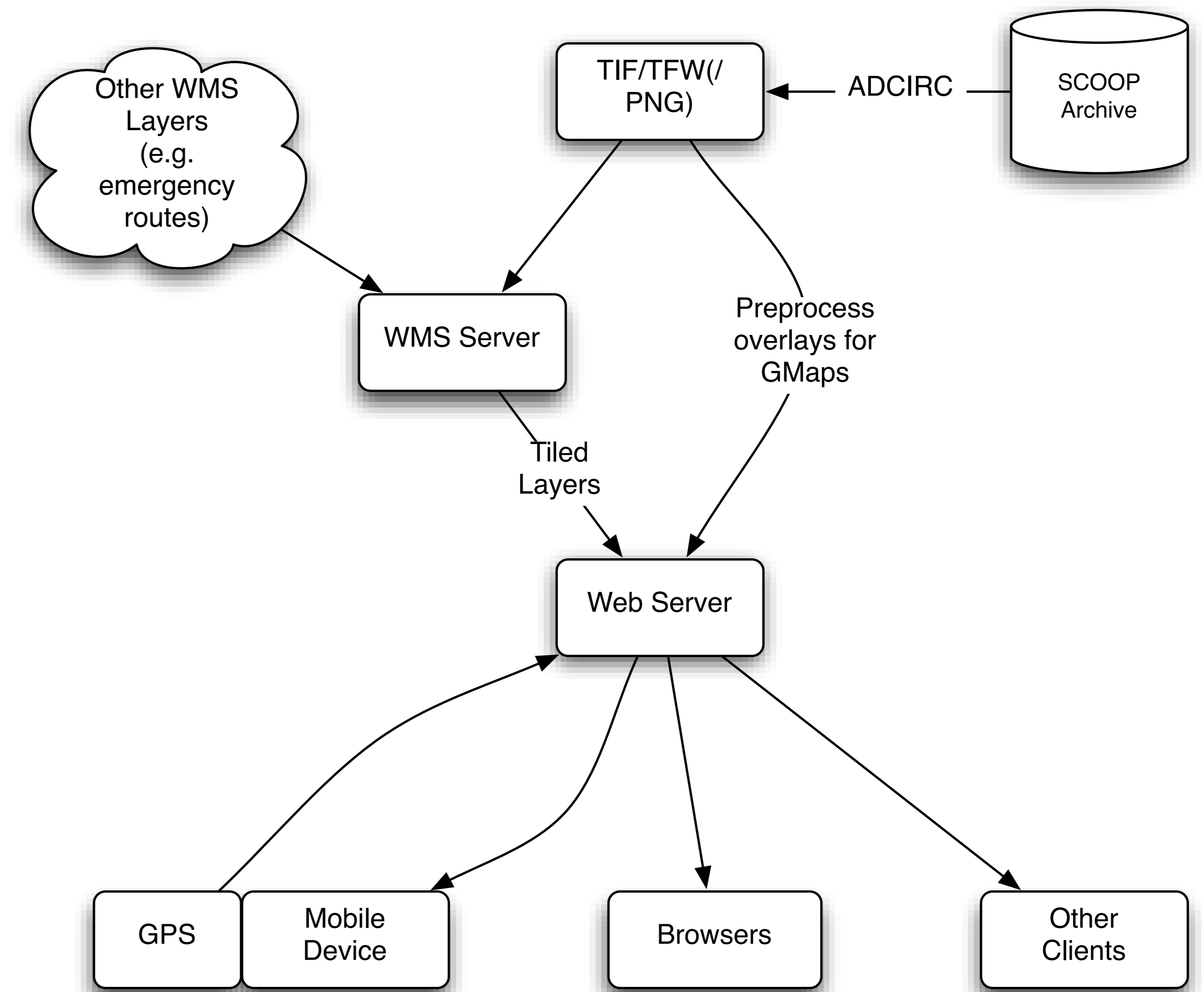
- Near realtime access to the data in the data archive (ADCIRC model results)
- Two hours time lag between the availability of the hurricane advisory and the visualization results
- Overlaid predicted wave surge and wind data of approaching cyclones in the Gulf of Mexico with topographic maps and emergency related information (such as locations of hospitals, evacuation routes, locations of police stations, etc.)

Google Maps

By using the Google Maps API for client side visualization we leverage the advantage of providing a simple, yet powerful user interface, and the availability of a comprehensive suite of topographical maps and satellite images. We developed a client side javascript-based interface to overlay the default Google Maps data with any spatial data exposed by a WMS service.

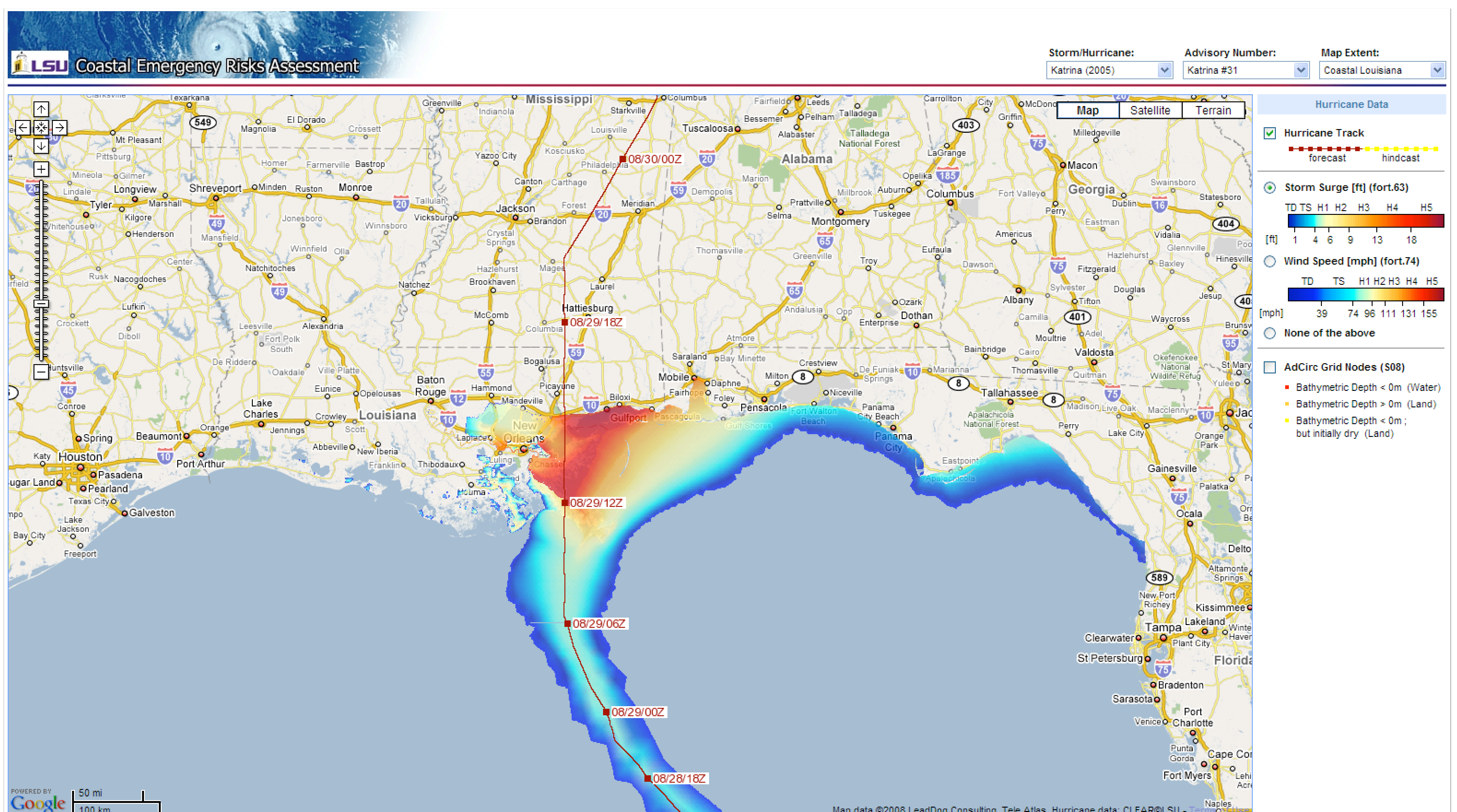
Web Map Service

We developed and set up a WMS service using the UMN Mapserver tool accessing and providing the generated image data directly from the data archive to the WMS client.



Workflow of Geospatial Visualization

ADCIRC model result data is stored in the data archive as soon as it is available. We developed a custom tool to generate colored GeoTIFF image data for the visualization, together with the metadata to describe where geospatially the images belong. This image data is stored in the data archive as well and is directly accessed during the processing of the web client request, ensuring up to date information being visualized.



Google Maps Visualization: http://fortytwo.cct.lsu.edu/cgi-hurricane_alert/katrina.cgi?