Development of Web Mapping Service Capabilities to Support NASA Disasters Applications / App Development

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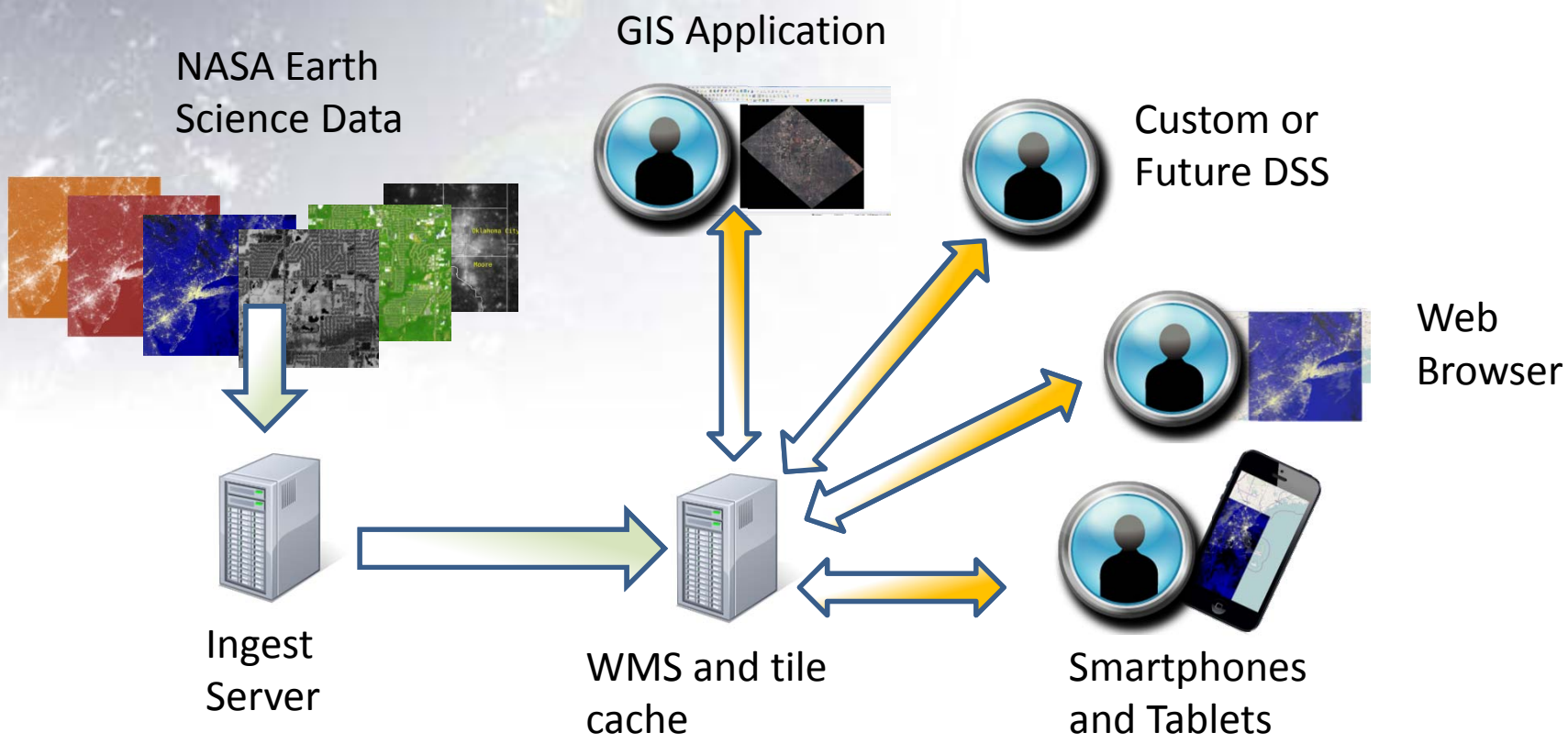
18th IOAS-AOLS Conference
94th AMS Annual Meeting (2014) in Atlanta, GA
Session: "Satellite Data and Technology for Forecasting and Responding to Natural Disasters"

Motivation

- Seamless method to deliver earth science data to multiple platforms
  - Scientists:
    - want to deliver data for science and collaboration via:
      - web
      - mobile phones
      - native GIS applications
    - don't want to spend time developing delivery mechanism for each system
- Control development and maintenance costs

Data Flow


NASA Earth Science Data
GIS Application
Custom or Future DSS
Web Browser
Ingest Server
WMS and tile cache
Smartphones and Tablets

Server Framework

Technology Tools:

Type	Tool	Description
Web Mapping Service	Geoserver	Provides imagery via HTTP
Tile Cache	GeoWebCache	Caches map slices
Web Server	Tomcat	Serves HTTP requests
Database	Postgres/PostGIS	Backend to store layer information
Application Framework	Spring	Glues together application
Enterprise Service Bus	Camel	Routes data to be processed

Developed restful services , ingest application, and purging service

Client Framework

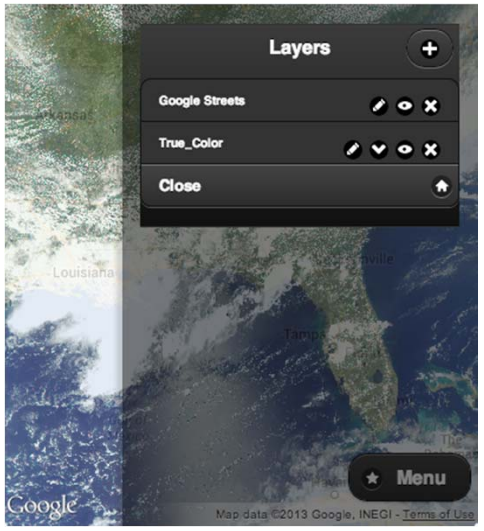
- Technology Stack
  - OpenLayers (Javascript Web Mapping)
  - JQuery (JavaScript Framework)
  - JQuery Mobile (Mobile JavaScript Framework)
- Use of JavaScript framework to support iOS, Android and Web clients from common code base
  - Framework supports discovery of data
  - Map interface
  - Animation
  - Flexible enough to be configured for specific use within various applications

Project Enabled Capabilities

- SPoRT
  - Real-time Imagery
  - Damage Assessment Toolkit (NWS)
  - Response to Super Typhoon Haiyan in Philippines Nov 7, 2013
  - Response to tornadoes in Illinois and Indiana Nov 17, 2013

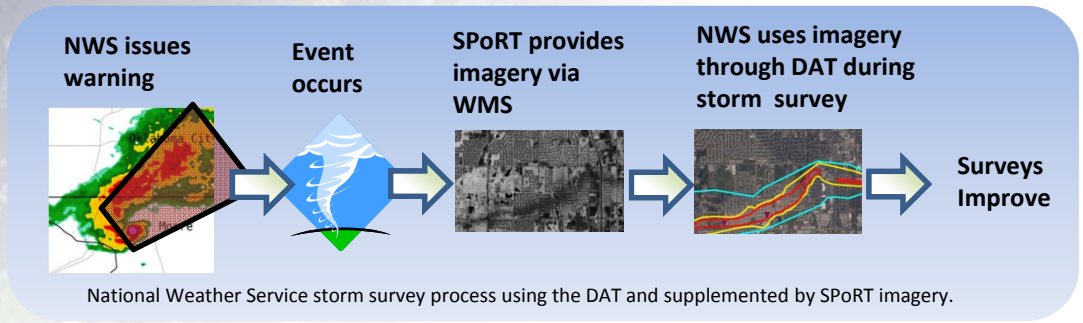
- SERVIR
  - Hosting cloud fraction product for ISERV targeting
  - Beginning planning for deployment to nodes
  - Assessing additional products to add to system

- Arctic Collaborative Environment (ACE)
  - Demonstration to support ACE
  - Hosting SPoRT real-time imagery



Case Study

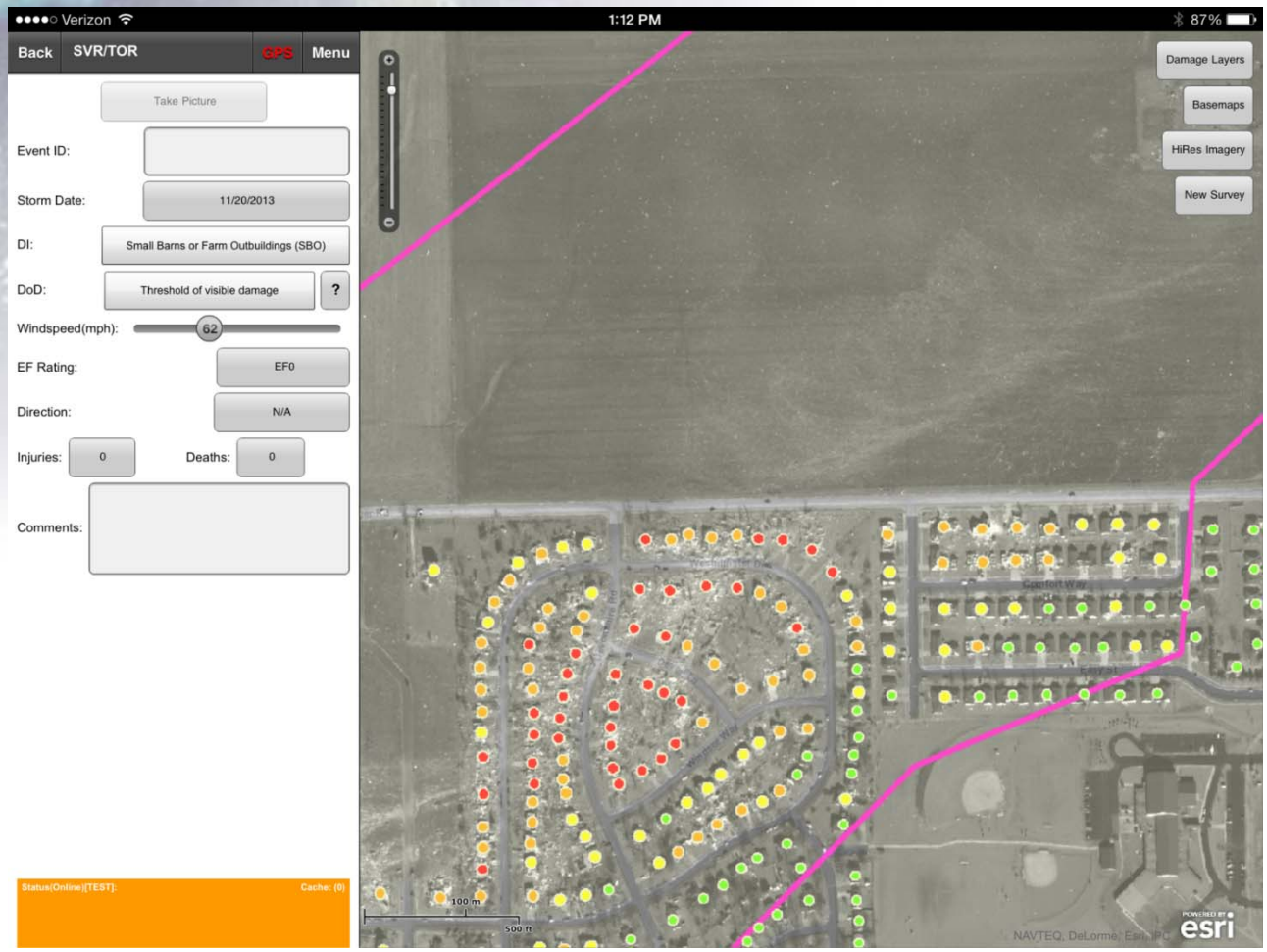
- Damage Assessment Toolkit (DAT) SPoRT NASA ROSES Applied Science: Disasters proposal



National Weather Service storm survey process using the DAT and supplemented by SPoRT imagery.

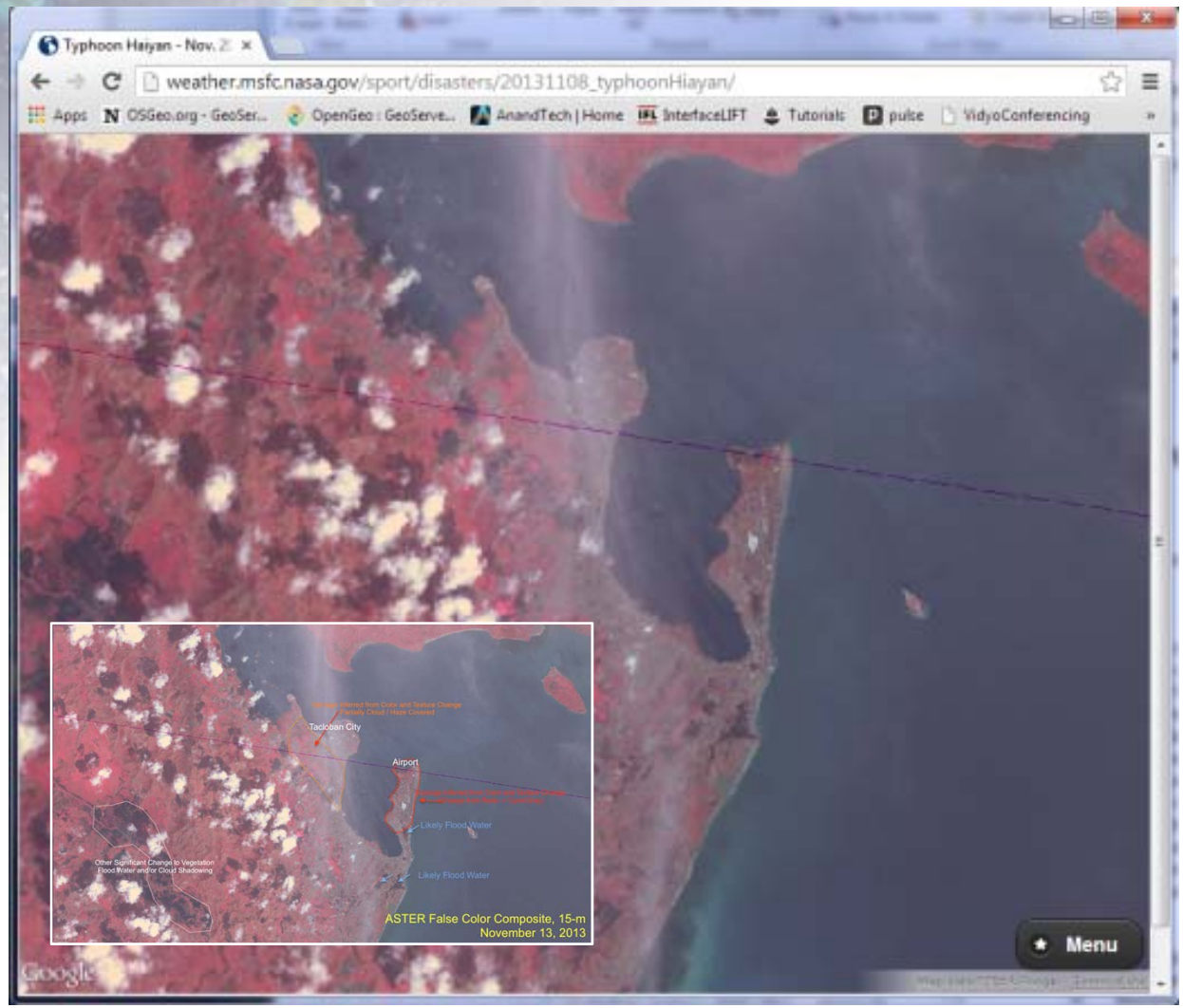
ASTER False color composite, ISERV imagery, and the official NWS storm survey for the Moore, OK tornado

Data within the Damage Assessment Toolkit



Screenshot of Worldview imagery in the DAT provided by WMS along with SPoRT analysis of the damage

Super Typhoon Haiyan



ASTER imagery provided via the web interface for Super Typhoon Haiyan

Future Work

- Continue work extending the framework based on feedback from scientists
- Develop better numerical model handling
- Build in additional scalability (load balancing)

Questions

Funding provided by
Marshal Space Flight Center and
NASA ROSES Applied Science Disasters