

Applications of Web Mapping to Mobile Devices

Science Advisory Committee Meeting

26 – 28 August, 2014

National Space Science and Technology Center, Huntsville, AL

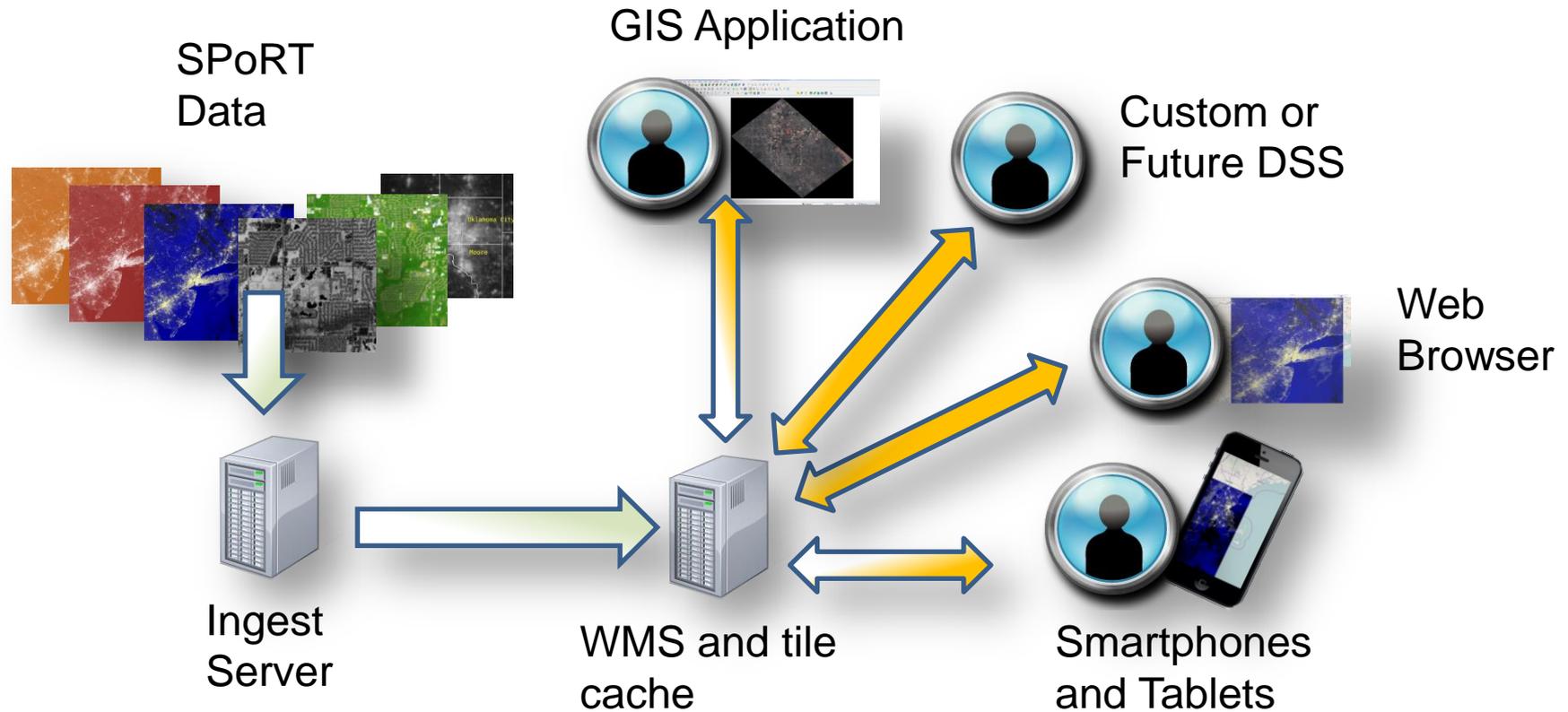


Motivation

- Expand user base to include groups that use:
 - GIS Applications
 - Mobile phones
- Method of delivery needs to be seamless for data creator
- Don't want to spend time developing delivery mechanism for each system
- Control development and maintenance costs

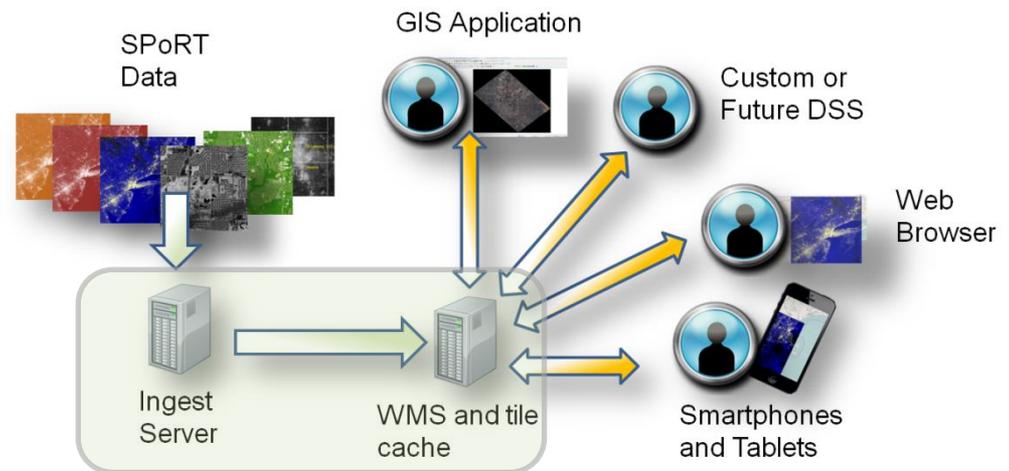


Data Flow



Requirements for Server Framework

- Support Open GIS Consortium (OGC) Standards
- Easy to integrate new datasets
- Support purging
- Scalable
- Reliable



Benefits of using OGC Standards

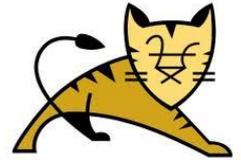
- Automatically works in common GIS applications such as:
 - ArcGIS
 - Udig
 - QGIS
- Others can integrate data into existing applications
 - Web mapping applications
 - Mobile apps



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



PostgreSQL

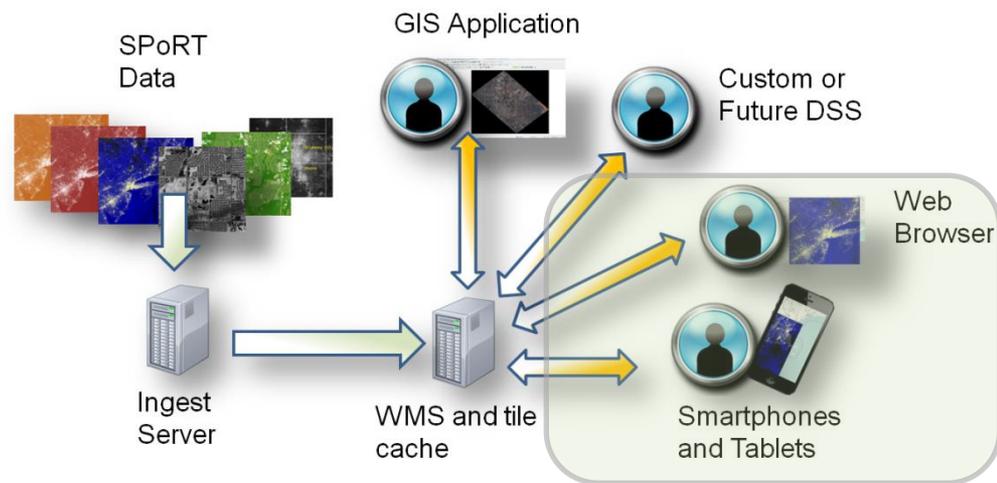


Used Open Source Tools to create Framework



Requirements of Client Framework

- Based on OGC Standards
- Flexible
- Responsive
- Discover new data
- Shared codebase
- Based on Javascript



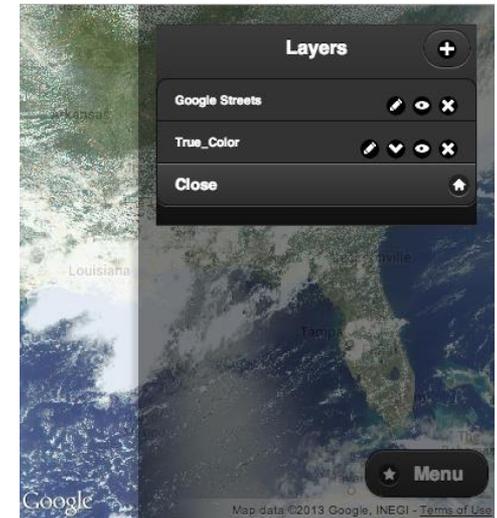
Client Framework

- 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
 - Time based requests
 - Flexible enough to be configured for specific use within various applications

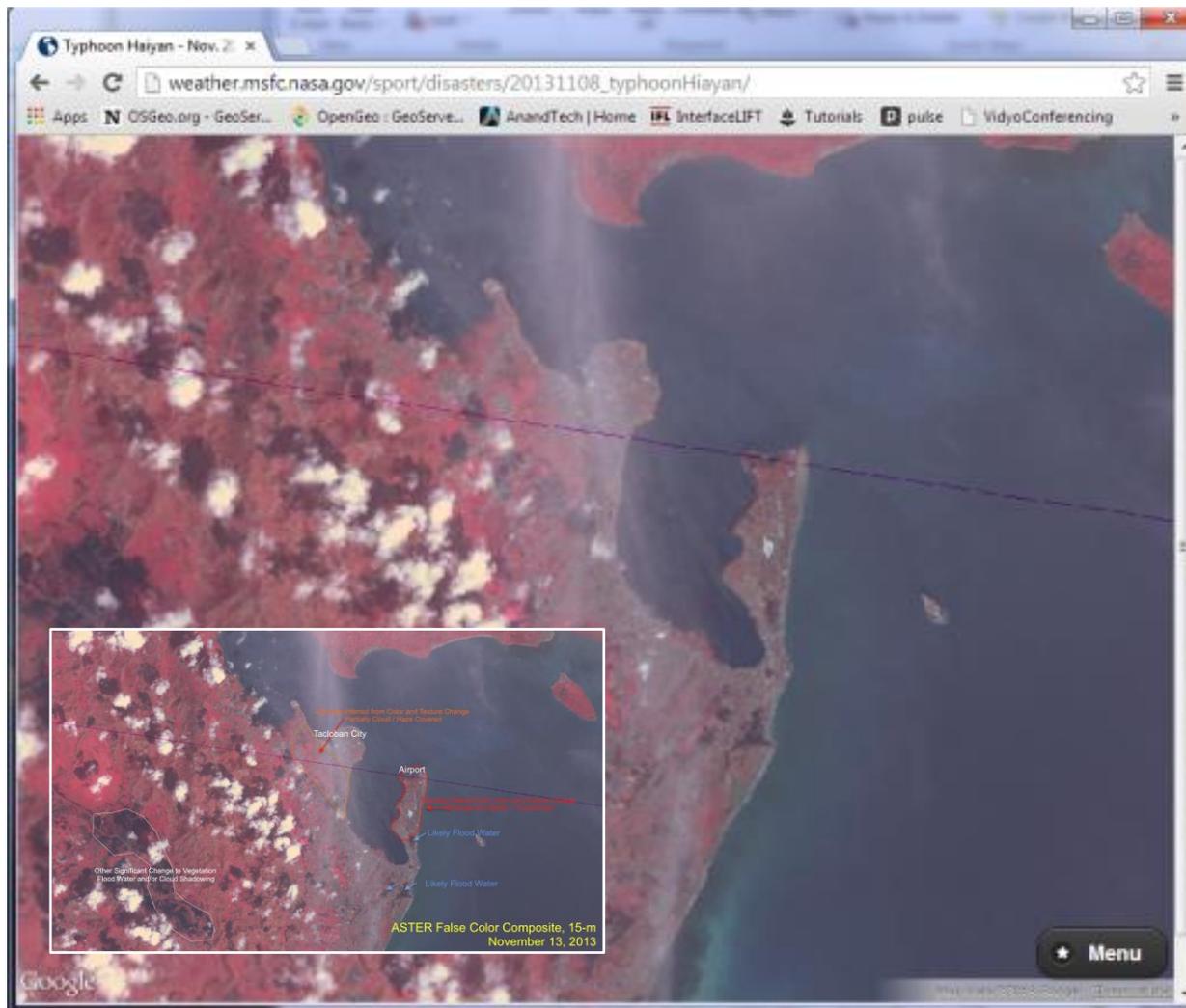


Current Uses

- Short-term Prediction Research and Transition Center (SPoRT)
 - transitioning unique data and research technologies to operations
 - Real-time Imagery
 - Disaster Response:
 - 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
 - integrates satellite observations, ground-based data, and forecast models to improve disaster response in Central America, the Caribbean, Africa, and the Himalayas
 - Hosting cloud fraction product for ISERV (camera on the Intl' Space Station) targeting
 - Beginning planning for deployment to nodes
 - Assessing additional products to add to system



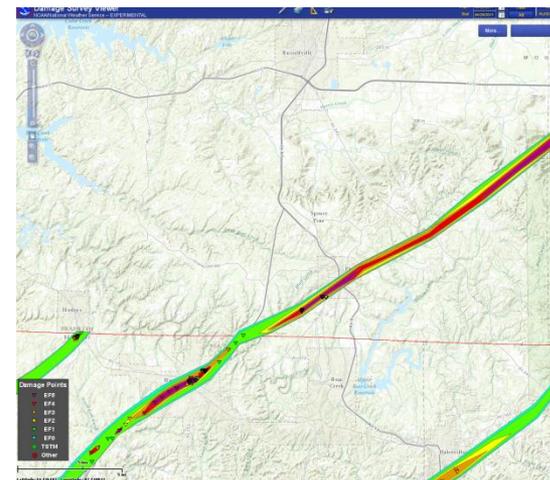
Web Interface for Super Typhoon Haiyan



ASTER imagery provided via the web interface for Super Typhoon Haiyan

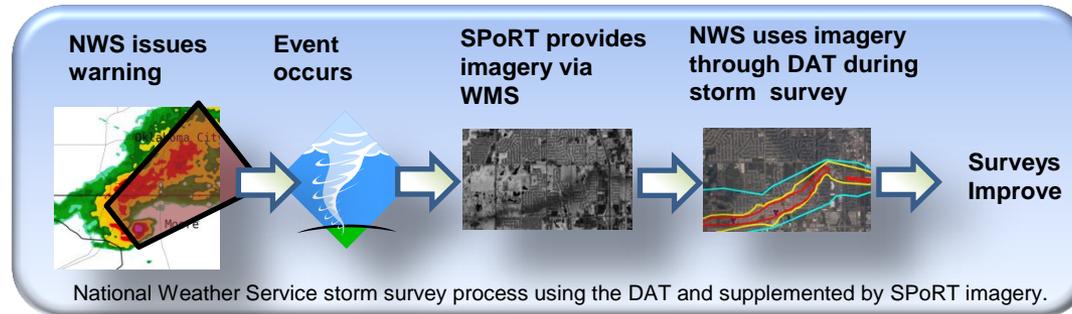
Damage Assessment Toolkit (DAT)

- Mobile and desktop platform to aid NWS storm surveys
- Take pictures and notes of damage during storm damage assessments
- Sync'd to server to provide seamless assessment
- GIS based
- Can accept additional imagery from Web Mapping Services
- Helps complete damage surveys and improve future forecasts
- Reduce time and effort in storm surveys



Case Study

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



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



Quick Demo of DAT



Future Work

- Continue work extending the framework
- Develop better numerical model handling
- Deliver SPoRT's real-time data fully via the Framework
- Scale up system to provide high availability and adaptable scaling



Questions

