Namibia Dashboard Enhancements

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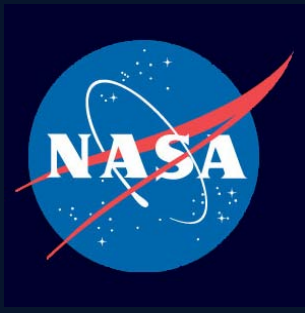
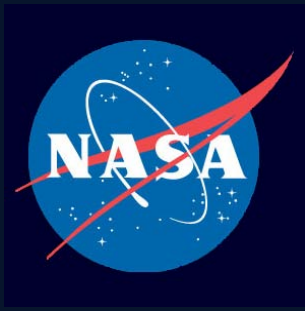
for Technical Interchange Meeting with Namibia Hydrological Services (NHS) in Namibia 2/20/14

Overview



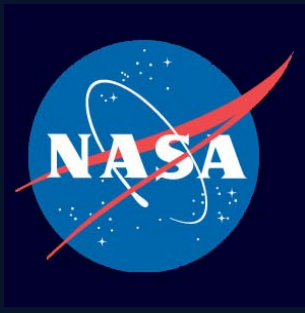
- Motivation / Objectives
- Tool Overview
- Tool Capabilities
- New Features
- Future Plans
- Wrap Up

Motivation / Objectives



- Aggregate information sources –> better situational awareness and decision making
- Integrate and compare data feeds -> enhanced analysis capability
- Disseminate information -> wider availability of data products and analysis
- Rapid configuration and deployment-> software can be rapidly applied to diverse situations
- Enable crowd sourcing and OpenStreetMap standards to enhance interoperability and improved data gathering methods
- Train Namibia Hydrological Services (NHS) and related government departments in capacity building effort

Tool Overview



- Bulletin System (current and archive)
- Google Maps/Earth powered geospatial data display
- River gauge station graphing and comparison (with upload)

Main Page

Namibia Flood Dashboard

SensorWeb enabled for early flood warning

Daily Report

Januar
31

Daily Bulletin:

HYDROLOGICAL SERVICES NAMIBIA – DAILY FLOOD BULLETIN 30 JANUARY 2013

Rains returned to central northern Namibia. NMS reported 25.4 mm for Okahao and 15.4 mm for Oshikango, and Ms Nancy Robson gave 7 mm for Odibo. Satellite images showed also good rains in the headwater of Kavango and Kunene rivers, and higher flows may be building up to reach Namibia next week. The Zambezi River is further rising at Katima Mulilo, but more slowly now. The forecast is still for 5.50 m by 10 February, which would be the normal seasonal floodlevel that is usually reached by the beginning of April.

View Complete Current Bulletin
View Bulletin Records
Search Bulletin Records
New Bulletin

Configure Layers
Upload Layer

River Stations

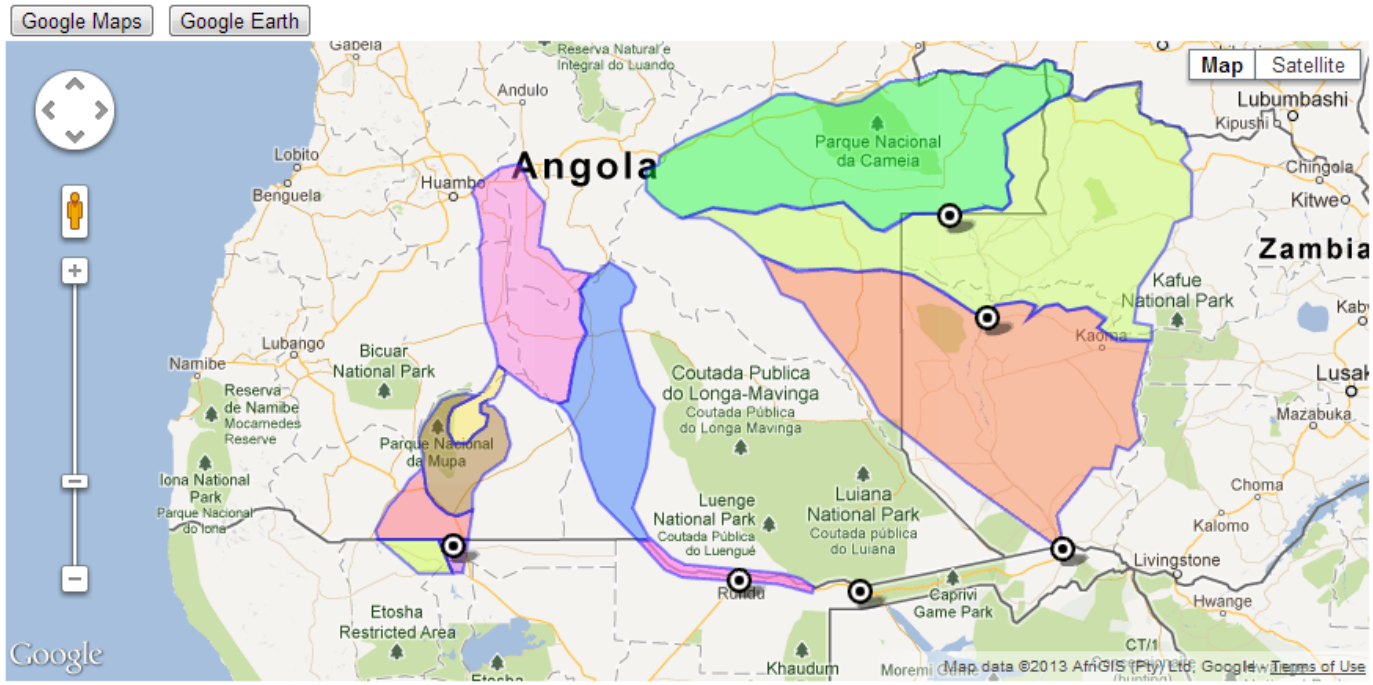
SensorWeb Layers

Water Lines and Areas

Google Maps | Google Earth

Geospatial Display (The Big Map)

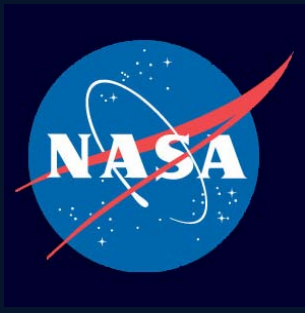
- River Stations
- SensorWeb Layers
- Water Lines and Areas
- Satelite Overlays
- Ground Pics
- Kavango Radarsat Data
- Cuvelai Radarsat Data
- TRMM Rainfall Accumulation and Flood Forecast
- Global Scene Counts
- MODIS Floodmaps
- Infrastructure
- ALI Flood Classification



Legend:

ALI Flood Classification	Class 1 - Background:	Class 2 - Opaque Clouds:	Class 3 - Cloud Shadow:	Class 4 - Haze and Thin Clouds:	Class 5 - Clear Water:	Class 6 - Turbid Water:	Class 7 - Dry Land:

Tool Capabilities



- Bulletin system
- Historical river level display & graphing
- Tropical Rainfall Measuring Mission (TRMM) rainfall history/projections
- Moderate Resolution Imaging Spectroradiometer (MODIS) flood classification
- Web Coverage Processing Service (WCPS) image retrieval / Earth Observing 1 (EO-1) Advanced Land Imager (ALI) Flood Classification
- Infrastructure mapping / correlation
- Global Disaster and Coordination System (GDACS) triggering

Bulletins

Current Bulletin

HYDROLOGICAL SERVICES NAMIBIA – DAILY FLOOD BULLETIN 30 JANUARY 2013

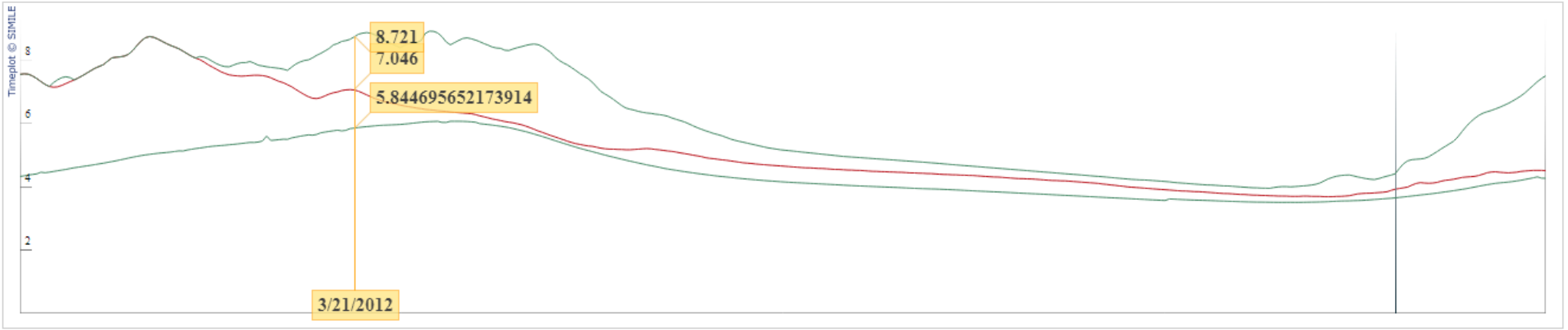
Rains returned to central northern Namibia. NMS reported 25.4 mm for Okahao and 15.4 mm for Oshikango, and Ms Nancy Robson gave 7 mm for Odibo. Satellite images showed also good rains in the headwater of Kavango and Kunene rivers, and higher flows may be building up to reach Namibia next week. The Zambezi River is further rising at Katima Mulilo, but more slowly now. The forecast is still for 5.50 m by 10 February, which would be the normal seasonal floodlevel that is usually reached by the beginning of April.

This morning's river flow readings:

River	Site	One week ago (23 Jan 2013)	Yesterday (30 Jan 2013)	Today (30 Jan 2013)	One year ago (30 Jan 2012)	Normal for 30 Jan
Zambezi	**Katima Mulilo**	**2.86 m**	**4.55 m**	**4.73 m**	**2.43 m**	**1.52 m**
Kwando		estimated:	estimated:	Estimated:	3.23 m	2.39 m
	Kongola	3.09 m	3.03 m	2.99 m		
	Camp Kwando (+)	-	0.65 m	9.64 m	-	-
Linyanti Swamps	Nkasa Luapala Camp (++)	1.95 m	1.85 m (note correction)	-	-	-
Kavango	Nkurenkuru	1.71 m	1.52 m	1.51 m	3.14 m	-
Rundu	5.72 m	5.40 m	5.36 m	6.81 m	4.87 m	
Andara	1.80 m	1.80 m	1.79 m	1.99 m	1.44 m	

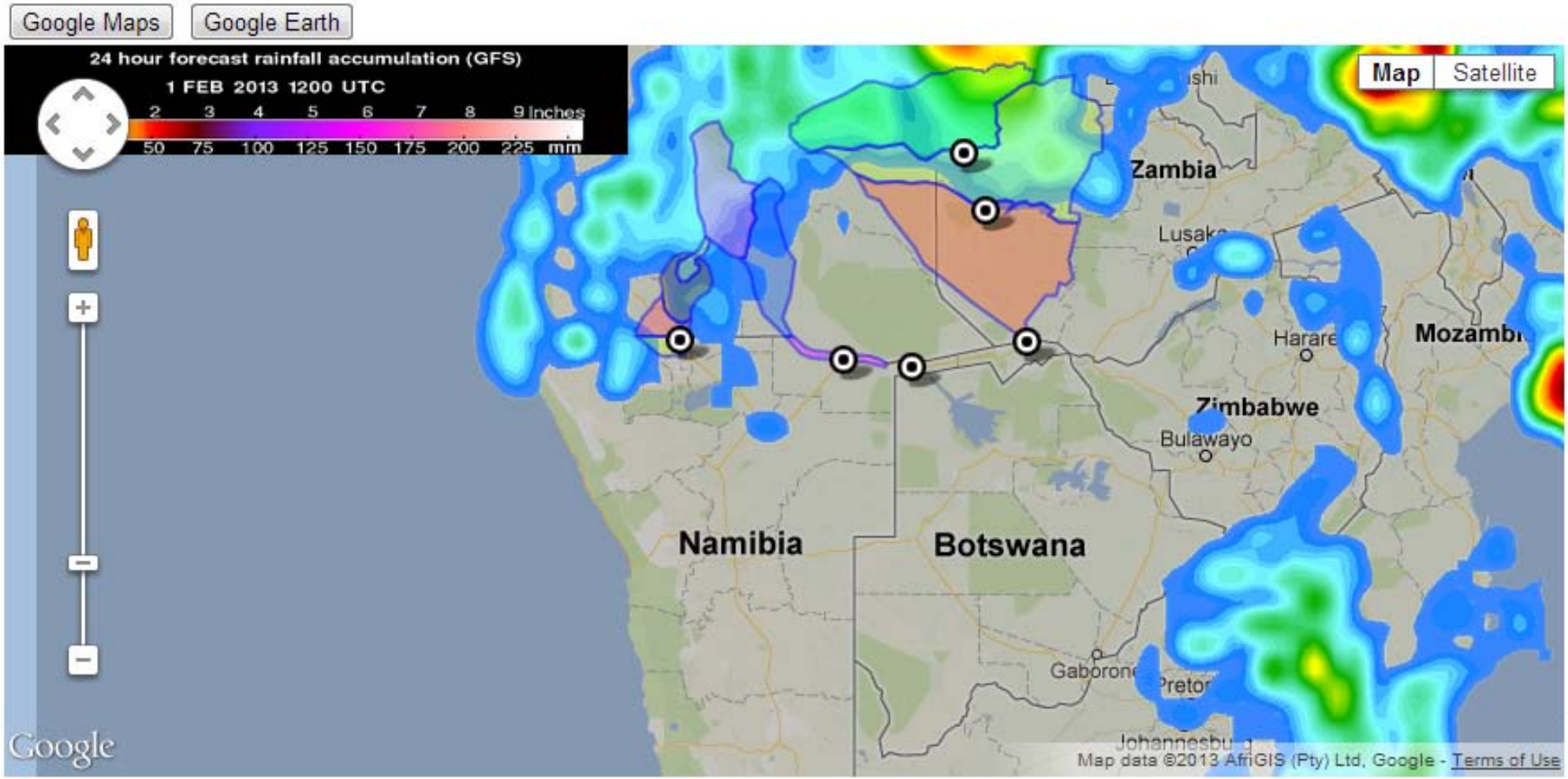
River Gauge Stations

Rundu

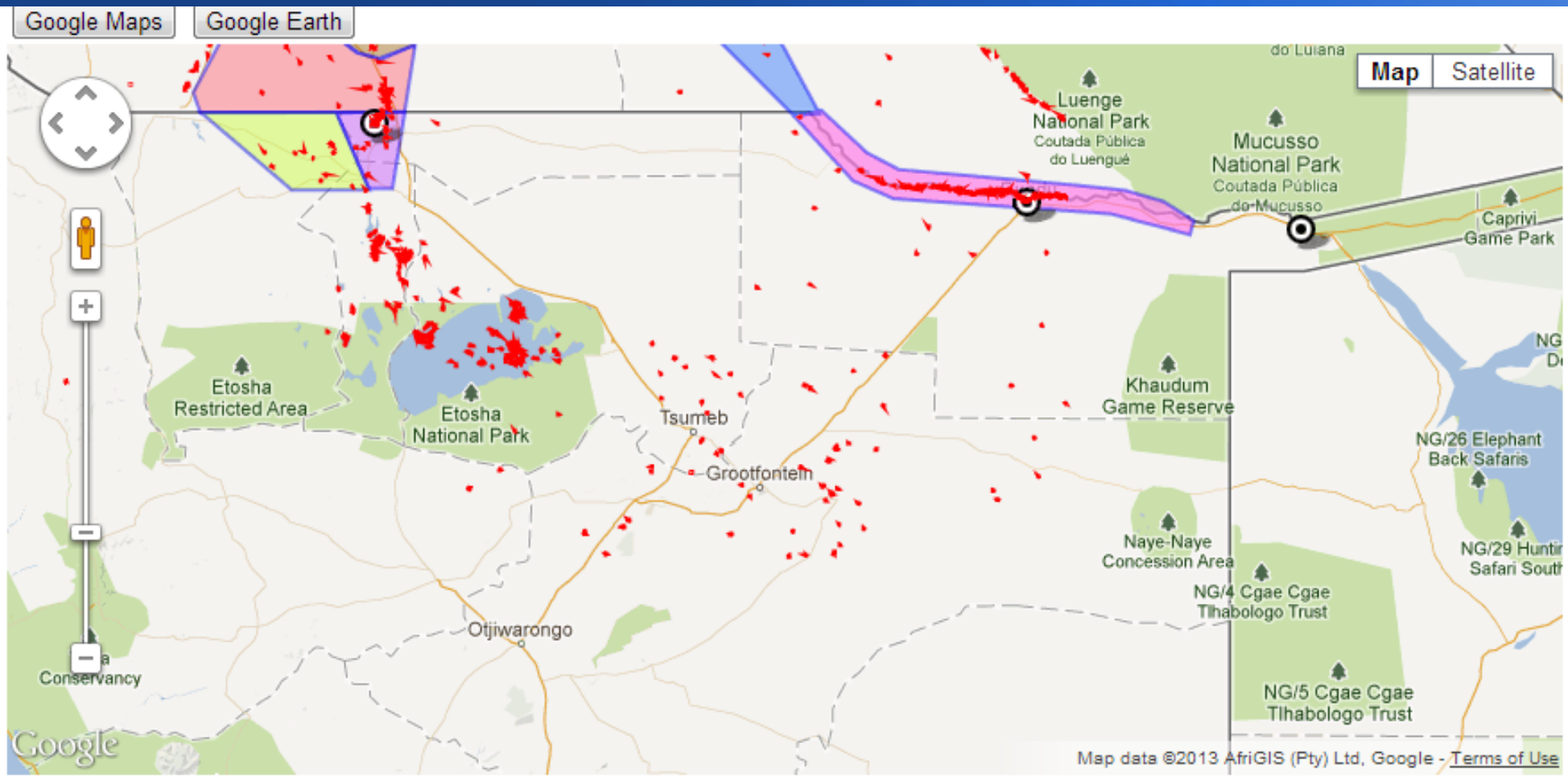


Select Station: Rundu Select Year: 1969 Select Series Color: Red
Select Station: Rundu Select Year: Select Select Series Color: Blue
Select Station: Rundu Select Year: Select Select Series Color: Green
Select Station: Rundu Select Year: Select Select Series Color: Gold
Select Station: Rundu Select Year: Select Select Series Color: Light Green
Display Average: ☑ Select Average Color: Green
Display Minimum: ☐ Select Minimum Color: Blue
Display Maximum: ☑ Select Maximum Color: Green
Lower Date Bound: 01/01/2012 Upper Date Bound: 12/31/2012

TRMM Rainfall

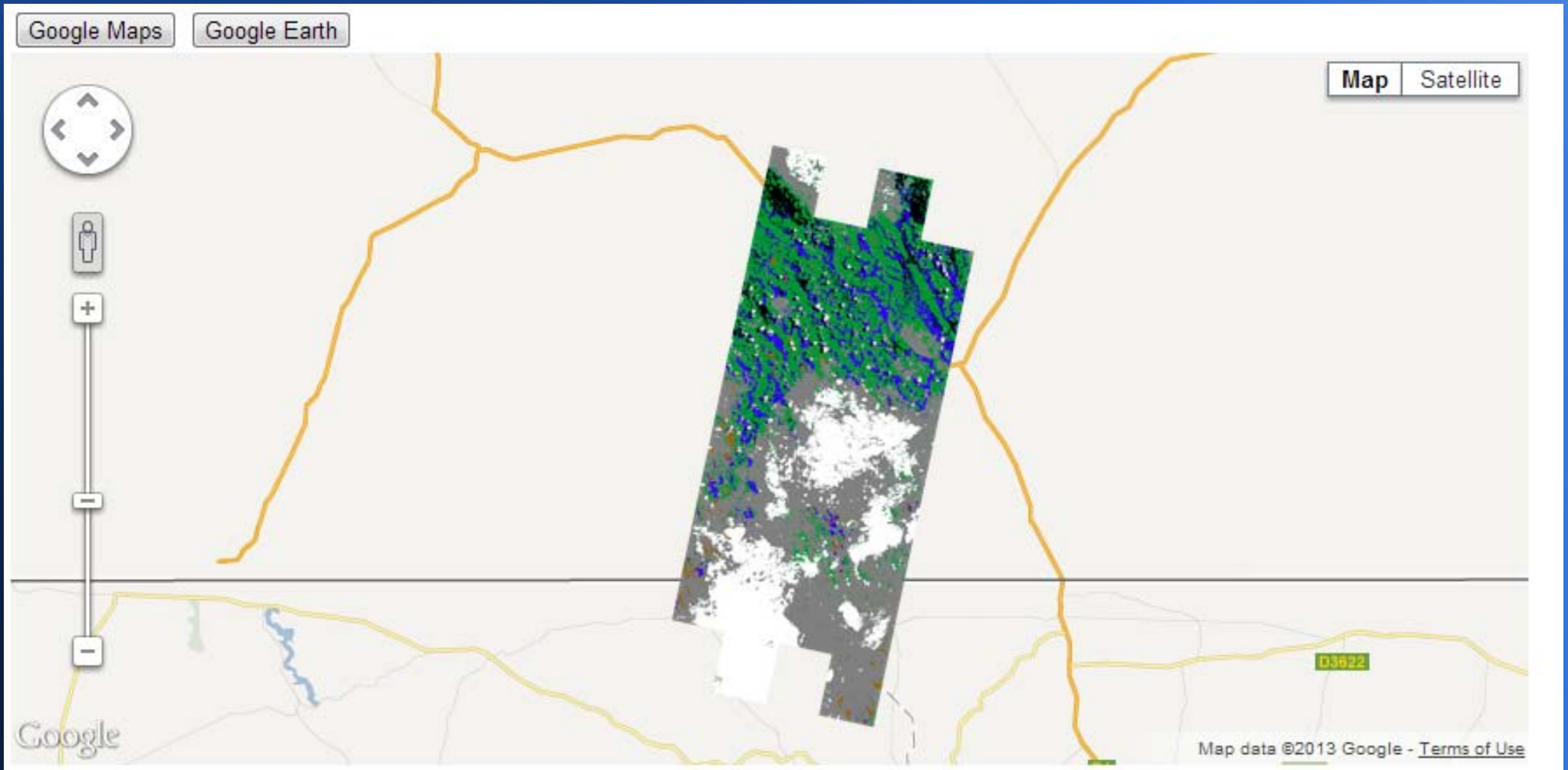


MODIS Flood Classification

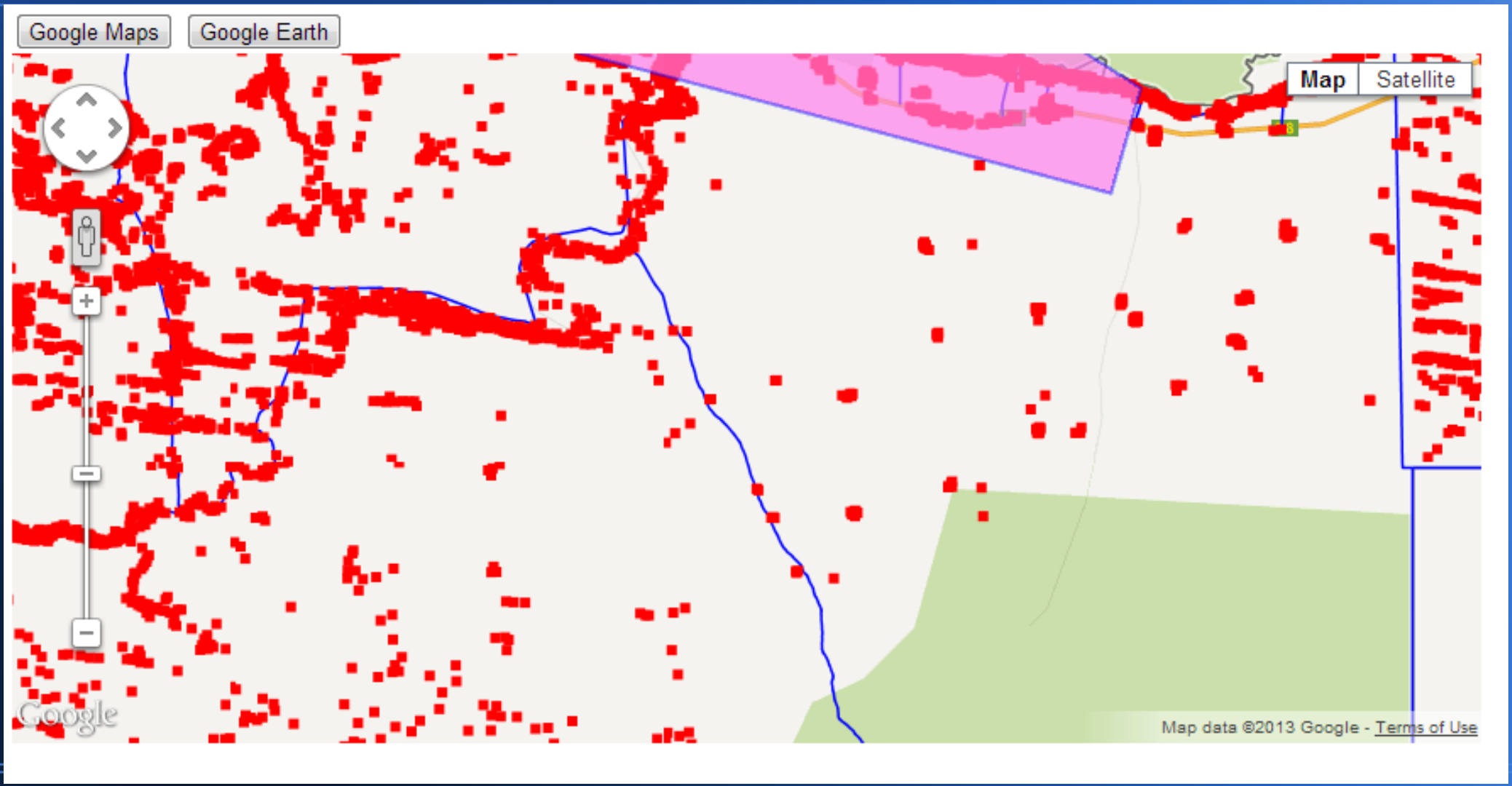


Legend:

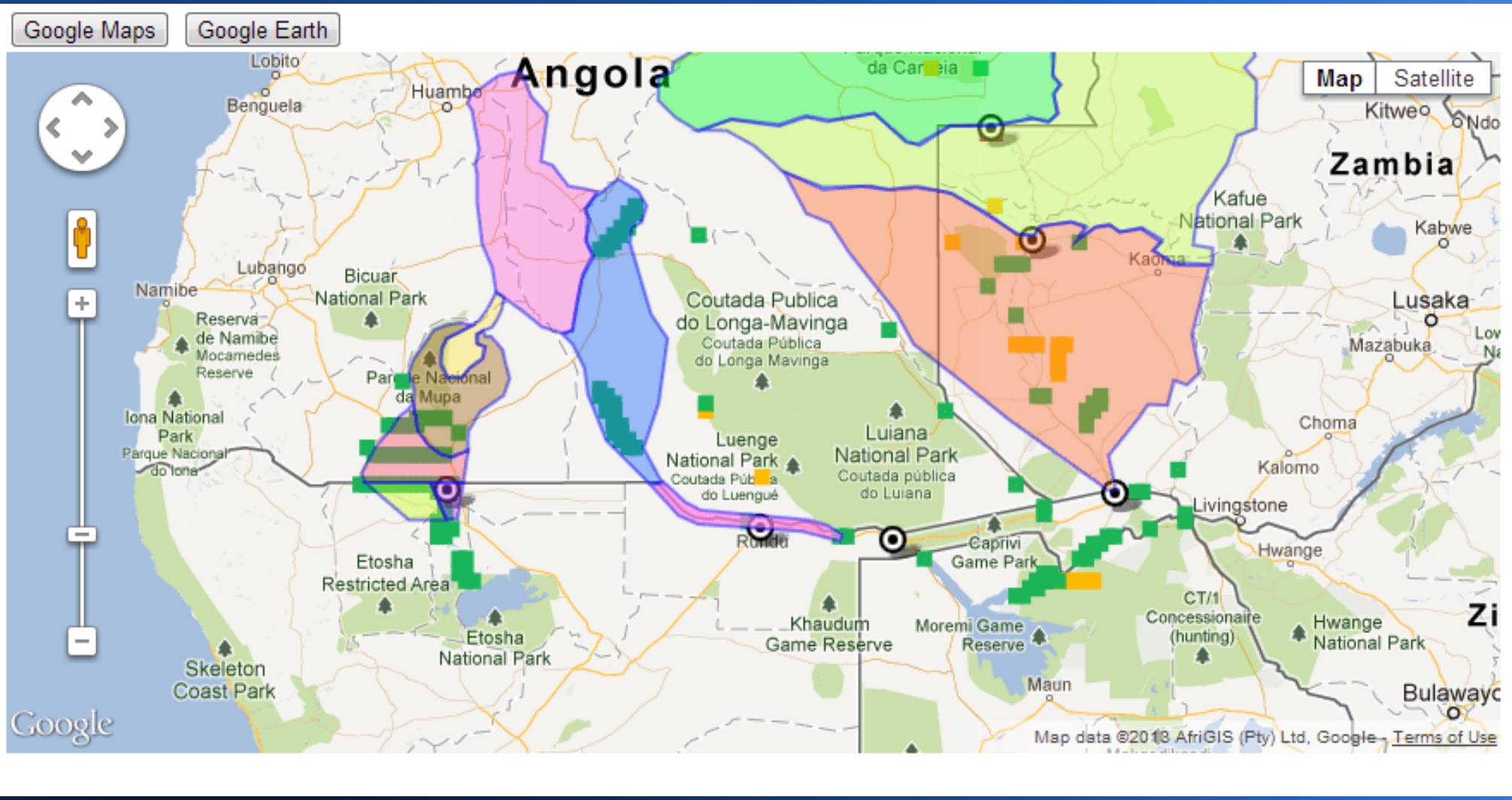
ALI Flood Classification



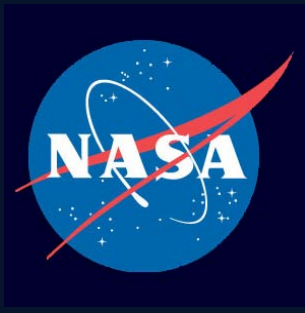
Infrastructure Mapping
(using Dwelling Unit Database)



GDACS Triggering

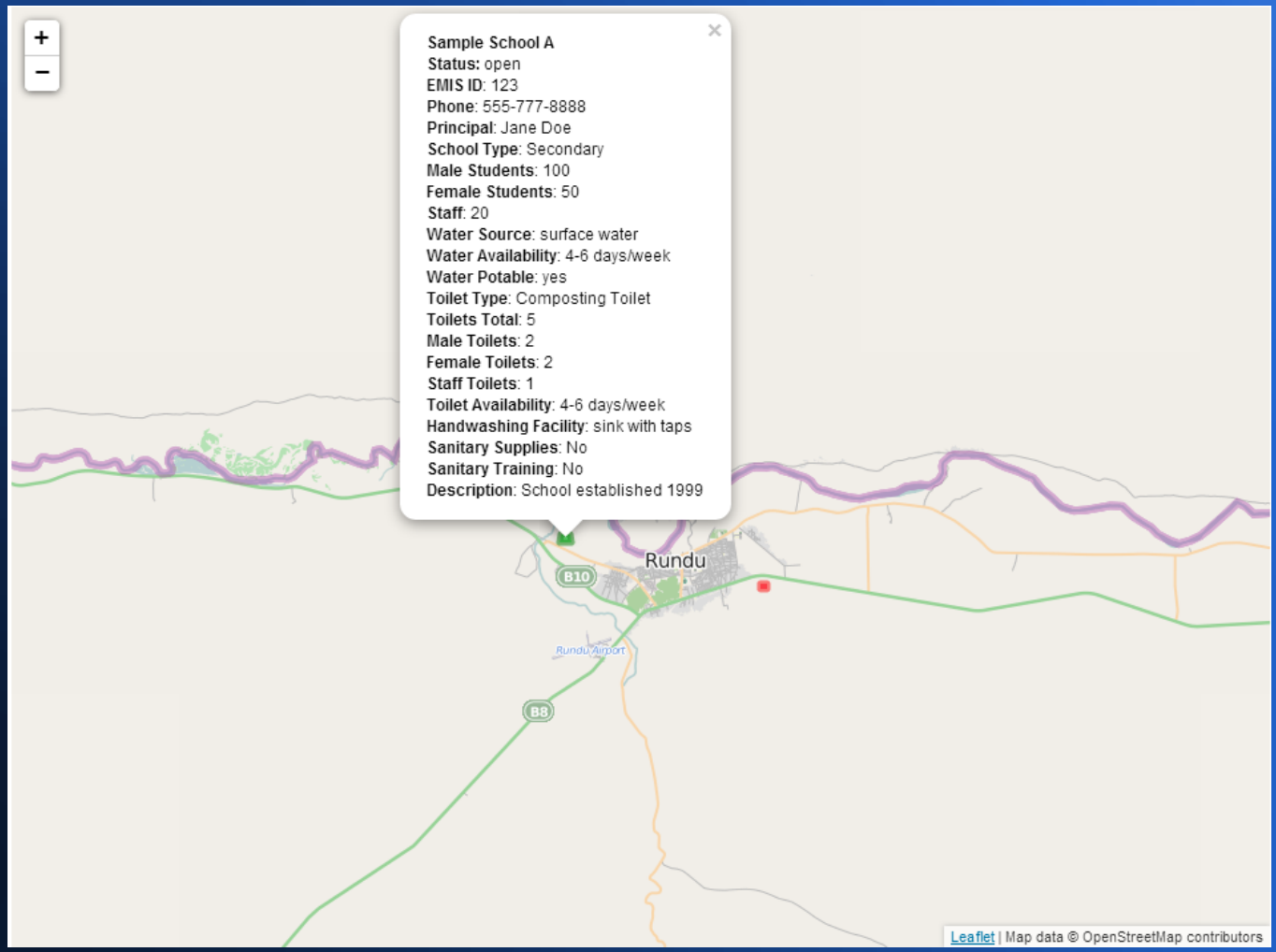


New Features

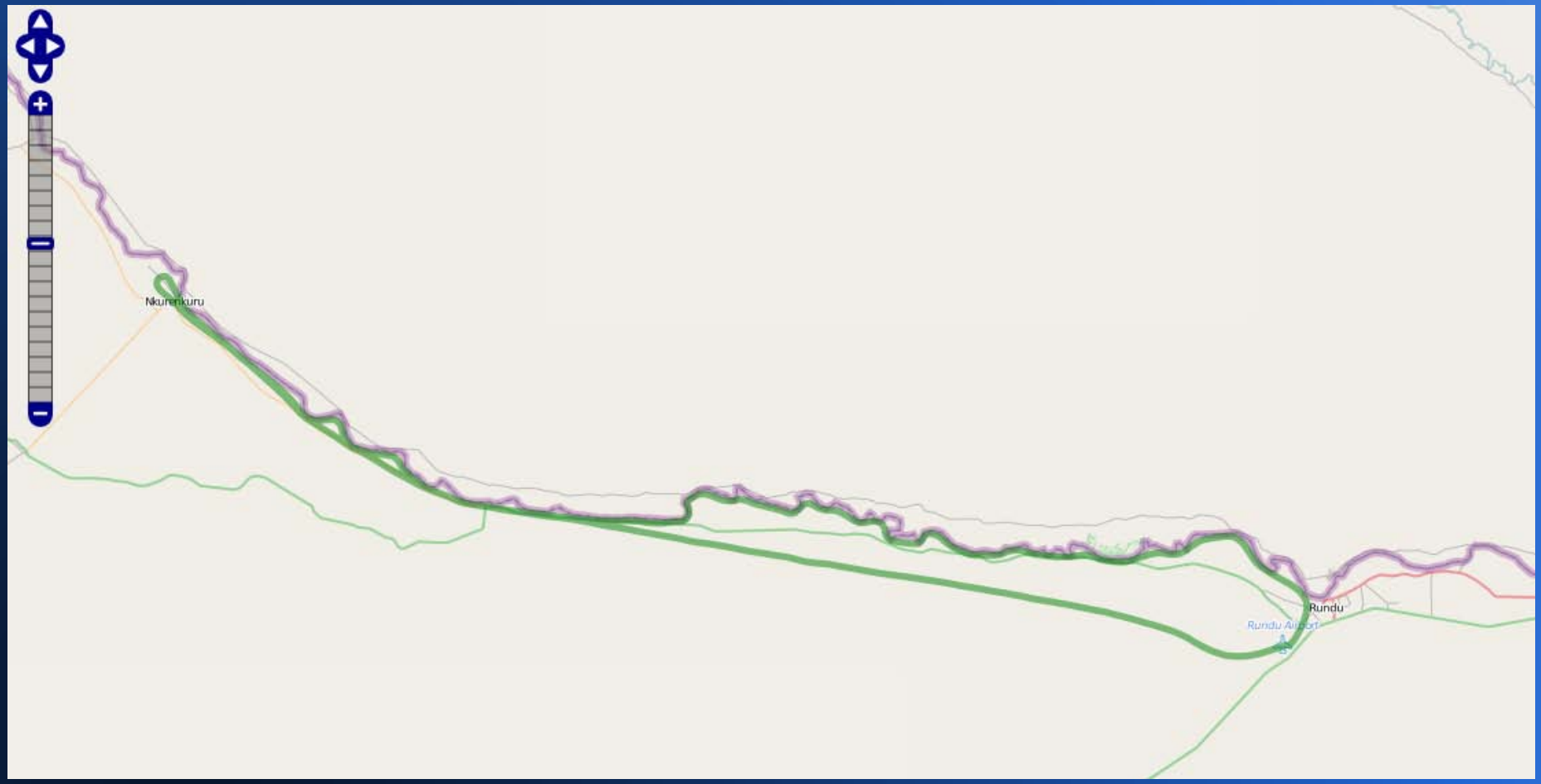


- Upload form for Excel files containing river gauge data
- Prototype OpenStreetMap (OSM) infrastructure information (school tracker)
- Co-registration of EO-1 satellite data with Landsat Global Land Survey
- New collaboration with National Oceanic and Atmosphere Administration (NOAA) (Flash Floods)

OSM Prototype (Infrastructure – School Tracker)



OSM Prototype (Science Data)



NOAA Collaboration

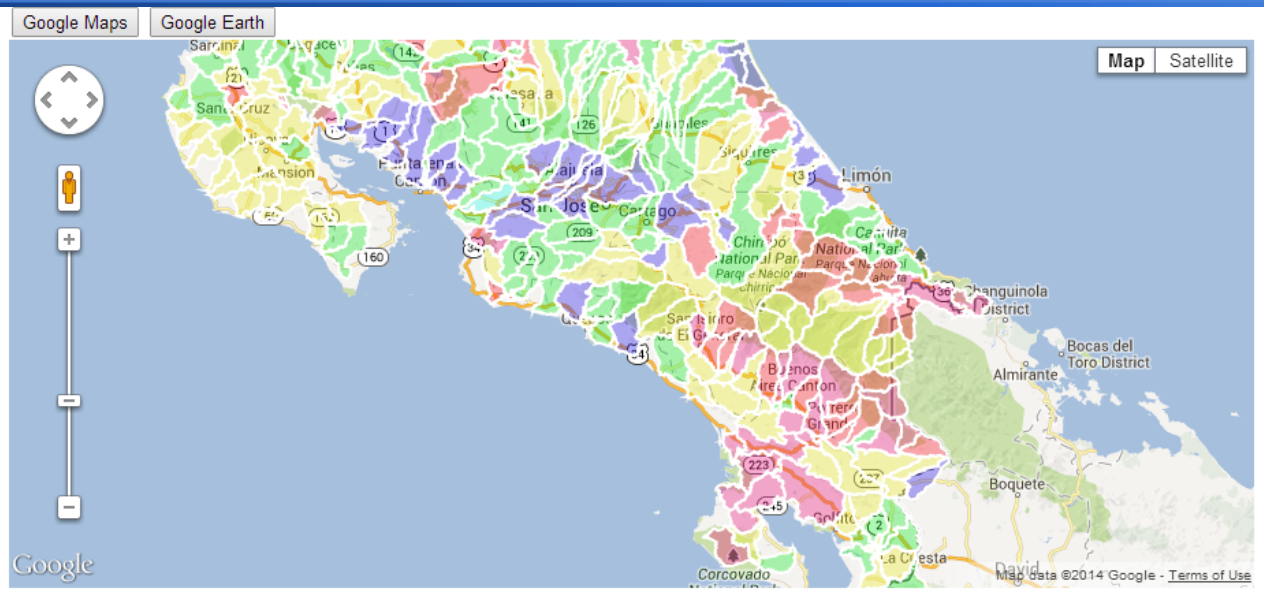
TRMM Rainfall Accumulation and Flood Forecast

FFG Basins

- Belize FFG Basin 1hr
- Belize FFG Basin 3hr
- Belize FFG Basin 6hr
- Costa Rica FFG Basin 1hr
- Costa Rica FFG Basin 3hr
- [x] Costa Rica FFG Basin 6hr
- El Salvador FFG Basin 1hr
- El Salvador FFG Basin 3hr
- El Salvador FFG Basin 6hr
- Guatemala FFG Basin 1hr
- Guatemala FFG Basin 3hr
- Guatemala FFG Basin 6hr
- Honduras FFG Basin 1hr
- Honduras FFG Basin 3hr
- Honduras FFG Basin 6hr
- Nicaragua FFG Basin 1hr
- Nicaragua FFG Basin 3hr
- Nicaragua FFG Basin 6hr
- Panama FFG Basin 1hr
- Panama FFG Basin 3hr
- Panama FFG Basin 6hr

MODIS Floodmaps

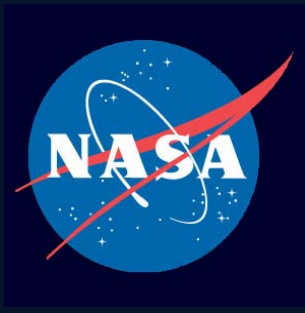
Central America Shapefiles



Legend:

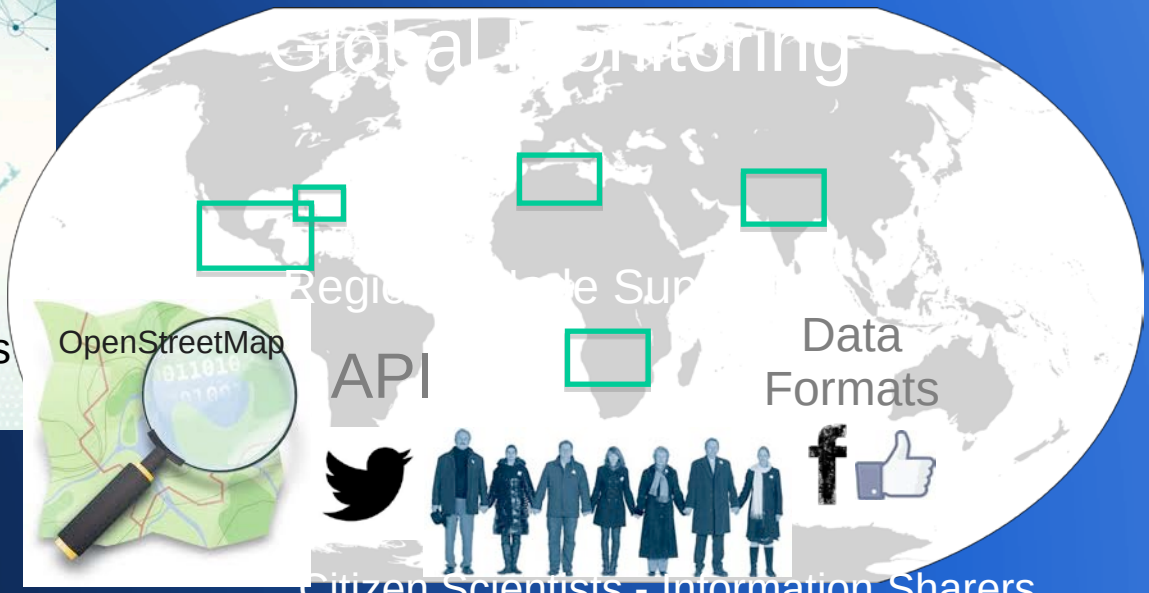
FFG Color Coding - 1 hr	0 - 25.0:	25.1 - 35.0:	35.1 - 50.0:	50.1 - 70.0:	70.1 - 100.0:	> 100.1:
FFG Color Coding - 3 hr	0 - 30.0:	30.1 - 45.0:	45.1 - 60.0:	60.1 - 80.0:	80.1 - 140.0:	> 140.1:
FFG Color Coding - 6 hr	0 - 45.0:	45.1 - 65.0:	65.1 - 85.0:	85.1 - 110.0:	110.1 - 150.0:	> 250.1:

Future Plans



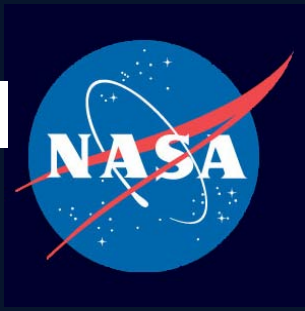
- Evolve Dashboard into “Disaster Node” with GeoSocial Application Program Interface (API)
- Add hydrograph to satellite cross-indexing of data products
- Formalize implementation of OpenStreetMap (OSM) layer display to supplement Google Maps / Earth
- Add TRMM Precipitation data products (WABBIT)
- Add per-layer access control

OSM, Disaster Node, GeoSocial API Concept



Disaster Architecture Framework

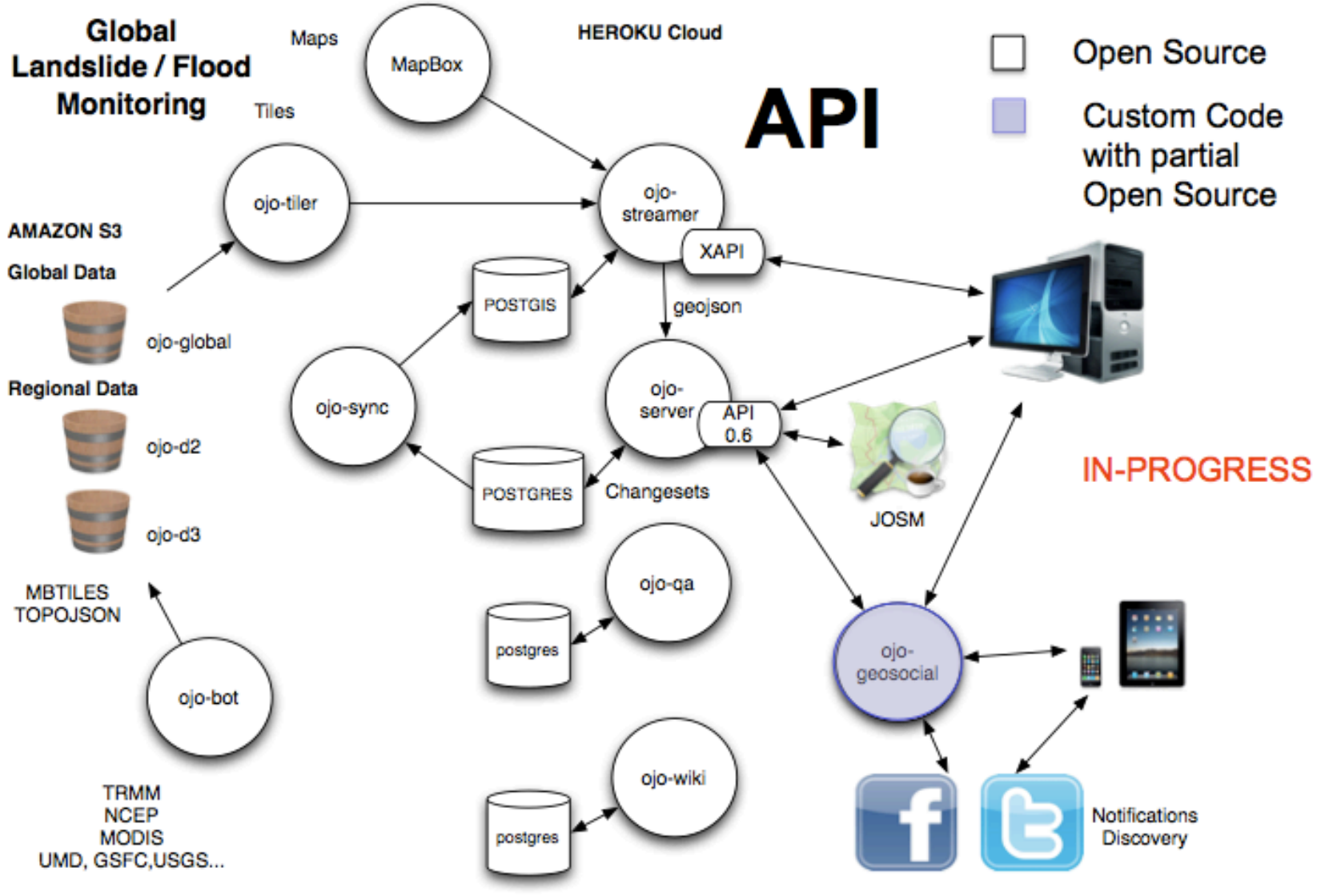
OSM, Disaster Node, GeoSocial API Concept



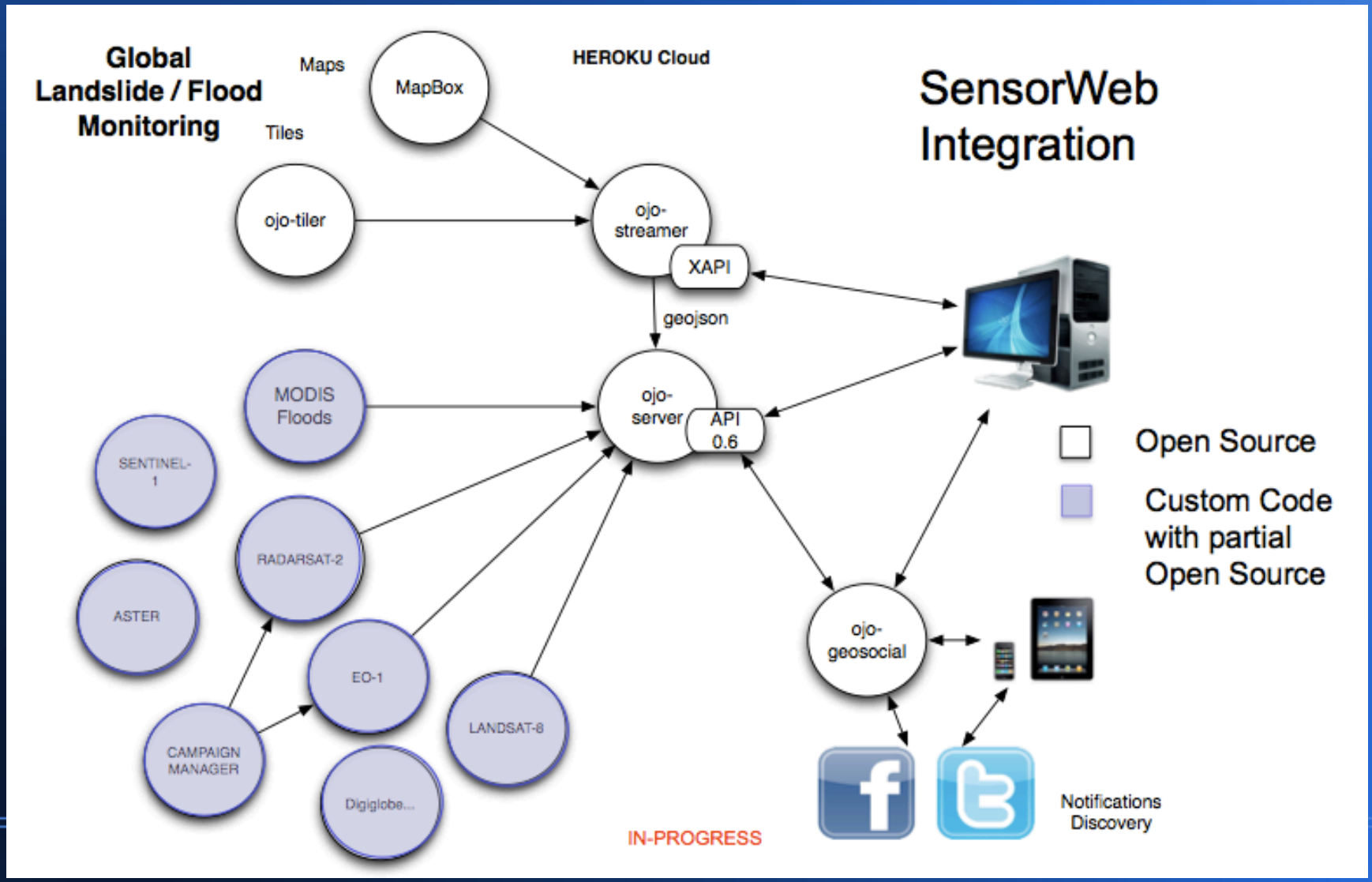
- Distributed OpenStreetMap tools
- Distributed implementations
- Handle different data formats
- Use social networks for story telling, information sharing and discovery
- Leverage existing infrastructure (protocols, database schemas, code etc.)
- Support crowd-sourcing
- Community-based data stewardship
- Common higher level API, including for use on mobile devices
- Tiling and vectorization services to reduce size and enable common database storage with queries
- Editing of Geographic Information System (GIS) data in OpenStreetMap to enable crowd-sourced data to augment and improve satellite data

OSM, Disaster Node, GeoSocial API Concept

OSM, Disaster Node, GeoSocial API Concept



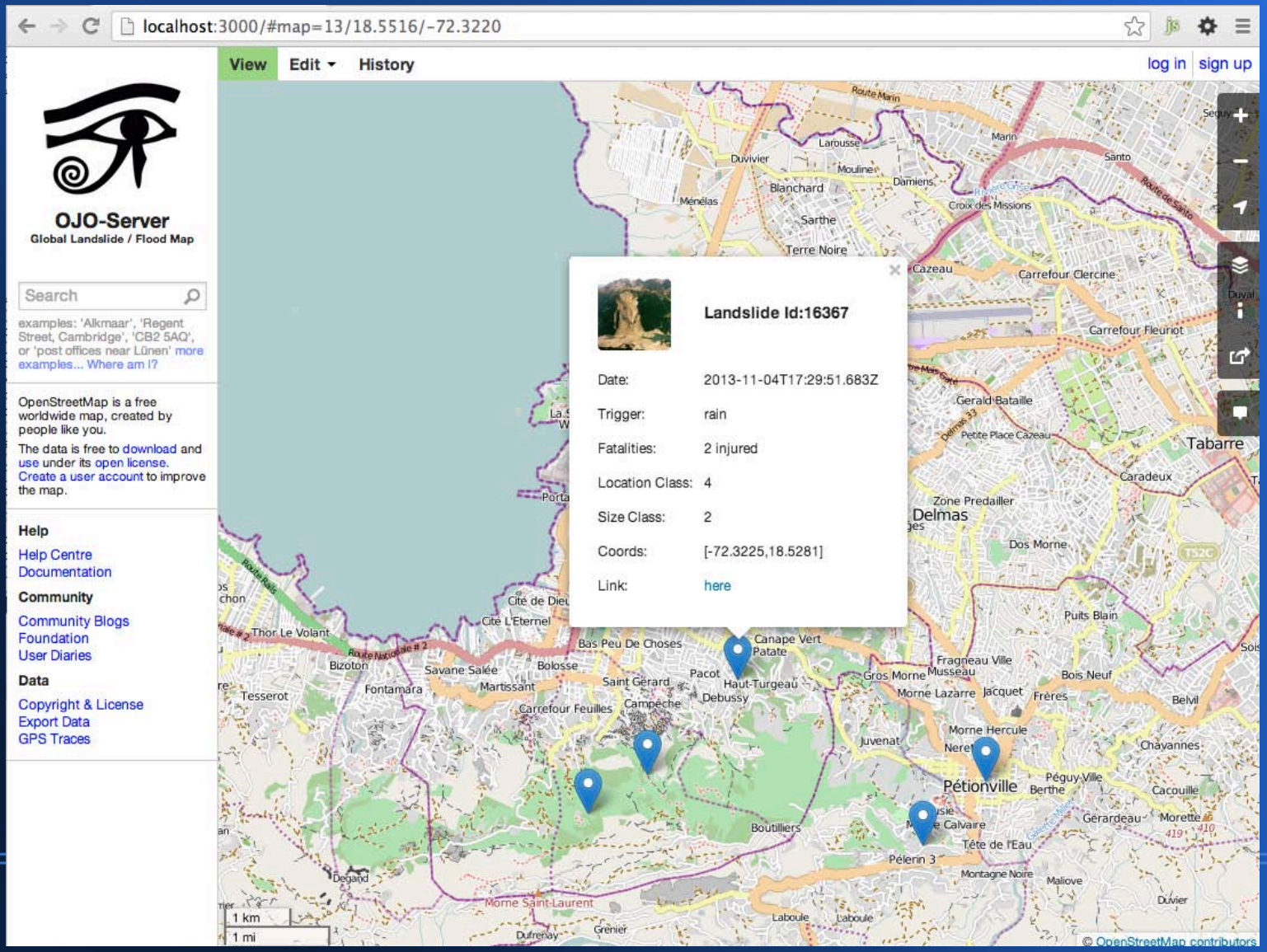
OSM, Disaster Node, GeoSocial API Concept



OSM, Disaster Node, GeoSocial API Concept

GSFC 2-day MODIS Flood Extent
[Coming soon: EO1, Landsat-8, Radarsat-2 flood extents]

OSM, Disaster Node, GeoSocial API Concept



OpenStreetMap Viewer/Editor for Crowd-Sourcing

Wrap Up

- Rapid delivery of technical information through bulletins
- Access to EO-1 ALI data products
- Access to MODIS flood classification, TRMM prediction
- Correlation with infrastructure details
- Graphing and comparison of river levels
- Plans to allow even more powerful comparisons, such as retrieval of satellite products based on ground data comparison

Wrap Up

- Future access to more satellite data via mobile devices and OpenStreetMap compatible
- Future crowd-sourced community based data collection and management capability