



[**CLICK TO KNOW MORE**](#)

Leveraging Open-Source Software for Local Gov Management

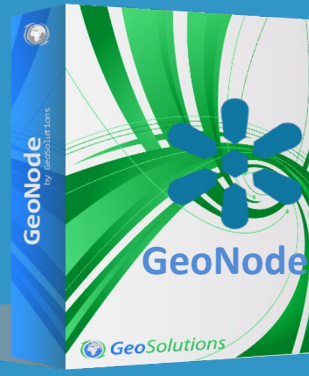
Ryan Burley | GeoSolutions USA
Ryan.Burley@GeoSolutionsGroup.com
www.geosolutionsgroup.com





Introduction – About Us

- Founded in 2006, offices in Italy & US
- Our core FOSS4G products



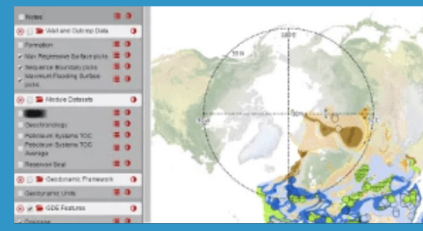
• Services



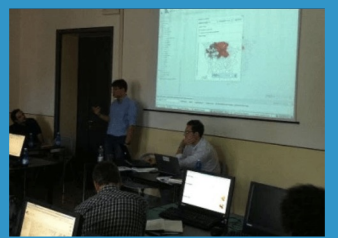
Enterprise Support Services



Deployment Subscription



Customized Solutions



Professional Training

GeoSolutions
 your one-stop-shop for geospatial open source software





Digital Twin Use Case: City of Genoa



City of Genoa Geoportal and SDI

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The screenshot displays the City of Genoa Geoportal and SDI interface. At the top, there is a search bar with the text "search..." and a button that says "Press F11 to exit full screen". Below the search bar, there are two social media icons (Facebook and Twitter). The main content area is divided into two sections: "Featured" and "Contents".

The "Featured" section contains four map thumbnails:

- Protezione Civile per il cittadino**: Visualizzazione di alcuni strati informativi facenti parte del Piano Comunale di Emergenza.
- Livello 3 del Piano Urbanistico Comunale - PUG**: Tematismi del Piano Urbanistico Comunale facenti parte del livello 3 - Locale di Municipio.
- Interventi LLPP da luglio 2017**: Mappa degli interventi sul territorio.
- EMERGENZA MORANDI**: Aerial view of a building.

Below the featured maps, there is a "Show more..." button and a "Results 4 of 5" indicator.

The "Contents" section has a sub-section for "Maps" with two tabs: "Maps (55)" and "Dashboards (6)". Below this, there are eight map thumbnails:

- Visualizzatore**: componi le tue mappe attraverso il catalogo delle informazioni geografiche.
- P.E.B.A. - Piano di Eliminazione delle barriere arc...**: DATI AD ACCESSO CONSENTITO DALLA RETE INTERNA.
- Mobilità e fermate trasporto pubblico (AMT)**: ZTL Blu Area, Fermate trasporto pubblico (linea AMT) e piste ciclabili.
- Assets tecnologici - DATI AD ACCESSO CONSE...**: DATI AD ACCESSO CONSENTITO DALLA RETE INTERNA.
- AZIENDE ZONA LOGISTICA SEMPLIFICATA**: ACCESSO RISERVATO.
- Indicatori VAS del Piano Urbanistico Comunale ...**: Indicatori per la definizione della Valutazione Ambientale Strategica (VAS).
- Aree Verdi - DATI AD ACCESSO CONSENTITO D...**: DATI AD ACCESSO CONSENTITO DALLA RETE INTERNA - Aree verdi Comune di Genova.
- EMERGENZA MORANDI**: Aerial view of a building.

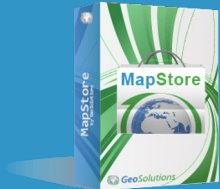
On the right side of the interface, there are three product boxes:

- GeoServer**: A box with a green and blue design, labeled "GeoServer" and "GeoSolutions".
- MapStore**: A box with a green and blue design, labeled "MapStore" and "GeoSolutions".
- GeoSolutions**: A box with a green and blue design, labeled "GeoSolutions".



City of Genoa Geoportal and SDI

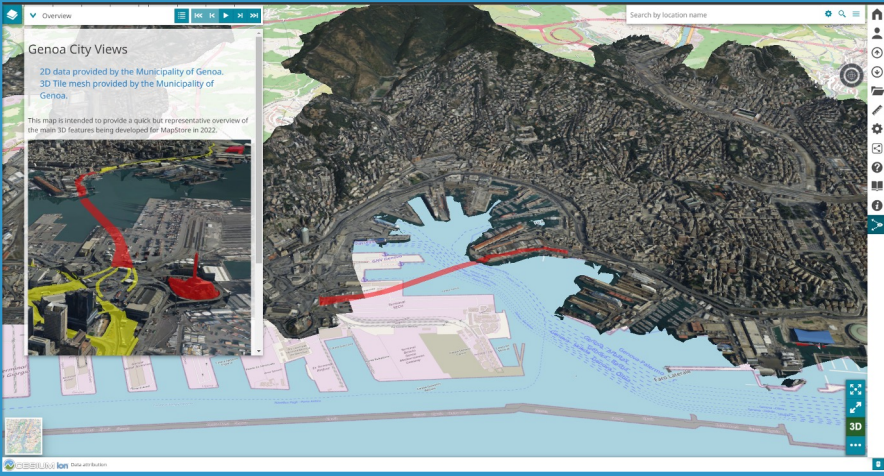
- **Complemented Legacy Proprietary Software**
 - Oracle
 - ArcGIS
- **Maps + Dashboards**
- **MapStore 2 + GeoServer Cluster**
- **Multilevel - Enterprise security**
 - SPID
 - Active Directory
 - DBMS
- **Integration with third party software**
 - Map Embedding
 - Integration with Civil Works



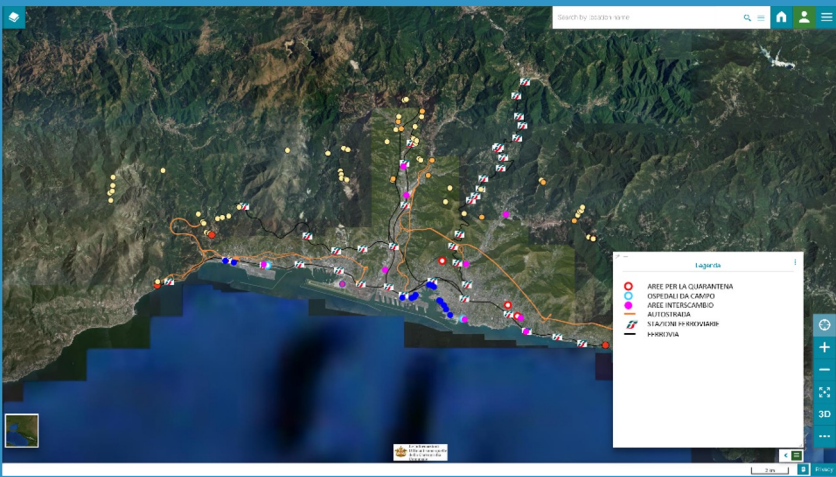
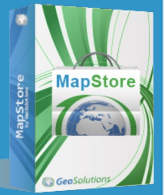


City of Genoa Geoportal

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City-wide GeoPortal
Smart City dashboards
Indexes, maps and charts
Internal + Citizens
Assets + Civil Works +
Energy Data +
everything!



Smart City Dashboard

504

OVERVIEW

CODICE	COMUNALE	STATO	ABBONATI	INDICAZIONE	BLP	ESPLORATE	ESPLORATI	NUMERATO	NUMERATI	ID
00001	REGIONE SICILIA	INTERVENTI IN FASE	PAZZALE GIOVANNI	Manichio	08-09-2008	1	1	1	1	278
00002	REGIONE SICILIA	INTERVENTI IN FASE	PAZZALE GIOVANNI	Manichio	08-09-2008	1	1	1	1	279
00003	REGIONE SICILIA	INTERVENTI IN FASE	PAZZALE GIOVANNI	Manichio	08-09-2008	1	1	1	1	280
00004	REGIONE SICILIA	INTERVENTI IN FASE	PAZZALE GIOVANNI	Manichio	08-09-2008	1	1	1	1	281
00005	REGIONE SICILIA	INTERVENTI IN FASE	PAZZALE GIOVANNI	Manichio	08-09-2008	1	1	1	1	282
00006	LAZIO DI ROMA	INTERVENTI IN FASE	PAZZALE GIOVANNI	Manichio	08-09-2008	1	1	1	1	283
00007	LAZIO DI ROMA	INTERVENTI IN FASE	PAZZALE GIOVANNI	Manichio	08-09-2008	1	1	1	1	284
00008	LAZIO DI ROMA	INTERVENTI IN FASE	PAZZALE GIOVANNI	Manichio	08-09-2008	1	1	1	1	285
00009	LAZIO DI ROMA	INTERVENTI IN FASE	PAZZALE GIOVANNI	Manichio	08-09-2008	1	1	1	1	286



City of Genoa - Video

Overview

Search by location name

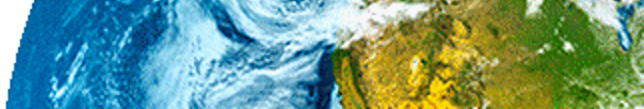
Genoa City Views

2D data provided by the Municipality of Genoa.
3D Tile mesh provided by the Municipality of Genoa.

This map is intended to provide a quick but representative overview of the main 3D features being developed for MapStore in 2022.

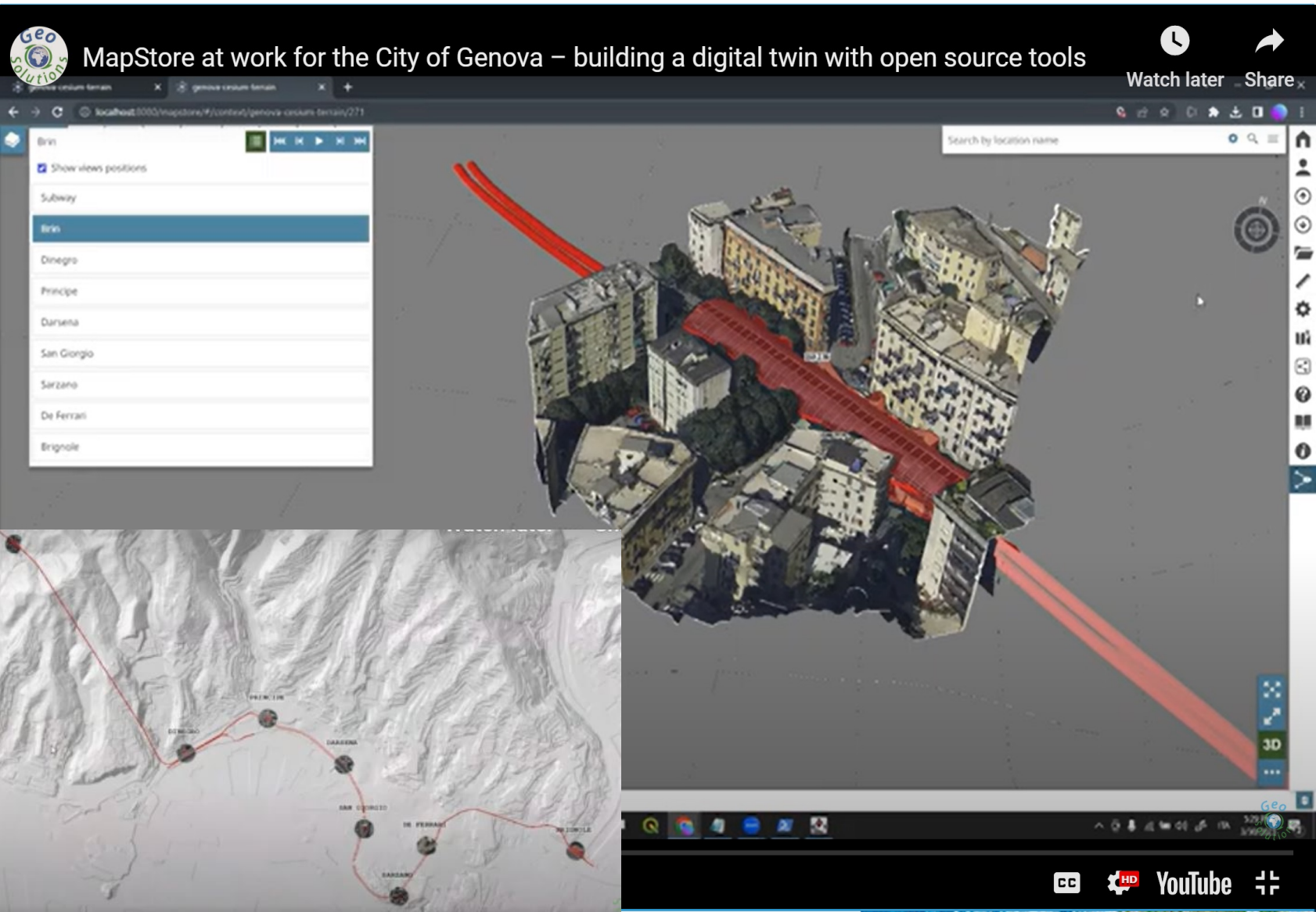
3D

CESUM ion



City of Genoa - Stations

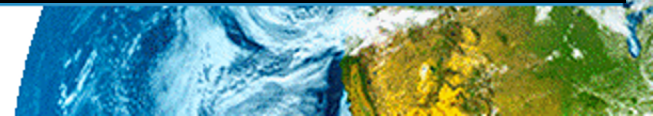
MapStore at work for the City of Genova – building a digital twin with open source tools



The screenshot shows the MapStore web application interface. On the left, a sidebar lists subway stations: Brin, Dinegro, Principe, Darsena, San Giorgio, Sarzano, De Ferrari, and Brignole. The main area displays a 3D perspective view of a city block with a red subway line overlaid. A search bar at the top right says "Search by location name". The bottom of the screen shows a Windows taskbar with various application icons and a system tray.



<https://youtu.be/M5uCoS-ILbY>



City of Genoa – Stations



MapStore at work for the City of Genova – building a digital twin with open source tools

Watch later Share

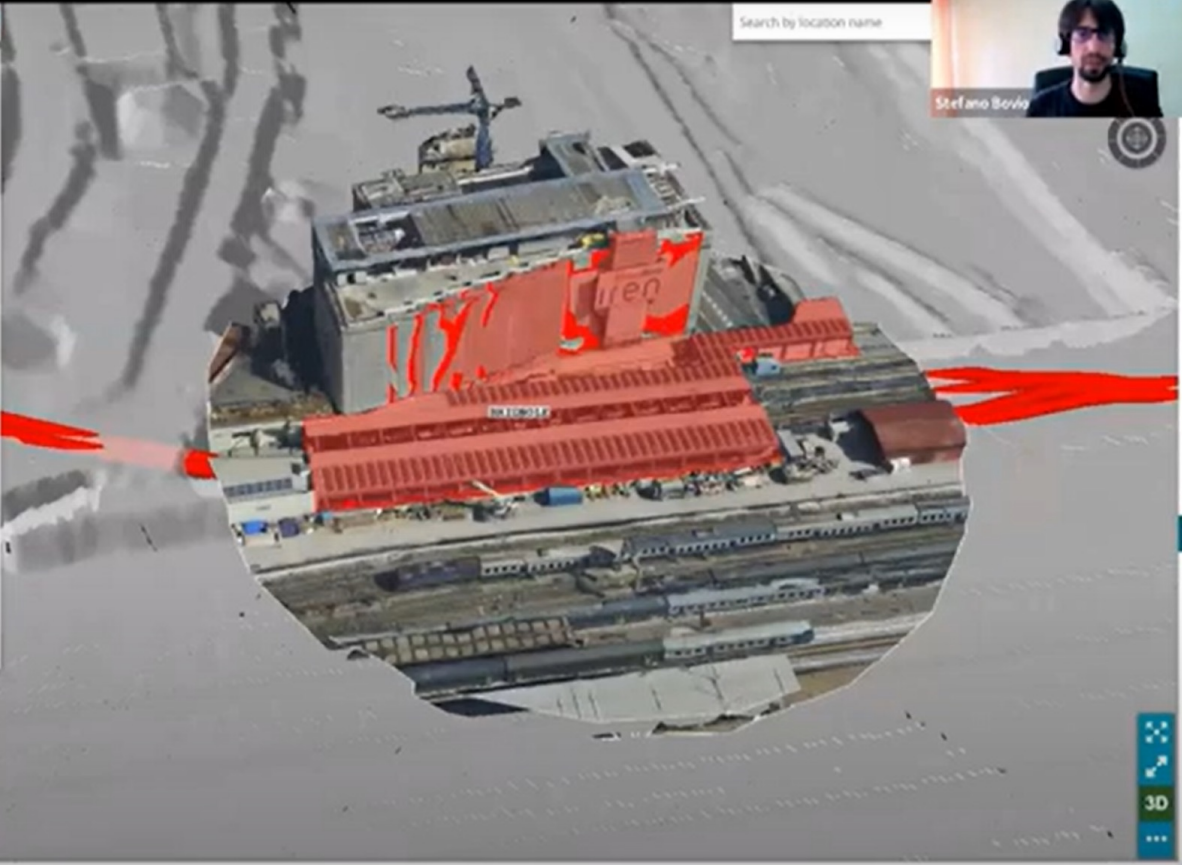


Brignole

Brignole Metro Station

Adjacent to the homonymous railway station (to which it is connected via underpass) it is built in the open air. It rises in the San'Agata area and near Borgo Inrocchiati, on the border between the Foce district and the beginning of Val Bisagno. It is currently the terminus station, although the extension project towards Piazza Martinez, which has already been planned for several years, is now taking shape.

From the very first projects, the Brignole station was conceived as the eastern terminus of the underground. Originally planned under Piazza Verdi, it was instead built on the surface, upstream from the railway station, to avoid having to cross the Bisagno stream underground. After having excavated the long tunnel between the walls of San'Agata and the old railway tunnels of the Graziè, the station was...

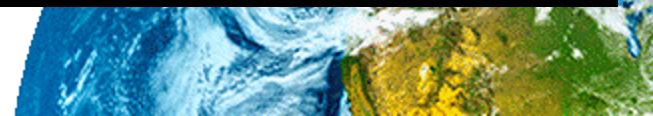


MORE VIDEOS

23:37 / 1:12:45

CC HD YouTube

<https://youtu.be/M5uCoS-ILbY>





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From Open Data to Digital Models/Twins





digital-twin-toolbox is a collection of Open Source softwares and processes to generate 3DTiles

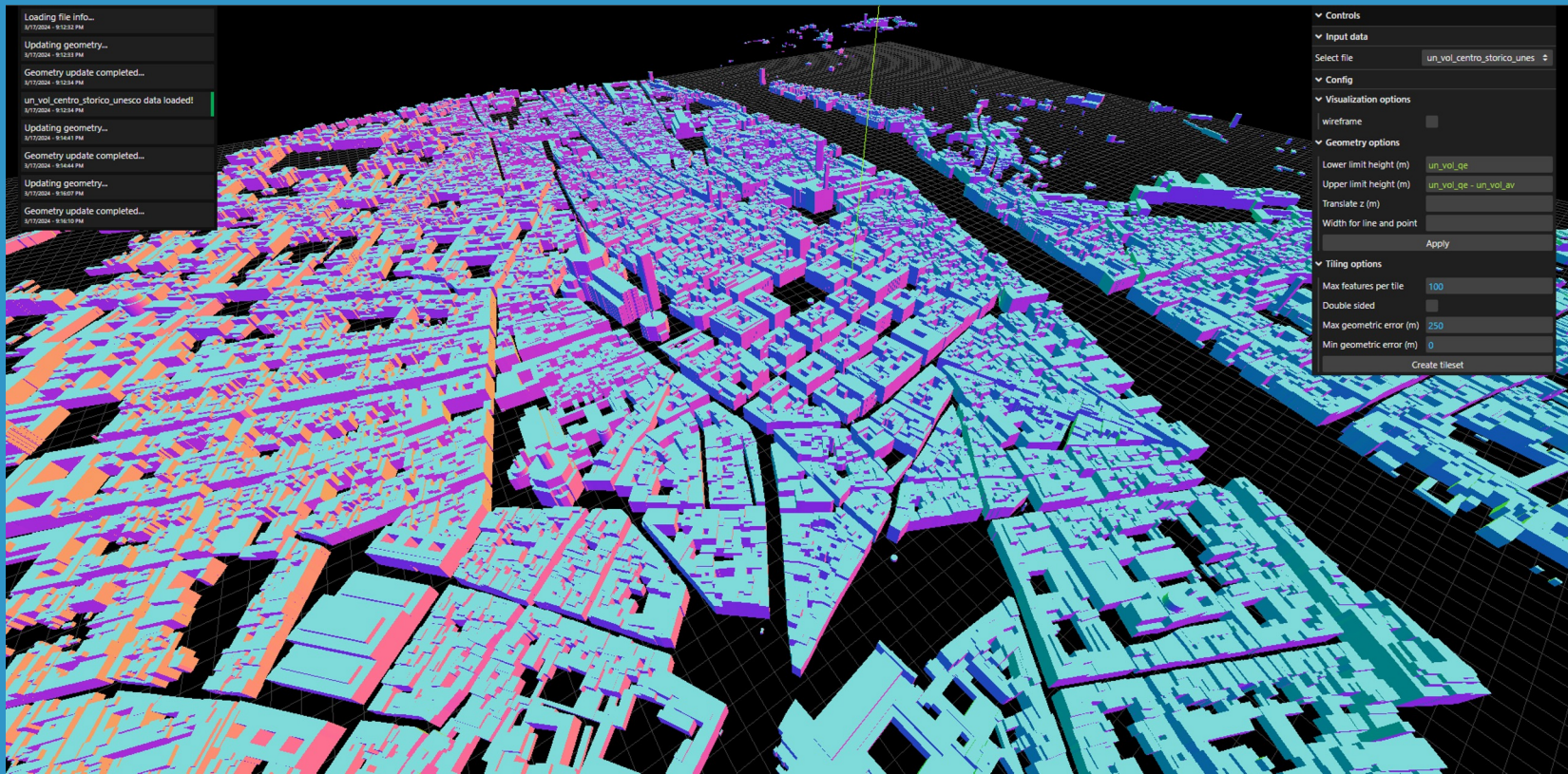


Documentation:

<https://github.com/geosolutions-it/digital-twin-toolbox/blob/main/README.md>

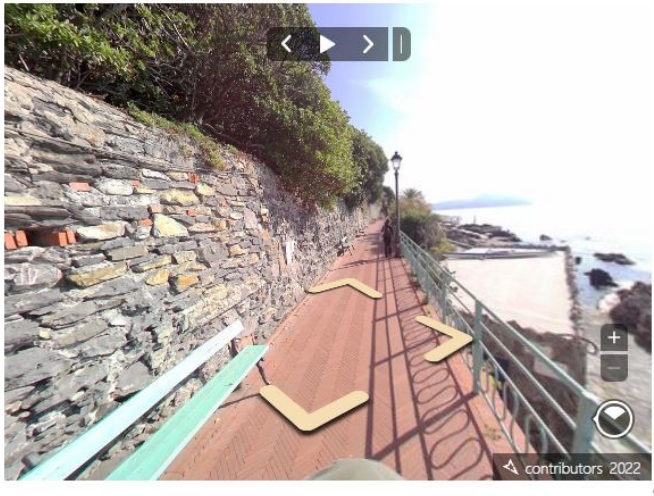
Repository:

<https://github.com/geosolutions-it/digital-twin-toolbox>



Search by location name

Street View



Mapillary Integration



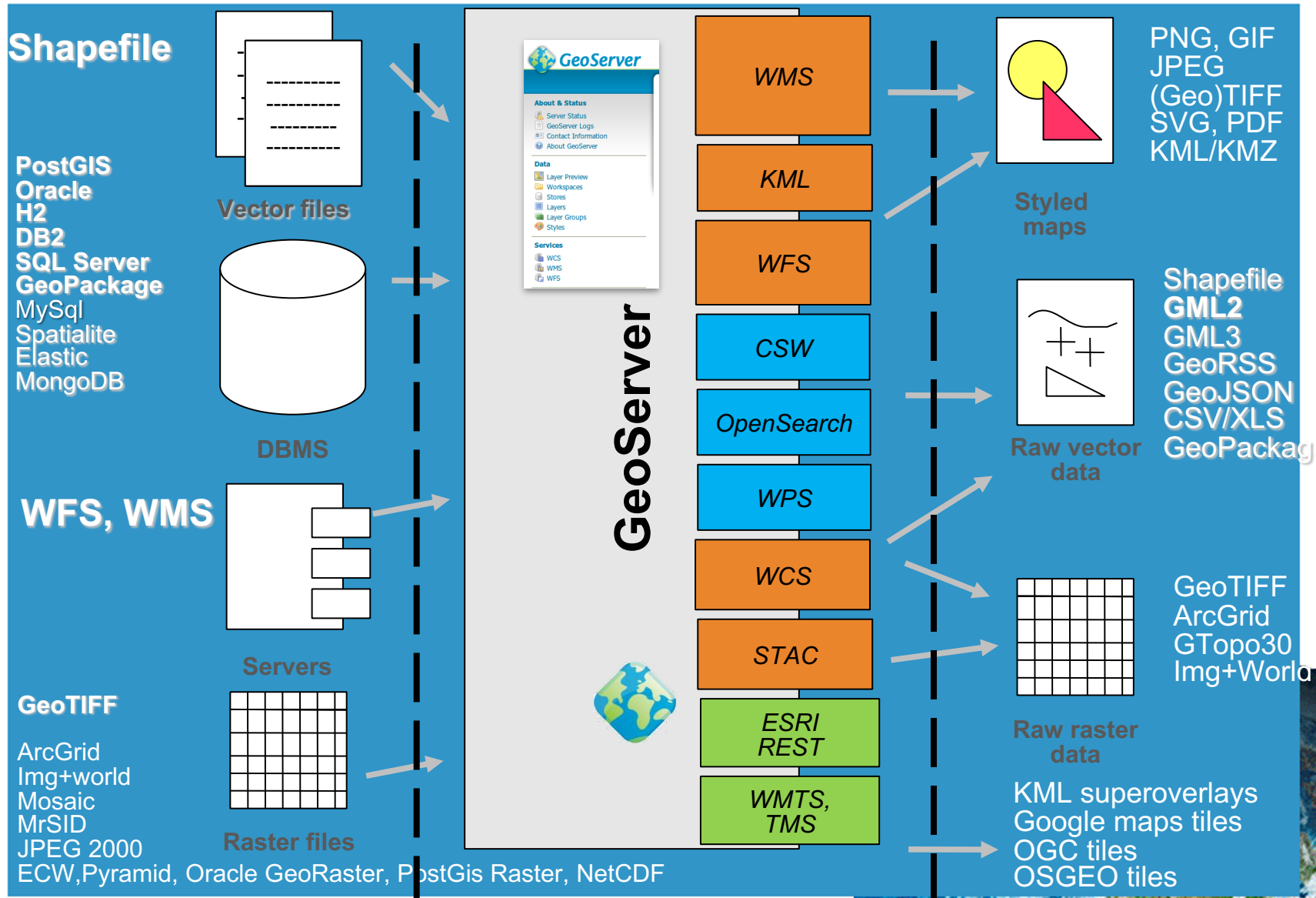
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Open Source WebGIS Software: GeoServer, GeoNode, and MapStore



GeoServer





GeoServer

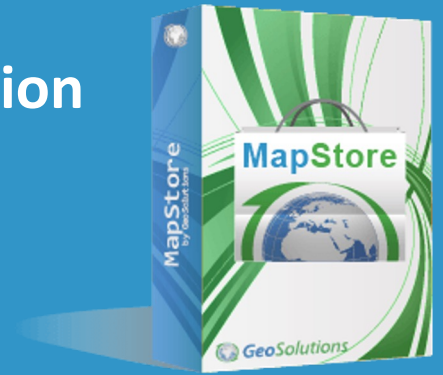


- **GeoSpatial enterprise gateway**
 - Modular & extensible
 - Management & dissemination of raster and vector data
- **Cloud/ Big Data friendly**
 - Cluster deployments in AWS, Azure, On Premise
 - Powering petabytes-size data (EO, MetOcean, etc.)
 - Serving up to 10k+ requests per second
- **Standards compliant**
 - OGC WCS 1.0, 1.1.1 (RI), 2.0.1
 - OGC WFS 1.0, 1.1 (RI), 2.0
 - OGC WMS 1.1.1, 1.3
 - OGC WPS 1.0.0
 - OGC CSW 2.0.2
- **Google Earth/Maps support**
- **License is GPL v2.0**

[More Information](#)

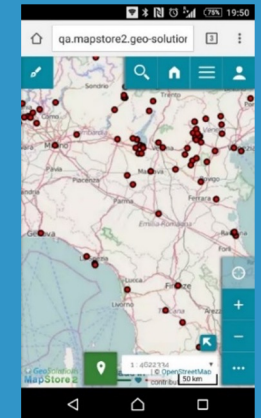
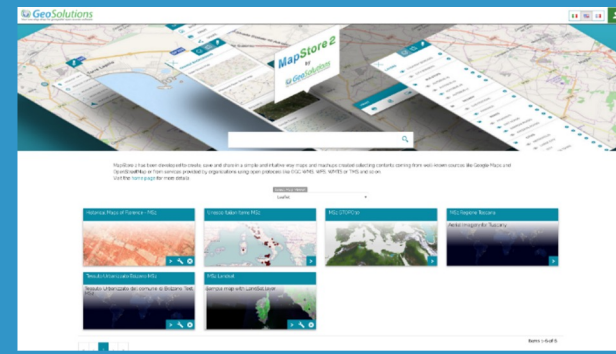


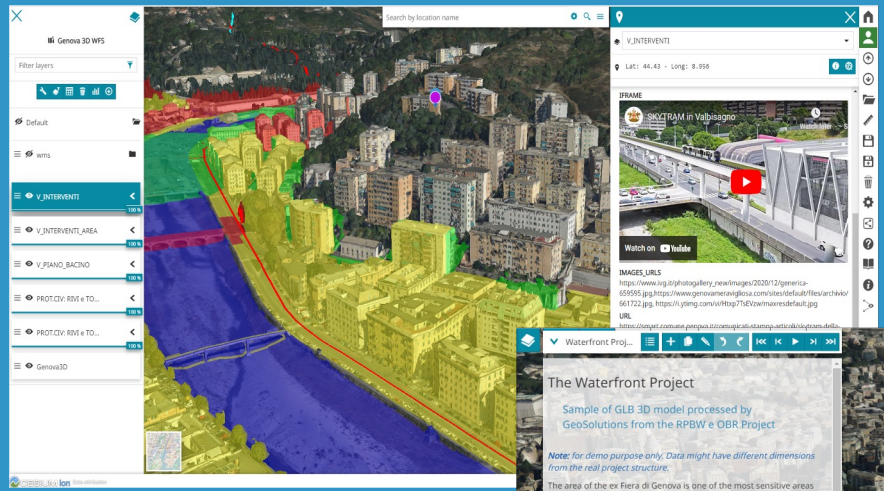
- Create, manage, share maps, dashboards and stories
- Integrate, visualize & exploit 3D Tiles
- Embed in portals or use as complete solution
- Mobile first & responsive
- OpenLayers, Leaflet or Cesium
- ReactJS + Bootstrap + Redux
- Pluggable Look & Feel
- Supports various sources
 - Maps, OpenStreetMap, Bing, WFS, CSW, WMS, WMTS, 3D Tiles and TMS...



- License is Simplified BSD
 - Commercial friendly!

[More Information](#)





The Waterfront Project

Sample of GLB 3D model processed by GeoSolutions from the RPBW e OBR Project

Note: for demo purpose only. Data might have different dimensions from the real project structure.

The area of the ex Fiera di Genova is one of the most sensitive areas being abandoned in the city and one of the most fragile stretches of its coastline. Now the vision of the Eastern Waterfront donated by Renzo Piano to the City of Genoa intends to recreate a strong urbanity on the sea, addressing the theme of the port starting from the city, redeveloping the abandoned areas in the delicate border between



About this map

The Google Photorealistic 3D Tiles map

This demo map is intended to provide an overview of some cities around the world using the **Photorealistic 3D Tiles** released by Google as part of Google / O 2023 series.

Photorealistic 3D Tiles - Lower Manhattan

This is possible thanks to **MapStore** developments in 3D functionality performed during the last year, including the ability to use 3D Tiles in maps (such as the Photorealistic 3D Tiles) and the Map View tool through which it is possible to set up multiple map views and navigate between them.

Brecksville Rd. Crosswalk

This project will renovate the existing all purpose trail crosswalk where Valley Parkway meets Brecksville Road. Once finished, this project will allow for a safer user experience when using the trail. Construction began in May of 2022, with an anticipated finish in August of the same year.

US States

STATE_NAME	STATE_FPS	SUB_REGION	STATE_ABBR
Illinois	17	E N Cen	IL
Missouri	29	W N Cen	MO
Arizona	04	Mtn	AZ
Oklahoma	40	W S Cen	OK
North Caro	37	S Atl	NC
Tennessee	47	E S Cen	TN
Texas	48	W S Cen	TX
New Mexico	35	Mtn	NM
Alabama	01	E S Cen	AL
Mississippi	28	E S Cen	MS

US Unemploy

US Population

Infrastructure Projects

Open Source WebGIS Software: MapStore and GeoNode

Training Documentation:

<https://training.mapstore.geosolutionsgroup.com/>

Latest Release:

<https://github.com/geosolutions-it/MapStore2/releases/tag/v2023.02.02>





GeoSpatial Content Management System



Spatial Data Discovery

- Powerful Search Engine
- Federated OGC Services
- Metadata Catalogue



Import and Manage

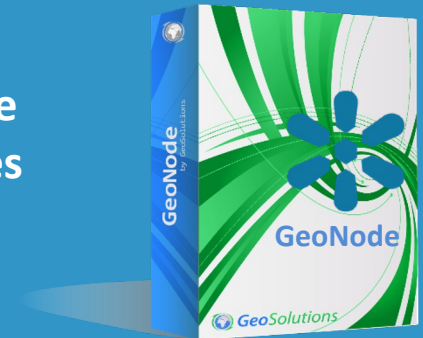
- Publish raster, vector, and tabular data
- Manage metadata and related documents
- Securely or publicly share data



Interactive Mapping

- Integrated GIS client
- Graphical style editor
- Create multi-layer interactive maps
- Share and embed maps in web pages
- Create and share Dashboards and stories

- License is GPL v2.0





Training Documentation:

<https://training.geonode.geosolutionsgroup.com/master/>

Latest Release:

<https://github.com/GeoNode/geonode/releases/tag/4.2.3>

Copy from: building_footprints_join_building_3d_epsg_26985

Code editor

Classification

Color ramp: OrRd

Reverse order: Inactive

Attribute: median_z

Method: Equal interval

Intervals: 5

Opacity: 100

Outline color: [Color swatch]

Outline width: 0 px

[-]	0.045	[+]	9.0674	[+]	:
[-]	9.0674	[+]	18.1798	[+]	:
[-]	18.1798	[+]	27.2923	[+]	:
[-]	27.2923	[+]	36.4047	[+]	:
[-]	36.4047	[+]	45.5171	[+]	:

© OpenStreetMap contributors.

Scale: 1:9028

geonode.org Developers About





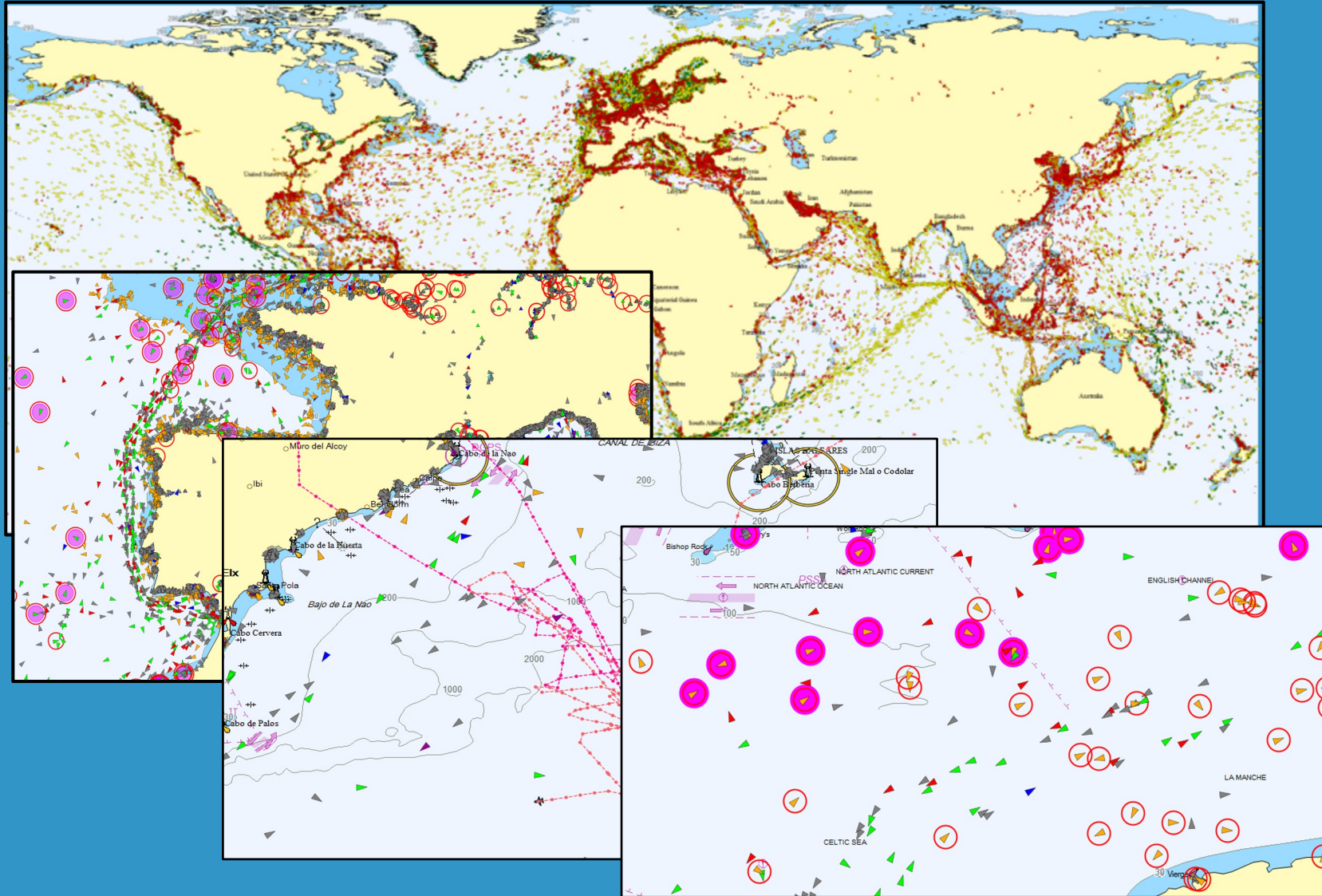
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Additional Examples



Other examples: EMSA Use Case



EMSA Real Time Maritime Picture

- **Maritime Data** is produced by a variety of sources:



- Ships positions → **AIS**, SAR, VMS, ...
- Maritime assets → ports, **navigational aid systems**, ...





EMSA Real Time Maritime Picture

- The maritime data is provided as:
 - Streams of data, landing on Kafka topics
 - Enrichment data files, pushed in the system
- In **24 hours**:
 - We receive up to 50 million ship positions
 - We handle up to **500K** different ships
- Peak activity during daytime:
 - Up to 2500 messages per second!



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MassGIS – Infrastructure Mapping



Identify Results

Data Layer Name

WiFi Sites - Commonwealth of MA Labels

<input type="checkbox"/>	id	facility	status	ad
<input type="checkbox"/>	16	MCDHHEXECUTIVE	Complete	600...



Infrastructure Mapping - Parcels

- > Courthouses
- > Dams
- > DCR Pools
- > Farmers Markets
- > Ferry Routes
- > Fire Stations
- > Highway Exits and Interchanges
- > Highway Mile Markers
- > Hospitals
- > Ice Rinks
- > Libraries
- > Lighthouses
- > Long Term Care Residences
- > Massachusetts Address Points
- > MassGIS-MassDOT Roads
- > MBTA Bus Routes and Stops
- > MWRA Towns With Water or Sewer
- > Park and Ride Lots
- > Places of Worship
- > Police Stations
- > Prisons

[Property Tax Parcels](#)

Data Consumption - Instructions

TABLE OF CONTENTS

- ▼ Downloads
- ▼ View the data
- ▼ Overview
- ▼ Digital Parcel Standard
- ▼ Complying with the Standard
- ▼ Production
- ▼ Attributes
- ▼ Maintenance
- ▼ Updates

Downloads

By city or town from a map →	By city or town from an Excel file of links →	Download most current Statewide data →
Download a FGDB with all vintages for every municipality (5.92GB zip) →	Download a SHP with all vintages for every municipality (5.37GB zip) →	

RELATED

- [Browse all MassGIS data layers →](#)
- [MassGIS home →](#)
- [Bureau of Local Assessment →](#)
- [Division of Local Services →](#)

Twice per year (Jan 1 and July 1), we create a zip file that has all vintages of parcel data for every municipality available as shapefiles or FGDB. The current files were created on January 2, 2024. We're always interested in how this aggregate data is used. Please share any studies or research results with us at massgismail@mass.gov



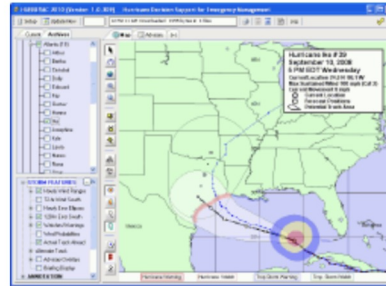
Emergency Management Example: HURREVAC



Sea Island Software, Inc. is the developer of the **HURREVAC program**, used by government emergency managers around the world to track and analyze the threat for hurricanes in the Atlantic, East and Central Pacific, typhoons in the West Pacific, and cyclones in the South Pacific.

The HURREVAC program is funded by FEMA, and the US Army Corps of Engineers, and also supported by NOAA. HURREVAC is free to qualified government emergency managers. See our [HURREVAC support site](#) for details.

We realize that there are services desired by Hurrevac program users which do not have a likelihood of being funded by the government. Therefore, we have developed **this Sea Island Software site** to offer products and services related to the Hurrevac program, which are **not funded by**, or normally available from, government agencies.



News

We also offer hurricane tracking services for users of ESRI's ArcGIS and Google Earth.

www.hurricanemapping.com

Direct, realtime feeds of critical hurricane tracking data in **KML** and **Shapefile** format

The products/services we offer include:

- On-site Hurrevac **training** tailored to your needs.
- Hurricane **Exercise Services** (3 levels depending on need)
- State Specific **Risk Profile Add-Ins** for the Hurrevac program
- **Other programming services** related to the display and management of hurricane related information.

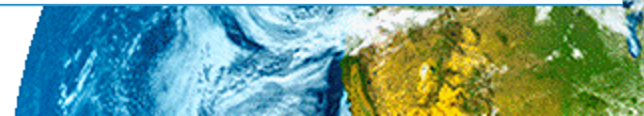
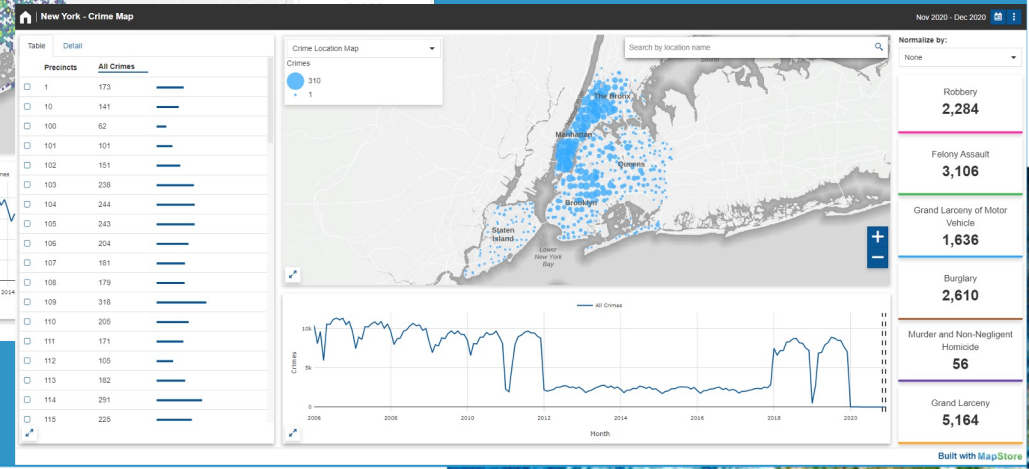
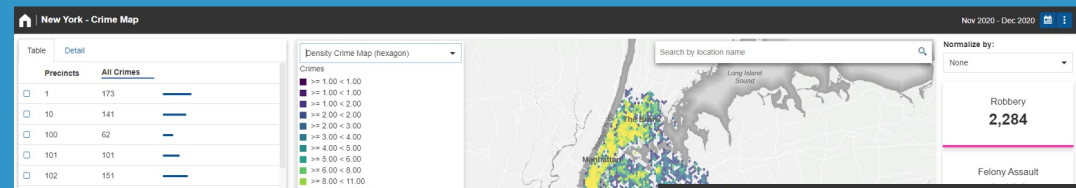
Our mission is to help you prepare for the hurricane threat in your community. Let us know if we can be of assistance!

!!!!Free to most .gov, .edu, .mil – All levels of government and supporting contractors!!!!

Cluster of GeoServers supporting complex multidimensional data



- GeoServer Support
- MapStore Support & Development
 - Empowering DOITT team on Web GIS Development
 - Developing a simple platform for crime data visualization



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← → ↻ Not secure | maps.nyc.gov/doitt/nycitymap/

Gmail Activities Dashboard... My Drive - Google... GeoSolutions Grou... (1) Ryan Burley | Lin... My Meetings - Zoom Maps ARC 2.0->My Arc Helpdesk: GeoSolu... Project Manage...

NYC gov
Residents | Business | Visitors | Government | Office of the Mayor | Search | Email Updates | Contact Us

NYCityMap Feedback Form | User Guide | Disclaimer | Other Map Themes | Blog

Search for a location: Enter an address, intersection, community district, ZIP code Search

Advanced Search Searched Locations Show Additional Data on Map

Capital Projects

- Capital Projects Dashboard
- Design/Construction
- Federal Stimulus
- NYC DOT 10 year Capital Plan
- NYC DOT Protected Streets

City Life

- Green Market
- Park
- Public Beach
- Kayak/Canoe Launch
- Public Pool
- Recreation Center
- Spray Fountain
- Water Fountain
- Public Wifi Hotspot

City Programs

- Broadband Technology and Opportunities Program
- Connected Communities
- Connected Foundations
- Connected Learning
- TWC Learning Lab
- Business Improvement District
- Empire Zone

Elements Console Sources Network >> 19 3

```

class="basemap" height="512" width="512" x="0.0"
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05/R0000000f/C00000011.jpg" y="0.0"></svg:image>
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class="basemap" height="512" width="512" x="1024.0"
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05/R0000000f/C00000013.jpg" y="0.0"></svg:image>
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xlink:href="http://maps3.nyc.gov/gis/data/tiles/basic/L
  
```

er svg:svg#innerSvgContainer svg:svg#basemap,GISBasic.basemap svg:image.basemap

titles 4 of 20 Cancel

Styles Computed Layout Event Listeners DOM Breakpoints Properties Accessibility

Filter :hov .cls +

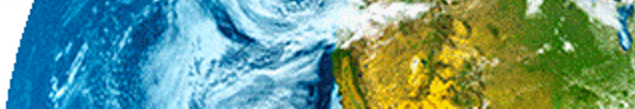
```

element.style {
}
svg:image[Attributes Style] {
  height: 512;
  width: 512;
  x: 1536;
  y: 0;
}
:not(svg) {
  transform-origin: 0px 0px;
}
image {
  overflow: hidden;
}
  
```

Inherited from div#wm_widget_MapEvent_0.d...

Console What's New X

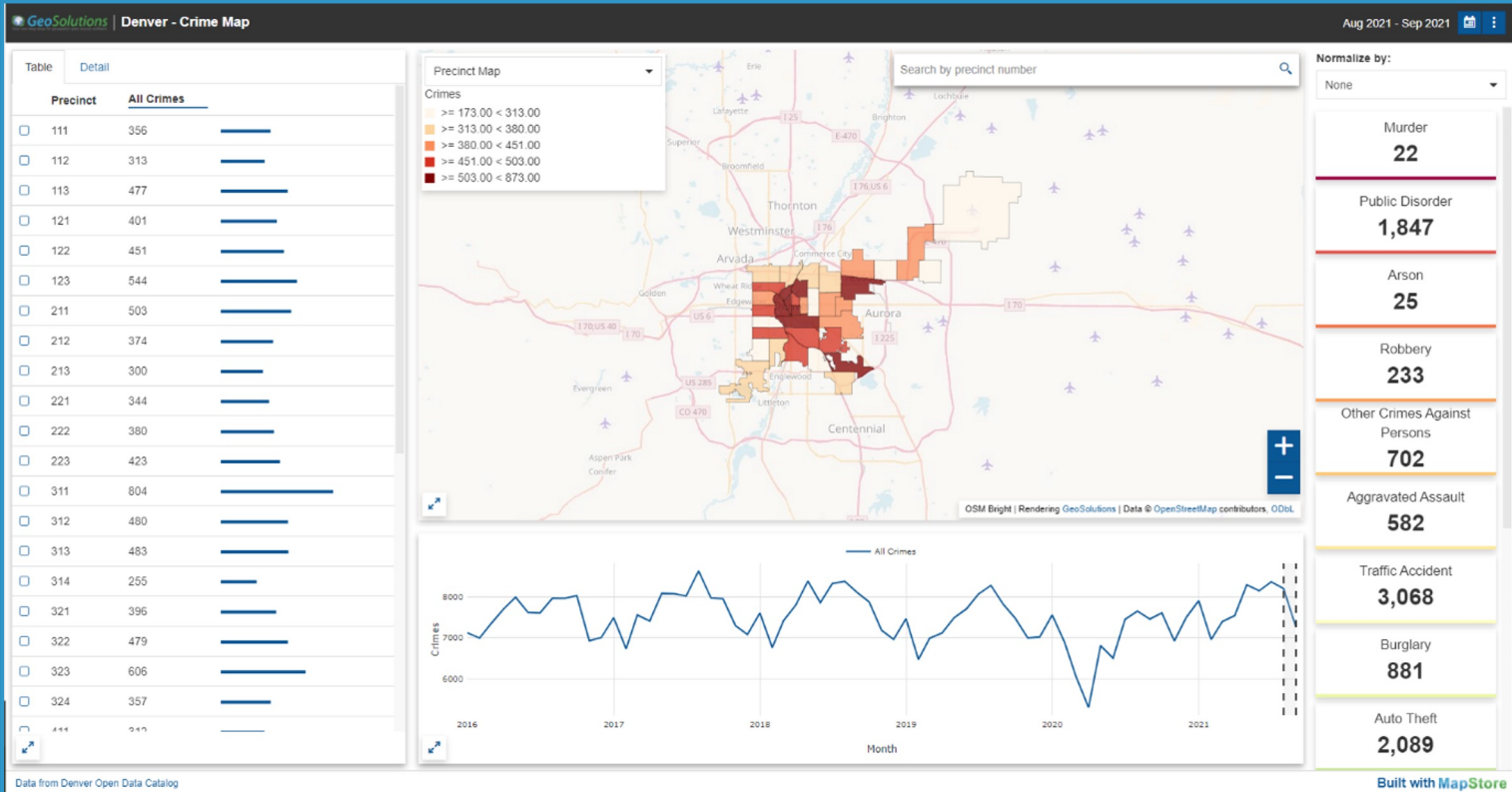
Highlights from the Chrome 114 update



City of Denver – Crime Mapping

- Online POC with Denver OpenData

GeoSolutions
your one-stop-shop for geospatial open source software



<https://www.crime-map.info/>





Cleveland Metroparks SDI

GeoSolutions
your one-stop-shop for geospatial open source software



Cleveland Metroparks GIS Portal

search...

Featured

- CM Public BaseMap
- CM Public Toner BaseMap

Results 2 of 2

Contents

- Maps (14)
- Dashboards (2)
- GeoStories (3)

GeoStories

- CM Coordinated Infrastructure

Kiosk/Directional at the Southwest Corner of Edgewater Roundabout

Cleveland Metroparks Whiskey Island Trail

EASTBOUND

You are at Edgewater Park Trail Connects to:

- Wendy Park
- Whiskey Island Marina
- Volleyball Courts
- Wendy Park Bridge
- Historic Coast Guard Station
- Cleveland Foundation Centennial Trail
- The Flats West Bank

1 Kiosk/Direct... 2 Fingerpointer... 3 Directional at ... 4 Fingerpointer... 5 Fingerpointer... 6 Directional at ... 7 Kiosk/Directio... 8 Fingerpointer... 9 Fingerpointer... 10 Directional at ... 11 Fingerpointer... 12 Kiosk at Carte... 13 Fingerpointer...

TIGER Proposed Signage





Howard County, MD

data.howardcountymd.gov/InteractiveMap.html

Gmail Activities Dashboard My Drive - Google... GeoSolutions Grou... (1) Ryan Burley | Lin... My Meetings - Zoom Maps ARC 2.0->My Arc Helpdesk : GeoSolu... Project Manageme...

HOWARD COUNTY MARYLAND

Info Legend About

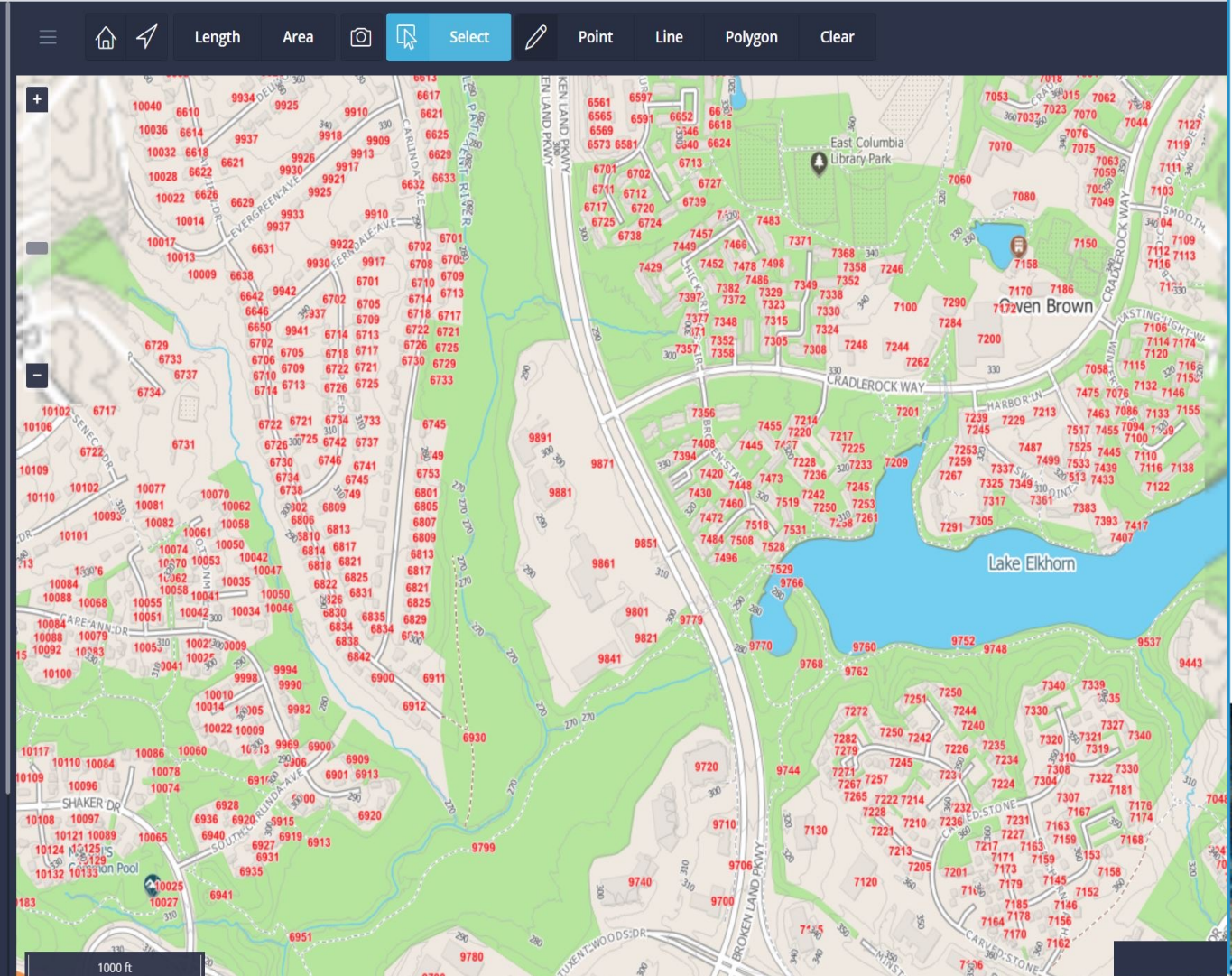
Search Addresses...

Detailed Search

Add Layer

Howard County Base Map

- GENERAL LAYERS
- ADDRESS POINTS
- STREETS & LABELS
- PROPERTY BOUNDARIES
- ZIPCODES
- CONTOURS 2018
- CONTOURS 2011
- COMMUNITY RESOURCES & SERVICES
- PARKS, OPEN SPACE, & EASEMENTS
- PLANNING AND ZONING



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EM/ER – Wildfire – Overwatch Imaging



OVERWATCH IMAGING

Missions Products Company Careers News [Contact Us](#)

DELIVERING CRITICAL INTELLIGENCE

FASTER THROUGH AUTOMATION

Missions Products

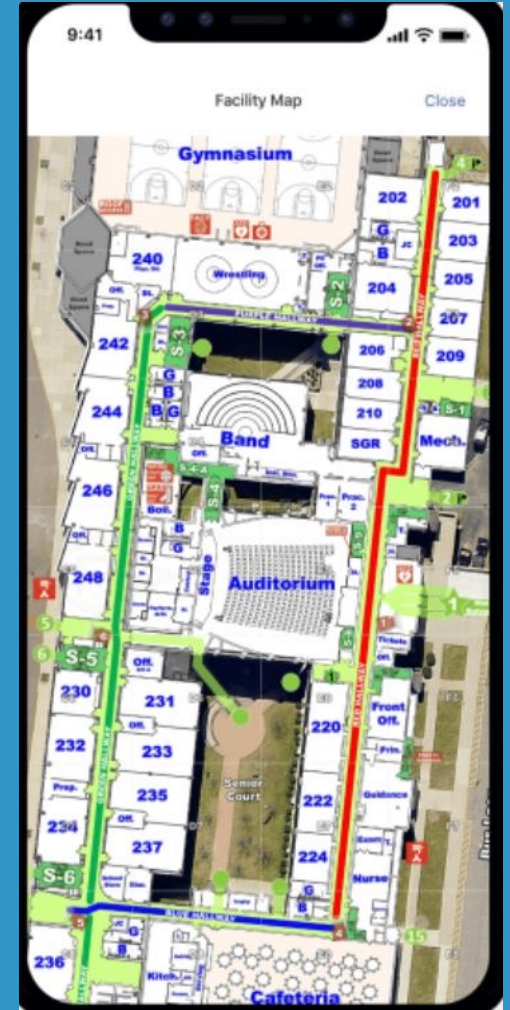
Search, Scan, and Detect Airborne Imaging Solutions | Portable, Collaborative Airborne Autonomy | Real-time Edge Processing and Data Delivery | Wide-area, Multispectral Imaging Systems



Critical Response Group - CRG



Critical Response Group - CRG





Live Demos

MapStore

Modern webmapping with OpenLayers, Leaflet and ReactJS.
Visit the [documentation page](#)

Featured

1 - Demo Map
Annotations, Search tool, Details, Widgets, Layer filter, Identify, domain sharding and other

2 - Demo Dashboard
Filtering Capabilities

2 - Demo Map
Sample map from GS demo context

3 - Demo GeoStory
Highest Astronomical Observatories

Show more...

Results 4 of 24

Contents

- Maps (151)
- Dashboards (34)
- GeoStories (21)

Maps

https://lnkd.in/drWKM7_r

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Resources for Learning More

YouTube Channel:

<https://www.youtube.com/c/geosolutionsgroup>

GeoServer Instructionals: https://youtu.be/Kga_xBK5xXE

GeoNode Instructionals: <https://youtu.be/orXUiYKrecc>

MapStore Instructionals: <https://youtu.be/o9EVnJyUflM>

Migration Instructionals: <https://youtu.be/24e443PmwEs>

(Specific How-to Videos, etc...)

Past Webinars:

FEMA TOP Demo: <https://youtu.be/wljUBO8LEA>

City of Genova/3D Demo: <https://youtu.be/M5uCoS-ILbY>

GeoServer for Emergency Management Demo:

<https://tinyurl.com/49z799mu>

(Several other demos)

Continued...

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Additional Resources

Community Support:

GeoServer: <https://geoserver.org/comm/>

GeoNode: <https://geonode.org/>

MapStore: <https://groups.google.com/g/mapstore-users>

Documentation:

GeoServer: <https://docs.geoserver.org/>

GeoNode: <https://docs.geonode.org/en/master/>

MapStore:

<https://docs.mapstore.geosolutionsgroup.com/en/latest/user-guide/home-page/>

GeoSolutions Blog:

<https://www.geosolutionsgroup.com/category/blog/>

Events: FOSS4G North America: <https://foss4gna.org/>

Need Assistance finding OS support resources? Let me know!





We want to hear from you!

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