



24 September 2025

LIVEABLE CITIES  
PHILIPPINES

# Leveraging Geospatial Intelligence for Flood Resilience

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*Geodata Systems Technologies, Inc.*





Flood on Mother Ignacia Ave. near cor. Samar Avenue, QC on August 30, 2025. 24 Oras Weekend

© 24 Oras Weekend

Project Map Insert Analysis View Edit Imagery Share Satellite Imagery for ArcGIS Help

Paste Cut Copy Copy Path Clipboard

Explore

Bookmarks Go To XY

Basemap Add Add Data From Path XY Table To Point Add Graphics Layer

Select Select By Attributes Select By Location

Attributes Clear Zoom To

Measure Locate Infographics

Pause Lock View Unplaced More

Convert Download Map Sync Remove Offline

Contents

Search

Drawing Order

- 2D
- 3D Layers
- 2D Layers
  - ☒ Hybrid Reference Layer
  - ☒ World Imagery
- Elevation Surfaces
- Ground
  - ☒ WorldElevation3D/Terrain3D



Project Map Insert Analysis View Edit Imagery Share Satellite Imagery for ArcGIS Help Simulation

Flood Layer - QC 15mm ▾  
Modify Region  
Zoom To  
Active

Cell Size: 1,499 m ▾  
Temporal: Low ▾  
Precise ————— Fast  
Resolution

Duration: 01:00:00 hrs  
Rainfall/hr: 100 mm ▾  
Evaporation/hr: 0 mm  
Configuration

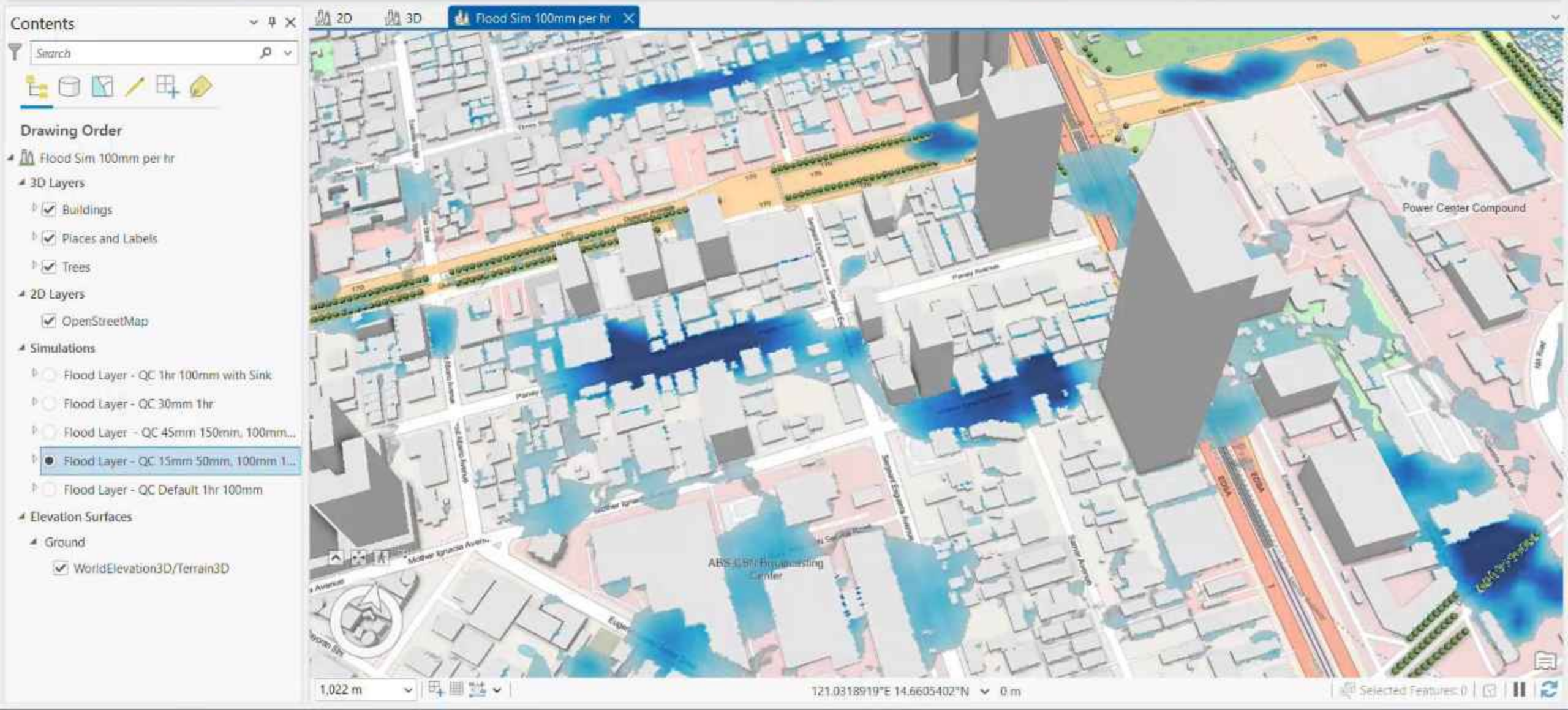
Run  
Build

Current: 00:59:00  
Step: 00:05:00  
Rate: 1 fps ▾  
Playback

Clear  
Start  
End  
Rain

Channel  
Water Area  
Barrier  
Insert

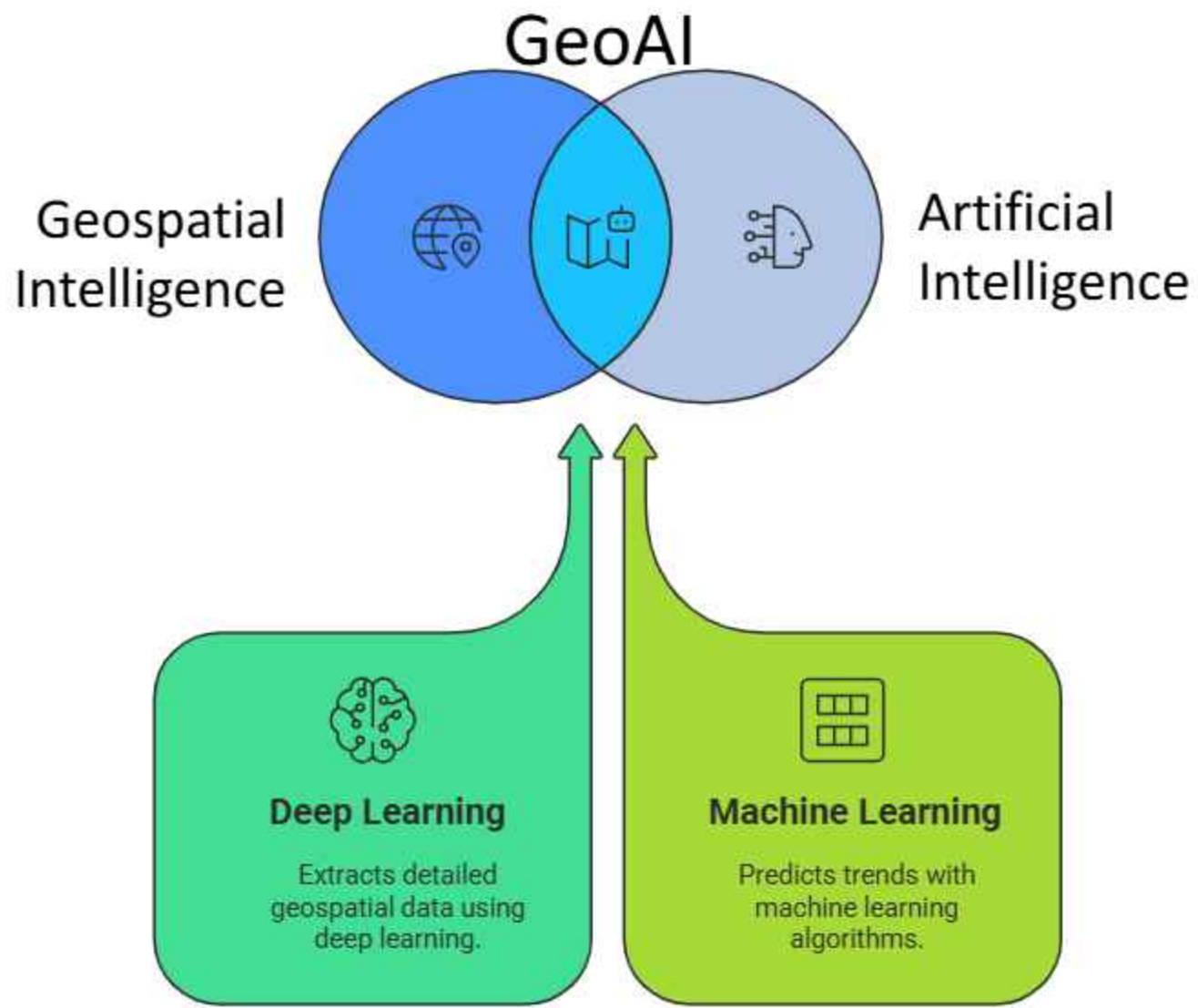
Analysis Results  
Export





### Model the real world for prediction

Aerial imagery is used to extract imagery of buildings and roads in Grenada to identify the population and infrastructure at risk for landslides.



# What can GeoAI do?



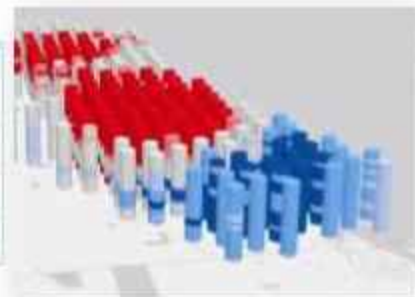
Extract features from  
imagery & lidar



Make predictions



Find patterns & clusters



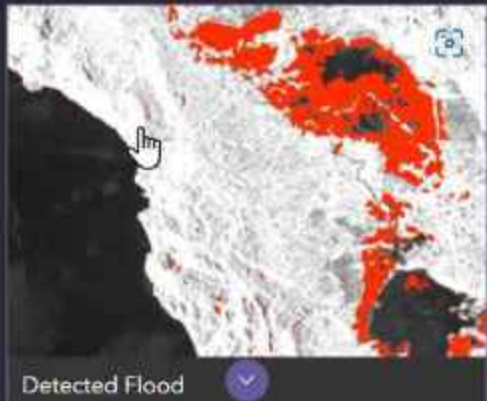
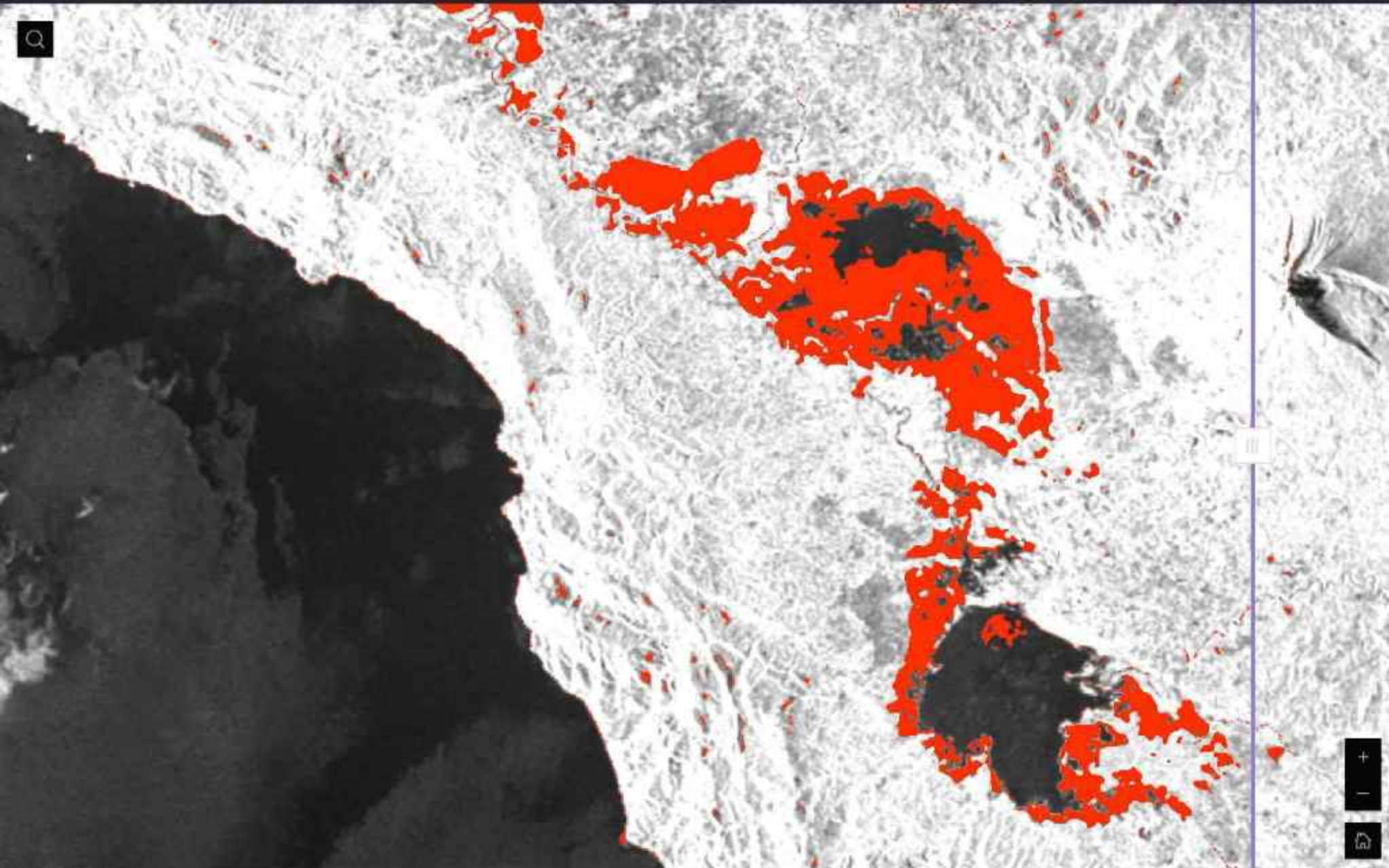
Detect anomalies and  
outliers



Extract insights from  
unstructured text



# Flood Extent Dashboard: Impact of Typhoon Kristine in Naga City



**Contents**

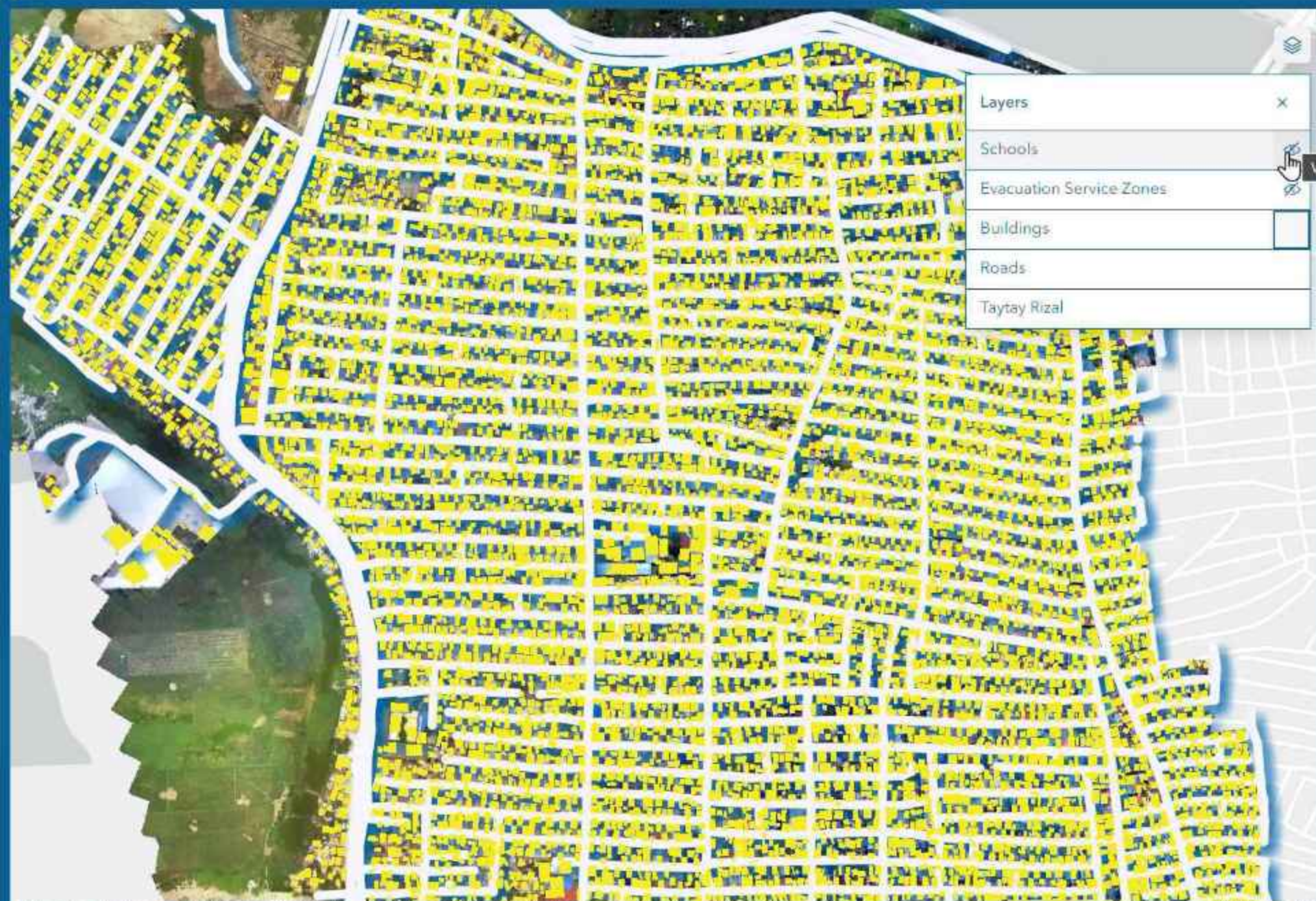
Search

**Drawing Order**

- Map
  - ☒ Change Detection
    - Class\_name
      - new water
      - lost water
      - No Change
  - ☐ Flooded
    - Value
      - no water
      - water
  - ☐ Pre-flood
    - Value
      - no water
      - water
  - ☐ Sentinel-1 July 28 2025
  - ☐ Sentinel-1 July 16 2025
  - ☐ July28\_Waterbody\_Mask
  - ☐ July16\_Waterbody\_Mask
  - ☐ July16\_Filter
  - ☐ July28\_Filter
  - ☐ July28\_Calcu
  - ☐ July16\_Calcu
  - ☐ July26\_Waterbody
  - ☐ July28\_Mask\_Co\_CompositeBand







## Building Count

9.2k

## Road Segment Count

1.4k

## Evacuation Centers

-  Sitio-Tapayan Elementary School
-  Greenhomes Integrated School Of Pasig City
-  Taytay Immanuel Church
-  Voice of Hope in Christ Jesus Ministry
-  St. John Calabria Foundation

# Coconut Tree Farm Monitoring Dashboard

Grid Block

Q Search...

● None

1

2

3

4

5

Reset

Unplanted Area (%)

52.98 - 95.8

52.98

95.8

Reset

Tree Height (m)

0.01 - 19.98

This dashboard showcases the output of a drone survey of 76-hectare (4,16,56 ha) coconut farm located in Cajesar Farm in Sariaya, Quezon Province.



Esri Community Maps Contributors, Esri, TomTom, Garmin, Foursquare, METI/NASA, USGS

Powered by Esri

## Coconut Tree Count

186

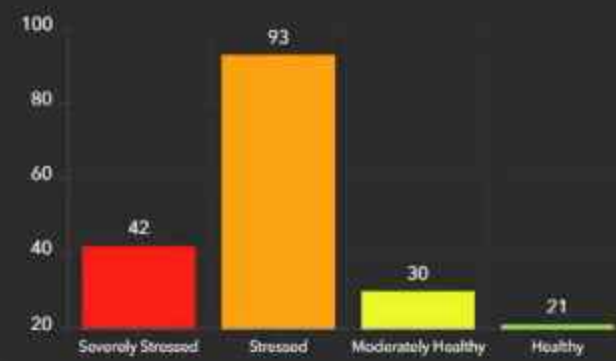
## Planted Area (ha)



Planted

Unplanted

## Tree Health



Tree Health

Yield Time Series



- Overview
- High Angle View 1
- High Angle View 2
- High Angle View 3
- Eye Level
- Flooded Overview
- Flooded High Angle View
- Flooded Eye Level View
- Flooded Bird's Eye View





## Pretrained Models



Image feature extraction  
and detection

Pixel classification



Point cloud classification

Object tracking



Image redaction



*Over 100 pretrained models available in ArcGIS  
Living Atlas and growing*



| Alert Type | Time                | Event                                                                                                                                                                                                               | Location                                                                                                    |
|------------|---------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------|
| Urgent     | 9/22/2025, 12:10 PM | Philippine Interior and Local Government Secretary Remulla says 216 arrested, including 89 minors, in connection with September 21 protest on Recto Avenue in Manila: Reporter Photo via X.                         | Recto Ave, Binondo, Manila, Metro Manila, Philippines                                                       |
| Urgent     | 9/22/2025, 12:05 PM | One killed and 48 injured during September 21 protest on Mendiola Street in Manila, Philippines: Local News Outlet Photo via X.                                                                                     | Mendiola St, San Miguel, Manila, 1008 Metro Manila, Philippines                                             |
| Urgent     | 9/22/2025, 11:52 AM | All offices and schools closed across 29 provinces in Philippines due to Typhoon Ragasa: Local News Outlet via Newstalk ZB.                                                                                         | Calayan, Cagayan, Philippines                                                                               |
| Alert      | 9/22/2025, 11:45 AM | Over 270 vehicles damaged after flooding at Kusunoki Parking Lot in Hamadacho, Yokkaichi, Mie, Japan: Major News via TV Asahi.                                                                                      | Kusunoki Parking Lot, 2-5 Hamadacho, Yokkaichi, Mie 510 0067, Japan                                         |
| Urgent     | 9/22/2025, 11:36 AM | Philippine Health Department confirms one killed during September 21 protest on Recto Avenue in Manila: Local News Outlet Photo via X.                                                                              | Recto Ave, Binondo, Manila, Metro Manila, Philippines                                                       |
| Urgent     | 9/22/2025, 11:28 AM | Magnitude 4.3 earthquake detected 18 km southeast of Manado, Indonesia: Blog via X.                                                                                                                                 | Manado, Manado City, North Sulawesi, Indonesia                                                              |
| Urgent     | 9/22/2025, 11:27 AM | Typhoon Ragasa detected 110 km east of Calayan, Cagayan, Philippines with wind speed up to 215 km per hour: Local News Outlet Photo via X.                                                                          | Calayan, Cagayan, Philippines                                                                               |
| Urgent     | 9/22/2025, 11:25 AM | At least 700 passengers affected by 14 domestic flight cancellations at Ninoy Aquino Airport and Clark Airport in Philippines due to severe weather: Manila Standard, Local Source Photo via X.                     | Clark International Airport, N 6900 CRK Airport Road, Clark Freeport Zone, Pampanga, Philippines            |
| Alert      | 9/22/2025, 11:20 AM | Philippine Presidential Task Force on Media Security condemns harassment of journalist Gary de Leon during September 21 protest on Mendiola Street in San Miguel, Manila: Phil News Agency, Government Photo via X. | Mendiola St, San Miguel, Manila, 1008 Metro Manila, Philippines                                             |
| Urgent     | 9/22/2025, 11:15 AM | Magnitude 4.4 earthquake detected 19 km west of Siocan, Philippines: Blog via X.                                                                                                                                    | Siocan, Zamboanga del Norte, Philippines                                                                    |
| Urgent     | 9/22/2025, 11:01 AM | Nissan Motor starts testing new driver-assistance system with technology from British startup Wayve, ahead of planned launch in Japan in 2027: Major News Outlet via Reuters.                                       | Nissan Global Headquarters Gallery, 1F, 1-chōme-1-1 Takashena, Nishi Ward, Yokohama, Kanagawa 220-8586, ... |
| Alert      | 9/22/2025, 10:56 AM | Philippine National Police Acting Chief Lieutenant General Jose Melencio Nartatez visits police officers injured during protest at PNP General Hospital in Manila: Reporter Photo via X.                            | PNP General Hospital, Camp Panopio, P Tuazon Blvd. Corner EDSA Main Avenue, Kaulanran, Cubao, Quezon Ci...  |
| Alert      | 9/22/2025, 10:51 AM | CCTV repaired after being damaged during protest on September 21 in front of Disaster Risk Reduction and Management Office in Manila, Philippines: Local News Outlet Photo via X.                                   | Manila Disaster Risk Reduction Management Office, 659, Ermita, Manila, 1000 Metro Manila, Philippines       |
| Urgent     | 9/22/2025, 10:31 AM | Heavy rainfall prompts suspension of classes in 29 areas in Philippines, including Iloilo City, Leon, Zarraga, Tigbauan, Oton, Badiangan, and Tubungan: Local News Outlet via INQ News.                             | Iloilo City, Iloilo, Philippines                                                                            |
| Urgent     | 9/22/2025, 10:16 AM | Update on Category 5 Hurricane Ragasa, currently positioned in the Philippine Sea: Sensor via DTN.                                                                                                                  | Philippine Sea                                                                                              |



# Geospatial Strategy Framework



Understand

Flood Layer - with drain

Modify Region

Zoom To

Cell Size: 1433 m

Temporal: Low

Precise Fast

Duration: 01:00:00 hrs

Rainfall/hr: 100 mm

Evaporation/hr: 0 mm

Run

Clear

Current: 01:00:00

Step: 00:05:00

Rate: 1 fps

Start

End

Rain

Channel

Water Area

Barrier

Analysis Results

Export

Contents

Search

Drawing Order

2D Layers

OpenStreetMap

Simulations

Flood Layer - with drains

Water Depth

2.000000

0.000000

Area of Interest

Water Sources

Drainage

Sink Area 1

Sink Area 2

Sink Area 3

Sink Area 4

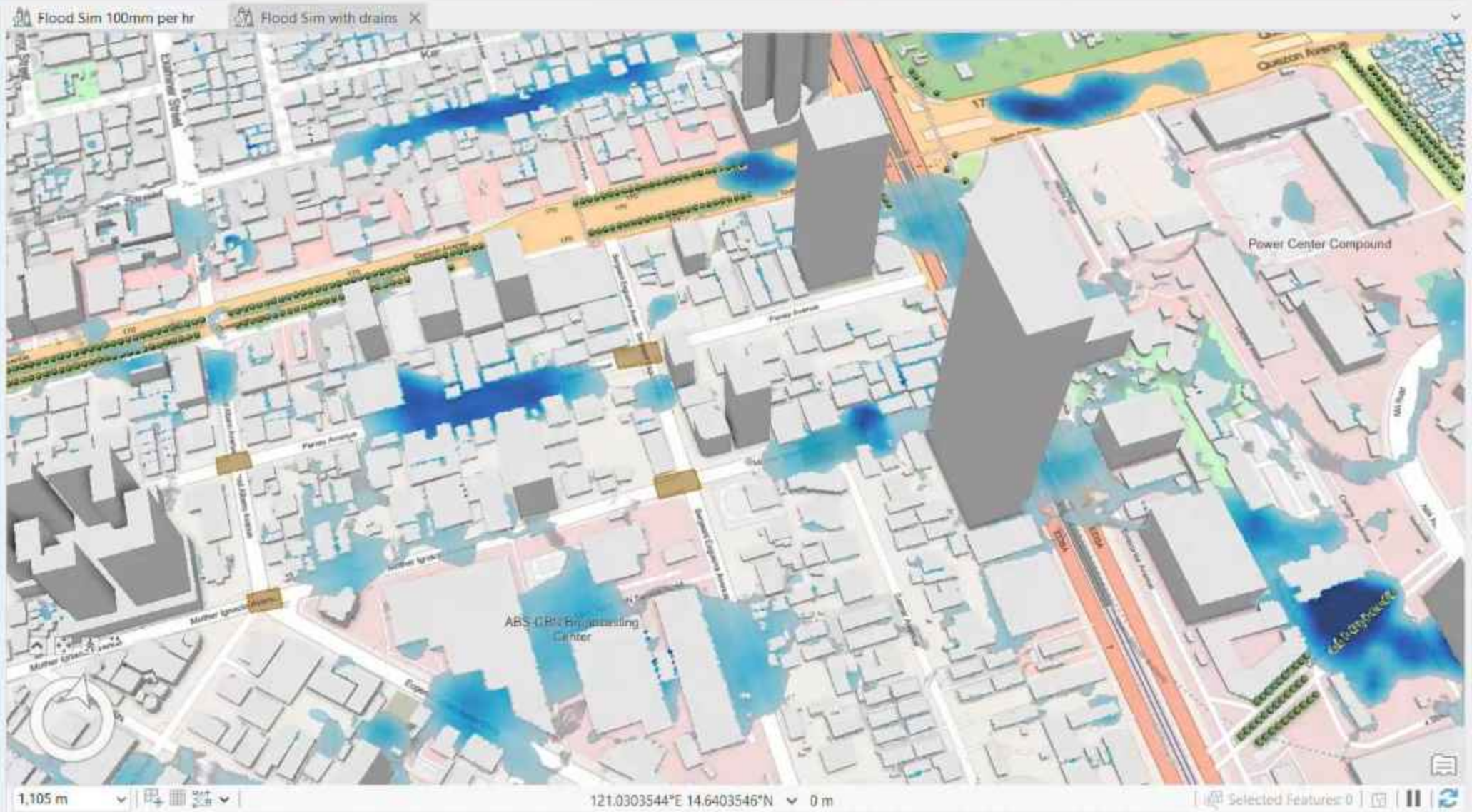
Sink Area 5

Sink Area 6

Barriers

Flood Layer 3

Flood Layer 2



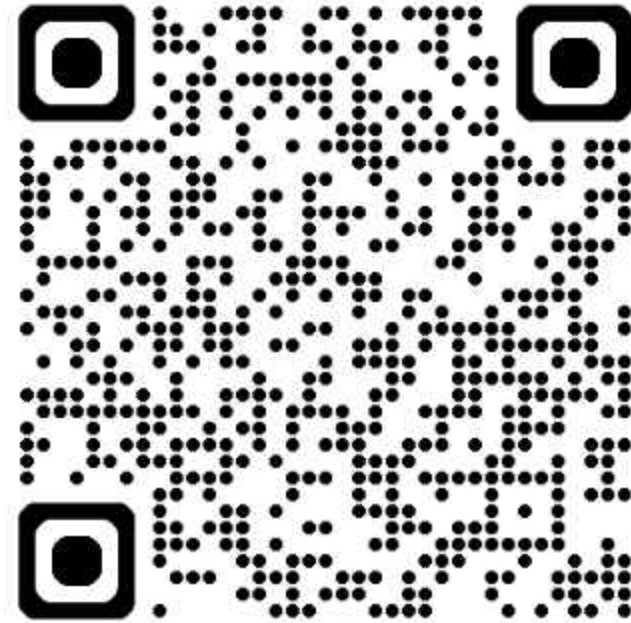
**Flood resilience isn't just about weathering the storm—  
it's about harnessing our collective resources and embracing technology,  
deeply anchored in genuine love of country,  
and rising above it.**



Connect with us.



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SYSTEMS

