Lightning Talks:

Inundation Technology Innovations

Public-Private Partnerships for Improved Monitoring, Alerting, and Predictions of Hyperlocal Flooding
Brian Glazer, Hohonu

Leveraging FloodVision to inform Resilience Decision-Making
Dan Rizza, Climate Central
Fara Ilami, Northeast Florida Regional Council

Alaska Flood Inundation Tool (AK-FIT)
Keith Horen, State of Alaska Division of Geological & Geophysical Surveys

Diving Into the Digital Coast
Bret Folger and Maravilla Clemens, NOAA Office for Coastal Management

Hohonu

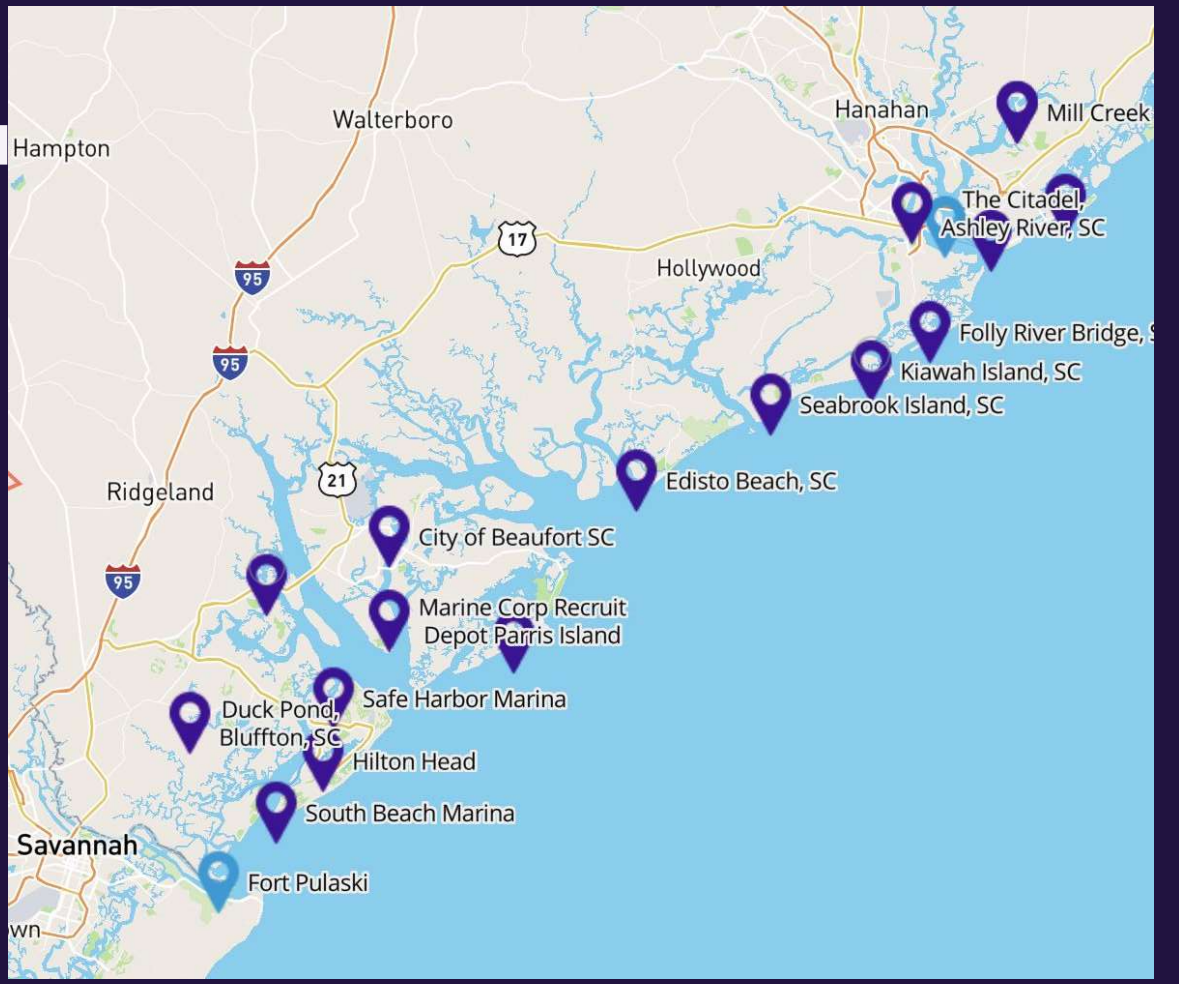
Public-private partnerships to support and enhance flooding resilience

“Sustainability” and “Resilience”
“Adaptation” and “Mitigation”
are neither interchangeable terms,
nor independent concepts

…neither do they need to be politically decisive

Value of quantifying and predicting variability in spatial impacts are beginning to match value of 30-year records at sparse locations

Different tools for different applications



Software + ML Unleashes Low-Cost Hardware

Hohonu

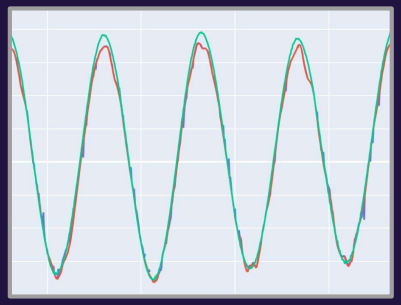
Affordable Sensors

Internet-Connectivity +
No External Power

- **<1 Hour Installation -** Can be installed by anyone
- **Compact** - Hold w / 1 Hand
- **Ultra Low Power** → No external power required

ML Analytics + Forecasts

Actionable
Data & Insights



- **Real-time QARTOD**
- **Data Conversions** depending on sensor environment
- **80% Better Predictions** compared to NOAA tidal

SaaS Products

Consumer-Designed
Software Tools

INTRODUCING
TideCast
by Hohonu

Download on the App Store

- **Anyone** can access data captured by Hohonu sensors
- **Alerts** for early flood warnings
- **Reports** for post-flood analysis

The Only Full-Stack Water Data Platform

Hohonu

Team

Decades of expertise building and deploying water sensors

Network

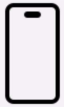
Already in 16 states capturing over 100,000 hours of data per month

Data

Hohonu retains rights to sell collected data for commercial purposes

Modular Hardware Design

Integrate any off-the-shelf water sensor



Full-Stack Software Platform

Data QA/QC

Urban Real-Time Monitoring

Satellites cannot monitor dense environments

Data Ownership

Hohonu owns all data it collects

Expansion Opportunities

Proprietary dataset = competitive advantage for forecasting and other services

Partnered With NOAA, ASBPA, etc.

Hohonu

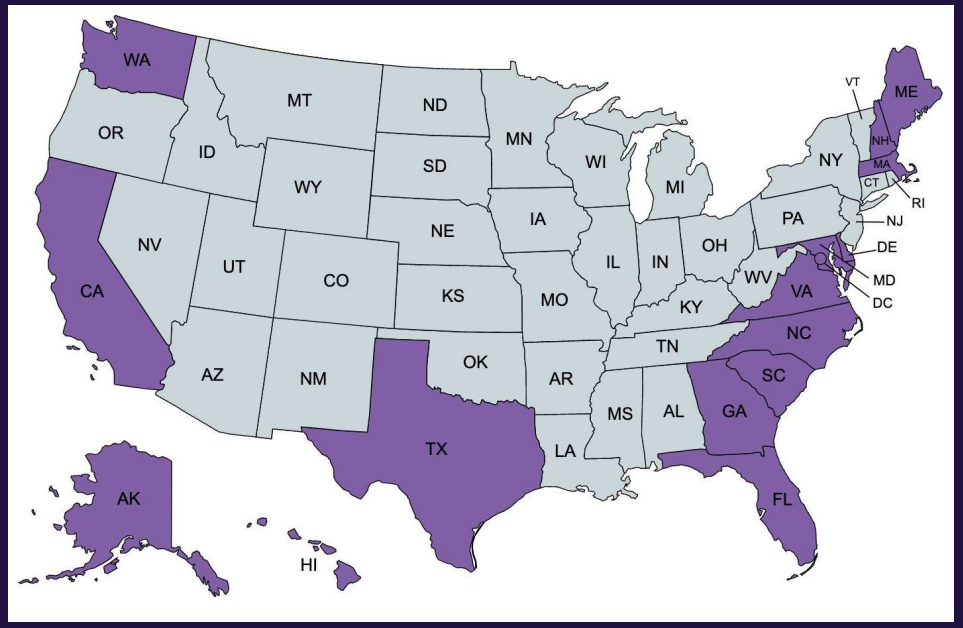
Multi-Year Projects From Alaska to Florida

Multiple Divisions of NOAA

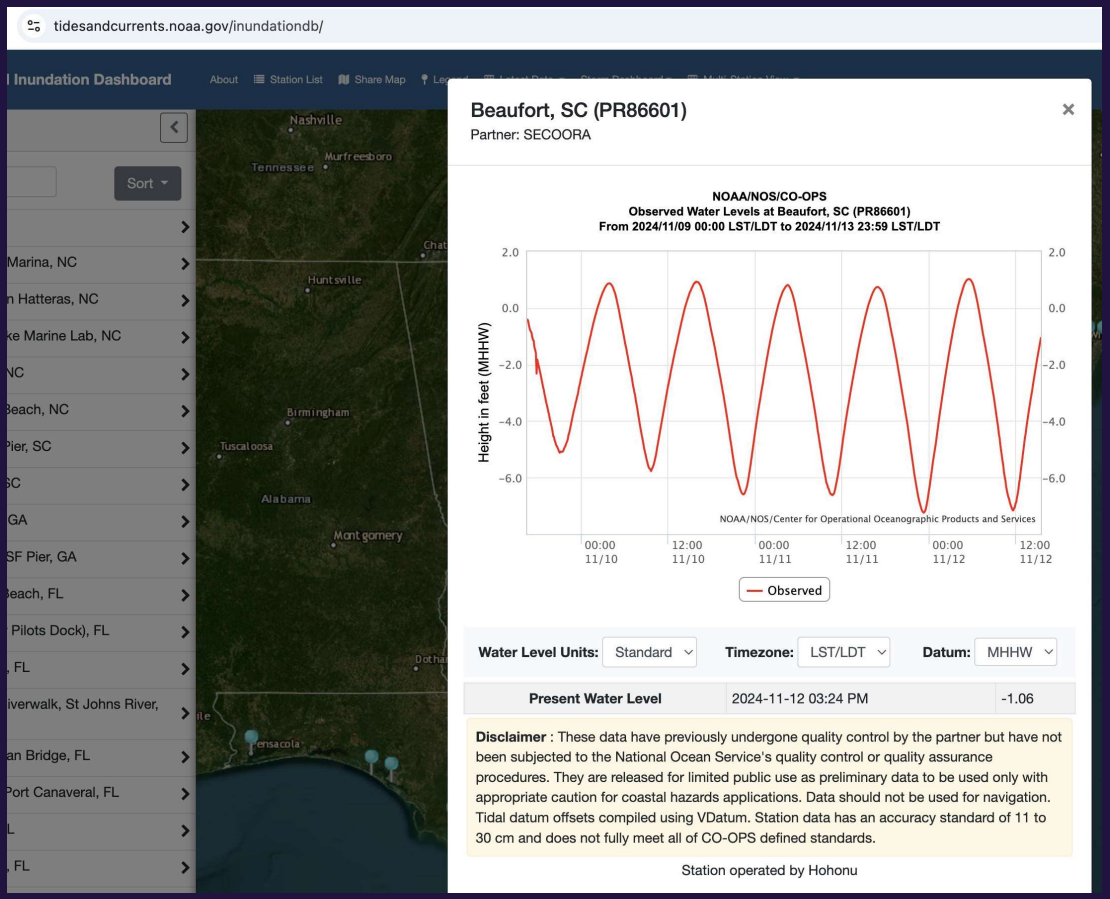
16 States

160+ installations

Counties, towns, municipalities, etc.



Case Study: SECOORA Water Level Network

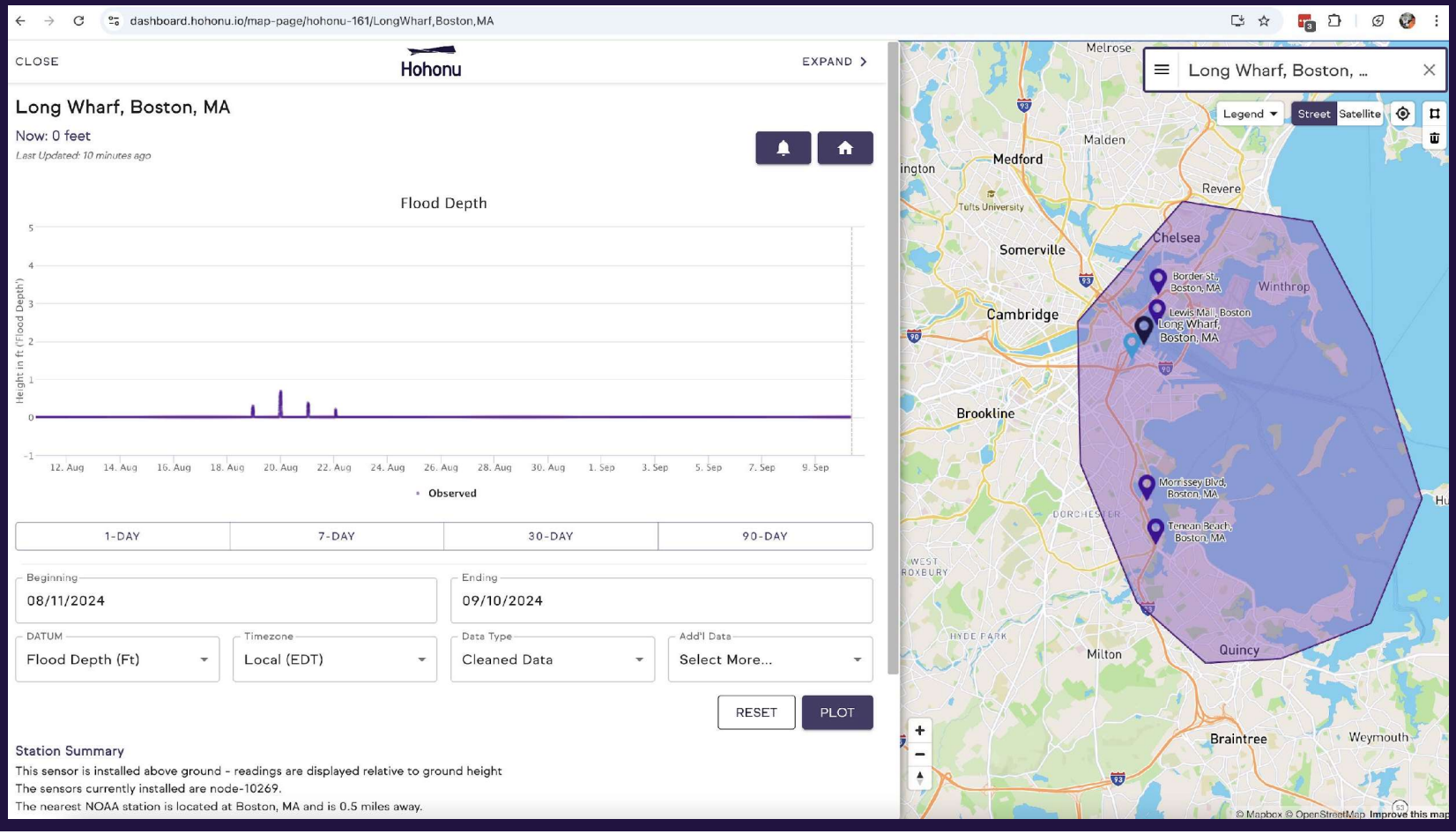


57 Hohonu water level stations fed directly into SECOORA's data portal

41 communities are collecting water level
4,000 unique visitors to Hohonu dashboard

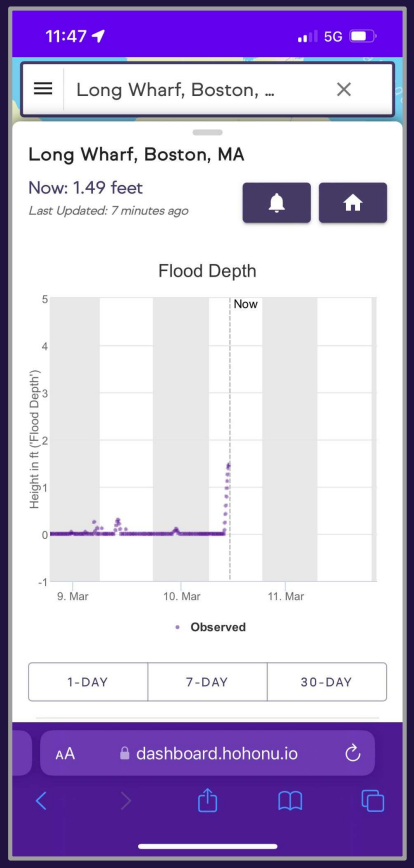
Deployed **13 active monitoring sites** between Fort Pulaski and Charleston NOAA tidal stations

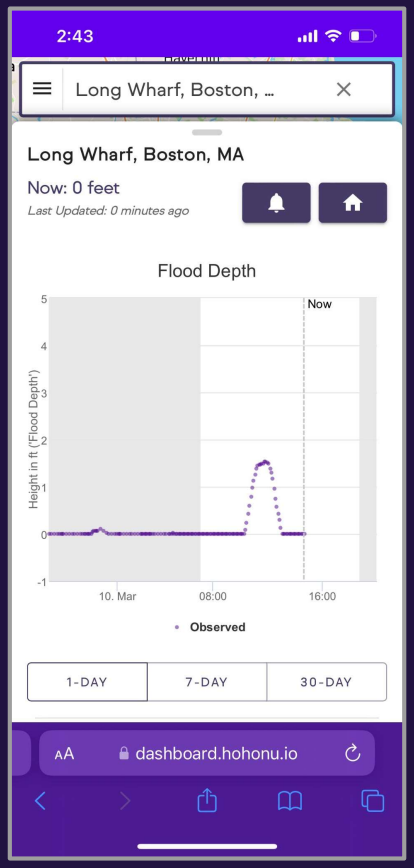
Real-Time High Spatial Resolution

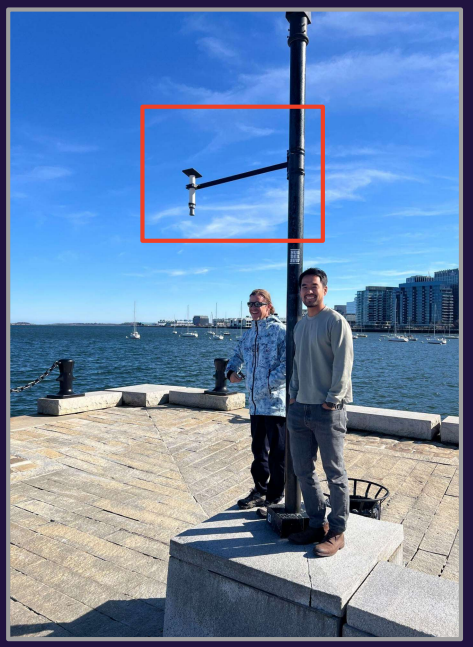


Real-Time Temporal Resolution

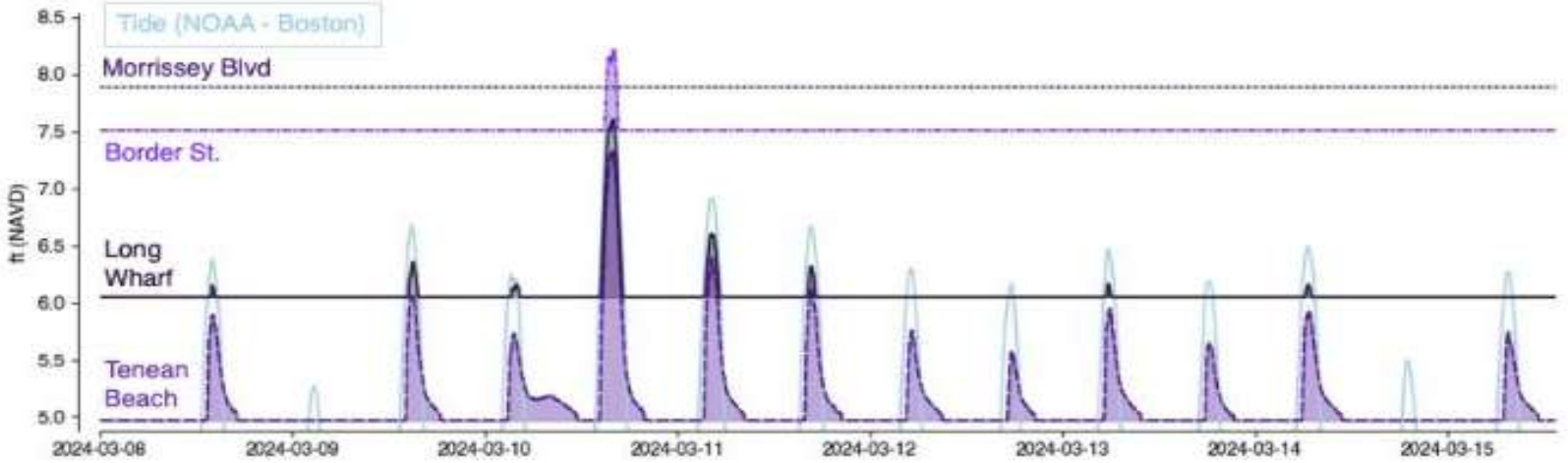
Hohonu





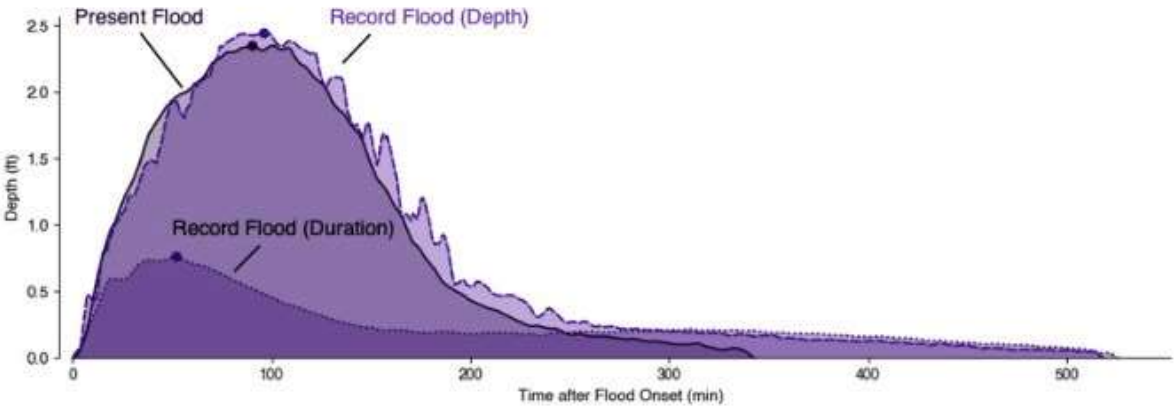


Flood Analyses



Station	Individual Floods	Max Inundation (ft)	Total Duration (min)	Avg. Time to Peak (min)	Avg. Time to Drain (min)	Avg. Tide at Onset (ft NAVD)
Tenean Beach	12	2.35 (3/10)	3512	50	242	6.01
Long Wharf	8	1.55 (3/10)	574	35	36	6.40
Border St.	1	0.70 (3/10)	106	77	29	7.28
Morrissey Blvd.	0	-	-	-	-	-

Flood Analyses



Flood	Peak Inundation (ft)	Flood Duration (min)	Time to Peak (min)	Time to Drain (min)	Tide at Onset (ft NAVD)
Present	2.35	343	90	253	6.21
Record Flood (Depth)	2.45	519	96	423	7.23
Record Flood (Duration)	0.76	526	52	474	5.99
Average (N=20)	1.15	297	54	243	6.09

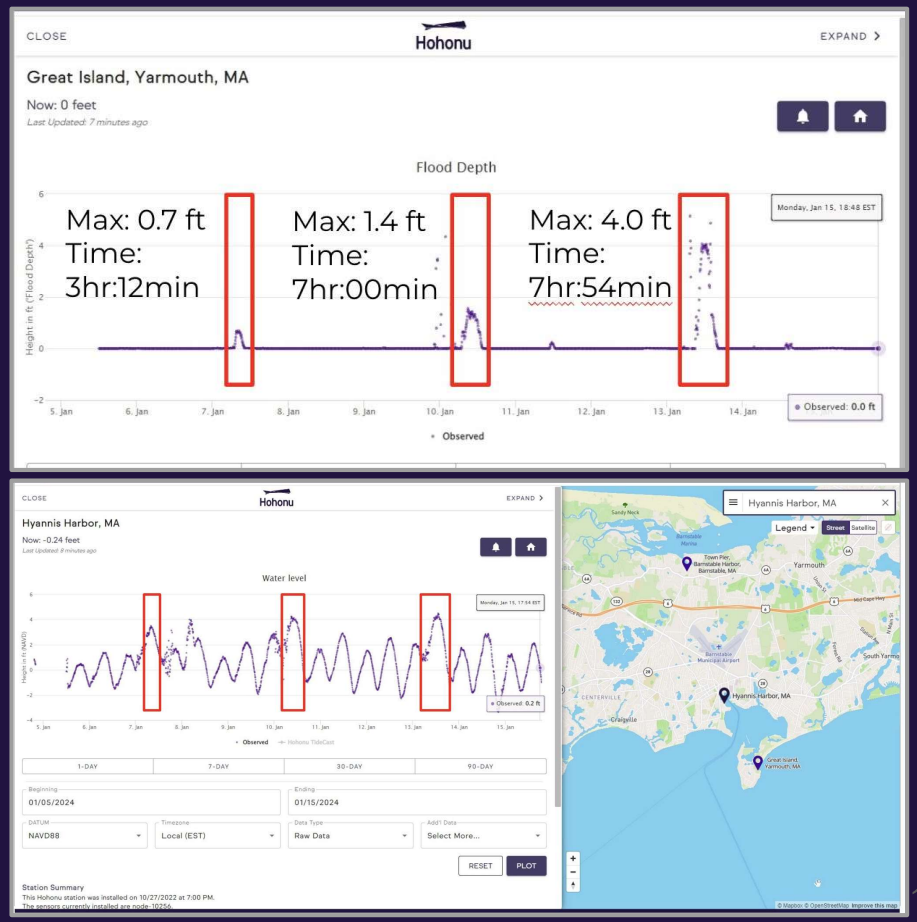
Improved Predictive Analytics

Hohonu

Monitoring Flooded Roads

An HOA community has 1 road in/out that routinely flooded, but did not have quantitative metrics to prove it

Purchased a subscription to quantify exactly **how high, how long, and how often** the entrance / exit road floods



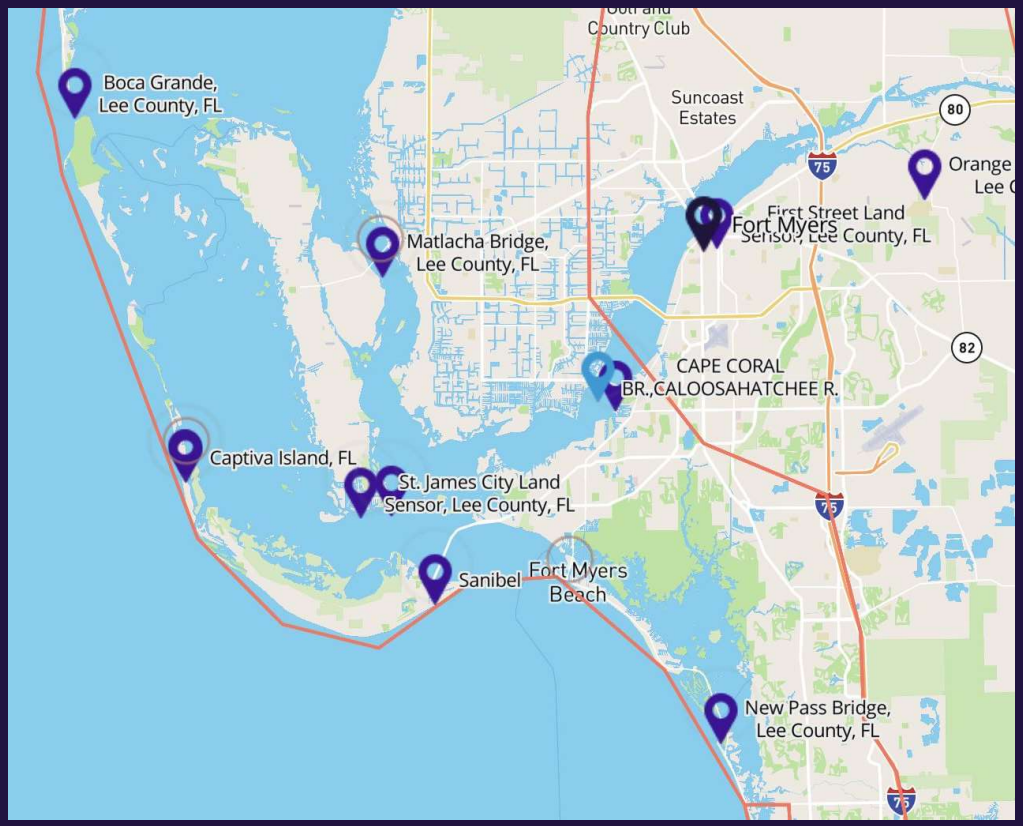
Hohonu <> Lee County deployments 9/2024

11 new Hohonu gauges

Installed Sep. 2024

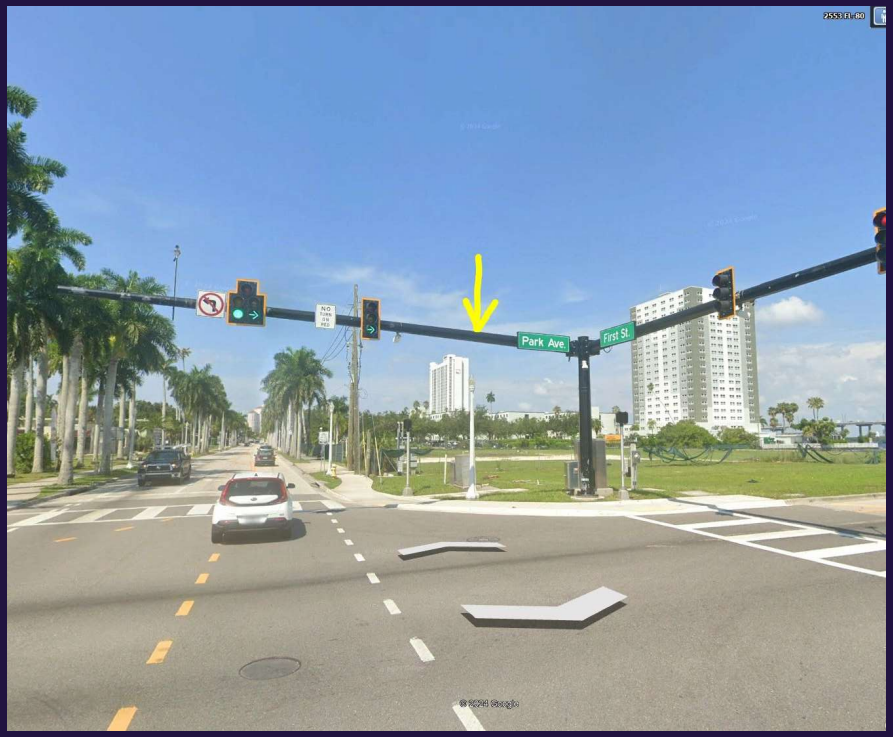
Maximum residual with the nearest NOAA observations was about 3.5’

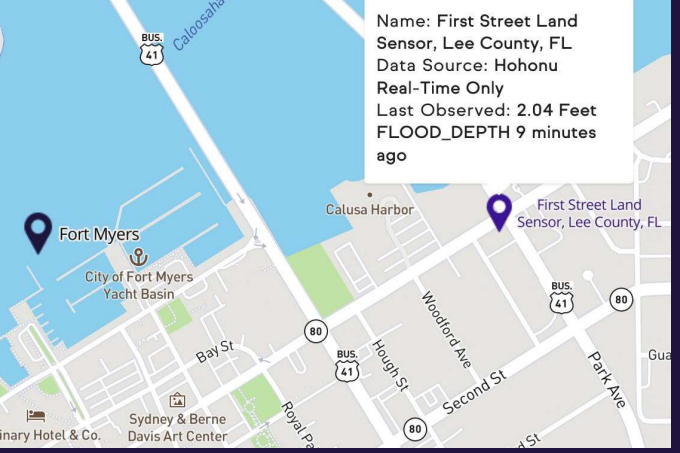
Maximum residual with the NOAA harmonic prediction about 7’

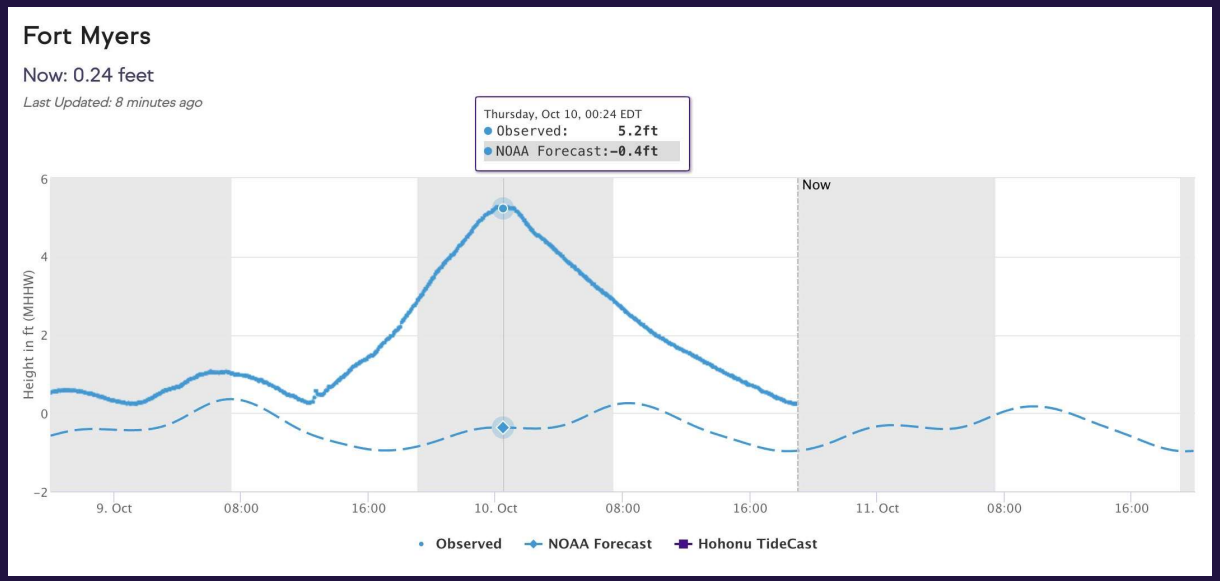


Hurricane Helene – 1st St. Ft. Meyers

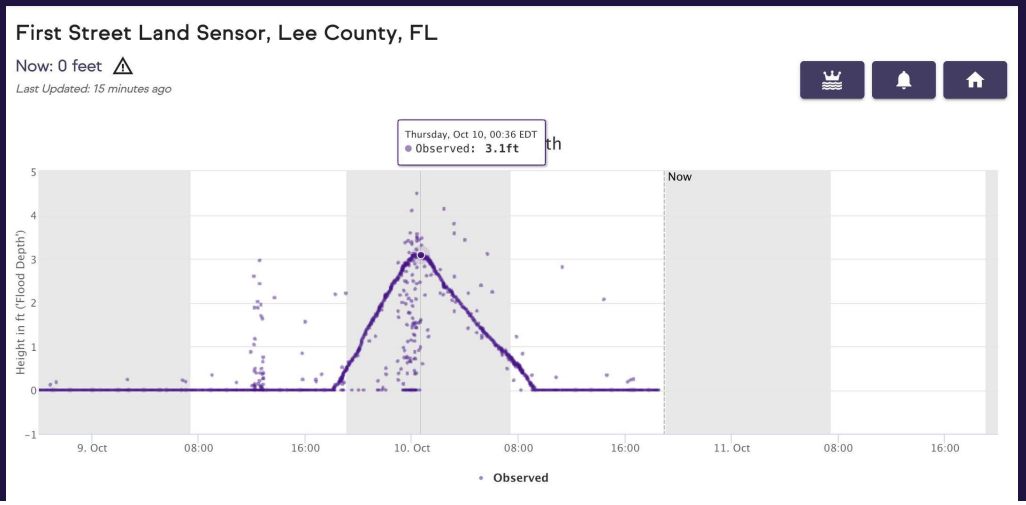
Hohonu



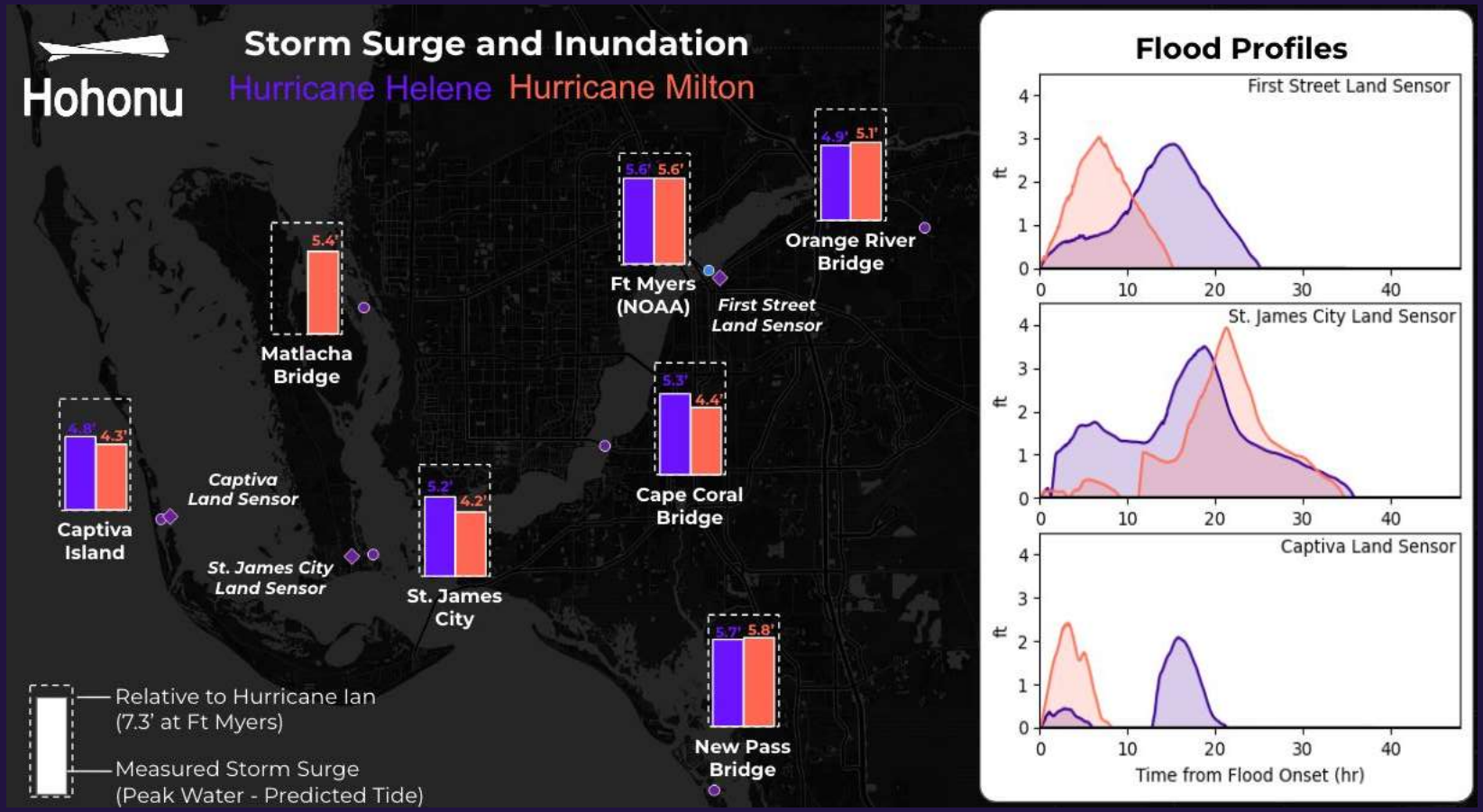

Name: First Street Land Sensor, Lee County, FL
Data Source: Hohonu Real-Time Only
Last Observed: 2.04 Feet FLOOD_DEPTH 9 minutes ago
Fort Myers
City of Fort Myers Yacht Basin
Calusa Harbor
First Street Land Sensor, Lee County, FL
Bay St
Hough St
Woodford Ave
Second St
Park Ave
Sydney & Berne Davis Art Center
BUS. 41
80


Fort Myers
Now: 0.24 feet
Last Updated: 8 minutes ago
Thursday, Oct 10, 00:24 EDT
Observed: 5.2ft
NOAA Forecast: -0.4ft
Now
Height in ft (MHHW)
9. Oct
08:00
16:00
10. Oct
11. Oct
Observed
NOAA Forecast
Hohonu TideCast

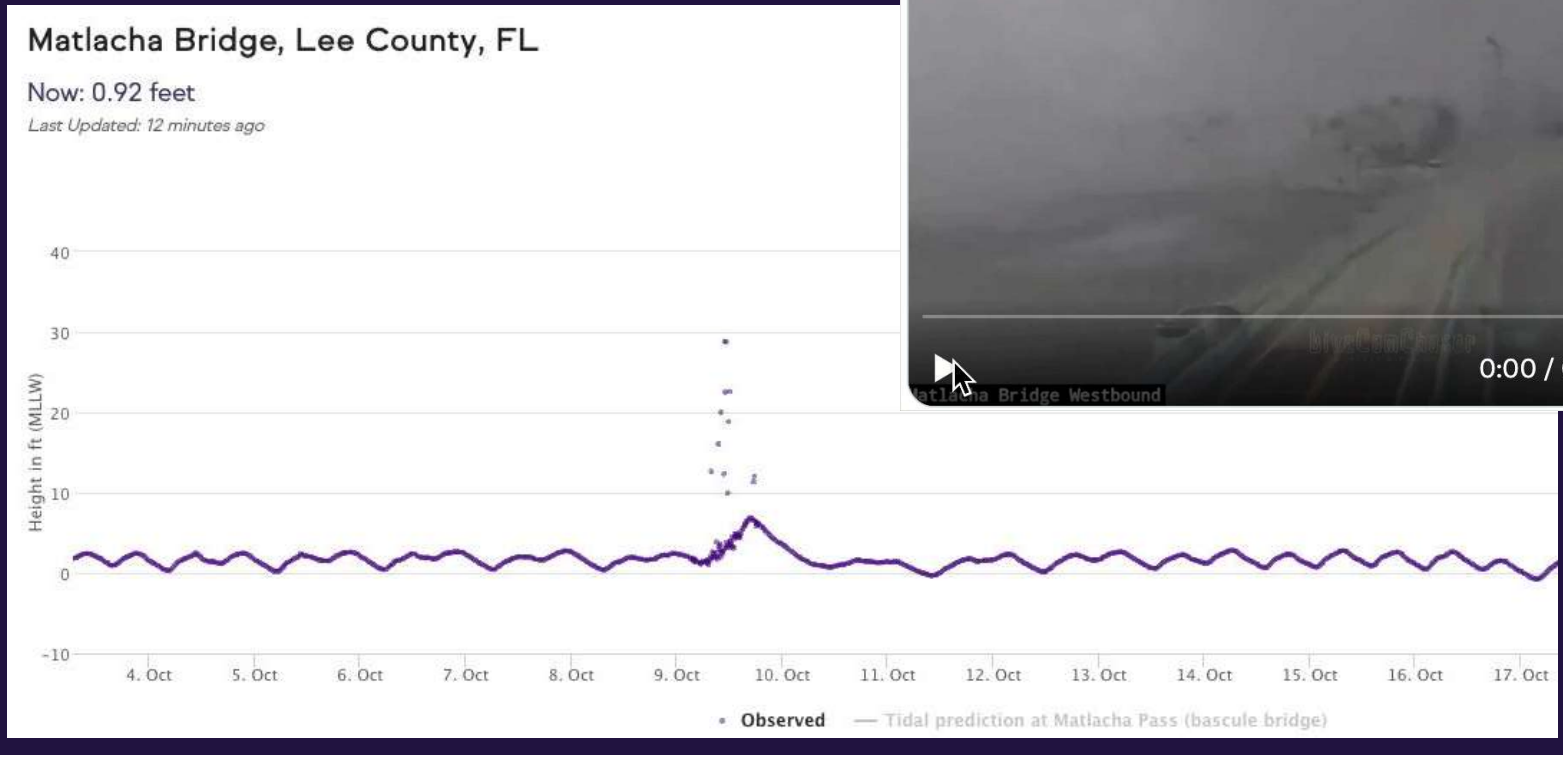

Park Ave at First St
FDOT


First Street Land Sensor, Lee County, FL
Now: 0 feet
Last Updated: 15 minutes ago
Thursday, Oct 10, 00:36 EDT
Observed: 3.1ft
Now
Height in ft ('Flood Depth')
9. Oct
08:00
16:00
10. Oct
11. Oct
Observed

Hurricane Helene & Milton



Hurricane Milton, Matlacha Bridge Tornado



Article | Published: 26 June 2024

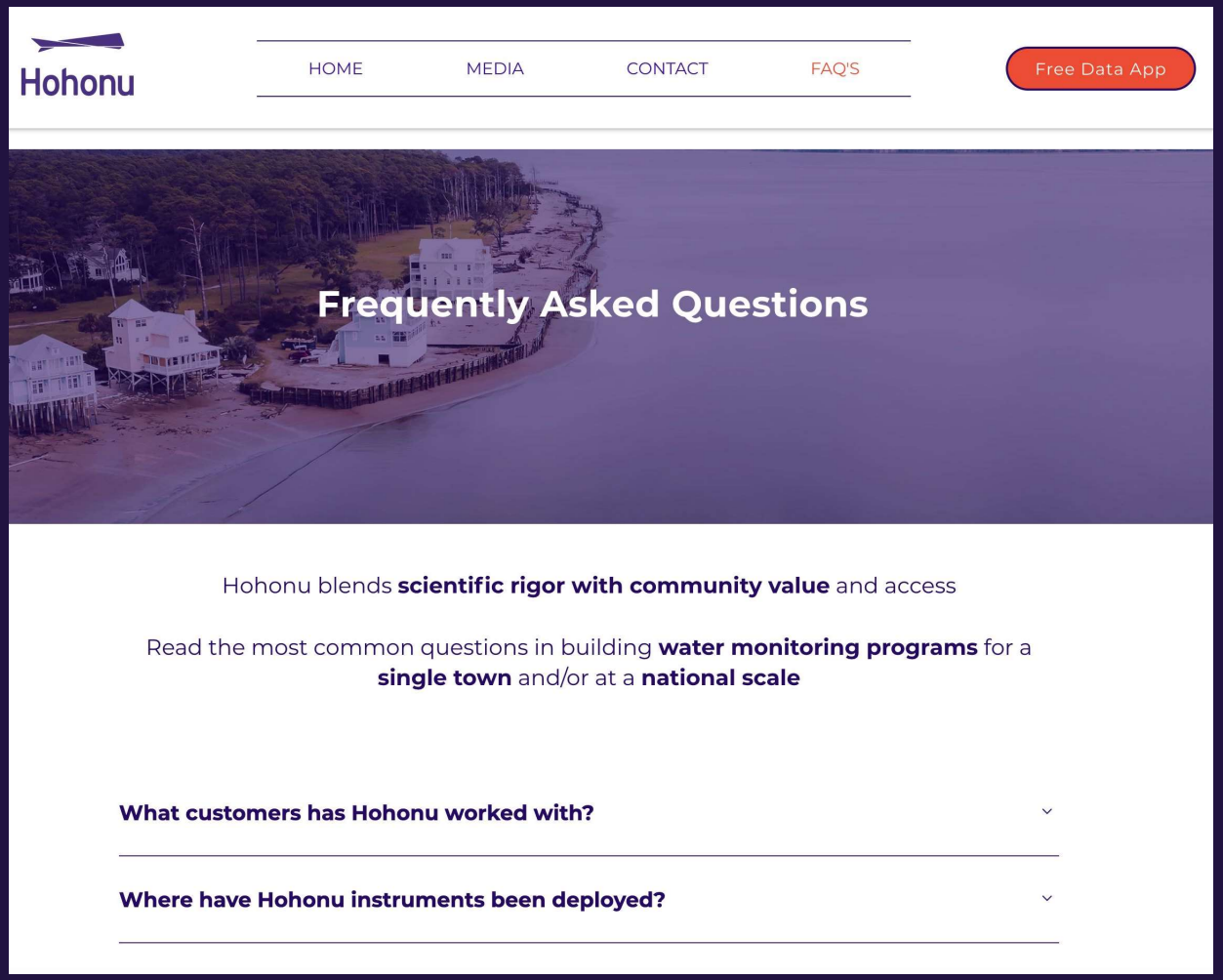
Unintended consequences of using maps to communicate sea-level rise

Matto Mildenberger, Alexander Sahn, Chris Miljanich, Michelle A. Hummel, Mark Lubell & Jennifer R. Marlon

Nature Sustainability **7**, 1018–1026 (2024) | Cite this article

Hohonu

- **Flood maps can backfire: Coastal residents, even those facing future flooding, can become less concerned when shown sea-level rise projections for the distant future.**
- **Coastal residents became more worried about flood risks when told how sea-level rise will affect their daily commute.**
- **Test before scaling: Risk communicators should test different data visualization strategies before launching climate communication campaigns.**



Hohonu FAQs

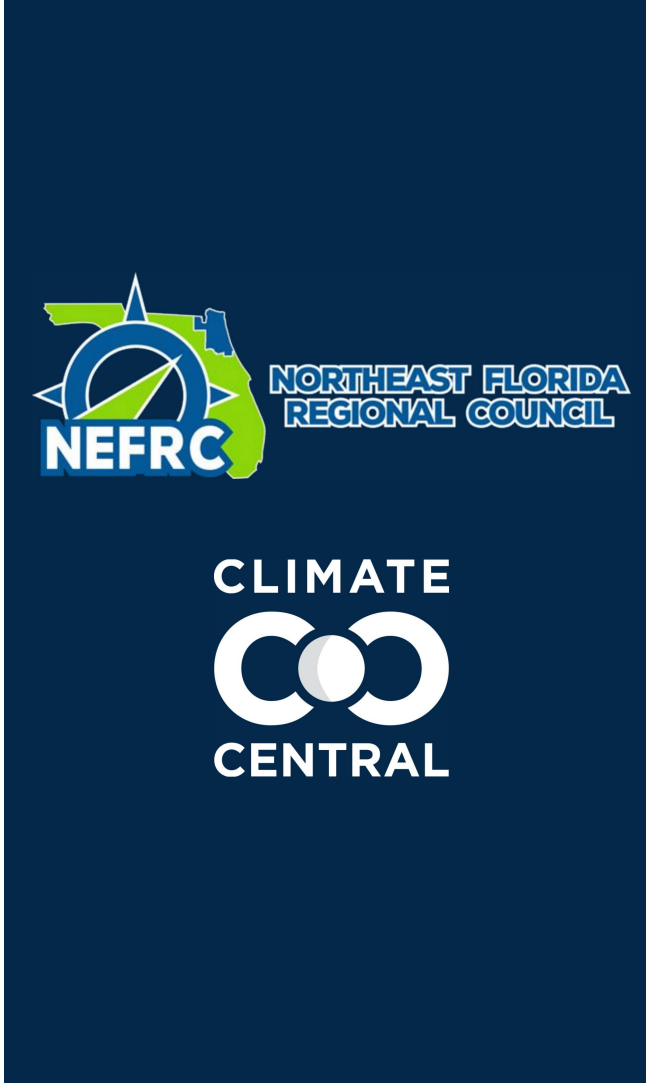
Brian T. Glazer
CEO, Hohonu, Inc.

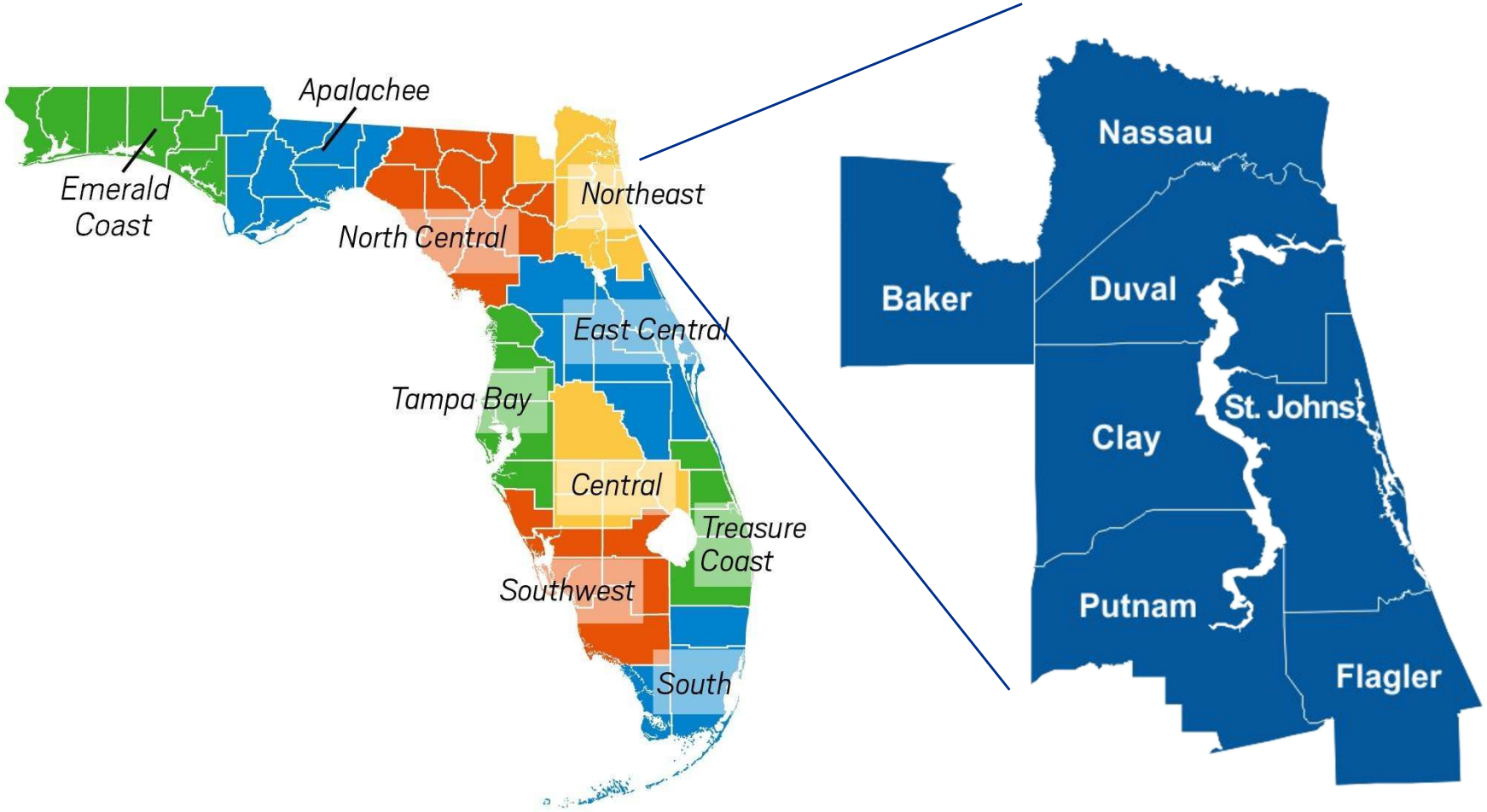
glazer@hohonu.io

Leveraging FloodVision to inform Resilience Decision-Making

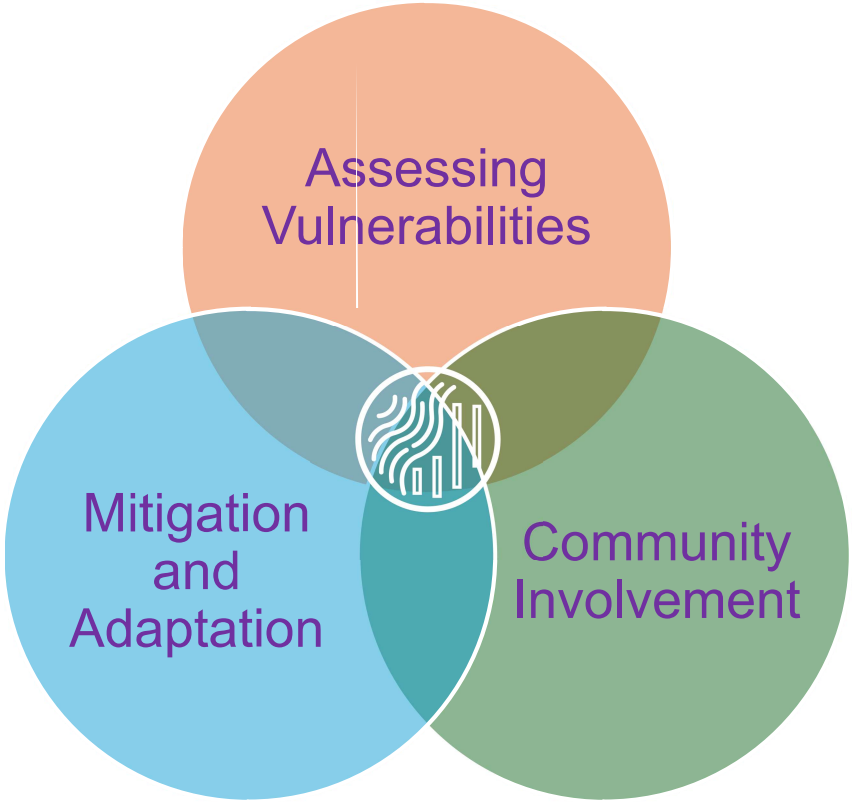
2024 Coastal Inundation Community of Practice Workshop, Seattle, WA

November, 13, 2024




Apalachee
Emerald Coast
Northeast
North Central
East Central
Tampa Bay
Central
Treasure Coast
Southwest
South
Nassau
Baker
Duval
St. Johns
Clay
Putnam
Flagler

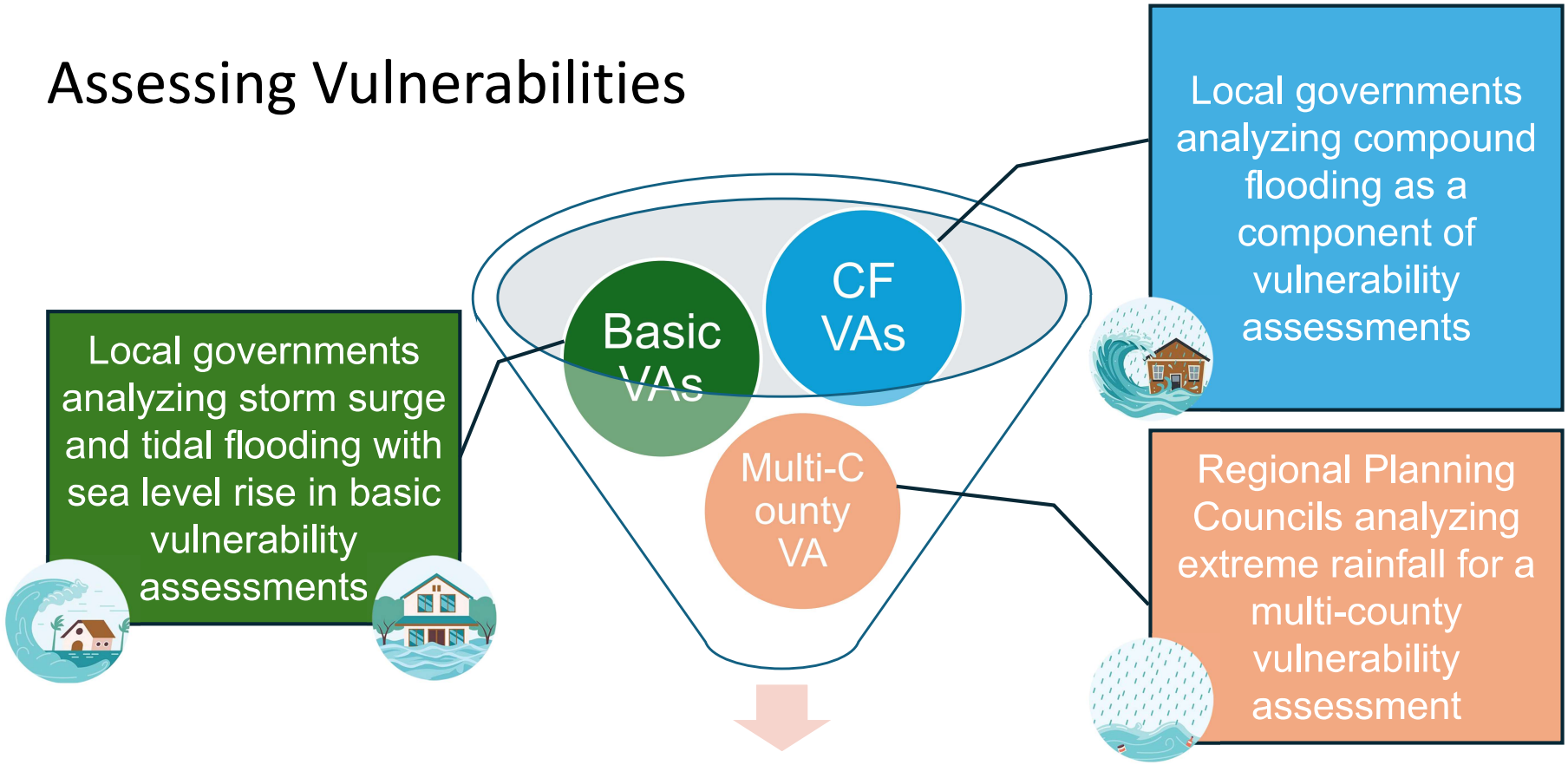
NEFRC Resiliency Program: Spheres of Action



Challenges


Inconsistenc y among communities
Duality of flooding and SLR concepts
Holistic approach to resilience
VAs too technical for lay people
Outdated guide for adaptation planning

Assessing Vulnerabilities



Visualizations of flood vulnerabilities throughout Northeast Florida

FloodVision®

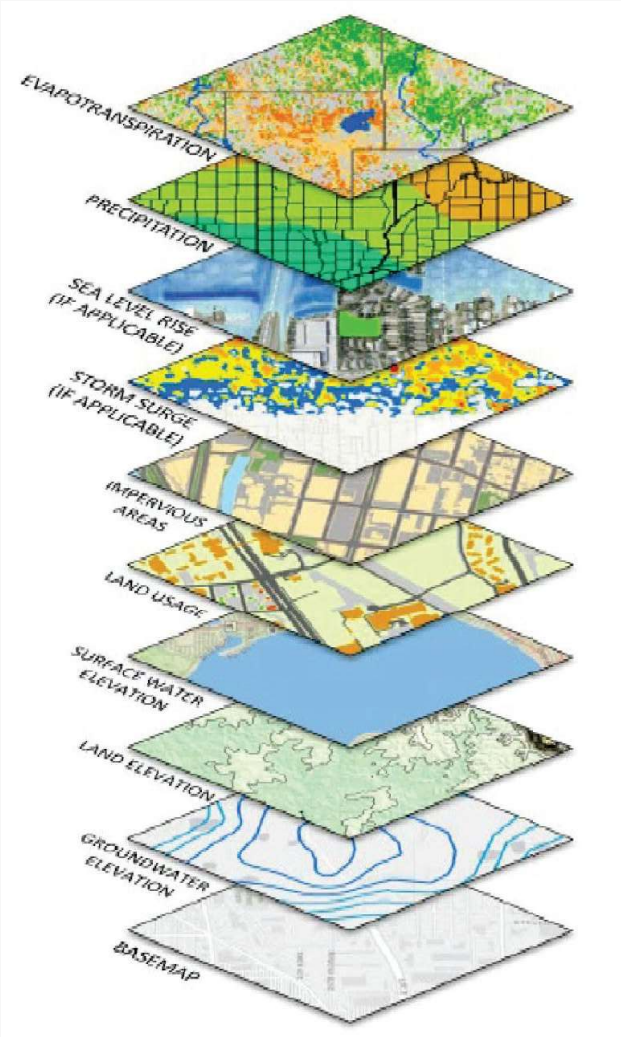
- High quality entry-floor elevation data for quantitative flood risk assessments
- Photorealistic flood visualizations for effective risk communication

FloodVision®

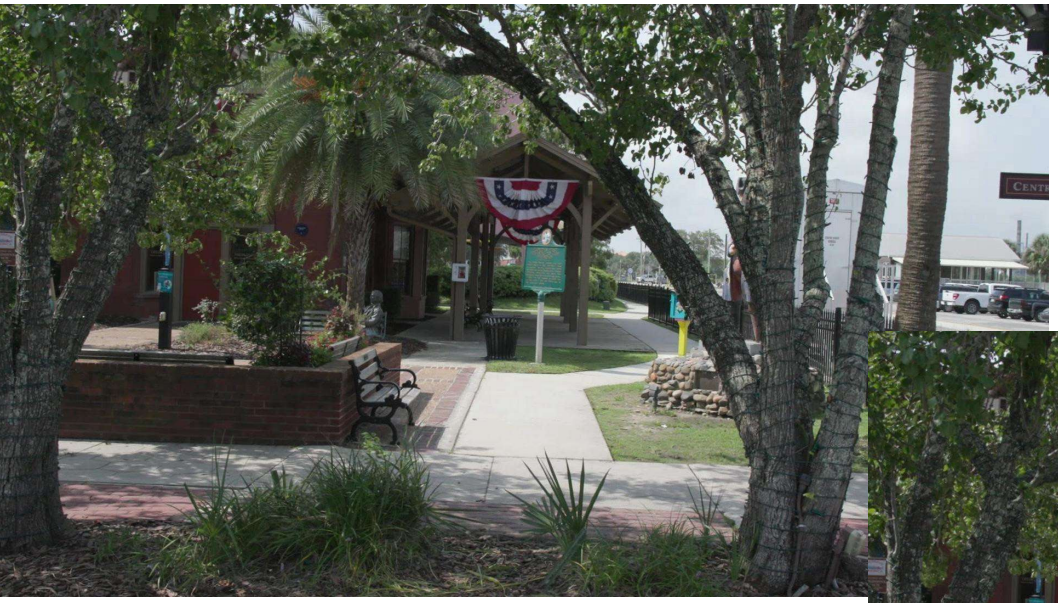

SIMULATION

Flood Scenario Parameters for Visualizations (to match most NE FL Vulnerability Assessments)

- Years 2040 and 2070
- NOAA 2022 SLR, Int-Low and Int-High
- 10-year, 100-year, and 500-year floods
- Relative to MHHW and NAVD88
- 50th percentile



Example of FloodVision® Results in Fernandina Beach



SLR: Int-High, 2040

AEP: 1%

Example of FloodVision® Results in Flagler Beach

SLR: Int-Low, 2040
AEP: 1%


MODELED
VISUALIZATION
5 ft. above ground level
Water Height: 8' 4" above MHHW
© 2023 Climate Central


VIP INDOOR CRUISE PARKING
409-765-7300 galvestonvipcruiseparking.com

MODELED VISUALIZATION

5 ft. above ground level
Water Height: 8' 2" above MHHW


IPUH


MODELED
VISUALIZATION
NOAA 2022 Intermediate-High Sea Level Rise
Scenario for 2050 + 1% annual chance flood
Water Height: 7' 6" above MHHW
© 2023 Climate Central


MODELED
VISUALIZATION
NOAA 2022 Intermediate-High Sea Level Rise
Scenario for 2050 + 1% annual chance flood
Water Height: 7' 4" above MHHW
© 2023 Climate Central


utmb Health
EMERGENCY
UTMB Health Clinics
UTMB HEALTH CLINICS
HERE
utmb Health
MODELED VISUALIZATION
NOAA 2022 intermediate-high sea level rise scenario for 2100 + 1% annual chance flood
Water height: 12' 7" above MHHW
© 2024 Climate Central


LION FORCE

MODELED VISUALIZATION

2 ft. above road level
Water height: 8' 0" above MHHW

MODELED VISUALIZATION

5 ft. above road level
Water height: 11' 0" above MHHW

Metadata includes:
- **Address**
- **EFE (Entry Floor Elevation)**
- **Road Elevation**
- **Latitude**
- **Longitude**


Metadata includes:
• Address
• EFE (Entry Floor Elevation)
• Road Elevation
• Latitude
• Longitude
MODELED VISUALIZATION
5 ft. above road level
Water height: 6' 2" above MHHW
© 2024 Climate Central


Metadata includes:
• Address
• EFE (Entry Floor Elevation)
• Road Elevation
• Latitude
• Longitude
MODELED VISUALIZATION
NOAA 2022 intermediate-high sea level rise scenario for 2070
1' 11" above road level
Water height: 3' 1" above MHHW
© 2024 Climate Central


CLIMATE CENTRAL


MODELED
VISUALIZATION
NOAA 2022 Intermediate-High Sea Level Rise
Scenario for 2050 + 10% annual chance flood
Water Height: 4' 5" above MHHW
© 2023 Climate Central

Edge of America (EOA) Tour:
Groundbreaking Expedition from Maine to Texas

Stops so far

FloodVision® integrates elevation data, camera inputs, and sensor data through AI, allowing us to precisely estimate entry floor elevations of buildings and structures. As we drive through coastal communities, we can generate photorealistic flood and sea level visualizations with precision. This enables us to identify structures--homes and businesses, hospitals and senior facilities, bridges and public transportation-at risk from exposure to potential flooding. The resulting images and data provide local leaders with critical information for both emergency preparedness and long-term planning for adaptation and resilience efforts.

Tour Stop #1: Blue Hill to Rockland, Maine

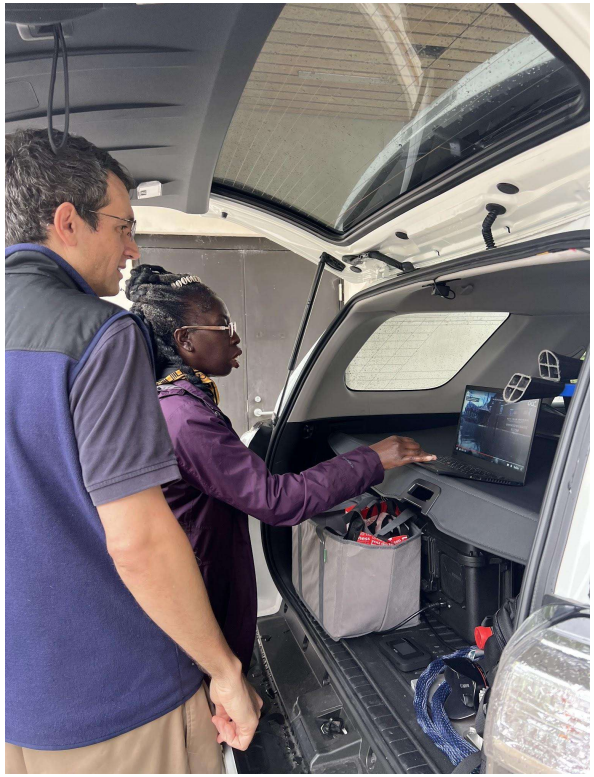
Tour Stop #2: Portland to Kittery, Maine

Tour Stop #3: New Hampshire

Tour Stop #4: Newburyport to Revere, Massachusetts

Tour Stop #5: Boston, Massachusetts

Connect with people, communities



Connect with government officials

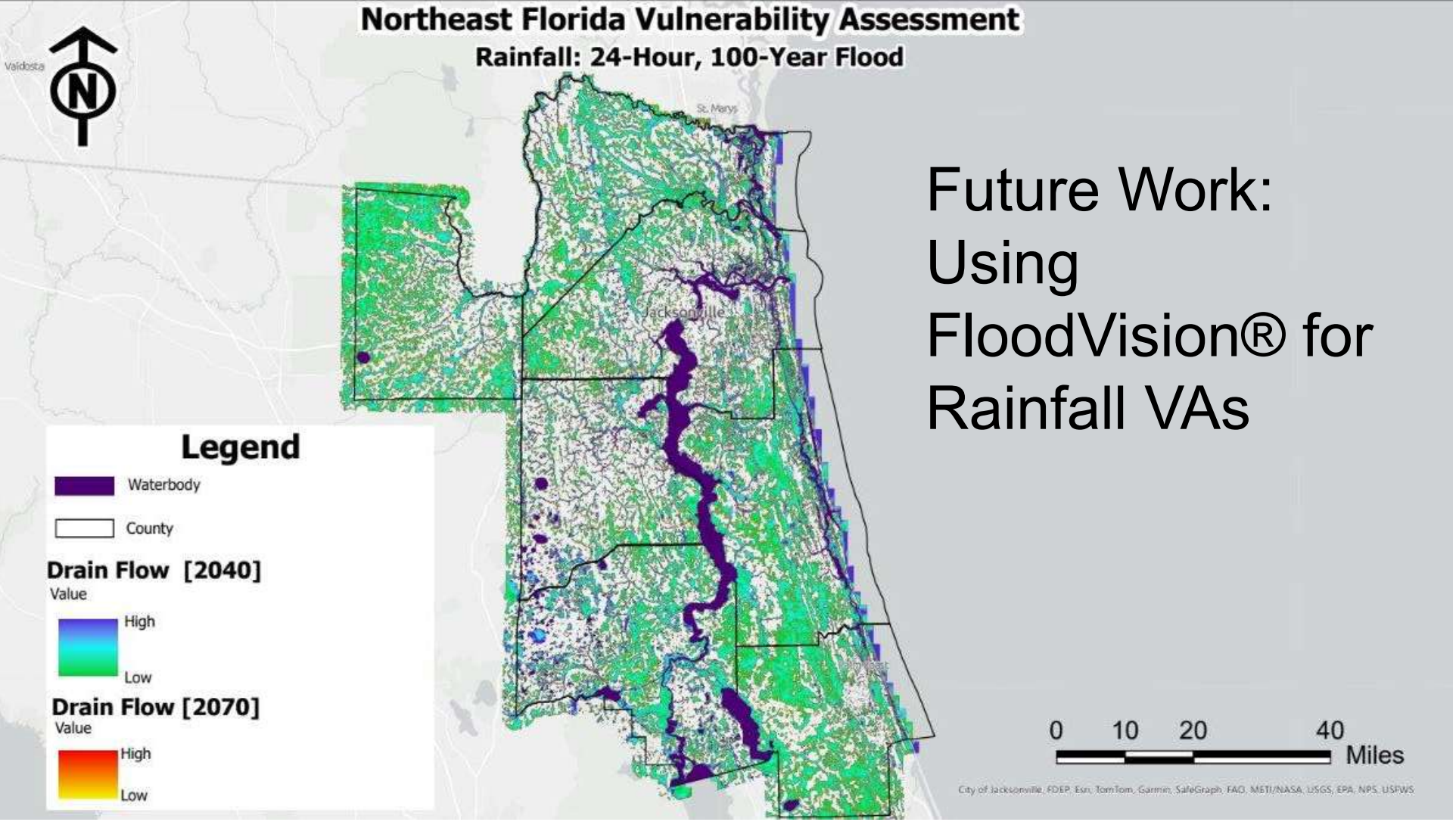

RISE TOGETHER
JOIN THE NEW ERA FOR THE ELIZABETH


FloodVision

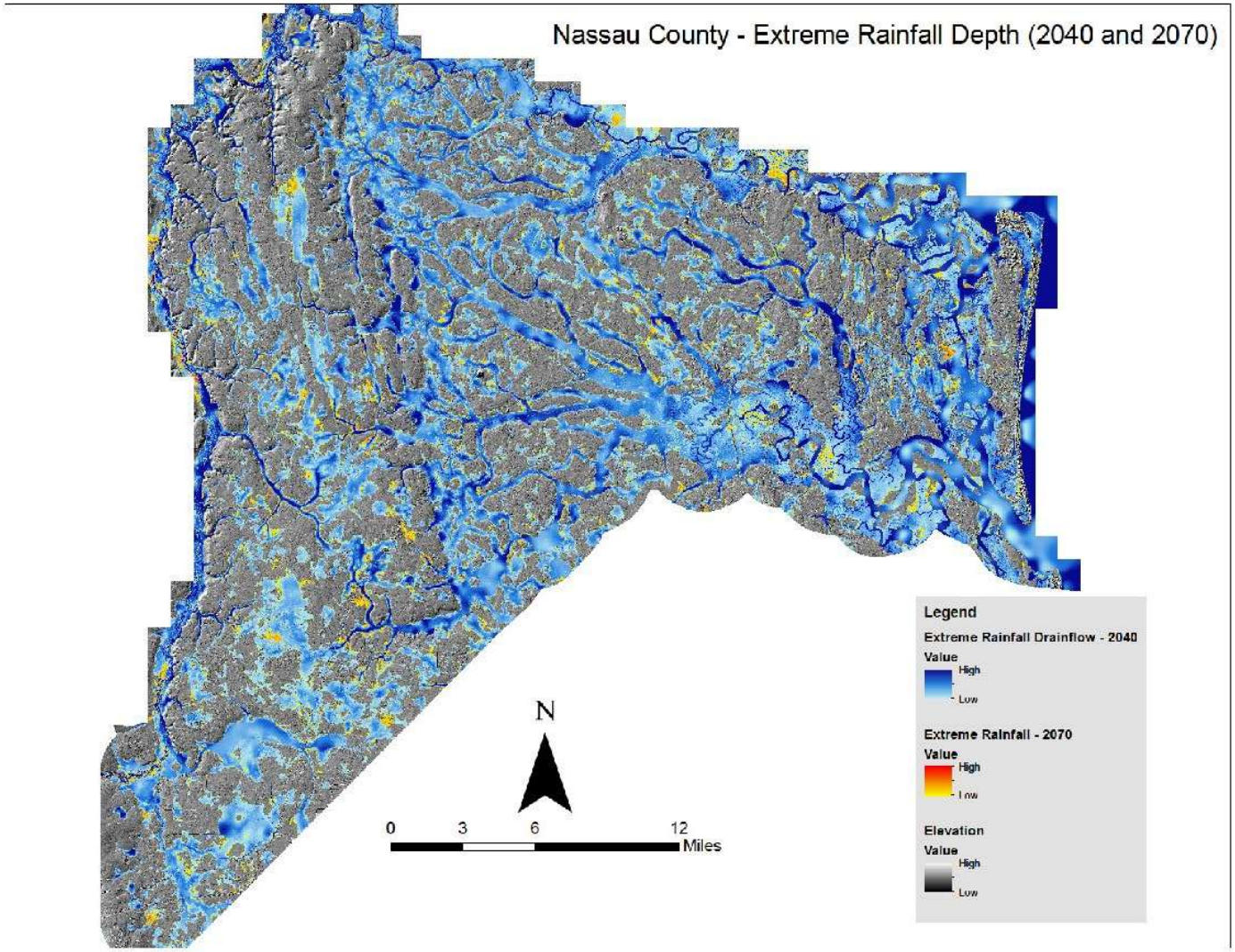

FloodVision

How is FloodVision® helping Northeast Florida?

- Public awareness of flood risk
- Emergency Preparedness
- Resilience Planning



Future Work: Using FloodVision® for Rainfall VAs


Nassau County - Extreme Rainfall Depth (2040 and 2070)
N
0
3
6
12
Miles
Legend
Extreme Rainfall Drainflow - 2040
Value
High
Low
Extreme Rainfall - 2070
Value
High
Low
Elevation
Value
High
Low

Thank you!

Fara Ilami, Northeast Florida Regional Council
FIlami@nefrc.org

Dan Rizza, Climate Central
drizza@climatecentral.org