

Smart Sea Level Sensors Chatham County



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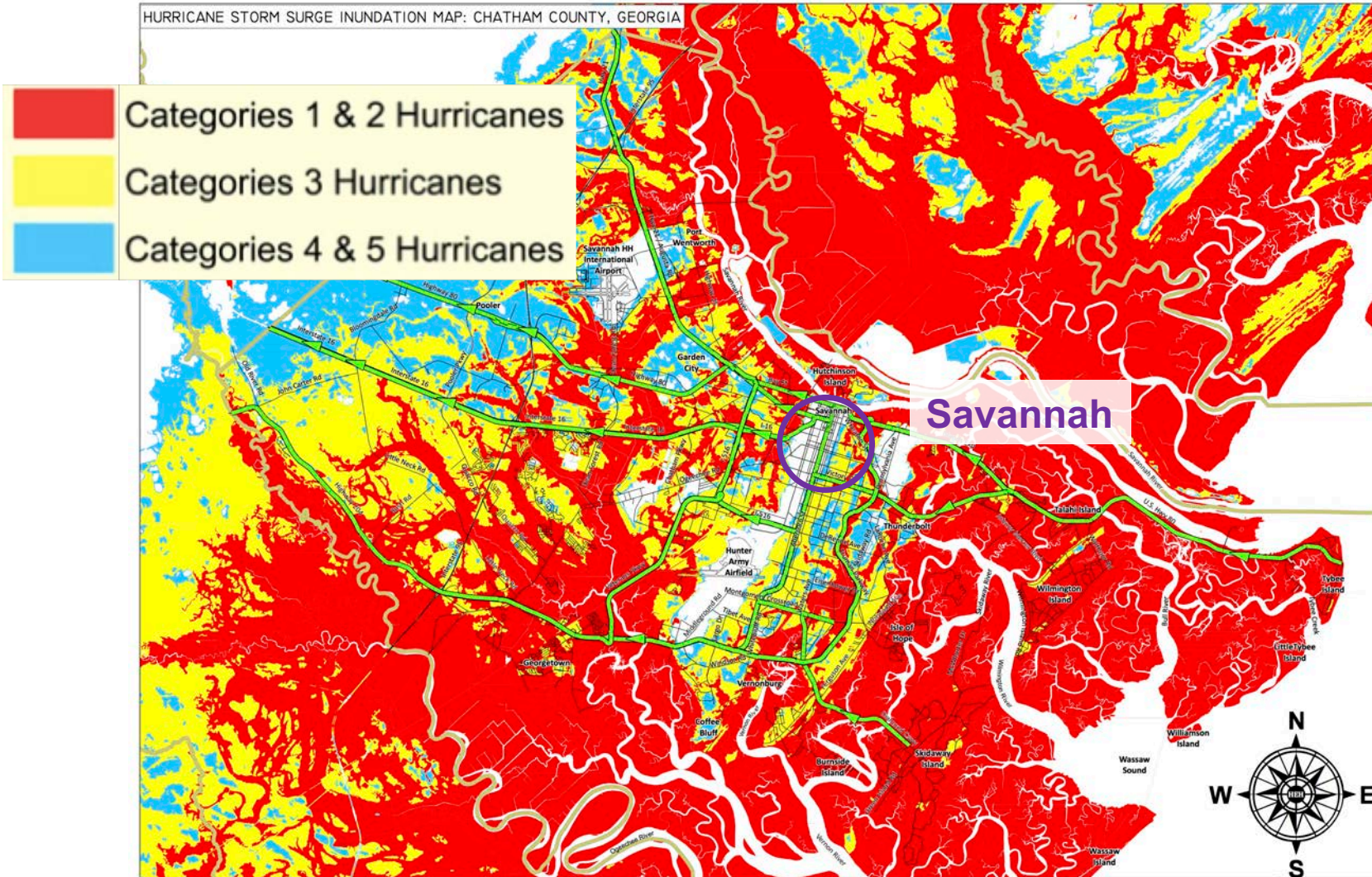
Randall Mathews

CEMA



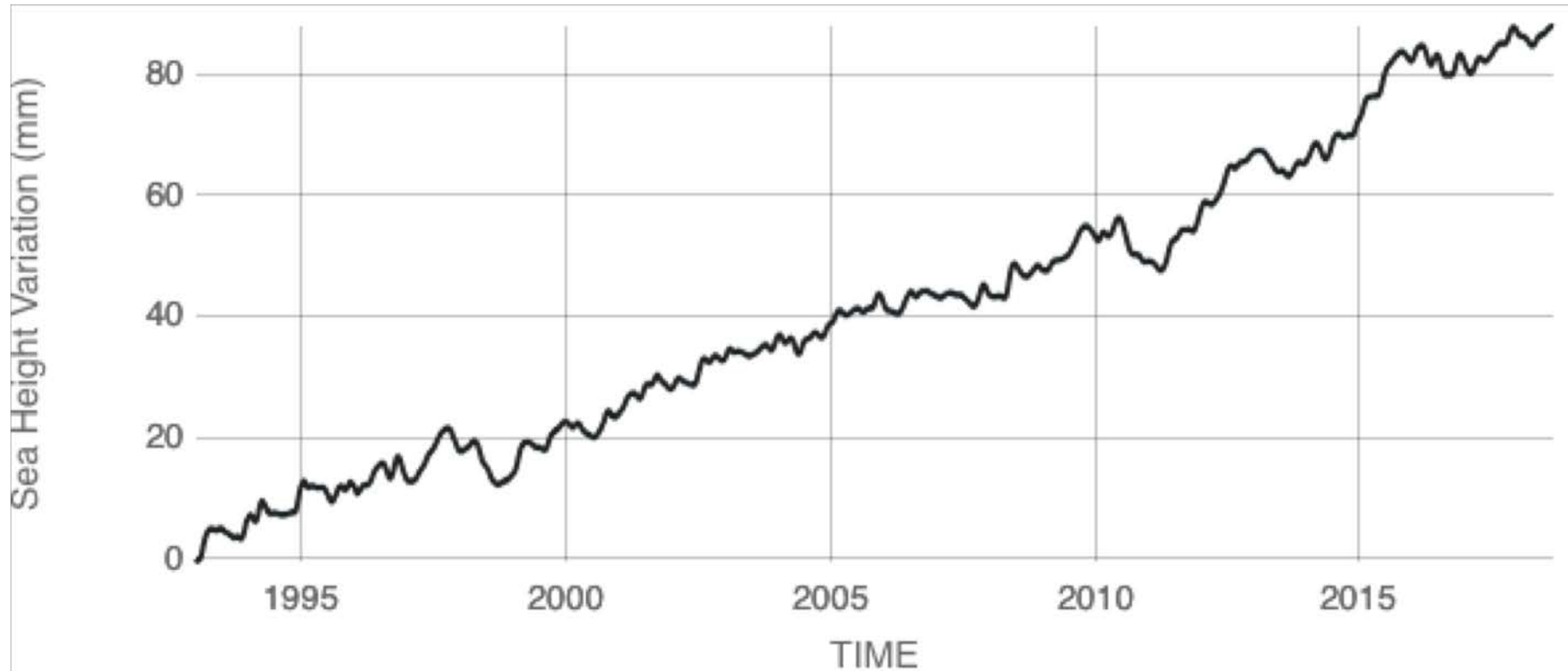
Coastal flooding – a current threat

HURRICANE STORM SURGE INUNDATION MAP: CHATHAM COUNTY, GEORGIA



<https://www.chathamemergency.org/storm-surge-impact-by-category.php>

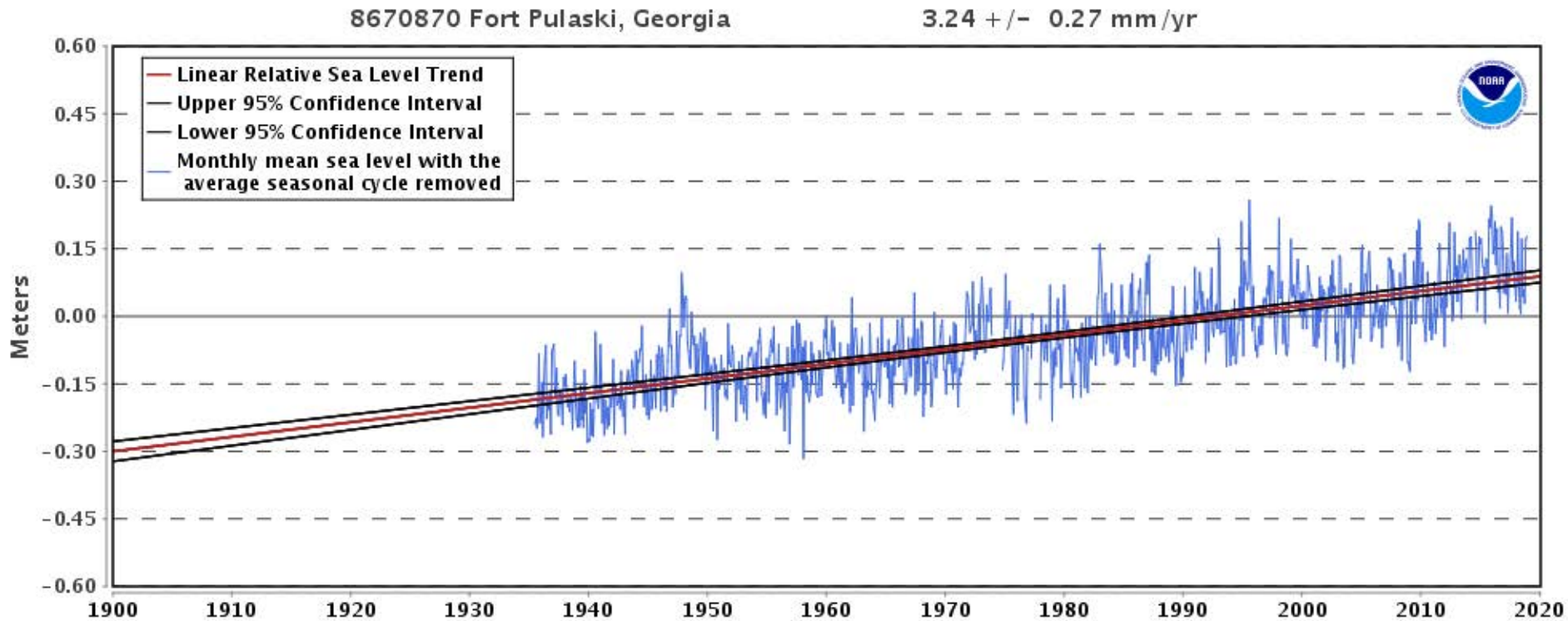
Sea level rise – a growing threat



Source: climate.nasa.gov

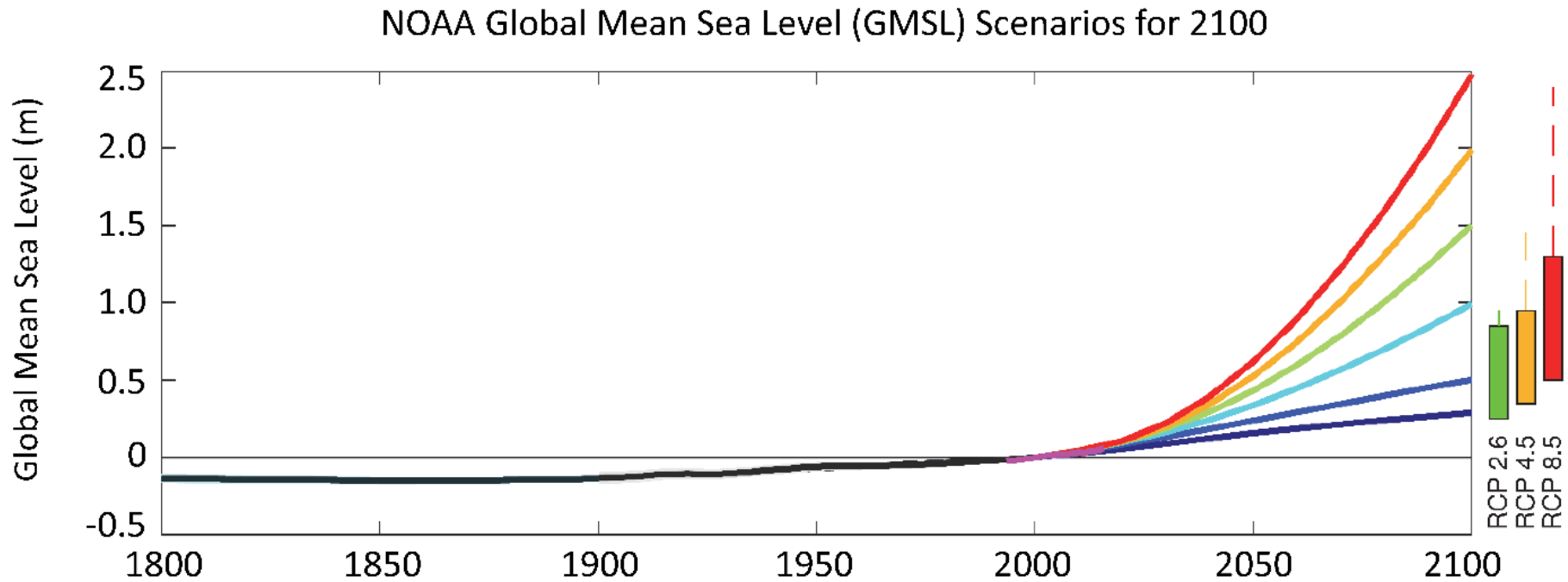
current rate of sea level rise = +3.2 mm/yr
→ in 100yrs, +320mm (or 12") minimum

Ft. Pulaski - Georgia's only NOAA tide gauge



local sea level has risen by +10" in 85yrs

Global sea level rise scenarios



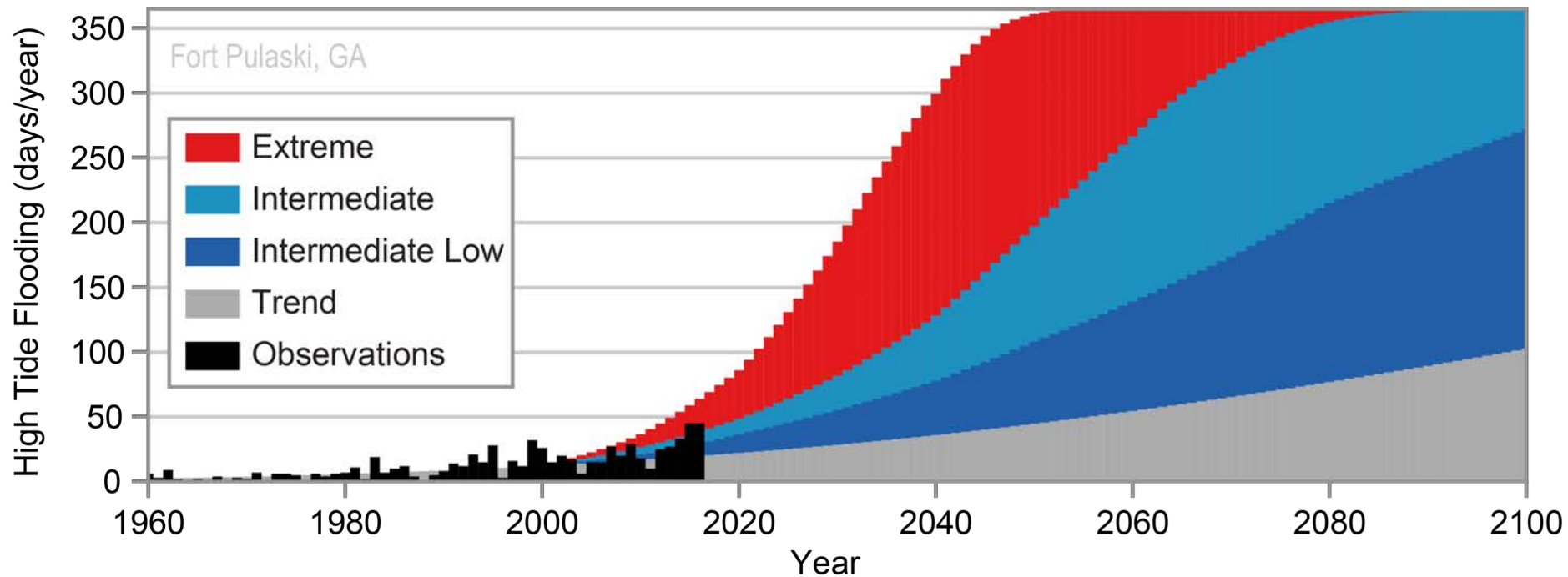
future sea level rise rates depend on:

- 1) our emissions pathway
- 2) response of the ice sheets to warming

Sweet et al., 2017

<https://nca2018.globalchange.gov/chapter/19/>

Ft. Pulaski – flooding becoming more frequent



More extreme scenarios project +1300mm (+51") of global sea level rise by 2100.

Sweet et al., 2017

<https://nca2018.globalchange.gov/chapter/19/>

“Blue sky flooding”

Savannah,
Nov 24, 2018



photo by Russ Clark

<http://sealevelsensors.org>

SMART SEA LEVEL SENSORS

CHATHAM COUNTY, GA

Watch video



Dr. Kim Cobb
Dr. Russ Clark
Dr. Emanuele Di Lorenzo
Dr. David Frost
Lalith Polepeddi
Tim Cone (GT-Savannah)
Jayma Koval



Randall Mathews
David Anderson
Dennis Jones



Nick Deffley
Director, Sustainability
Tom McDonald
David Donnelly

Project goals

emergency planning & response

real-time data portal & toolkits

short- and long-term risk assessment and resilience planning

develop & test educational resources

middle school & high school curricula

communication and building awareness

public events, installations, website

Community engagement

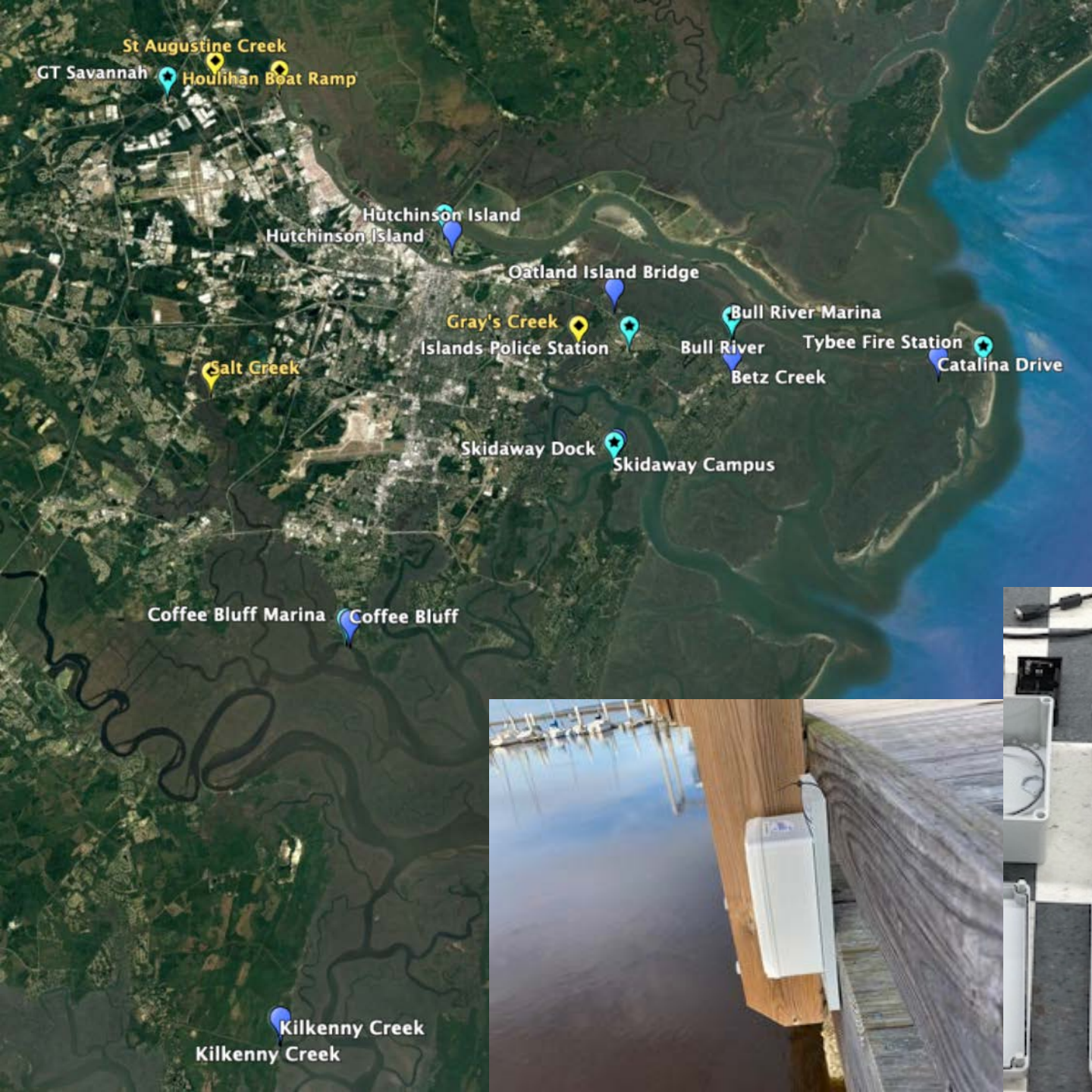
e.g.
Brunswick workshop on sea level rise Jan 22, 200+ attendees



Sensor Placement Team Updates

Russ Clark





8+4 sensors
8 gateways
30 sensors
in production

Still target:
100 sensors
by August



GDOT Approval!!!



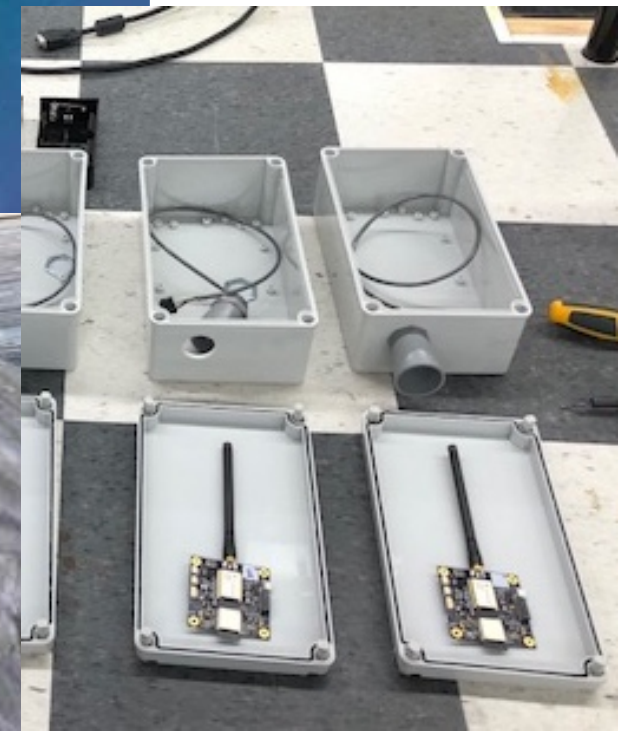


currently:
sea level, air temperature

planned:
seawater properties
air quality
inland flooding

8 sensors
8 gateways

goal: 100
sensors by
August





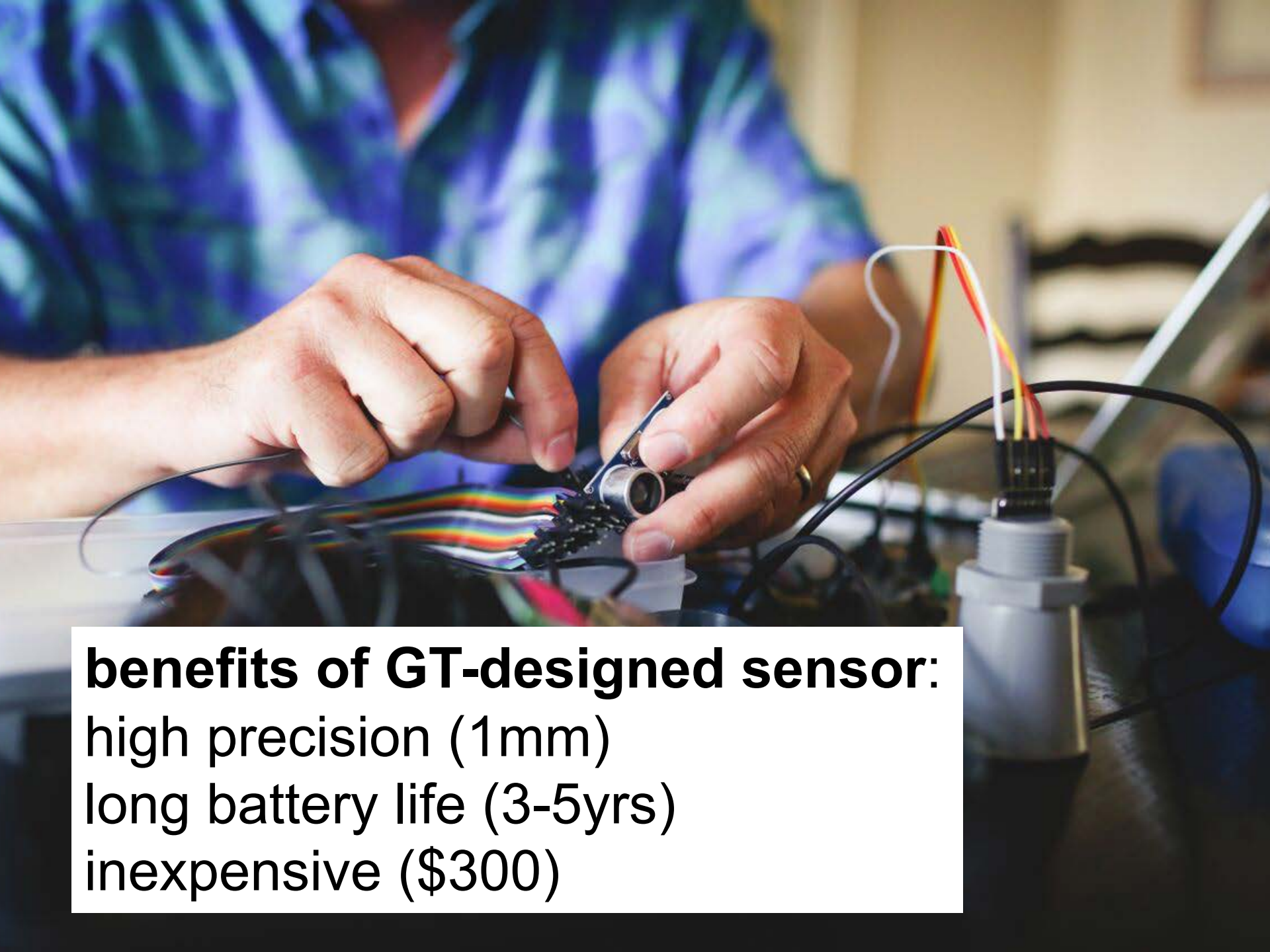
gateway device:

- roughly \$1,500
- 1 to 4 mile range
- can serve hundreds of sensors
- needs internet, power



goal:

provide backbone for
diverse IoT applications



benefits of GT-designed sensor:

high precision (1mm)

long battery life (3-5yrs)

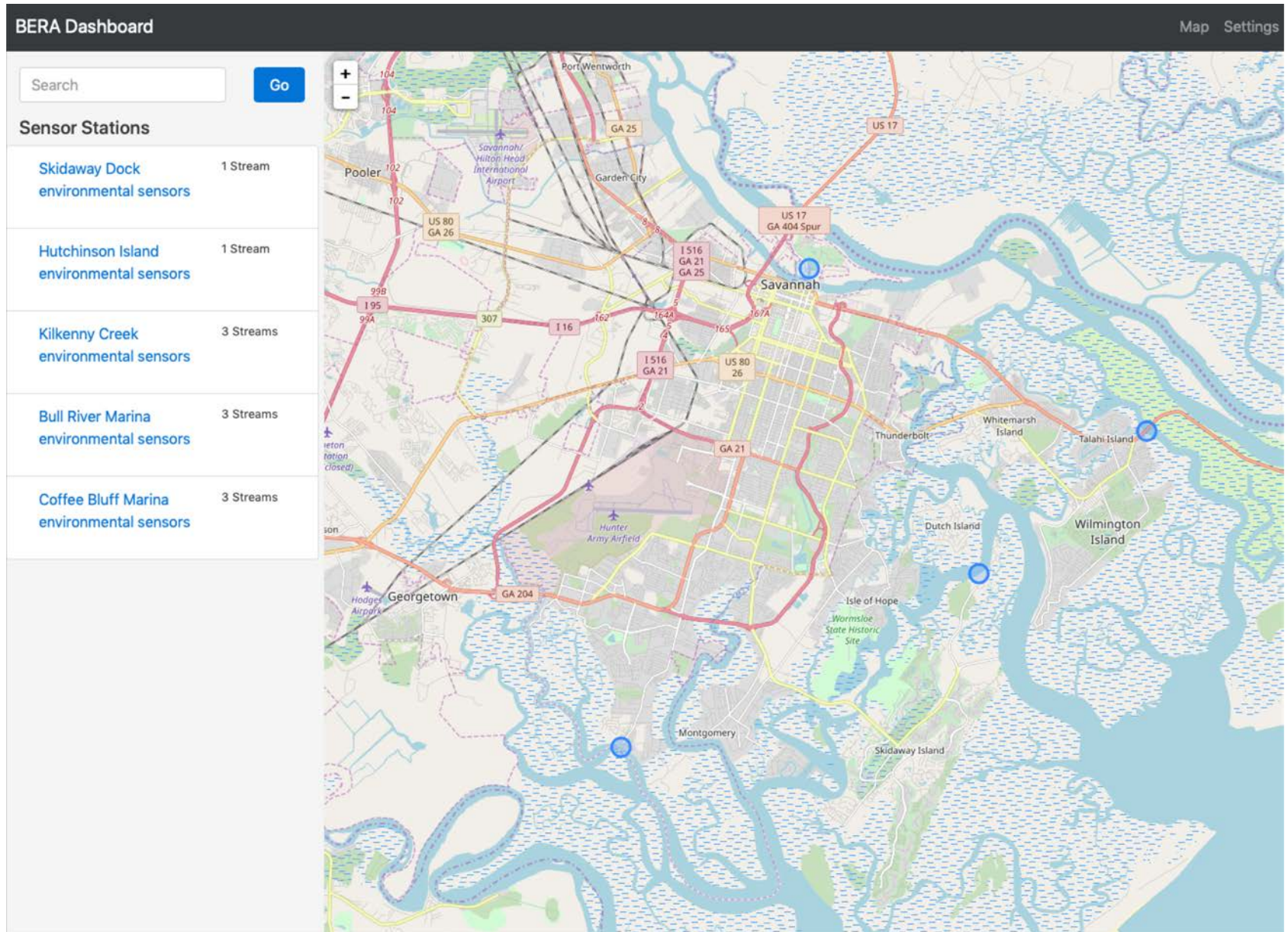
inexpensive (\$300)

Sensor Assembly

Jenkins High School – 20 sensors to be assembled and tested in February/March



Dashboard Demonstration



Dashboard Demonstration

Coffee Bluff Marina environmental sensors

ID
7

[API Link](#)

Location Description

Coffee Bluff Marina

Properties

```
{  
  "sslsId": "gt-envsense-001",  
  "elevationNAVD88": "2.4",  
  "notes": "Installed on wooden dock of city park adjacent to the marir"  
}
```



Time Range

Sun Jan 20 2019 20:40:59 GMT-0500 📅 to Sun Jan 27 2019 20:40:59 GMT-0500 📅

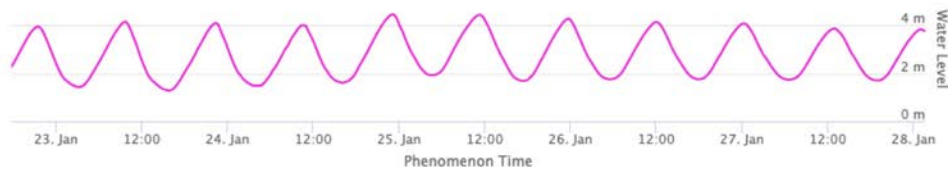
Datastream of vertical distance measurements from the sensor to the surface of the water

[API Link](#)

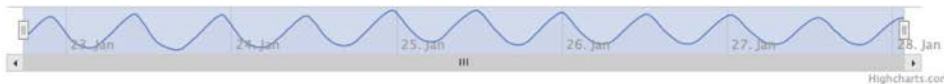
1519 Observations

Zoom 1m 3m 6m YTD 1y All

From Jan 22, 2019 To Jan 28, 2019



Stat	Value
Last	2.237 m
Min	1.276 m
Max	4.473 m
Average	2.7695 m



Details

Download CSV

Integrated Coastal Ocean Modeling and Forecasting

Emanuele Di Lorenzo



Sea Level Science Education for a Changing Climate

Jayma Koval &
Alex Robel



Week-long Phenomena Based Learning curriculum for 6th grade Earth Science

- **Topics covered:**

- Science: Tides, sea level rise, coastal flooding, climate change
- Math: Statistics and Probability

- **Leverages:**

- Smart Sea Level Sensors Project- perfect intersection of science/technology/society
- Authentic Smart Sea Level Sensors data for data visualization exercises & data analysis
- Georgia Climate Stories videos
- NASA-JPL activities on sea-level rise

- **Implementation:**

- April-May 2019 at Oglethorpe Charter School, revisions summer 2019

City of Savannah goals

Nick Deffley



City of Savannah

Short Term: Emergency response & management

Long Term: Inform resilience/adaptation efforts and prioritize infrastructure planning

- Community engagement & partnership
- Sensor and gateway host
- Additional sensor applications
- Support and promote larger coastal resilience efforts