



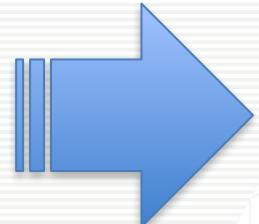
Sensor and Gateway Deployment Updates

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October 26, 2018

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New Sensor Platform



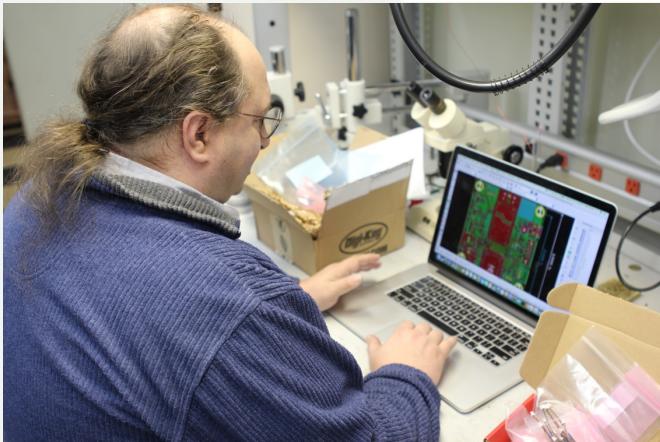
August 2018

October 2018



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The Masters at Work



Georgia Tech Interactive Media
Technology Center

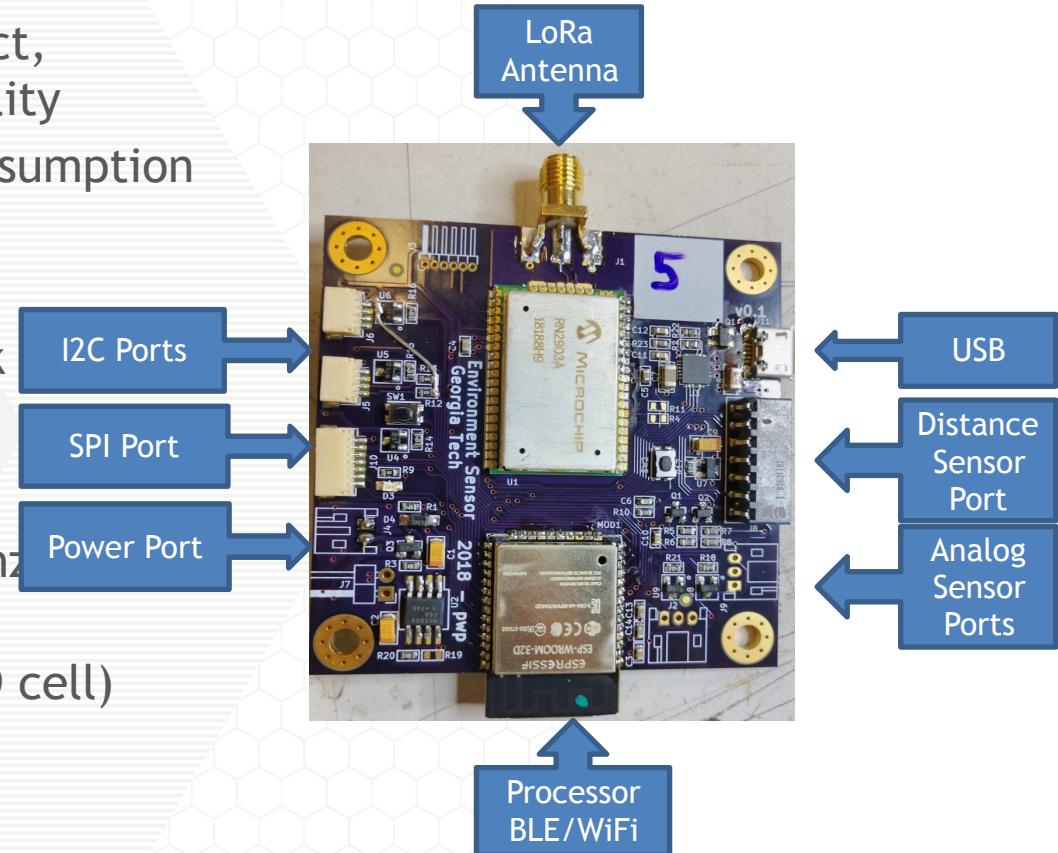


Peter Presti and Scott Gilliland
www.imtc.gatech.edu

Sensor Development

GT IoT Sensor Board Design

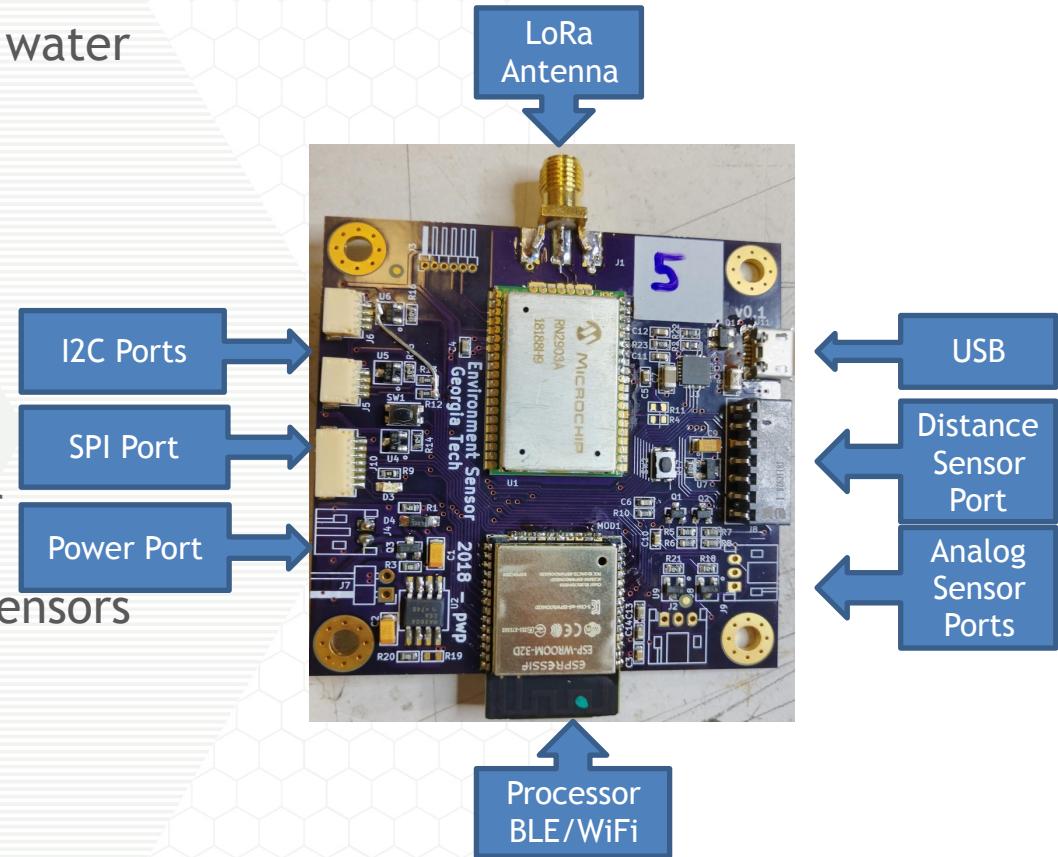
- Inspired by Sea Level Sensor project, designed for flexibility and versatility
- Focus on extremely low power consumption use cases
- ESP32 Processor
 - Dual core 32 bit, 240Mhz clock
 - 4MB flash memory
 - Builtin BLE/WiFi (2.4 ghz)
- RN2903A-RM103 LoRa radio (915mhz band)
- Powered by 4 standard (e.g. C or D cell) batteries
 - Many options including solar



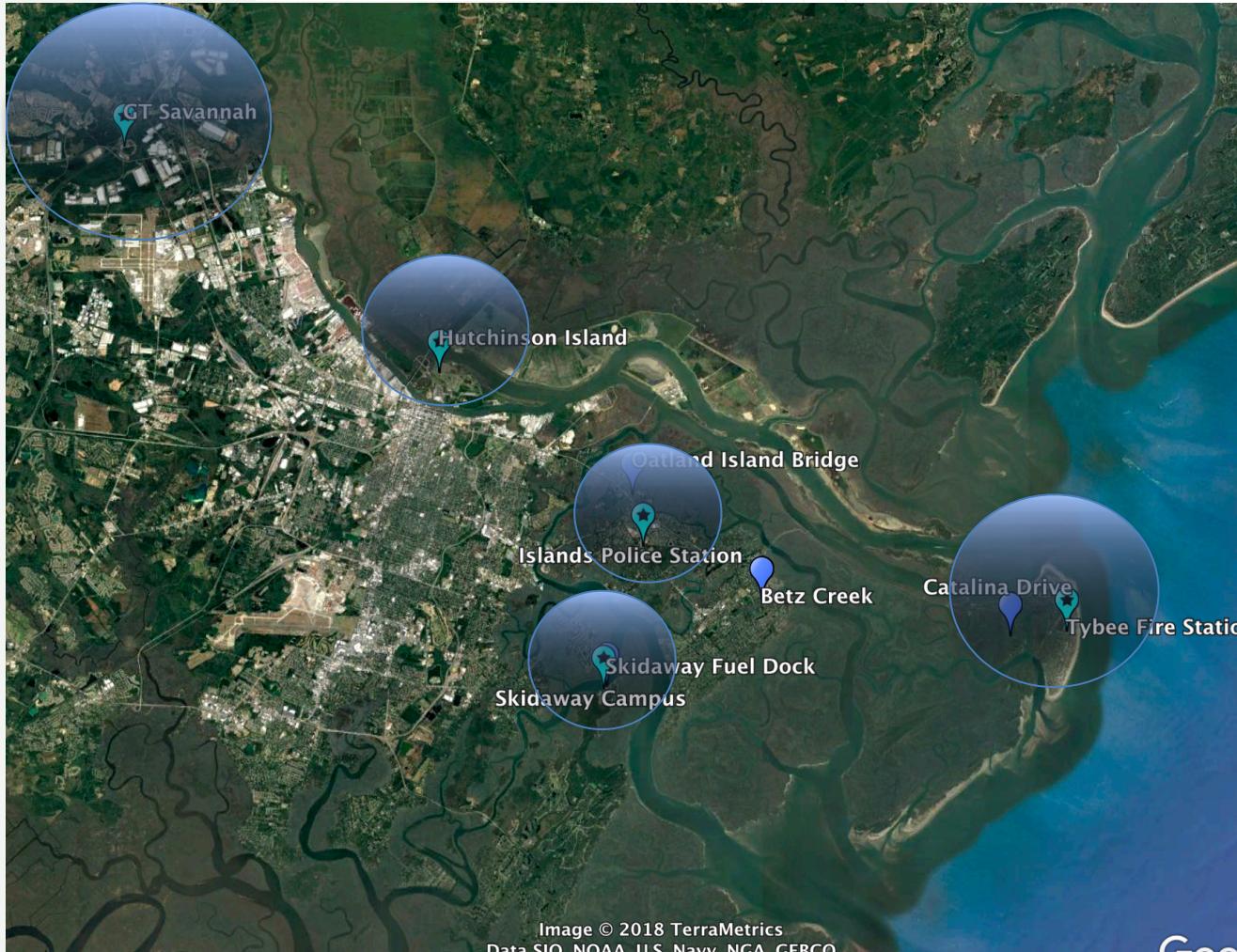
Sensor Development

Extensible Design

- Distance sensor port for ultrasonic water level measurement
- 2 I2C ports for digital sensors
 - barometric pressure, digital temperature, GPS, humidity, proximity, movement, etc
- SPI port for high speed sensors
 - audio, accelerometer, thermal imaging, etc
- 2 analog ports for voltage output sensors
 - temperature, wind speed, etc



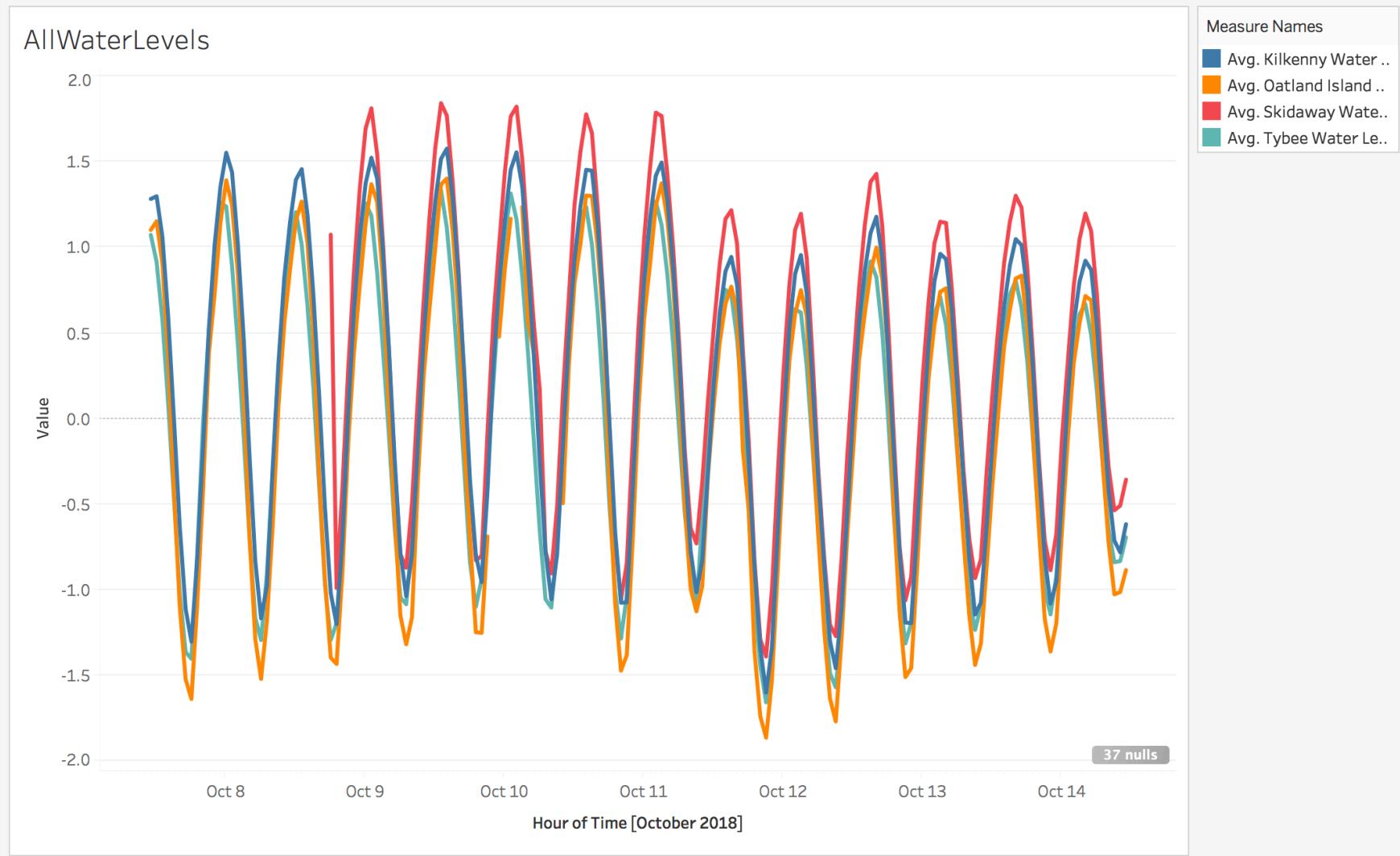
Gateway Deployments



New Deployments at GT Savannah, Skidaway Campus, Hutchinson Island

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Hurricane Michael



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Sharing The Data



First draft of data APIs. Ready for your suggestions.

Sensors

/sensors/

- List of all Sensor objects

/sensors/?location.id=catalina-drive

- List with the one Sensor object located at 'catalina-drive'.

/sensors/gt-envsense-005

- Sensor object with id of 'gt-envsense-005'.

Sensor Observations

/sensors/gt-envsense-005/observations

List of all Sensor Observation objects for sensor id of 'gt-envsense-005'.

/sensors/gt-envsense-005/observations?

start_time=2018-09-22T20:00:52.21&end_time=2018-10-02T22:01:22.45Z

List of Sensor Observation objects for sensor id of 'gt-envsense-005' within a time span.

/sensors/gt-envsense-005/observations?offset=500&limit=100

List of Sensor Observation objects for sensor id of 'gt-envsense-005' paged by offset and limit.

/sensors/gt-envsense-005/observations?exclude=metadata

List of Sensor Observation objects for sensor id of 'gt-envsense-005' with metadata excluded.

Perhaps More Useful



Sea Level Observations

/sealevels/catalina-drive/observations

/sealevels/catalina-drive/observations?
start_time=2018-09-22T20:00:52.21&end_time=20
18-10-02T22:01:22.45Z

/sealevels/catalina-drive/observations?
offset=500&limit=100

/sealevels/catalina-drive/observations?
exclude=metadata

Results

```
[  
  {  
    "time": "2018-10-22T20:00:52.21Z",  
    "sealevel": 1.325  
  },  
  {  
    "time": "2018-10-22T20:05:02.08Z",  
    "sealevel": 1.302  
  },  
  {  
    "time": "2018-10-22T20:10:4.64Z",  
    "sealevel": 1.281  
  }  
]
```

Next Steps



Sensor Deployments

- 12 new sensors ready to go
- Temperature data included
- Remote sample rate setting now supported

Gateway Deployments

- City, county and private locations
- Looking at Lift Stations

Identify and plan broader activities

- Local students helping with sensor assembly
- Community involvement in determining next sensor locations and new measurements

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