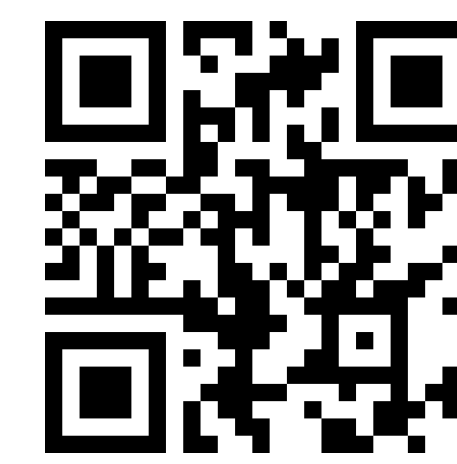


Enhanced Marine Awareness through Real-Time Processing of Crowd-Sourced Mobile Device Observations



Marc Shapiro¹, Jerry Bieszczad¹, Eric Desjardins¹, David Callender¹, Brian Colle²

¹Creare, Hanover, NH

² Stony Brook University, Stony Brook, NY

Correspondence: mls@creare.com



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Motivation

- Accurate marine weather "nowcasts" and forecasts are critical to maintain situational awareness and ensure safe navigation.
- Existing marine weather observations are sparse and limited (buoys, volunteer ships, remote sensing)
- Smartphones enable multi-modal environmental sensing using built in device sensors and multimedia inputs

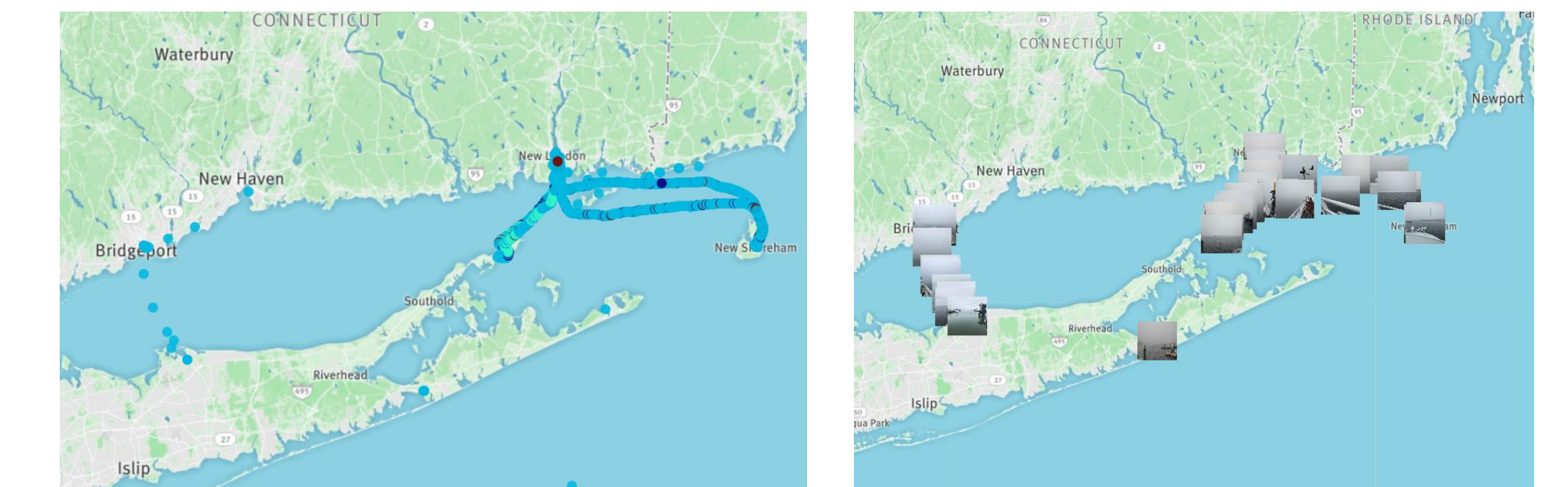
Project Objectives

- Support the development of the WeatherCitizen crowd sourcing platform (see bottom left)
- Deploy WeatherCitizen to crowd-source marine observations
- Develop real-time quality control routines for crowd-sourced data and disseminate nearby observations and NOAA warnings in real-time using the map and feed
- Demonstrate advanced data products and derive Insights from crowd-sourced data

Demonstration

On June 20, 2019, 12+ observers in the Long Island Sound used commuter ferries (4), research vessels (1), and shore locations (4) to make WeatherCitizen observations throughout a single day.

The demonstration aimed to collect WeatherCitizen data to stress test the system, evaluate the usability of the interface, and generate data to assess the impact of WeatherCitizen data on forecasting models.



Pressure measurements (left) and images (right) collected by 12+ observers on June 20, 2019 in the Long Island Sound

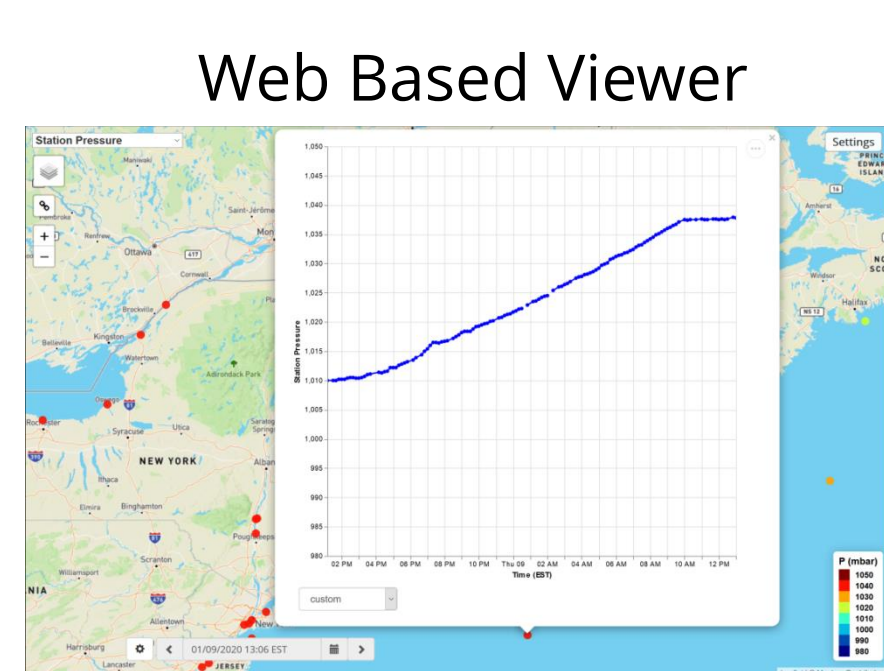


Aboard a commuter ferry recording observations using WeatherCitizen and a Bluetooth connected Kestrel 5500. Fog warnings from NOAA arrived in the WeatherCitizen feed (right).

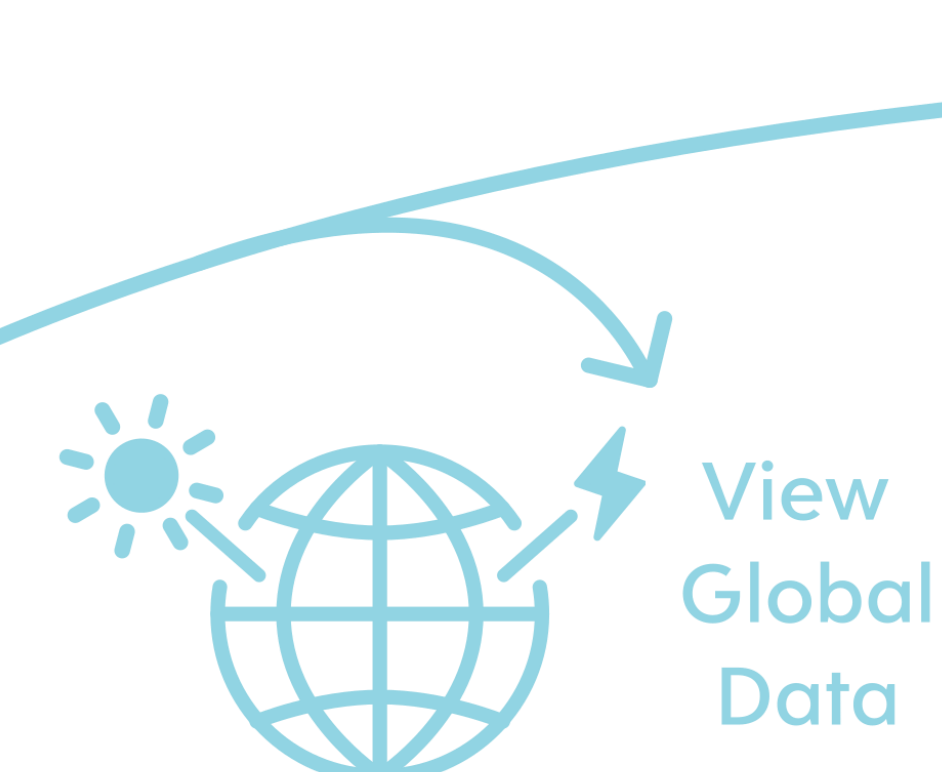


WeatherCitizen is a mobile platform for collecting and distributing crowd-sourced environmental observations

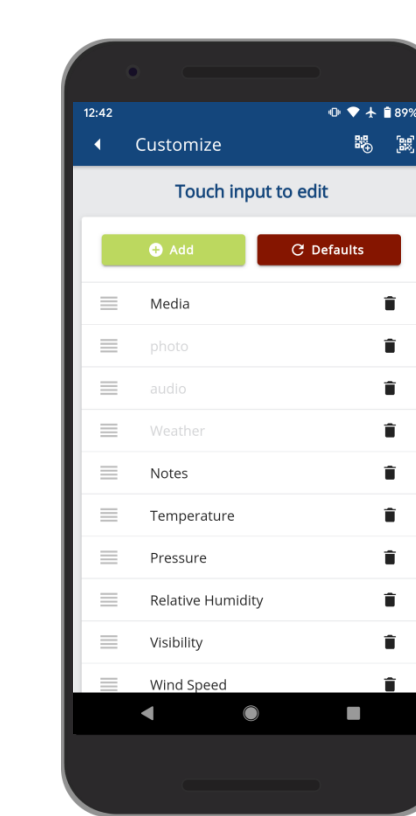
Try it Now
Download the app and design/deploy your study within minutes using the public WeatherCitizen server.



5 Analyze
data to enhance your research



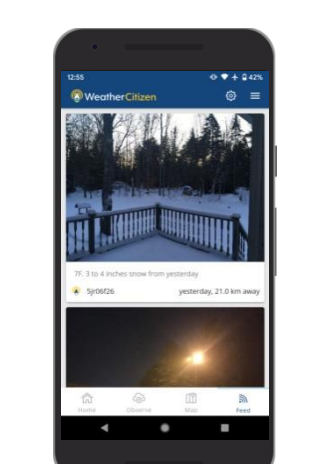
View Global Data



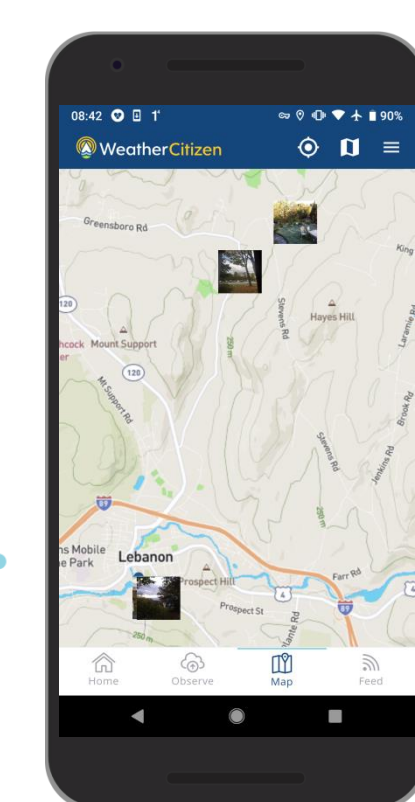
1 Design
your study using our app-based editor



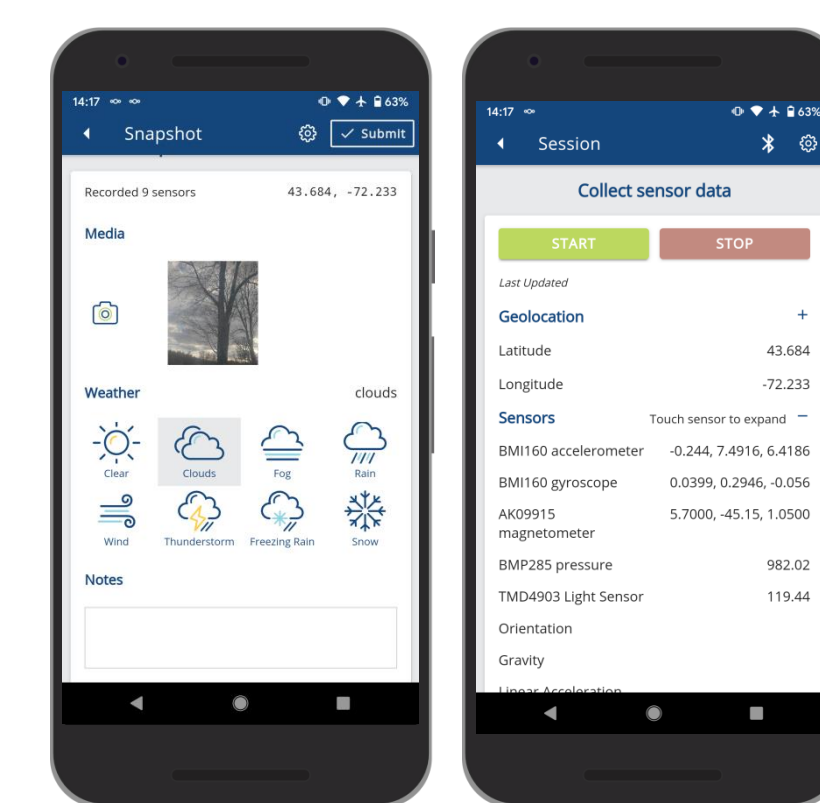
2 Deploy
your study to other WeatherCitizen users



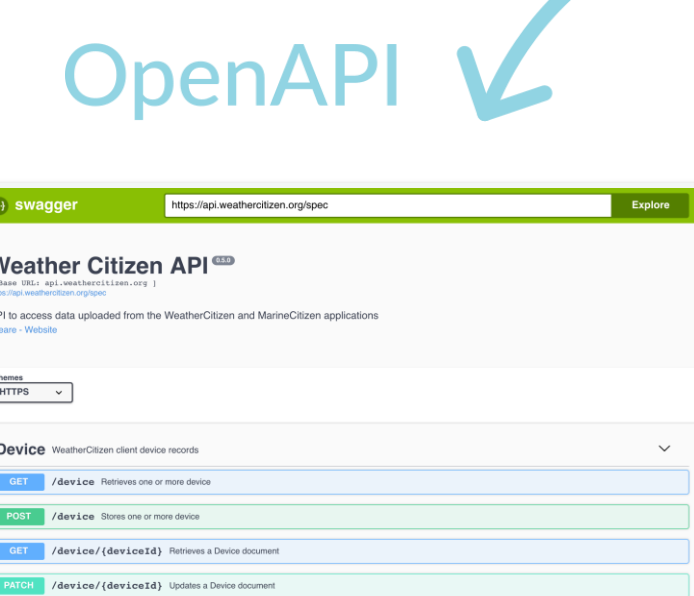
Share & Connect



4 Upload & Store
store and export data locally or upload to a centralized server



3 Collect
data in the field



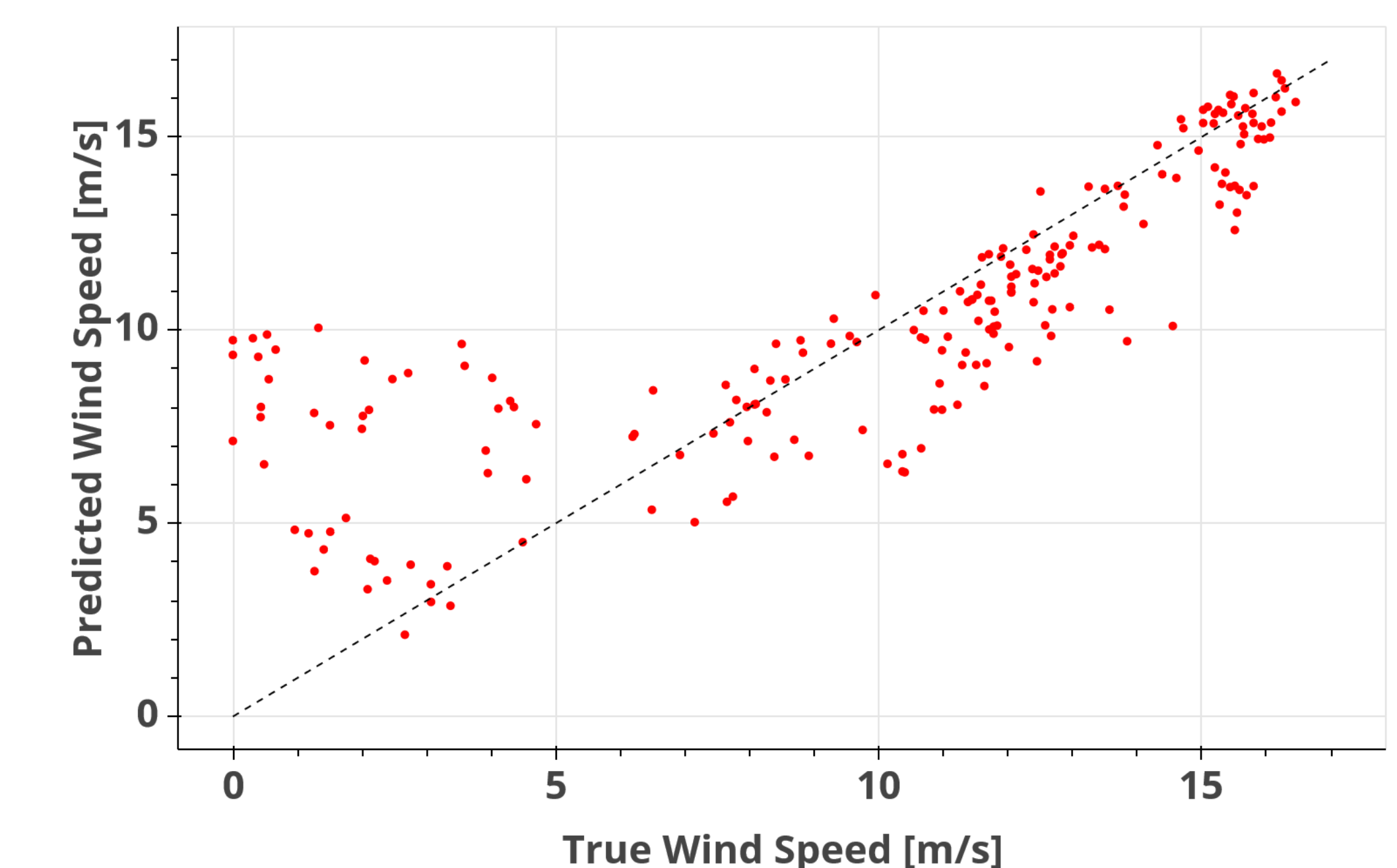
OpenAPI

Data Products

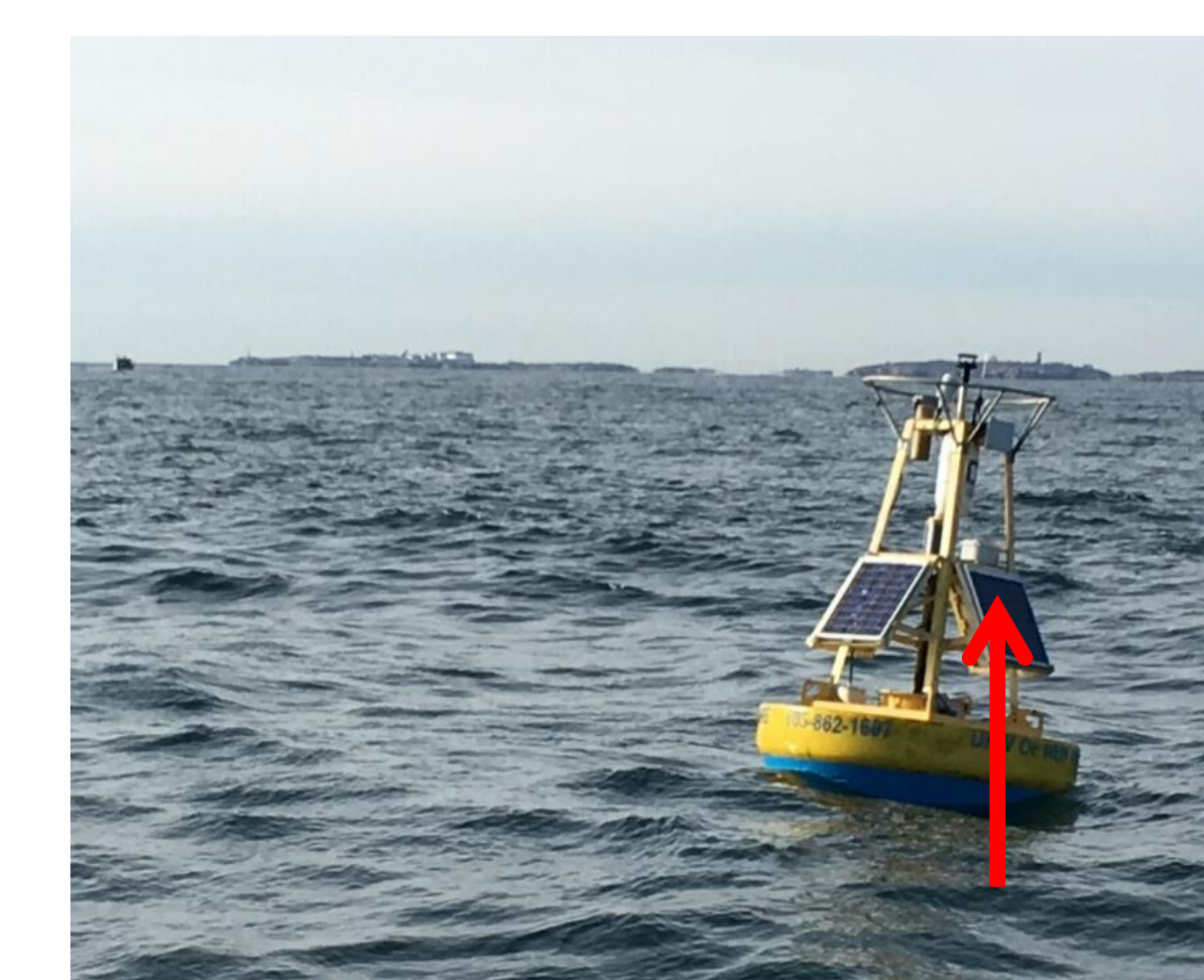


Wind Speed

High frequency (10 Hz) pressure measurements recorded using WeatherCitizen to model wind speed

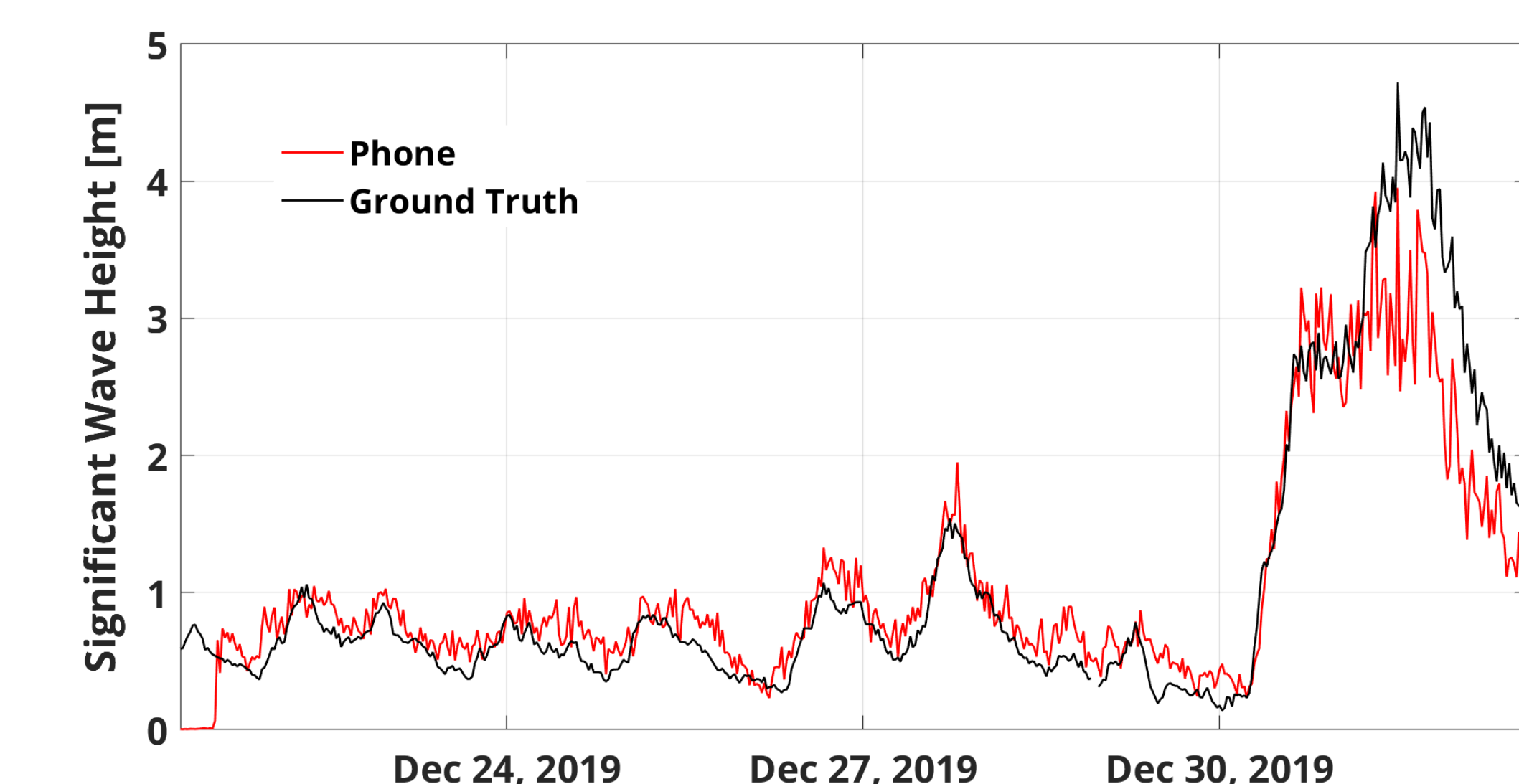


Wind Speed derived from high frequency pressure measurements using WeatherCitizen compared to true wind speed measured by the Kestrel 5500 weather station connected to WeatherCitizen via Bluetooth. The model agrees well above 5 m/s true wind speed.



Sea State

WeatherCitizen attached to research buoy in the Gulf of Maine collected data remotely for 12 days to model sea state



Significant Wave Height derived from the linear accelerometer and the gravity sensors of WeatherCitizen mounted to buoy (left)