

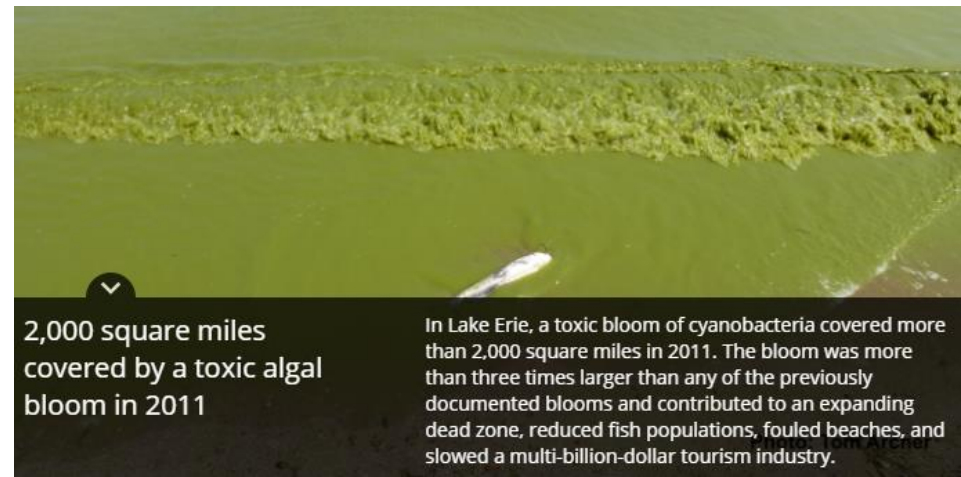
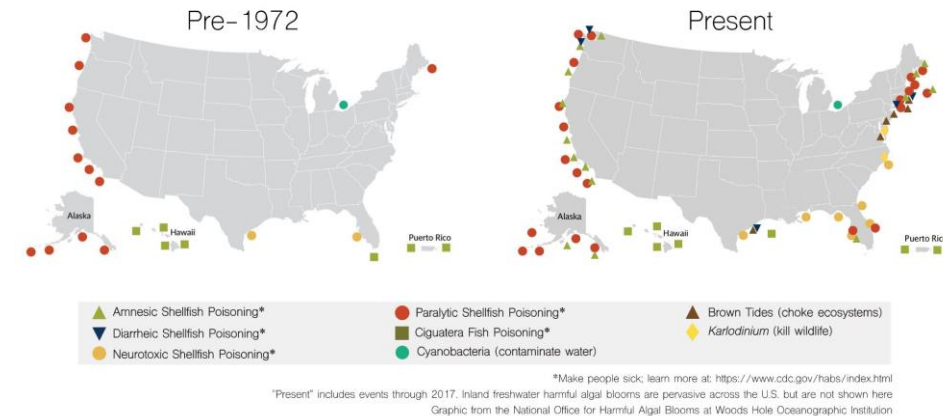


Bloom Early Detection (BED) Model

A platform for forecasting and visualizing harmful algae blooms.

Motivation

- Detrimental to economies: \$900 million each year on health and illness costs
- Over last three decades
 - More severe
 - More frequent



The Problem

01

Harmful algal bloom (HAB) portals are hard to use for the general public.

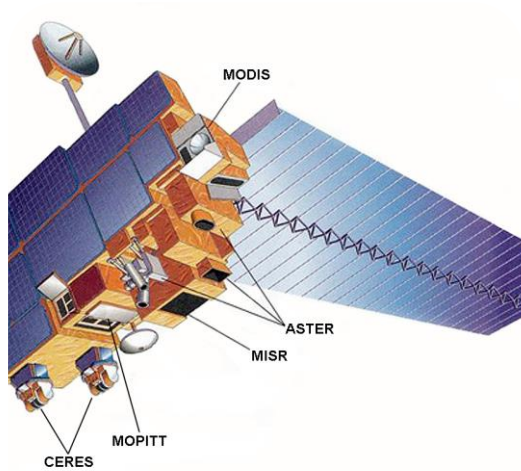
02

Forecasting algal blooms is difficult and time consuming.

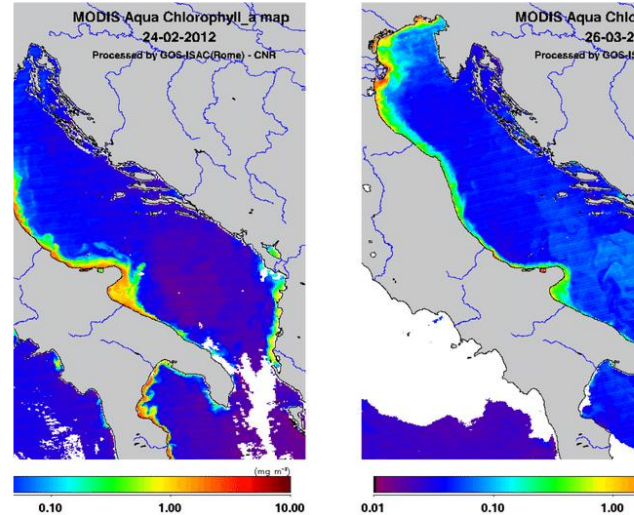
03

Wanted to develop a dashboard for identifying HAB growth with a focus on ease of use and accessibility.

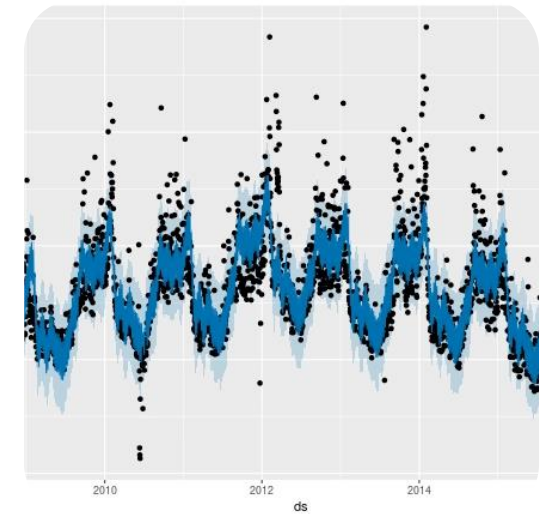
Our Model



Data collected from
Aqua MODIS



Data processed to extract
Chlorophyll-A and Sea Surface
Temperature data over time



Machine learning model used
to learn multivariate trends in
location-specific waterbodies

Our Solution



Easy to use interactive dashboard with bloom forecasting



Monthly predictions provided with machine learning algorithm

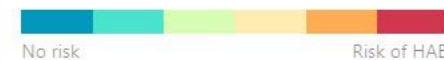


Multivariate study: uses Sea Surface Temperature and Chlorophyll-A data to determine risk

☒ Pins ☐ Chlorophyll-a Heatmap

Bloom Early Detection

An investigation in bloom early prediction.



Lake Huron

2020-07-17 to 2020-08-16

1 month Chloro-a
Change:

↓ -8.38 %

Current Chlorophyll
Concentration

2.19 mg/ml

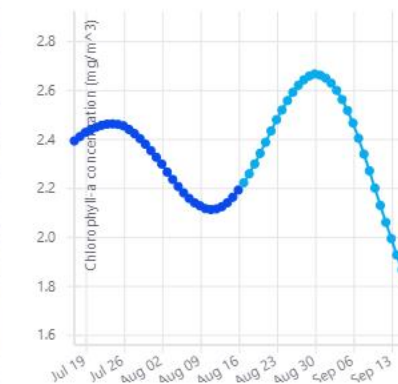
2020-08-17 to 2020-09-16

Chloro-a forecast (1
month)

1.81 mg/ml

Prediction interval (95%
confidence)

1.43 /2.21 mg/ml



View Code: [GitHub](#)

Interactive
waterbody points

Forecasted information
for waterbody

Relevant statistic for
current and future bloom
conditions

Bloom Early Detection (BED) Model

☐ Pins ☒ Chlorophyll-a Heatmap

Multiple visualizations available: surface pins and Chlorophyll-a concentration heatmap

Bloom Early Detection

An investigation in bloom early prediction.



United States

Percent of states with harmful algae blooms annually

> 50 %

Annual health costs

\$ 900,000,000

Percent of waterbodies with excessive nutrient input

> 65 %

Dead Zone surface area

245,000 (sq. km.)

View Code: [GitHub](#)

Visualization can readily handle millions of points with ease in real time

Bloom Early Detection (BED) Model