WATER QUALITY AND PHYTOPLANKTON MONITORING: A CITIZEN SCIENCE APPROACH

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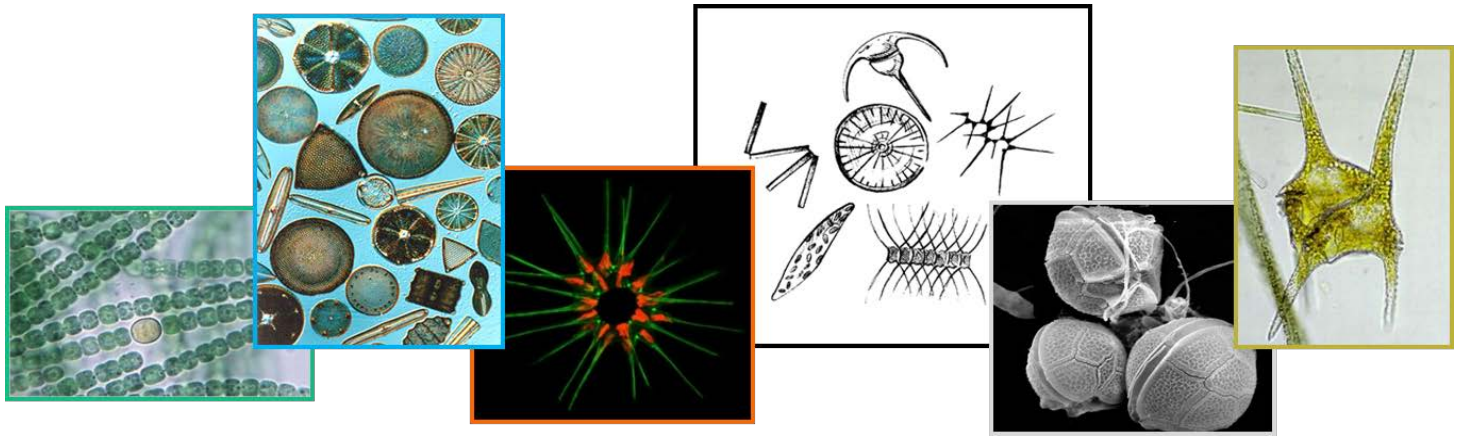
Life on Earth would not exist
without phytoplankton.

Phytoplankton



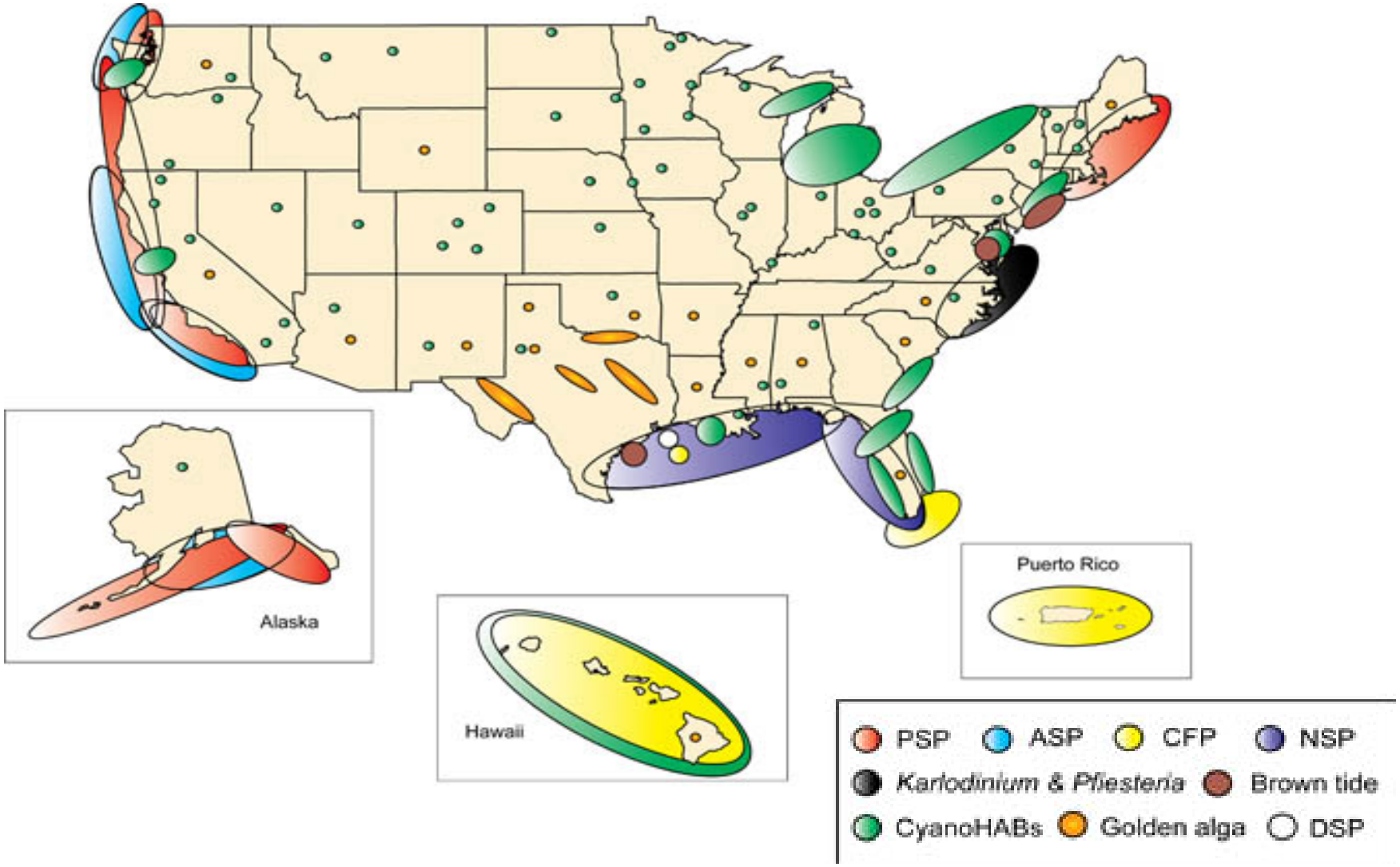
- aquatic photosynthetic primary producers (generate ~50% atmospheric O_2!)
- form the base of the food web in aquatic systems
- growth and productivity regulated by light, nutrients, temperature, microbial & food web interactions among others

Phytoplankton Blooms

high nutrient loading, often a result of human activities, can result in harmful algal blooms or ‘HABS’

- significant, often rapid increase in algae that cause negative ecological, health, and or economic impacts
- these blooms can emit powerful toxins which endanger human and animal health.

Phytoplankton Blooms



HABs are ubiquitous throughout the US (and globally)

Phytoplankton Blooms

- threatens drinking water & food supplies
- $10's of millions annual losses in commercial fishing
- $1 billion annual losses in tourism

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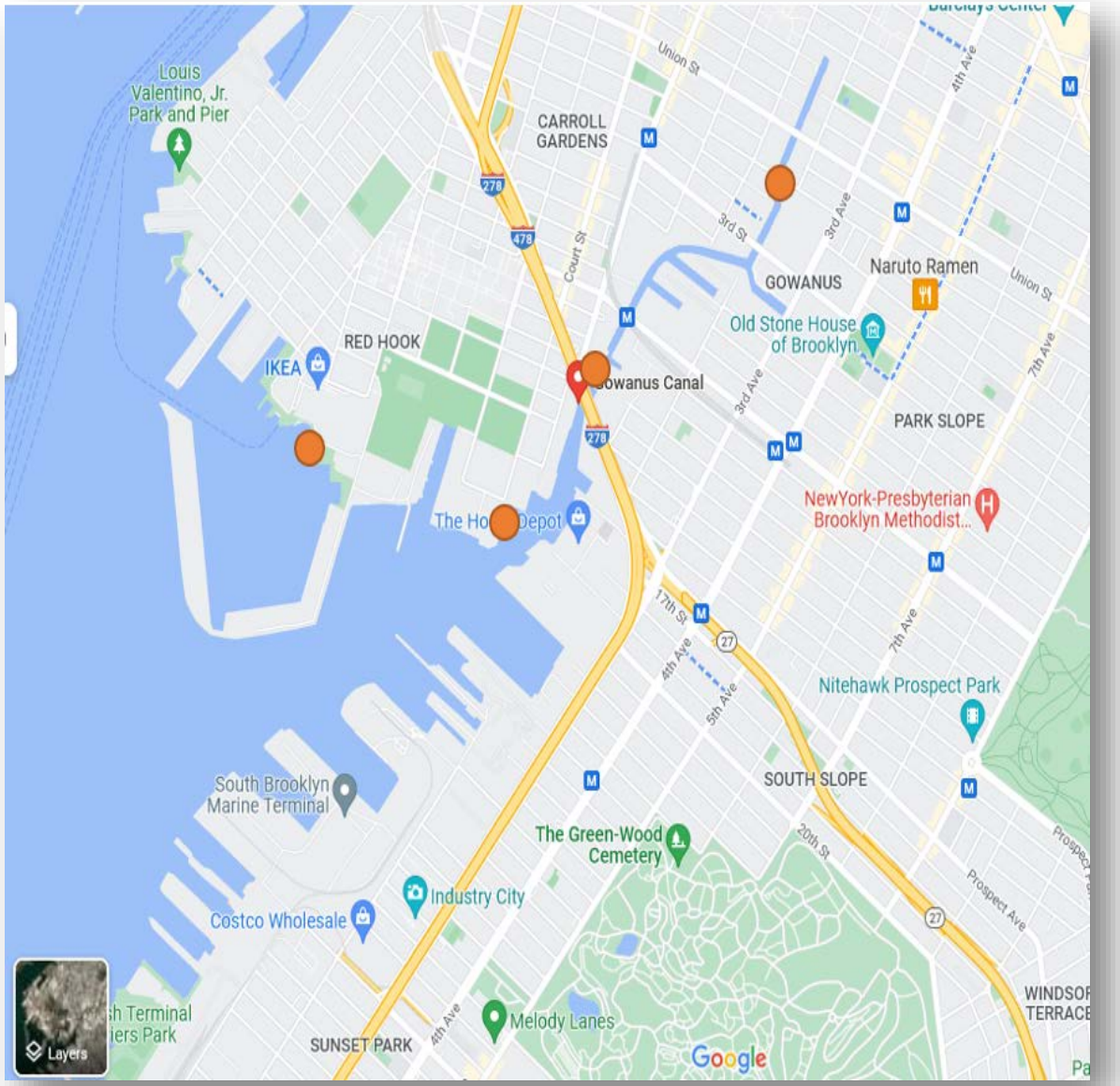
NOAA's National Centers for Coastal Ocean Service (NCCOS)

NCCOS promotes a better understanding of HABS via the **phytoplankton monitoring network**

- a community-based network of volunteers monitoring marine phytoplankton and harmful algal blooms (HABs).
- recognizes the interrelationships between humans and coastal ecosystems while providing volunteer citizen scientists with meaningful opportunities for hands-on science engagement.
- enhances the Nation's ability to respond to and manage the growing threat posed by HABs by collecting important data for species composition and distribution in coastal waters

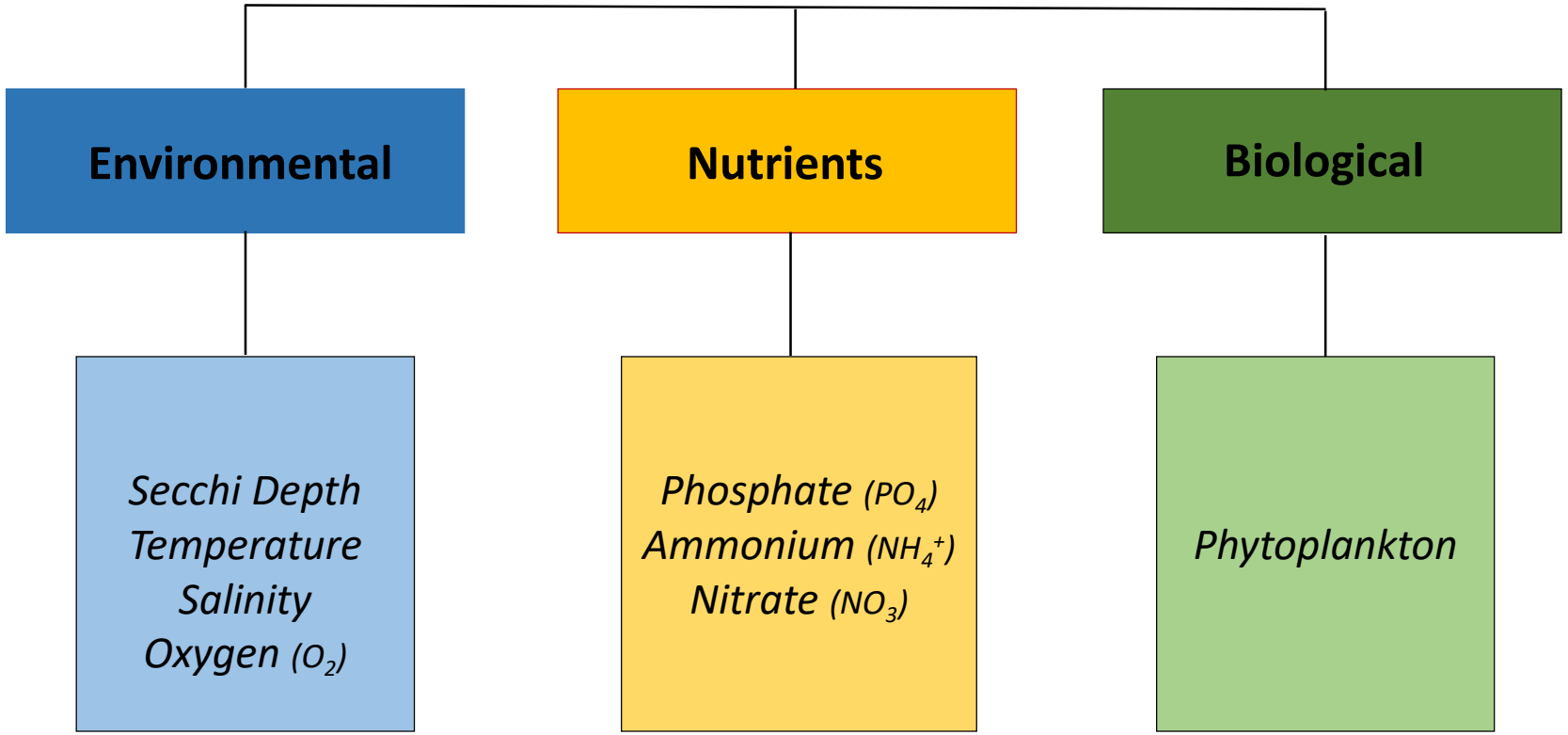
NCCOS then uses this information to conduct and fund research to help **communities protect the public and combat blooms in cost-effective ways,**

Where You'll be Working: Gowanus Harbor in Red Hook, Brooklyn on a barge at the RETI Center



What You'll Be Doing: Learning Sampling and Analysis Techniques Commonly Used by Environmental Scientists

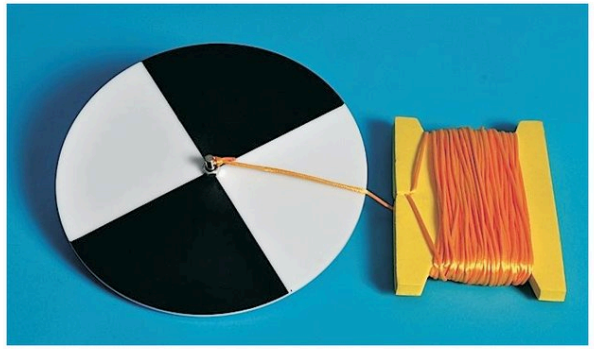
There are 3 Categories of parameters that will be monitored



Collectively, this work will contribute important data to NOAA's Phytoplankton Monitoring Network

Environmental Parameters

Secchi Depth - Secchi Disk



How 'clear' is the water & how deep can light penetrate?

Salinity- refractometer

What's the salinity of the water that organisms are living in?

Temperature- thermometer

What's the water temperature that organisms are living in?

Oxygen Concentration- analytical kit

How much oxygen is in the water for aquatic organisms to breath?

Nutrient Parameters

Ammonium Concentration- analytical kit

How much nitrogen as ammonium is available for phytoplankton growth?

Nitrate Concentration- analytical kit

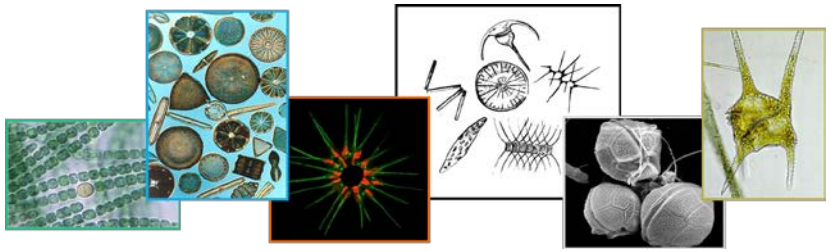
How much nitrogen as nitrate is available for phytoplankton growth?

Phosphate Concentration- analytical kit

How much phosphate is available for phytoplankton growth?

Biological Parameter

Phytoplankton are collected with a phytoplankton net



And then the samples are viewed on a microscope to see ‘who’s’ there

Biological Parameter

Phytoplankton composition (i.e. who's there) is then analyzed using a microscope

KEY OUTCOMES

- Water Sampling and Data Analysis Skills
- Hands-on Laboratory skills
- Better Understanding of HABs and Impact on our Water Systems and Communities
- Advocacy on HABs impact on Humans, Marine Life and Society
- Citizen Science Approach to Early Monitoring and Prevention of HABs Occurrence
- Stakeholder Engagement, Environmental Literacy