

2015

Citizens, Science and A Changing Bay (2015 State of the Bay Presentation)

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Citizens, Science and A Changing Bay



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Friends of Casco Bay



Friends of Casco Bay
Casco BAYKEEPER

State of the Bay 2015 Conference
October 13, 2015
Casco Bay Estuary Partnership



Friends of Casco Bay



- Formed by **concerned citizens** in 1989
- Mission: to **improve and protect** the environmental **health of Casco Bay**
- Focus on **Water Quality**
- Three key strategies:
 - Science
 - Public Education and Outreach
 - Advocacy



Friends of Casco Bay



- Staff of ten **professionals**
- **Citizens** are a core (corps) part of all we do

Casco Bay belongs to all of us!



Water Quality Monitoring Program



- **Quality Assured Project Plans** for data collection by staff and volunteers
- **Scientifically sound data** shared with and used by scientists, academics, policy makers
- 24 years of data
- Significant for State of Maine and **Clean Water Act** compliance reporting to federal government
- Our work is essential for water quality **classifications** of regions of the Bay: upgrades = ultimate goal



A Changing Casco Bay



- How healthy is Casco Bay?
- **Report** released April of this year
- Copies here and available on our website cascobay.org

➤ Changes are happening faster than anyone could have expected



Award Winning **Citizen Stewards Water Quality Monitoring Program**



- Program began in 1992
- Trained over 750 volunteers – Citizen Stewards – to collect water quality data all over the Bay
- **Funding from Casco Bay Estuary Partnership and EPA has been essential** to the success of this program

Thank you, CBEP!



Citizen Stewards Water Quality Monitoring Program



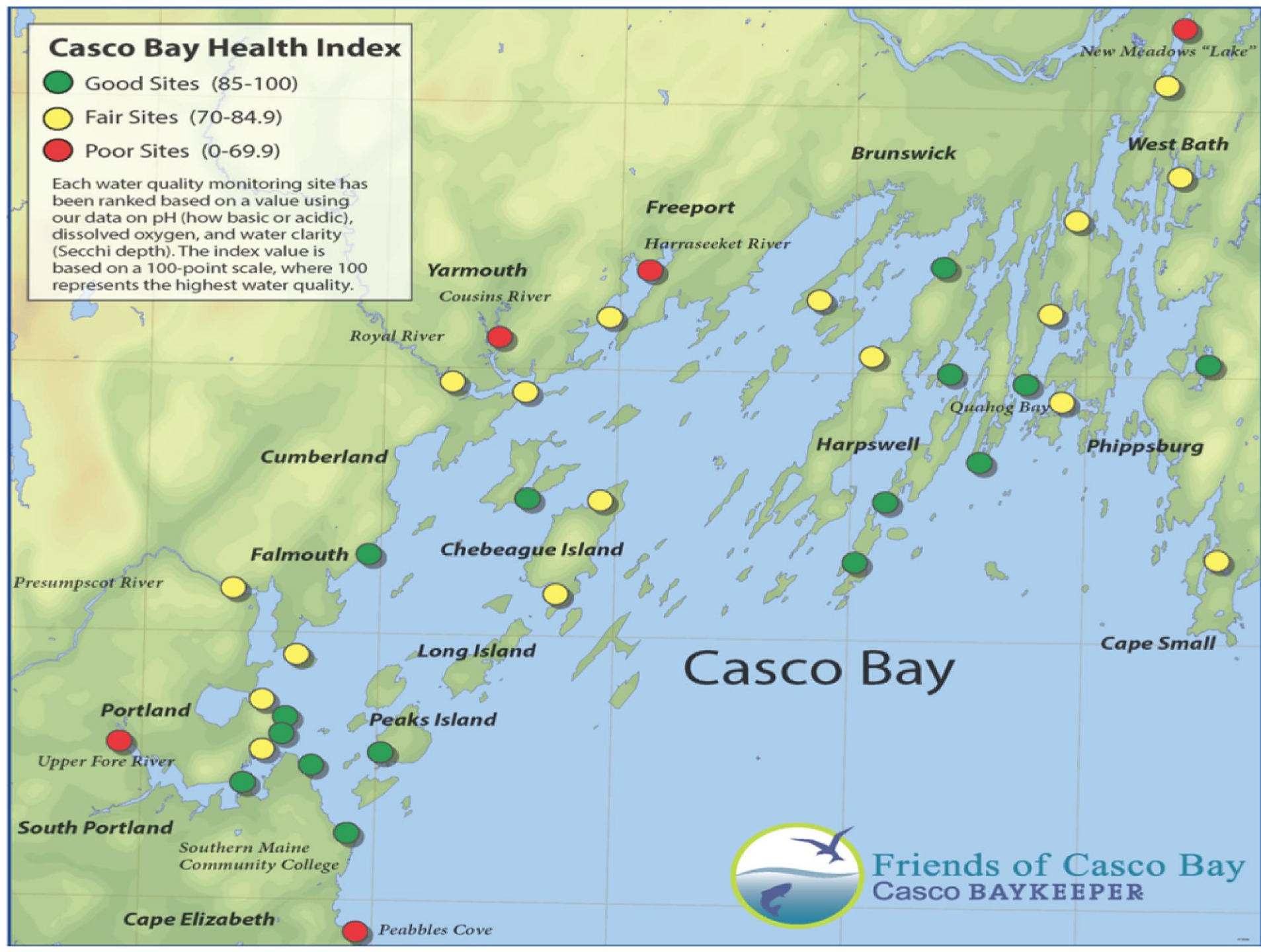
- **Synoptic and Spatial Coverage at Surface**
- Volunteers, now at 35 sites around the Bay
- Twice a day: 7 a.m. and 3 p.m.
- 10 Saturdays, April – October
- **Diurnal fluctuations** in pH and Dissolved Oxygen with respiration and photosynthesis
- **Health Index**



Casco Bay Health Index

- Good Sites (85-100)
- Fair Sites (70-84.9)
- Poor Sites (0-69.9)

Each water quality monitoring site has been ranked based on a value using our data on pH (how basic or acidic), dissolved oxygen, and water clarity (Secchi depth). The index value is based on a 100-point scale, where 100 represents the highest water quality.



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Sampling & Monitoring by Staff



- ❑ Water quality monitoring using **data sondes**
10 sites around the Bay, profiles (depth)
- ❑ **Episodic** sampling – investigate anomalies
- ❑ **Stormwater** sampling
- ❑ **Nitrogen** sampling
- ❑ **Sediment** grabs
- ❑ **Eelgrass** monitoring, restoration collaborations
- ❑ **Mud pH** measurements, buffering & predation collaborations on clam flats





Nitrogen



- **Essential nutrient**
- Too much = **pollutant**
- **Three sources** of input to Casco Bay, in almost equal proportions:
 - **Air** deposition of pollutants in the atmosphere
 - **Sewage** treatment plants
 - **Stormwater runoff** containing fertilizers and other sources of nitrogen (and other contaminants)



The rise of SLIME



- Too much nitrogen can cause nuisance – even harmful algae **blooms**
- **Decay** of blooms results in bacterial uptake of dissolved oxygen and **release of Carbon Dioxide**
- Eutrophication
- Leading cause of **COASTAL ACIDIFICATION**
- Casco Bay suffers from a **double whammy** from coastal and ocean acidification

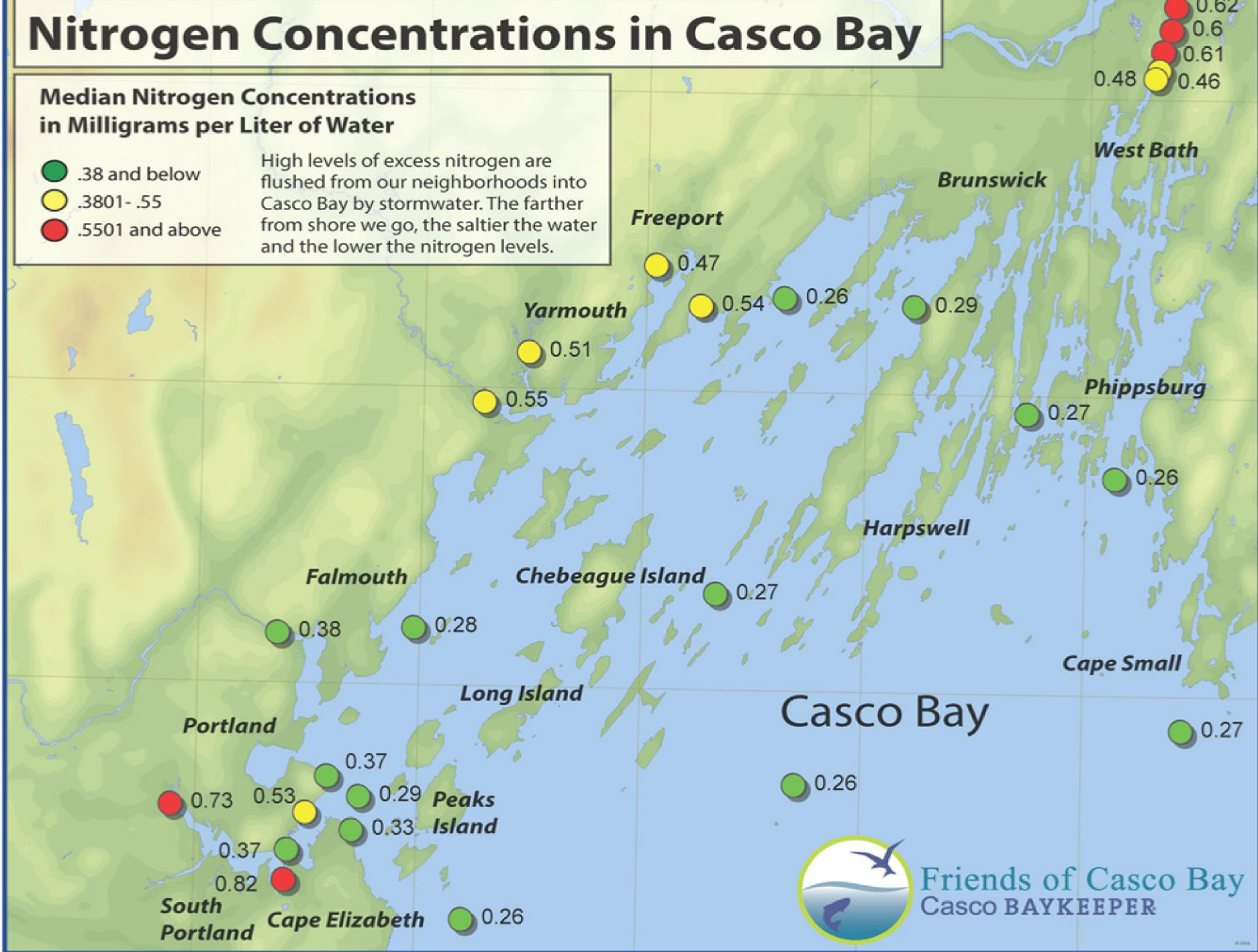


Nitrogen Concentrations in Casco Bay

Median Nitrogen Concentrations in Milligrams per Liter of Water

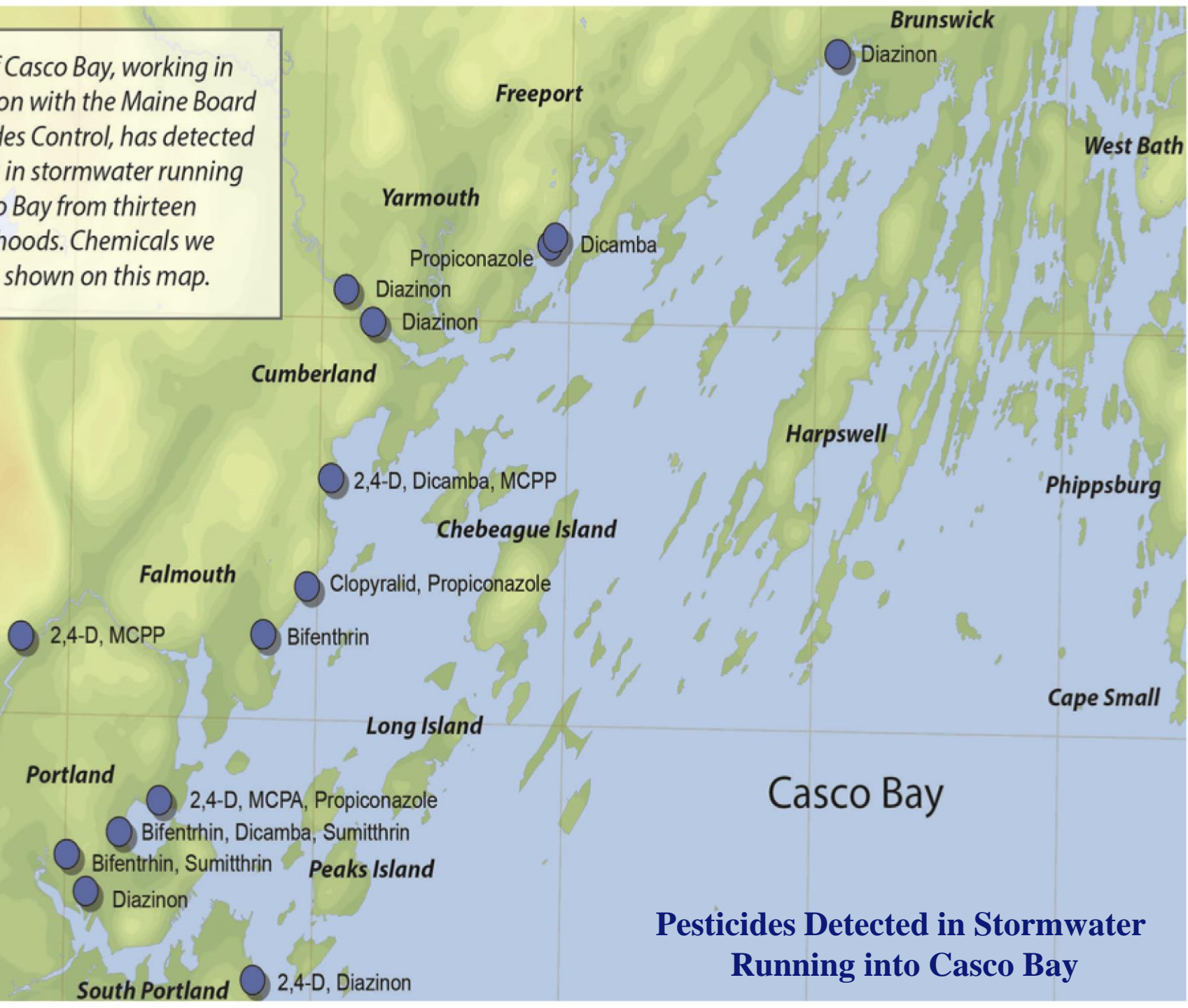
- .38 and below
- .3801- .55
- .5501 and above

High levels of excess nitrogen are flushed from our neighborhoods into Casco Bay by stormwater. The farther from shore we go, the saltier the water and the lower the nitrogen levels.

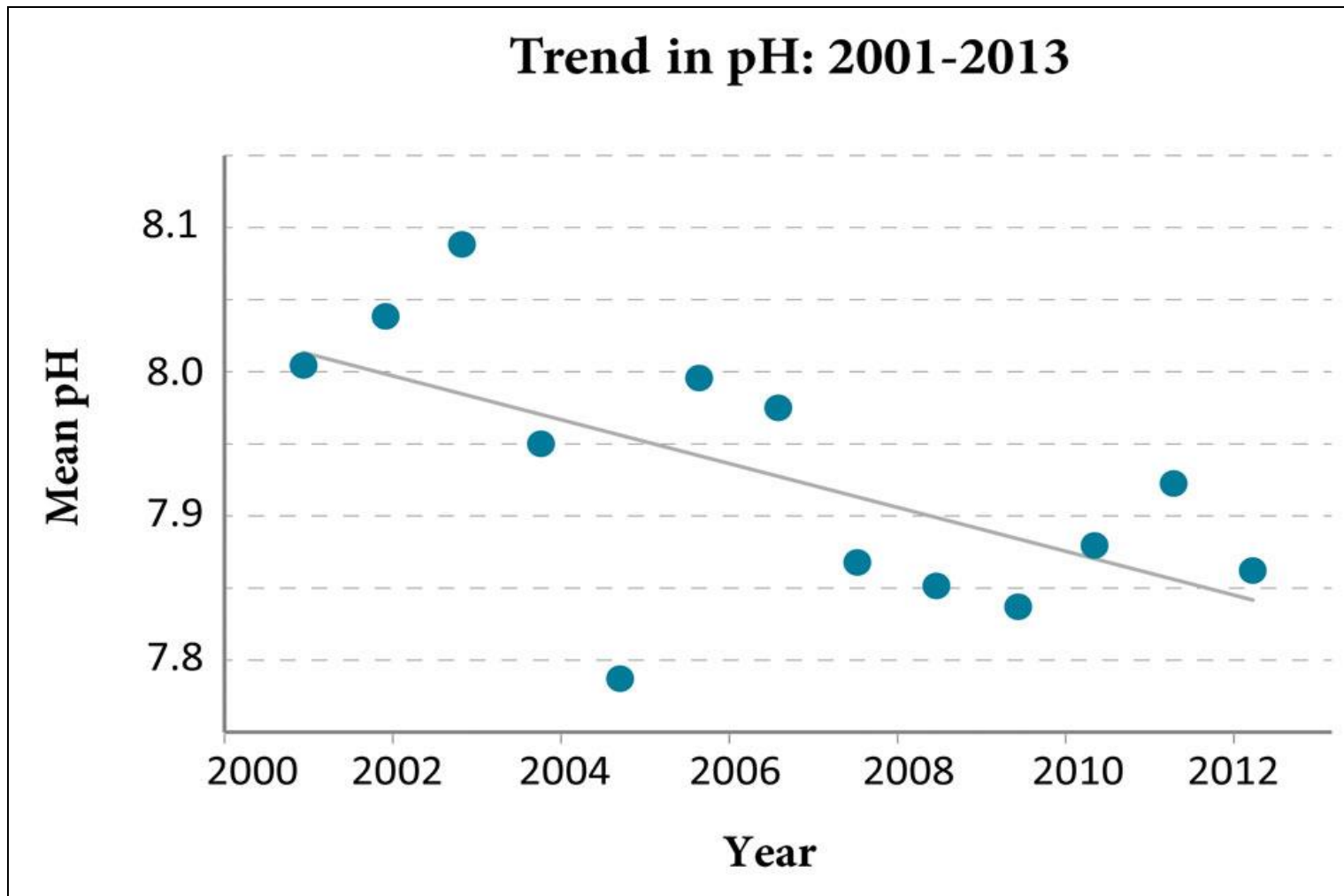


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Friends of Casco Bay, working in conjunction with the Maine Board of Pesticides Control, has detected pesticides in stormwater running into Casco Bay from thirteen neighborhoods. Chemicals we found are shown on this map.



**Pesticides Detected in Stormwater
Running into Casco Bay**



**Mean pH of bottom water
over the past decade at our
three sentinel sites in Casco Bay**

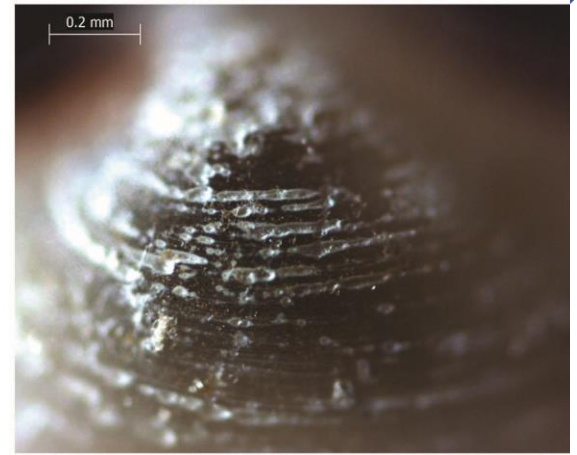




Clam A Pre-deployment



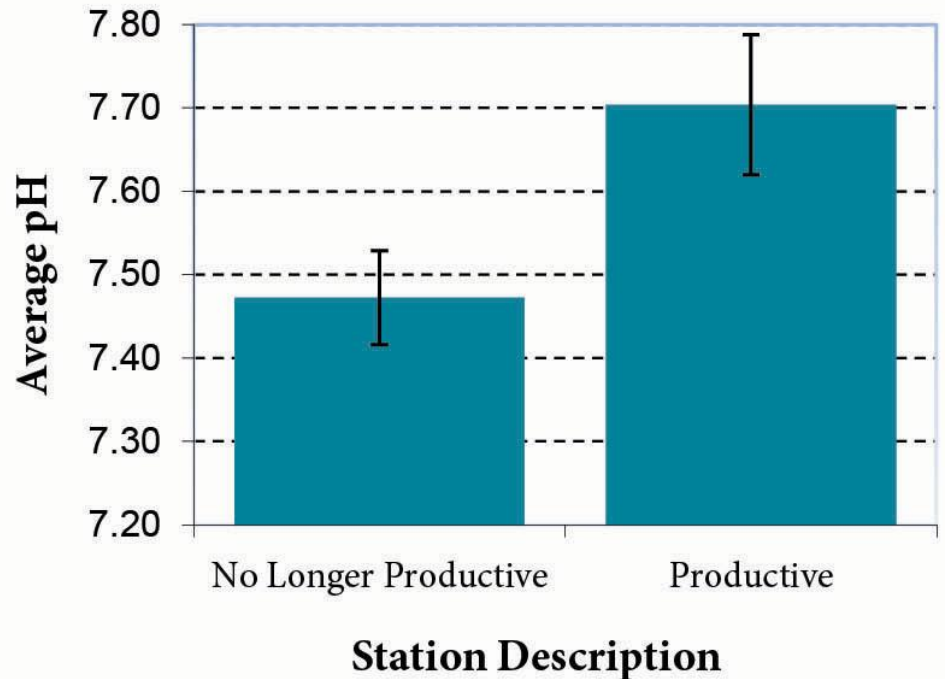
Clam B After one week



Clam C Close-up after one week

Sediment pH

2012 Casco Bay Clam Flat pH



Change – the only certainty



- **Climate chaos / climate disruptions**
- **Local effects, global effects**
- **Increasing population in the region**
- **Increasing tourism**
- **Aging population means changes in demographics and changes in volunteering styles and giving patterns**
- **Unknowns, unexpecteds, extremes**





The Work of Friends of Casco Bay

GOALS:

- **Increase citizen involvement** to create more “ownership” and educate
- **Key monitoring** and data collection efforts
- Continue **collaborations** around the Bay, water and sediment sampling, outreach and education, and advocacy efforts especially on the local level



Responsive Shifts in Our Work



- **Citizen Stewards Water Quality Monitoring Program**
- **Alkalinity** and **calcium carbonate** saturation potential
- **Sentinel Sites** for profiles for long-term data sets
- Increase **frequency** of electronic data collection – better statistical veracity
- **Nabbing Nitrogen** initiative with volunteers
- **Mud flat pH** and clam flat buffering collaborations
- **Eelgrass** collaborations
- Other **Volunteer activities**: Storm Drain Stenciling, Coastal Clean Ups, Slime Watchers
- **Advocacy/Policy** and **Public Education/Outreach** work



