

2015

Modeling and Monitoring Approach (2015 State of the Bay Presentation)

Damien Brady
Darling Marine Center

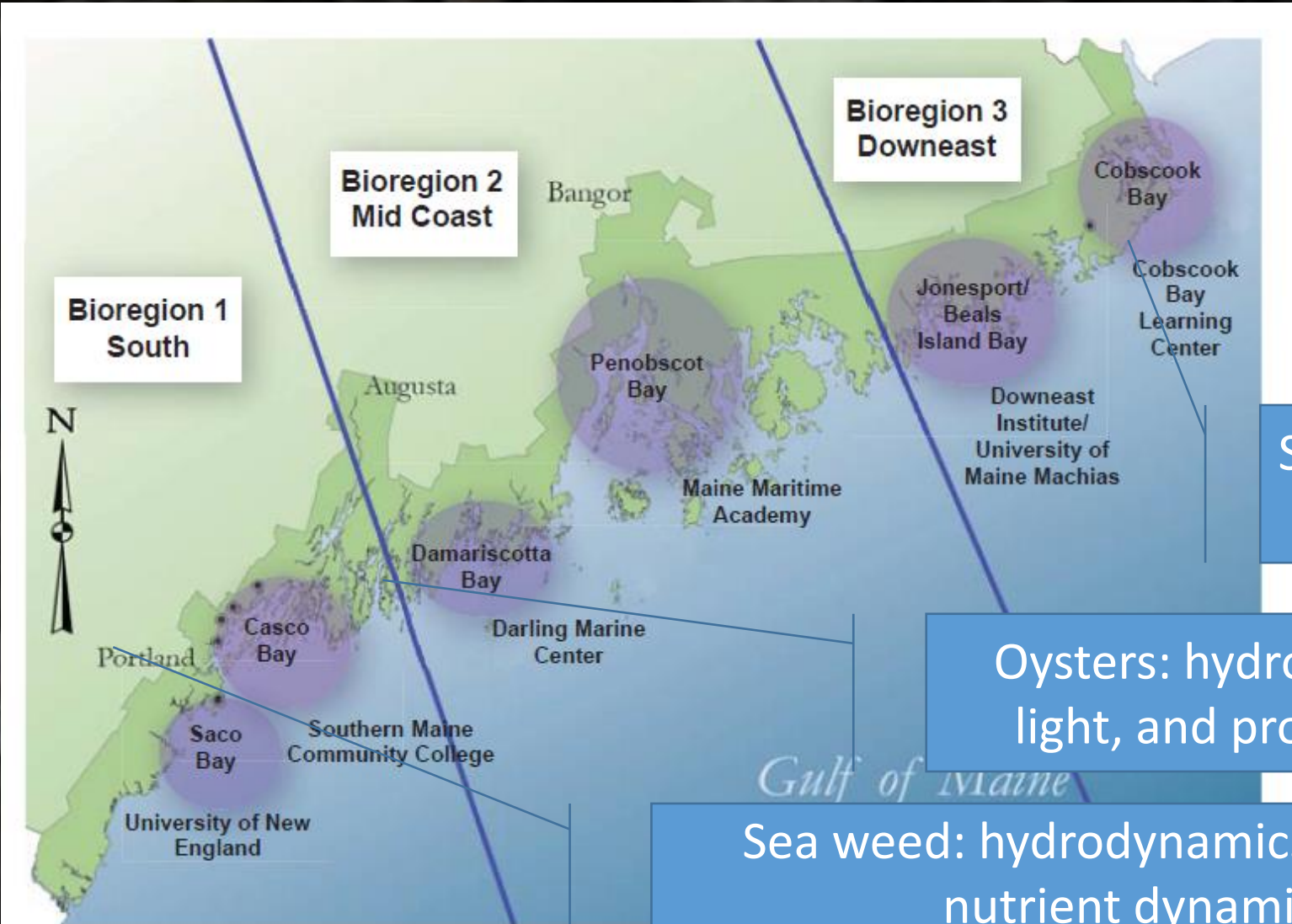
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Modeling and Monitoring Approach



- Place-Based and Idea-Based (organism-based)

Salmon: hydrodynamics (sea lice transport)

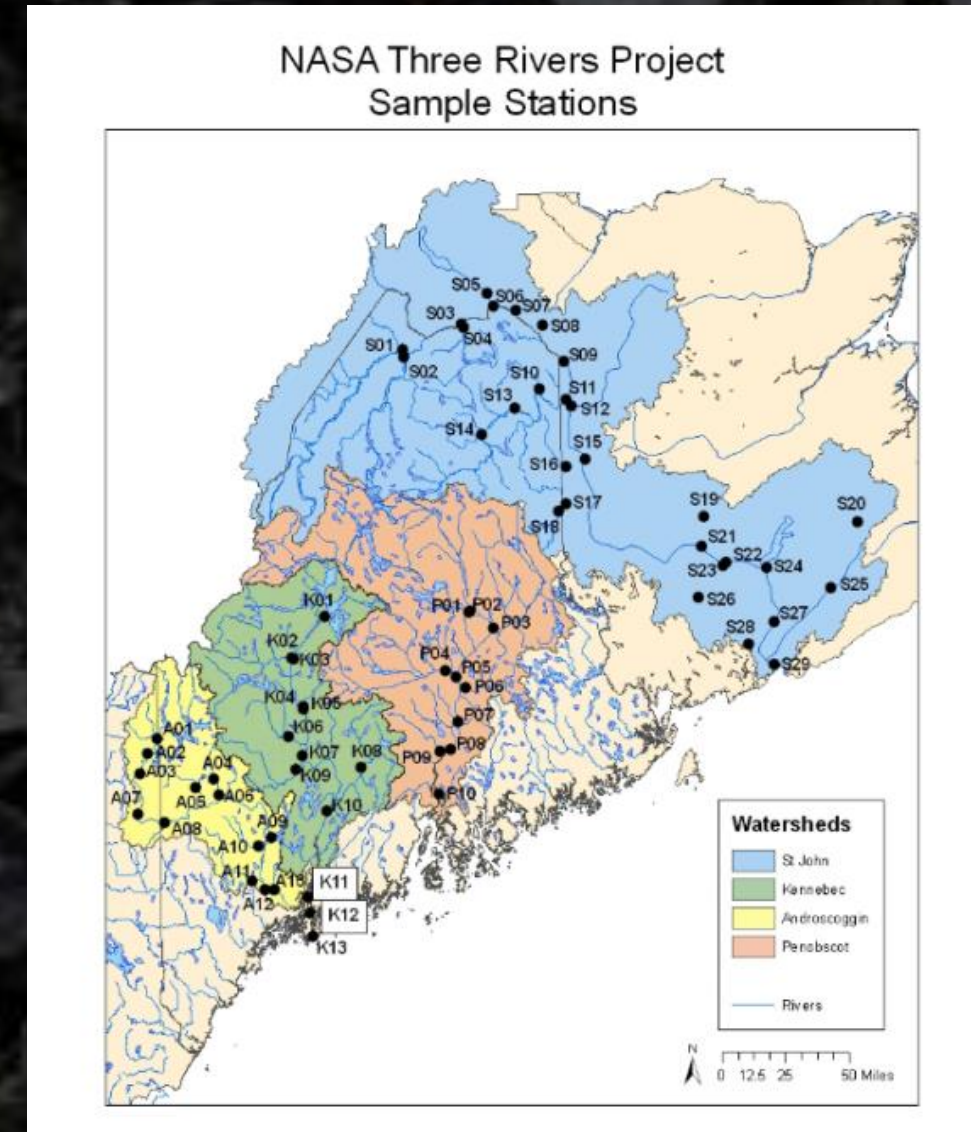
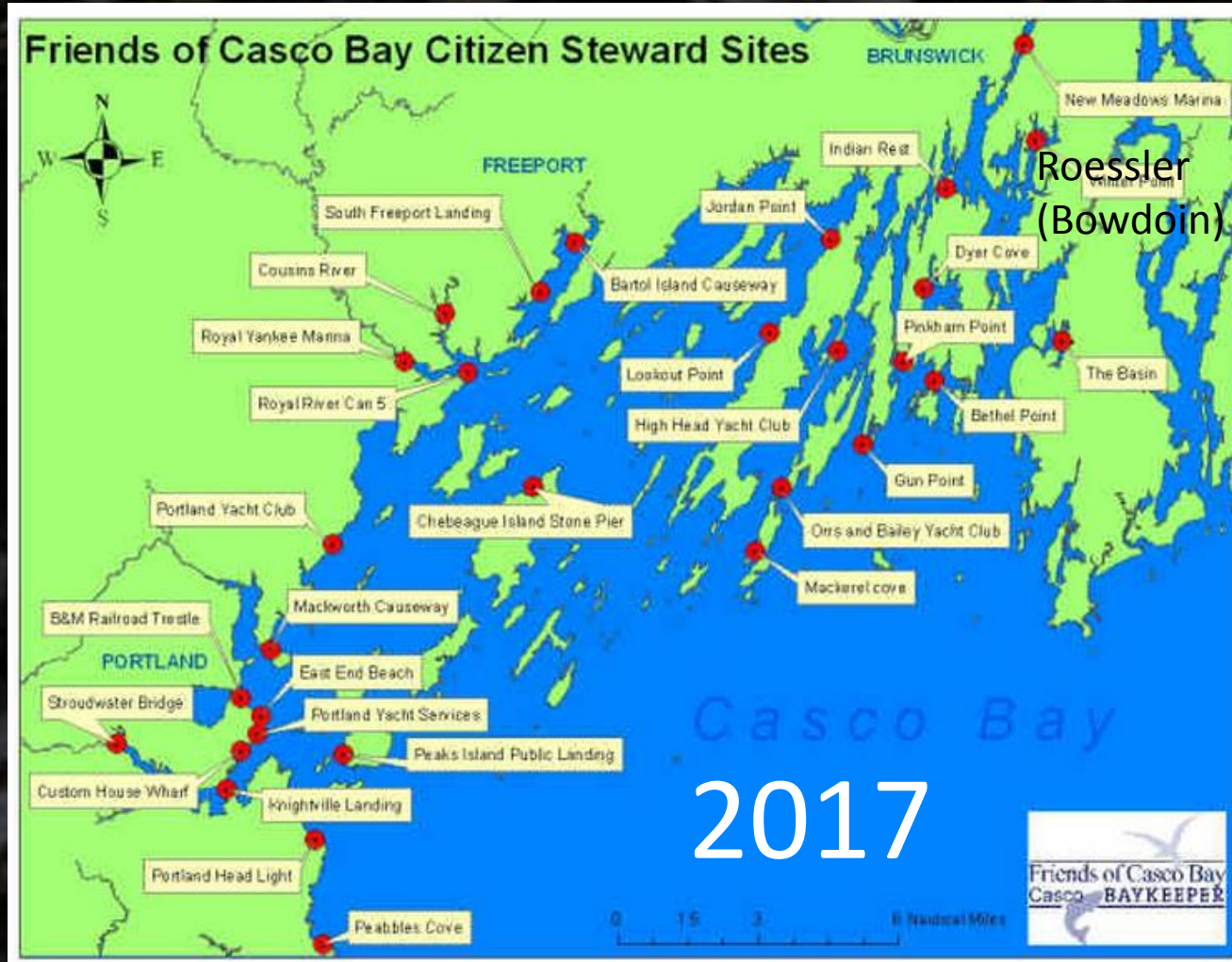
Oysters: hydrodynamics, nutrient, light, and productivity dynamics

Sea weed: hydrodynamics, light, and nutrient dynamics

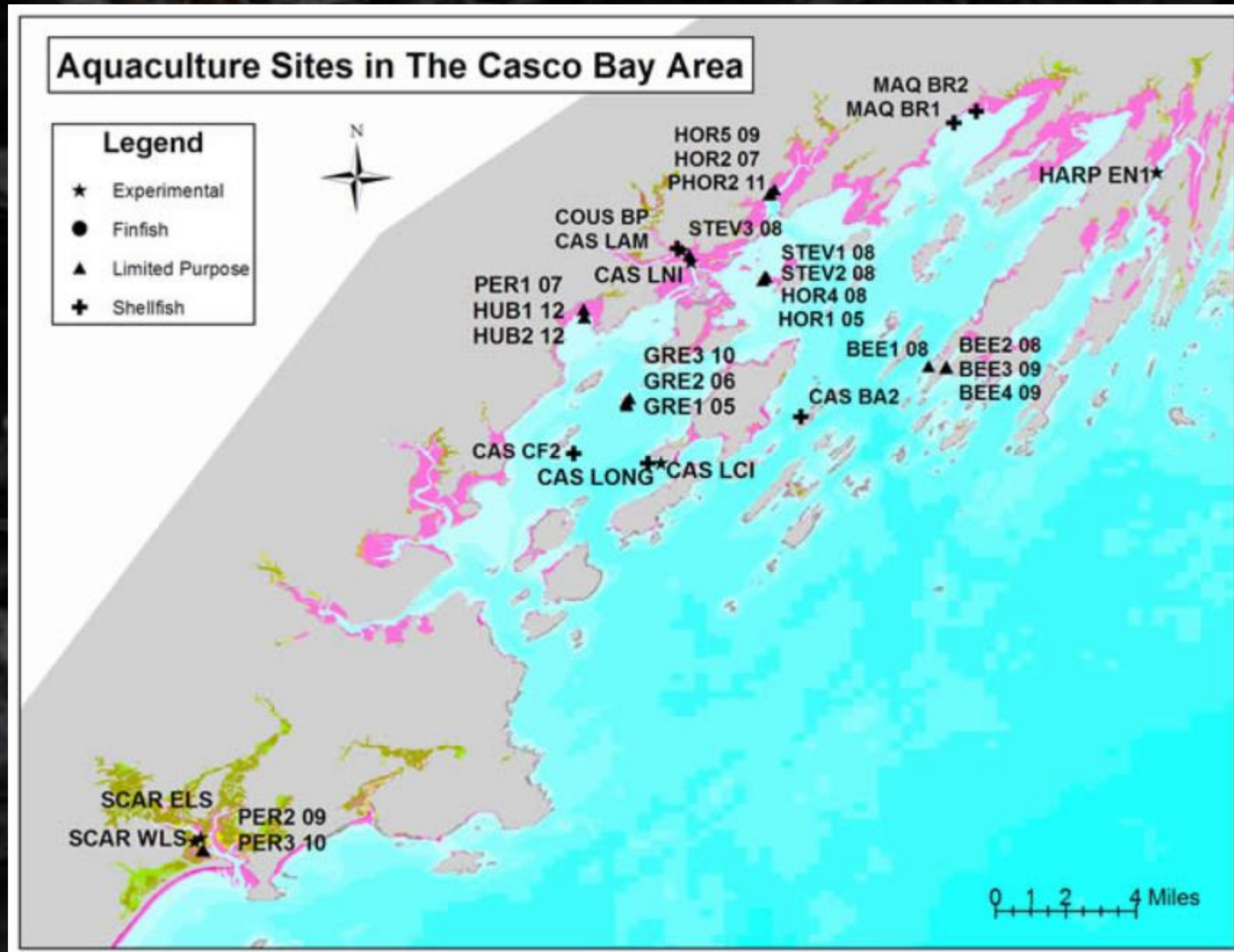
Theme 1: Growing Areas – What do we want to know and what do we want to model?

- Food flux (velocity x concentration)
- Food quality (phytoplankton and detritus)
- Nutrients (source, timing, availability) and light
- Abiotic factors (Temperature, Salinity, DO)
- Negative factors (waves, pollution, toxic algae)
- Ecological interactions

Compile Existing Data with the help of Stakeholders



Aquaculture
will inform
site selection



**LOBO****Land/Ocean Biogeochemical Observatory**[HOME](#)[LOBOVIZ](#)[WIRELESS](#)[GE](#)[CGI](#)[ABOUT](#)[CONFIG](#)[CONTACT](#)

Latest

site1

2015-10-12 18:00:00 EST

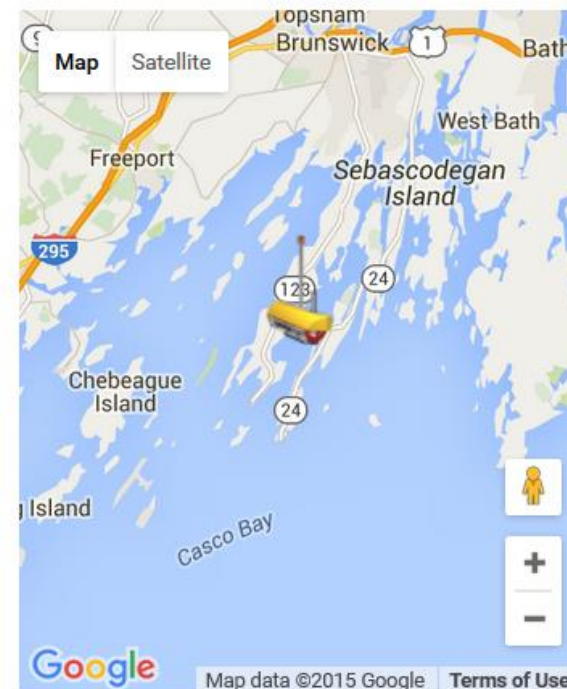
CDOM	31.20 QSDE
Conductivity	3.58 S/m
Current Direction	27.2157 NNE °
Current Speed	207.843 mm/s
Depth	0.000 dm
Fluorescence	40.03 µg/L
Latitude	4345.6523 °
Longitude	6959.2756 °
Nitrate	0.0 µM
Salinity	29.72 PSU
Temperature	13.45 C
Turbidity	0.06 NTU
Battery Voltage	14.3 V



LOBO-0052 Bowdoin College



Located in Maine.

43° 45.70 N 69° 59.30 W

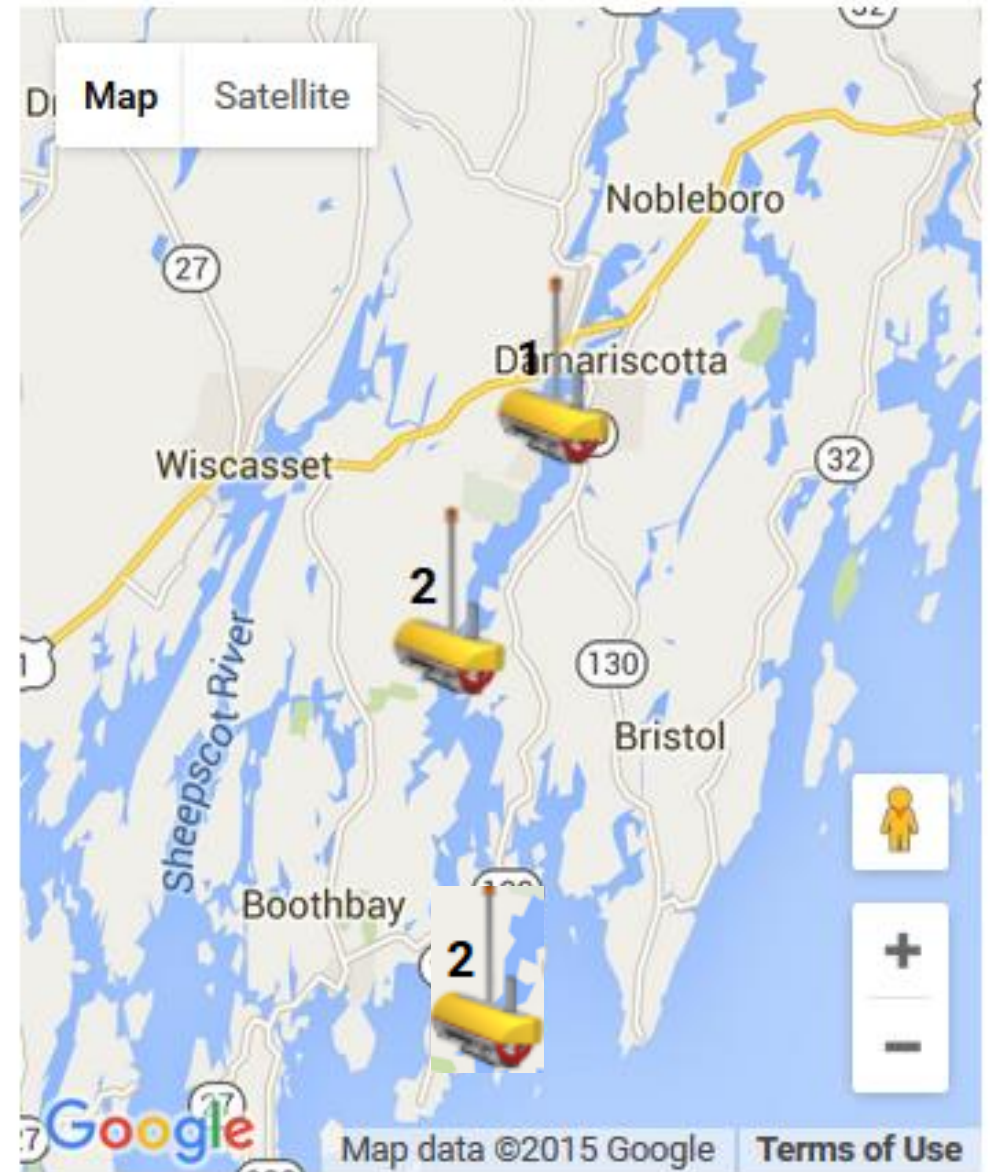
Archived Data

Use **LOBOviz** to graph and download archived data from this LOBO

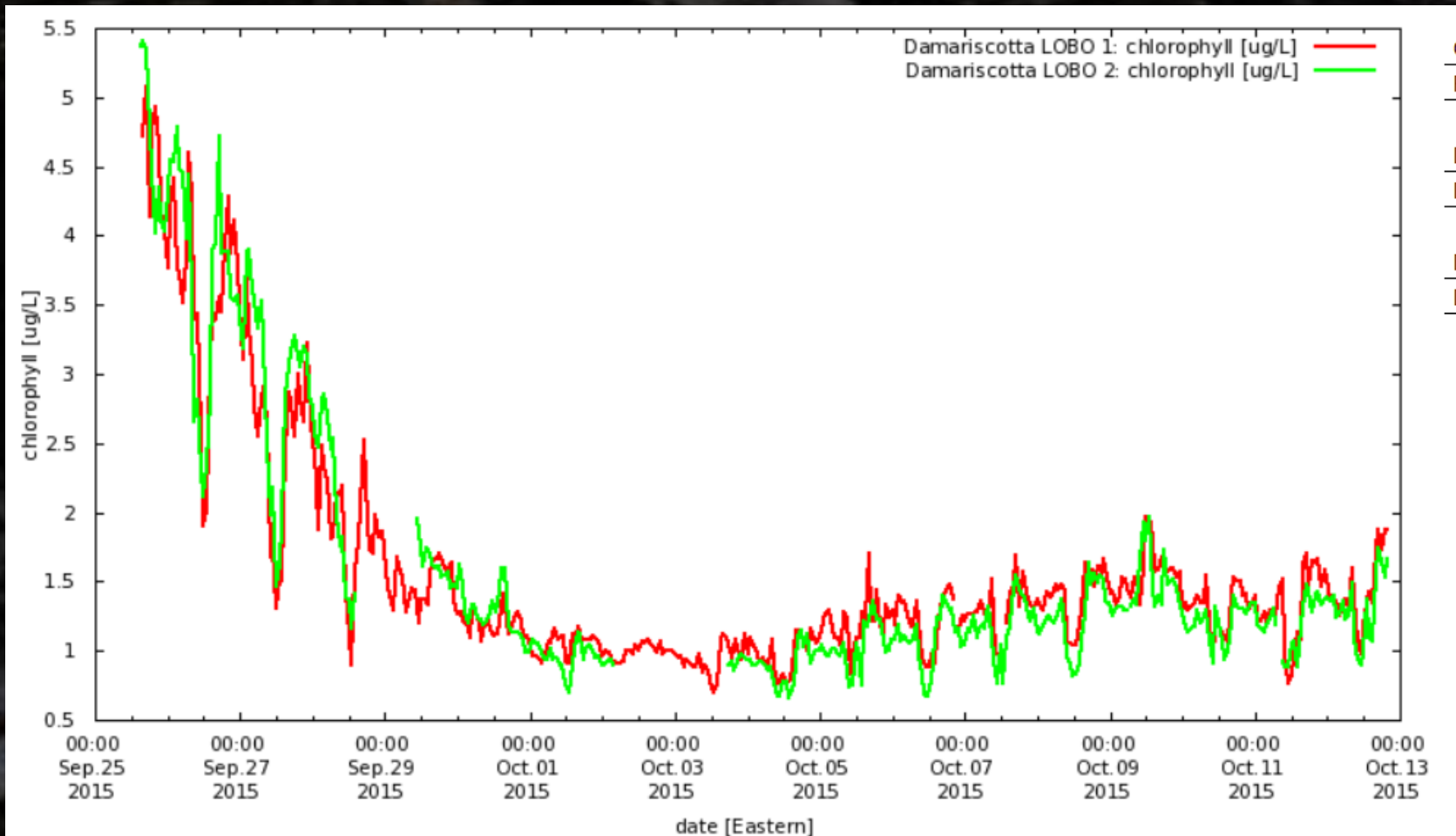
Damariscotta

- Sampling along the Estuarine Gradient
- Growing Area
- Darling Center
- Boothbay

43.9°N 69.5°W



What we will be monitoring

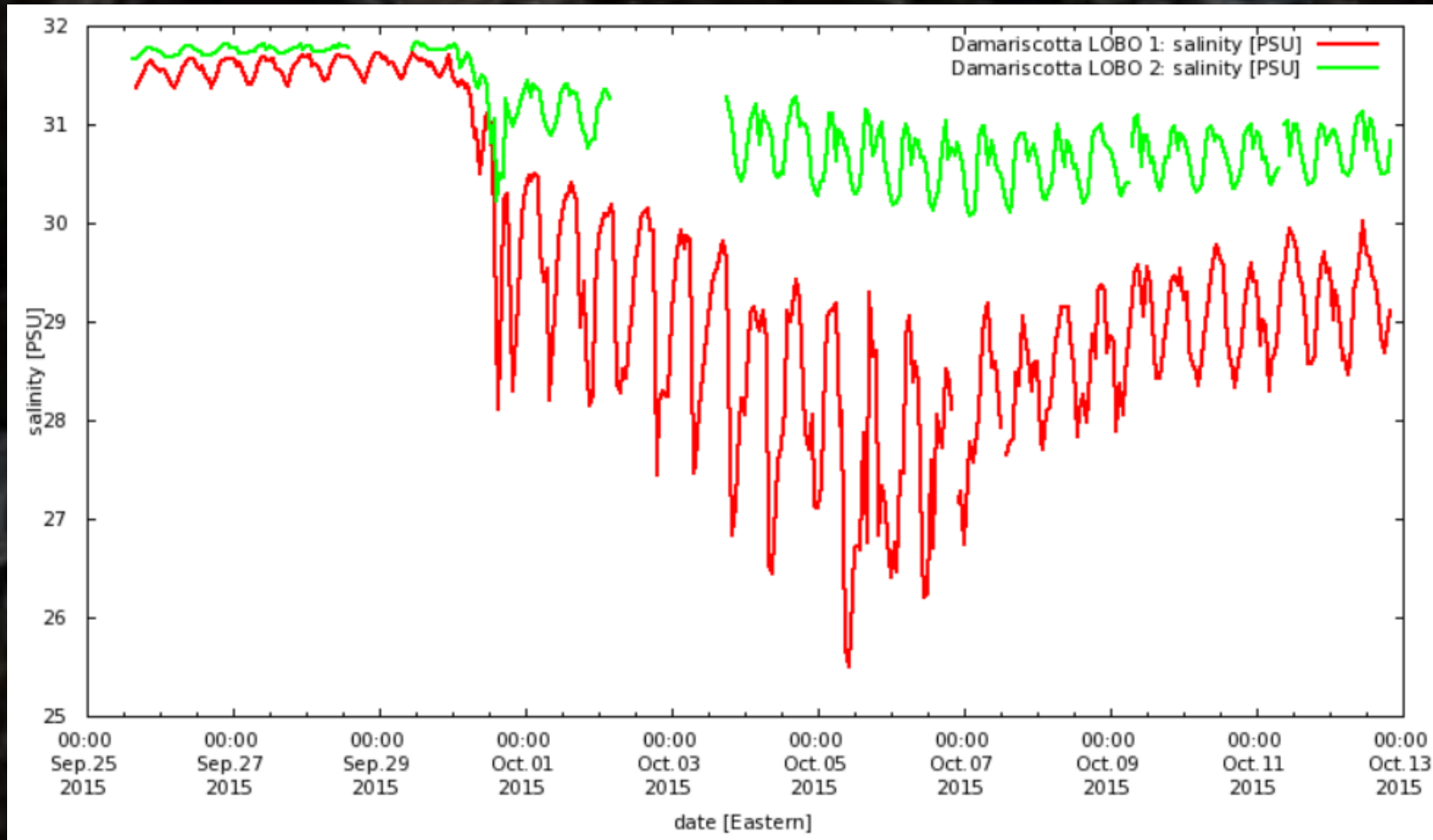


Latest

Damariscotta LOBO 1
2015-10-12 20:00:00 EST

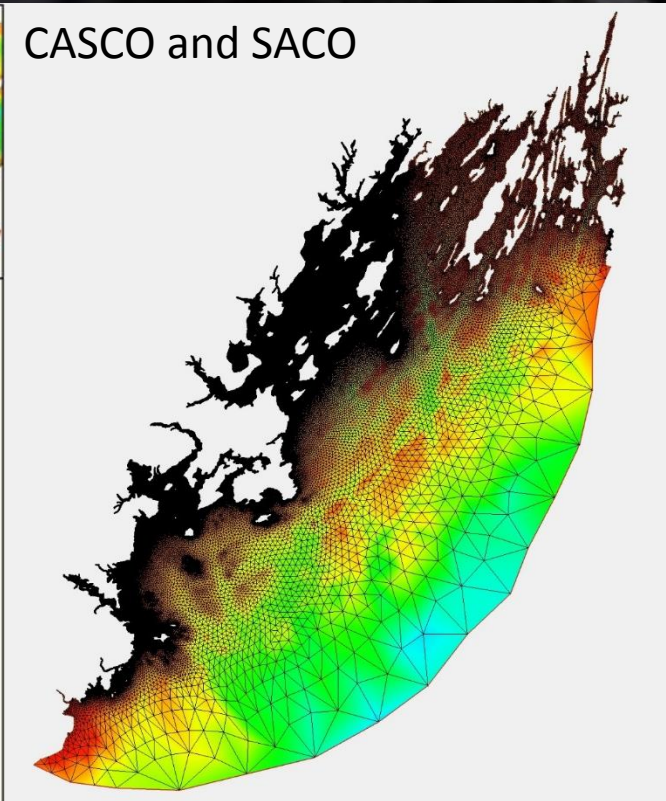
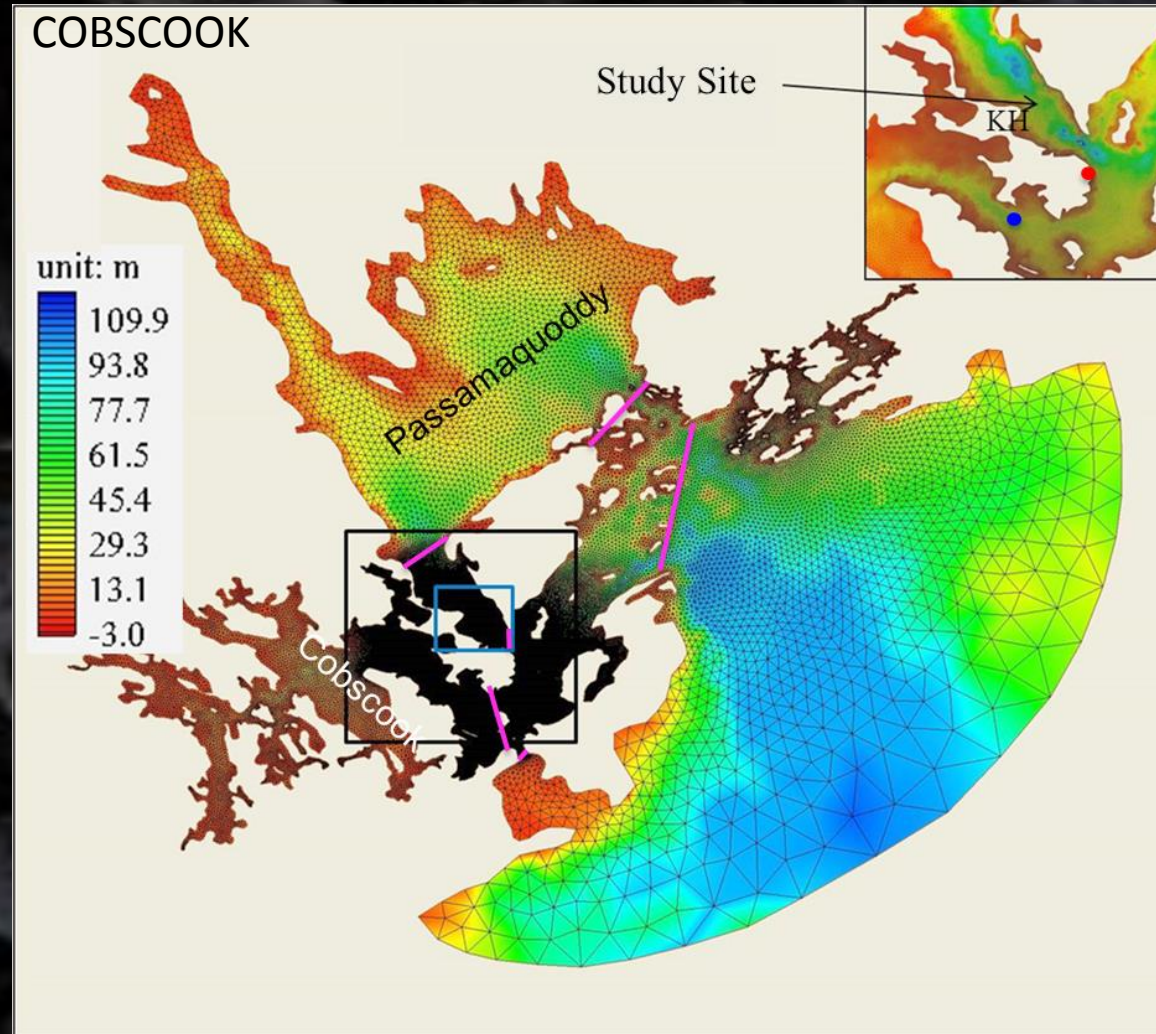
Battery Voltage	11.6 V
CDOM (Water Color)	8.23 QSDE
Chlorophyll a	1.88 µg/L
Conductivity	3.60 S/m
Current Direction	41.3 NE °
Current Speed	25.4 cm/s
Dissolved O2	6.26 ml/l
Depth (Instrument)	0.780 m
PAR(0-)	0.039 µM/m^2/sec
PAR(0+)	-0.039 µM/m^2/sec
pH	7.893
Nitrate Concentration	9.5 µM
Salinity	29.11 PSU
Temperature	14.54 °C
Transmission	7.384 m ⁻¹
Turbidity	1.93 NTU
Latitude	4359.9795 ddmm.m
Longitude	6932.4512 ddmm.m

Storm in Late September



Building Modeling Capacity – INTEGRATION

- Hydrodynamics
- Waves
- Biogeochemical
- Aquaculture Productivity
- Ecosystem
- 5 of 6 Regions with Existing Common Hydrodynamic Model Framework! (Xue)

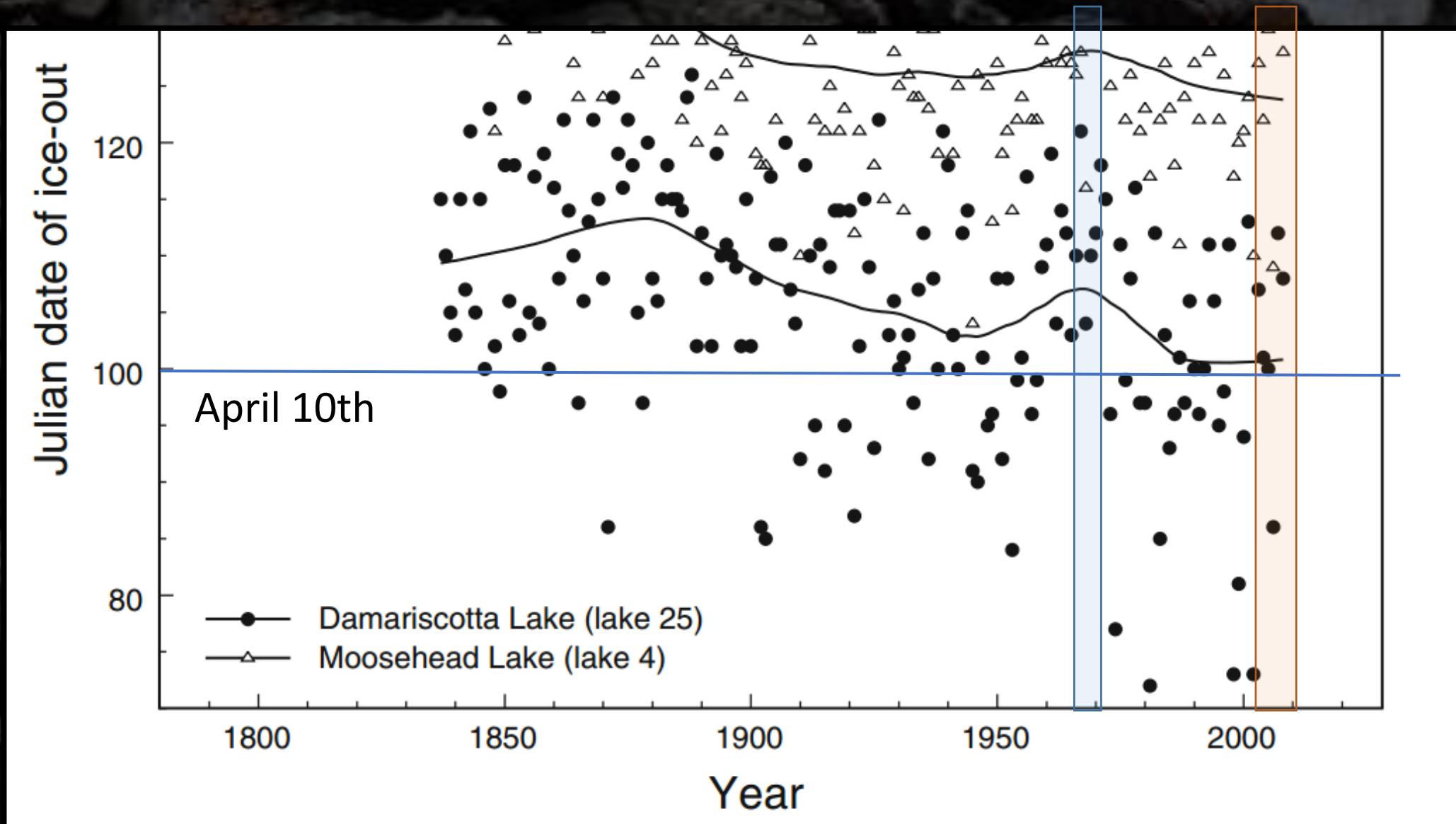


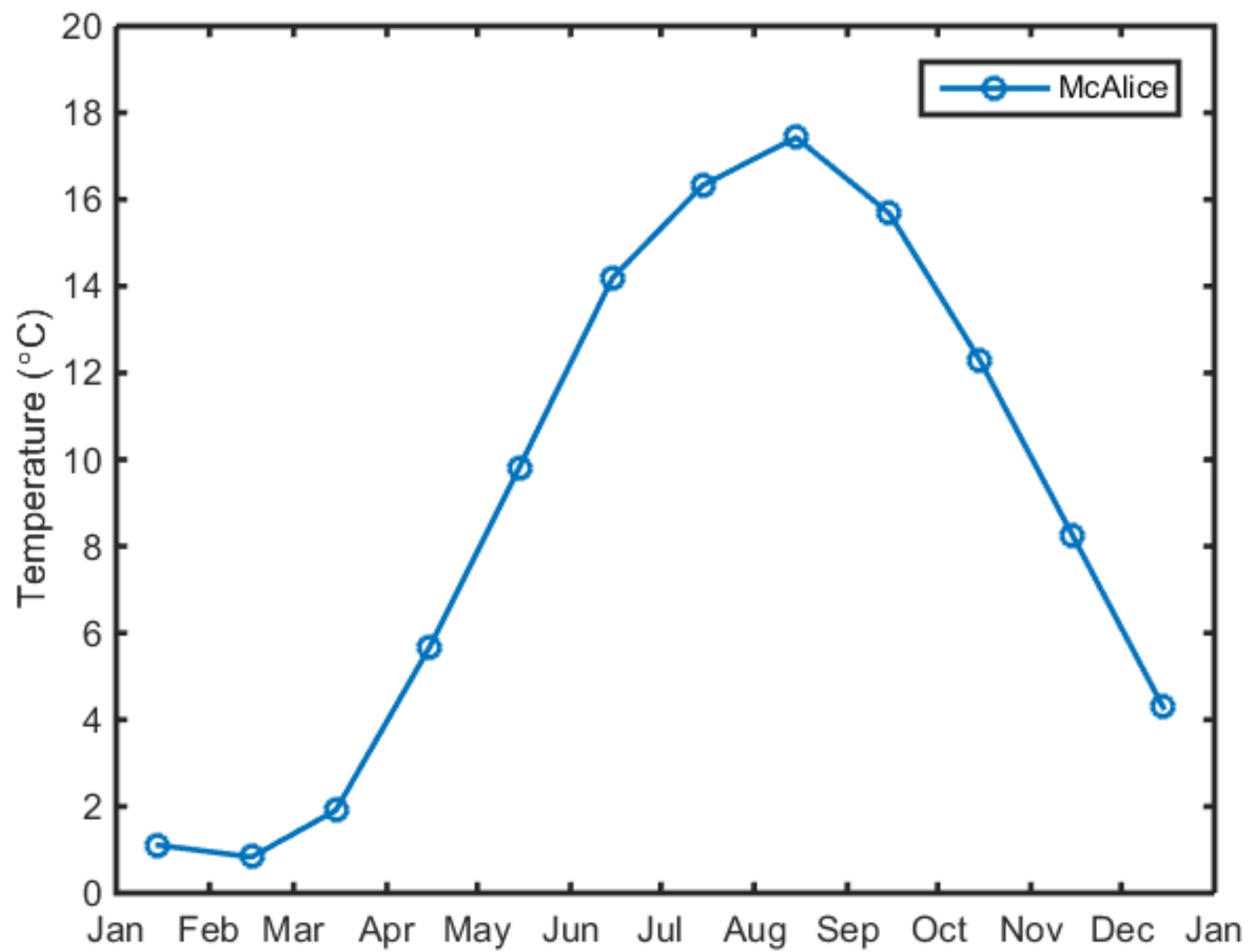
The times (and estuaries) are a changin'

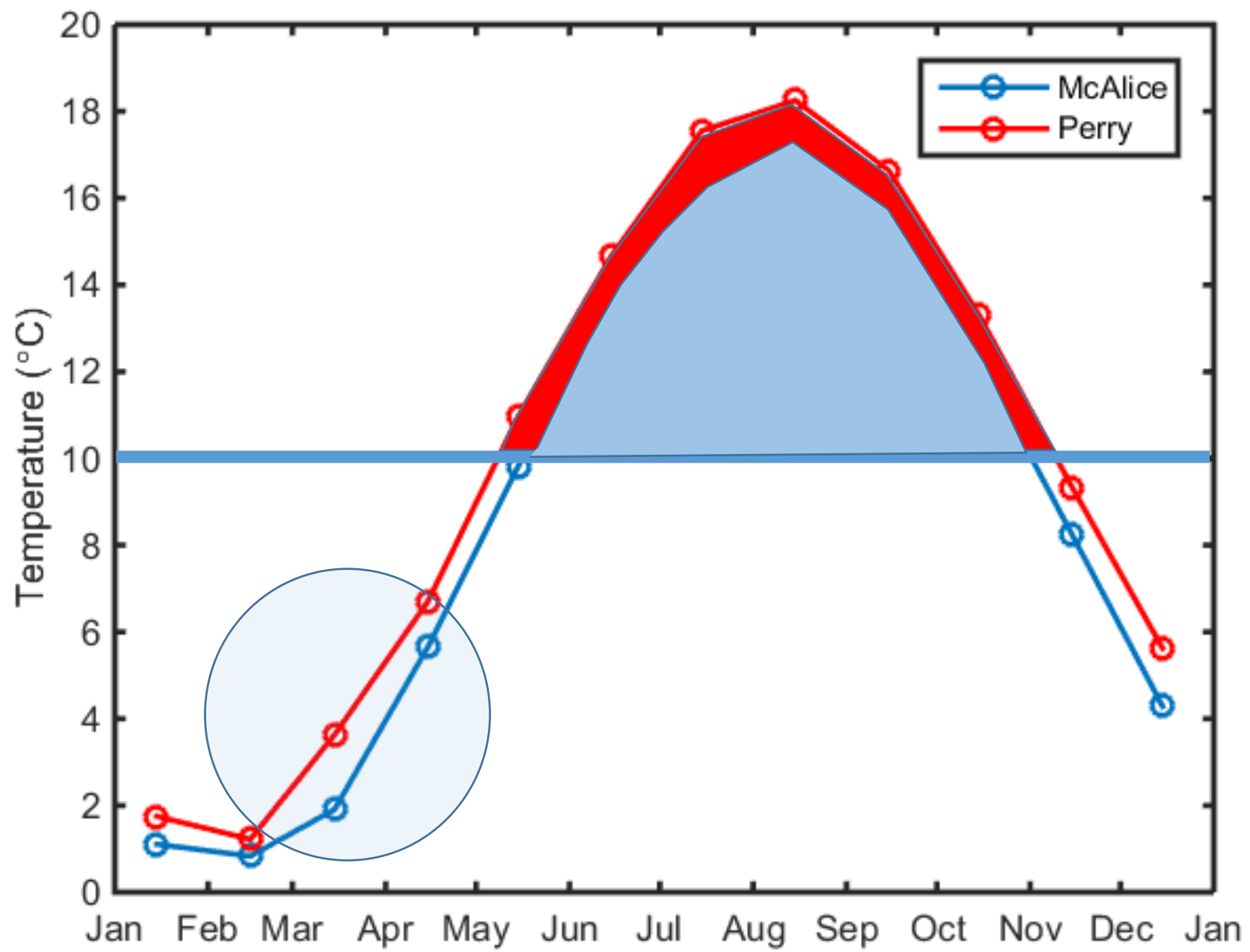
- Bernie McAlice took temperature (and other measurements) from the Darling Marine Center dock for approximately 10 years (1967-1977)
- Mary Jane Perry (current Director) has been collecting CHL and temperature for the last 14 years



Lake Ice Out Dates in the Damariscotta River

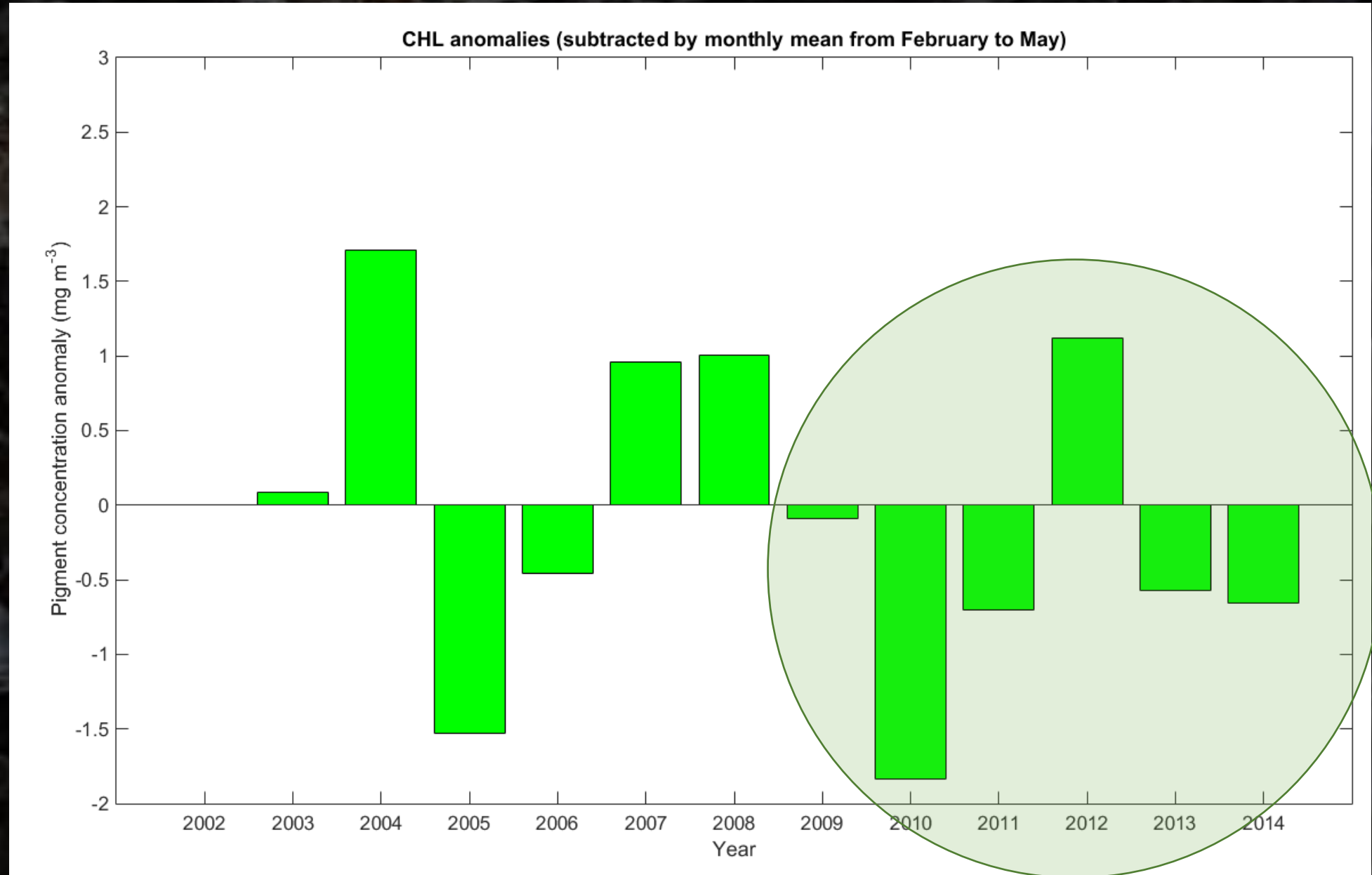






Spring

- Spring Bloom?



Bigger Fall Blooms

