



2018 Water Quality and Eelgrass Survey Updates

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MAINE DEPARTMENT OF ENVIRONMENTAL PROTECTION

Protecting Maine's Air, Land and Water

Reasonable Potential Analyses (2015-)

- DEP's discharge permits started including RP analyses, using eelgrass as aquatic life indicator and total nitrogen (TN) threshold of 0.32 mg/L
- Need three pieces of info. for RP analysis: effluent TN loading, ambient TN concentrations, biological indicator data
- Portland Water District's East End permit renewed in early 2017
 - pledge to monitor effluent [nitrogen], reduce TN load by 20-40% (PWD), conduct ambient water quality and biological monitoring 2017-2020 (DEP)



East End Vicinity Monitoring

- Sampled every three weeks from June-Sept. (2017) and May-Oct. (2018) on alternating ebb and flood tides
 - Temperature (c)
 - Salinity (c)
 - pH (c)
 - Dissolved oxygen (c)
 - Turbidity
 - Chlorophyll
 - Transparency (Secchi)
 - Light attenuation (PAR)
 - Grabs: surface (and bottom at sites >10 m depth) water
 - Nutrients: nitrate+nitrite, ammonium, TN, orthop., TP
 - Chlorophyll *a*
 - Total Suspended Solids
 - Eelgrass mapping and “health” assessments

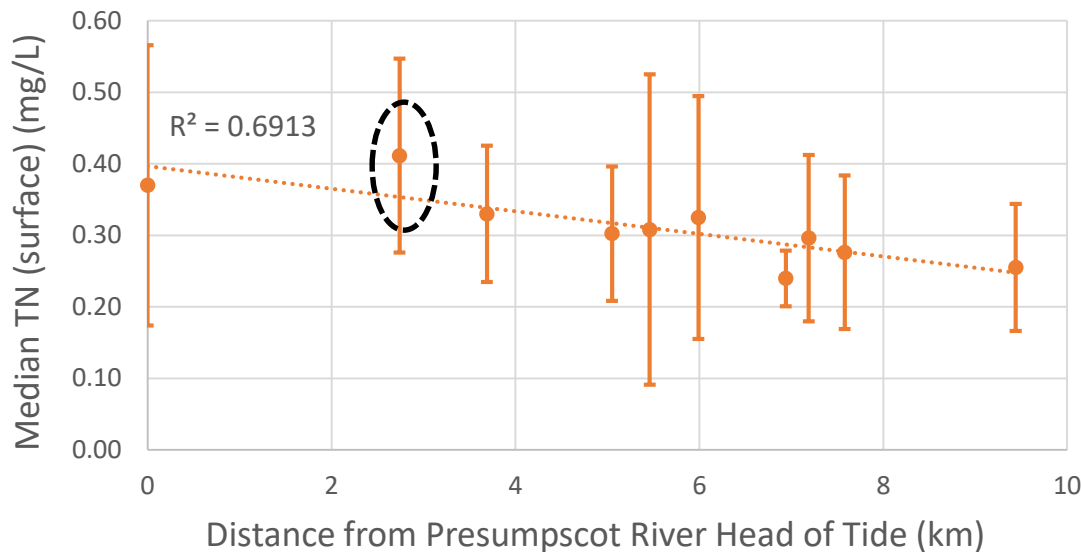
* (c) indicates additional continuous monitoring of this parameter



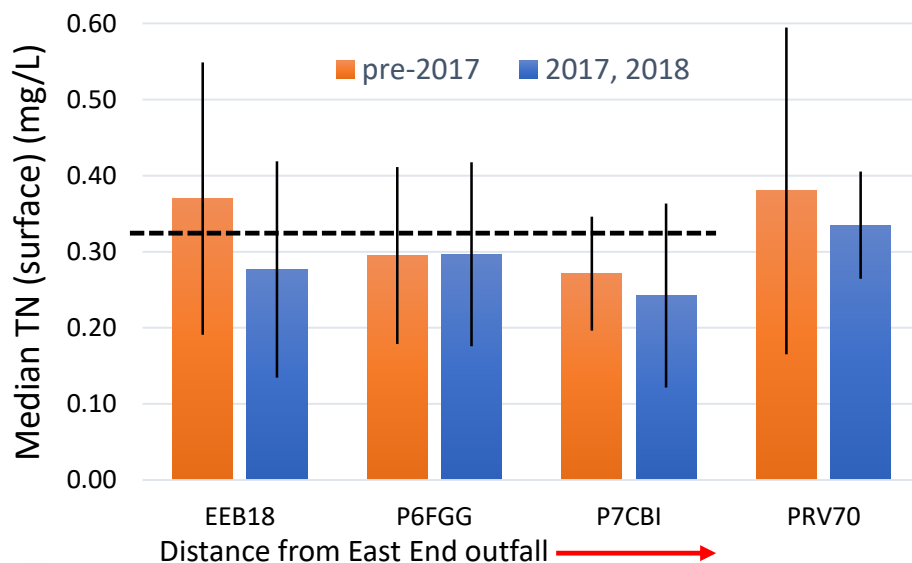
Fig. 2: Portland East End

- DEP
- FOCB
- Wastewater Outfalls
- Eelgrass Beds 2013





➤ Total Nitrogen values (2007-2018) more reflective of estuarine gradient with rainfall effects than of wastewater influence

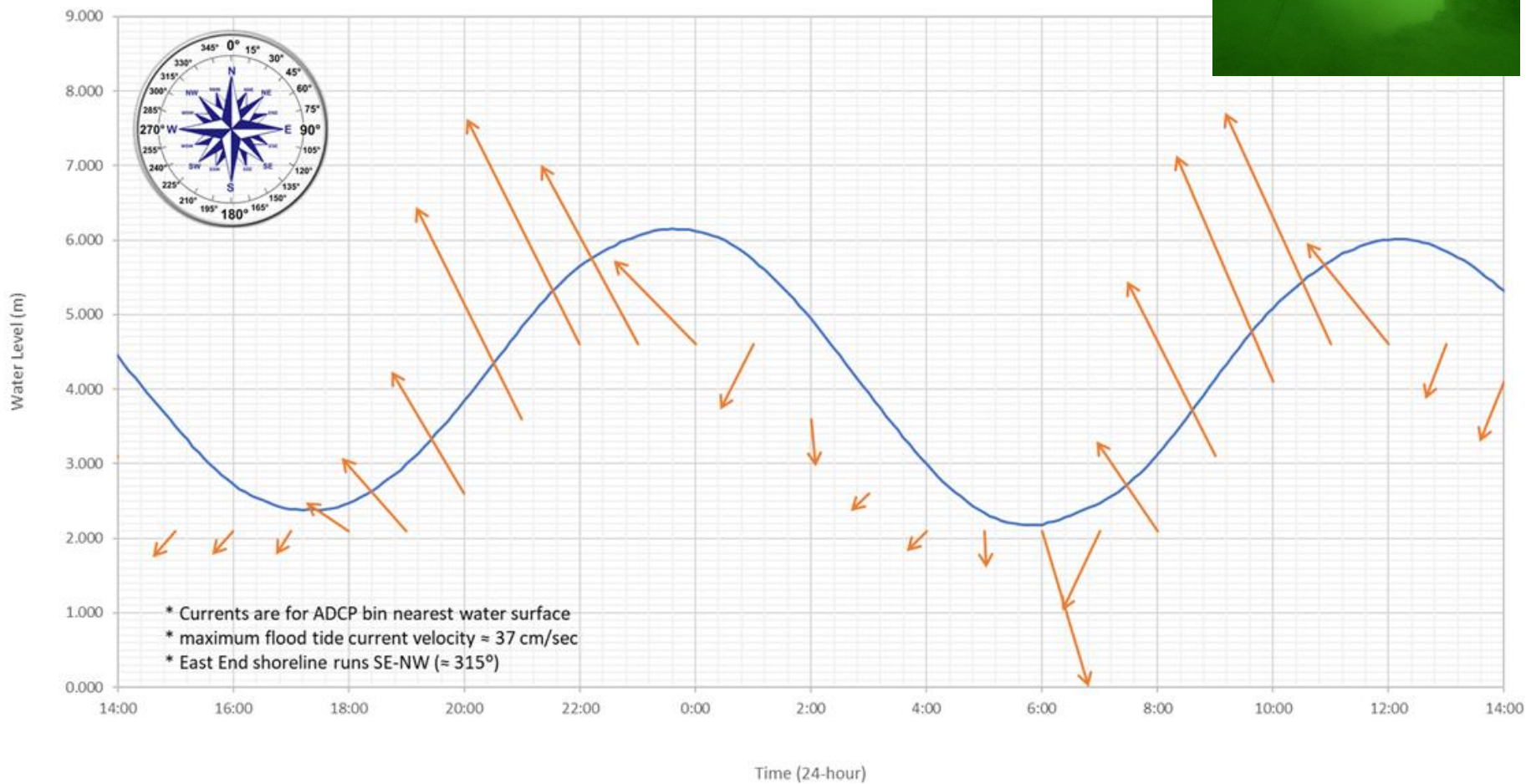


➤ PWD East End TN load reduction measurable in the immediate vicinity?

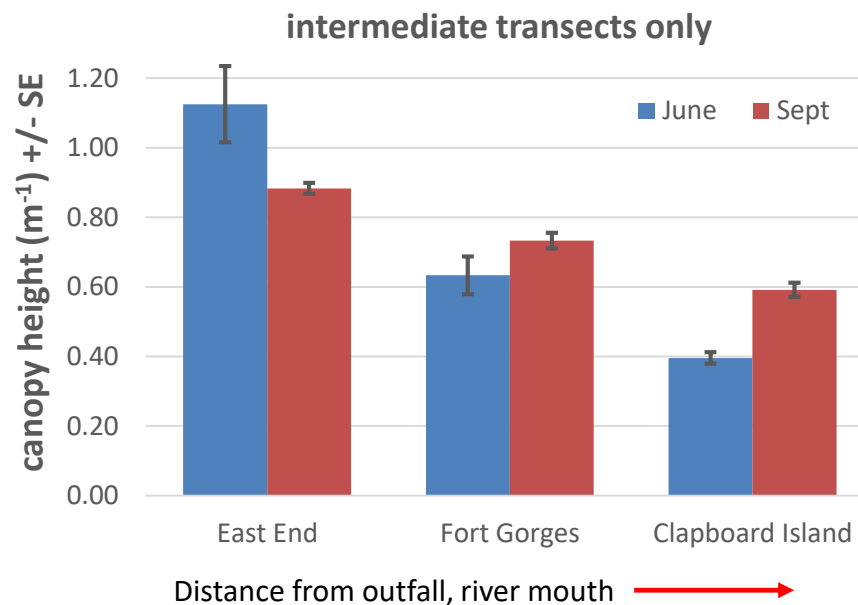
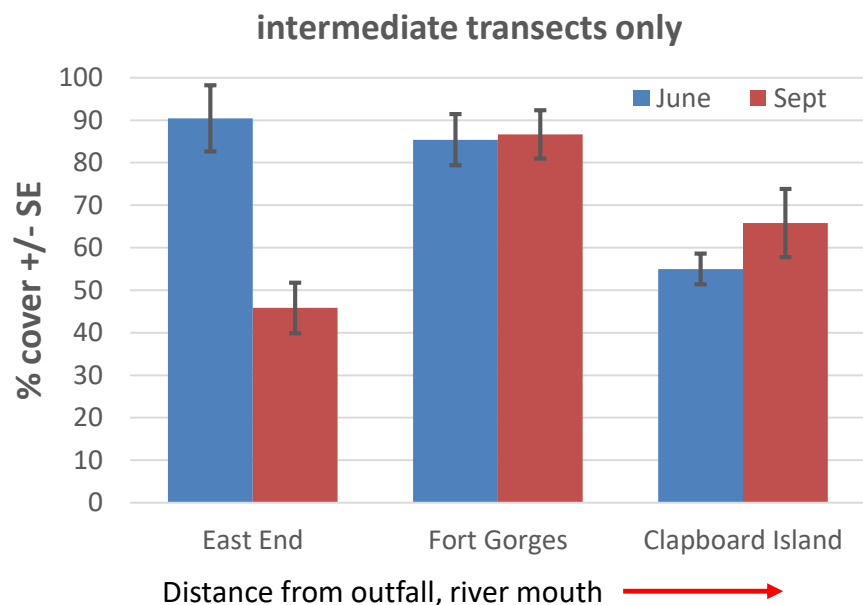
➤ East End vicinity [TN] under RP threshold in 2017, 2018



9/9/2018 - 9/10/2018 SPRING TIDE: Hourly Average Surface Currents*

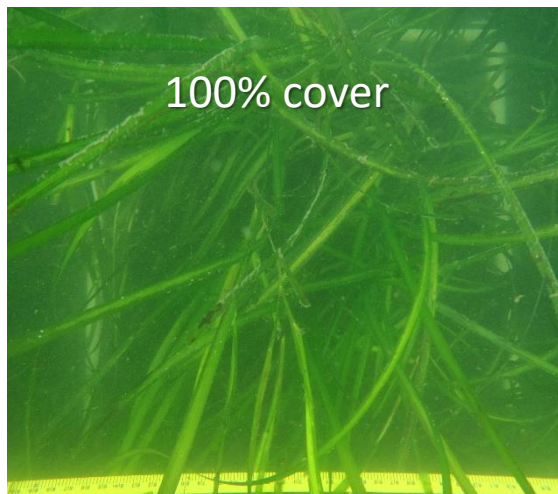


- Three eelgrass sites set up in June: East End, Fort Gorges, Clapboard Island
 - Three, 50 m-long, permanent transects / site, with 12, 0.25 m² quadrats / transect
 - June and Sept. monitoring (shoot density, % cover, canopy height, light attenuation and intensity, temp., depth at deep edge, video transect)

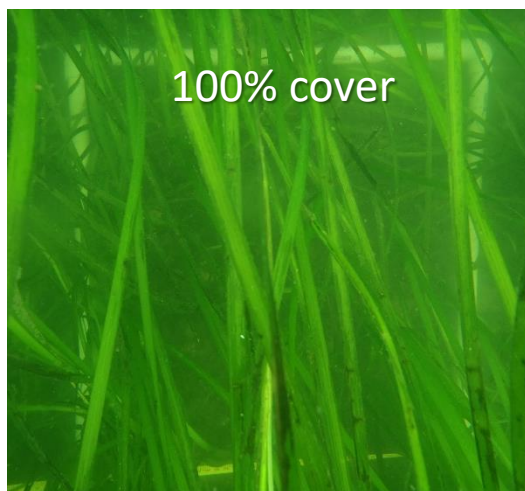


June

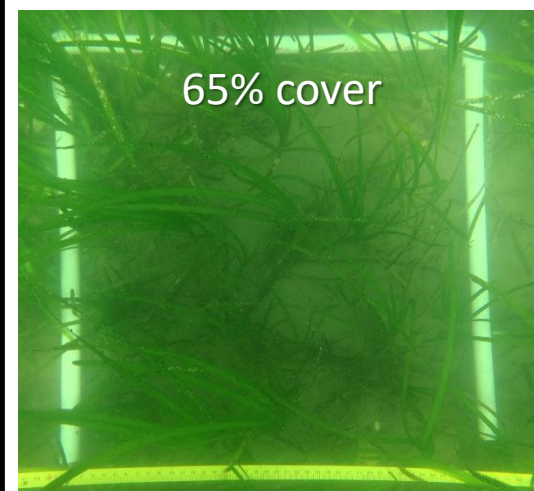
East End



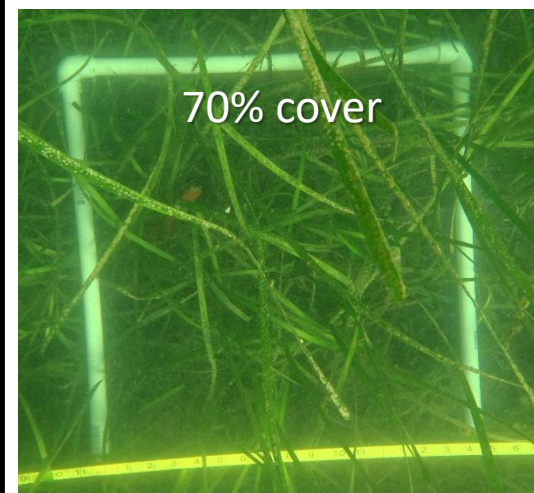
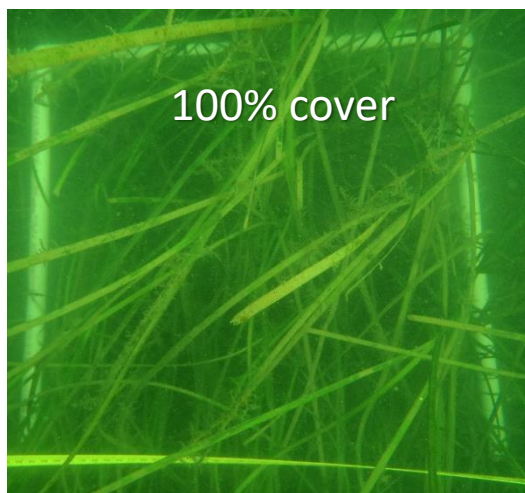
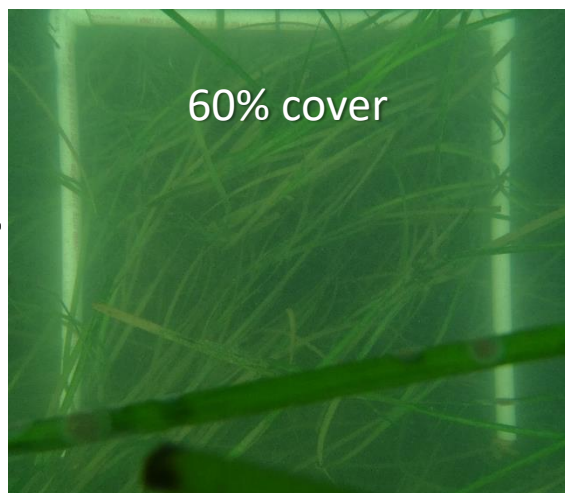
Fort Gorges



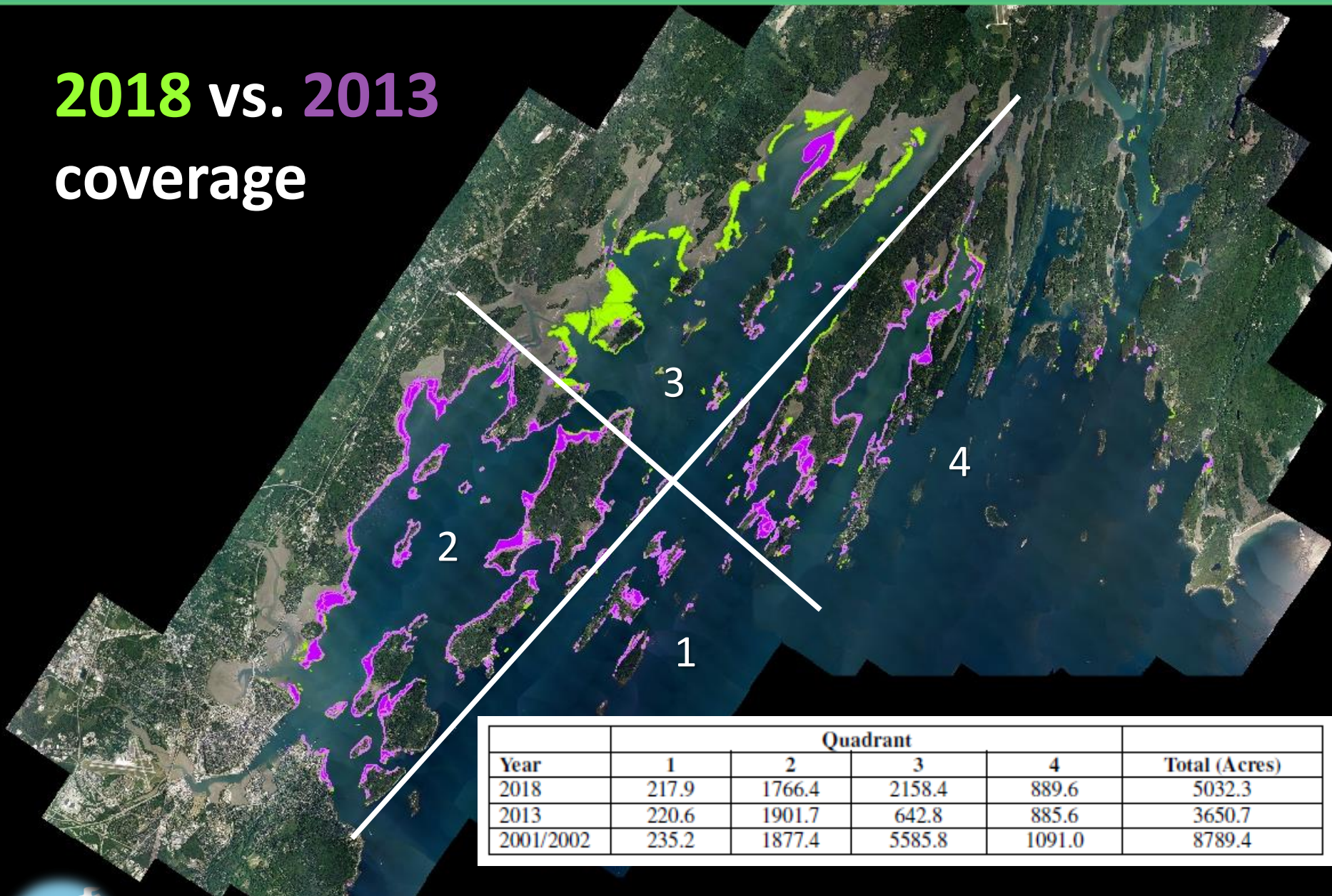
Clapboard Isl.



Sept.



2018 vs. 2013 coverage





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