



Seasonal variation in apparent conductivity and soil salinity at two Narragansett Bay salt marshes

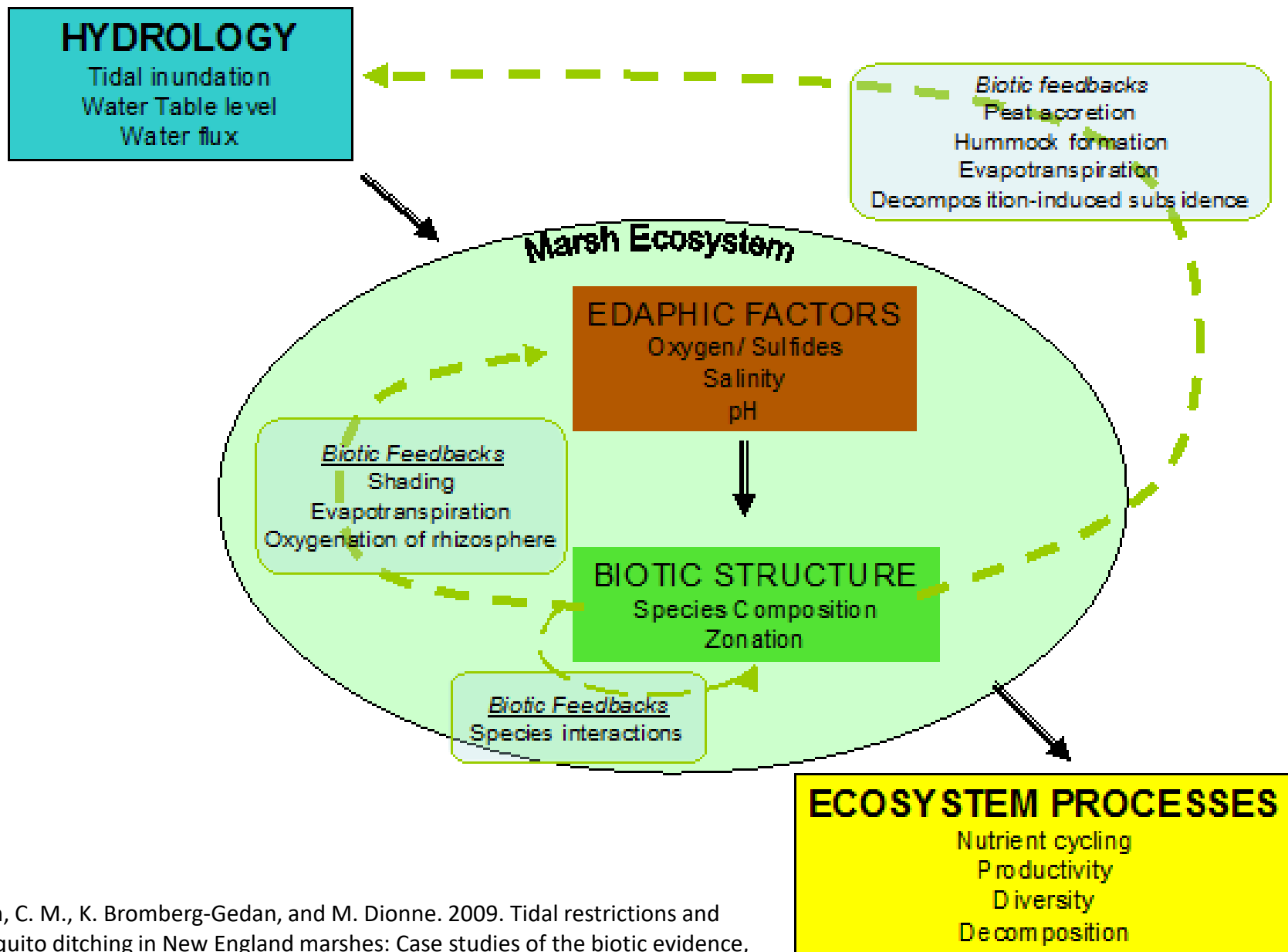
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US Environmental Protection Agency, Narragansett, RI

*SRA International Inc., Narragansett, RI

Increased high marsh ponding





Crain, C. M., K. Bromberg-Gedan, and M. Dionne. 2009. Tidal restrictions and mosquito ditching in New England marshes: Case studies of the biotic evidence, physical extent and potential for restoration of altered tidal hydrology. In B. R. Silliman, M. D. Bertness, and T. Grosholz, editors. Human Impacts in Salt Marshes: A Global Perspective. University of California Press.

EM38-MK2 Theory of Operation

Primary EM Field
generated at Coil

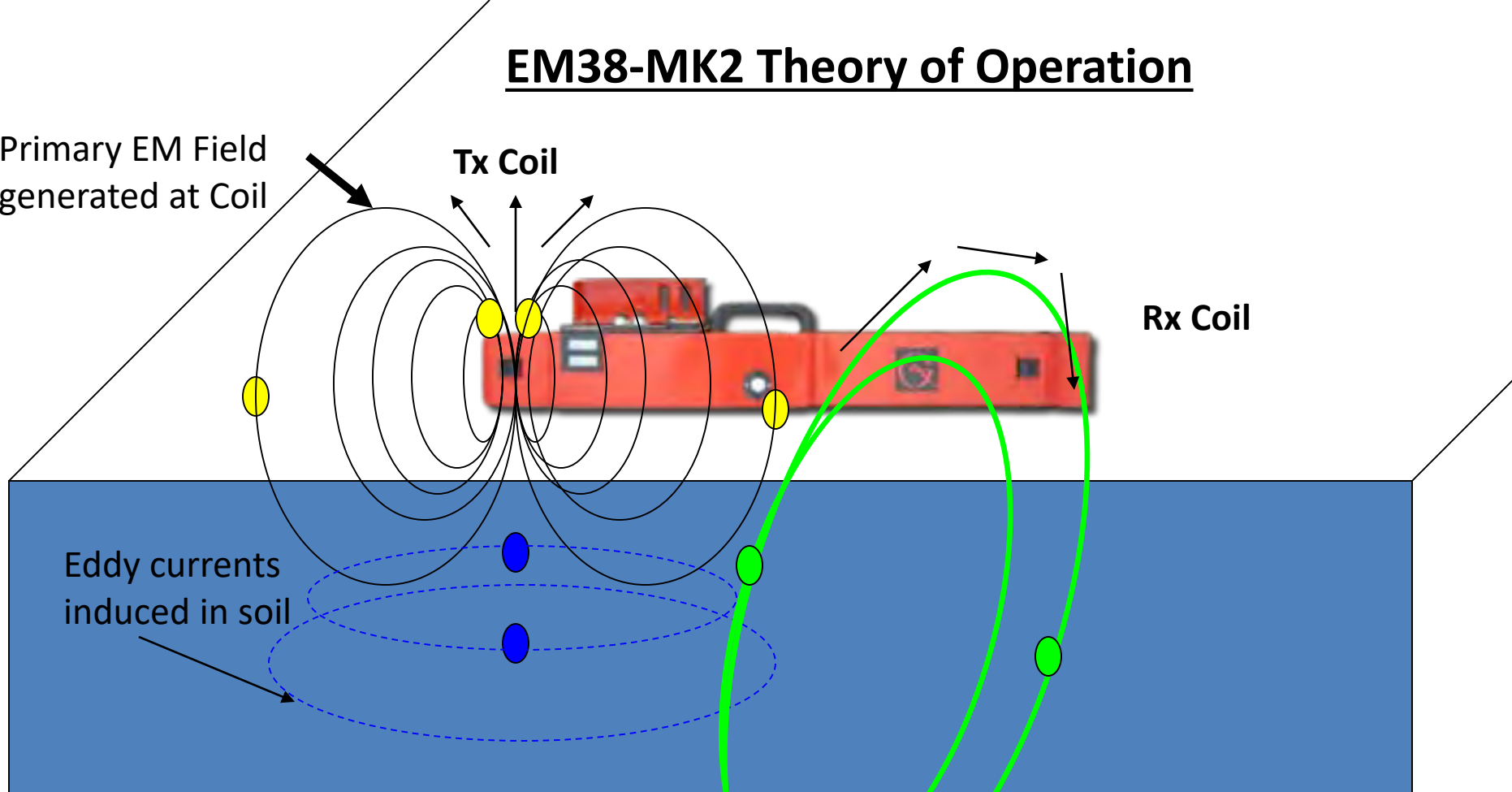
Tx Coil

Rx Coil

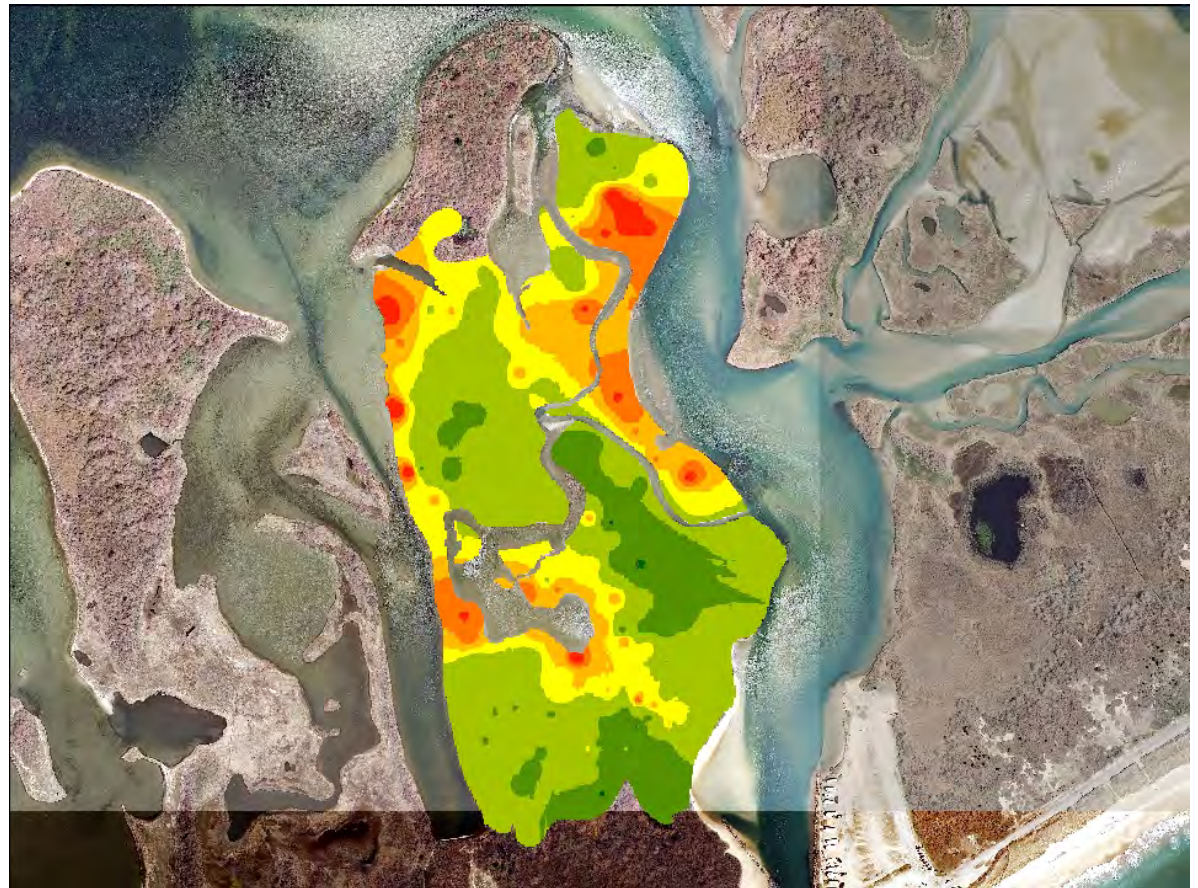
Eddy currents
induced in soil

Soil type (percent clay)
Bulk density
Moisture content
Salinity

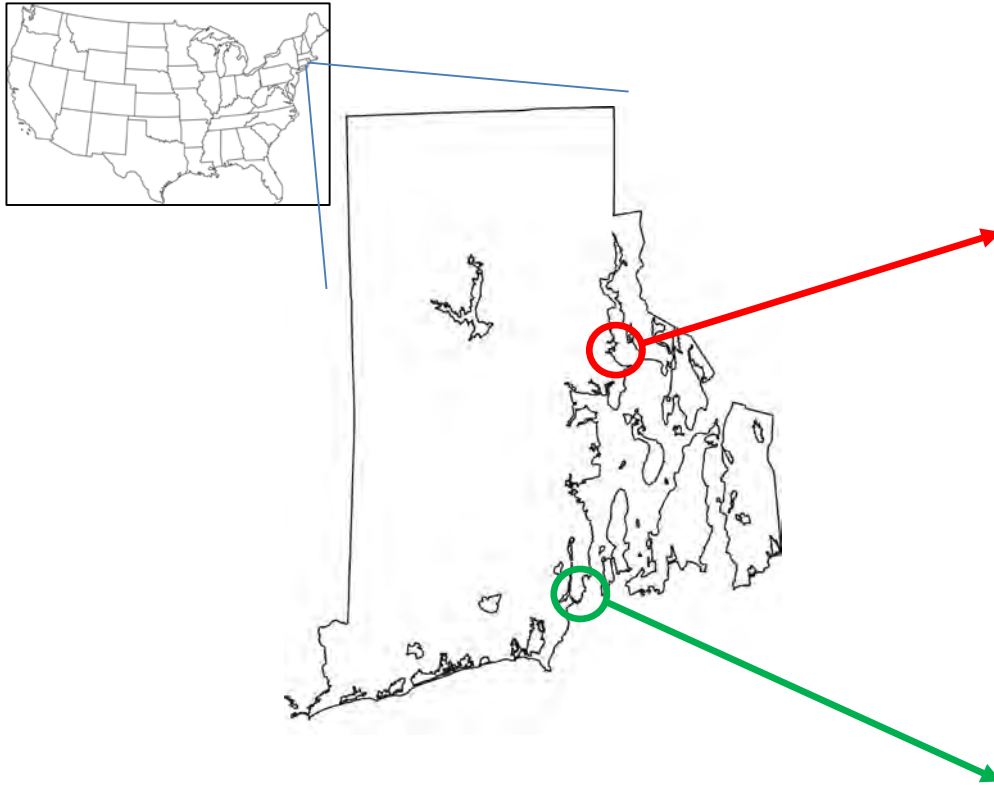
Secondary EM
field generated by
eddy currents and
detected as voltage
at Receiver coil



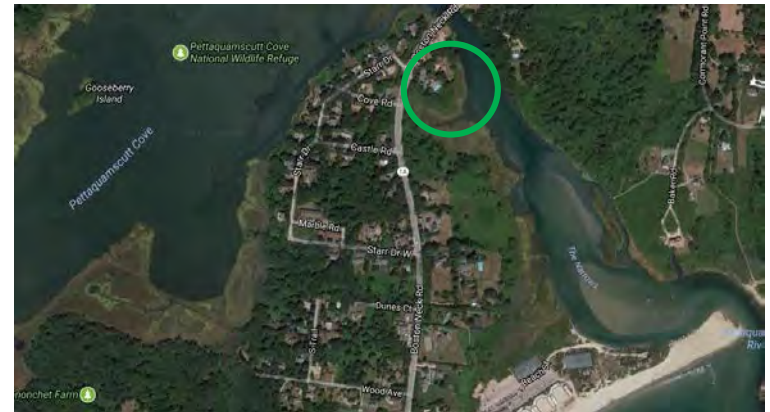
Moore et al. 2016. Mapping soil pore water salinity of tidal marsh habitats using electromagnetic induction in Great Bay Estuary, USA. *Wetlands* 31:309-318.



Study Sites

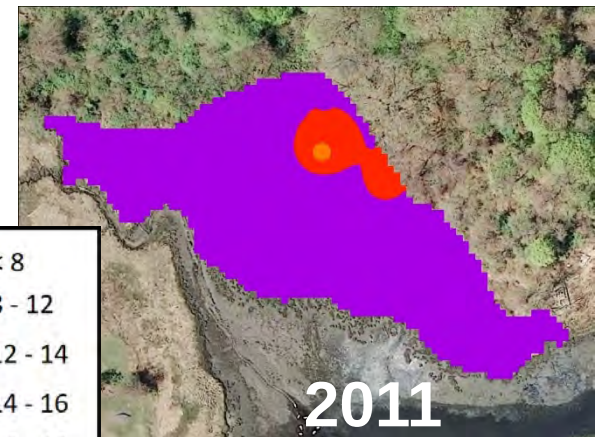
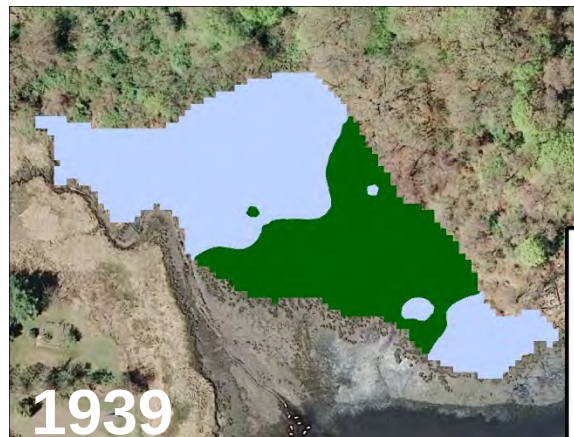
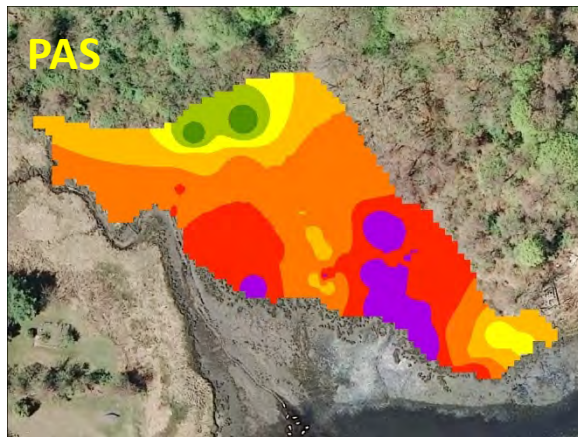


Passeonkquis Cove (PAS)



Narrow River (NAR)

Inter-marsh differences



October 2015

April 2016

August 2016

Calculated salinity



Oct 2015



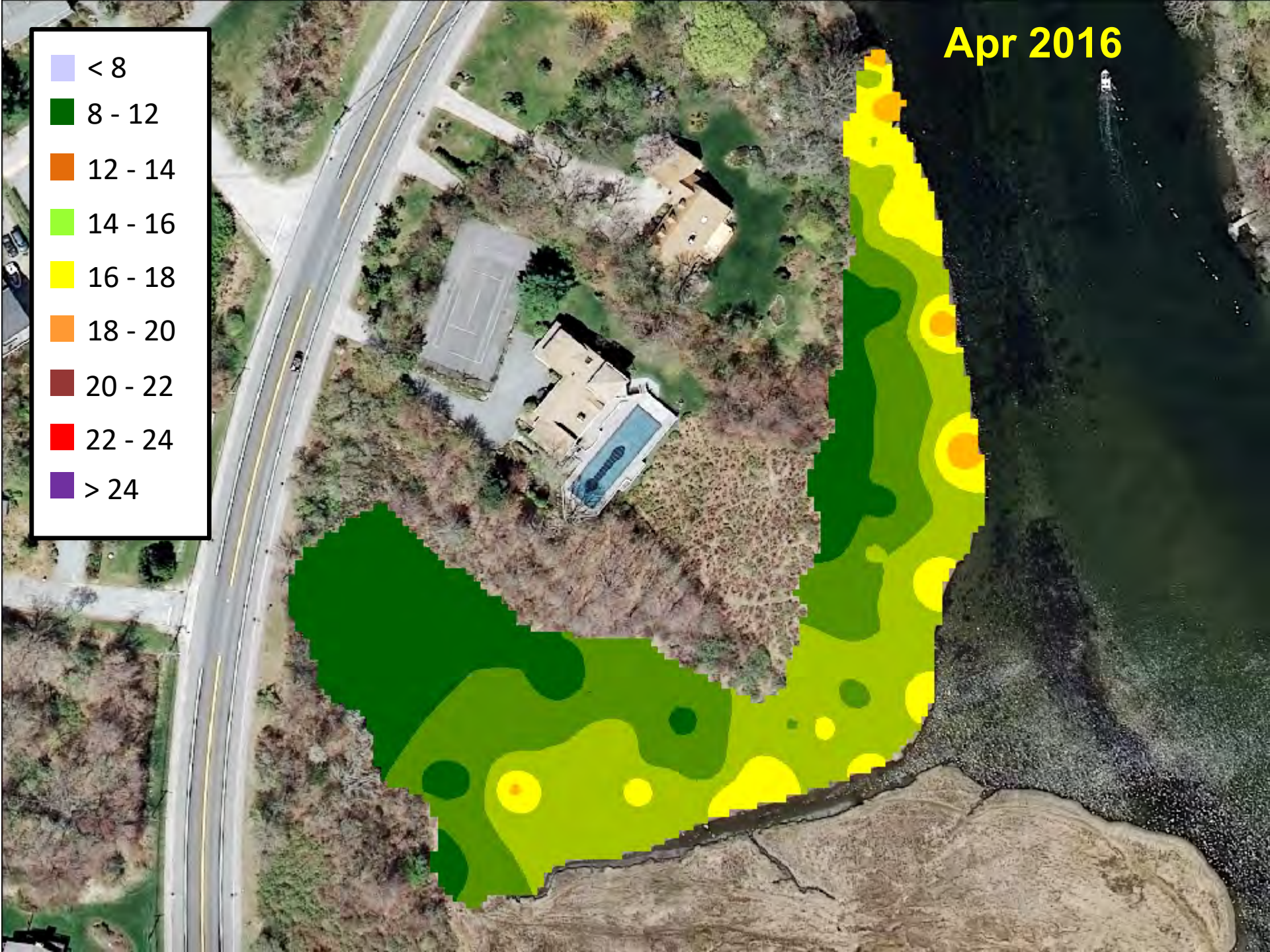
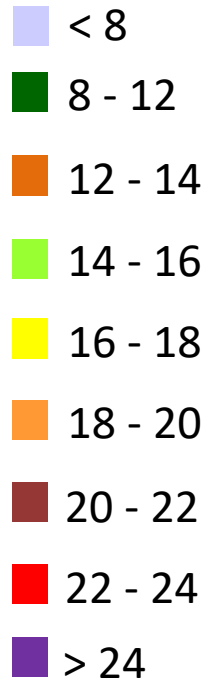
Dec 2015



Feb 2016



Apr 2016



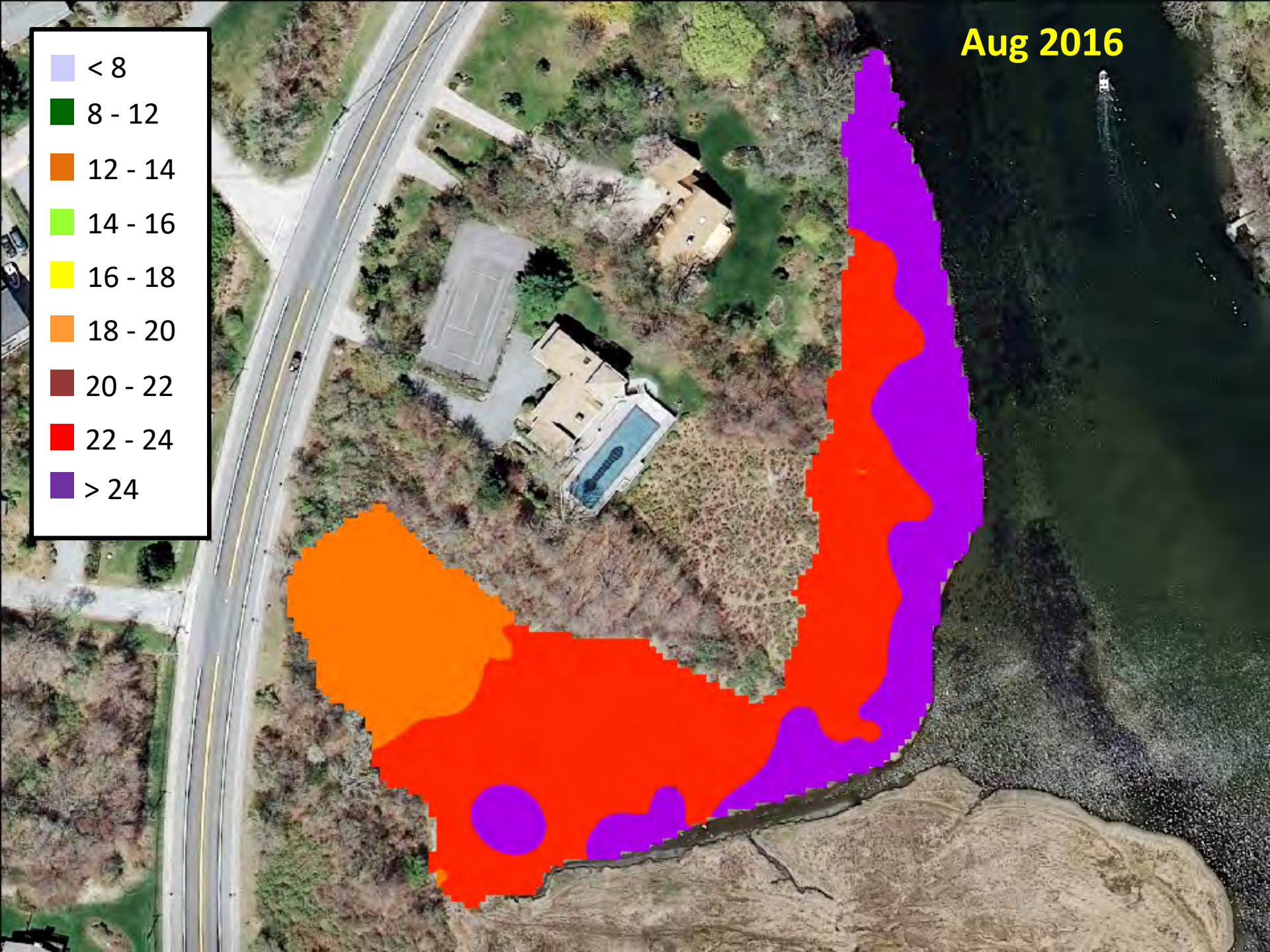
June 2016



July 2016



Aug 2016

- 
- < 8
 - 8 - 12
 - 12 - 14
 - 14 - 16
 - 16 - 18
 - 18 - 20
 - 20 - 22
 - 22 - 24
 - > 24

Oct 2016



Dec 2016



Jan 2017



Apr 2017



June 2017



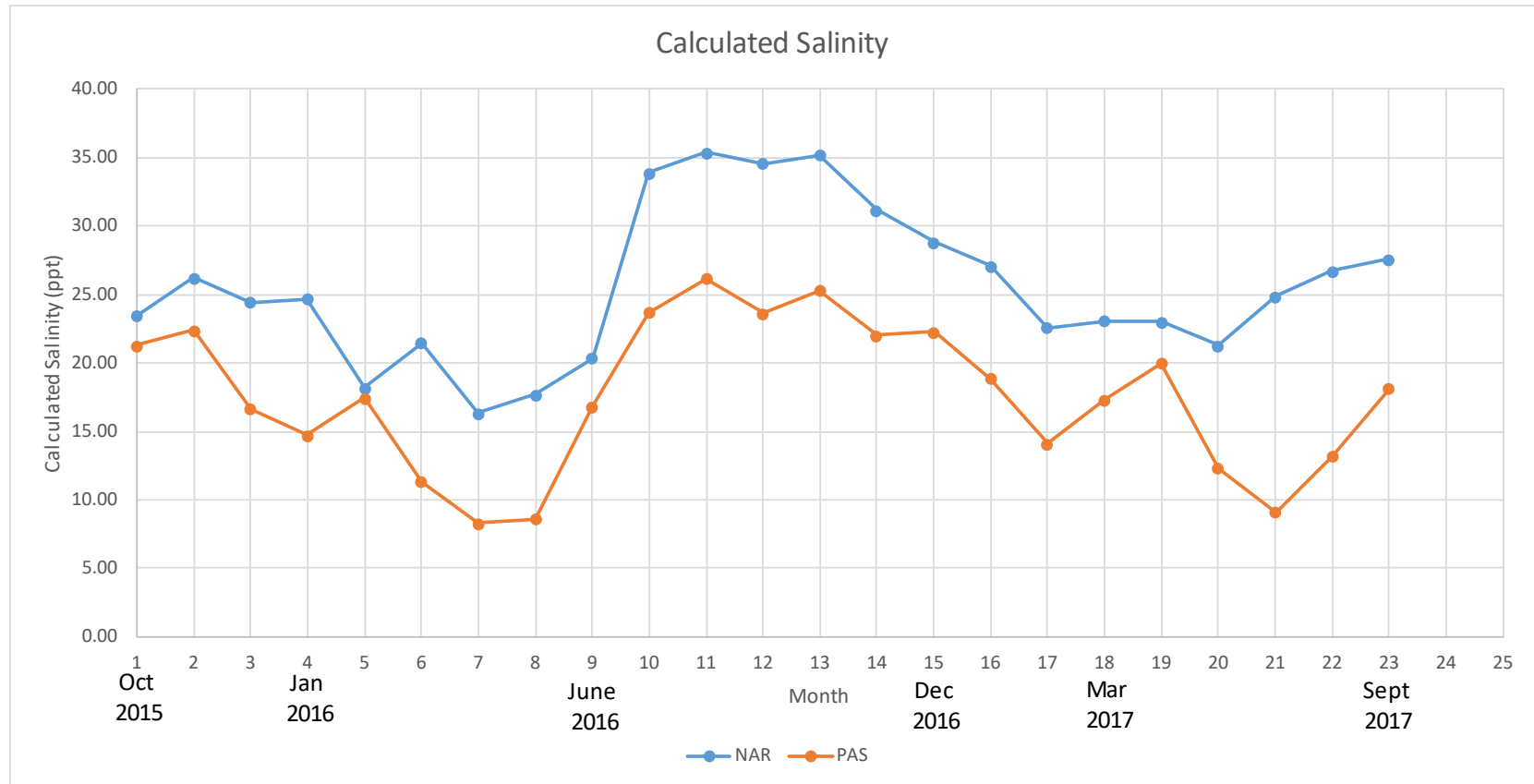
July 2017



Sept 2017

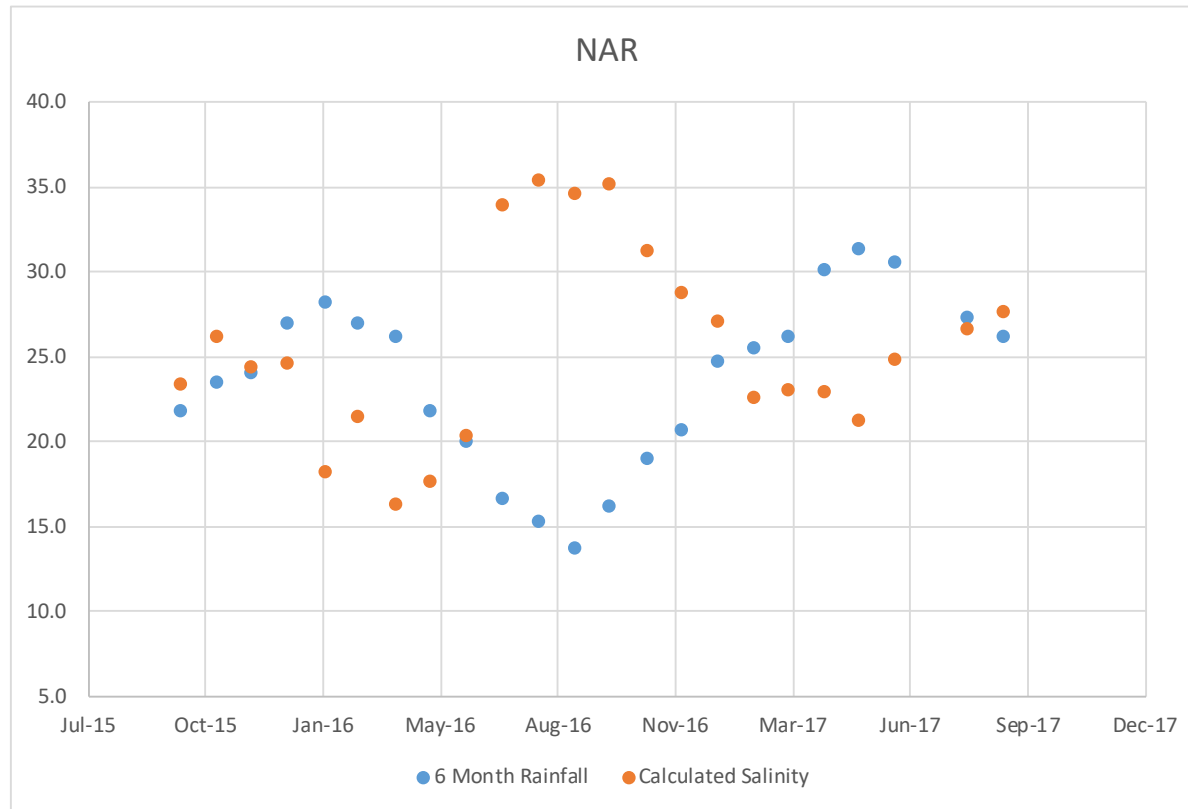


Marsh salinity



- No correlation with tide level, season, or time of day
- Best rainfall models were evaluated using small sample Akaike Information Criteria (AIC_c)

Marsh salinity



6 MONTH RAINFALL ($\Delta AIC_c = 0.00$; AICwt = 0.253, $r^2 = 0.489$)

3 MONTH + 6 MONTH RAINFALL ($\Delta AIC_c = 0.06$; AICwt = 0.246, $r^2 = 0.523$)

1 MONTH + 6 MONTH RAINFALL ($\Delta AIC_c = 1.76$; AICwt = 0.105, $r^2 = 0.509$)

Applications

Provide input to dynamic system models to help determine best adaptation actions in face of multiple stressors



Many thanks...

- Gregg Moore & Chris Peter, UNH
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Nicole Gutierrez
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Troy Hill