

Developing regional landscape layers in tidal marshes of the northeast

Mo Correll and Brian J. Olsen
Hurricane Sandy Marsh Resiliency Workshop
Dec 8, 2014





High Marsh Zone
(weekly-monthly flooding)

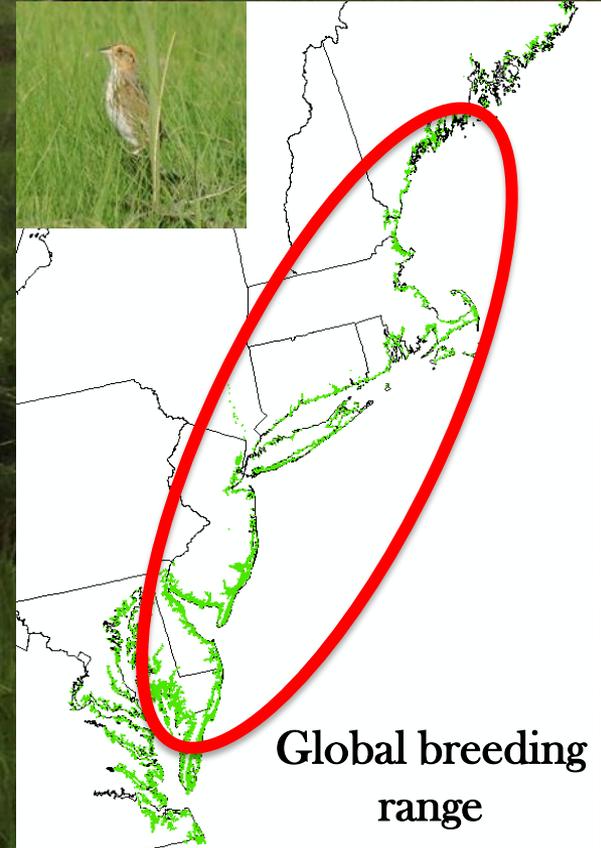
Spartina patens
Juncus gerardii
Distichlis spicata

Low Marsh Zone
(daily flooding)
Spartina alterniflora

High-marsh habitat is critical to several species of birds



Saltmarsh Sparrow
(*Ammodramus caudacutus*)



The Saltmarsh Habitat and Avian Research Program - SHARP

Principle Investigators:

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Brian Olsen - University of Maine

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Chris Field

Sam Roberts



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Comprehensive Regional
Monitoring Program:



Surveys



Demographics



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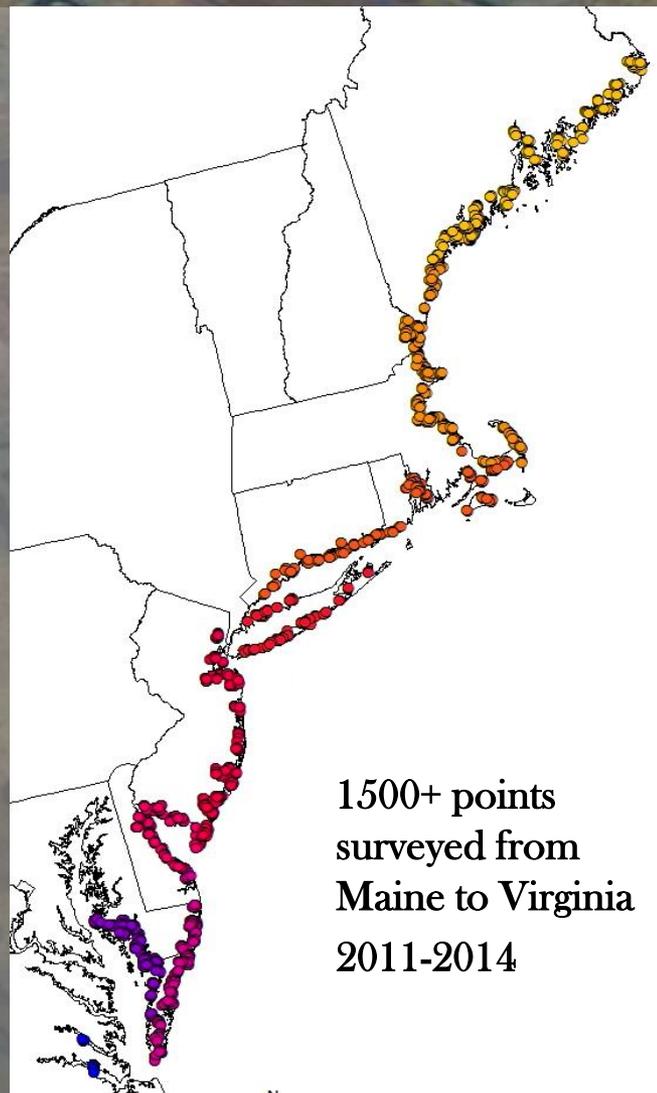
Comprehensive Regional
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The Saltmarsh Habitat and Avian Research Program - SHARP

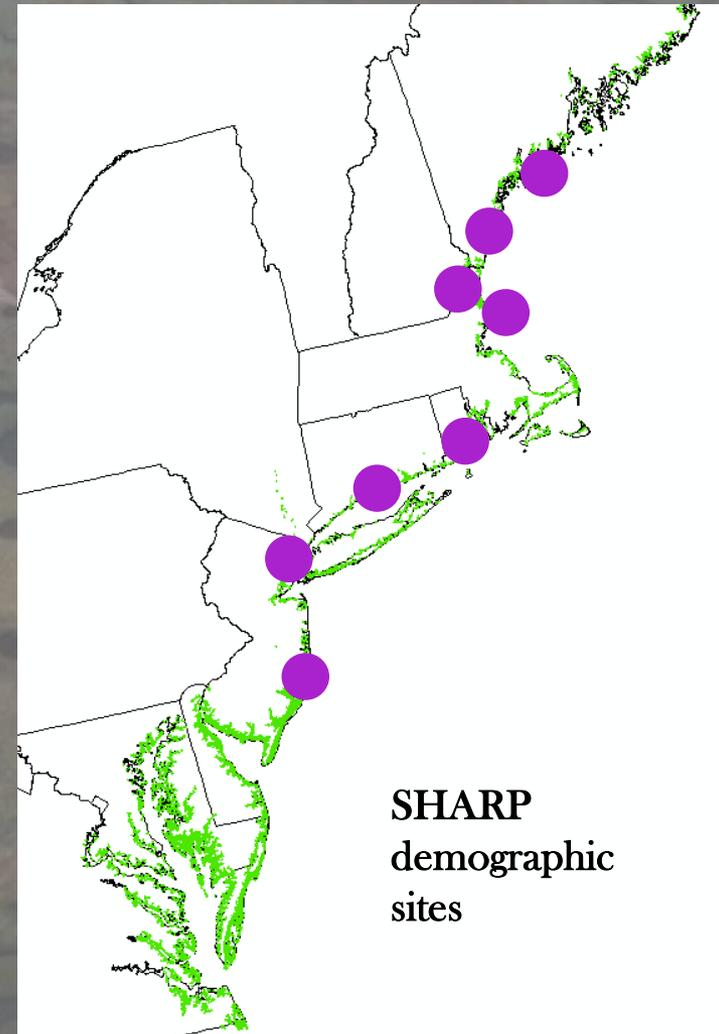
Comprehensive Regional
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Surveys



Demographics



The Saltmarsh Habitat and Avian Research Program - SHARP

www.tidalmarshbirds.org

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End goals:

- High-marsh predictive tool (70% minimum accuracy)

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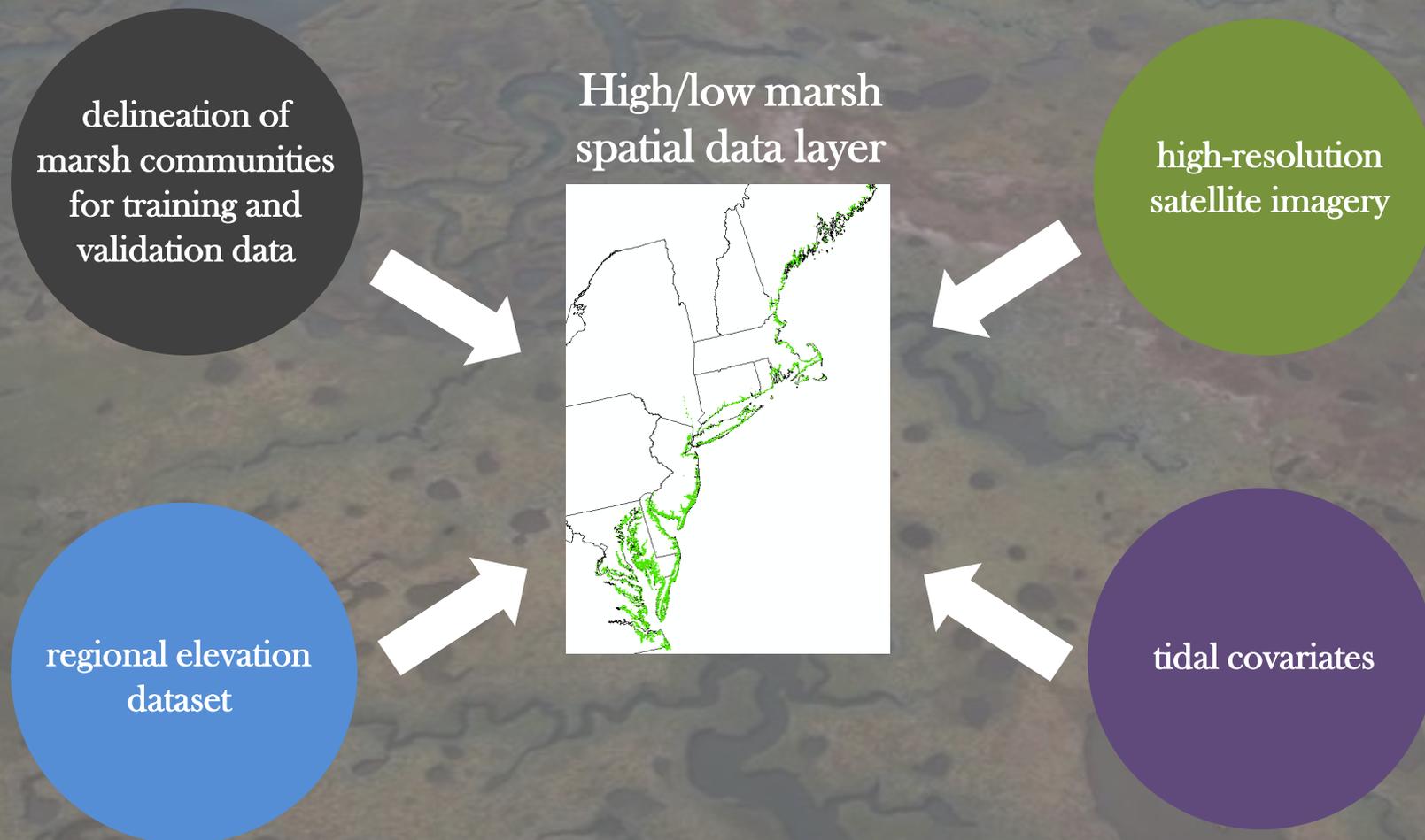
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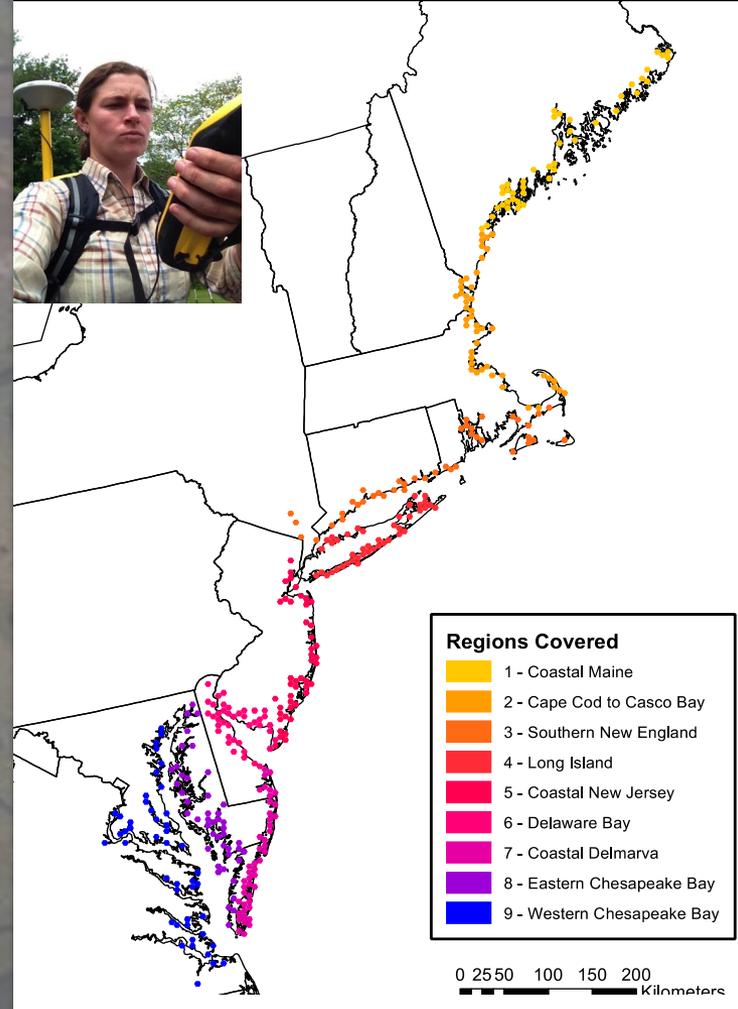


2015 - 2016 effort - Maine to Virginia

Community-specific delineation:

Delineate representative marsh communities within each SHARP sub-region:

- Low marsh
- High marsh
- Mixed

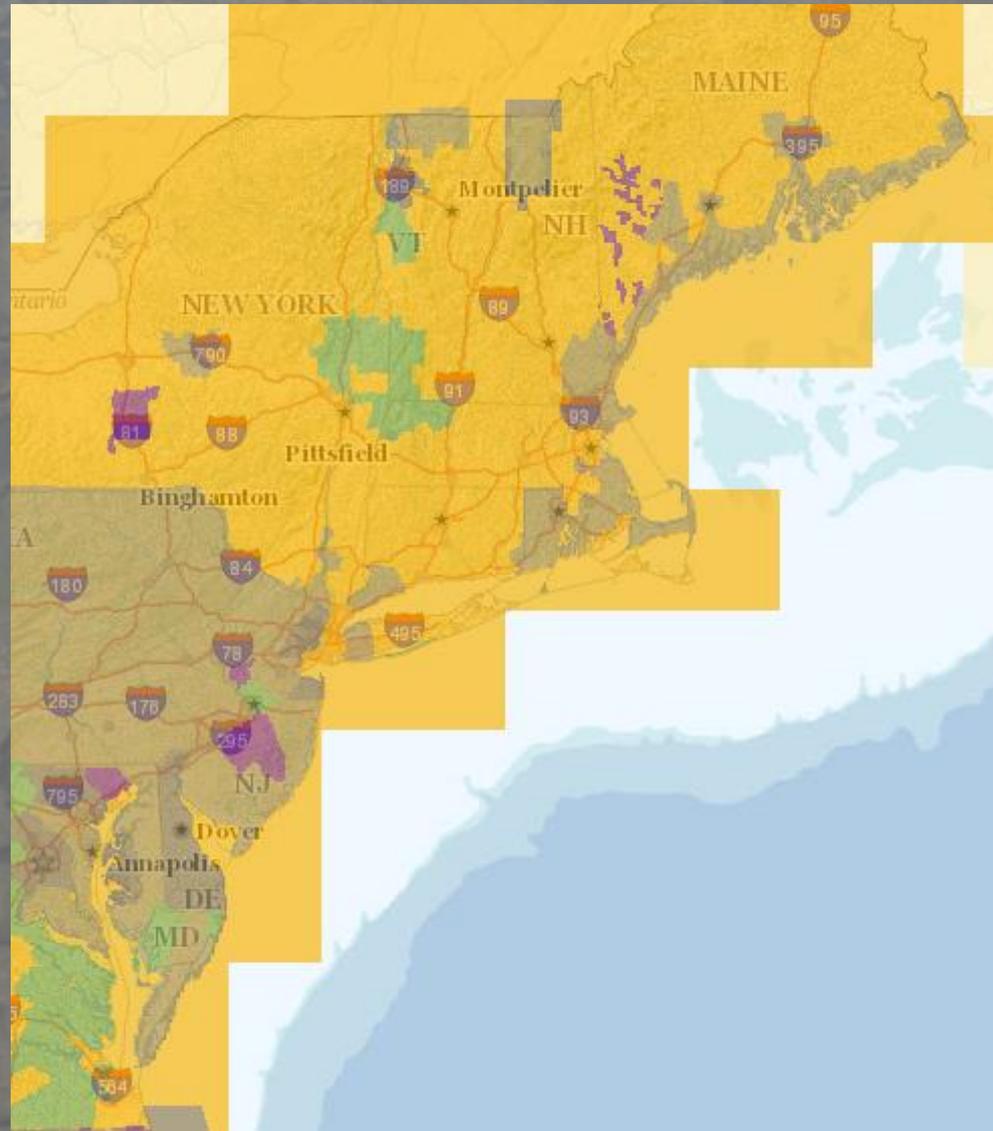


2015 - 2016 effort - Maine to Virginia

National Elevation Dataset

10 m resolution

3 m resolution



2015 - 2016 effort - Maine to Virginia

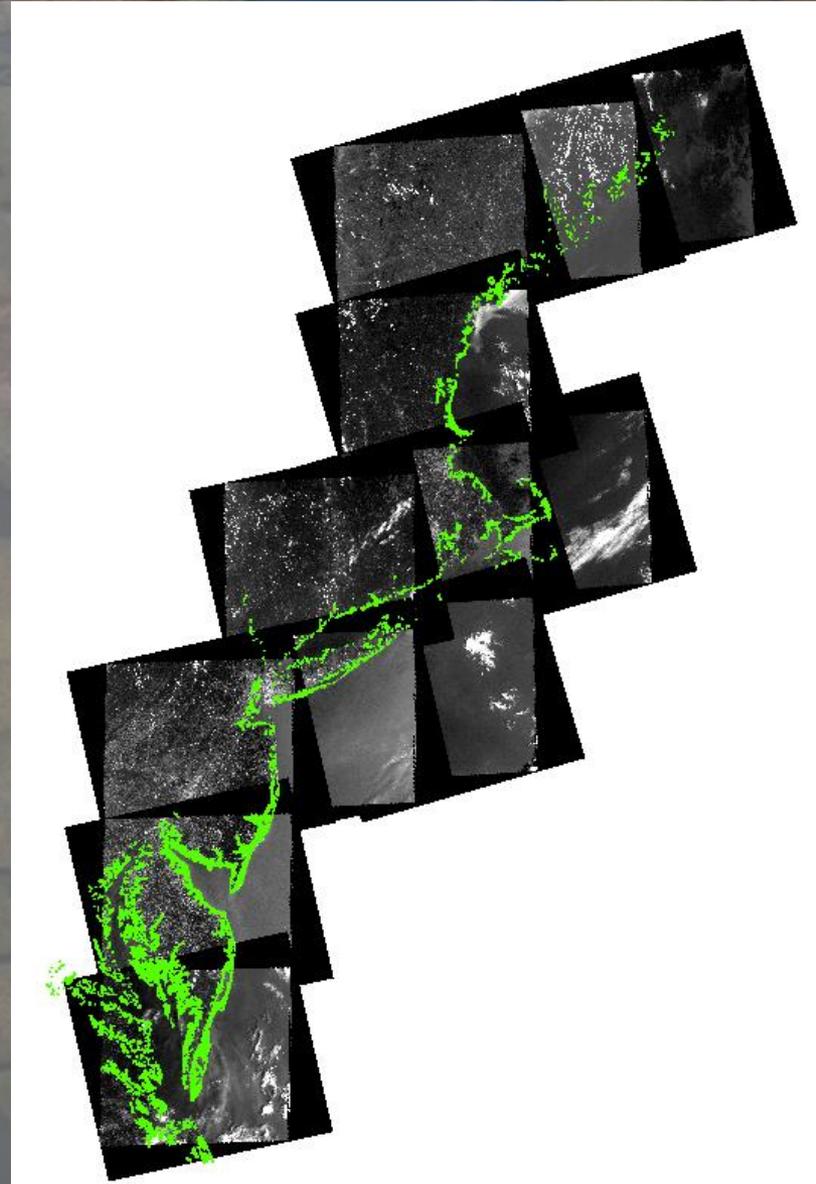
High-resolution imagery

National Agriculture Imagery Program (NAIP)

- 1 m X 1 m
- Near-IR Band now included
- 2010 - 2013

SPOT Imagery (if needed)

- 20 X 20 m
- Near, Mid IR bands included
- Annual imagery available

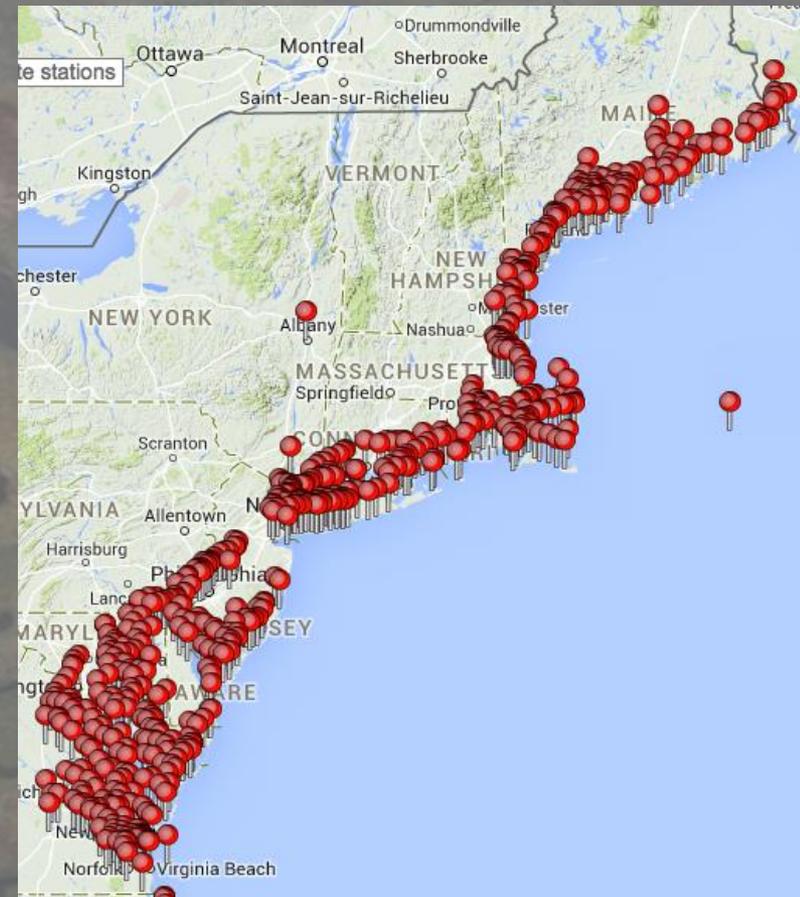


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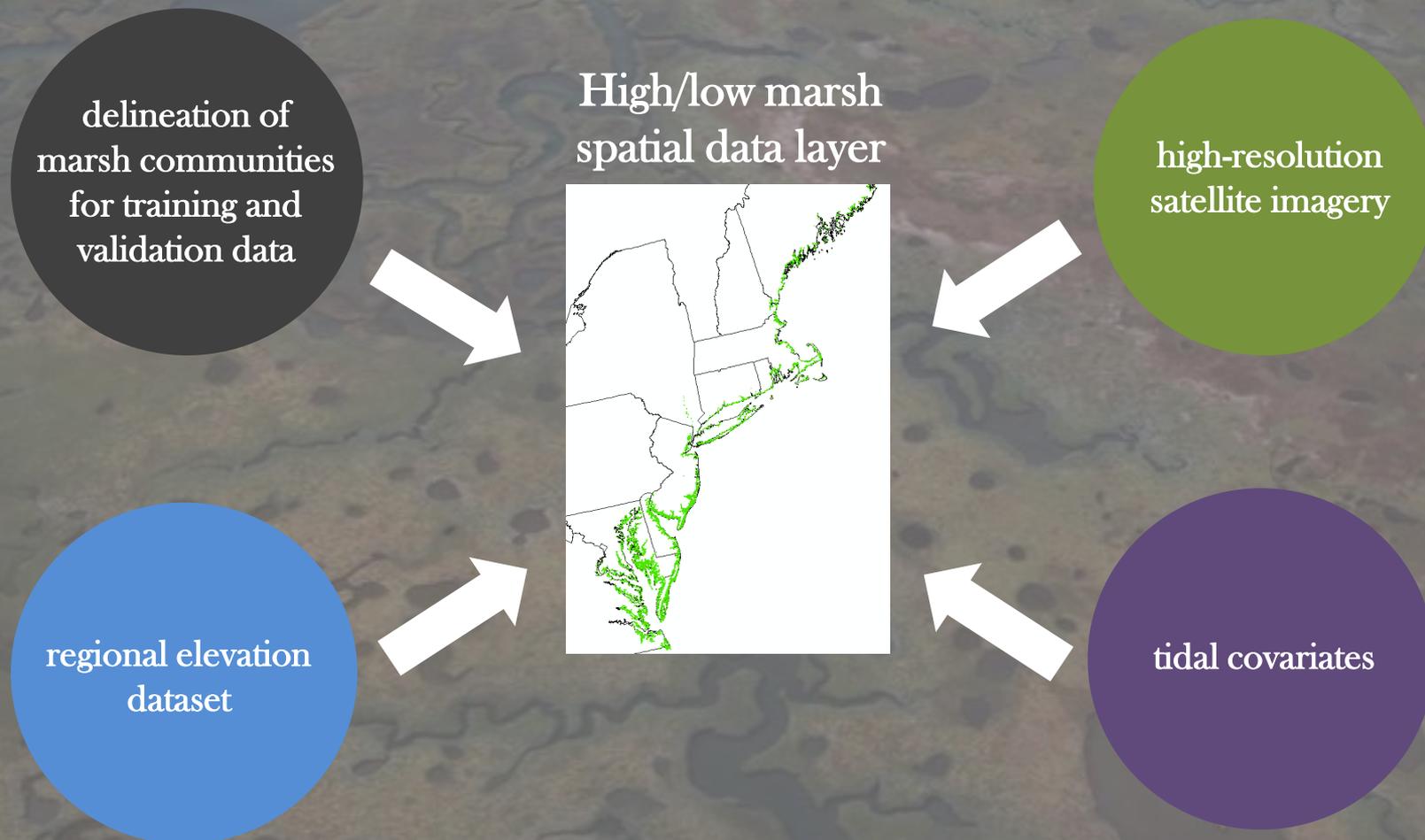
Fine-scale tidal data for imagery:

National Oceanographic and Atmospheric Administration (NOAA) regional tide predictions

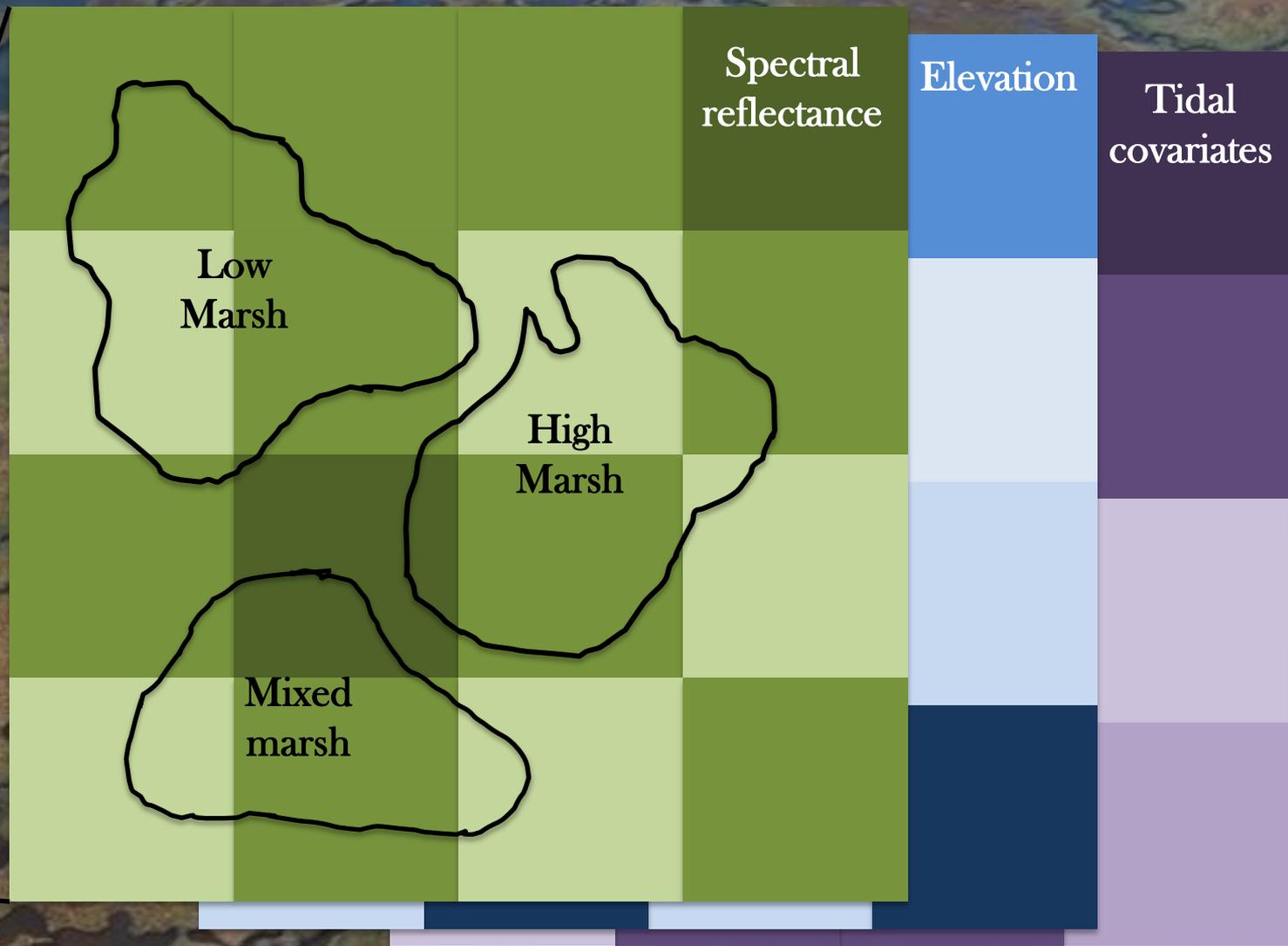
- Julian Day
- Time since high tide
- Time since astronomical tide
- Time since last precipitation event



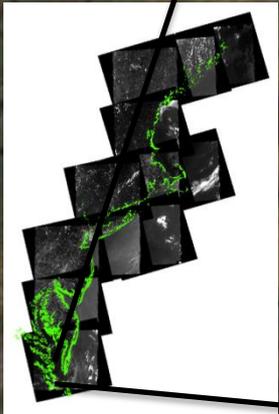
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Use Classification And Regression Trees (CART) to develop predictive community models within the NWI



NAIP/
SPOT



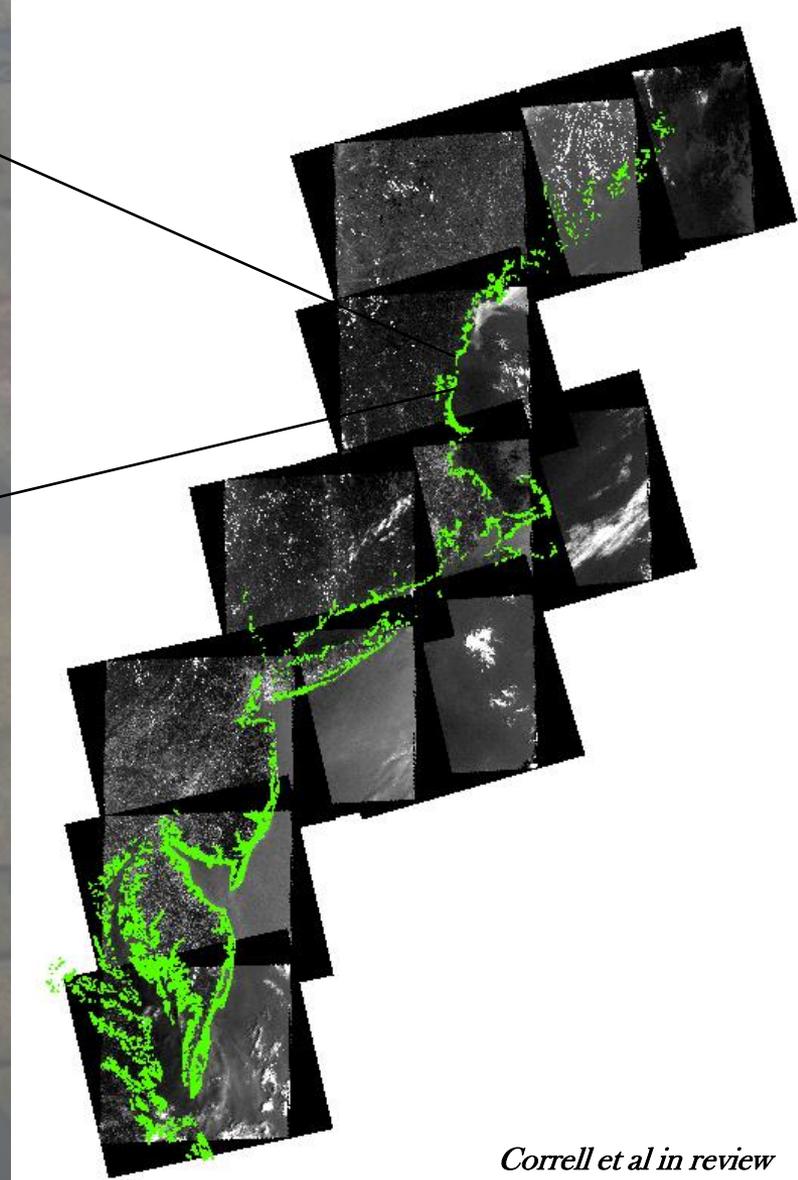
Some regional data is currently available



High / Non-high marsh layer

71% overall accuracy

CART analysis with Landsat band values,
Landsat band Principle Component (PC) values,
and tidal covariates



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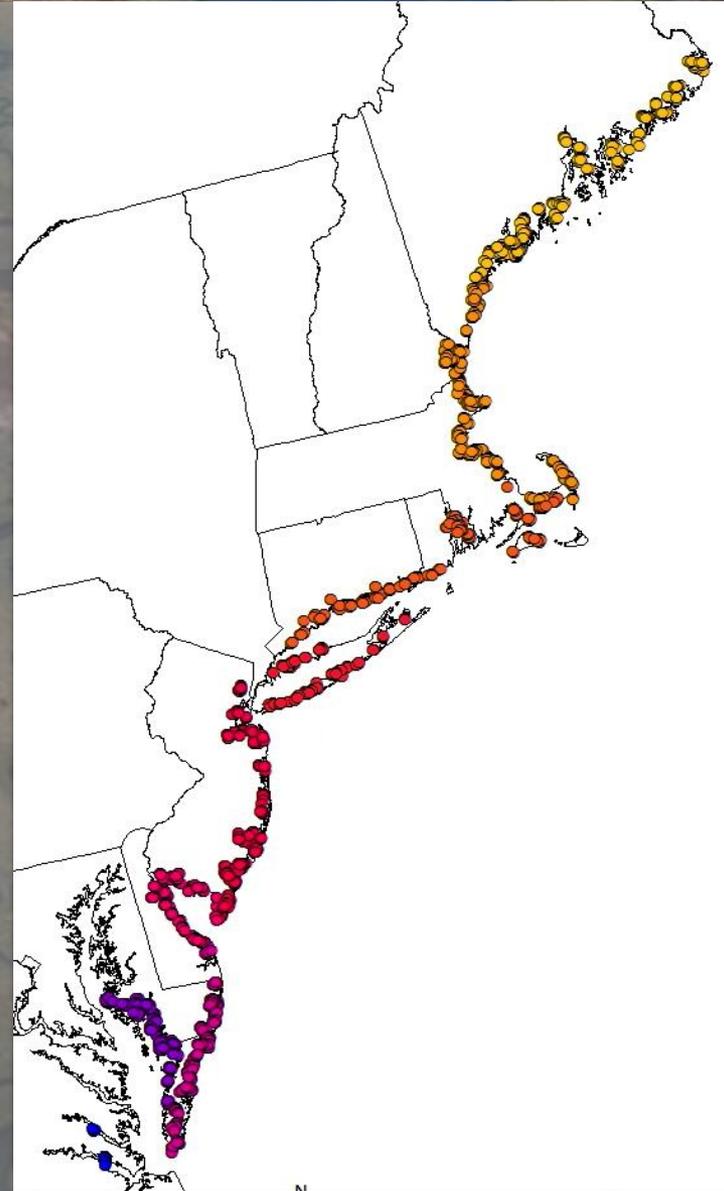
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2015 - 2016 effort - Maine to Virginia

Elevation data layer:

Real Time Kinematic (RTK)
elevation data for SHARP-
surveyed points

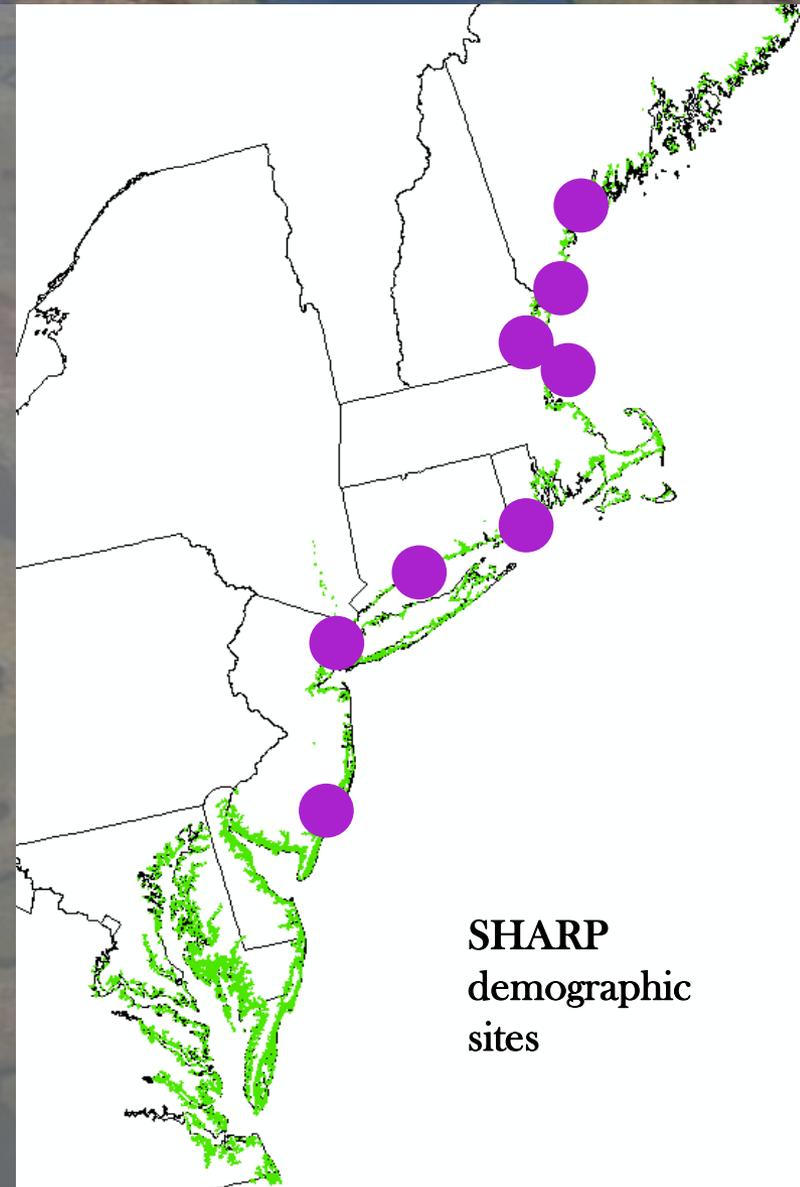
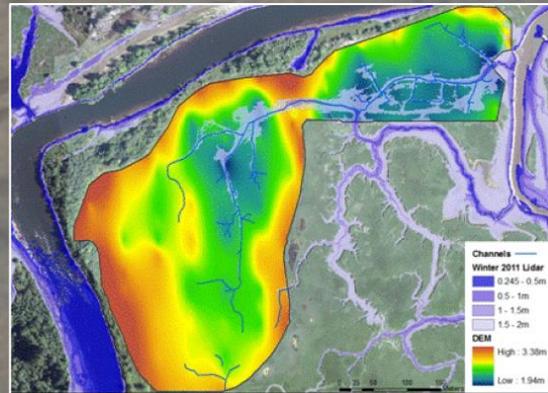
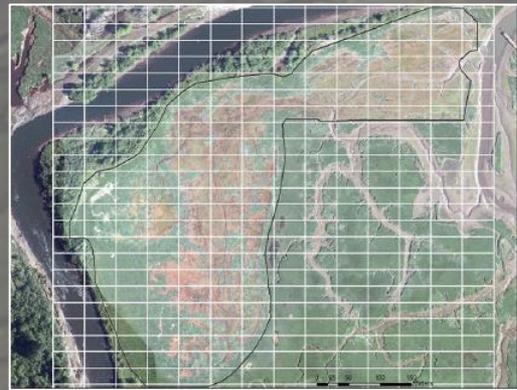
Compare RTK to existing LiDAR



2015 - 2016 effort - Maine to Virginia

Elevation data layer:

Topographic mapping of
representative marshes



SHARP
demographic
sites

2015 - 2016 effort - Maine to Virginia

Timeline:

-  Field data collection: Summer 2015
-  RTK vs. LiDAR comparison: Fall 2015
-  Plant model development: Fall 2015 – Spring 2016
-  Final layer developed: Summer 2016



2015 - 2016 effort - Maine to Virginia

Applications:



Reassessment of high marsh cover on sub-decadal basis
(e.g. after disturbance events)



Input into regional conservation models - Designing
Sustainable Landscapes

2015 - 2016 effort - Maine to Virginia

Next steps in discussion:

-  LiDAR input sources
-  RTK transect sites and methods



Acknowledgements

Previous funding :

The Saltmarsh Habitat and Avian Research Program (SHARP)

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NSF, USFWS, MDIFW, NALCC, GSG

the troop of technicians that make SHARP possible



Questions?

