

# Sea-Level-Rise/ Species Habitat Modeling Project

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# Project goals

- Develop species-habitat models describing the distribution of targeted bird species
- Develop models for the impact of sea level rise in saltmarshes for the Northeastern US
- Integrate these two modeling approaches to assess the potential impact of sea level rise on target bird distributions

# Selected Habitat Covariates

- Need habitat data to predict locations of species
- Elevation, average, within a 480 m radius
- % habitat within a 480 m radius
  - Estuarine and Marine Deepwater, Estuarine and Marine Wetland, Freshwater Emergent Wetland, Freshwater Forested/ Shrub Wetland
- Habitat covariates pulled from National Wetlands Inventory, processed using raster and rgdal libraries in R

# Modeling

- Occupancy models using “Unmarked”
- Only 282 models (out of 700+) converged
- Top detection model (for most species) included wind speed and sky class
- Models available for 18 species
- AIC - model averaging used to make predictions

## Summary statistics for Least Bittern occurrence predictions in refuges where presences were recorded

Refuge	State	Mean	SD	2.5/ Quantile	97.5/ Quantile
Back Bay NWR	VA	0.442	0.084	0.385	0.658
Bombay Hook NWR	DE	0.885	0.062	0.835	0.99
Merritt Island NWR	FL	0.077	0.017	0.047	0.128
Moosehorn NWR	ME	0.978	0.101	0.458	1
Rappahannock River Valley NWR	VA	0.934	0.164	0.385	1
Stewart B. McKinney NWR	CT	0.943	0.028	0.847	0.956
Supawna Meadows NWR	NJ	0.024	0.062	0.006	0.247
Ten Thousand Islands NWR	FL	0.052	0.011	0.047	0.08

# Synthesis

- Data collected locally, but inference regional
- Pool data to generate regional analysis but collections clearly independent
- Highly variable data
- Minimize consistency in datasets or drop them from analysis