

Roadblocks to Seagrass Recovery

Seagrass Recovery Potential Model for Panhandle estuaries

Physical Disturbance: Exposure to Wave Energy
2011 through 2016



What these data show

This dataset shows physical disturbance by wave exposure for these Florida panhandle estuaries: Perdido Bay, Big Lagoon, Escambia Bay, East Bay Pensacola Bay, Pensacola Bay, Santa Rosa Sound, Choctawhatchee Bay, St. Andrew Bay, and St. Joseph Bay. To create this dataset, FWRI staff used the Wave Exposure Model (WEMo) Version 4.0 created by Mark S. Fonseca and Amit Malhotra at NOAA. Bathymetry and wind data were input to the model, and these data were obtained from the NOAA National Center for Environmental Information, and adjusted by FWC staff. Shoreline and 1-ha point grid shapefiles, additional model inputs, were created by FWRI staff. Using the average top 5% of daily wind speeds and direction, the model calculated a Relative Exposure Index (REI), a unit-less value indicating the exposure of each cell to wind-generated waves for January 1, 2011 through December 31, 2016. Maps for each estuary show the mean REI for each cell.

This project was completed by the Florida Fish and Wildlife Conservation Commission Fish and Wildlife Research Institute and funded by the Gulf Environmental Benefit Fund of the National Fish and Wildlife Federation.

Technical Information

Bathymetric data were obtained from NOAA bathymetric digital sounding survey data, collected between 1981 and 1994. These data were adjusted for sea level rise and converted to mean sea level (MSL). Wind data were obtained from NOAA National Center for Environmental Information land-based station data historical records. Wind data were collected from three stations: Pensacola Regional Airport, Destin Fort Walton Beach Airport, and Panama City Bay County Airport. The top 5% of daily average of wind speeds (and the corresponding wind directions) from January 1, 2011 00:00 to December 31, 2016 23:59 were calculated.

A shoreline shapefile was created for each estuary. A grid of 1-ha square cells was placed over the water area of each estuary. The average depth was calculated for each 1-ha cell. For areas without survey data, depth values were extrapolated. A point shapefile was created from the center points of each cell where depth was less than or equal to 3 meters.

WEMo was run in Relative Exposure Mode, which calculates a unit-less value called the Relation Exposure Index (REI) based on how exposed a site is to wind generated waves in comparison to any other site. Model input was run the top 5% of daily averages of wind speeds (and the corresponding wind directions) from January 1, 2011 00:00 to December 31, 2016 23:59. Each cell of the grid was given a corresponding REI value. Values shown on estuary maps are means of the daily values.

Note that the bin range shown in the map legends differs between each estuary map.

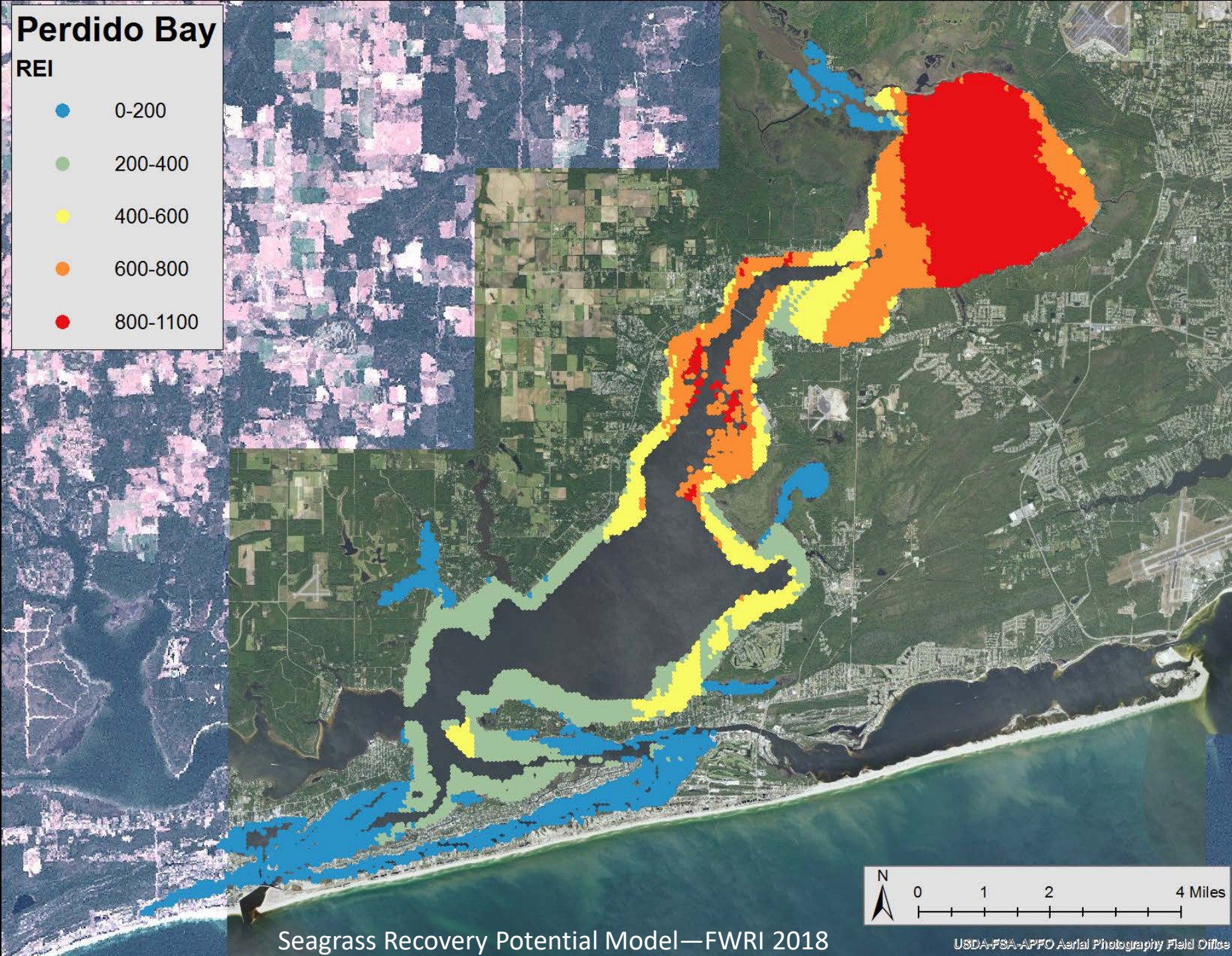
Reference: Malhotra, A., and M.S. Fonseca. 2007. WEMo (Wave Exposure Model): Formulation, procedures and validation. NOAA Technical Memorandum NOS NCCOS 65. Beaufort, NC. 28 pp.

https://coastalscience.noaa.gov/data_reports/wemo-wave-exposure-model-formulation-procedures-and-validation/.

Perdido Bay

REI

- 0-200
- 200-400
- 400-600
- 600-800
- 800-1100

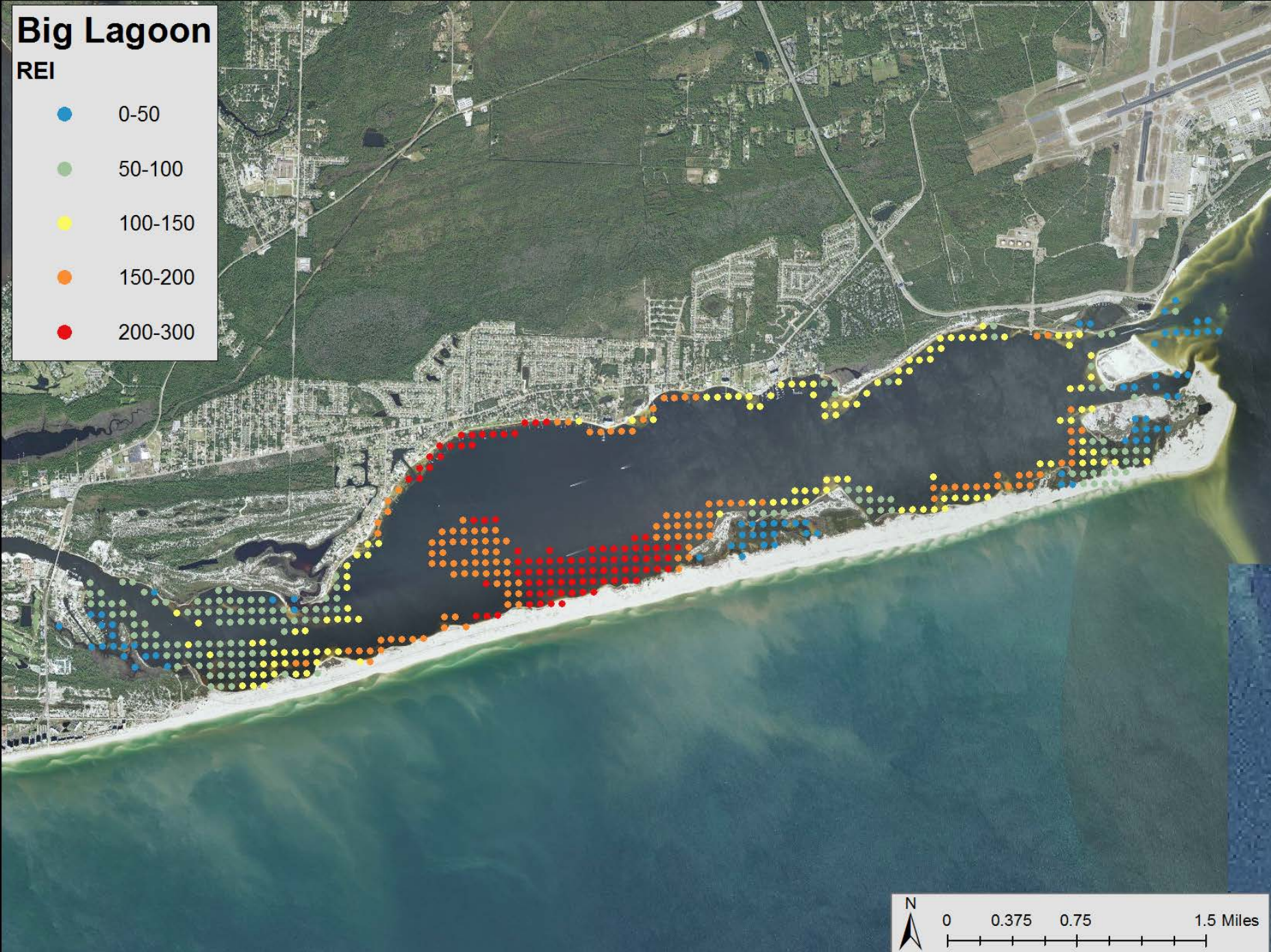


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Perdido Bay

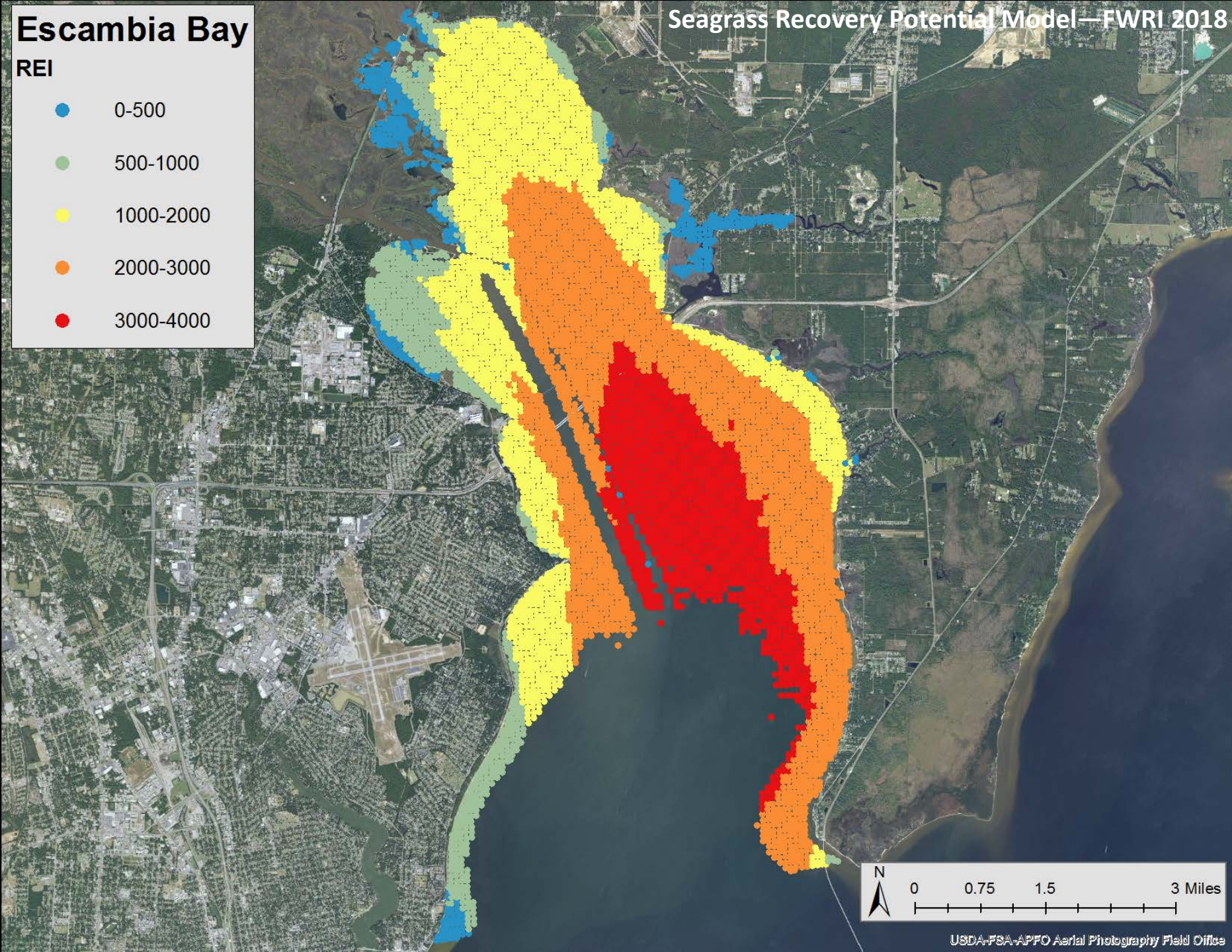
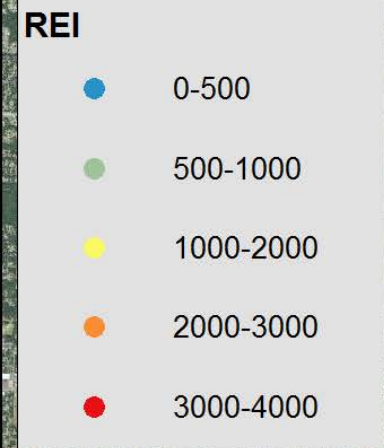




Big Lagoon

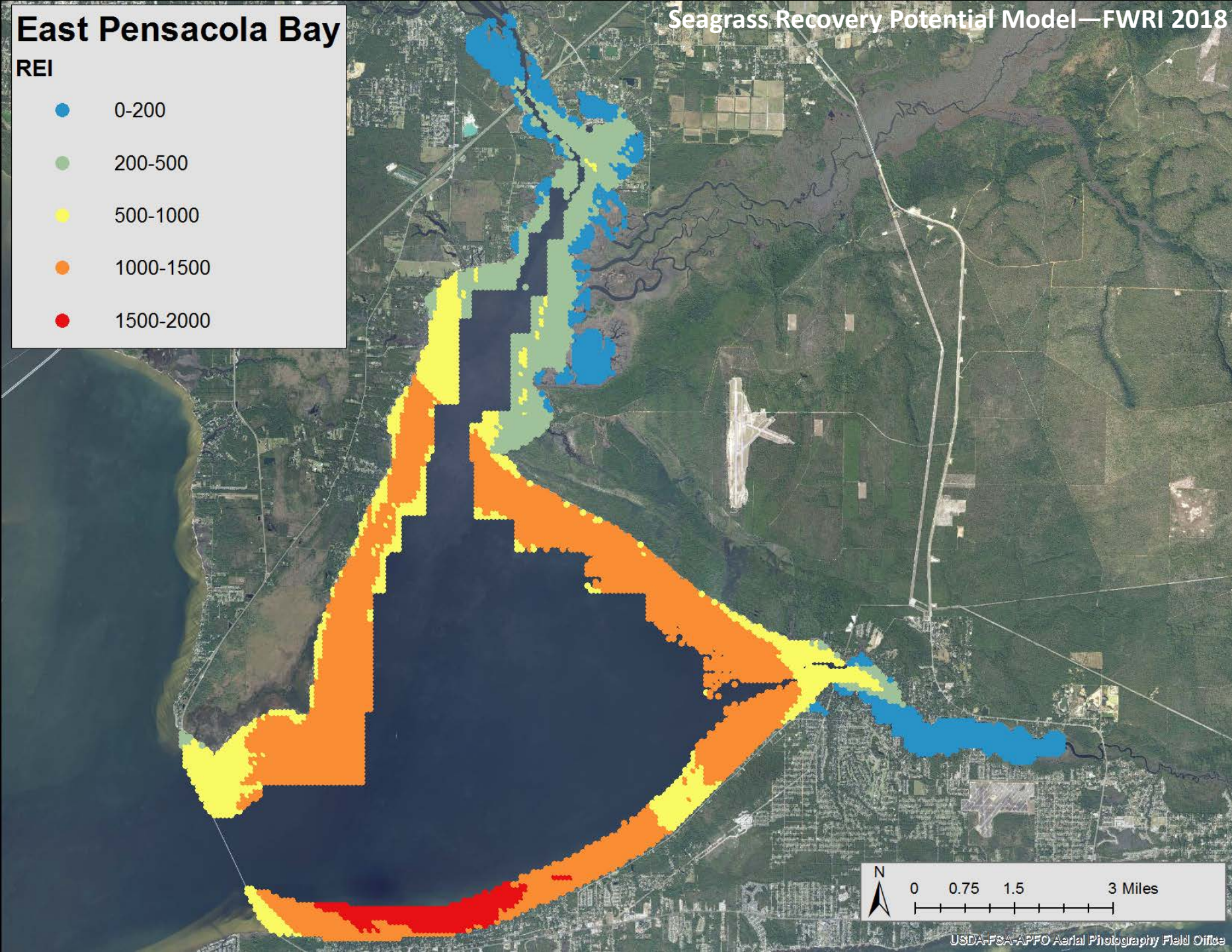


Escambia Bay



Escambia Bay

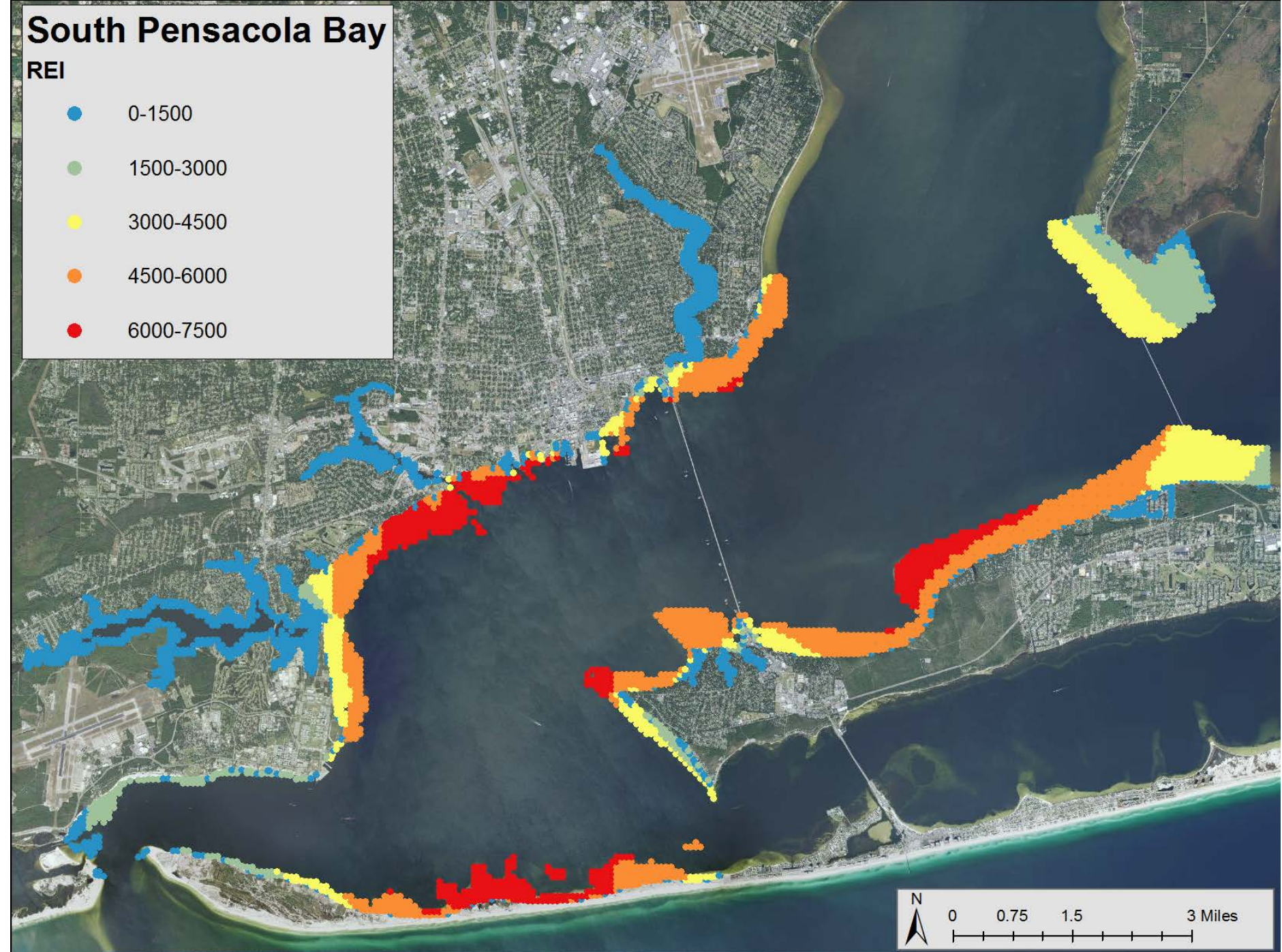




East Bay Pensacola Bay



South Pensacola Bay



Pensacola Bay



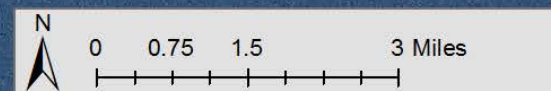
Santa Rosa Sound

REI

- 0-200
- 200-400
- 400-600
- 600-800
- 800-1000



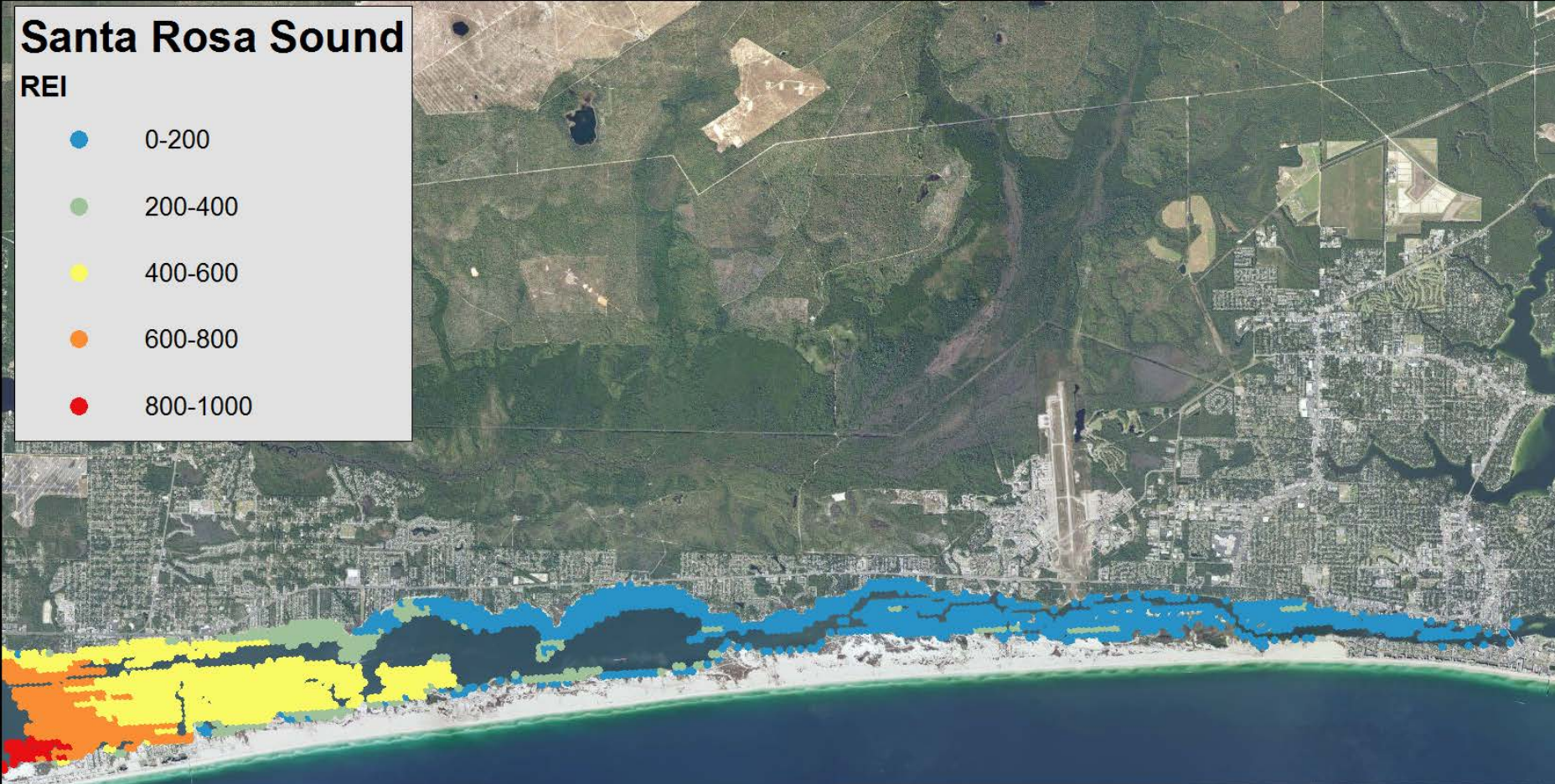
Western Santa Rosa Sound



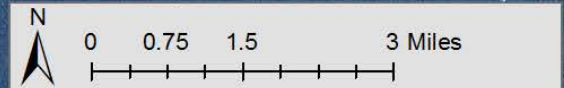
Santa Rosa Sound

REI

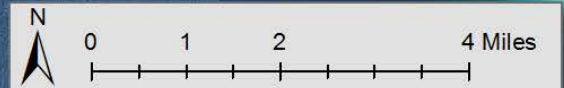
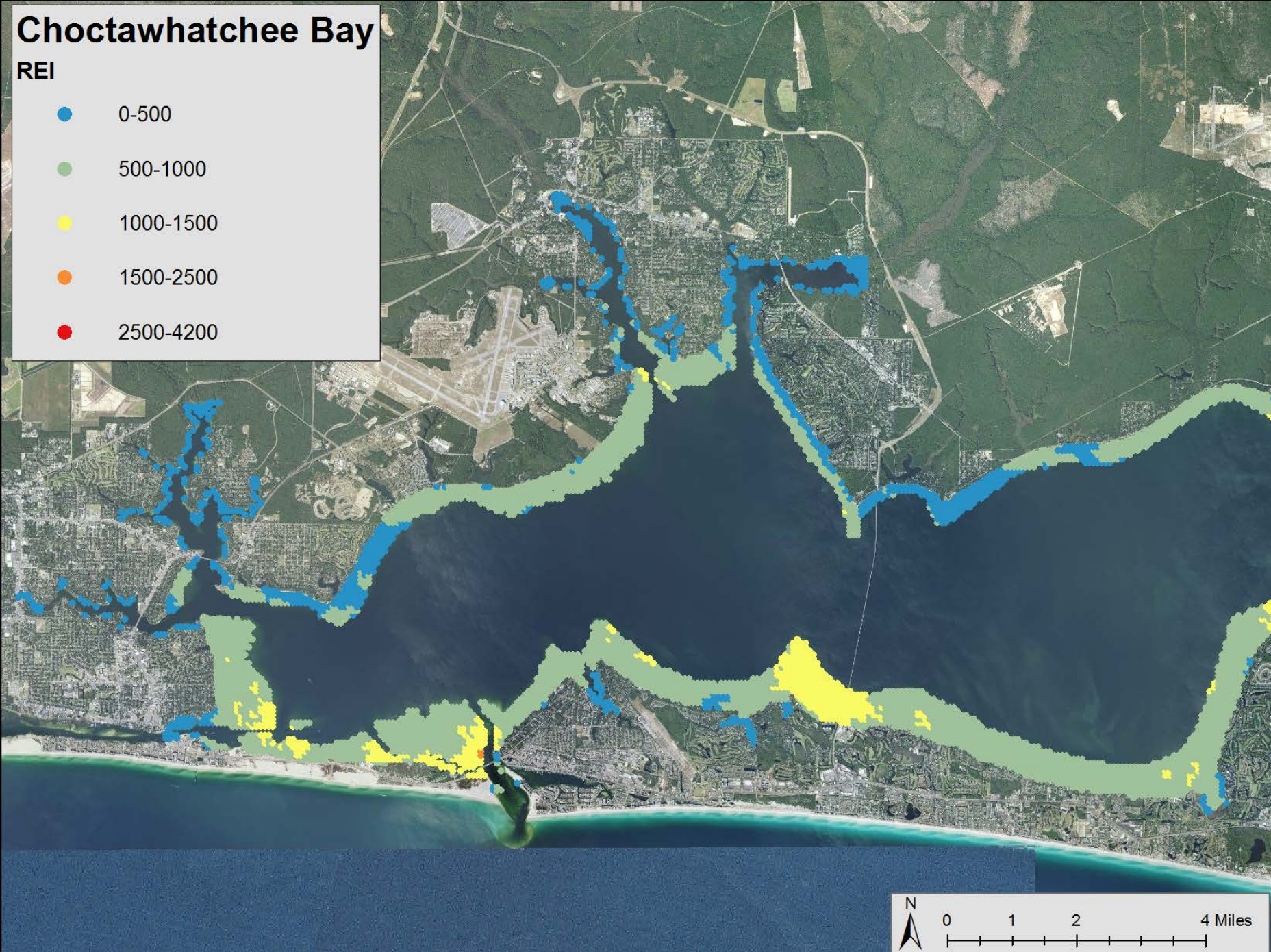
- 0-200
- 200-400
- 400-600
- 600-800
- 800-1000



Eastern Santa Rosa Sound



Choctawhatchee Bay



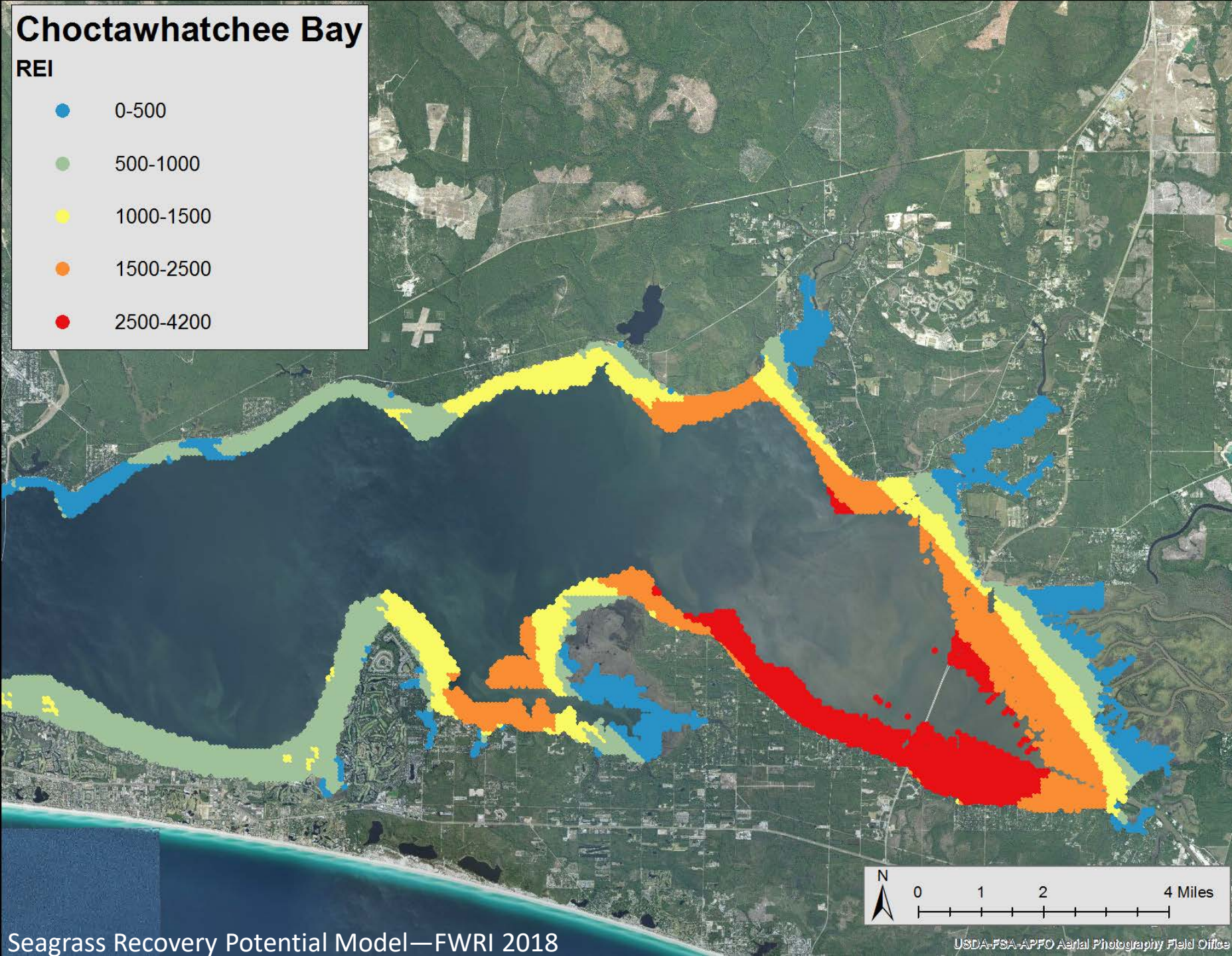
Western Choctawhatchee Bay



Choctawhatchee Bay

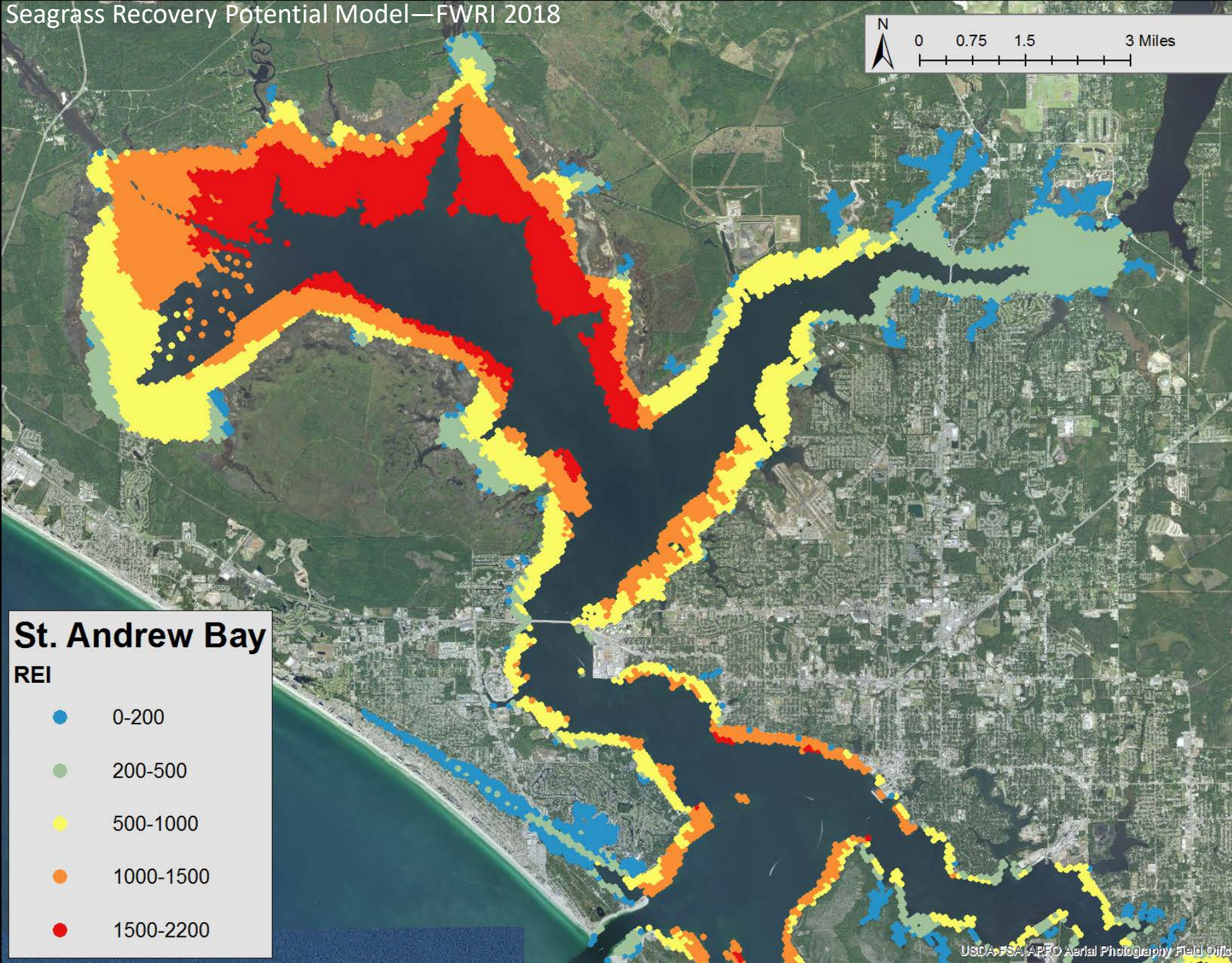
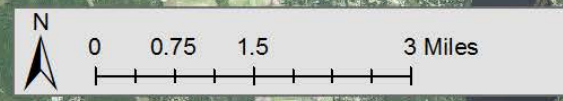
REI

- 0-500
- 500-1000
- 1000-1500
- 1500-2500
- 2500-4200

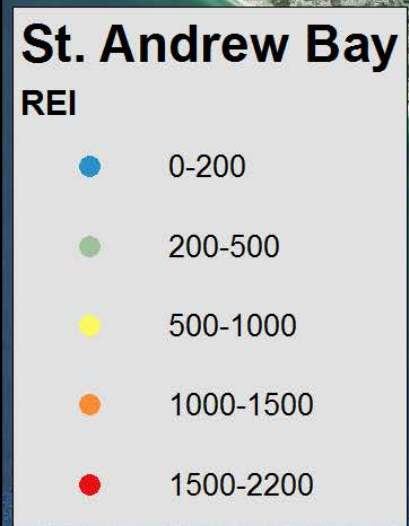


Eastern Choctawhatchee Bay

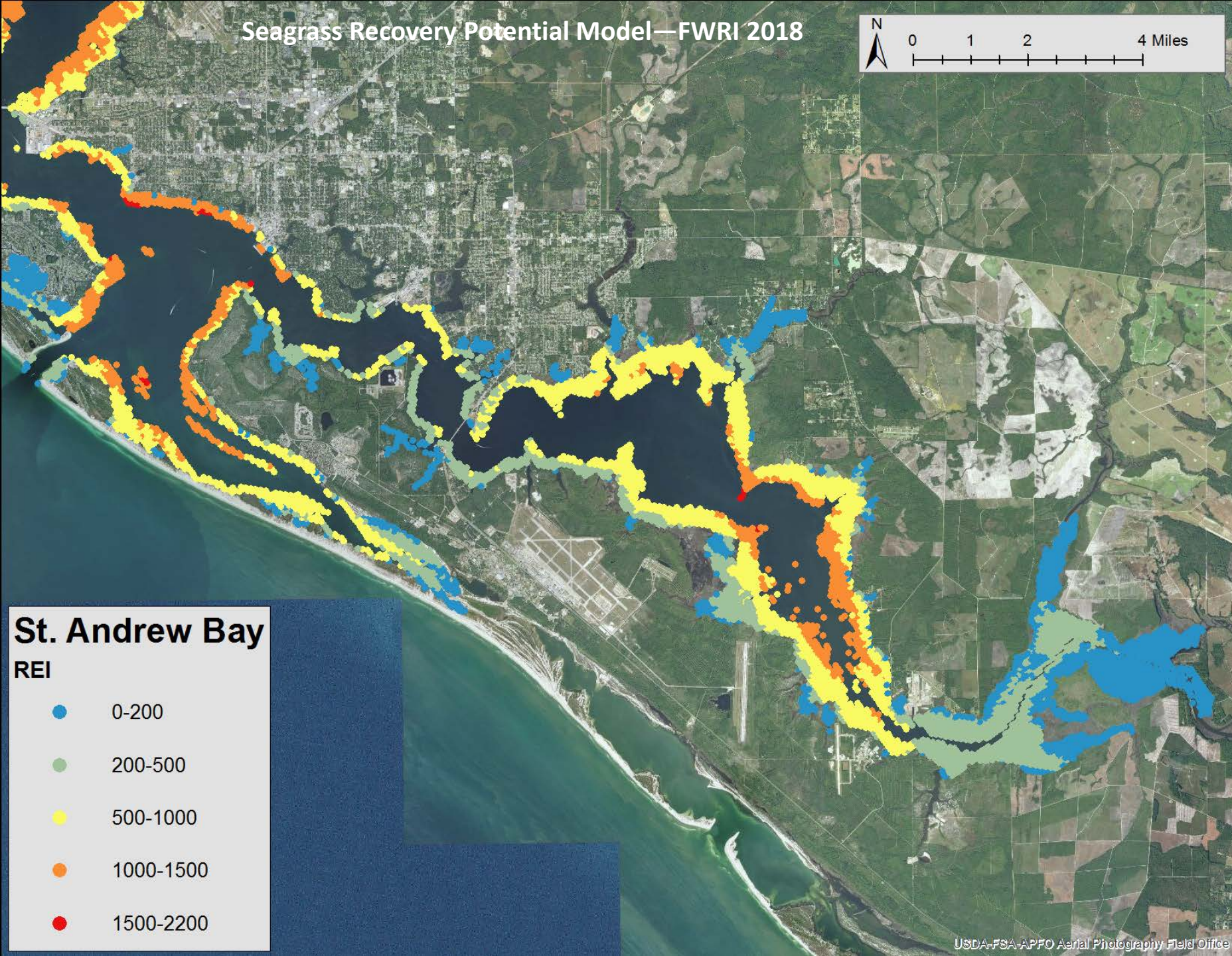
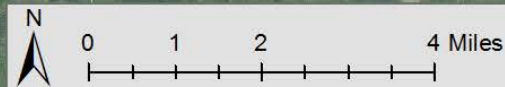




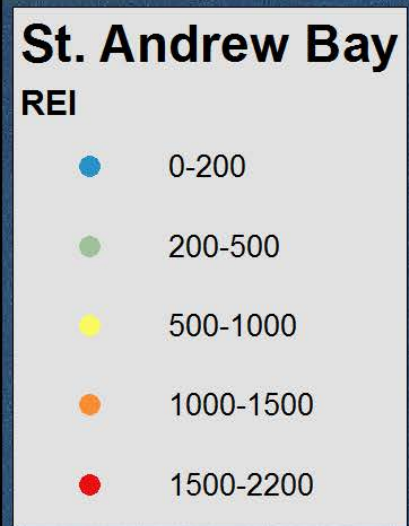
Western St. Andrew Bay



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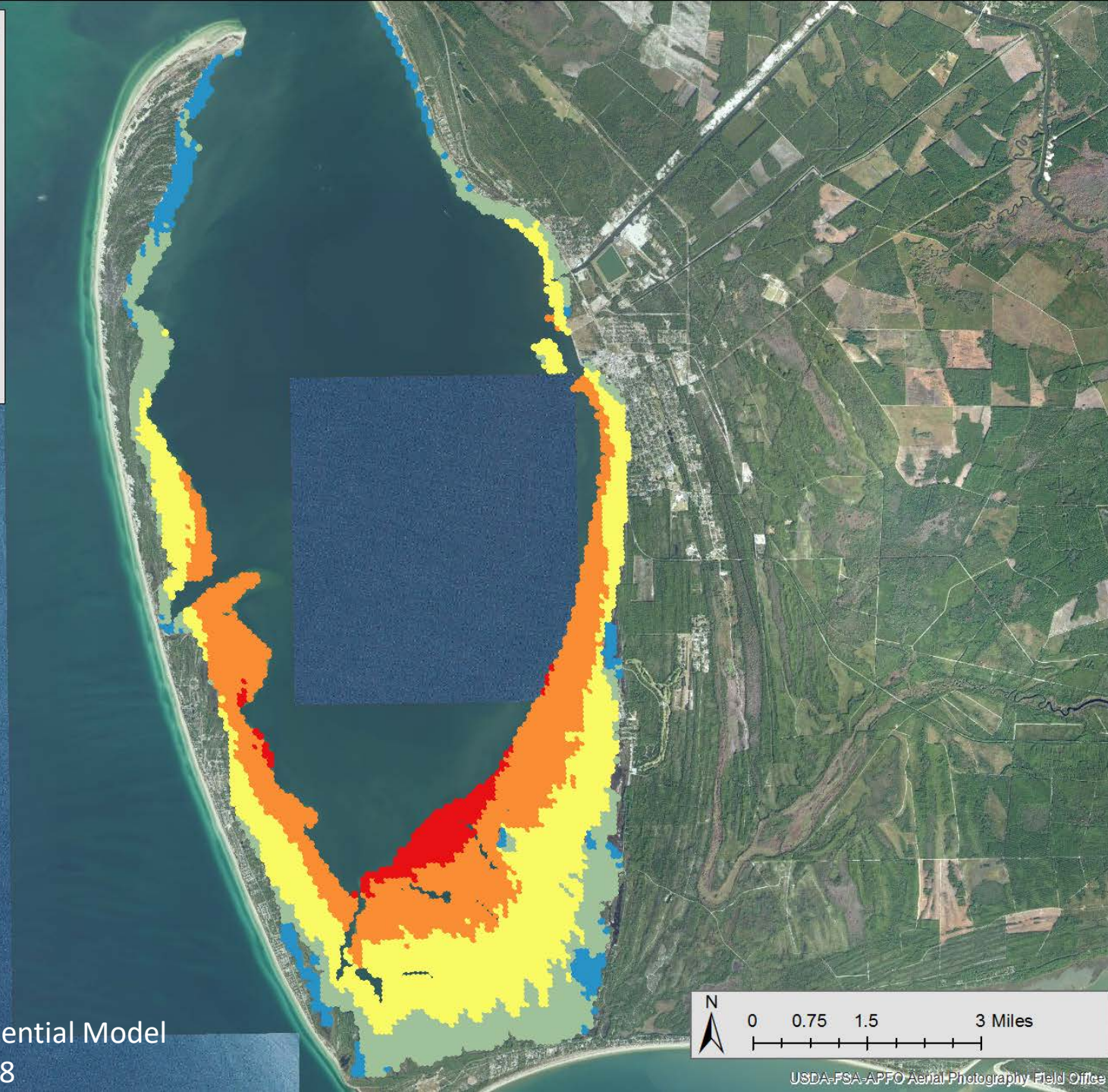
Eastern St. Andrew Bay



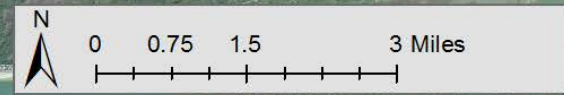
St. Joseph Bay

REI

- 0-500
- 500-1000
- 1000-1500
- 1500-2000
- 2000-2500



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St. Joseph Bay

