Roadblocks to Seagrass Recovery

Seagrass Recovery Potential Model for Panhandle estuaries

Physical Disturbance: Exposure to Wave Energy

2004 through 2005

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, 2004 through December 31, 2005. 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

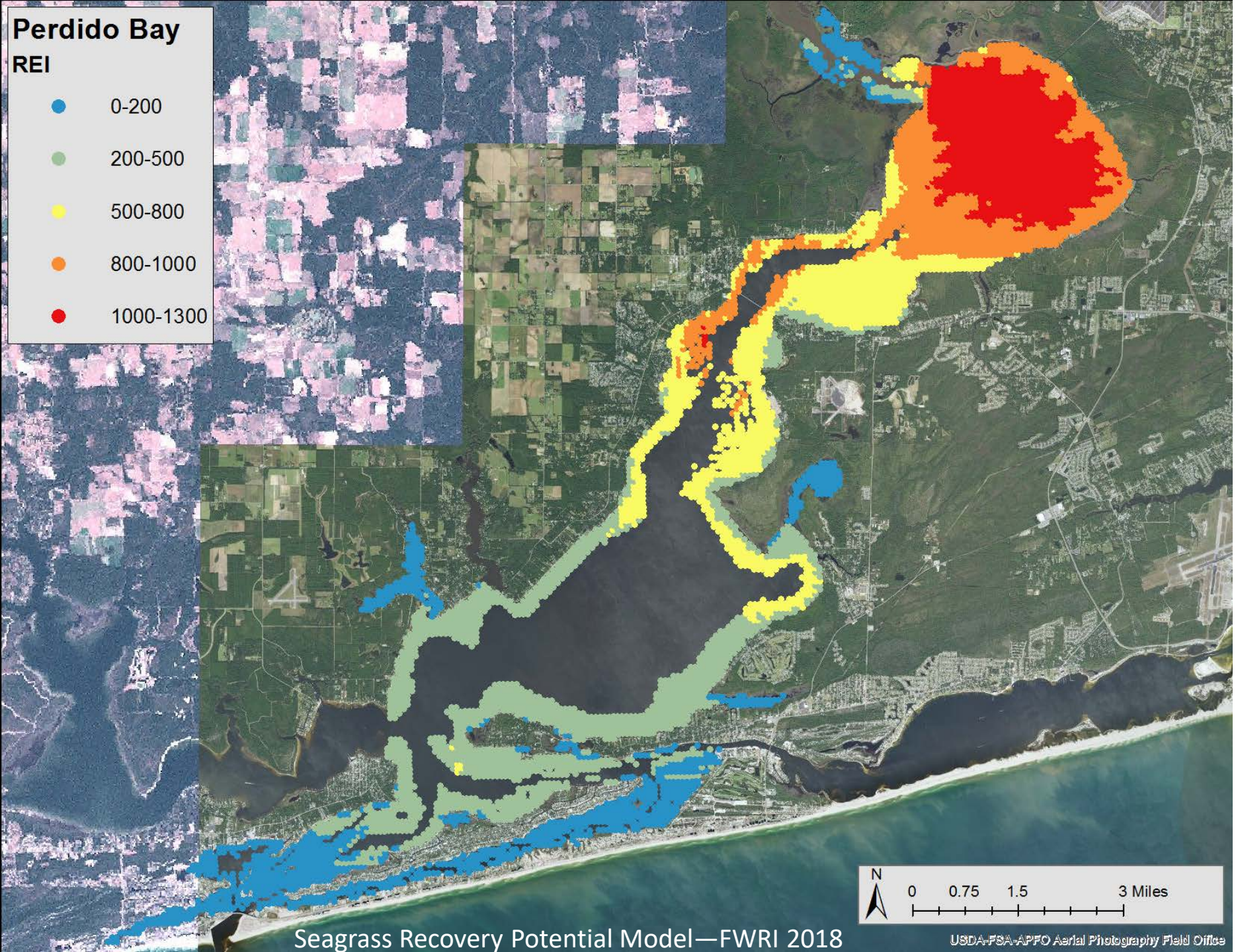
Bathymetric data were obtained from NOAA bathymetric digital sounding survey data, collected between 1981 and 1994. These data were adjusted for sea level rise and converted to mean sea level (MSL). Wind data were obtained from NOAA National Center for Environmental Information land-based station data historical records. Wind data were collected from three stations: Pensacola Reginal 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, 2004 00:00 to December 31, 2005 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 Relative 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, 2004 00:00 to December 31, 2005 23:59. Each cell of the grid was given a corresponding REI value. Values shown on estuary maps are means of the daily values.

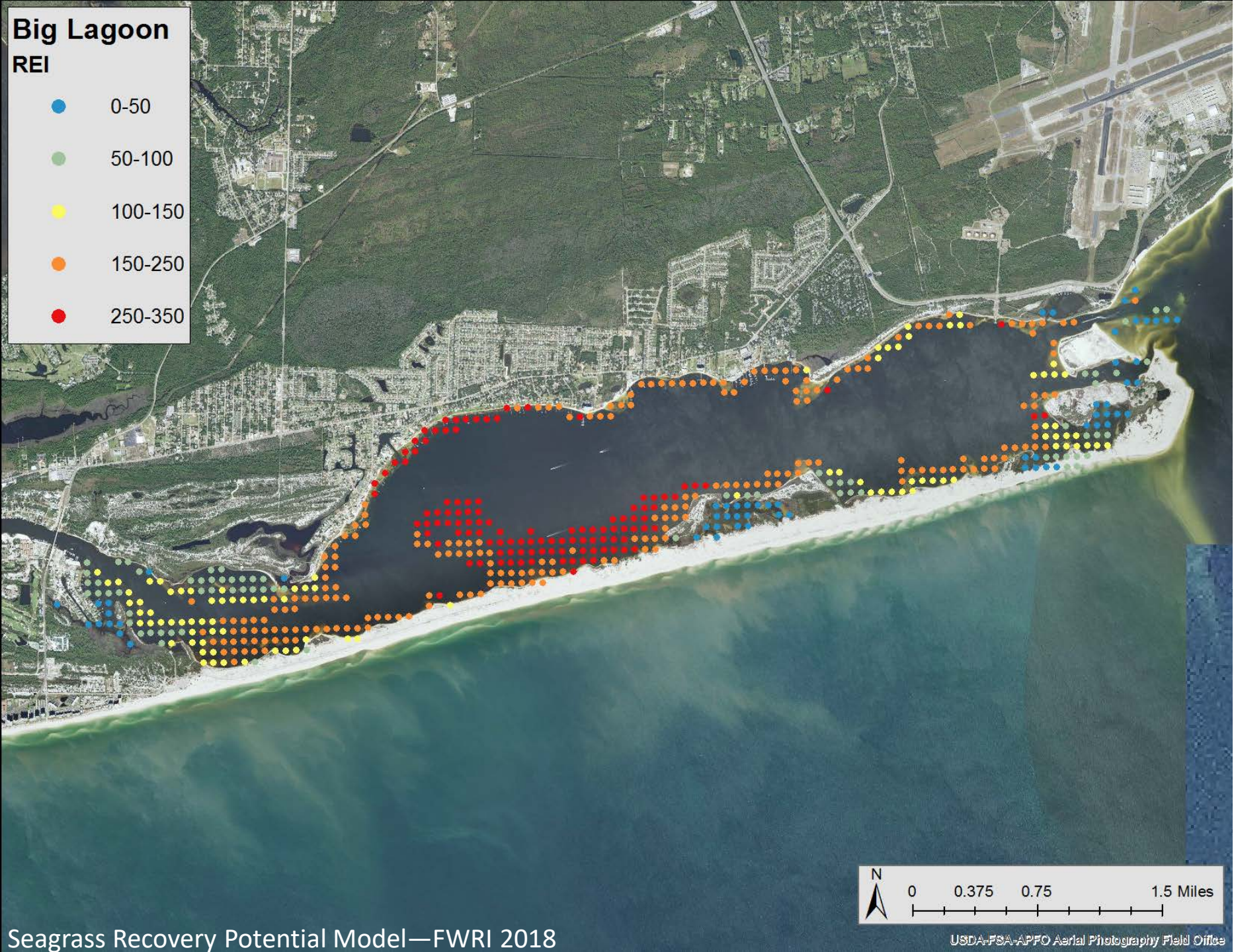
Note that the bin range shown in the map legends differs between each estuary map.

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/.



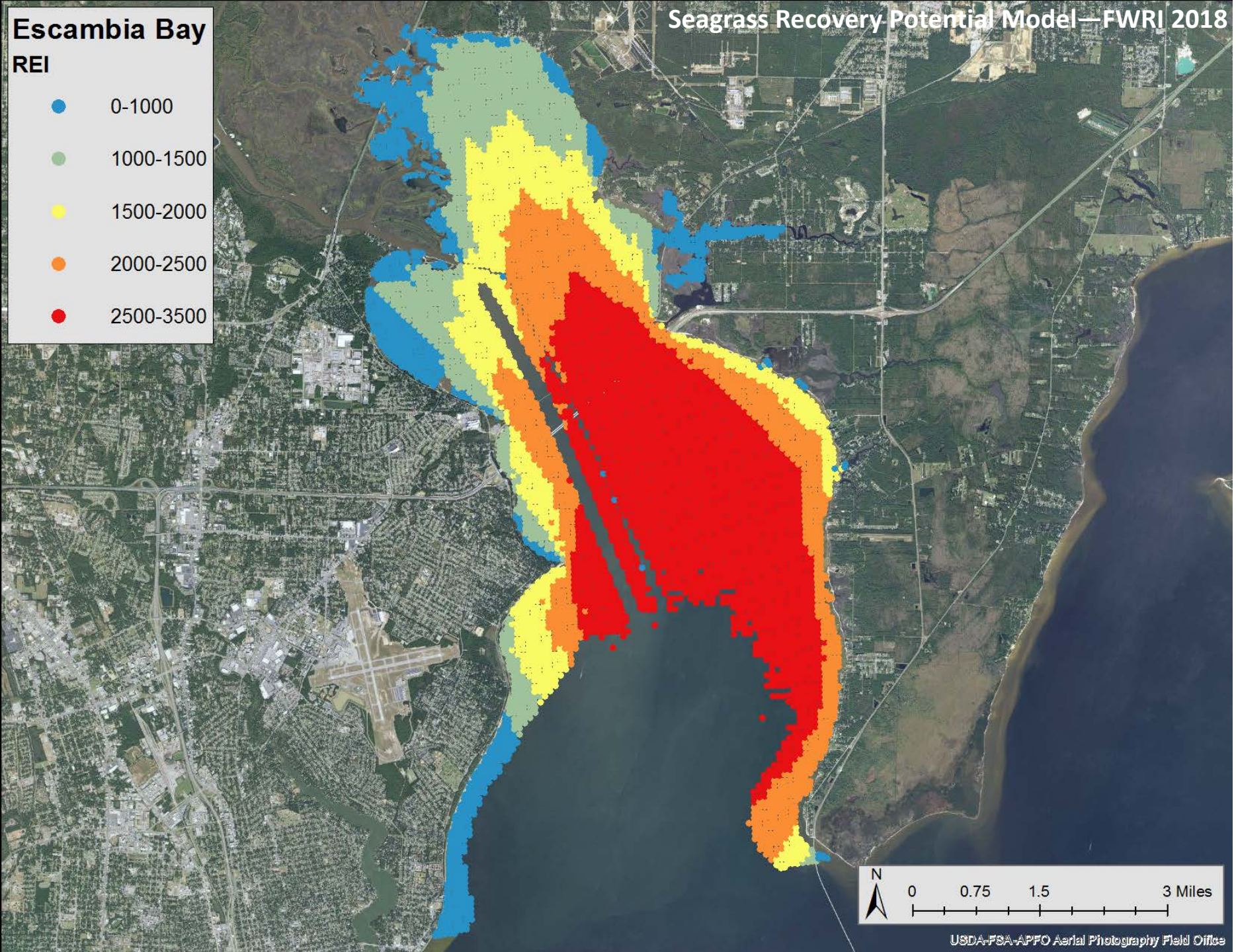
Perdido Bay

Roadblocks to Seagrass Recovery

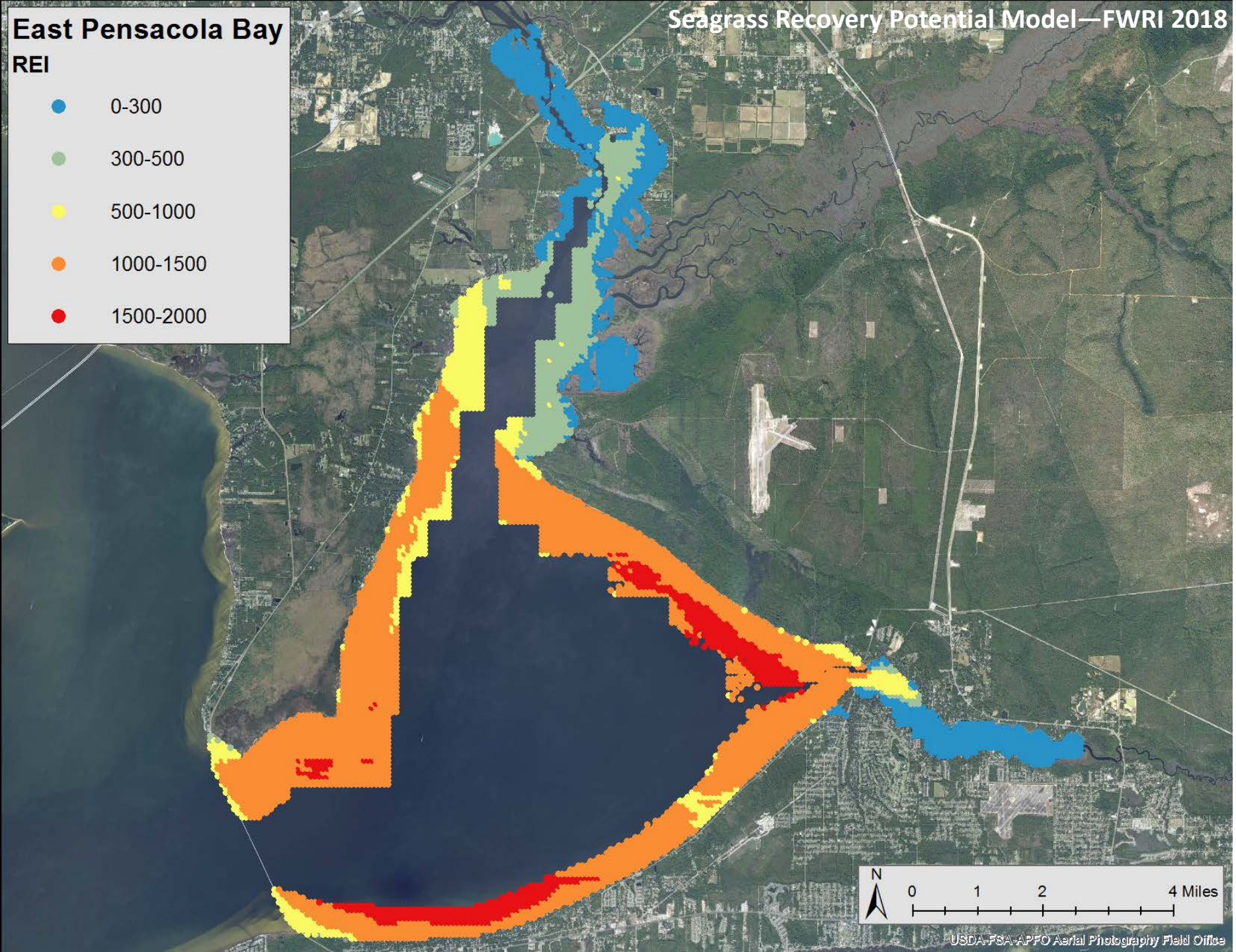


Seagrass Recovery Potential Model—FWRI 2018

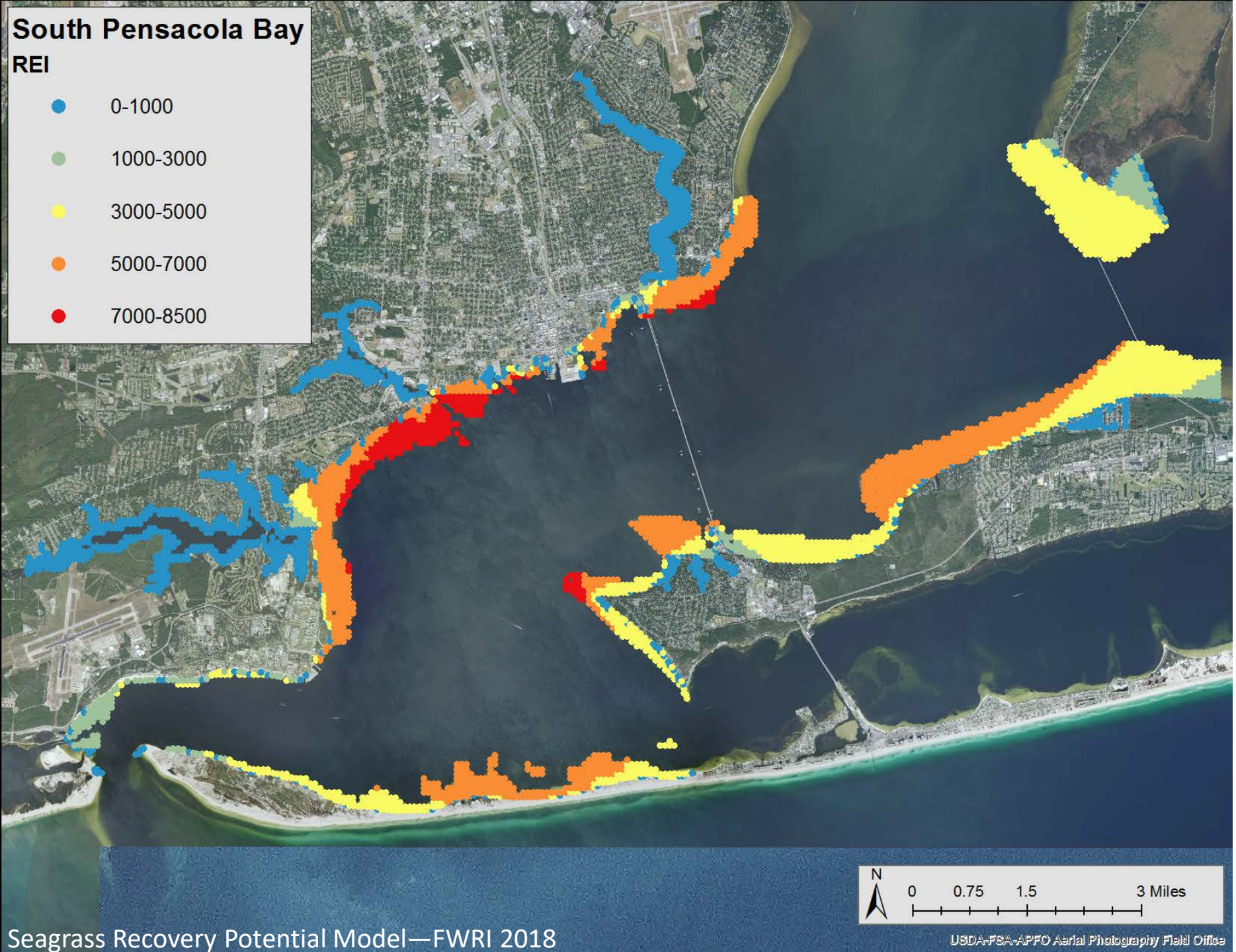
Big Lagoon



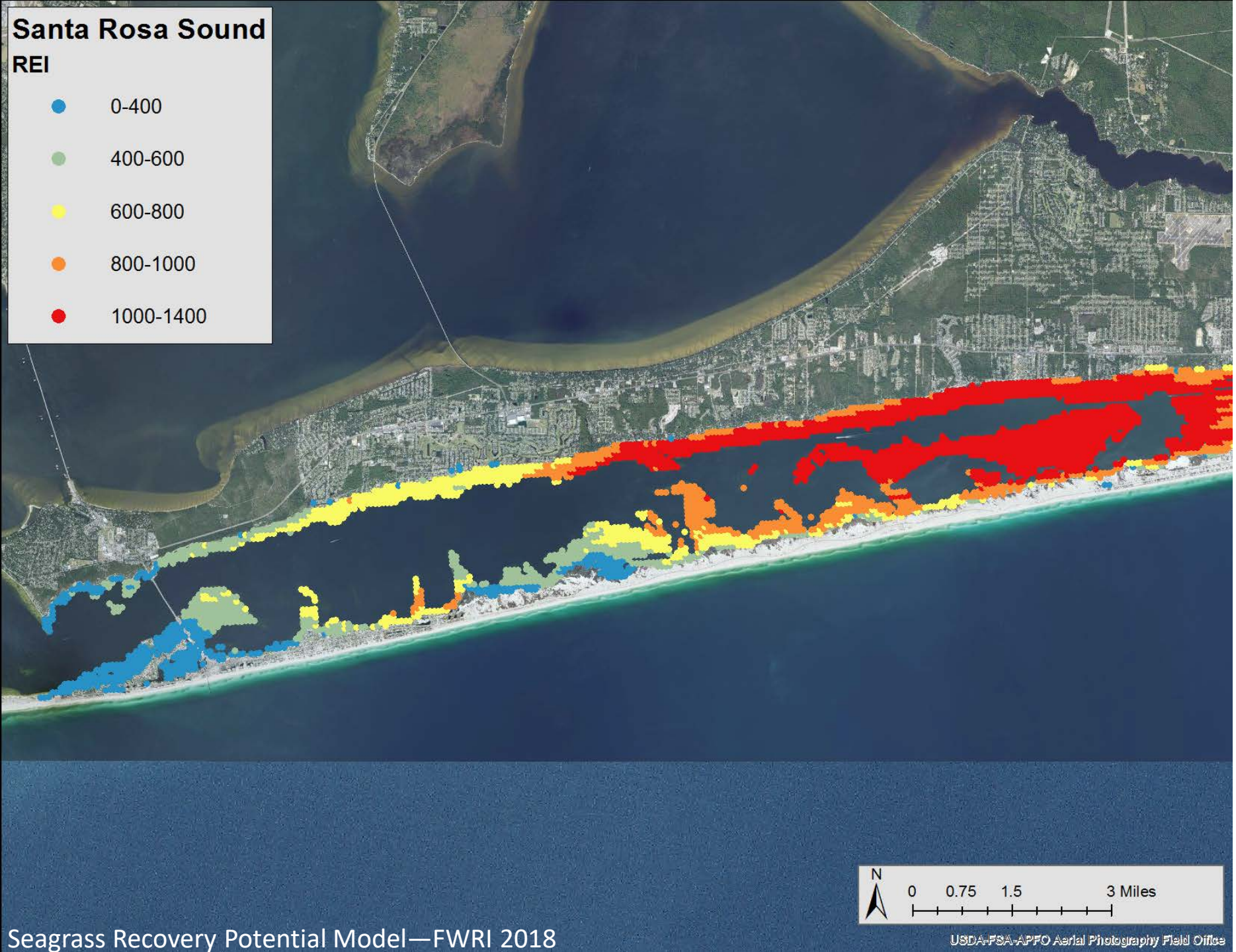
Escambia Bay



East Bay
Pensacola Bay

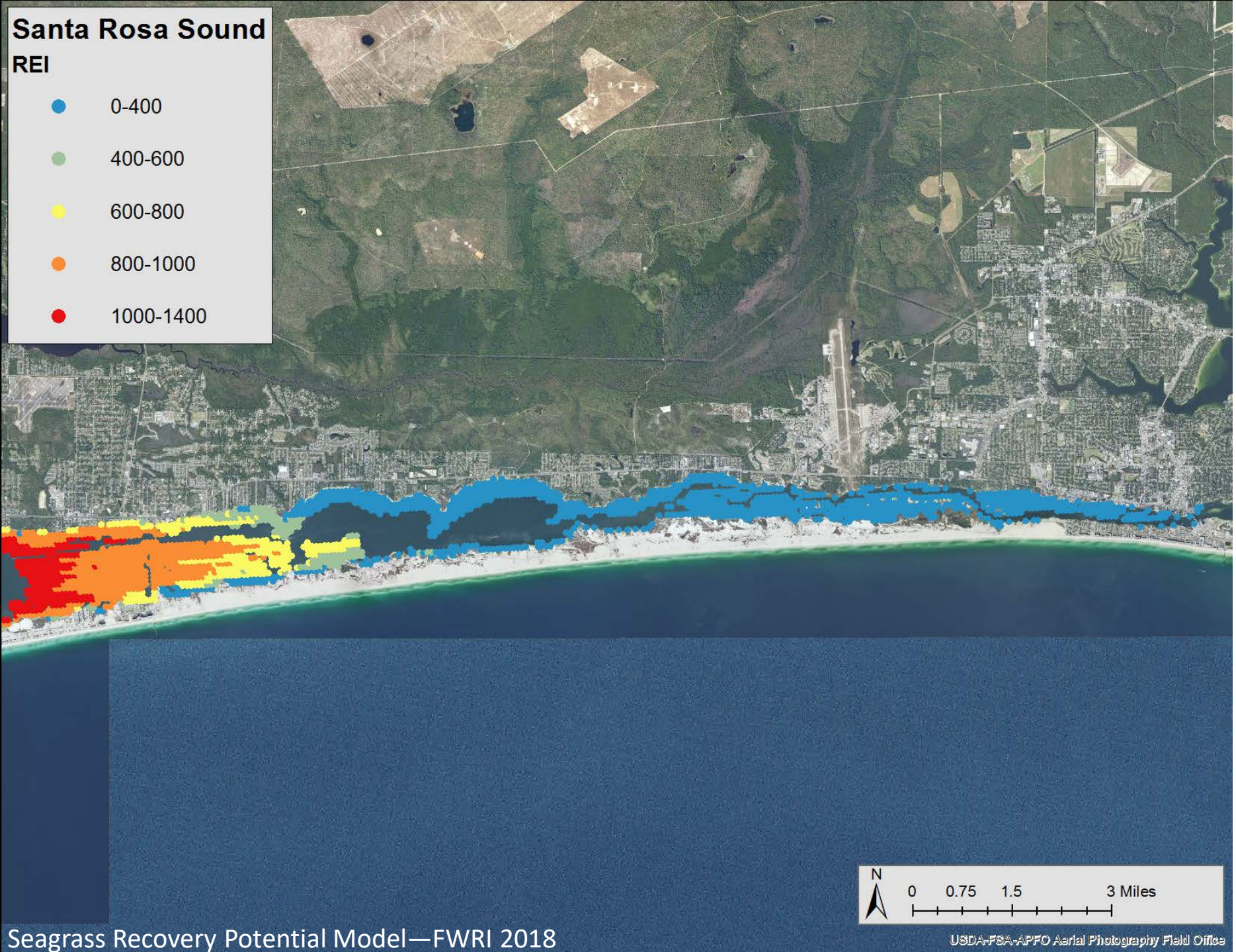


Pensacola Bay



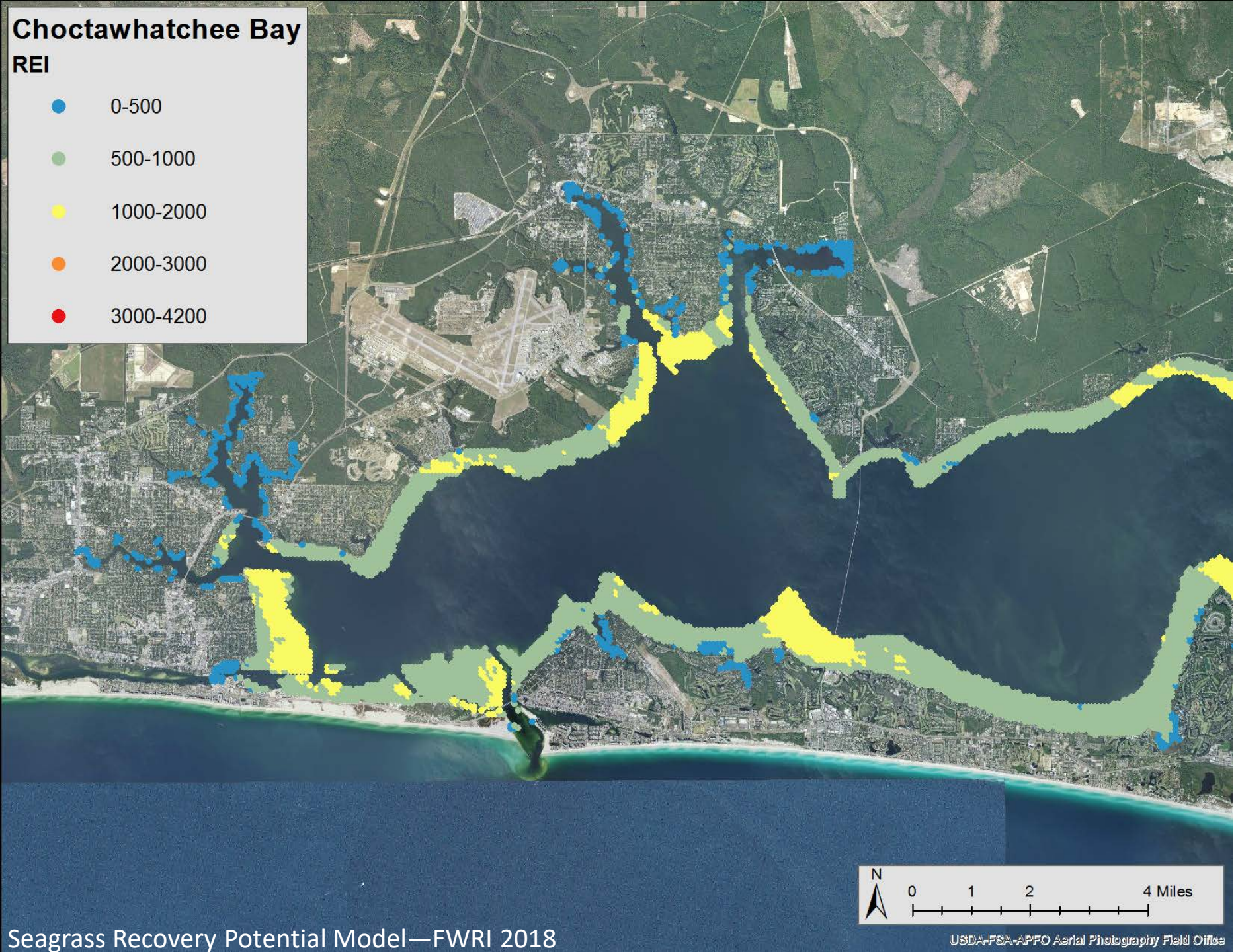
Seagrass Recovery Potential Model—FWRI 2018

Western Santa Rosa Sound



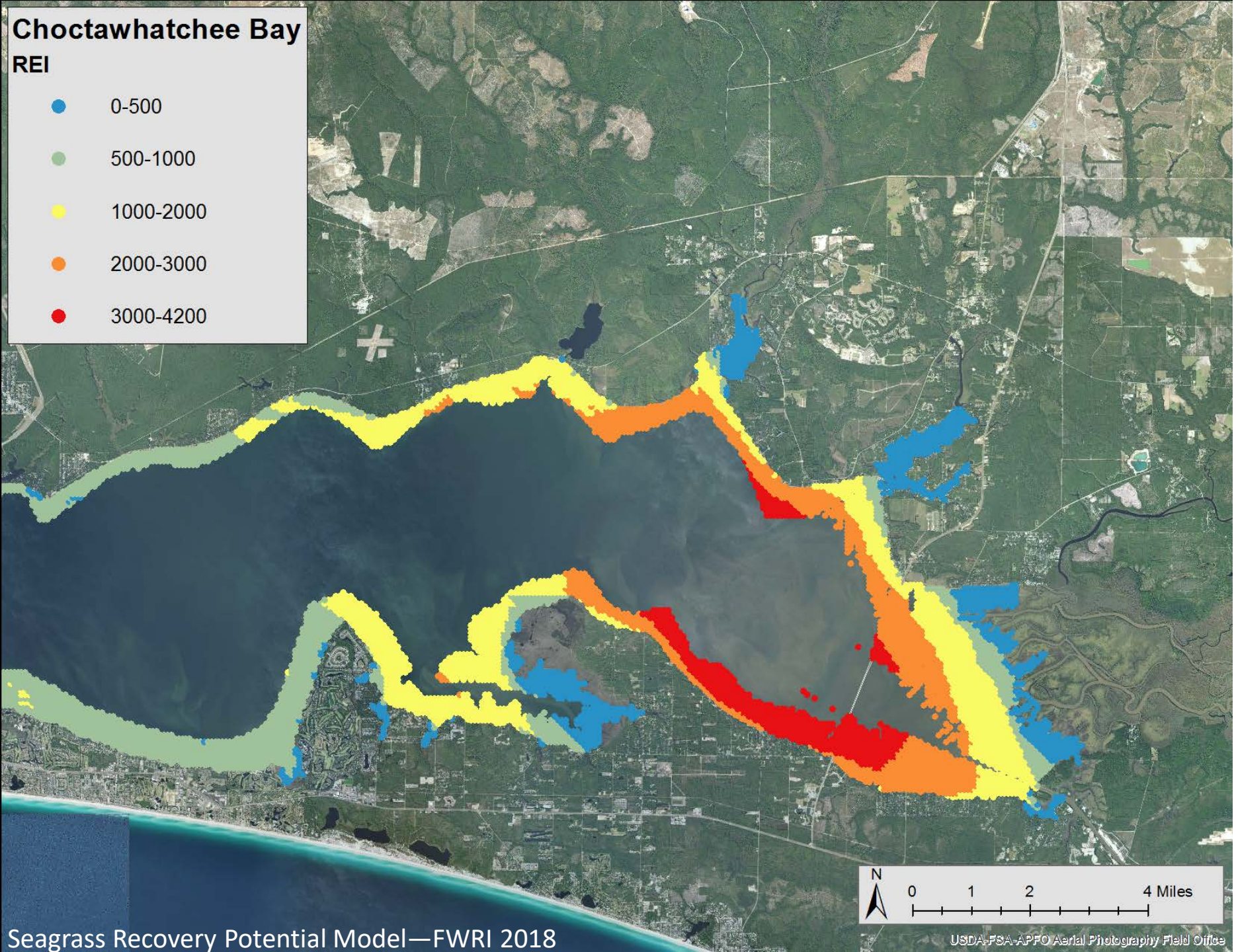
Seagrass Recovery Potential Model—FWRI 2018

Eastern Santa Rosa Sound



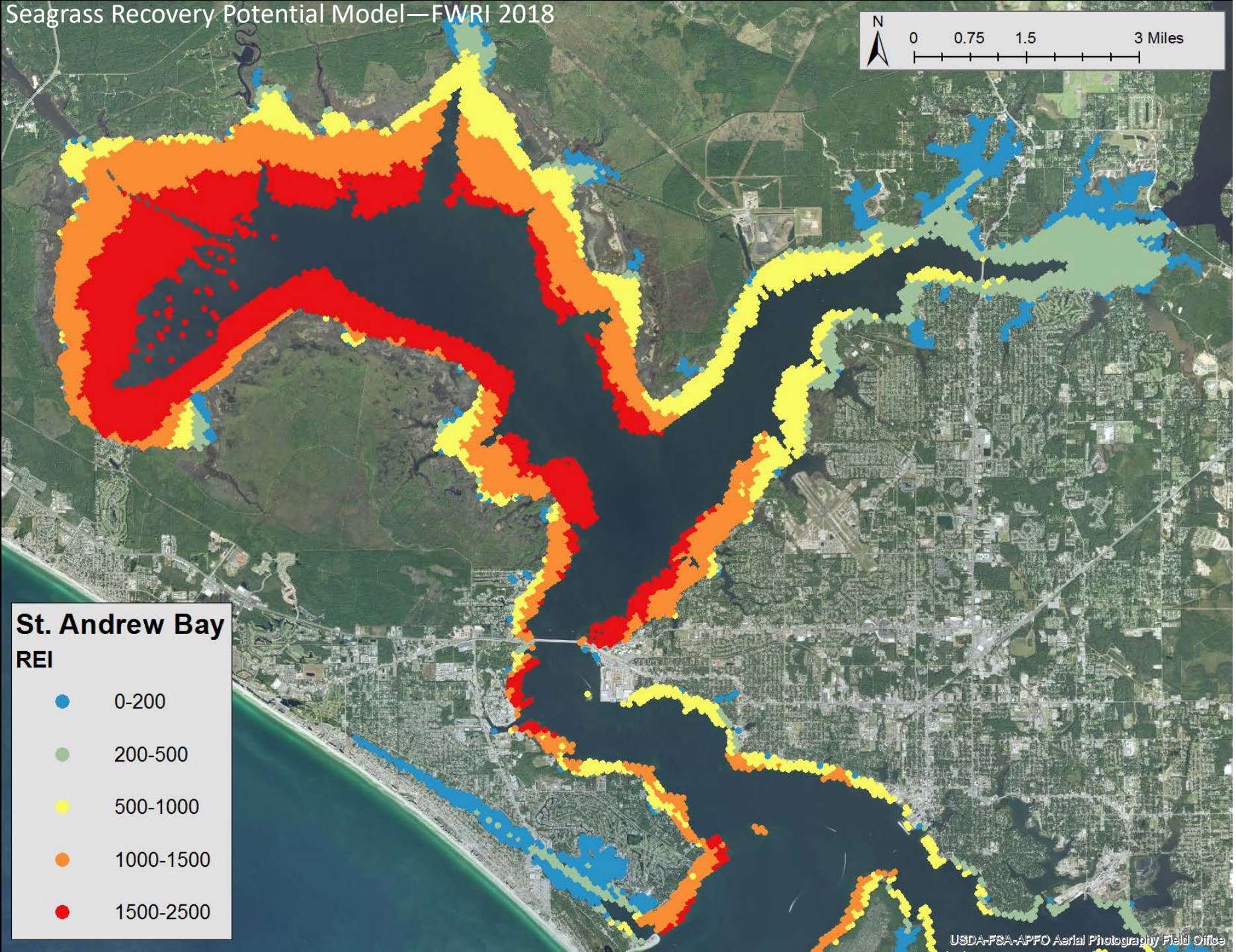
Western Choctawhatchee Bay

Roadblocks to Seagrass Recovery



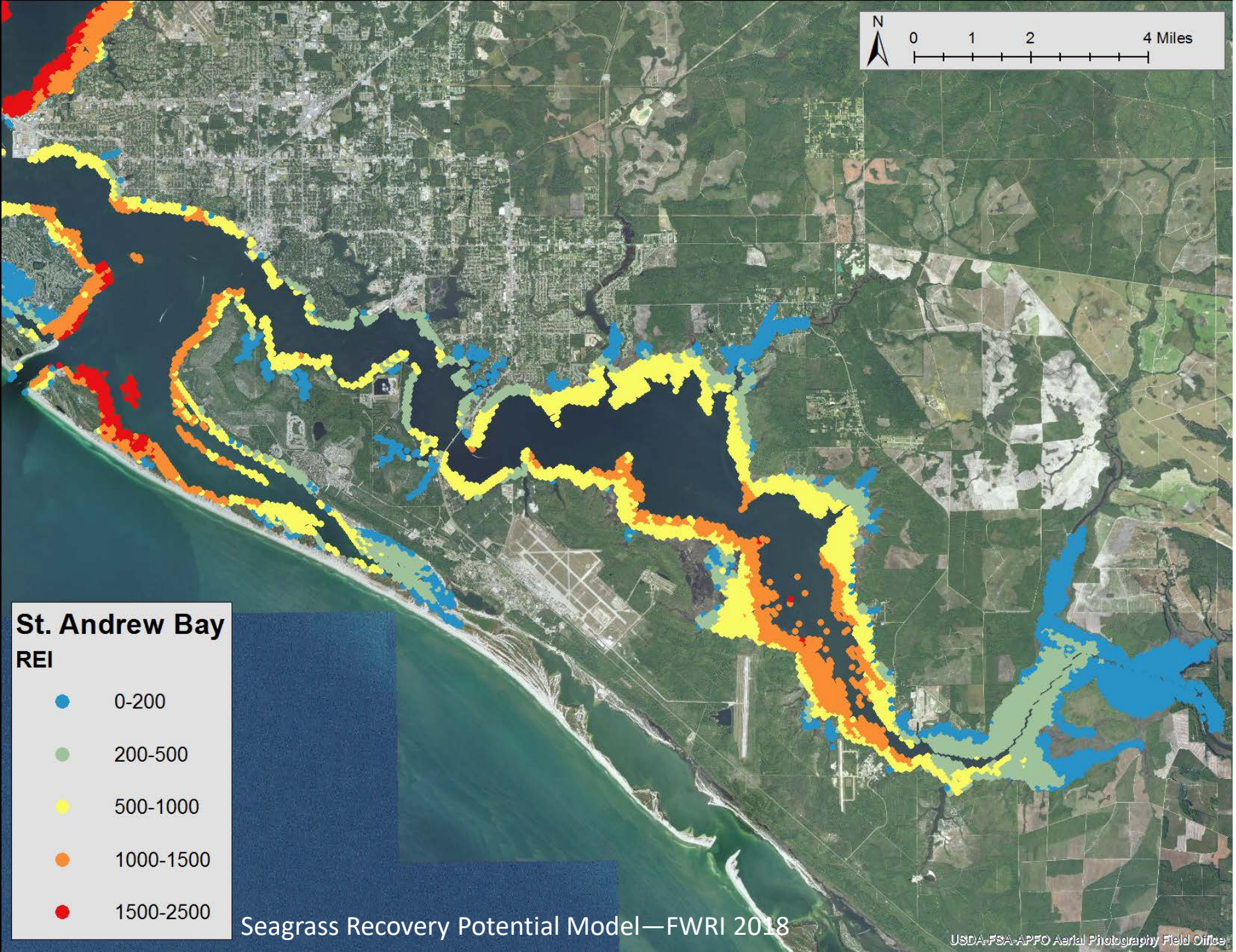
Seagrass Recovery Potential Model—FWRI 2018

Eastern Choctawhatchee Bay

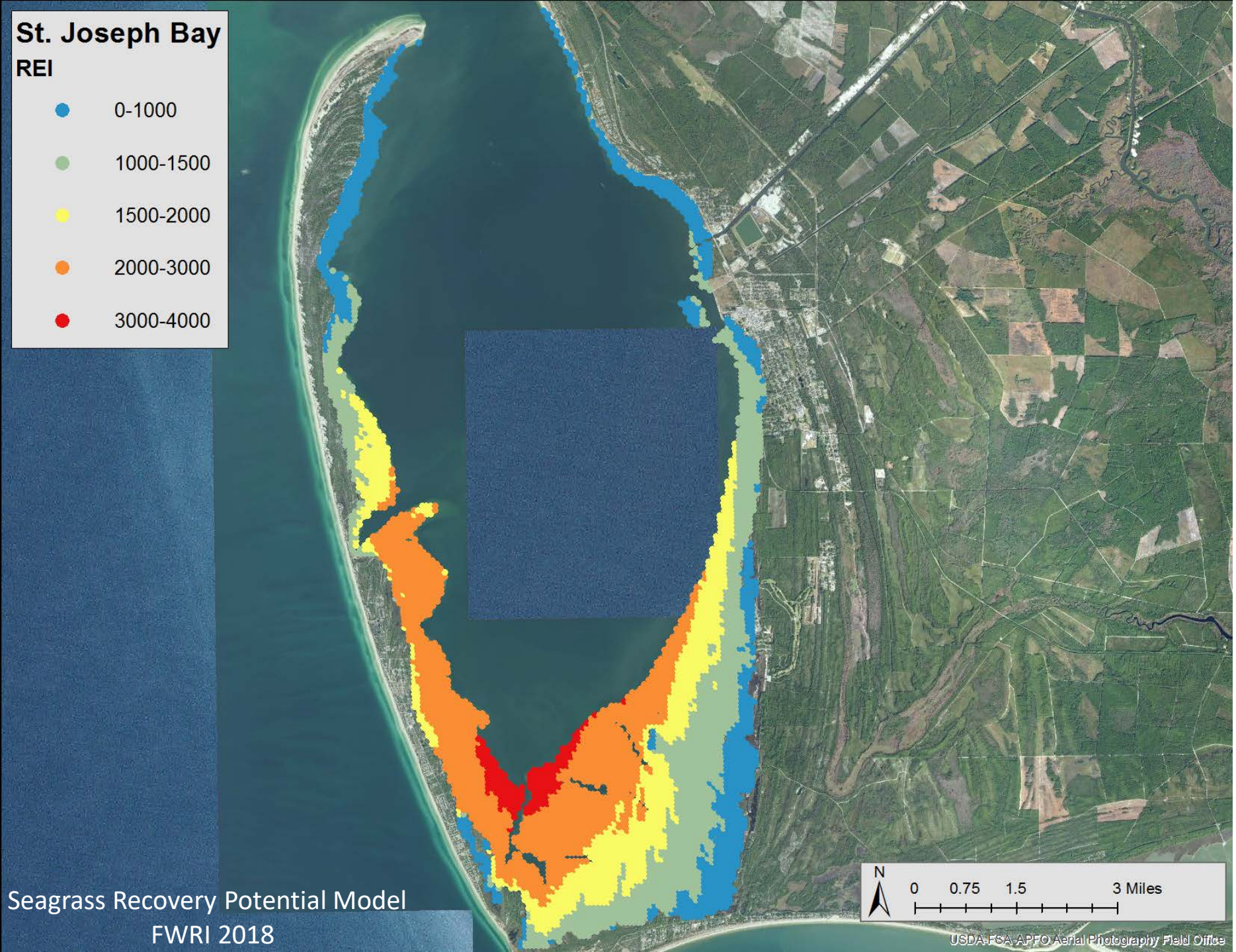


Western St. Andrew Bay

Roadblocks to Seagrass Recovery



Eastern St. Andrew Bay



Seagrass Recovery Potential Model
FWRI 2018

St. Joseph Bay