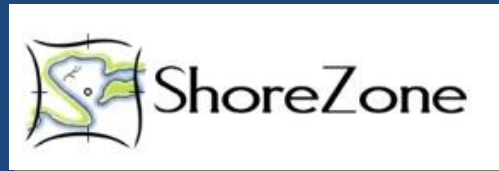



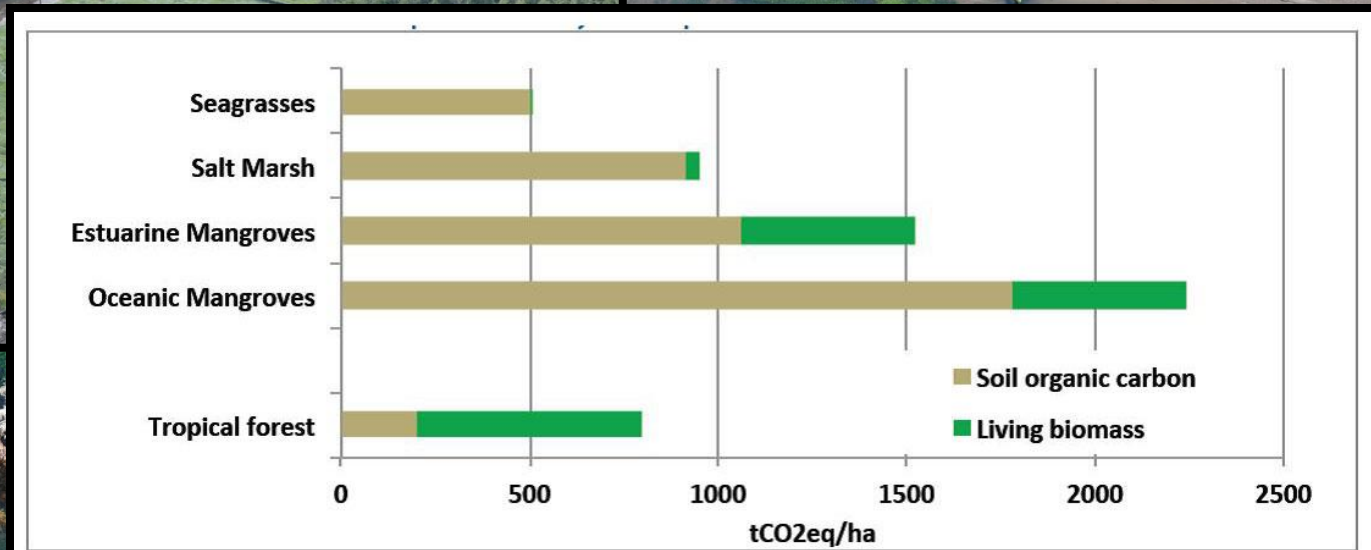
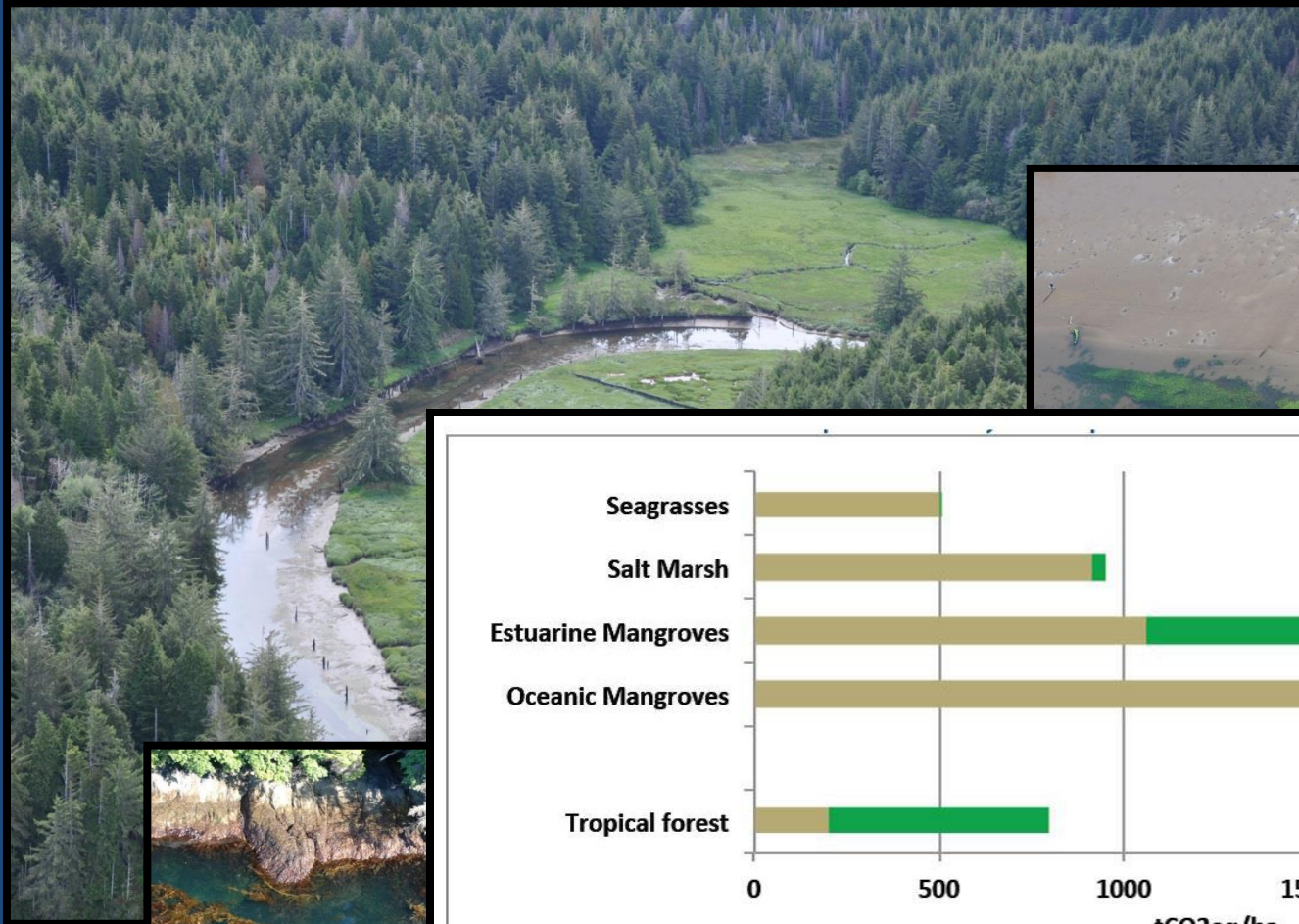
Mapping Blue Carbon in South Slough National Estuarine Research Reserve Using ShoreZone

Sarah Cook
Coastal and Ocean Resources



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- An aerial photograph showing a dense forest of evergreen trees. A river flows through the lower left portion of the image. To the right of the river, there is a large, flat, green area that appears to be a marsh or wetland. The text is overlaid on a semi-transparent dark blue rectangle in the center of the image.
- **Using ShoreZone to map Salt Marshes**
 - Methodology
 - Results
 - Comparison to Previous Mapping
 - **Using InVEST to calculate Blue Carbon**
 - **Looking Forward**

What is Blue Carbon?



*Data is per unit area, where tCO₂eq/ha is tons of carbon dioxide equivalents per hectare

Source: Murray, Brian, Linwood Pendleton, W. Aaron Jenkins, and Samantha Sifleet. 2011. Green Payments for Blue Carbon: Economic Incentives for Protecting Threatened Coastal Habitats. Nicholas Institute Report. NI R 11-04

An aerial photograph of a lush green forested wetland area. A river flows through the center, surrounded by dense evergreen trees. A semi-transparent blue map overlay is visible, showing the same area with a different perspective or data layer. The map overlay is semi-transparent, allowing the underlying landscape to be seen. The text is overlaid on the map area.

Why Use ShoreZone to Map Blue Carbon Resources?

- Blue Carbon ecosystems are already identified
- Oblique shoreline imagery gives unique perspective
- Geographic extent of ShoreZone
- GIS platform already exists

Using ShoreZone to map Salt Marshes

South Slough National Estuarine Research Reserve

Pilot Project in South Slough National Estuarine Research Reserve

- Oregon ShoreZone completed in 2011
- Site of national importance
- Availability of 'ground-truthing'
- Core samples

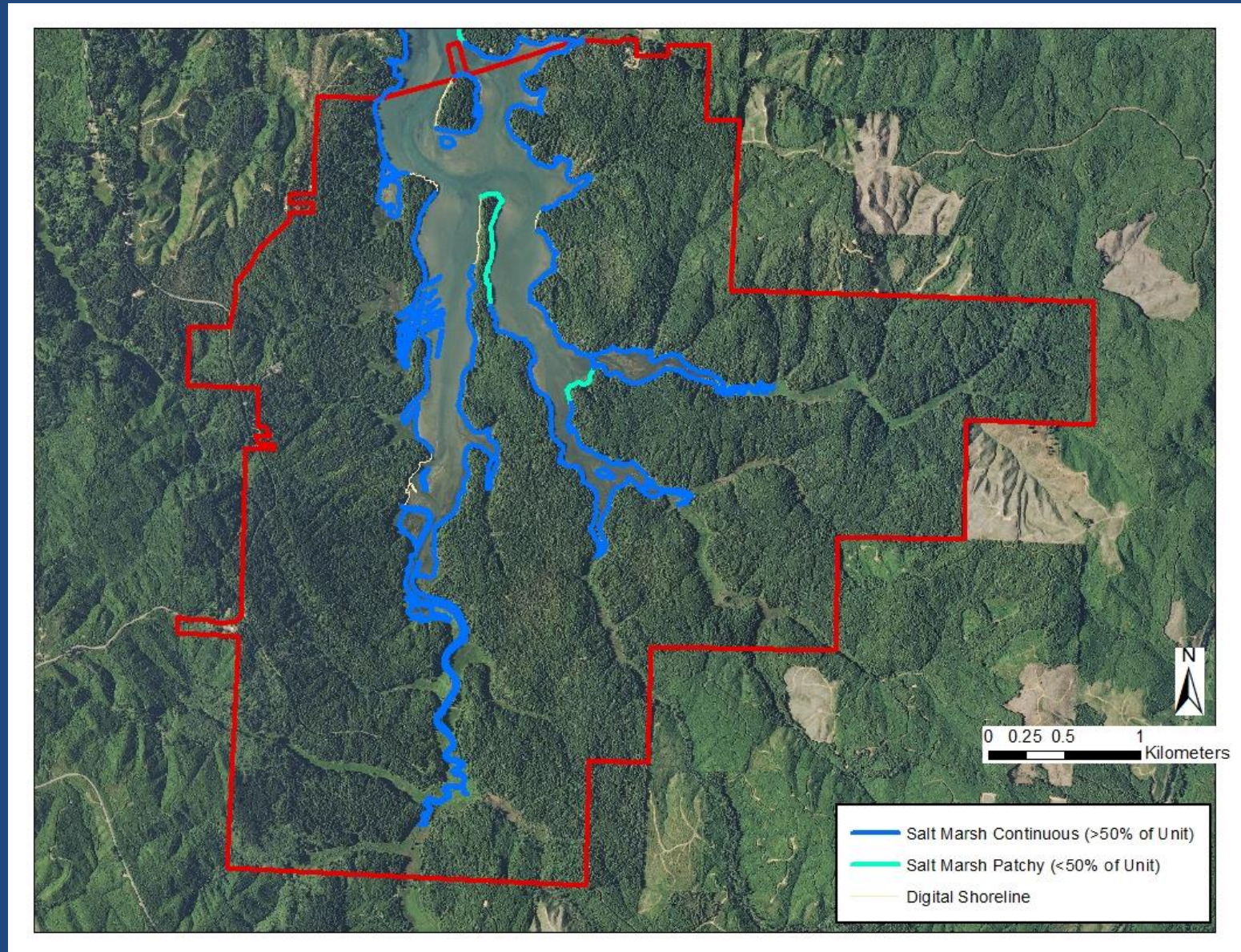
Google Earth

© 2015 Google
Image Landsat
Data SIO, NOAA, U.S. Navy

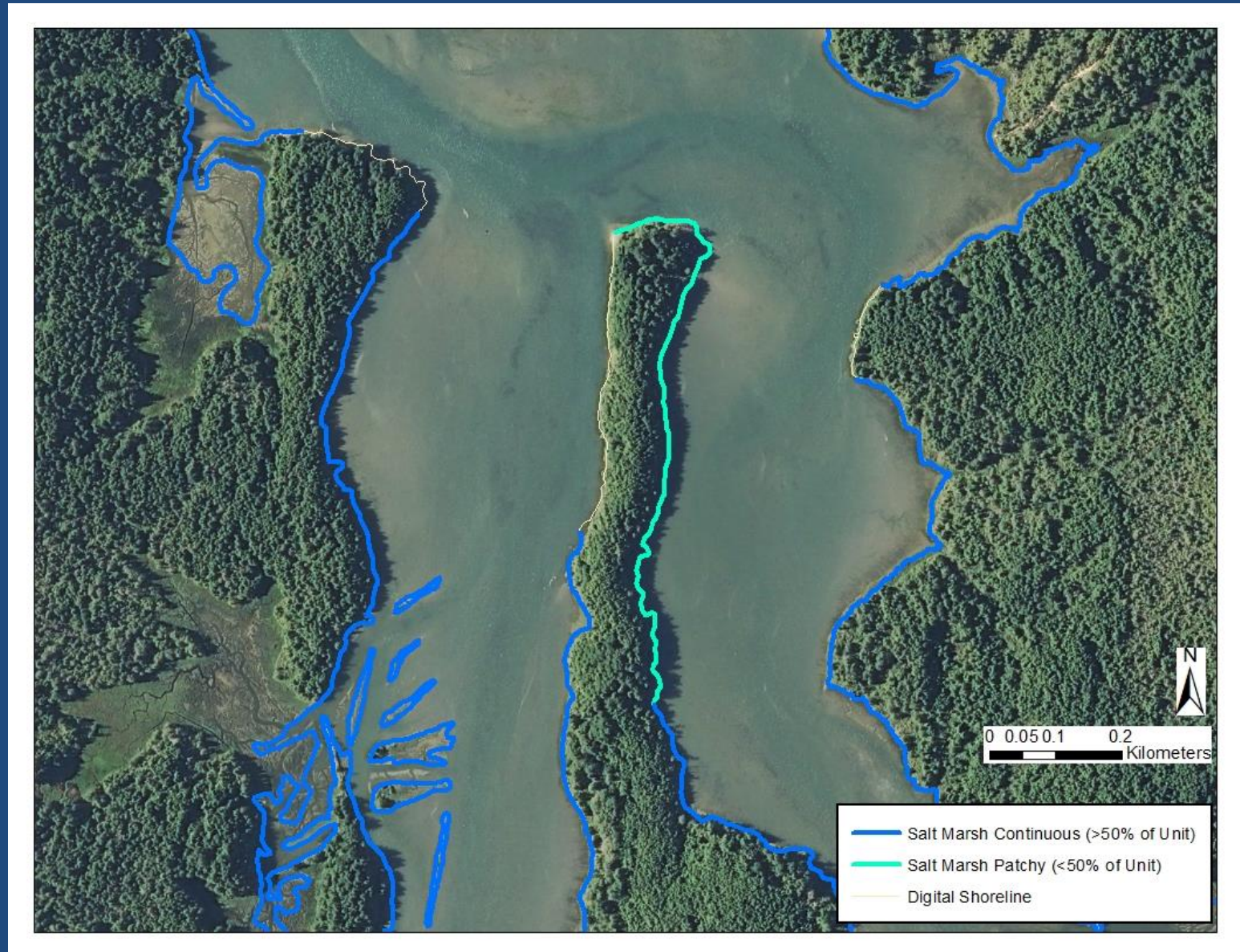
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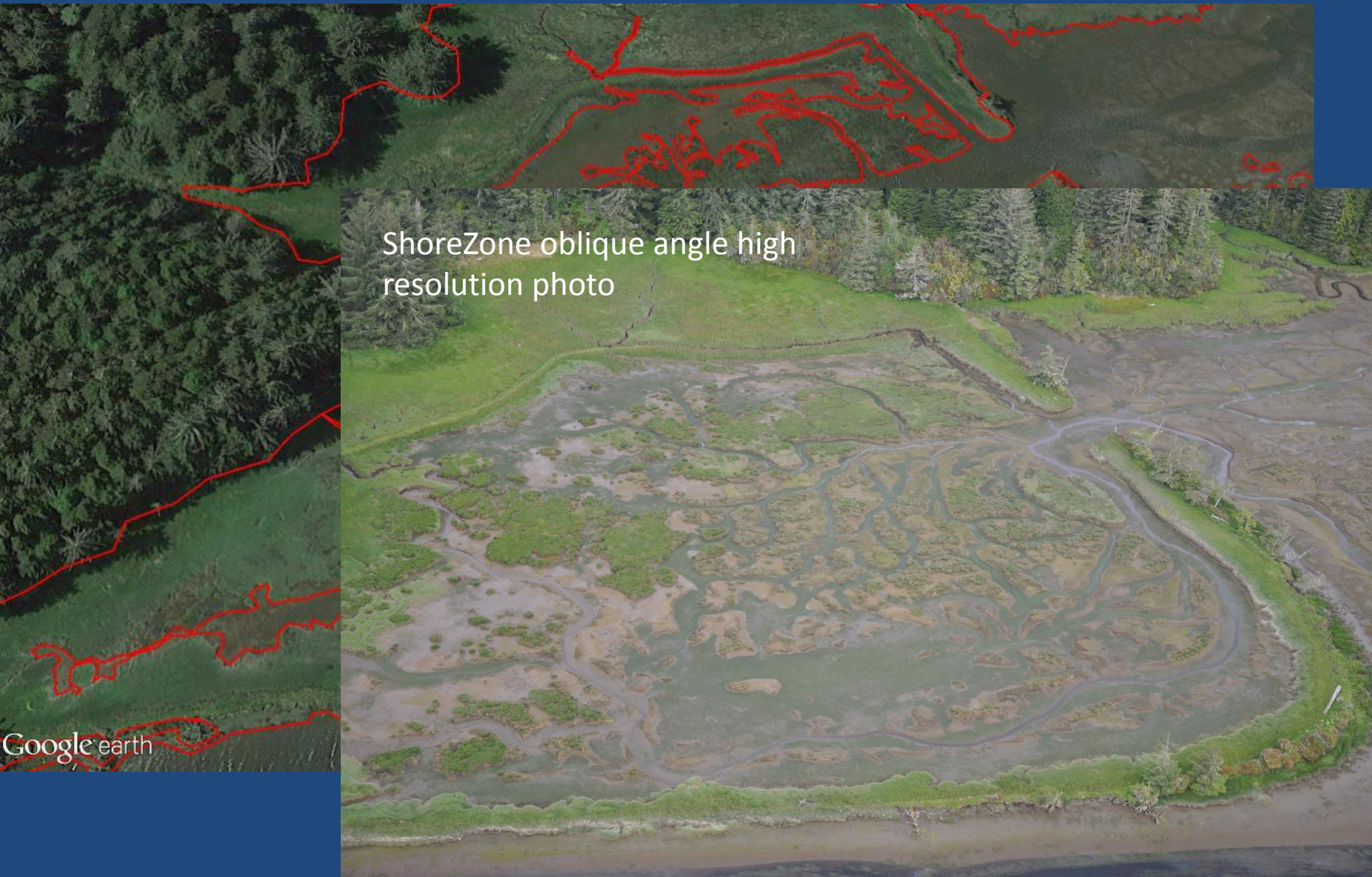
ShoreZone Classification for South Slough



ShoreZone Classification for South Slough



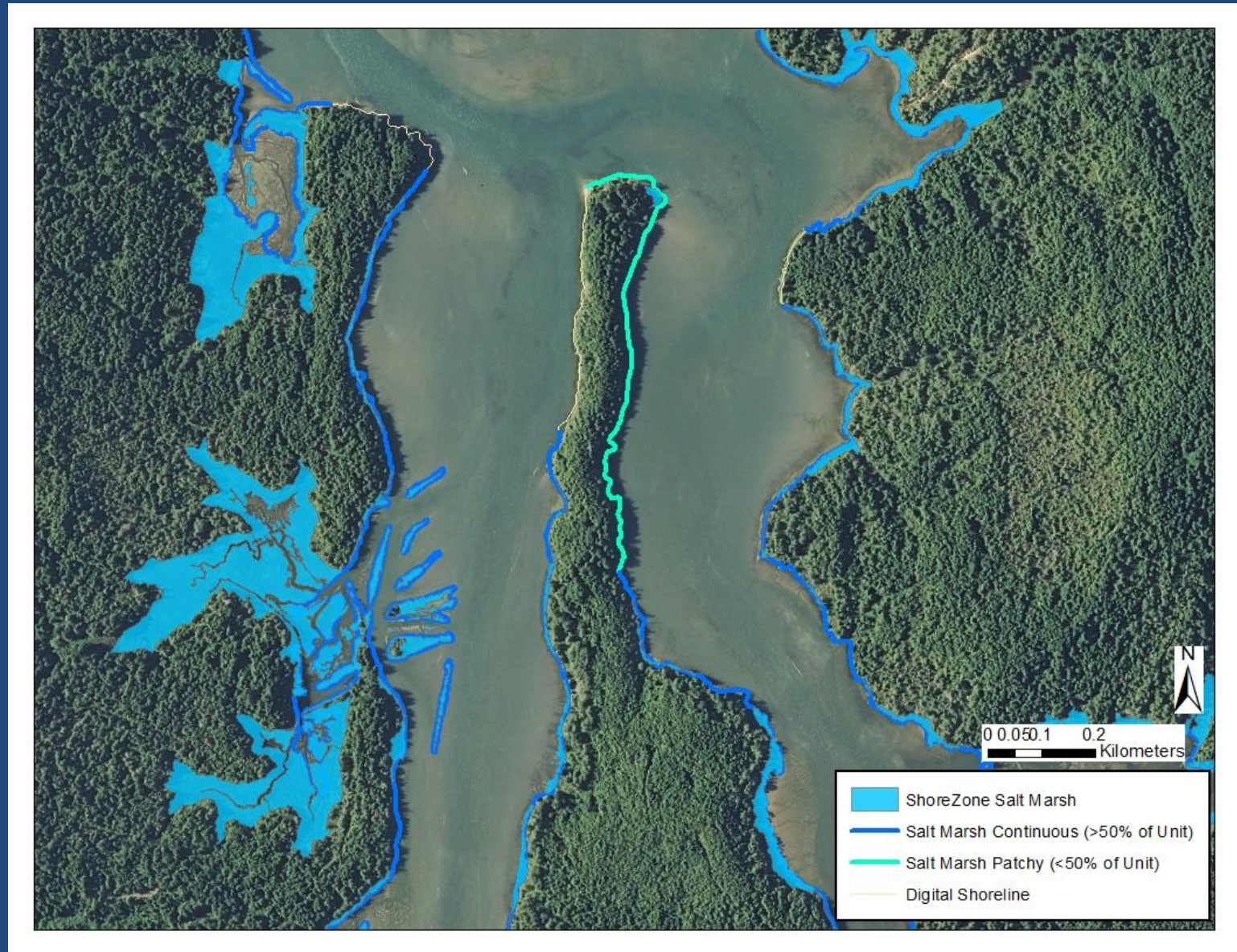
ShoreZone Classification for South Slough



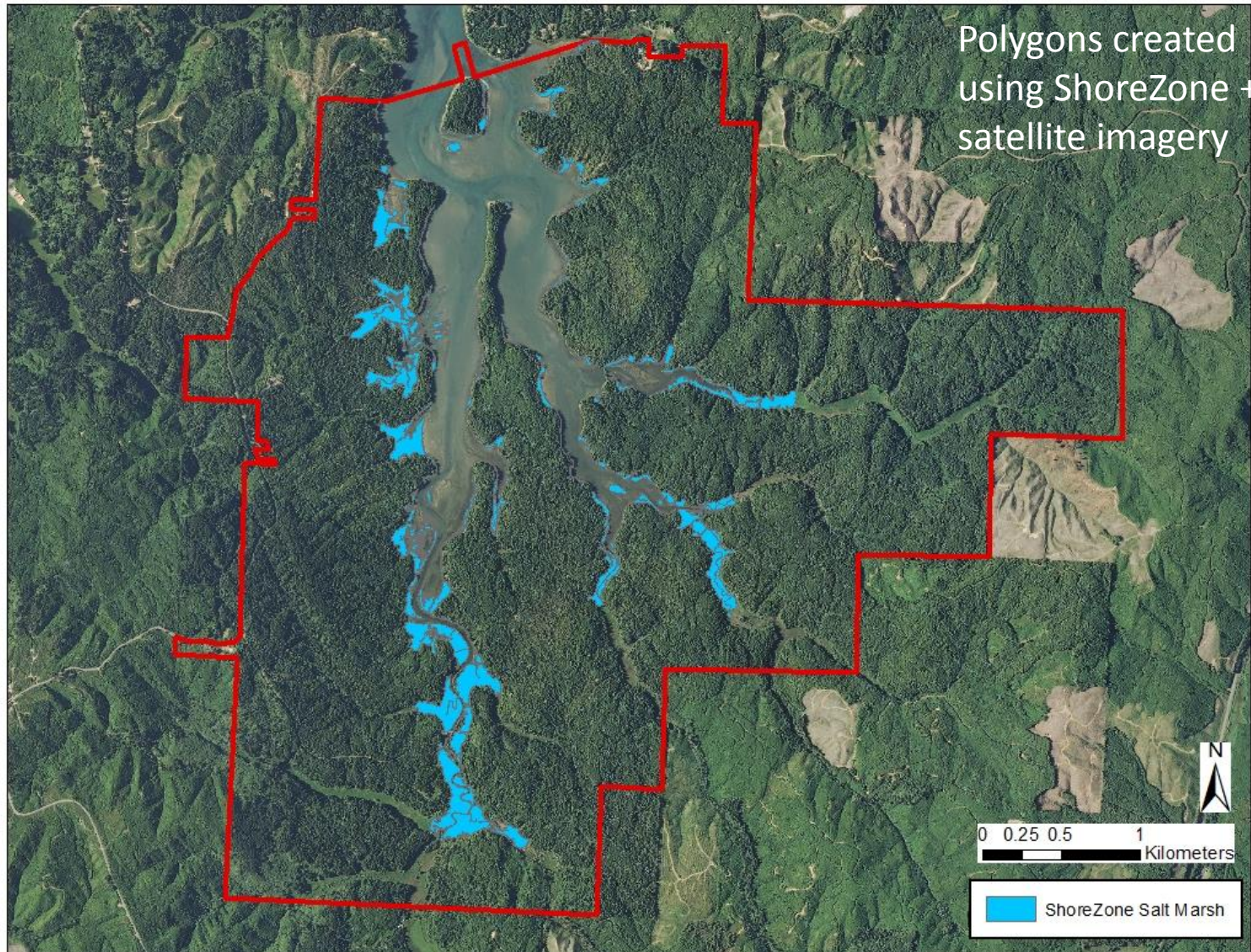
ShoreZone oblique angle high resolution photo

Google earth

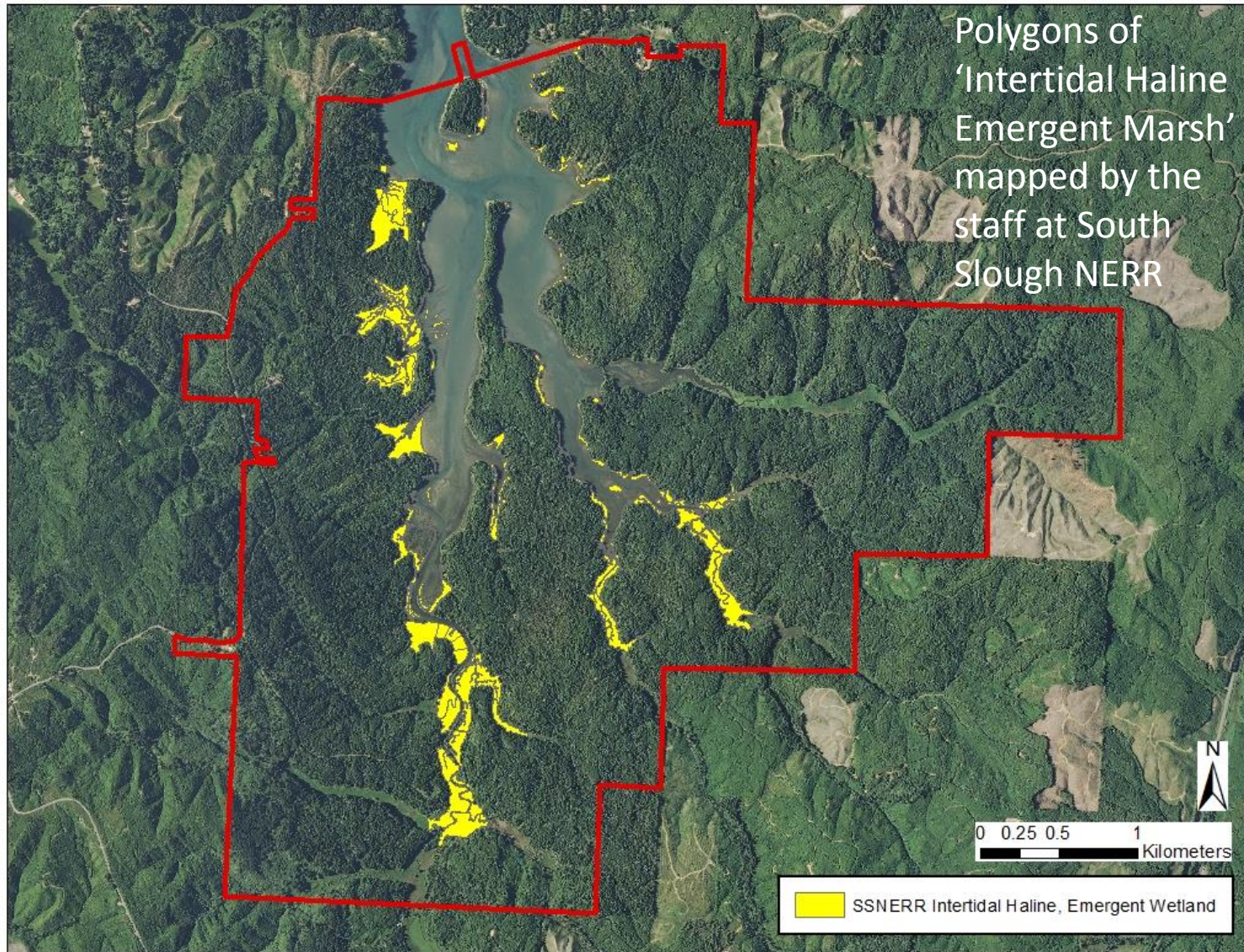
ShoreZone Classification for South Slough



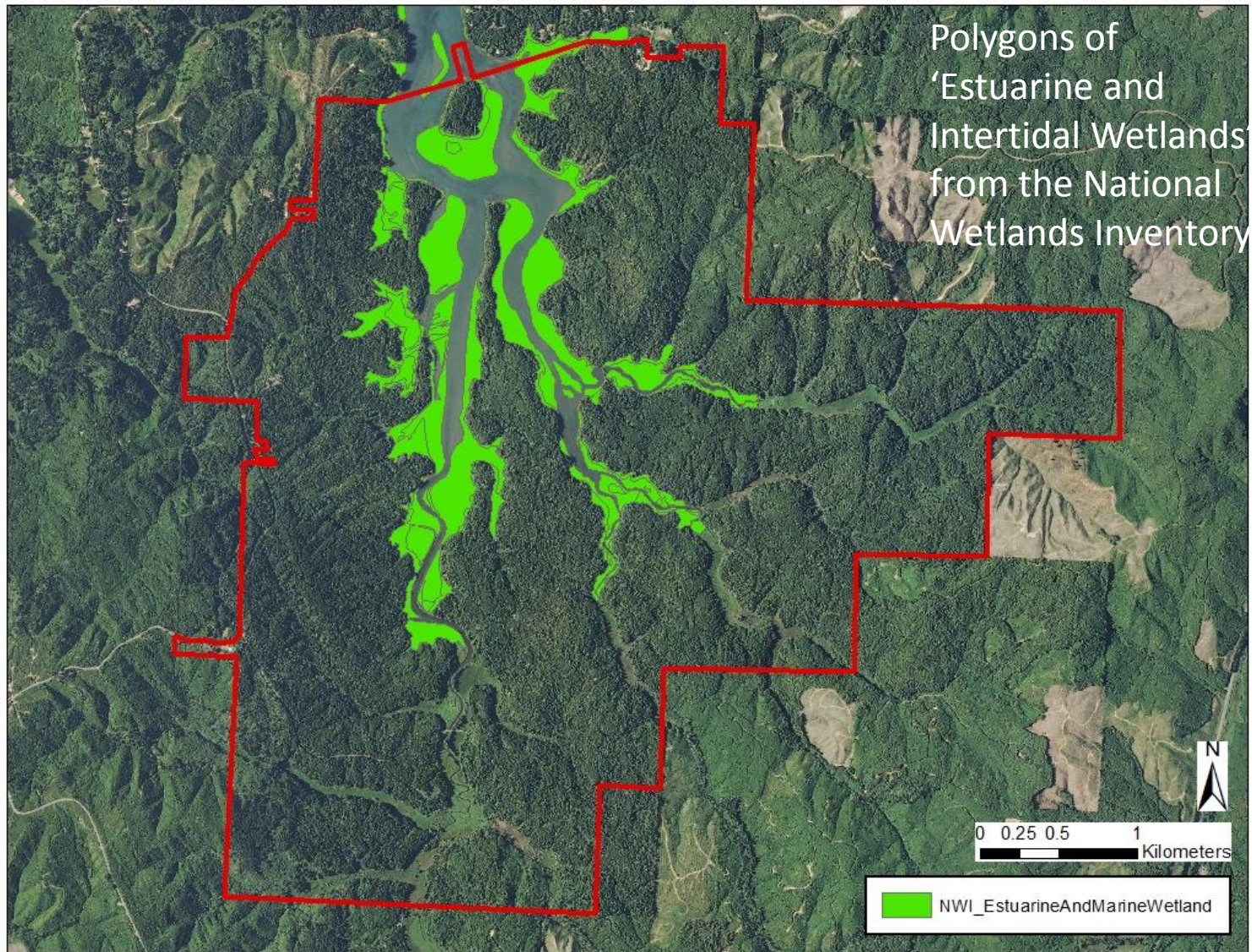
Accuracy of Using ShoreZone to Map Salt Marshes



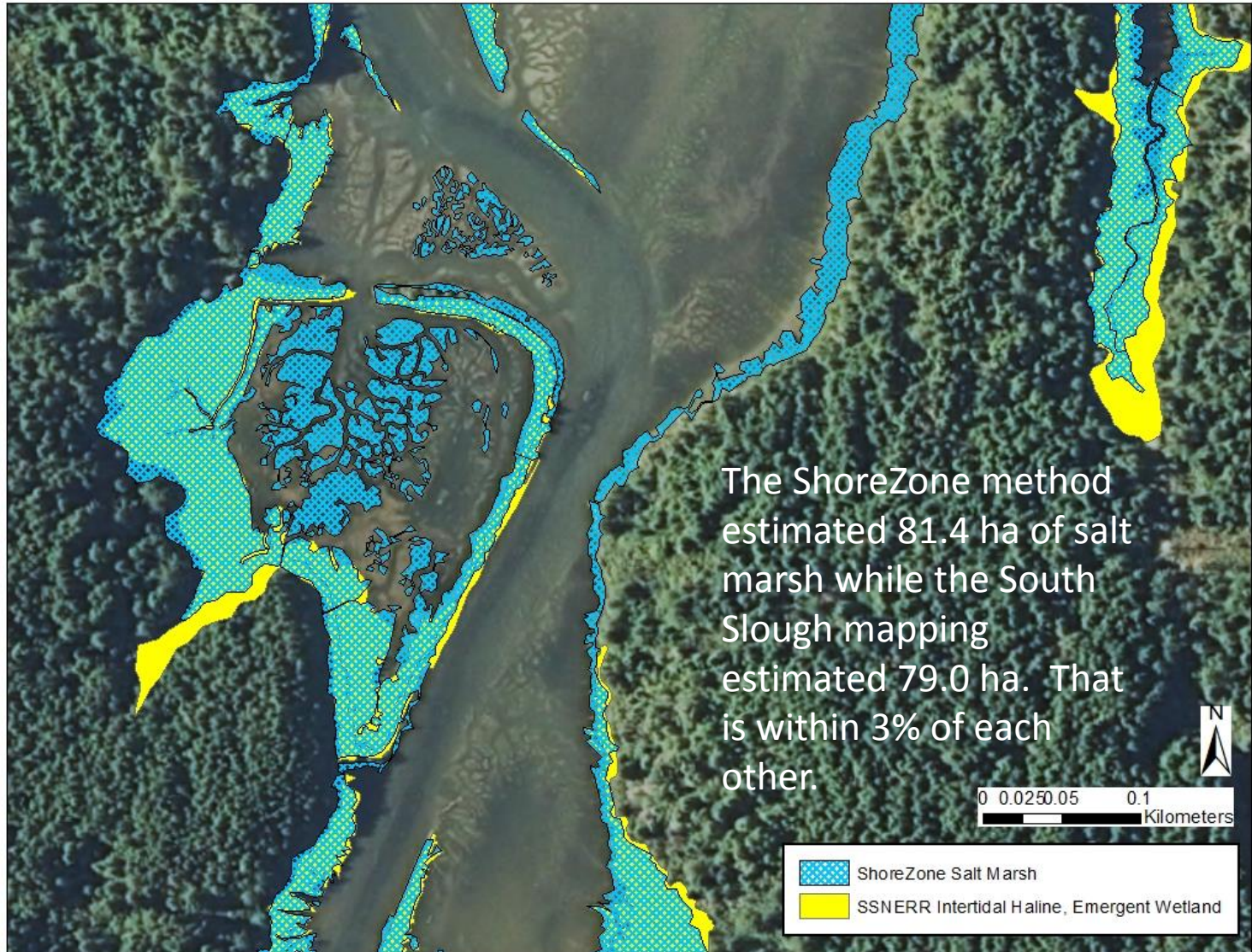
Accuracy of Using ShoreZone to Map Salt Marshes



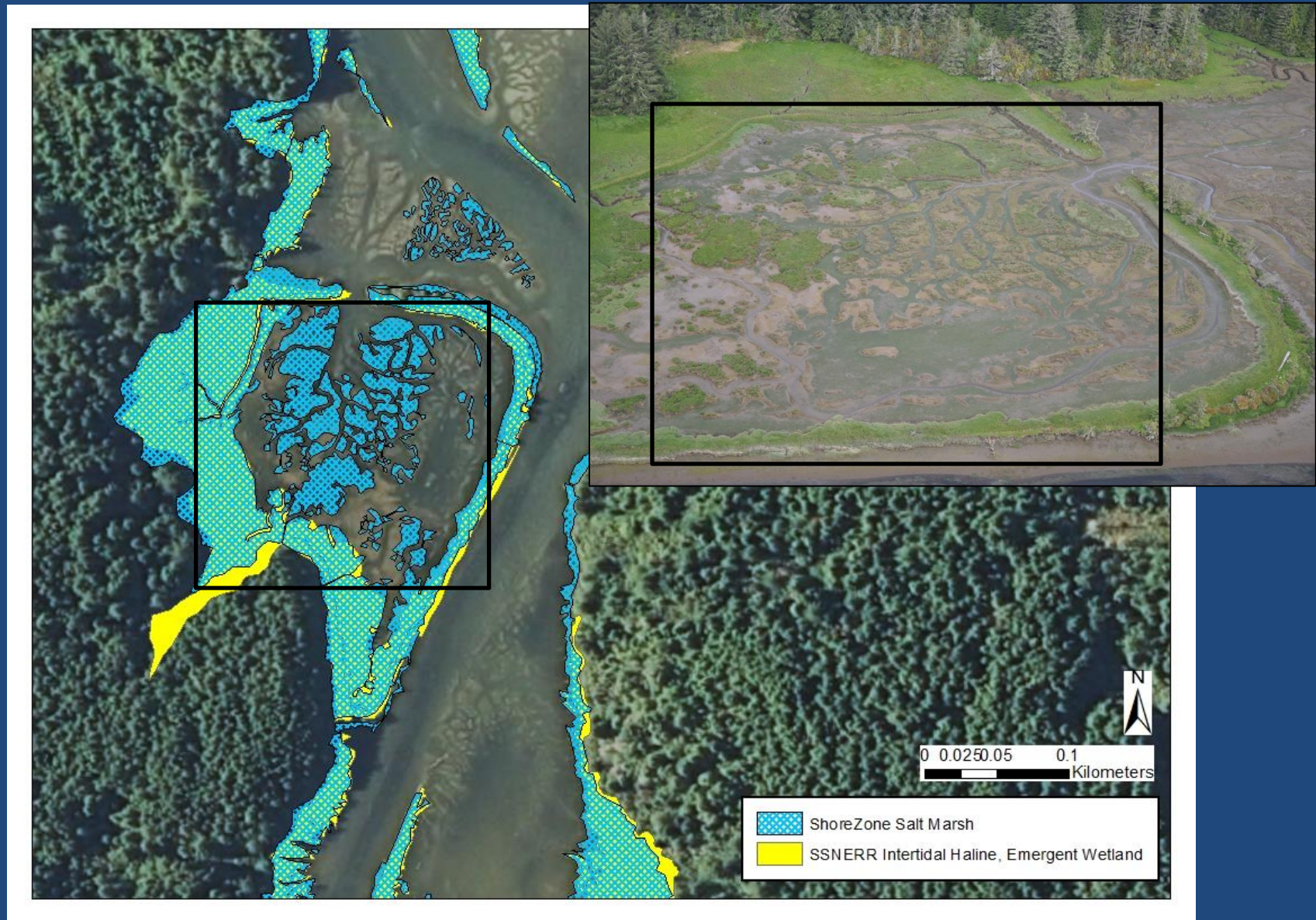
Accuracy of Using ShoreZone to Map Salt Marshes



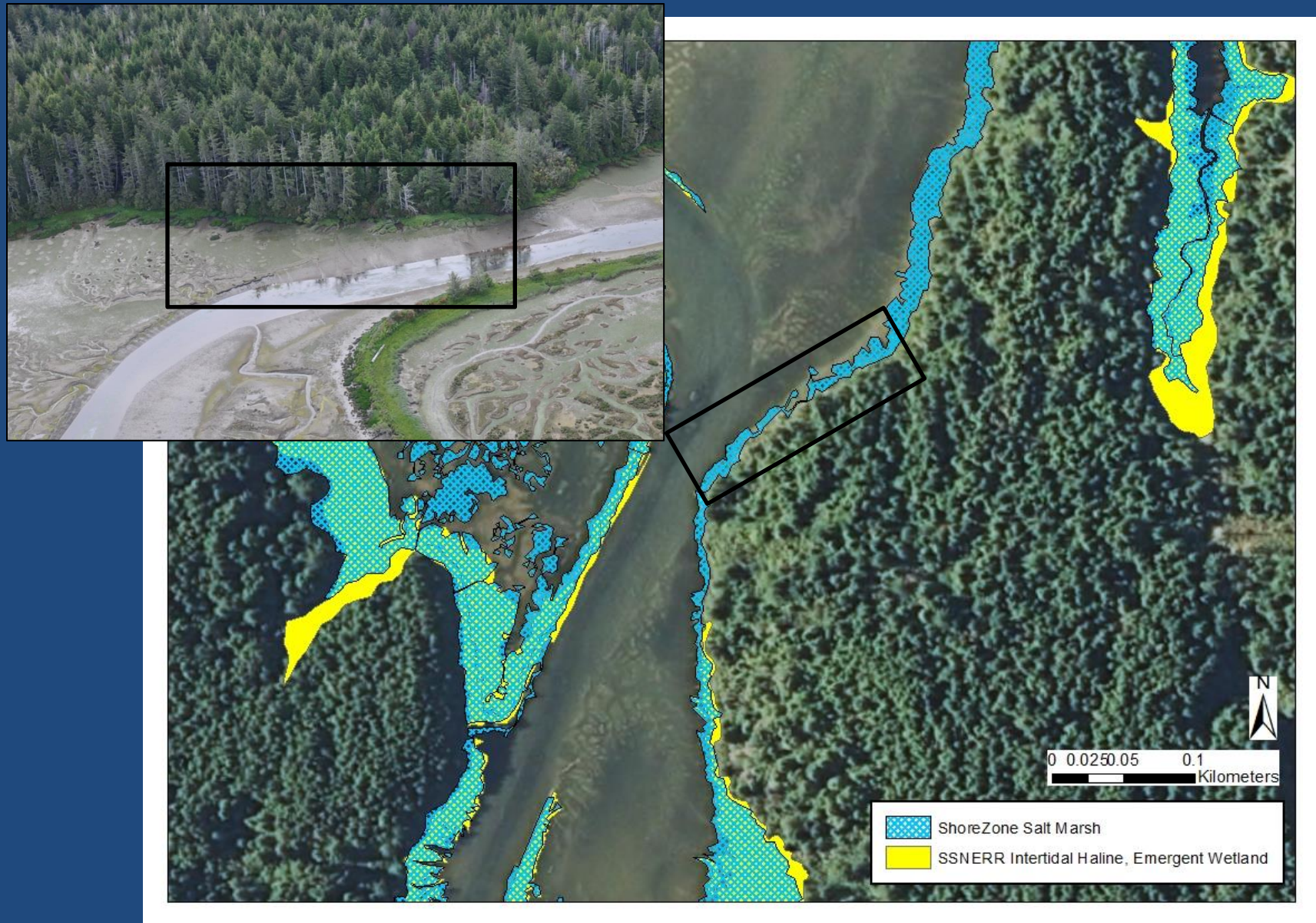
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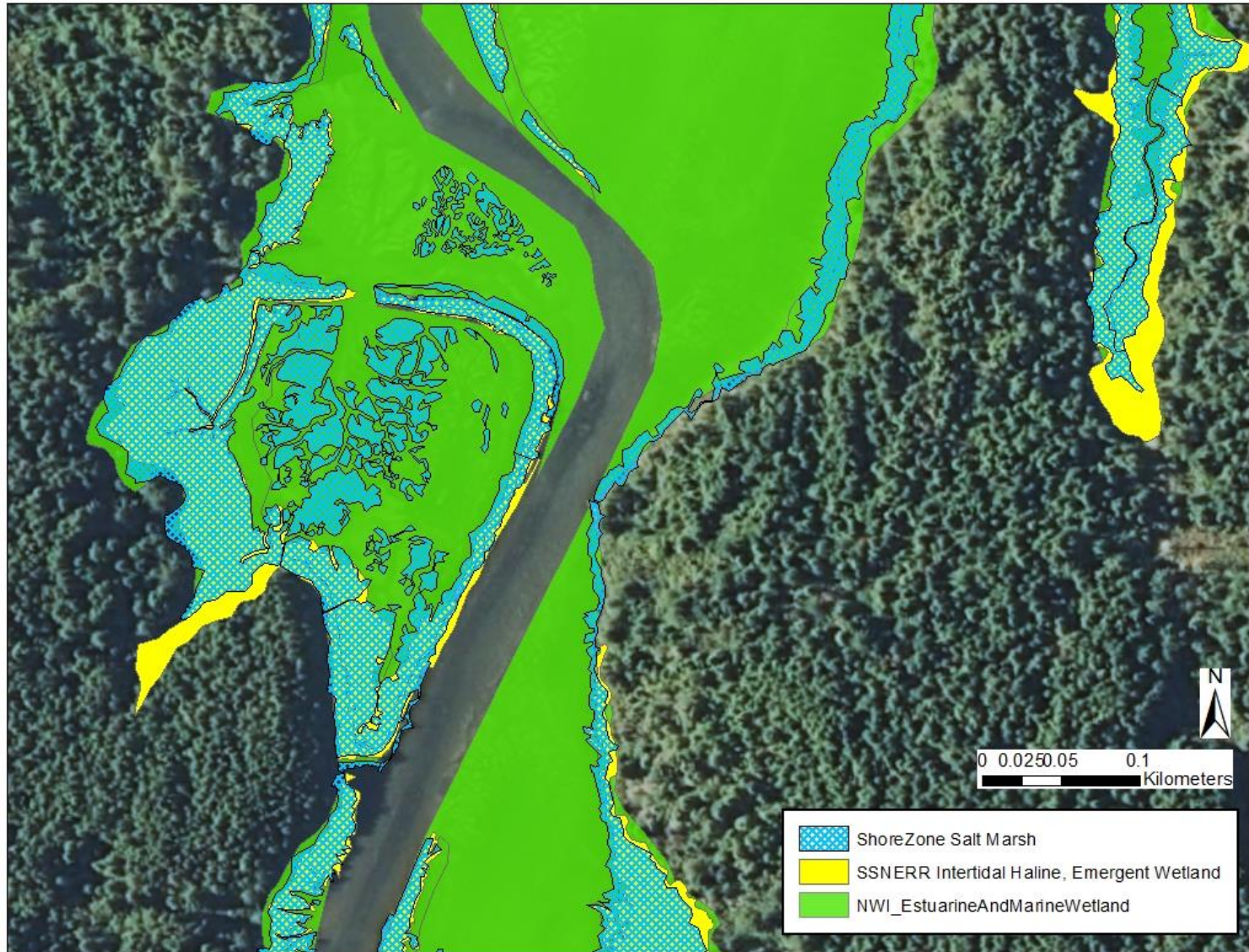
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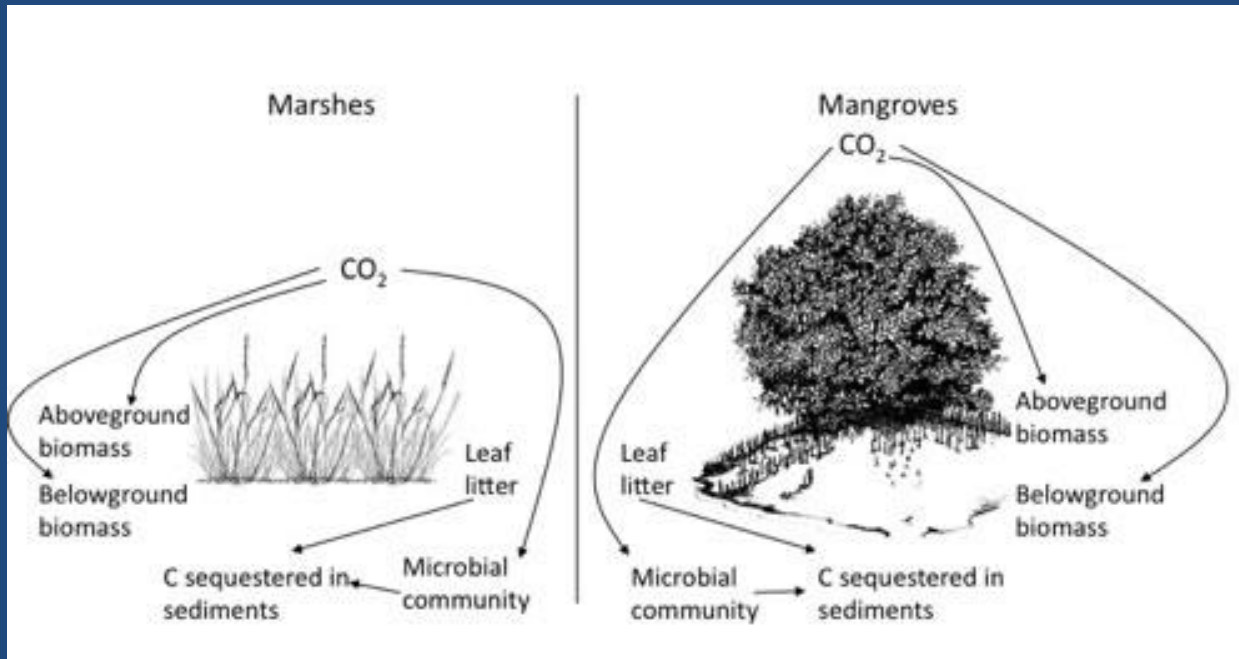
Accuracy of Using ShoreZone to Map Salt Marshes



Accuracy of Using ShoreZone to Map Salt Marshes



Calculating Blue Carbon Storage Using InVEST



Above ground carbon pool

Area of salt marsh
in the unit

Below ground carbon pool

Total stored carbon $\rightarrow C_{xt} = A_{xt} (C_a + C_b + (C_s * d) + C_l)$

Soil carbon pool Depth Litter carbon pool



81.4 hectares of Salt Marsh

Stored Carbon

Equivalent of 21,413.6 metric tonnes of CO₂

Carbon Sequestration Capacity

Equivalent of 871.0 metric tonnes of CO₂ each year.

Future Work

- Integrate Core Sample Data Into Model
- Model and map the effects of sea level rise on the carbon storage and sequestration capacity
- Use ShoreZone imagery and habitat classification to map the eelgrass beds of South Slough estuary