Exploiting Small Unmanned Aerial Systems in Coastal Watersheds

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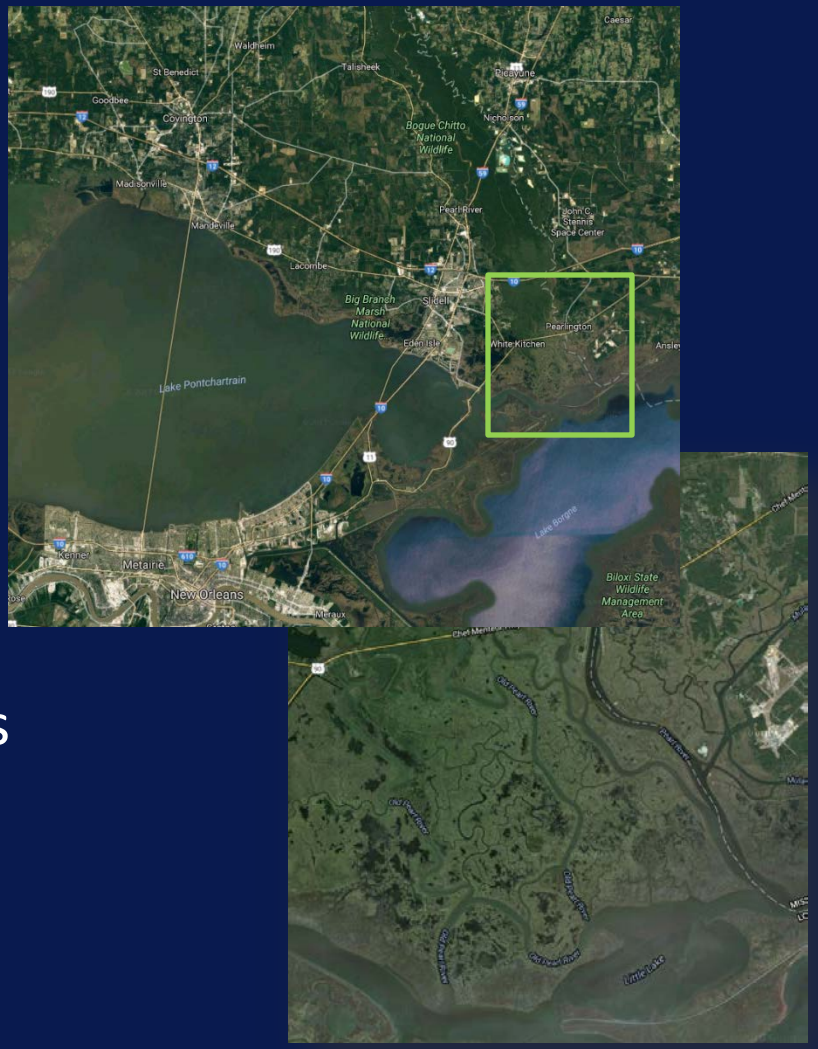
SHOUT4Rivers Project

- More precise mapping of waterways
- Document changes in waterways over several years, flying bimonthly
- Advance hydrological models (verification and parameterization)
- Identify species (plants and animals)
- Develop high resolutions digital surface models
- Ultimate Goal: Better Predictions of Total Water Level
  - Updated stream networks
  - Improvements in flood forecasts



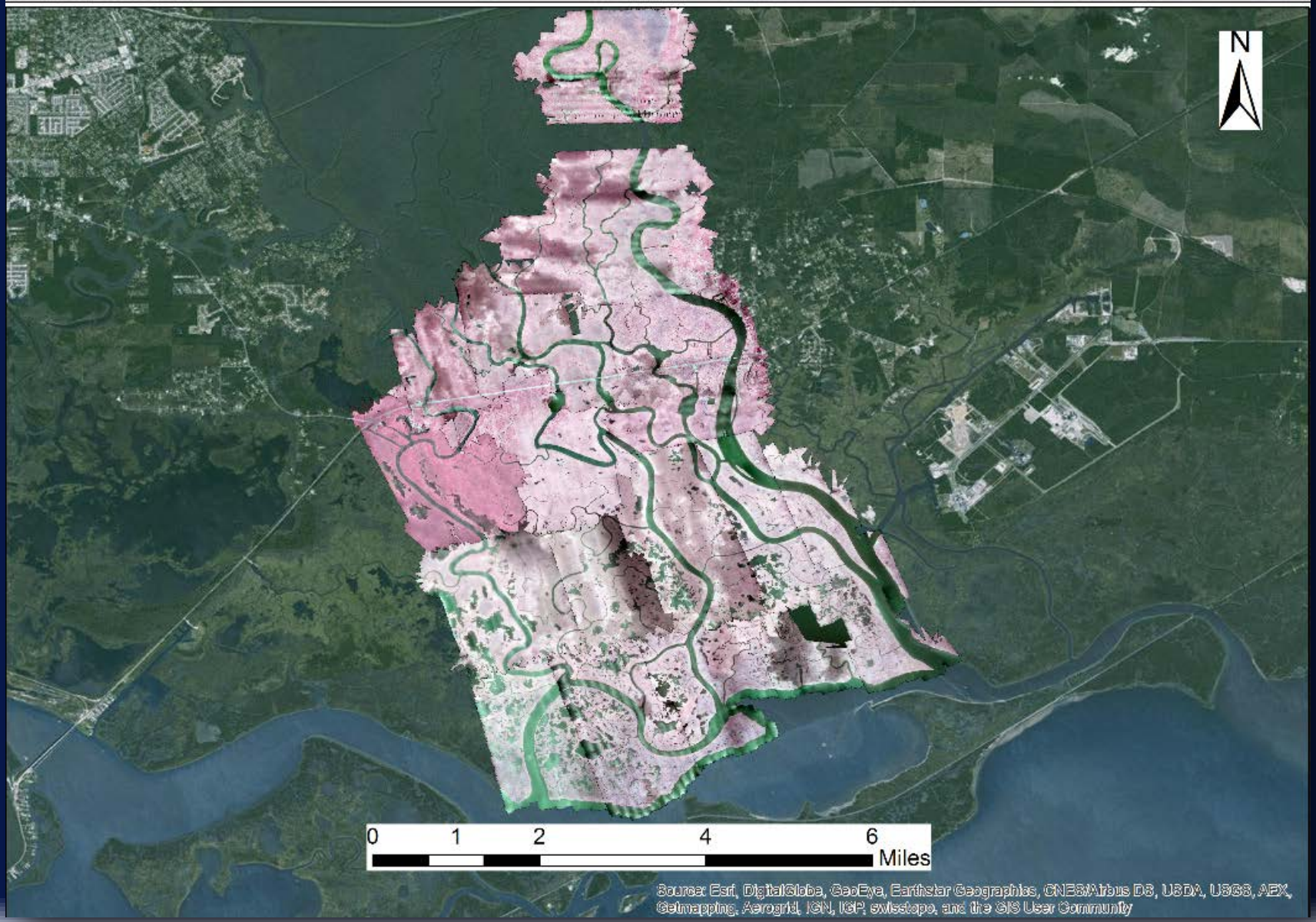


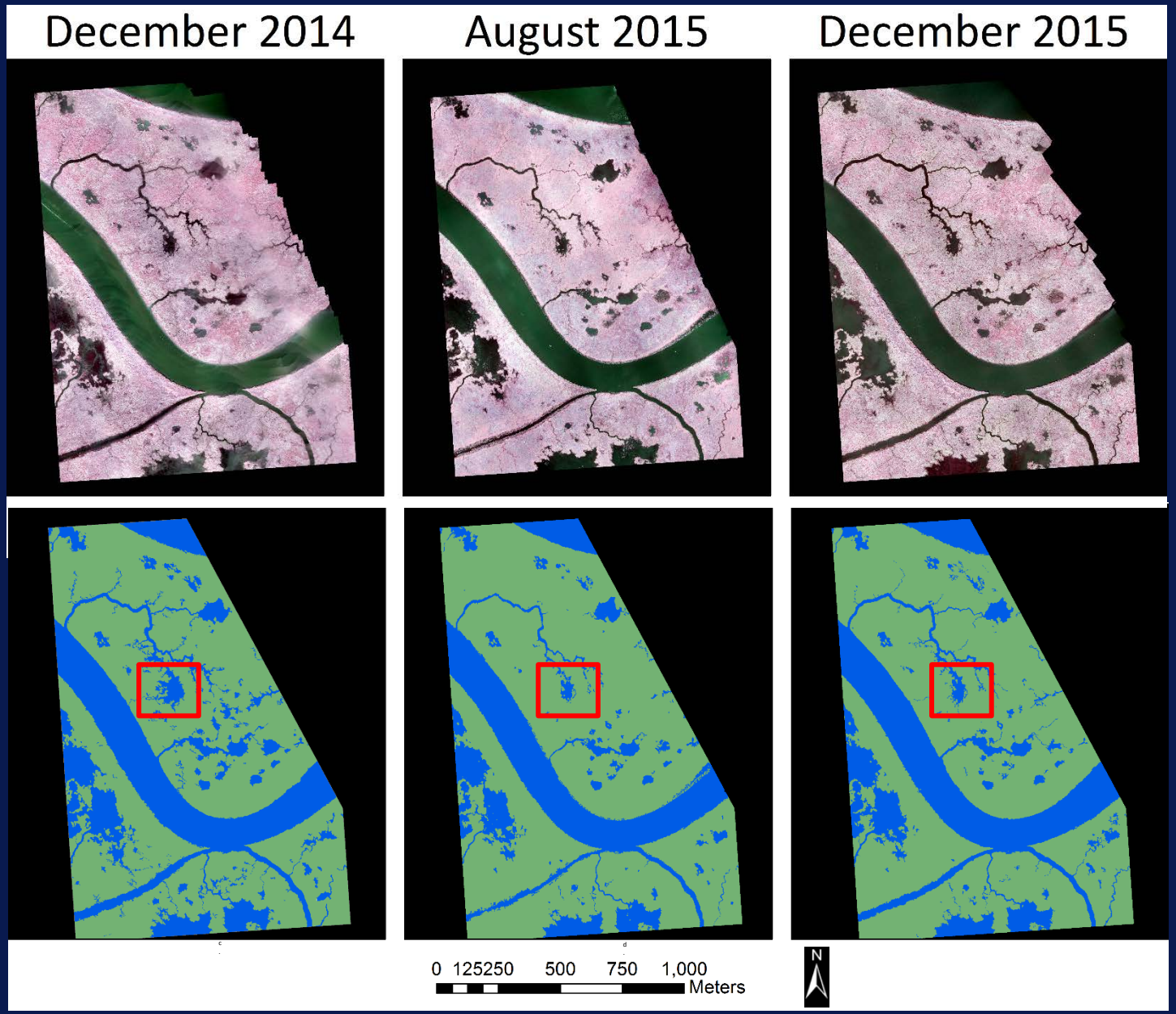


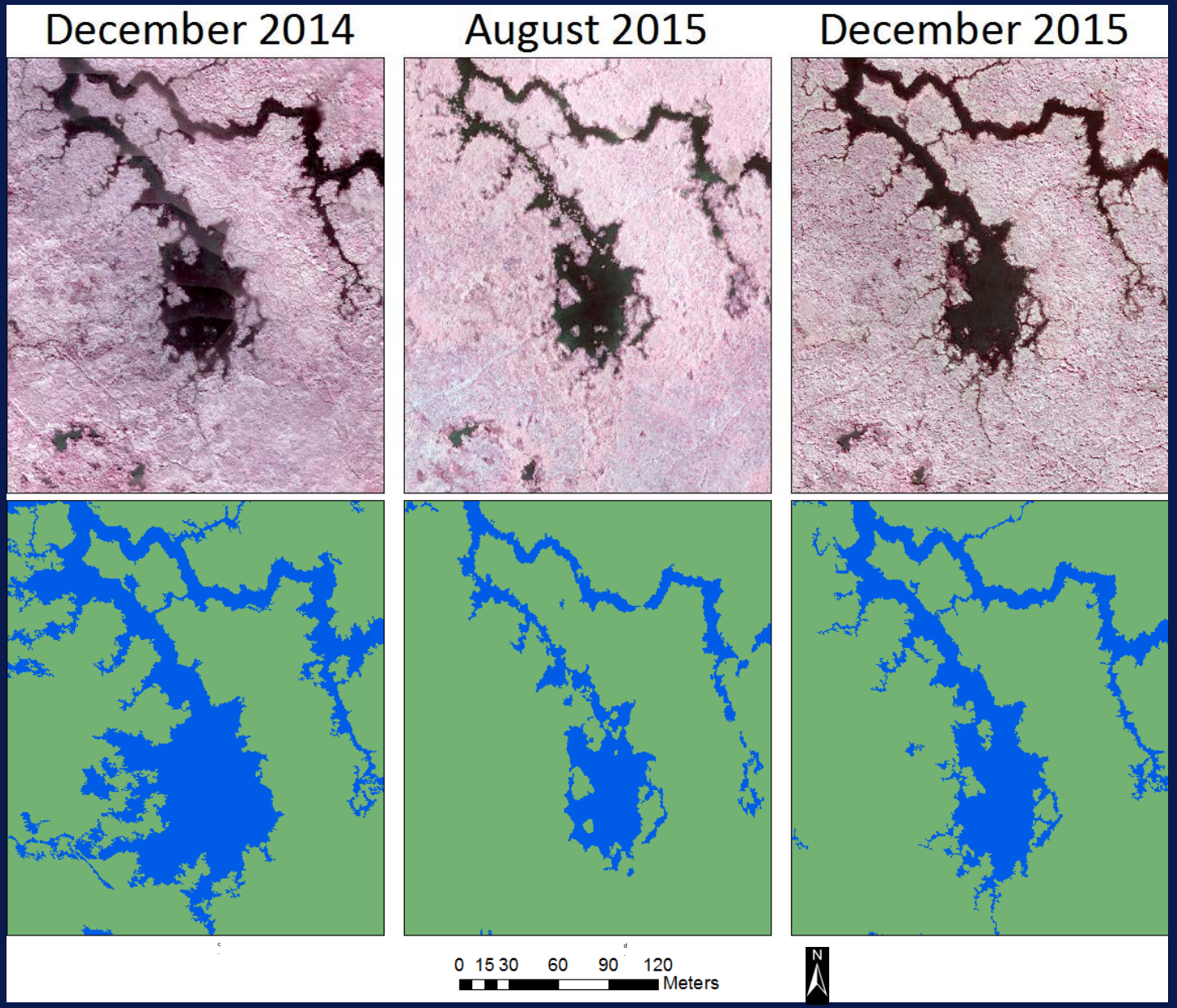


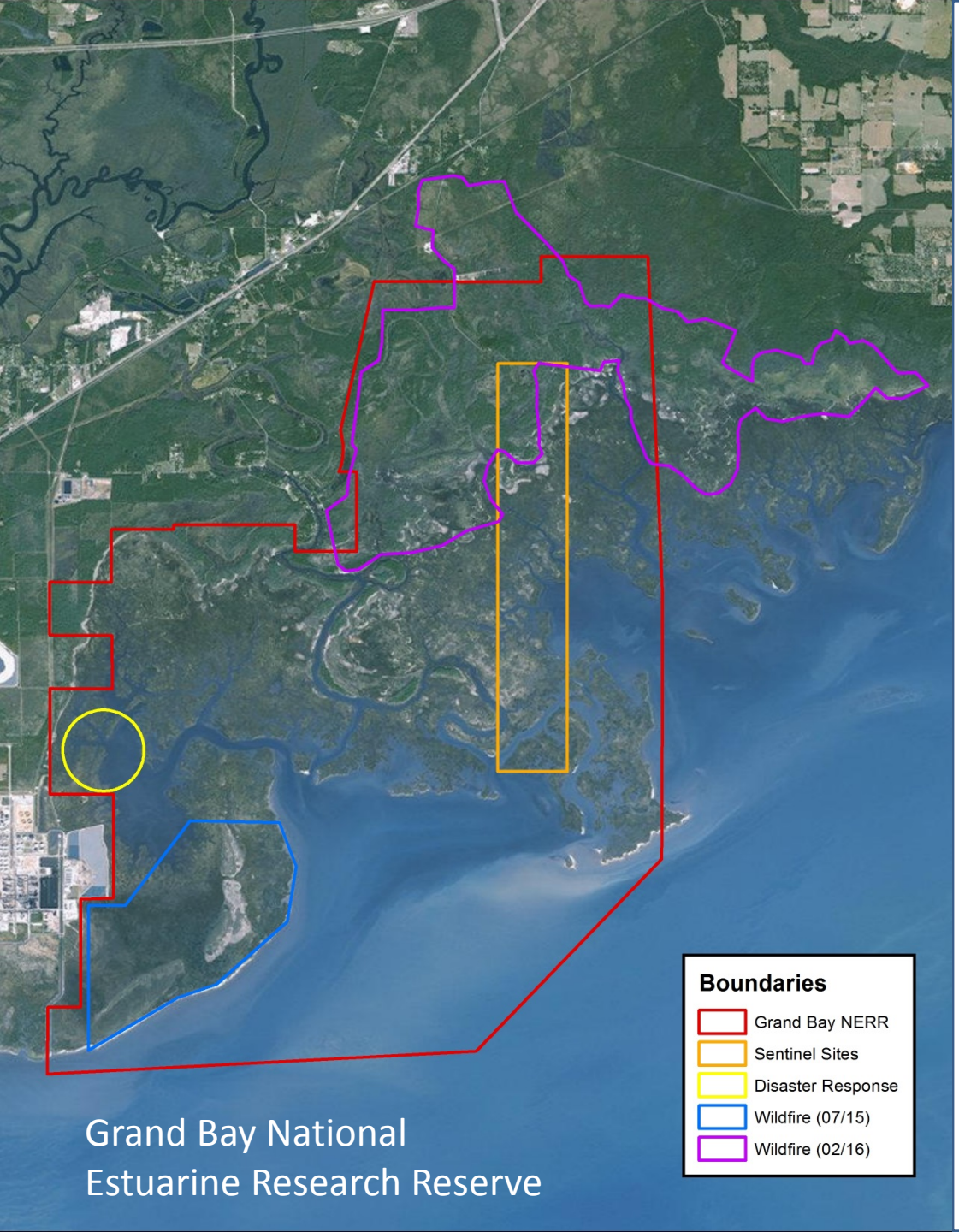


August 2015

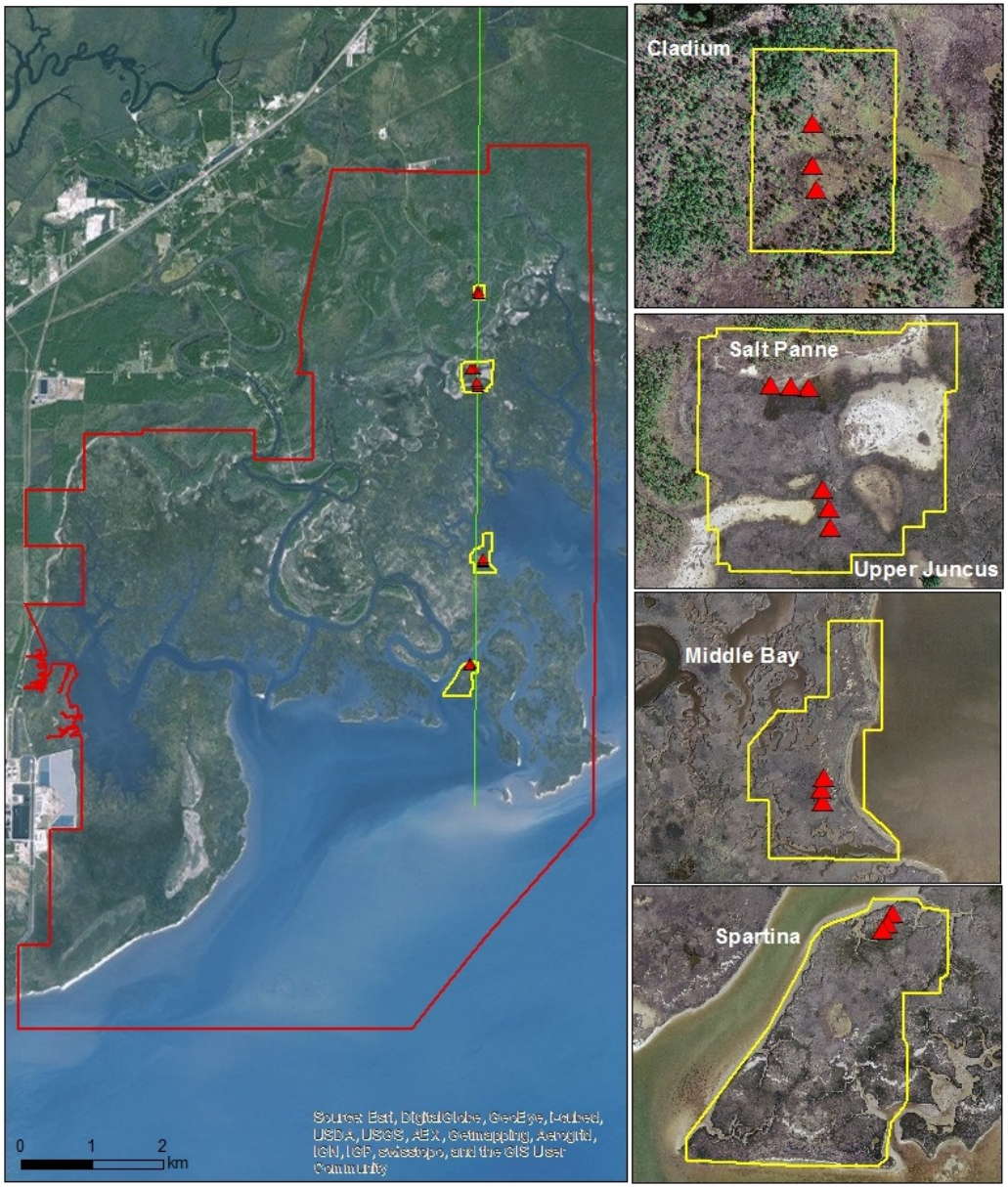

N
0
1
2
4
6
Miles
Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community


December 2014
August 2015
December 2015
0 125250 500 750 1,000
Meters
N


December 2014
August 2015
December 2015
0 15 30 60 90 120
Meters
N



- Sentinel Sites (5/15 & 8/16)
  - Precision Hawk
  - CIR-modified Nikon J3
  - 165’ altitude
  - 0.5” pixels
- Disaster Response (6/15)
  - DJI Phantom 2
  - Vision Plus
  - Various altitudes
  - Various pixel sizes
- Marsh Wildfire (7/15)
  - Altavian Nova
  - CIR-modified Canon EOS Rebel SL1
  - 800’ altitude
  - 2.0” pixels
- Wildfire (2/16 & 8/16)
  - Altavian Nova
  - Micasense RedEdge
  - 400’ altitude
  - 3.2” pixels



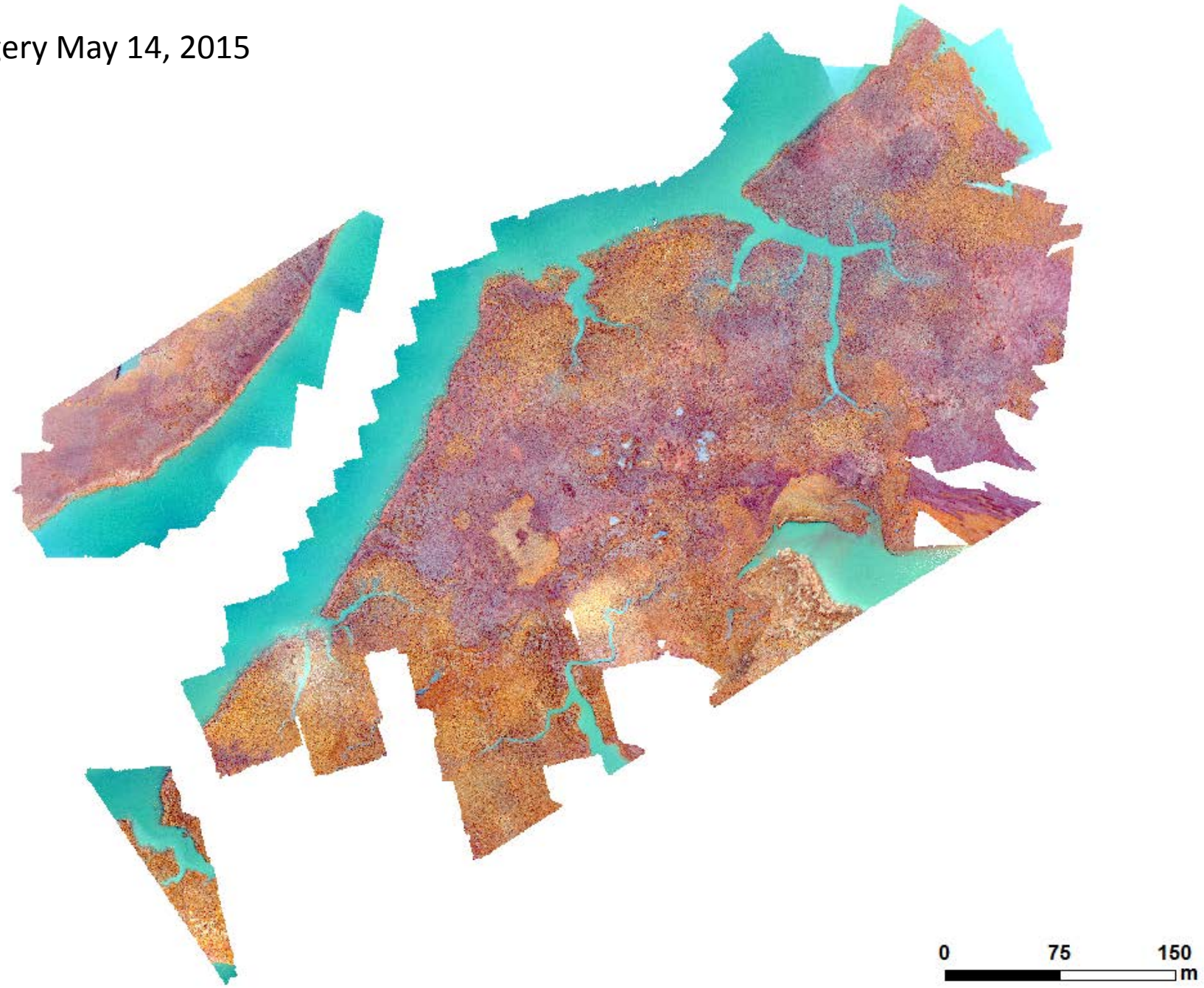
Site	Area (mi^2)
Spartina SETs	0.062
Middle Bay SETs	0.046
Upper Juncus/Salt Panne SETs	0.078
Cladium SETs	0.011
SETs swath	5.87
Entire Reserve	29.06
Marsh within COA (not on map)	21

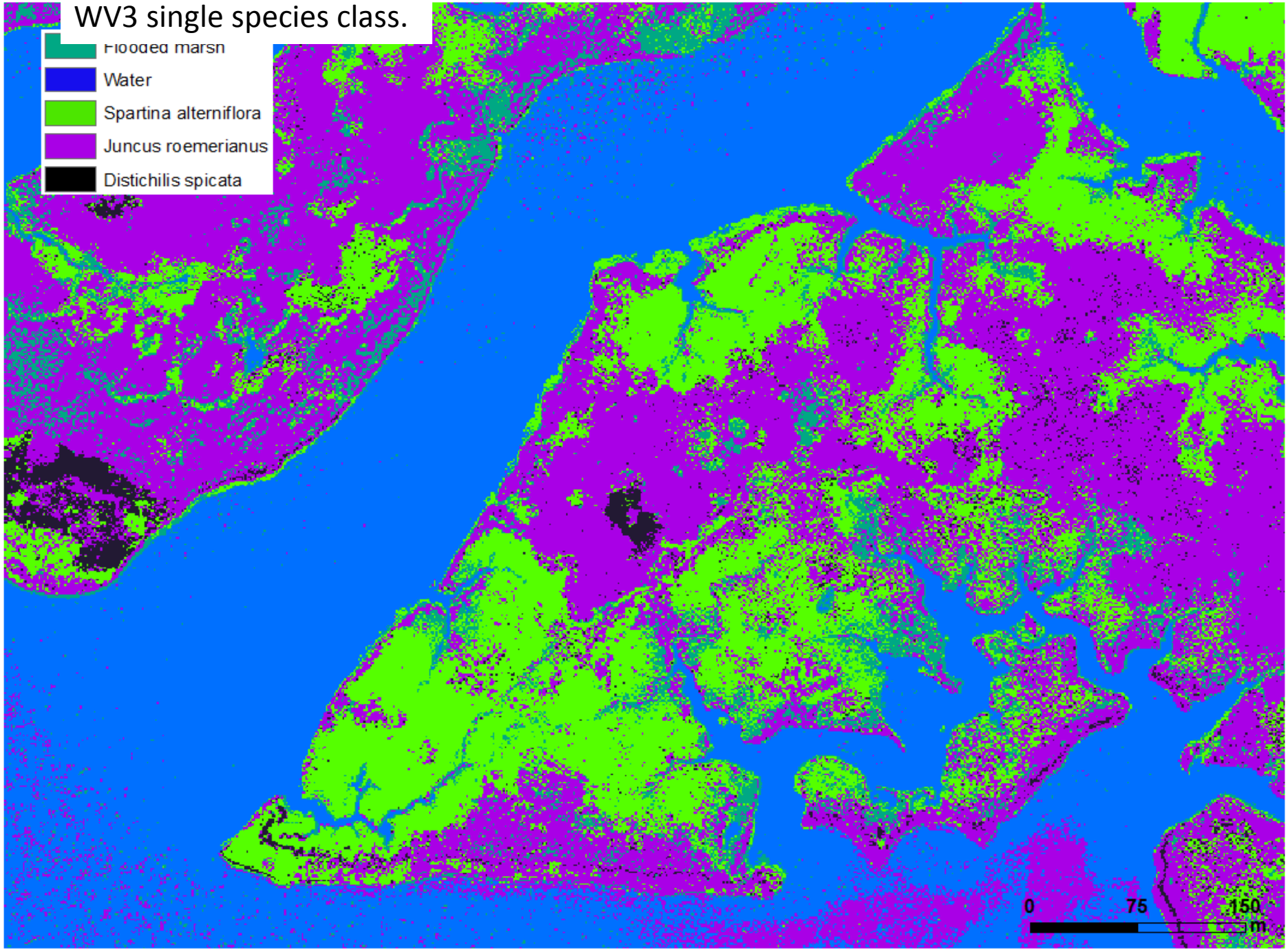
Black Needlerush, *Juncus roemerianus*

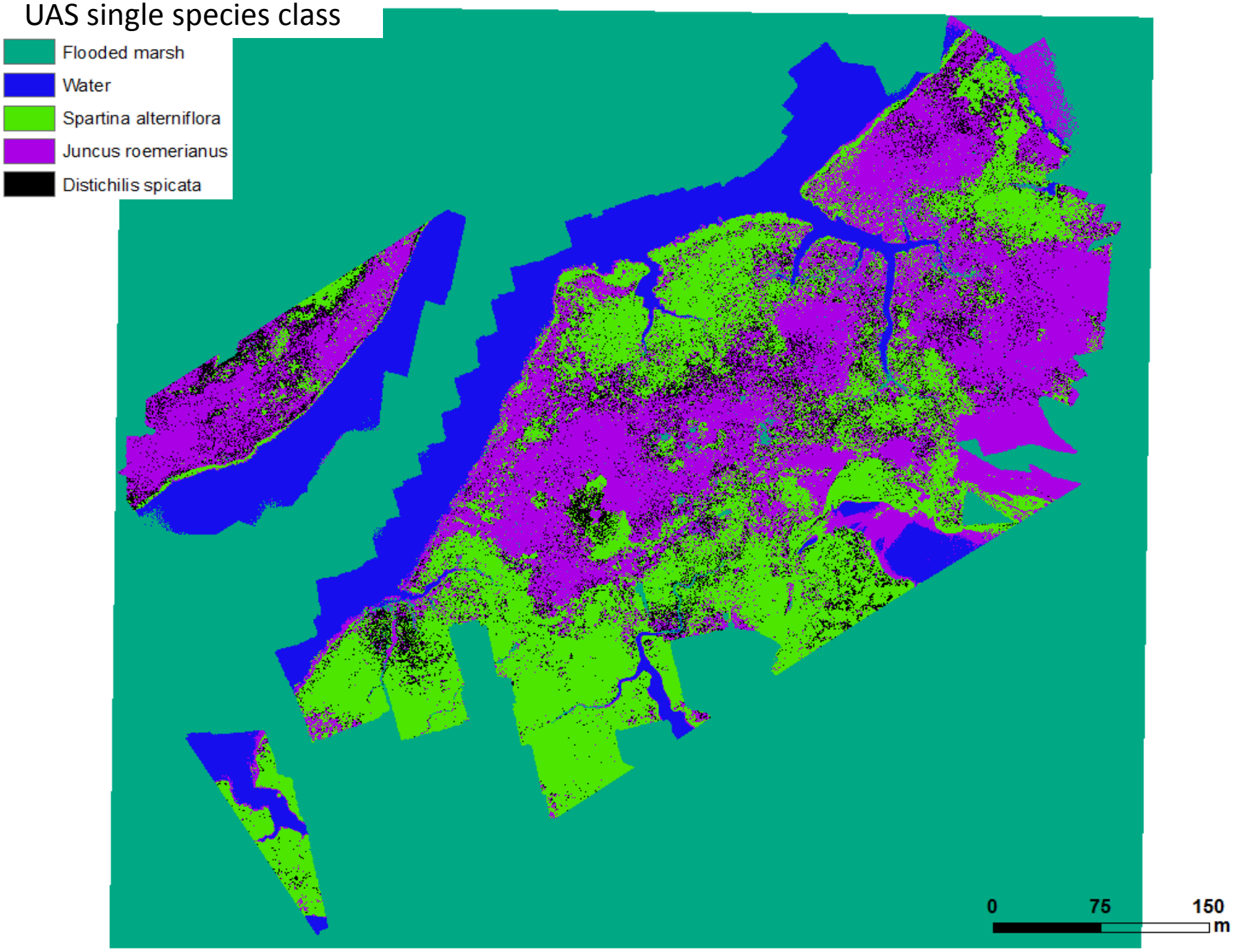
Smooth Cordgrass, *Spartina alterniflora*

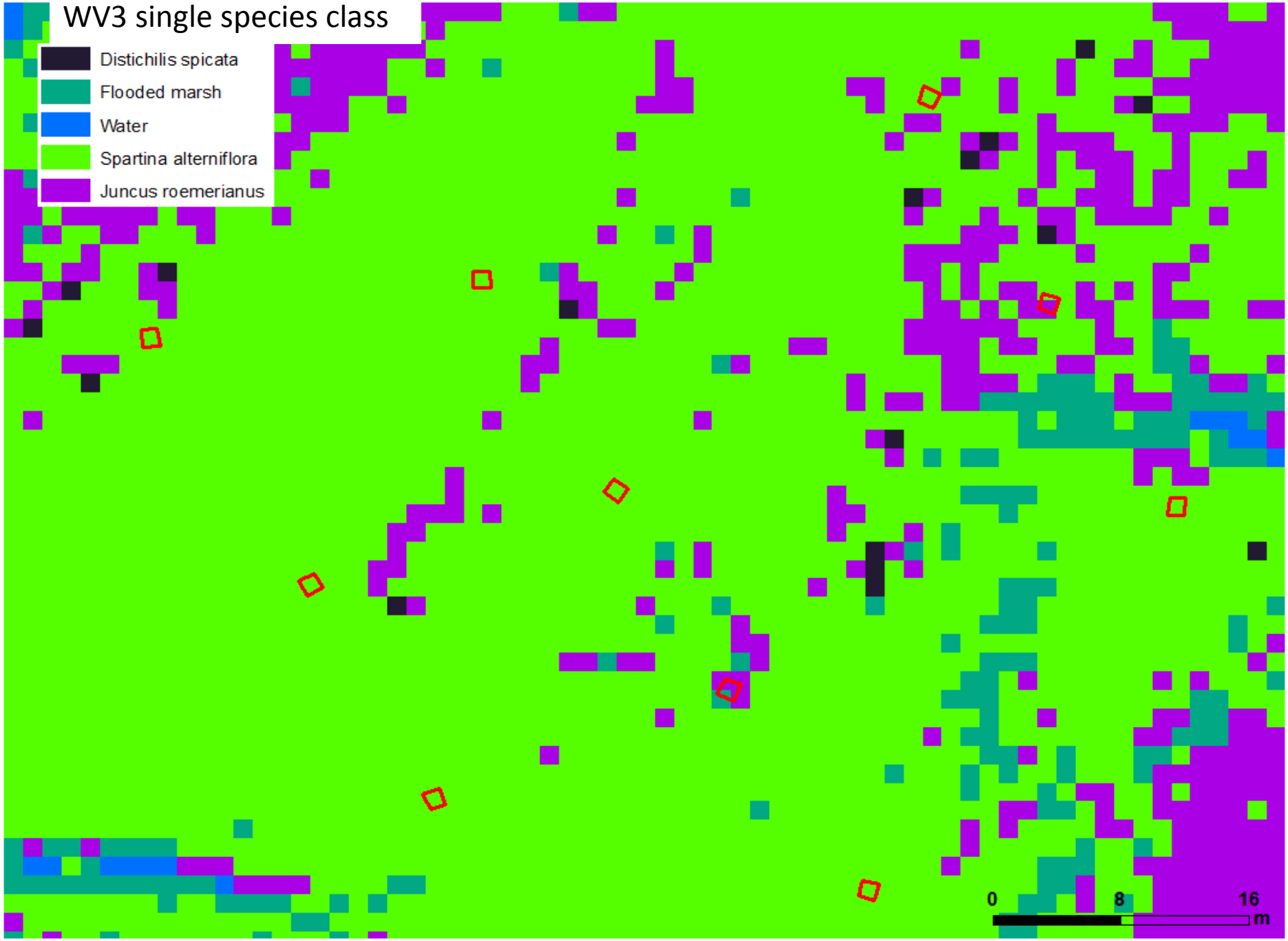

WV3 imagery May 3, 2015
0
75
150
m

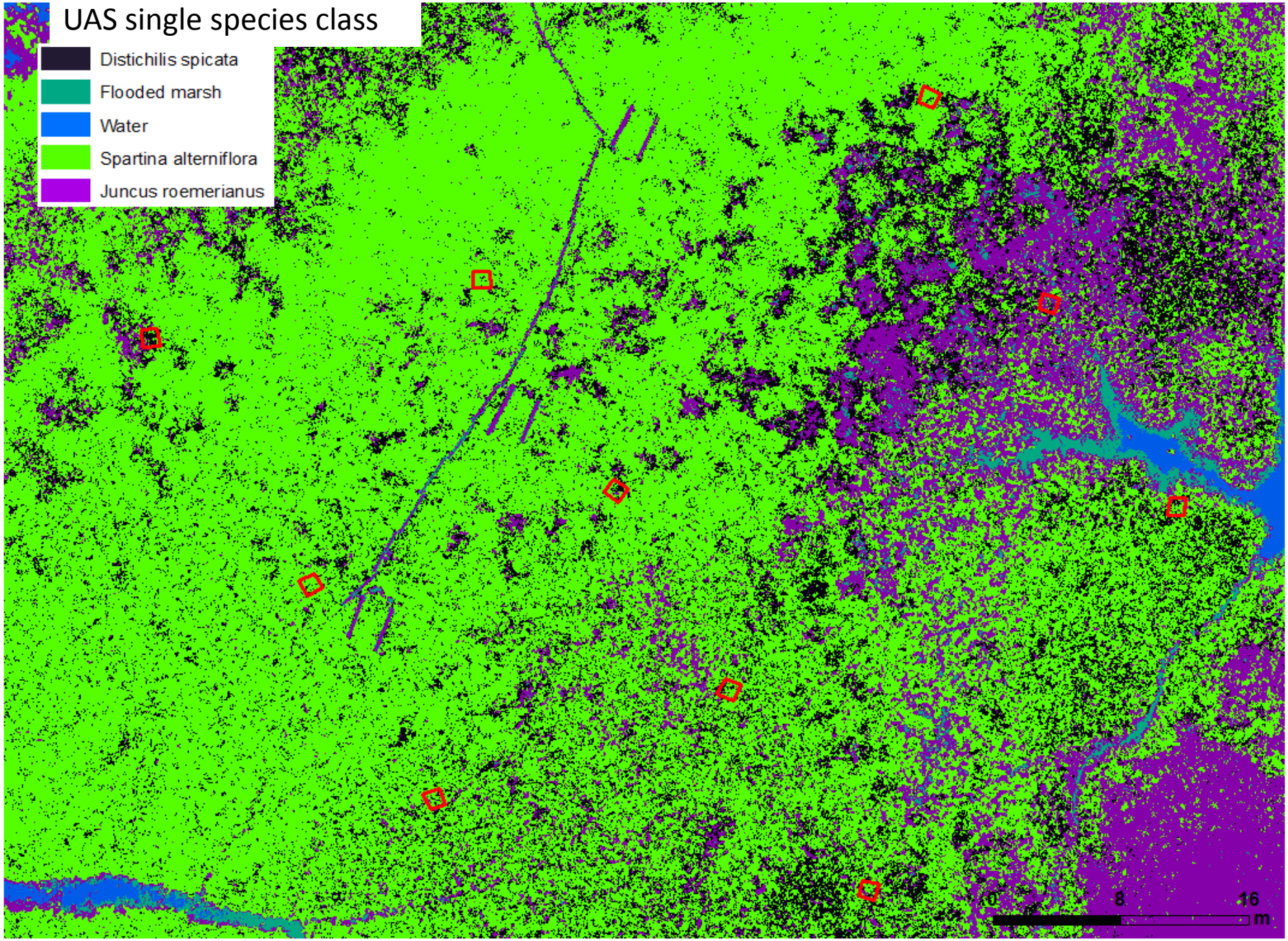
UAS imagery May 14, 2015




WV3 single species class.
Flooded marsh
Water
Spartina alterniflora
Juncus roemerianus
Distichilis spicata
0
75
150
m


UAS single species class
Flooded marsh
Water
Spartina alterniflora
Juncus roemerianus
Distichilis spicata
0
75
150
m


WV3 single species class
Distichilis spicata
Flooded marsh
Water
Spartina alterniflora
Juncus roemerianus
0
8
16
m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Juncus roemerianus
0
8
16
m

Key Points

- How UAS PO funding helped to advance TRL
- Transition to NOAA
  - NWS: RFCs
  - NMFS: Marsh Reconstruction
  - NOS: OCM
- Transition to Public Sector
  - Altavian
  - PrecisionHawk

Principal Contributors

- Robbie Hood and JC Coffey
  - NOAA UAS Program Office
- Suzanne van Cooten
  - Lower Mississippi River Forecast Center
- Lindsay Spurrier and Jonathan Pitchford
  - Grand Bay National Estuarine Research Reserve and Mississippi Department of Marine Resources
- Lee Hathcock, Chris Zarzar, Gray Turnage, and Jamie Dyer
  - Mississippi State University