National Park Service
U.S. Department of the Interior

South Florida/Caribbean Network Inventory & Monitoring Program

The Everglades National Park & Big Cypress National Preserve Vegetation Mapping Project

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Introduction

- **Cooperative Effort Between**
  - South Florida Water Management District
  - United States Army Corps of Engineers
  - National Park Service:
    - National Vegetation Inventory Program
    - South Florida/Caribbean Network Inventory & Monitoring Program

Project Goal

- **Provide resource managers and policy makers with a tool to assess the success of the CERP.**

- **Provide baseline vegetation and land-cover information to NPS park managers and scientists for use in park management, resource management, and conservation.**

Project Rationale

- **A complete system-wide vegetation map would provide:**
  - A effective statistical method of monitoring landscape level vegetation change resulting from restoration efforts.
  - A effective way to monitor exotic species as well as willow and cattail expansion.
  - A tool for monitoring the effects of climate change and sea level rise.
  - A scaling up tool for other RECOVER projects.
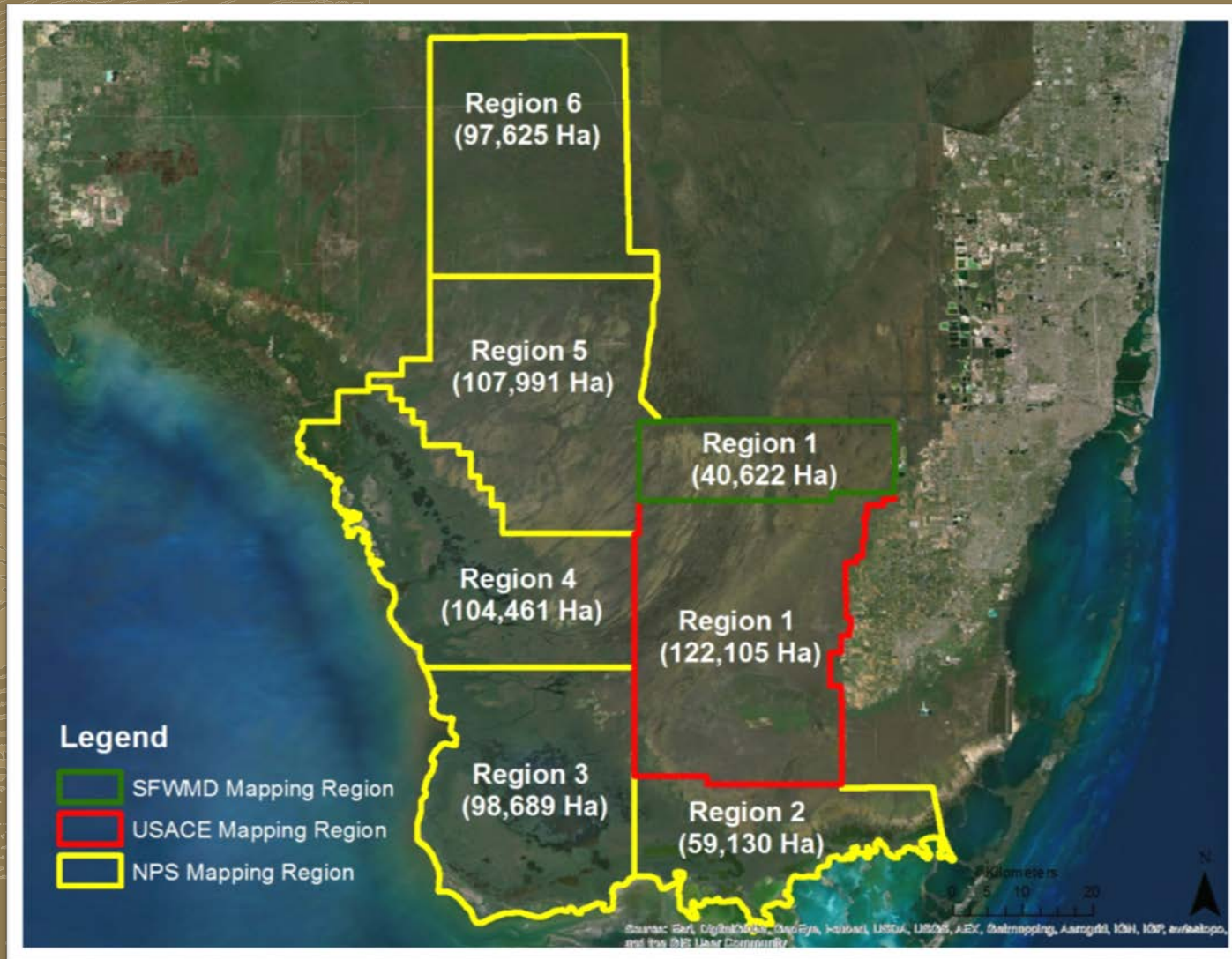
Project Extent: Greater Everglades

RECOVER/SFWMD Mapping

- Water Conservation Areas
- Rotenberger WMA
- Northeast Shark River Slough
- Southeast Dade Wetlands

NPS Mapping

- Biscayne National Park
- Western Big Cypress
- Panther Refuge
- Everglades City, NW EVER.
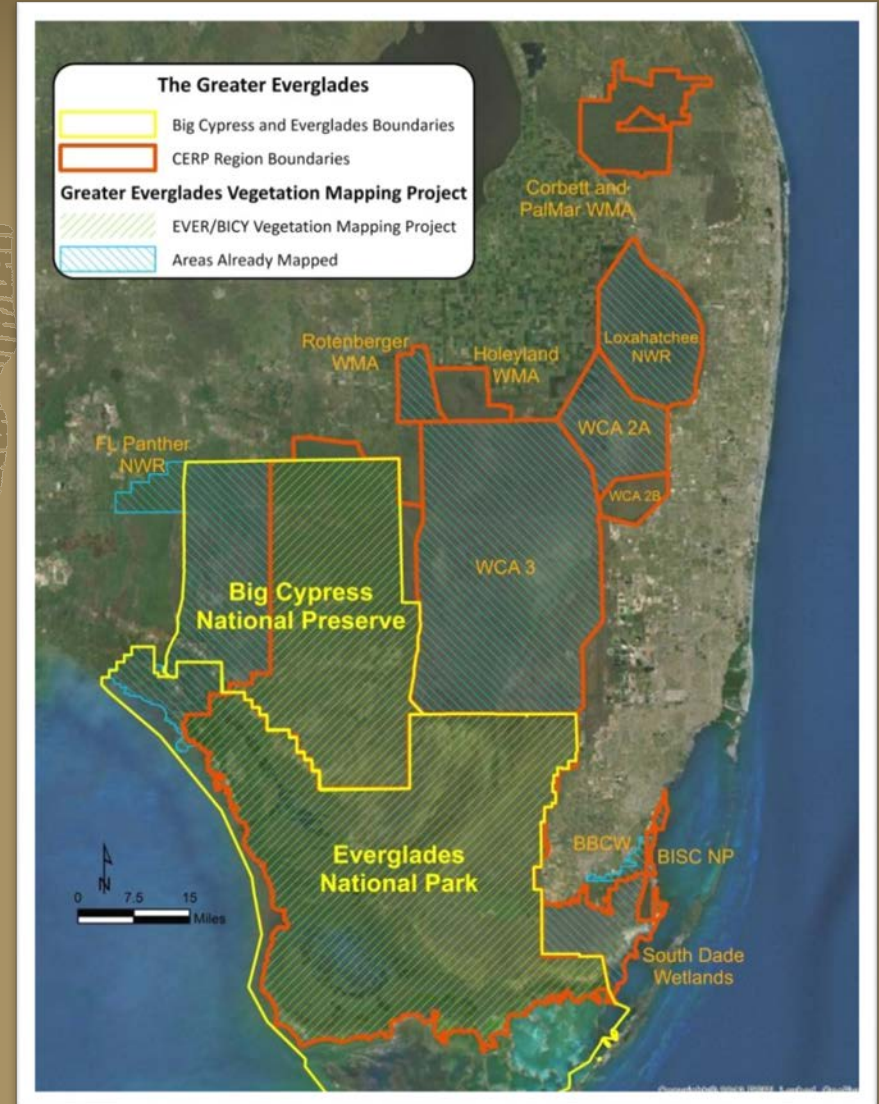
~40 of the GE has been mapped

Project Extent: EVER & BICY

■ Six regions totaling 630,922 Ha. (~ 1.6 million acres):

Methodology[1]

- Landscape-wide 50 x 50 m grid base vegetation mapping:
  - Lacks true topology (community boundaries lost due to grid geometry).
  - More accurate than traditional vector method.
  - Ideal for change detection.
  - Majority rule classification.

[1]Rutchey, K. and J. Godin, 2009. Determining an appropriate scale in vegetation mapping for ecosystem restoration: a case study from the Everglades, USA. *Landscape Ecology*

Methodology

- Cell partitioned into discrete homogenous units.

Red Mangrove Scrub – Open Marsh
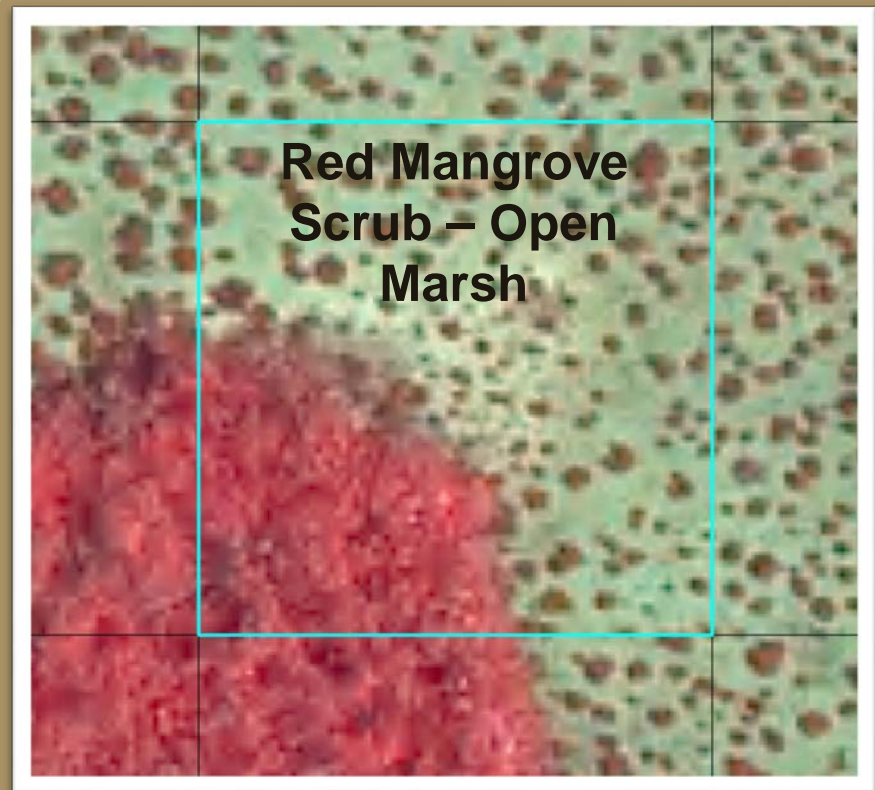
Classification System

- Vegetation Classification for South Florida Natural Areas

Rutchey, K., T.N. Schall, R.F. Doren, A. Atkinson, M.S. Ross, D.T. Jones, M. Madden, L. Vilchek, K.A. Bradley J.R. Snyder, J.N. Burch, T. Pernas, B. Witcher, M. Pyne, R. White, T.J. Smith, J. Sadle, C.S. Smith, M.E. Patterson, and G.D. Gann, 2006. Vegetation Classification for South Florida Natural Areas, USGS Open File Report 2006-1240, Saint Petersburg, Florida

- Hierarchical classification system.
- Finer classes nested within broader groupings based on:
  - Height
  - Cover
  - Species composition

L1: Marsh (M)

L2: Freshwater Marsh (FM)

L3: Graminoid Fresh Water Marsh (MFG)

L4: Spikerush (MFGe)
L4: Panicgrass (MFGa)
L4: Common Reed (MFGh)
L4: Gulfdune Paspalum (MFGpa)
L4: Beakrush (MFGr)
L4: American Cupscale (MFGs)
L4: Cattail (MFGt)
    L5: Cattail Monotypic (MFGtM)
    L5: Cattail Dominant (MFGtD)
    L5: Cattail Sparse (MFGtS)
L4: Sawgrass (MFGc)
    L5: Short Sawgrass (MFGcS)
    L5: Tall Sawgrass (MFGcT)

Level 6

Kilometers

0   2.25   4.5

N

Methodology: Grid Cell Attributes

- **Grid Cell Attributes:**

  - Photo-interpreter.

  - VegCode.

  - Disturbance (Anthropogenic, Fire, Freeze, Windstorm).

  - Density of cattails and exotics as Sparse, Dominant or Monotypic.

Table

R2_Grid_Cells

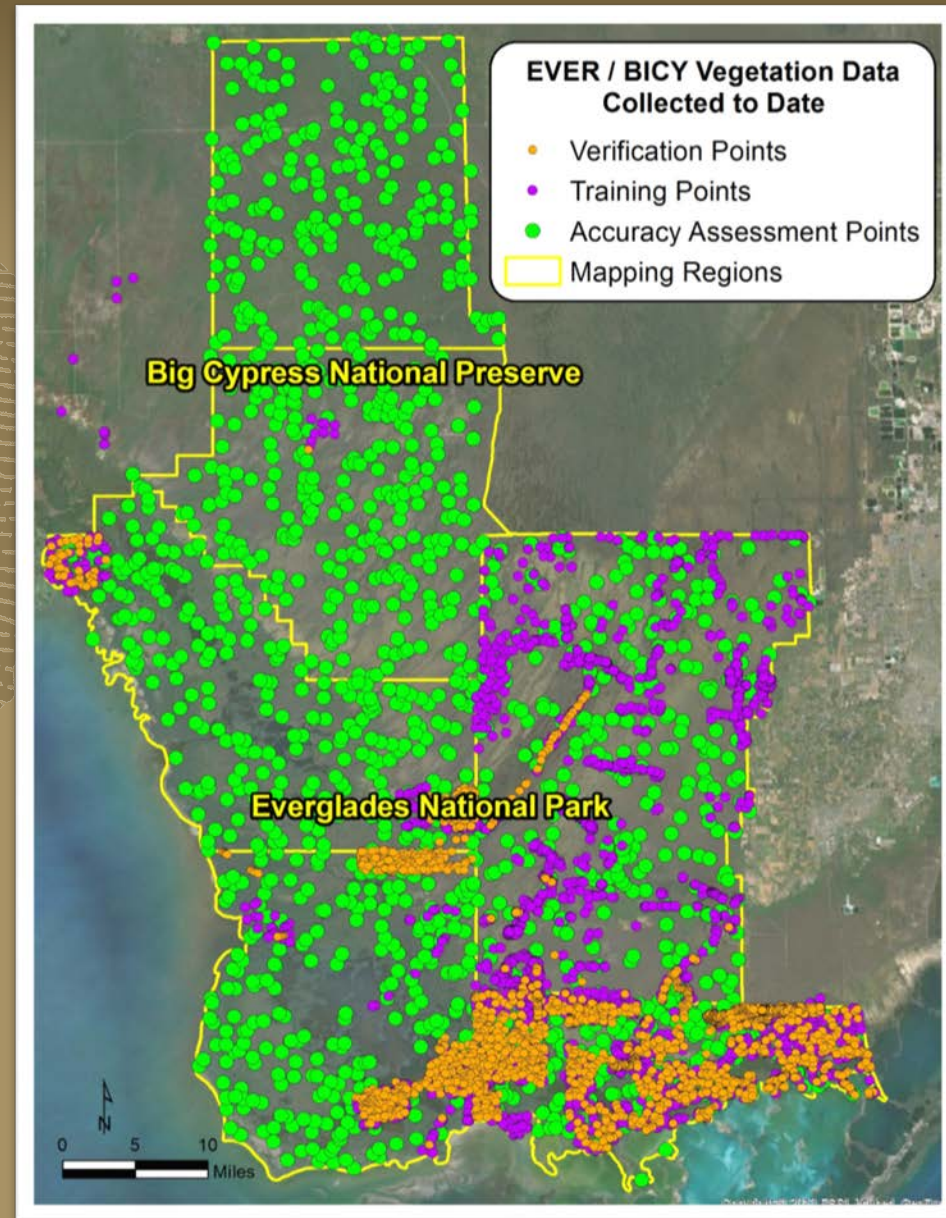| OBJECTID	SHAPE *	Photo-Inter	Model Num	Cell ID	VegCode	Disturbance	TYPDOM	CASEQU	LYGMIC	MELQUI	SCHTER	SYZCUM	THEPOP	Giant Grasses	SHAPE_Length	SHAPE_Area
89583	Polygon	CP	1107	1559399	SMXcr	Windstorm					Sparse				656.390419	26928.023926
89584	Polygon	CP	1107	1559400	SMXcr	Windstorm					Sparse				656.391076	26928.077764
89585	Polygon	CP	1107	1559401	FMXcr	Windstorm					Sparse				656.391076	26928.077764
93583	Polygon	CP	1107	1558149	ONW	Windstorm					Sparse				656.391076	26928.077764
93584	Polygon	CP	1107	1558150	FMXcr	Windstorm					Sparse				656.390419	26928.023926
93585	Polygon	CP	1107	1558151	FMXcr	Windstorm					Sparse				656.391076	26928.077764
95152	Polygon	CP	1107	1554326	FMXcr	Windstorm					Sparse				656.390419	26928.023926
95153	Polygon	CP	1107	1554327	FMXcr	Windstorm					Sparse				656.391076	26928.077764
95202	Polygon	CP	1107	1555609	FMXcr	Windstorm					Sparse				656.391076	26928.077764
95203	Polygon	CP	1107	1555610	FMc	Windstorm					Sparse				656.391076	26928.077764
95252	Polygon	CP	1107	1556883	FMXcr	Windstorm					Sparse				656.390419	26928.023926
95253	Polygon	CP	1107	1556884	FMXX	Windstorm					Sparse				656.389763	26927.970087
95319	Polygon	CP	1107	1560626	FMXX	Windstorm					Sparse				656.390419	26928.023926

Data Collected

- Everglades National Park (EVER)
  - 2,572 Training Points
  - 2,072 Verification Points
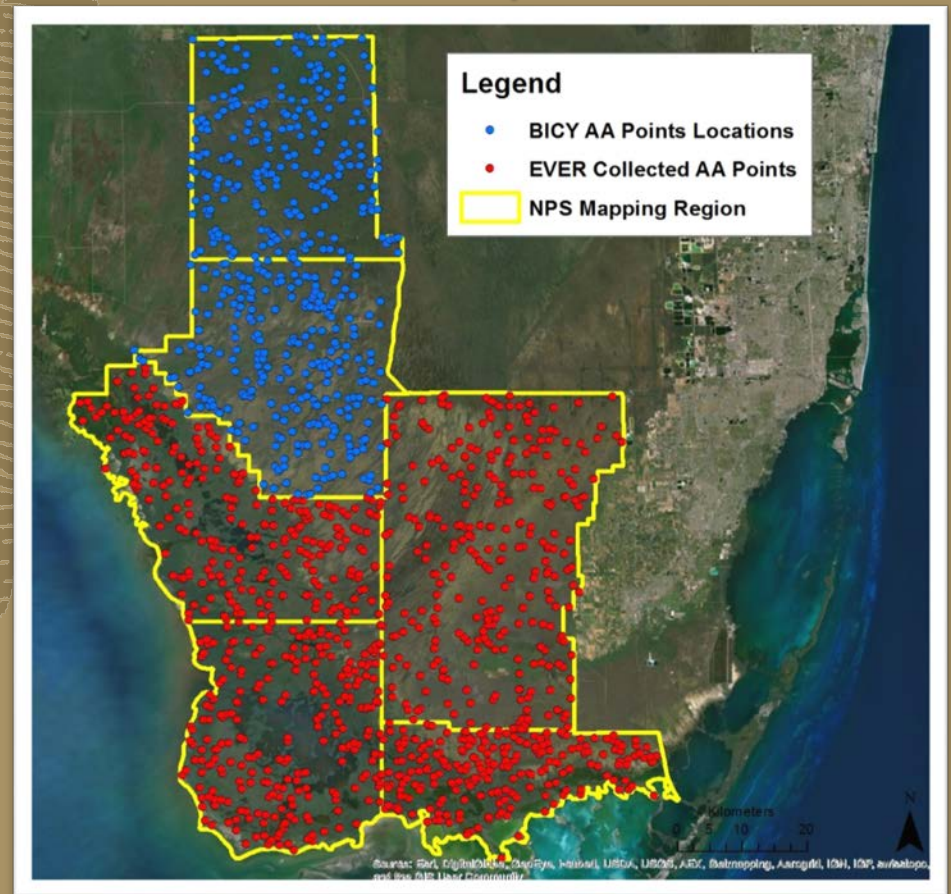 - 1,021 Accuracy Assessment Points
  - 16,004 Geotagged Photos
- Big Cypress National Preserve (BICY)
  - 18 Training points
  - 480 Accuracy Assessment Points
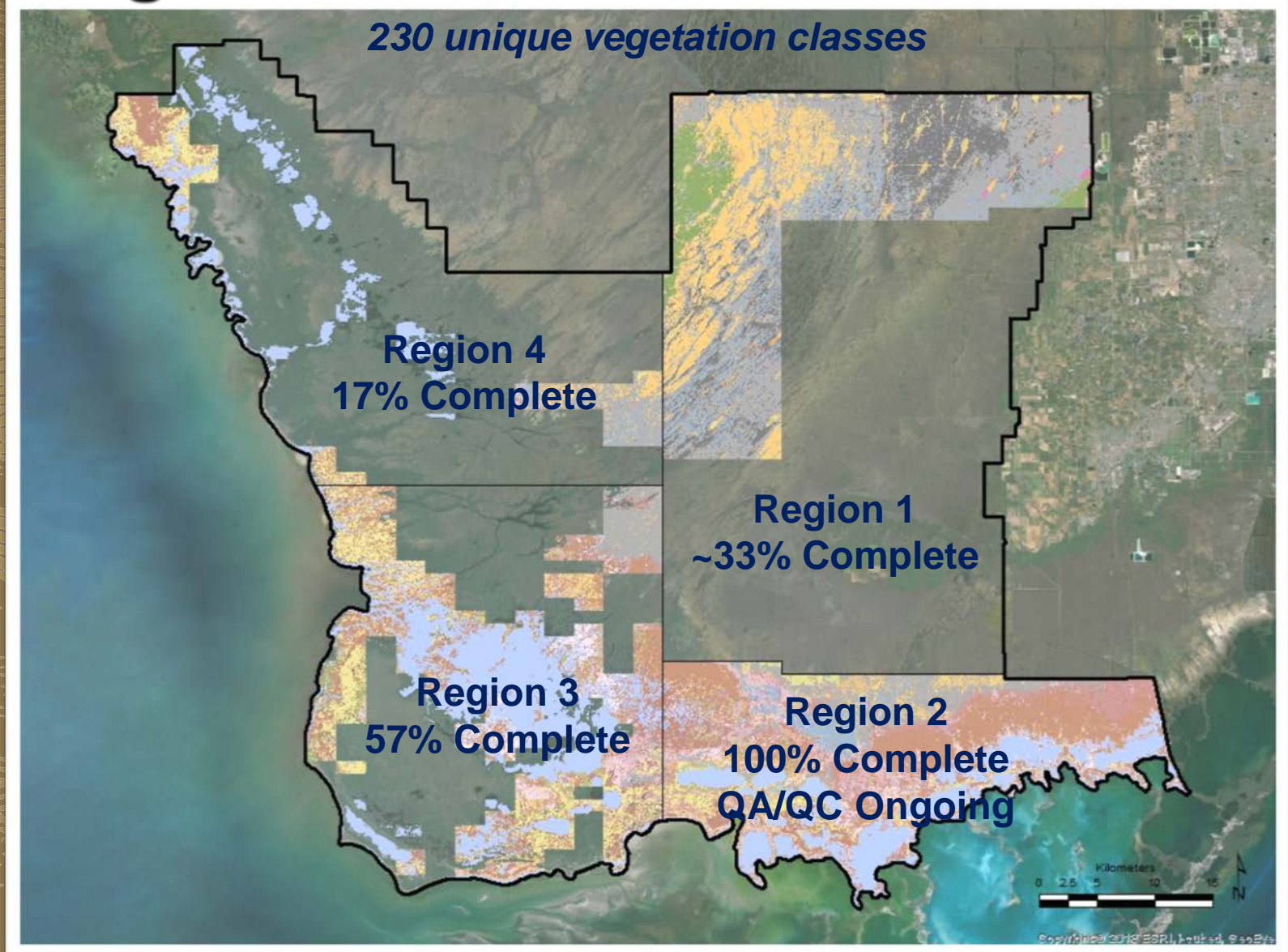 - 2,561 Geotagged Photos

EVER / BICY Vegetation Data Collected to Date
- Verification Points
- Training Points
- Accuracy Assessment Points
- Mapping Regions

Big Cypress National Preserve

Everglades National Park

Accuracy Assessment

- Final map accuracy will be assessed by verification of approximately 210 randomly selected cells per region.

- Internal firewall between AA data collection and photo-interpretation.

- Final project accuracy is expected to be greater than 80% with 90% confidence.

Progress to Date:

230 unique vegetation classes

Region 4
17% Complete

Region 1
~33% Complete

Region 3
57% Complete

Region 2
100% Complete
QA/QC Ongoing

Application: Vegetation Maps

- **What are they, what do they tell us…**
  - They are an inventory of plant communities.
  - They are landscape models that delineate, group, classify, and describe vegetation communities within a specific area of interest at a given time.
  - They reveal the relationship between plants, the environment (soil type or substrate, hydrology, climate, disturbance history, etc.), and man.
  - They provide economic information about the landscape.
  - They are management and restoration tool.

Application:

- **Habitat Delineation**
  - Endemic and endangered flora and fauna
    - Cape Sable Seaside Sparrow
    - Roseate Spoonbill (roosting and foraging)
    - Cape Sable false thoroughwort
- **Species/Community Distribution**
  - Red Mangrove (scrub)
  - Thatch Palm Hammocks
  - Coastal Hammocks
  - Water Lily Sloughs

Keith A. Bradley

Application: Cattail Management
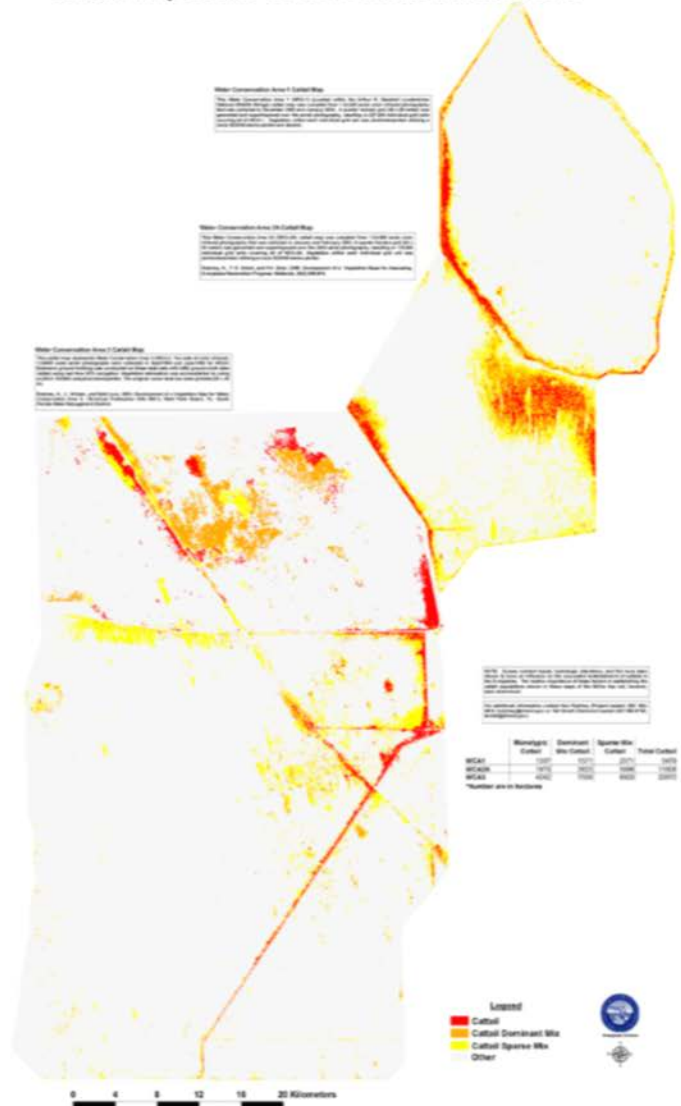
Application: Brazilian Pepper

Region 2, EVER

Legend

Schinus (Brazilian Pepper) Density

Dominant

Sparse

Kilometers
0   2.5   5   10

N

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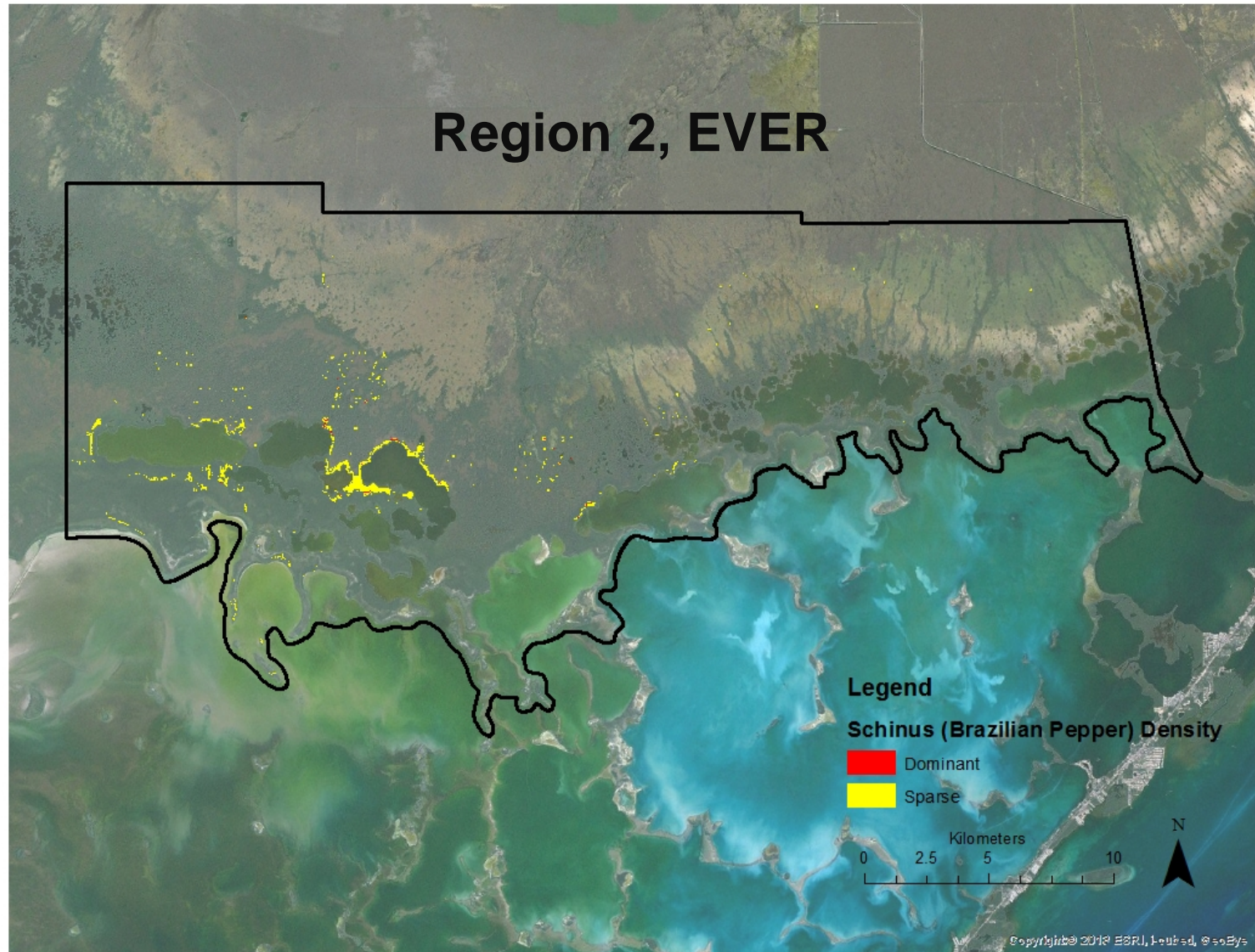
Application: Dataset (AA & TP)

- **Legacy Points (1,501 randomly AA selected points)**
  - Provides structural and species specific absolute cover data.

Acknowledgements

SFWMD:

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