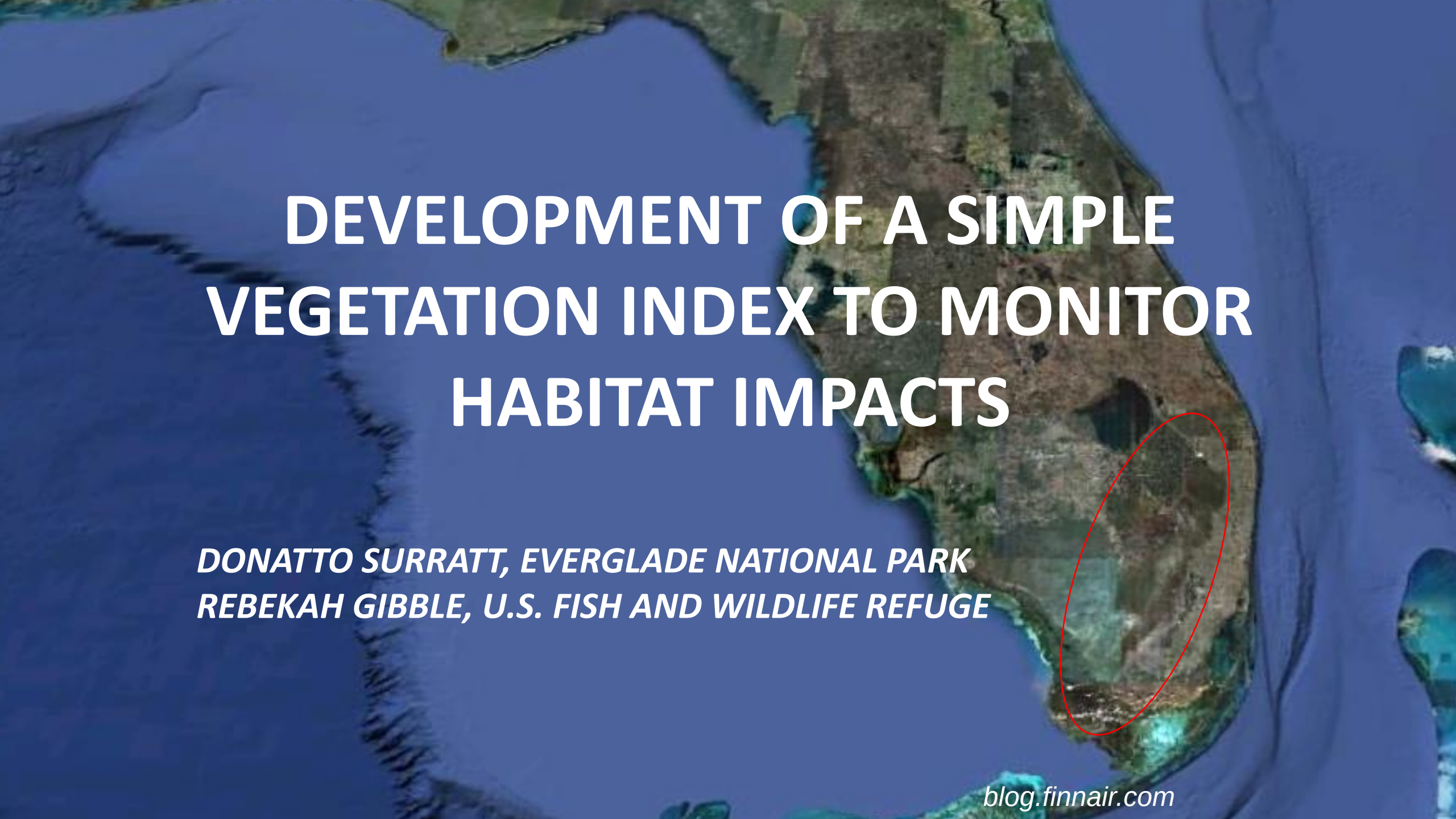
DEVELOPMENT OF A SIMPLE VEGETATION INDEX TO MONITOR HABITAT IMPACTS

DONATTO SURRATT, EVERGLADE NATIONAL PARK
REBEKAH GIBBLE, U.S. FISH AND WILDLIFE REFUGE



Background

- **2010**: FWS, ENP, and SFWMD, working under the Everglades Technical Oversight Committee (TOC) subteam, developed an index to track long-term changes in vegetation community quality in the Everglades
- **2010**: Rapid visual vegetation data collection began
- **2012**: Presented the index to the TOC

Objective

Apply the Index of Vegetation Community Fidelity (IVCF) for the Refuge to track habitat structure alterations through time in response to ecosystem restoration

Methods

- IVCF depends on species specific coefficients of conservation (CC) and normalized plant species percent cover
- CC developed as part of the Florida Floristic Quality Assessment[1] (FQA) tool
- CC are scores applied to each individual plant species in Florida: ranges from 0 to 10
  - 0 = impacted areas; 10 = unimpacted areas
- Normalized plant species percent cover (SPC)
  - 0:absent; 1:<=10%; 2:<=75%; 3:>75%

[1] *http://www.conservationresearchinstitute.org/assets/southfloridafqa.pdf*

Methods

7 plant species selected for IVCF development

Species indicative of unimpacted conditions (CC≥5):

Bacopa caroliniana

Eleocharis elongata

Ericaulon compressum

Nymphoides aquaticum

Xyris spp.

Methods

7 plant species selected for IVCF development

Species indicative of impacted conditions (CC<5):

Typha spp.

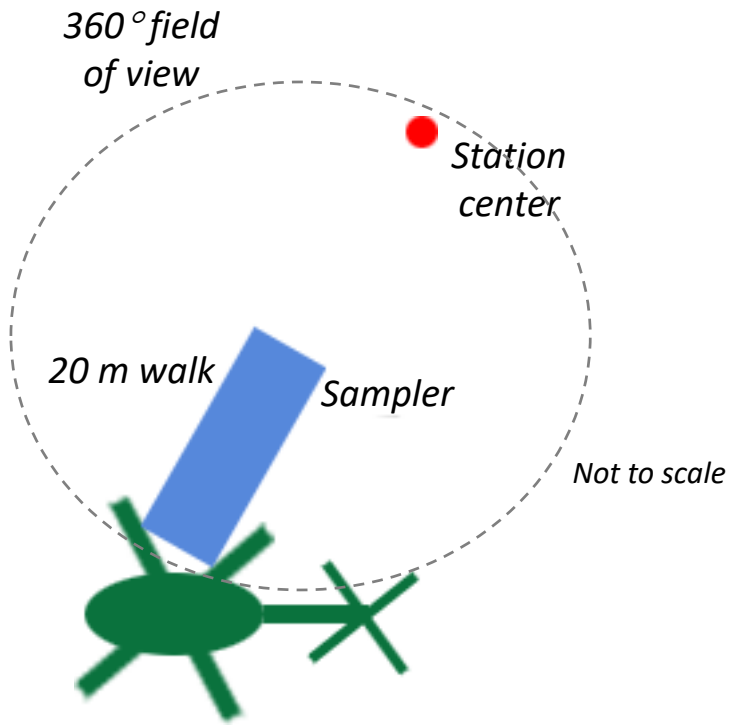
Polygonum spp.

Methods

Species data collection

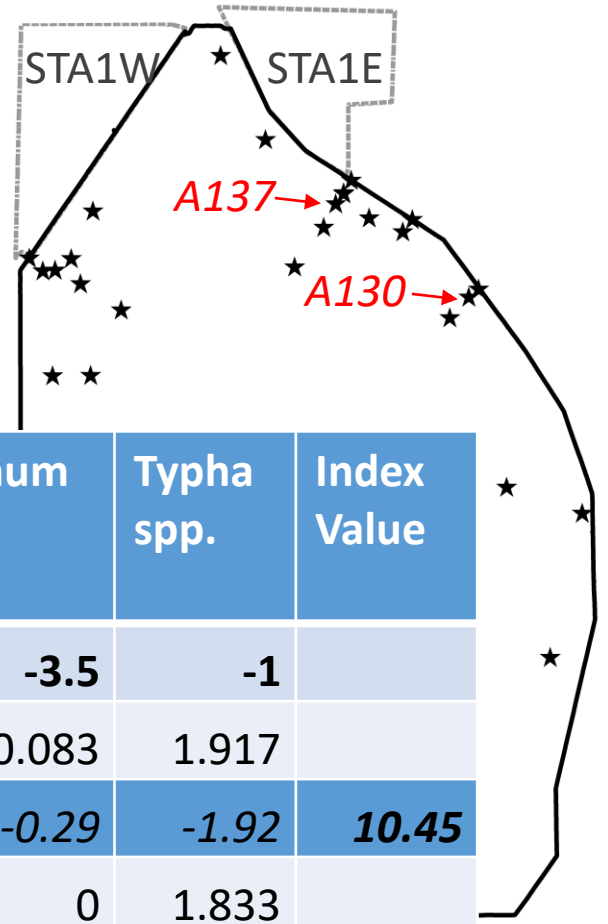
Data were collected as percent cover

- 32 stations surveyed: Nov 2010-Apr 2016
- walked ≥20 m from helicopter to sampling location
- along path identified indicator species within 1 m to either side of the sampler
- at sampling location, collected emergent vegetation information up to 25 m with a 360° field of view



Methods

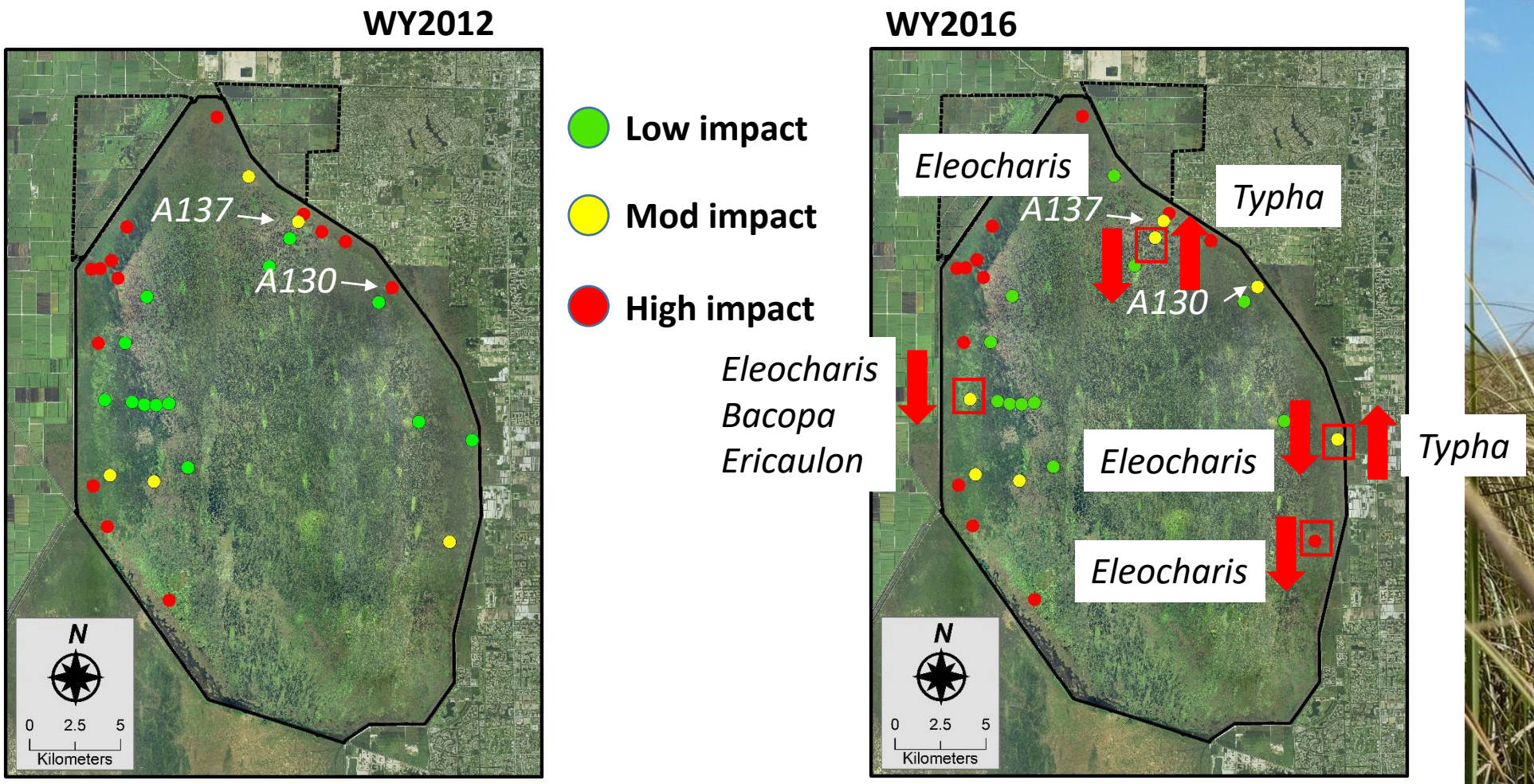
- IVCF score =
  - CC * SPC
- Examples,



Station	Bacopa carolinensis	Eleocharis elongata	Eriocaulon compressum	Nymphoides	Xyris spp.	Polygonum spp.	Typha spp.	Index Value
CC - Score	**8**	**8**	**8**	**5**	**8**	**-3.5**	**-1**	
A130.WY16.SPC	0	1.583	0	0	0	0.083	1.917	
A130.IVCF	*0*	*12.66*	*0*	*0*	*0*	*-0.29*	*-1.92*	***10.45***
A137.WY16.SPC	0	1.833	0	0	0	0	1.833	
A137.IVCF	*0*	*14.66*	*0*	*0*	*0*	*0*	*-1.83*	***12.83***

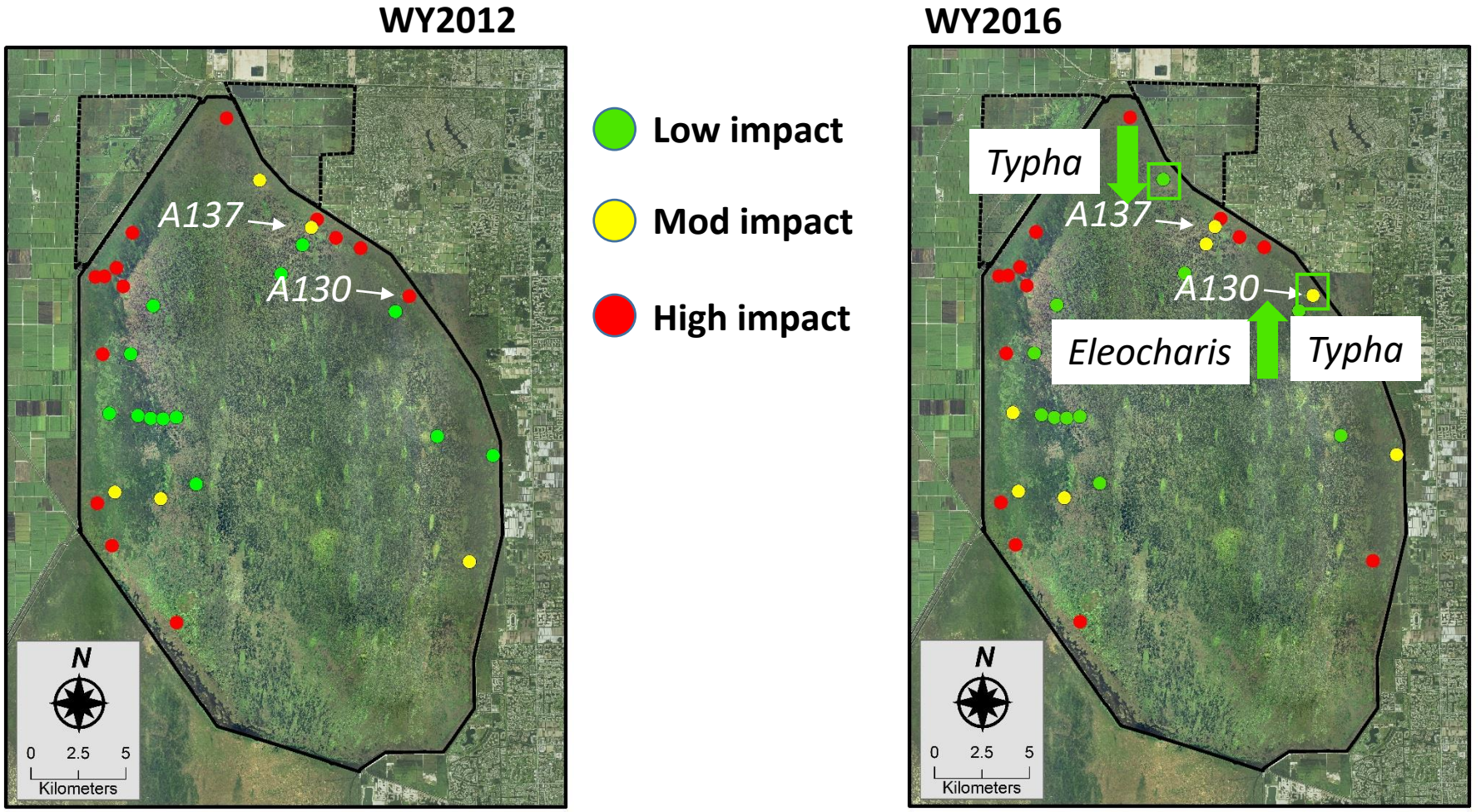
IVCF < 5 High Impact	5 ≥ IVCF ≤ 14 Mod Impact	> 14 Low Impact

Results: IVCF



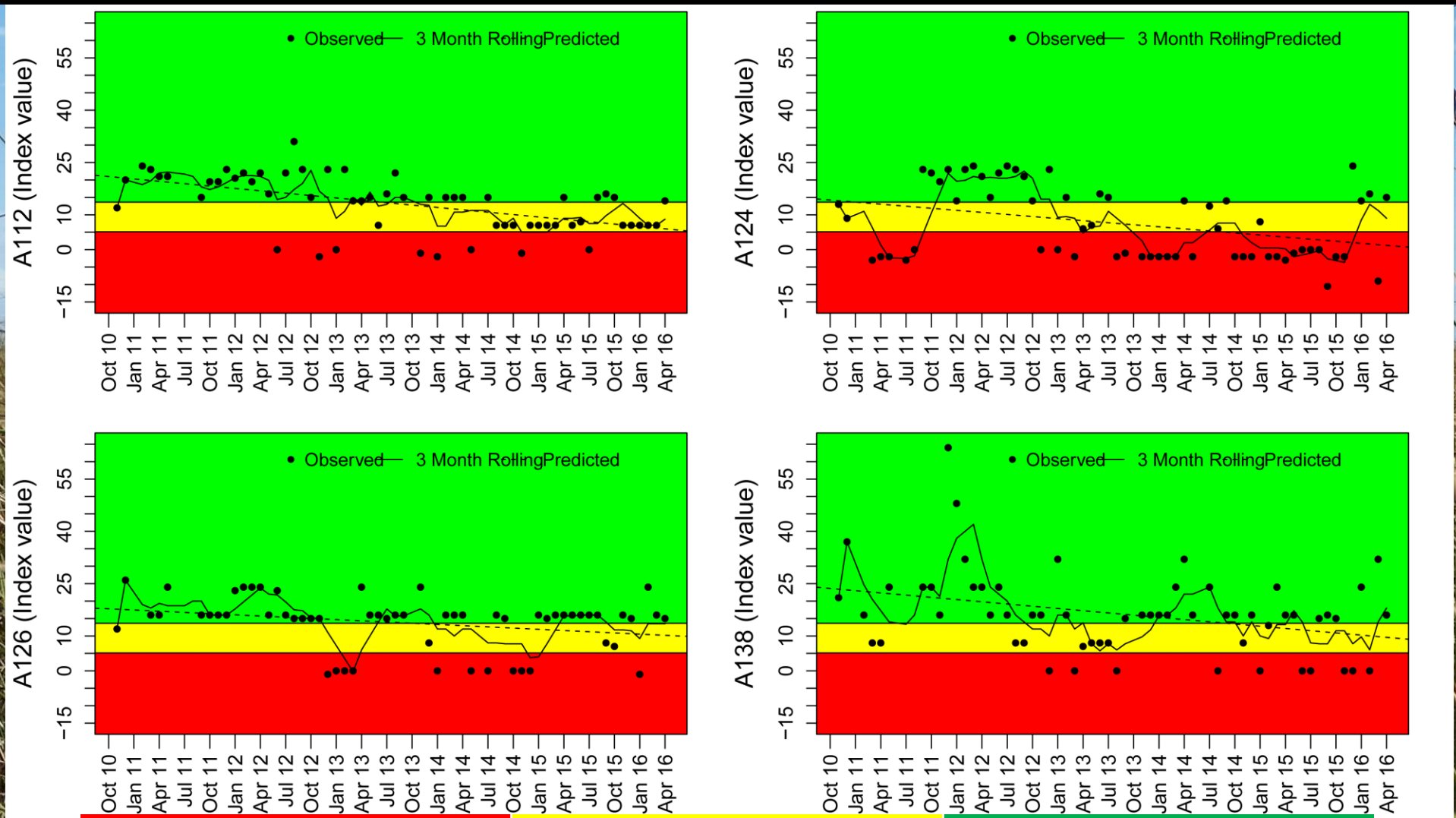
IVCF < 5 High Impact	5 ≥ IVCF ≤ 14 Mod Impact	> 14 Low Impact

Results: IVCF

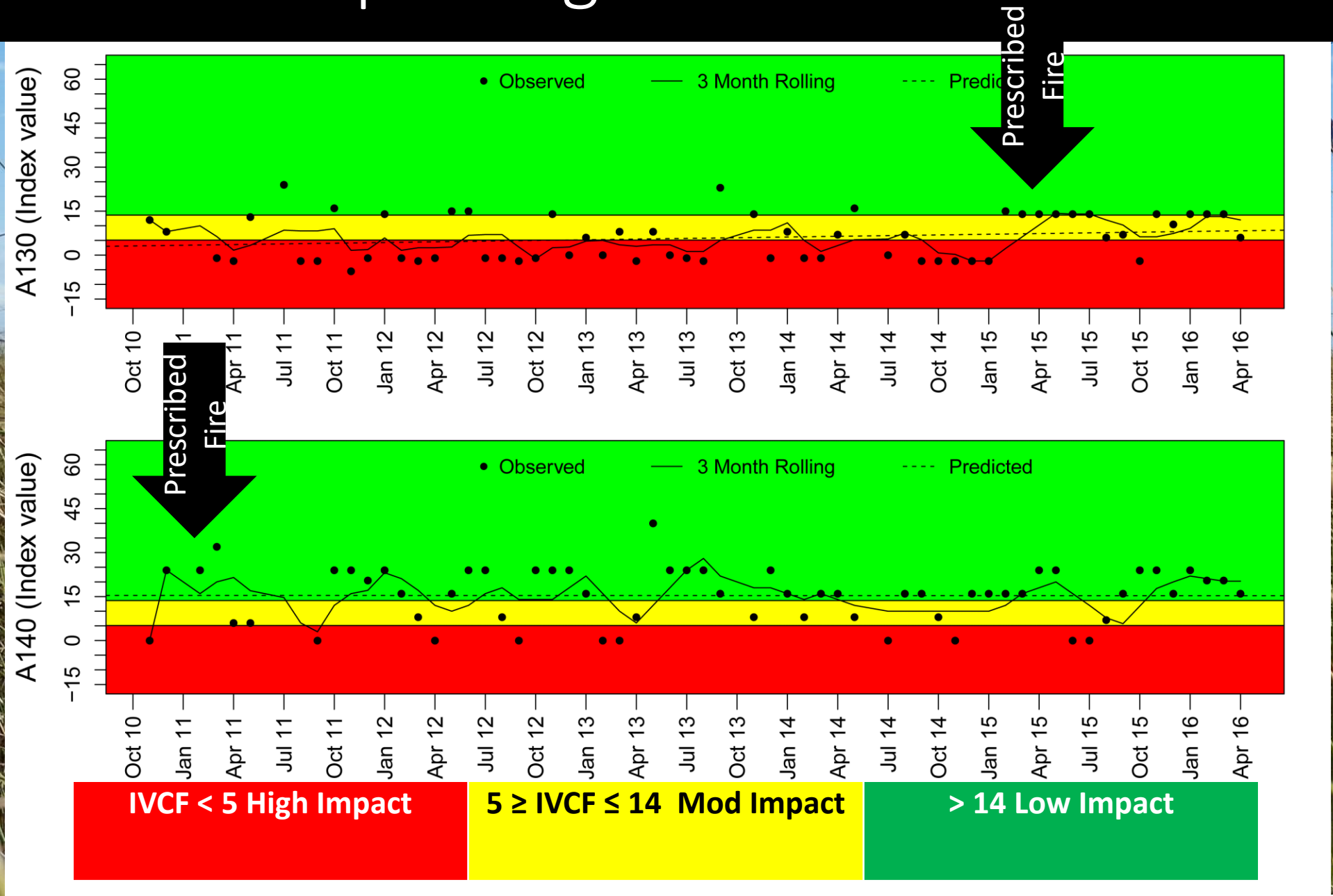


IVCF < 5 High Impact	5 ≥ IVCF ≤ 14 Mod Impact	> 14 Low Impact

Results: IVCF - **deteriorating**

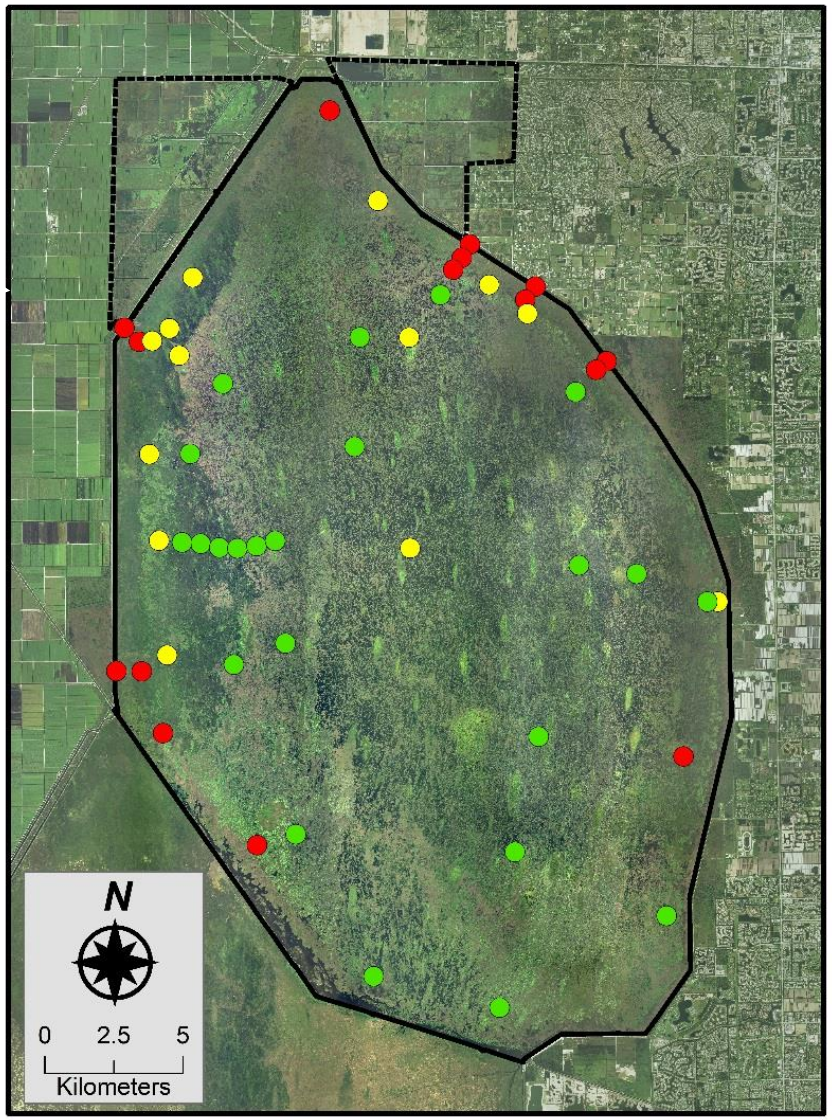


Results: IVCF - improving



Results: Total Phosphorus

WY12-16



- **≤ 7 ppb**
- **7 – 10 ppb**
- **> 10 ppb**

Take Home Points

- Vegetation community at most stations near the canal are highly impacted and consistent with TP levels
- Greater than 4 km into the marsh stations reflect low impact conditions consistent with TP levels

Vegetation community quality deteriorations

- 4 stations (A112, A124, A126, and A138) declined in vegetation community quality
  - Stations A112, A124, and A126 experienced reductions in *Eleocharis e*.
    - A112 also exhibited a reduction in *Bacopa c*. and *Ericaulon c*.
    - A126 experienced an increase of the frequency of observation of *Typha*
  - Stations A138 experienced an increase in *Typha* abundance

Take Home Points

<u>Vegetation community quality improvements</u>

- 2 stations (A130 and A140) improved in vegetation community quality
  - Fire at A130 in April 2015 was coincident with a increase in *Eleocharsis e.* percent cover from $\leq$ 10% to more than 10% there after
  - Fire at A140 in 2011 was coincident with removal of *Typha* there after

- Improvements at A130 was consistent with reclassification of the station form an impacted station to an unimpacted station by the Florida Department of Environmental Protection

Next steps

- Expand the analyses to the rest of the Everglades Protection Area
- Continue to collect the vegetation data with a minimal aim of developing a 10 year dataset for trend analysis
- Assess drivers of long-term vegetation community patterns
- Work with SFWMD to get data loaded into their web-based data portal – DBHYDRO