STATUS OF FLORIDA BAY SEAGRASS COMMUNITIES FOLLOWING THE RECURRENCE OF SEAGRASS DIE-OFF AND THE IMPACTS OF HURRICANE IRMA: ADDING INSULT TO INJURY?

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NOTE

Mass mortality of the tropical seagrass *Thalassia testudinum* in Florida Bay (USA)

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ABSTRACT: This report documents rapid and widespread mortality of the seagrass *Thalassia testudinum* Banks ex König (turtle grass) in Florida Bay at the southern tip of the Florida peninsula (USA). More than 4000 ha of seagrass beds have been completely lost in recurring episodes of mortality since summer 1987. An additional 23 000 ha have been affected to a lesser degree. Loss of *T. testudinum*, the dominant macrophyte species in this highly productive system, may affect ecosystem function within the bay as well as estuarine-dependent sport and commercial fisheries. A pathogenic protist related to the causal agent of the eelgrass wasting disease may be involved in the mortality and may place *T. testudinum* populations outside Florida Bay at risk. Environmental factors and chronic hypoxia of below-ground *T. testudinum* tissue may also contribute to the die-off.

Florida Bay is a shallow, triangular lagoon at the southern tip of peninsular Florida bordered on the north by the Florida mainland and on the southeast by the Florida Keys; its western margin is open to the Gulf of Mexico. Shallow carbonate mud banks divide the bay into basins, restrict circulation, and attenuate the Gulf's lunar tidal influence. Freshwater enters the bay in the northeast from Taylor Slough, as overflow from the C-111 Canal that is part of the South Florida Water Management District's canal system, and as sheet flow generated by local rainfall. Depending on the timing and amounts of local rainfall, water conditions in the

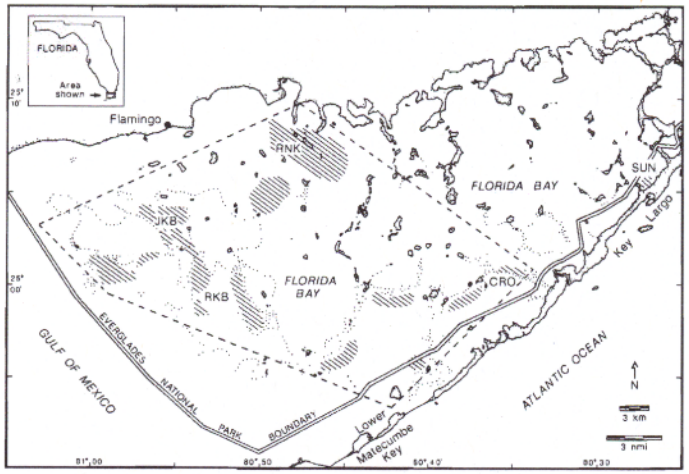

Fig. 1. Distribution of *Thalassia testudinum* die-off in Florida Bay. Continuous double line is Everglades National Park boundary. Dashed line encloses most known die-off areas. Hatched areas are severely affected, having lost up to 95 % of *T. testudinum*. Dotted lines mark shallow carbonate mud banks. JKB: Johnson Key Basin; RKB: Rabbit Key Basin; RNK: Rankin Lake; CRO: Cross Bank; SUN: Sunset Cove

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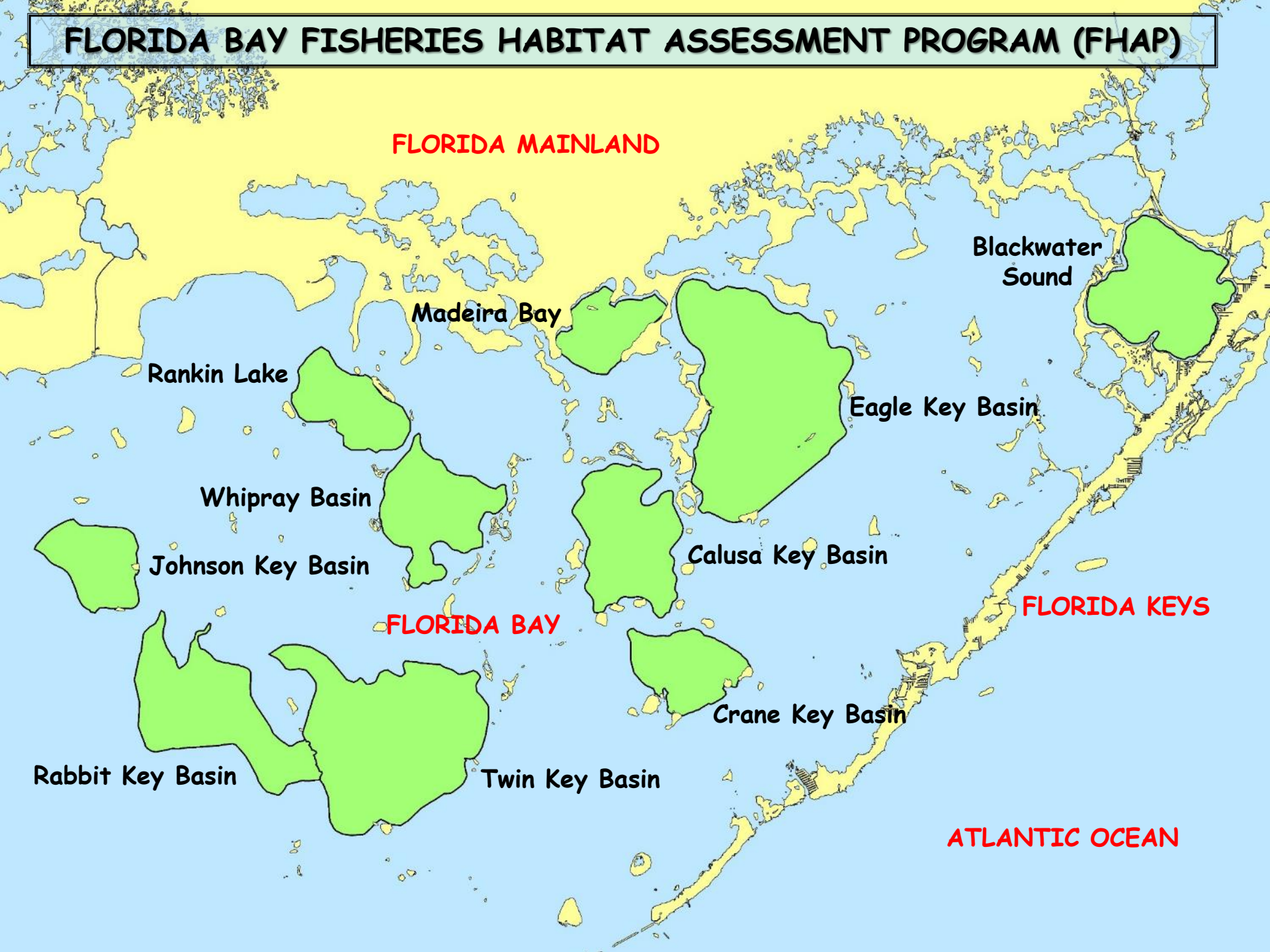
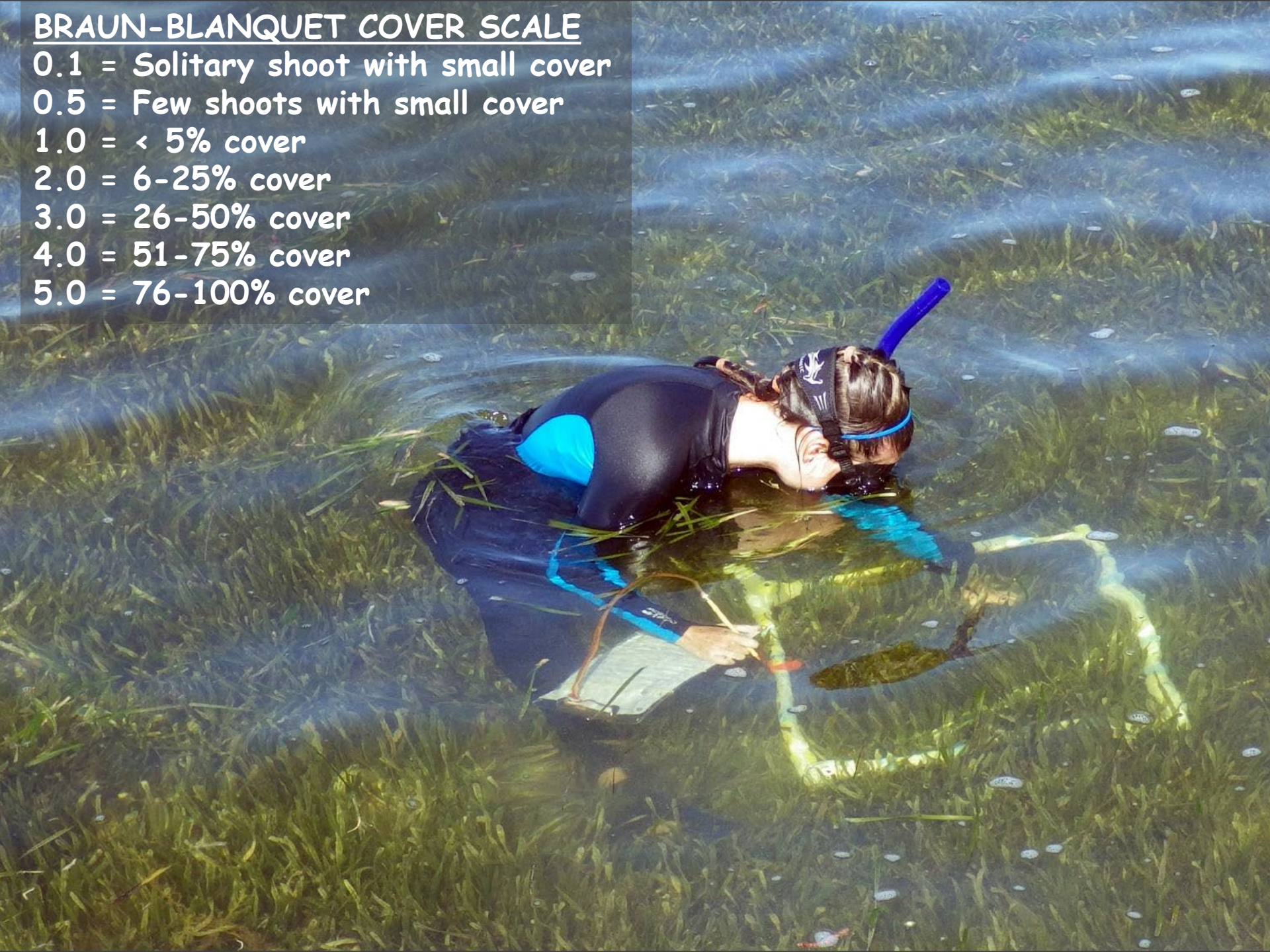
DUMP KEYS CIRCA 1991

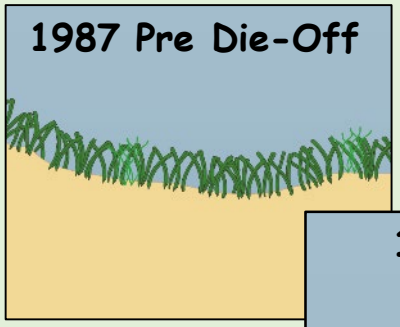
FLORIDA BAY FISHERIES HABITAT ASSESSMENT PROGRAM (FHAP)

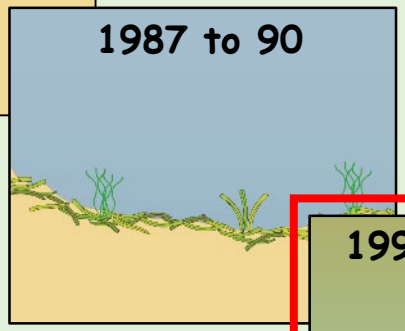


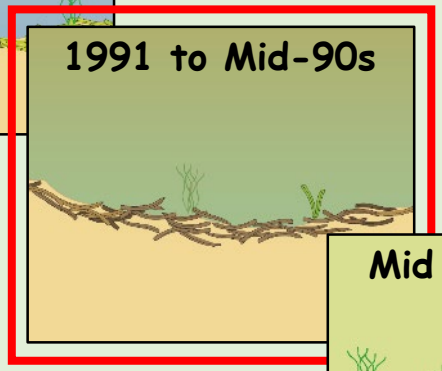

FHAP
25 YEARS (and counting...).
GO SEAGRASS RANGERS!

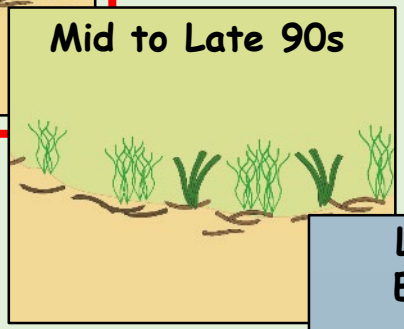

BRAUN-BLANQUET COVER SCALE
0.1 = Solitary shoot with small cover
0.5 = Few shoots with small cover
1.0 = < 5% cover
2.0 = 6-25% cover
3.0 = 26-50% cover
4.0 = 51-75% cover
5.0 = 76-100% cover

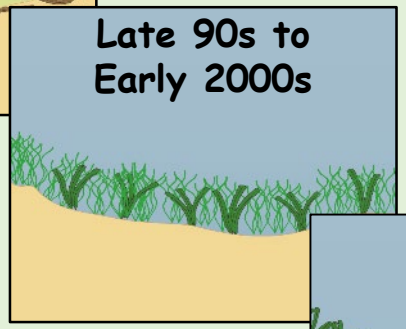
Halodule wrightii (shoal grass)

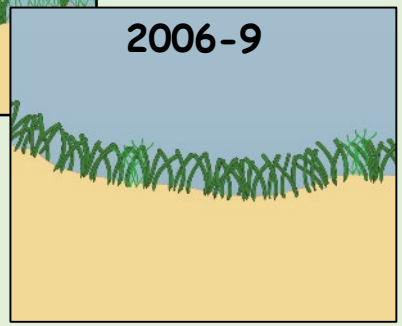

1987 Pre Die-Off

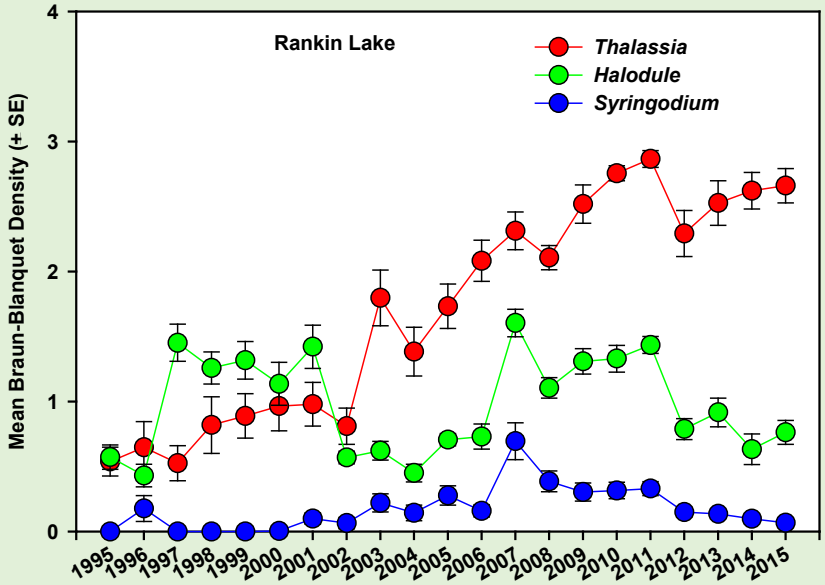

1987 to 90

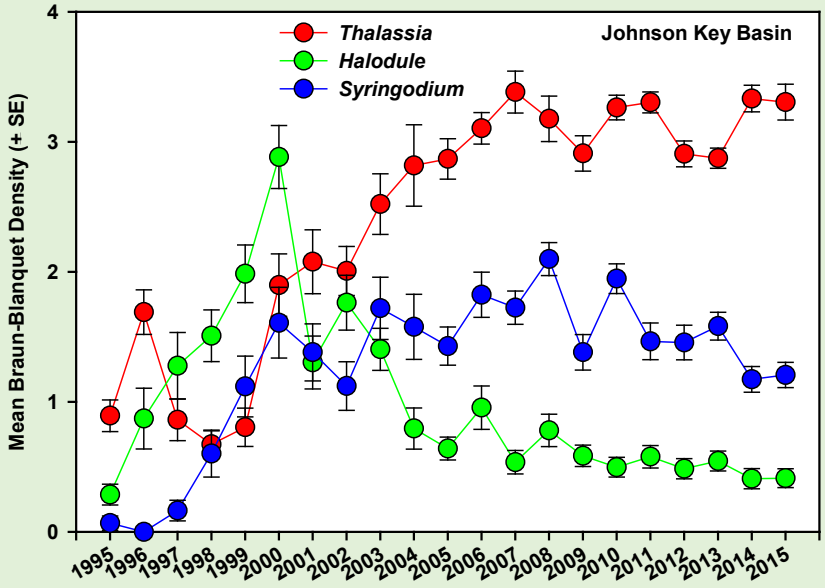

1991 to Mid-90s

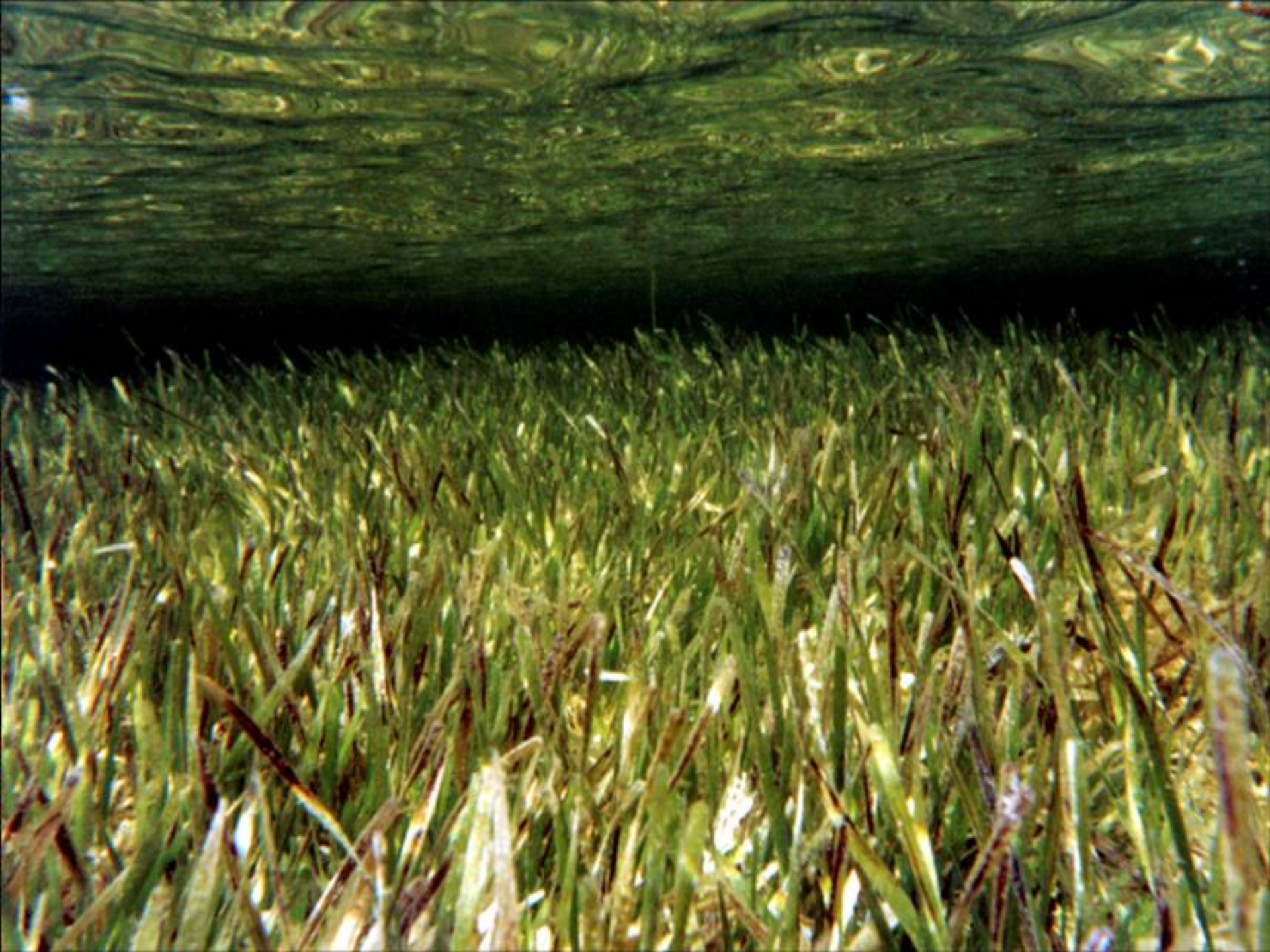

Mid to Late 90s

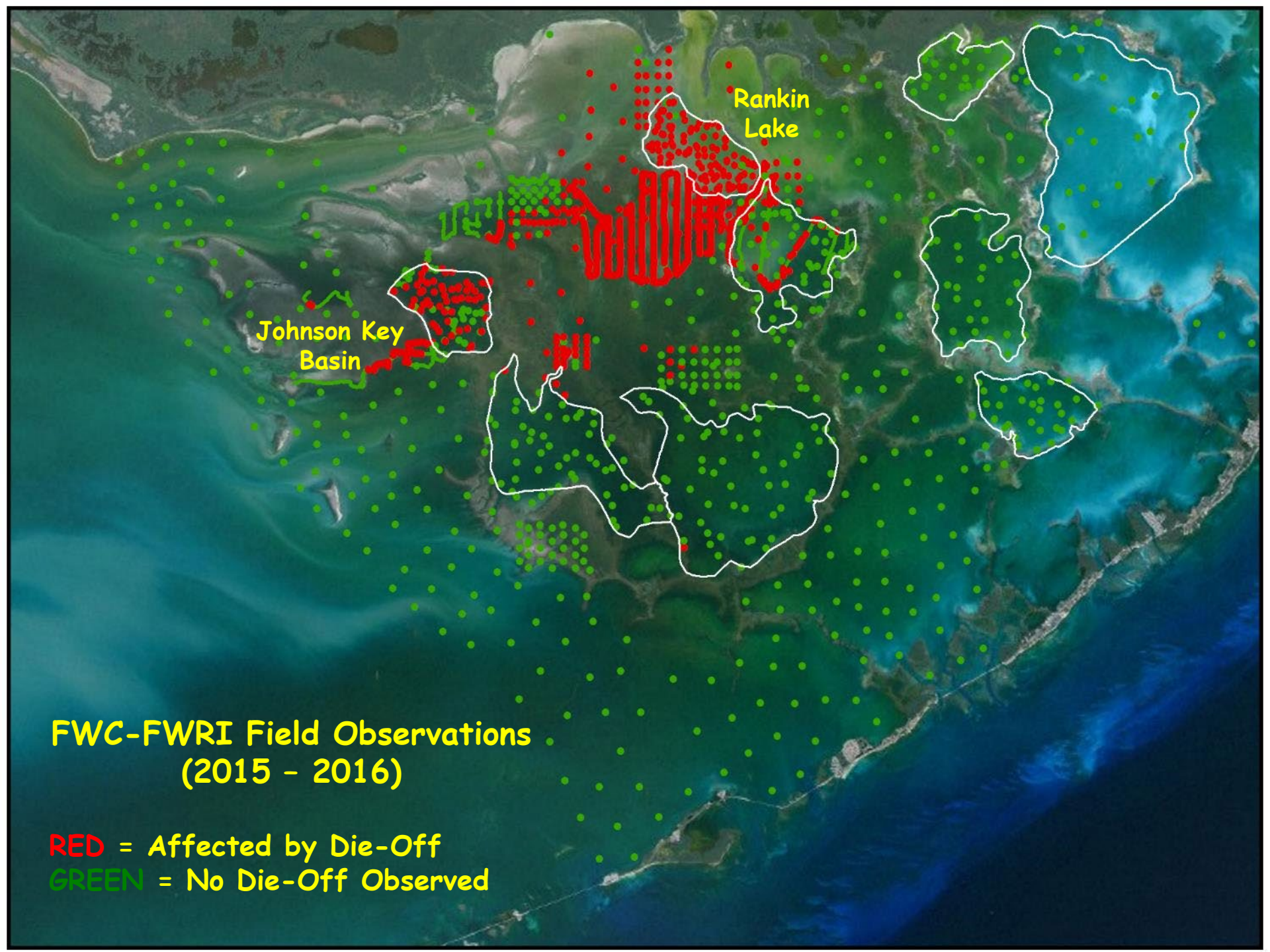

Late 90s to
Early 2000s

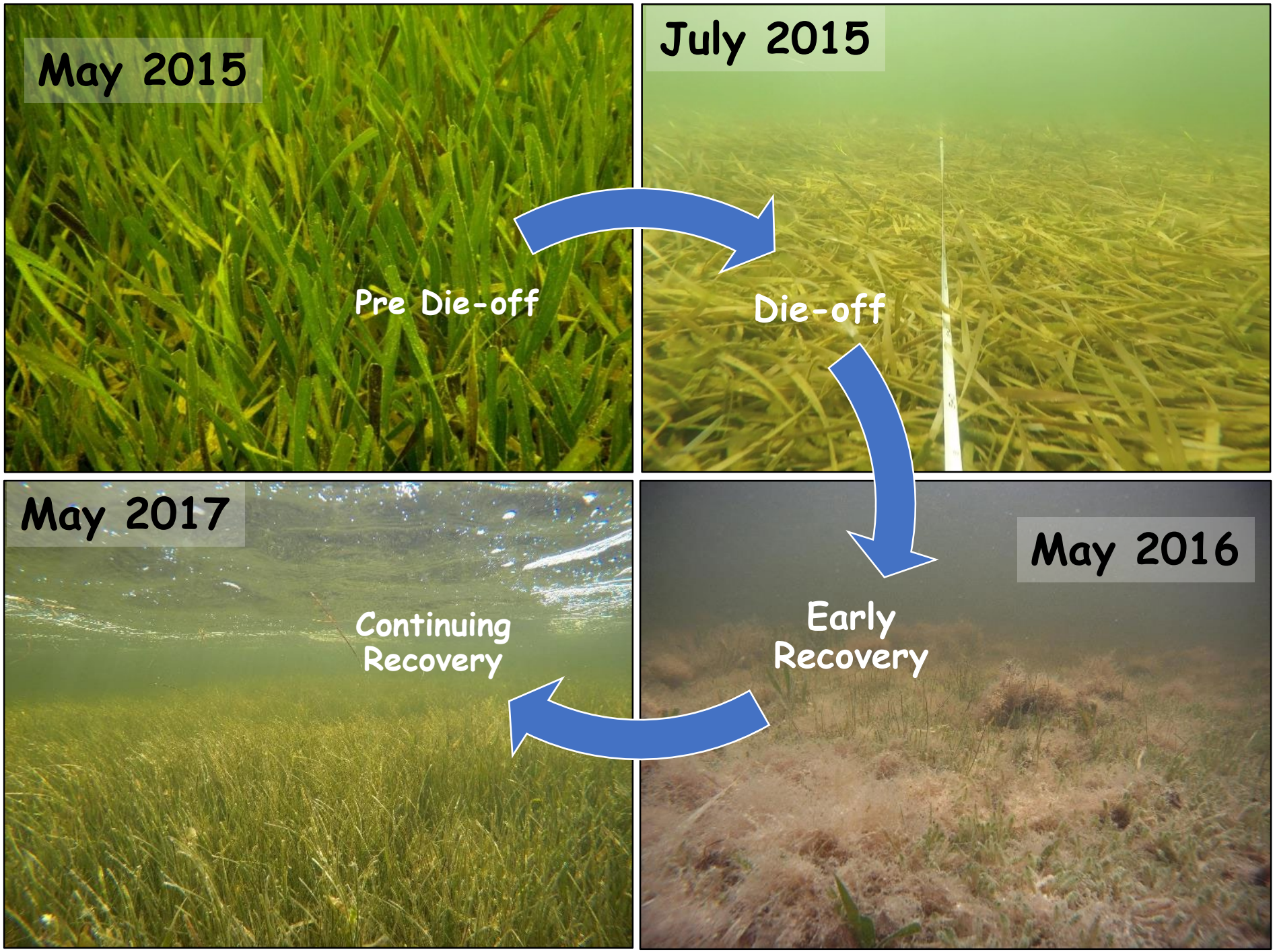

2006-9


Rankin Lake
Thalassia
Halodule
Syringodium
Mean Braun-Blanquet Density (+ SE)
0
1
2
3
4
1995
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
2007
2008
2009
2010
2011
2012
2013
2014
2015

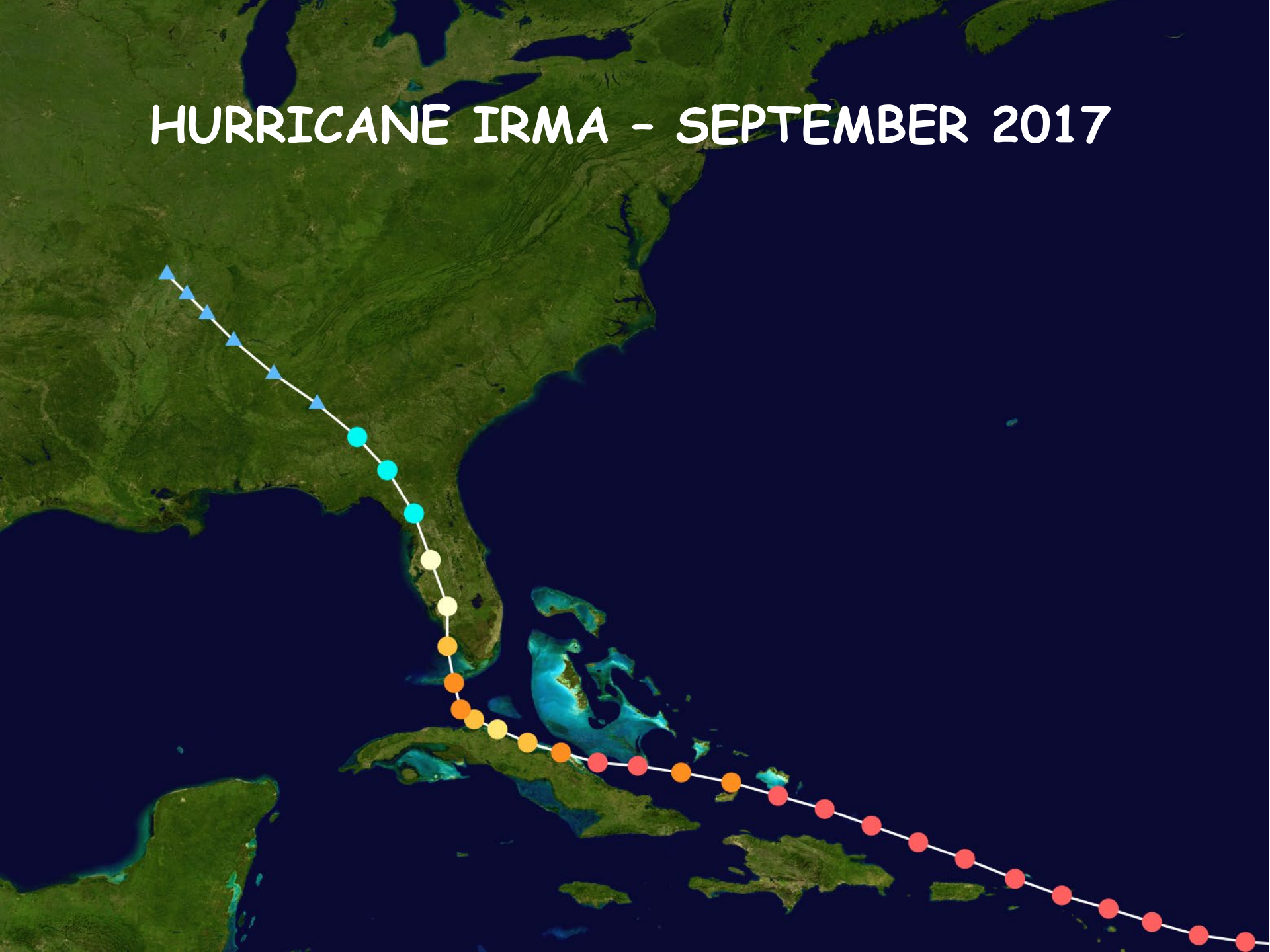

Johnson Key Basin
Thalassia
Halodule
Syringodium
Mean Braun-Blanquet Density (+ SE)
0
1
2
3
4
1995
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
2007
2008
2009
2010
2011
2012
2013
2014
2015




Rankin
Lake
Johnson Key
Basin
FWC-FWRI Field Observations
(2015 - 2016)
RED = Affected by Die-Off
GREEN = No Die-Off Observed


May 2015
Pre Die-off
July 2015
Die-off
May 2016
Early Recovery
May 2017
Continuing Recovery

HURRICANE IRMA - SEPTEMBER 2017



Miami Herald

HURRICANE

After Irma, dead seagrass 'as far as the eye can see' in Florida Bay

BY JENNY STALETOVICH
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September 15, 2017 07:49 PM
Updated September 15, 2017 08:18 PM

Hurricane Irma left a massive footprint across the Florida Everglades.

From Florida Bay to Shark River, signs of the Category 4 hurricane could be seen in vast mats of floating dead seagrass, mangroves stripped of their leaves, and rafts of seaweed pushed far ashore. Along the northwest side of Cape Sable, where the powerful hurricane's storm surge hit hardest, a

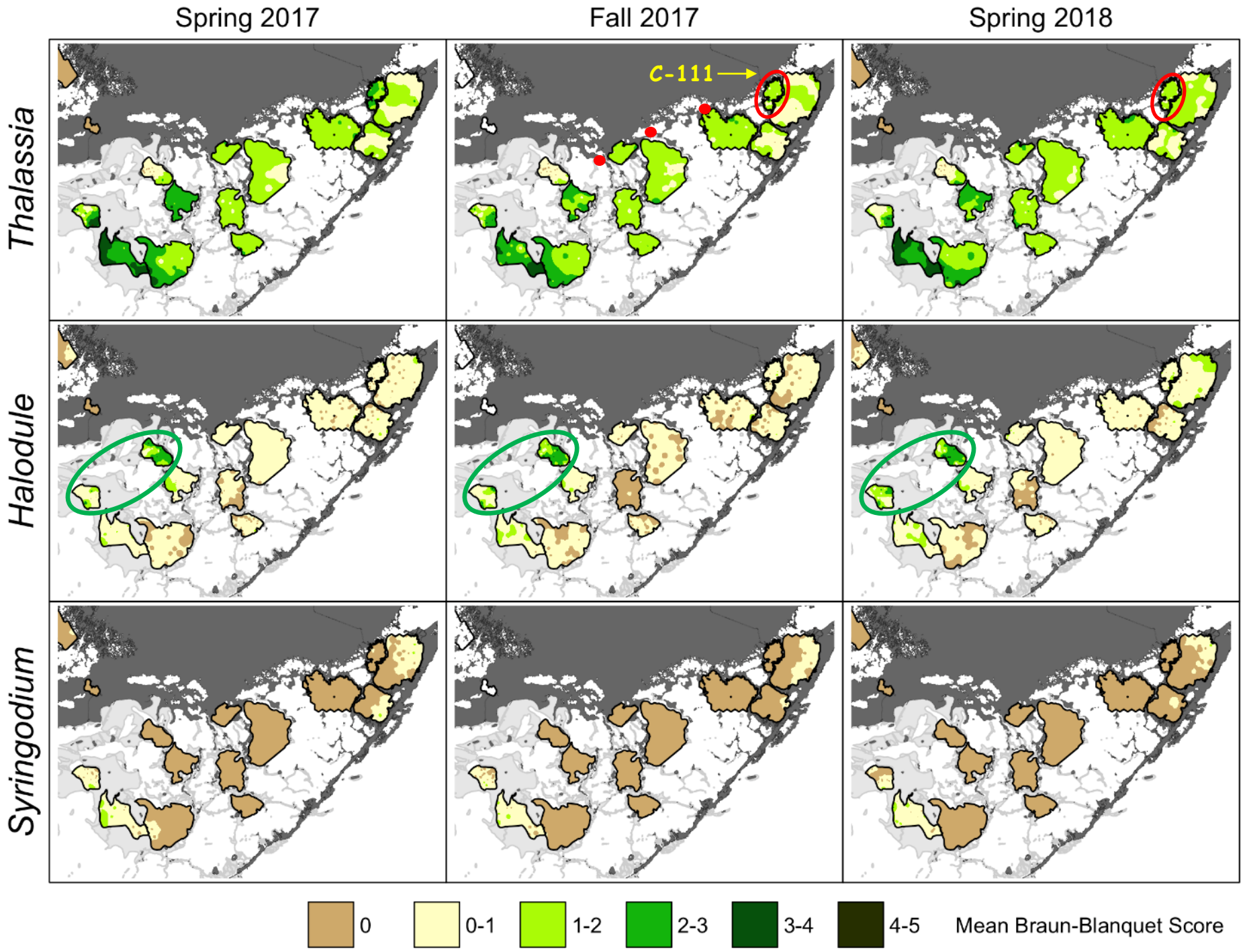
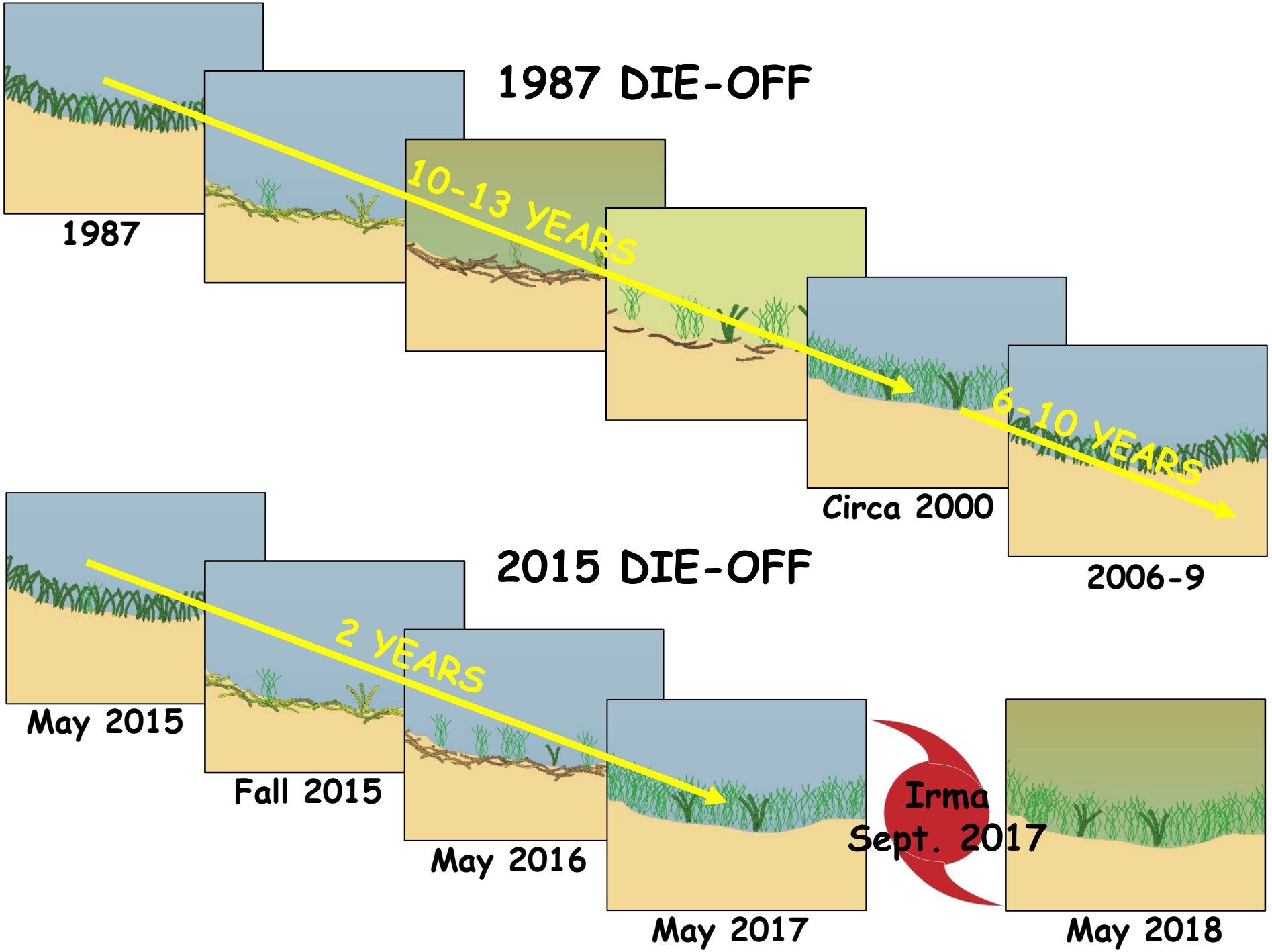

Spring 2017
Fall 2017
Spring 2018
Thalassia
Halodule
Syringodium
C-111
0
0-1
1-2
2-3
3-4
4-5
Mean Braun-Blanquet Score

Photo courtesy of ENP


1987 DIE-OFF
1987
10-13 YEARS
Circa 2000
6-10 YEARS
2006-9
2015 DIE-OFF
May 2015
2 YEARS
Fall 2015
May 2016
May 2017
Irma
Sept. 2017
May 2018


MAY 2019???


MAY 2019???

THANK YOU

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