The Conservation of Tidal Marsh Birds: Guiding action at the intersection of our changing land and seascapes

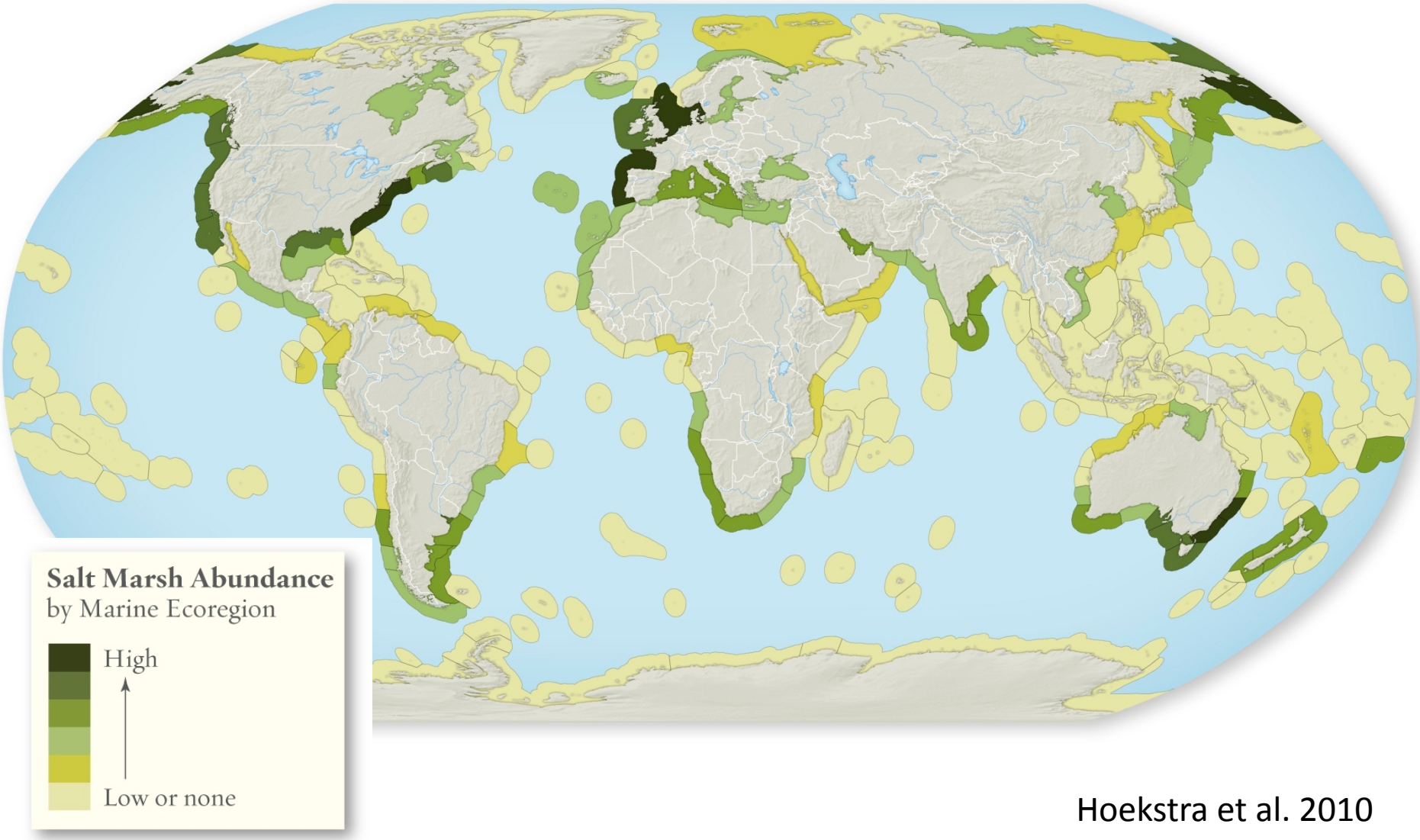
Delaware Wetlands Conference

Greg Shriver, University of Delaware
Chris Elphick, University of Connecticut
Brian Olsen, University of Maine
Tom Hodgman, Maine Dept. of Inland Fisheries and Wildlife

Presented by: Rebecca Kern, University of Delaware

30 January 2014
Dover, DE

Tidal Marshes: A Restricted Ecosystem



Hoekstra et al. 2010

1930's – 1960's Grid ditching to reduce mosquitos

Phragmites/Mosquito Spraying

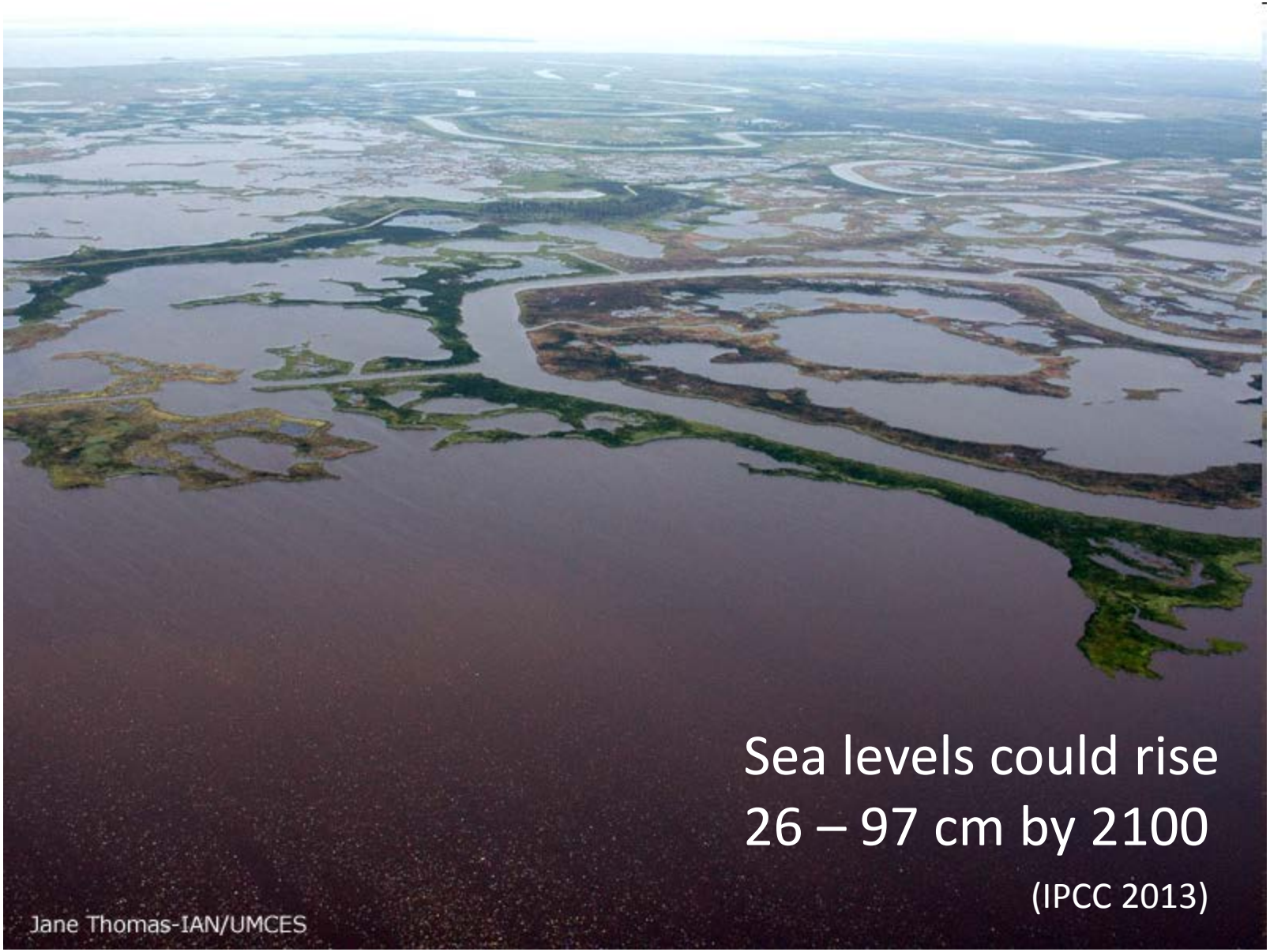
Prescribed Burning

Snow Geese Control

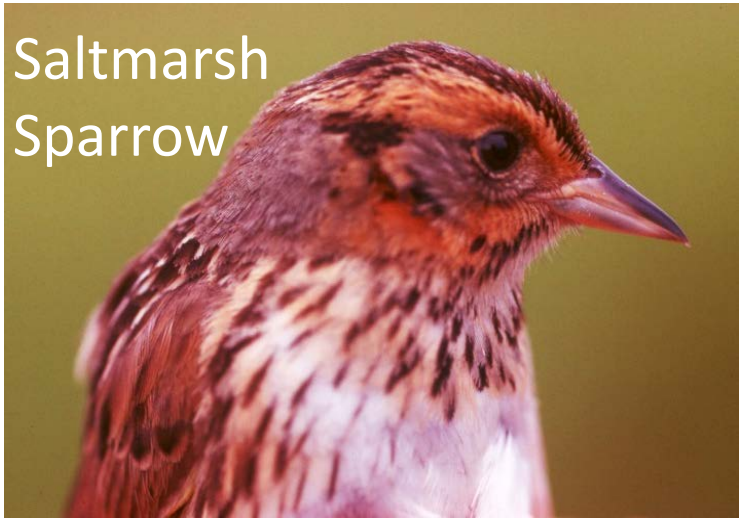
Tidal Restoration

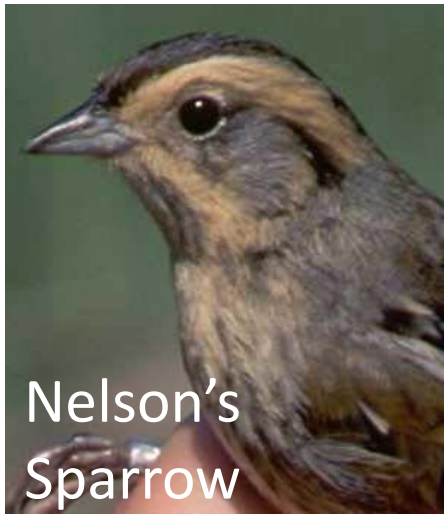
Nutria Control

Jane Thomas-IAN/UMCES

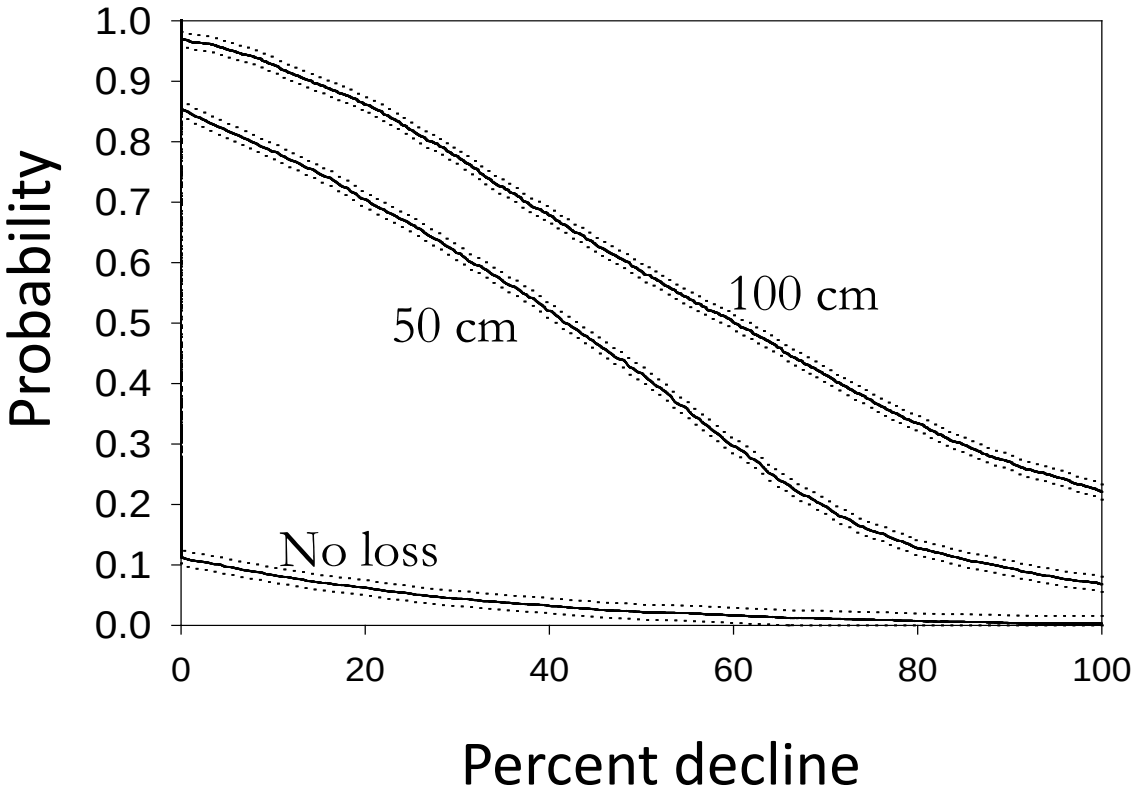

Sea levels could rise
26 – 97 cm by 2100
(IPCC 2013)
Jane Thomas-IAN/UMCES

Tidal Marsh Breeding Birds



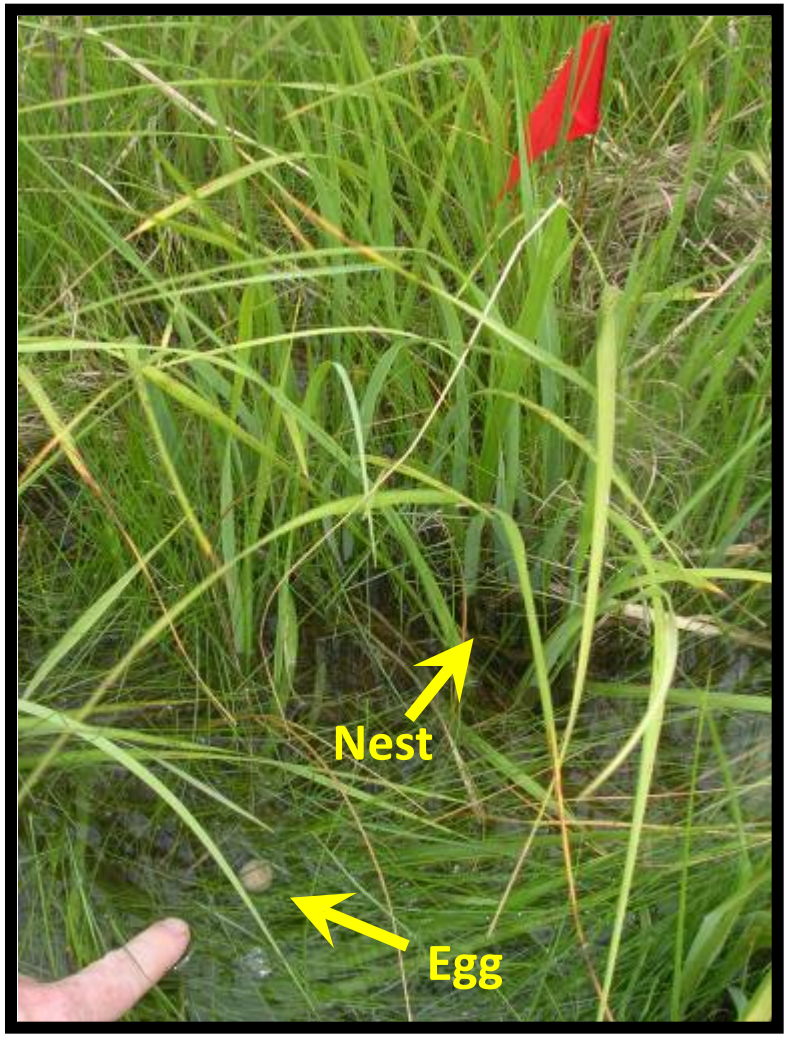


Probability of Seaside Sparrow Decline in Connecticut



Shriver, W. G., and J. P. Gibbs. 2004. in Species Conservation and Management: Case Studies, Oxford University Press.

Saltmarsh Sparrow nest loss is due to tidal flooding



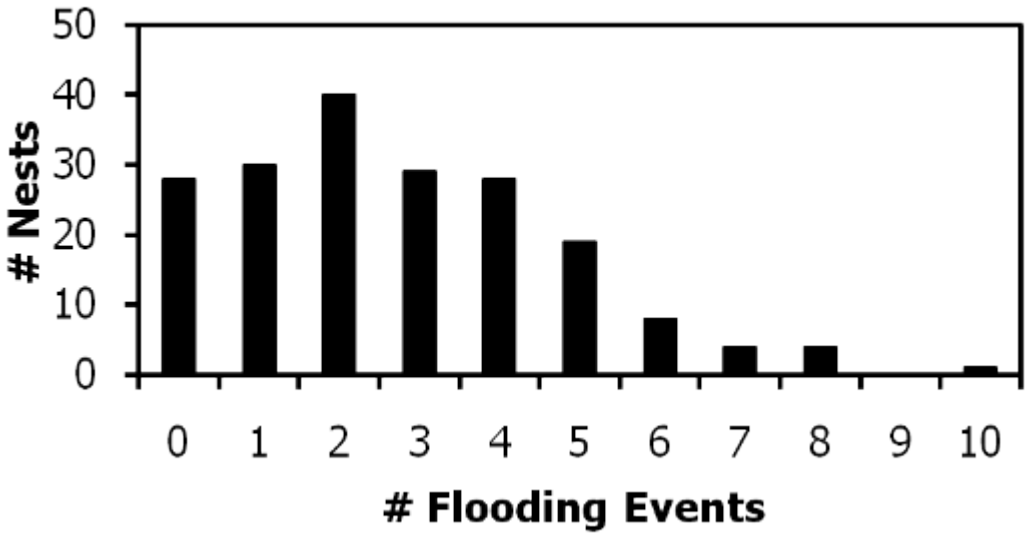
2002-03 (136 nests)

40% lost chicks to flooding

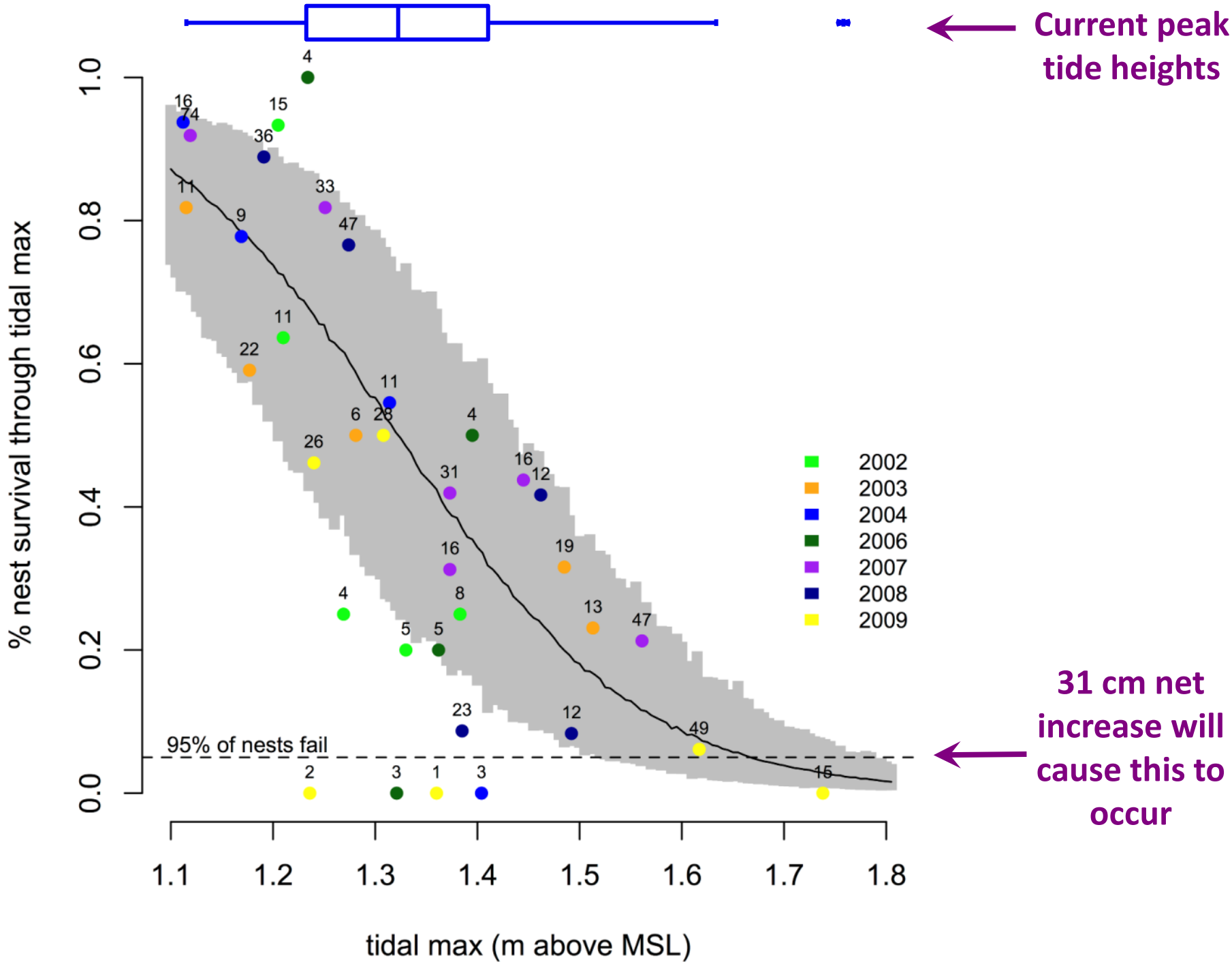
2007-09 (191 nests)

85% flooded at least once

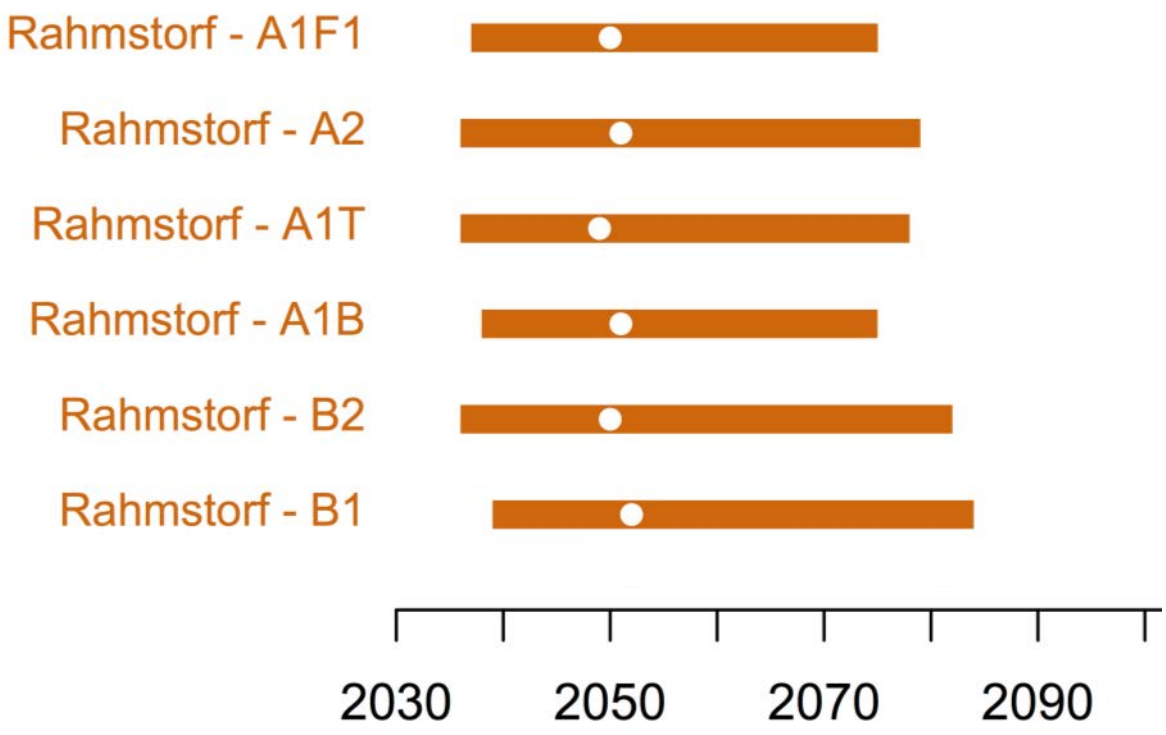
54% failed due to flooding



Gjerdrum et al. 2005 Condor; Bayard 2010 PhD diss.; Bayard and Elphick 2011 Auk

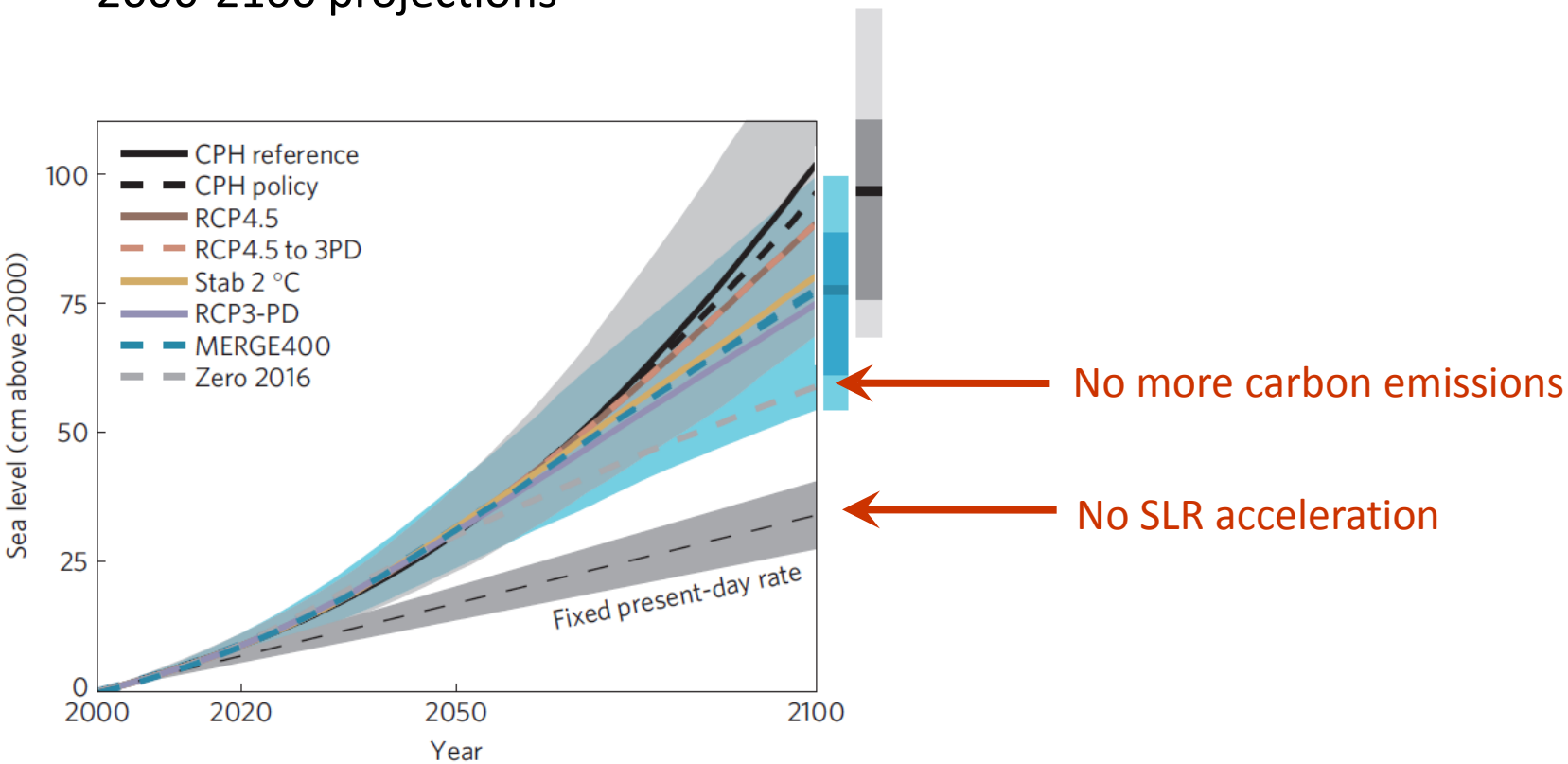

Current peak tide heights
31 cm net increase will cause this to occur
% nest survival through tidal max
tidal max (m above MSL)
95% of nests fail
2002
2003
2004
2006
2007
2008
2009
0.0
0.2
0.4
0.6
0.8
1.0
1.1
1.2
1.3
1.4
1.5
1.6
1.7
1.8

When will reproduction fail?



Sea-level rise is not going to stop anytime soon

2000-2100 projections



"mitigation measures, even an abrupt switch to zero emissions, have practically no effect on sea level over the coming 50 years and only a moderate effect on sea level by 2100"

Schaeffer et al. 2012 Nature Climate Change

SHARP: General Objectives

1) Fill gaps in current surveys

2) Produce population estimates and identify regional population centers

3) Repeat historic surveys

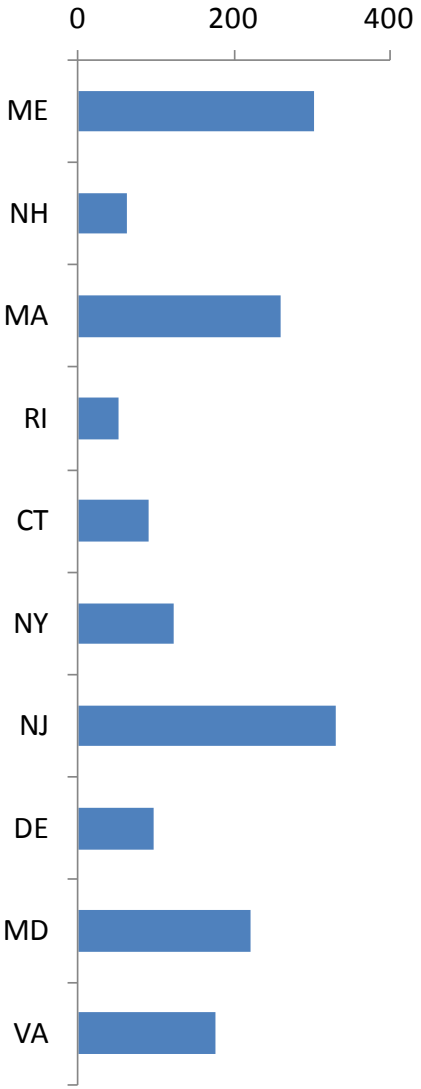
4) Model geographic variation in productivity and survival

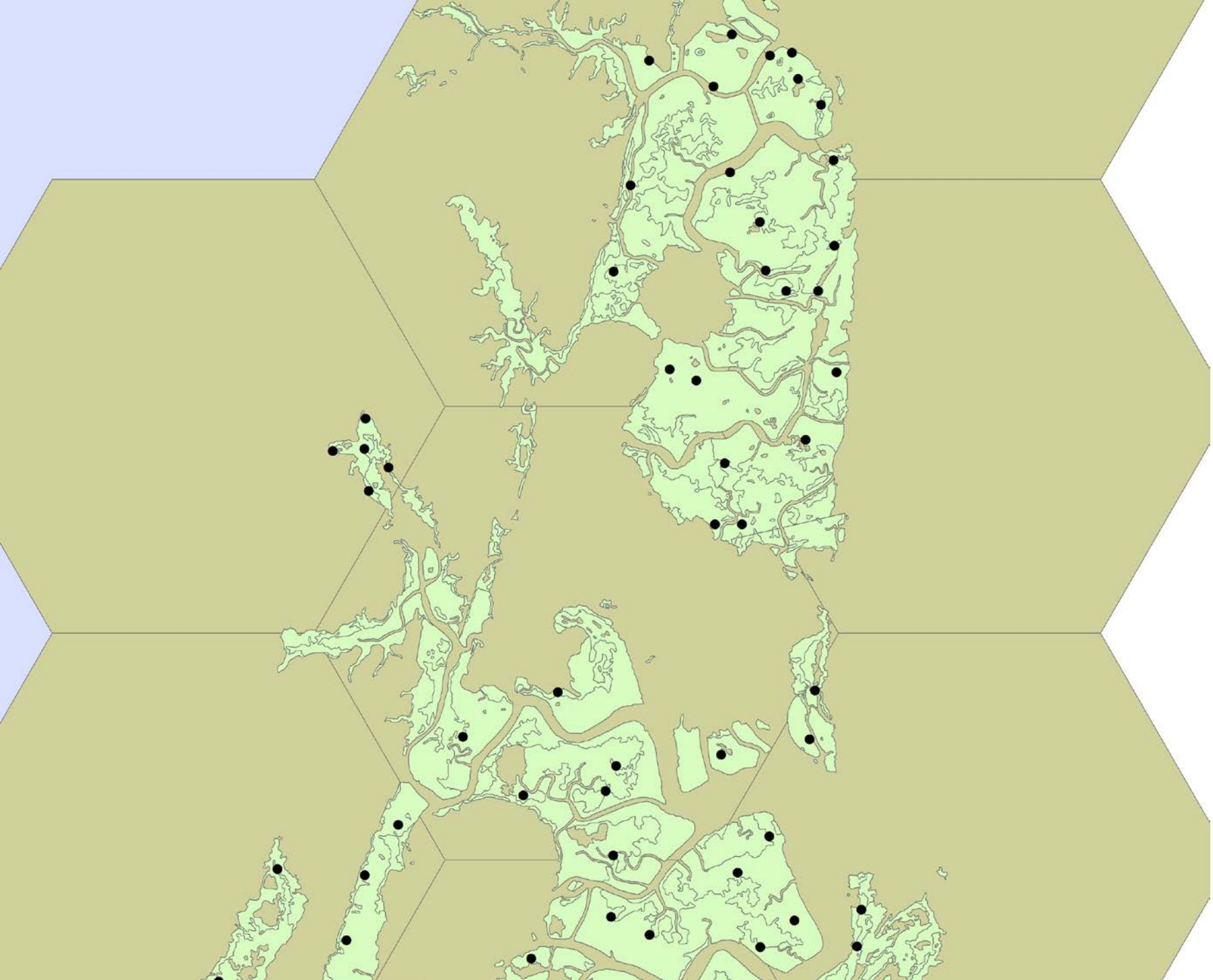
5) Provide a detailed description of states' regional responsibility

6) Identify the most critical areas for the long-term preservation of the tidal marsh bird community within each state

www.tidalmarshbirds.org

~ 1,700 points sampled (2011 – 2013)



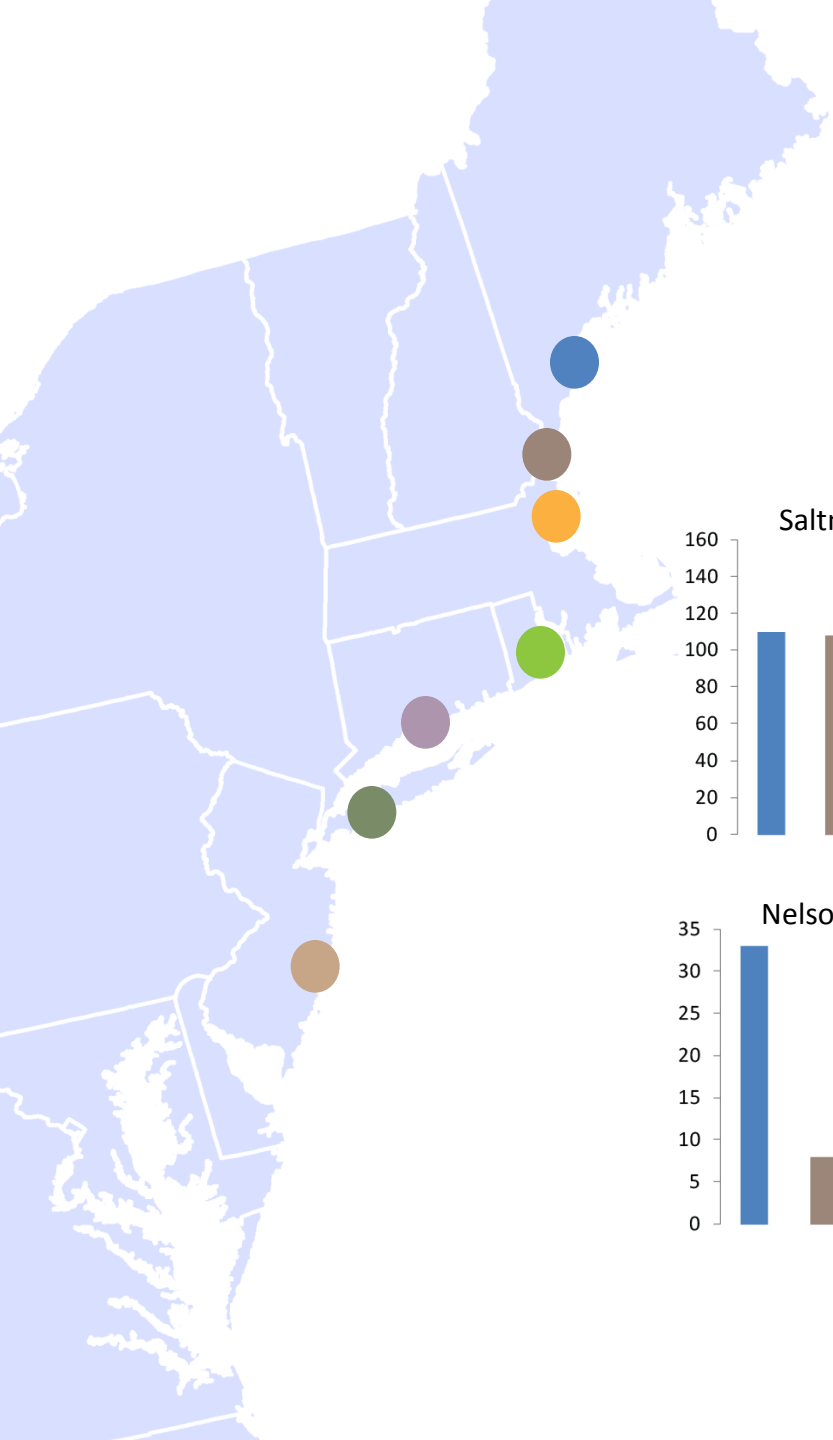


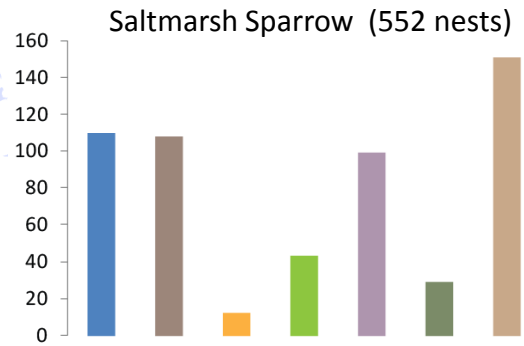
% occurrence (raw)

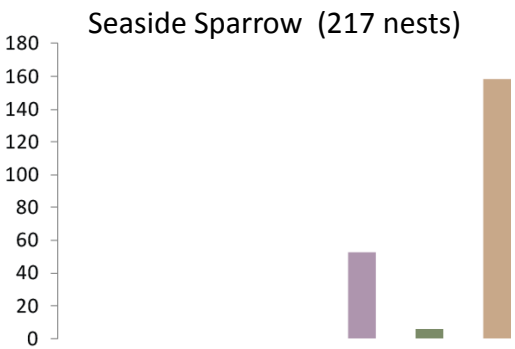
Species	2011	2012
American black duck	6.2	10.3
Clapper rail	28.7	38.4
Willet	41.5	50.8
Nelson’s sparrow	8.6	9.8
Saltmarsh sparrow	14.9	29.0
Seaside sparrow	24.2	30.5

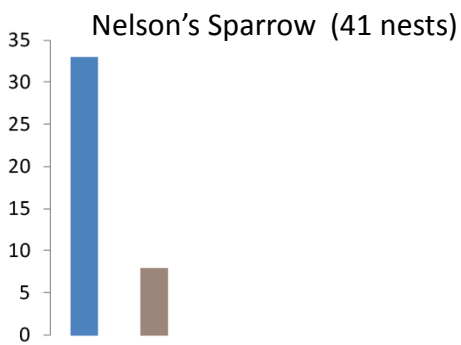
Demographic patterns

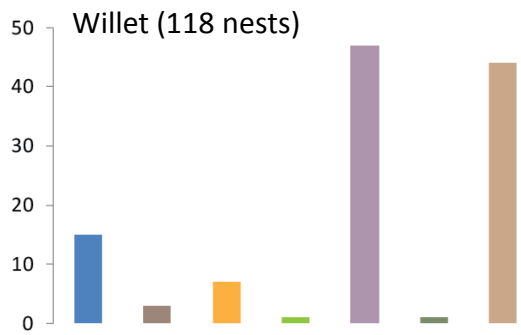
- nesting success
- renesting patterns
- adult survival
- population viability











3274 sparrows banded**

State	Nelson's	Saltmarsh	"Sharp-tailed"	Seaside
ME	161	391	275	**0**
NH	45	174	189	0
MA*	0	153	0	3
RI	0	237	0	0
CT	13	374	0	78
NY	0	69	0	20
NJ	0	656	0	436
Totals	**219**	**2054**	**464**	**537**

* 2012 only; **breeding season only

Graduate student projects

University of Maine

- **Mo Correll:** historical changes, high marsh remote sensing
- **Kate Ruskin:** reproductive biology, contaminants
- **James Style:** reproductive biology, chick development

University of New Hampshire

- **Jen Walsh:** population genetics, hybrid zone dynamics
- **Lauren Kordonowy:** endocrinology and behavior

University of Connecticut

- **Alyssa Borowske:** within-season survival, condition, migration
- **Chris Field:** annual survival, PVA, conservation planning, DST
- **Emma Shelly**: breeding systems, mate choice

SUNY-ESF, Syracuse

- **Alison Kocek:** impacts of restoration

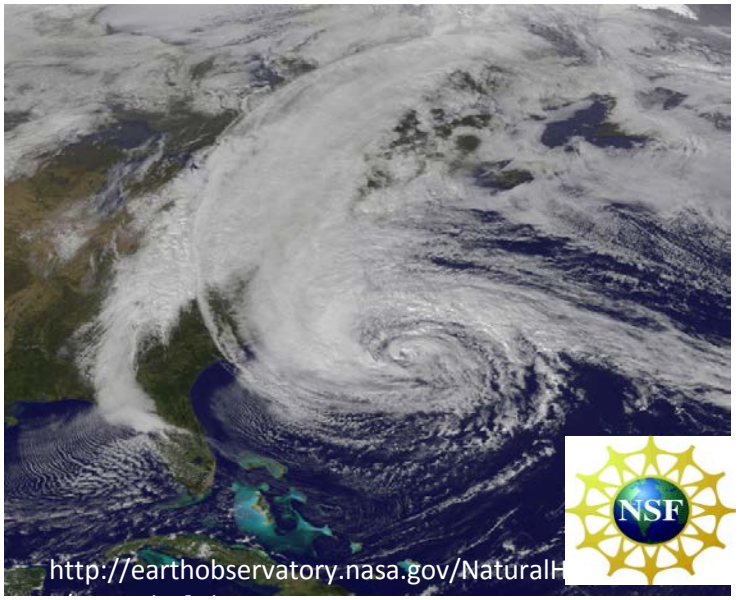
University of Delaware

- **Becky Kern:** reproductive biology, predation, flooding
- **Whitney Wiest:** population distributions, conservation planning

Clapper Rail population estimate

State	2011		2012	
	Points (n)	Total CLRA (SE)	Points (n)	Total CLRA (SE)
ME	312	0	305	0
NH	62	0	62	0
MA	253	0	253	0
RI	50	0	55	0
CT	97	925.0 (157.4)	90	395.0 (99.2)
NY	100	3,782.3 (500.4)	124	3,669.2 (421.6)
NJ	269	80,322.0 (6,828.3)	338	122,841.1 (7,782.5)
DE	102	18,709.3 (2,393.8)	93	24,973.9 (2,803.4)
MD	210	32,698.0 (2,956.1)	221	24,536.0 (2,248.7)
VA	188	116,774.3 (7,507.8)	169	88,802.3 (5,539.4)
Total	1,643	253,211.0 (20,343.8)	1,710	265,217.4 (18,894.7)

Hurricane Sandy Project Initiated…



2014 – 2016

- Two more years of demographics work
- Three more years of surveys (2015 – 2016 surveys focused on pre- and post-restoration monitoring)

Heads up to existing partners!

SHARP collaborators

U.S. Fish & Wildlife Service

Connecticut Department of Environmental Protection

Delaware Division Fish & Wildlife

Maryland Department of Natural Resources

National Park Service

Virginia Department of Game & Inland Fisheries

ESF

University of New Hampshire

The Nature Conservancy

New York City Audubon

New Jersey Audubon

New Jersey Division of Fish and Wildlife

Connecticut Audubon Society

Mass Audubon — Protecting the Nature of Massachusetts

N.H. Audubon

Commonwealth of Massachusetts — Division of Fisheries & Wildlife

Smithsonian National Zoological Park

USGS — science for a changing world

NSF

… and more

www.tidalmarshbirds.org
R. Kern