Additional stress throughout ontogeny

Drought

Weather changes

Temperature shifts

Hypoxia

Food web shifts

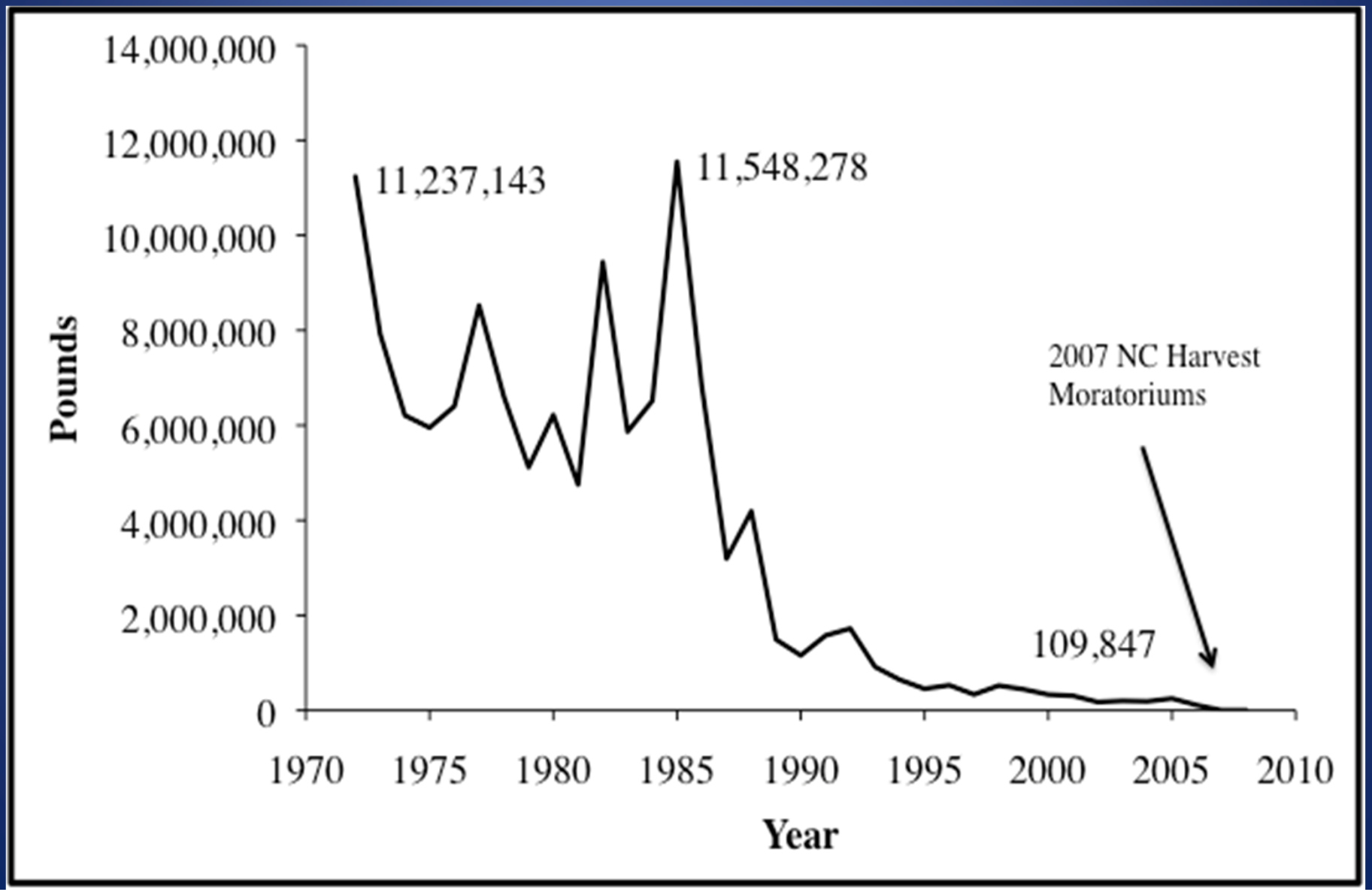
Straying rate

North Carolina River Herring Datasets Related to Climate Change

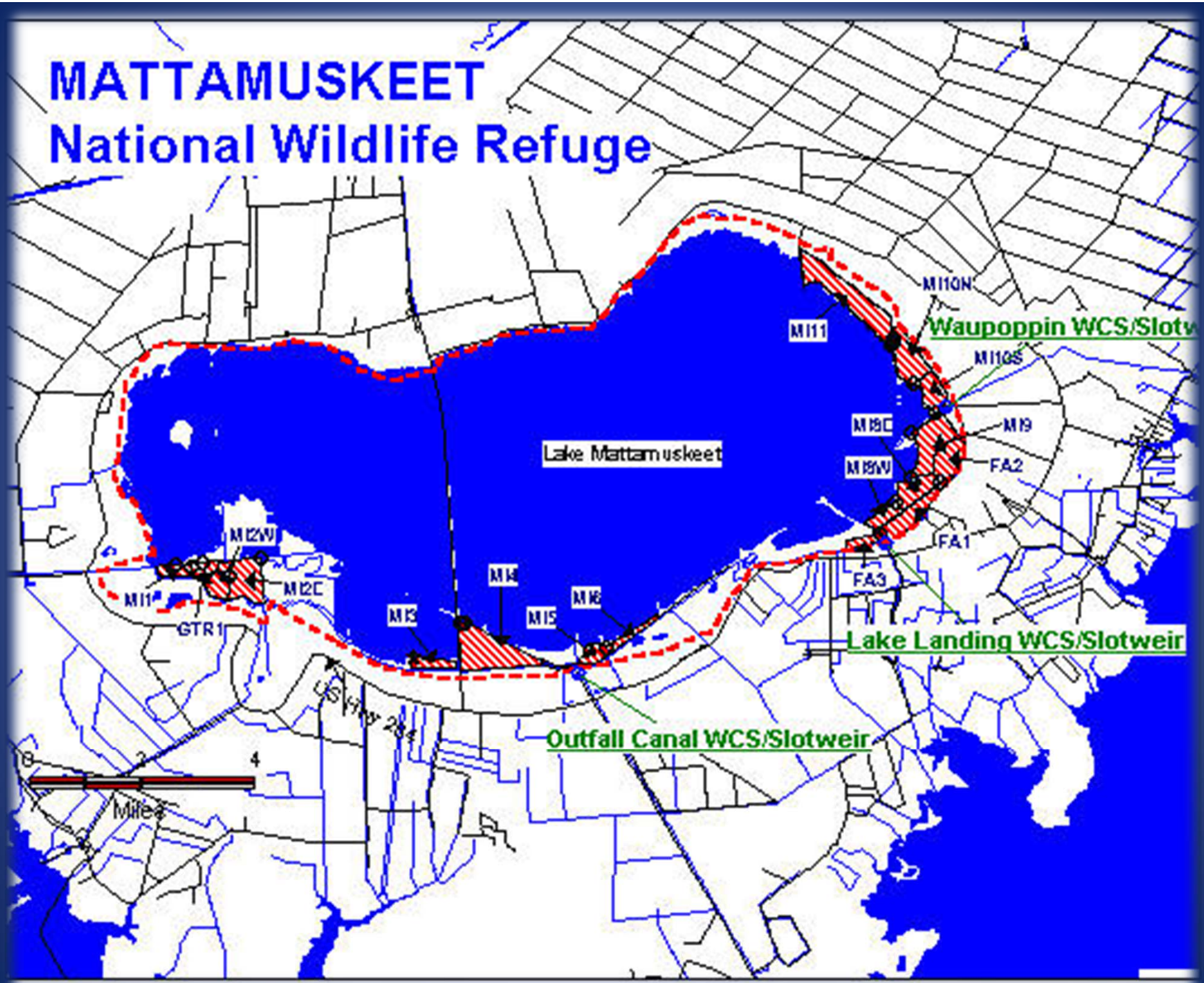
NMFS River Herring Climate Change Workshop
NMFS Northeast Regional Office, Gloucester, MA
July 18-19, 2012

Roger A. Rulifson
East Carolina University
And
R. Wilson Laney
US Fish and Wildlife Service

NCDMF Commercial Catch Data



North Carolina's unique barrier island and sound system


MATTAMUSKEET
National Wildlife Refuge
Lake Mattamuskeet
M10N
M11
Waupoppin WCS/Slotw
M10S
M9C
M9
M9W
FA2
FA1
FA3
M12W
M12C
M11
GTR1
M13
M14
M15
M16
Lake Landing WCS/Slotweir
Outfall Canal WCS/Slotweir
US Hwy 264
0
2
4
Miles

Water Control Structures

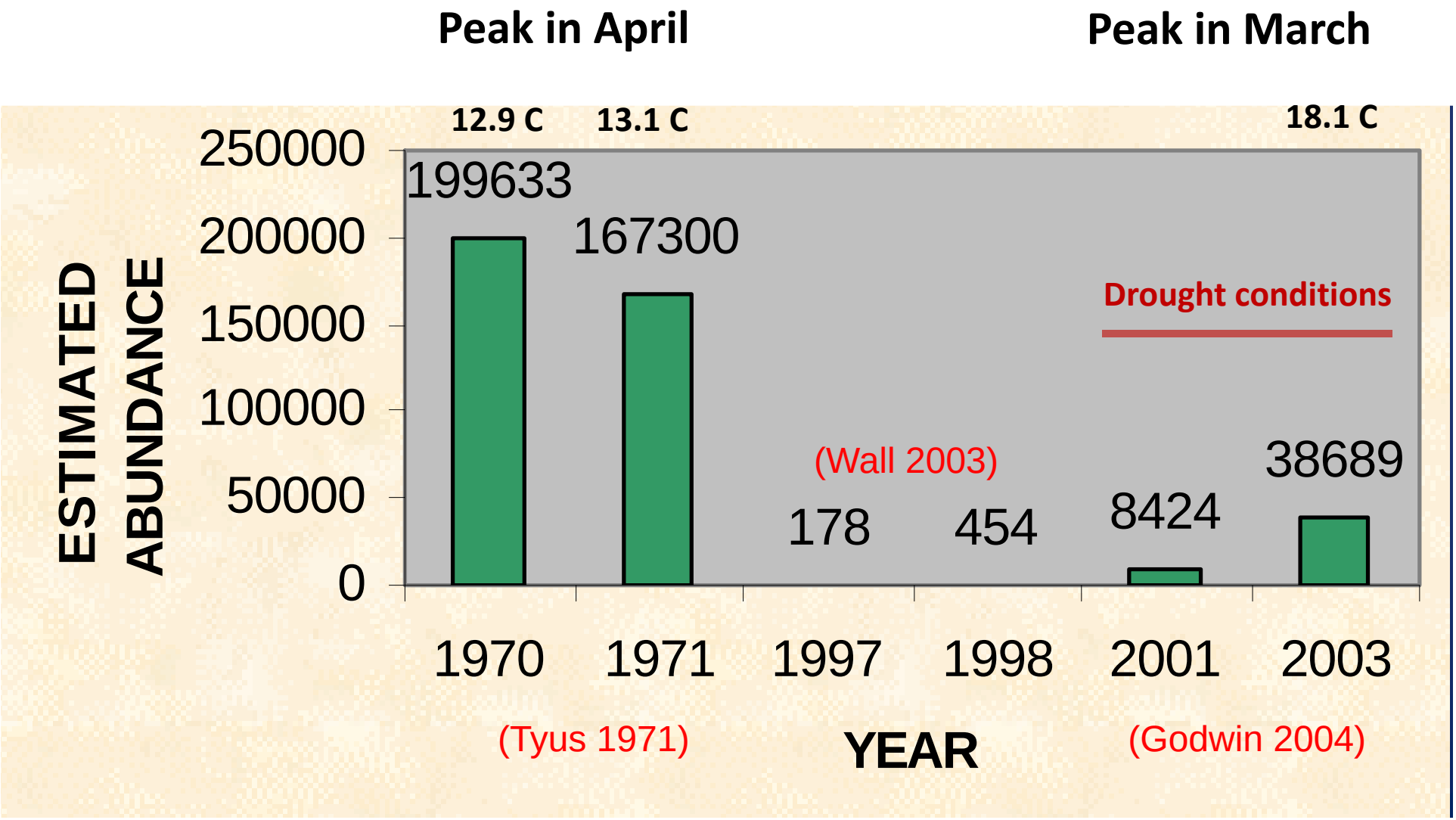
Water control structure with Mattamuskeet "pumping station"

Fishing for river herring in the 1970s

Lake Mattamuskeet

Godwin (2004)

Mattamuskeet Alewife Runs



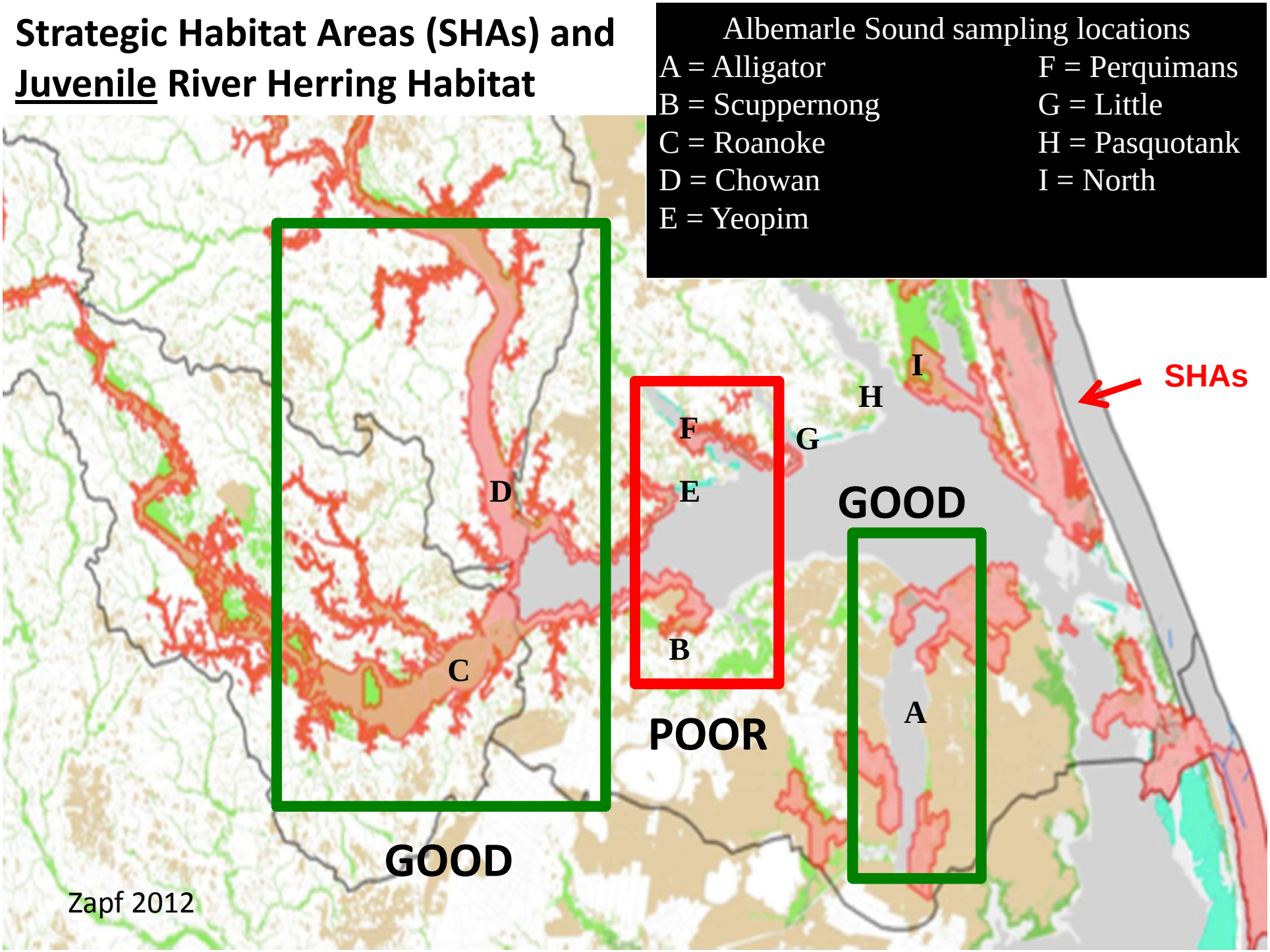
A variety of available habitats at Mattamuskeet NWR:

Open water

Soundside canals

Lakebed canals

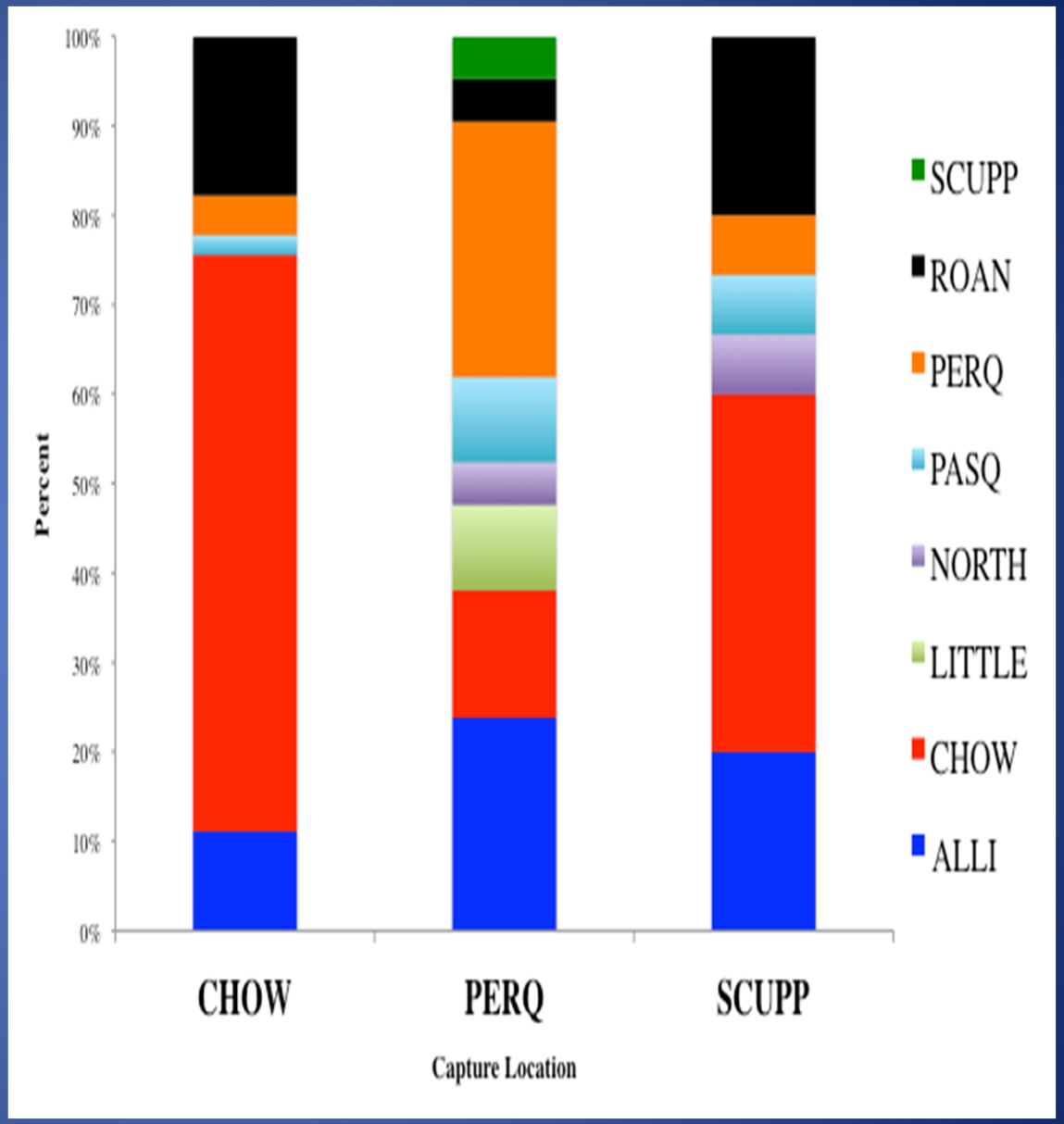
Strategic Habitat Areas (SHAs) and <u>Juvenile</u> River Herring Habitat



Blueback Herring

Straying Rate?
Drought
Poor juvenile habitat

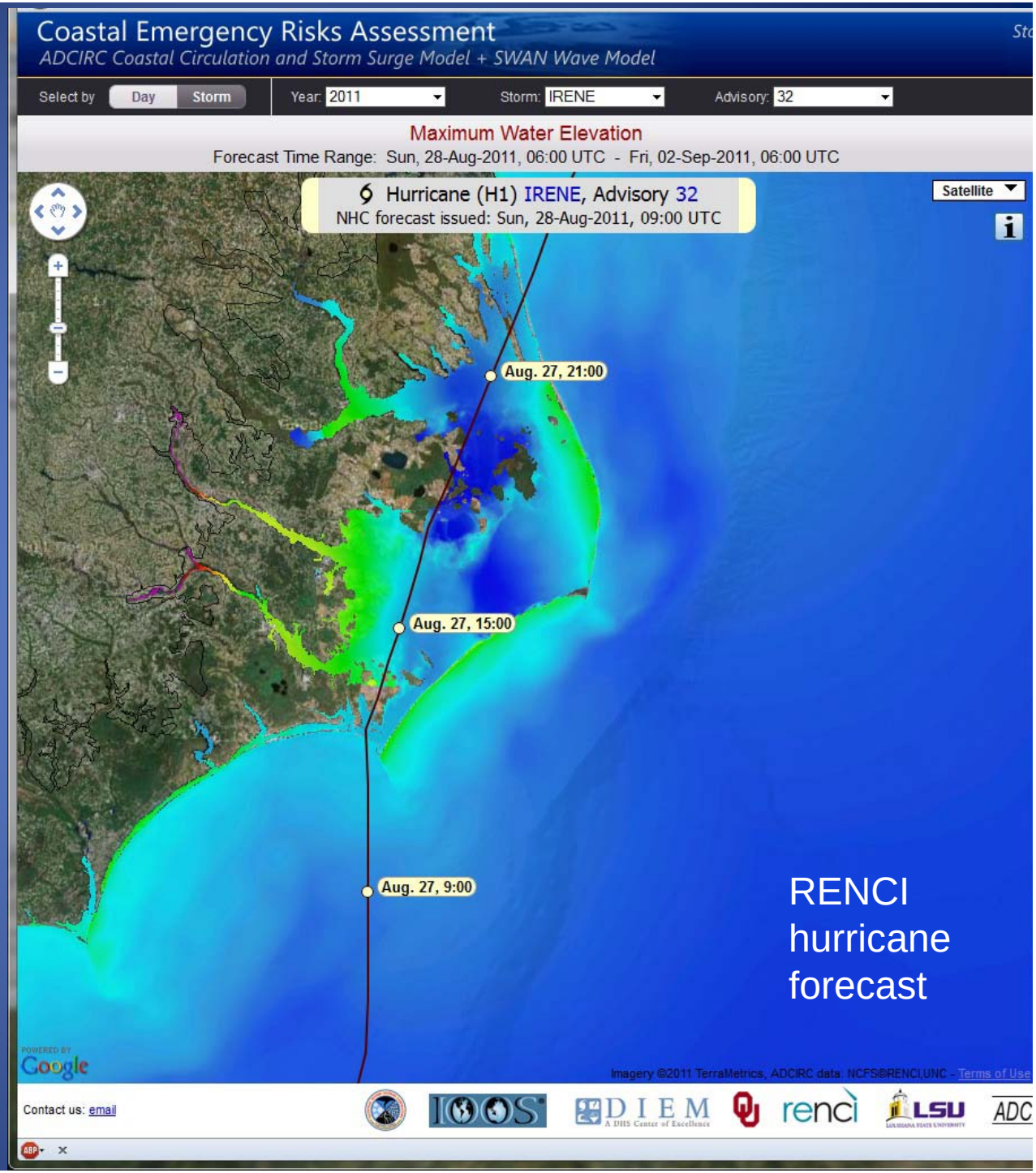
River of origin of adults returning to the Chowan, Perquimans and Scuppernong rivers based on elemental fingerprints obtained from juvenile river herring



Zapf 2012

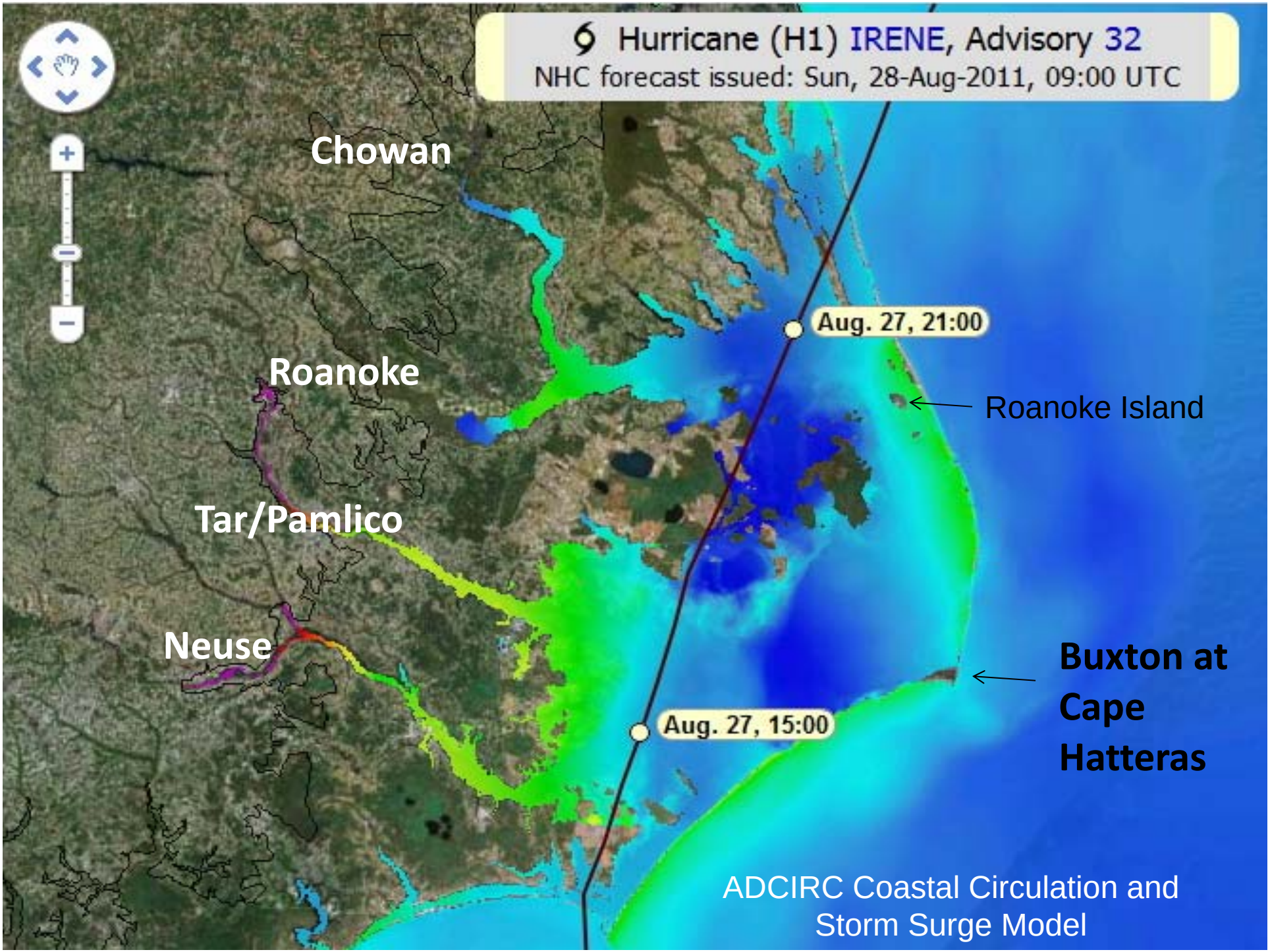
We need both otolith and DNA fingerprints

Hurricane Irene floods entire Outer Banks



RENCI hurricane forecast

(ADCIRC Coastal Circulation and Storm Surge Model)


Hurricane (H1) IRENE, Advisory 32
NHC forecast issued: Sun, 28-Aug-2011, 09:00 UTC
Chowan
Roanoke
Tar/Pamlico
Neuse
Aug. 27, 21:00
Aug. 27, 15:00
Roanoke Island
Buxton at Cape Hatteras
ADCIRC Coastal Circulation and Storm Surge Model