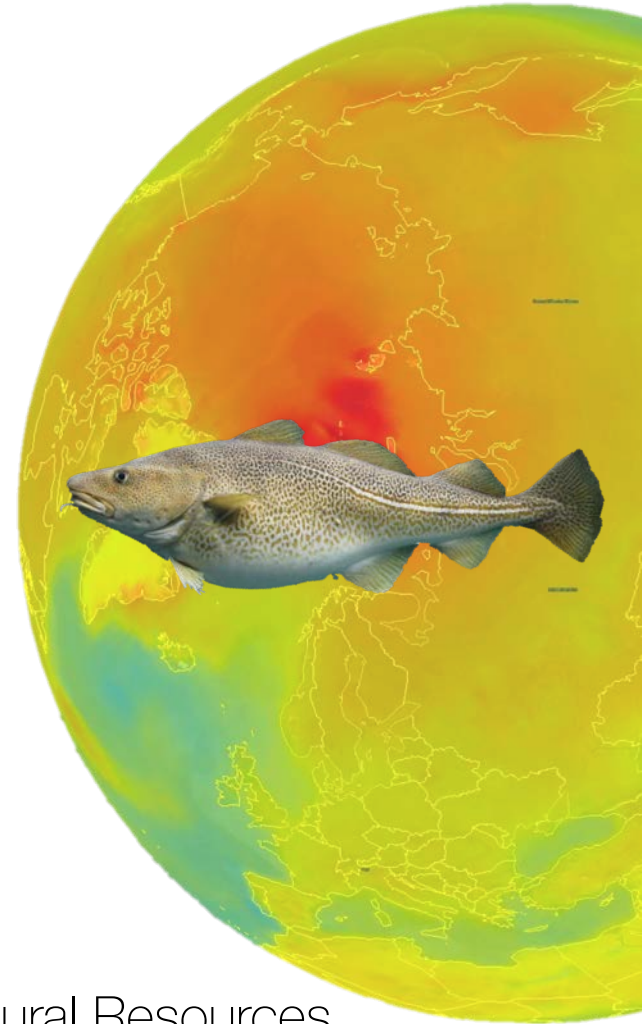


Climate change, fisheries, and “fish wars”

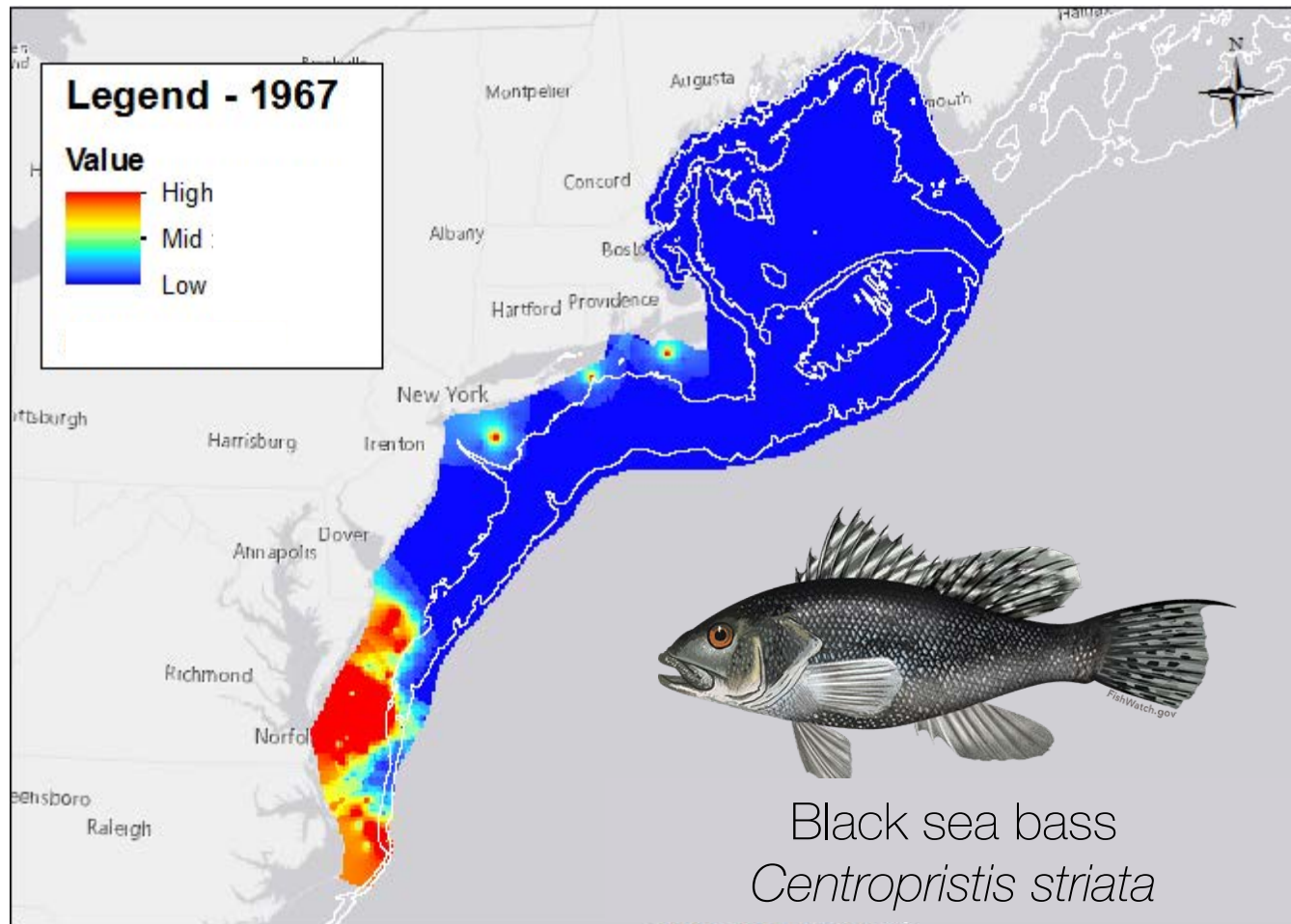


Department of Ecology, Evolution, and Natural Resources
Institute of Earth, Ocean, and Atmospheric Sciences

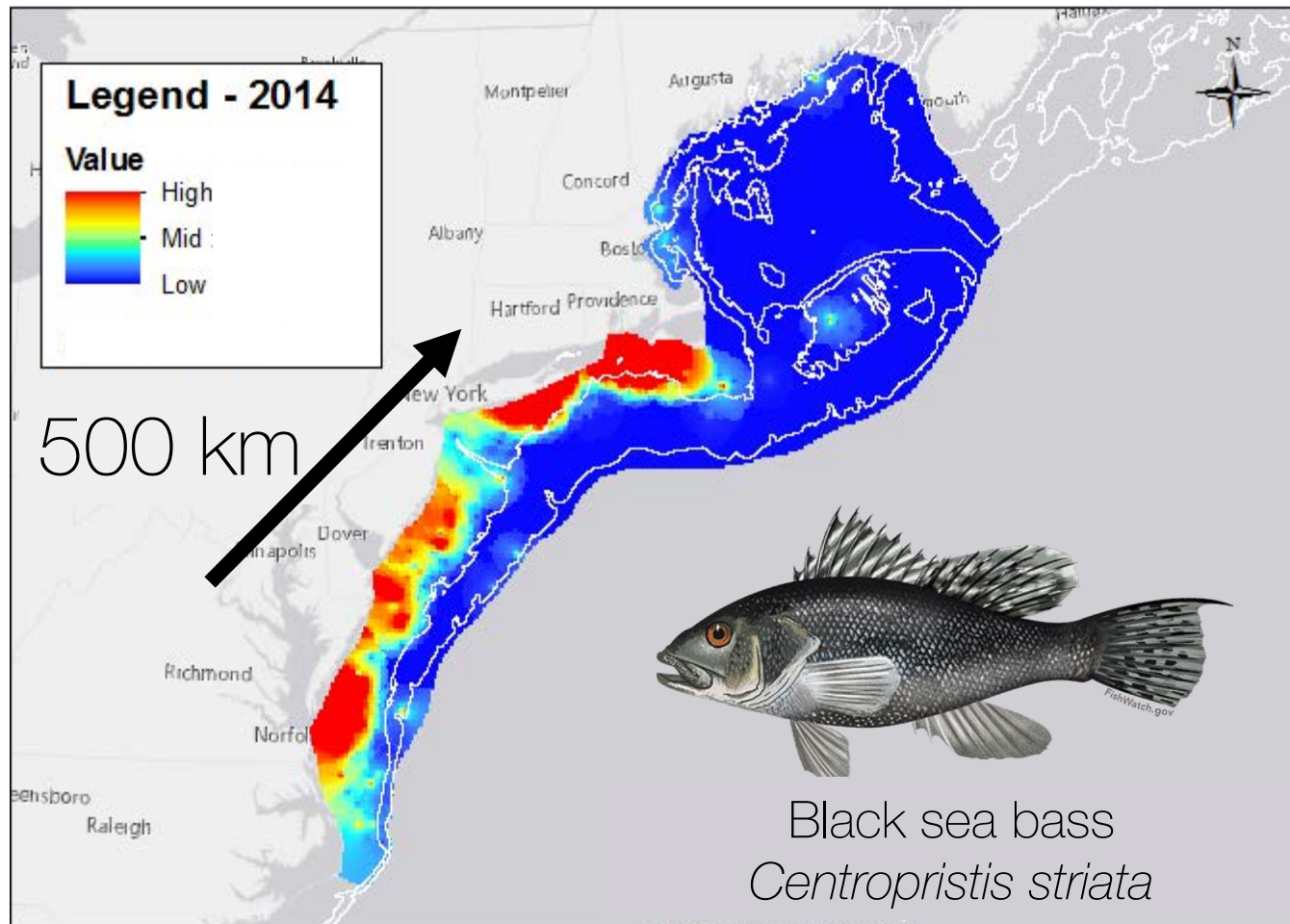
Food for the world



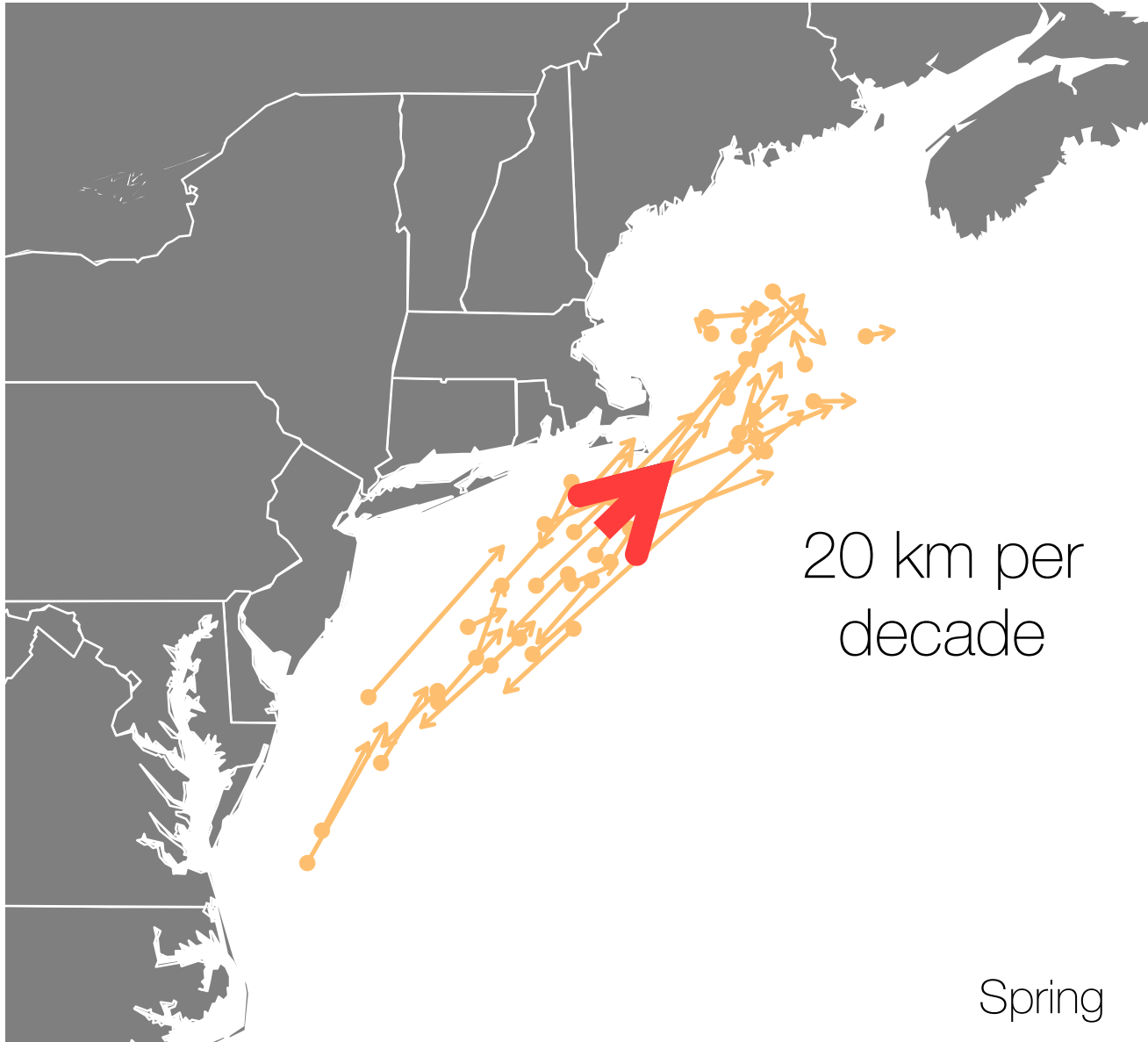
Shifting distributions 1967



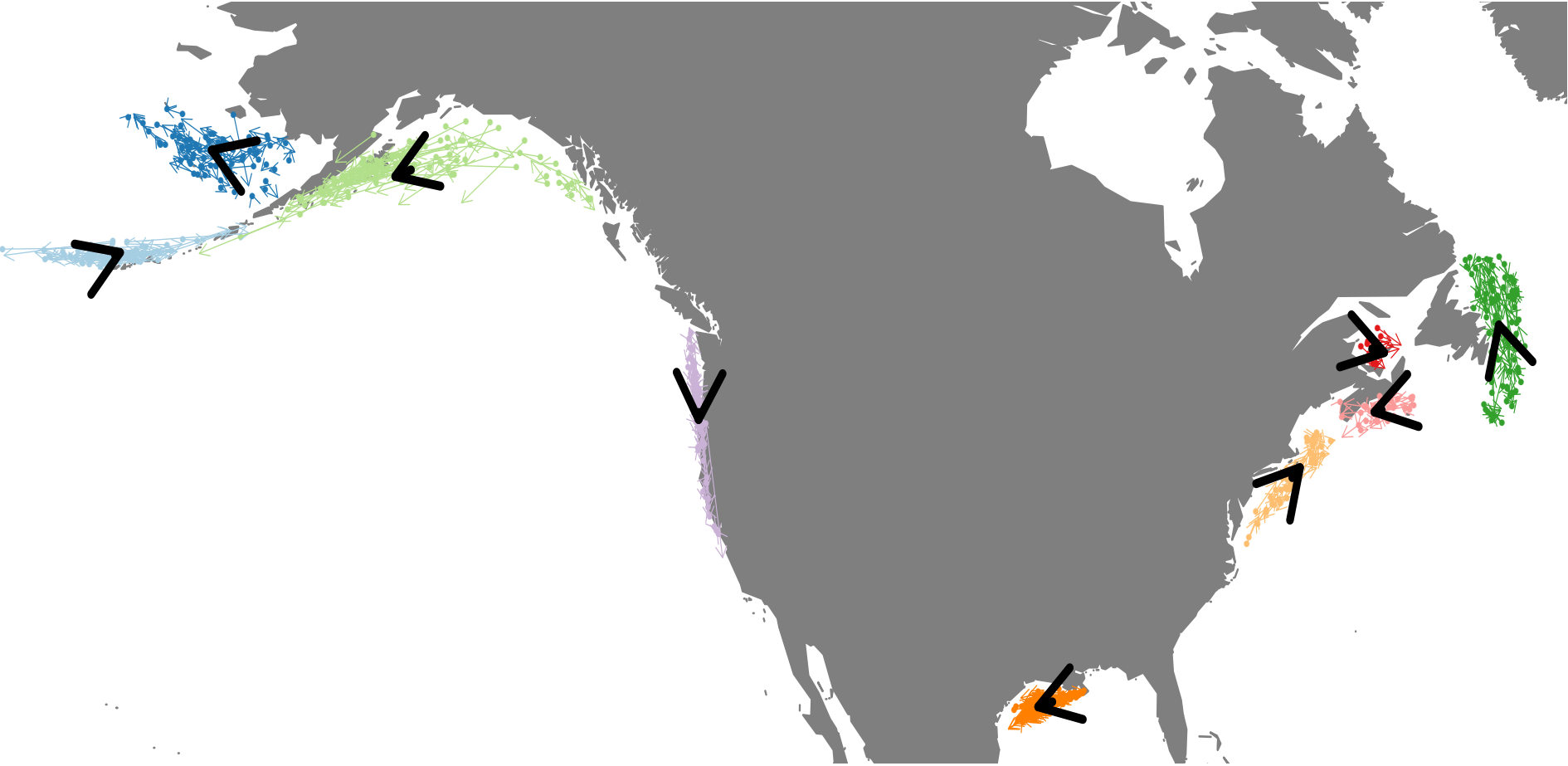
Shifting distributions 1967-2014



Many species on the move



Many species on the move



Bottom-up fishery adaptation

- Travel further



Bottom-up fishery adaptation

- Travel further
- Switch ports



Bottom-up fishery adaptation

- Travel further
- Switch ports
- Switch species



Bottom-up fishery adaptation

- Travel further
- Switch ports
- Switch species
- Leave fishing



Bottom-up fishery adaptation

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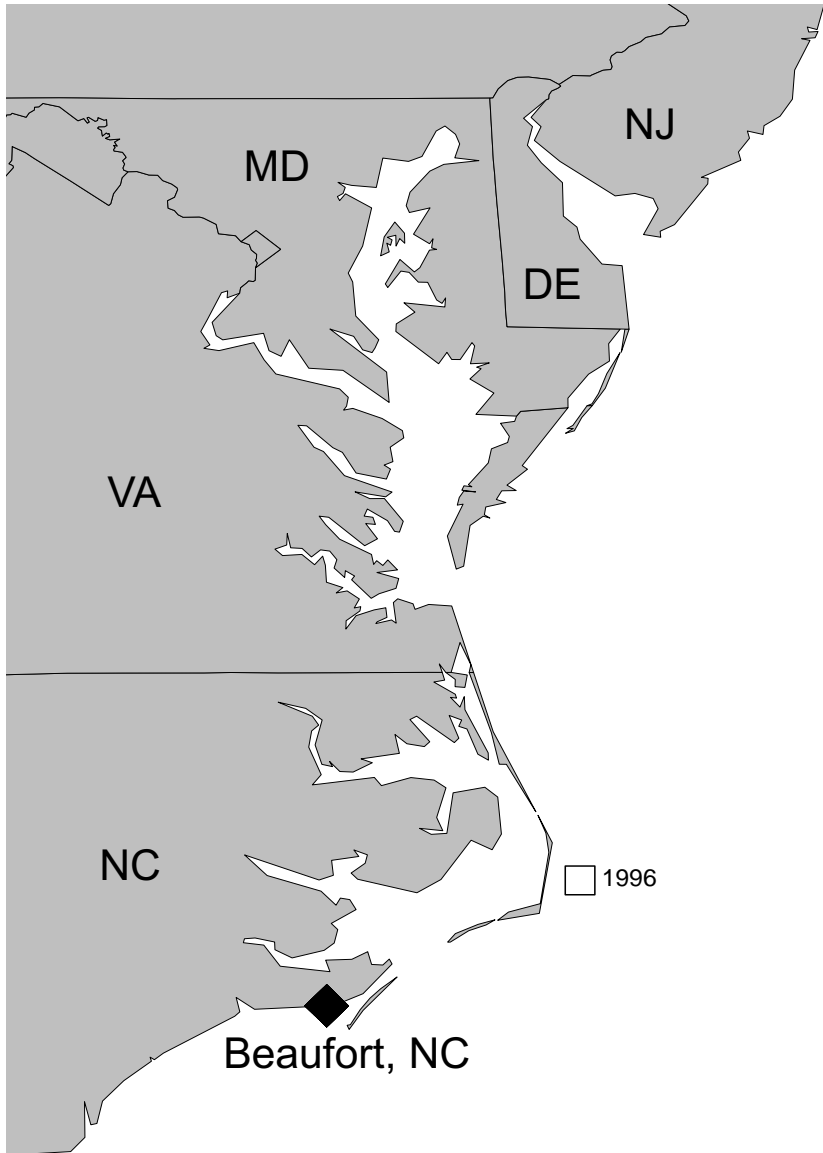
**Regulations
Economics
Technology**

Bottom-up fishery adaptation

- Travel further
- Switch ports
- Switch species
- Leave fishing



Longer fishing trips

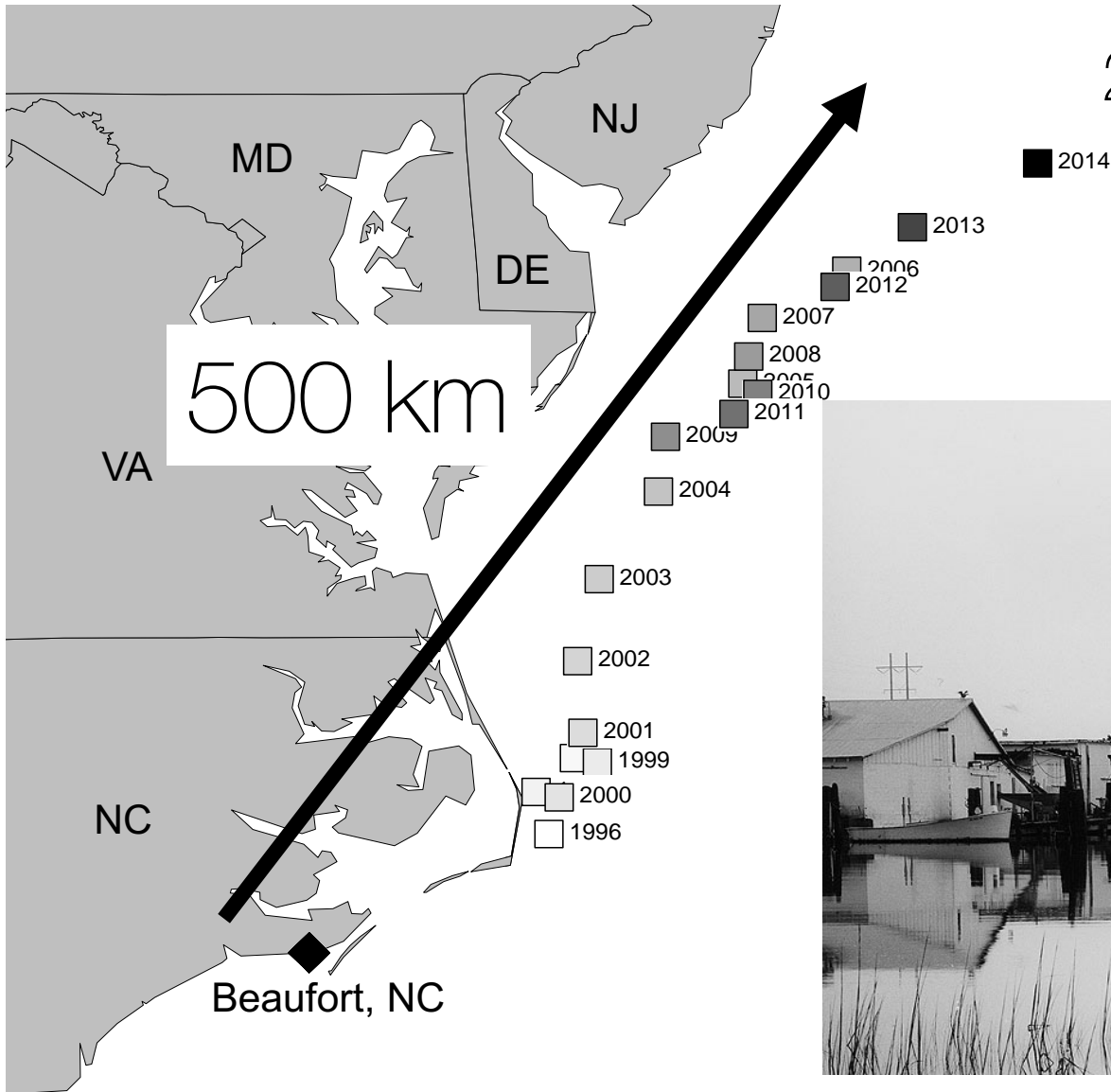


1996

From Vessel Trip Reports



Longer fishing trips

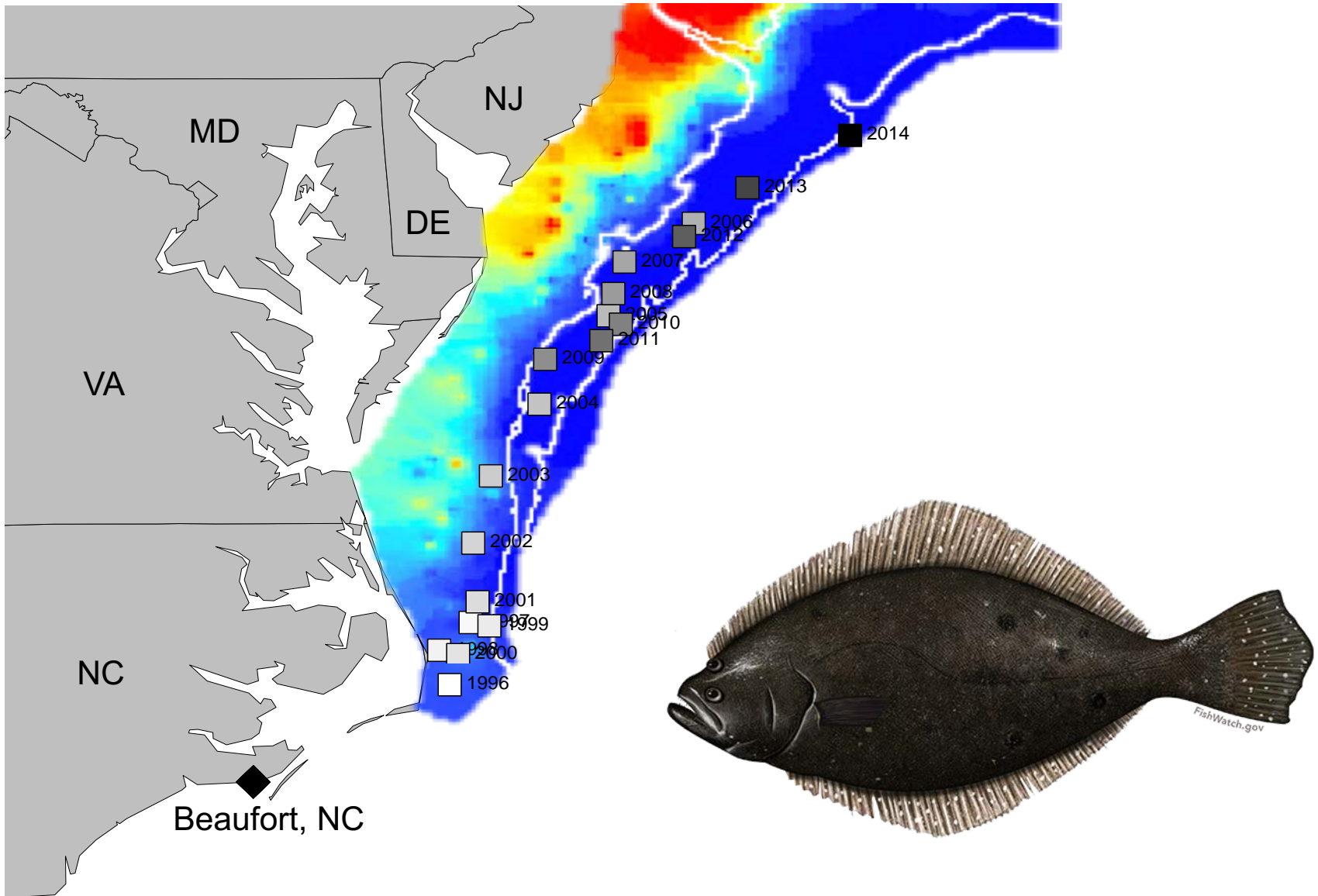


2014

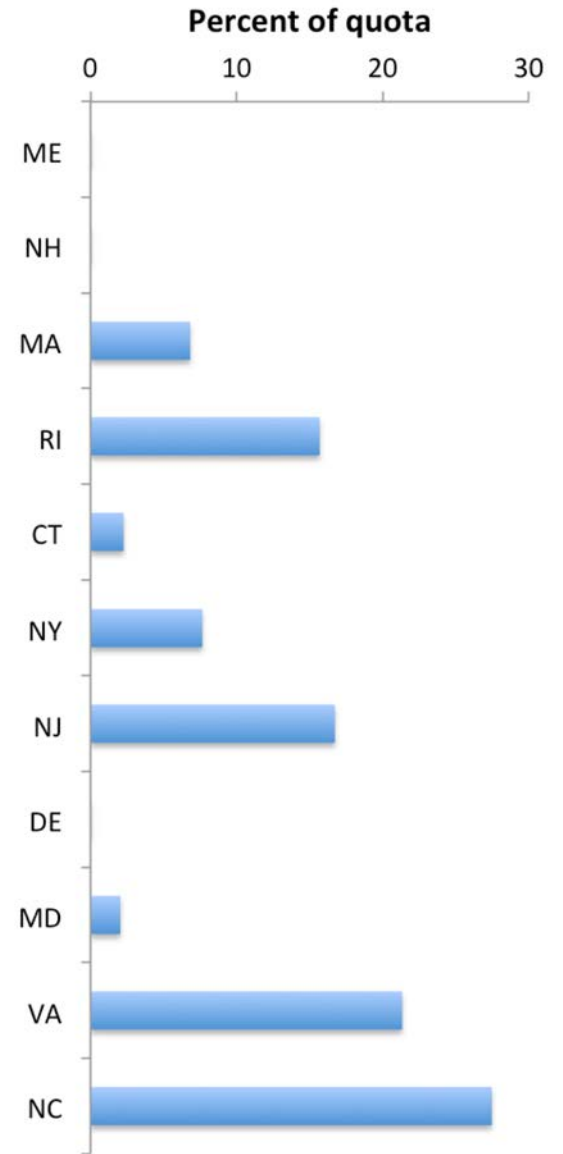
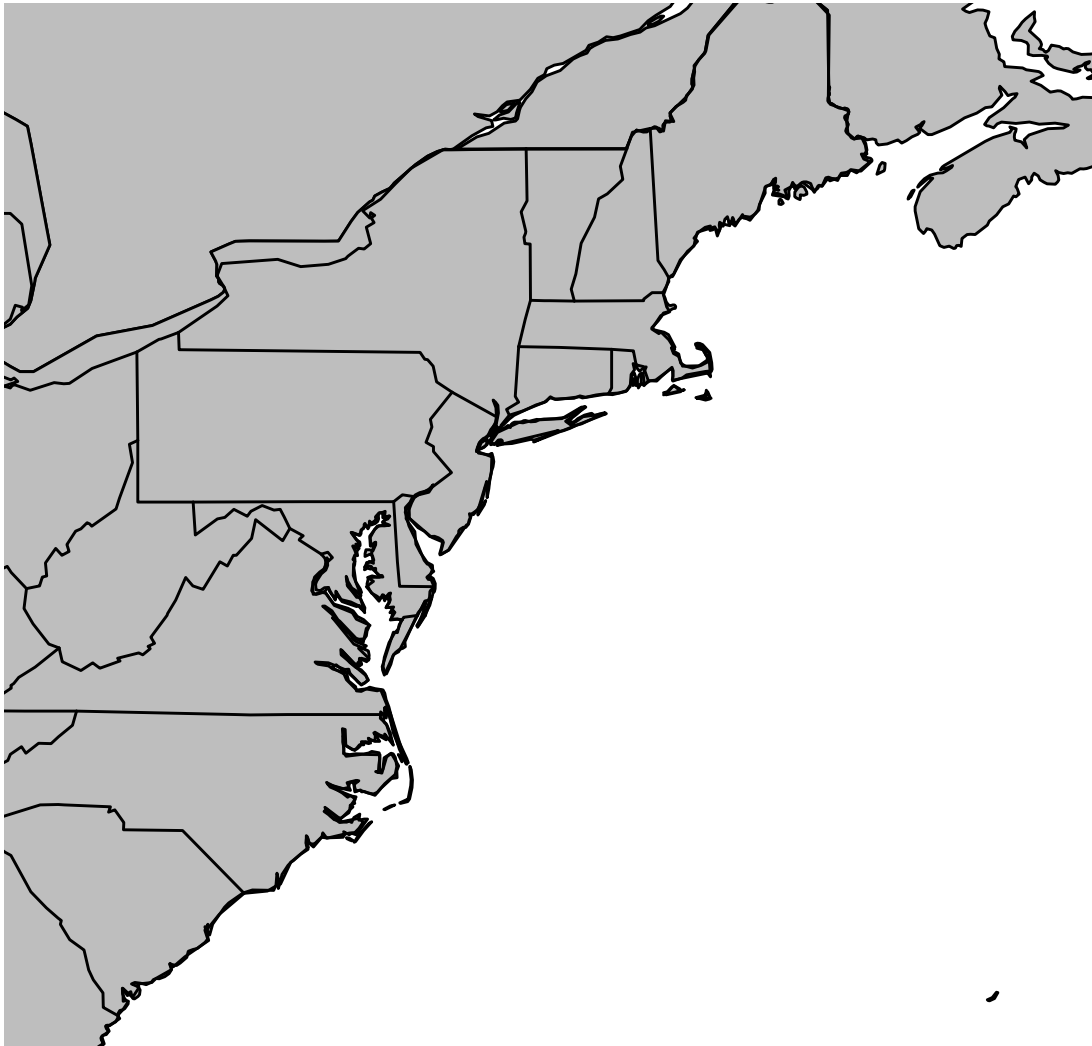
From Vessel Trip Reports



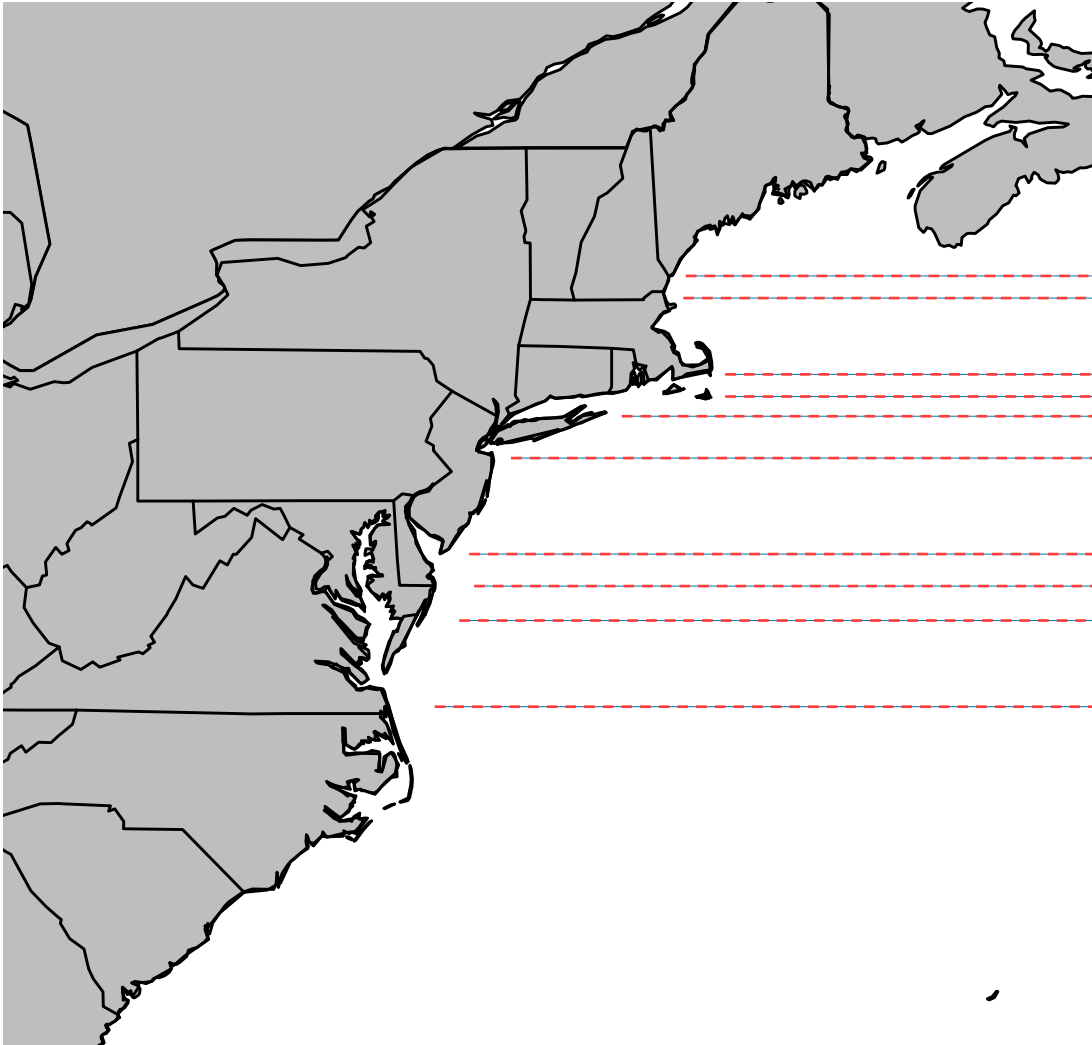
Specialist fishers in a changing world



Summer flounder: allocation of landings



Challenges from crossing boundaries



Summer flounder
Paralichthys dentatus



Challenges from crossing boundaries

Summer flounder
Paralichthys dentatus
2016

Congress of the United States
Washington, DC 20515

May 23, 2016

The Honorable Penny Pritzker
Secretary
U.S. Department of Commerce
1401 Constitution Avenue, N.W.
Washington, D.C. 20230

Dear Secretary Pritzker:

As Members of Congress from states with rich fishing resources, we write today to voice our concerns about the current management of summer flounder, black sea bass, and scup fish stocks. The shift in fish populations northward, New England fishery management changes, and bountiful stocks managed by a Fishery Management Council, have led to local states low catch quotas.

It has long been acknowledged that changes in fishery management coordination among Regional Fishery Management Councils (RFMC) required by the 2006 MSA reauthorization (MSA) are necessary. In fact, in a 2007 report required by the 2006 MSA reauthorization, the MAFMC Council stated that "issues arise which require joint management by the Council." However, there are several instances where RFMCs have prudently managed jointly by the MAFMC (NEFMC) rather than exclusively.

Since the aforementioned 2007 report, concerns regarding black sea bass and summer flounder in the New England states are noticing that fishing grounds, yet state-to-state boundaries continue to throw catch quotas into the air. Legally take sometimes results in using summer flounder allocations on a state-by-state allocation basis, while North Carolina noted that 24 percent of the total catch of 537—a zone just

Looking at the current trends in the fishery, the U.S. Department of Commerce to direct the MAFMC to develop a management plan for the black sea bass and scup fishery that recognizes member states' interests are officially considered. Through joint management, our fishing communities benefit through joint management. We sincerely request that you update the allocation formula. We sincerely request that you

look forward to greater coordination among the coastal Atlantic states. Thank you for your attention to this important matter.

Sincerely,

Joe Courtney
JOE COURTNEY
Member of Congress
Go Murphy
CHRISTOPHER S. MURPHY
United States Senate

Edward J. Markey
EDWARD J. MARKEY
United States Senate

Richard E. Neal
RICHARD E. NEAL
Member of Congress

Michael E. Capuano
MICHAEL E. CAPUANO
Member of Congress

Niki Tsongas
NIKI TSONGAS
Member of Congress

Elizabeth H. Esty
ELIZABETH H. ESTY
Member of Congress

Joseph P. Kennedy, III
JOSEPH P. KENNEDY, III
Member of Congress

Katherine M. Clark
KATHERINE M. CLARK
Member of Congress
Seth Moulton
SETH MOULTON
Member of Congress

Richard Blumenthal
RICHARD BLUMENTHAL
United States Senate

Rosa L. DeLauro
ROSA L. DELAURO
Member of Congress

John B. Larson
JOHN B. LARSON
Member of Congress

William R. Keating
WILLIAM R. KEATING
Member of Congress

Stephen F. Lynch
STEPHEN F. LYNCH
Member of Congress

James A. Himes
JAMES A. HIMES
Member of Congress



International: Mackerel wars

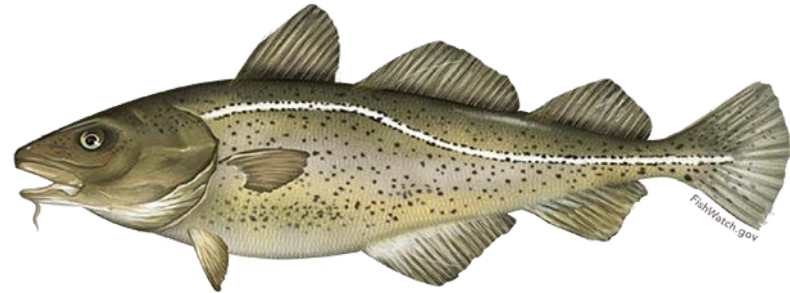
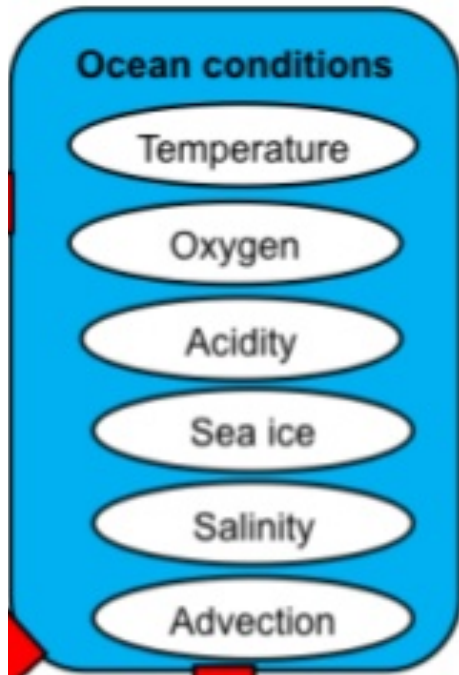


“A large proportion of the militarized disputes between democracies in the post-WWII period involve fisheries...”

Underprepared for fisheries on the
move across political boundaries

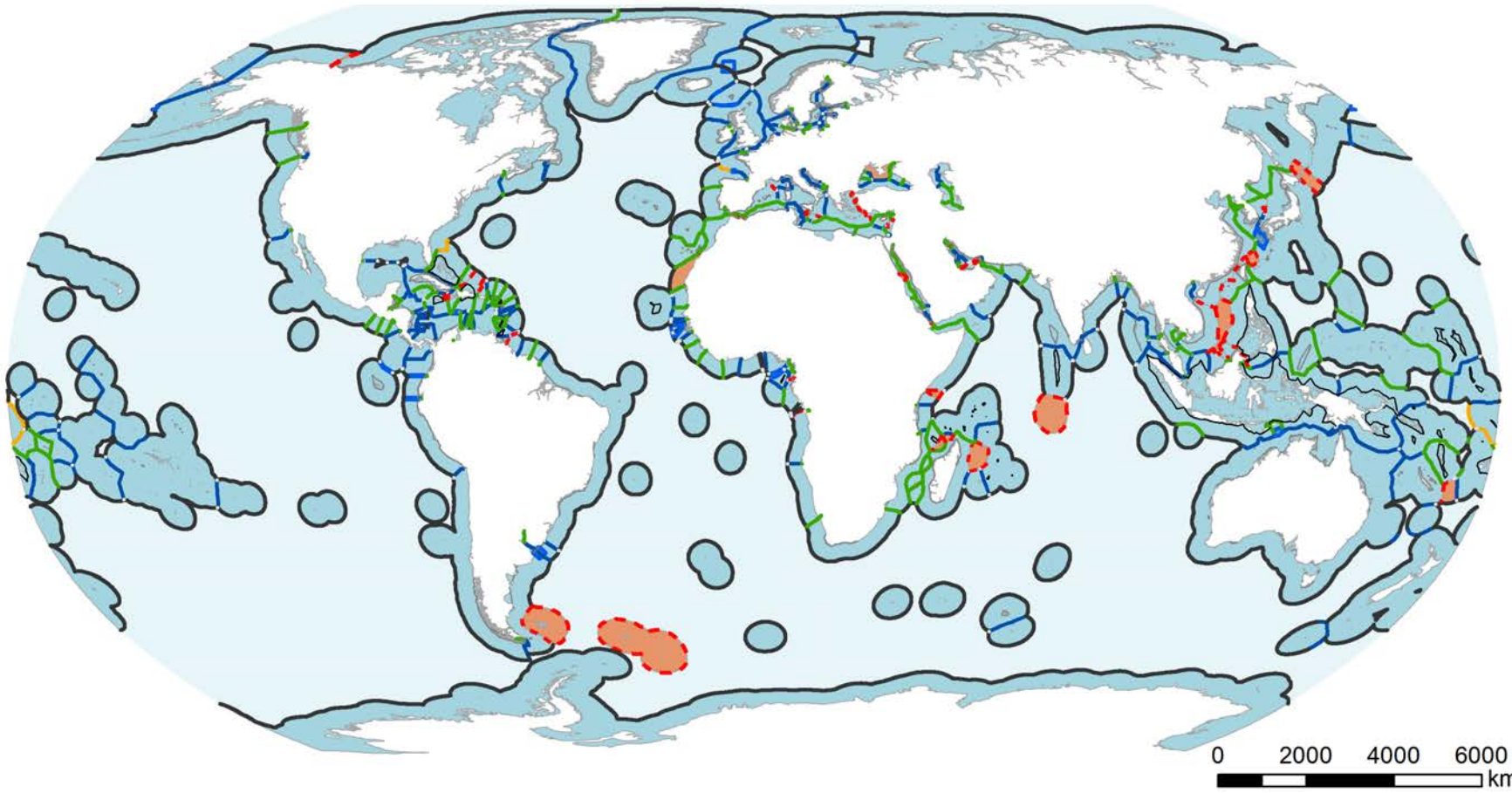
How much of a problem?

Species distribution models



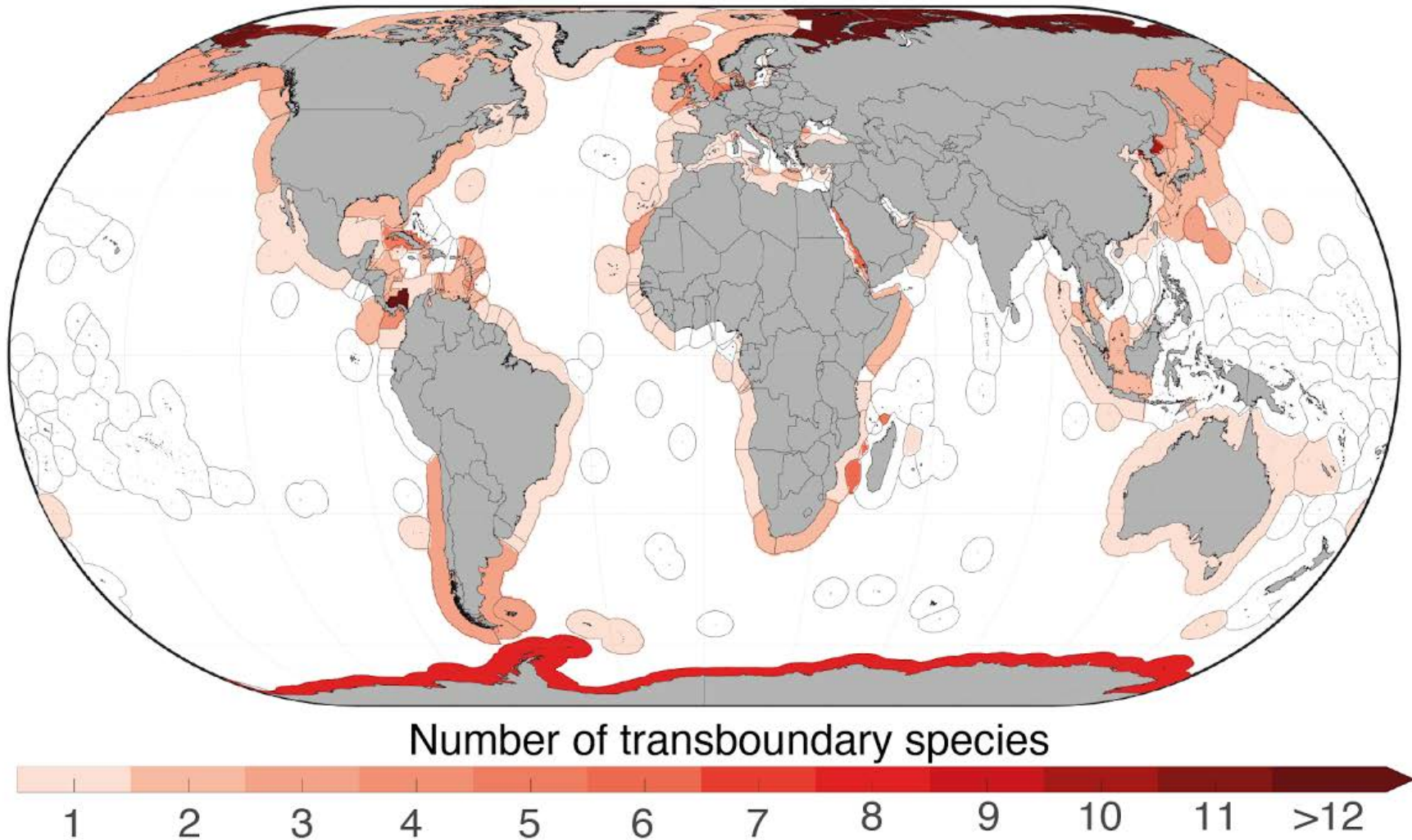
892 species

Exclusive economic zones

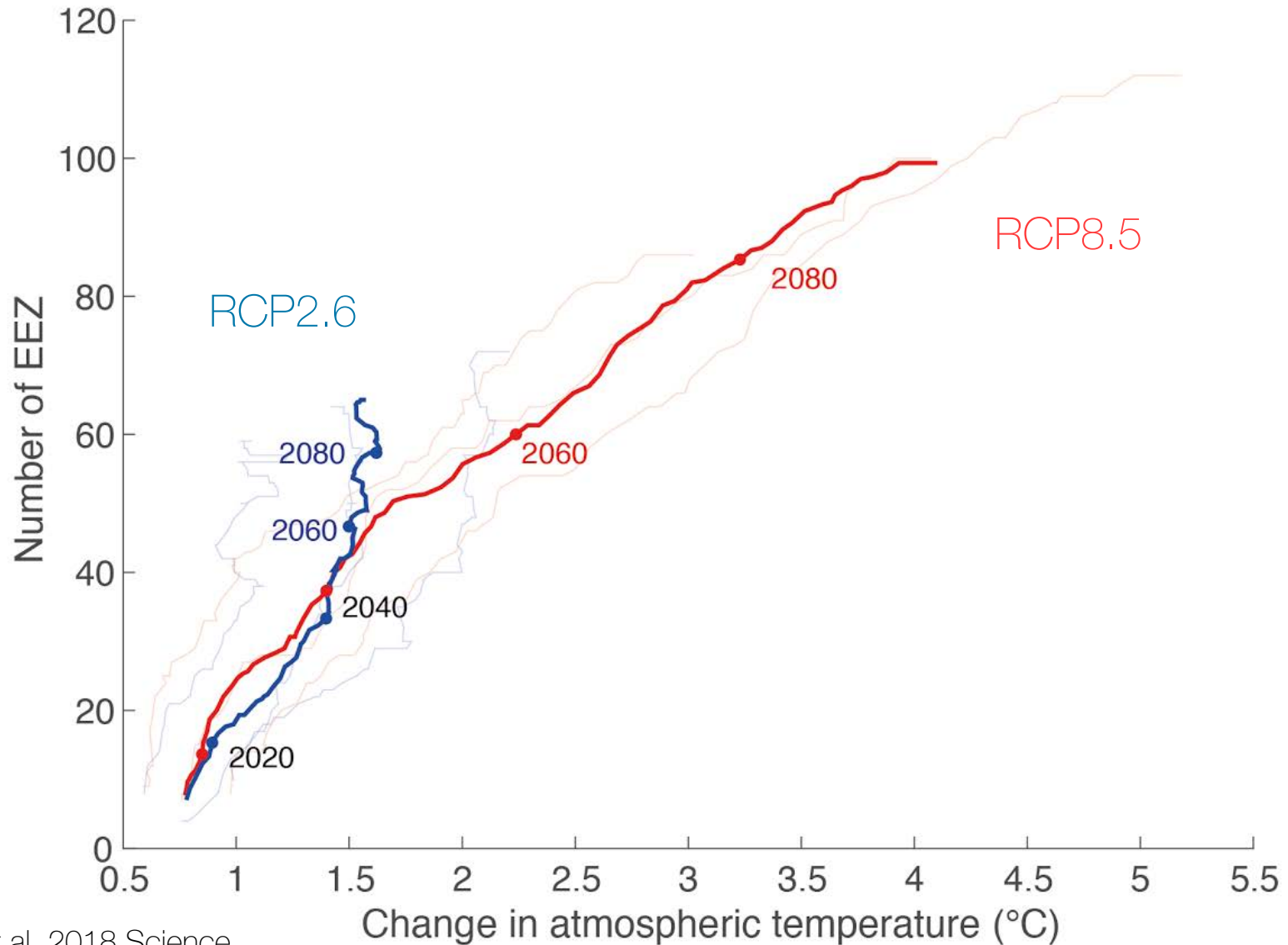


New transboundary stocks by 2100

A



Less potential conflict with lower emissions



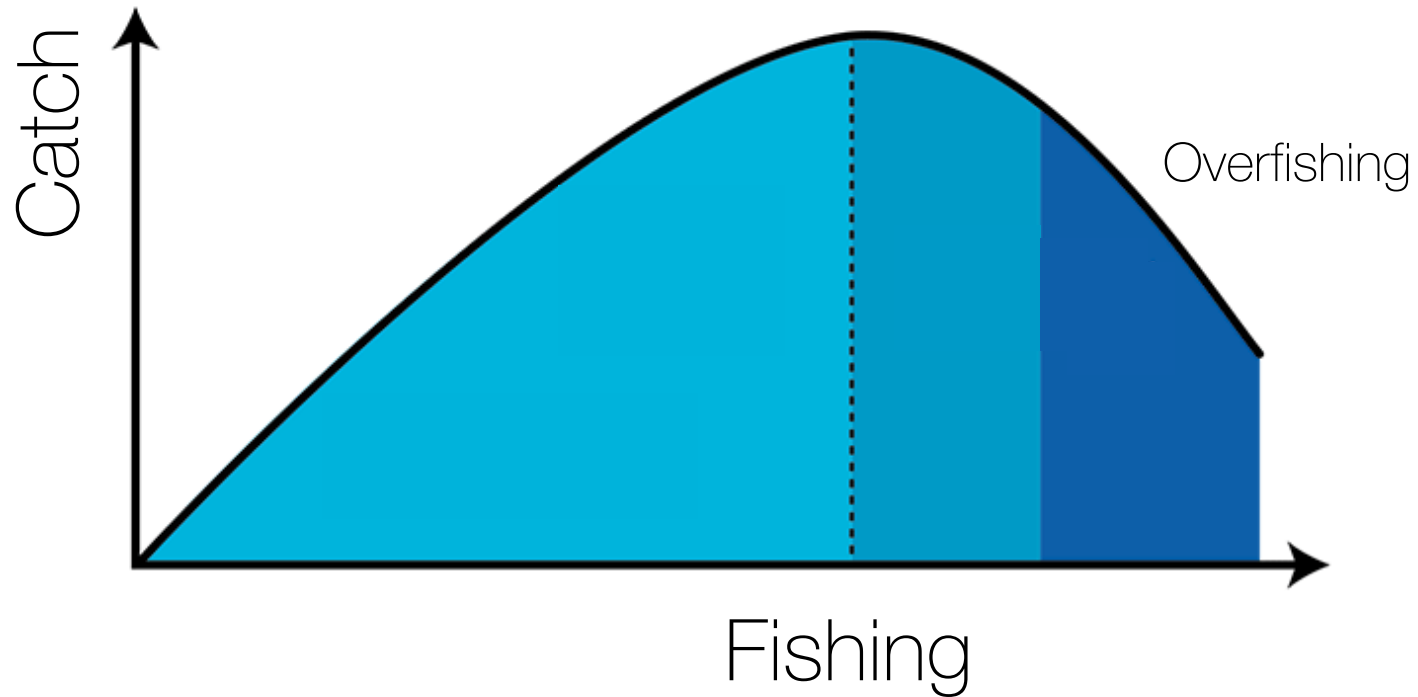
What solutions exist?

Cooperate to build shared knowledge



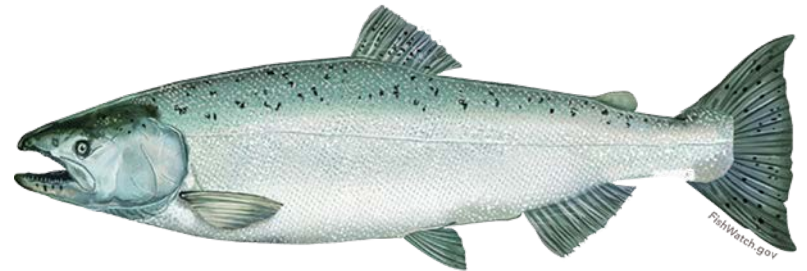
<http://oceanadapt.rutgers.edu>

Shared oversight and joint limits



Mechanisms for reciprocity

Side payments



Mechanisms for reciprocity

Tradeable permits and updated allocations



Parties to the Nauru Agreement

Summary

- Underprepared for fisheries on the move across political boundaries

Summary

- Underprepared for fisheries on the move across political boundaries
- Fisheries are set to move across 70+ new national boundaries

Summary

- Underprepared for fisheries on the move across political boundaries
- Fisheries are set to move across 70+ new national boundaries
- We have tools to avoid the loss of fish, food, and employment

Acknowledgments

William Cheung

Gabriel Reygondeu

Juliano Palacios-Abrantes

Jessica Spijkers

Richard Caddell

Talia Young

Emma Fuller

Brad Dubik

Jim Morley

Becca Selden

Thomas Frölicher

Rob Latour

Rich Seagraves

Eli Fenichel

Kevin St. Martin

Eva Papaioannou

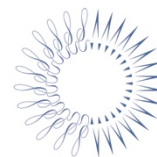
Kaycee Coleman

Mikaela Provost

Pinsky Lab



Society for Conservation Biology



THE
PEW
CHARITABLE TRUSTS

Summary

- Underprepared for fisheries on the move across political boundaries
- Fisheries are set to move across 70+ new national boundaries
- We have examples and governance tools to avoid the loss of fish, food, and employment

malin.pinsky@rutgers.edu

@pinskylab

<http://oceanadapt.rutgers.edu>