

Current State and Future Scenarios for Transboundary Fisheries Management on Changing Oceans of Canada and United States

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The Effects of Climate Change on the World's Oceans, Washington DC.

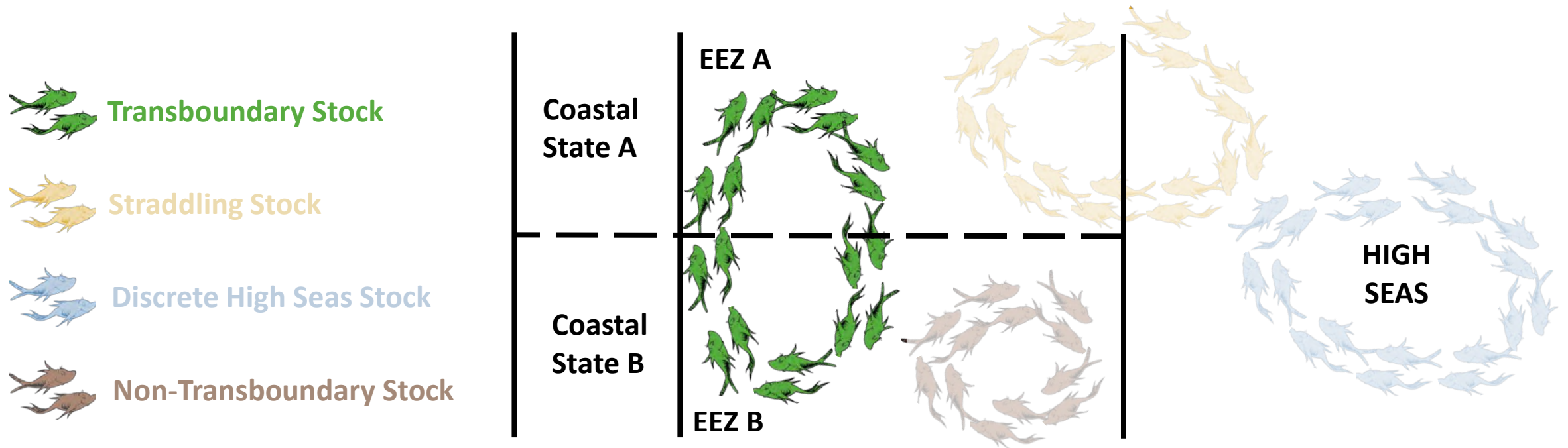


Intro. | The Future of Transboundary Species



Main Question

- What will be the effects of shifting species to the co-management of transboundary fisheries?



Methods | Treaties Under the Spotlight



Pacific Hake

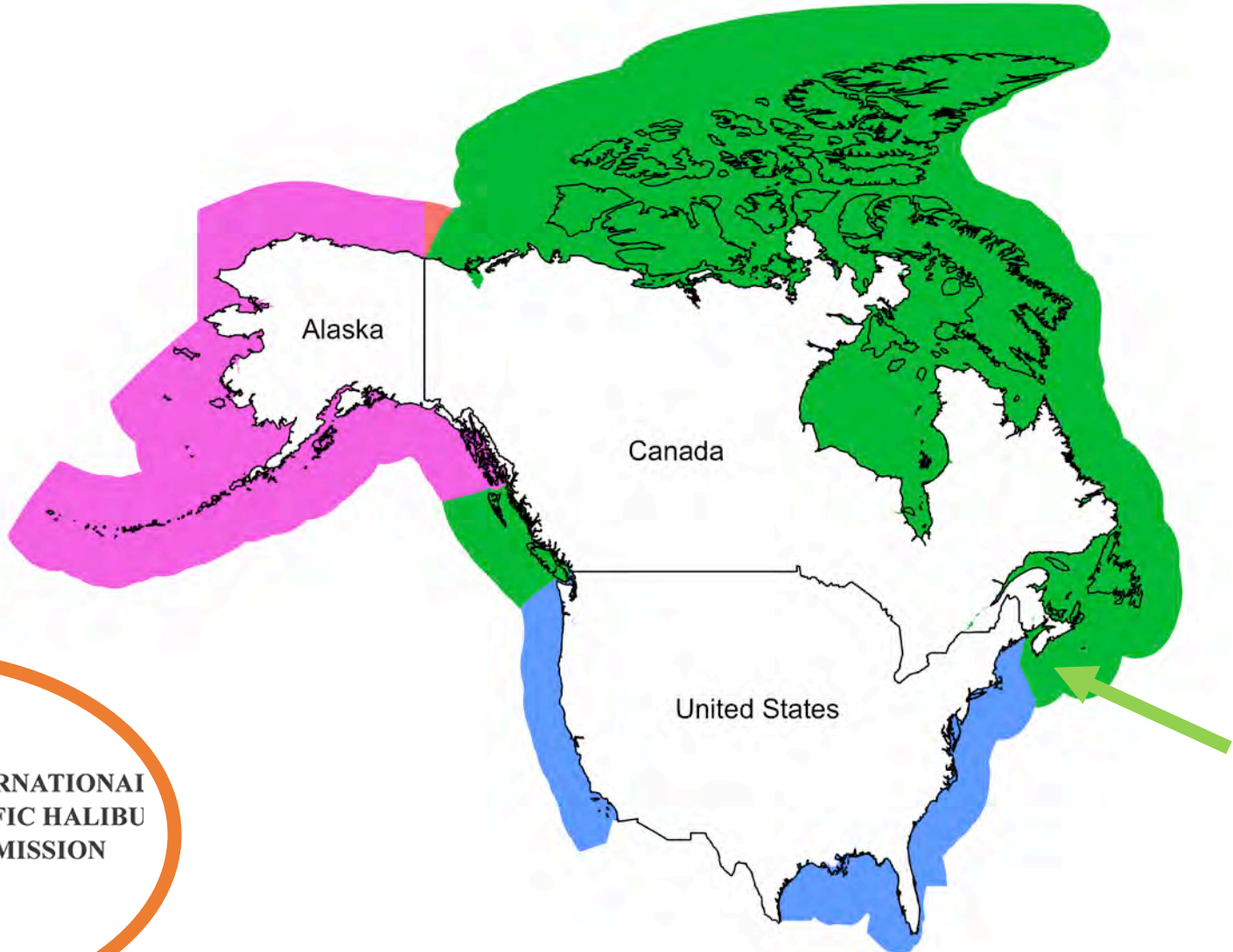
Spp. = 1



Spp. = 5



Spp. = 2



NAFO

Spp. = 20

Gulf of Maine "gentlemen's" Agreement (CIA, 2012)



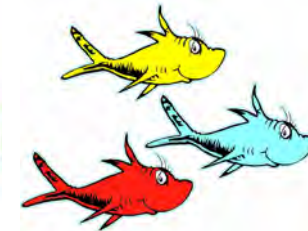
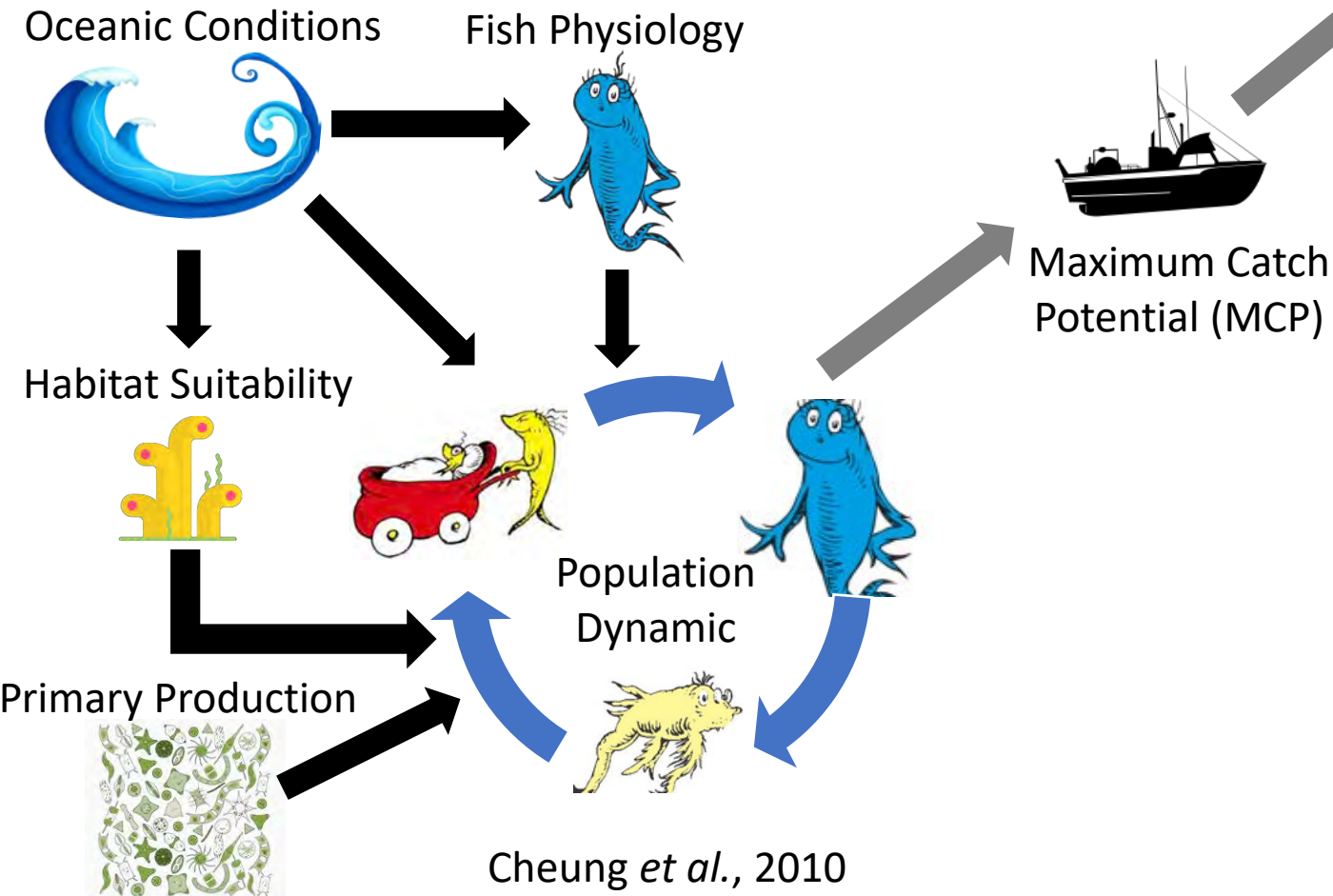
Spp. = 3

Total Spp. = 31

Methods | Modeling & Data Analysis

Dynamic Bioclimate Envelope Model

Data Synthesis



RCP 2.6
RCP 8.5

- **Today** = Mean MCP 2005-2014
- **Future** = MCP 2015 – 2100
- **Mid Century** = Mean MCP 2045-2055

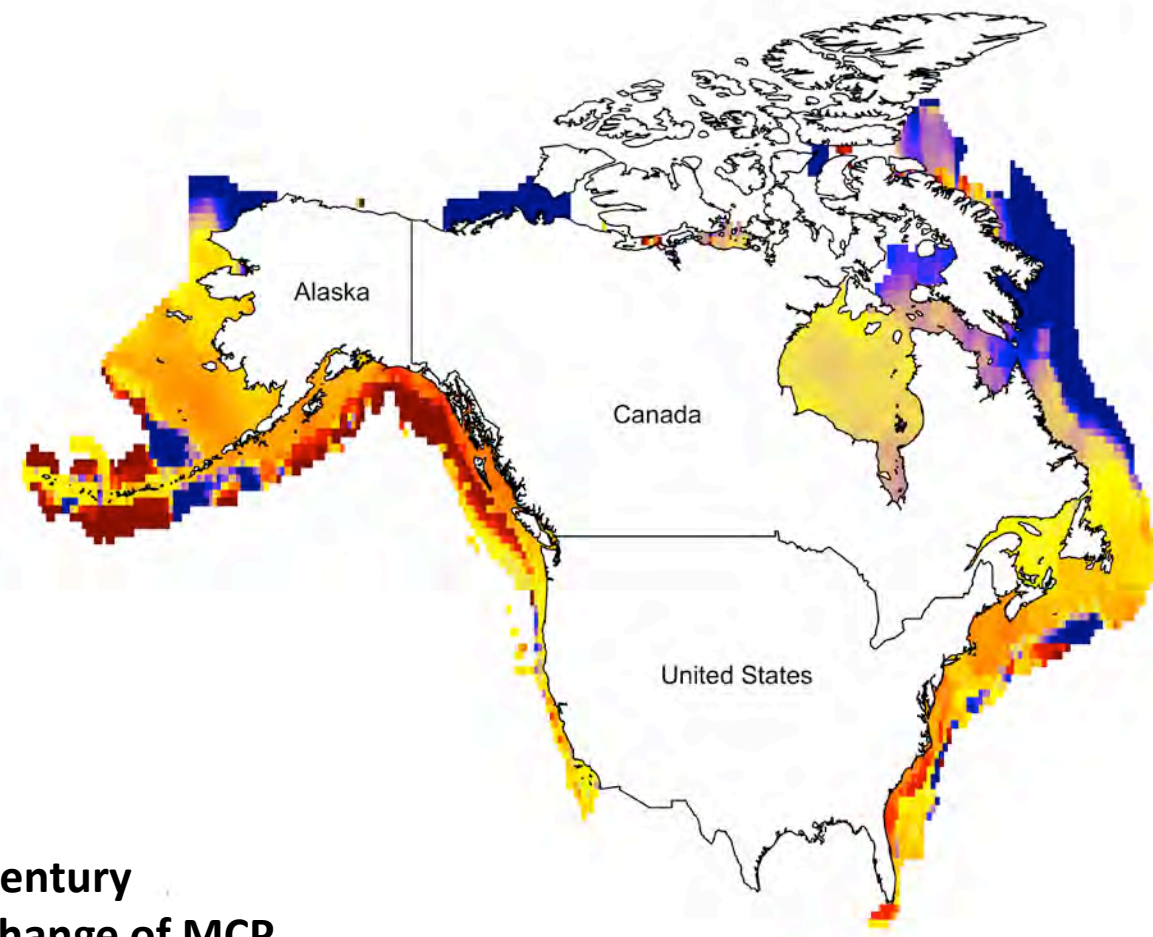
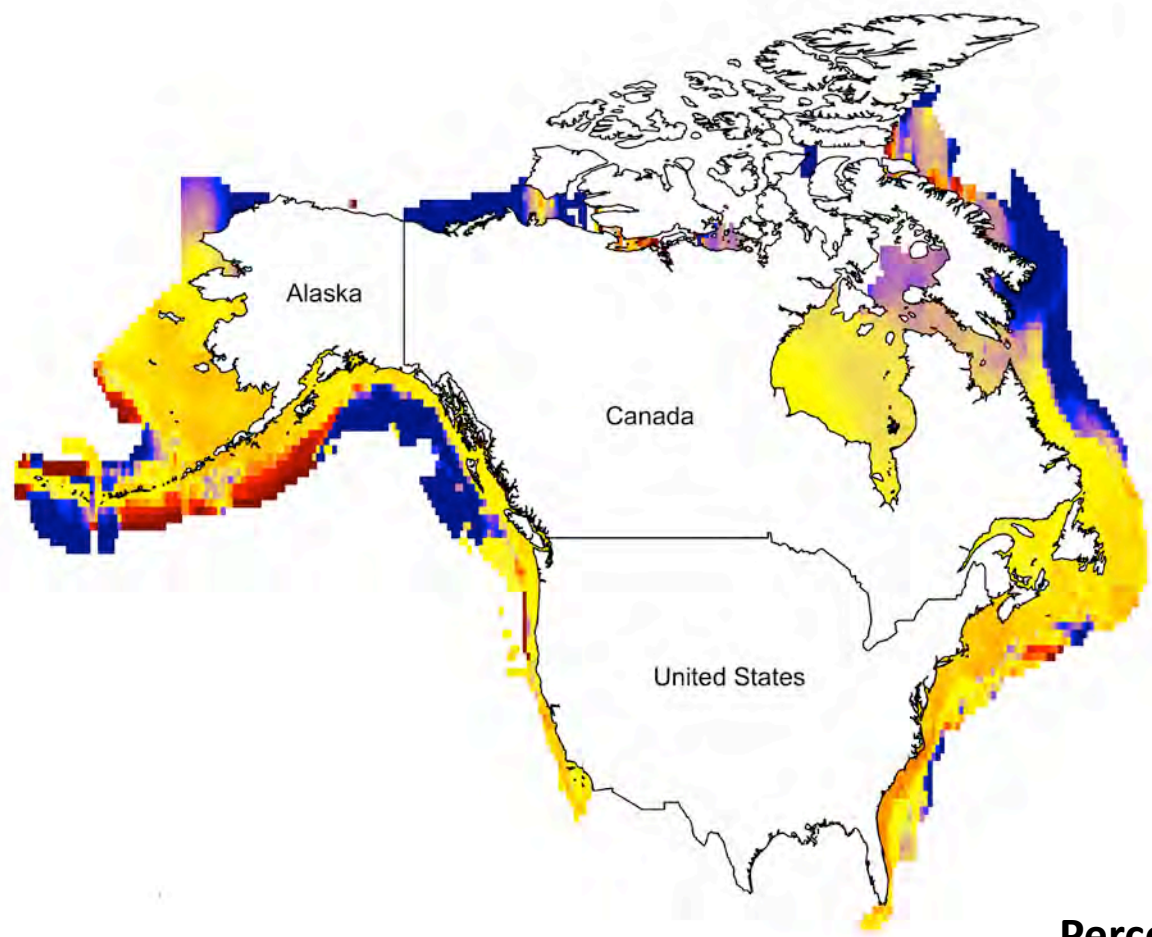
Results =

- $\Delta MCP > 0\%$
- $\Delta MCP = 0\%$
- $\Delta MCP < 0\%$

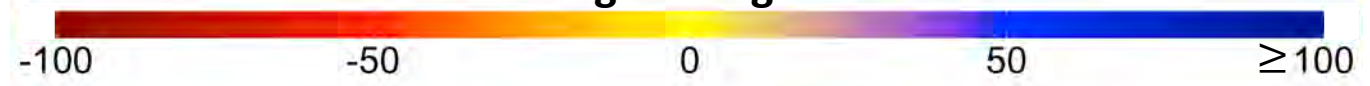
Results | Different per RCP and coast

RCP 2.6

RCP 8.5



**Mid Century
Percentage Change of MCP**



Results | Different per RCP and coast

- **Implications for management will depend on the management plans themselves**
 - Species considered
 - Climate change considerations
 - “Legal strength”
 - Management rules *
 - Covering range



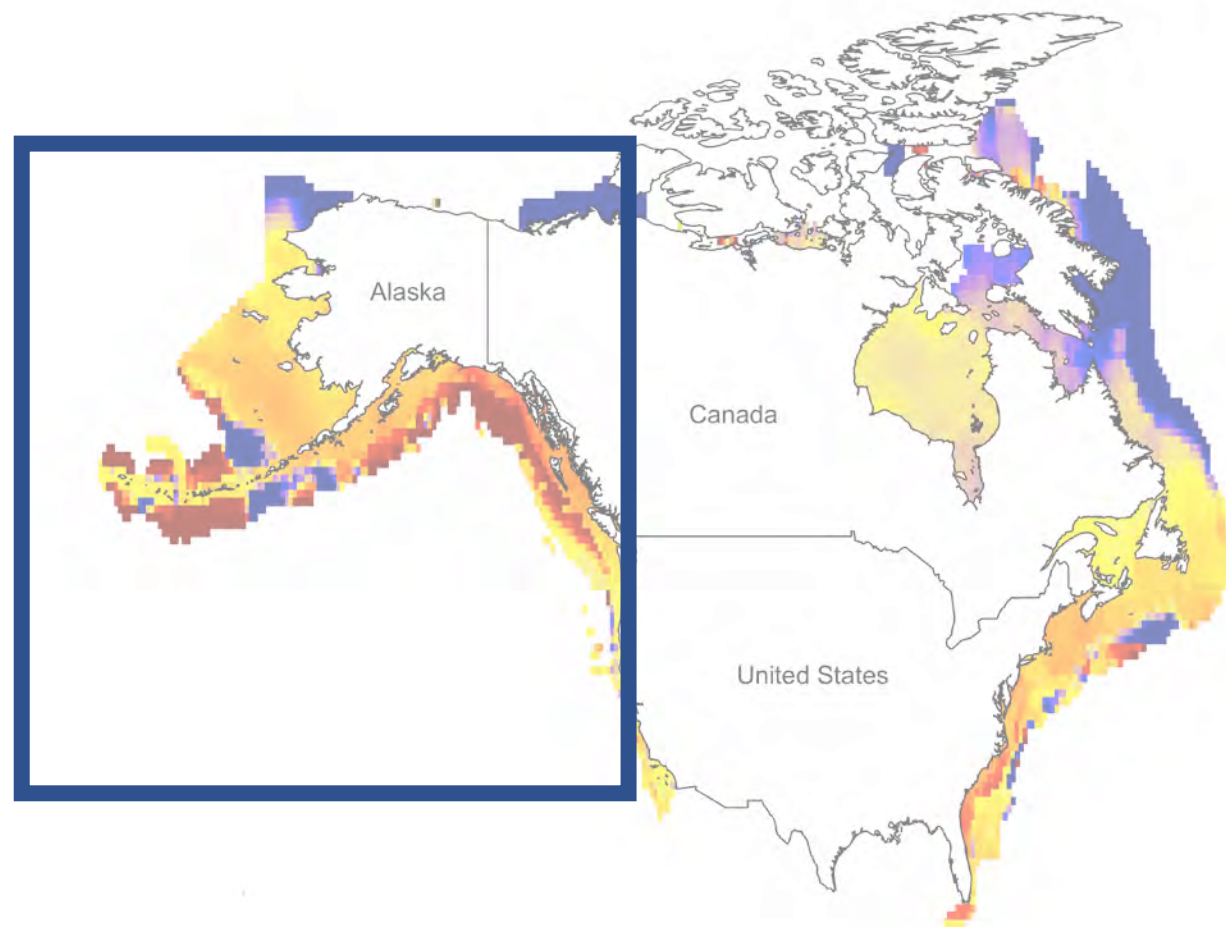
INTERNATIONAL
PACIFIC HALIBUT
COMMISSION



Pacific halibut (*Hippoglossus stenolepis*)

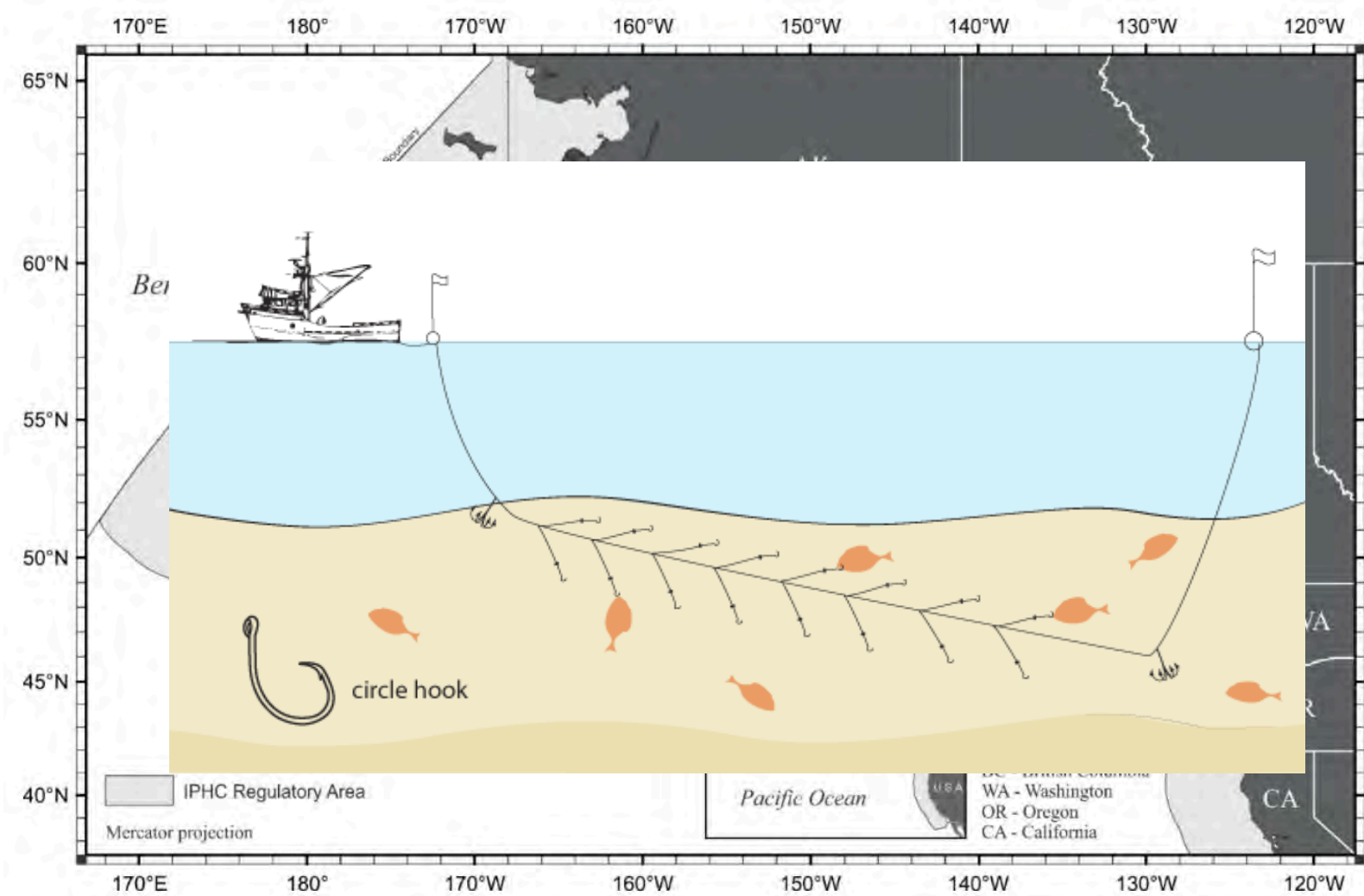


Sablefish (*Anoplopoma fimbria*)

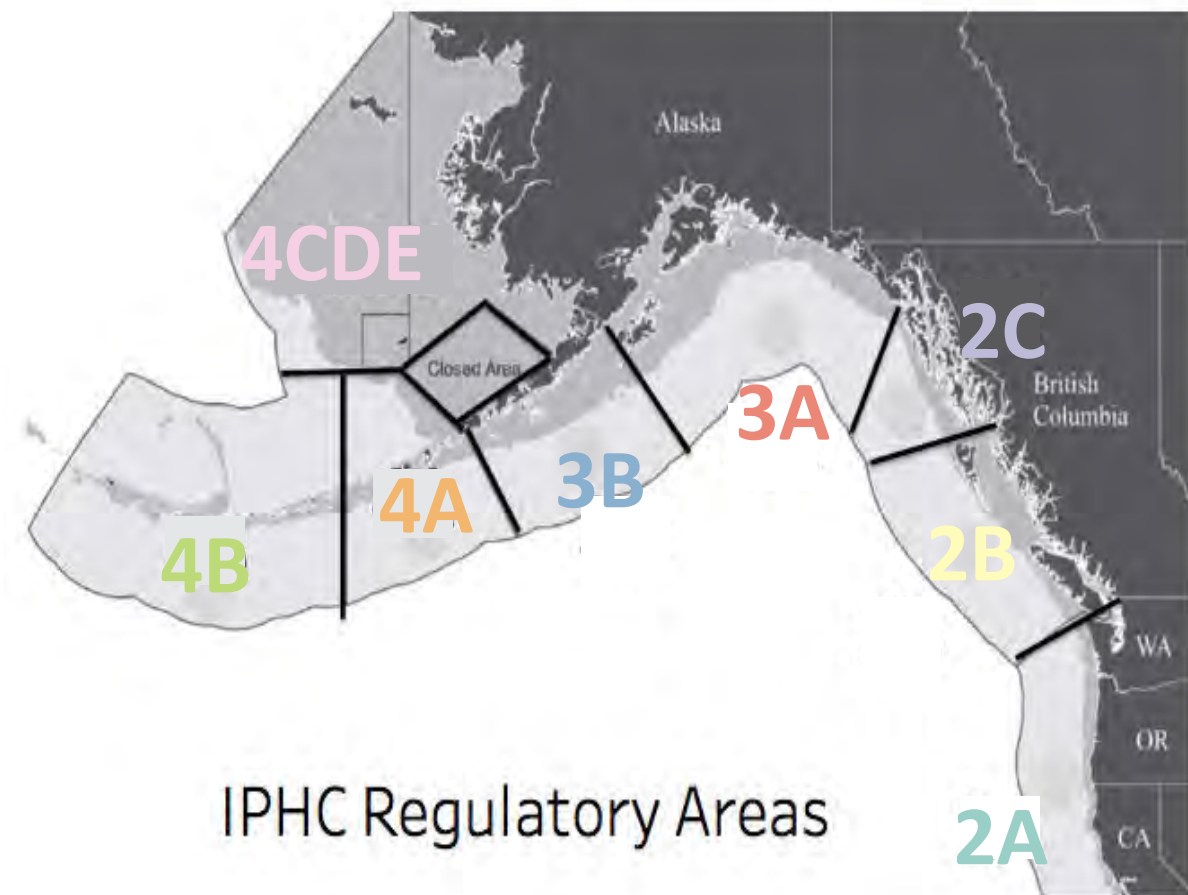


IPHC | Management Rules

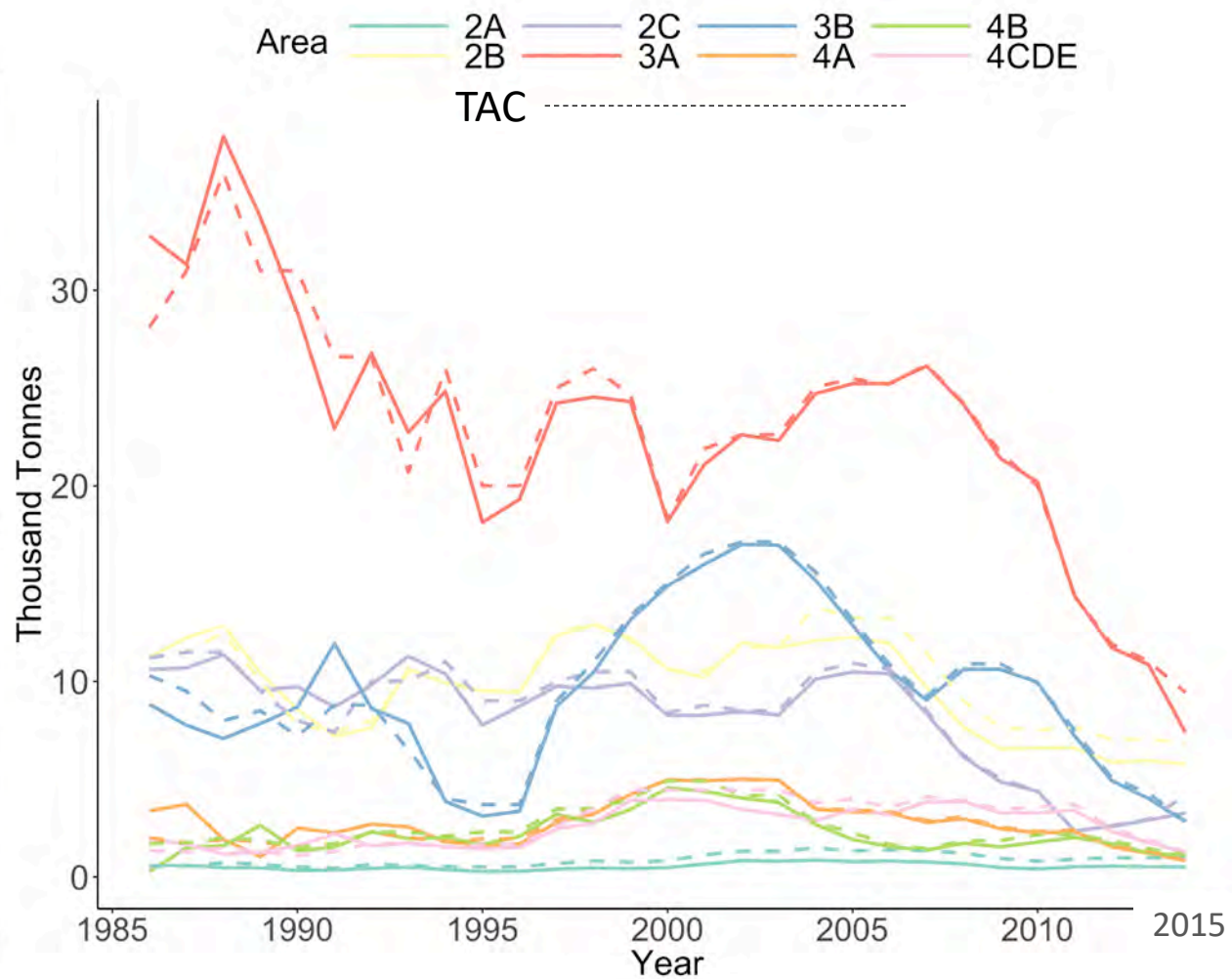
- **Management:**
 - US = NOAA Fisheries
 - Canada = DFO
- **Harvest Control:**
 - ✓ Total Allowable Catch (TAC)
 - ✓ Longline with “J” hook
 - ✓ Minimum catch size
 - ✓ Bycatch quota
 - ✓ Season (Mar. ~ Nov.)
 - ✓ Effort (time)



IPHC | Historical TAC & Catch

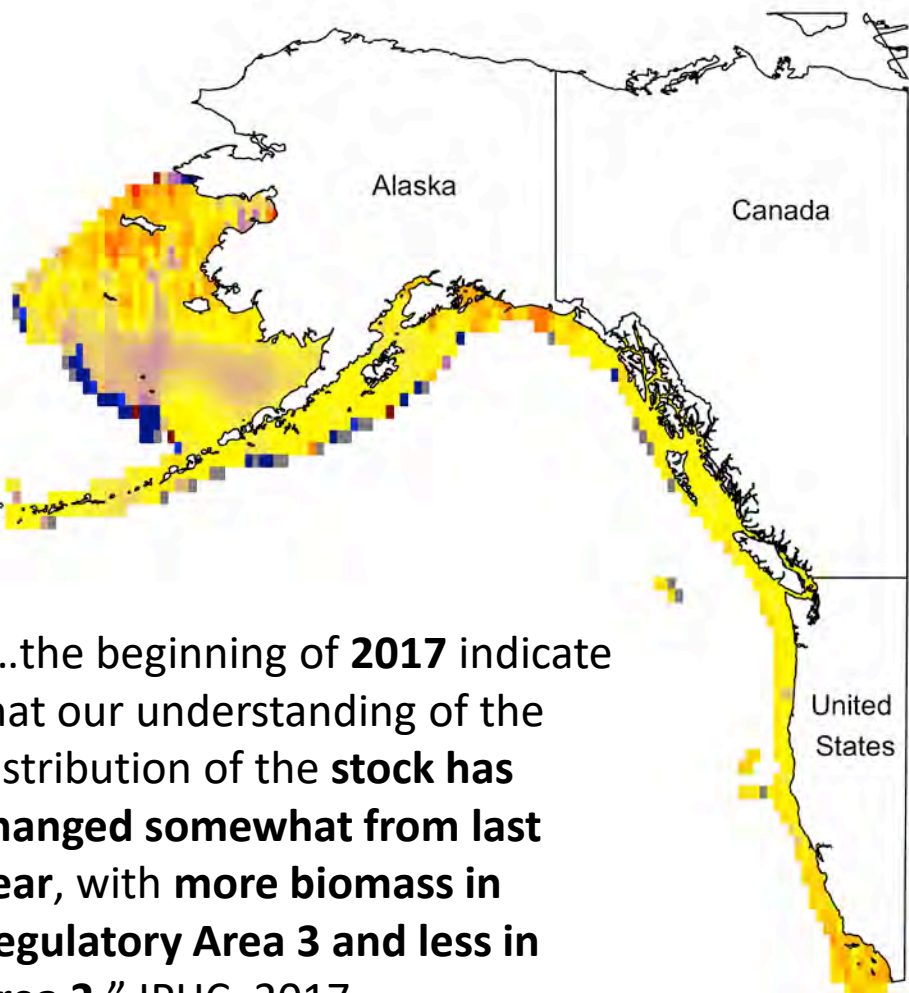


IPHC Regulatory Areas

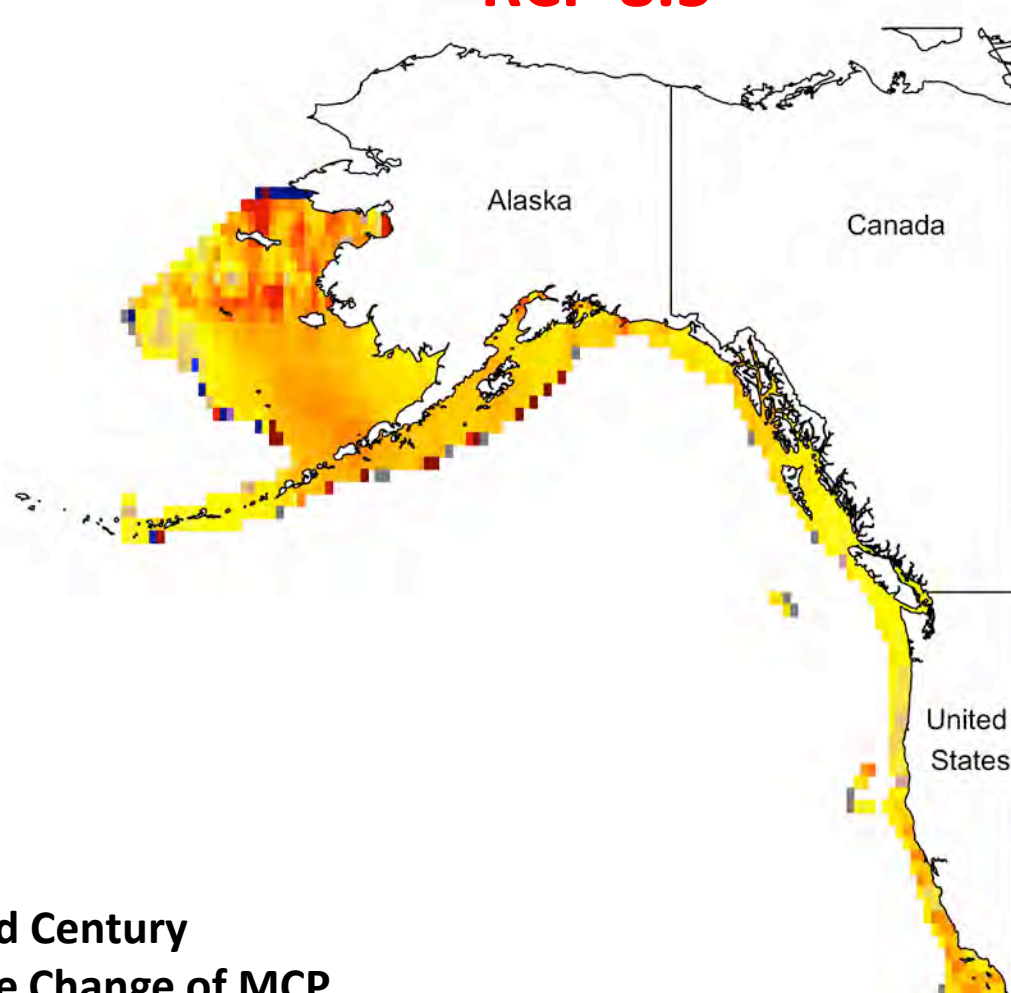


IPHC | Differences in MCP per RCP and EEZ

RCP 2.6



RCP 8.5

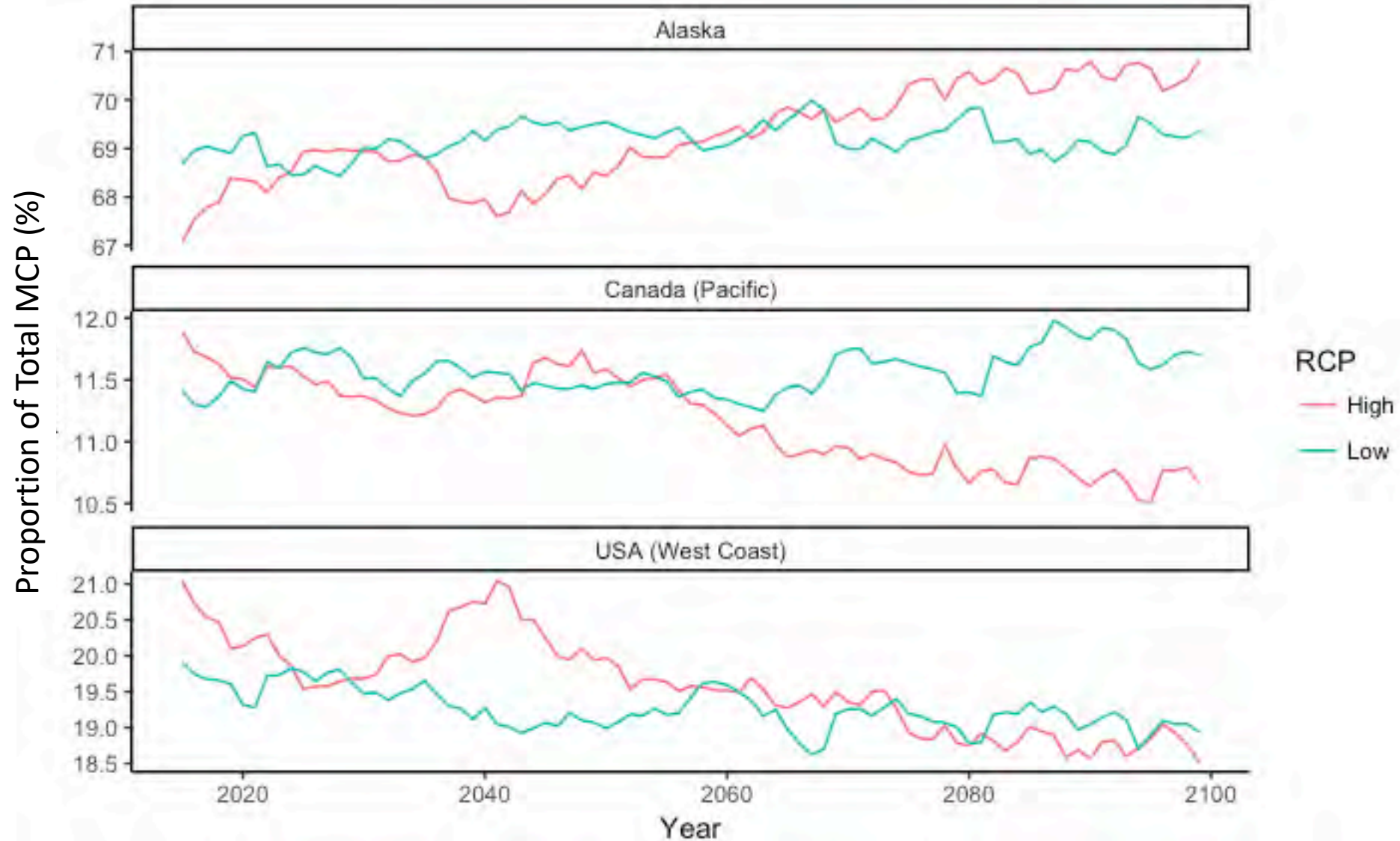


“...the beginning of **2017** indicate that our understanding of the distribution of the **stock has changed somewhat** from last year, with **more biomass in Regulatory Area 3** and **less in Area 2.**” IPHC, 2017

**Mid Century
Percentage Change of MCP**



IPHC | Changes in MCP proportion



Management implications

- Dynamic TAC estimation ✓✓
- Flexible quota ✓✓
- Regime shifts ✓
- Countrywide trade-offs
 - Landings might equilibrate under 2.6
 - Larger landings difference under 8.5
- Regional trade-offs
 - Conservation (Closed area)
 - Social consequences
 - Bycatch quota



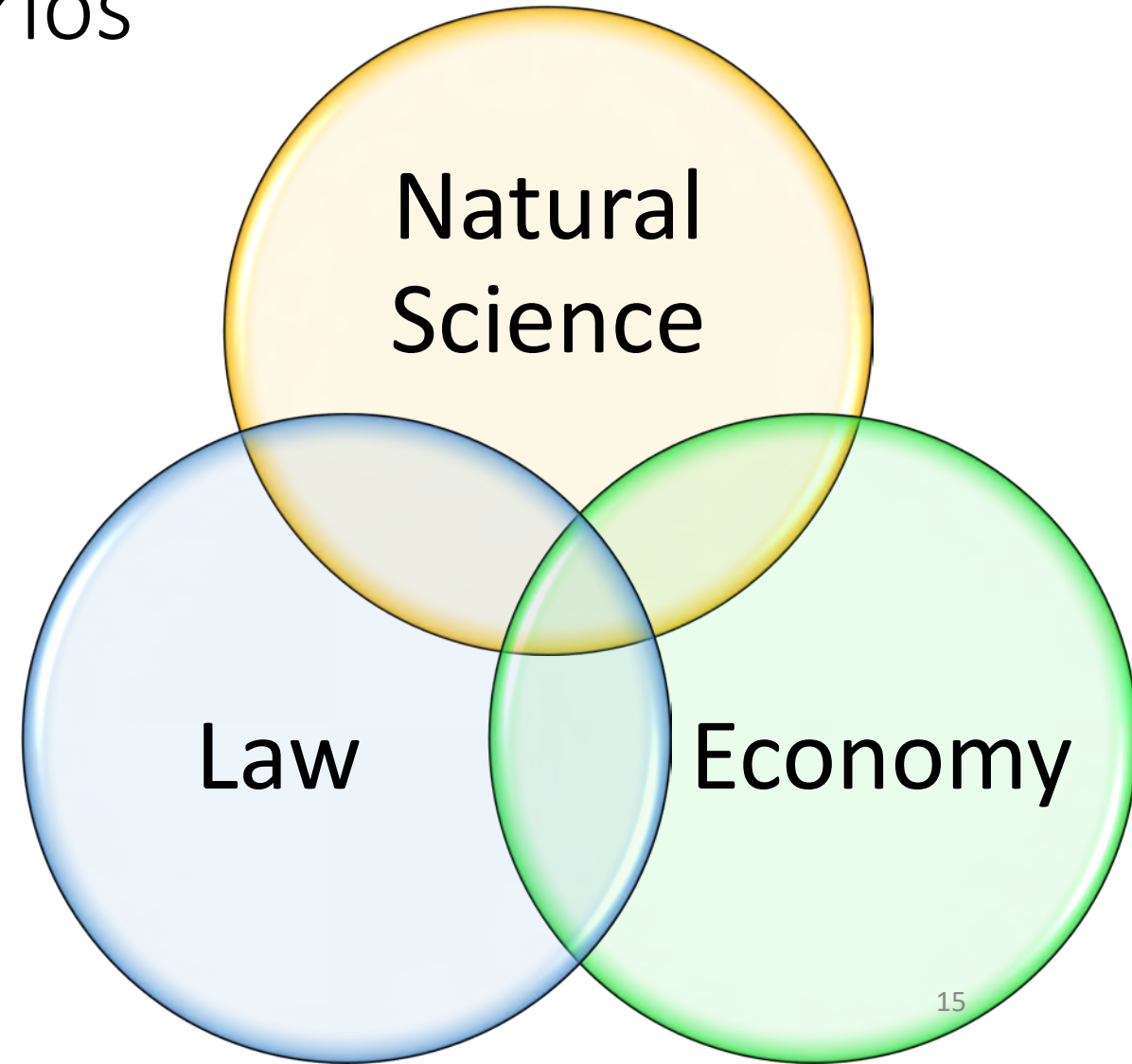
The crew of the *F/V Seymour* pull a large Pacific halibut over the rail. Photo by Chris Noren.

Transboundary Fisheries Management in North Atlantic and Pacific Oceans: Taking Stock, Future Scenarios



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Today was good.
Today was fun.
Thank you.
THANK YOU
everyone!

