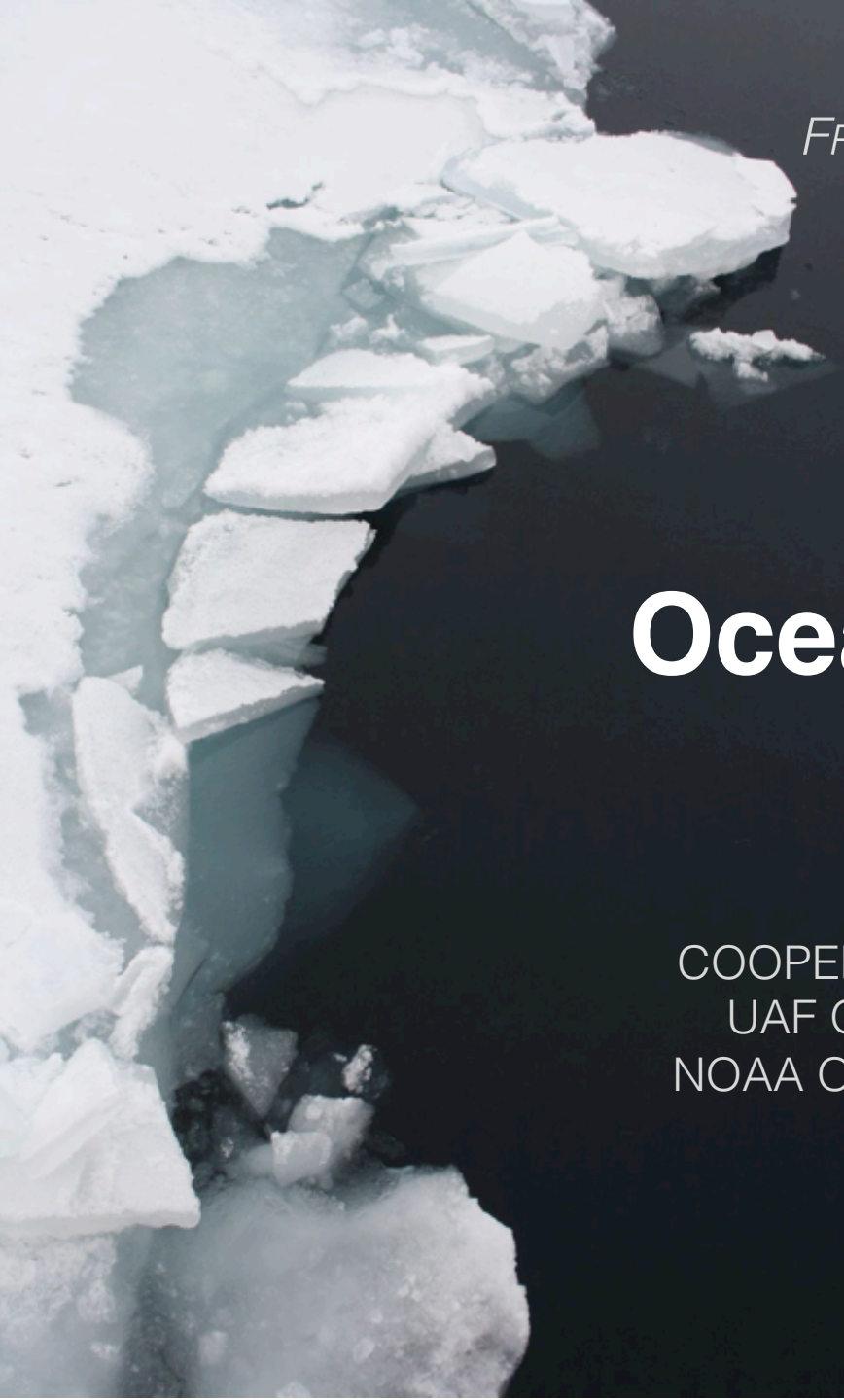

From the boreal forest to the open ocean:

How Climate Change Impacts the Alaskan Arctic

Ocean Acidification

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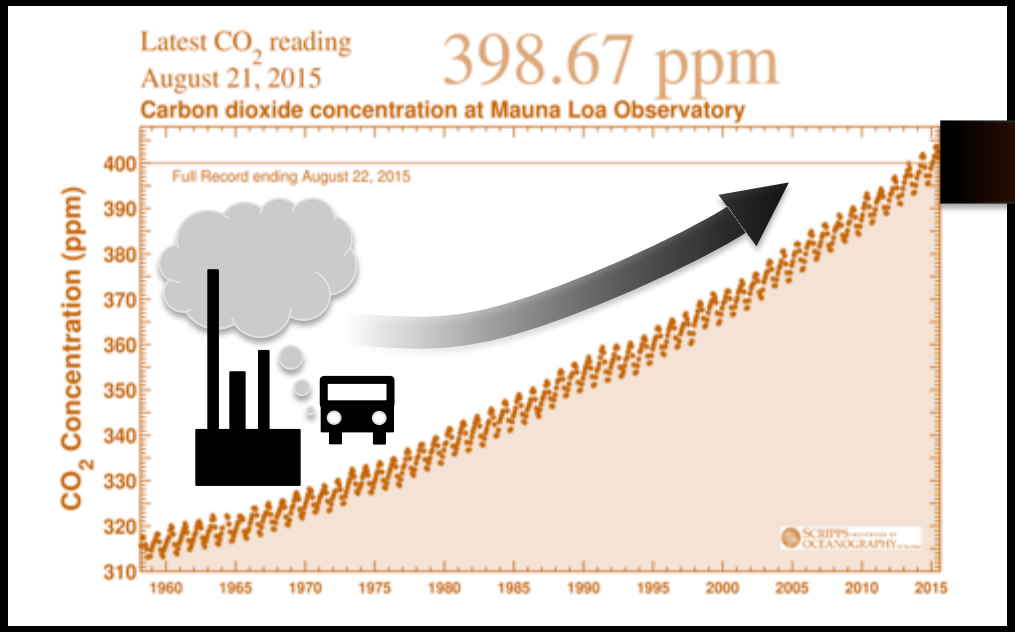


22 TONS EVERY DAY

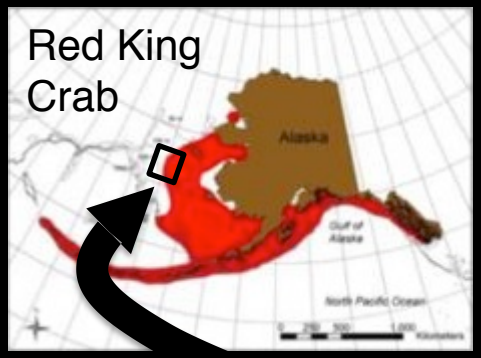
1/3 OF ALL CO_2 RELEASED IS ABSORBED BY THE OCEAN.

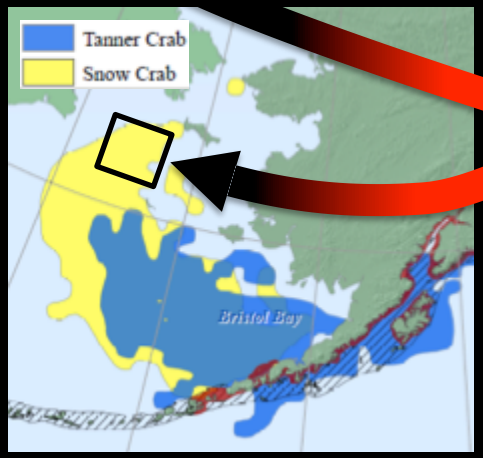
ALASKAN COASTAL WATERS ARE **NATURALLY** HIGH IN CO_2

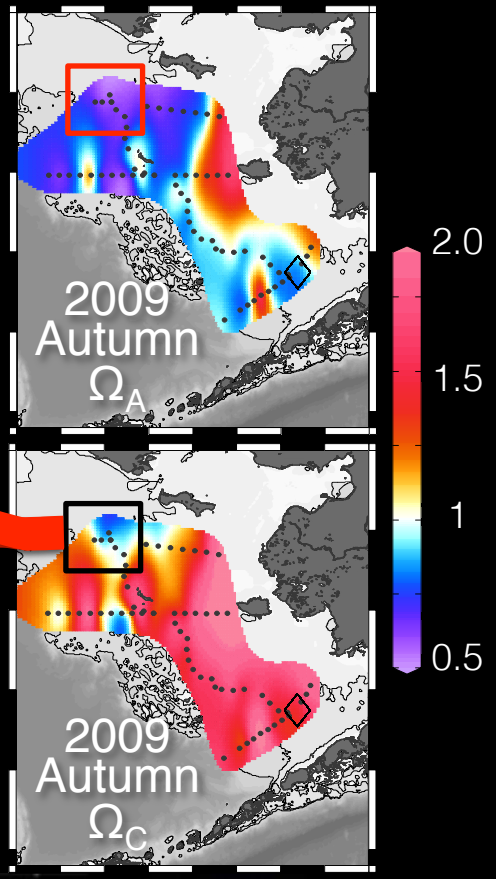
MARINE CALCIFIERS ARE ESPECIALLY VULNERABLE TO OA EVENTS

$\Omega < 1.0$ is bad!

WHEN Ω PASSES OUTSIDE THE RANGE OF **NATURAL VARIABILITY**, ORGANISMS CAN BE IMPACTED.

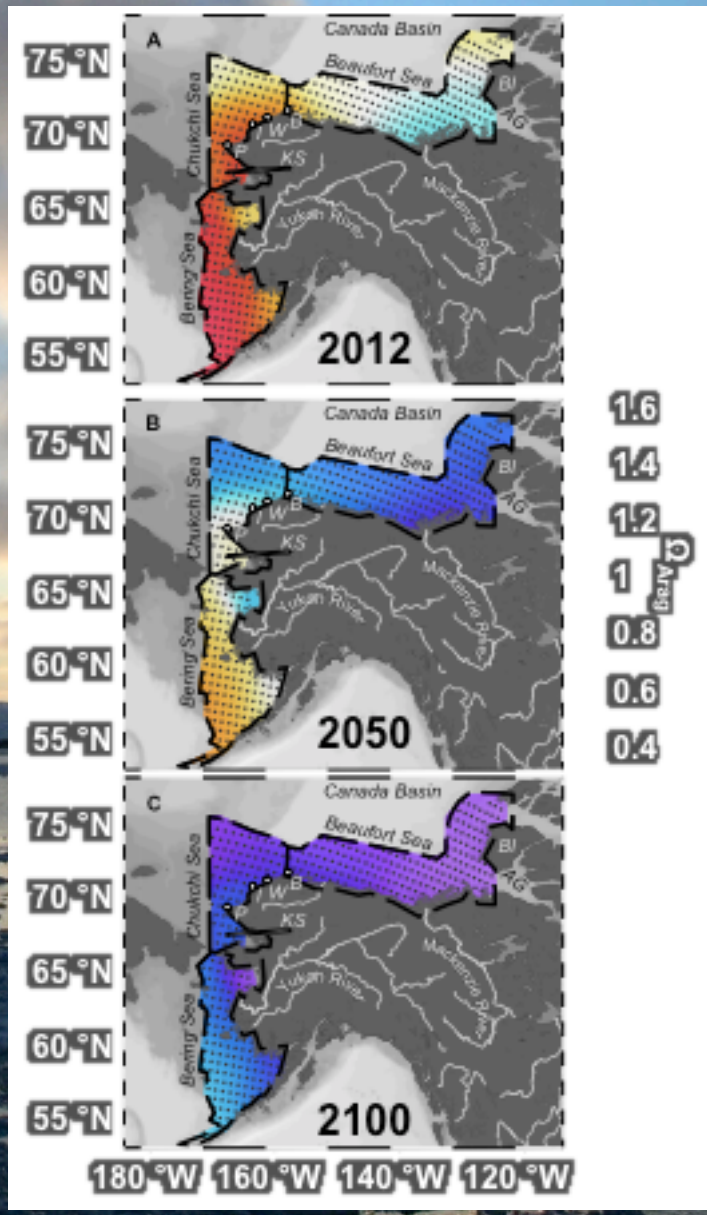






OVER THE NEXT DECADES, OA WILL HAVE IMPORTANT CONSEQUENCES FOR ALASKA.

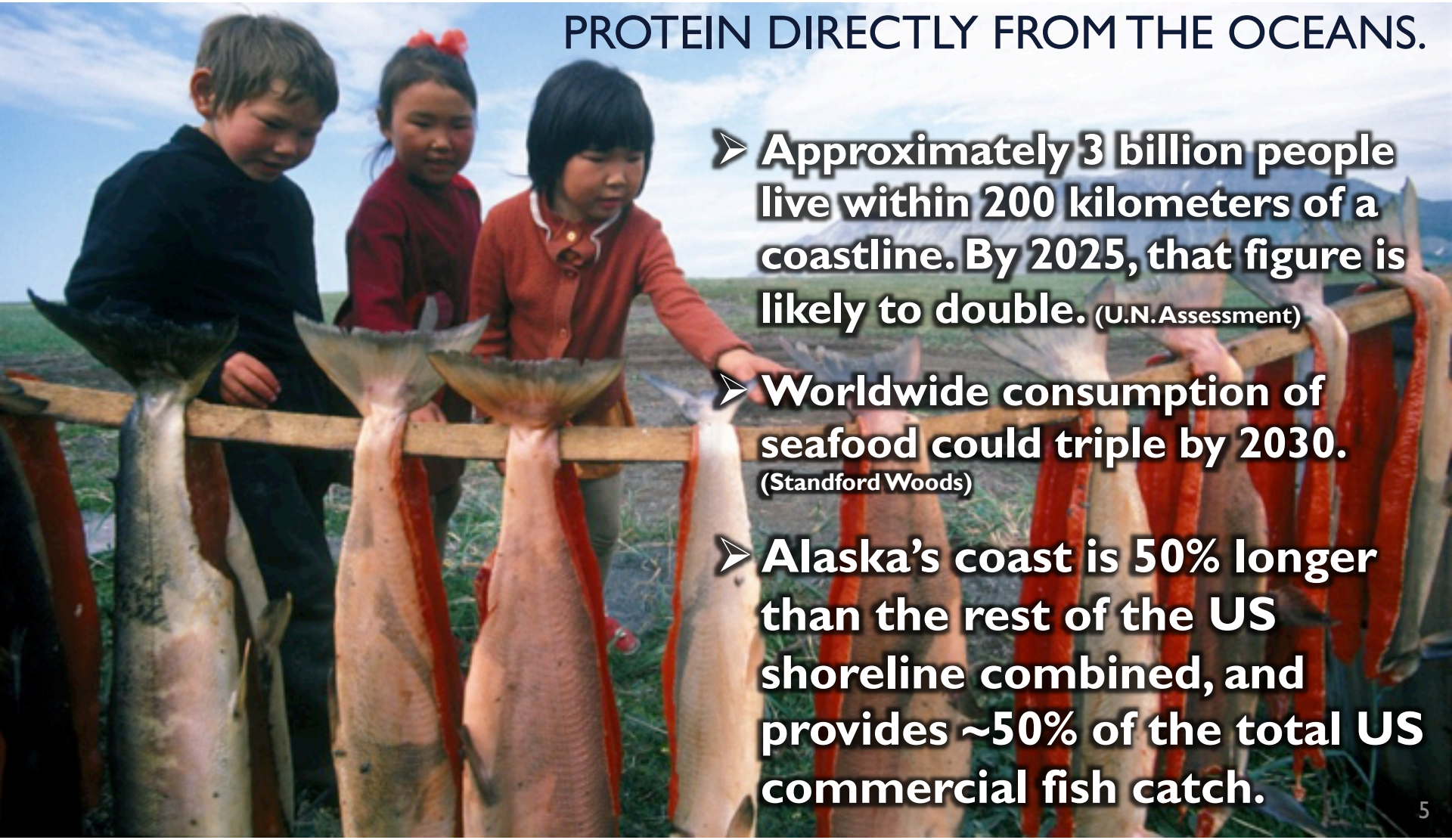
Mathis, J.T. et al., 2015, Progress in Oceanography, 136, 71-91



Mathis, J.T., Cross J.N., Evans, W.E., and Doney, S.C., 2015. Oceanography Magazine, 28(2), 122-135.

ALASKAN OA MATTERS

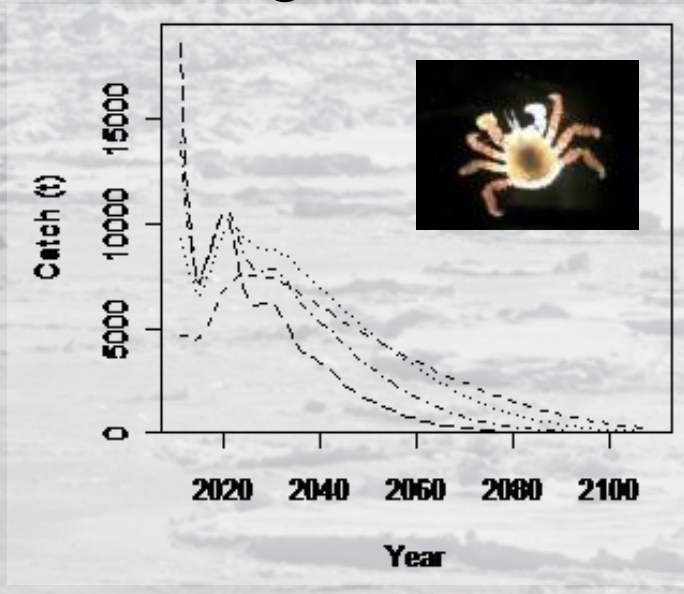
OVER 1 BILLION PEOPLE DERIVE ALL OF THEIR DIETARY PROTEIN DIRECTLY FROM THE OCEANS.



- **Approximately 3 billion people live within 200 kilometers of a coastline. By 2025, that figure is likely to double.** (U.N. Assessment)
- **Worldwide consumption of seafood could triple by 2030.** (Standford Woods)
- **Alaska's coast is 50% longer than the rest of the US shoreline combined, and provides ~50% of the total US commercial fish catch.**

WE CAN "BUY TIME" THROUGH ADAPTIVE MANAGEMENT STRATEGIES

Red King Crab Juveniles



- **At a pH of 7.8 stocks and catches decline**
- **Under current catch levels fishery would be closed in ~2100**

Punt, Poljak, Dalton, Foy. 2014. Evaluating the impact of ocean acidification on fishery yields and profits: The example of red king crab in Bristol Bay. **Ecological Modeling. 285: 39-53**.

Shellfish Hatchery Monitoring

Evans, Mathis, Ramsay, and Hetrick, 2015. On the frontline: Tracking Ocean Acidification in an Alaskan Shellfish Hatchery. PLOS ONE, DOI: 10.1371/journal.pone.0130384

THERE'S STILL A LOT WE DON'T KNOW.

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NEW TECHNOLOGY WILL PLAY A CRITICAL ROLE IN CONTINUING RESEARCH.