



# Ocean Governance: Past, Present, Future

Rachel Carson Distinguished Lecture

Scott Barrett  
Columbia University  
London School of Economics

# Blue marble



Taken by the crew of Apollo 17, 7 December 1972.

Most of the Earth's surface is ocean.

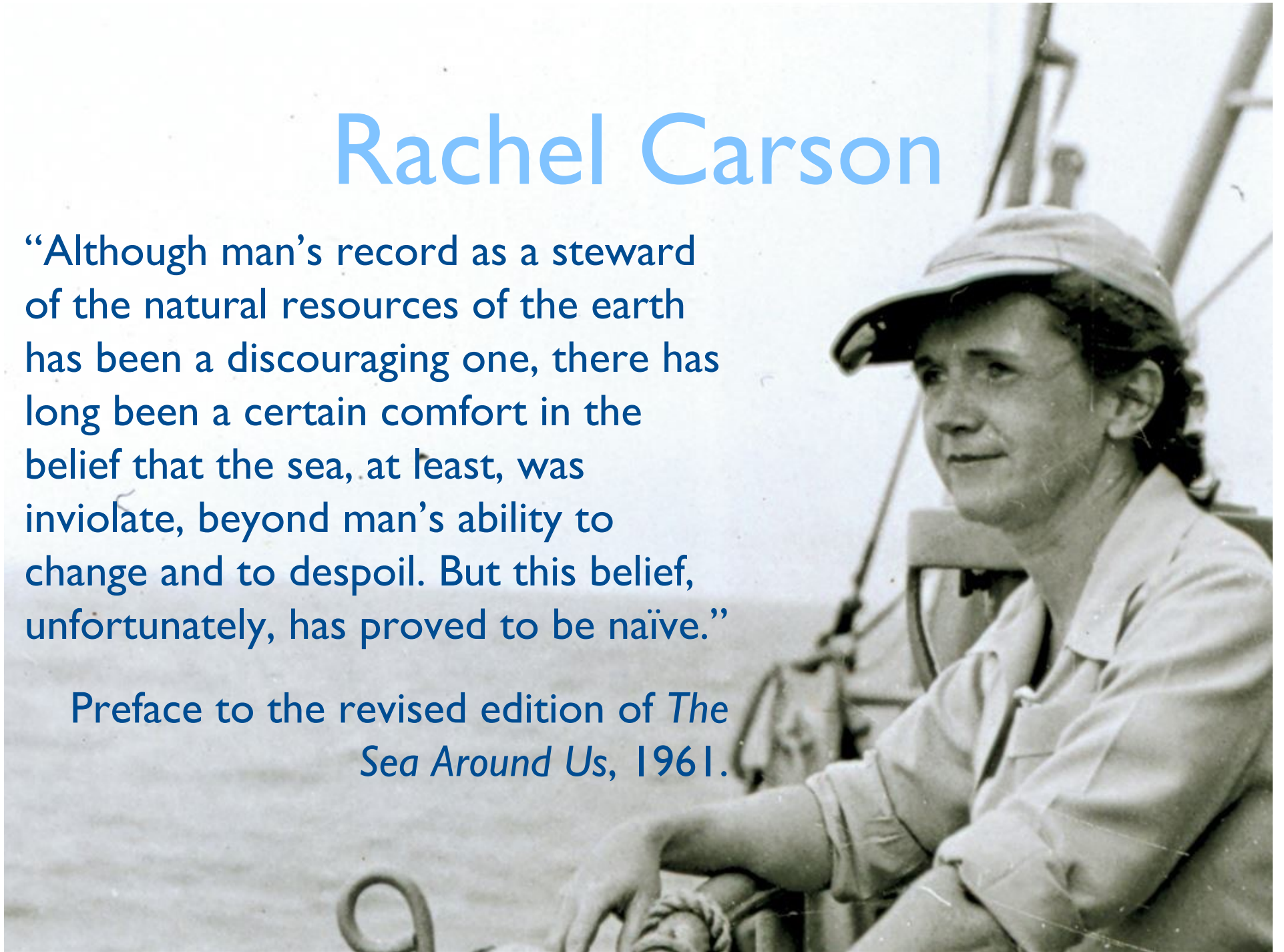
# Many states



# Rachel Carson

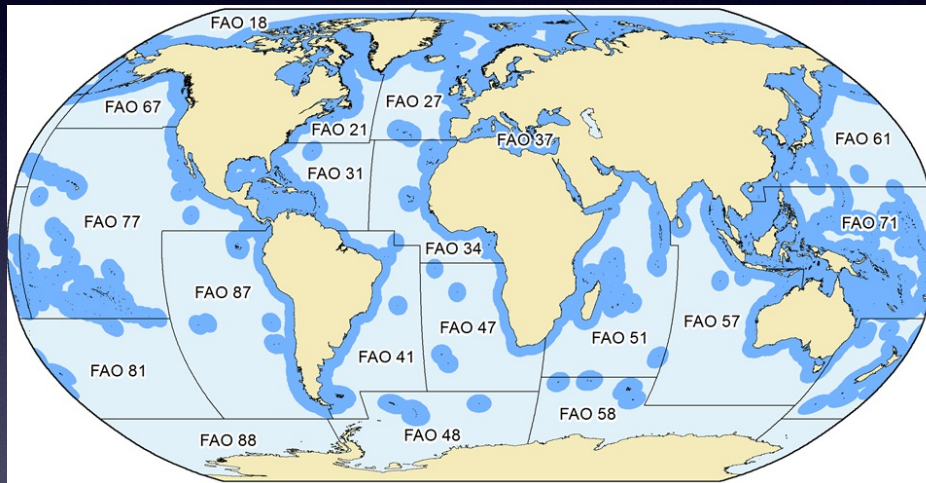
“Although man’s record as a steward of the natural resources of the earth has been a discouraging one, there has long been a certain comfort in the belief that the sea, at least, was inviolate, beyond man’s ability to change and to despoil. But this belief, unfortunately, has proved to be naïve.”

Preface to the revised edition of *The Sea Around Us*, 1961.



# Ocean governance today

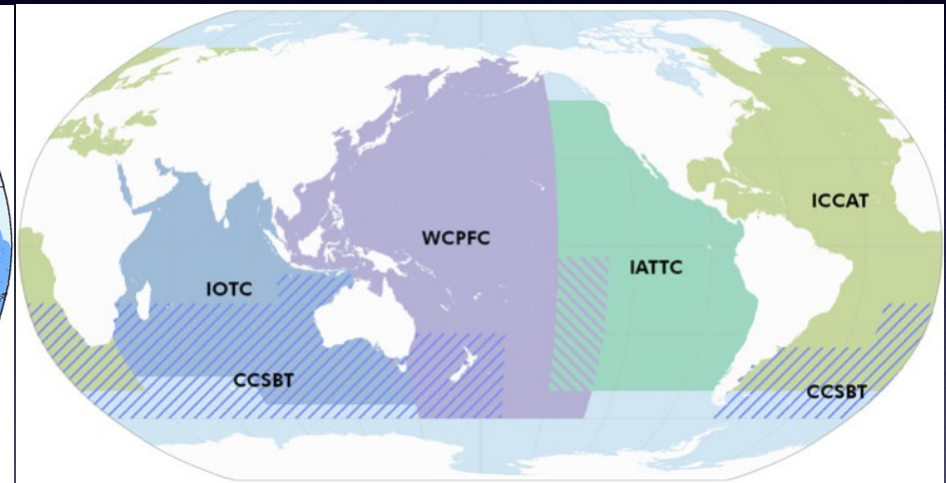
## Property rights



Exclusive Economic Zones (EEZs) were established in the 1970s and make up about 40 percent of the Earth's surface.

EEZs established in **customary international law**.

## Cooperative arrangements



About 17 Regional fisheries management organizations (RFMOs) cover most of the ocean.

RFMOs established in **treaty law**.

# Treaty vs. customary law

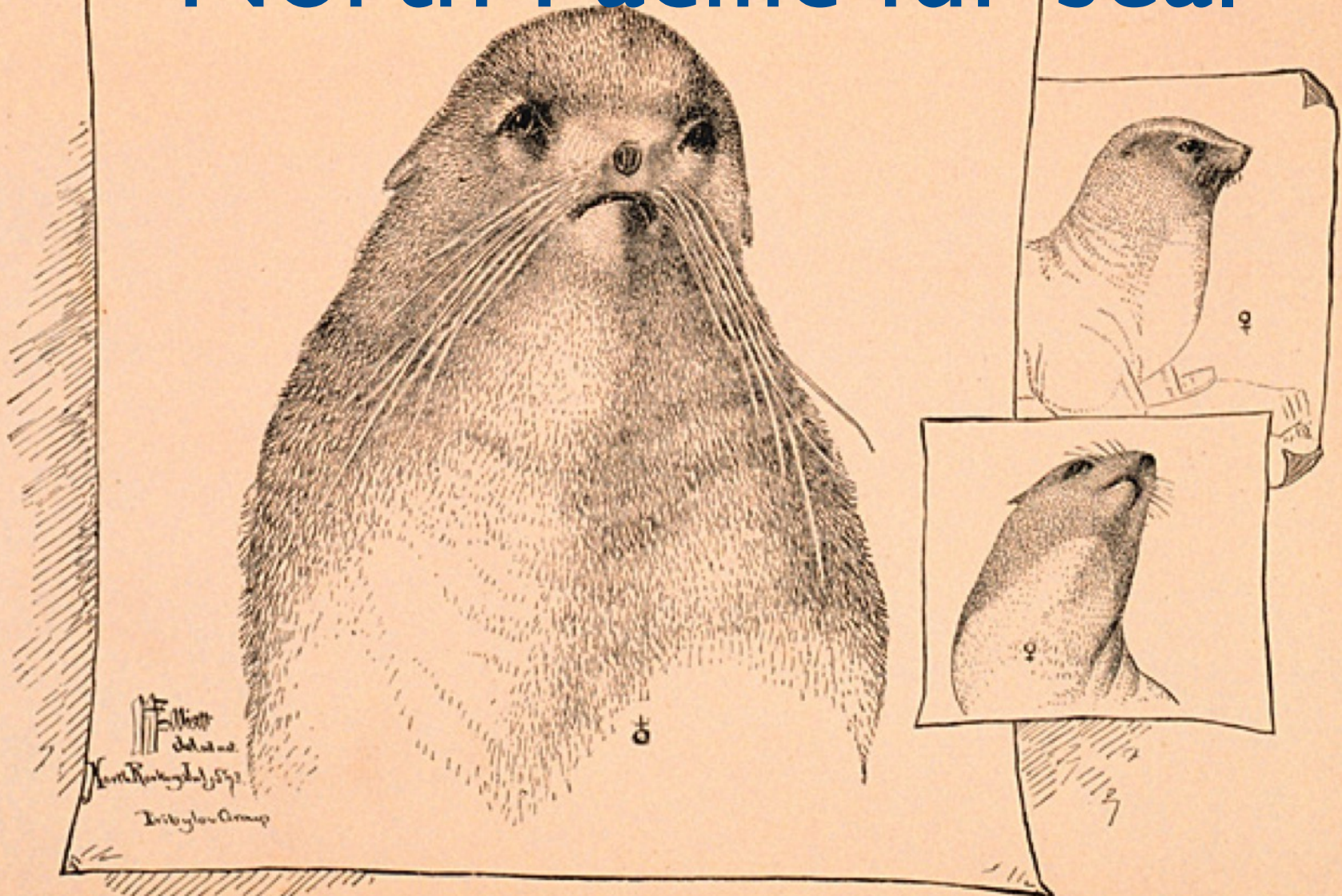
	Treaty	Custom
Participation	Voluntary	Universal*
Type	Formal/ negotiated	Informal/ spontaneous

\*Applies to all countries that have not objected to them at the time of their creation. The exception are the peremptory norms that are considered to be *jus cogens*. These customary laws apply universally.

A treaty that worked

*Callorhinus Rex.*

# North Pacific fur seal



THE COUNTENANCE OF CALLORHINUS.—A LIFE STUDY OF AN ADULT MALE FUR-SEAL.  
(Full face of old male, profile and under view of female heads.)

Drawing by Henry W. Elliott, North Bookery, Pribylov Group, July 5, 1913. (p. 75.)





# Sole ownership



allows efficient management

# Open access



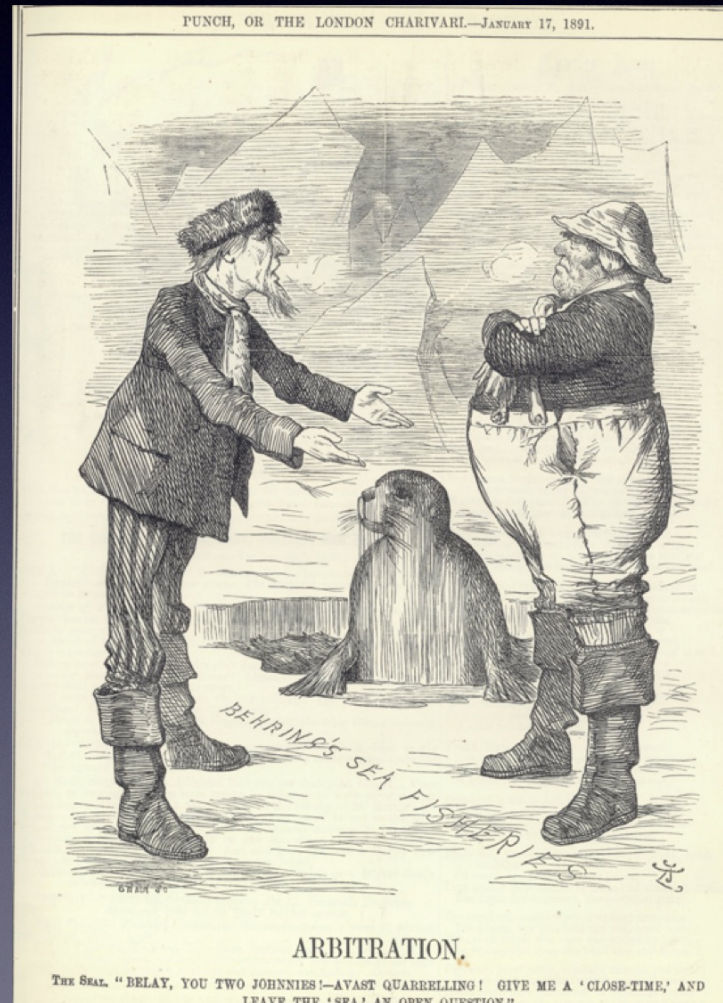
PELAGIC FUR-SEAL HUNTING OFF AKOOTAN PASS, BERING SEA.—AFTER A SKETCH BY HENRY W. ELLIOTT.

can ruin a fishery

# US claimed a right to “its” fur seals anywhere

US acquired Pribilofs in 1867, and granted a monopoly to the Alaska Commercial Company, assuring the sole owner solution.

However, not long afterwards, Canadian schoolers began harvesting seals at sea. The US declared such catches to be illegal, and began seizing vessels.



Britain and the US let their dispute be settled by an arbitration tribunal.

The tribunal ruled that US jurisdiction was limited to the cannon shot rule.

However, it also recommended regulations that restricted harvesting at sea.

# Multilateral success

- Bilateral agreements to limit harvests failed.
  - When US and Britain entered into an agreement, Canadian vessels moved to other breeding grounds, and Japanese vessels to the Pribilofs.
- Towards the end of the 19th century, extinction appeared likely.
- Treaty of 1911 changed everything.
  - By 1917, the herd had tripled in size.
  - By 1940, the population recovered to its pre-pelagic-sealing size, 2 million.

62D CONGRESS }  
1st Session }

• SENATE

{ DOCUMENT  
No. 75

24  
U.S. Treaties, etc., 1909 - (Taft)

## FUR SEALS PROTECTION

### MESSAGE

FROM THE

President of the United States

TRANSMITTING

A CONVENTION LOOKING TO THE PROTECTION AND PRES-  
ERVATION OF FUR SEALS AND SEA OTTERS IN A CERTAIN  
DEFINED ZONE OF THE NORTH PACIFIC OCEAN, SIGNED BY  
THE PLENIPOTENTIARIES OF THE UNITED STATES, GREAT  
BRITAIN, JAPAN, AND RUSSIA, AT WASHINGTON  
ON JULY 7, 1911



PRESENTED BY MR. LODGE

JULY 25, 1911.—Ordered to be printed

WASHINGTON  
1911

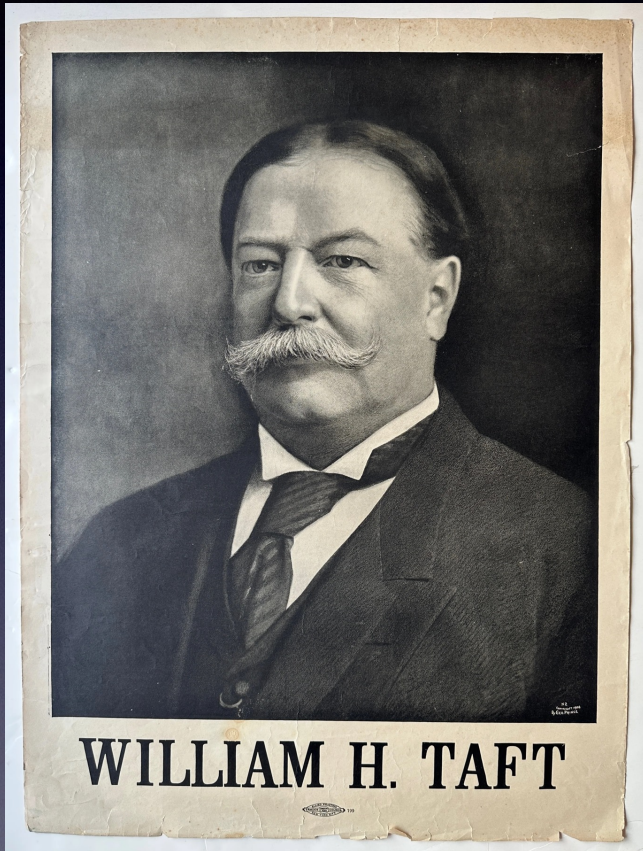
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# Why?

Treaty changed the rules  
of the game.

# How?

1. Achieved sole owner solution.
2. Side payments ensured that every party got something.
3. Enforced participation.
4. Enforced compliance.
5. Deterred entry.



*“This convention is a conservation measure of very great importance, and if it is carried out in the spirit of reciprocal concession and advantage upon which it is based, there is every reason to believe that not only will it result in preserving the furseal herds of the north Pacific Ocean and restoring them to their former value for the purposes of commerce, but also that it will afford a permanently satisfactory settlement of a question the only other solution of which seemed to be the total destruction of the fur seals. In another aspect, also, this convention is of importance in that it furnishes an illustration of the feasibility of securing a general international game law for the protection of other mammals of the sea, the preservation of which is of importance to all the nations of the world.”*

*State of the Union address, 5 December 1911*



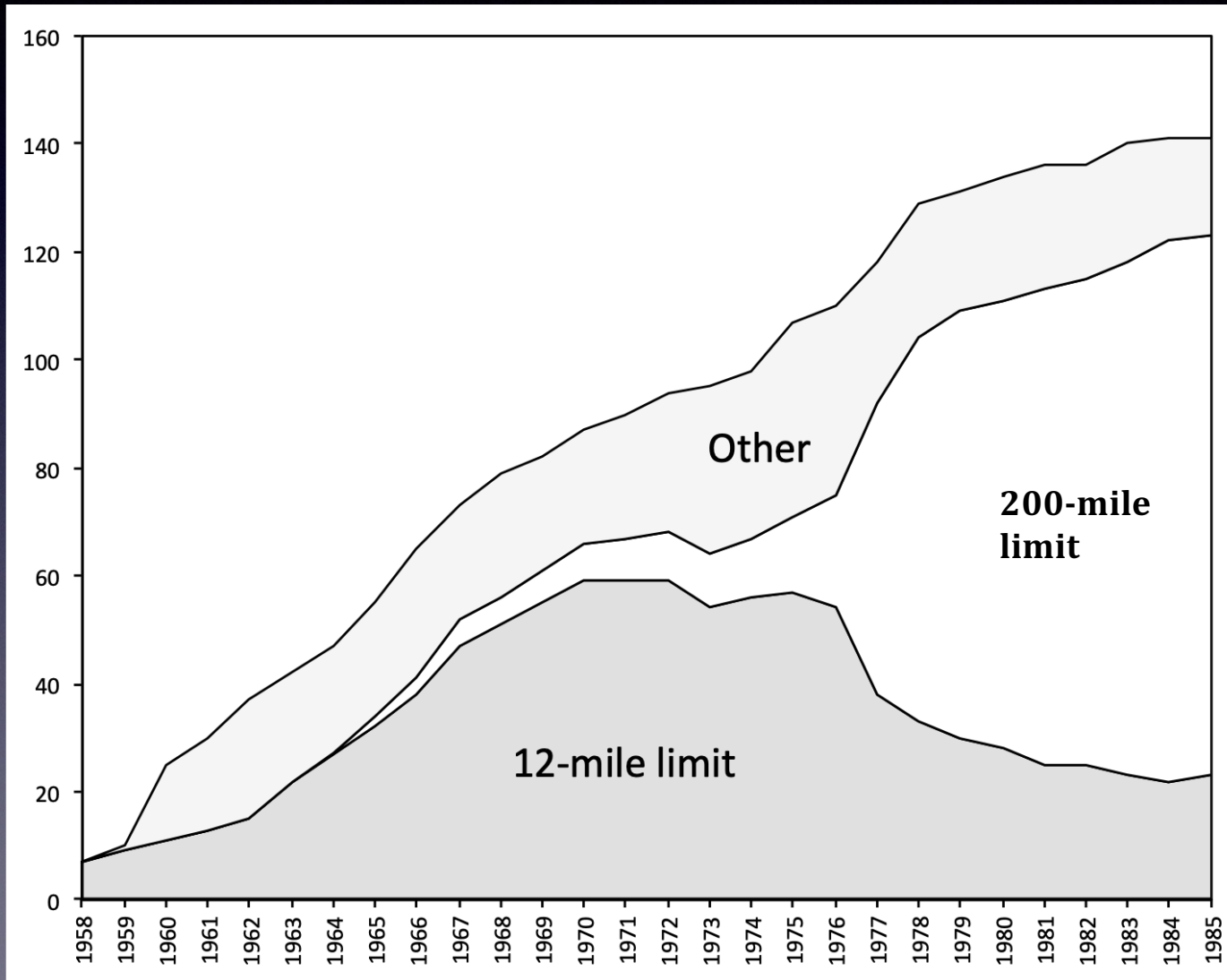
# Property rights vs. cooperative agreements

- The agreement was needed because the tribunal ruled out a property rights solution.
- By deterring entry, the agreement converted an open access resource into common property shared by just four countries.
- However, this agreement stands out as an exception.

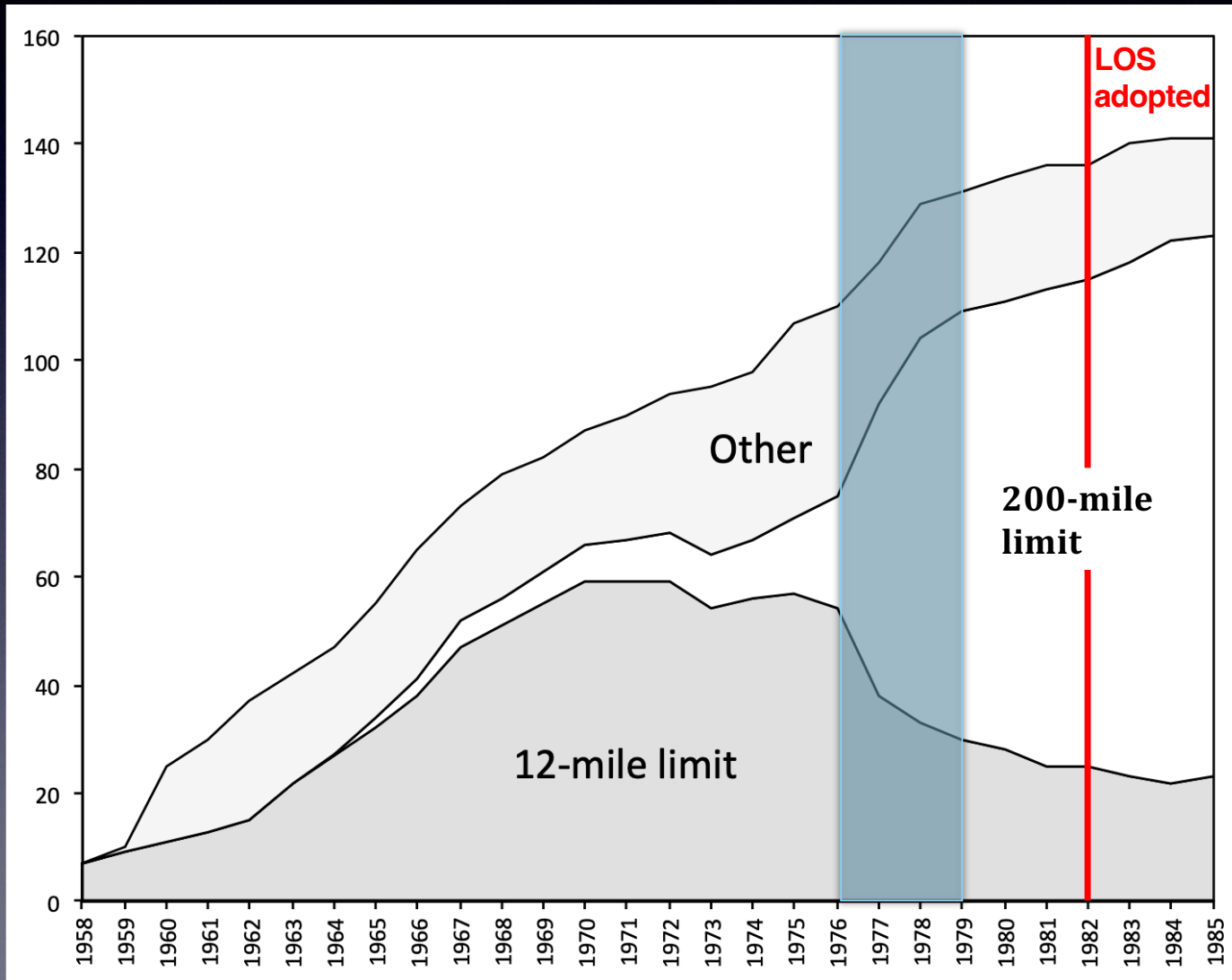
A radical change in  
property rights

# Establishment of the EEZ

New claims relative to three-mile territorial sea that existed since the late 18<sup>th</sup> century.



# Establishment of the EEZ



LOS  
Enters  
into  
force  
1994

# Customary international law

- Two requirements:
  1. A behavioral regularity.
  2. A belief in legal obligation or right.

## Examples:

- States are free to join treaties or not as they please.
- Treaties are to be kept.

# How to model creation of the EEZs?

- Fisheries are spatially situated in relation to states; new variable, distance.
- Three kinds of fishery—nearshore, offshore, and highly migratory.
- Solve for equilibrium property rights in customary law, and juxtapose this with the outcome that would arise were countries to act independently (Nash equilibrium).

# The world is complicated



# Theory provides a helpful misrepresentation of reality

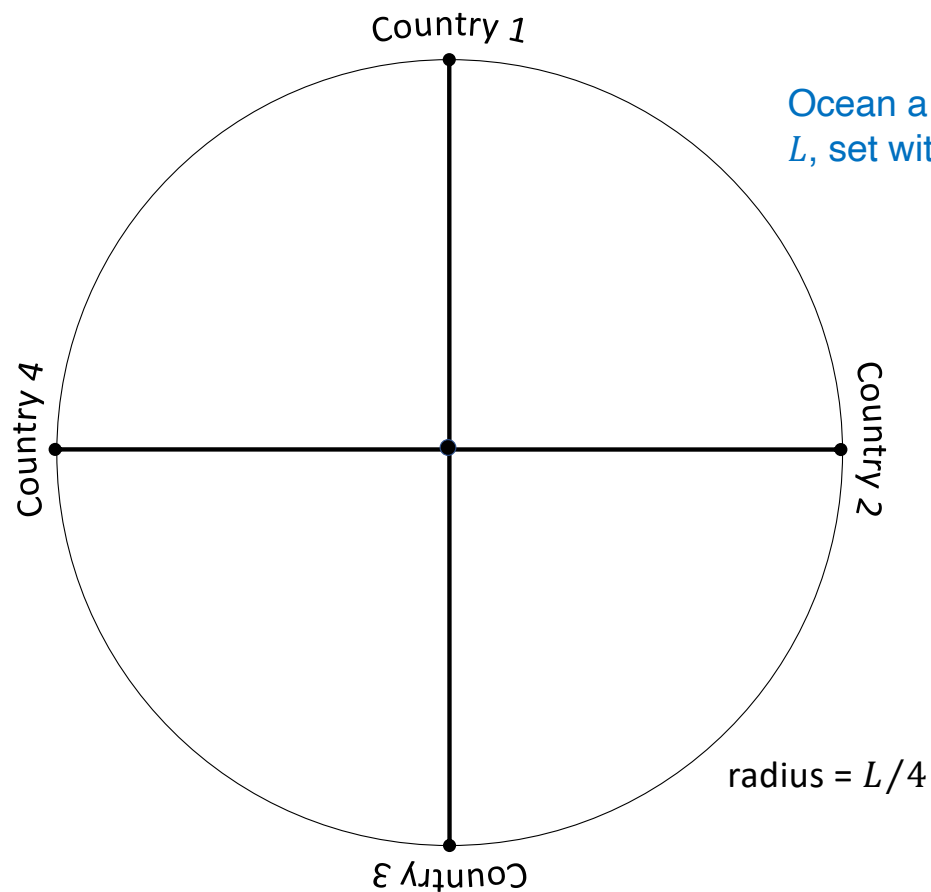


Harry Beck's 1933 design made it easier to see how to get from point A to point B.



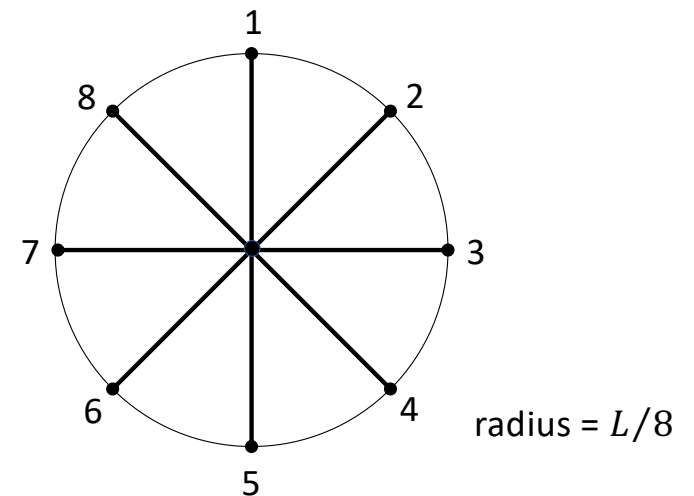
# The ocean

Ocean with  $n = 4$



Ocean a line of length  $L$ , set within a circle.

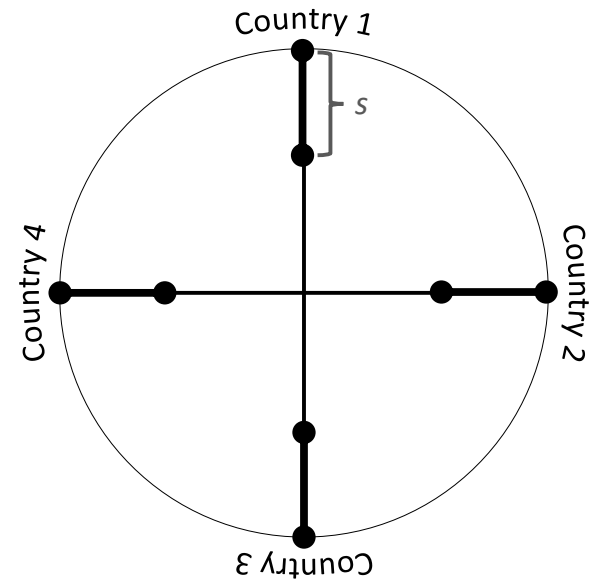
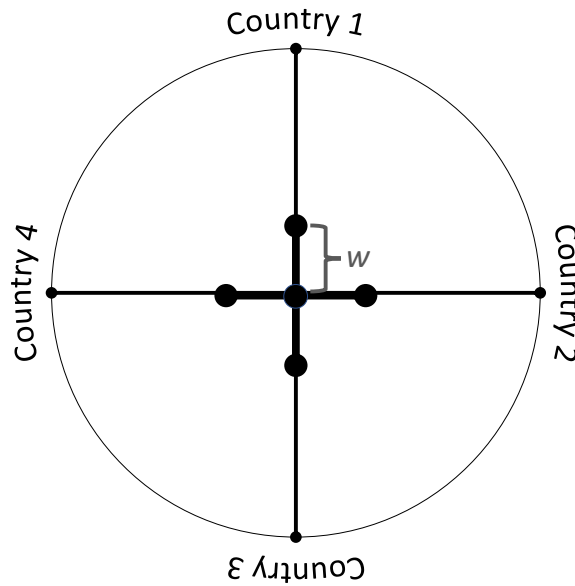
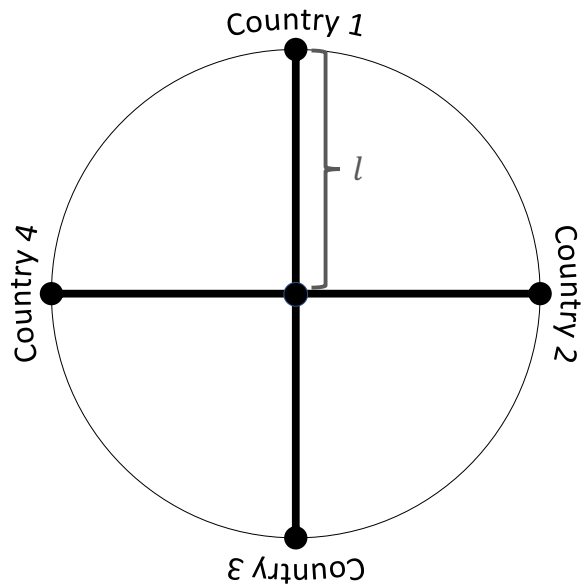
Ocean with  $n = 8$



$n$  countries represented by "home ports" located equidistantly on circle. The length of each "spoke" is  $l = L/n$

# The three fisheries

$n = 4$



Highly migratory

Offshore

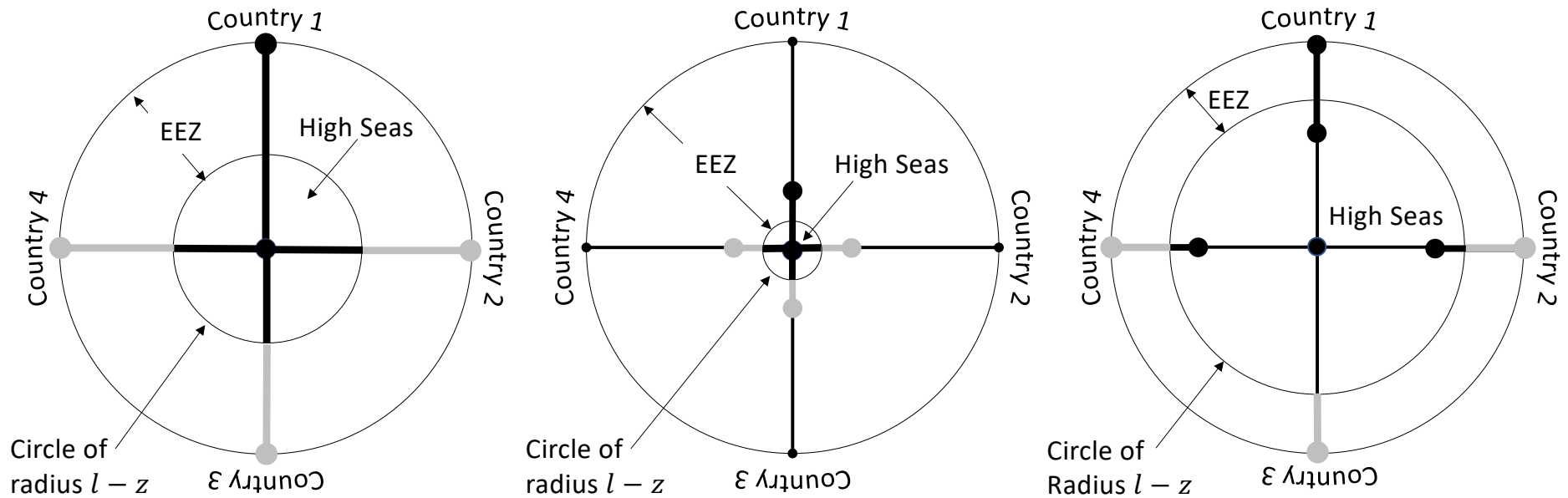
Nearshore

Fish are distributed uniformly on the line.



# EEZ given

Figures drawn from Country 1's perspective



Highly migratory

Offshore

Nearshore

To fish, a fleet travels from its homeport in the direction of the center of the circle; from there, it might also travel along any of the other rays or “spokes” available to it.

The fleet returns the way it came to offload.

# Choosing property rights

- **Default:** Countries choose independently (Nash).
- **Alternative:** Customary law.

# Customary law vs. Nash

	Nash	Custom
Highly migratory	no high seas	no EEZ
Offshore	no high seas	no EEZ
Nearshore	EEZ big enough to deter entry by foreign fleets	EEZ big enough to deter entry by foreign fleets

## A Theory of Customary International Law

Jack L. Goldsmith†  
Eric A. Posner††

*This Article presents a theory of customary international law ("CIL") that seeks to resolve the many well-known difficulties with standard accounts of CIL. The theory uses simple game-theoretical concepts to explain how CIL arises, why nations "comply" with CIL*

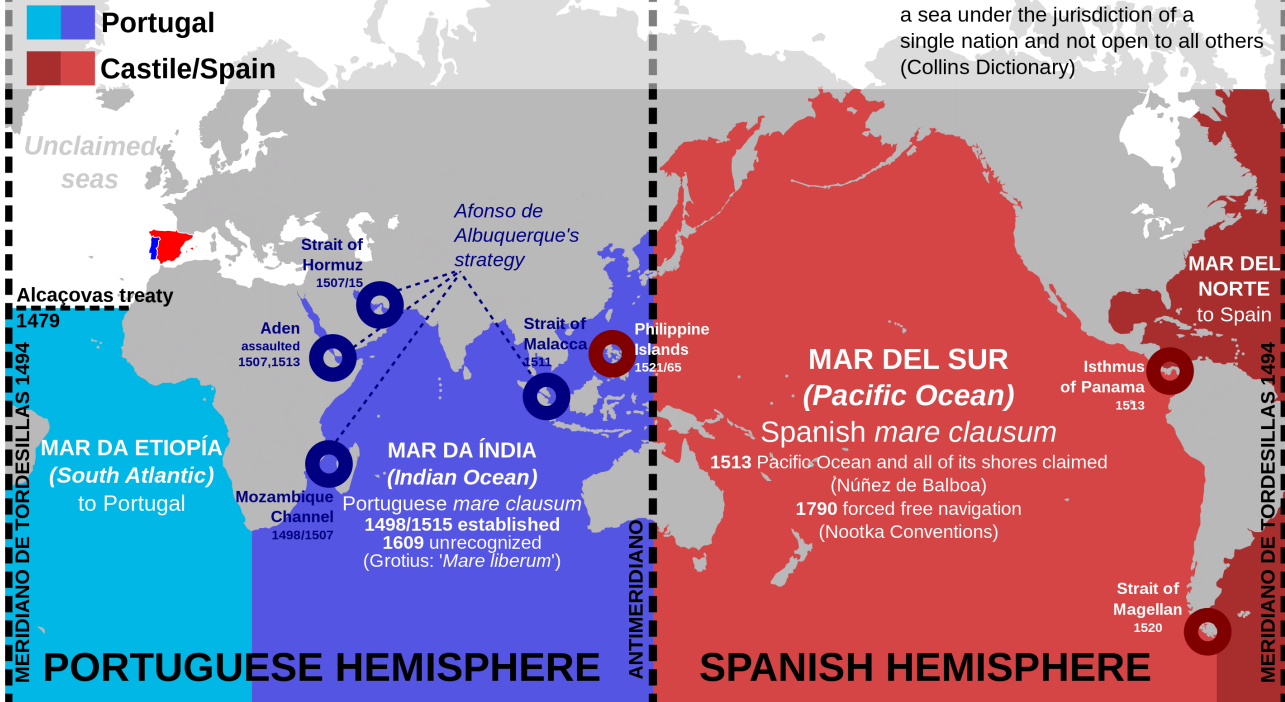
# An earlier claim

Line established by the Treaty of Saragossa in 1529



## Iberian *mare clausum* claims

\**mare clausum*: a sea under the jurisdiction of a single nation and not open to all others (Collins Dictionary)



Line established by the Treaty of Tordesillas in 1494

The alternative rule of *mare liberum* was proposed by Hugo Grotius in the early 17th century, just as international law was developing.

# How to know if custom differs from Nash?



NW Atlantic nearshore fishery extends beyond 200-miles in the "Nose" and "Tail" (and Flemish Cap).

If the EEZ reflected Nash behavior, Canada would claim sovereignty over these areas.

And, yet, it doesn't...

A Parliamentary committee said it shouldn't because other countries wouldn't countenance such a move.



# Why a 200-mile EEZ?

- No good reason!
- In model, the EEZ must only be “big enough.”
- How and why did the world choose 200 miles?

# US got the ball rolling

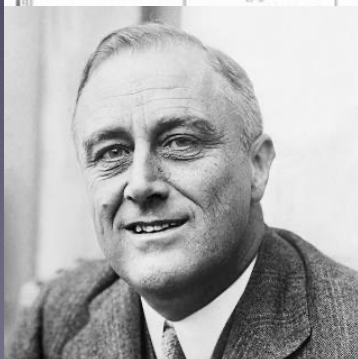
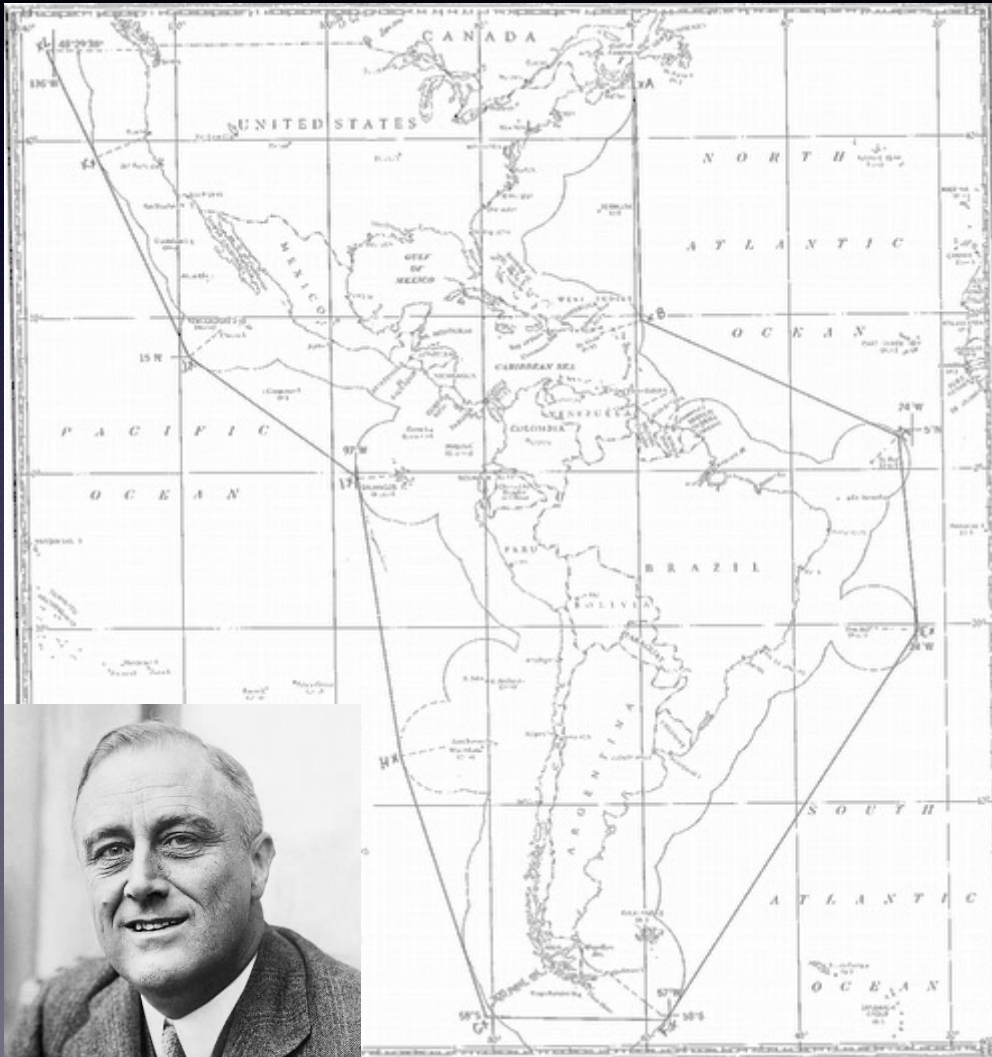


- Truman Proclamation of 1945, asserted a right by the US to establish fisheries conservation zones “*in those areas of the high seas contiguous to [its] coasts,*” due to a concern about “*the inadequacy of present arrangements for the protection and perpetuation of the fishery resources*” in these seas.
- Recognized “the right of any State to establish conservation zones off its shores in accordance with” the same principles—as would be required if the right was to be established in customary law.

# Chile first to declare

- In 1947, Chile declares a 200-mile zone.
- Case for the zone put to the president by a Chilean whaling company. The company only wanted a 50-mile zone, but its legal counsel said any claim would have to be grounded in precedent. The precedent they found suggested 200 miles.

# 1939 Declaration of Panama



- State Department drew 300-mile security zone.
- Roosevelt made this 300-500 m.
- Declaration only showed coordinates.
- Company used a map incorrectly showing 200 m.
- President of Chile accepted this without fact-checking.



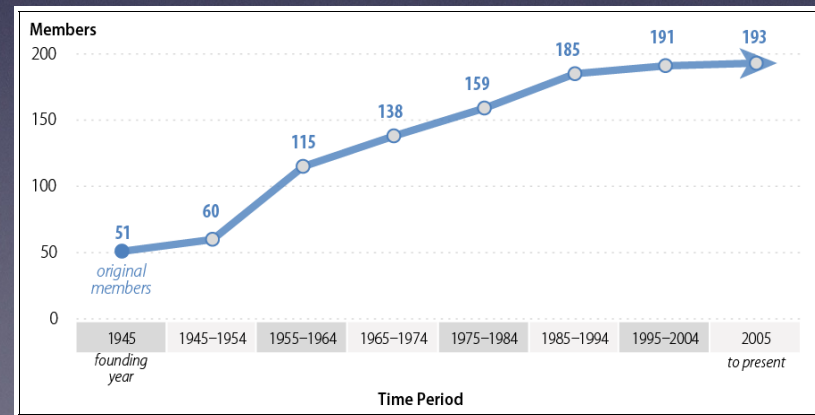
# Timing?

WWII revealed the abundance of resources offshore, and made states want to keep what had just been revealed.

In model, two parameters changed:

$n$  tripled from 1945 to 1978.

$\alpha$  increased. New fleets could operate farther from home; new gear increased catch per unit of effort.



# Scope of EEZ?

## Species vs. zonal approach

	Species	Zonal
EEZ Scope	Highly migratory species common property throughout their range	All fish in EEZs belong to coastal state.
Favored by	Distant water states	Coastal states

# Tuna Wars

In Eastern Tropical Pacific, coastal states would capture and fine US vessels. The US government would pay the fine.

Both acted in accordance with their respective interpretations of custom.

THE NEW YORK TIMES, TUESDAY, JANUARY 6, 1970

## U.S. Tuna Boats Fear New Clashes

By JUAN de ONIS  
Special to The New York Times

SAN DIEGO, Calif., Jan. 4—The American tuna fleet has put to sea for the start of a new season that seems bound to reopen the United States dispute with South American countries over fishing rights on the high seas in the eastern Pacific.

With the New Year's Eve celebrations and the televised Rose Bowl game out of the way, the captains and their crews assembled at the piers that seem to be at the foot of all streets that come down from the hillsides of this port, and then raced their clippers



The New York Times Jan. 6, 1970  
Tuna fleet operates from the area of San Diego (1) to below the Galápagos (2).

ereignty and the tuna boat operators refuse to do this, a stand that is backed by the United States Government.

August Felando, general manager of the American Tuna Boat Association, which represents the clipper owners, took part in the Buenos Aires conference on the fishing dispute. He was a member of the United States delegation, headed by Donald L. McKernan, special adviser on international fisheries to Secretary of State William P. Rogers.

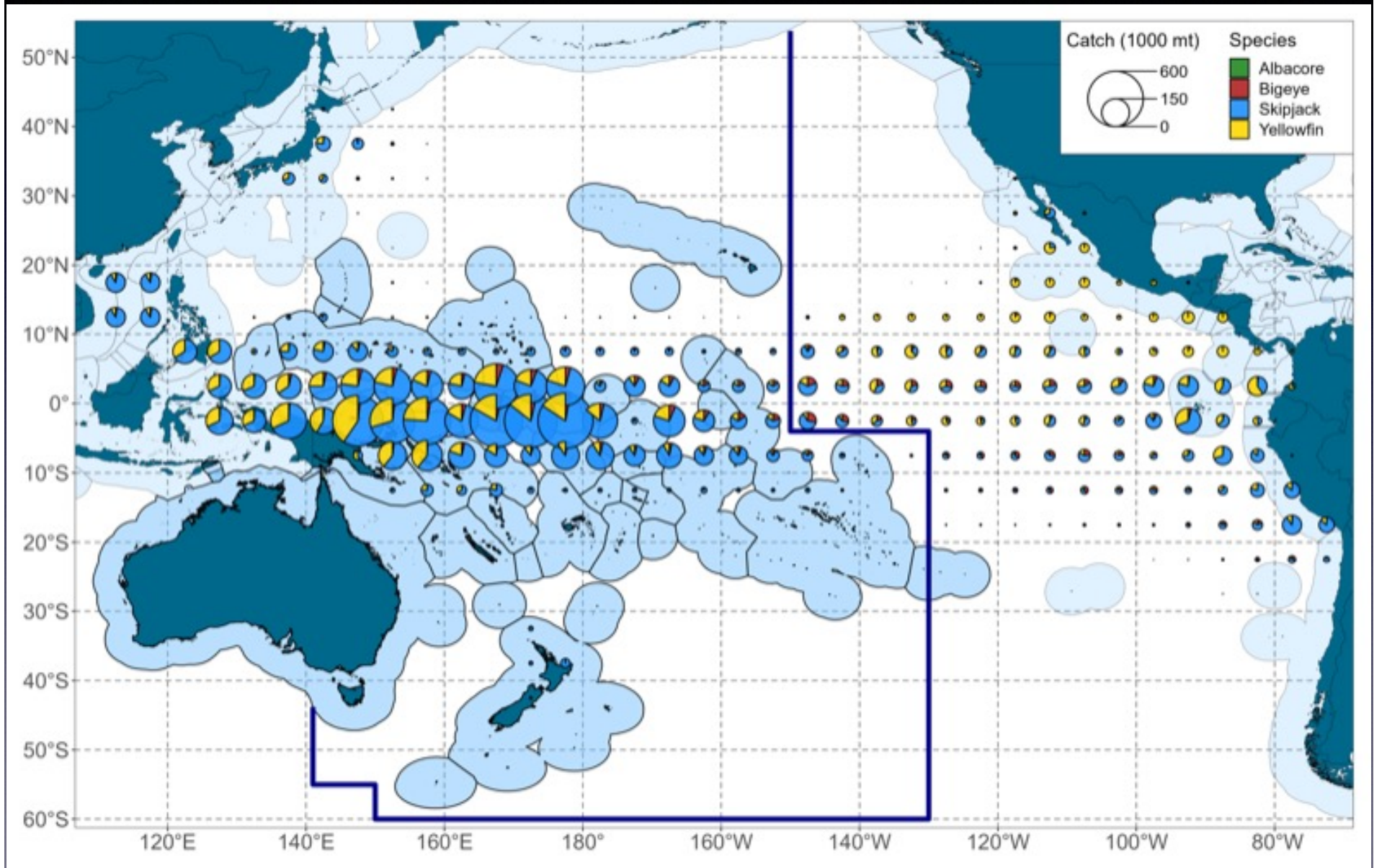
### Commission Regulates Catch

The association has been instrumental in promoting United States participation in the Inter-American Tropical Tuna Com-

Over time, US fleet moved to Central and Western Pacific. There, the EEZs were even more important.

# Purse Seine Tuna Catch in the Pacific, 2016-2020

Source: Hare et al. (2022), Figure 5, p. 41.





# Tuna Wars

Washington Compromised Last Week on a Missile Test Range

## Pacific Atolls Show Feisty Independence

By ROBERT TRUMBULL

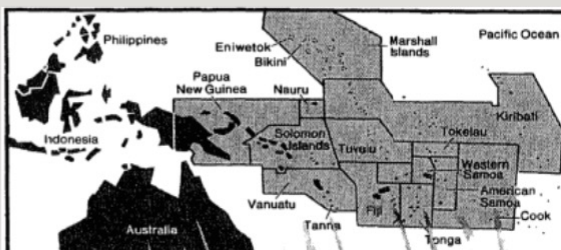
HONOLULU — Disputes over nuclear policy, fishing rights and the Law of the Sea Treaty are eroding the warm relations, dating back to World War II, between the United States and the newly sovereign nations of the central and south Pacific.

Defusing a dispute affecting an important American security interest, the Defense Department last week agreed to cut 20 years from its 50-year agreement for use of a missile test range on Kwajalein atoll in the Marshall Islands. American aid payments to island residents were increased. The islanders agreed to halt demonstrations that had interfered with testing of intercontinental missiles and antisubmissiles since June.

The nuclear issue has been revived in a suit against the United States by former servicemen and others claiming they were harmed by exposure to radioactive fallout from a 1954 nuclear test explosion, also in the Marshall Islands.

Attitudes have changed since entire populations on Bikini and Eniwetok Atolls in the Marshalls allowed themselves to be moved from ancestral homelands in 1946 and 1947, to make way for nuclear tests. Several islands were blasted out of existence and others rendered uninhabitable for generations. It is inconceivable that the present generation of educated island leaders would tolerate such treatment.

Except in the Marshalls and other islands taken from Japan in the war and administered as a United Nations trust territory since 1947, the American presence was minimal for decades. Then, in 1978, when most of the larger groups were becoming independent, the State Department set up an Office of Pacific Island Affairs. Its first director, William Boalke Jr., concluded as-yet unratified treaties that dropped 19th century American claims to 25 small, mostly uninhabited islands. These islands were also claimed by the new states of Kiribati and Tuvalu (formerly the British Gilbert and Ellice Islands) and Tokelau and



Cargo cultists, who venerate a faded army field jacket of an American medical corpsman, marching with wooden rifles on Tanna Island in Vanuatu.

US signs Tuna Treaty in 1987.

licenses. The United States has angered the islanders by demanding an exemption for tuna, the most lucrative catch, arguing that tuna, as a migratory species, may be freely pursued. An

US amends own law in 1991.

Resolved scope of EEZ

# Two radical proposals

	Proposal
Global Ocean Commission (2014)/ White & Costello (2014)	<b>Ban high seas fishing</b>
Hannesson (2011)	<b>Nationalize the high seas</b>

My research support's neither proposal.

# A different solution



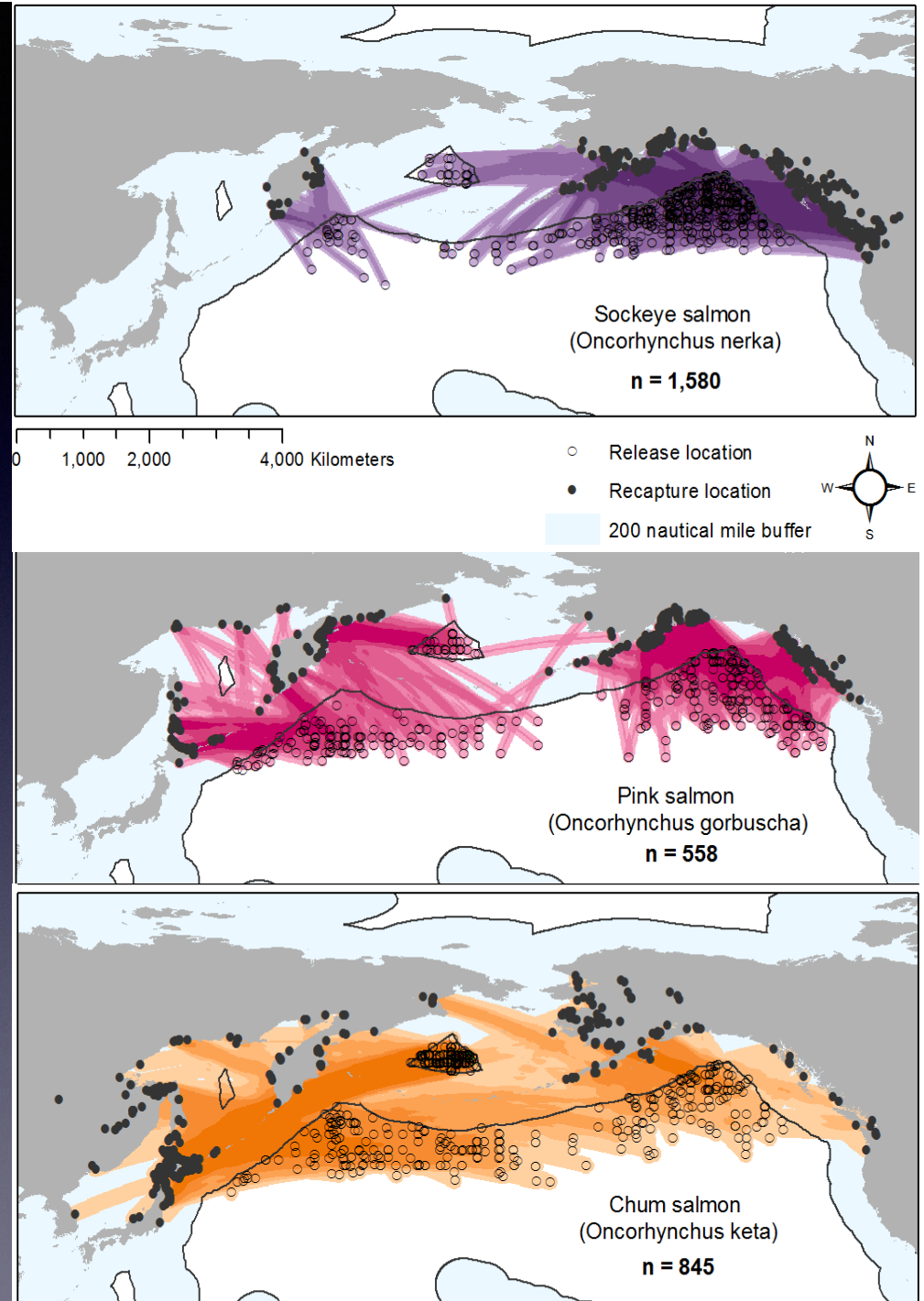
From the perspective of “states of origin,” ban on high seas fishing may be a second best approach to exclude distant water fleets.

# North Pacific Salmon

- LOS says that “*states of origin*” have a “*primary interest in and responsibility for [anadromous stocks].*”
- States of origin may fish for salmon “*only in waters landward of the outer limits of the [EEZs].*”
- This has become a ban on high seas fishing.\*

LOS creates a property right that the Arbitrational Tribunal of 1892 rejected.

\*A primary aim of the Convention for the Conservation of Anadromous Stocks is to enforce the high seas ban.



# Summary

- There are two ways to limit overfishing: treaties and property rights arrangements in customary law.
- The NPFST achieves an outcome like the sole owner, but the conditions that enable this rarely exist.
- Property rights arrangements can also help, especially for near-shore fisheries, but this solution is also limited.
- My research does not support proposals to extend the existing EEZs or to close the high seas.
- More effort needs to go into improving the design of cooperative agreements.

# Related issues

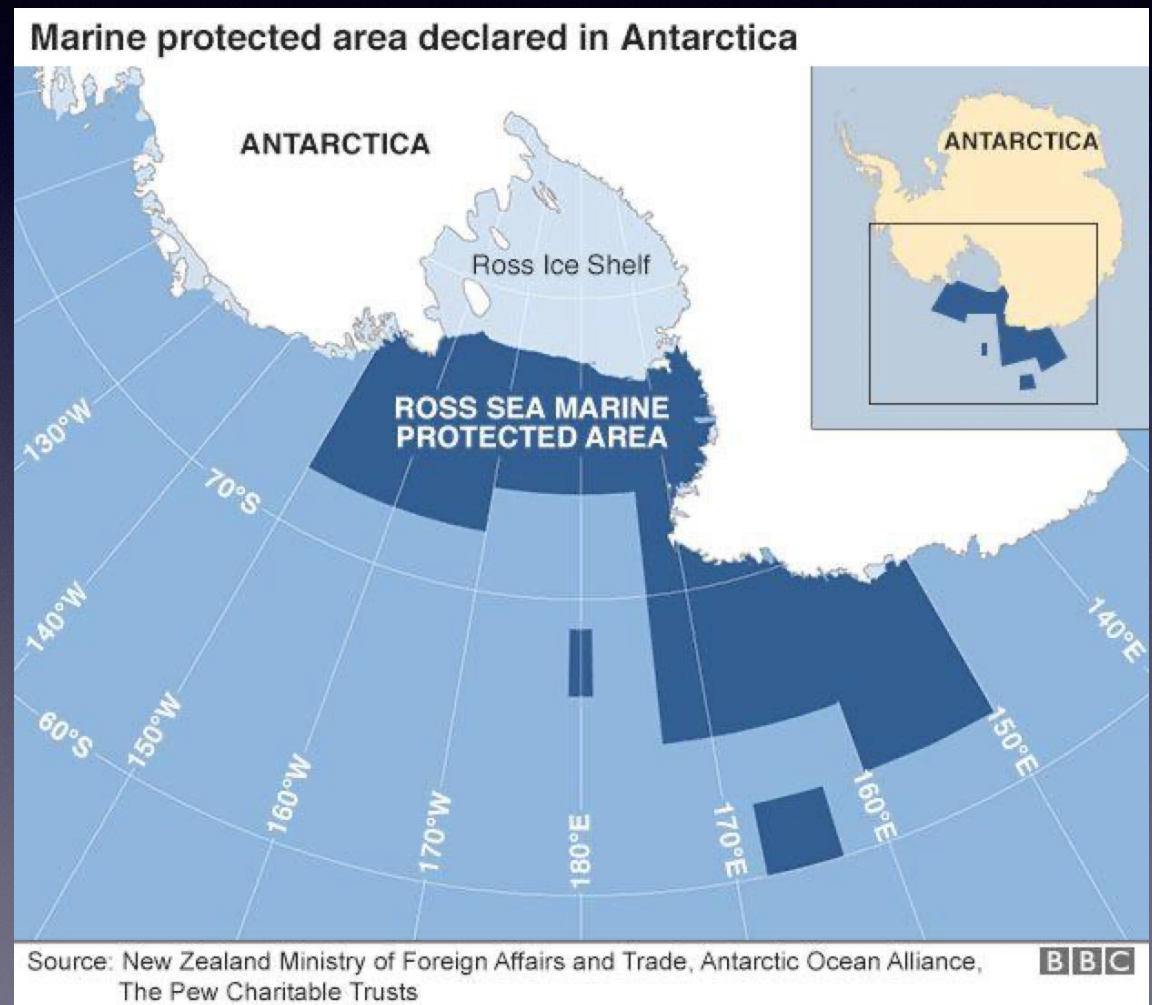
- Marine Protected Areas
- Climate change

# Marine Protected Areas

Agreement on the Conservation and Sustainable Use of Marine Biological Diversity of Areas Beyond National Jurisdiction adopted June 2023.

May establish MPAs, but parties may “object” and decisions by parties do not apply to non-parties.

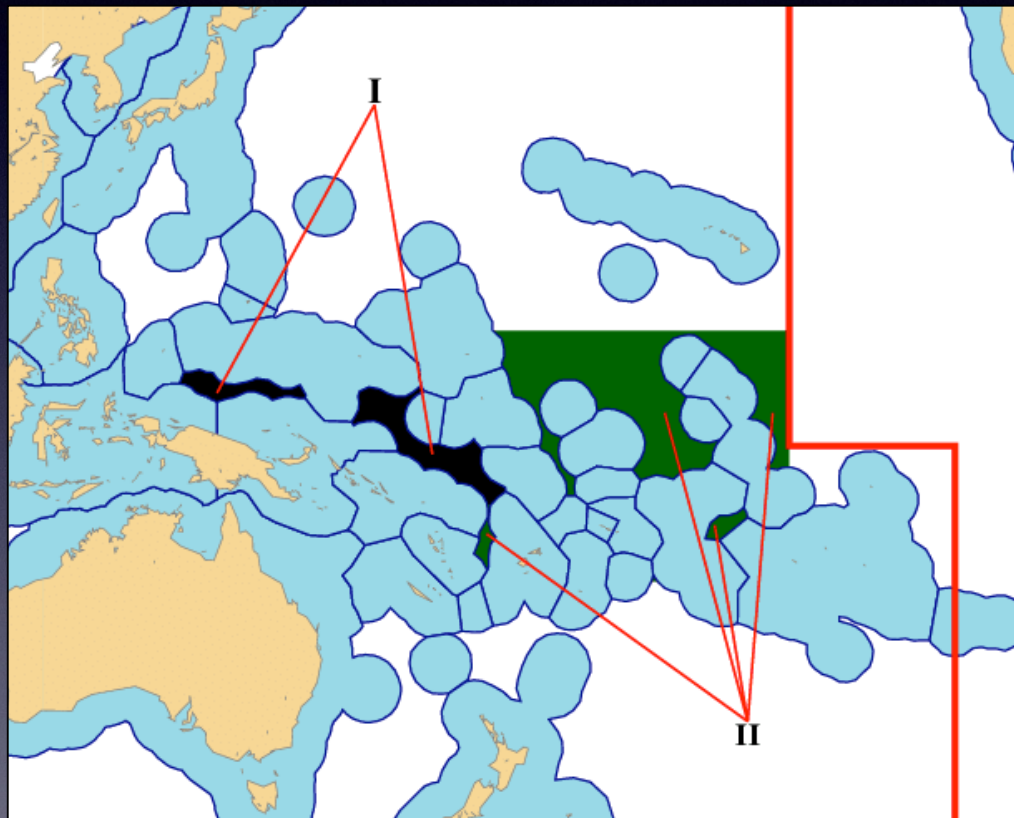
Ross Sea MPA established by parties to the Convention for the Conservation of Antarctic Marine Living Resources. To last 35 years. Fishing displaced by this MPA to be redistributed to other areas, including areas that currently have zero catch limit.



# Closure of high seas “pockets”

The WCPFC closed high seas pockets I in 2010.

Analysis by Sibert et al. (2012) shows that fishing effort increased 10% and was deployed in adjacent EEZs



Modeling shows spatial measures alone are not generally effective, but can be if taken along with other measures.

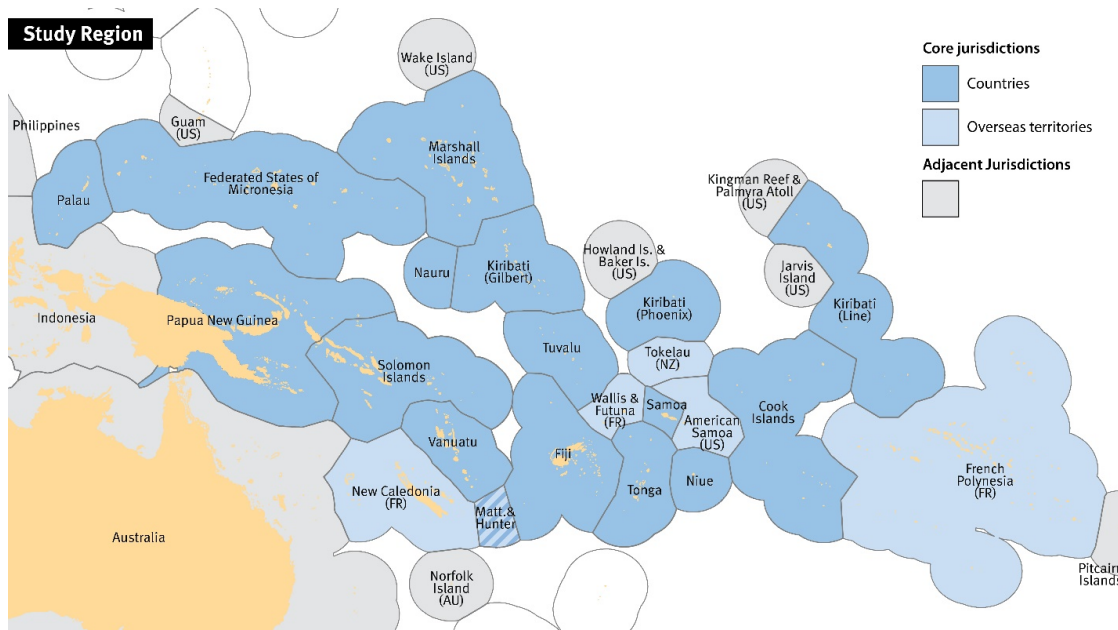
Not a panacea.

Source: Sibert et al. (2012), Fig. 1.

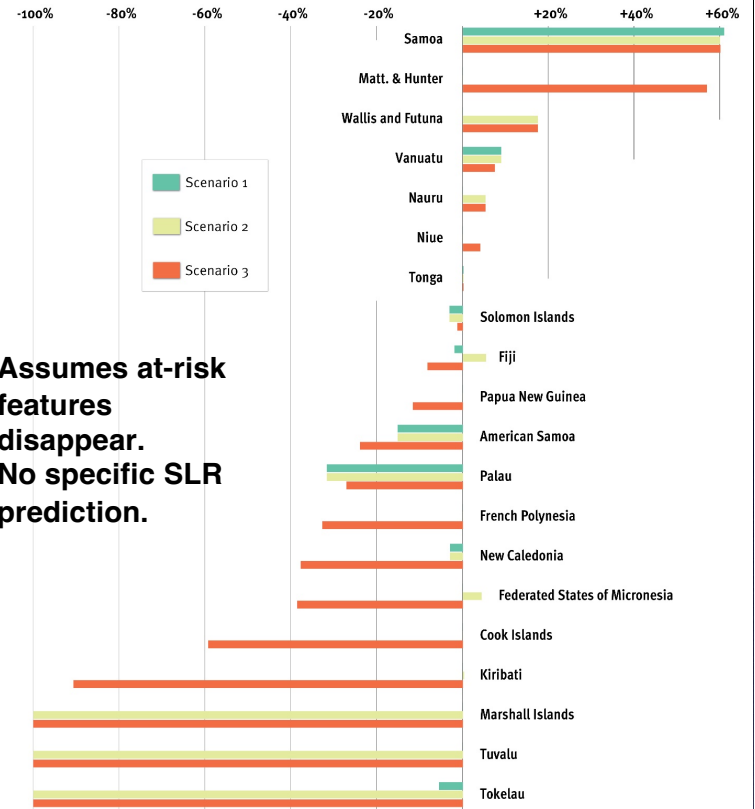


# Shifting baselines

Westerveld (2020).



Results: relative change in EEZ area compared to current in %



Assumes at-risk features disappear. No specific SLR prediction.

Will rules remain unchanged and EEZs change as baselines change due to SLR?

Will EEZs remain fixed even as baselines change?

What happens if a state disappears?

High seas pockets disappear into the high seas.

Some states like Tuvalu, Tokelau, and the Marshall Islands disappear.

Scenario 3: change in high seas

Original high seas area, Additional new high seas area, EEZ areas, "dissolved" high seas pocket



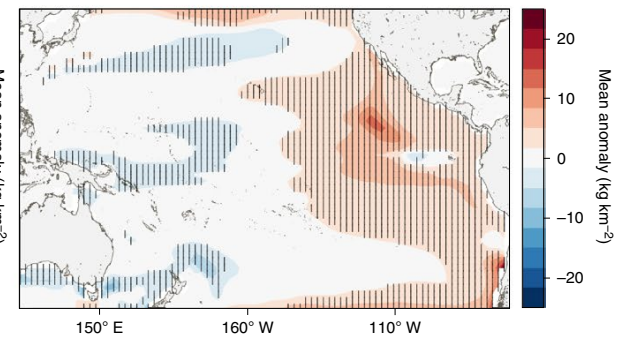
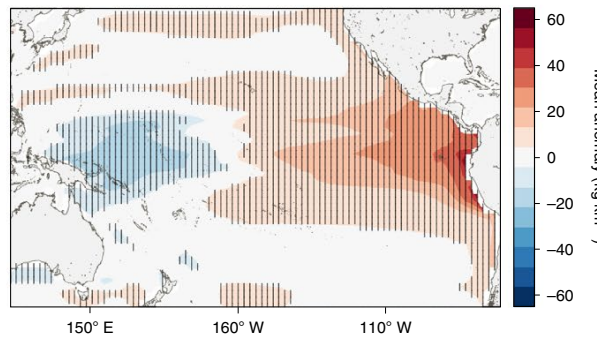
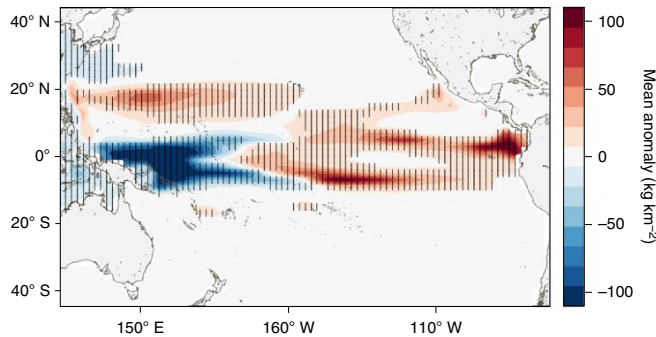
# Shifting stocks

Skipjack

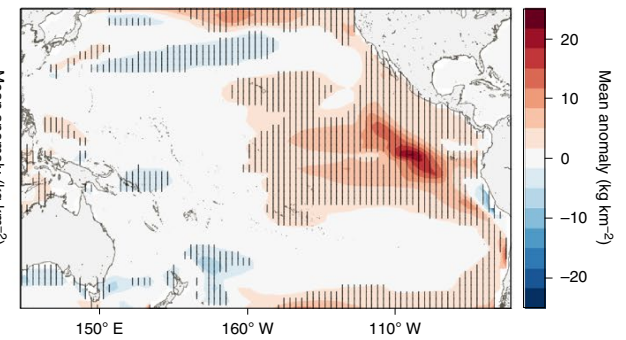
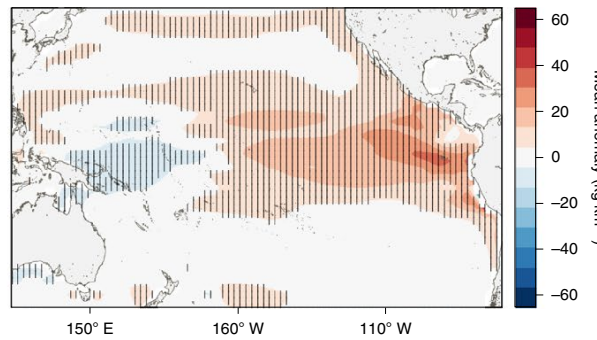
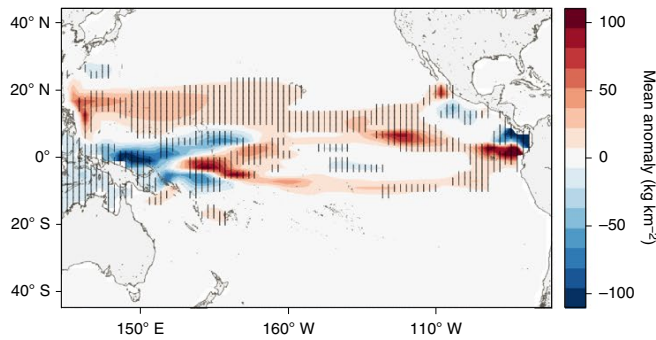
Yellowfin

Bigeye

RCP 8.5 2050



RCP 4.5 2050



Bell et al. (2021).

Climate change is causing stocks to move.

The most pronounced moves are from EEZs to high seas and from the Central and Western Pacific to the Eastern Pacific Ocean.

# Final comment on climate change

- CO<sub>2</sub> is like DDT. It spreads everywhere and persists.
- However, DDT has a short half-life; in human mother's milk, about 5 years. US banned DDT in 1972, and bald eagles showed signs of recovery as soon as 1974.
- CO<sub>2</sub> is more like a forever problem.

