Our Future Ocean

Small-scale fisheries and food security in a changing climate

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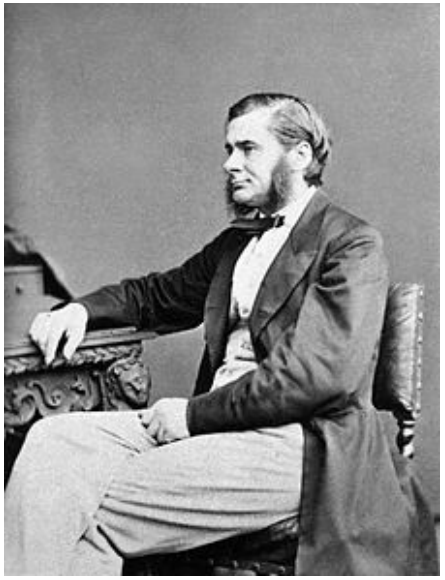
The view from Atagoyama in 1867

The Past Ocean

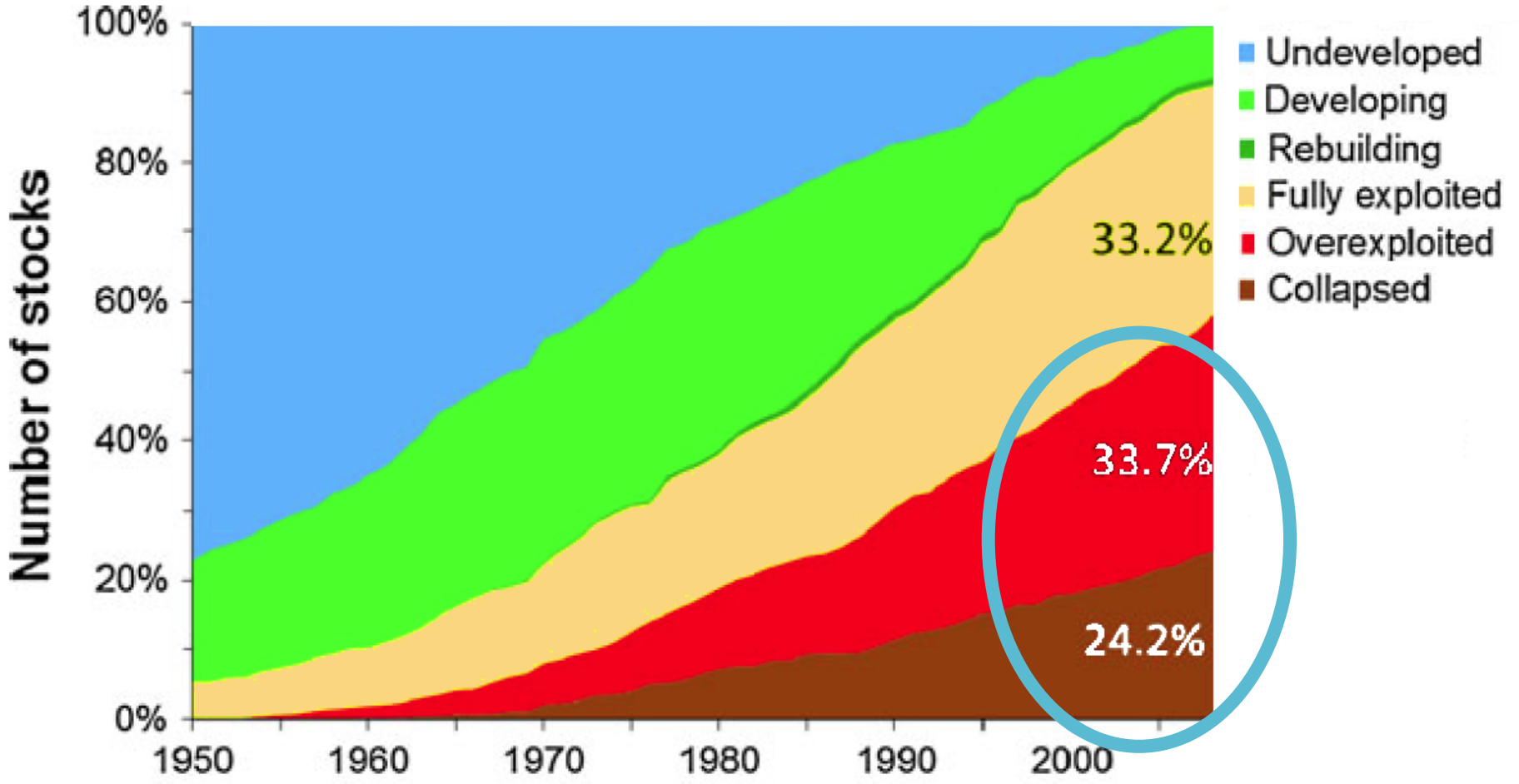
All the great sea fisheries are inexhaustible.

Nothing we do seriously affects the numbers of fish. Any attempt to regulate these fisheries seems ..to be useless

(Thomas Huxley, 1884).



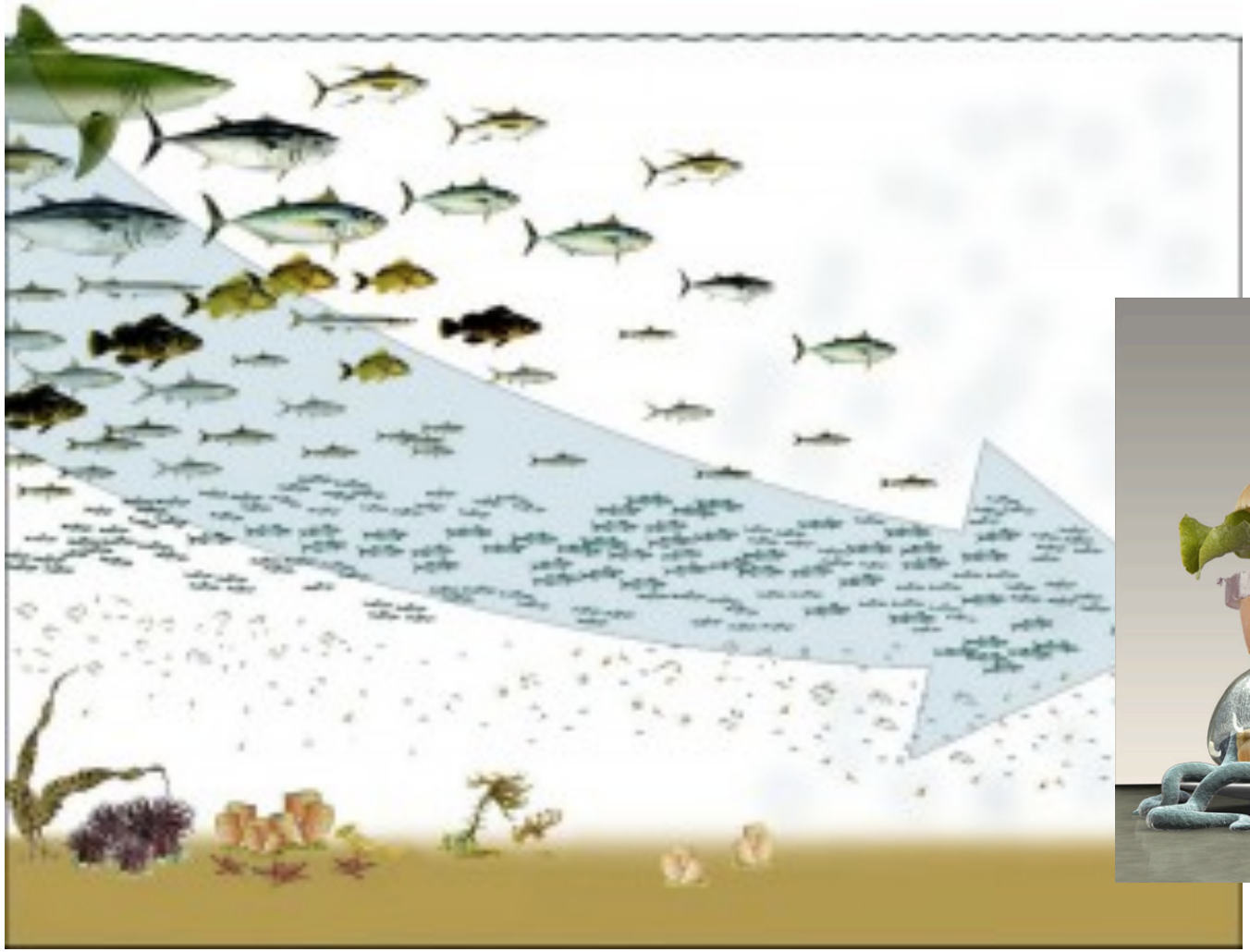
Global Fisheries Sustainability

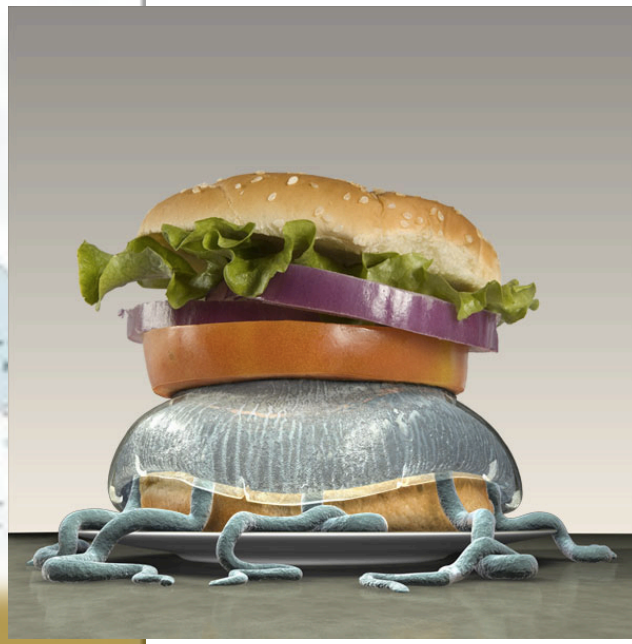


The Future Ocean?

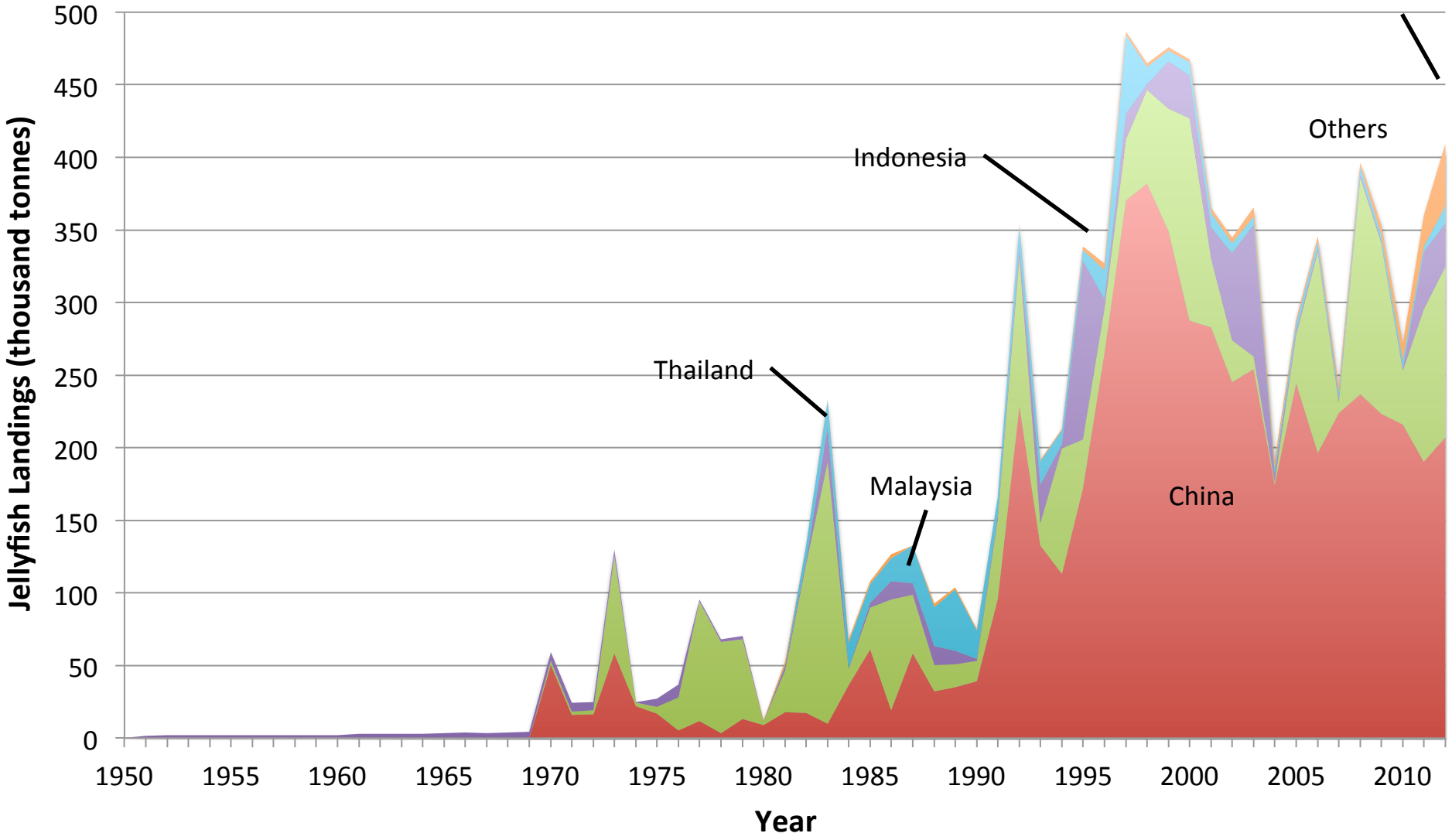
If we don't manage marine living resource,
we will be left with a diet of
jellyfish and plankton stew
(Daniel Pauly, Fisheries Scientist at UBC).

Fishing down to Jelly Fish burger?





Jelly Fish Fisheries: The International Catch (FAO)



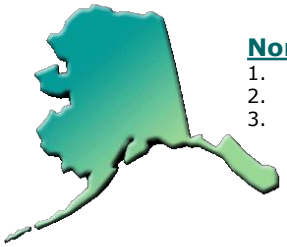
Rebuilding fish stocks

The average exploitation rate is not at or below the rate predicted to achieve maximum sustainable yield for 7 out of 10 system

(Ray Hilborn, Fisheries Scientist at University of Washington).

We are rebuilding our stocks.

Rebuilding Fish stocks in US



North Pacific:

1. Southern tanner crab - Bering Sea (2007 and 2012)
2. Blue king crab - Saint Matthews Island (2009)
3. Snow crab - Bering Sea (2011)

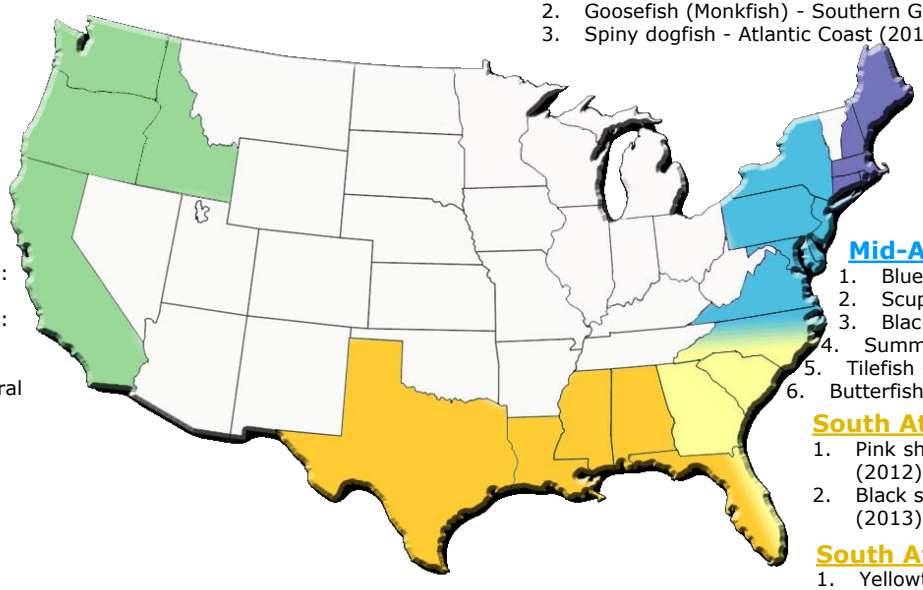
2. Silver hake – Gulf of Maine/Northern Georges Bank (2002)
3. Silver hake - Southern Georges Bank / Middle Atlantic (2007)
4. Winter flounder – Georges Bank (2003)
5. Haddock - Georges Bank (2010)
6. Pollock - Gulf of Maine / Georges Bank (2010)
7. Haddock - Gulf of Maine (2011)
8. Acadian redfish - Gulf of Maine / Georges Bank (2012)
9. Windowpane - Southern New England / Mid-Atlantic (2012)
10. Yellowtail flounder - Southern New England / Mid-Atlantic (2012)

New England/ Mid-Atlantic

1. Goosefish (Monkfish) - Gulf of Maine / Northern Georges Bank (2008)
2. Goosefish (Monkfish) - Southern Georges Bank / Mid-Atlantic (2008)
3. Spiny dogfish - Atlantic Coast (2010)

Pacific:

1. Pacific whiting – Pacific Coast (2004)
2. Lingcod – Pacific Coast (2005)
3. Chinook salmon - Northern California Coast: Klamath (fall) (2011)
4. Widow rockfish - Pacific Coast (2011)
5. Coho salmon - Washington Coast: Queets (2011)
6. Coho salmon - Washington Coast: Western Strait of Juan de Fuca (2012)
7. Chinook salmon - California Central Valley: Sacramento (fall) (2013)



Highly Migratory Species:

1. Blacktip shark – Atlantic / Gulf of Mexico (2003)[1]
2. Swordfish - North Atlantic (2009)

Mid-Atlantic:

1. Bluefish - Atlantic Coast (2008)
2. Scup - Atlantic Coast (2009)
3. Black sea bass - Mid-Atlantic Coast (2009)
4. Summer flounder - Mid-Atlantic Coast (2011)
5. Tilefish - Mid-Atlantic Coast (2014)
6. Butterfish - Gulf of Maine / Cape Hatteras (2014)

South Atlantic:

1. Pink shrimp - Southern Atlantic Coast (2012)
2. Black sea bass – Southern Atlantic Coast (2013)

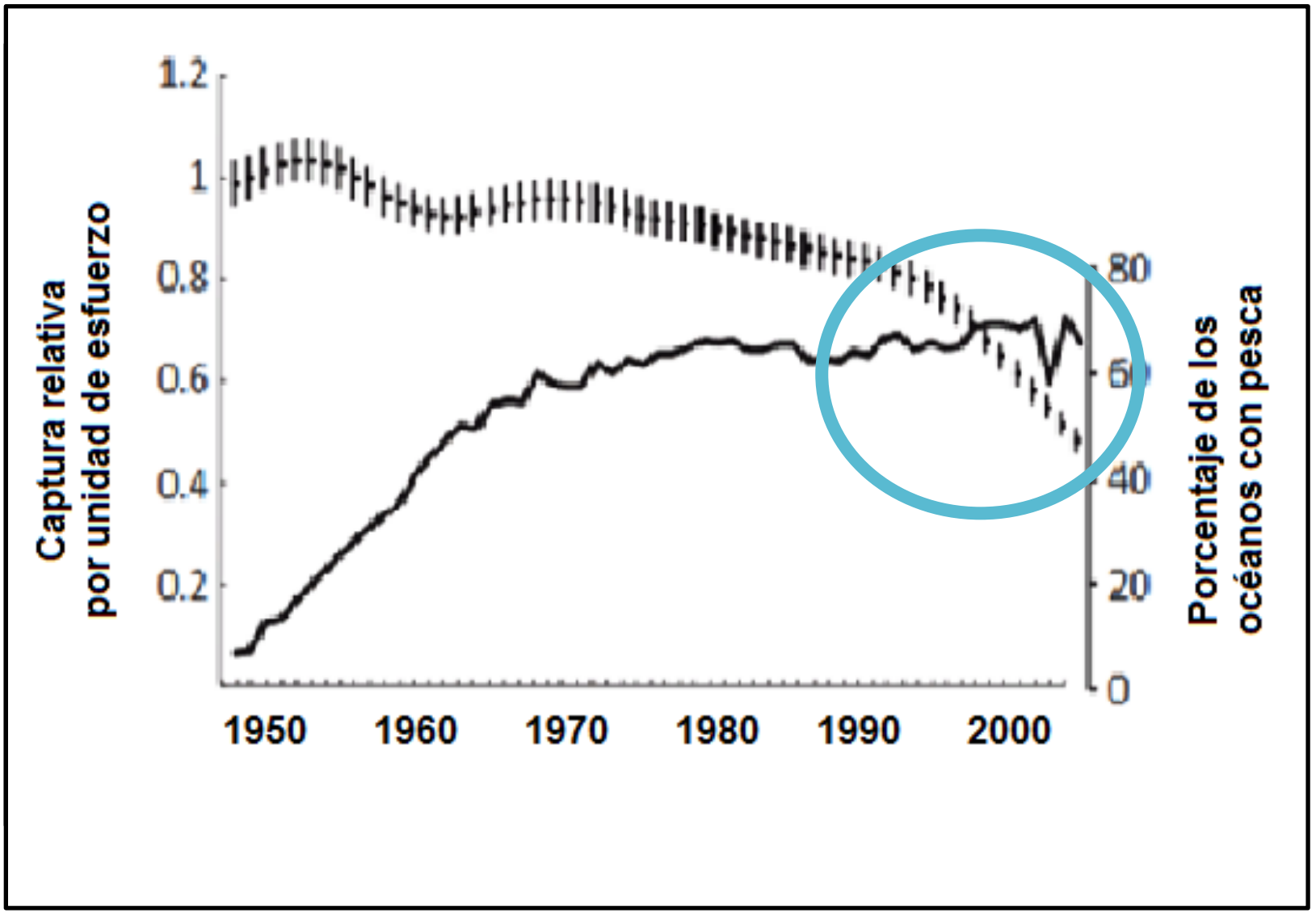
South Atlantic/Gulf of Mexico:

1. Yellowtail snapper – South Atlantic / Gulf of Mexico (2003)

Gulf of Mexico:

1. Red grouper - Gulf of Mexico (2007)
2. King mackerel - Gulf of Mexico (2008)
3. Gag – Gulf of Mexico (2014)

Trend of Fishing Catch and Effort



Sustainable brand and Consumer Awareness

243: Certified fisheries.

10% of global wild catch

US CANADA: 20

EUROPE (NORTHEAST ATLANTIC): 90

AFRICA: 2

SOUTH EAST ASIA: 2

PACIFIC ISLANDS: 1

SOUTH AMERICA: 4

SOUTH ASIA: 0

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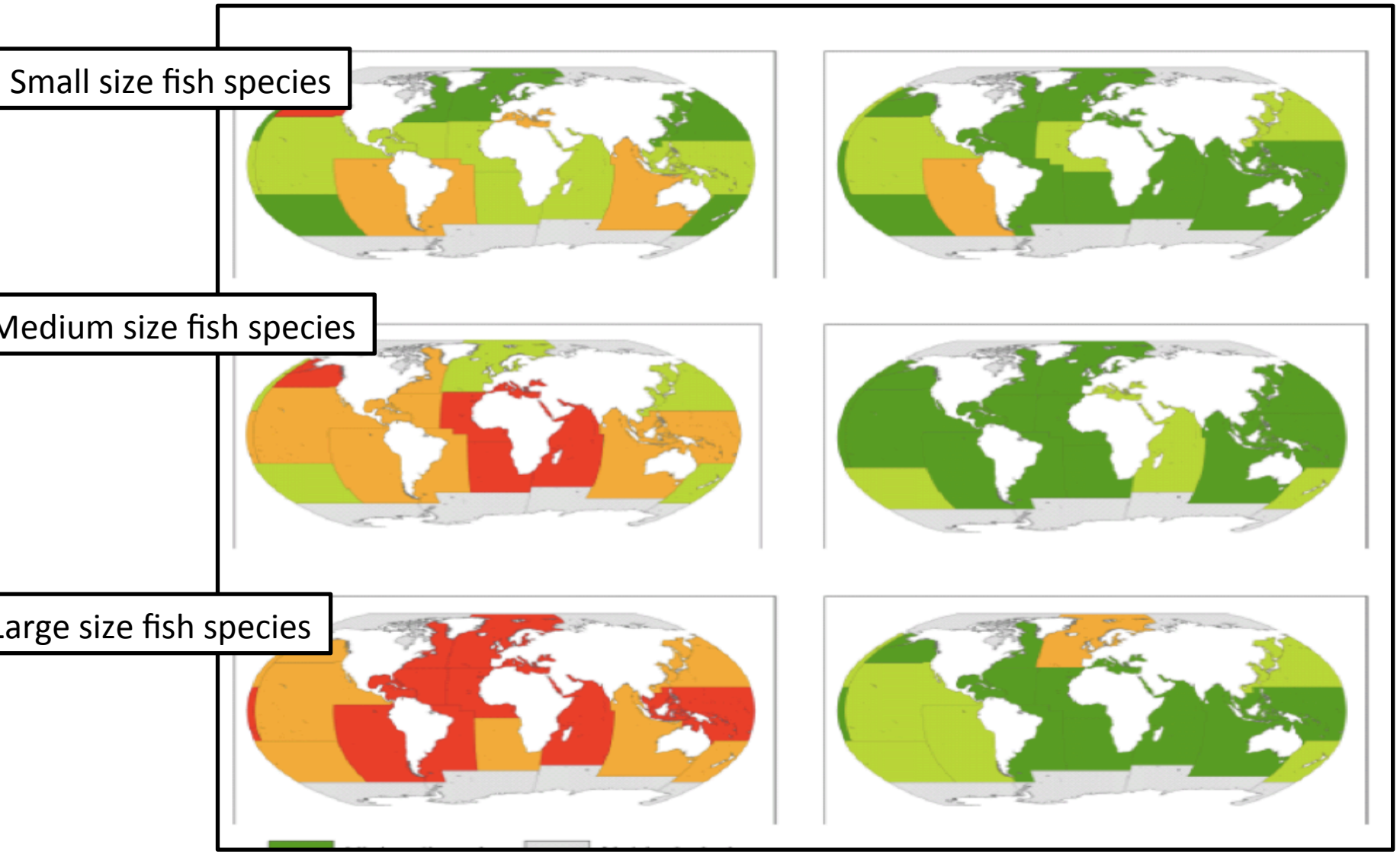
Our Future Ocean and fish?
私たちの海の未来は？

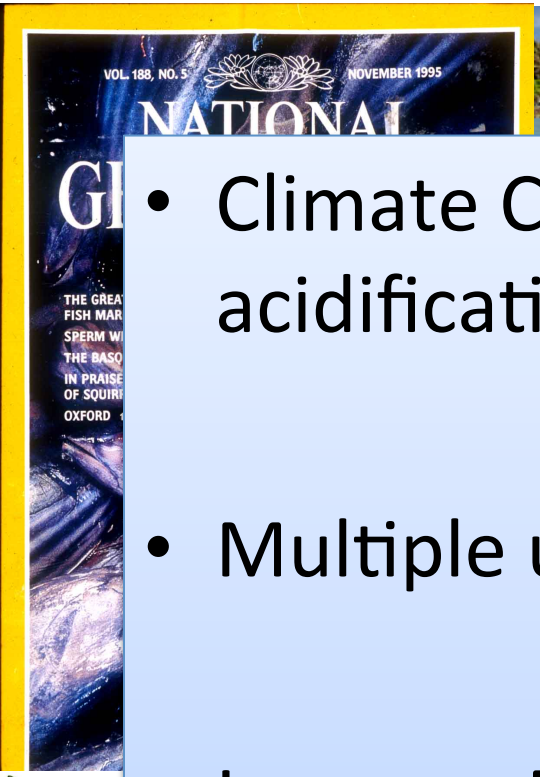
Projection of future sustainability of Global Fisheries (by 2050)

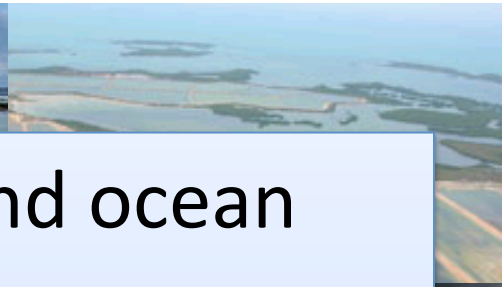


Our future will not be the same as the past!

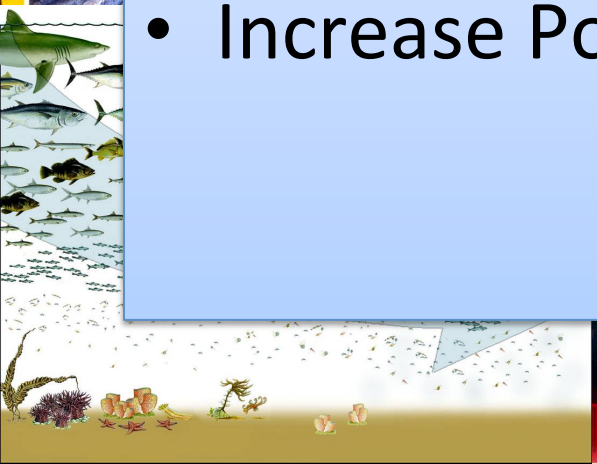
未来の海は過去の海と異なる。

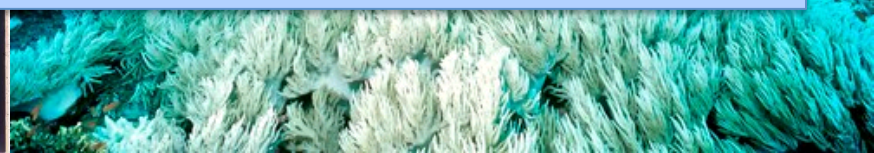
Multi drivers to change the ocean and coast



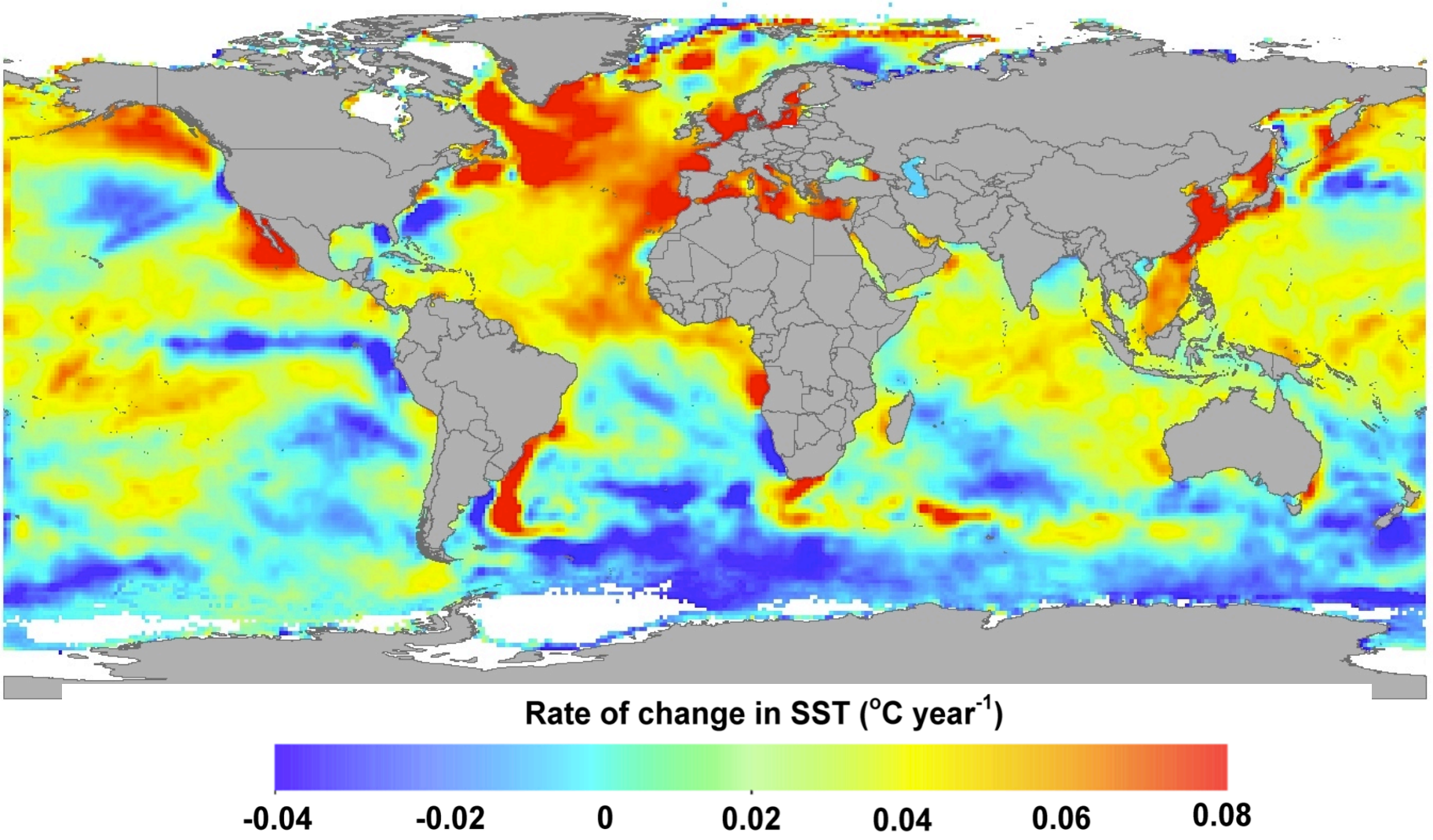


- Climate Change (global warming and ocean acidification)
- Multiple use of Ocean and Coastal space
- Increase Political conflict and social inequality

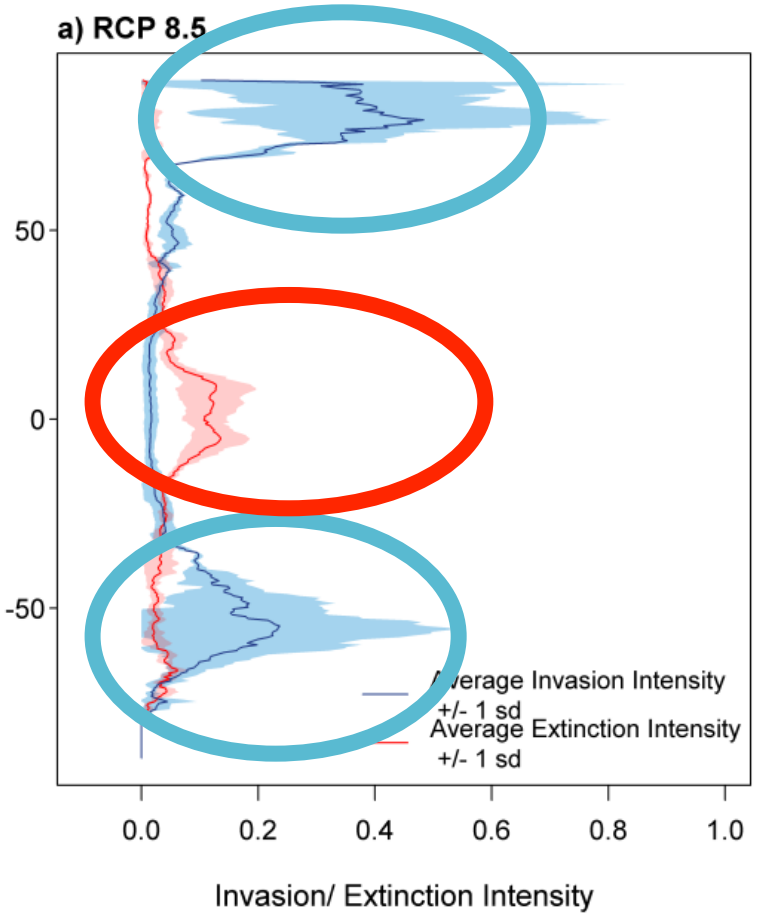


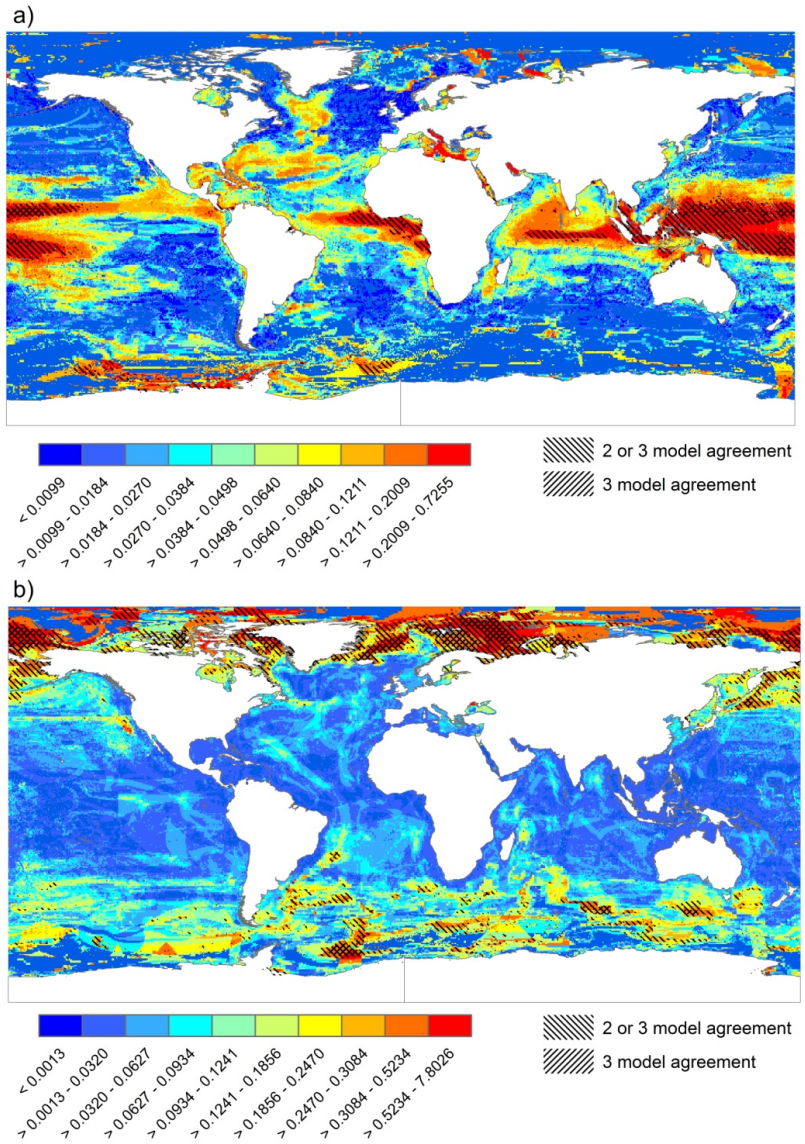


Rate of change in SST from 1970 to 2010



Where a fish moves?
The impact of global warming to the fish distribution





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Who is vulnerable?

The outlook of Small scale fisheries

FISHERY / BENEFITS	LARGE SCALE	SMALL SCALE
Subsidies	$$$$$ 25-27 billion	$ 5-7 billion
Number of fishers employed	about 1/2 million	over 12 million
Annual catch for human consumption	about 30 million t	same: about 30 million t
Annual catch reduced to fishmeal and oils	35 million t	Almost none
Annual fuel oil consumption	about 37 million t	about 5 million t
Catch per tonne of fuel consumed	= 1-2 t	= 4–8 t
Fish and other sealife discarded at sea	8–20 million tonnes	Very little

Also supporting 90% of fisheries employment

39% of world catch but supporting half of our seafood consumption.

Extremely important for Coastal food security

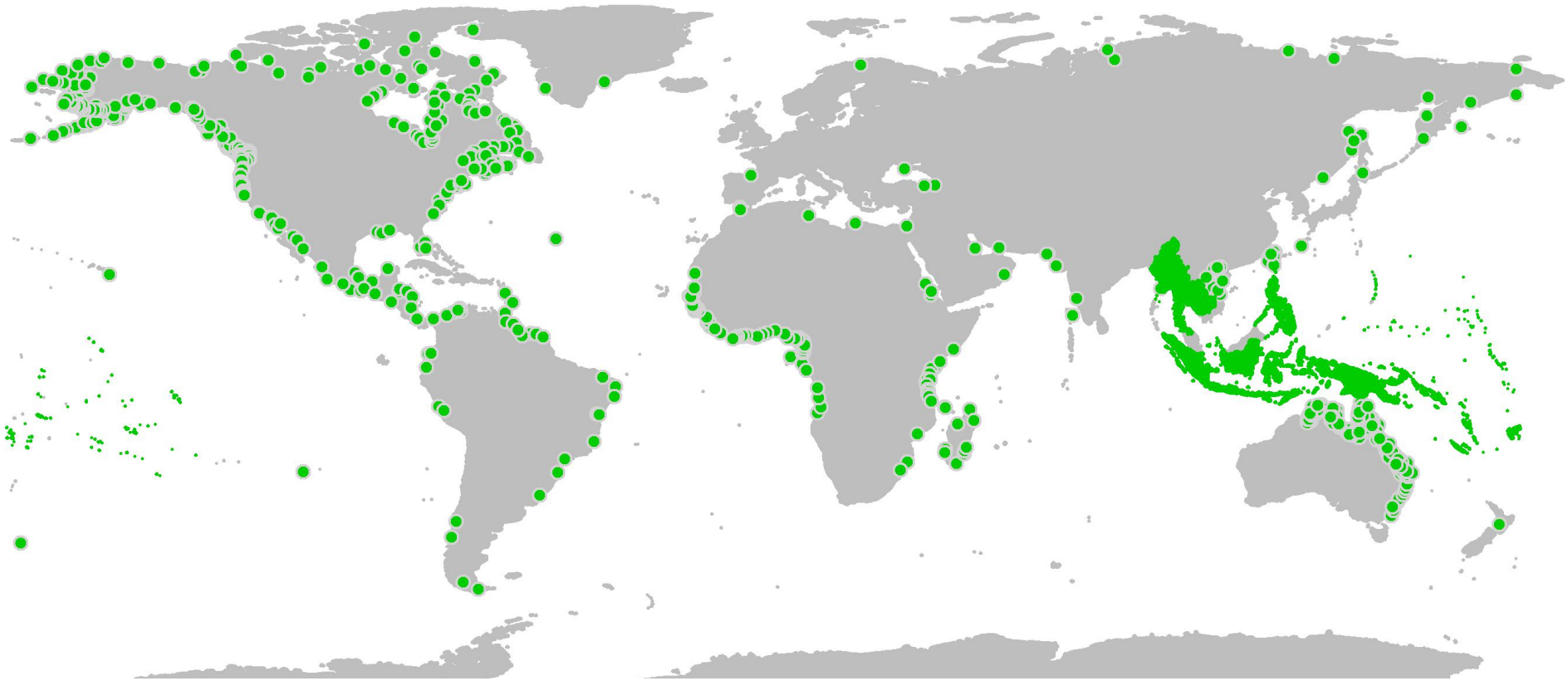
HOWEVER:

Location specific

Less mobility

Less resource for conversion

Coastal indigenous PEOPLES



5000 distinct peoples and 370 million people in 70 countries.
5% of World population.

How vulnerable indigenous peoples are?

86 % living in extreme poverty.

In the British Columbia, Canada, 41% of Aboriginal households on reservations are food insecure [5]. compared with only 9% among the general population [6].

High rate of those people face extreme poor and high political marginalisation

International Organisations

- 1989 ILO Indigenous and Tribal People Convention
- 1993 CBD, Article 8. Preserve, respect and maintain knowledge, innovation and practices of indigenous and local communities for the conservation and sustainable use of biological diversity.
- 2007 United Nations Declaration on the Rights of Indigenous peoples
- 2009 FAO, Code of conduct for responsible fisheries and indigenous peoples
- 2014 The First World Conference on Indigenous Peoples

Food security for Coastal indigenous group

preliminary results

219 million people

4.9 million tonnes fish/year*

Implications to UNCLOS(or global ocean governance?)

- Problem of classing climate change as "pollution" - hybrid causes and may not strictly satisfy test of "introduction by man" (Article 1(1)(d)).

- Problems in assigning liability for damage to fish stocks and other uses of marine living resources.

- Problems in regulating novel fishing techniques and fisheries through the current legal framework.

Implication to global ocean governance

- Increasing need to address the issue of inequality and human wellbeing.
- Increasing need for capacity building to develop cross-sectorial and cross-disciplinary knowledge and action.
- Increasing need for Inter-treaty consideration to respond cumulative environmental and anthropologenic effect on ocean sustainability.

Future will not be the same as the past.

And it is up to us to save the sea for the future generations.

未来の海は過去の海とは異なる。
だからこそ，私たちは、次世代の為に海を救う事が出来る。

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