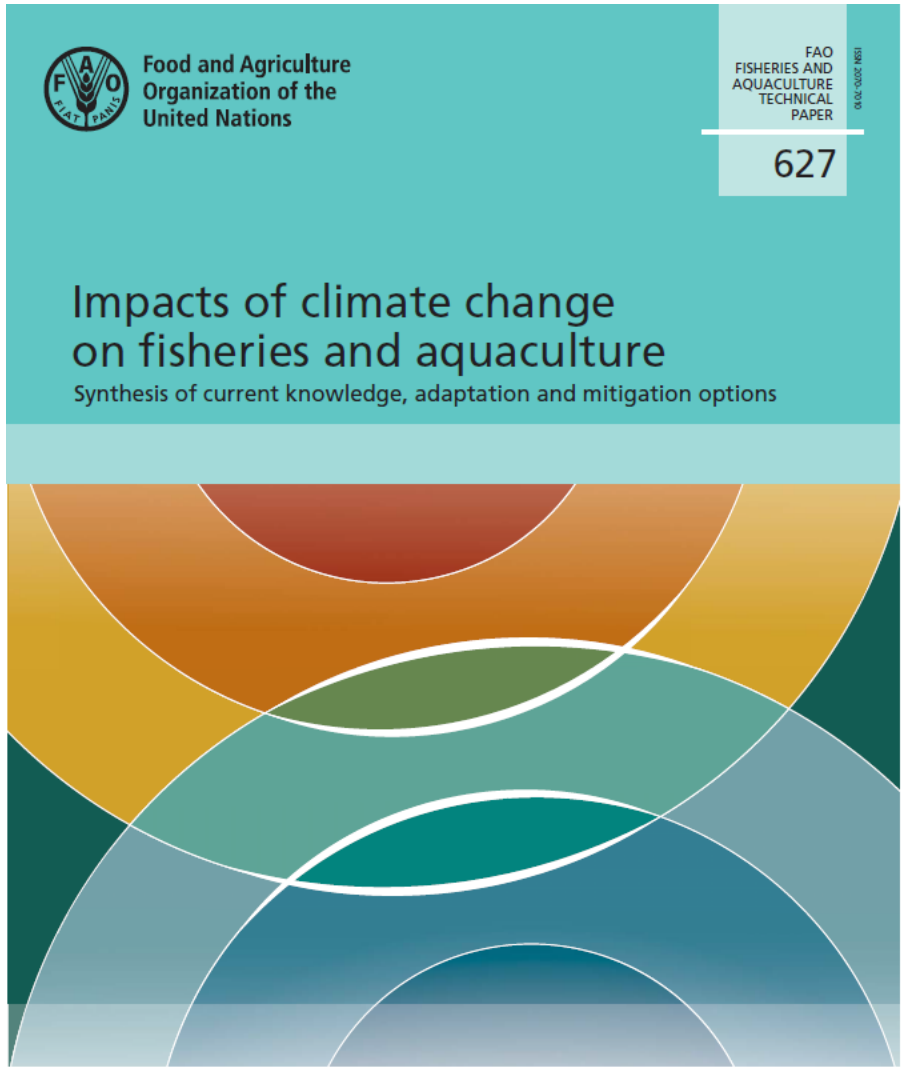
Fisheries and Climate Change. The international Context

Ernesto Penas

çThe Impact of Climate Change on Fisheries in the North Western Waters: Examining policy, research, and potential mitigation and adaptation strategies.

November 26, 2020



Fisheries and carbon footprint

The displacement of fish biomass

Climate change and marine biodiversity

The carbón footprint and the Green Deal

- Carbon-neutral economy in 2050
- Zero pollution
- Preserving biodiveristy
- A healthy, environmentally-friendly food system

Energy balance of fishing

- Fuel costs ca. 15% of total costs, but very variable:

Type of fishing	Ton. fuel/ton.catch	US$/Kg
Hake, offshore long-line	1,551	1,40
Horse-mackerel, coastal trawl	0,316	0,28
Sardine, coastal purse-seine	0,175	0,16
Anglerfish, offshore trawl	2,547	2,29
Tuna, purse-seine Indian Ocean	0,313	0,29
Mussel, intensive mariculture	0,013	0,01

Source: FAO (2015): FUEL AND ENERGY USE IN THE FISHERIES SECTOR Approaches, inventories and strategic implications

Decarbonizing the maritime-fisherires sector

Improving fuel efficiency of engines. The Wärtsilä 31.

Hybrid (diesel-electric) engines. A Project in Urk

Liquid Natural Gas

In the long run, 15% reduction in CO_2 emissions

Solar and wind?

Solar boat

Solar/wind

The hydrogen fuel-cell engine (I)

An hydrogen fuel-cell research vessel in the US for the Scripps Oceanographic Institution

The hydrogen fuel-cell engine (II)

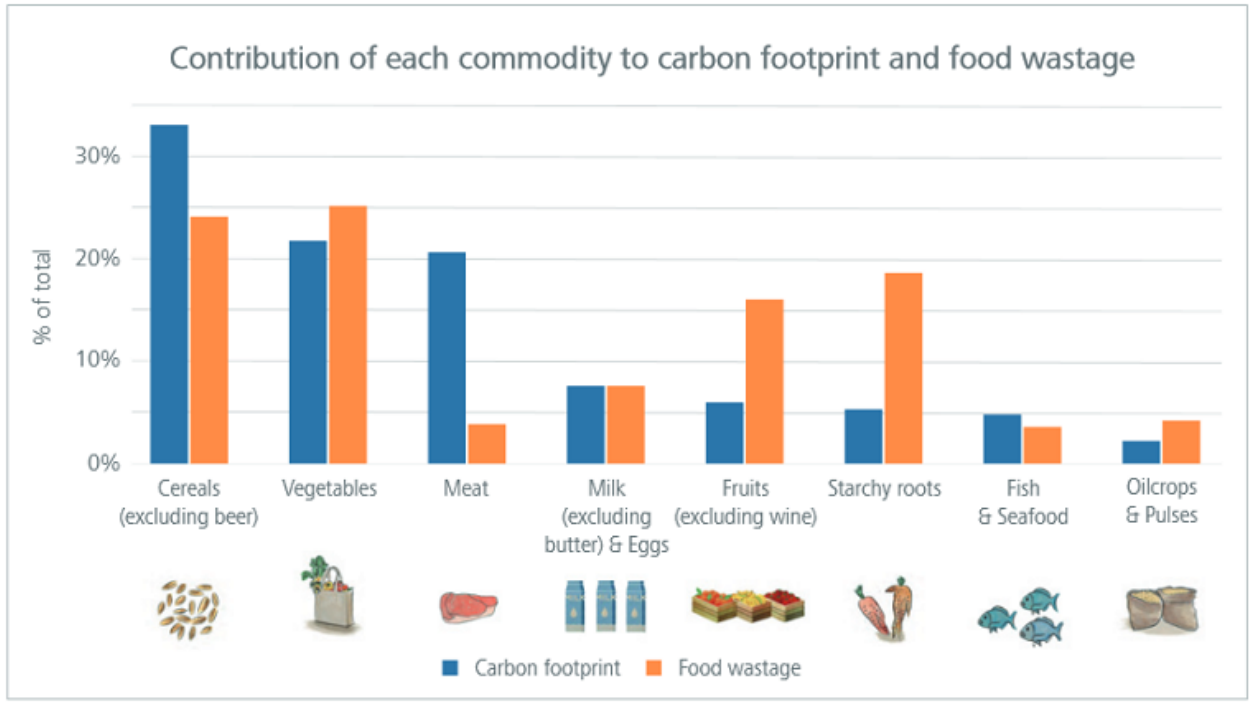
The Tsekoa II for the Coast Guard in Canada

The first fuel-cell fishing vessel (with a Toyota engine) in Japan

Hydrogen fuel-cell technology and the EU

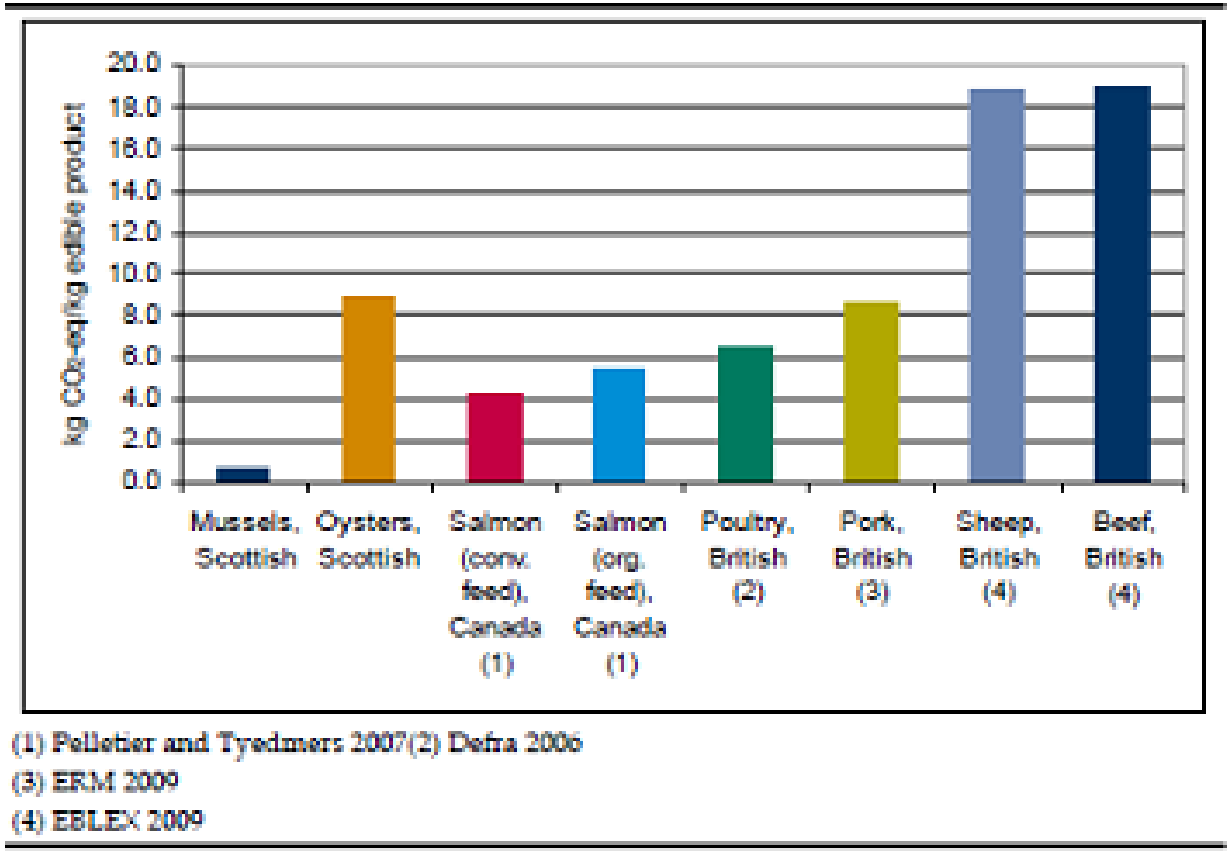
- Horizon 2020 (2014-2020) has funded 108 research programmes on hydrogen technology
  - But few on the maritime sector
  - And even fewer on the fisheries sector
- Next programme (2021-2027): the fishing sector as an objective?

Climate change as an opportunity: the carbon footprint of seafood (I)



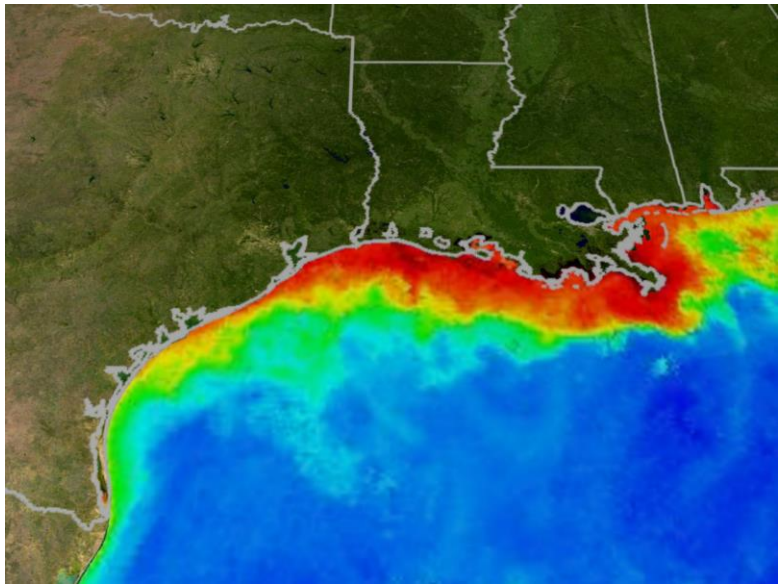
Marine protein: healthy and with a (generally) lower carbón footprint

Carbon footprints of seafood and meat products

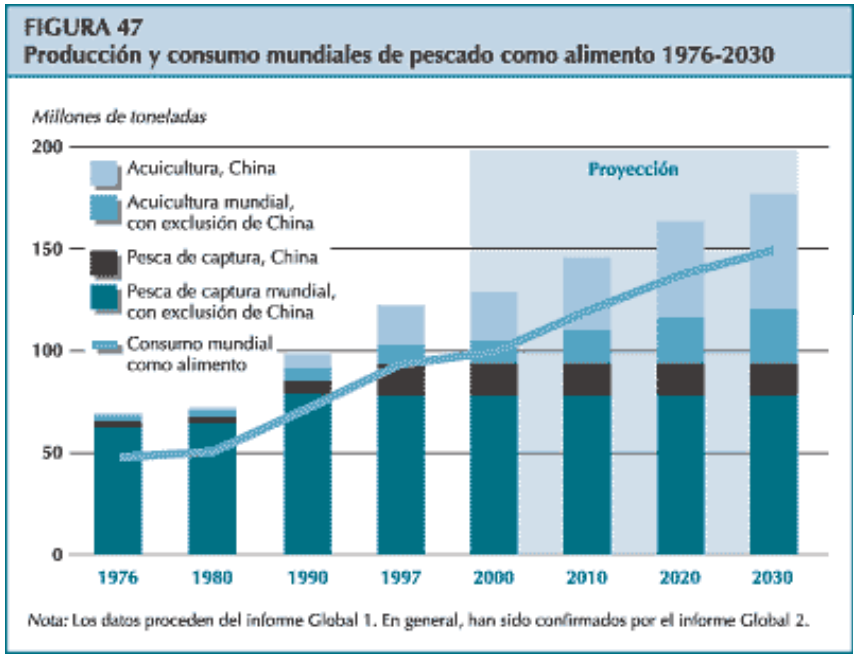


(1) Pelletier and Tyedmers 2007(2) Defra 2006
(3) ERM 2009
(4) EBLEX 2009

Climate change as an opportunity: the carbon footprint of seafood (II)



Pollution from agriculture runoff: the Mississippi river and the dead zone of the Gulf of Mexico



World´s consumption of seafood. Source: FAO

Land-based production of food and biodiversity loss: the Gran Chaco and soybean farming

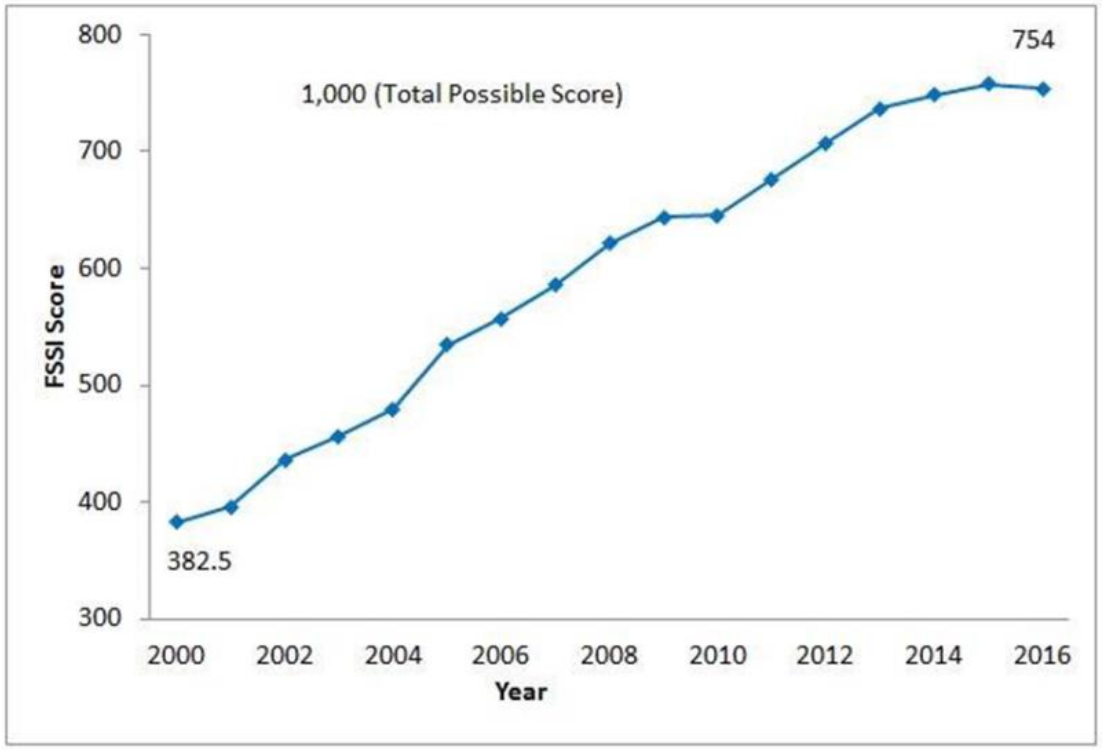
The role of fisheries in food security

Ban all fisheries in the high seas?

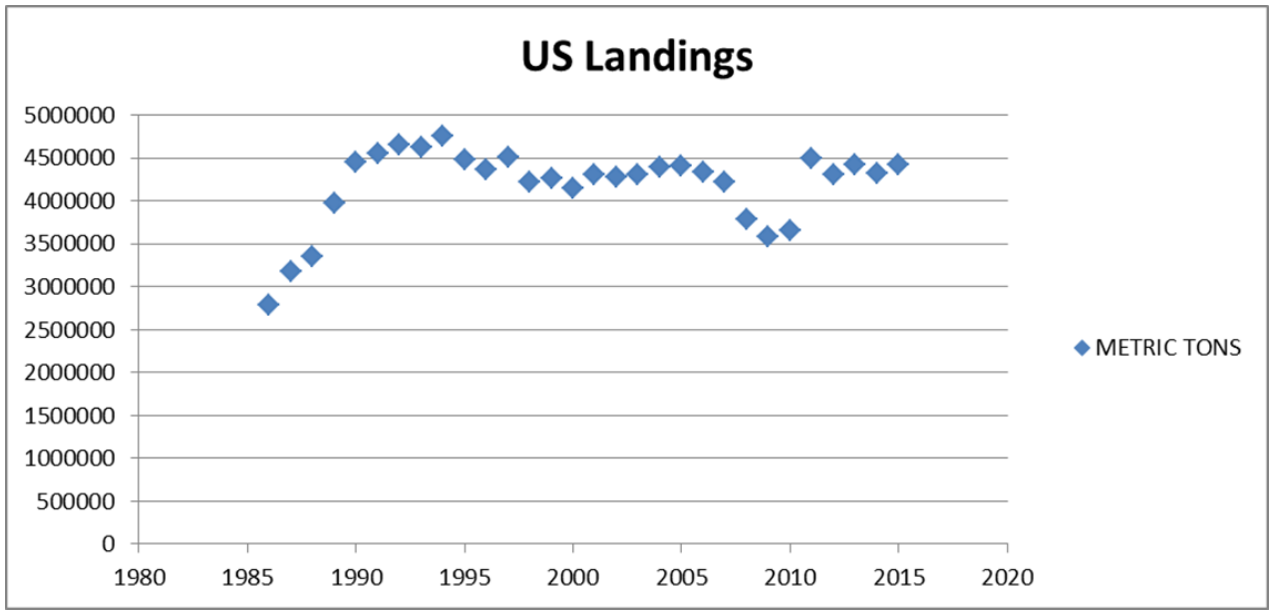
…or maximize the sustainabkle production of seafood?

Fisheries as a source of the healthiest and most climate-friendly animal protein source

Is our system efficient to turn ocean's productivity into sustainable marine protein?



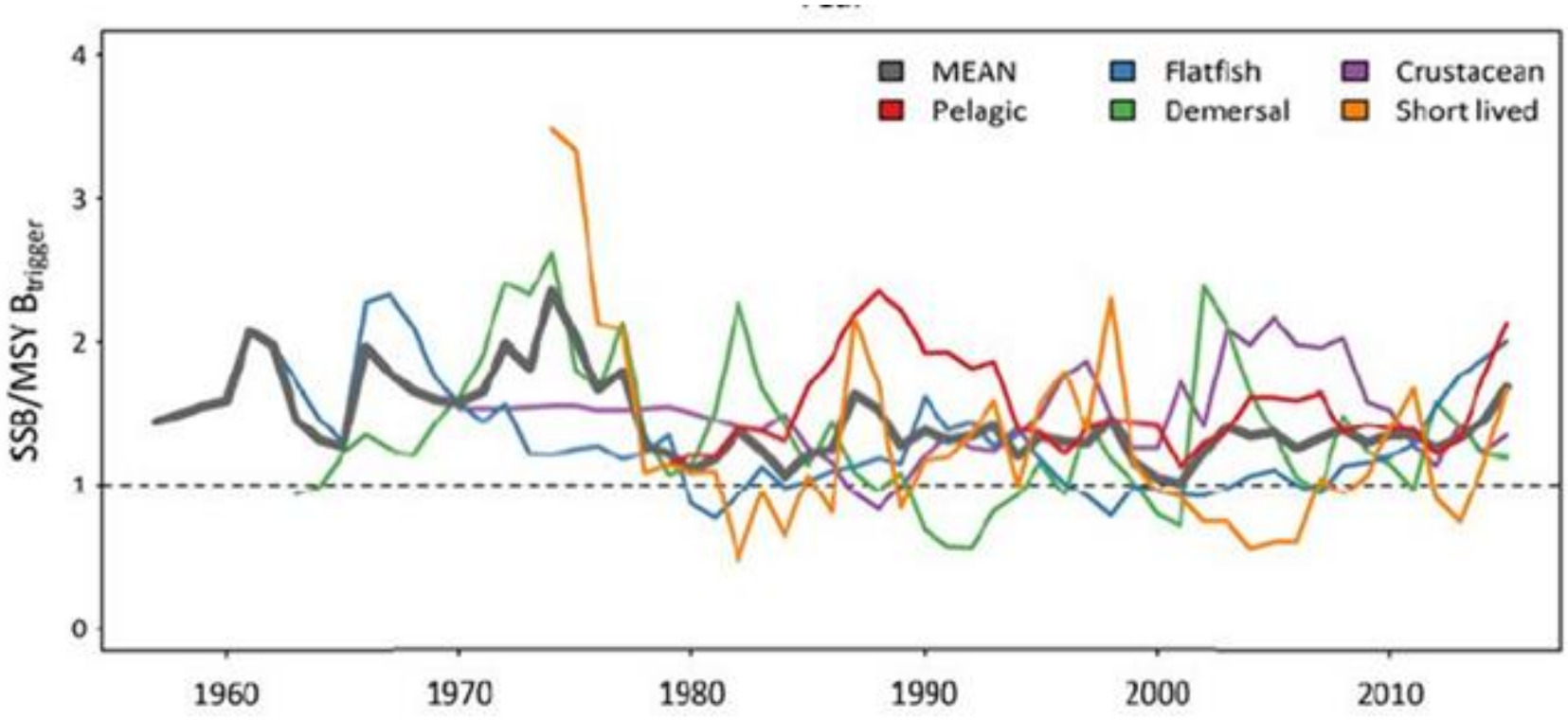
The US' fish stock sustainability index…



…and the evolution of the fish landings in the US

Changing the paradigm? From fishing what the market wants to selling what the nets catch (or the Chinese approach)

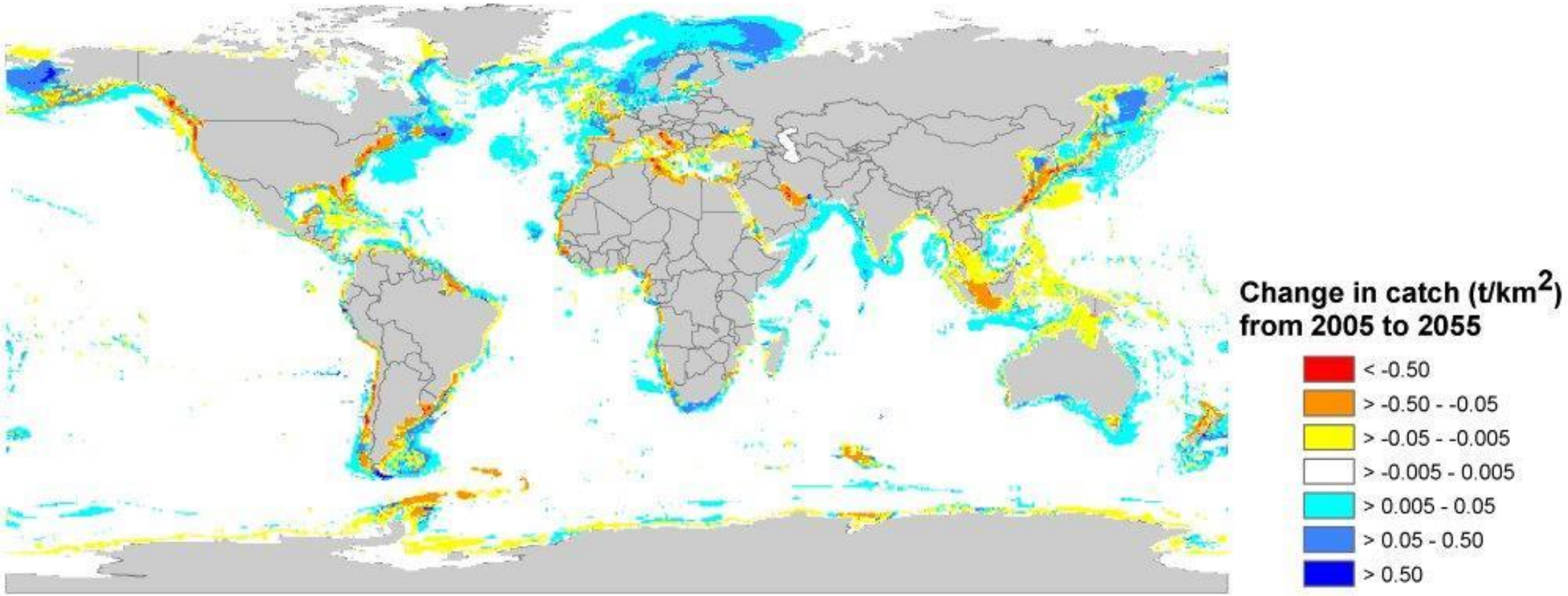
The ecosystem approach: do we mean it?



Source: ICES (2016a). Greater North Sea Ecoregion – Ecosystem overview. Published 04 March 2016. Version 2; 13 May 2016

Focusing on ocean productivity or individual species?

The displacement of fish biomass



The ‘big movers’

Species	Distribution Shifts
Anchovy	Northern shift into the North Sea
Blue whiting	Increase of abundance in the North Sea and the West of Scotland
Anglerfish	Regional changes in the North Sea
Cod	Northward shift
Hake	Expansion into the North Sea
Herring	Changes in management areas
Mackerel	Major changes of distribution (and allocation) in the North Atlantic
Megrims	Regional changes in the Celtic Sea, North Sea and Bay of Biscay
Plaice	Increase in North and Baltic Seas, changes across management areas
Horse mackerel	Shifts but current management system takes shifts into account

Source: ICES WKFISHDISH REPORT 2016. Report of the Working Group on Fish Distribution Shifts (WKFISHDISH), 22-25 November 2016 ICES HQ, Copenhagen, Denmark

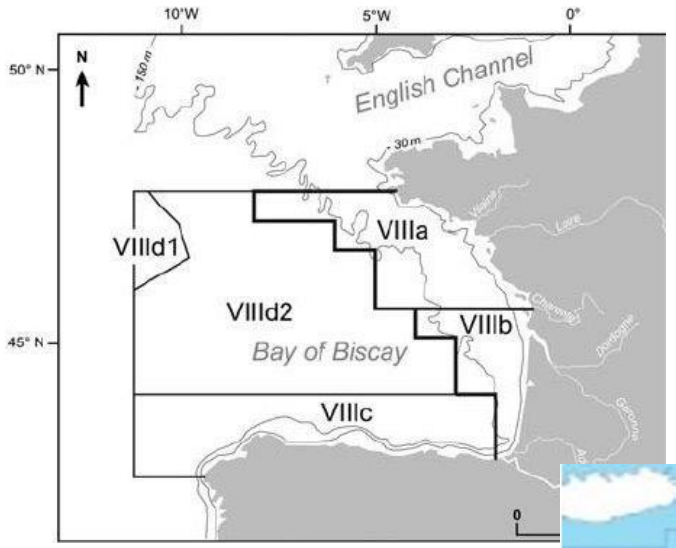
Can management areas (and relative stability) be adjusted?

Article 4

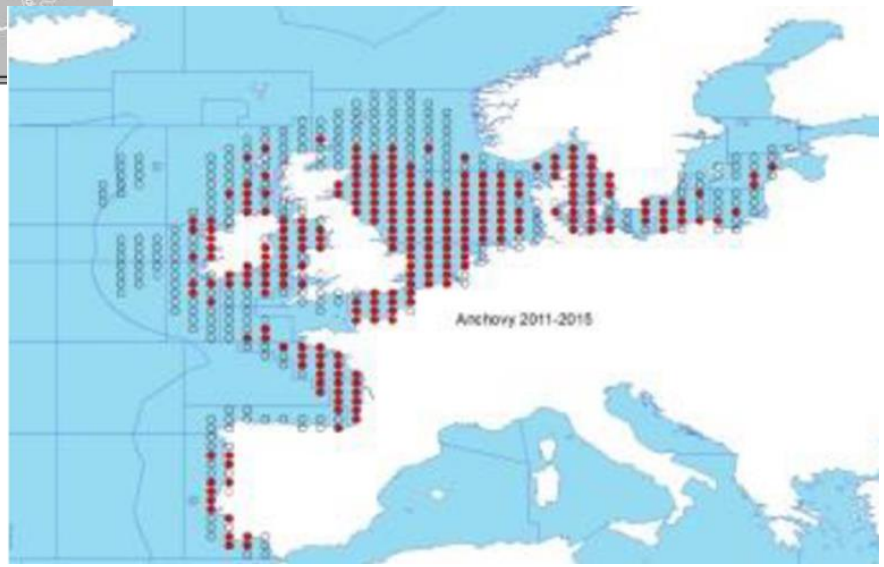
1. The volume of the catches available to the Community referred to in Article 3 shall be distributed between the Member States in a manner which assures each Member State relative stability of fishing activities for each of the stocks considered.

2. On the basis of the contents of the report referred to in Article 8, the Council, acting in accordance with the procedure laid down in Article 43 of the Treaty, shall enact provisions effecting the adjustments that it may prove necessary to make to the distribution of the resources among Member States in consequence of the application of paragraph 1.

Regulation 170/83

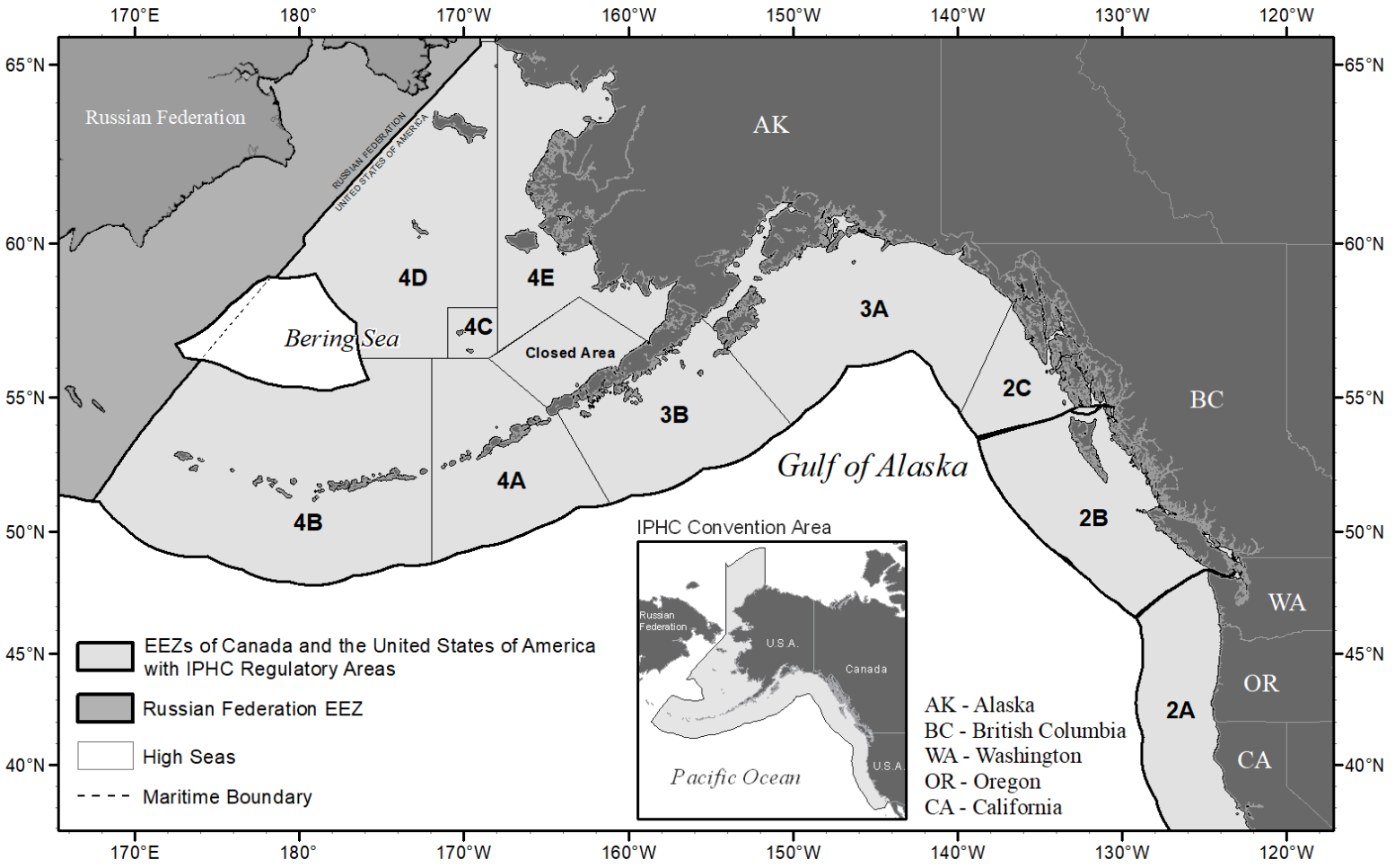


The example of Anchovy

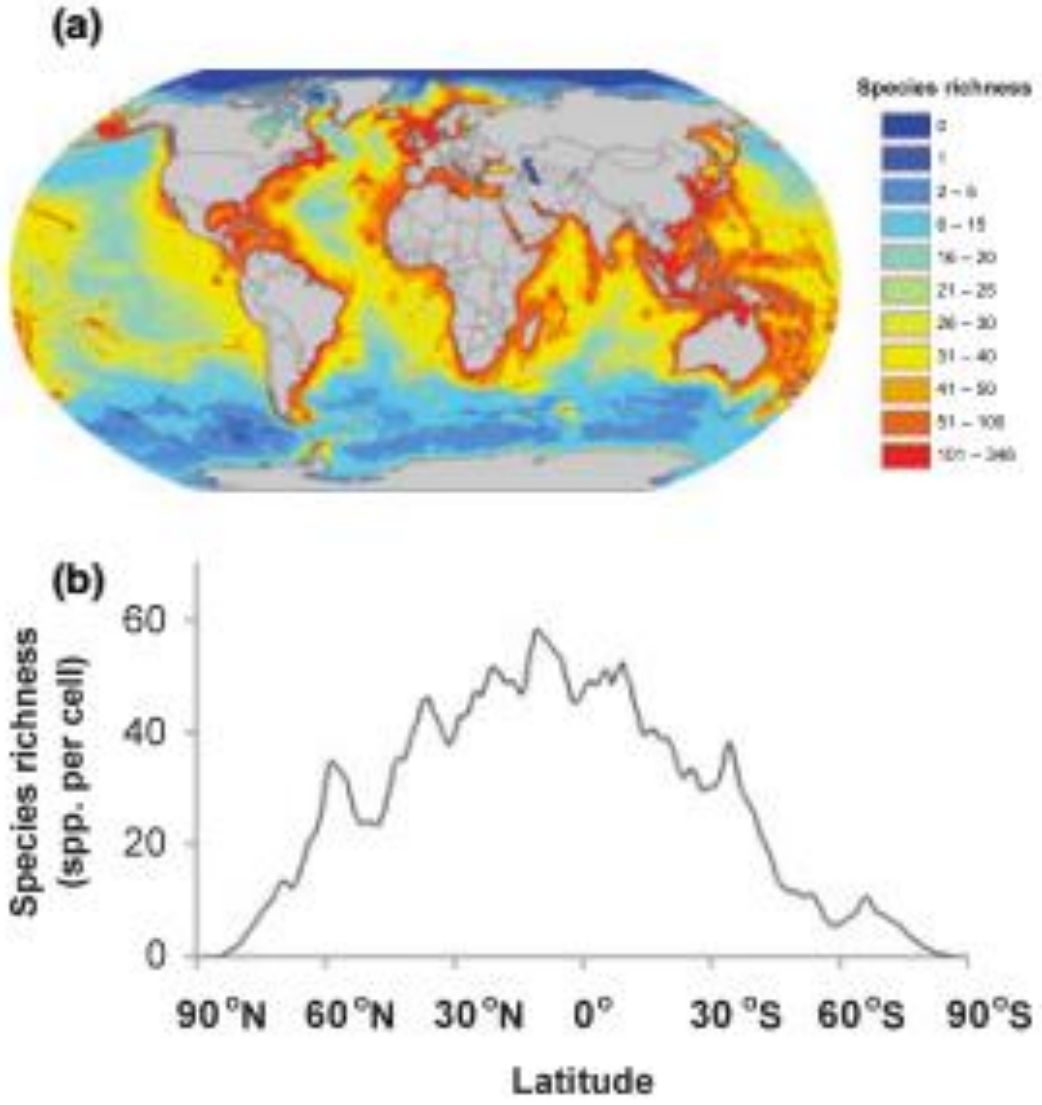


Source: ICES (2016)

Fixed allocation keys adaptable to climate change? The example of the International Pacific Halibut Commission



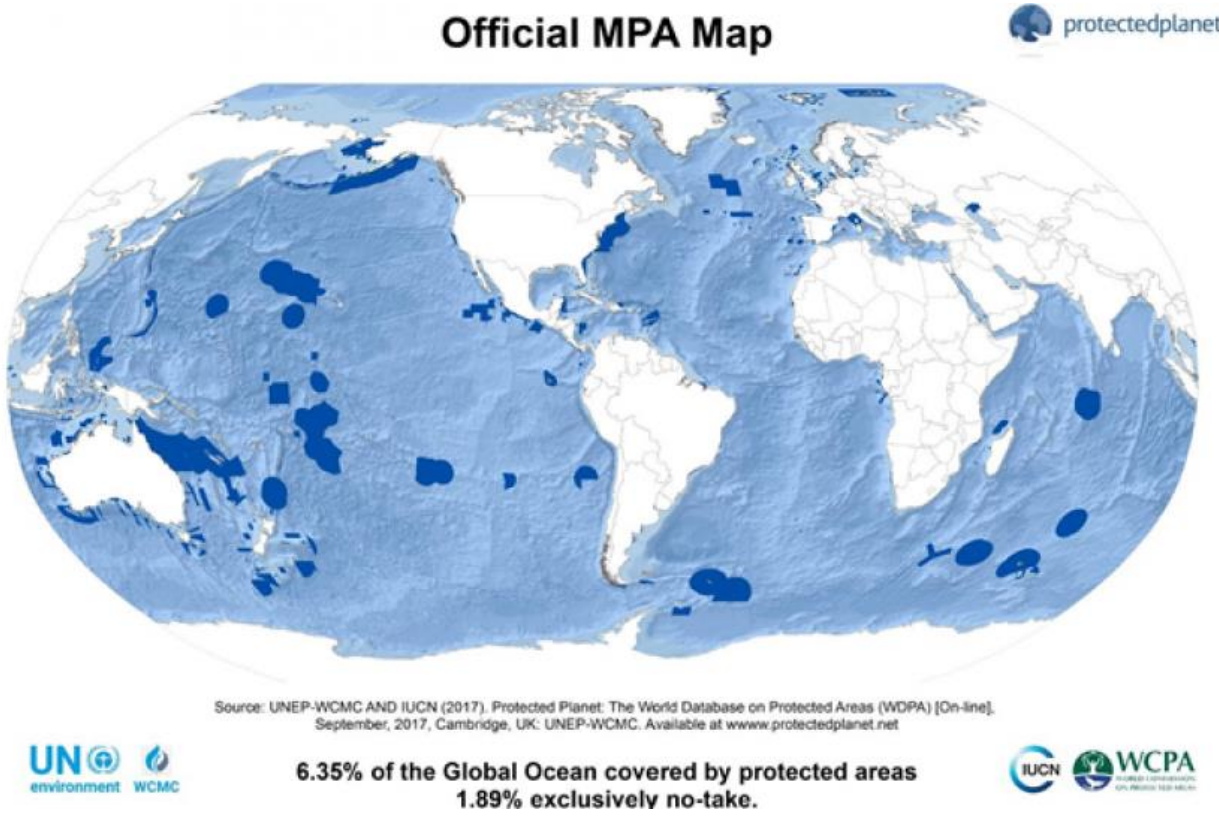
Climate Change and Marine Biodiversity



Loss of species

Lower ecosystem resilience

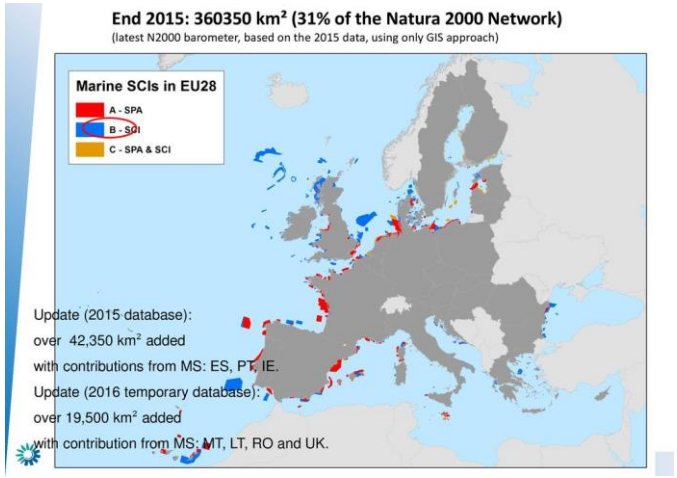
Convention on Biological Diversity: 30% of the ocean as MPAs ?

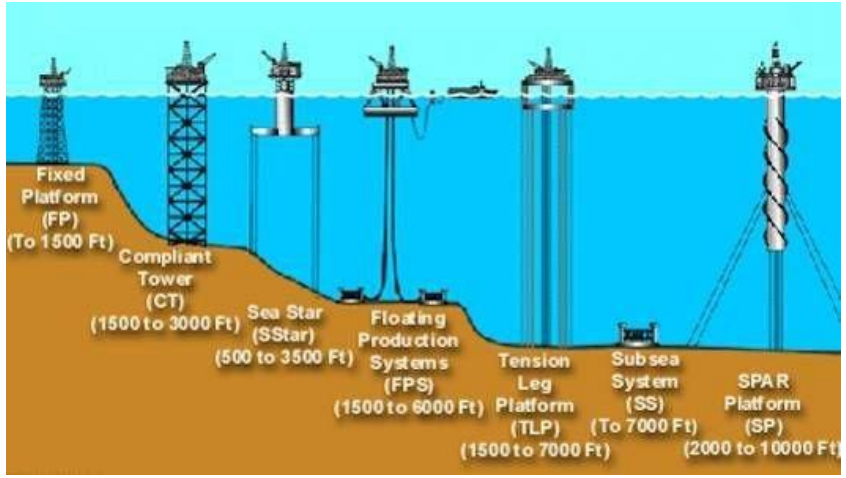


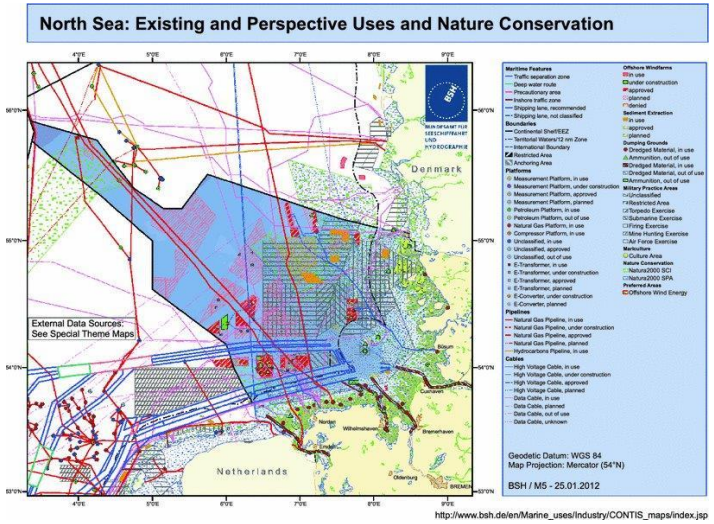
Which 30%?

What “other equivalent conservation measures”?

Biodiversity and the physical space available for fishing







Fisheries, a strategic source of animal protein but:

- Wind parks
- Oil and gas
- Seabed minerals
- Natura 2000 areas
- Protection of the seabed (Marine Strategy Framework Directive descriptor no. 4)
- Convention on biological diversity: from 10% (Aichi target) to 30%
- The BBNJ process
- Offshore aquaculture


Thank you