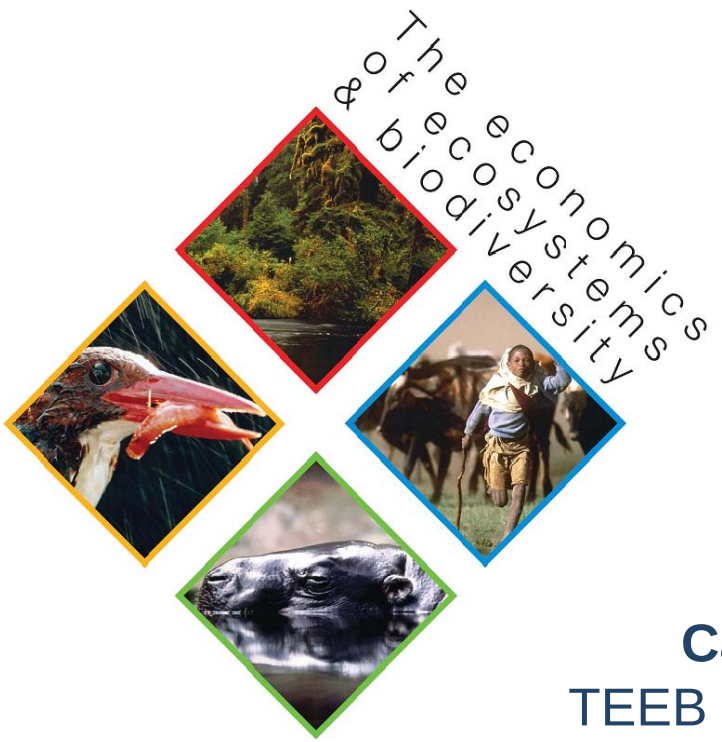
12th of January, 2010 - Dessau, Cop Bureau Meeting



The Economics of Ecosystems and Biodiversity

Insights for the marine sector from the TEEB report for International Policy Makers

Carsten Neßhöver
TEEB Scientific Coordination
UFZ

HELMHOLTZ CENTRE FOR ENVIRONMENTAL RESEARCH – UFZ

UNEP United Nations Environment Programme

Federal Ministry for the Environment, Nature Conservation and Nuclear Safety

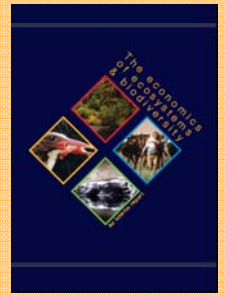
defra Department for Environment Food and Rural Affairs

TEEB genesis and development

2007

G8 2007
Environment Ministers Meeting
Potsdam, 15-17 March 2007

2008

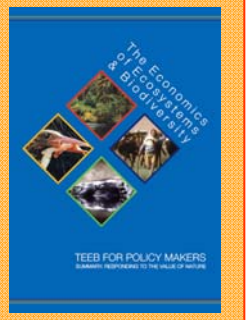


Bonn, COP9
2008

2009

G8
SIRACUSA
22-23-24 Aprile 2009

Berlin &
Stromstad
September



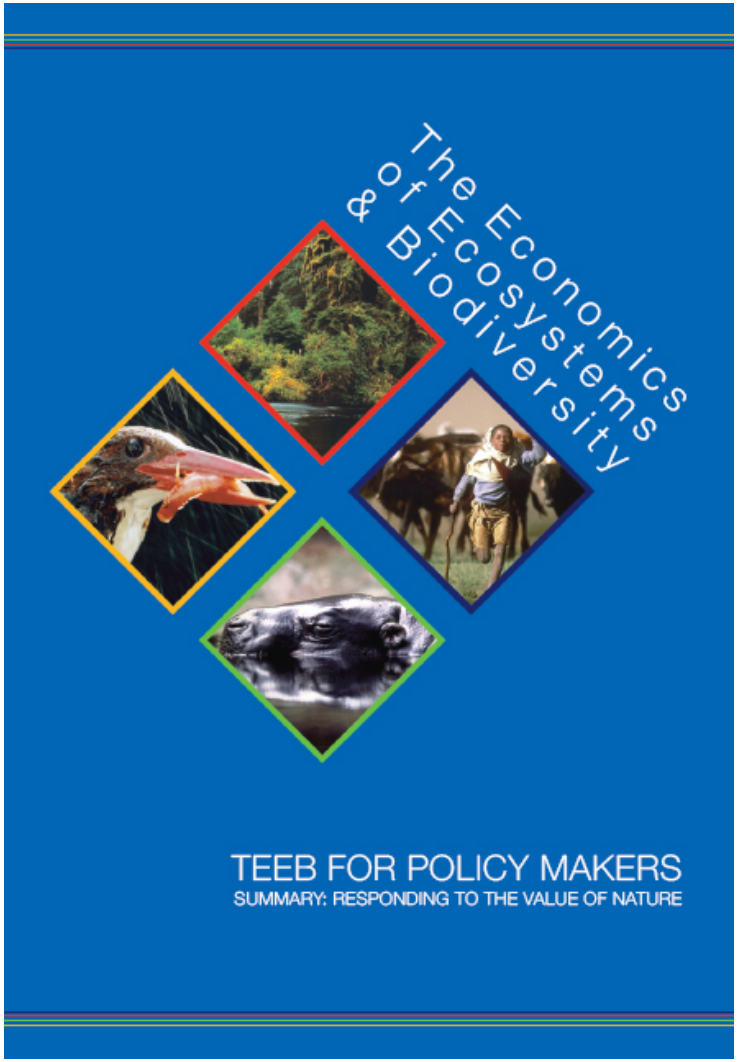
Brussels
November

2010

D2, D3, D4
releases in
summer

TEEB Climate Issues Update – Sept. 2009

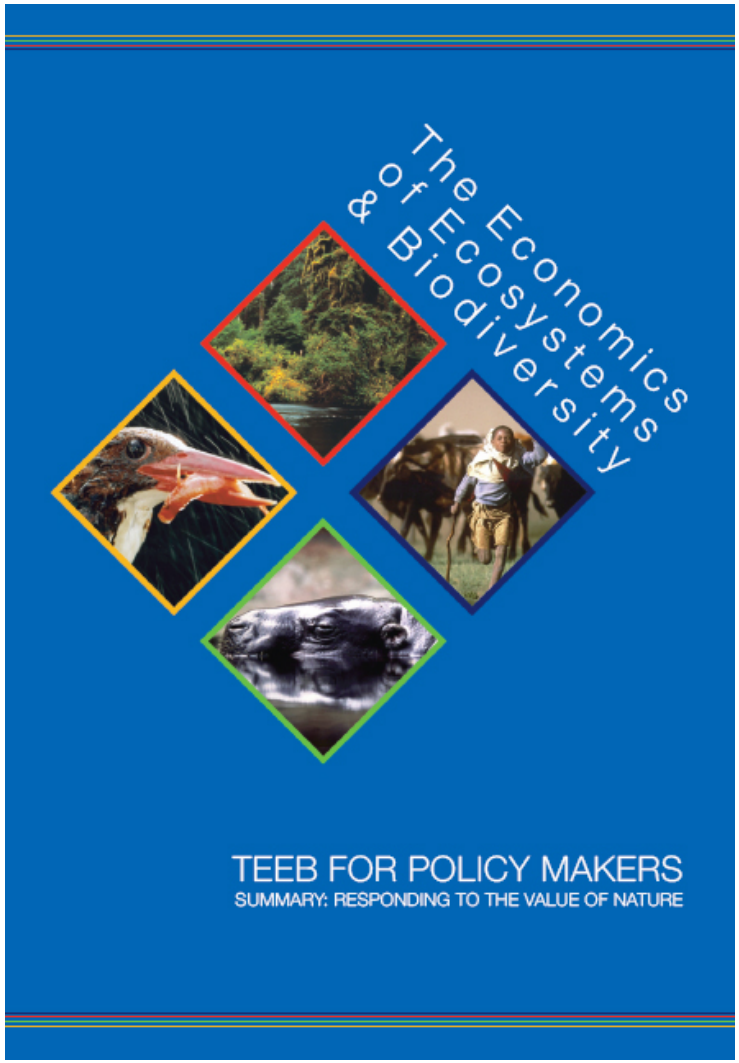
- **Coral reef emergency**
- **Forest carbon for climate mitigation**
- **National accounting for forest carbon**
- **Ecosystem investment for climate adaptation**



TEEB
for International and National Policy Makers

launched
13 November 2009

TEEB D1 Main Messages

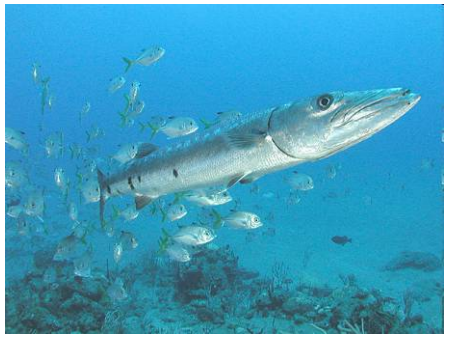


- **Rewarding benefits through payments and markets**
- **Reforming environmentally harmful subsidies**
- **Addressing losses through regulation and pricing**
- **Adding value through protected areas**
- **Investing in ecological infrastructure**

Marine and Costal Ecosystem Services

Marine systems

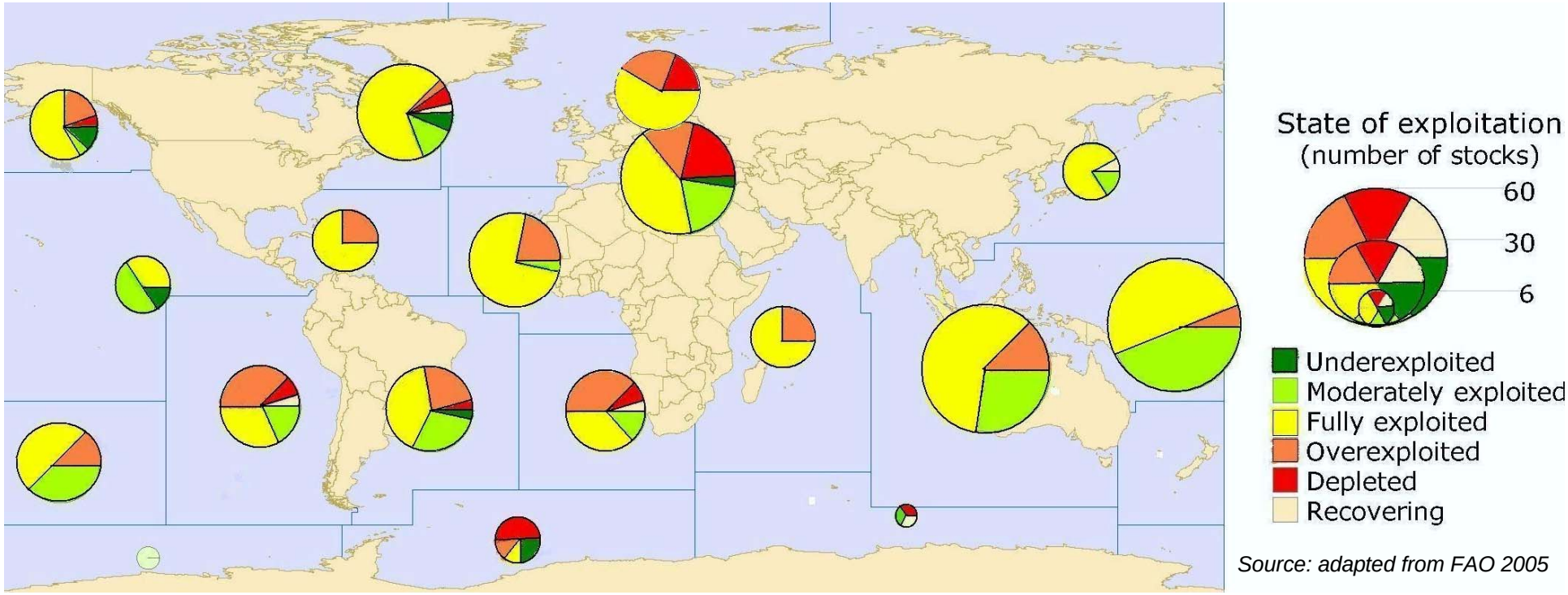
- Sea Food
- CO2-Sequestration (Blue carbon)
- Genetic Ressources



+ Coastal systems, including coral reefs

- CO2-Sequestration (sea grasses and kelp beds)
- Fish nursery
- Tourism
- Natural Hazard prevention

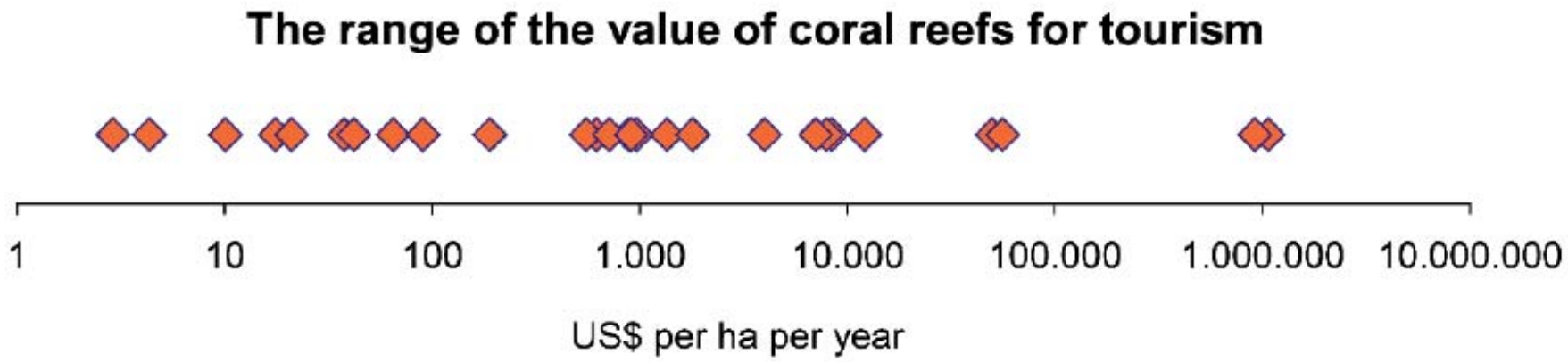
Global Fish stocks



Source: adapted from FAO 2005

- Half of wild marine fisheries are fully exploited; a further quarter already over-exploited
- At risk: $ 80-100 billion income from the sector
  - est. 27 million jobs
  - over a billion people rely on fish for animal protein

Range of values: Example Coral Reefs

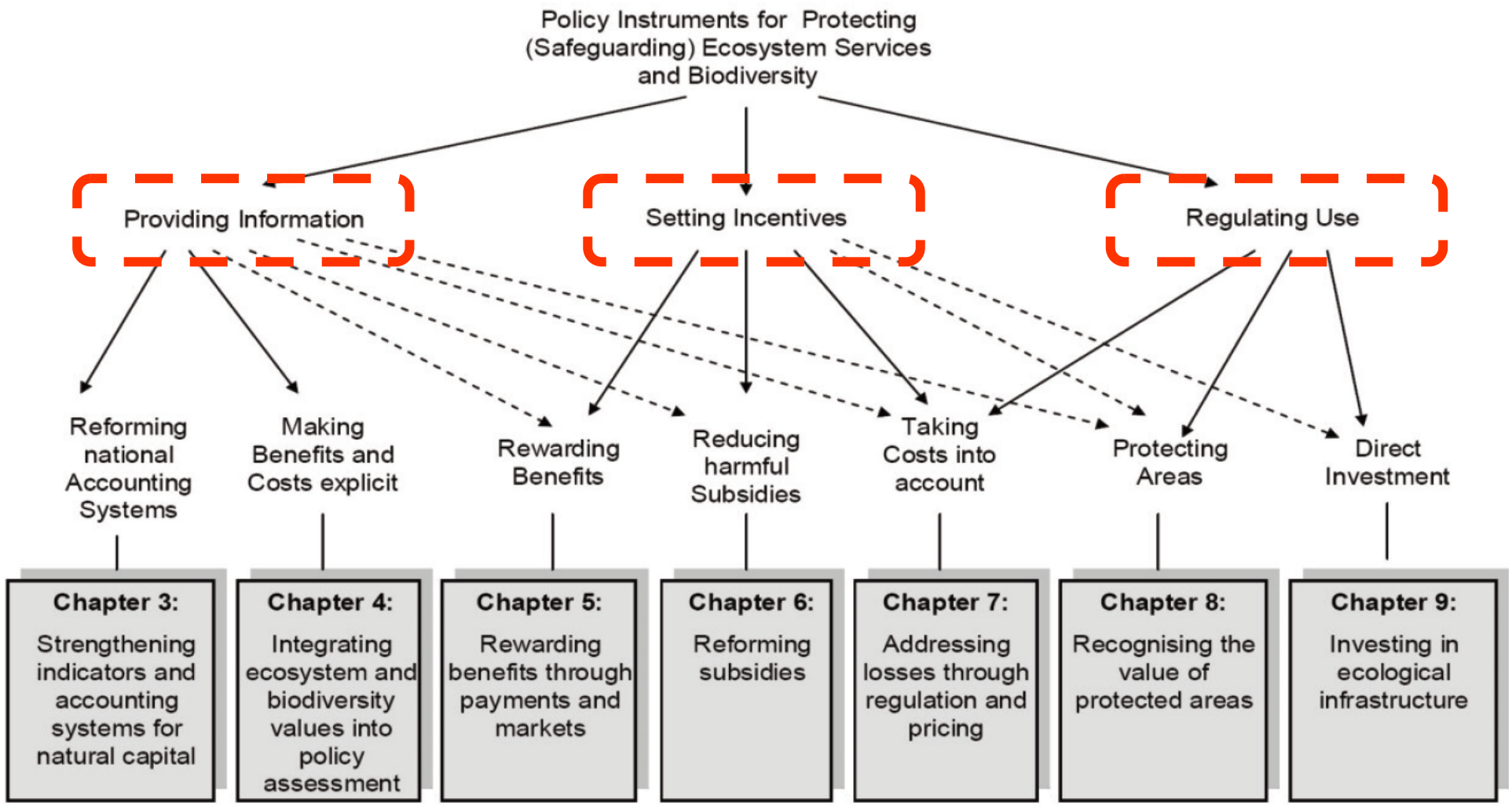


+ values for

- Natural hazard management — up to 189,000 US$ per ha and year
- Genetic materials — up to 57,000 US$ per ha and year
- Fisheries — up to 3,800 US$ per ha and year
- and others

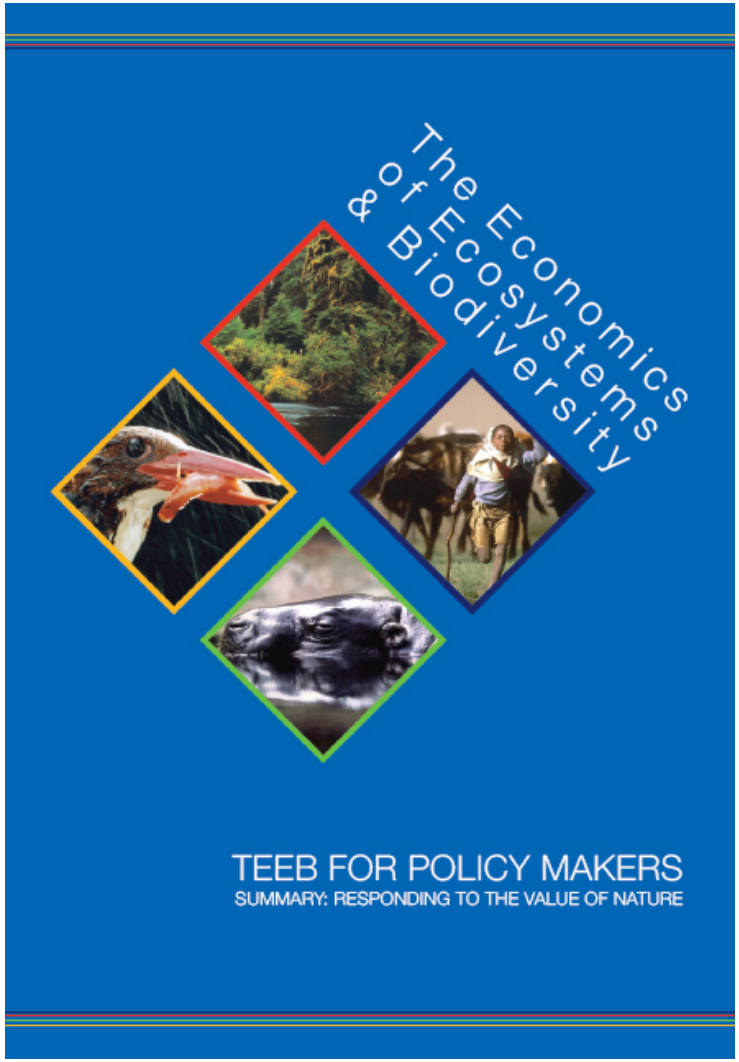
TEEB D1, Chap.10

TEEB Policy Options Overview



TEEB D1, Chap.2

TEEB D1 Main Messages



- **Rewarding benefits through payments and markets**
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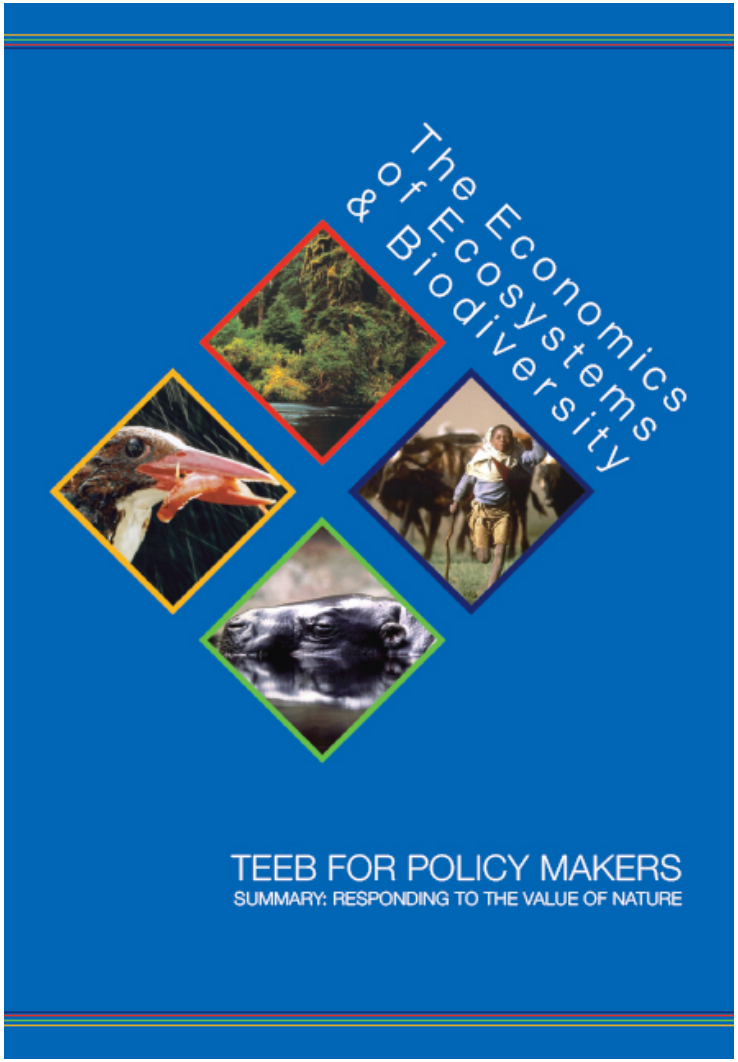
Labelling for developing sustainable markets

Development of MSC label

- Currently over 3000 MSC labelled products in more than 40 countries certified
- Annual certified catch of 4 Million tons (7% of global capture for human consumption)
- Retail value 1.4 Billion US$ (increase by 40% in 2008)
- Approaches to support the extensing to smale scale fisheries (MSC risked-based support framework)

TEEB D1 Main Messages



- Rewarding benefits through payments and markets
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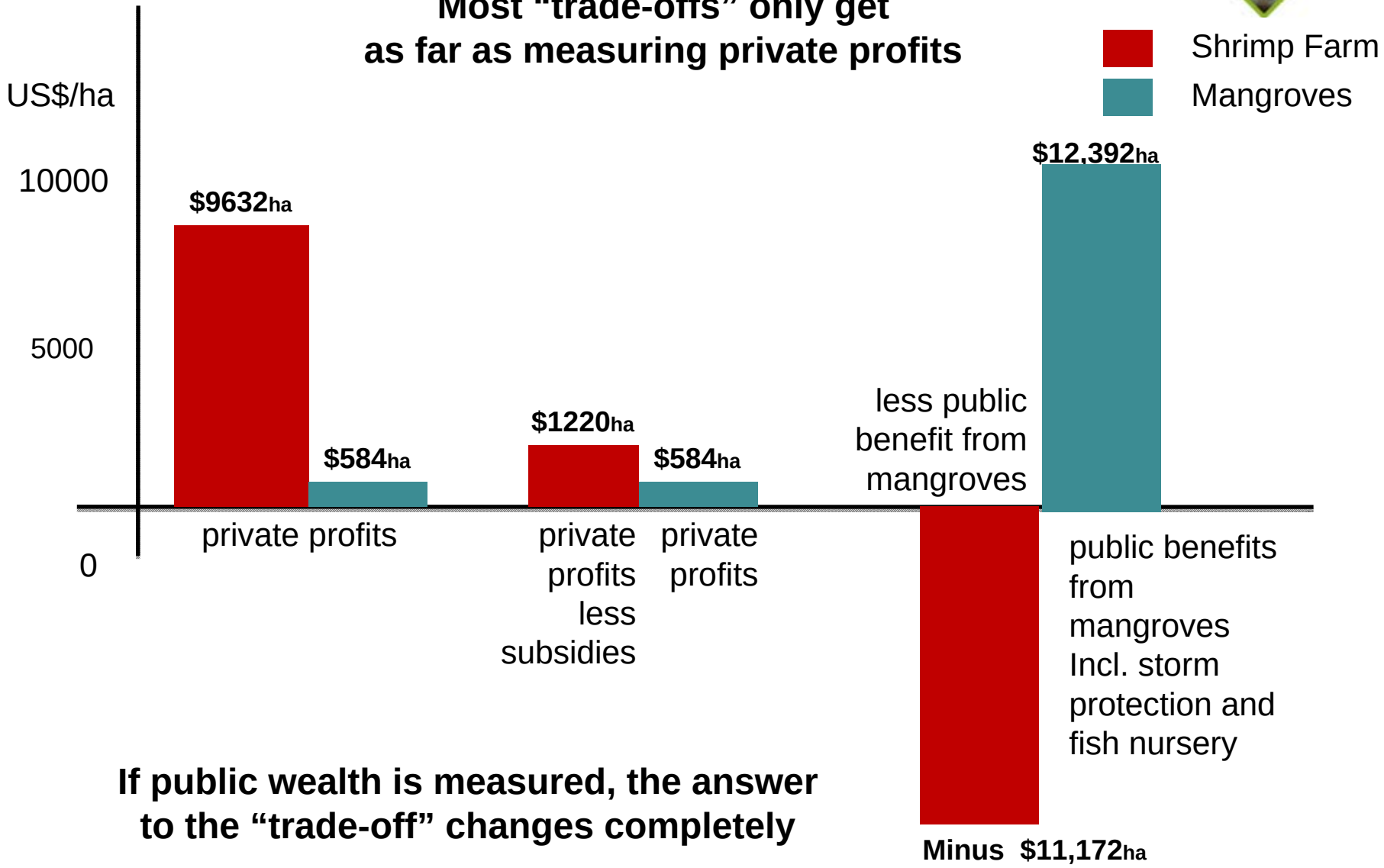
The Economics of Ecosystems & Biodiversity

Most "trade-offs" only get as far as measuring private profits



If public wealth is measured, the answer to the "trade-off" changes completely

Source: Hanley, N. and Barbier, E. B. (2009)

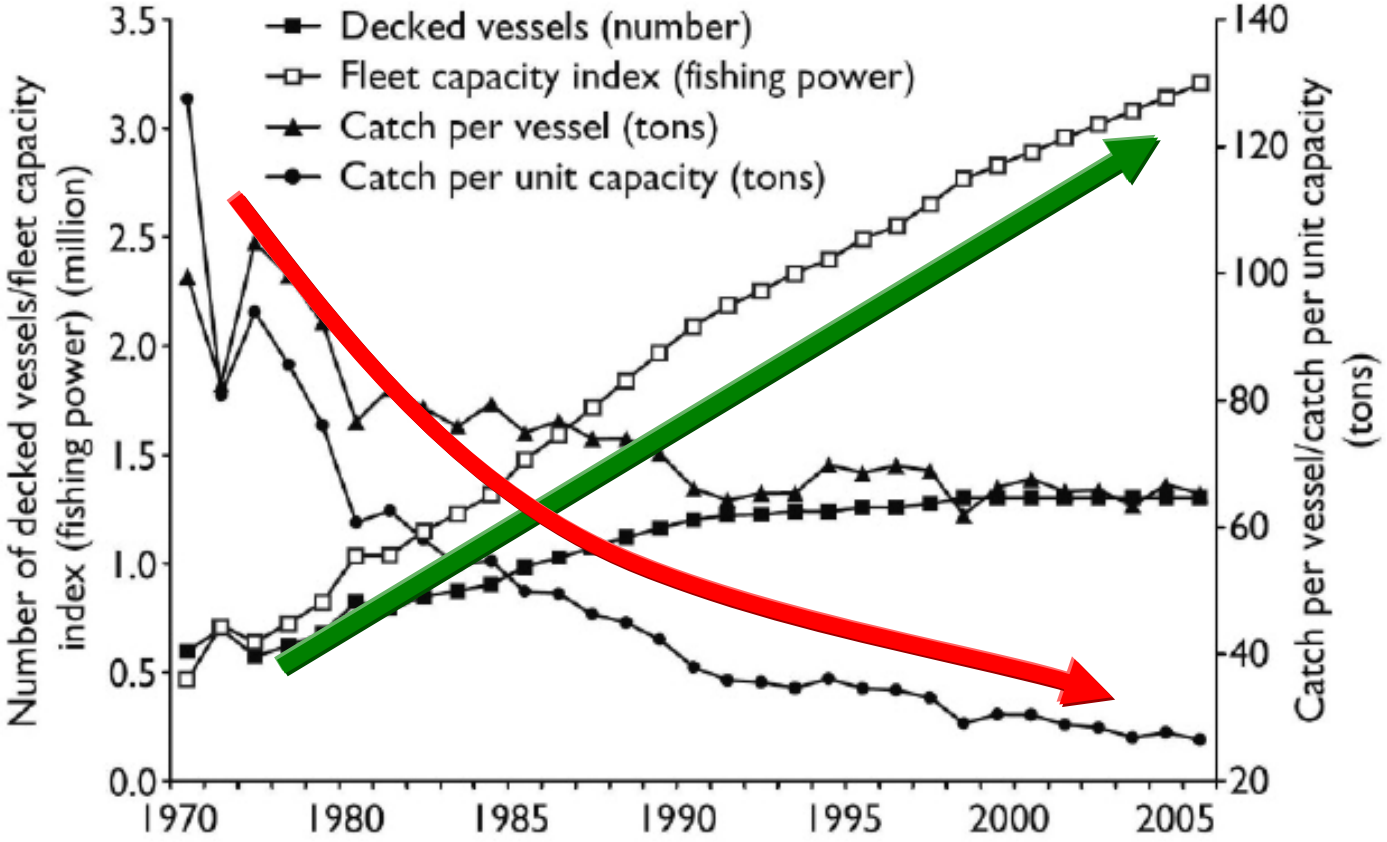
Subsidies in the fisheries sector

Table 6.1: Aggregate subsidy estimates for selected economic sectors	
Sector	**Region**
Agriculture	**OECD: US$ 261 billion/year (2006-8)** (OECD 2009) **Biofuels: US, EU and Canada US$ 11 billion in 2006** (GSI 2007; OECD 2008b)
Fisheries	**World: US$ 15-35 billion** (UNEP 2008)
Energy	**World: US$ 500 billion/year** (GSI 2009a) **US$ 310 billion in the 20 largest non-OECD countries in 2007** (IEA 2008)
Transport	**World: US$ 238-306 billion/year – of which EHS US$173-233 billion** (EEA 2005)
Water	**World: US$ 67 billion – of which EHS US$ 50 billion** (Myers and Kent 2002)

>> Estimates are rarely based on a detailed accounting of individual subsidy programs, limiting both their accuracy and usefulness for management decisions (Sharp+Sumaila 2009).

TEEB D1, Chap. 5

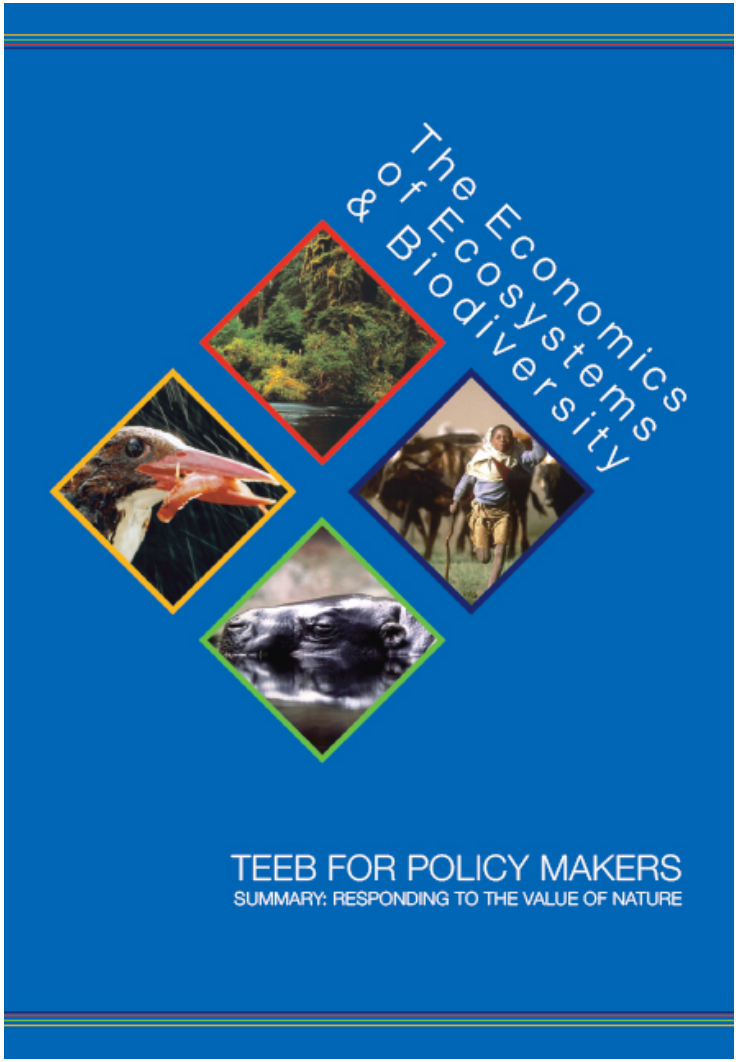
Fish stocks – an underperforming natural asset



>> World Bank estimates that net benefit losses from fisheries are 50 billion US$ per year

TEEB D1, Chap.10; World Bank & FAO 2008

TEEB D1 Main Messages



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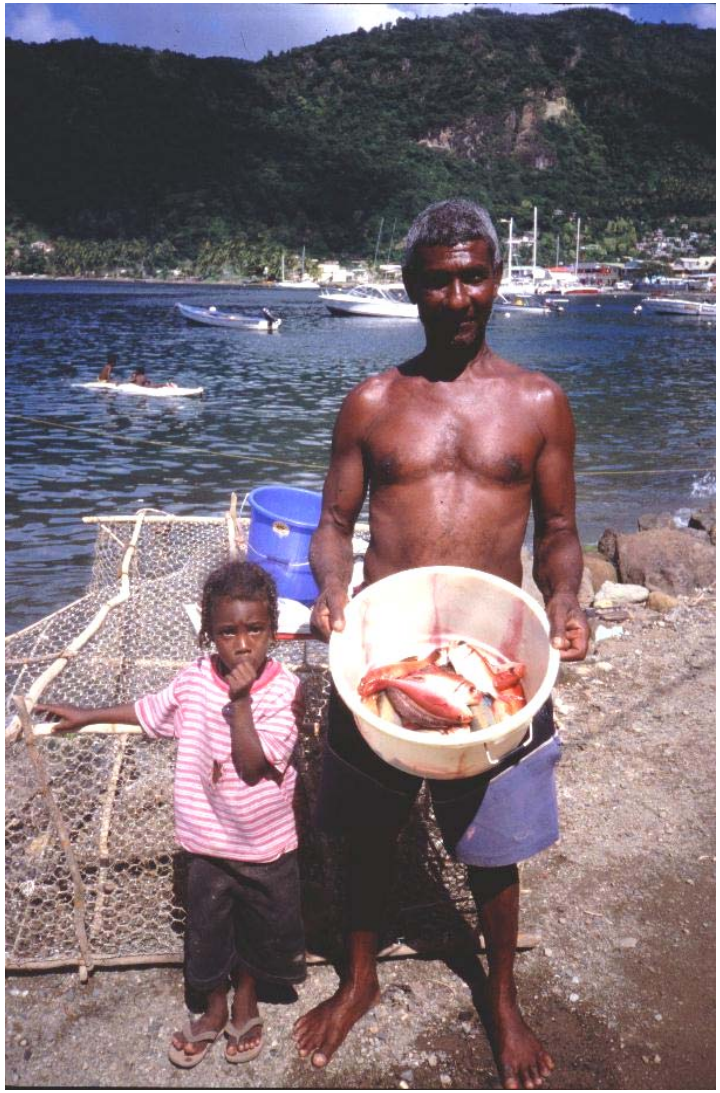
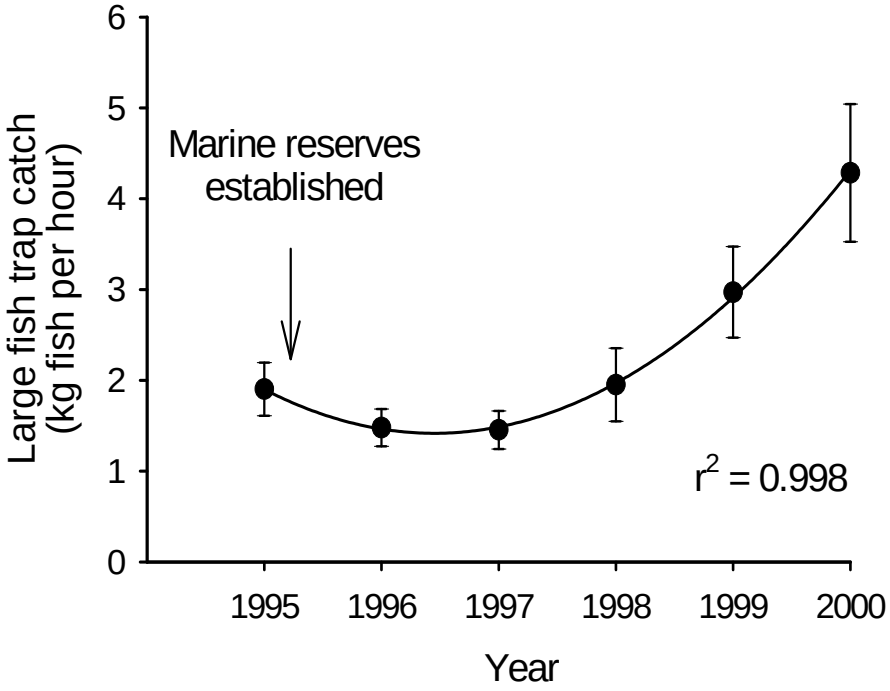
Soufrière Marine Management Area, St. Lucia : Established 1995
35% of reef area closed to fishing

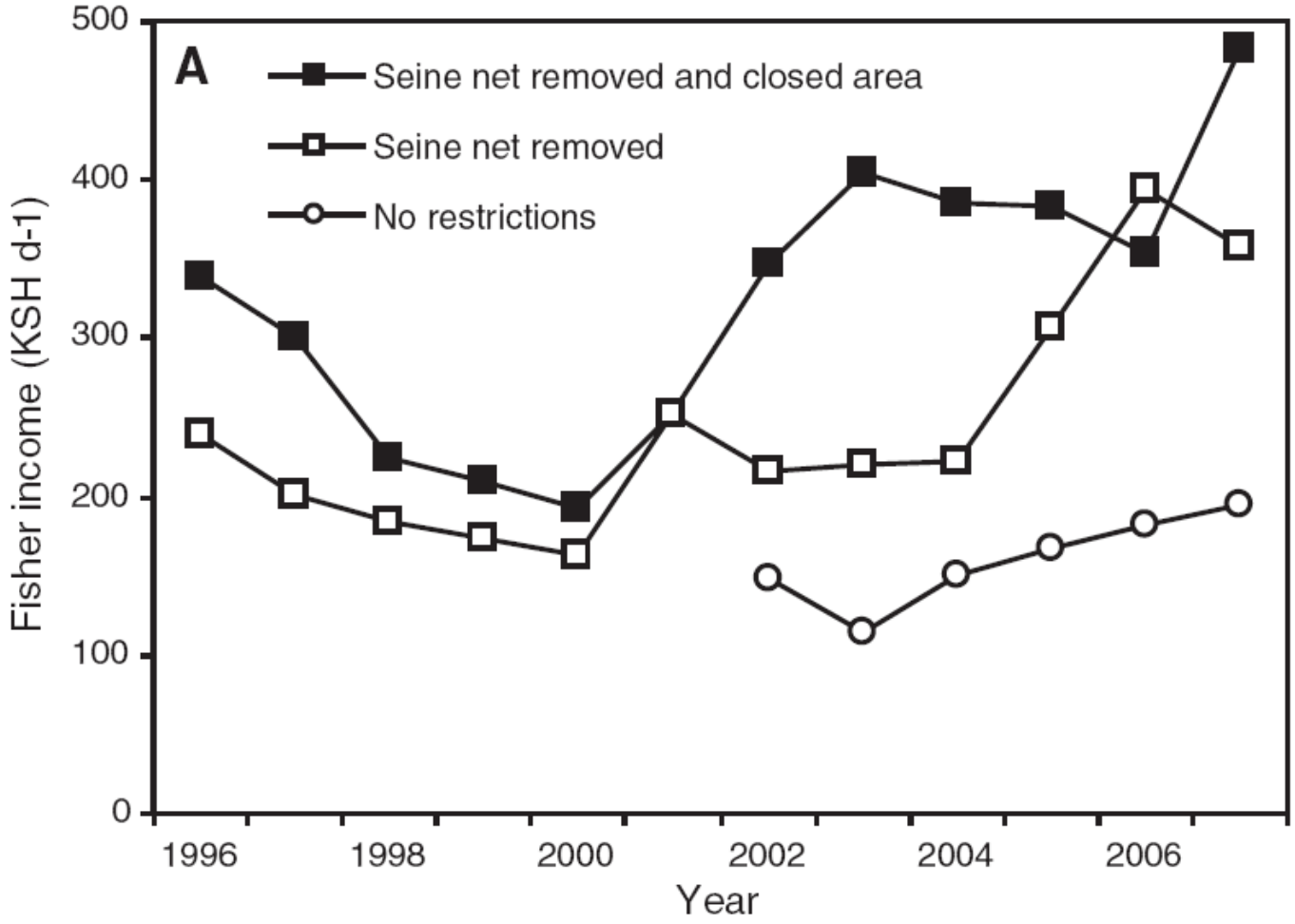
St. Lucia, Caribbean, Example



Fisherfolk now fish for less time and catch more than before reserves were set up



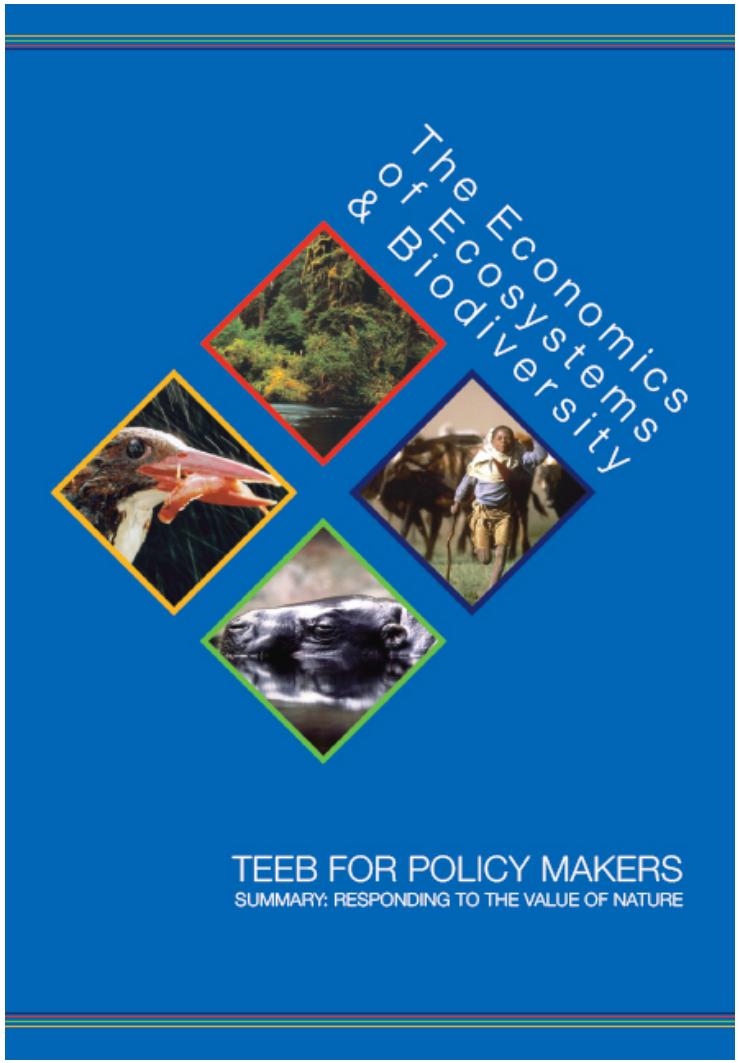
Role of gear restrictions and management



Rebuilding of Kenyan small-scale fisheries through gear restrictions and closed area management

Source: Worm et al. 2009

TEEB D1 Main Messages



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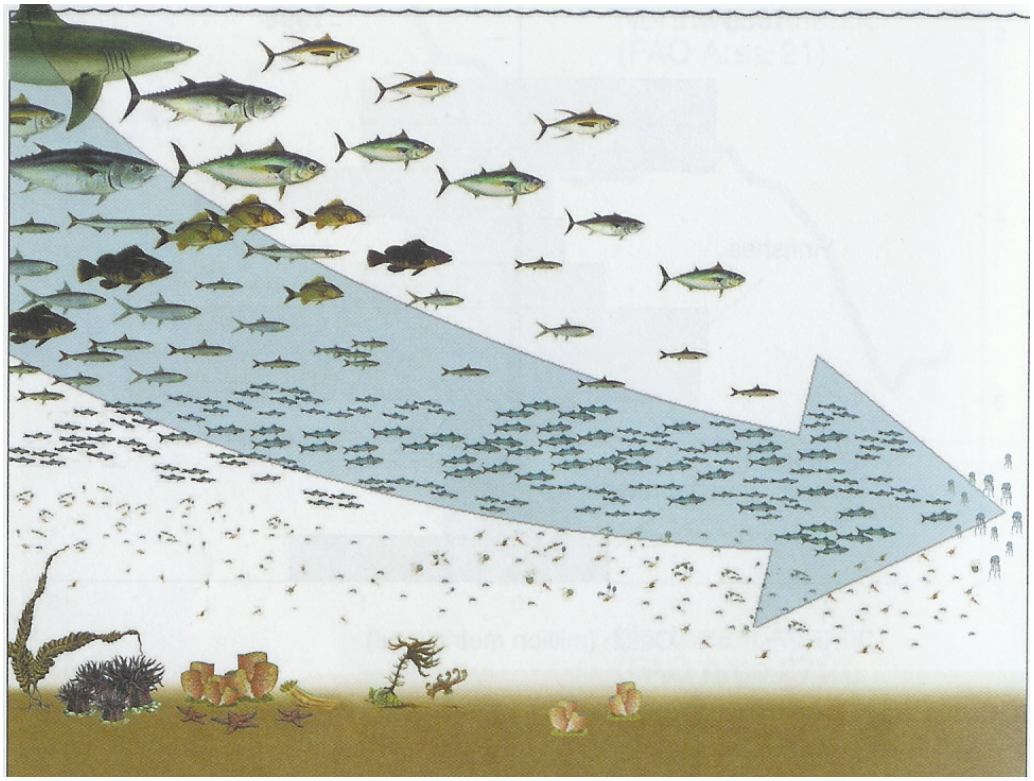
Global Loss of Fisheries… The Role of MPAs ?



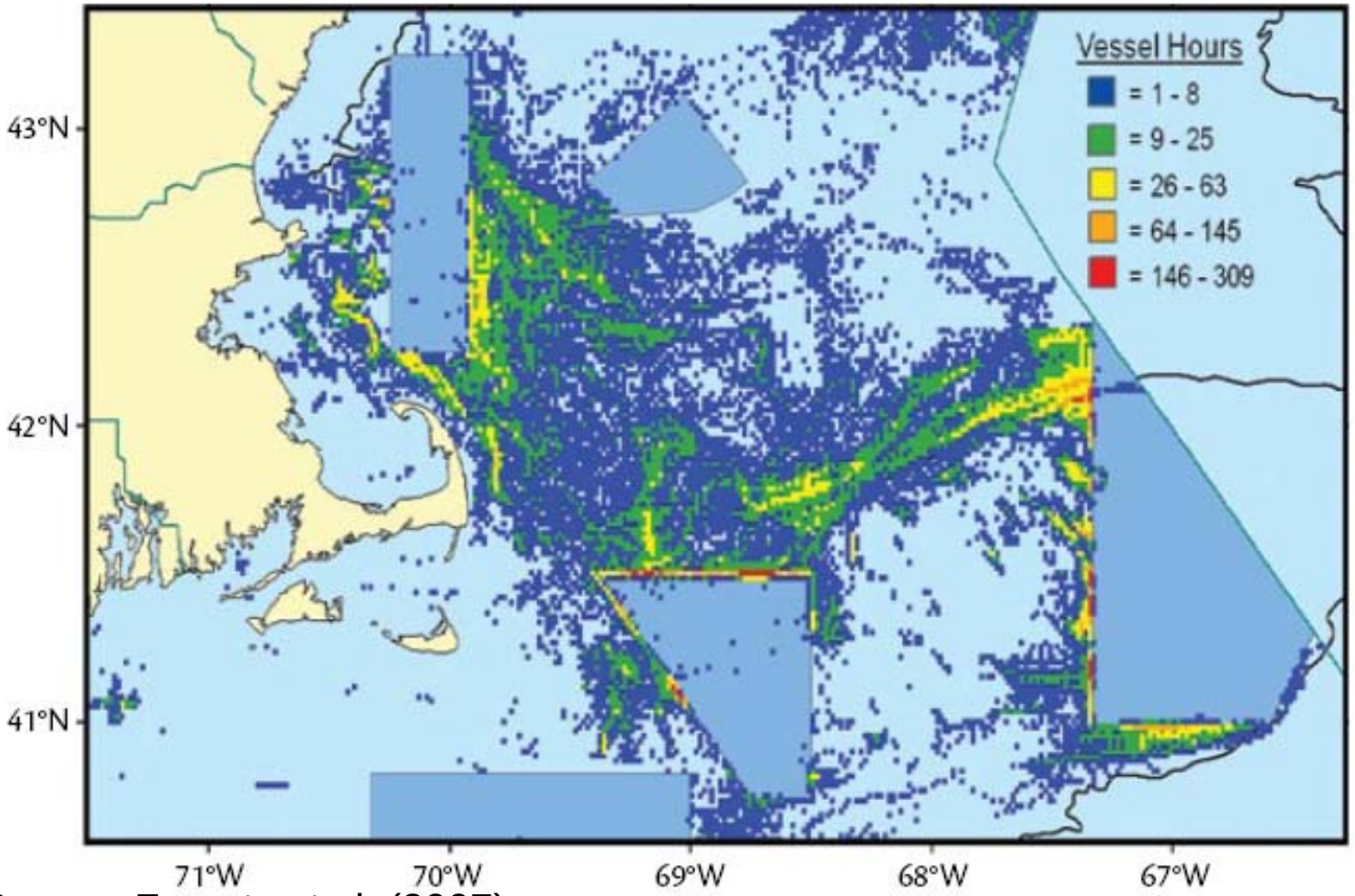
We are fishing down the food web to ever smaller species…

Is there evidence that reserves work ?

Reserves all over the world show strong increases in spawning stocks

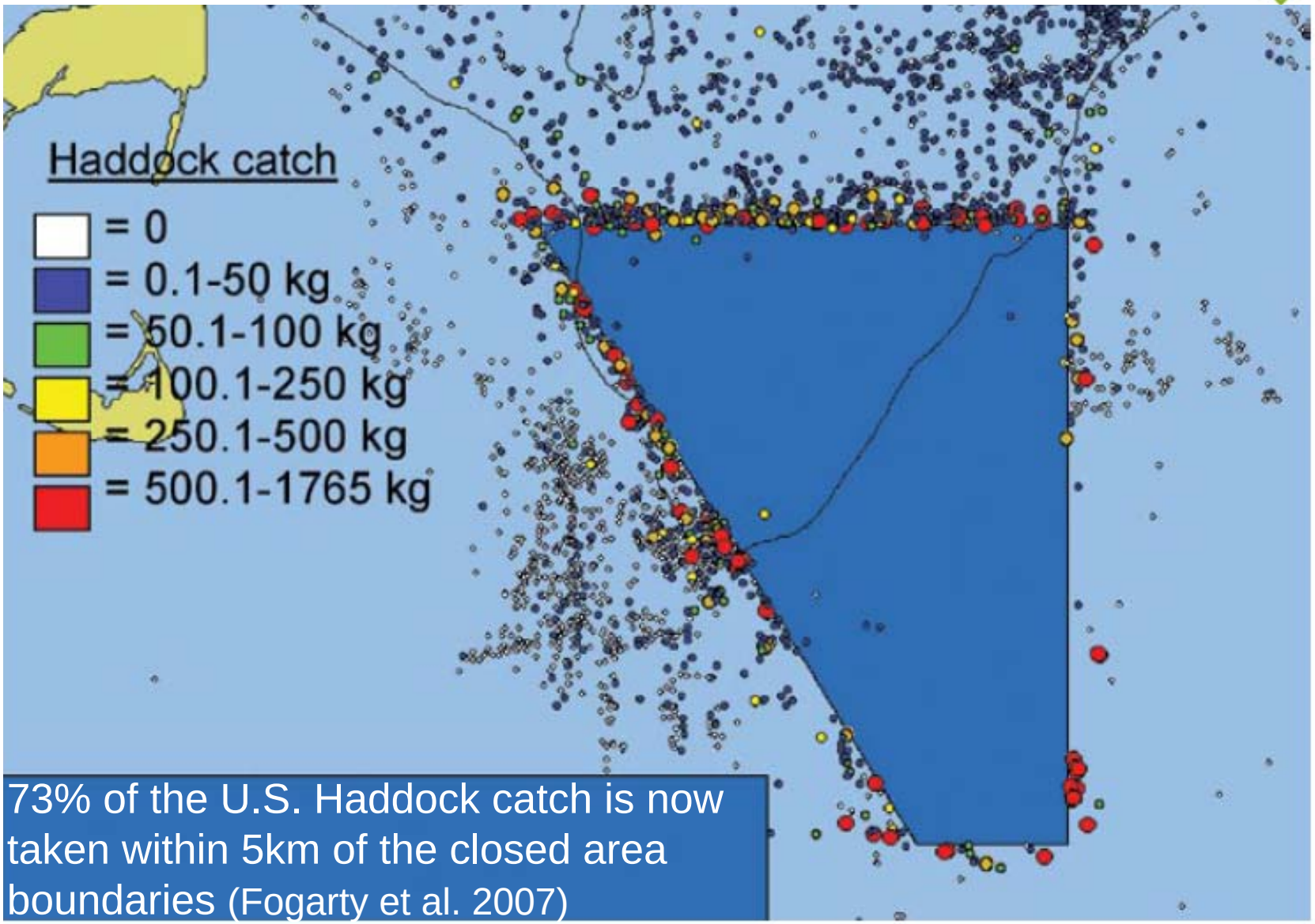
Sources : C. Roberts, University of York; Stewart et al. 2008, CEBC Syst. Review No.23

Distribution of fishing effort around Georges Bank closed areas



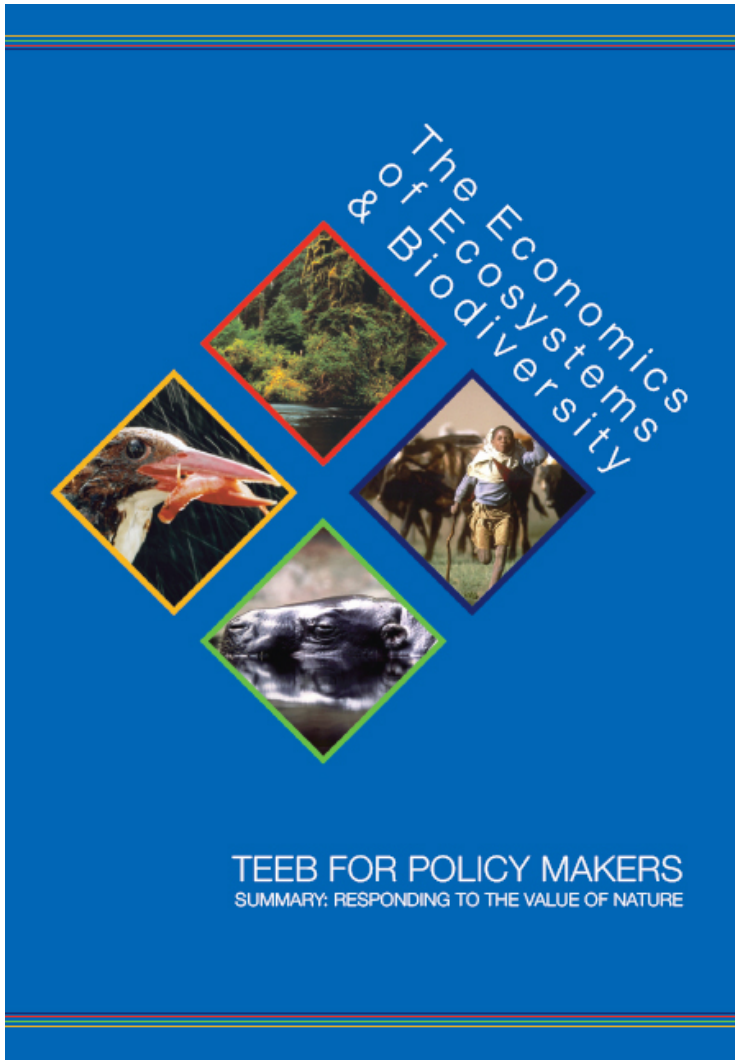
Source: Fogarty et al. (2007)

The Economics of Ecosystems & Biodiversity



73% of the U.S. Haddock catch is now taken within 5km of the closed area boundaries (Fogarty et al. 2007)

TEEB D1 Main Messages



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"Playing the full hand" of carbon colours

Brown Carbon

CO_2 emissions from human energy use and industry

Green Carbon

carbon stored in terrestrial ecosystems, forests, soils, …

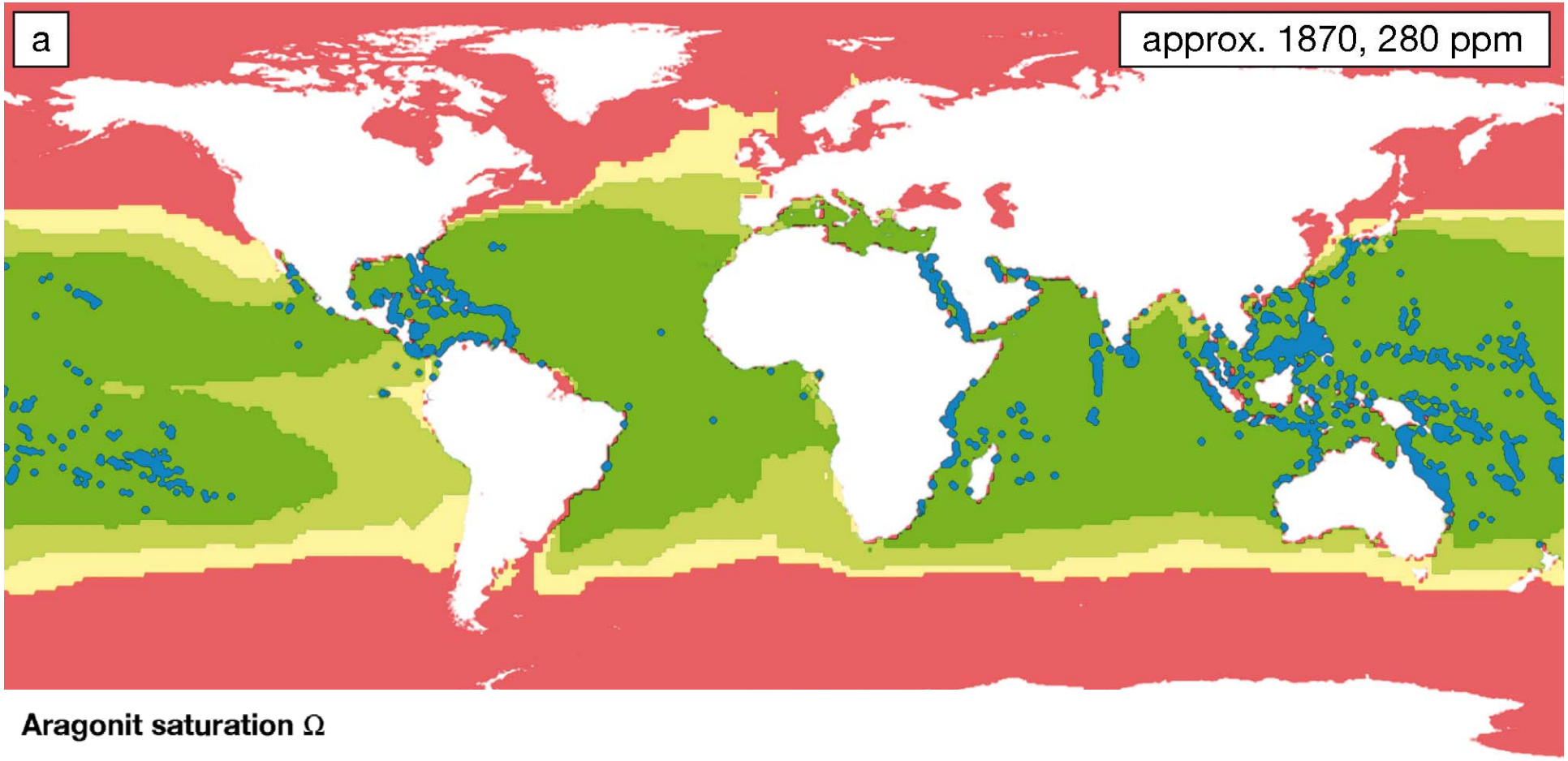
Blue Carbon

55% of all carbon in living organisms is stored in oceans

Halting the **loss** of ***green*** and ***blue*** carbon could mitigate as much as 25% of total GHG emissions,

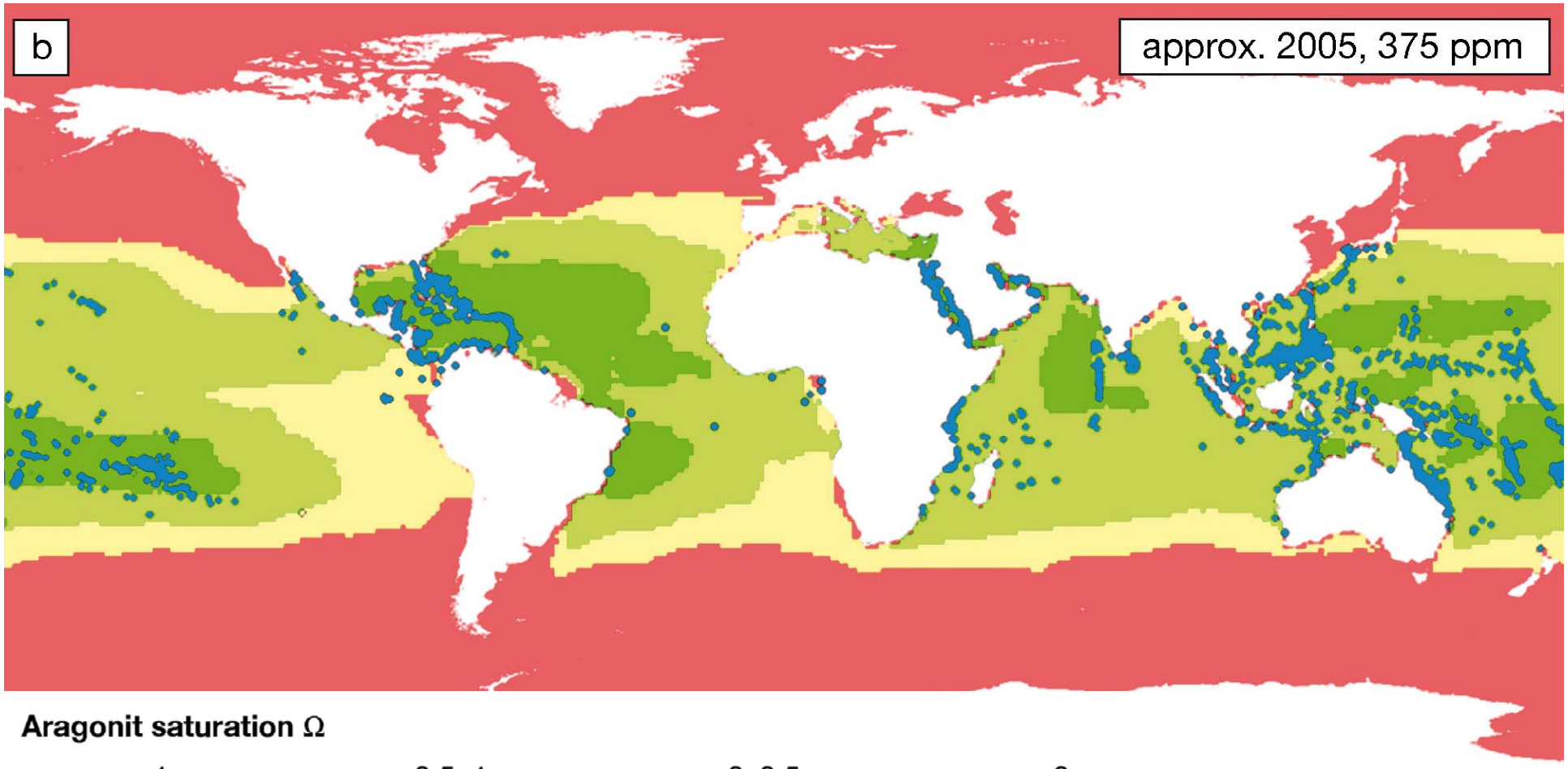
with co-benefits for **biodiversity, food security and livelihoods** (IPCC 2007, Nellemann 2009)

Coral Reefs and acidification
- Reduction of aragonite saturation



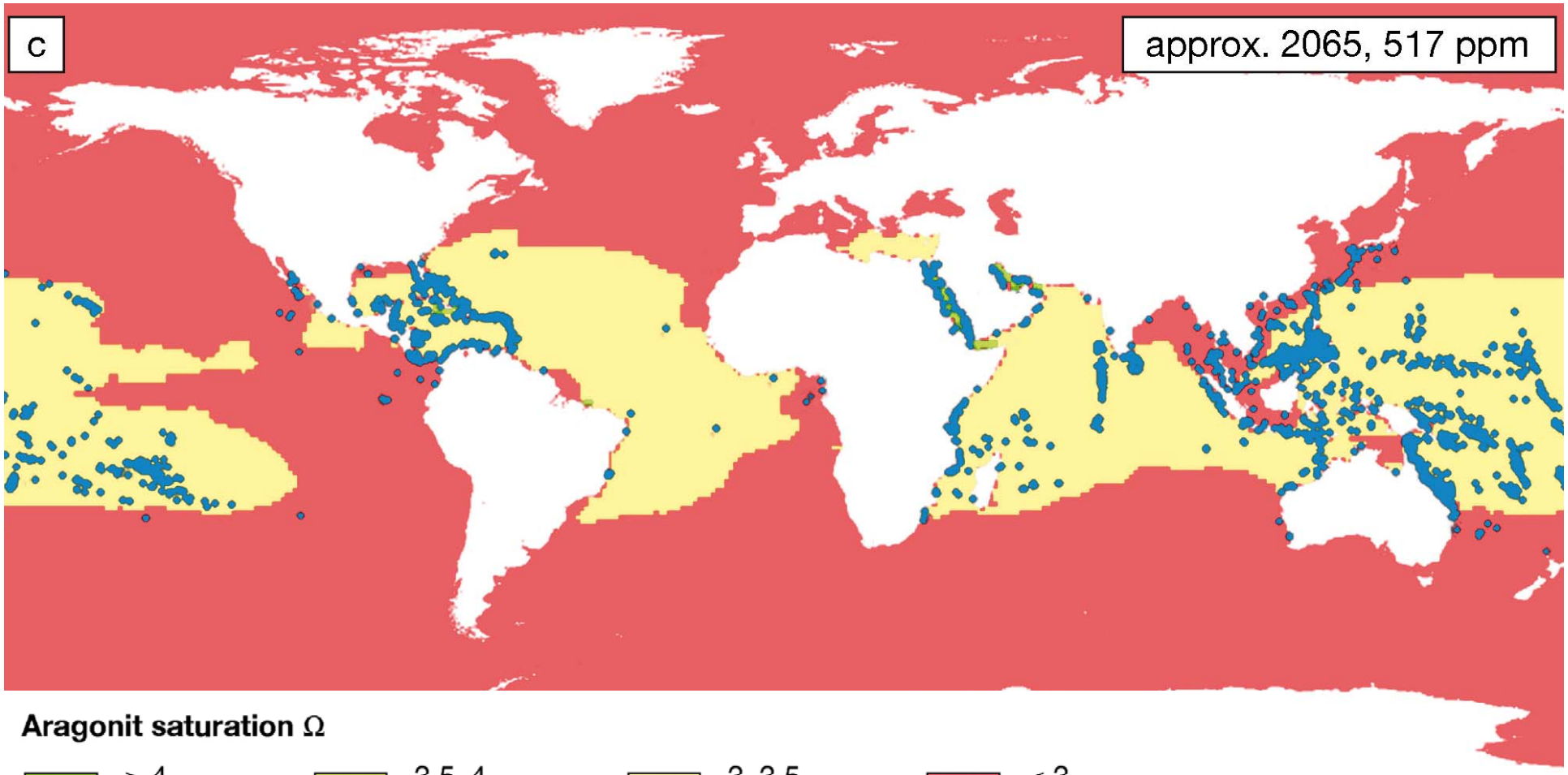
Source: WBGU 2006

Coral Reefs and acidification
- Reduction of aragonite saturation



Source: WBGU 2006

Coral Reefs and acidification
- Reduction of aragonite saturation

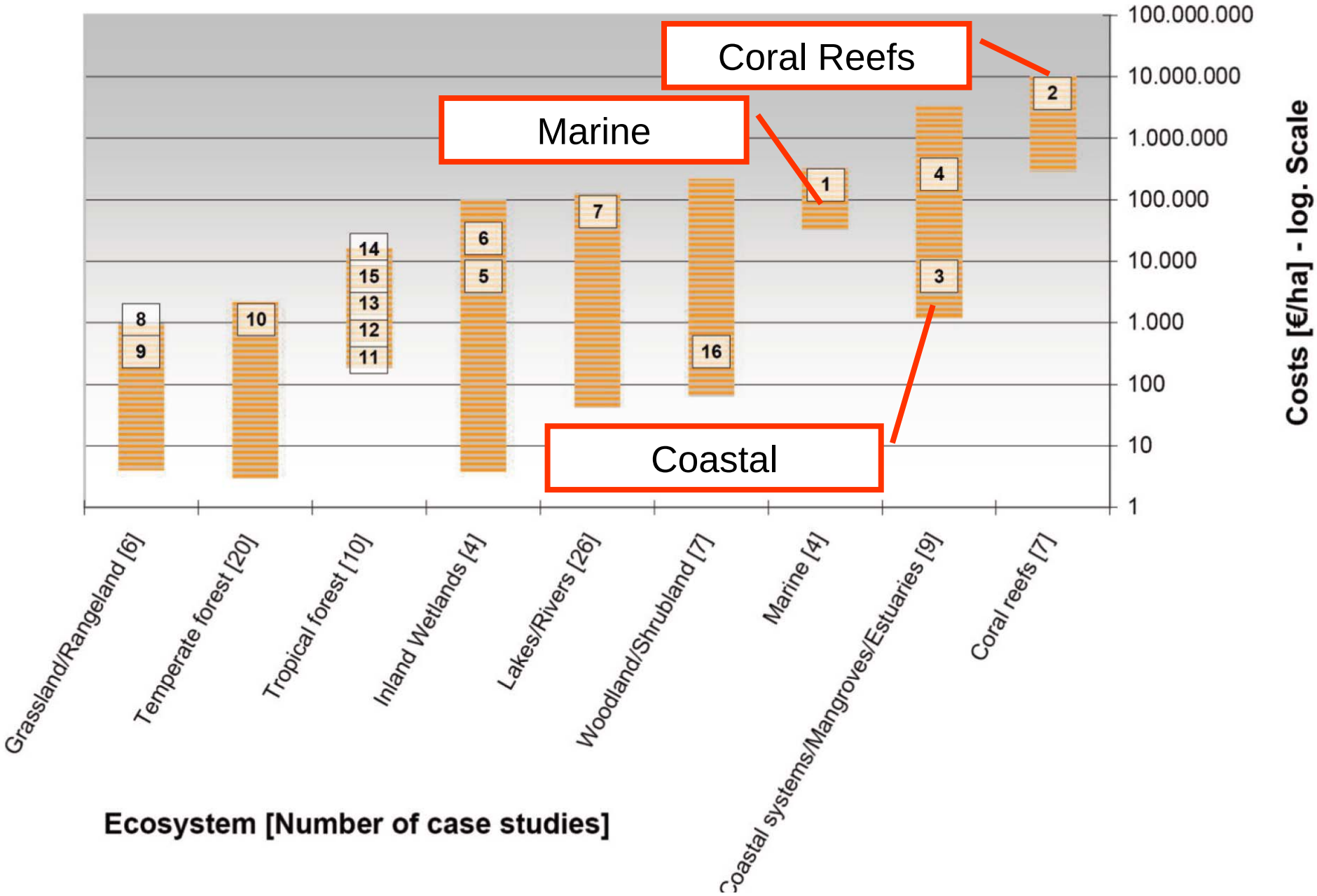


WBGU 2006

Coral Reef Valuations Thresholds…

- Coral Reef Services (per hectare) have high values
- Global Valuation studies place the value as high as US$ 172 billion per annum
- However…. Coral Reefs are an ecosystem at the threshold of irreversibility



Restoration costs of ecosystems

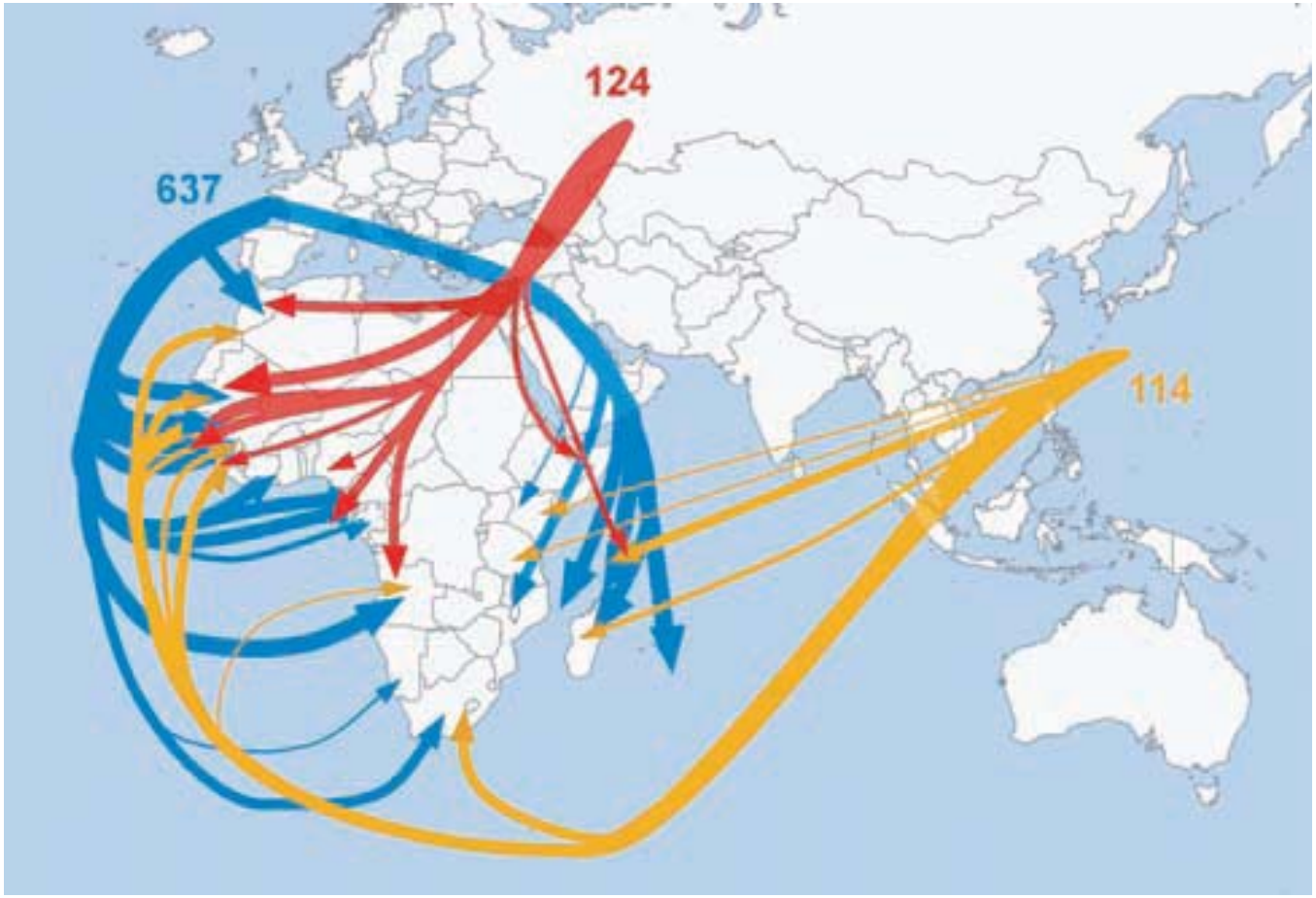
TEEB D1, Chap.9

The Economics of Ecosystems & Biodiversity

TEEB D1 Main Messages

Rewarding benefits through payments and markets	Improve certification and true market prices
Reforming environmentally harmful subsidies	Reduce harmful subsidies (fisheries, mangroves)
Addressing losses through regulation and pricing	Integrated Coastal Zone Manegement, new approaches for fisheries management
Adding value through protected areas	Set up coherent system of MPAs
Investing in ecological infrastructure	Focus on safeguarding (and rehabilitation) of coastal systems

The international challenge



Movement of fishing effort from developed nations to Africa in the 1990s. Data indicate total access years in distant-water fishing agreements.

Source: Worm et al. 2009

„Combined fisheries and conservation objectives can be achieved by merging diverse management actions, including catch restrictions, gear modification, and closed areas, depending on local context.“

Worm et al. 2009

The Economics of Ecosystems & Biodiversity

“Economics is mere weaponry, its targets are ethical choices.”

Pavan Sukhdev

Thank You!

- Further information and report download: **www.teebweb.org**
- Contact Scientific Coordination: teeb@ufz.de
- Further contributors:

University of Liverpool

Helmholtz Centre for Environmental Research – UFZ

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Organisation for Economic Co-operation and Development – OECD

IUCN

Convention on Biological Diversity

Indian Institute of Technology Bombay

European Environment Agency

UNEP

Federal Ministry for the Environment, Nature Conservation and Nuclear Safety

defra – Department for Environment Food and Rural Affairs

Norwegian Ministry of Foreign Affairs