

Production on Marine Food Resources and Ecosystem Services

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- Centuries ago, most people stopped hunting terrestrial animals for food.
- In contrast, today's people are still fishing from the wild on a large industrial scale.
- Where does this difference come from?



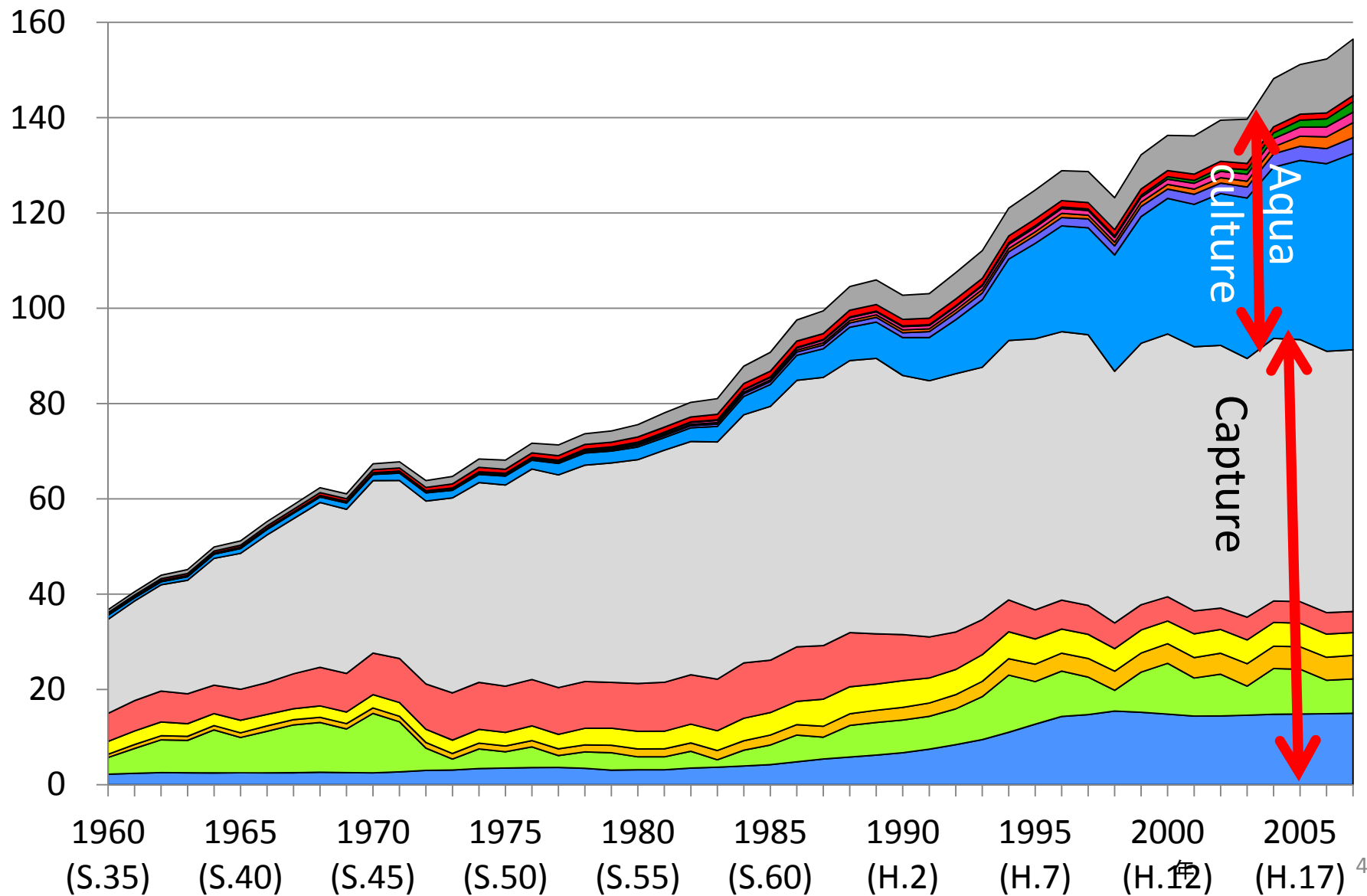
One reason:

The speed of nutrient cycling is much faster in ocean ecosystems than that of land ecosystems

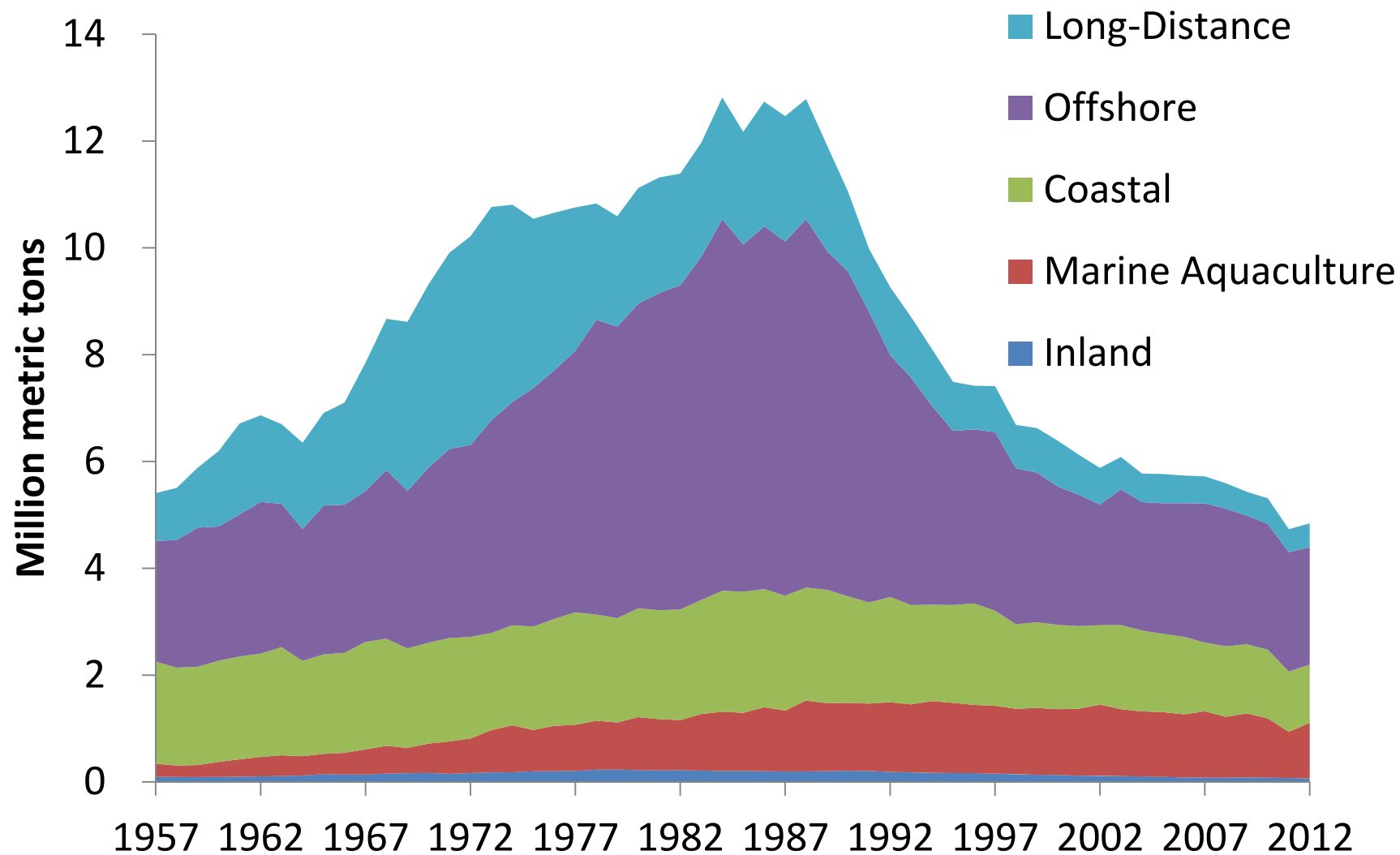
	Net Primary Production (g/m ² /year)	Existing Biomass (g/m ²)	Production/Biomass (P:B ratio) (/year)
Ocean	152	10	15.2
Land	773	12300	0.063

Source: Whitaker, E. (1975) Communities and Ecosystem 2nd ed. Macmillan, New York, 385pp

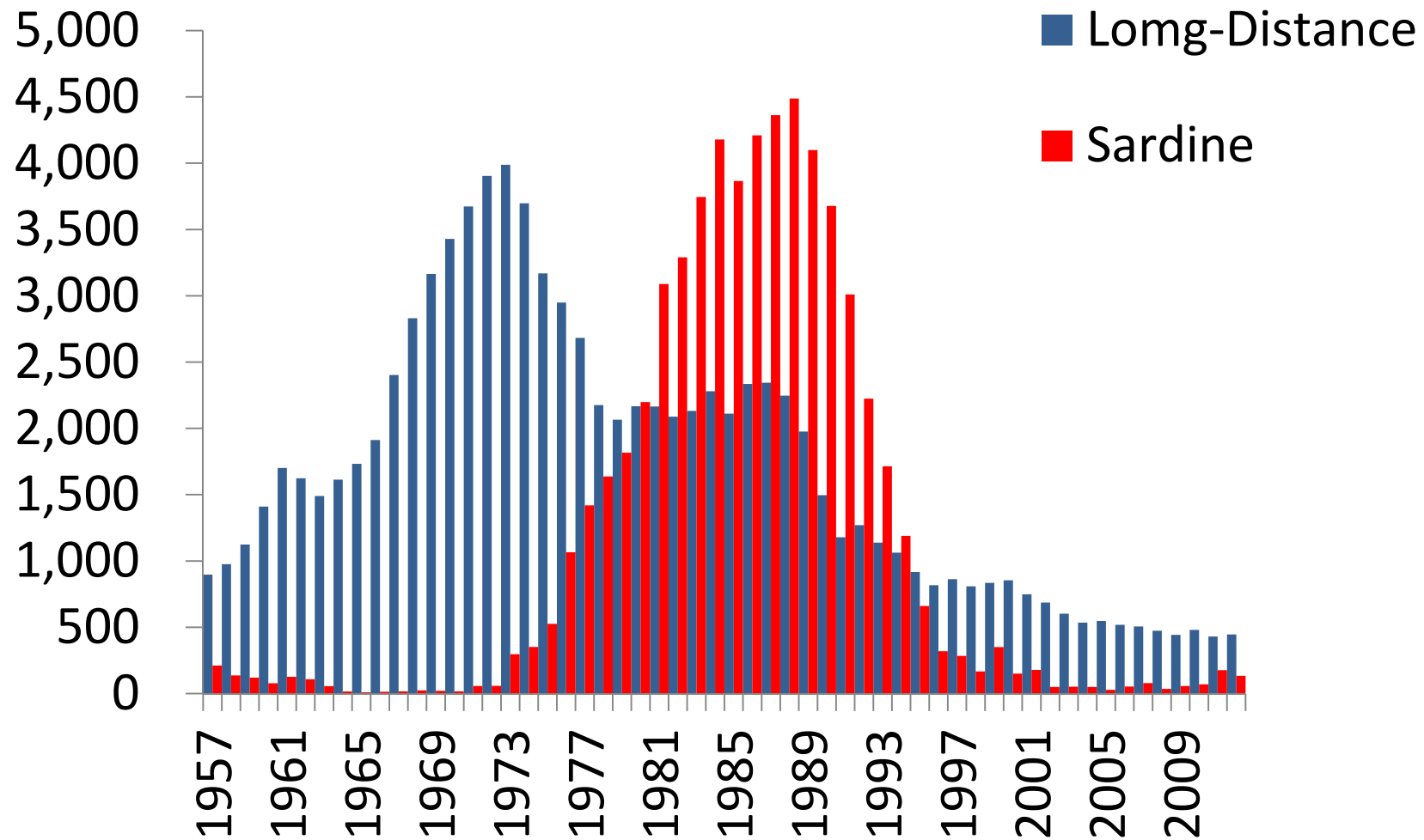
Productions in world fisheries and aquaculture (Unit: million metric tons) Data from FAO statistics



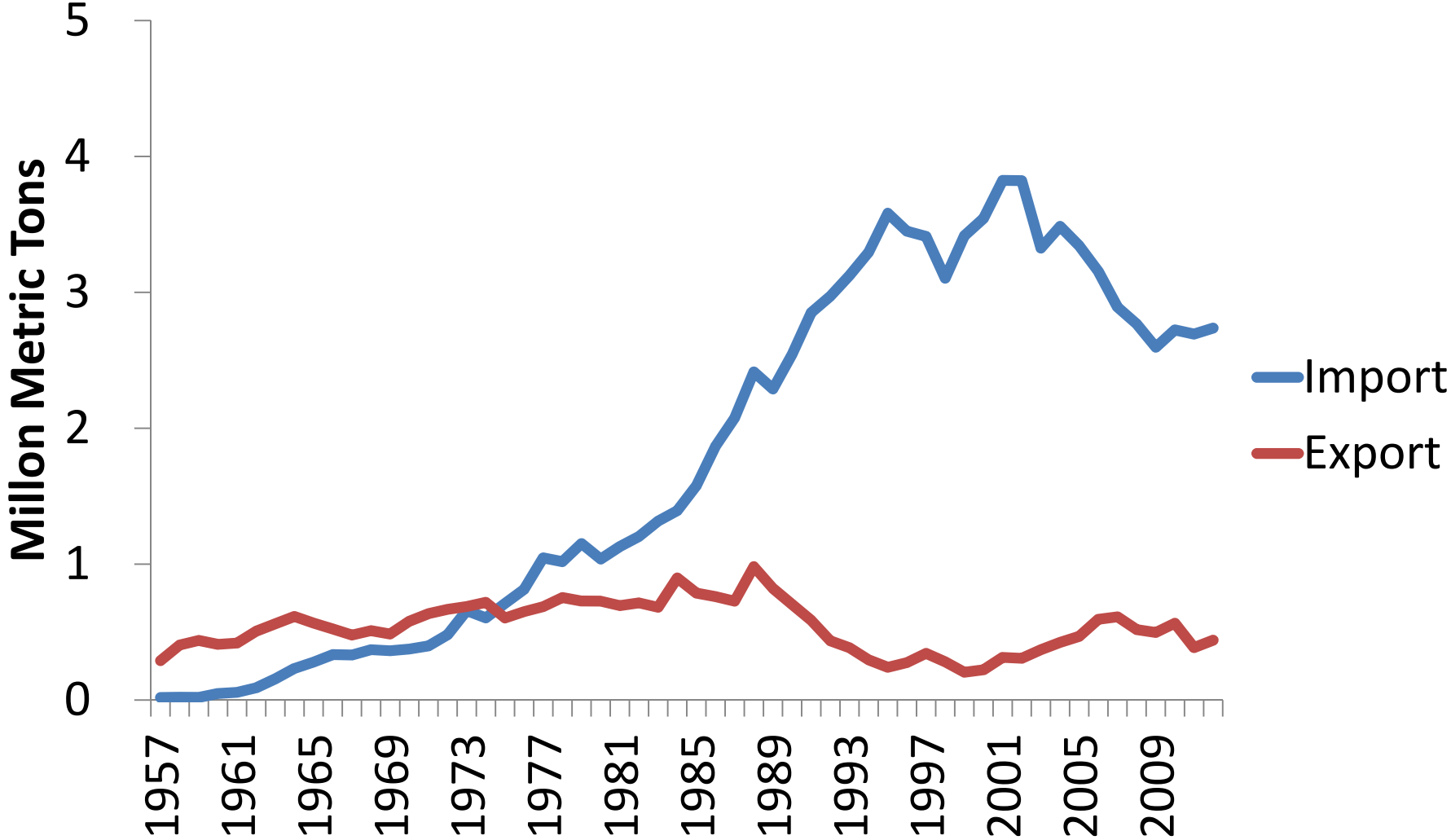
Declining fishery productions in Japan



Two major factors of the Japanese production decline

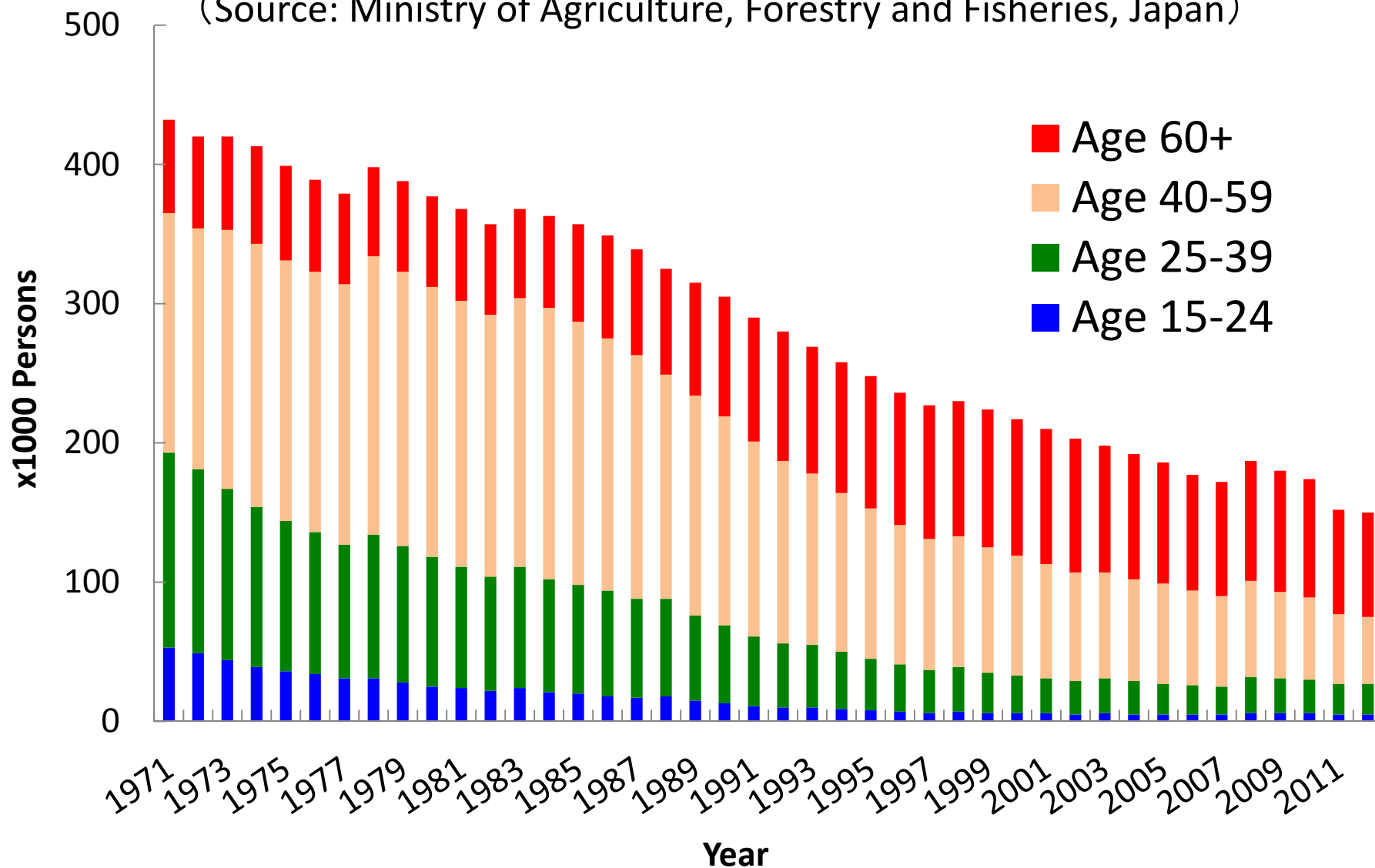


The amount of Japan's import and export in fishery products (latest figure 2012)



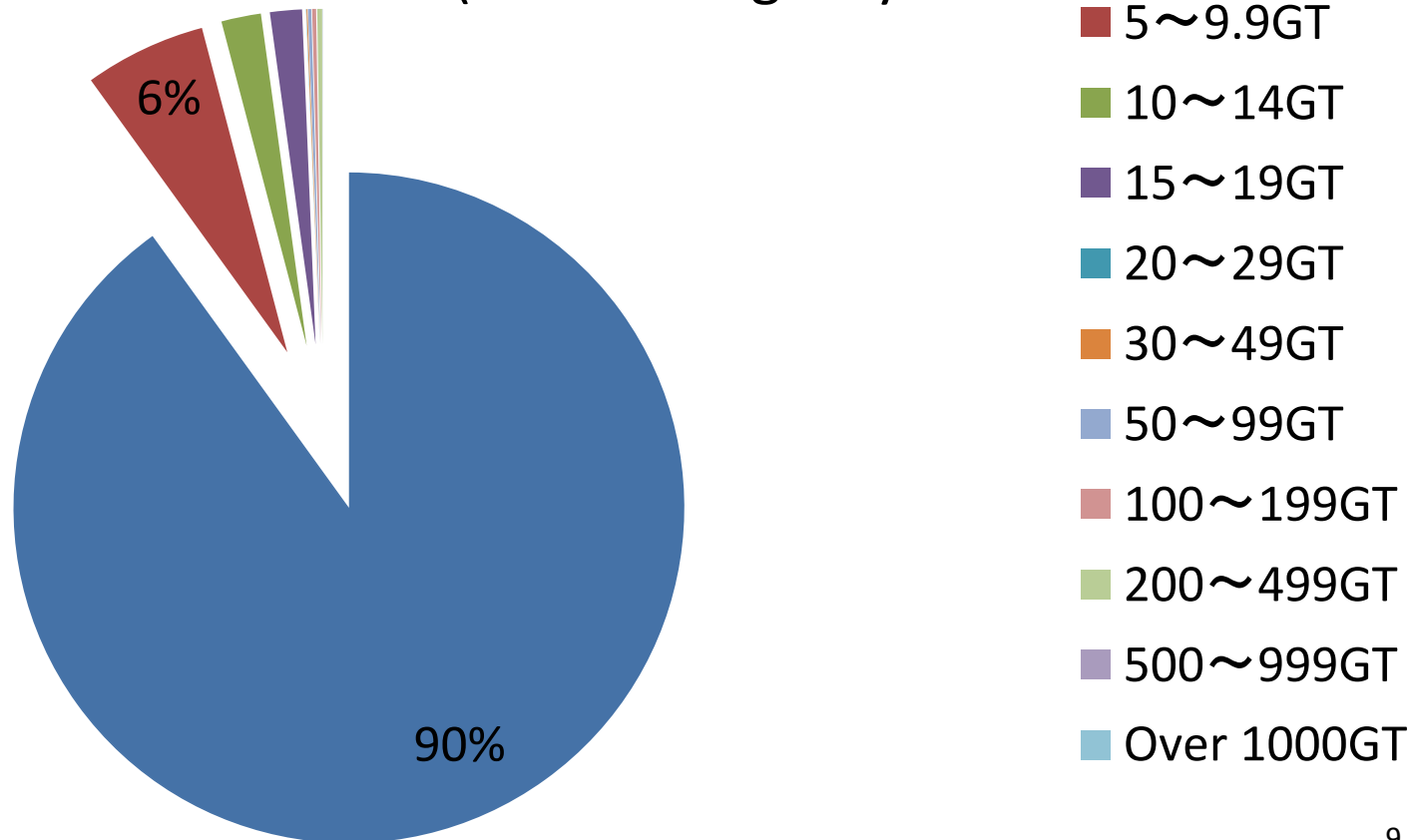
Number of male fishermen in Japan

(Source: Ministry of Agriculture, Forestry and Fisheries, Japan)

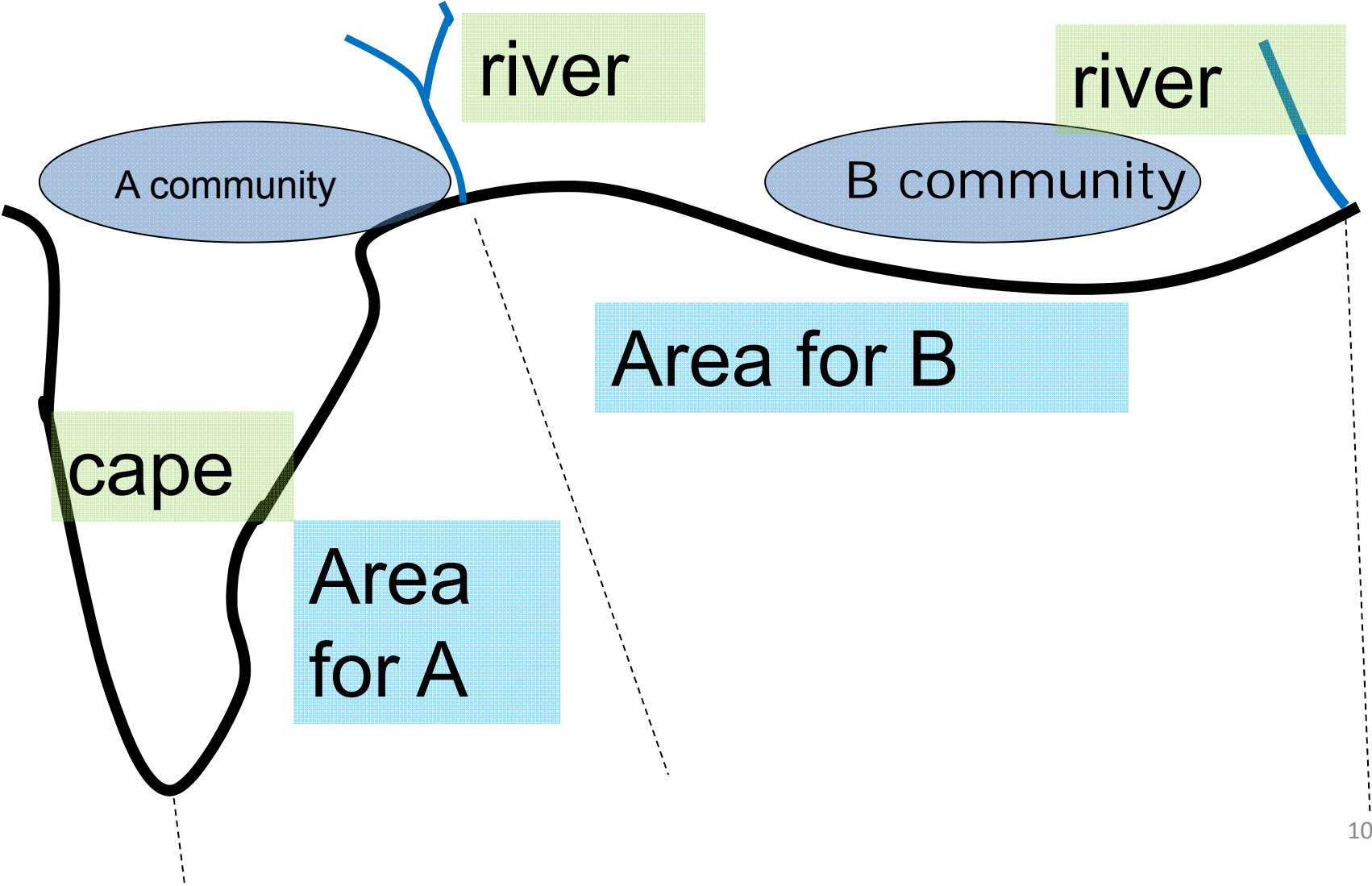


Small-scale fishery is dominant in Japan

Number of Japanese fishing vessels by size
Total 303,842 vessels in 2003 (Fisheries Agency of Japan)



Example of Territorial Use Right in Japanese coastal small-scale fisheries



An example of good practice in coastal Japan

- area based management and
gear restrictions on shrimp
trawl boats -

Photo: Courtesy of Notsuke Fisheries Cooperative Association

Eelgrass (amamo) provides habitat to shrimps.

Restrictions on fishing gear, season, area, and quota are in place. Habitat conservation activities are also conducted.

Picture: Courtesy of Notsuke fishery cooperative office

Characteristics of Management Practice in Notsuke

- Rights-based management for a fishery provides incentives for habitat conservation.
- Peer monitoring and sanctions by a fisher's organization
- Cooperation between fishers and scientists
- Fishers pay attention to ecosystem services such as connectivity of land and sea.
- Fishers are positive toward Ramsar registration.

Office of a local fishery cooperative association



Picture: Rausu office

Cooperation between fishermen and local scientists





Habitat restorations
(Removal of alien species)

Scientific outputs on land and sea connections have also been accumulated in the large scale.

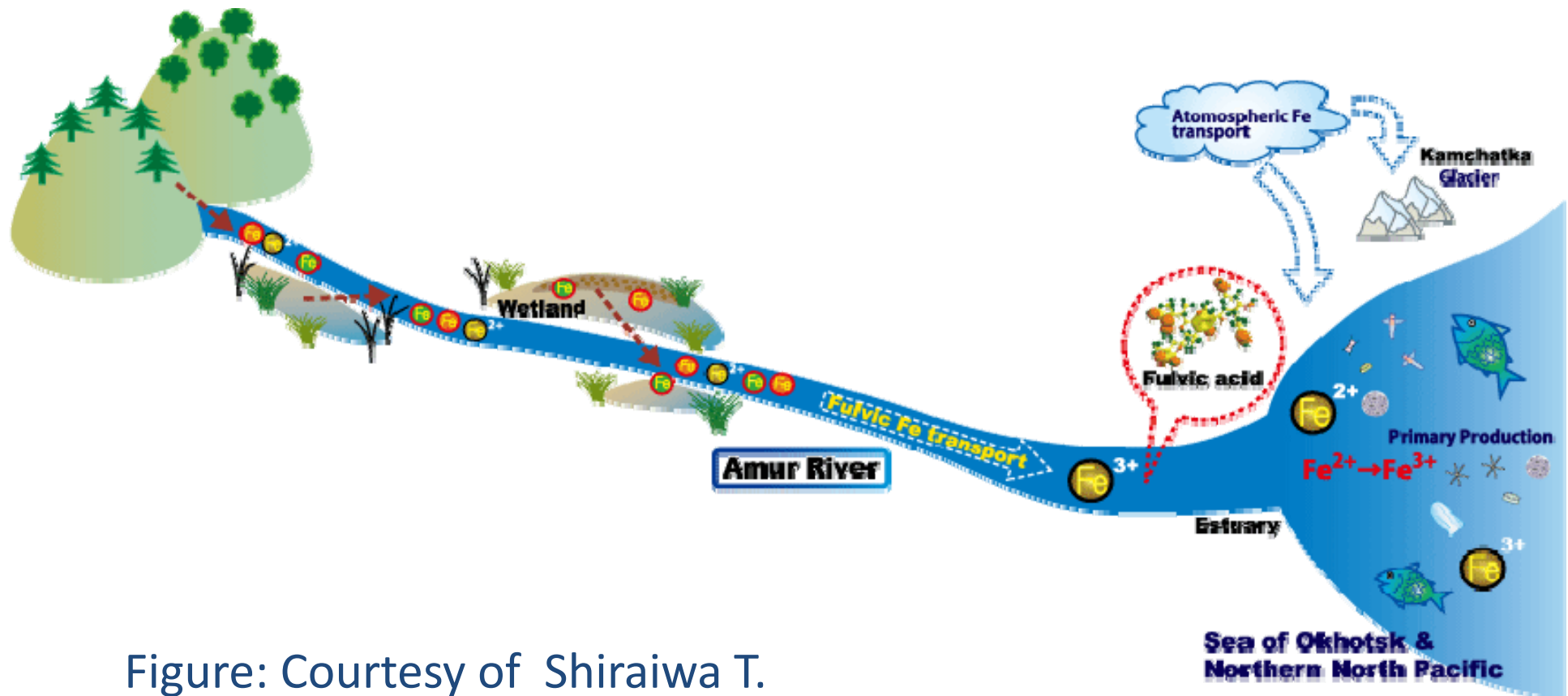
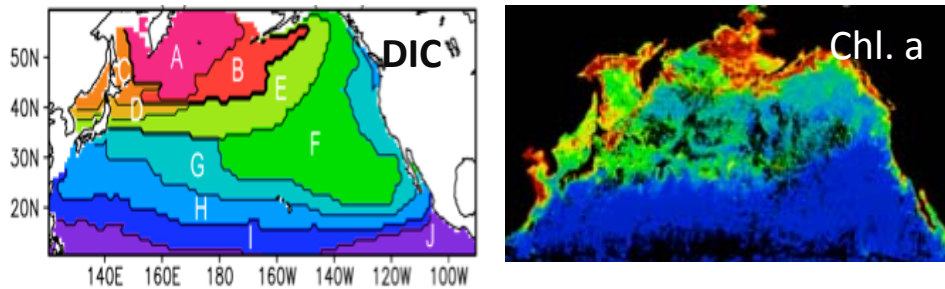


Figure: Courtesy of Shiraiwa T.

The most recent science tells us ...

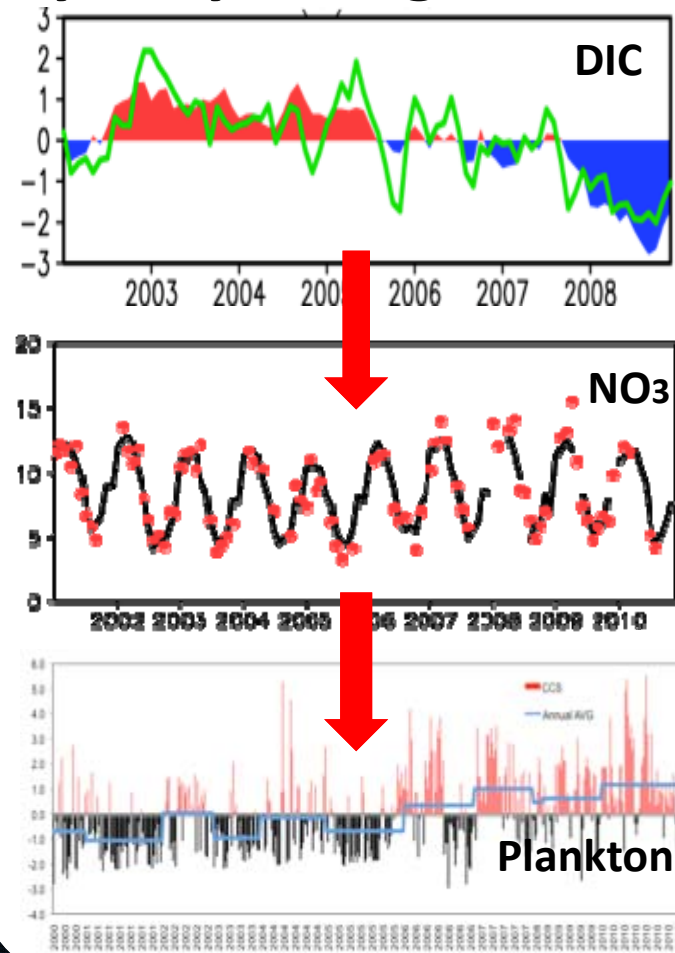
(1) Spatial characteristics of ocean ecosystems



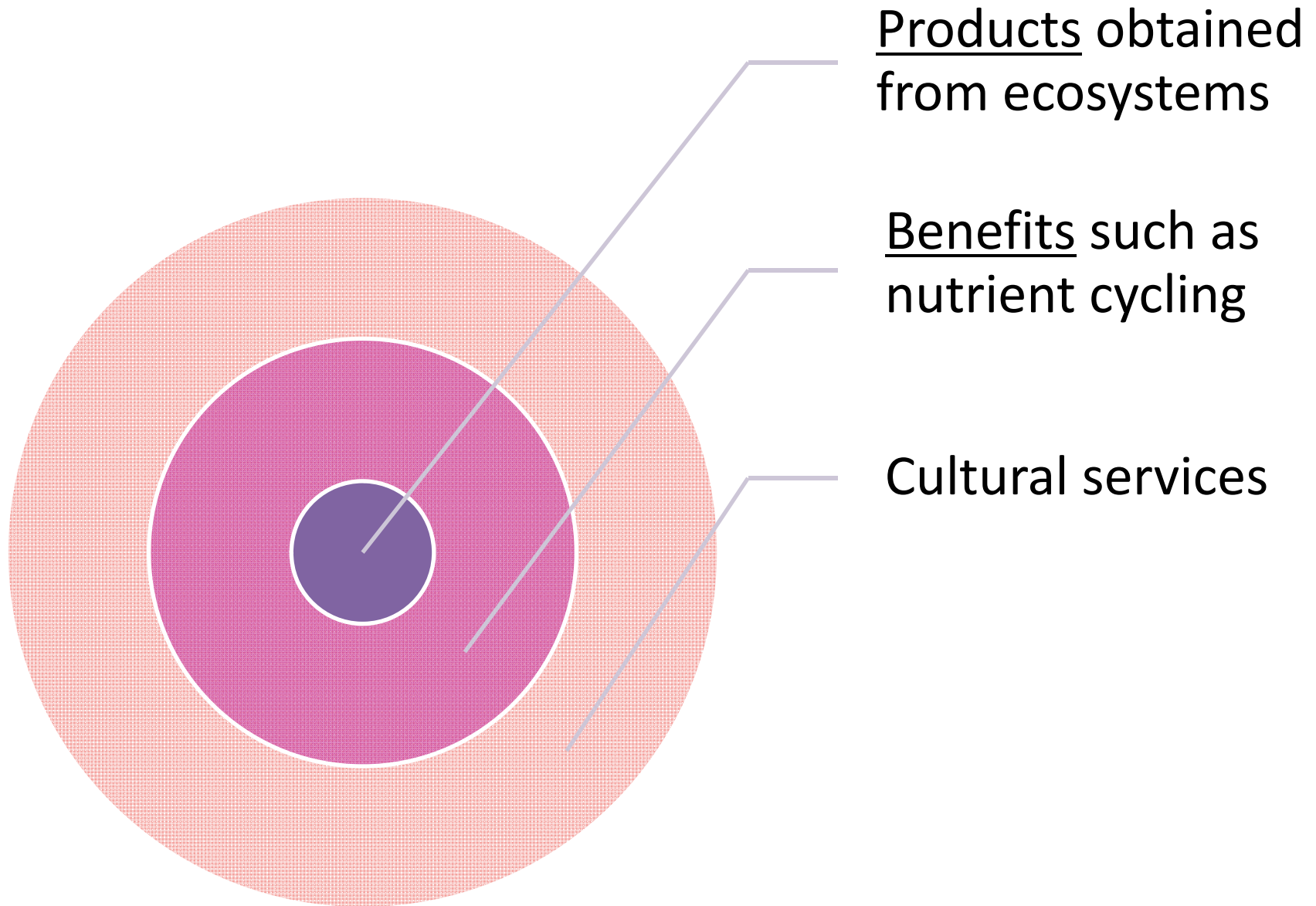
Management units can be identified

Figures: Courtesy of Chiba S., Yasunaka S., and Hashioka T.

(2) Seasonal and yearly changes

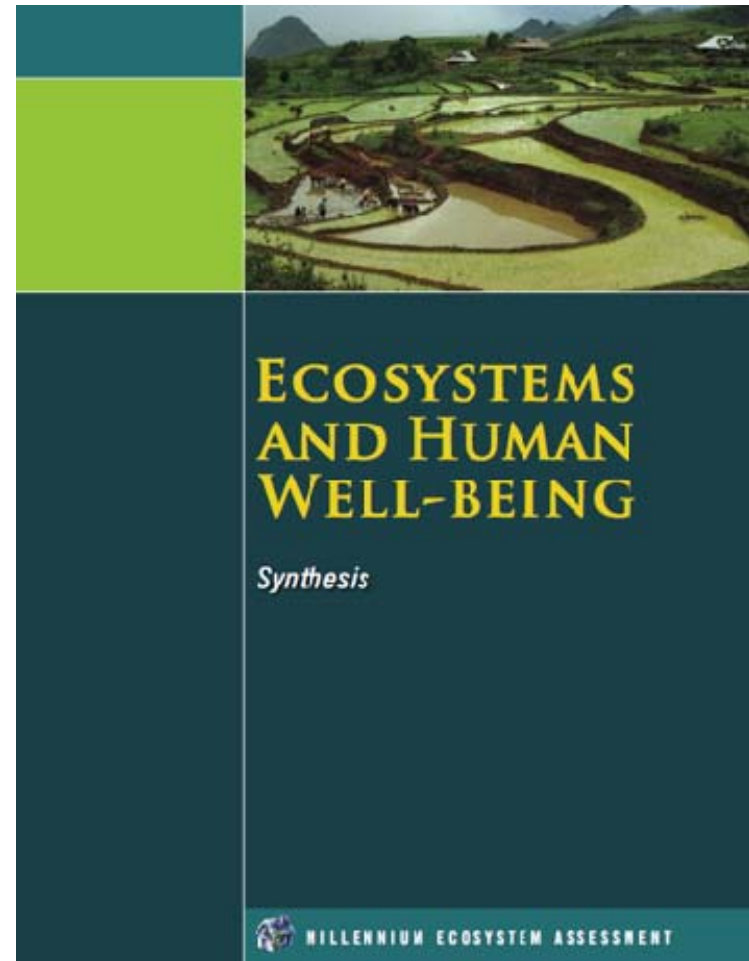


Ecosystem services



What should be the purpose of the area-based management?

- Maintaining ecosystem services (including nutrient cycling and primary production) needs to be emphasised.



Giddings, Hopwood, O'Brien (2002)

“Environment, economy and society: fitting them together into sustainable development”

Sustainable Development 10:187-196.

- Many English and American environmentalists give priority to issues of the countryside, wild animals and wilderness with the aim of preservation from people, with much less concern about the urban environment.
- This outlook has its roots both in a view that sees the environment as separate from humans and an anti-urban tradition.

Existing legal frameworks place too much emphasis on the management of “goods” (i.e., products)

Catch Quota based management	Area based management
All attention is on fish and fishing methods. (example: “allowable catch” at UNCLOS 61, or RFMO regulations)	Attention is mostly on habitat conservation (example: territorial use rights fishery managements in Japan)

Four aspects of food security (FAO's identification)

www.fao.org/docrep/013/al936e/al936e00.pdf

- AVAILABILITY of food: “Supply side” of food security including stock levels and trade.
- ACCESS to food: with a greater policy focus on incomes, expenditure, markets and prices.
- UTILIZATION: through good feeding practices, food preparation, diversity of the diet and intra-household distribution of food.
- STABILITY: Adverse weather conditions, political instability, or economic factors (unemployment, rising food prices) may have an impact on access to food.

Roles of market and consumers



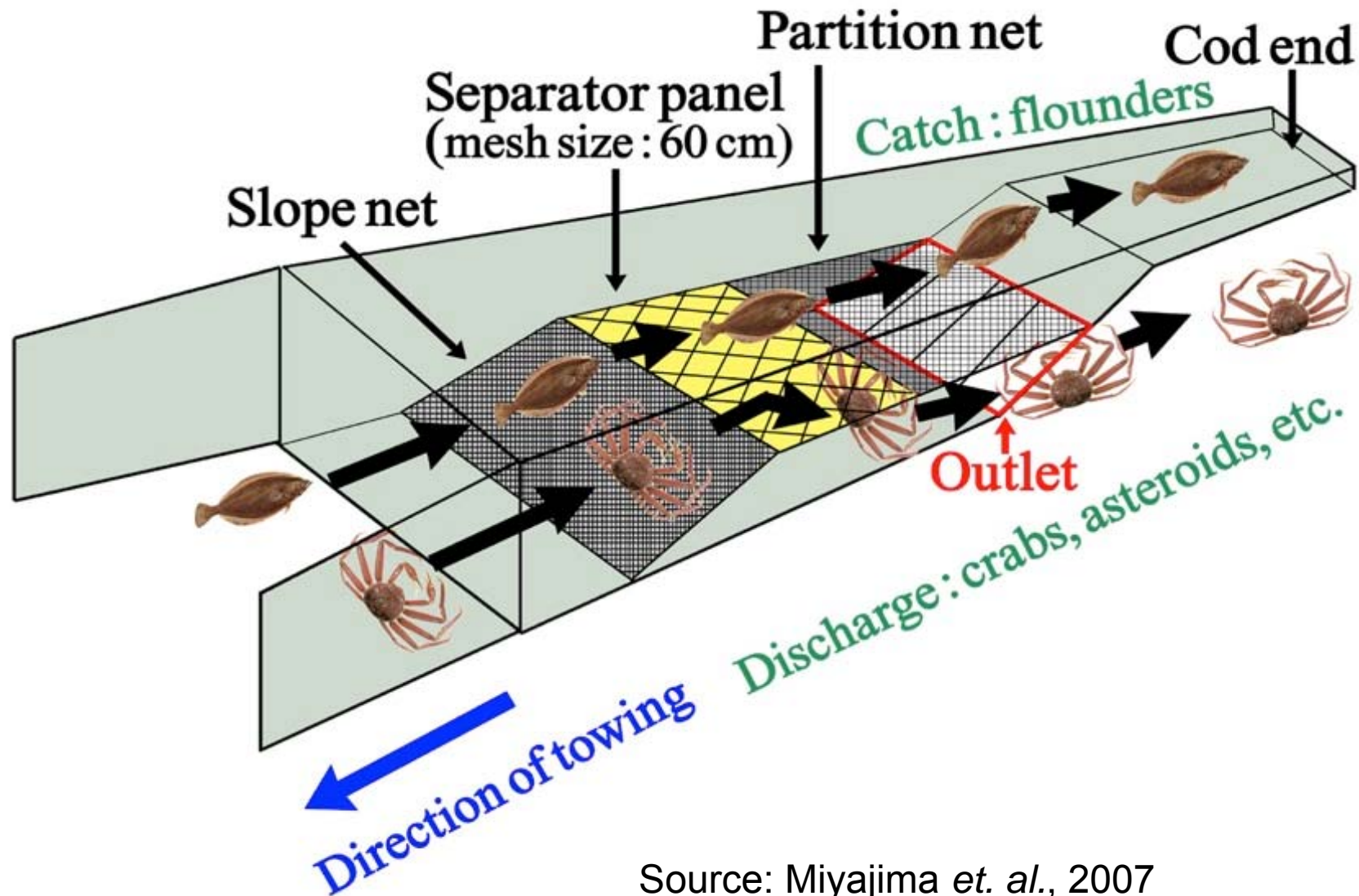
Picture: MSC Japan

MSC Ecolabel in Japan

- MSC (Marine Stewardship Council). Head office in UK.
- Started since 2000 (and 2006 in Japan)
- Japanese producer certificate include: (i) The Kyoto Danish Seine Fishery Federation snow crab and flathead flounder fishery was the first Japanese fishery in 2008, (ii) Tosakatsuo Suisan Japan pole and line skipjack tuna fishery in 2009, (iii) Scallop fishery in Hokkaido in 2013, and several other fisheries under assessment process.



Snow crab escape holes installed in fishing nets for Kyoto Danish Seine fisheries during the seasons for flounders



Source: Miyajima *et. al.*, 2007

Japanese original eco-label

- MEL (Marine Ecolabel Japan), Head-office in Tokyo.
- The first certification was issued in 2008 for red snow crab (*Chionoecetes japonicus*). Several certified fisheries exist. Products have not yet distributed outside of Japan.



Picture: Nobuyuki
Yagi



Source : www.suisankai.or.jp



Trap
entrance



Escape
hole for
juveniles



Picture: Nobuyuki
Yani

Some challenges

Consumers are willing to pay extra money for labeled fish, but

- fish distributors are not always cooperative,
- fisheries in developing countries needs additional considerations, and
- more supports are needed from consumers on habitat conservation (in addition to fish stock conservation)

Fish distributors are not always cooperative



Picture: Nobuyuki

Conclusion

- More attention is needed for ocean ecosystem services (in addition to fish populations) if we want to maintain food production.
- Because land-based activities exist, designing legally binding instruments for the conservation of ocean ecosystem will not be easy.
- Economic tools such as payment for ecosystem services or other forms of consumer involvement need to be considered.

Report subject

- Giddings, Hopwood, O'Brien (2002) argue that "Many English and American environmentalists give priority to issues of the countryside, wild animals and wilderness with the aim of preservation from people, with much less concern about the urban environment" and that "This outlook has its roots both in a view that sees the environment as separate from humans and an anti-urban tradition."
- Do you agree or disagree? Elaborate your views on the above, and provide an example to justify your views.