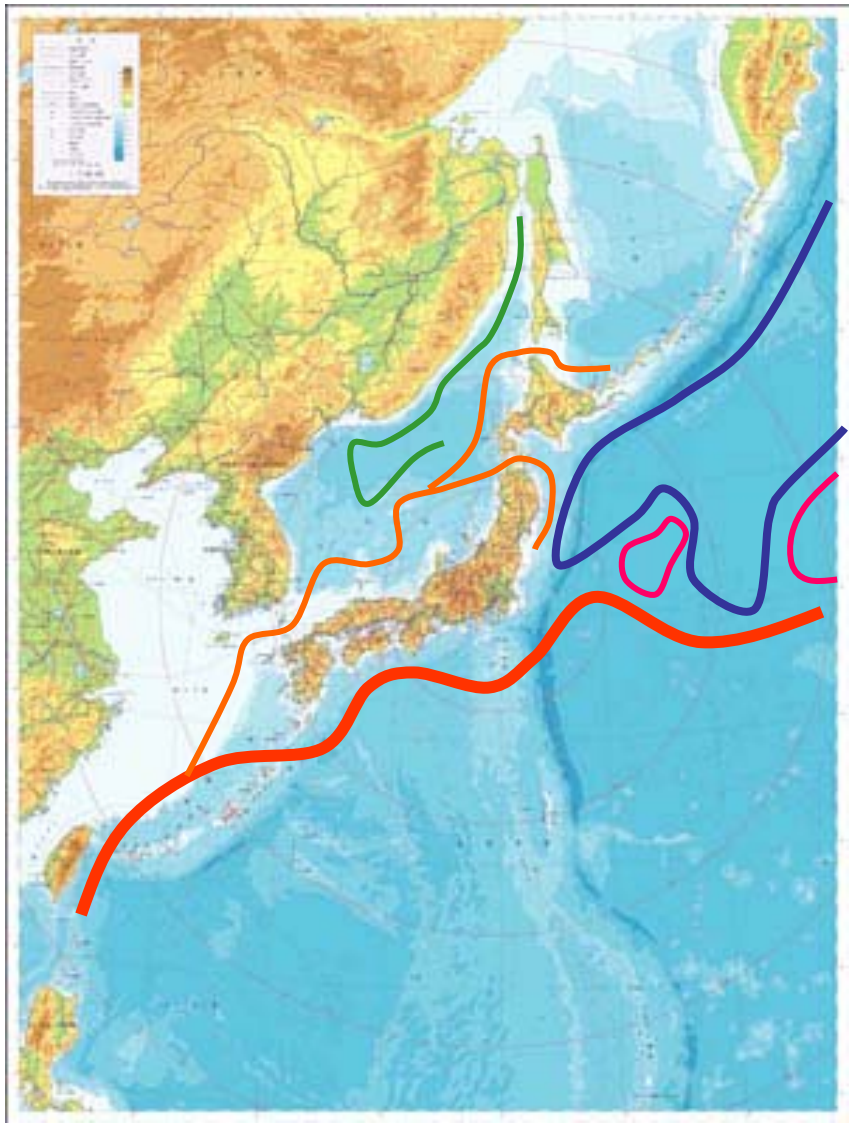
Physical and biological criteria for region identification around Japan

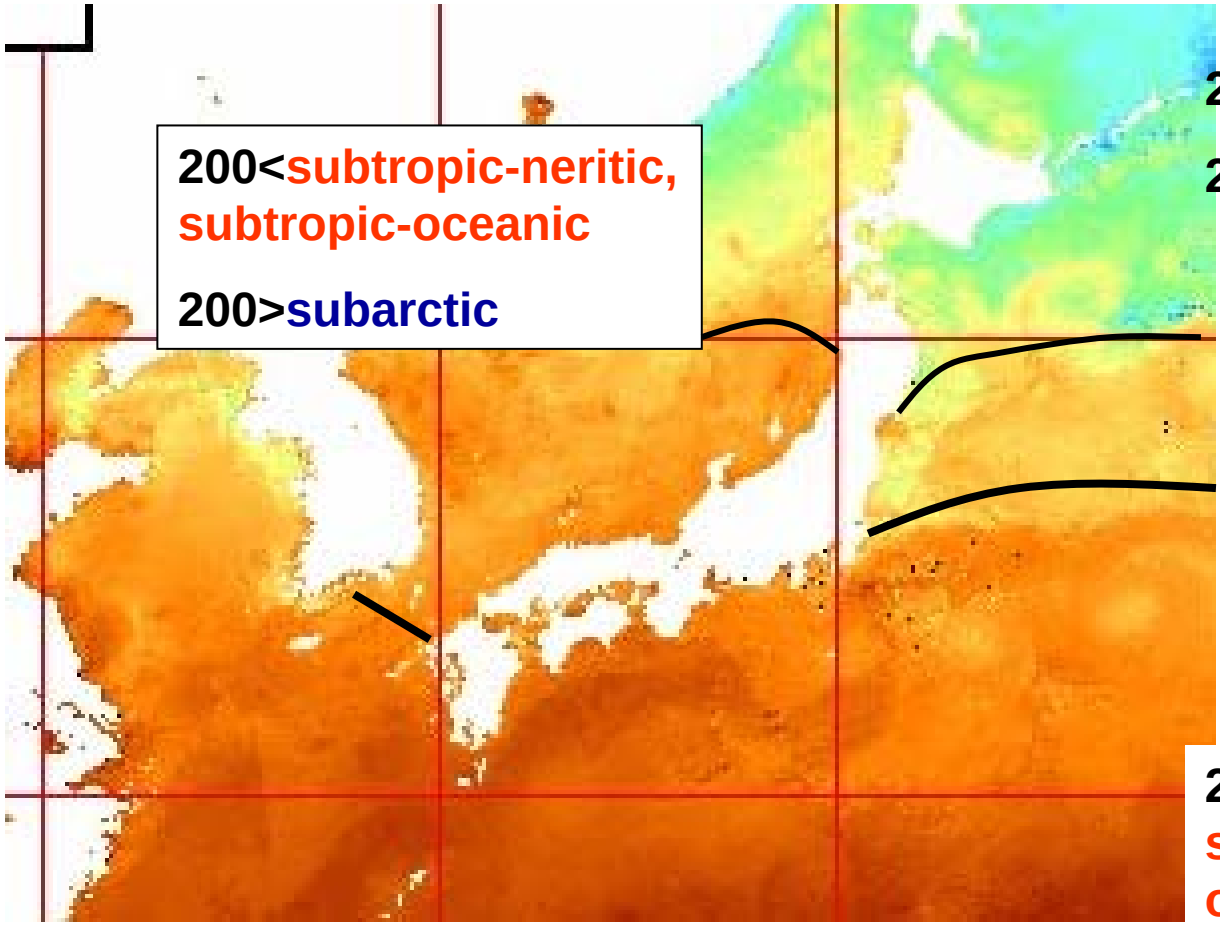
Tatsu Kishida

Japan Sea National Fisheries Research Institute, Fisheries Research Agency
Suido-cho, Niigata, 951-8121, Japan
E-mail: tatsu@affrc.go.jp

Ocean currents



Zooplankton communities around Japan



200<subtropic-neritic, subtropic-oceanic

200>subarctic

200<subarctic

200>meso- & bathy-pelagic

200<subarctic, subtropic-neritic, subtropic-oceanic

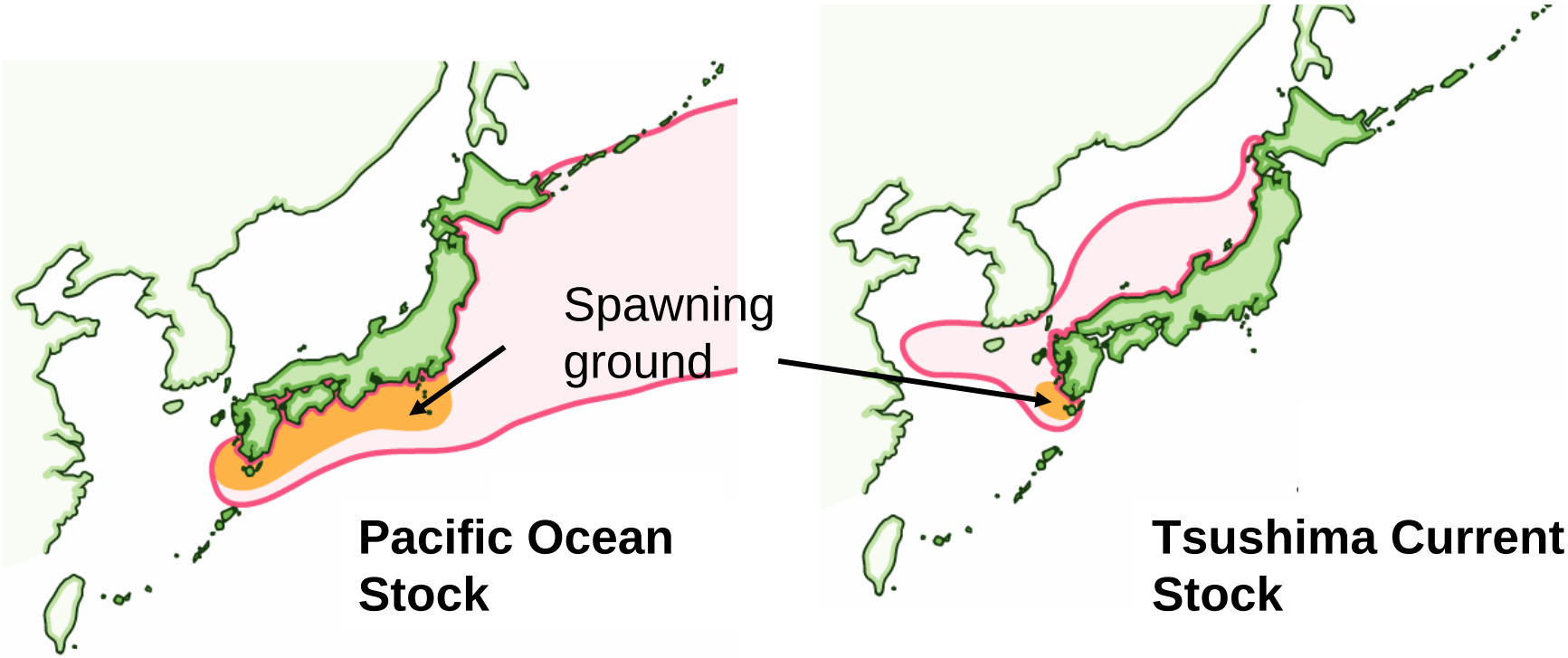
200>meso- & bathy-pelagic

200<tropic-oceanic, subtropic-neritic, subtropic-oceanic

200>meso- & bathy-pelagic

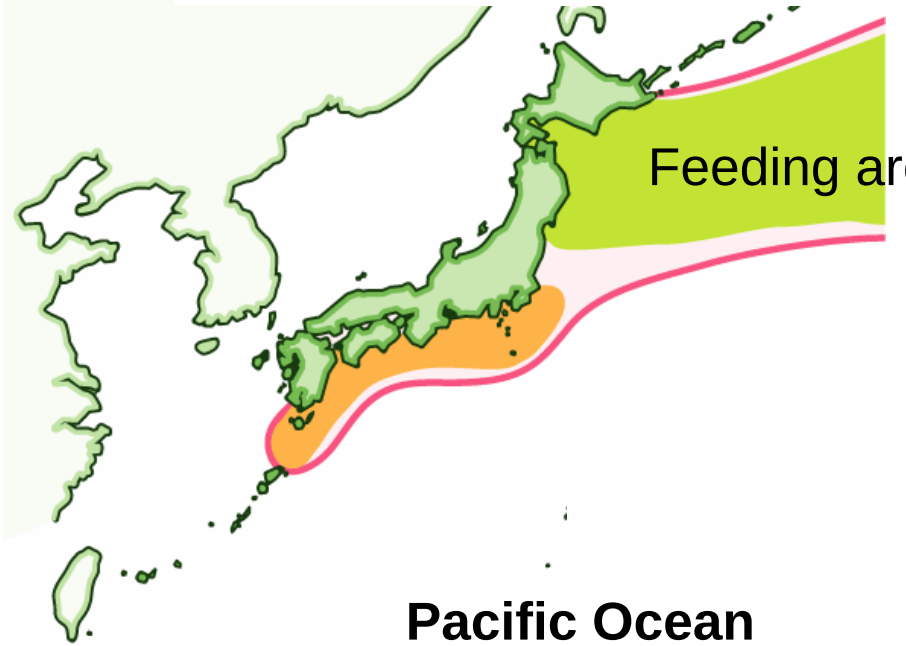
200<tropic-neritic, subtropic-neritic, subarctic

Distribution of sardine

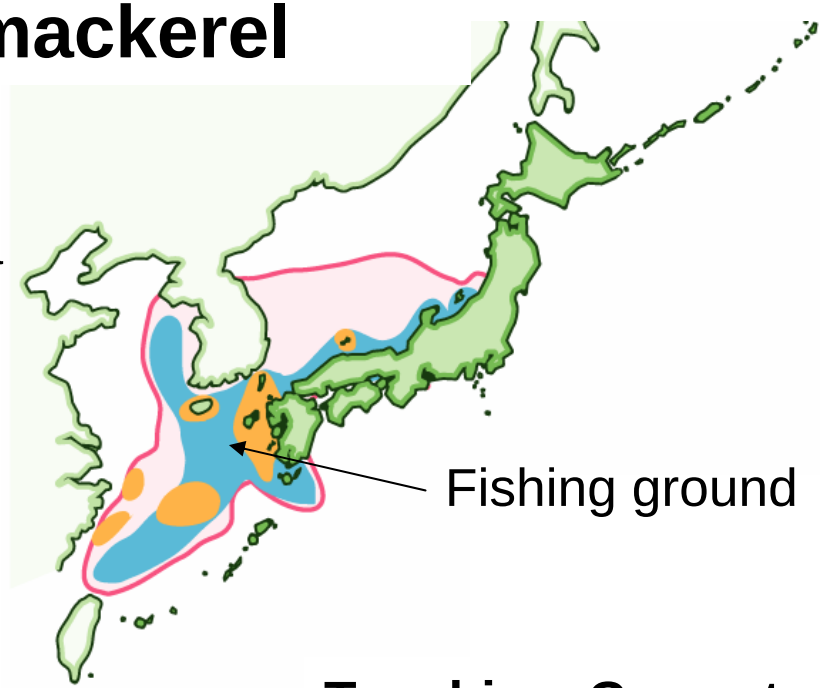


sardine

Distribution of chub mackerel



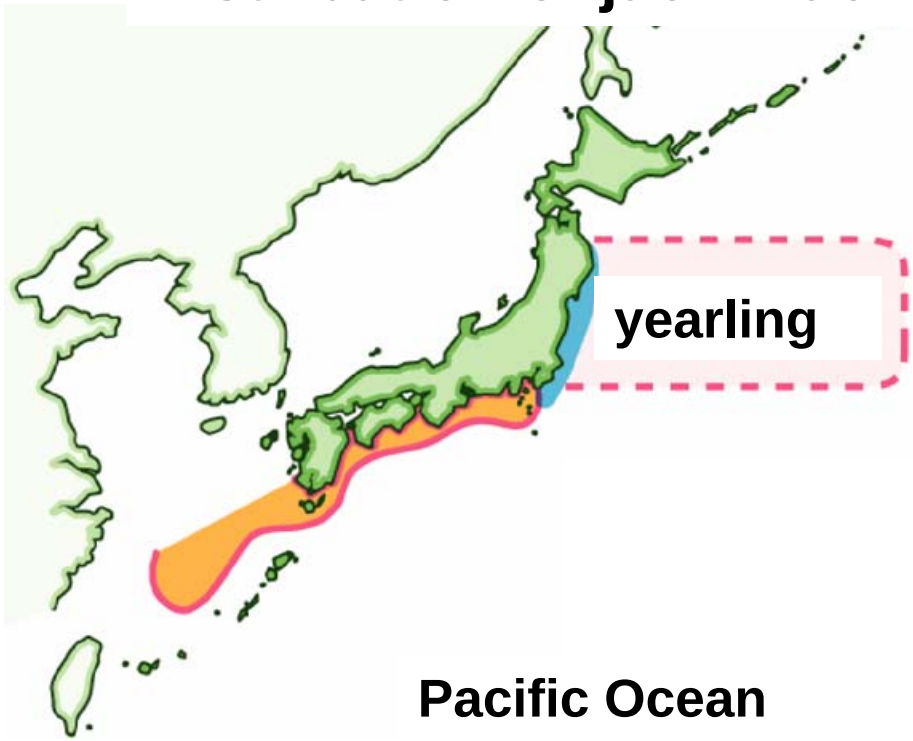
Pacific Ocean Stock



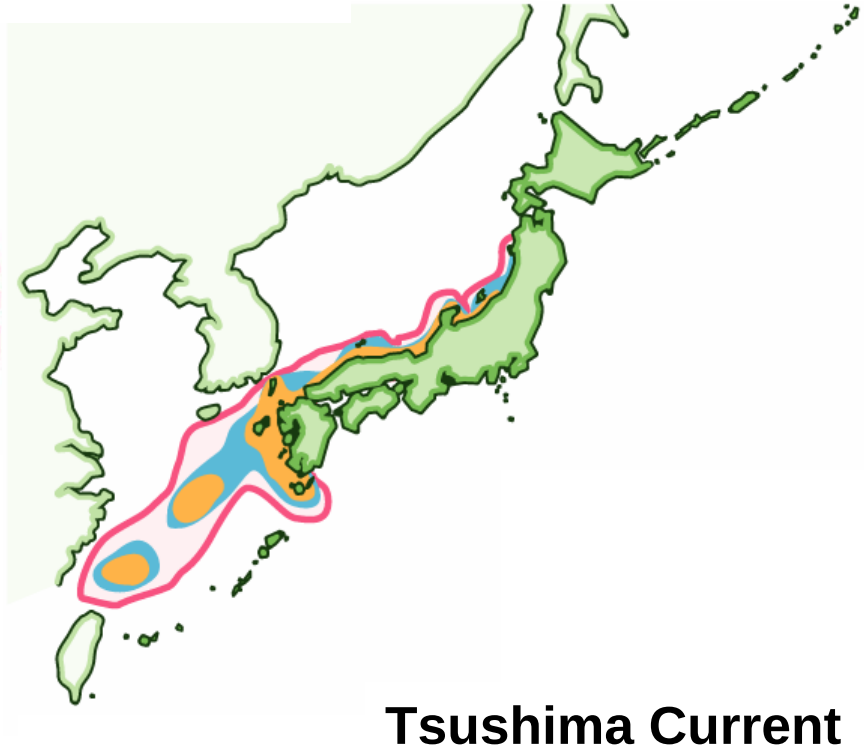
Tsushima Current Stock

Chub mackerel

Distribution of jack mackerel



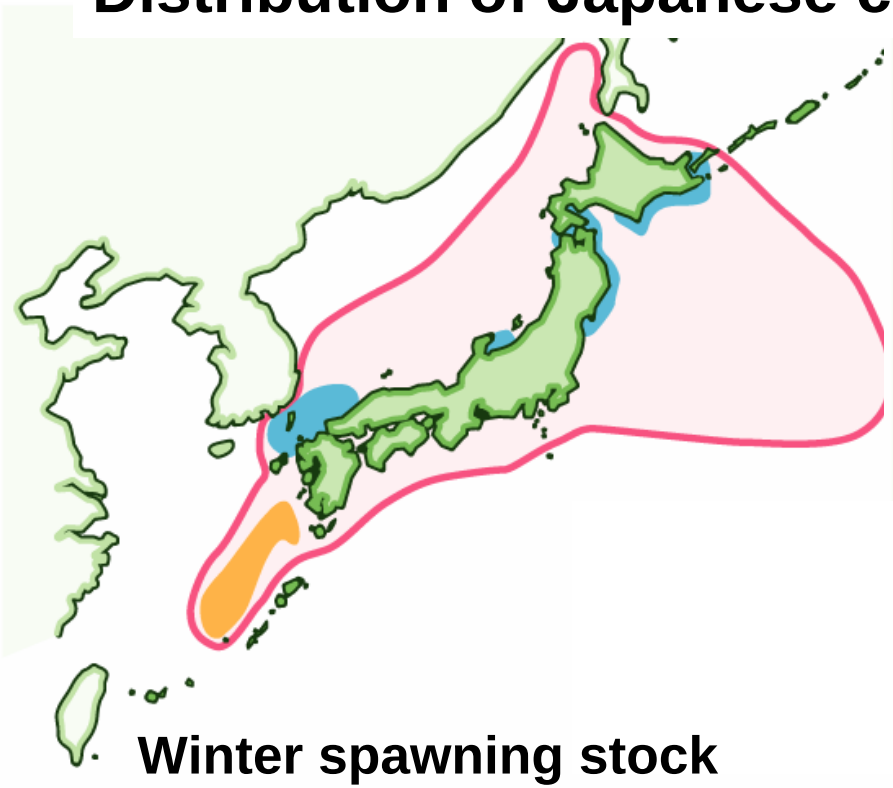
Pacific Ocean Stock



Tsushima Current Stock

Jack mackerel

Distribution of Japanese common squid

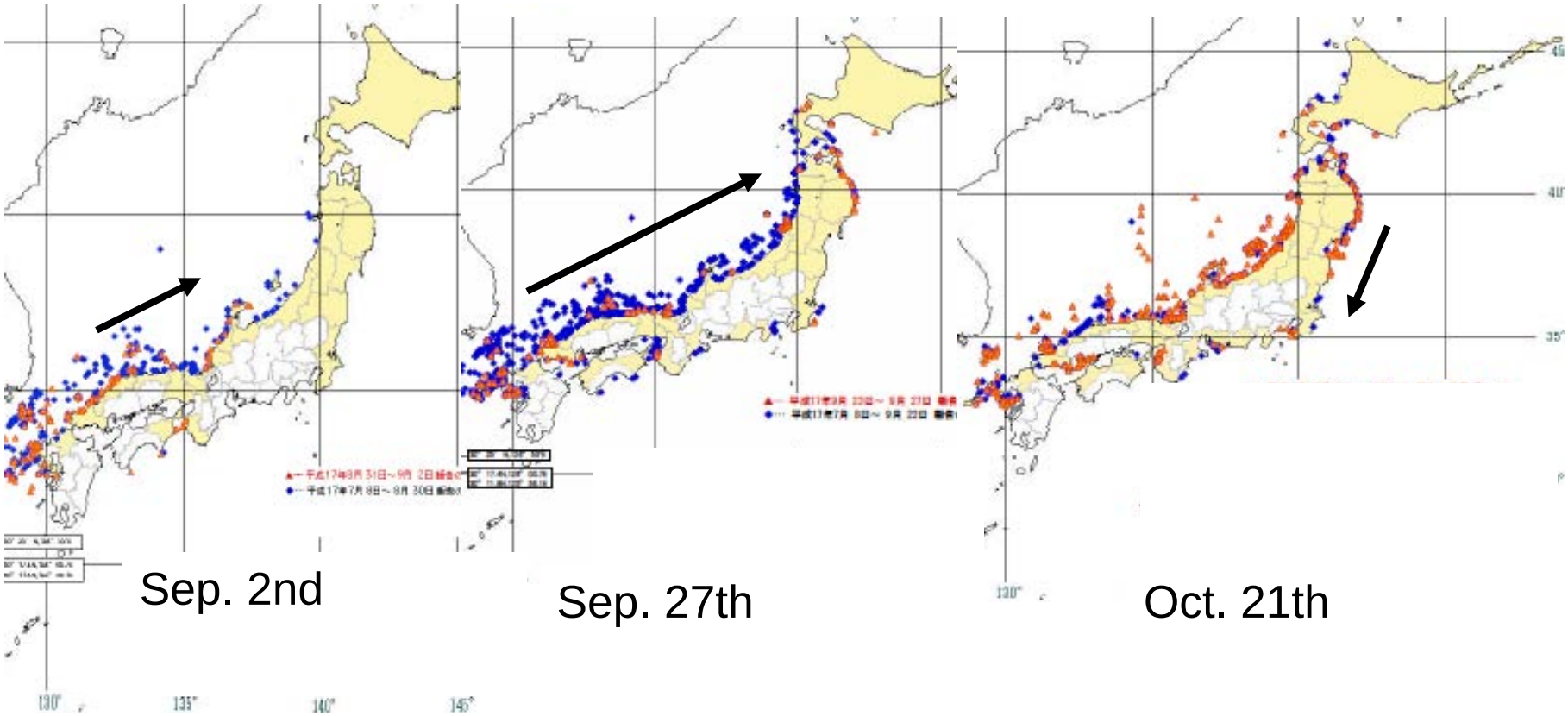


Winter spawning stock

Autumn spawning stock

Japanese common squid

Transported trace of giant jellyfish *Nemopilema nomurai*

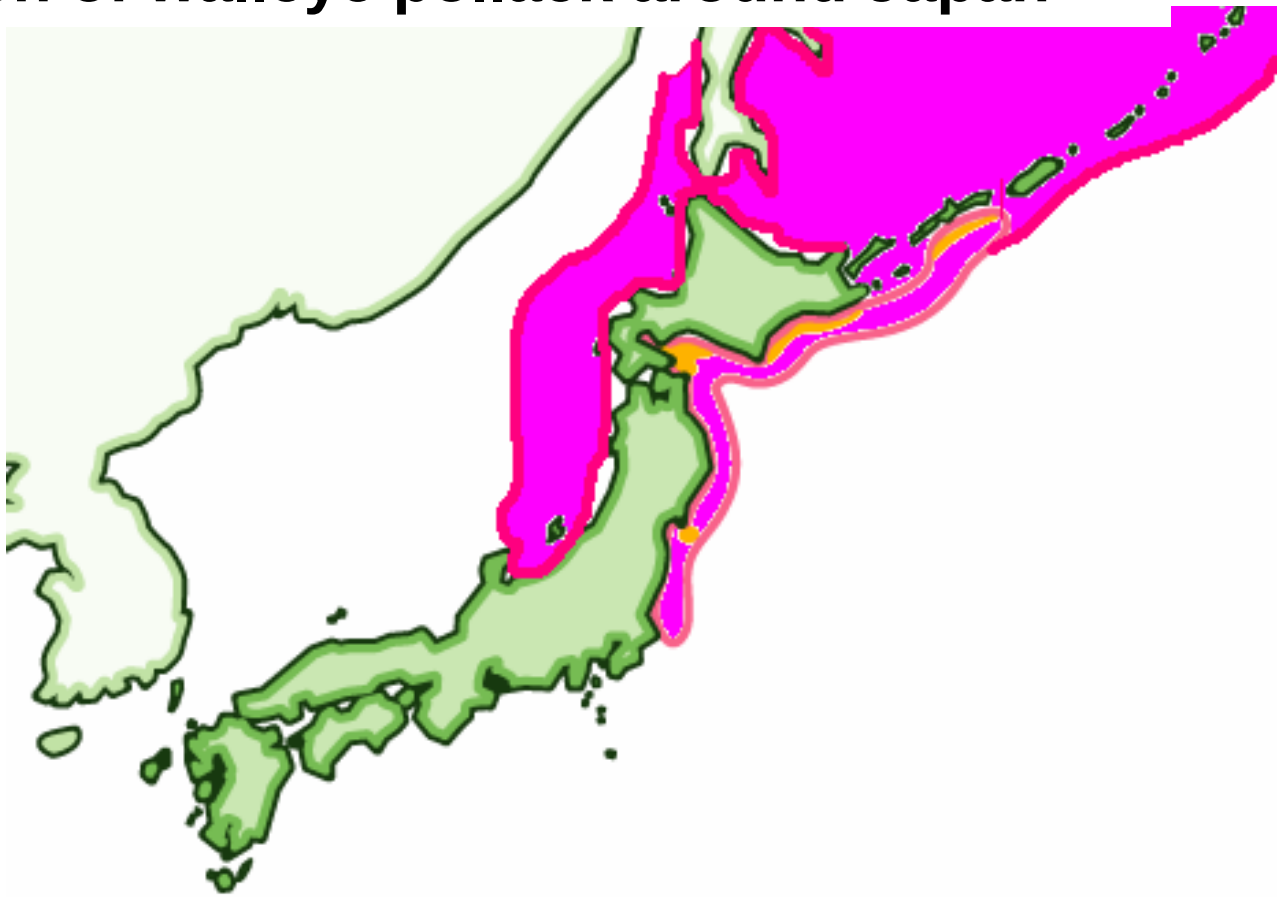


Sep. 2nd

Sep. 27th

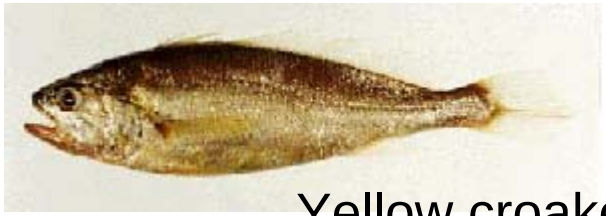
Oct. 21th

Distribution of walleye pollack around Japan

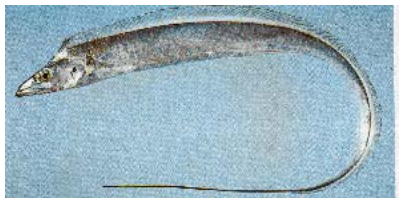


Walleye pollack

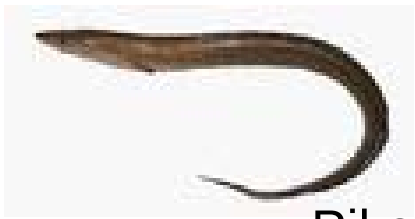
Dominant fisheries resources in the East China Sea



Yellow croaker



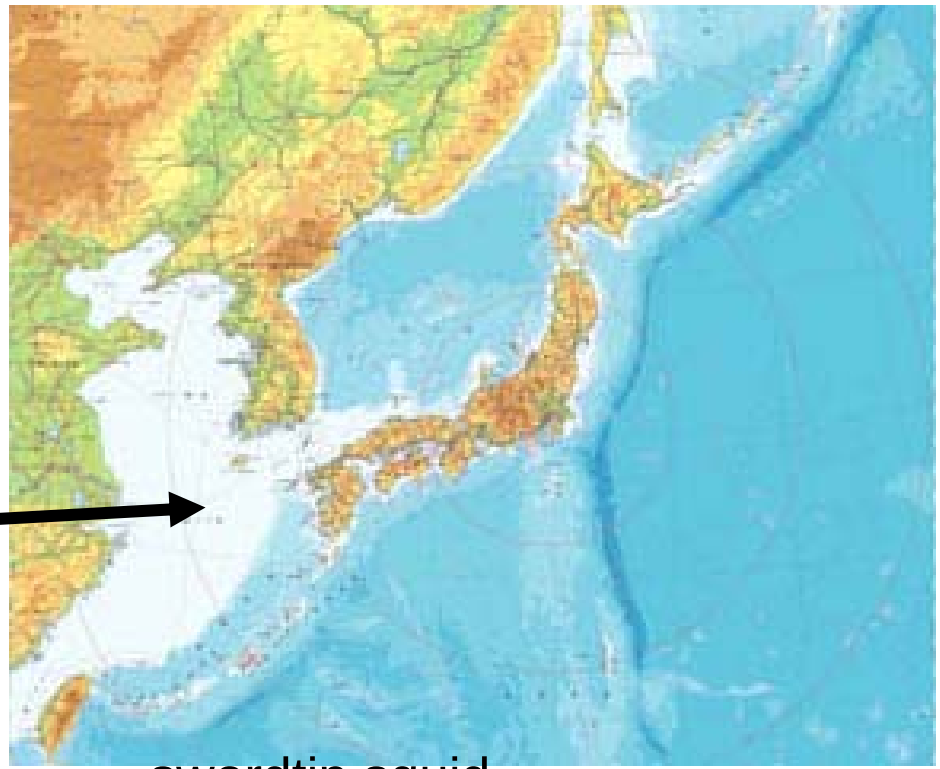
hairtail



Pike eel

croaker

lizardfish



swordtip squid

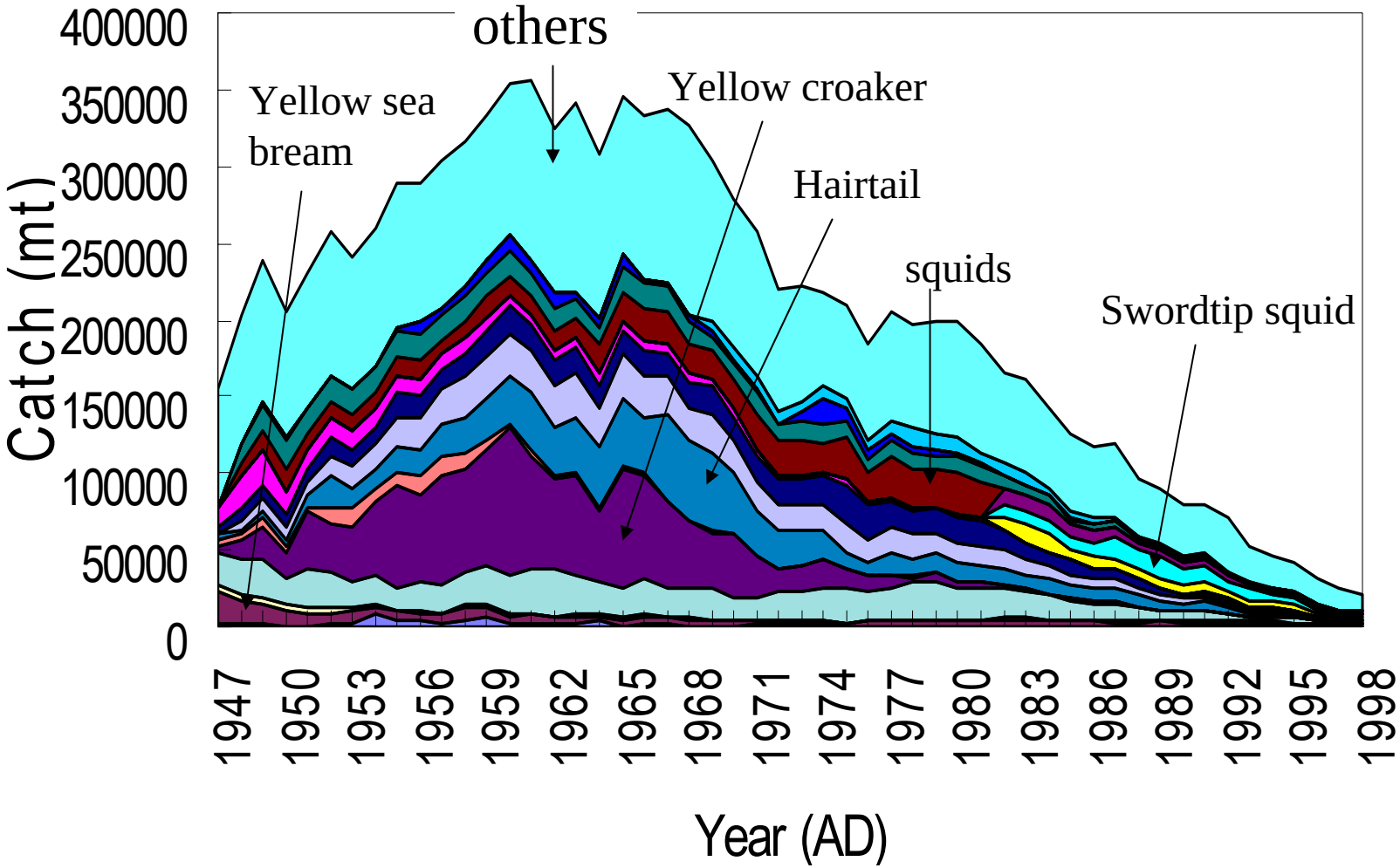
Japanese butterfish

cuttlefish

croaker

hairtail

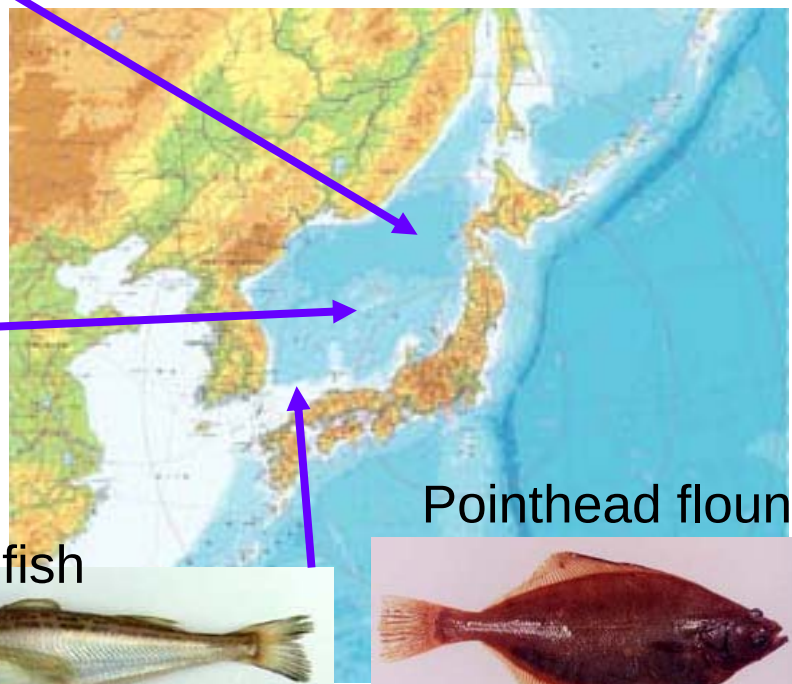
Yearly catch by Japanese pair trawler in East China Sea



Walleye pollack

Atka mackerel

deep sea smelt



Snow crab

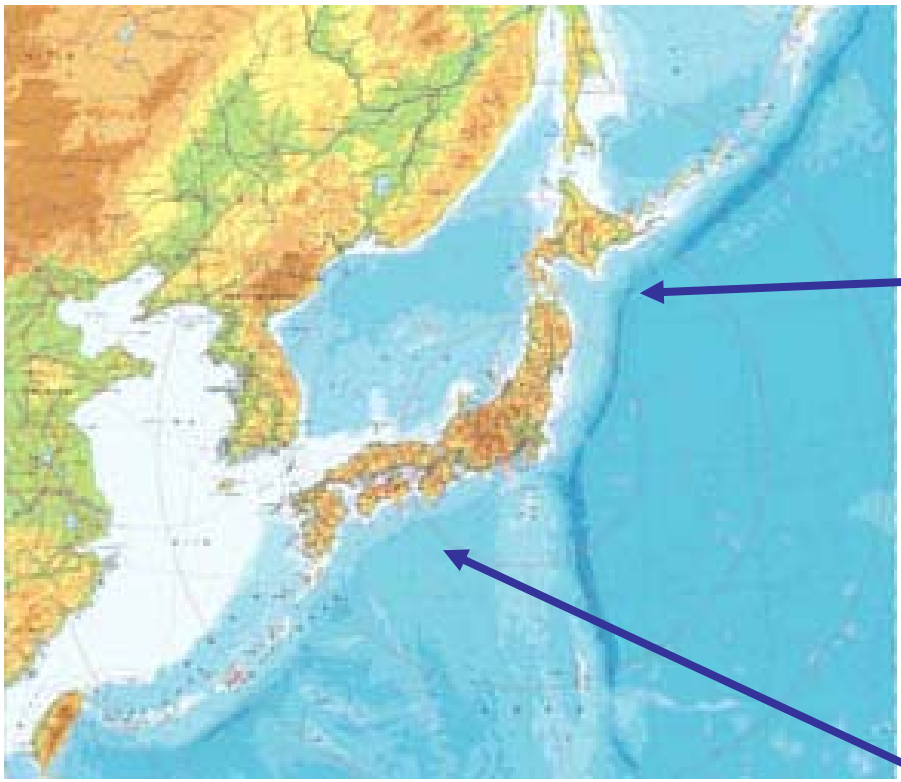
Pointhead flounder

Sailfin sandfish

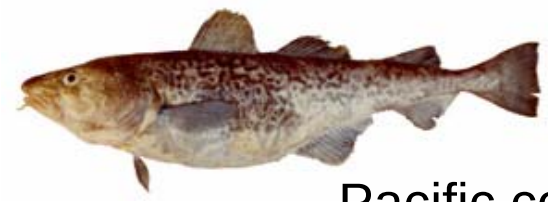
Flathead flounder

Pink shrimp

Korean flounder



Walleye pollack



Pacific cod

saffron cod

deep sea smelt

Bigeyed greeneye

Fisheries management (1)

Input control:

In Japan, fishing effort is restricted by license system and open access is prohibited except small scale line fishing.

Fisheries resources management in Japan has been basically left to fishermen themselves, who were licensed by government or local government.

So self-management or mutual regulation has been the traditional style in Japan’s fisheries.

Fishery management (2)

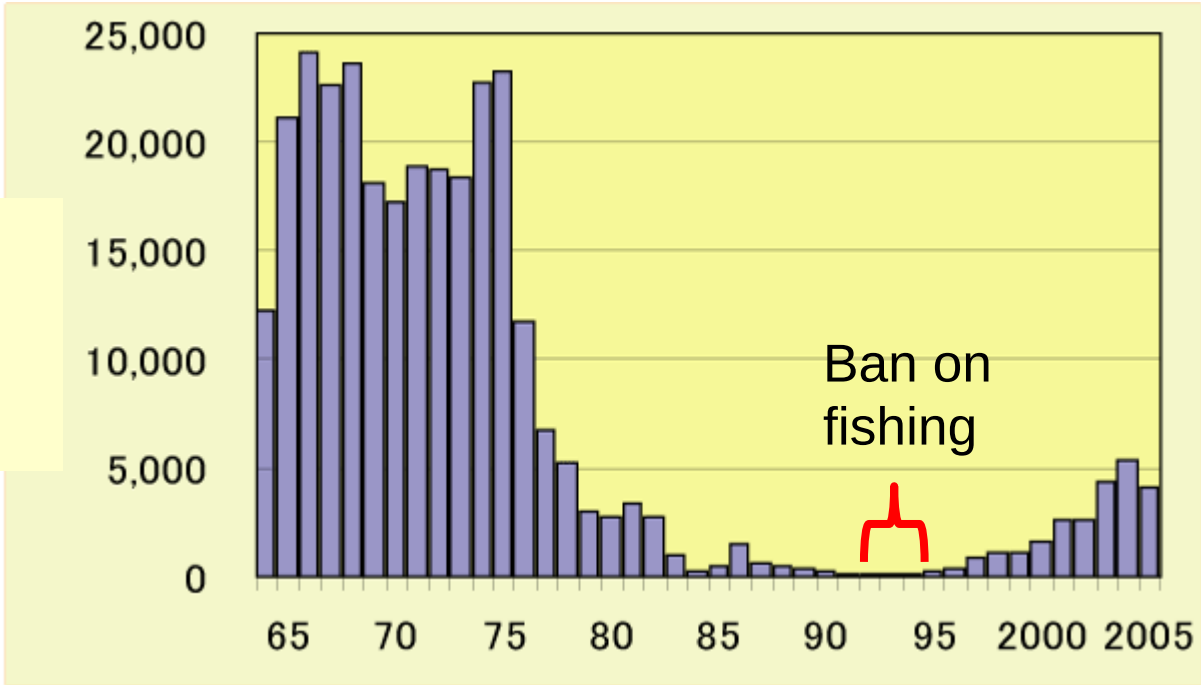
self-imposed fisheries management system

In recent years, more scientific self-imposed fisheries management system has been introduced in coastal fisheries.

Local government assists the management from scientific point of view.

Sailfin sandfish fishery in Akita prefecture.

Sailfin sandfish



Yearly catch in tons

- ban on fishing for 3 years
- stock enhancement
- preparation of seaweed bed for spawning

Sand eel fishery in Ise Bay

- Protect spawning fish through preservation of habitat of estivation.
- Protect larvae and juvenile by establishing a closed season.
- Ensure the proper escapement of sand eel before estivation by closing fishery.

Effects of fisheries management in Ise Bay sand eel fishery

	catch (ton)	gross earnings (billion yen)
Average of ten years before management started	6717	13.2
Average of ten years after management started	8854	16.5

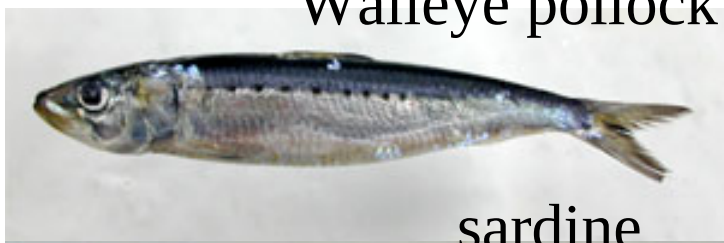
Mie Prefectural Fisheries Research Institutes

Fisheries management (3)　TAC

Jack mackerel

saury

Walleye pollock



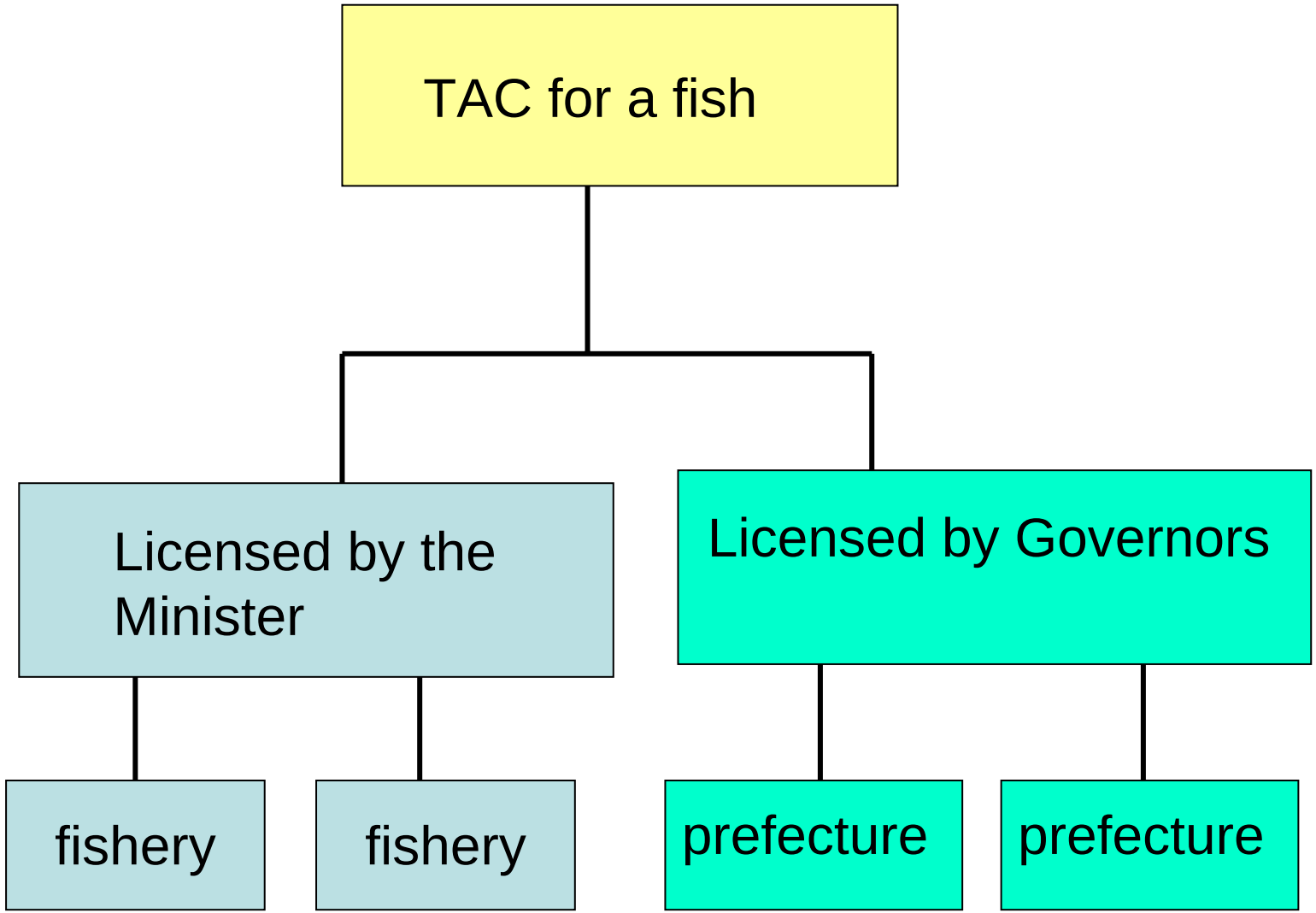
sardine

Japanese common squid

Chub mackerel

Snow crab

Spotted mackerel

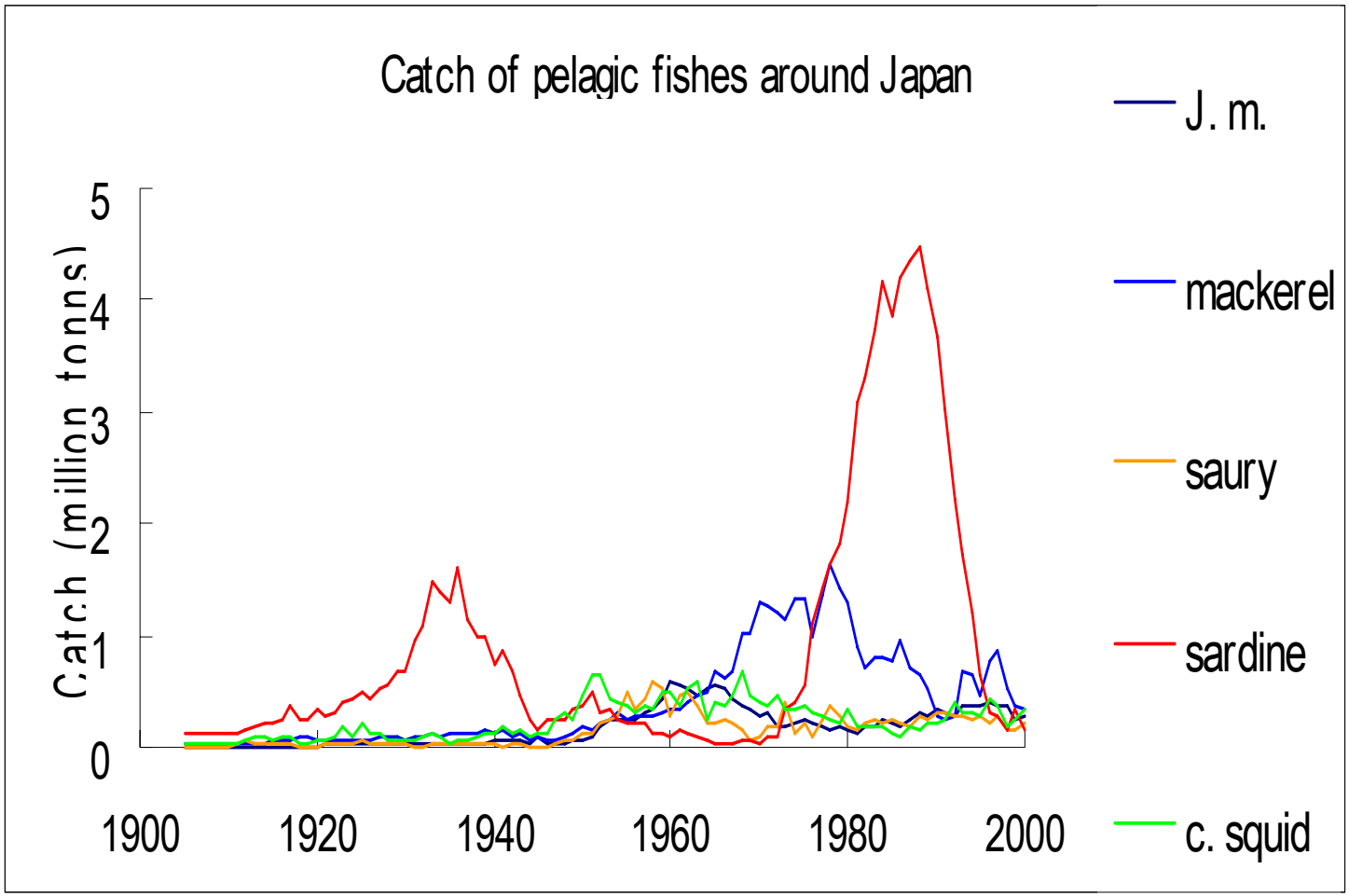

TAC for a fish
Licensed by the Minister
Licensed by Governors
fishery
fishery
prefecture
prefecture

Warm current pelagic ecosystem

Jack mackerel, Japanese common squid, sardine, chub mackerel and spotted mackerel

BRP for each fish is decided mainly based on its spawner-recruitment relationship in recent years and ABC　is calculated using each BRP.

Fisheries management by TAC in Japan is established aiming at species by species and ecosystem-based fisheries management have not been introduced for those off-shore resources.


Catch of pelagic fishes around Japan
Catch (million tonns)
0
1
2
3
4
5
1900
1920
1940
1960
1980
2000
J. m.
mackerel
saury
sardine
c. squid

Even though fisheries management is conducted species by species, we should take the viewpoint of ecosystem. It is suggested that the carrying capacity exist in warm current pelagic ecosystem around Japan and it is impossible to attain all fishes their high stock level by single species approach.

We should accept the reality of the natural stock fluctuation and the replacement of dominant species and have to introduce the management policy that the dominant species will permit to exploit with relatively high fishing rate, while critical species should be operated prudently not to exceed allowable catch at each phase.