

Marine sub-regions determined with physical and biological criteria in Korean waters

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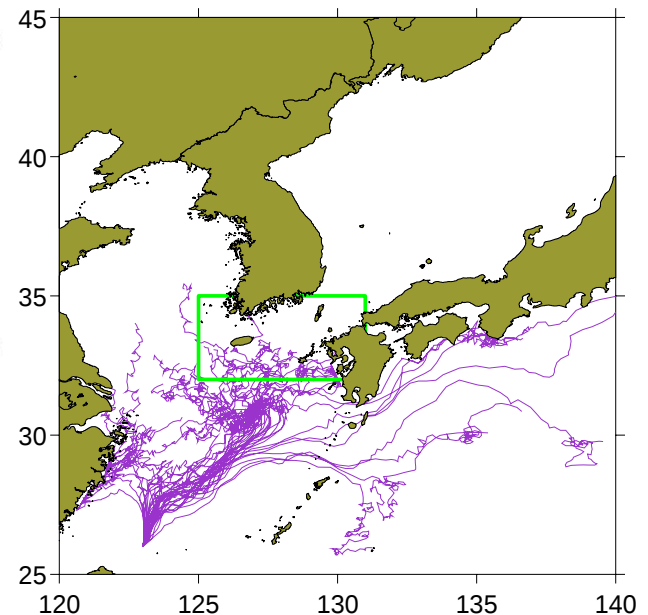
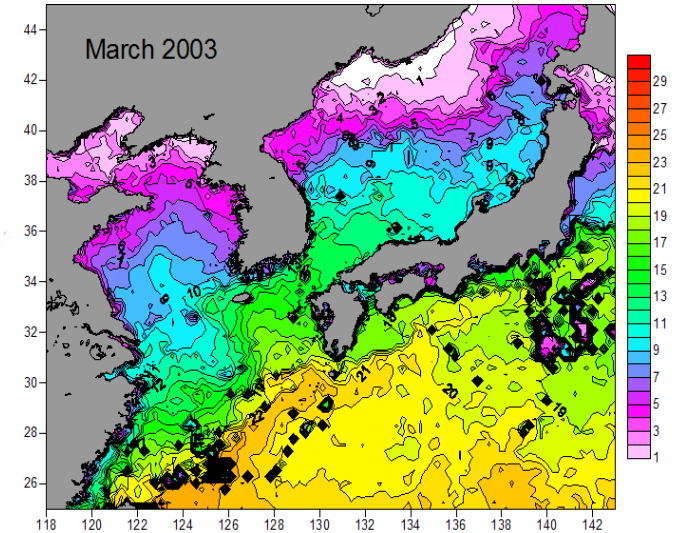
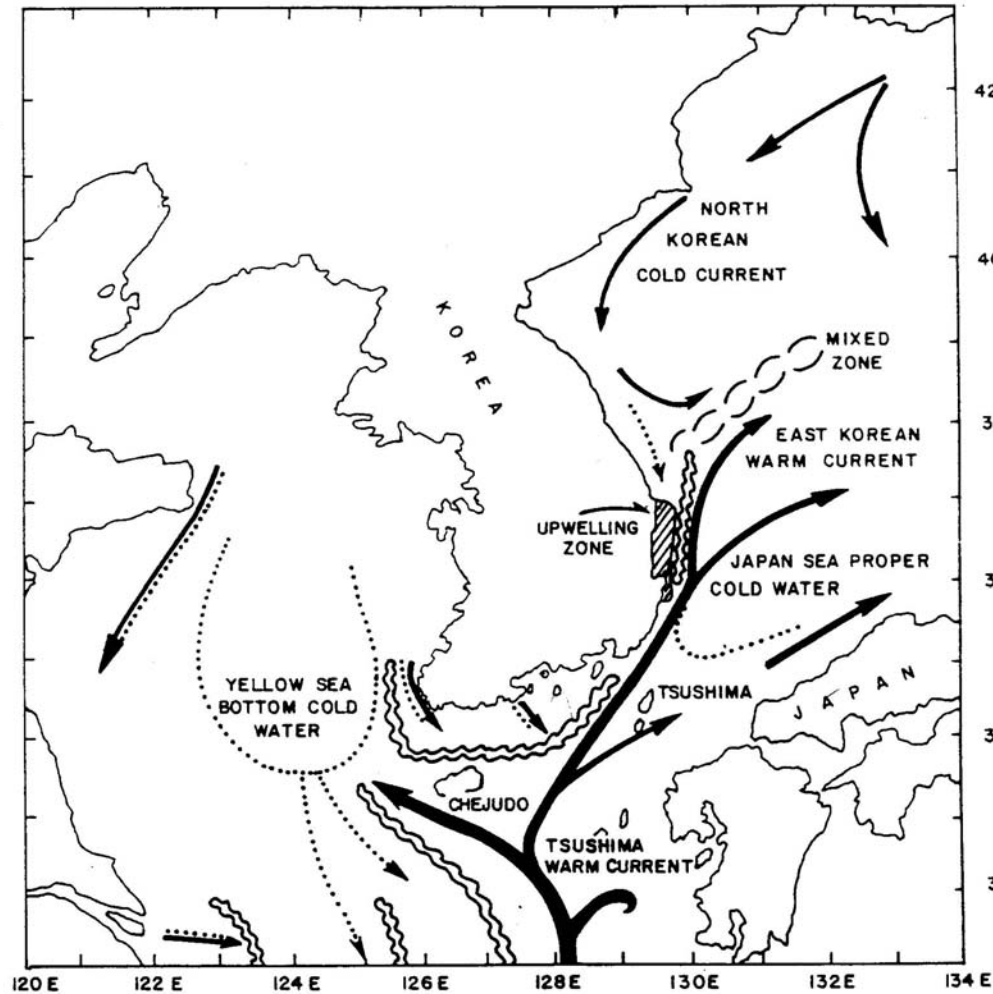
2 Pukyong National University, KOREA

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Exclusive Economic Zones around Korean waters

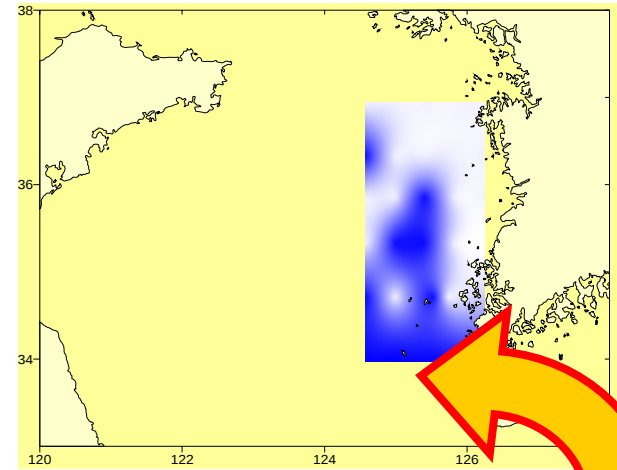
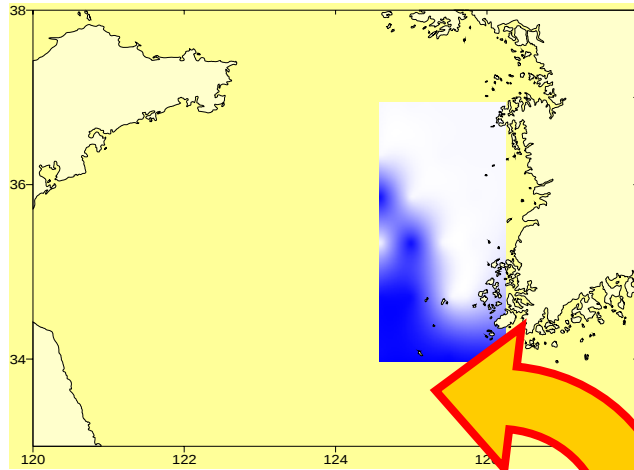


Currents around Korean waters

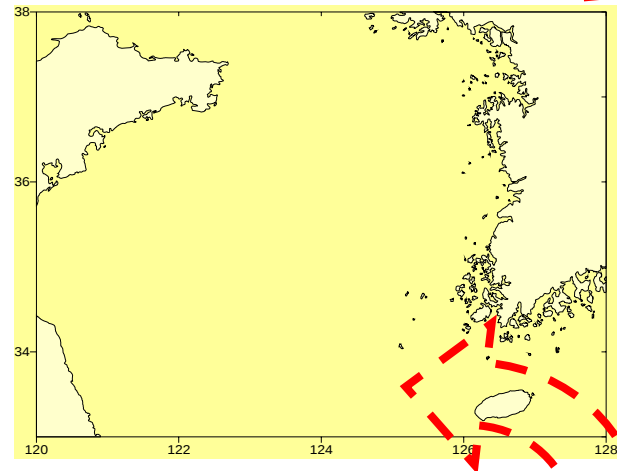
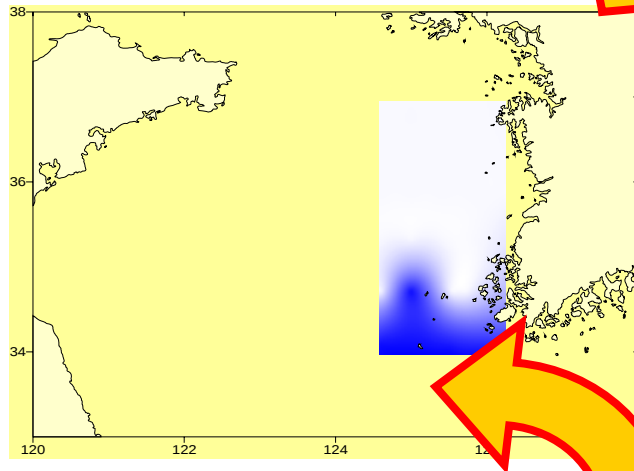


Distribution of Zooplankton

October



December

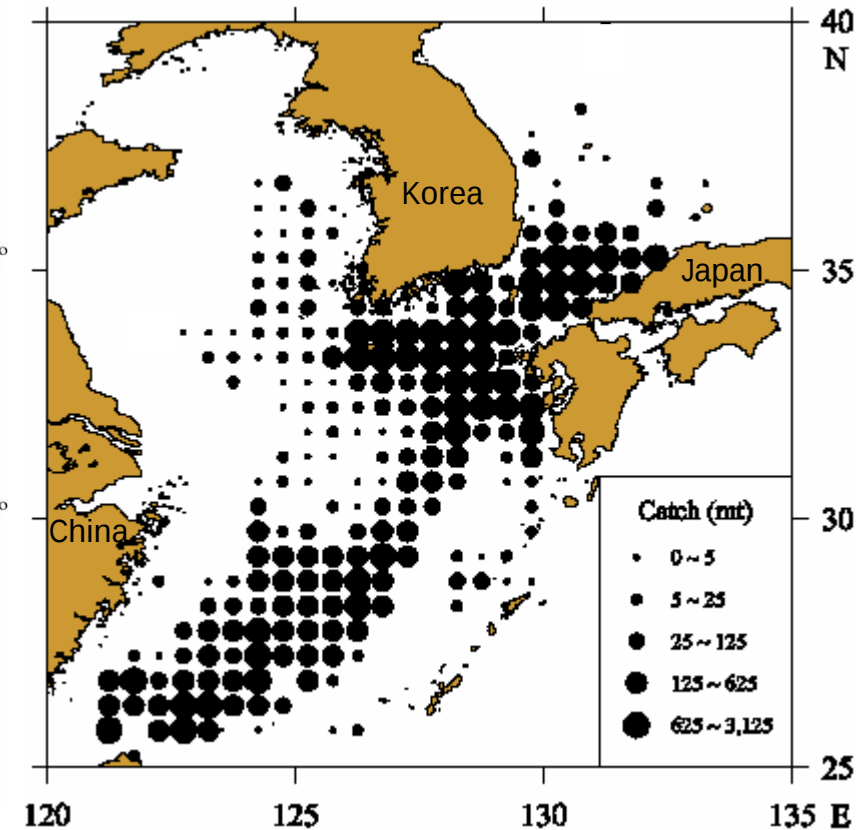
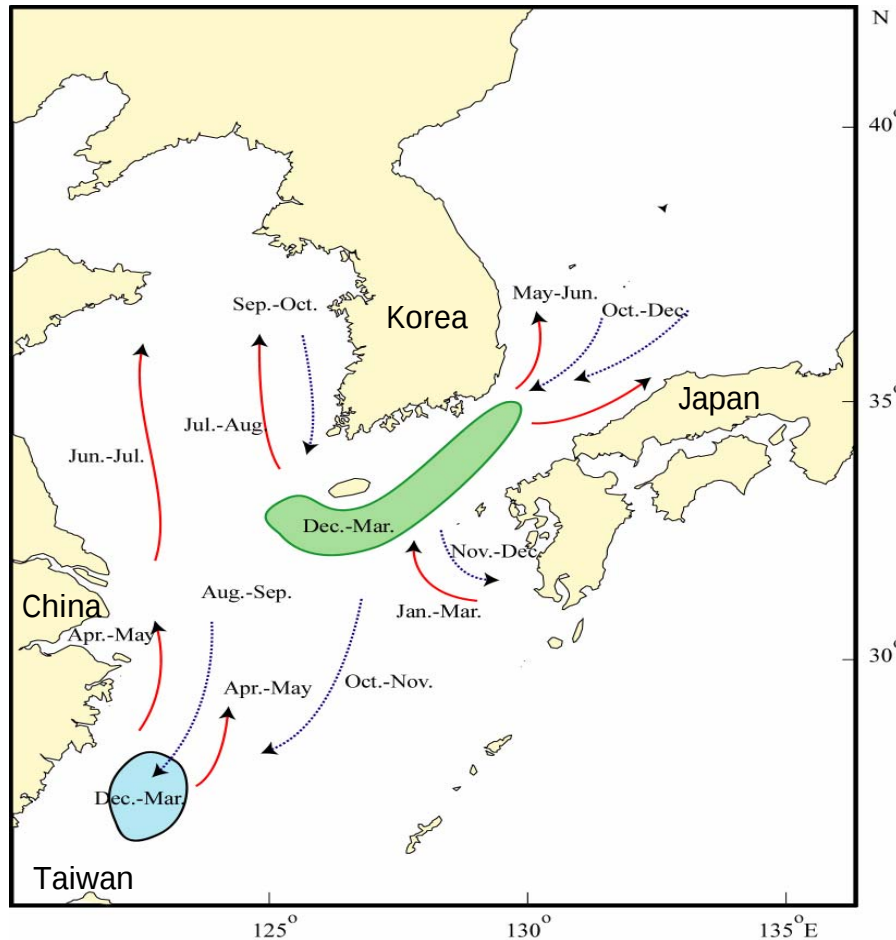


1997

1998

(Data from D.H. Lim, NFRDI)

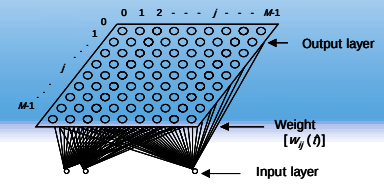
Distribution and migration of marine species



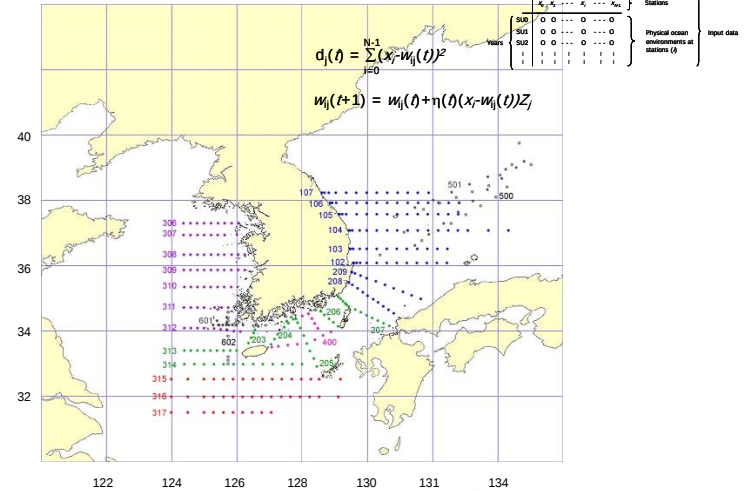
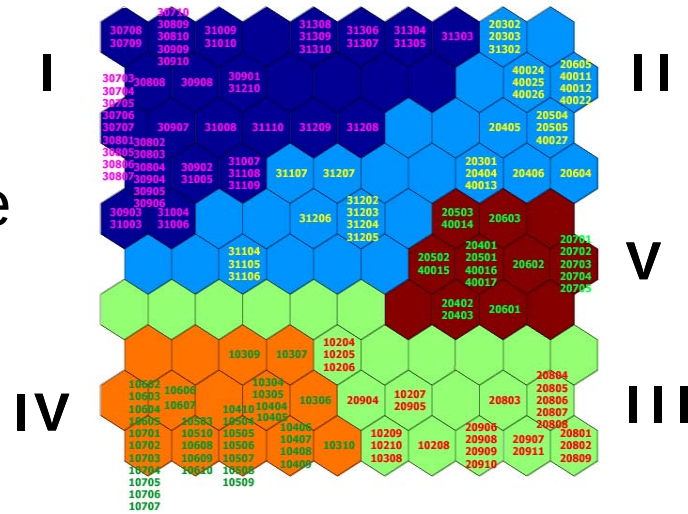
Marine sub - regions

Oceanographic criteria
(Temperature, Salinity,
Seawater density, Plankton)

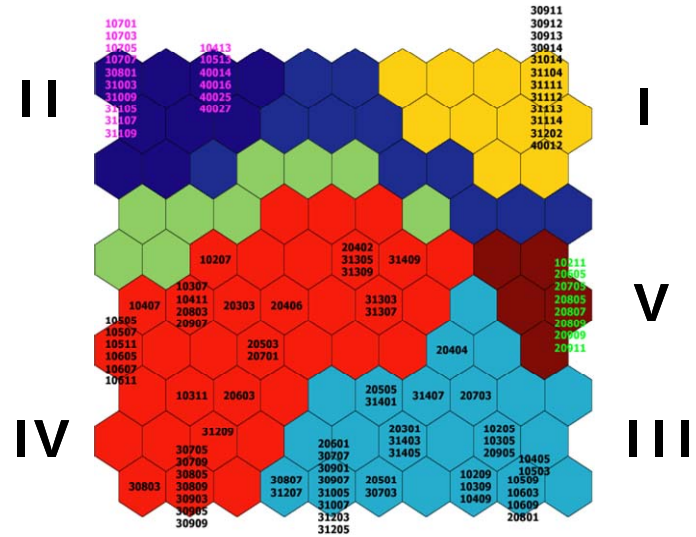
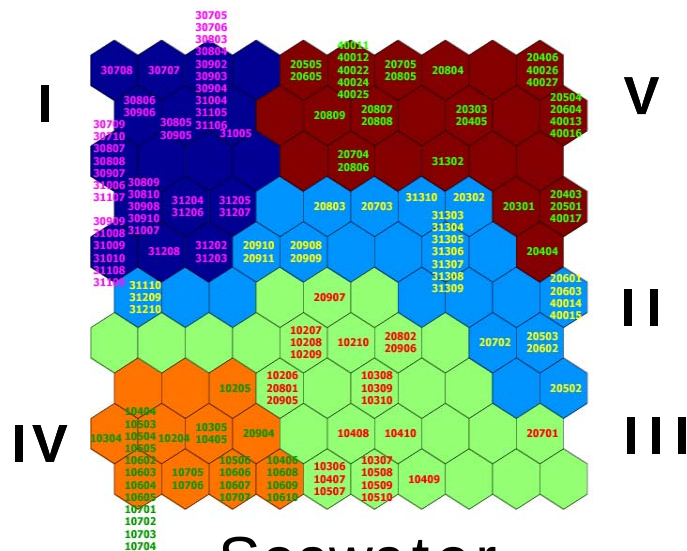
Oceanographic system



Surface



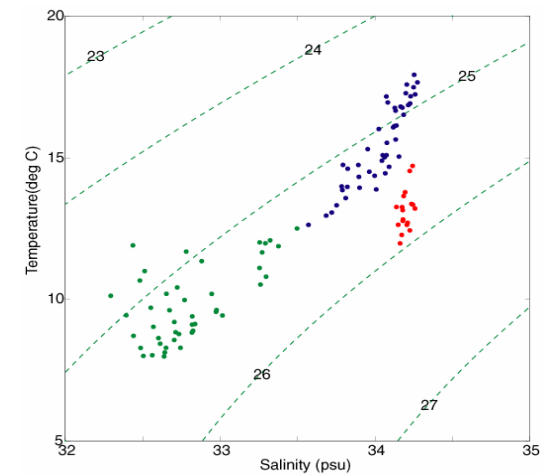
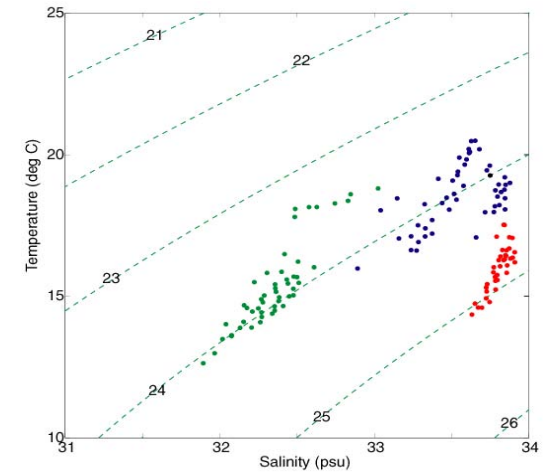
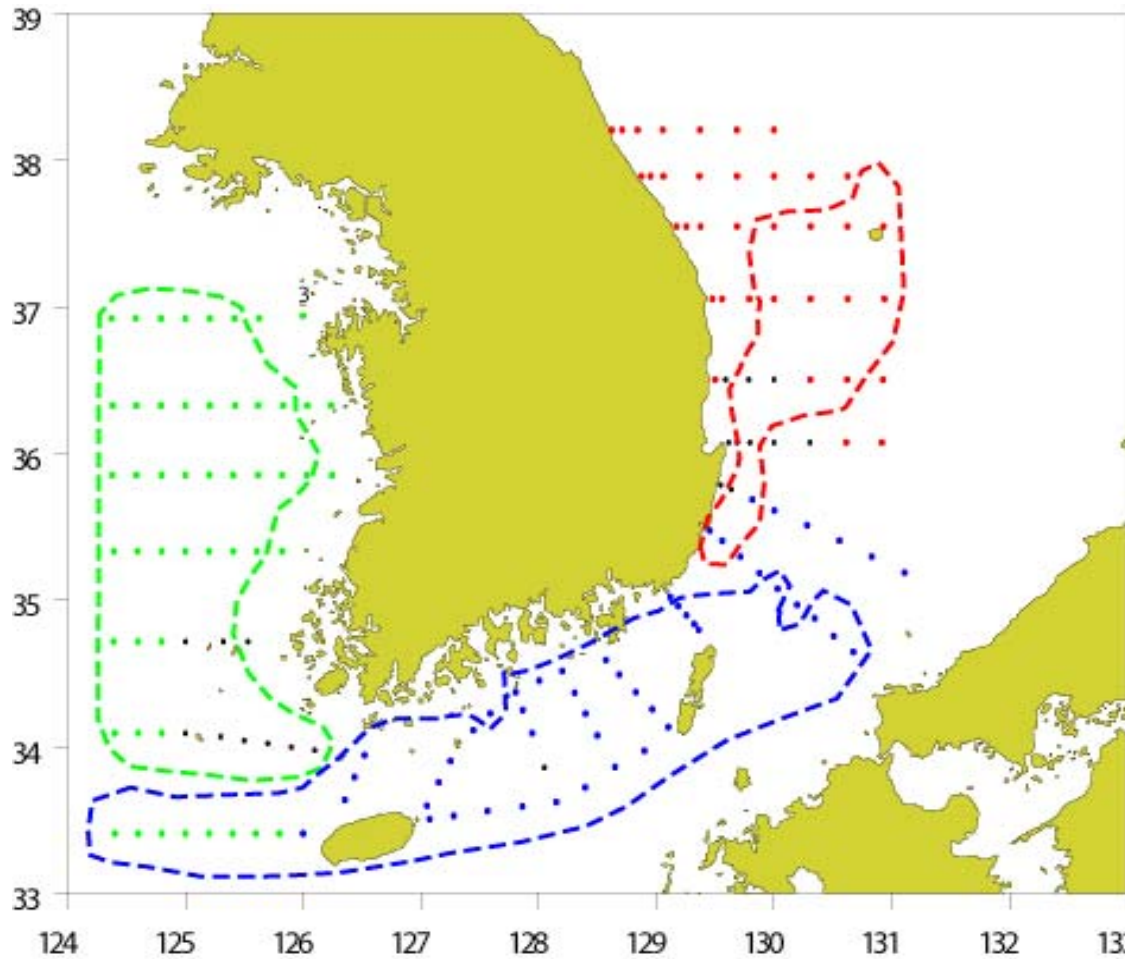
50m

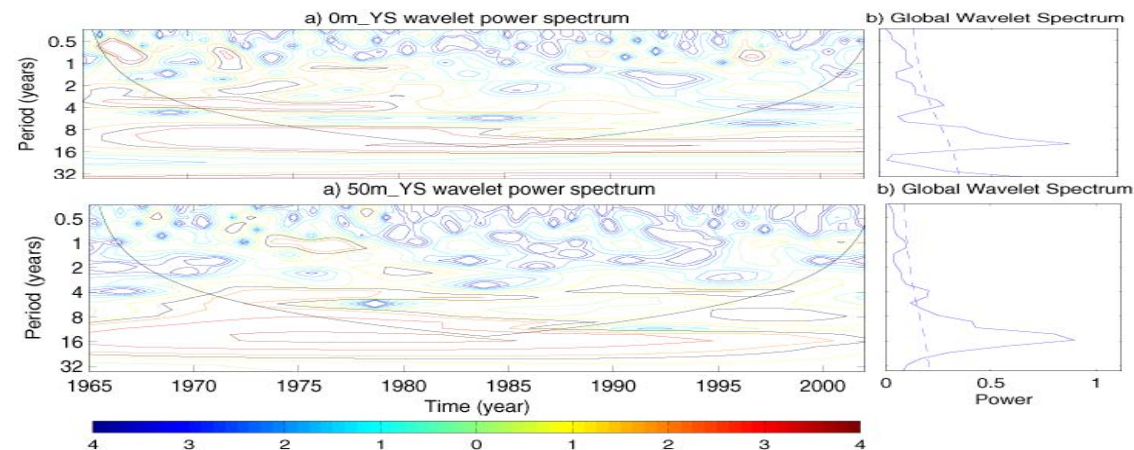
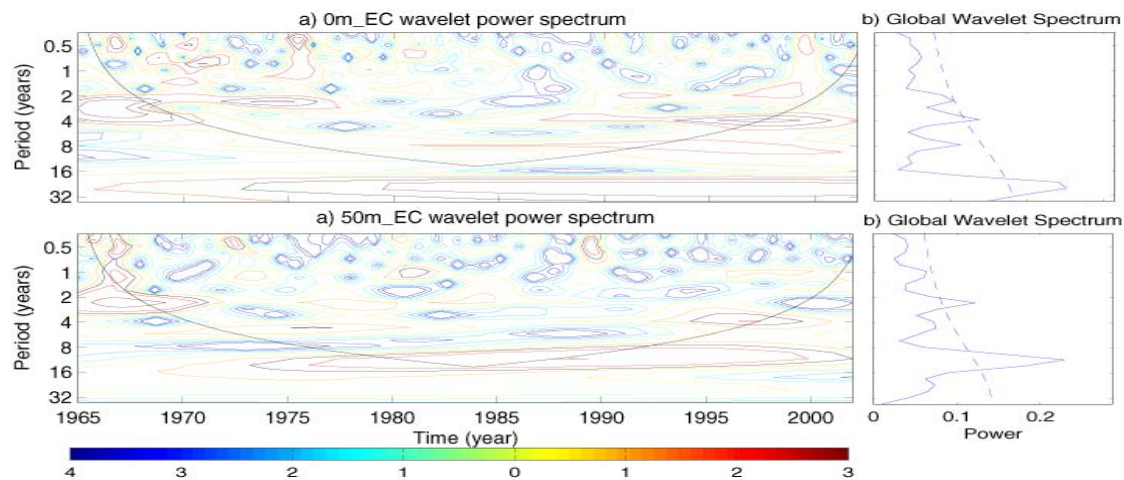
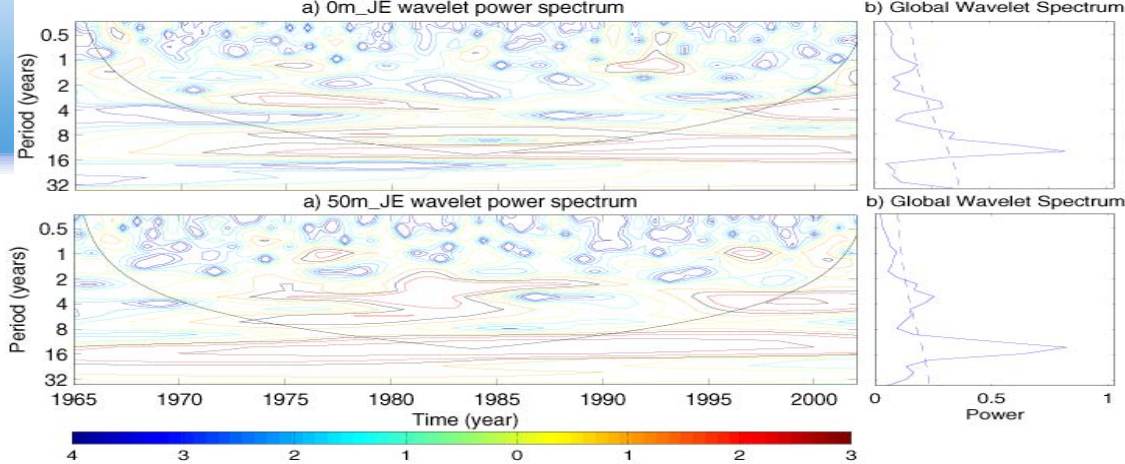


Seawater density

Zooplankton biomass

Three seas around Korean Peninsula

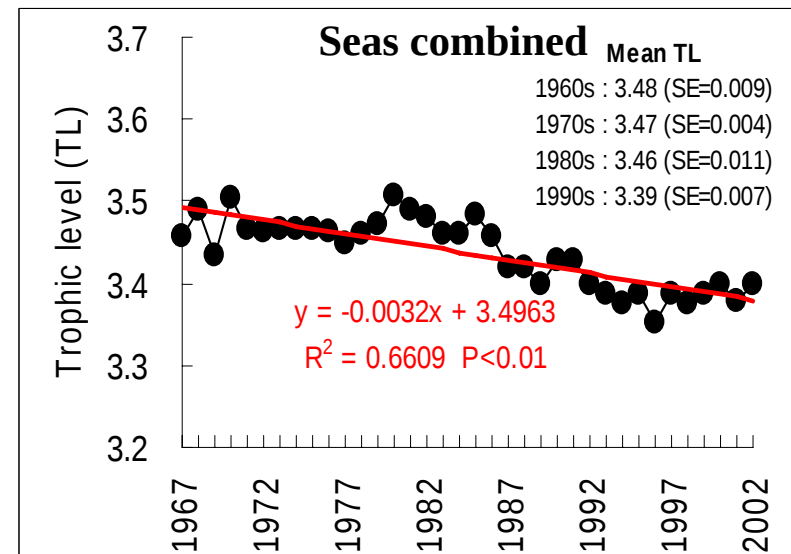
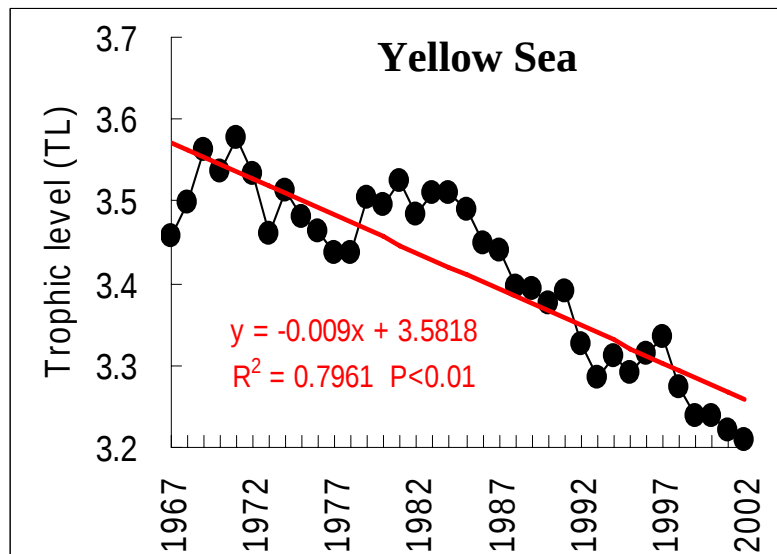
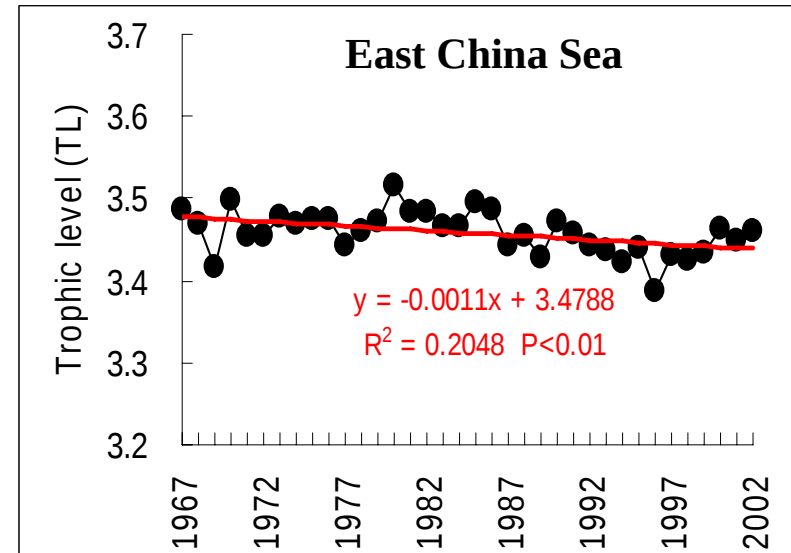
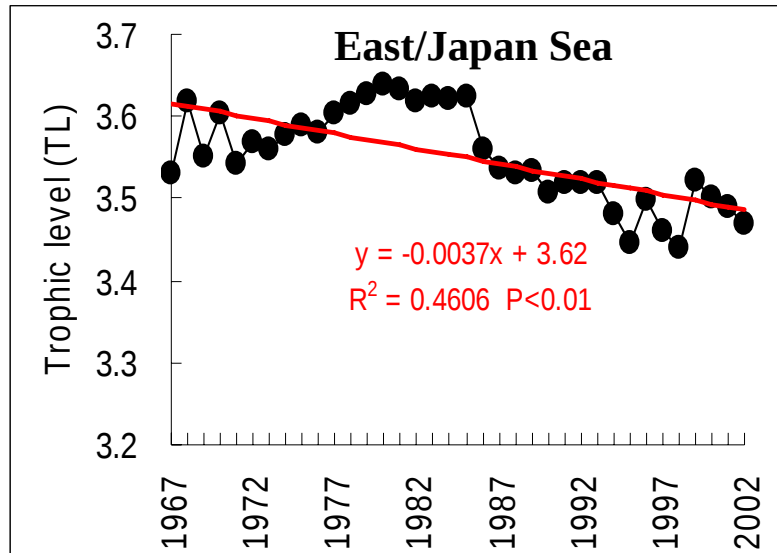




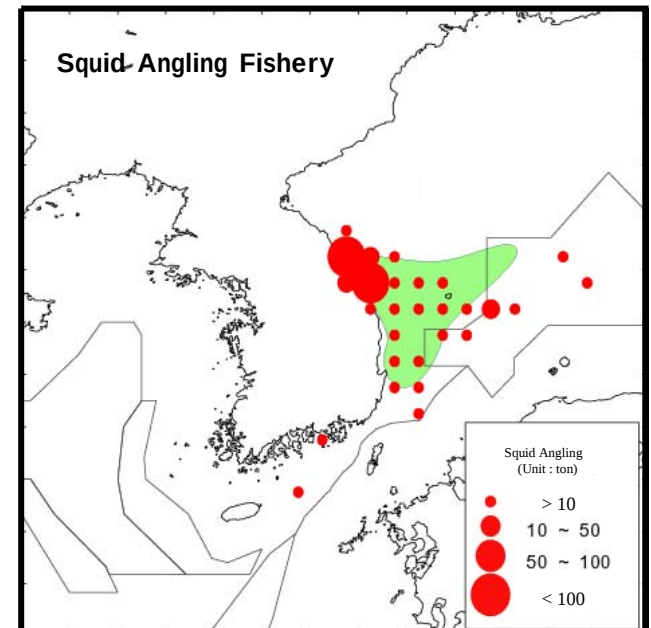
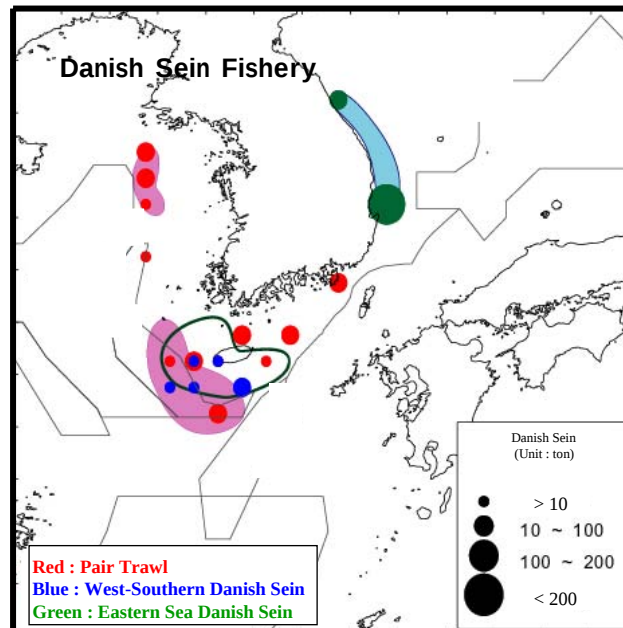
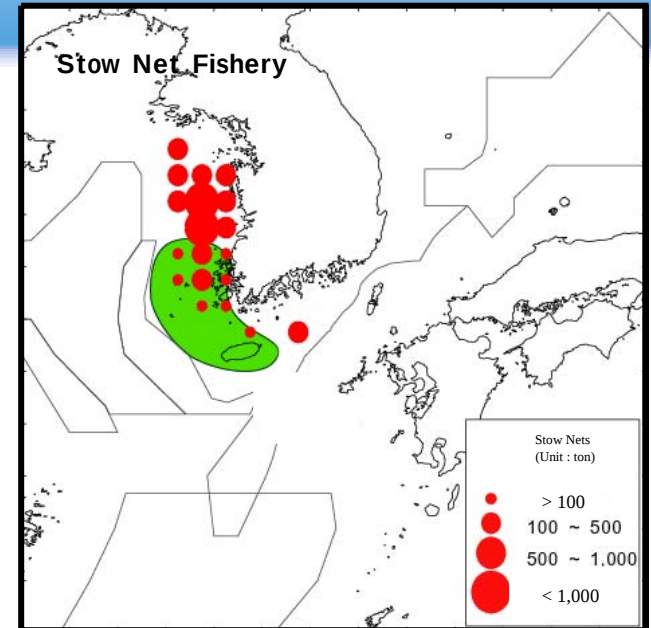
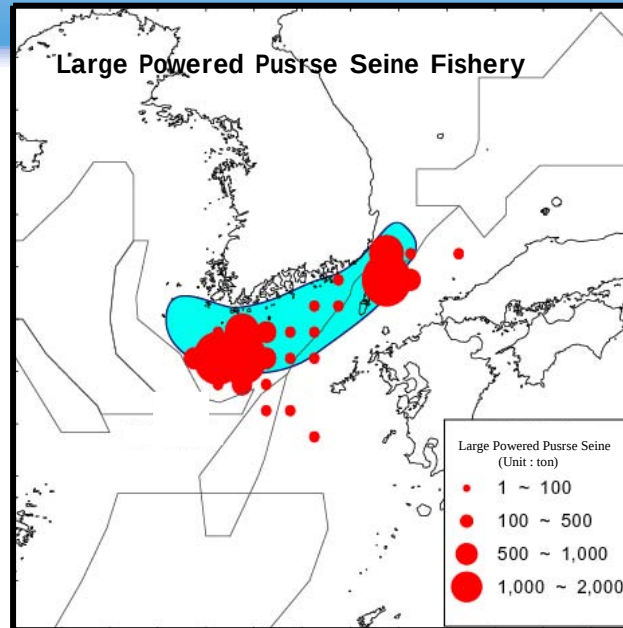
Marine sub - regions

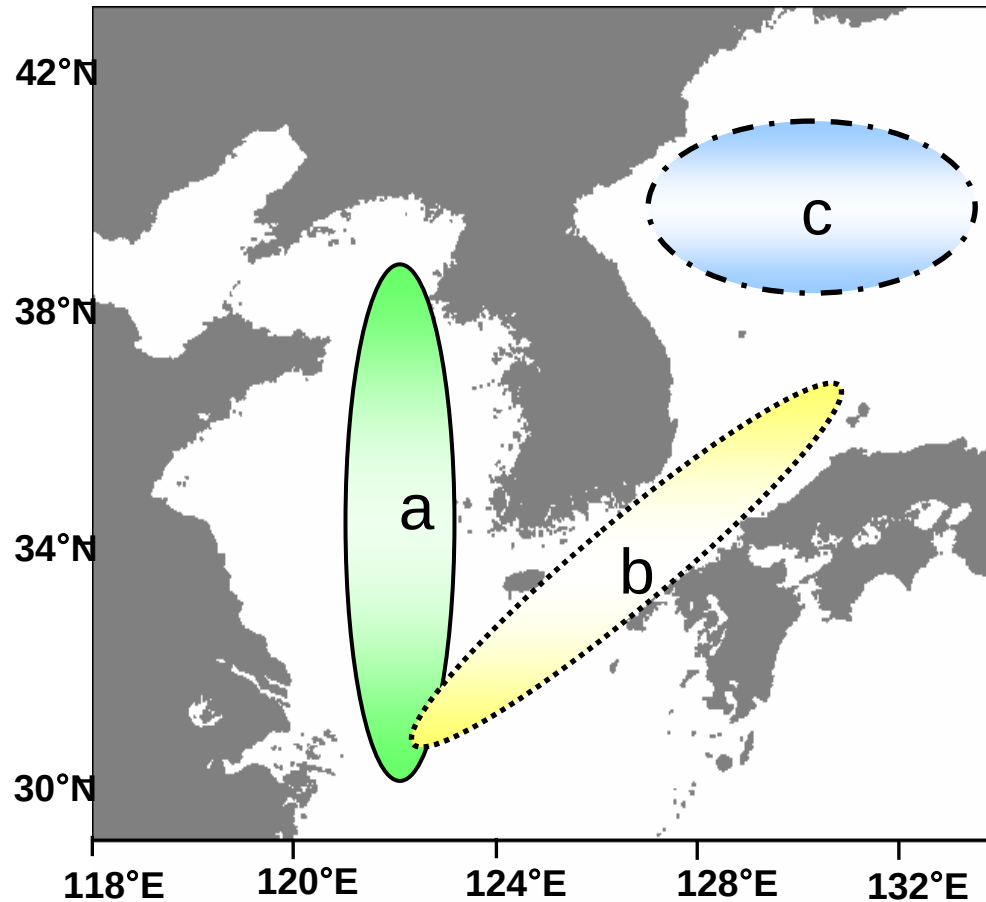
Biological criteria
(Fish species distribution)

Biological and ecological difference of three seas around Korean waters



Fishing grounds of main offshore fisheries in Korean waters





(from Kim, 2006)

Three categories of fish communities in Korean waters:

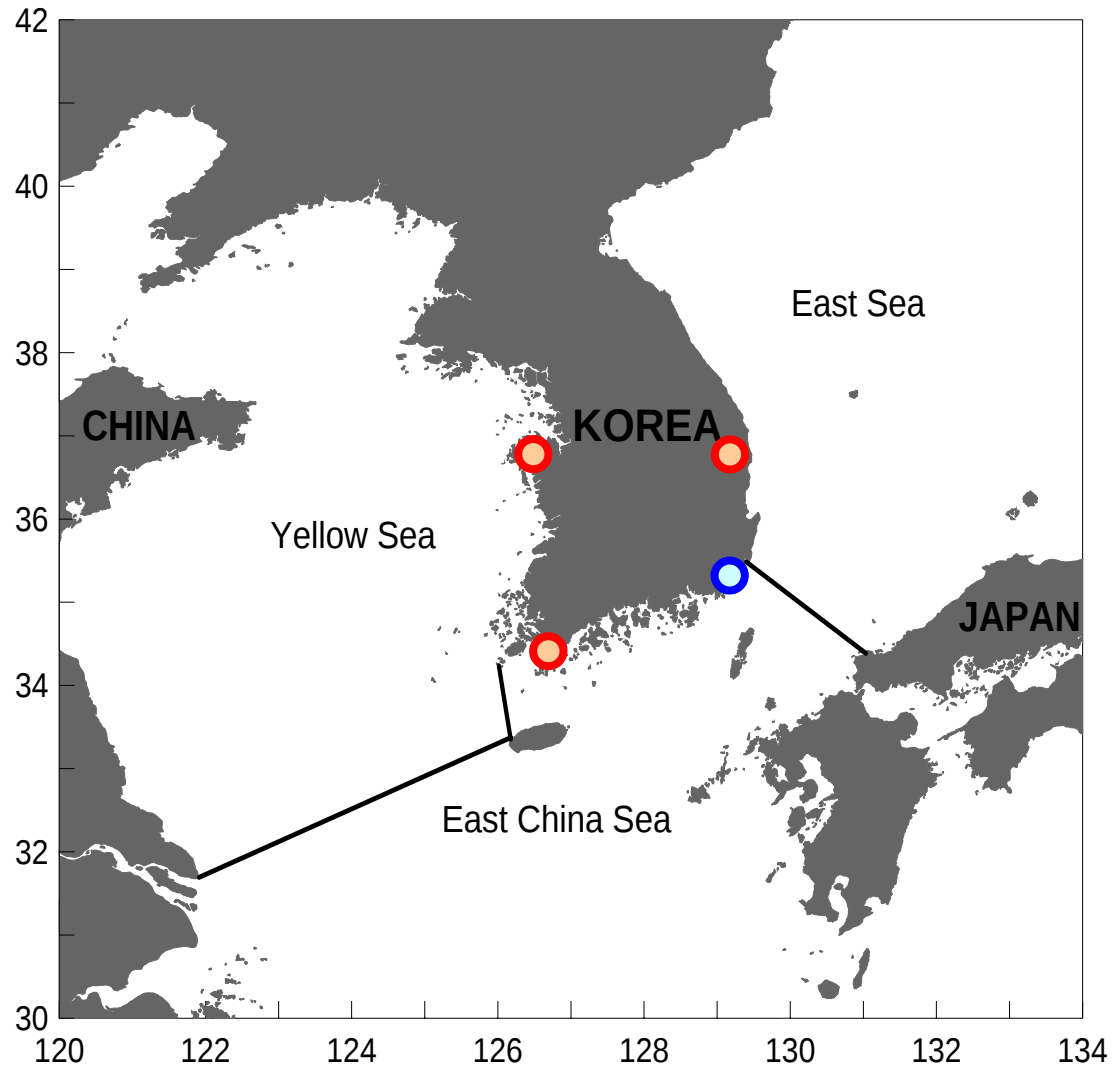
(a) Yellow Sea demersal community: small yellow croaker, hairtail

(b) Pelagic community in Tsushima warm current: chub mackerel, jack mackerel, squid

(c) East/Japan Sea demersal community: walleye pollock, Pacific cod, sandfish

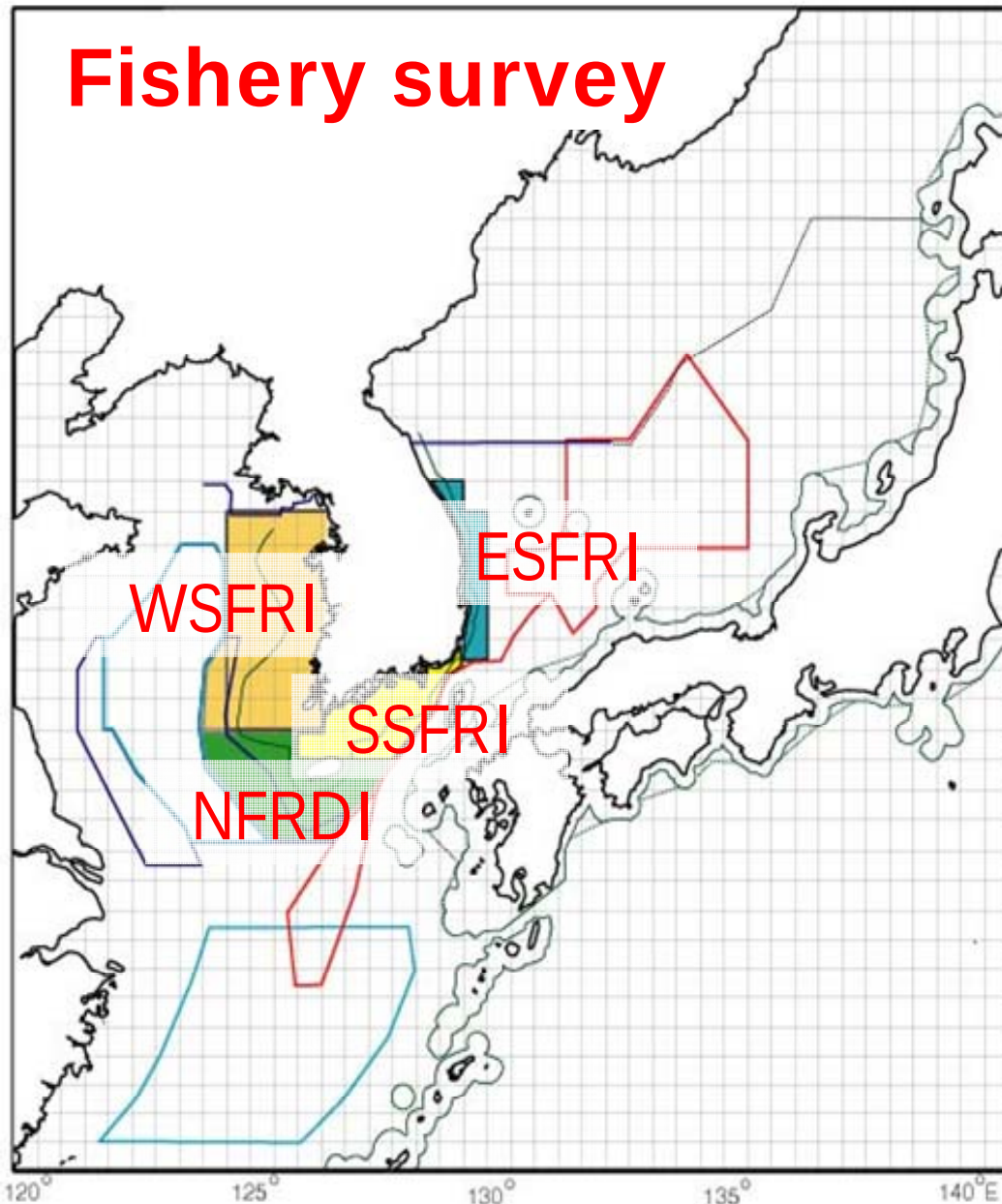
EBFM based on marine sub - regions in Korea

Sub-region for NFRDI

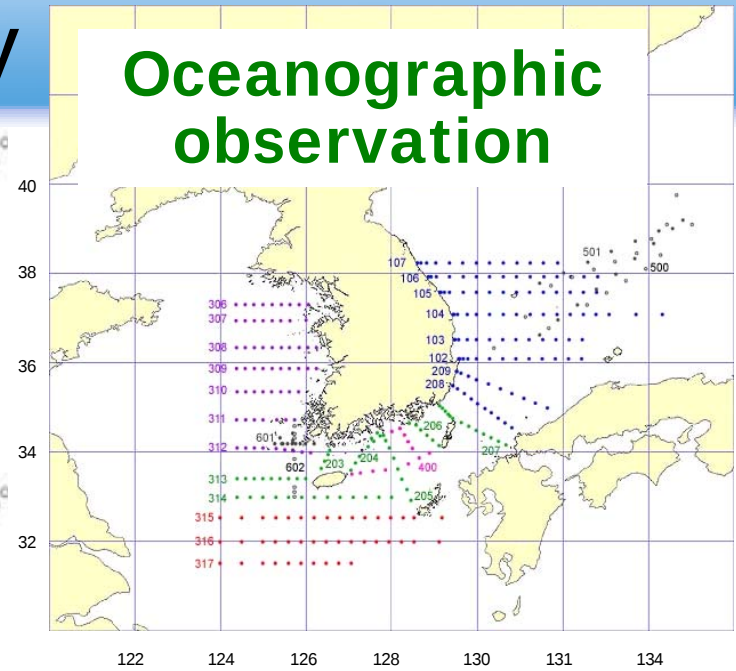


NFRDI research activity

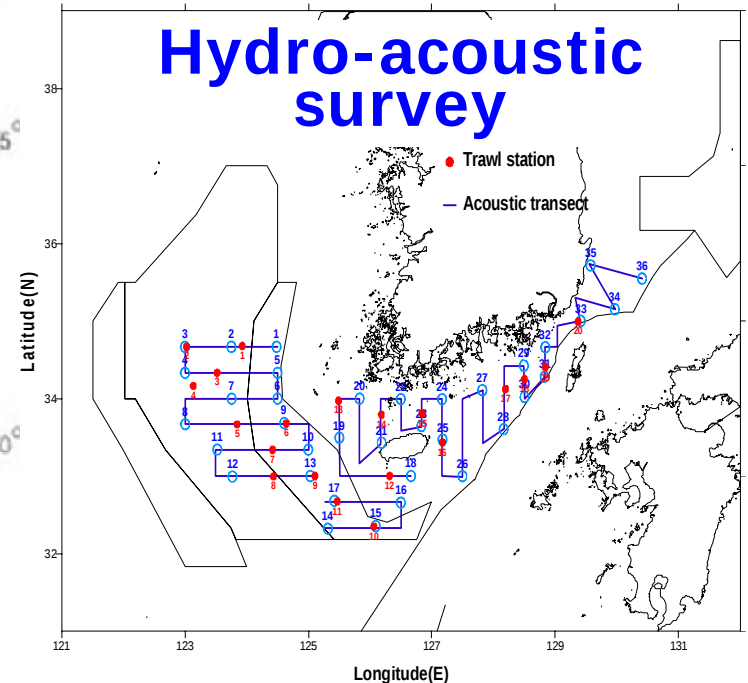
Fishery survey



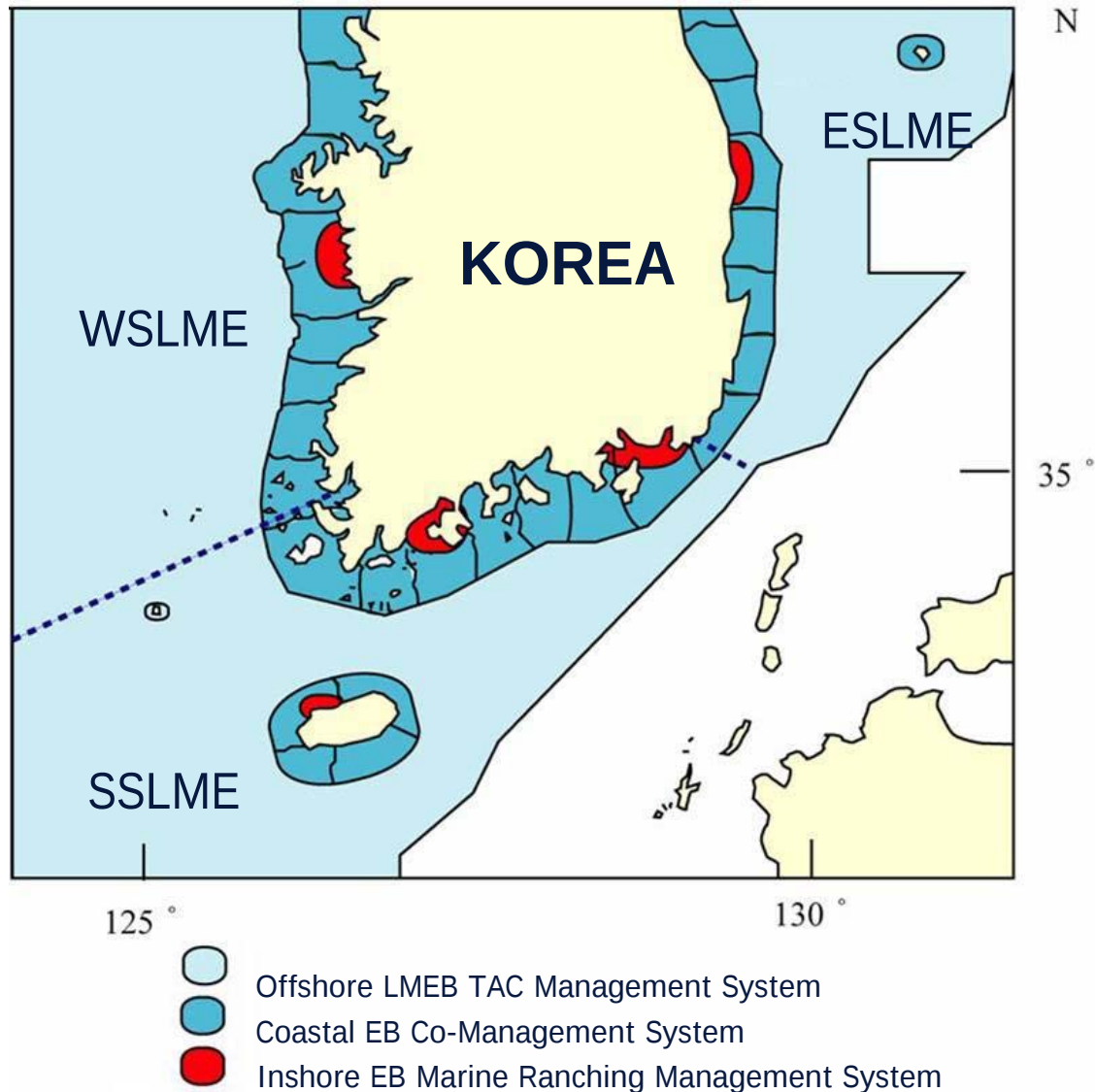
Oceanographic observation



Hydro-acoustic survey



Integrated Ecosystem-based Fisheries Management System



Offshore Ecosystem Management Subsystem

- Target area: **offshore large marine ecosystem**
(e.g. Yellow Sea, East / Japan Sea, East China Sea)
- Target fishery: **offshore fisheries**
- Management authority: **central government**
(eventually, establishing regional management body)
- Assessment and management: **joint surveys, assessment, and ecosystem-based precautionary management by the management body**



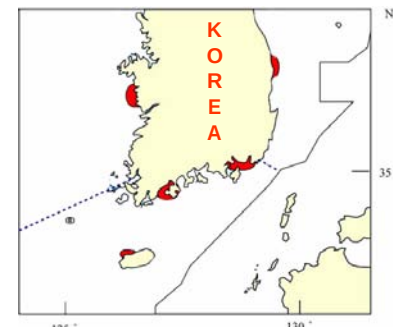
Coastal Ecosystem Management Subsystem

- Target area: coastal self-regulatory community ecosystem
- Target fishery: boat fishery, community fishery, aquaculture grounds, etc.
- Management authority: self-regulating community
- Assessment and management: ecosystem-level resource enhancement / rebuilding, TAC-based management, self-regulating ecosystem and fishery (protecting illegal fishing)
- * Central government provides knowledge and technology for ecosystem-based assessment and management



Inshore Ecosystem Management Subsystem

- Target area: marine ranching ecosystems
 - Target fishery: pole and line fishing, diving fishing
 - Management authority: ranch-related community
 - Assessment and management: Various enhancement activities, ecosystem-based assessment/management, TAC-based precautionary management, conservation of the ranching ecosystem quality
- * Central government provides assistance to establish ranch-related communities and their infra structure



Integrated Ecosystem-based Fisheries Management System

Subsystem Item \	Offshore LME	Coastal Self-regulatory	Inshore Marine ranching
Management Methods	• TAC	• TAC • Self-regulatory	• TAC • Self-regulatory • Artificial control
Attributes	• Management in natural environment	• Artificial stock enhancement activities	• Artificial stock enhancement activities • Artificial construction of habitat activities

General Investigation of Marine Ecosystem

11 sections

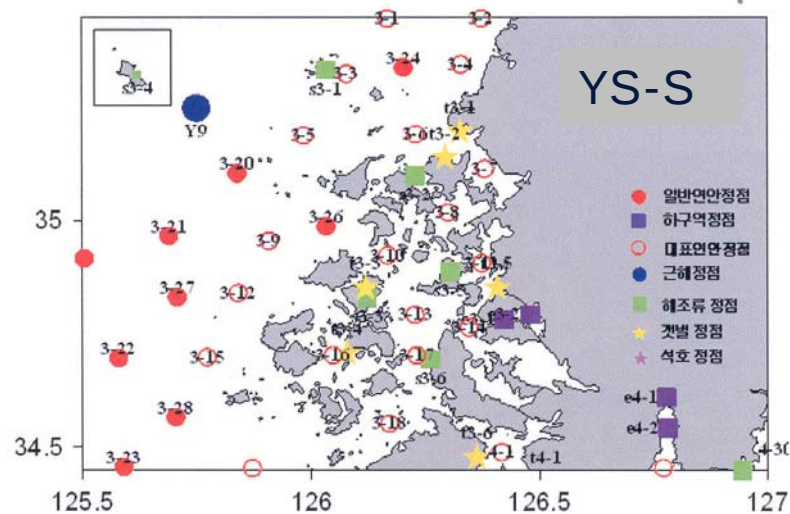
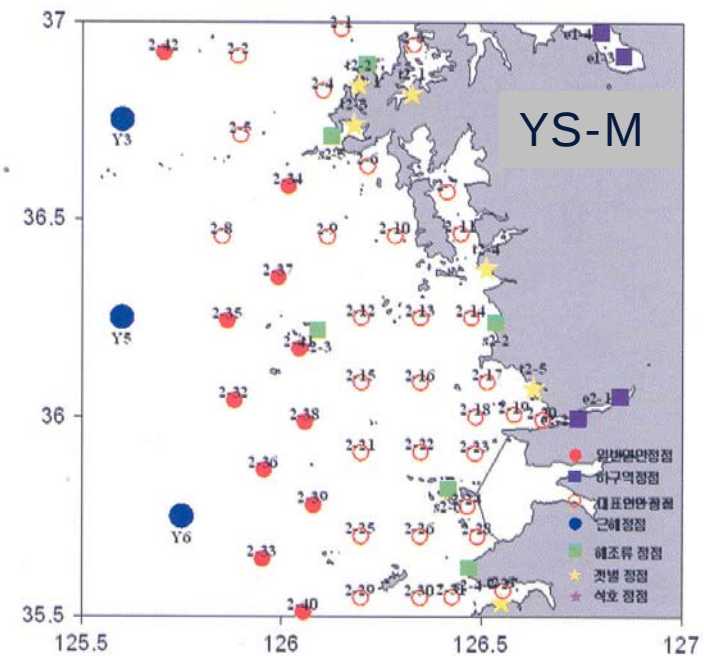
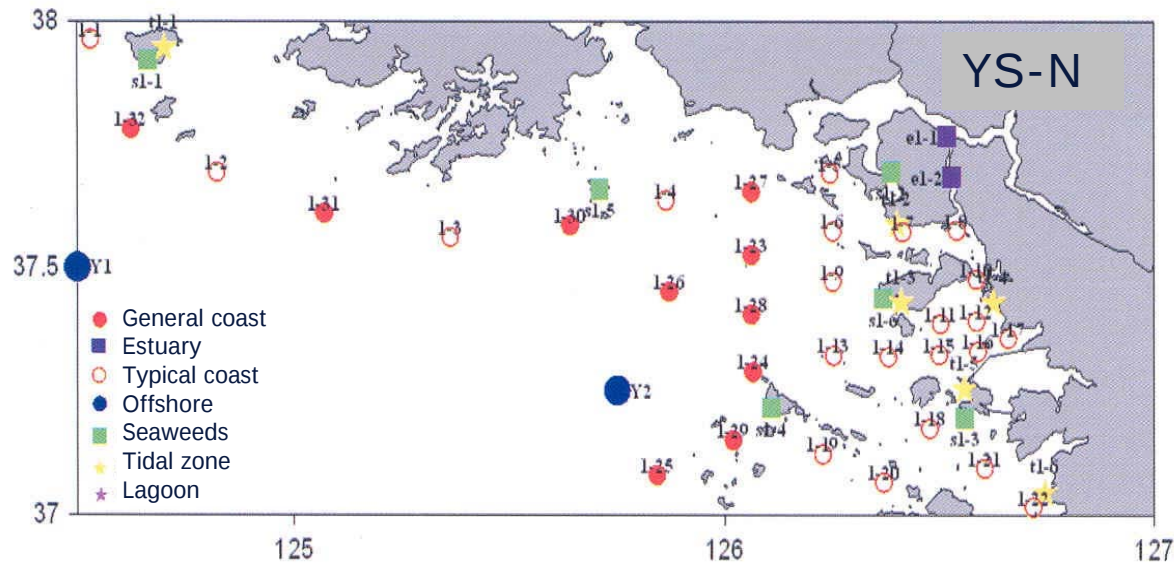
Oceanographic System

- Geological System
 - Sediments
- Physical Oceanographic System
 - Bottom Composition
 - Oceanographic Physics
- Physical-Chemical Oceanographic System
 - Water Quality
 - Trace Environments

Biological System

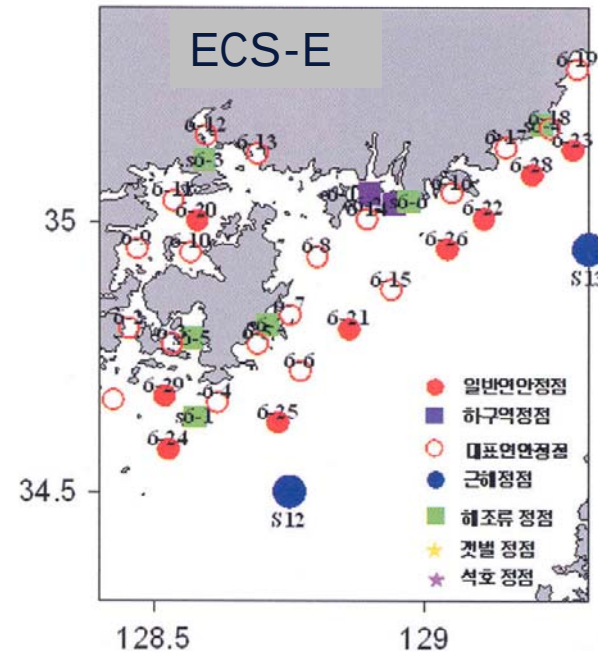
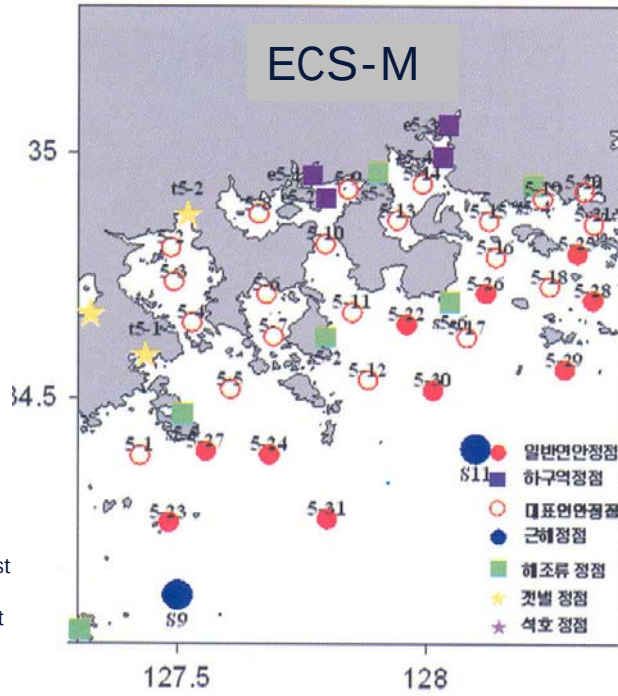
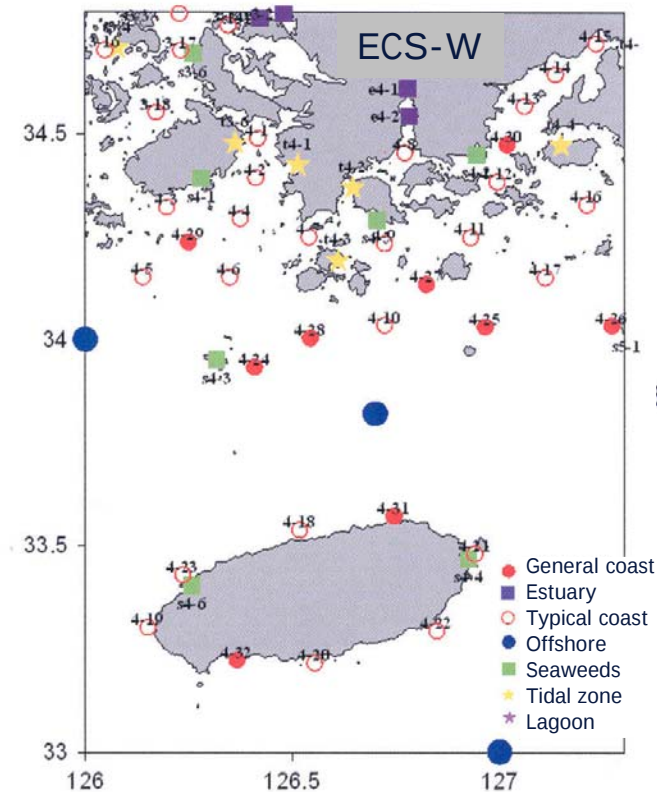
- Plankton Community
 - Microbiology
 - Phytoplankton
 - Zooplankton
- Benthic Community
 - Benthos
 - Seaweeds
- Nekton

General Investigation of Marine Ecosystem



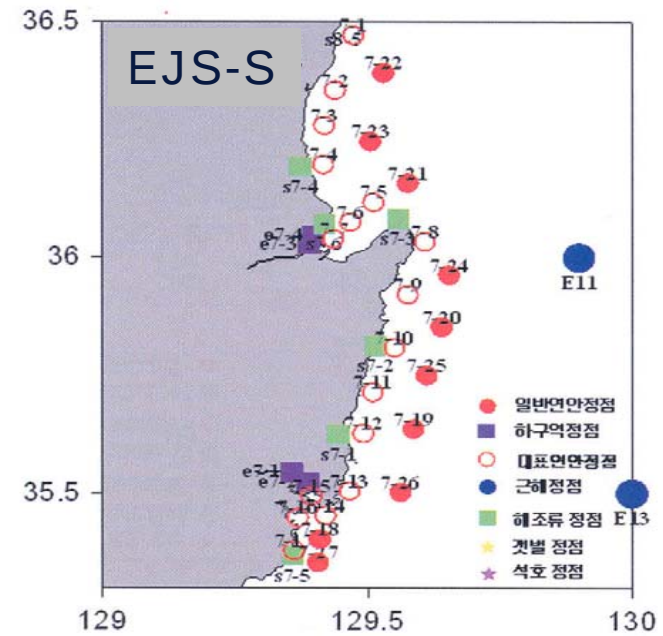
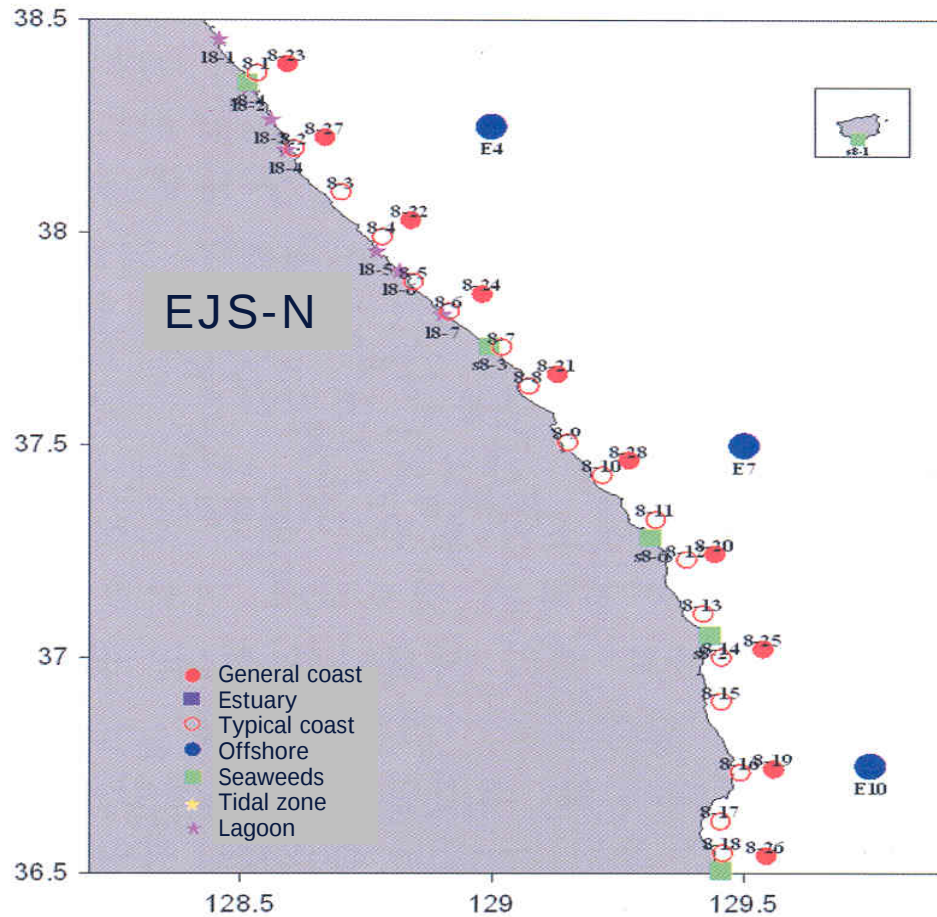
Stations	YS-N	YS-M	YS-S	Total
General coast	10	11	10	31
Estuary	2	4	2	8
Typical coast	22	31	18	71
Seaweeds	6	6	6	18
Tidal flats	6	6	6	18
Lagoon	0	0	0	0
Total	46	58	42	146

General Investigation of Marine Ecosystem



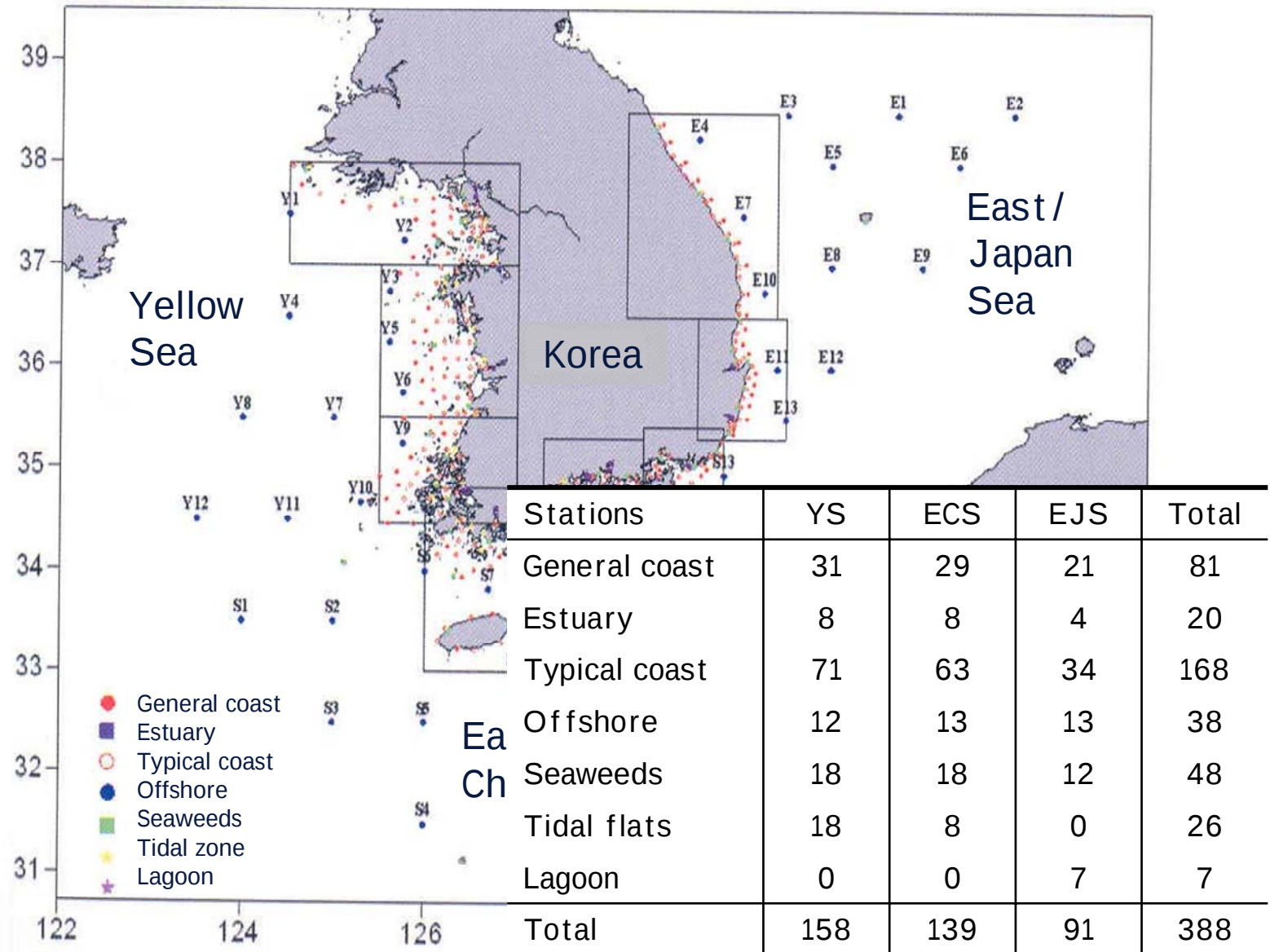
Stations	ECS-W	ECS-M	ECS-E	Total
General coast	9	10	10	29
Estuary	2	4	2	8
Typical coast	23	21	19	63
Seaweeds	6	6	6	18
Tidal flats	4	4	0	8
Lagoon	0	0	0	0
Total	44	45	37	126

General Investigation of Marine Ecosystem



Stations	EJS-N	EJS-S	Total
General coast	11	10	21
Estuary	4	0	4
typical coast	16	18	34
Seaweeds	6	6	12
Tidal flats	0	0	0
Lagoon	0	7	7
Total	37	41	78

General Investigation of Marine Ecosystem



Thank you !!