Ministry of Oceans and Fisheries

KOEM
Korea Marine Environment Management Corporation

Overview of the National Marine Ecosystem Monitoring program in Korea

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1 Overview

- Background
- General introduction

2 Major outcome

- Monitoring results
- Policy support

3 Next step

- Program structure enhancement

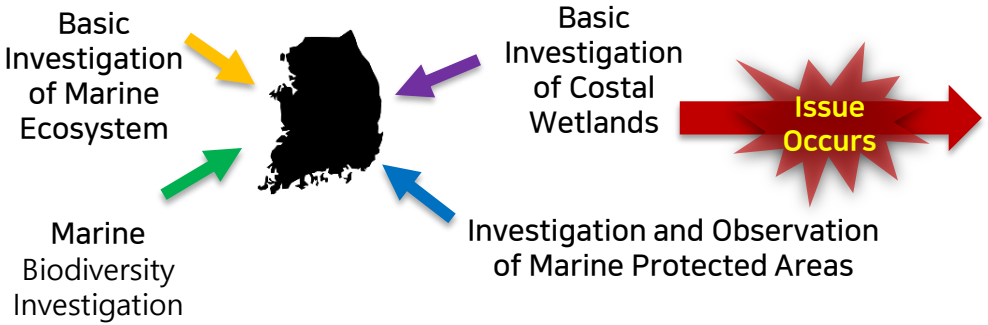
01

Overview of the National Marine Ecosystem monitoring program

- Background
- General introduction

Background

▪ **Various investigations have been performed since 1999** to understand the current status and changes of the marine ecosystem and to preserve and manage it comprehensively and systematically



- Redundancy, no connectivity, and lack of prompt response due to lack of a comprehensive plan
- Lack of comprehensive evaluation, assessment, and explanation compared to the growing public attention to changes in the marine ecosystem

▪ Individual investigation has been integrated with a comprehensive investigation system, and the investigation cycle has been reduced (5 to 8 years → 2 years) and the annual investigation scope is expanded (5 to 8 regions → 2 regions) to acquire time-series data

The System of the National Marine Ecosystem Monitoring Program has been established (2014) and executed (2015)

Aim

▪ Acquire systematic and scientific data on the current state of Korea's marine ecosystem and its long-term and short-term fluctuation characteristics and **apply in marine ecosystem conservation and management policies**

▪ Establish and execute systematic and comprehensive marine ecosystem conservation and management policies for threats, proactive responses to climate changes, marine ecological asset management, protection of excellent marine ecosystem, and sustainable and wise uses and **apply in marine spatial management**

Produce scientifically reliable marine ecosystem data

- (Project title) National Marine ecosystem Monitoring program
- (Cover area) Tidal flat, coast, bedrock, near-shore ecosystems

[Legal Basis]

「Conservation and Management of Marine Ecosystems Act

- Article 10 (National Comprehensive Investigation into Marine Ecosystems)

"The Minister of Oceans and Fisheries shall conduct a national comprehensive investigation into marine ecosystems throughout the nation in collaboration with the heads of the relevant central administrative agencies."

Implemented (2017.06.28)

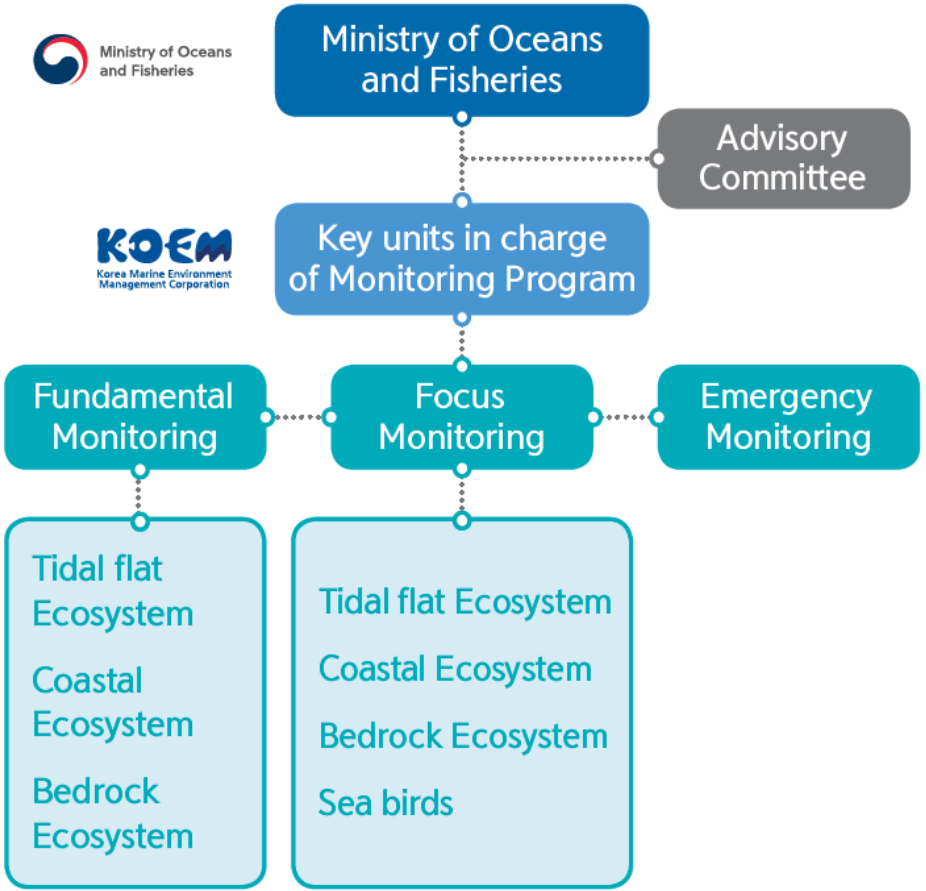
[Details]

- Investigation of marine ecosystems in all sea areas of Korea
- Publication of annual investigation report, collections, and promotional materials on marine ecosystems
- Support on government policies such as marine ecology map, designation of marine protected areas, and international cooperation

Study stations

Total of 1,078 Stations including basic and key investigation areas

1.2 Introduction



Fundamental monitoring

Monitored Areas
Coastal Ecosystem, Tidal flat Ecosystem, Bedrock Ecosystem

Monitoring Scope
Korea is classified into 2 areas(East, West)
- Even Years: East Sea, Eastern Part of South Sea, Jeju
- Odd Years: West Sea, Western Part of South Sea

Monitoring Cycle 1~2 times a year

Focus monitoring

Monitoring Field
Coastal Ecosystem, Tidal flat Ecosystem, Bedrock Ecosystem, Seabirds

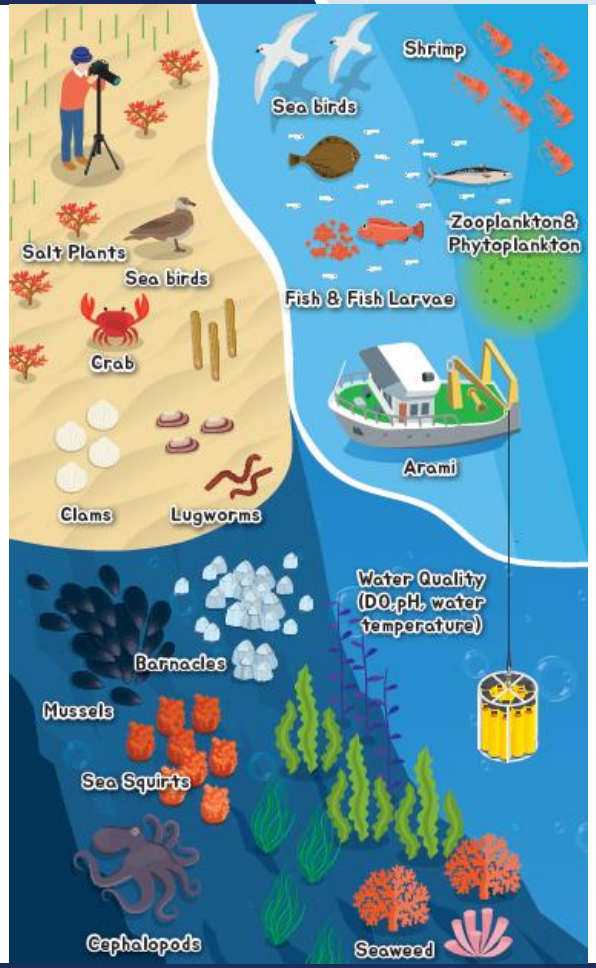
Monitoring Scope
All across Korea including Estuary, Upwelling Area(Coast), Marine MPA (Tidal flat), Subtropical Regions(Bedrock)

Monitoring Cycle 2~4 times a year

Emergency monitoring

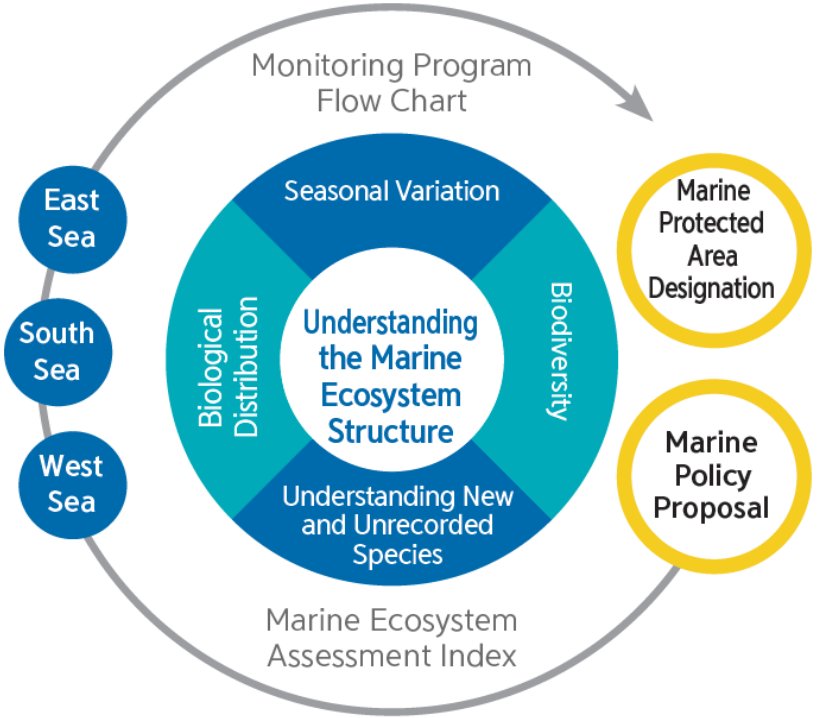
Perform when there is the need for emergency monitoring, such as social issues or civil complaints

1.2 Introduction



- **Total of 19 Monitoring Items**

  14 Biological (Plankton, Benthos, Sea birds etc.)
  15 Non-biological (Water Quality, Economic Value, Change in Consciousness of Local Residents, etc.)



National Marine Ecosystem Monitoring Program

- Ocean health checkup project of Korea

02

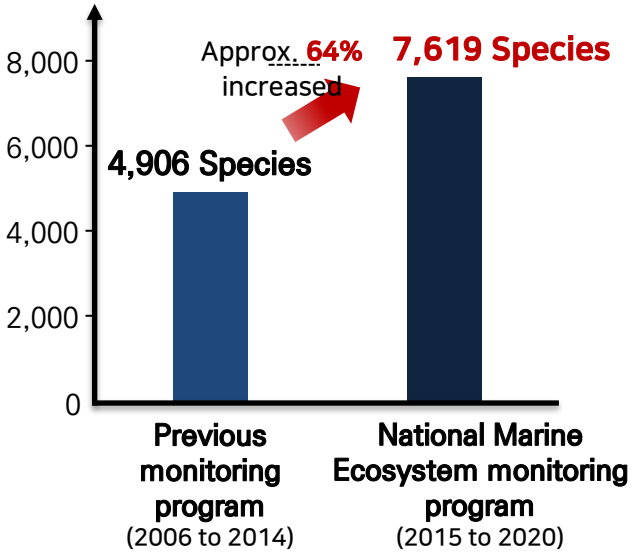
Major Outcome

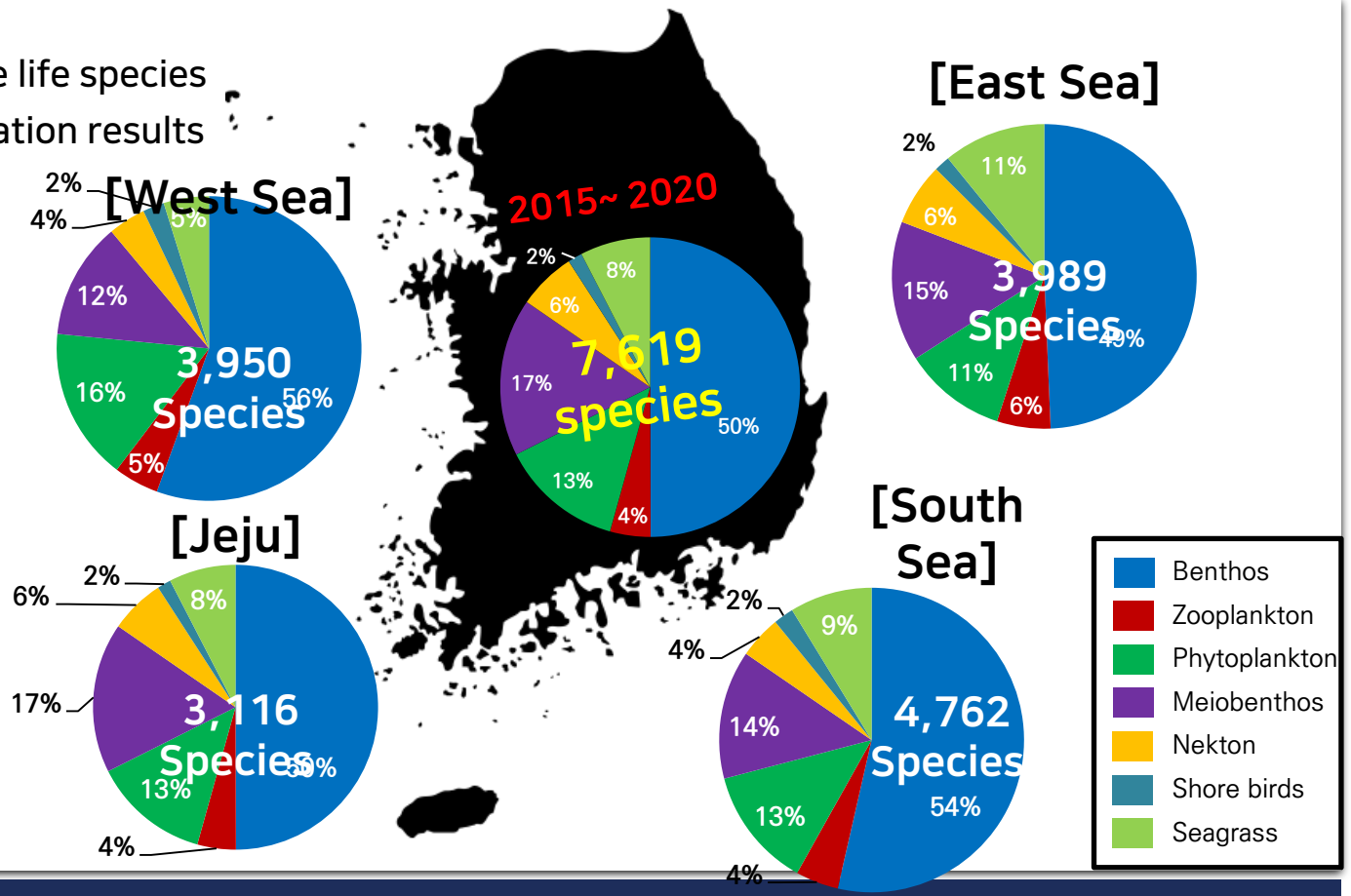
- Monitoring results
- Policy support

2.1 Results

Understanding Current Status of Marine Ecosystems

- Confirmation of the number of marine life species based on the comprehensive investigation results (2015 to 2020)
  - Compared to the past, **the basic information** from the marine ecosystem diagnosis through more **precise investigation**



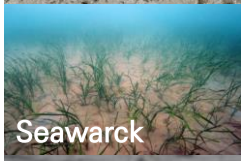


2.1 Results

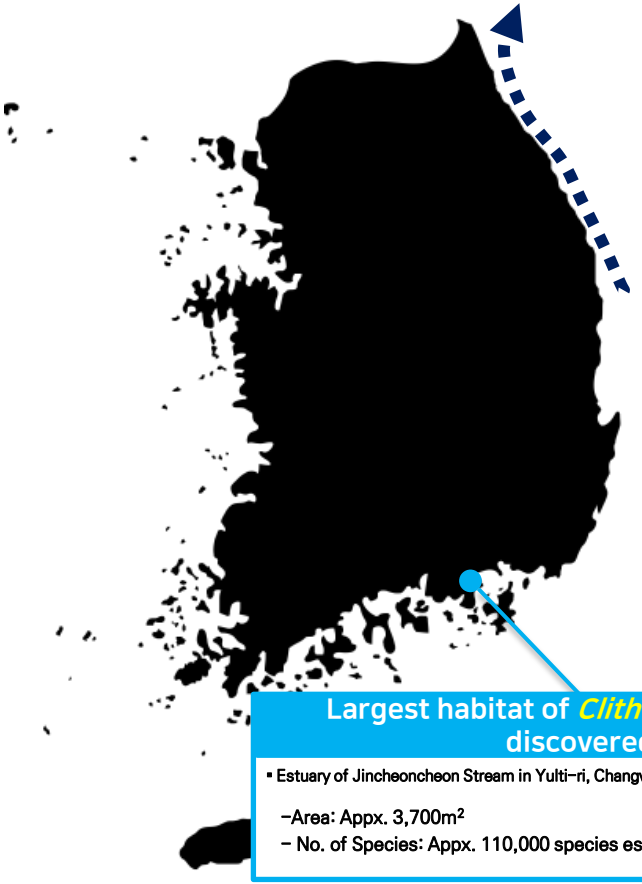
Understanding Current Status of Marine Ecosystems

- Confirmation of a total of 40 marine protected species appeared based on the results of the comprehensive investigation results (2015 to 2020)

Type	No. of Protected Species	No. of Species Confirmed for Appearance
Invertebrate	14	10
Coral	20	17
Marine Algae and Grass	7	4
Bird	14	8
Mammal	16	1
Total	80	40



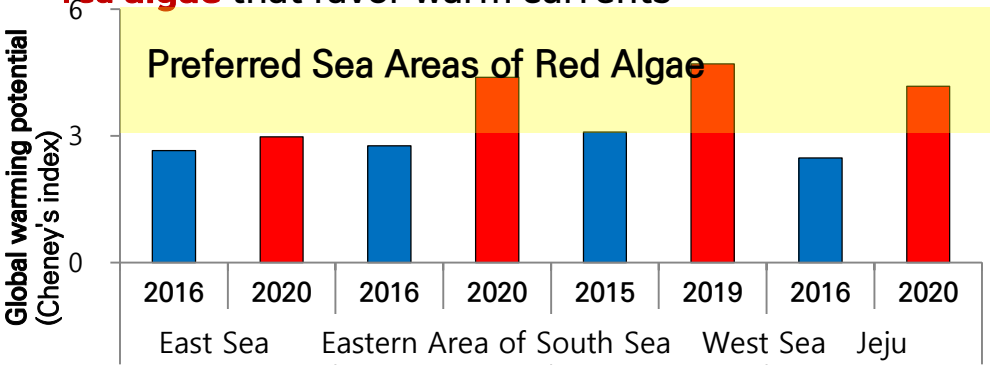
Migration route of a marine protected life, 'streaked shearwaters,' identified



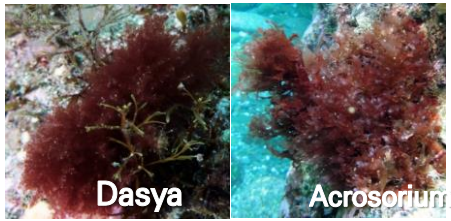
Identifying Changes in Marine Ecosystems

Confirmation of Korea's Sees Becoming Subtropical

[Changes in seaweeds] Increase observed **in red algae** that favor warm currents

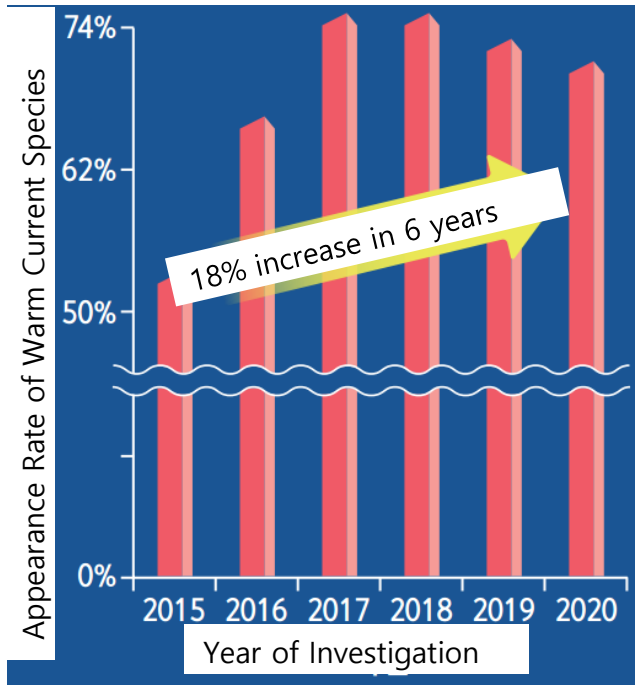


Decrease in **kelp** (favoring cold currents) → Decrease in **small red algae** (favoring warm currents)



[Increase in the proportion of warm current fish species] Based on investigation results from 6 sea areas*, a tendency of increase in warm current fish species is observed

*Investigation areas: Mun Island, Namhyeongje Island,, Wangdolcho, Geomun-do, Ulleung-do, Dok-do



2.1 Results

Identifying Changes in Marine Ecosystems

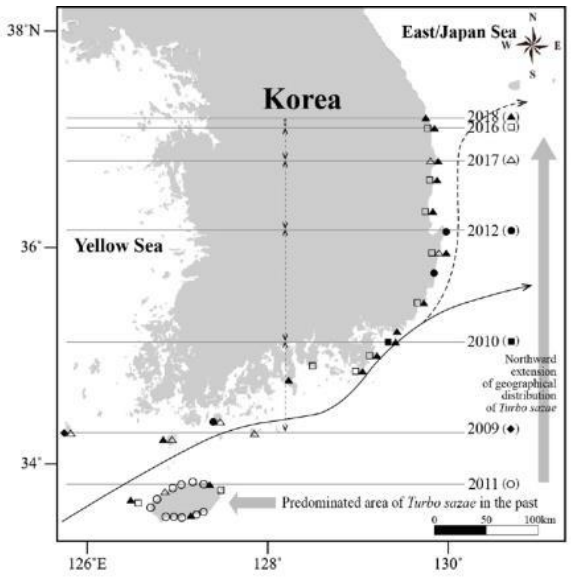
Confirmation of the northern limit line of marine life habitat moving north

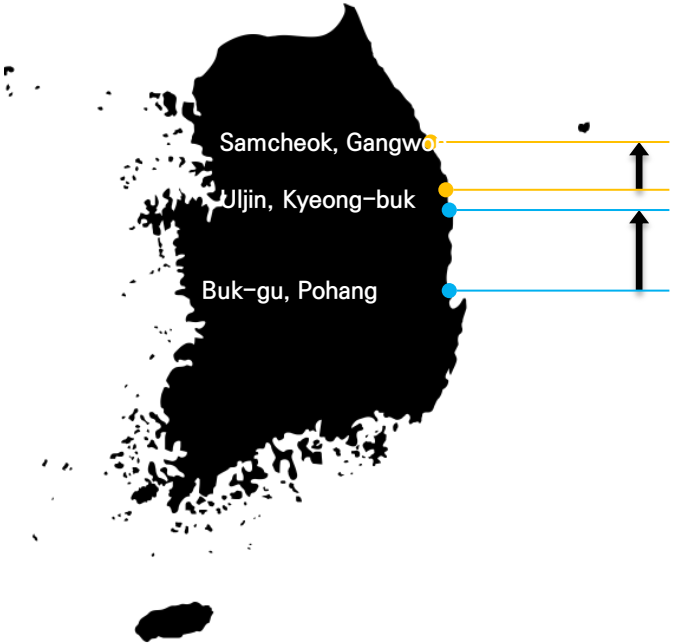
[Spiny turban shell] Confirmation of the habitat moving north due to changes in the power of Tsushima warm current

(North Coast Area → Uljin, Kyeong-buk, Moving appx. 124km north)

[Ocypode stimpsoni / Clithon retropictus] Conformation of the habitat moving north compared to the past

- *Ocypode stimpsoni* (Buk-gu, Pohang → Uljin, Kyeong-buk, Moving appx. 80km north)
- *Clithon retropictus* (Uljin, Kyeong-buk → Samcheok, Gangwon, Moving appx. 20km north)





Diagnosis and Assessment of Marine Ecosystems

- Preparation of Key Management Items (Draft) through Outlier Point Analysis

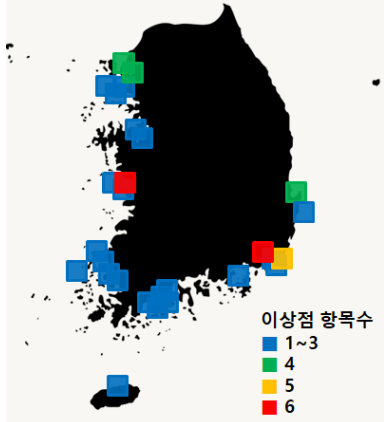
[Outlier Point] Peak points with outliers in data measured during the same investigation period and sea area

※ Relatively small or large figures based on results of an analysis using a statistical technique (quartiles)

[Key Management Items] Constant monitoring performed on peak points where outlier points have been observed

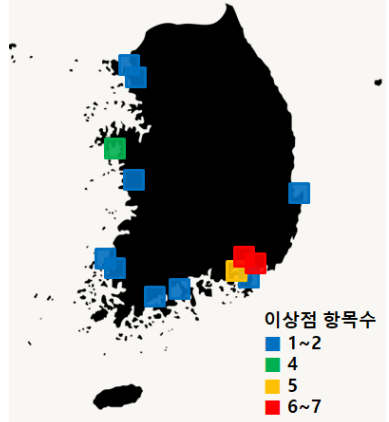
➡ If multiple items with outlier points are observed (6+), a cause analysis is performed and then focus management is executed

Planktonic Ecosystems



No. of Items with Outlier Point

Benthic Ecosystems



No. of Items with Outlier Point

- Setting the background level 'by season, sea area, and environmental factor

[Background Level] If there is no anthropogenic contamination, the range of normal values generally shown from ecosystem investigations

➡ **Can be used as comparative data** when the current status of marine ecosystems are analyzed such as the environmental impact assessment and sea area use conference

Application of monitoring results

Annual report

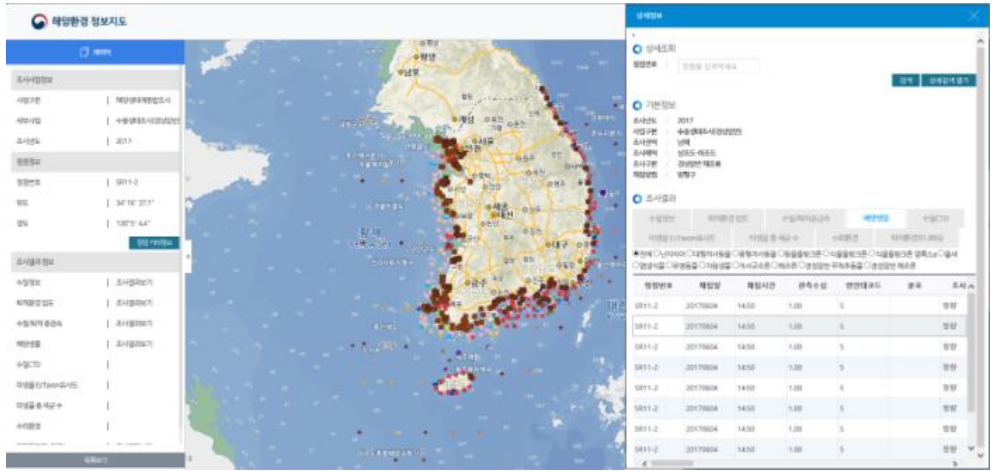
< Summary Book of Marine Ecosystem>

< Investigation Chronology >

- Investigation Chronology
  Investigation of Results Data through Monitoring Program
- Summary Book of Marine Ecosystem
  Total Explanatory Data based on the Results of the Monitoring Program

Open data and information for public

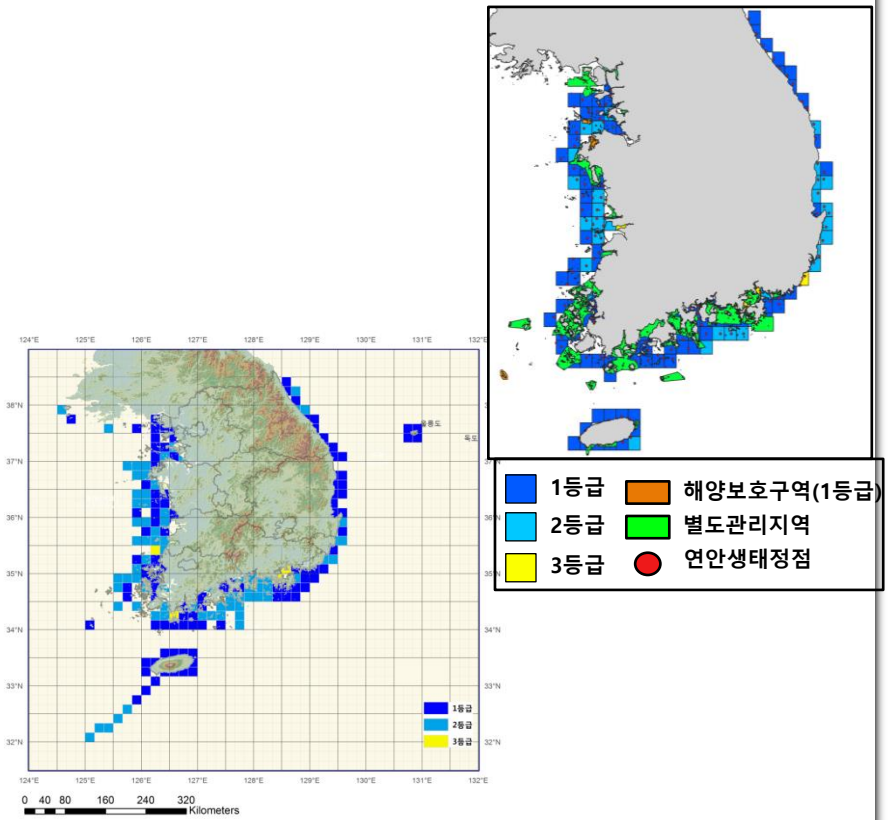
(www.meis.go.kr)



Application of monitoring results

Marine ecosystem grade

- 1st Grade: Habitat of Marine Life Subject to Protection; or Sea with high conservation value due to Marine Biological Diversity
- 2nd Grade: Sea with conservation value in the future or that is needed to protect a 1st Grade Sea
- 3rd Grade: Seas other than 1st and 2nd, which are subject to development or usage.

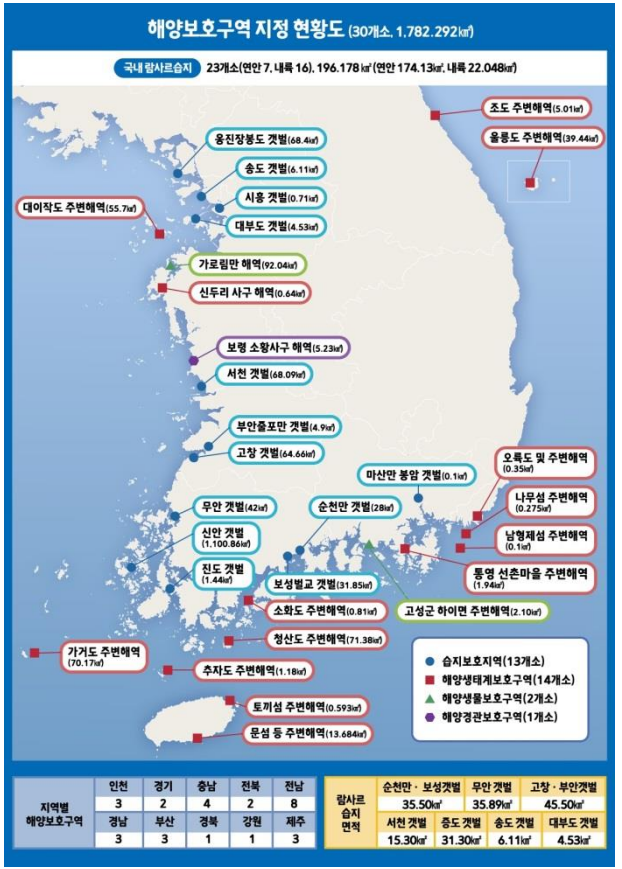


Application of monitoring results

Designating Marine Protected Area(MPA)

Discover the Proposed Site for Marine Sanctuaries and Suggest the scientific basis

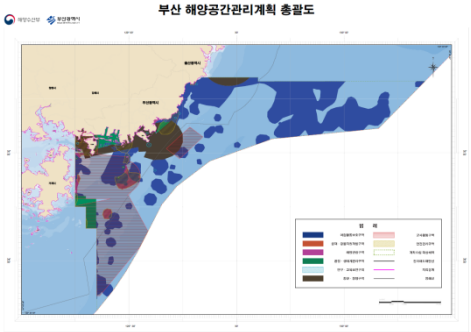
- Tidal flat MPA: Wetland that has been preserved in its natural state or has excellent Marine Biological Diversity
- Marine Ecosystem MPA: Superb or Vulnerable Marine Ecosystem that is to be protected
- Marine Life MPA: Area needed for Marine Life that is Subject to Protection
- Marine Scenic MPA: Superb Marine Scenic Area along with healthy Marine Ecosystem

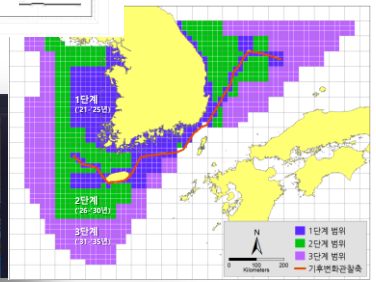


Application of monitoring results

Other applications

- Offer Basis for Sea Space Planning: Use as key materials for systemic, effective usage of Sea Space.
- Monitor noxious Marine Life: Use for policy to manage noxious marine life by investigating domestic habitation state of introduced species and establishing countermeasures.
- Support International Cooperation: Convention on Biological Diversity, the Ramsar Convention, Local consultative groups, UN Marine Evaluation





Establishment and Management of 5 Major Marine Ecological Axes(network)

Execution Progress

Suggesting special scopes and selection standards for each marine ecological axis

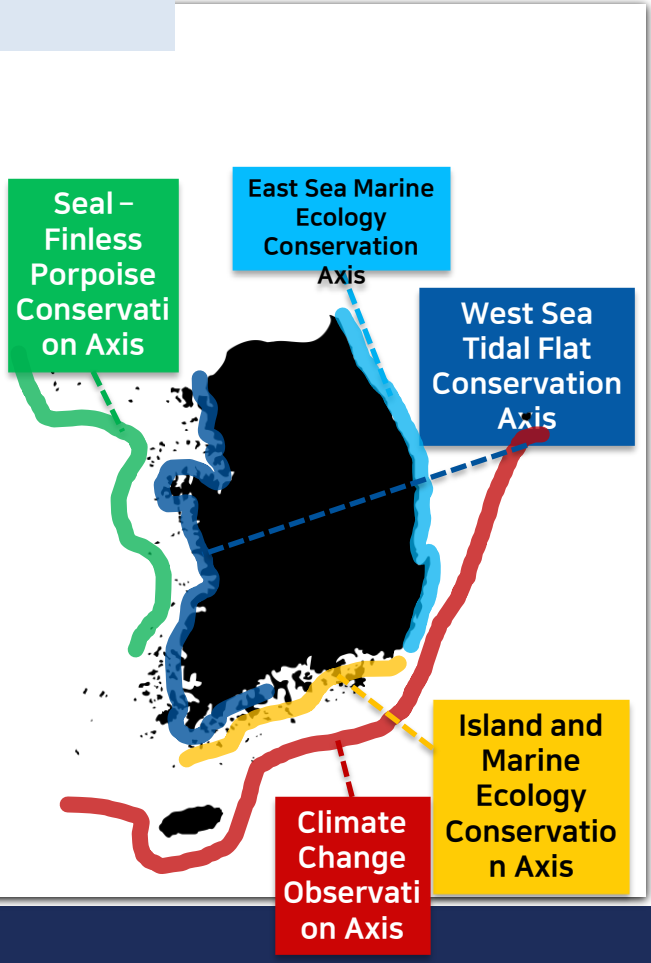
Preparing a detailed implementation plan for each marine ecological axis (Management objectives-Indicators-Measures)

Amending 『Conservation and Management of Marine Ecosystems Act』 for designation and management of marine ecological axes
(Noticed / '21.12.8.)

Execution Plan

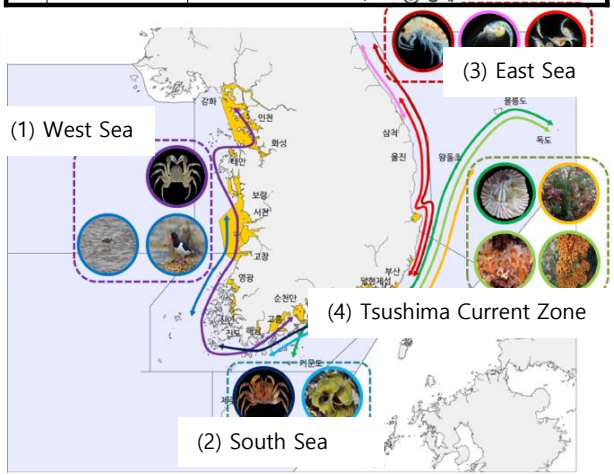
Establishing the management scope for each marine ecological axis
– Refining the spatial scope and collecting expert opinions

Establishing a management plan for each of 5 marine ecological axes



Selection of Each Sea Area's Indicator Species

Category		Indicator Species
①	West Sea	Scopimera bitympana, estern curlew, oystercatcher
②	South Sea	Ocypode stimpsoni, padina arborescens holmes
③	East Sea	Trinorchestia longiramus, large mysida, northeast mysida
④	Tsushima Current Zone	Triangle barnacle, jewel sea anemone, dendrophyllia cribrosa, Caulerpa okamurae



03 Next step

Program structure enhancement

3.1 Enhancement

Association of marine ecosystem management policies

Investigation Unit	Investigation Item	Marine Ecosystem Management Application							
		Protected Area	Marine Protected Life	Harmful Disturbing Creature	Marine Ecology Map	Community Change (Climate Impact, etc.)	Ecosystem Restoration	Marine Spatial Planning	Sea Area Use Conference
Tidal Flat Ecology	Large benthic animal	⦿	⦿		⦿	○	⦿	Application of basic assessment resources	Application of major review resources
	Halophyte	⦿		⦿		○	○		
	Sedimentation environment	⦿			○	○	⦿		
	Changes in residents' perception	⦿							
Coastal Ecology	Microorganism					○			
	Phytoplankton			○	⦿	○			
	Zooplankton				⦿	○			
	Fish roe, larvae					○			
	Medium benthic animal					○			
	Large benthic animal				⦿	○			
	Planktonic animal					○			
	Water quality environment				⦿				
	Sedimentation environment				⦿				
Bedrock Ecology	Large benthic animal	⦿	⦿	○	○	○			
	Marine algae and grass	⦿	⦿			○			
	Coral	⦿	⦿			○			
	Fish	○				○			
Sea Bird	Sea bird	⦿	⦿			○	⦿		

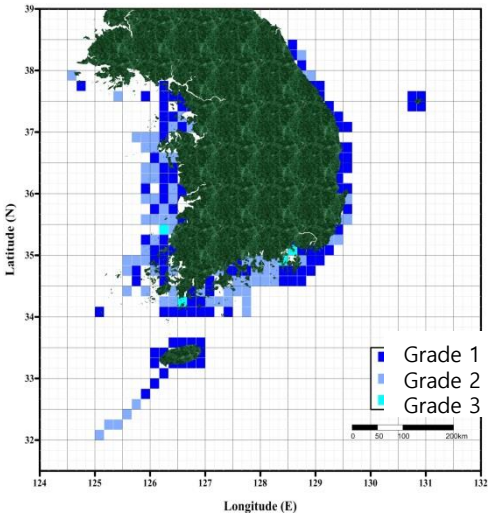
⦿ : Major Application, ○ : Secondary Application

3.1 Enhancement

Demand Based on Changes in Policy Environment

Establishment of Marine Sptial Management Plan

- Expansion of regional plan establishment in accordance with the basic marine spatial plan
  - Increasing demand for diagnosis and health assessment of marine ecosystems
- Expansion of demand for basic resources to establish marine use zones



CBD Post-2020

- Executing the continuous expansion (30%) of the marine protected areas

5) 2030 Action Targets

The framework has 20 action-oriented targets for 2030 which, if achieved, will contribute to 2030 Milestones and the outcome-oriented goals for 2050. Actions to reach these targets should be implemented consistently and in harmony with the Convention on Biological Diversity and its Protocols and other relevant international obligations, taking into account national socioeconomic conditions.

(a) Reducing threats to biodiversity

Target 2. By 2030, protect and conserve through well connected and effective system of protected areas and other effective area-based conservation measures at least **30 percent of the planet with the focus on areas particularly important for biodiversity.**

- Other effective area-based conservation measures outside of protected areas
- Executing (OECM*)

* Other Effective area-based Conservation Measures

Structure enhancement

Changes in Policy Conditions

- Enforcement of Act on Marine Spatial Planning (2019-04)
- Reinforcement of Tidal Flat Condition Investigations in Accordance with Enforcement of Act on Tidal Flats
- Monitoring of Marine Ecological Axes Required

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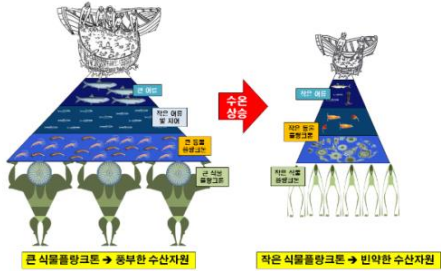
Increase in Threats to Marine Ecosystems

- Expansion of impacts on marine ecosystems due to climate changes
- Increase in harmful and disturbing marine creatures
- Continued increase in demand for sea area uses such as marine leisure and offshore wind power generation



Reorganization of the National Comprehensive Investigation into Marine Ecosystems

Point list

In perspective paper…

- Important of comprehensive monitoring program
- Reflect changes in policy environments
- Measure the marine ecosystem impacts due to climate change

Produce scientifically reliable marine ecosystem data

THANK YOU

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