

Environmental Management of the Coastal Areas

沿岸域の環境管理

Ago Bay Project and Health Check of Closed Sea

英虞湾再生プロジェクトと閉鎖性海域の健康チェック

Dr. Miyuki Maegawa
Prof. Mie University

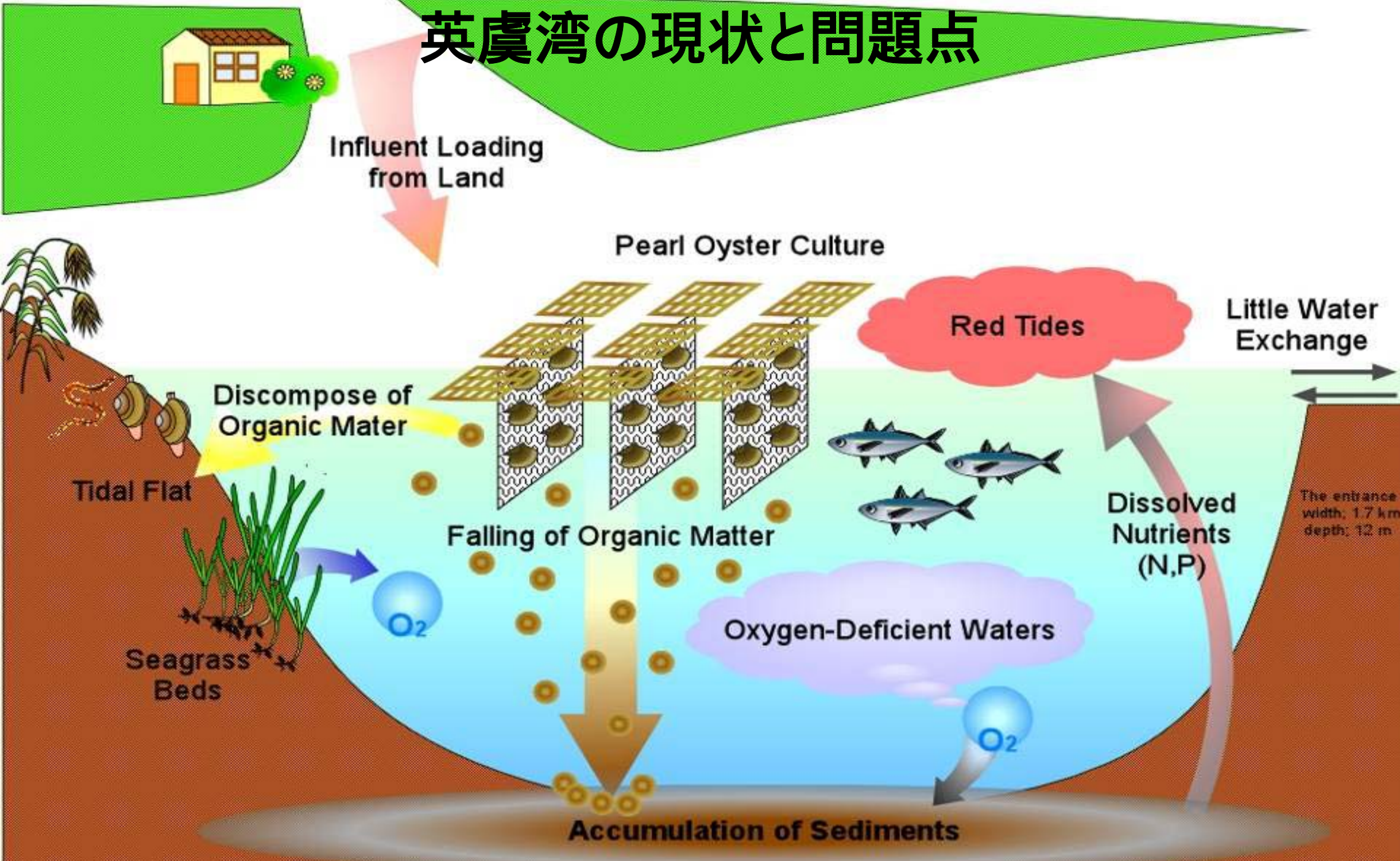
Ago Bay 英虞湾



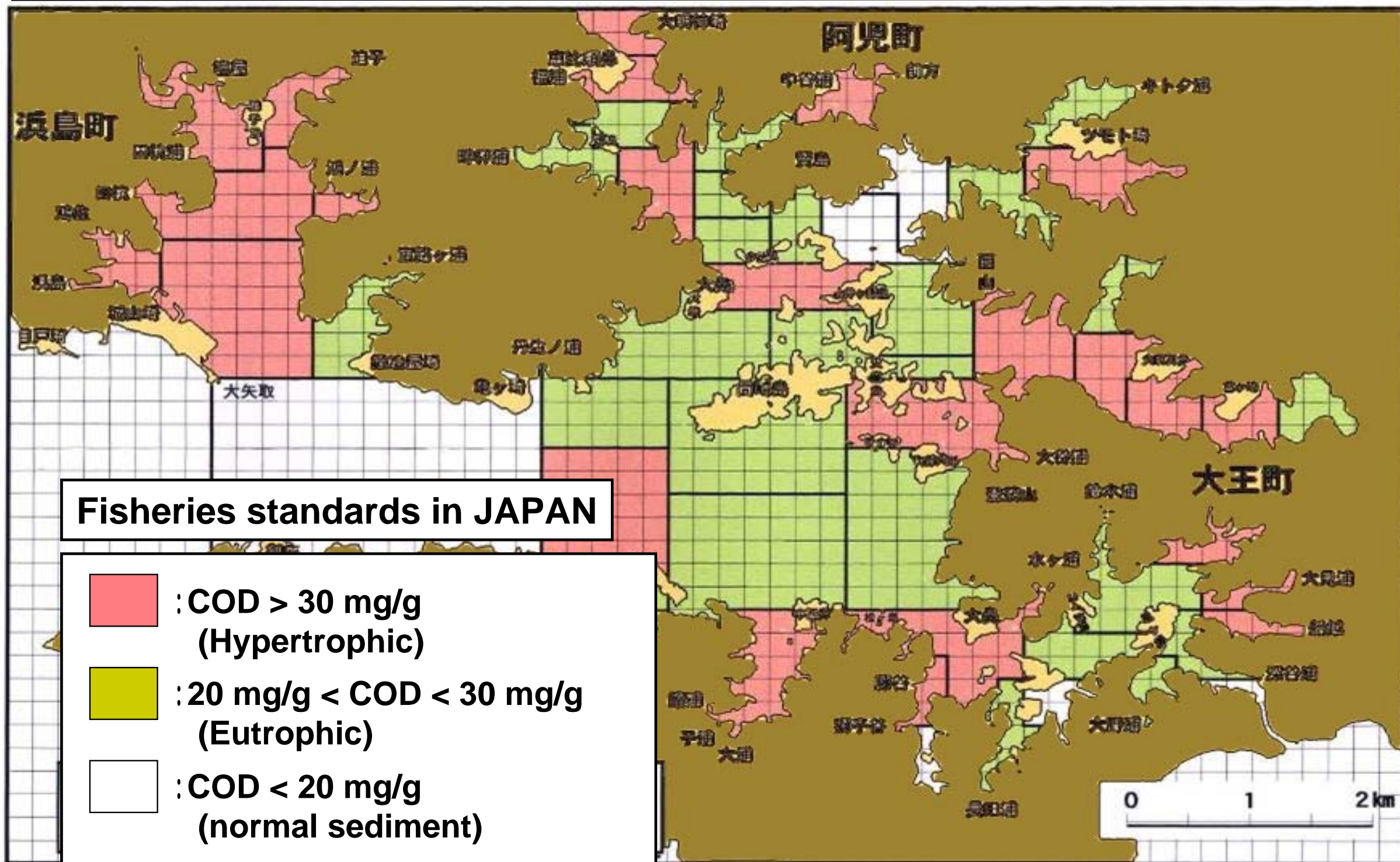
cultured pearl

Current state and problems of Ago Bay

英虞湾の現状と問題点



The Distribution of COD in Sediment



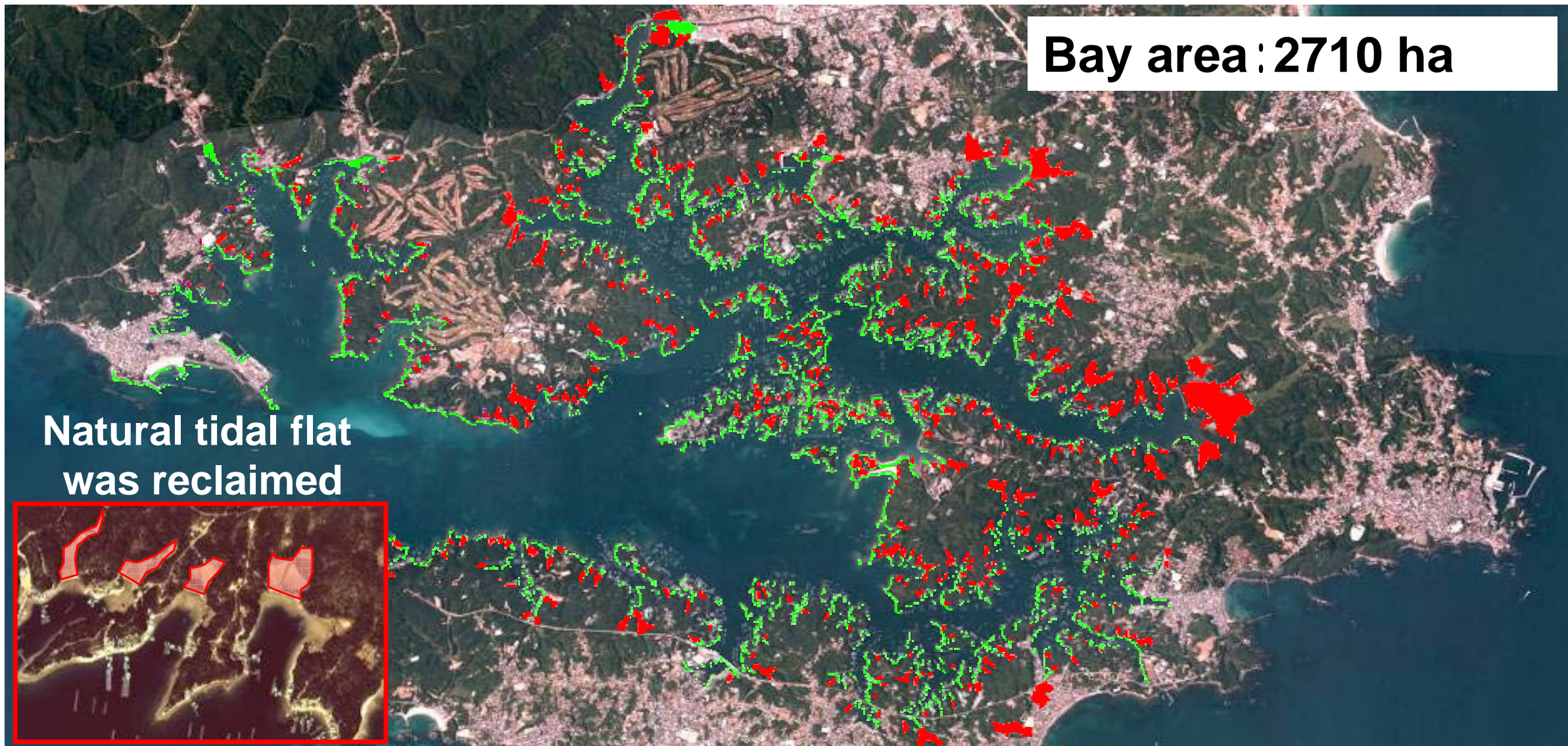
Reclamation of the tidal flats & the shallow area

-  : Existent tidal flat : 84 ha
-  : Reclaimed tidal flat : 185 ha

About 70% of tidal flat and shallow area were reclaimed

Bay area : 2710 ha

Natural tidal flat
was reclaimed



Small Scale Artificial Tidal Flat

Constructed by numerous volunteers in 2000



Co-works with fishermen



Environmental education

Environmental Restoration Project on Enclosed Coastal Sea, 2002 - 2007

“Ago Bay Restoration Project”

英虞湾再生プロジェクト

Project Aim

Better life through wise and sustainable
use of coastal environment

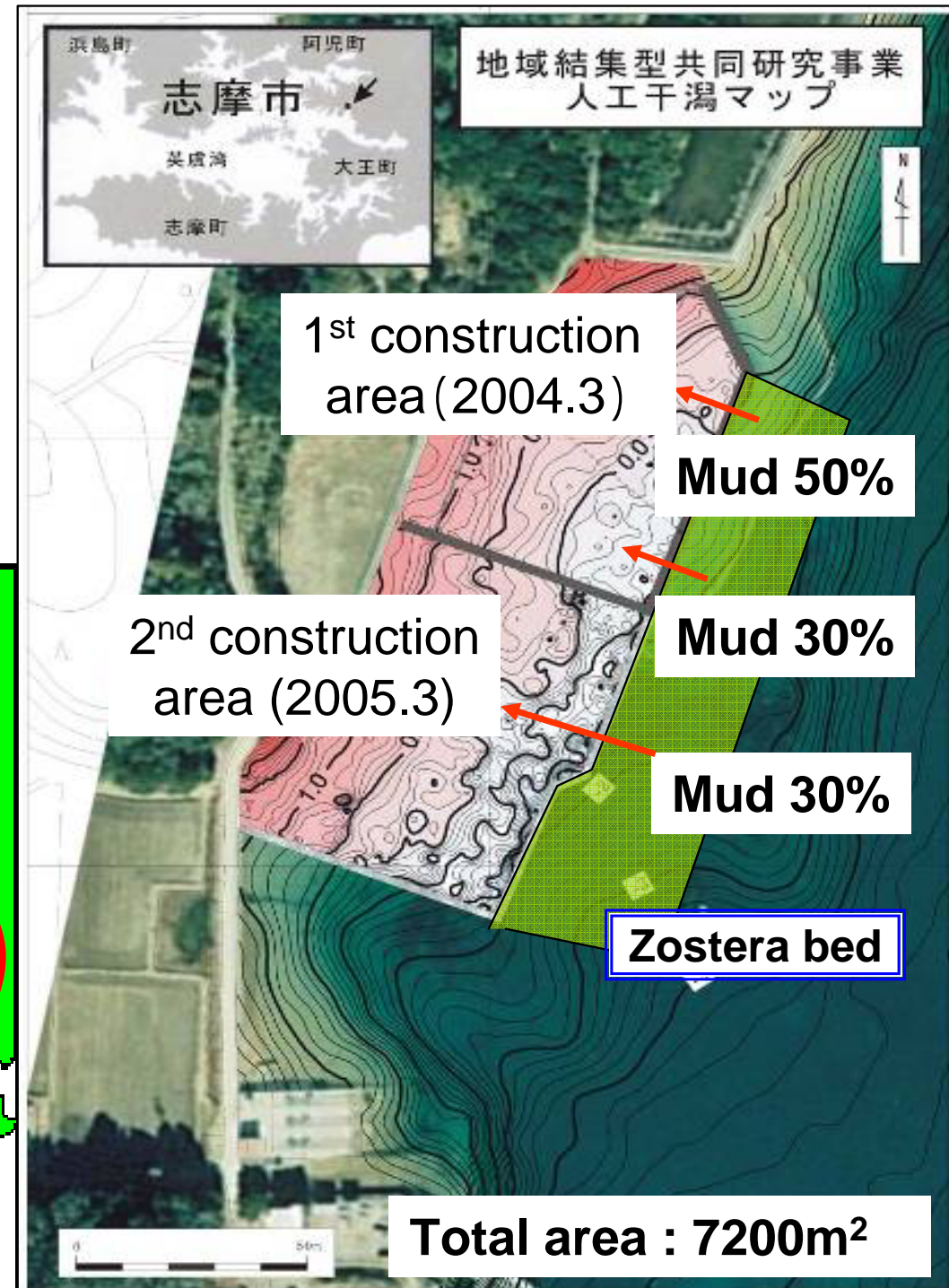
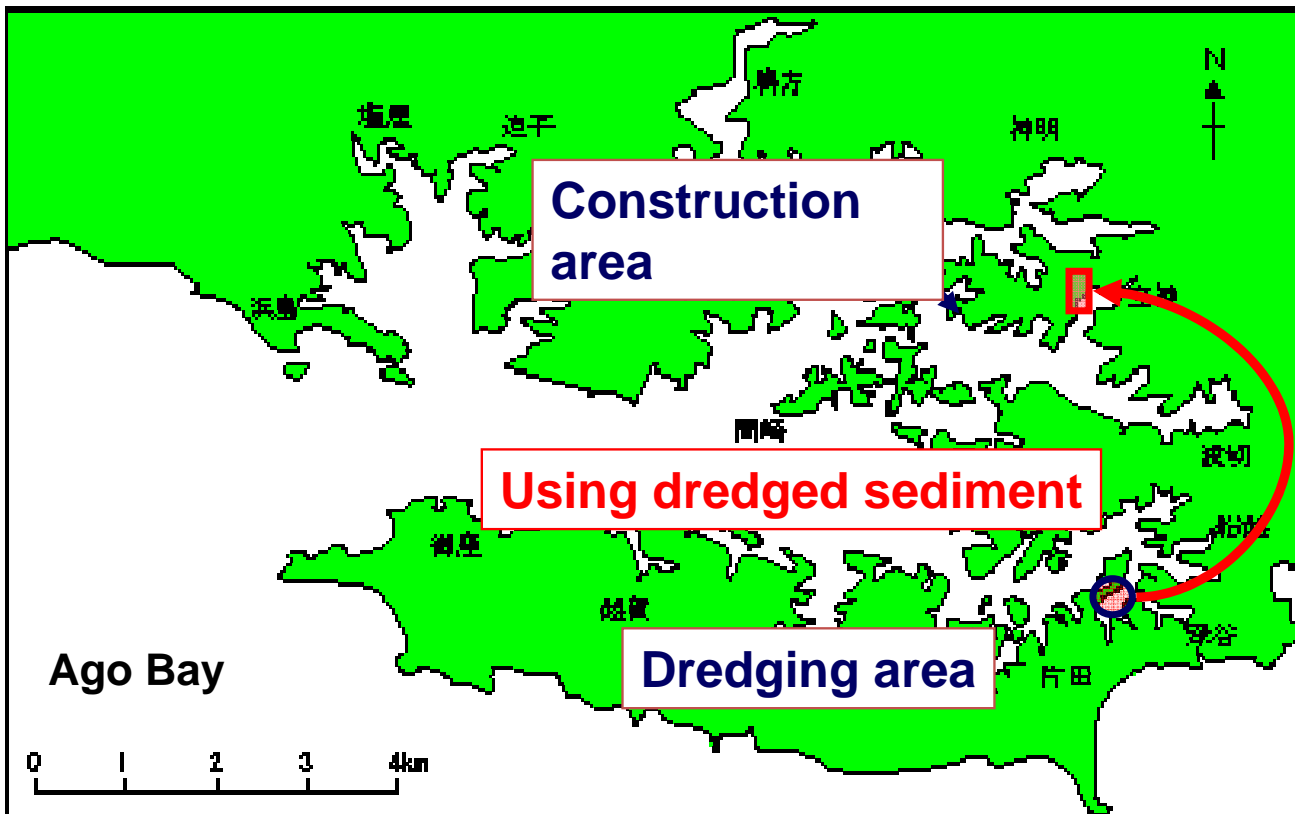
内湾環境の賢明で持続的な利用を目指したよりよい生活

里海

Sato Umi

Construct Large Scale Artificial Tidal Flat from 2004

- Area : 7200 m²
- Ground level : DL+1.2 ~ -0.8 m
- Slope : 2.5 m / 50 m
- Mixing ratio : 30%, 50%

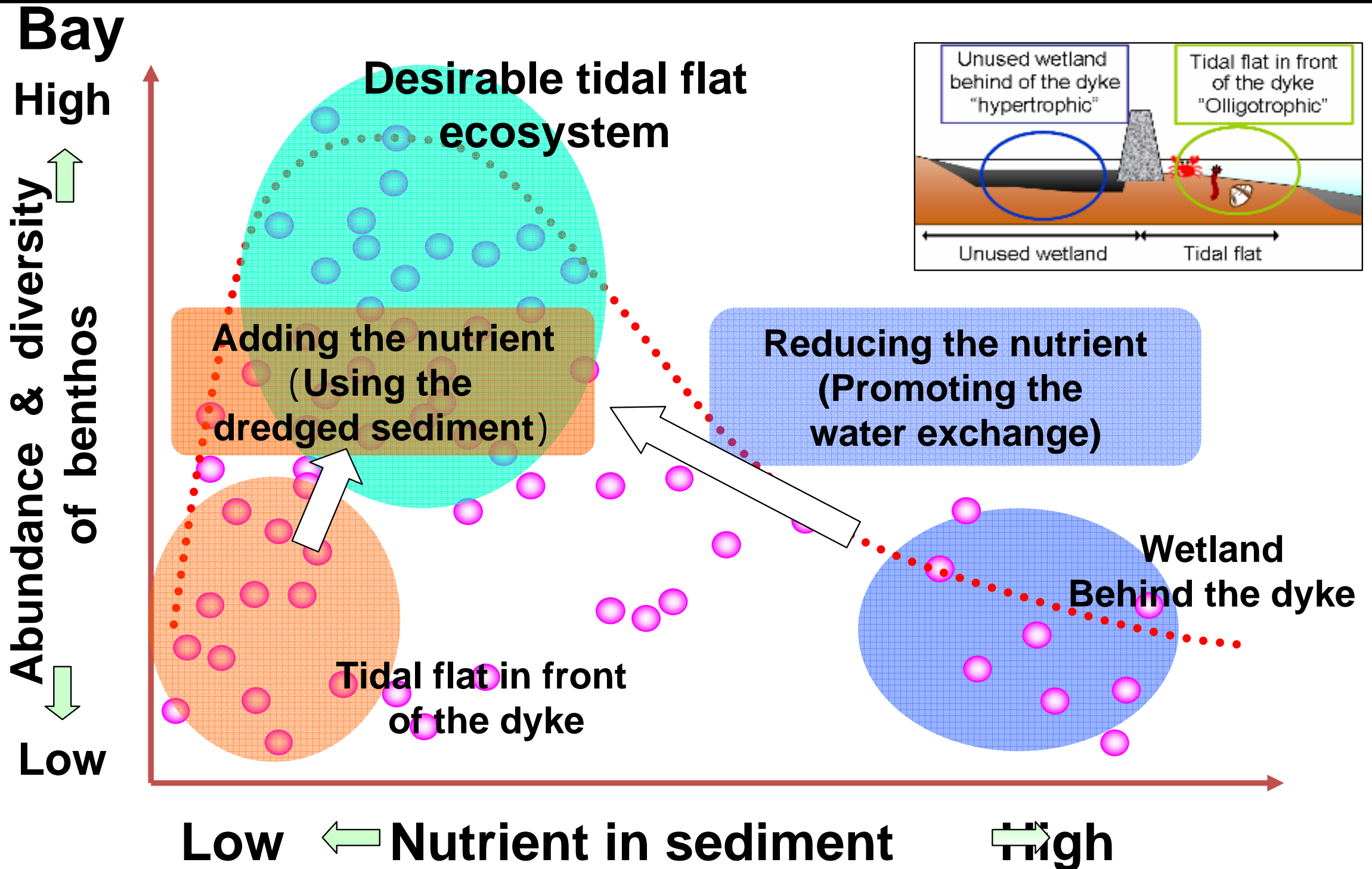




**Enhancing Biological Productivity by
Controlling the Sediment Nutrient
for the Benthos**

**底生生物に必要な底質の栄養塩をコントロール
することにより物質生産を高める**

Restoration Concept of Shallow Area in Ago





**Development of a new method
for recovering *Zostera* bed
in cooperation with fishermen**

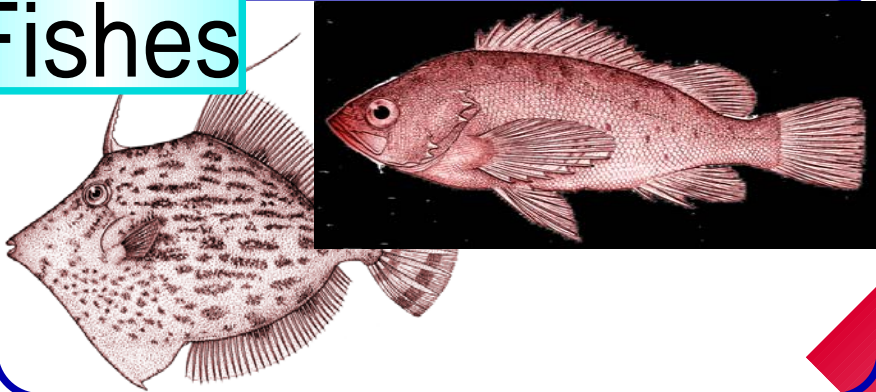
漁業者と協働したアマモ場造成

Roles of *Zostera* bed

Nursery ground

Photosynthesis

Fishes



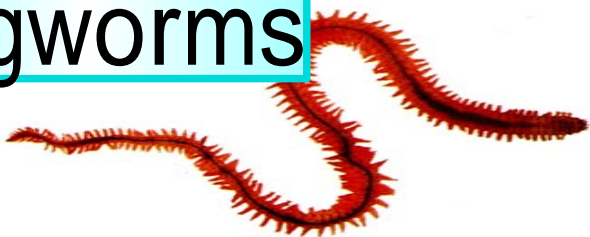
Crabs



Shells



Lugworms

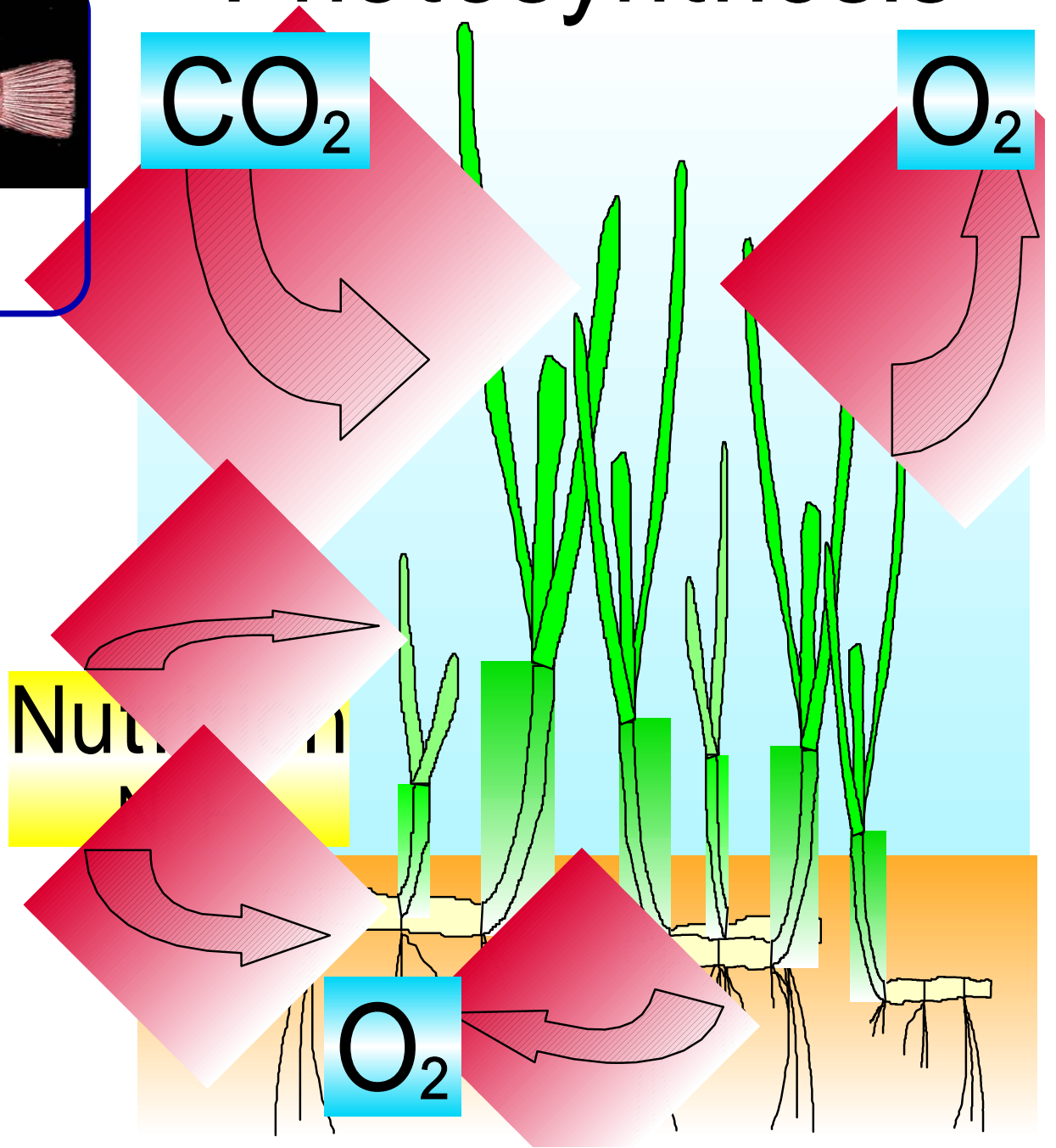


CO₂

O₂

Nutrients

O₂



Collecting seeds with fishermen - 1



collecting mature shoots



Jun 2005



selection of mature shoots



promoting maturation of seeds

Collecting seeds with fishermen - 2

July 2005



Fishermen gathered

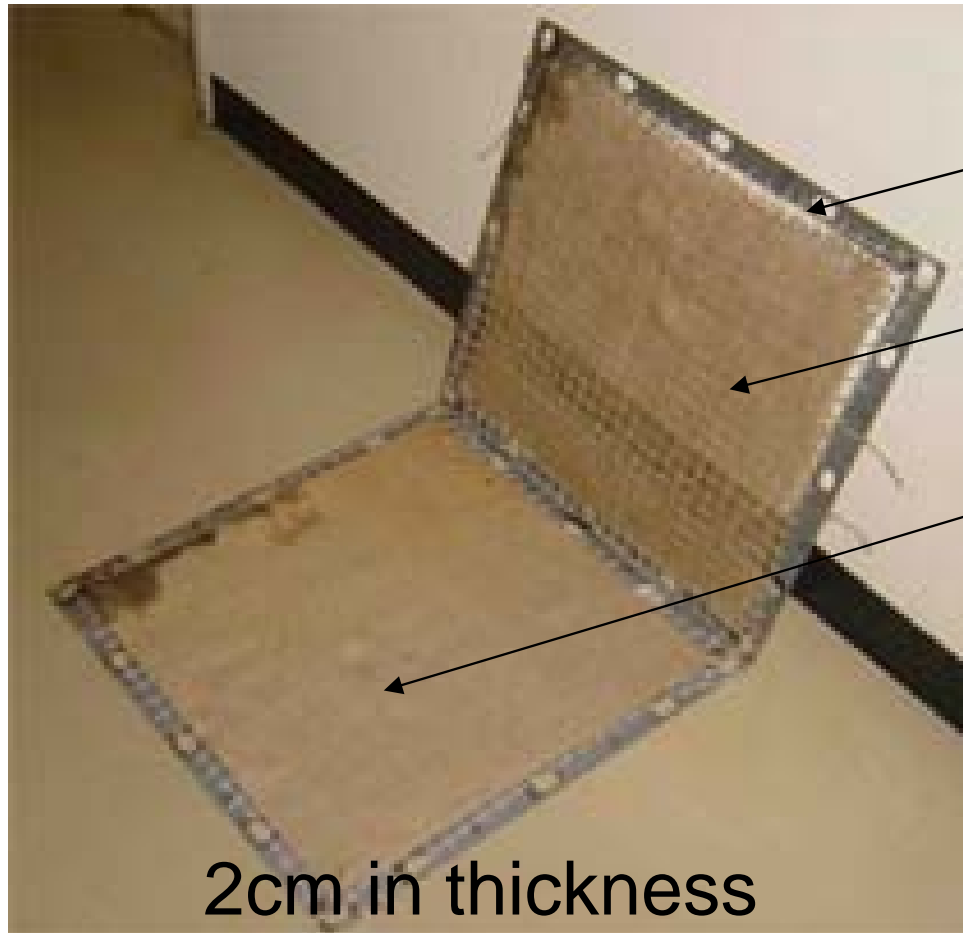


selection of seeds



400,000 seeds !

Newly developed "Zostera mat"



Iron frames with no coating

Jute mesh net

Jute mat

2cm in thickness

Each mat was joined with cotton ropes.



Encasing seeds and settlement of bases

Nov. 2005




encase seeds in *Zostera* mat



continuous setting from boat




Zostera mat on sediment



Growth of *Z. marina* on the mats

Dec. 2005, after 1 month
Many seedlings sprout
through jute mats.



April 2006,
after 5 months

Adult plants on the mat
Some of them matured.
About 1m long.
Iron frame already rusted.

Advantages of Zostera mats

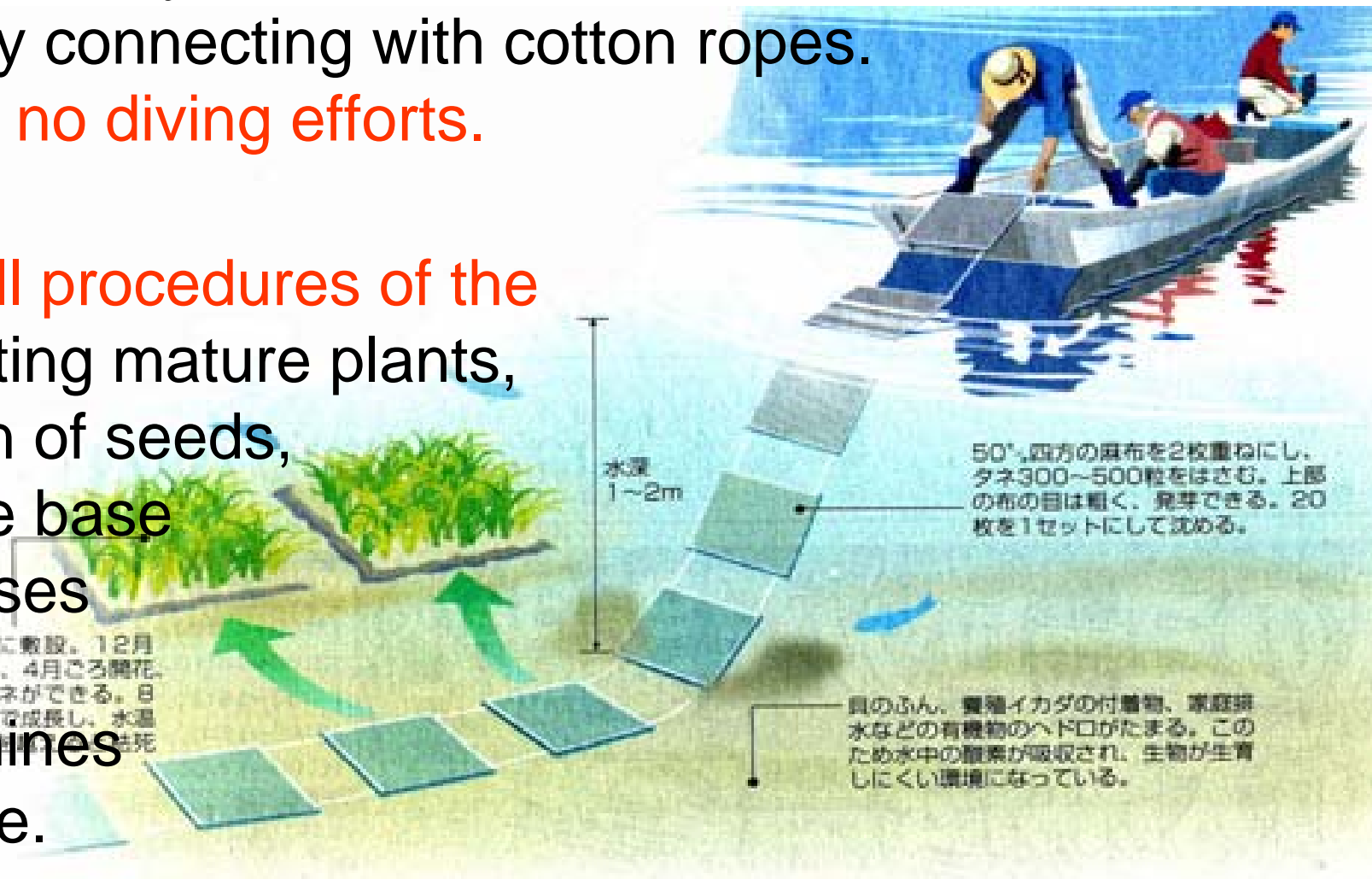
1. All parts are made by natural materials.

Environment-friendly technique.

2. The mats can successively be set from the boat on the sea bottom by connecting with cotton ropes.

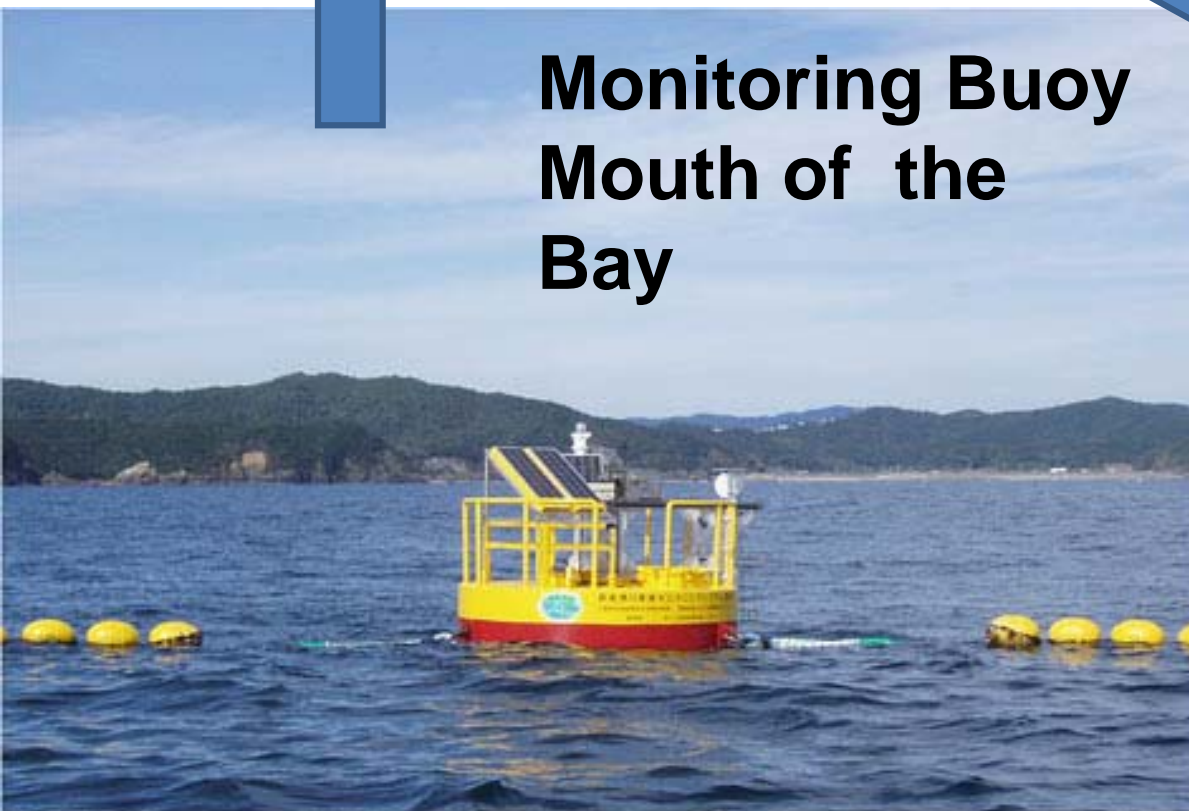
Low labor costs and no diving efforts.

3. **Fisherman can do all procedures of the routine works**, collecting mature plants, promoting maturation of seeds, encased seeds in the base and settlement of bases on the sea bottom without special machines and difficult technique.



Ago Bay Monitoring System

英虞湾環境モニタリングシステム



Monitoring Buoy
Mouth of the
Bay

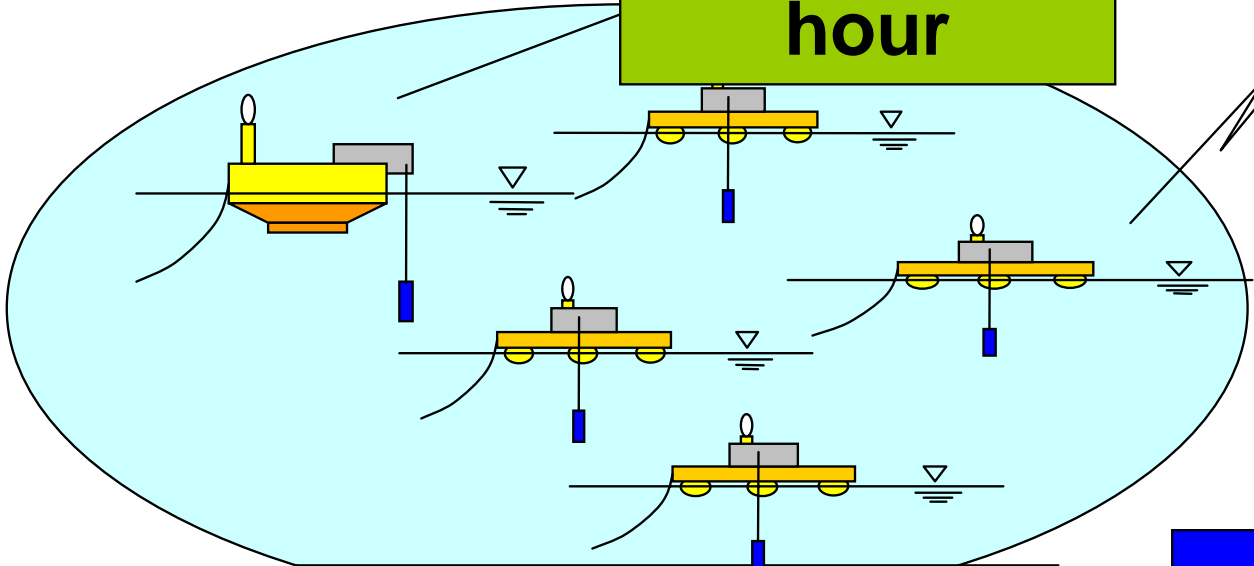


Raft System
Inner Bay

Schematic Diagrams of Monitoring System

Via Cellular Phone network

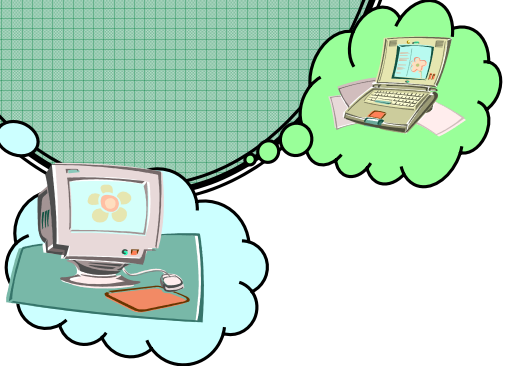
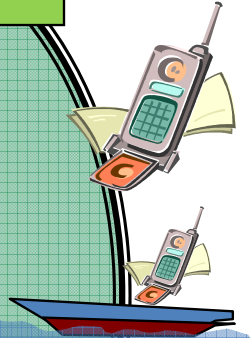
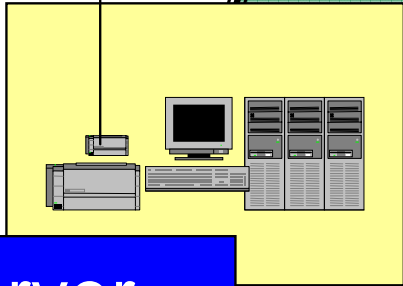
Every 1 hour



Monitoring Buoy

Server

Internet



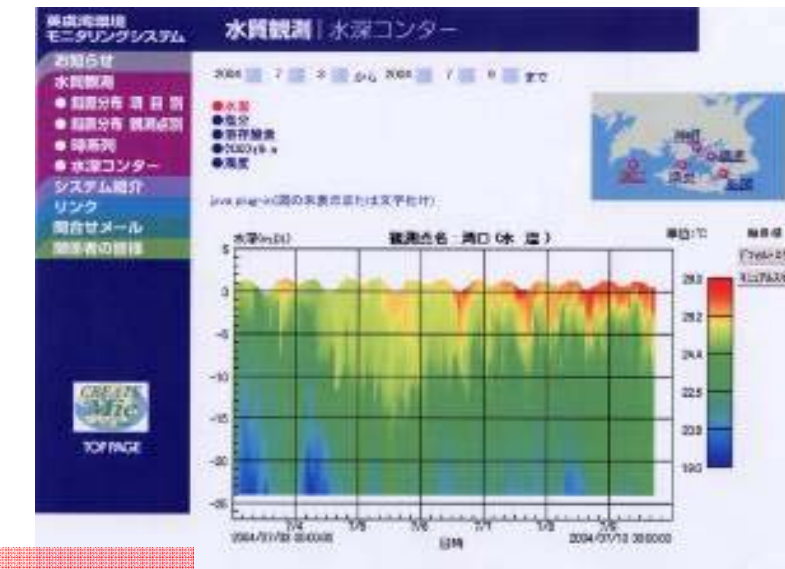
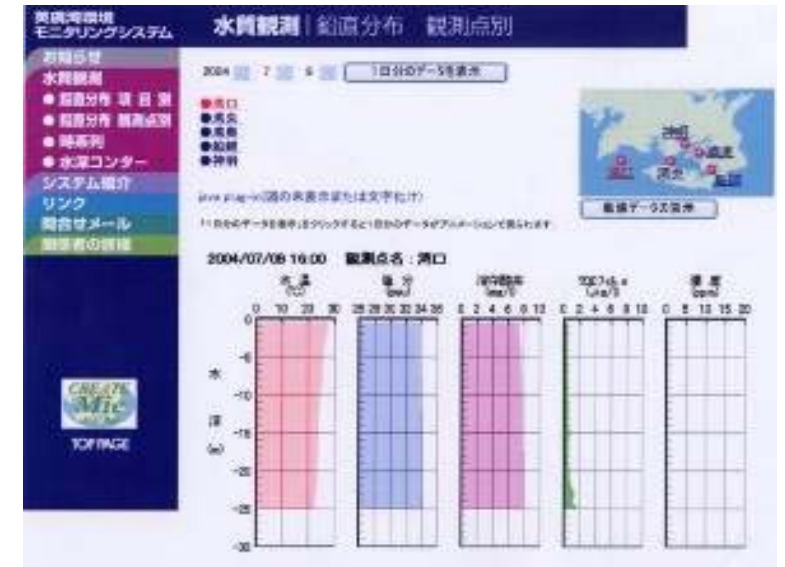
Measurement Item (from surface to bottom)
Water Temperature, Salinity, Dissolved Oxygen,
Chlorophyll, Turbidity, Water Current

<http://www.agobay.jp/agoweb/index.jsp>

Real time service

Internet System

Cellular Phone

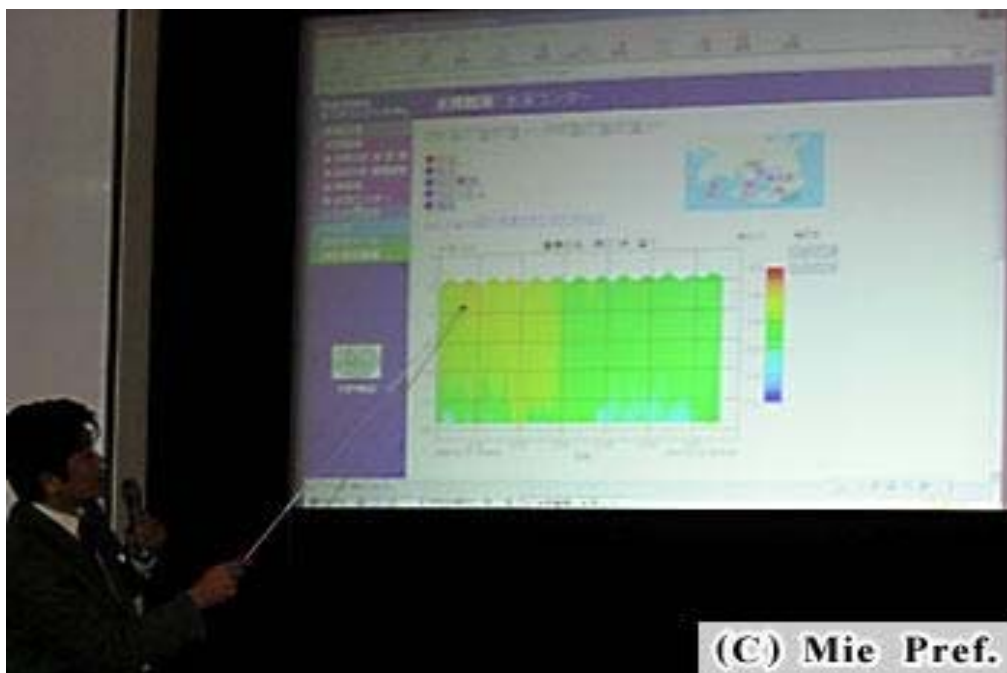


Ago Bay Environmental Dynamic Model



Forecast after 1 to 3 weeks

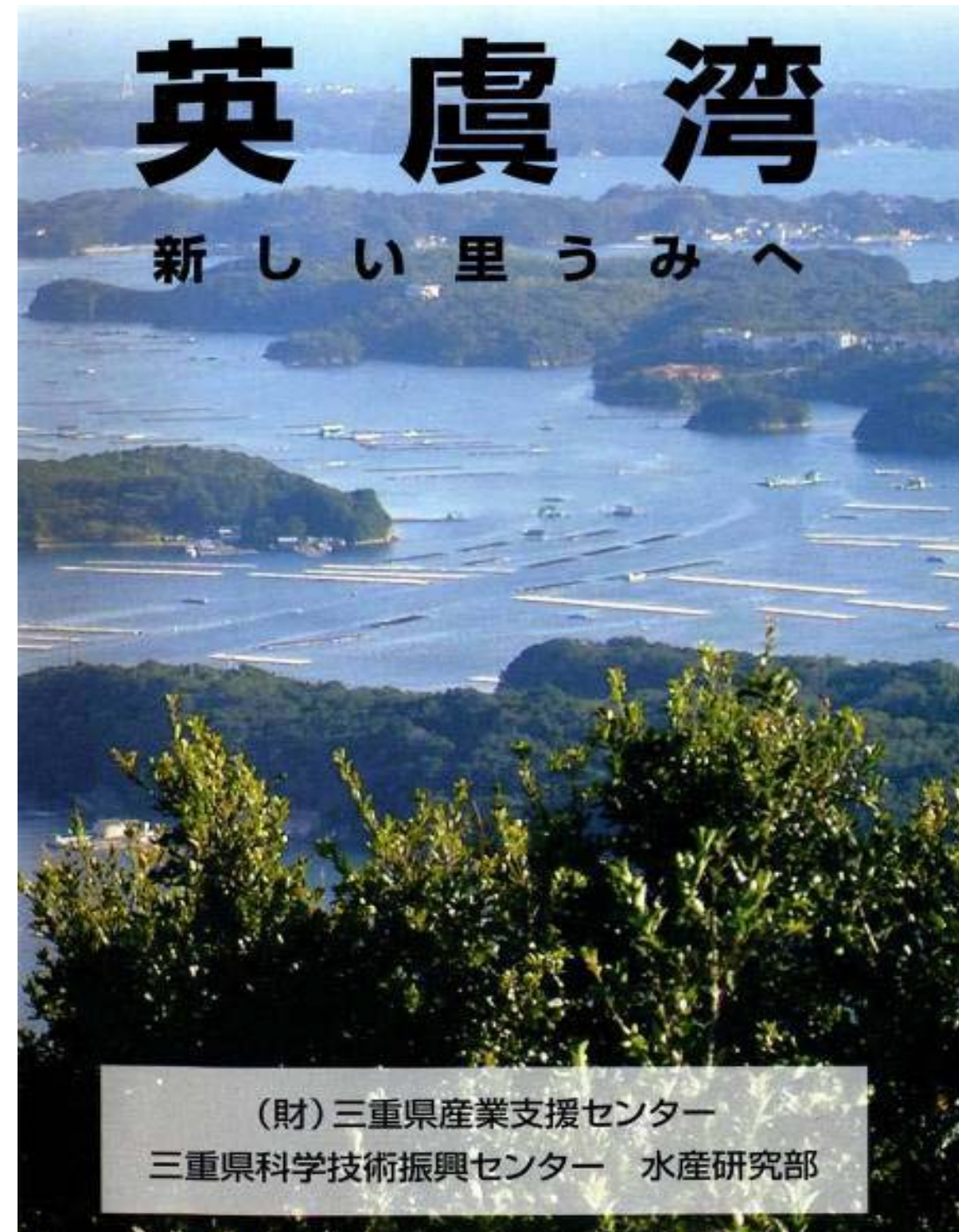
Training seminar of using monitoring system for fishermen and residents around Ago Bay



Seminar Held Every



Publish of Booklet





**Committee for the Promotion of
Nature Restoration in
Ago Bay from 2008
英虞湾自然再生協議会**

Committee for the Promotion of Nature Restoration in Ago Bay

Aim

This committee was established to improve the symbiotic relationship between Ago-Bay and the citizens through a natural restoration of a biologically rich and beautiful bay, which was famous for the cultured pearl and was the center of Ise-Shima National Park.

設立の目的

真珠のふるさとであり伊勢志摩国立公園の中心である豊かで美しい英虞湾の自然再生を通じ、英虞湾と市民との共生関係を再生していくことを目的に設立されました。



Committee for the Promotion of Nature Restoration in Ago Bay

Members

- Three groups of NPOs around Ago Bay
 - Fisherman Unions in Ago Bay (Fisheries, Pearl Oyster Culture)
 - Representatives of municipalities around Ago Bay
 - Several Fishermen
 - Staff of Shima City Office
 - Staff of Mie Prefectural Research Center in Ago Bay
 - Researchers of Mie University and Yokkaichi University
- Total of 25 groups and 8 individual members

メンバー

英虞湾周辺のNPO 3団体、漁業協同組合、真珠養殖漁業協同組合、地域の自治会代表者、漁業者、志摩市担当者、三重県水産研究所担当者、三重大・四日市大学の研究者 計 25団体 8人

Committee for the Promotion of Nature Restoration in Ago Bay

Objectives of the Committee

- 1 . Analysis of the current state and problems of Ago Bay, and seeking solutions
- 2 . Creating a network of restoration works which will be executed by the committee

検討課題

- 1 . 英虞湾の現状と課題、
また課題解決に向けた
方向性についての整理
- 2 . 委員が実施する自然
再生事業のネットワーク化



THANK YOU!

Please come to Ago Bay

