World BOSAI Forum 2017 in Sendai
TEAMS Session

Importance of Coastal eco-DRR which Promote Land-Ocean Interaction in Japan

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Coastal forest at *Tago-no-ura* by HOKUSAI (Traditional eco-DRR)

“Fish Breeding Forest”(*Uo-tsuki-rin*) of Japan has long history

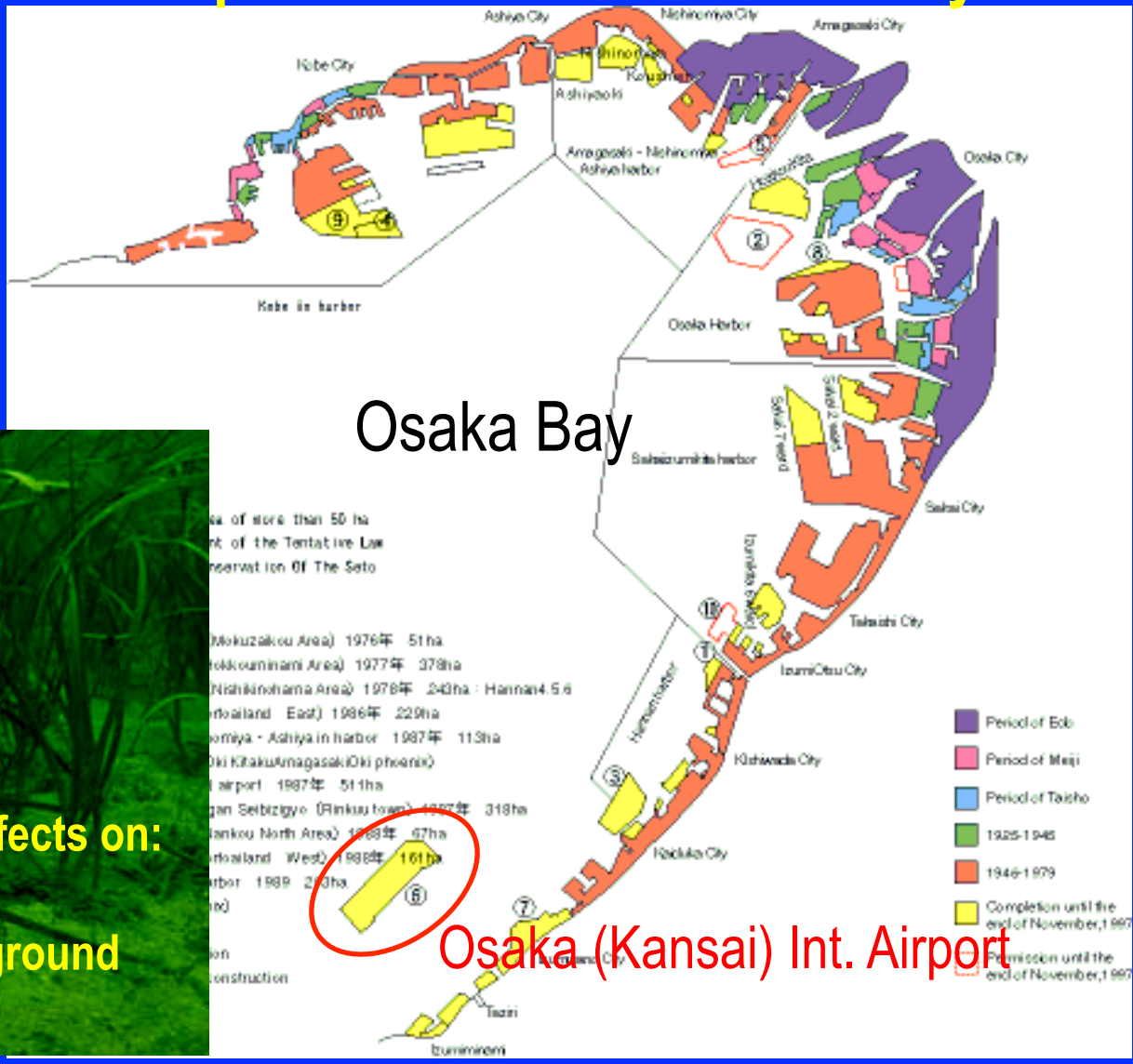
Present legal system of “Fish Breeding Forest” which conserves fish resources along coast is based on the law enacted in 1897.
About 60,000 ha of coastal forest are designated as F.B.F in Japan.

(Photo taken at Akou Coast, Hyogo prefecture)

Willow branch technology (*Ryu-shi-kou*) to prevent river bank erosion used to be very common in Japan (Traditional eco-DRR)

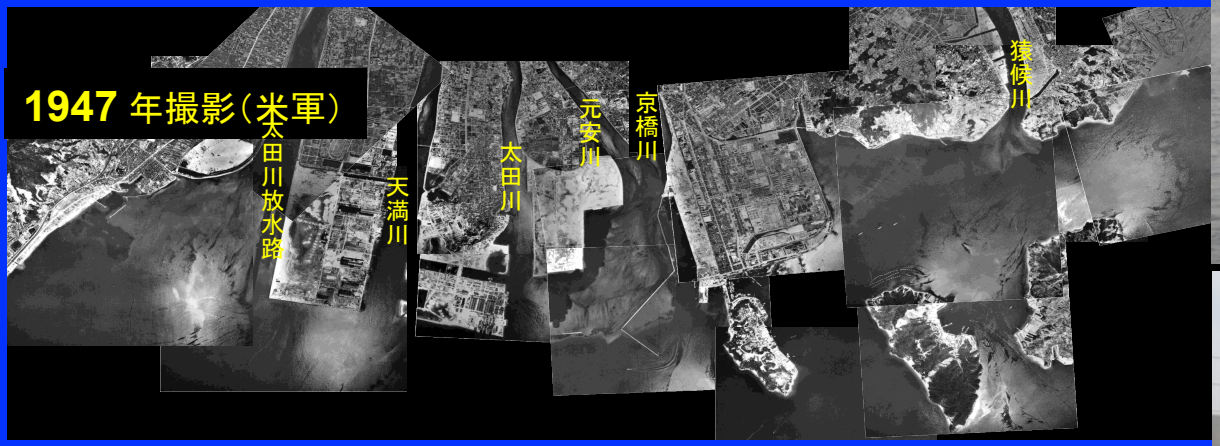
However, land based development of urban area entirely changed coastline

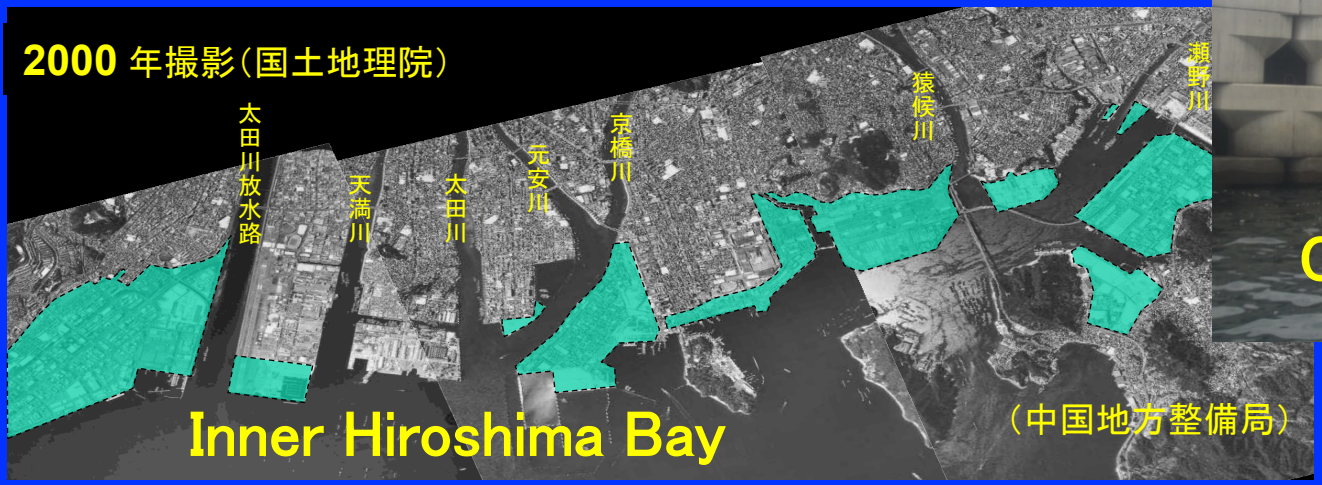
Water quality has been improved. However, ecosystem services by natural sea shore were seriously affected.



Tidal flats and sea grass beds disappeared. No natural shoreline at all.

Land reclamation and artificial coastline of urban area seriously affected function of shallow area (tidal flat & sea grass bed etc.) and also land-sea interactions





Non-eco-DRR

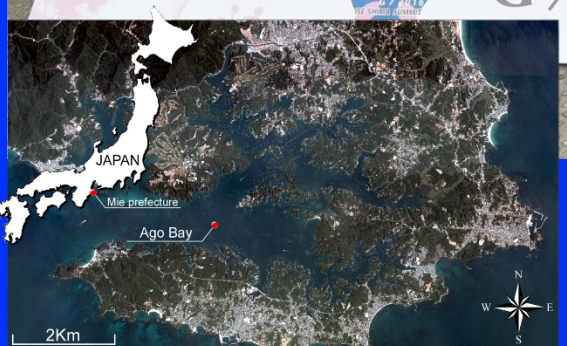
Introduction to the case of rural area:
Satoumi activity of Ago Bay in Shima City, Mie pref.

- *Satoumi* as a new concept of coastal management was first proposal by Prof. T. Yanagi in 1998.

- Outline of "*Satoumi*":

Satoumi is a coastal area where biological productivity and biological diversity has increased through human interaction (Ministry of the Environment).

Ago Bay of Shima City was the venue of G7 summit



Satoumi Promotion Section, Shima City:

Ago Bay at a glance looks very nice. However, there area many problems such as decreasing pearl production and fish catch.

Ago Bay Restoration Project: 2003-2007
Interdisciplinary study supported by JST and Mie Pref.
"Follow up" programs: 2008-

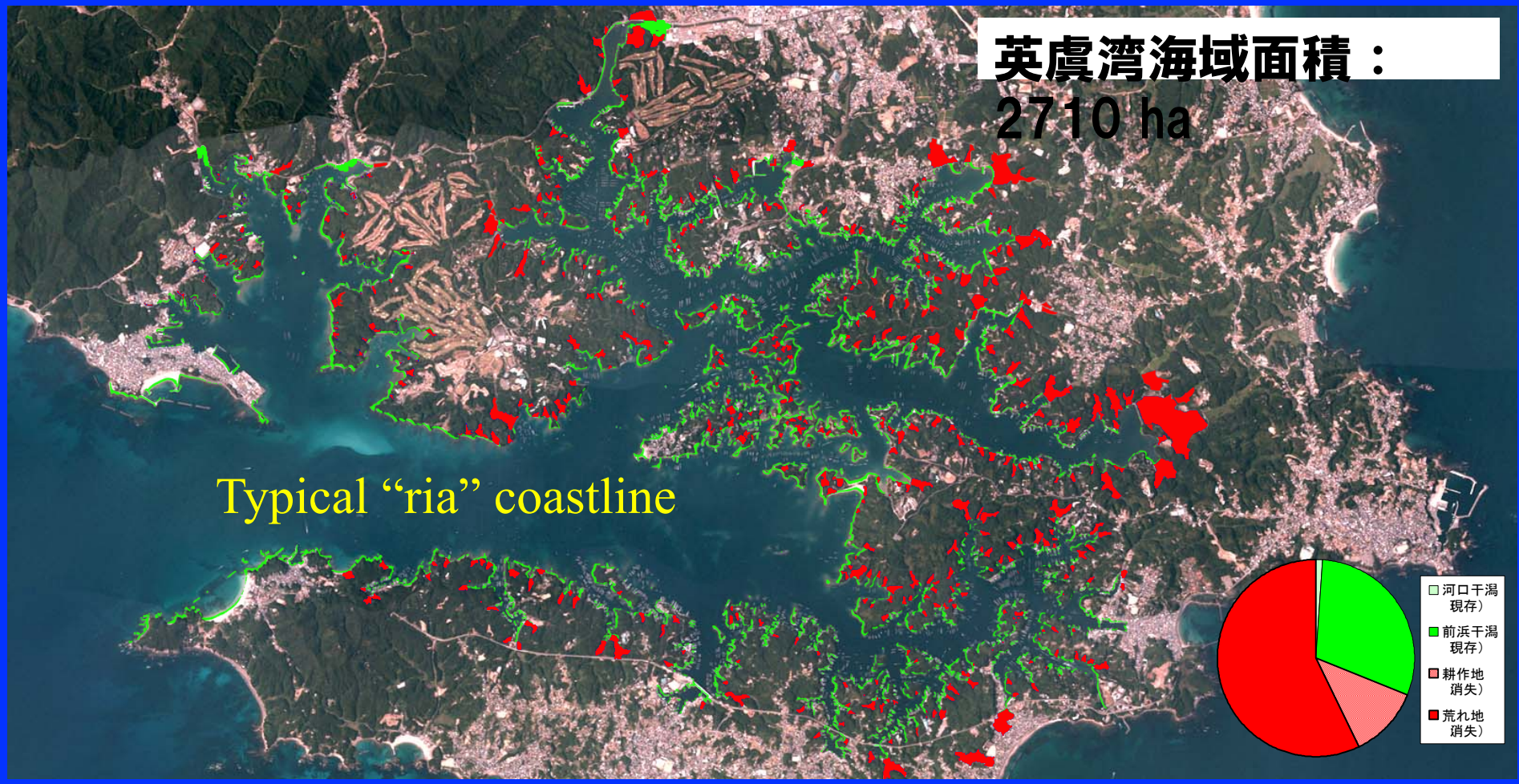
Acknowledgement: Dr. Hideki Kokubu,
Mie Fisheries Research Institute

Area of existing tidal flat and area of tidal flat historically lost

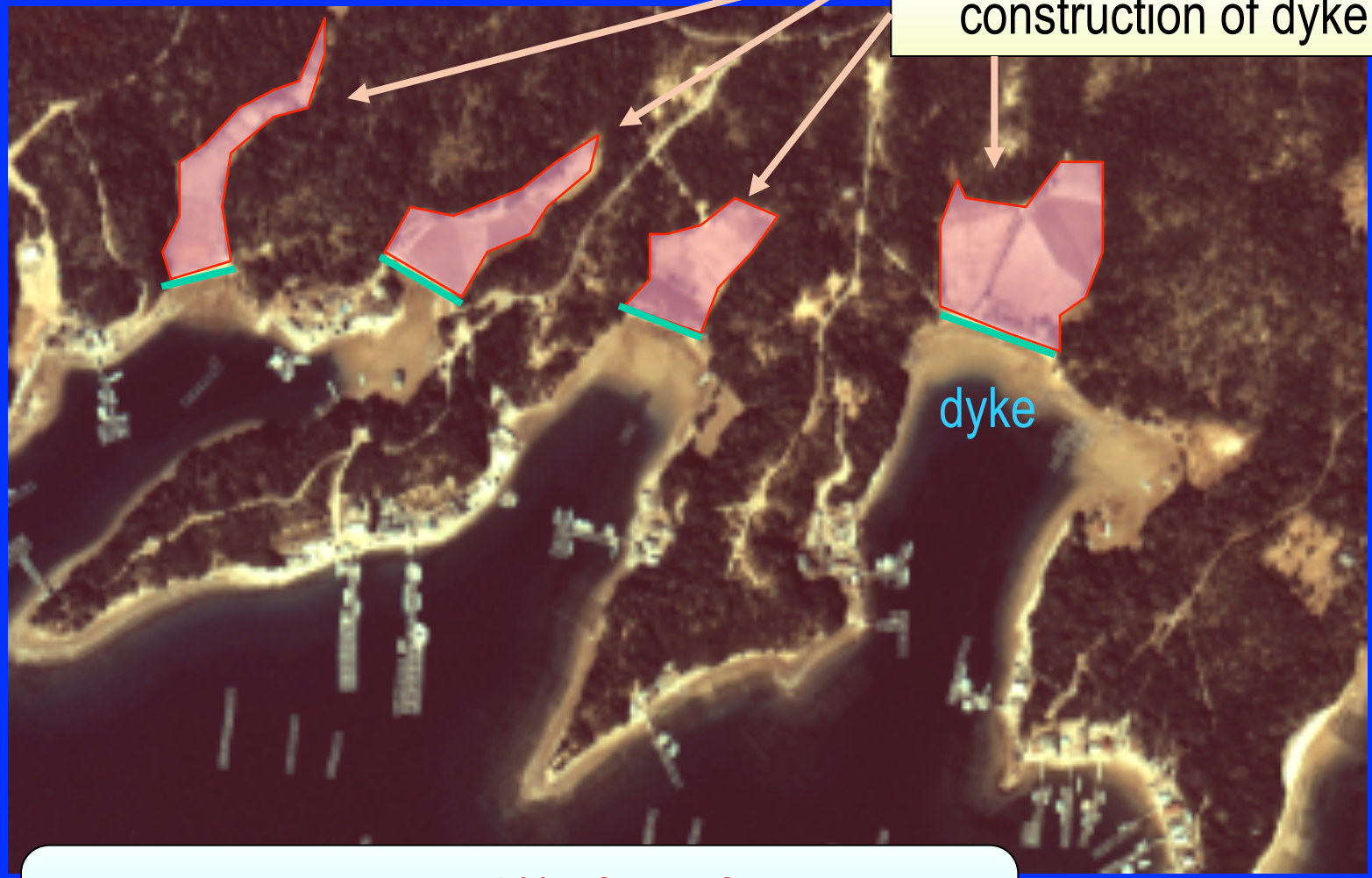
: existing 84 ha

: lost 185 ha

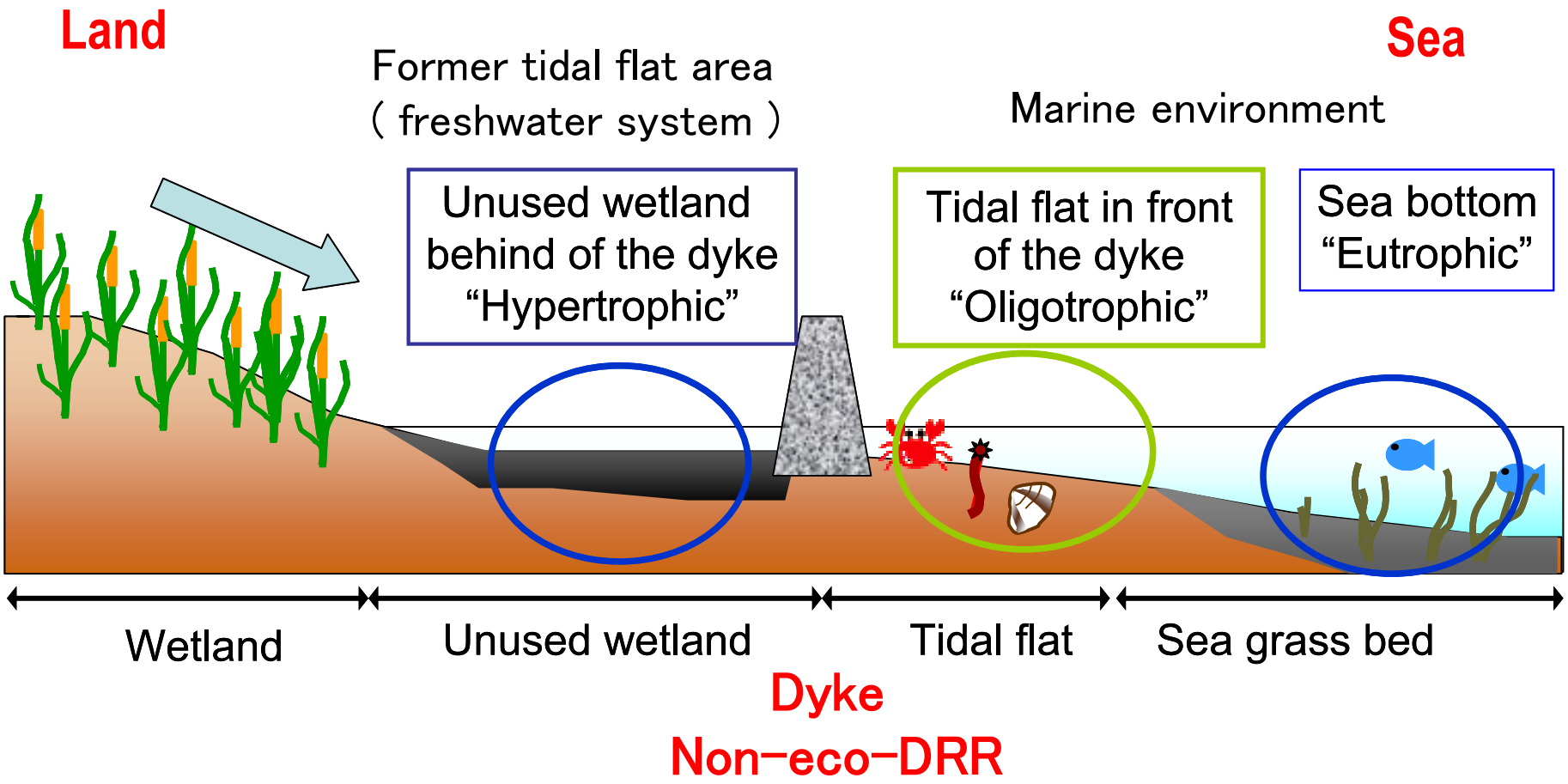
ca.70% of tidal flat has been already lost (indicated in red)



Reduction of Shallow Coastal Area



Approximately 70% of tidal flat area has been lost by coastal development



Schematic drawing of the characteristics of shallow area in Ago Bay.
Dyke prevented land-sea interaction and material circulation.
Artificial dyke gave negative effects to both sides of dyke.

The Situations around the Dyke

- Legal restriction
- Protection against disasters
- Ownership of the wetland

Very difficult to remove the dyke

New tidal flat restoration project with opening floodgate started in April., 2010

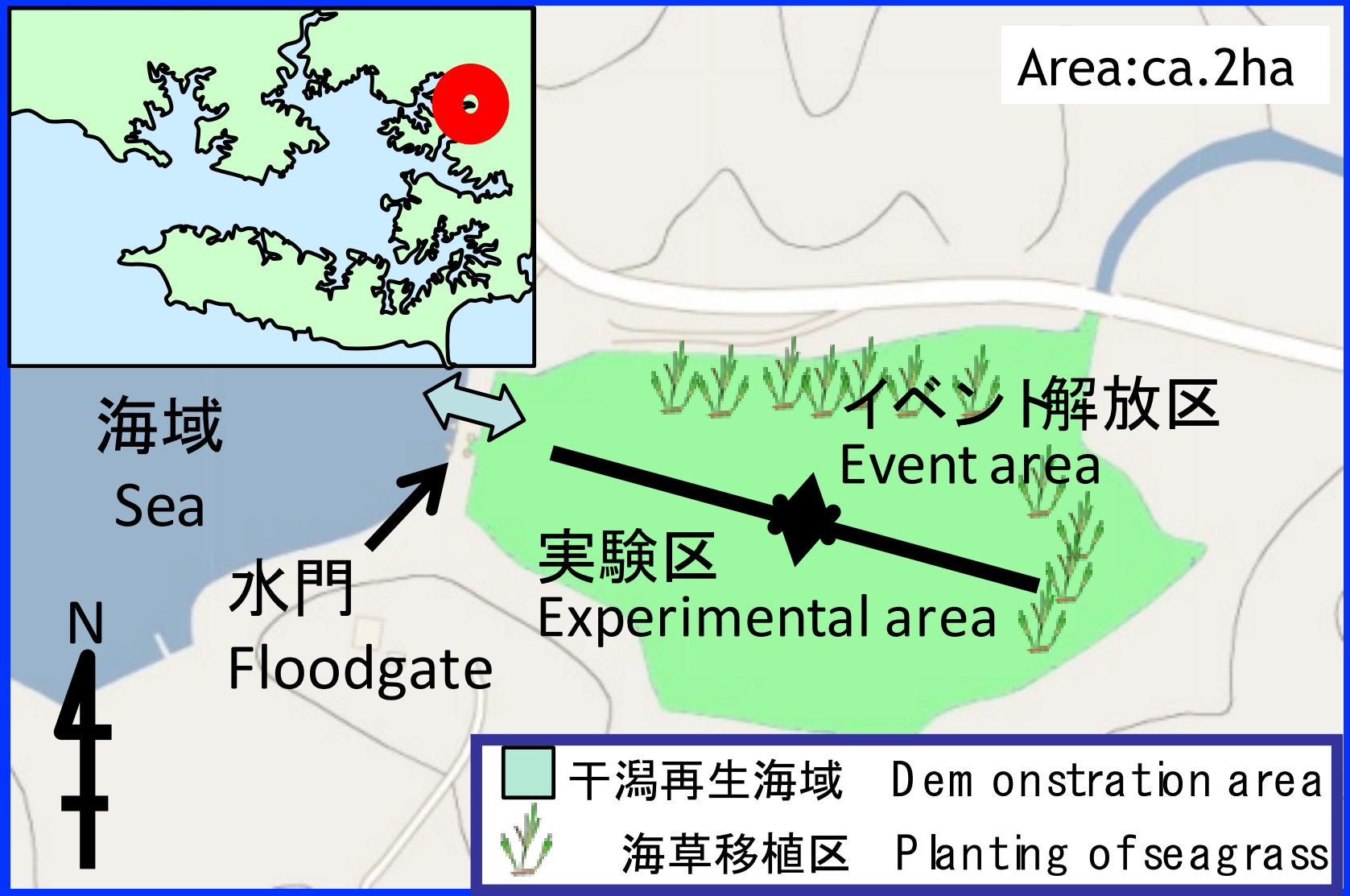
Improvement of small scale land-sea interaction in rural area

Floodgate on the concrete dyke

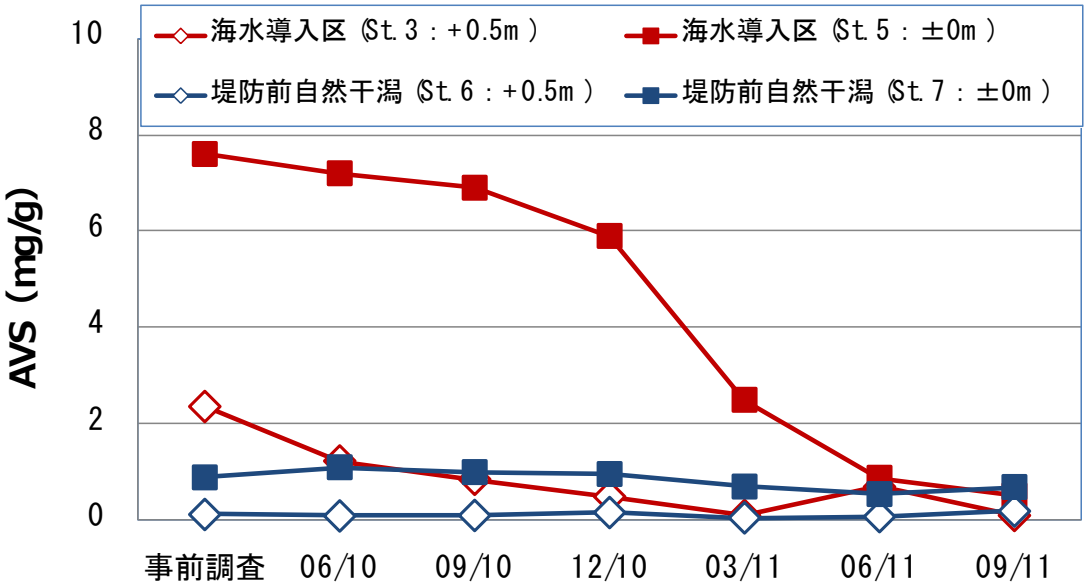
Introduction of natural tidal movement by opening the floodgate was made

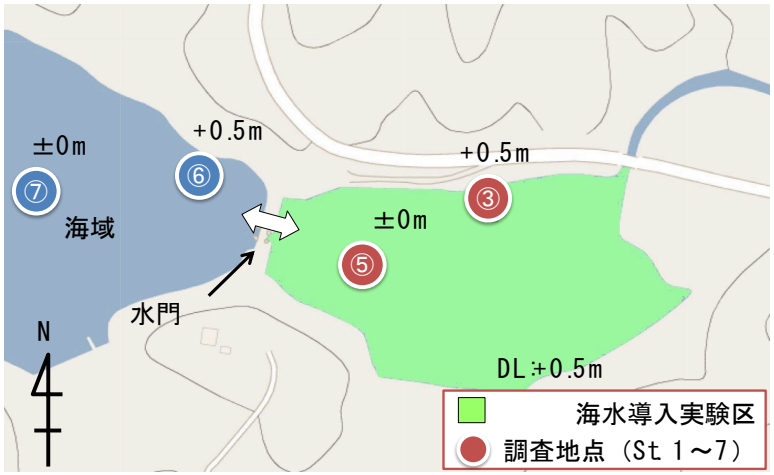
Now, this type of restoration is ongoing at 4 sites of Ago Bay.

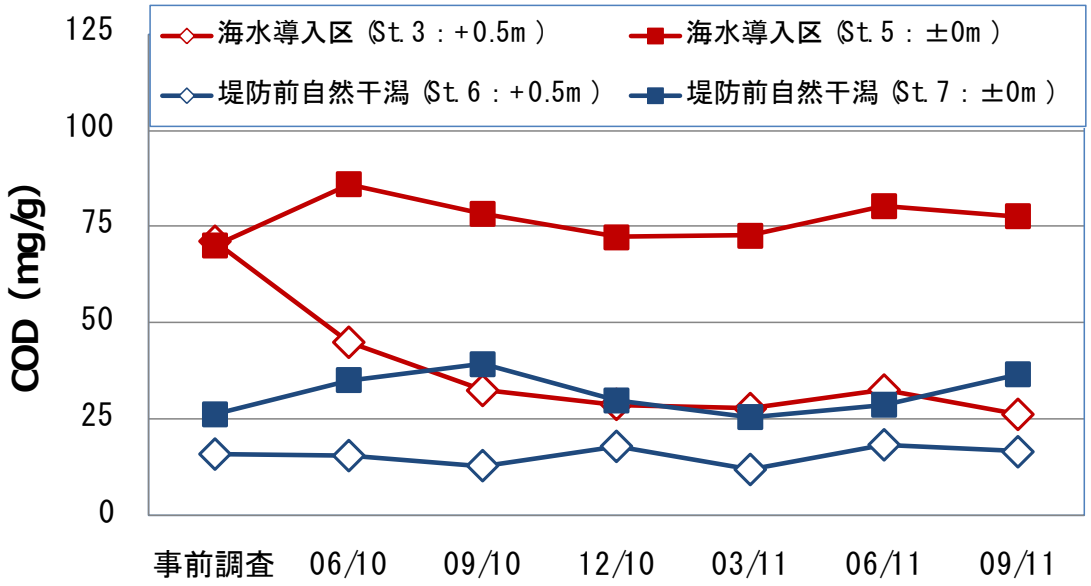
Outline of Tidal Flat Restoration Area at Ishibuchi



Change of Sediment Quality（AVS, COD）





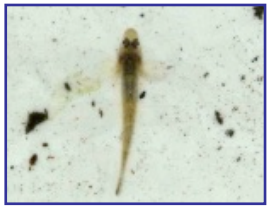


After introduction of sea water,
AVS and COD in sediment of affected station decreased.

Sediment quality improved. by promotion of water exchange

Changes of macrobenthos after water exchange

Benthic ecosystem restored (eco-DRR)



ハゼの稚魚
Goby

スズキの稚魚
Lateolabrax japonicus

アサリ
Ruditapes philippinarum

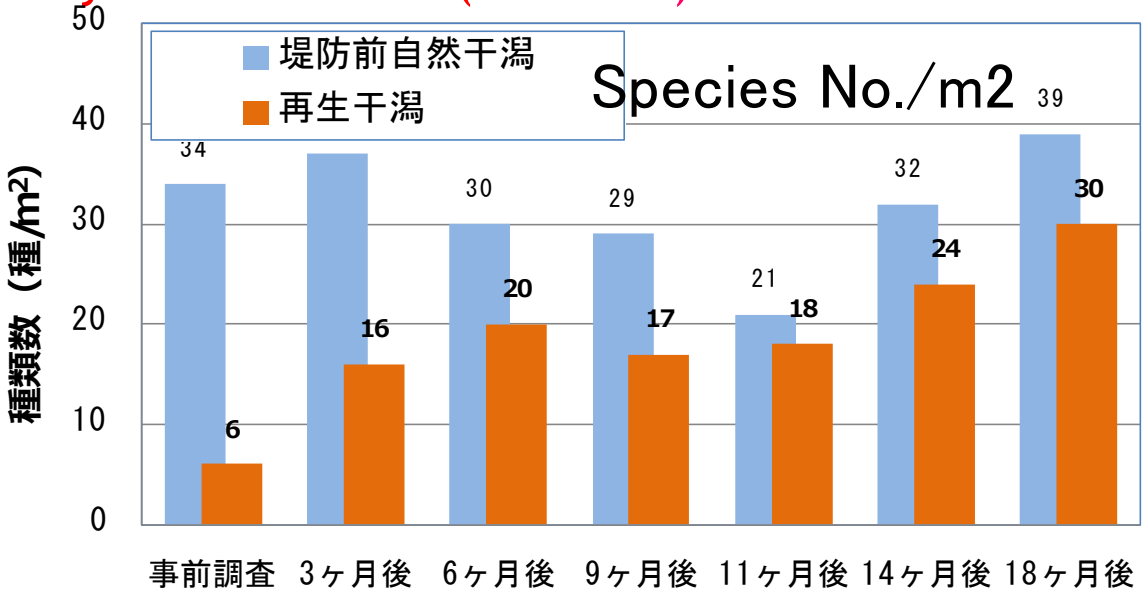
ソトオリガイ
Laternula marilina

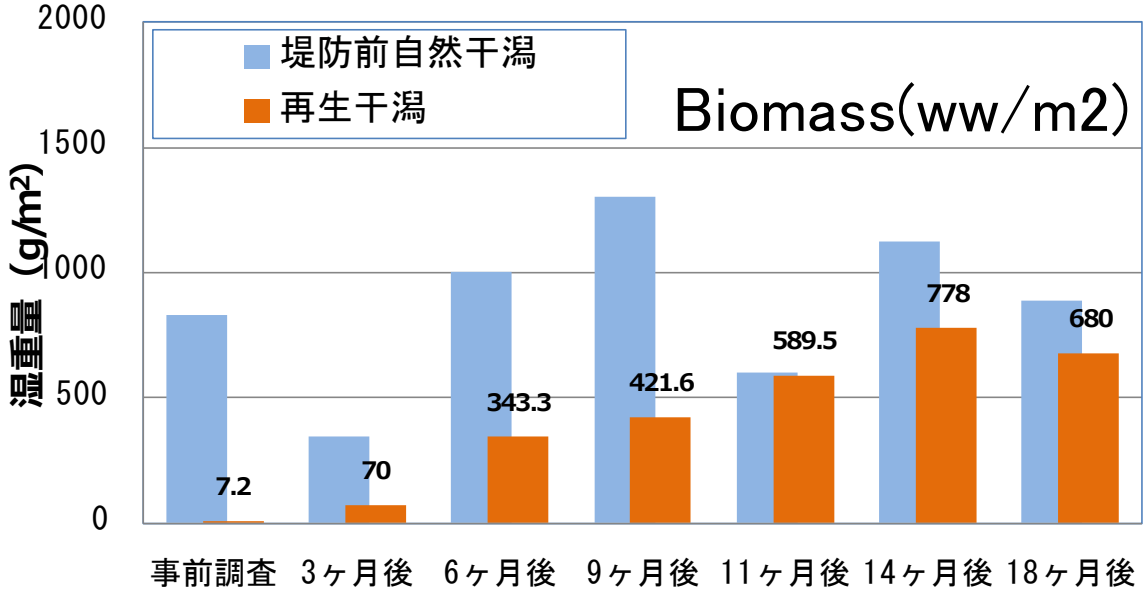
ボラの稚魚
Mugil cephalus

ケフサイソガニ
Hemigrapsus penicillatus

イオウハマグリ
Pitar sulfureum

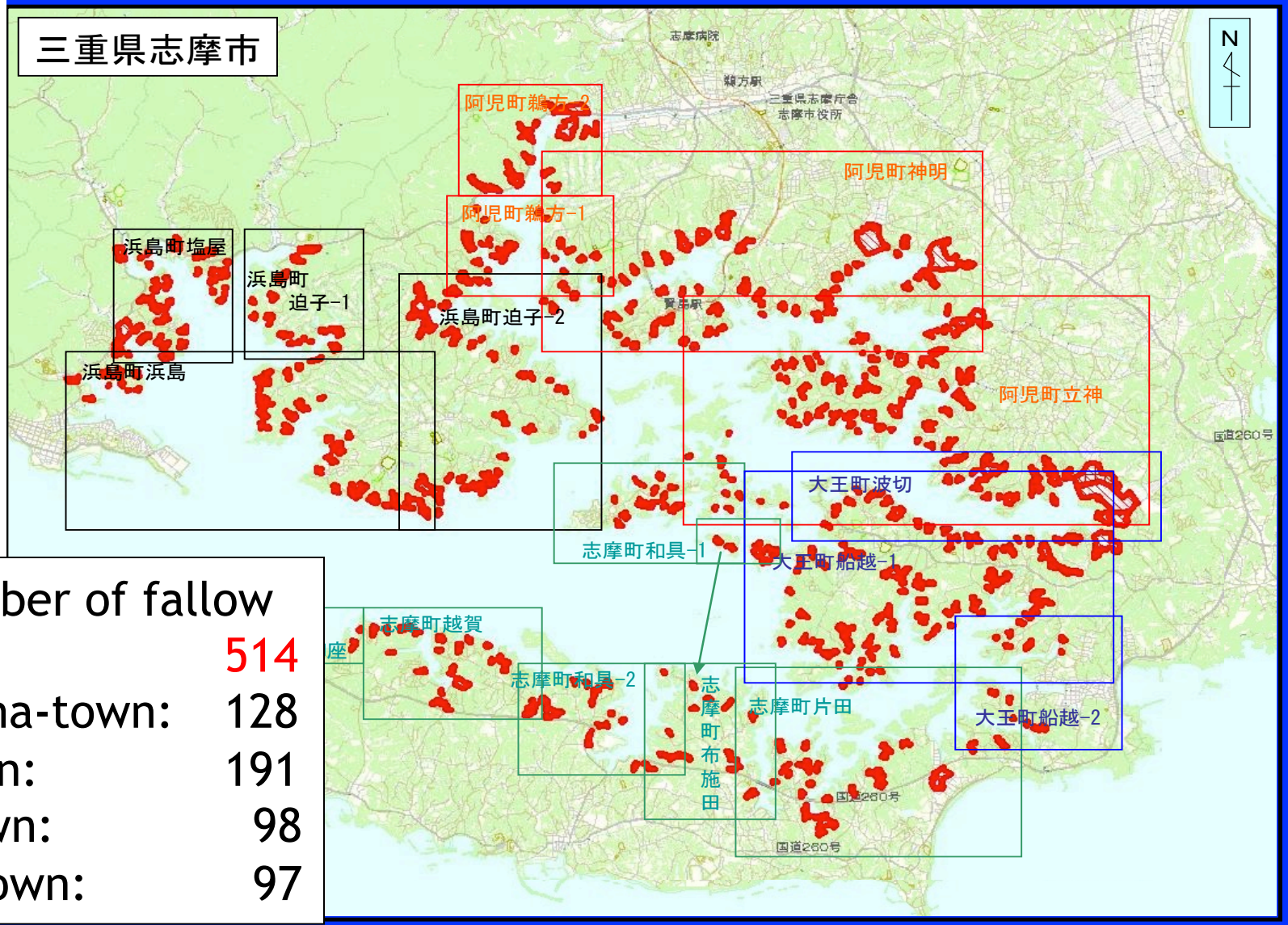
イボウミニナ
Batillaria zonalis





Future Possibilities: more than 500 candidate areas

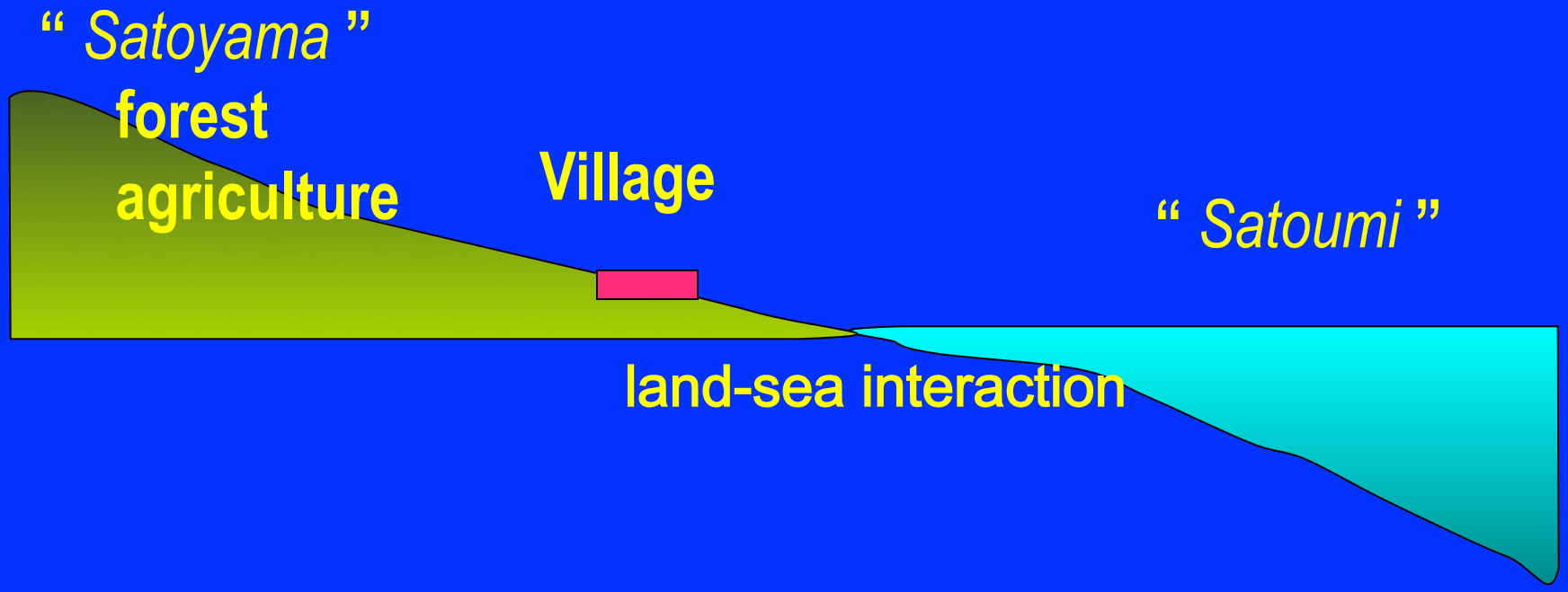
Restoration activities are expected to spread out all around Ago Bay.



Total number of fallow field : 514

- Hamajima-town: 128
- Ago-town: 191
- Daio-town: 98
- Shima-town: 97

Conceptual view of “ *Satoyama* ” and “ *Satoumi* ”



Combined restoration of “ *Satoyama* ” and “ *Satoumi* ” is more effective from the view point of material flow and land-sea interaction

Official Policy of Shima City

Basic Plan of *Satoumi* Creation, Basic ICM Plan, established by Shima City Government (2012. 3)

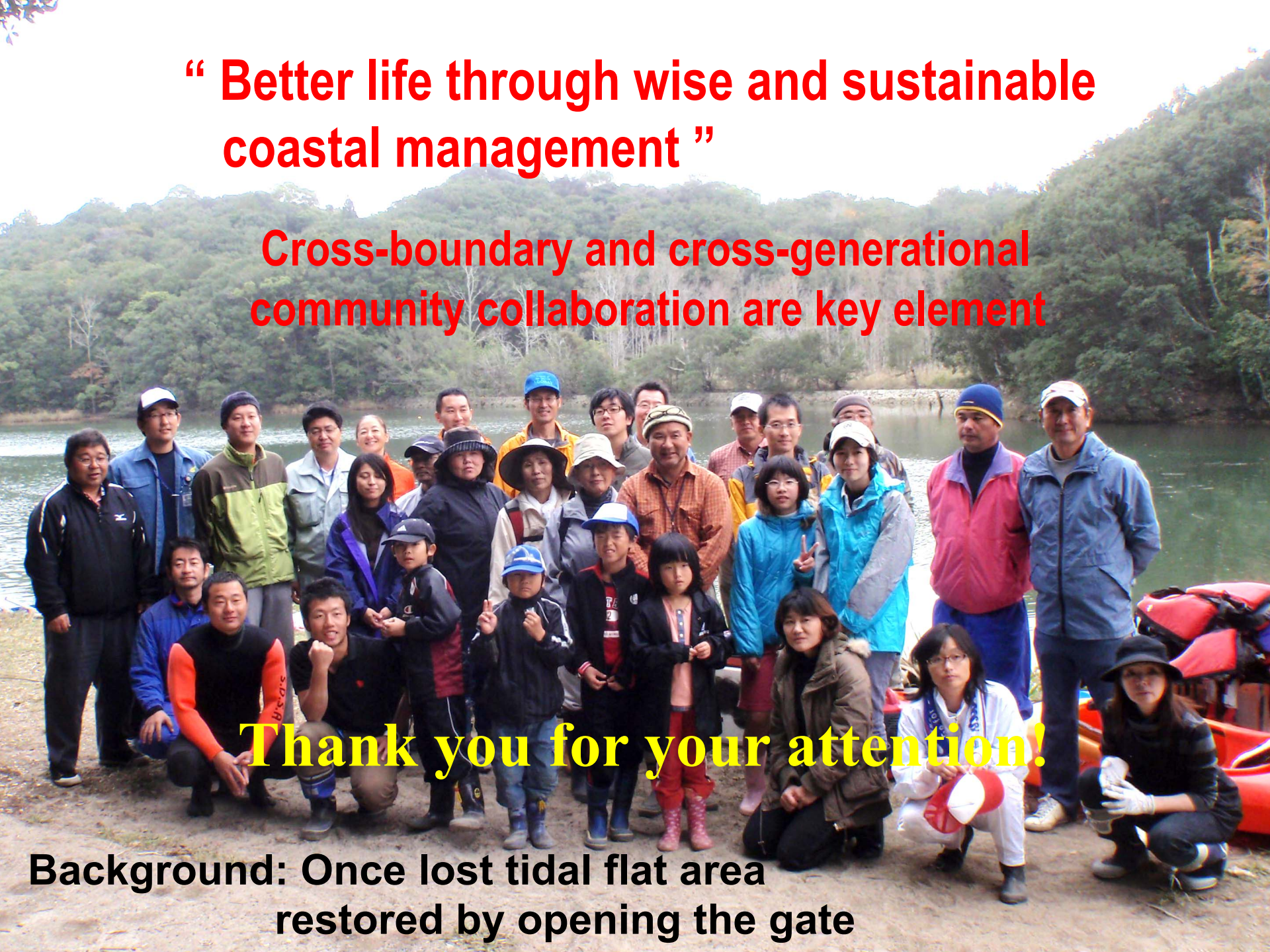
Satoumi Creation Committee with varieties of stakeholders officially started (2012. 8 -)

Public involvement is very important for restoration activities

Clam stocking and seagrass planting

Citizen's participation improved people-sea interaction

海草の移植　Seagrass planting


“ Better life through wise and sustainable coastal management ”
Cross-boundary and cross-generational community collaboration are key element
Thank you for your attention!
Background: Once lost tidal flat area restored by opening the gate