

Facilitation of Environmental Conservation and Sustainable Development by ICM:

- Lessons Learnt in Japanese Coasts of Urban and Countries

Network of Nature, Network of People

Dr. Keita Furukawa, Ocean Policy Research Institute, SPF
 Center for Oceanic Studies and Integrated Education, YNU

1

Paradime Shift: Free Access to Management

Protection of National Interests



Harry S. Truman

Proclamation (1945)

- Policy of the US with Respect to the Natural Resources of the Subsoil and Sea Bed of the Continental Shelf

United Nations Conference on the Human Environment: 1972

UNCLOS

- 1st Phase (1958) : Territorial Water, High Sea
 Continental Shelf, Fisheries, Living Resources
- 2nd Phase (1960) : n.a. 6NM Territorial Water, Fisheries Area
- 3rd Phase (1973~82) : UNCLOS

Global Environment Conservation



Elisabeth Mann Borgese

Preliminary Draft of a World Constitution (1948)

- Land, Water, Air and Energy as Common Heritage of Mankind

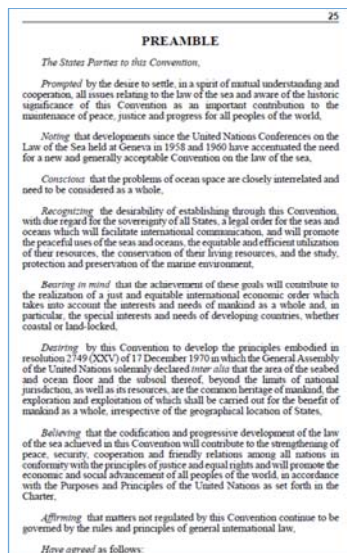
Pacem in Maribus: 1970~2013
 International Ocean Institute: 1972~
 UNICPOLOS : 2000~
 The Oceanic Circle: 1998



2

UN Convention on the Low of the Sea (UNCLOS)

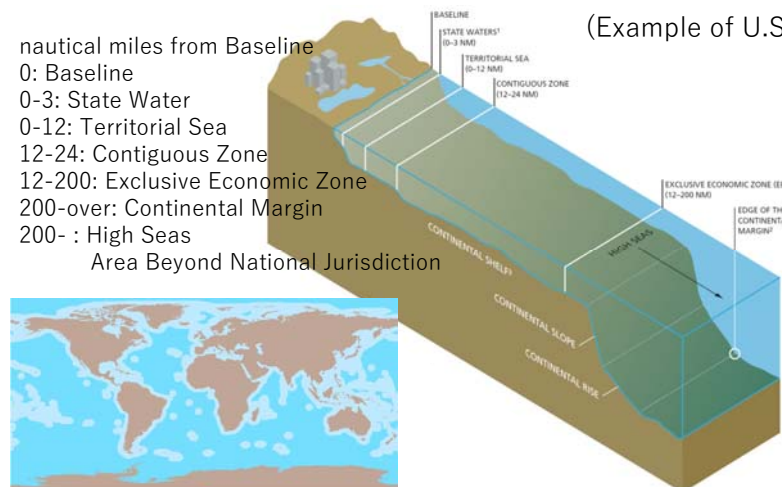
(Adoption: 1982, Enacted: 1994)



3

Ocean and Coasts (Legislation)

(Example of U.S.)

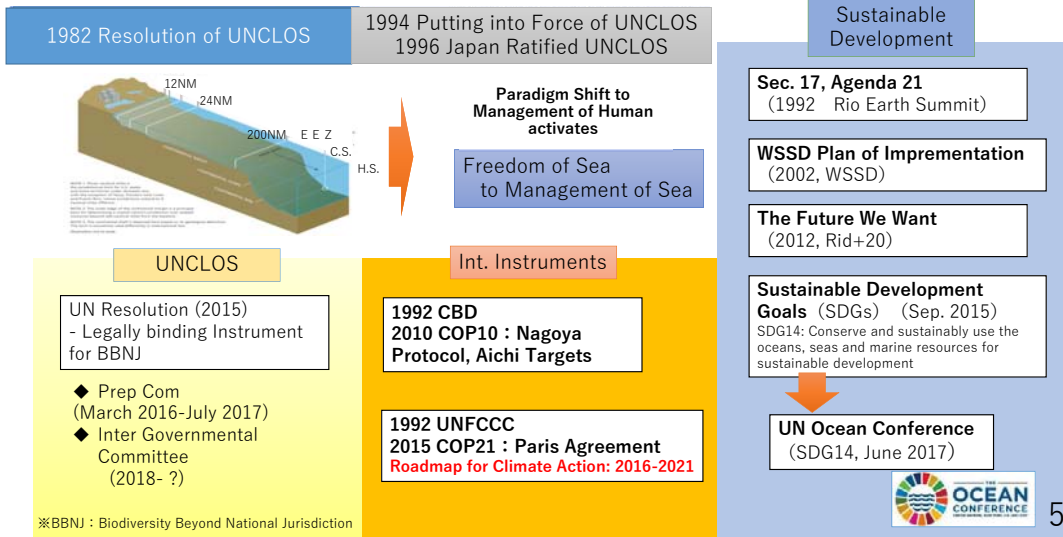


<http://www.seaaroundus.org/>

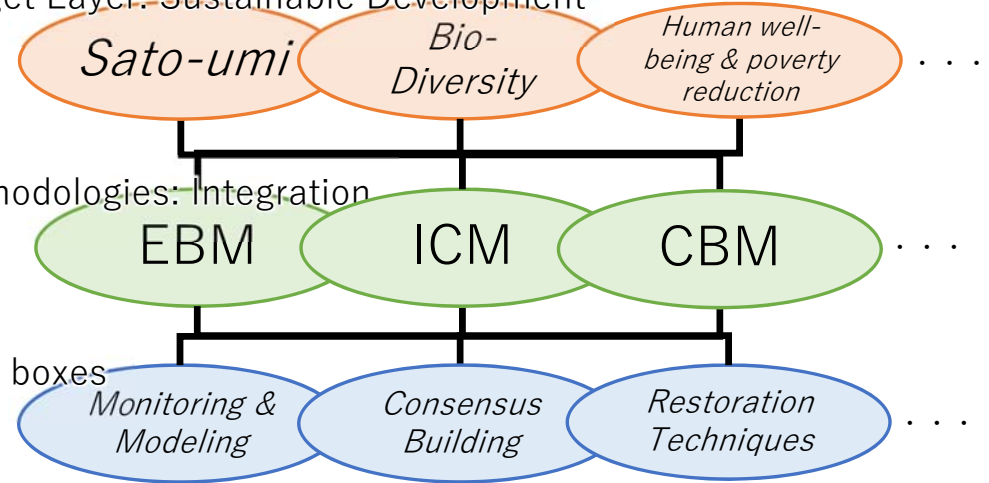
An Ocean Blueprint for the 21st Century Final Report of the U.S. Commission on Ocean Policy

4

UNCLOS, Instruments and Sustainable Development



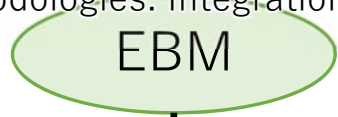
Target Layer: Sustainable Development



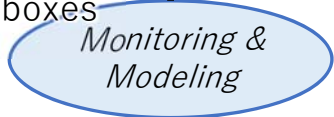
Target Layer: Sustainable Development



Methodologies: Integration



Tool boxes



Ecosystem Based Management

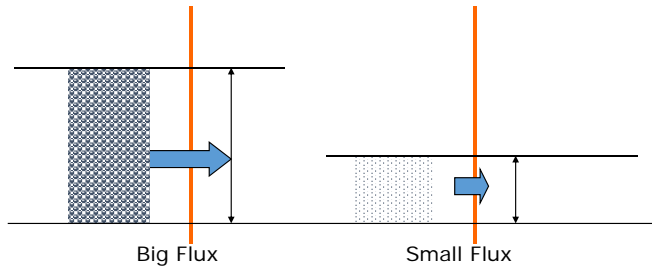
☆Ecosystem Classification by Material Flux

☆Sediment Flux in Coastal Zone

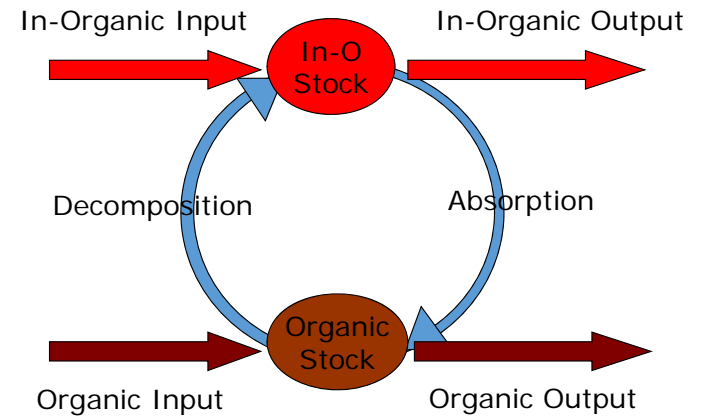
Movement of Material: Flux



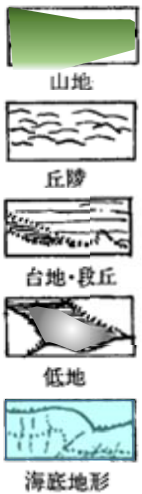
- Flux = Discharge x Concentration
- Discharge = Velocity x Depth x Width



Flux and Stock of Ecosystem



(d) 20th Centuries



Tokyo Bay as a "River"



After Kaizuka (1993)

Origin of Sectorial Management and its Development in Japan a. Pre Edo era (up to 1868)

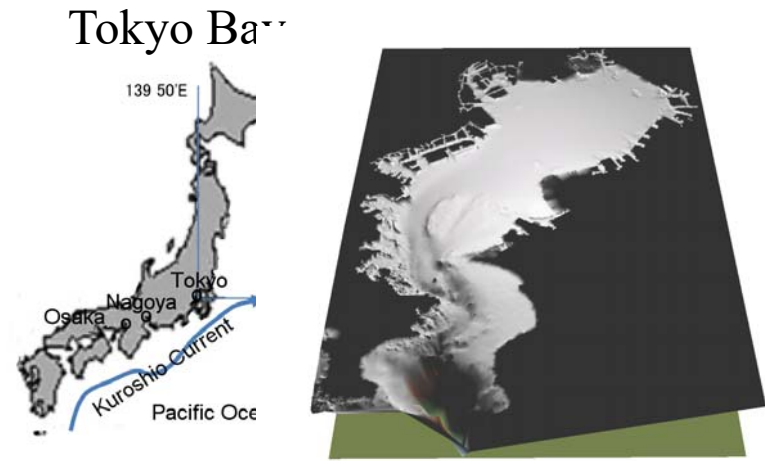
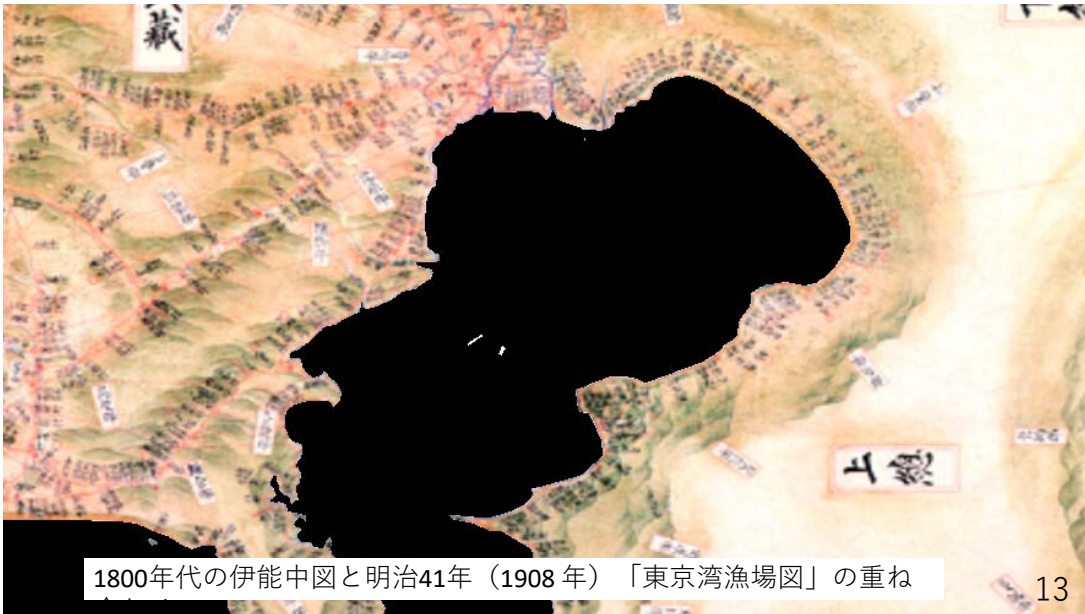
• Fisheries Management

- Development of coastal fisheries makes conflicts between fishing village and fishermen on use of fishing grounds.
- *Iso Netsuki, Oki ha Irai* (1742): Government made public announcement to allow free access to offshore (*Oki*) fishing ground, while coastal shore (*Iso*) and its resources were exclusively used by local village
- Conflicts were not able to eradicate by the announcement. Furthermore, development of new fishing techniques and evolution of fisheries made new conflicts.
- Japanese fisheries yield to maximum productivities of coastal area with no-engine-equipped small scale boats in Edo.



Fisheries in Edo Bay (Kanagawa Univ.)

Kisugi (2015)



50 km x 20 km of surface, 15 m depth, Open to Pacific Ocean
7,500 km², 26 Coastal cities, 26 million people, 1/3 industries

Tokyo Bay at Present

- Center for Economic Activities



from "100 sceneries of Tokyo Bay", Kanto Regional Construction

Tokyo Bay at Present

- Hub of Waterborne Transport



from "100 sceneries of Tokyo Bay", Kanto Regional Construction

Tokyo Bay at Present

- Human Use and Conservation of Nature



from "100 sceneries of Tokyo Bay", Kanto Regional Construction

Environmental Hazards of Tokyo Bay

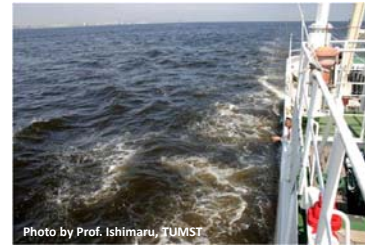


Photo by Prof. Ishimaru, TUMST
Red tide (Algal bloom)



Photo by KRT, MLIT
Blue tide (Anoxic Water Upwelling)



Photo by Mizuo, Yokohama City Institute for Env. Res.
Fish Kill on 2003 (due to Anoxic Water)



Tokyo Bay Renaissance Project

Tokyo Bay as Friendly, Beautiful, Rich Habitat and Comfort Play ground

Conference (Decision Making)

2003-2012
10 years plan

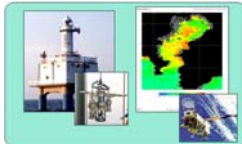
Organizing Committee

Organizations:
National Gov., MLIT, JCG, FA, MOE etc.
Local Gov. 9 Cities and Prefectures

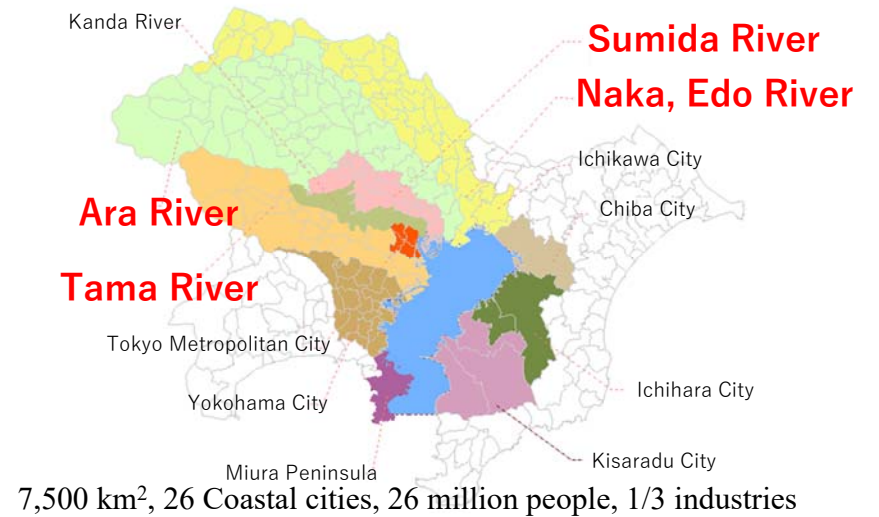
Land WG

Sea WG

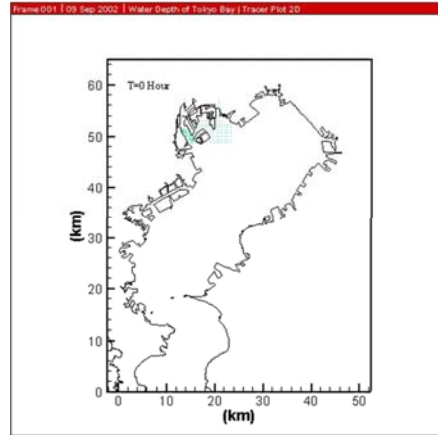
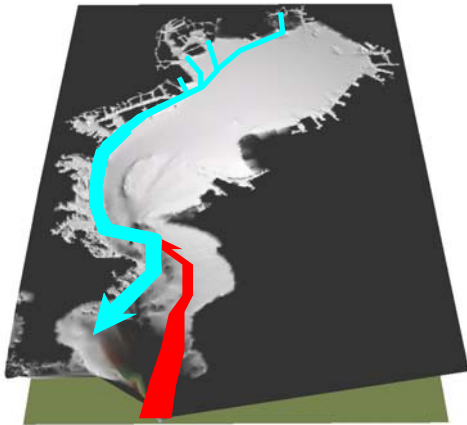
Monitoring WG



Tokyo Bay watershed

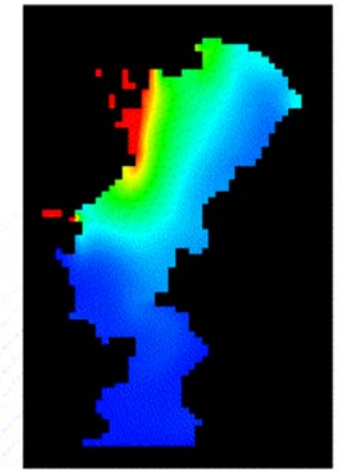
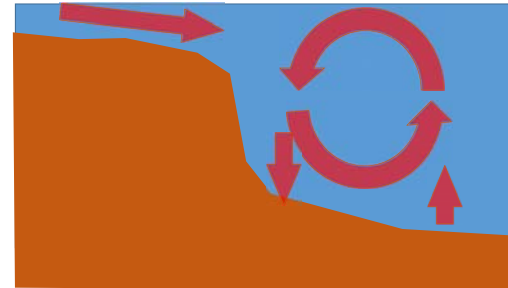


Physical Network: Water Circulation



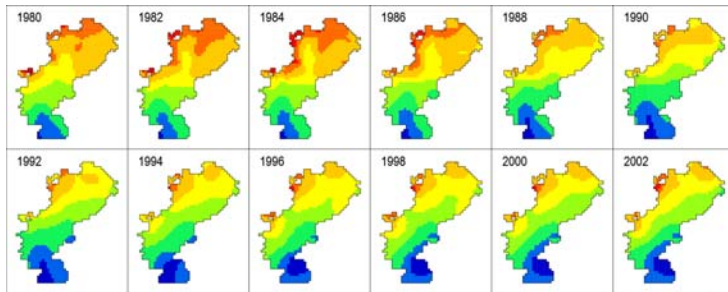
<http://www.nilim.go.jp> Nakayama (2003)

Physical & Biological Network

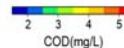


<http://www.aist.go.jp/NIRE/~eco-model/eco/>
 0 1000 2000 3000 4000
 chl a (mgC/m³)

Physical & Chemical Network

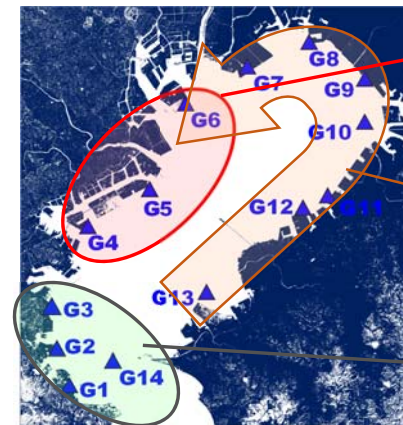


Long term trend of COD (surface layer)



H. Ando (2004), Tokyo Environment Institute

Biological Network: Sessile



Poor Biodiversity

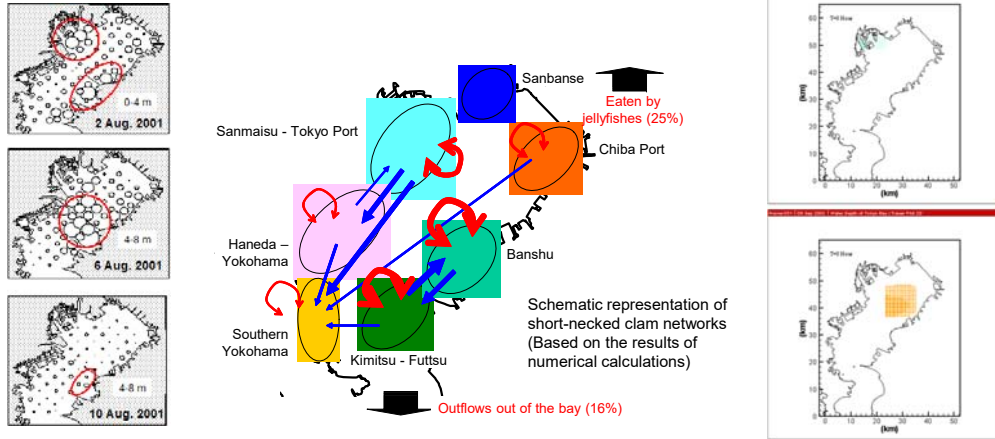
Decrease Biodiversity Counter Clockwise

Rich Biodiversity

Sessile Distribution

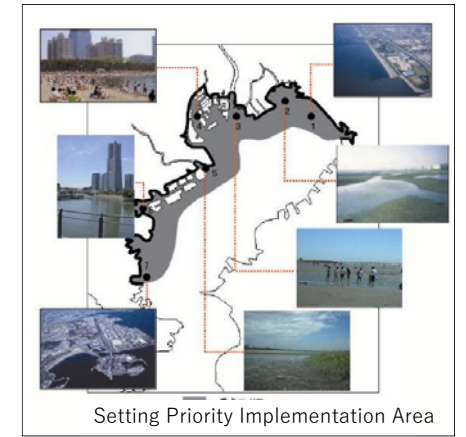
Igarashi & Furukawa (2006)

Ecosystem Network: Short-Necked Clam

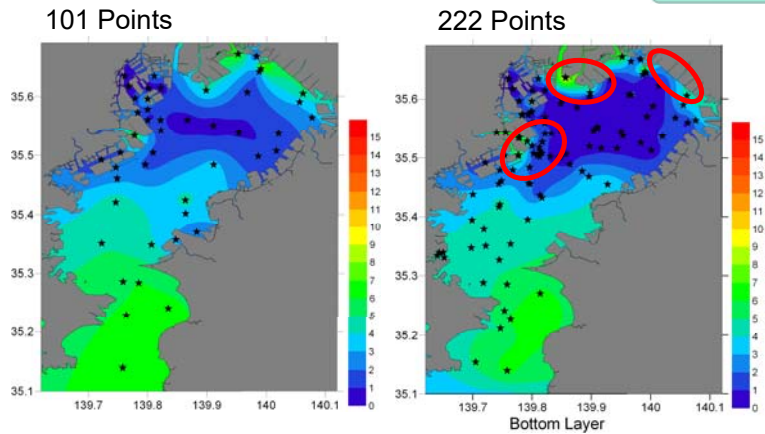
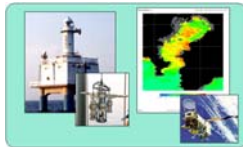


Hinata et.al (2000) 25

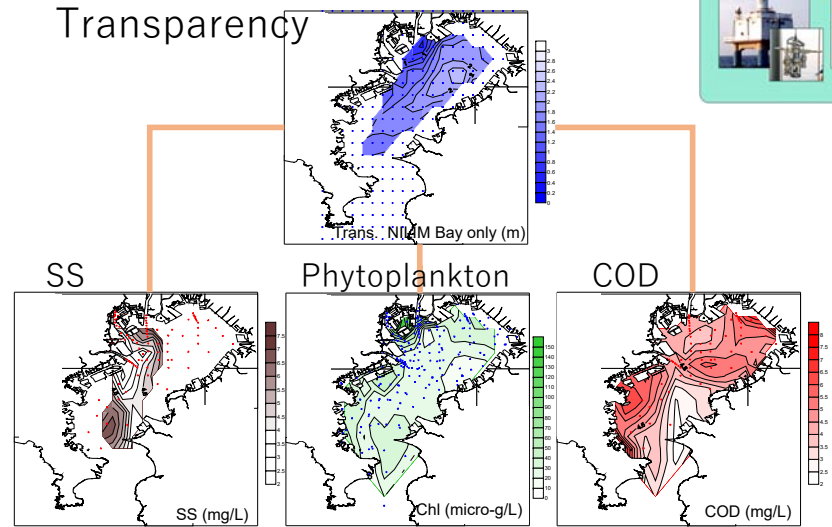
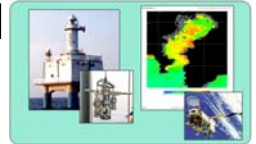
WG2: Sea



WG3: Monitoring



WG3: Monitoring



Targeting;

Integration of human-being and coastal environment (ICM)

considering;

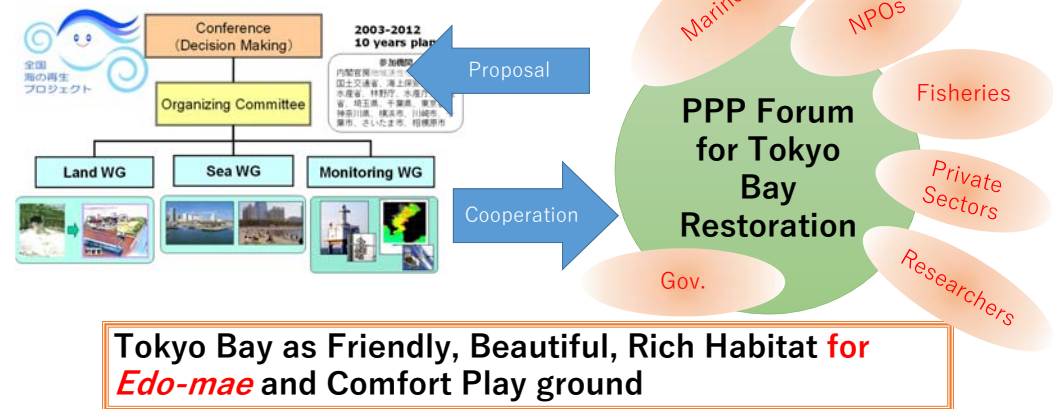
- 1) Monitoring visible indicator with various stake holders
- 2) Create and maintain habitat of benthos, sessile and fish larvae by ecosystem approach, and
- 3) Establishment of public participation mechanisms.



Revision of the Action plan on June 2013

Tokyo Bay Renaissance Project

The 2nd Phase



Preliminary attempt of habitat census for goby with public participation



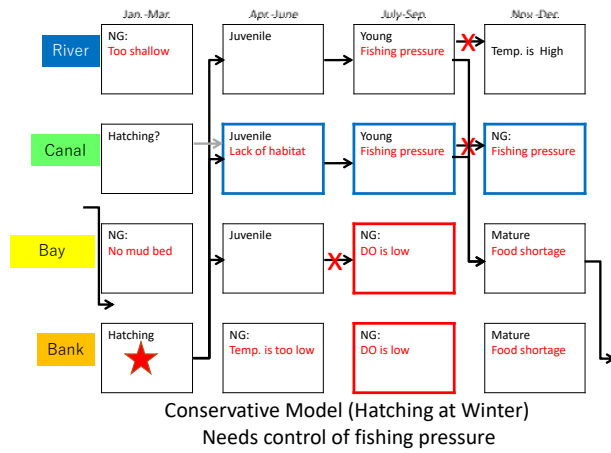
Preliminary attempt of habitat census for goby with public participation



Preliminary attempt of habitat census for goby with public participation



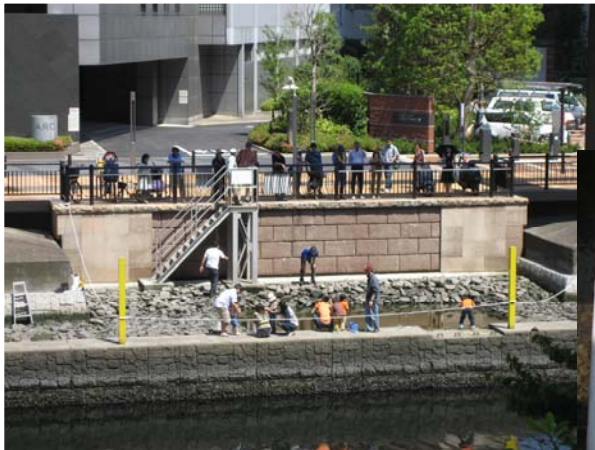
Missing Link?



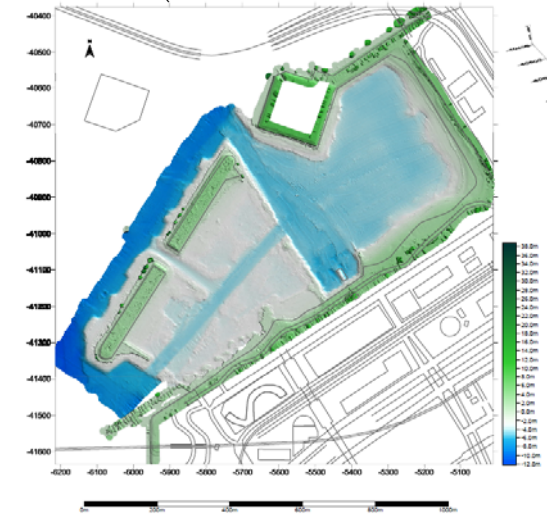
Preliminary attempt of habitat census for goby with public participation



Urban wetland restoration (Shibaura Island)



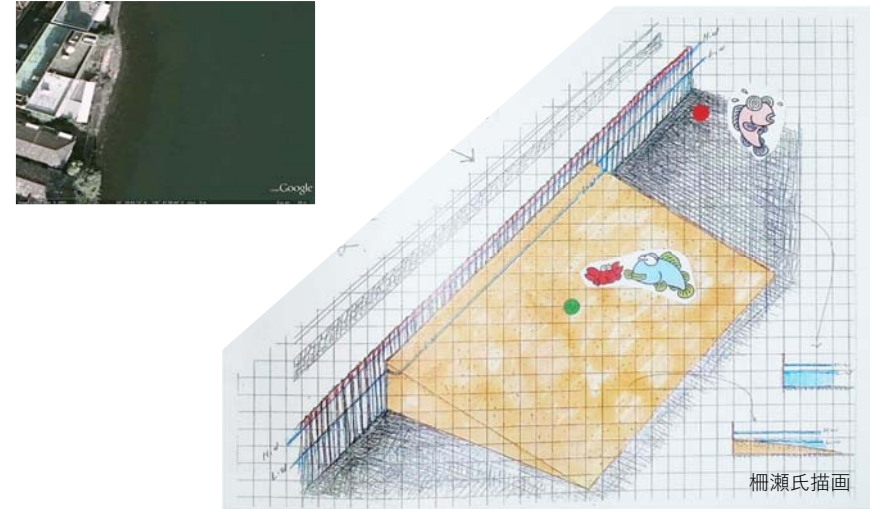
Urban wetland restoration (Odaiba Sea Side Park)



Urban wetland restoration (*Asashio* Canal)



Urban wetland restoration (*Asashio* Canal)



Lesson 1: Net Work of Nature

- Habitat Creation with Life Stage
 - Shallows for Larvae
 - Sand for Young
 - Deep and Mud for Adult
- Beneficial Use of Structure
- Management among different use
- Integration and Cooperation

