

# Sustainable Management of Tokyo Bay

Keita Furukawa Dr.(Eng.)

# Tokyo Bay at a Glance (Part 1:Development)

## History of Development, Environmental Degradation and Its Recovery

- Geological Development and Ecosystems
  - Geological Development
  - Tidal flat (dynamics, foods, Dottari)
  - Seagrass meadows (ecosystem services)
  - Ecosystem Services / ICM / Sato-umi
- History of Tokyo Bay & Edo as a typical coastal city
  - River management (water supply, flood control)
  - Transportation (importance of sea lane, canal, port and Kashi)
  - Swage system
  - Garbage management system (collection, transportation, reclamation)
  - Edo-mae / fisheries management (Iso-netsuke, Oki-iriai)
  - Security / Daiba, Kaiho
  - Leisure: Duck ponds / Hama-rikyu, Shinhama-ko
- Development and Conservation
  - Port construction
  - Reclamation / Chuou-bouhatei
  - Pollution control / TDL management by MOE
  - Tokyo Bay Renaissance Project

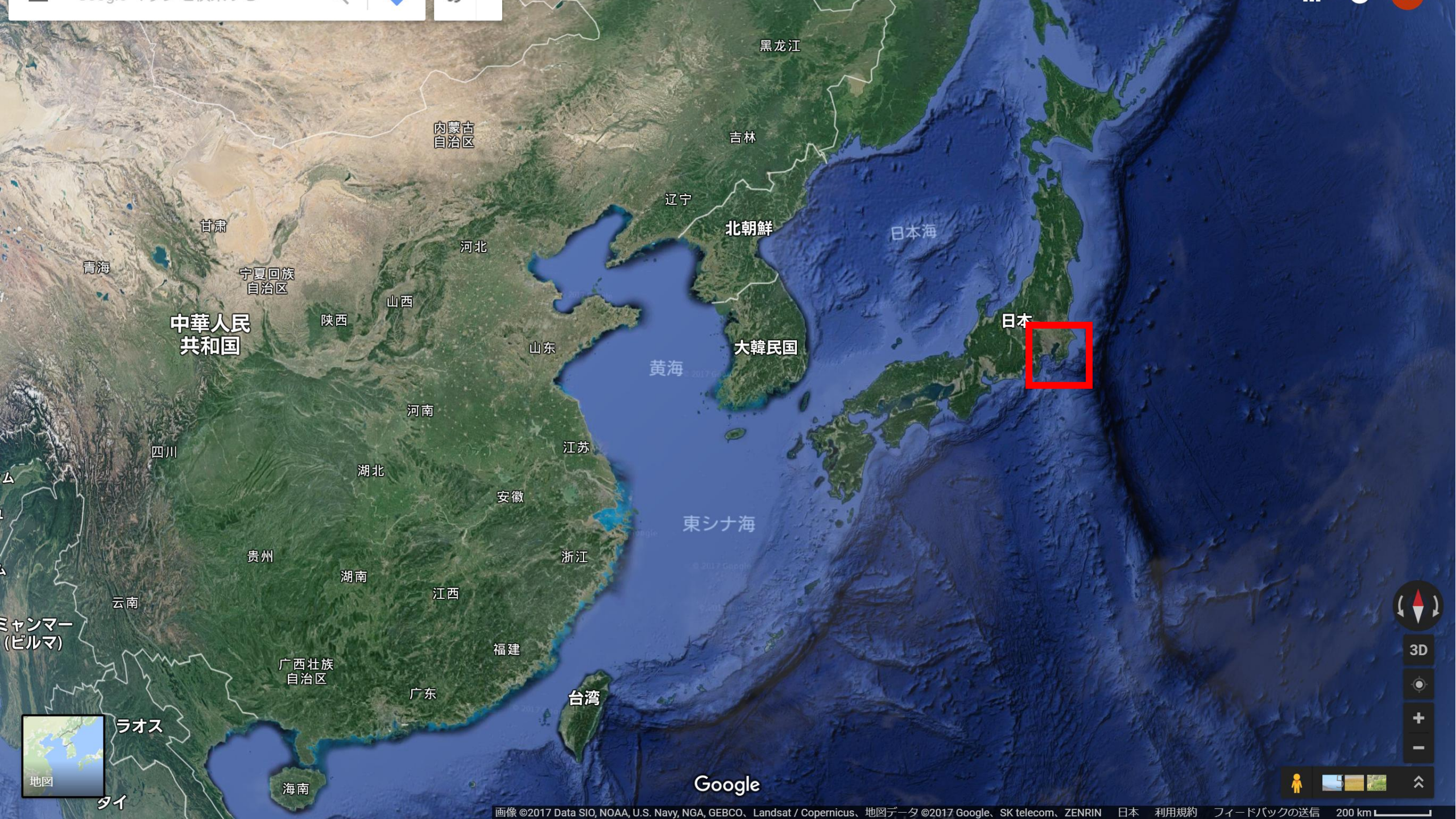
# Tokyo Bay

Where it is?



Google





中華人民  
共和国

北朝鮮

大韓民国

日本

黄海

日本海

東シナ海

台湾

Google



# Center for Coastal Developmnets



関東地方整備局：東京湾百選より

# Center for Maritime Transports



関東地方整備局：東京湾百選より



# Nature and Human Use



関東地方整備局：東京湾百選より

# **Geological Development and Ecosystems**

**Geological Development**

**Tidal flat (dynamics, foods, Dottari)**

**Seagrass meadows (ecosystem services)**

**Ecosystem Services / ICM / Sato-umi**

(d) 20<sup>th</sup> Centuries

# Tokyo Bay as a "River"

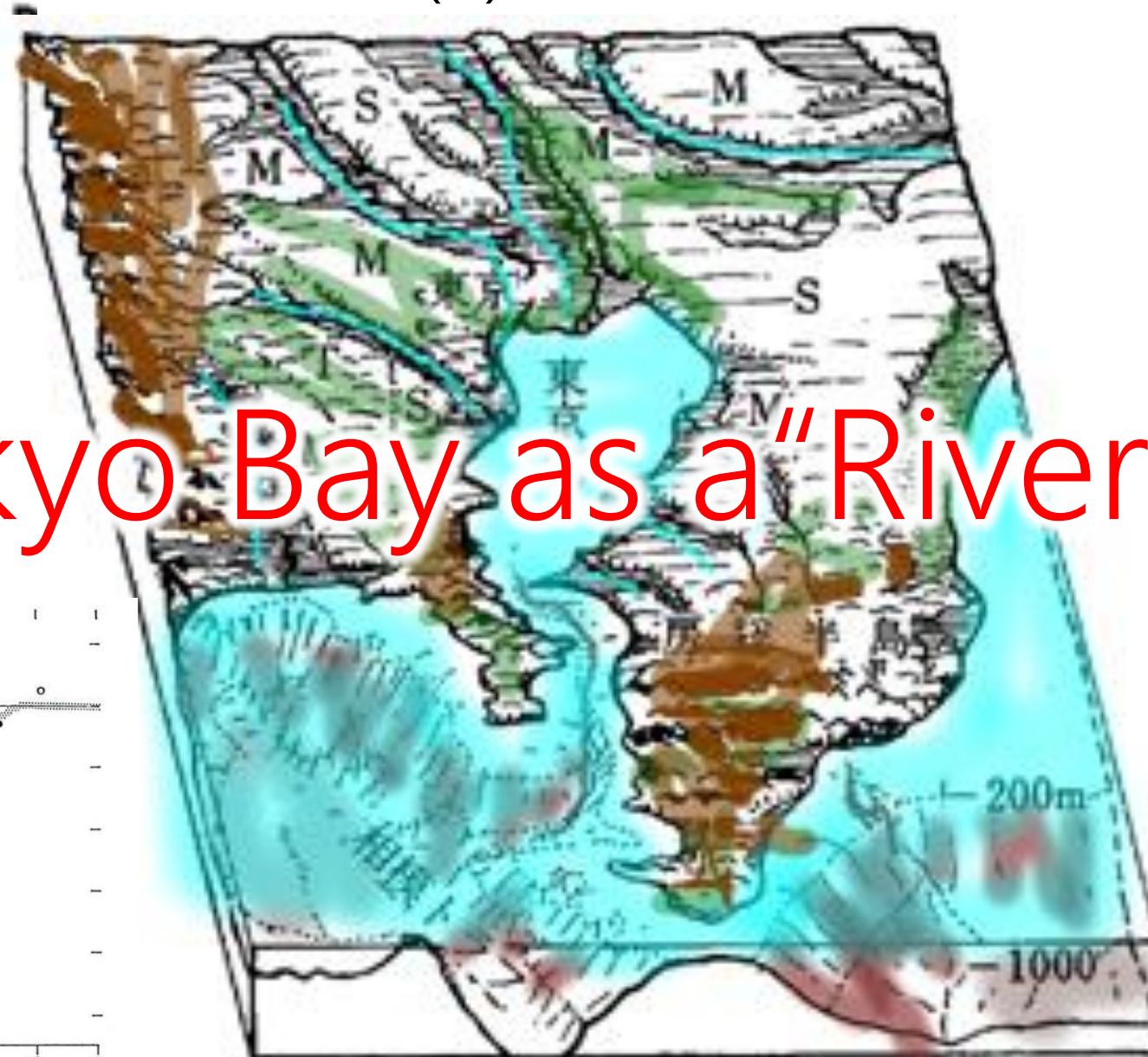
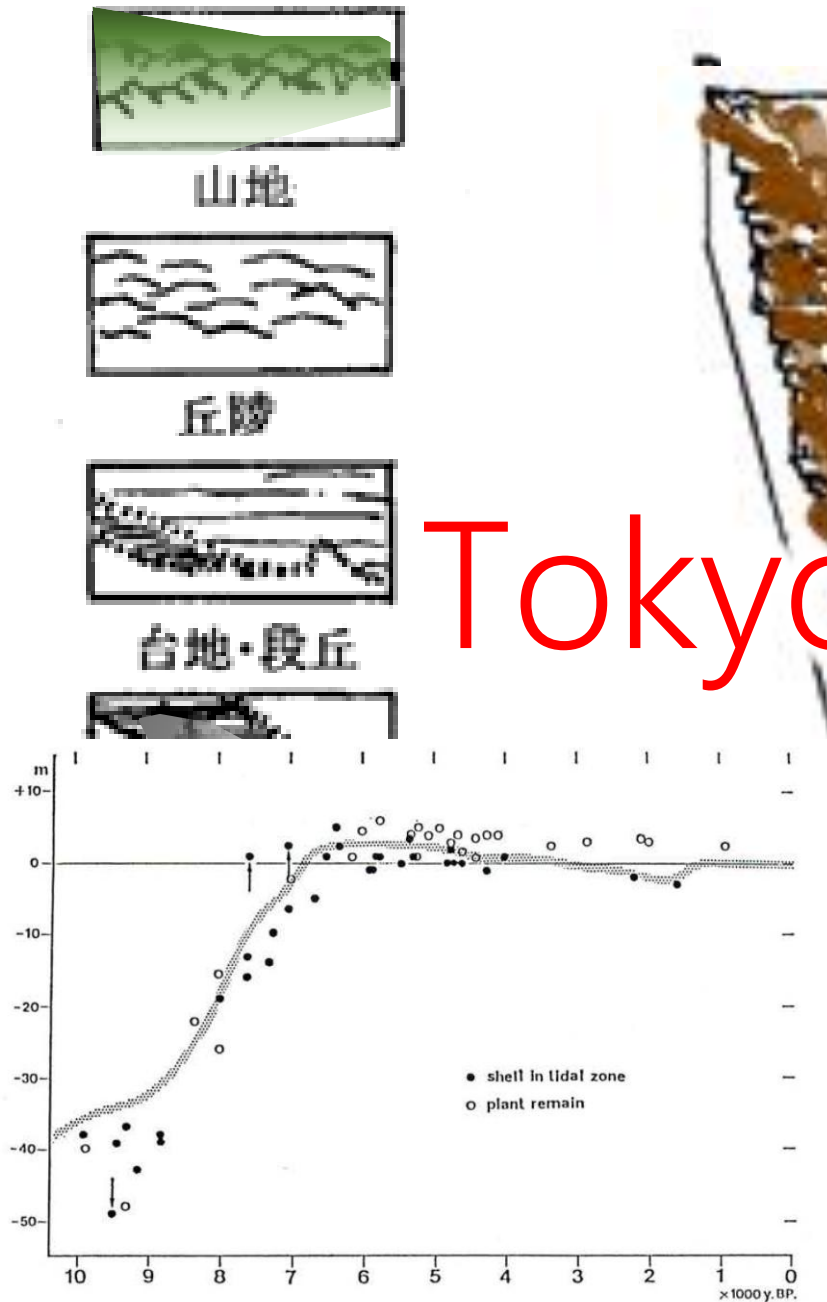


図2. 古奥東京湾周辺地域から得られた過去10000年間の相対的海水準変動曲線(遠藤ほか:投稿中)  
Fig. 2. Relative sea-level change curve in past 10000 years from the Paleo-Okutokyo bay and its surroundings.



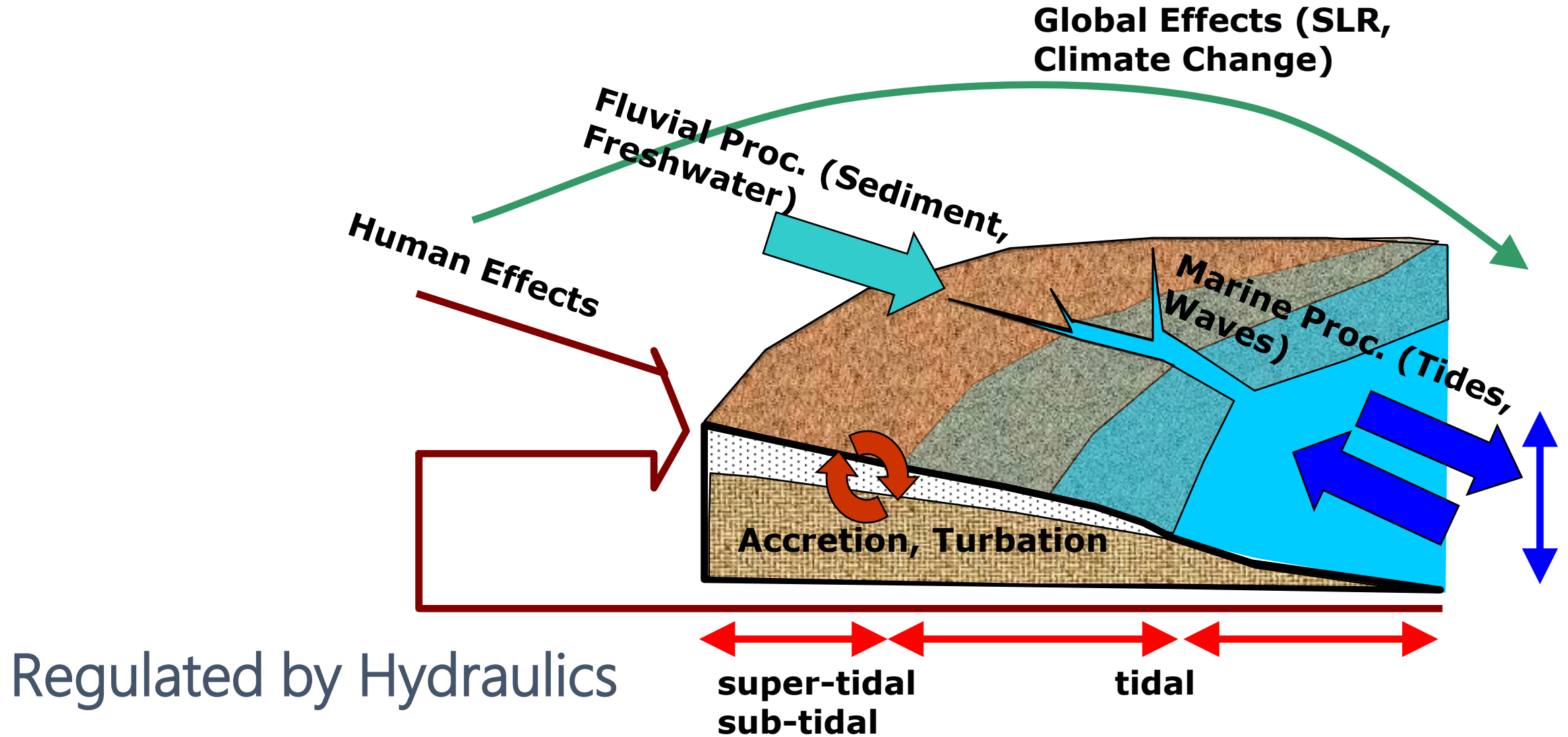
# Tidal Flats as Important Assets of Tokyo Bay



関東地方整備局：東京湾百選より

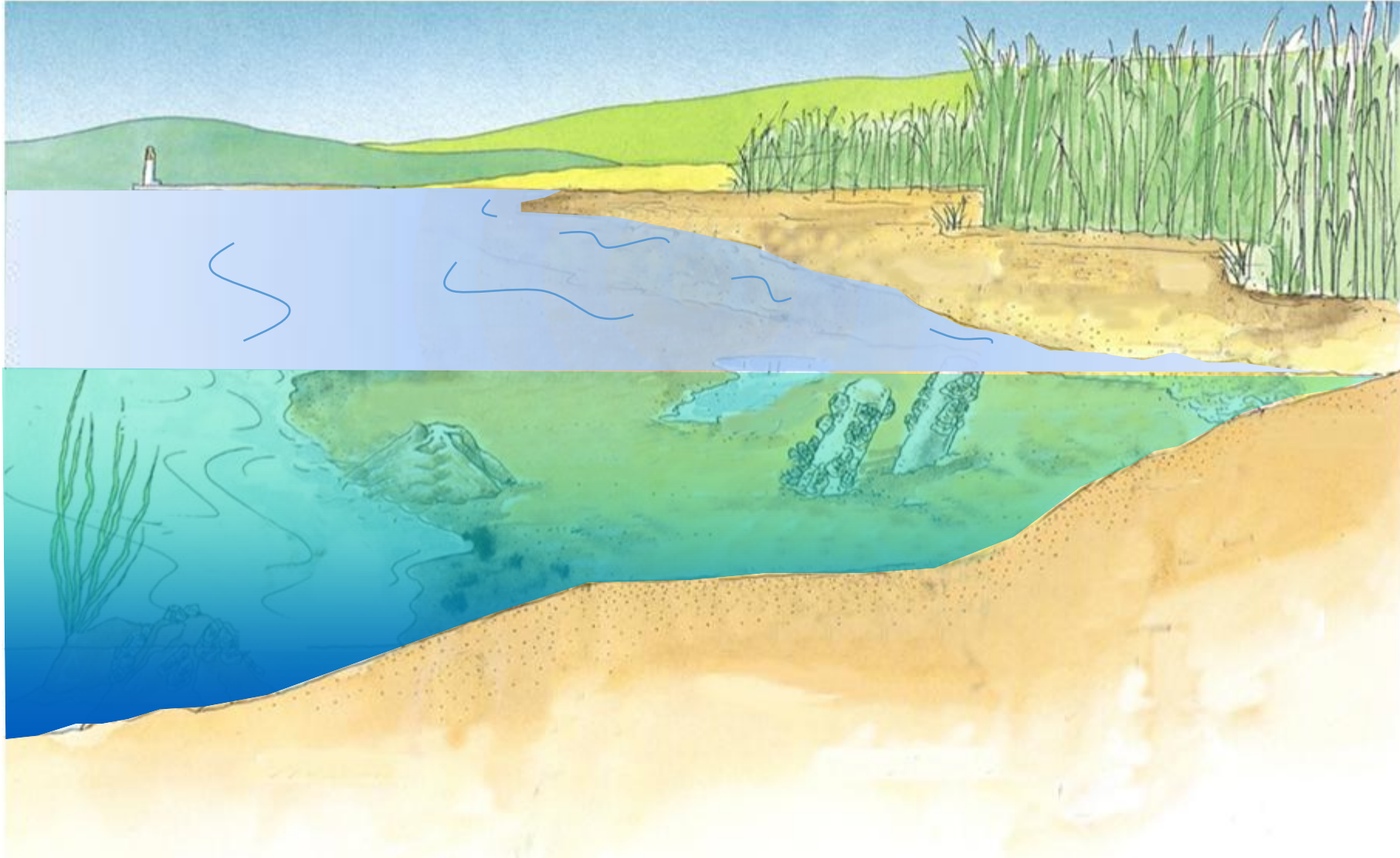
# Tidal Flats have...

## Coastal Ecosystem Dynamics and Flux



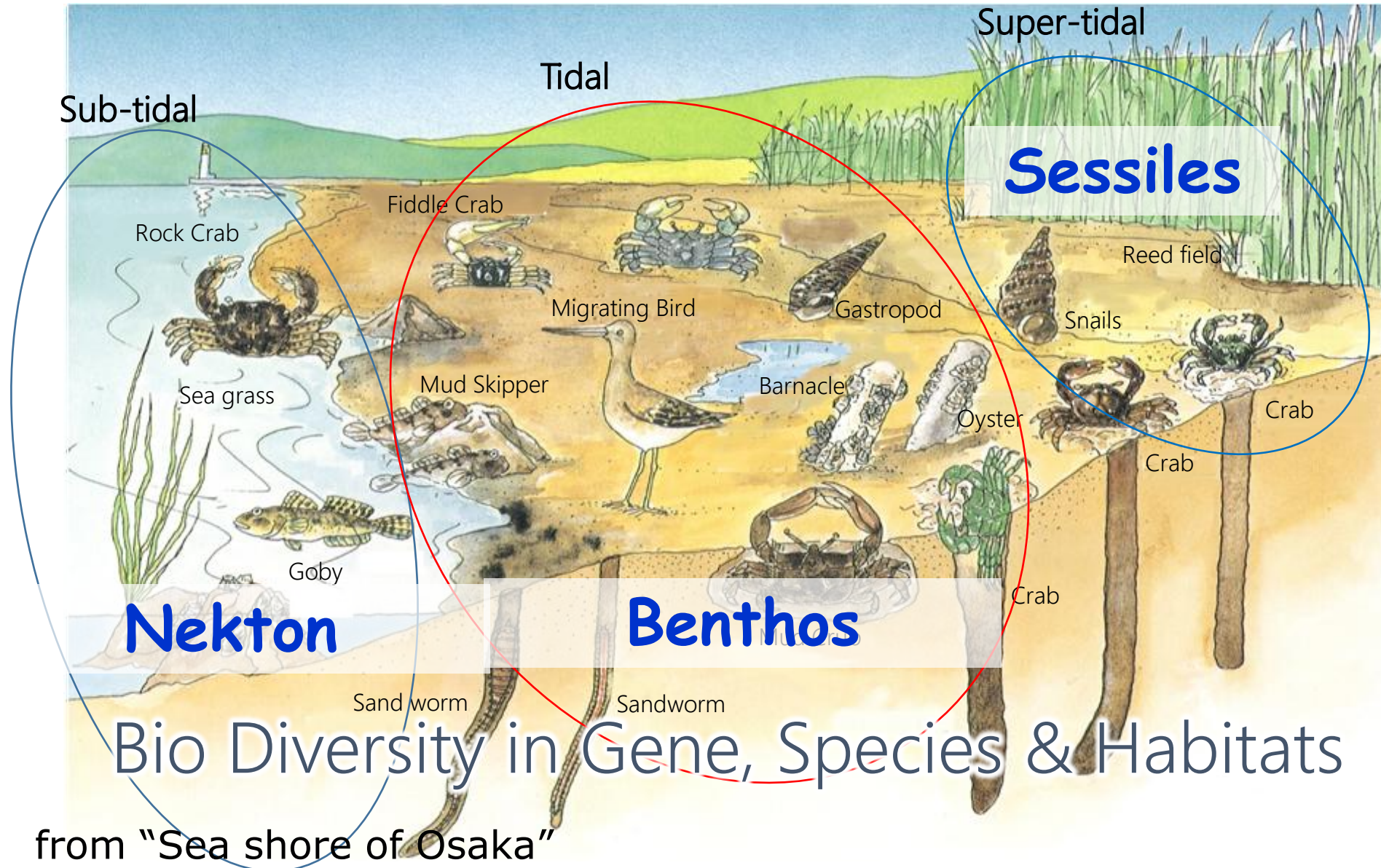


# In Coastal Zone...



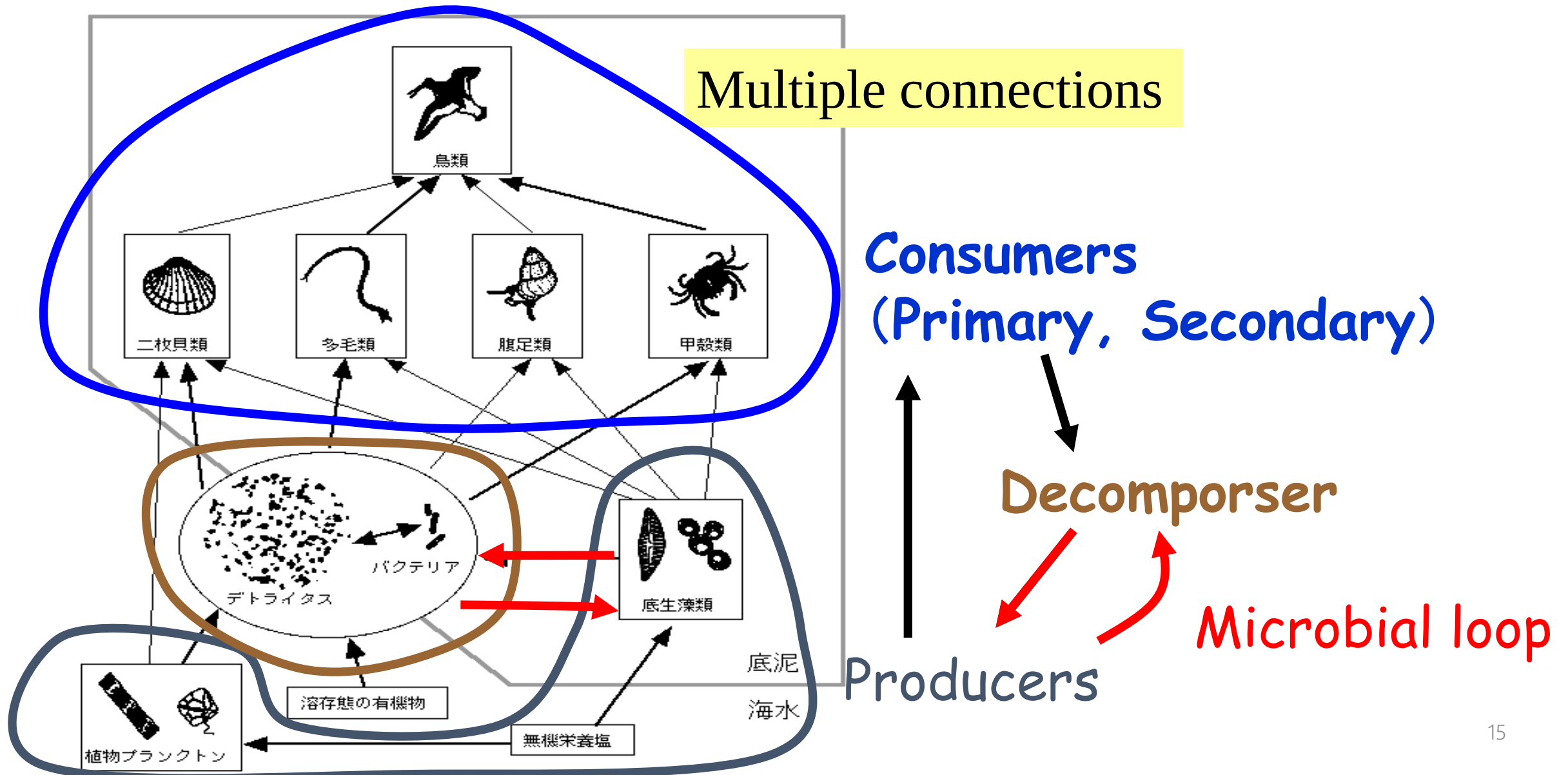
from "Sea shore of Osaka"

# In Coastal Zone...

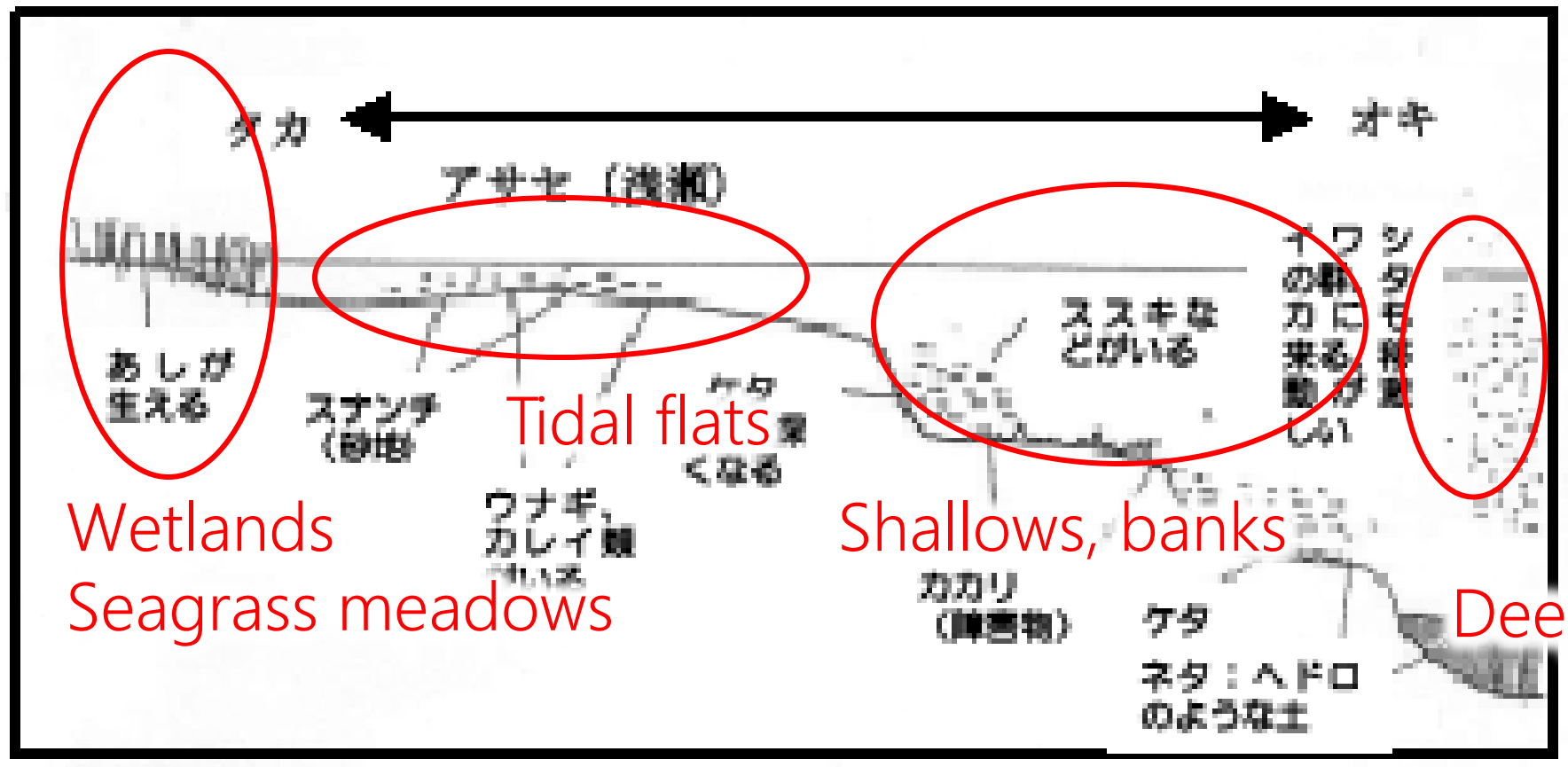
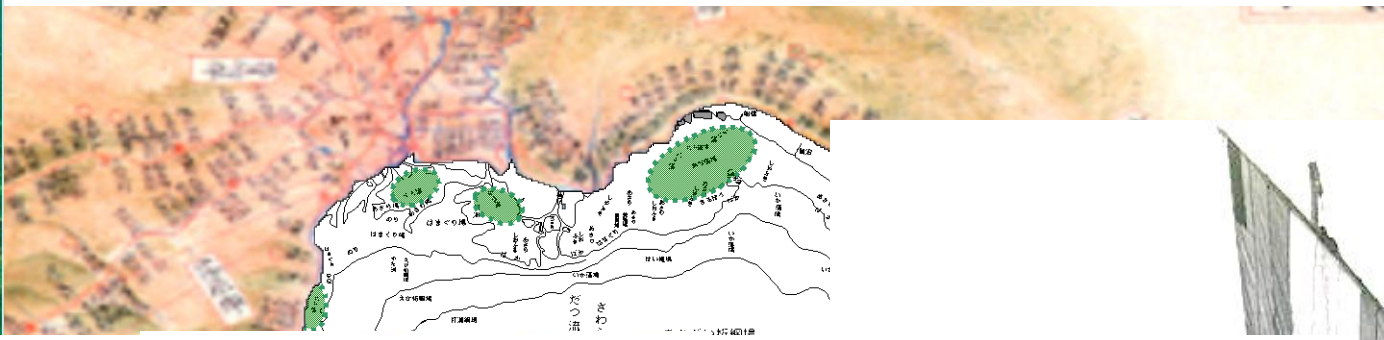
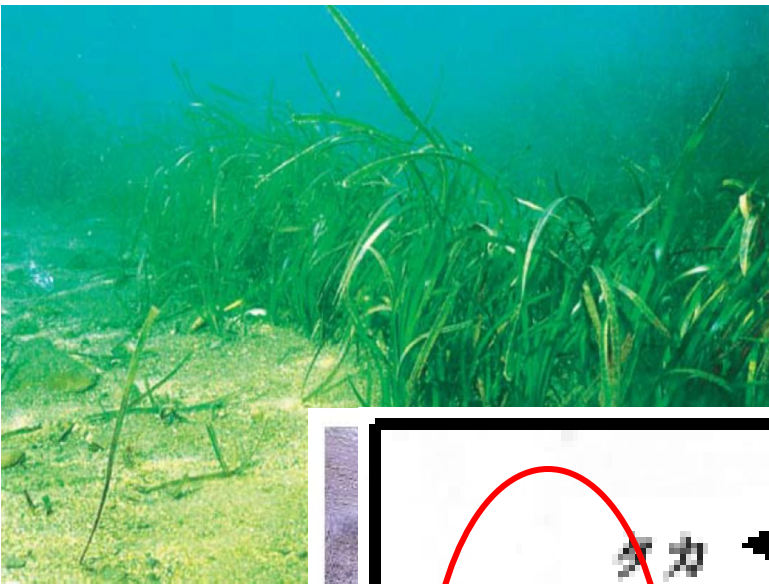




# Network of Living Creatures (Food Web)



# Wealth of Shallows



1800年代の伊能中図と明治41年（1908年）「東京湾漁場図」の重ね合わせ



# Tidal Flats its Harvests and Maintenance



*Dottari* for maintain foreshore tidalflats, Oota-ku local history museum





アマモステッカー 福井美香  
さん



Start point for  
Environmental Valuation



## ECOSYSTEMS AND HUMAN WELL-BEING

- Millennium Ecosystem Assessment: *Synthesis*
- International Collaborative Research of WRI, UNDP and WB
  - Initiated by CBD, CCD and RAMSAR
  - 180 countries have been adopted



MILLENNIUM ECOSYSTEM ASSESSMENT

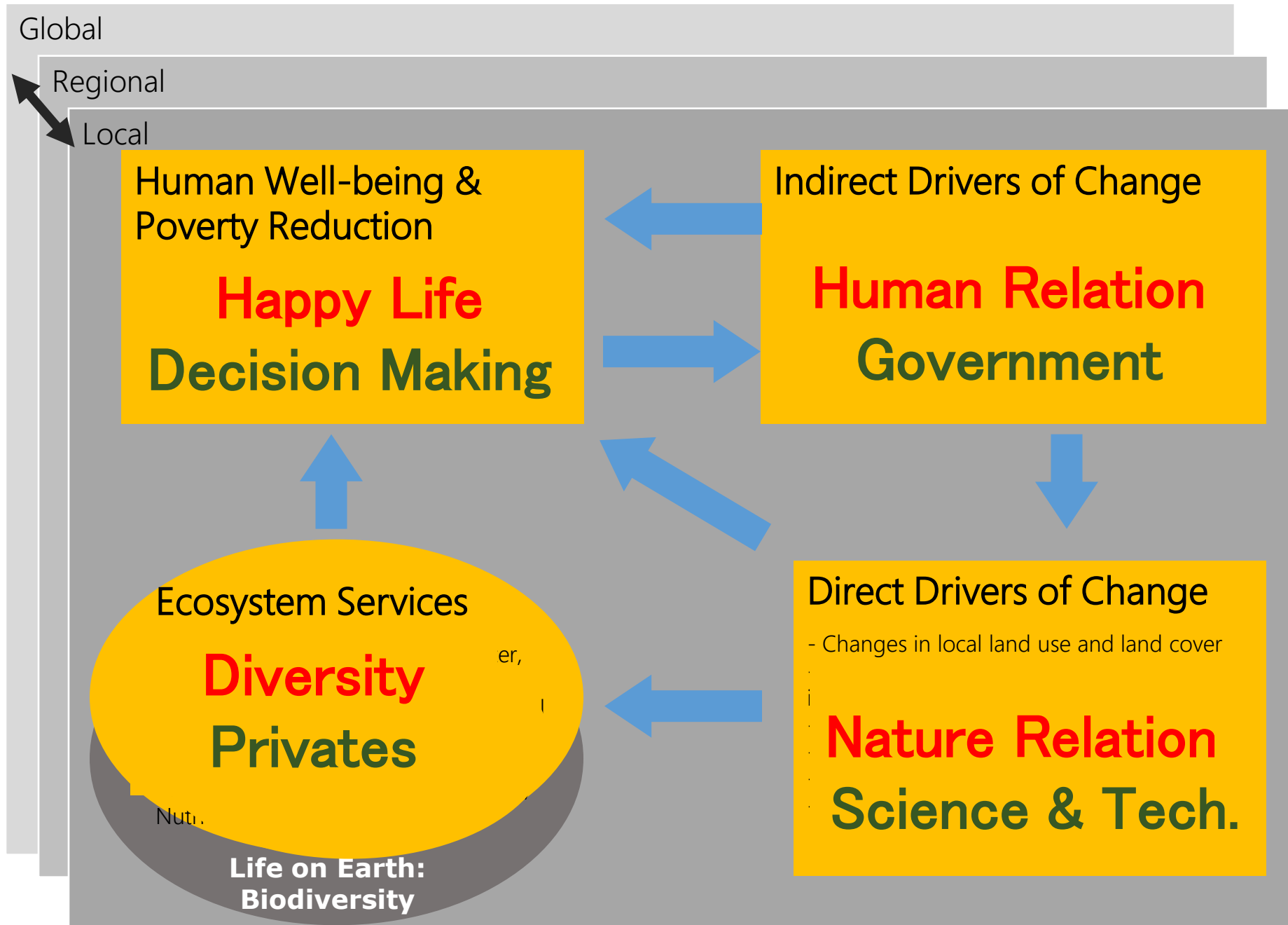
# Millennium Assessment

## Ecosystem Services

- Provisioning (e.g. food, fresh water, fuel, genetic resources)
- Regulating (e.g. climate, water, natural hazard mitigation)
- Cultural (e.g. spiritual, aesthetic)
- Supporting (e.g. primary production, Nutrient cycling)

Life on Earth:  
Biodiversity



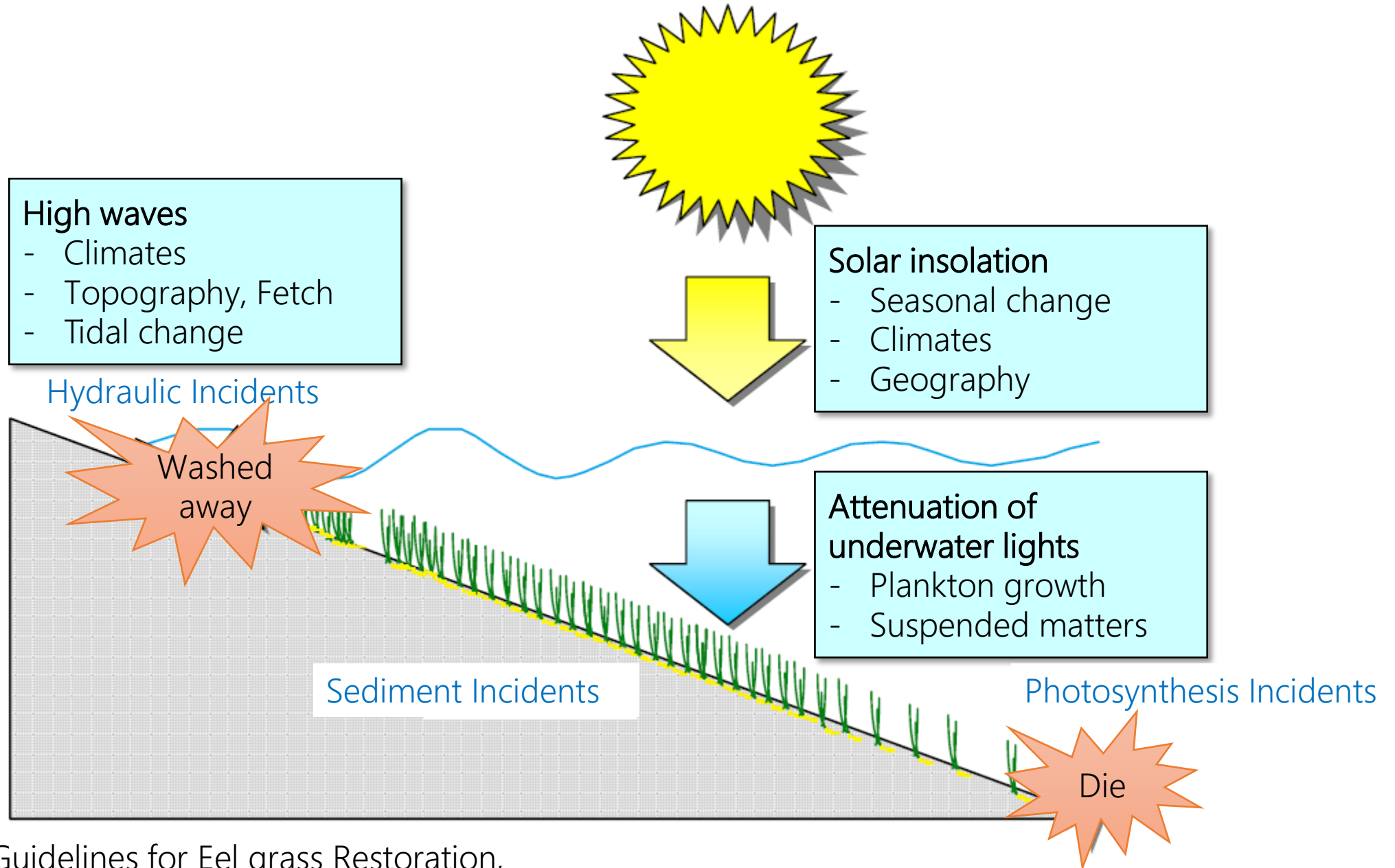




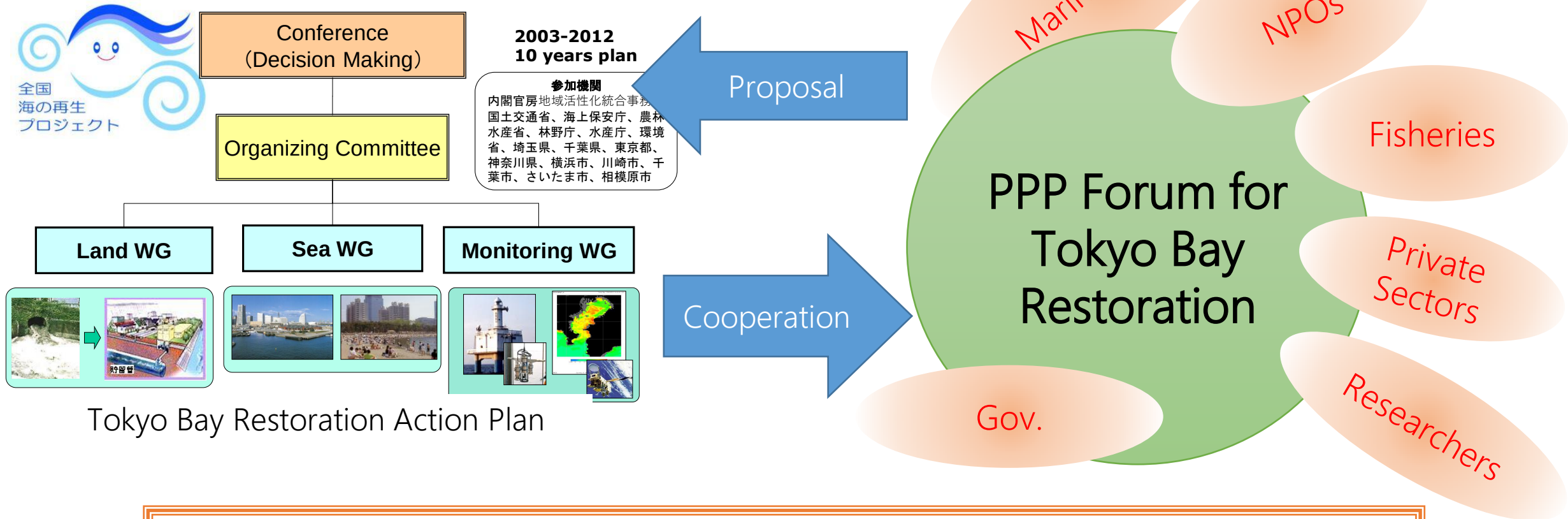
アマモス 写真・加工 福井美香  
さん 氏



# Direct (Natural) Limiting Factors for Eel grass habitats



# In-direct Limiting Factors for Eel grass Restoration



Tokyo Bay as Friendly, Beautiful, Rich Habitat *for Edo-mae* and Comfort Play ground



# Diverse joy of People / Children



東京湾のよくするために行動する会HPより



Global

Regional

Local

## Human Well-being &

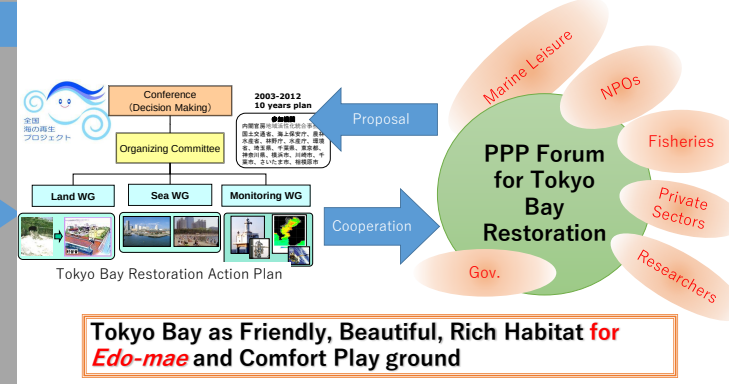


## Ecosystem Services

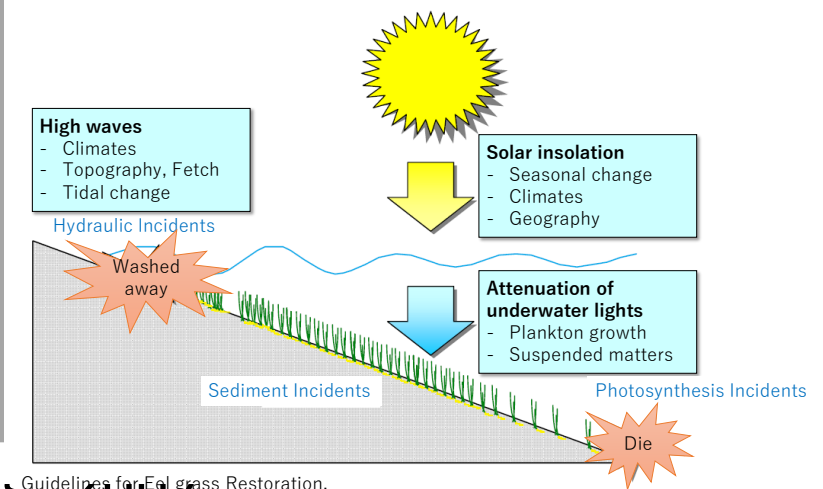


Biodiversity

## Indirect Drivers of Change



## Direct Drivers of Change





# History of Tokyo Bay & Edo as a typical coastal city

River management

Transportation

Swage system

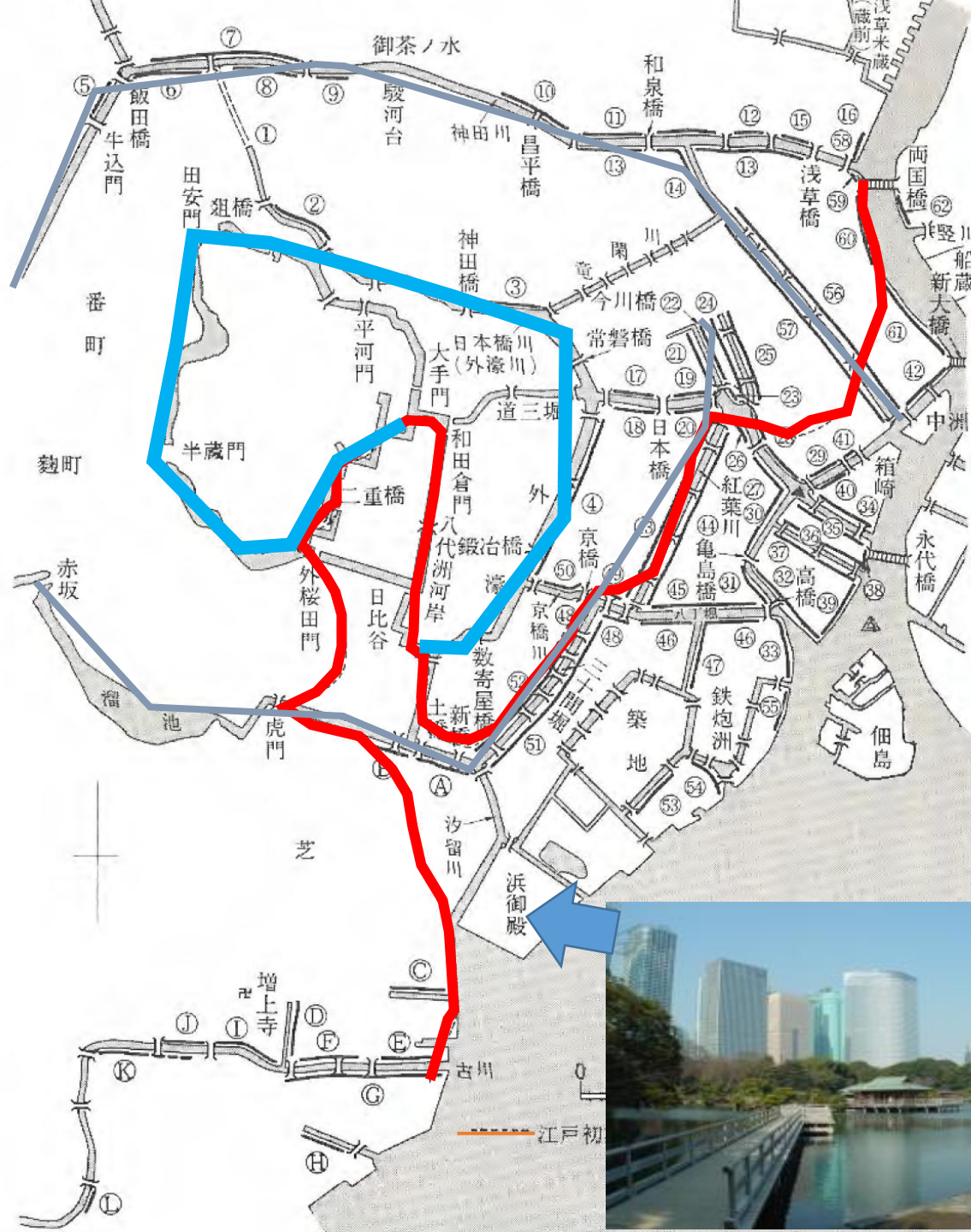
Garbage management system

Edo-mae / fisheries management

Security / Daiba, Kaiho

Leisure: Duck ponds / Hama-rikyu, Shinhama-ko





鈴木理生、江戸の川東京の川より

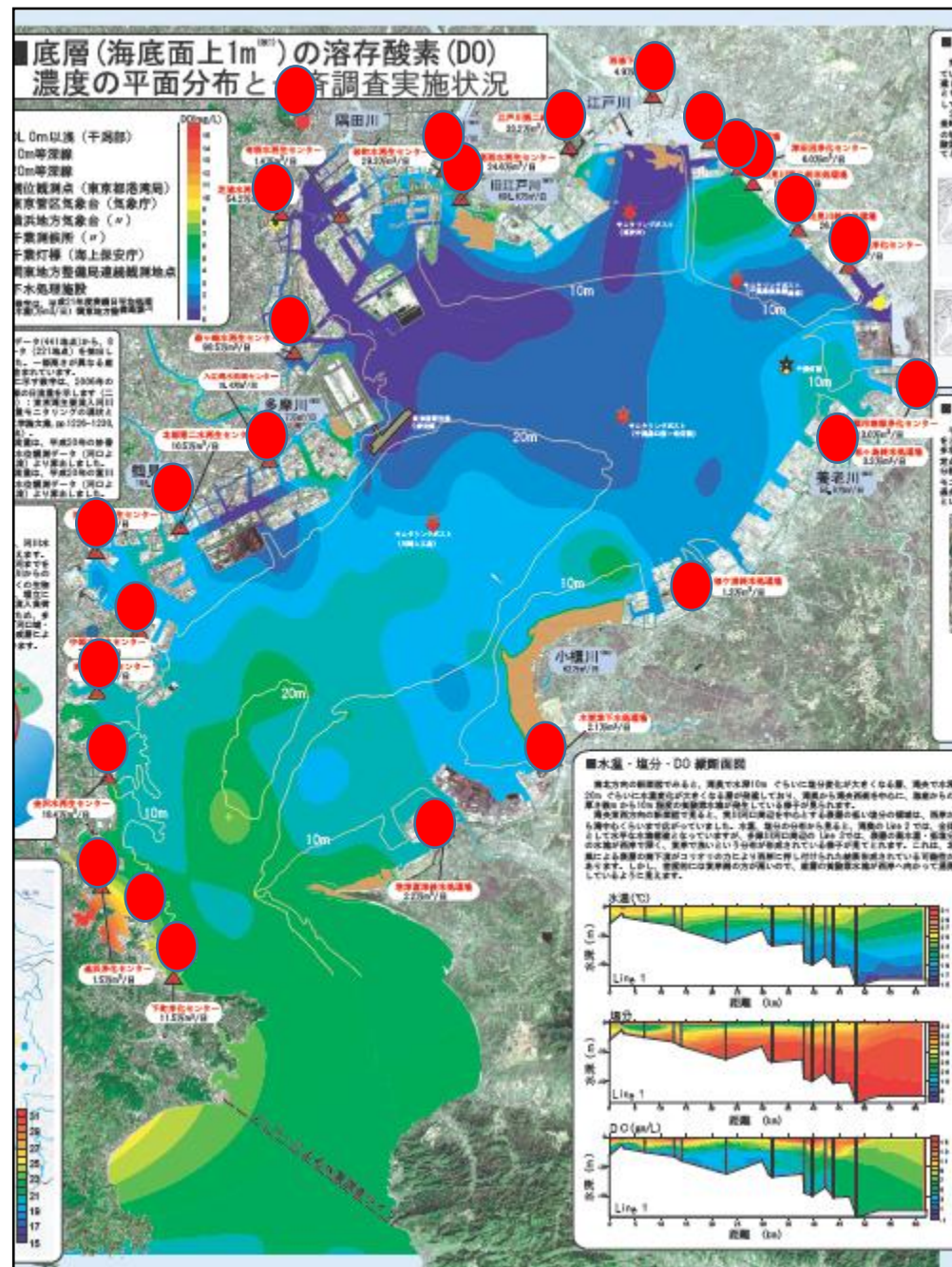
0 1 2km 28



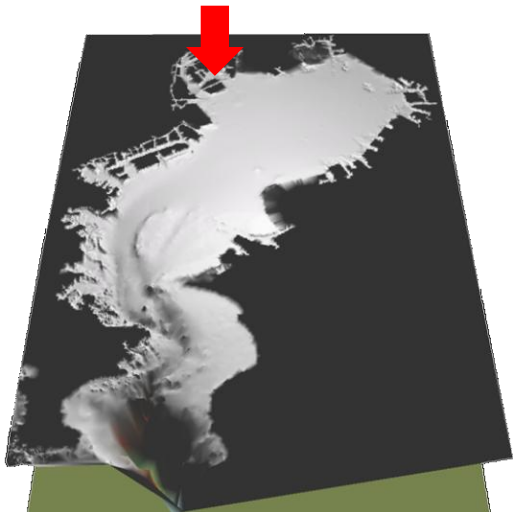
# Sewages

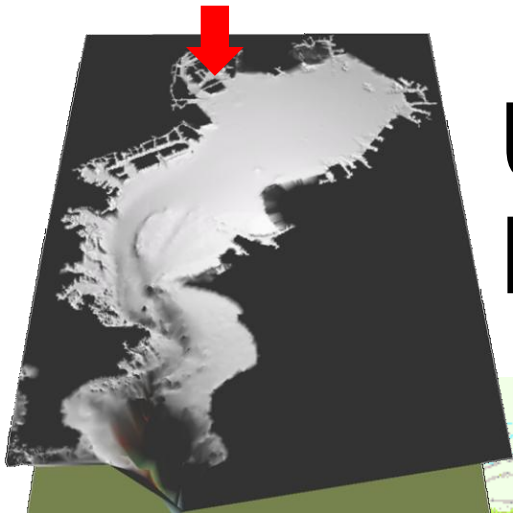


# Sewages

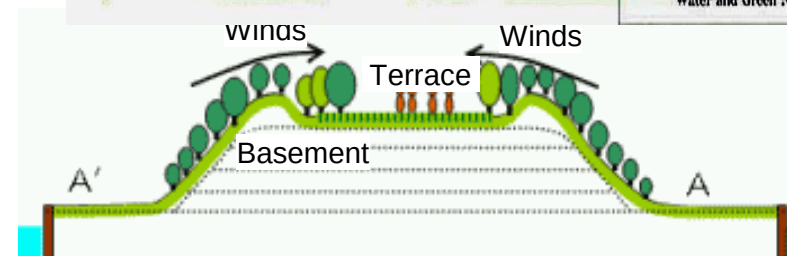
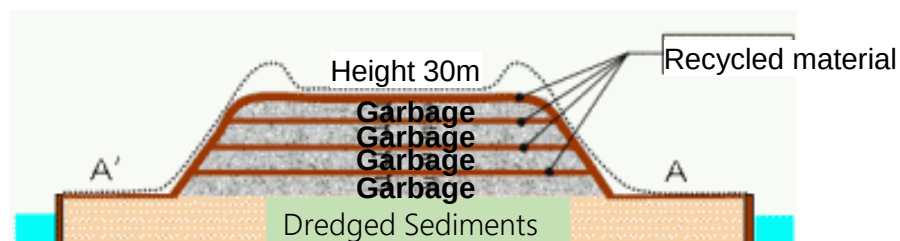
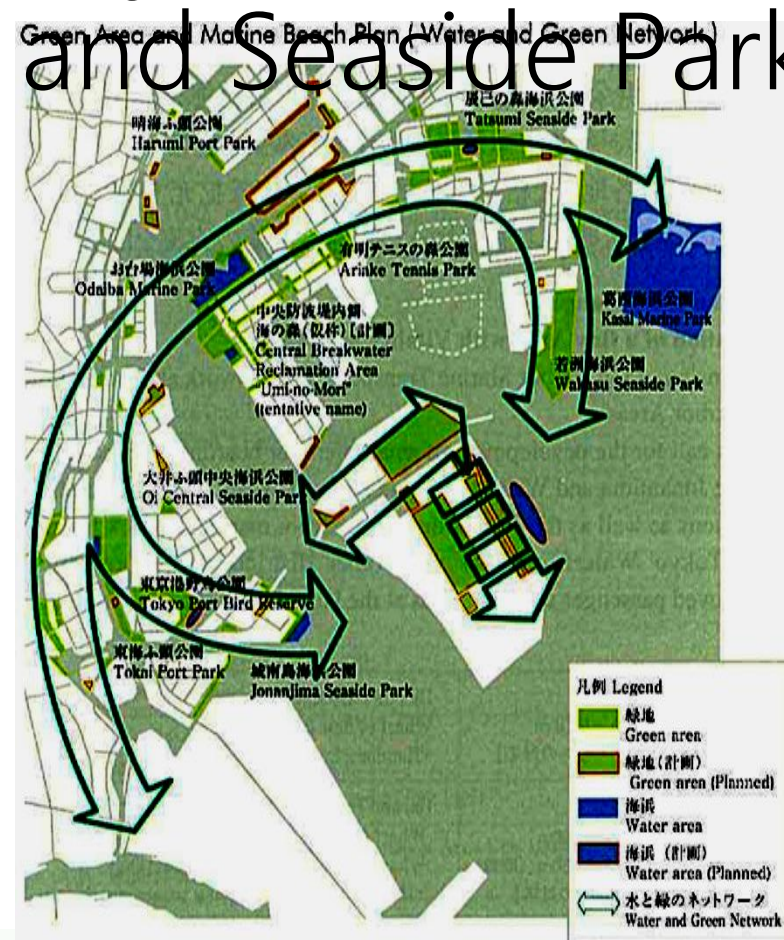








# Umino Mori (海森) Project; Network of Forests and Seaside Park







Sushi



Tempura



# ***Edo-Mae: Originated in Tokyo Bay, Harvest of Sato-umi***

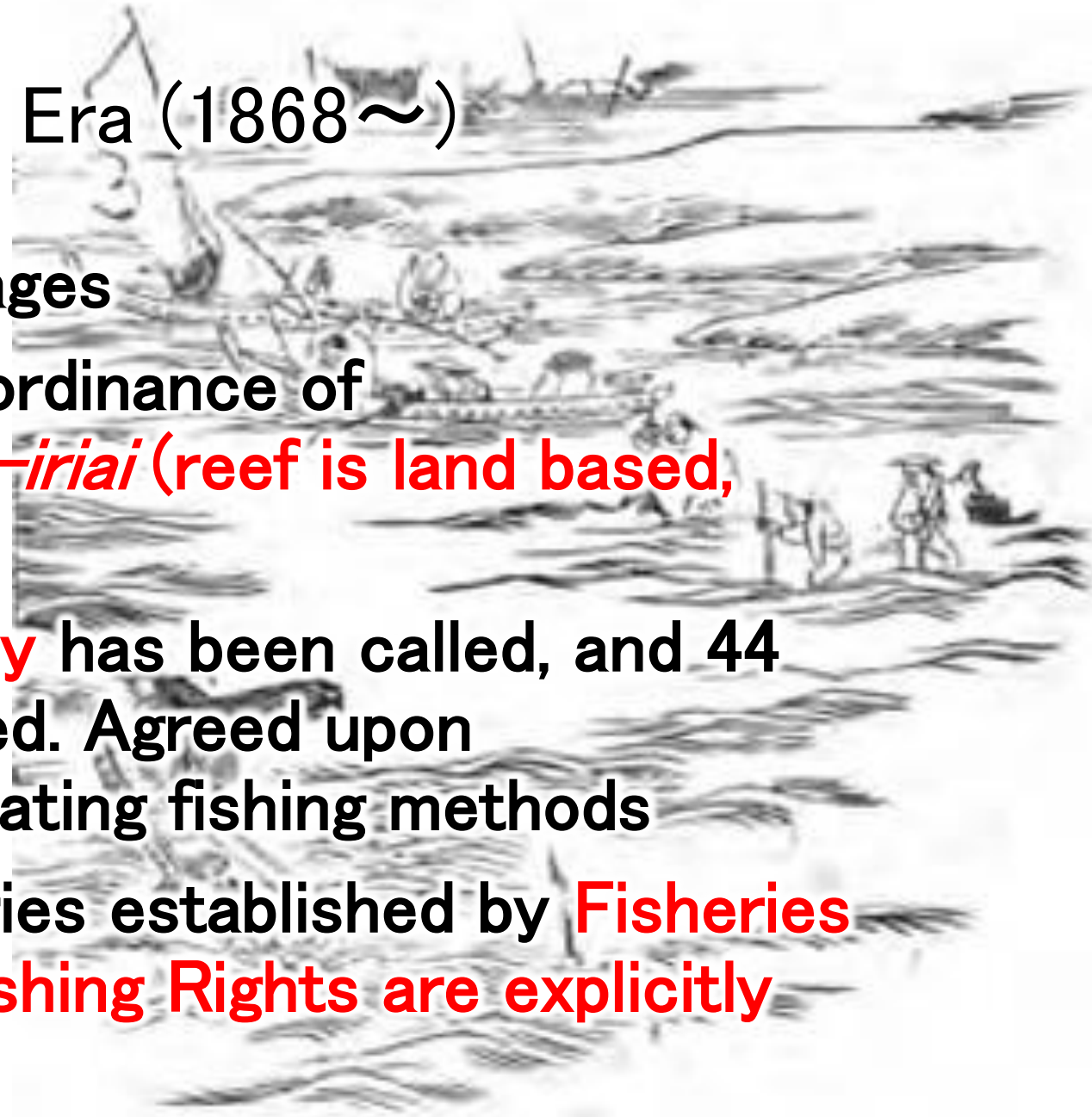


Photo by T. Hayashi, Chiba Museum



# Fisheries Management in Edo Era (1868~)

- Conflicts between fisheries villages
- In 1742, governments enacted ordinance of principal "*Isowa-netsuki-okiwa-iriai* (reef is land based, offshore is shared based)"
- In 1816, *the Kanagawa Assembly* has been called, and 44 villages representatives gathered. Agreed upon management principal and regulating fishing methods
- In 1910, modernization of fisheries established by *Fisheries Act* (Fisheries Cooperatives, Fishing Rights are explicitly described)





# 台場公園案内

## 都立台場公園のあらまし

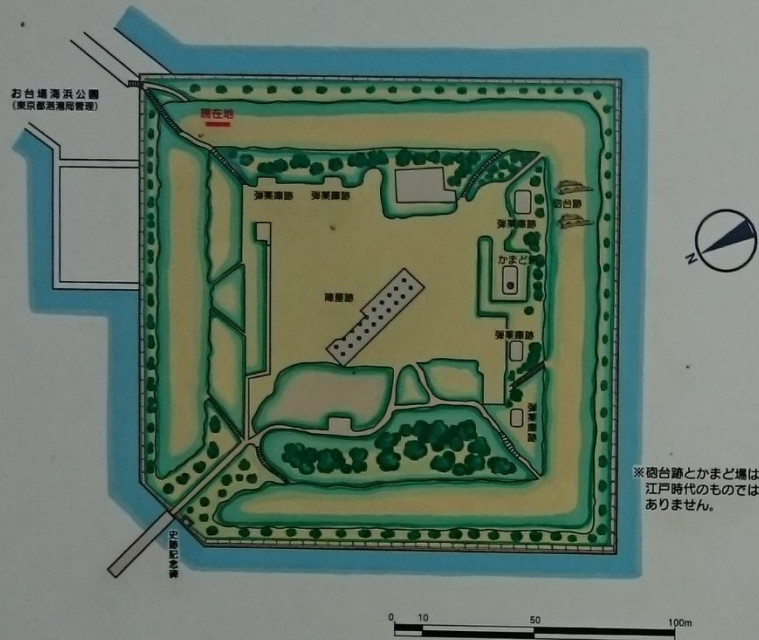
### 台場公園（第三台場）

「お台場」の名で知られる品川台場は、江戸幕府が黒船来襲にそなえて品川沖に築いた砲台跡です。設計者は伊豆・葦山の代官・江川太郎左衛門英龍で、ペリーが浦賀に来航した翌月の嘉永六年（一八五三年）八月に着工、一年三カ月の間に六基が完成しました。現在は大正十五年（一九二六年）に国の史跡に指定された第三、第六台場だけが残されています。

このうち第三台場は、昭和三年東京市（都）によって整備され、台場公園として解放されています。周囲には、海面から五、七メートルの石垣積み、土手が築かれ、黒松が植えられています。また内側の平坦なくぼ地には、陣屋、弾薬庫跡などがあります。

### 利用上の注意

- 一、この公園は国の史跡として大切に保存することを目的とした歴史公園です。
- 一、工作物や樹木などを傷めたり他人の迷惑になるような球技等は禁止されています。
- 一、火気の使用は禁止されていますので、タバコの投げ捨てなどしないで下さい。
- 一、景観保全のため、「ゴミ」はお持ち帰り下さい。
- 一、ロケーションなど占用を伴う写真撮影には許可が必要です。
- 一、犬の放し飼いはしないで下さい。



所在地 港区台場1丁目10番

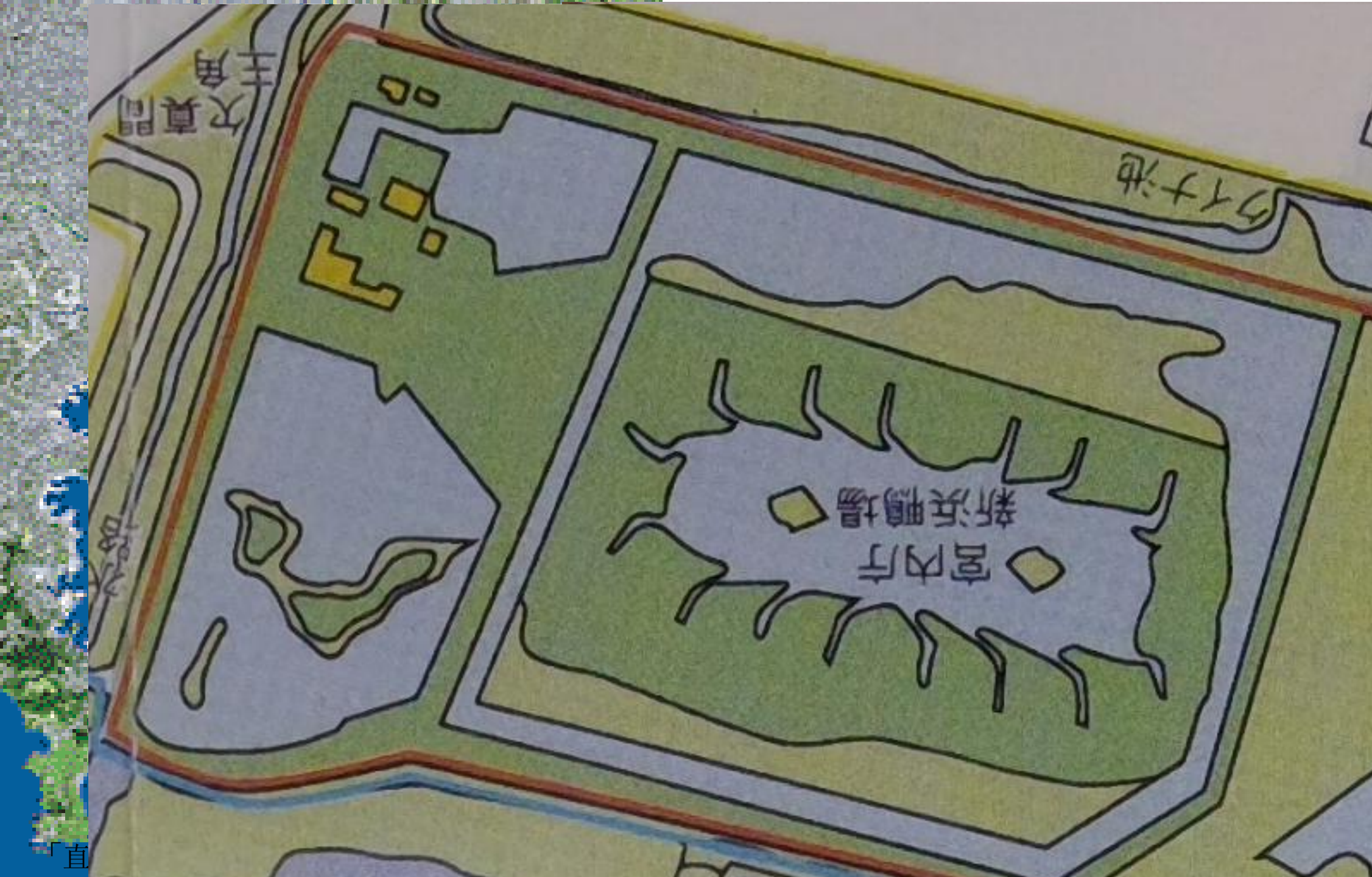
面積 29,963.40㎡

開園 昭和3年7月7日

史跡指定 大正15年12月20日（外周30間〈約55m〉の海面を含む）

（問い合わせ先）東京都潮風公園事務所 電話5500-2455







...the name of this  
...changed to "Hama Goden"  
...from that time onward, various Shoguns  
...the garden became a Detached Pal-  
...the Meiji Restoration, the garden was finally fin-  
...acc for the Imperial family and the name became the  
...Hama Detached Palace. The Great Kanto Earthquake and  
...a number of the buildings caused a great deal of damage to  
...den unrecognizable, but on November 3, 1945, the Im-  
...perial family gave the garden to the City of Tokyo and it  
...became open to the public in April of 1946. On Novem-  
...ber 22, 1952, Hama Detached Palace Garden was desig-  
...nated a famous site as well as a site with high historical  
...significance.

**Birds play in the pond**  
...ent seasons bring an array of  
...wild birds that fly in and live  
...the pond, making it a refuge  
...s for the creatures.

**Kamoba**  
...hunting sites in the garden)  
...two kamoba, Koshin-do  
...and Shinsen-za Kamoba.  
...was built in 1778 and the  
...791. The kamoba and the  
...y narrow watercourses  
...garden. Duck blinds  
...observe the ducks and  
...When they came too  
...caught using nets,  
...of duck hunting.

ound to con-  
「直正公品川台」

...the 6th Shogun, Ie-  
...pine was planted to celebrate the re-  
...novation. It has survived to the pres-  
...ent day.

...bloom with a great  
...ors. In the flower field, rape flowers  
...are also in blossom. The cosmos make  
...for a colorful scene in the fall.



**Sho**  
This w  
boarded  
time of  
in 1949,  
sunk into

**Shinhi**  
The top of  
sluice gate th  
a superb view

**Tokyo Bay, rig**  
From "Shin  
can view th  
Odaiba and  
ties as well as

**Shioiri-no-ike**  
(Shioiri: incoming  
The water for the pond  
the bay. This pond is the  
ing seawater pond with  
With the rise and fall  
sluice gate

**Nakajima-no-ochaya**  
From 1704, the first  
first



# **Development and Conservation**

**Port construction**

**Reclamation / Chuou-bouhatei**

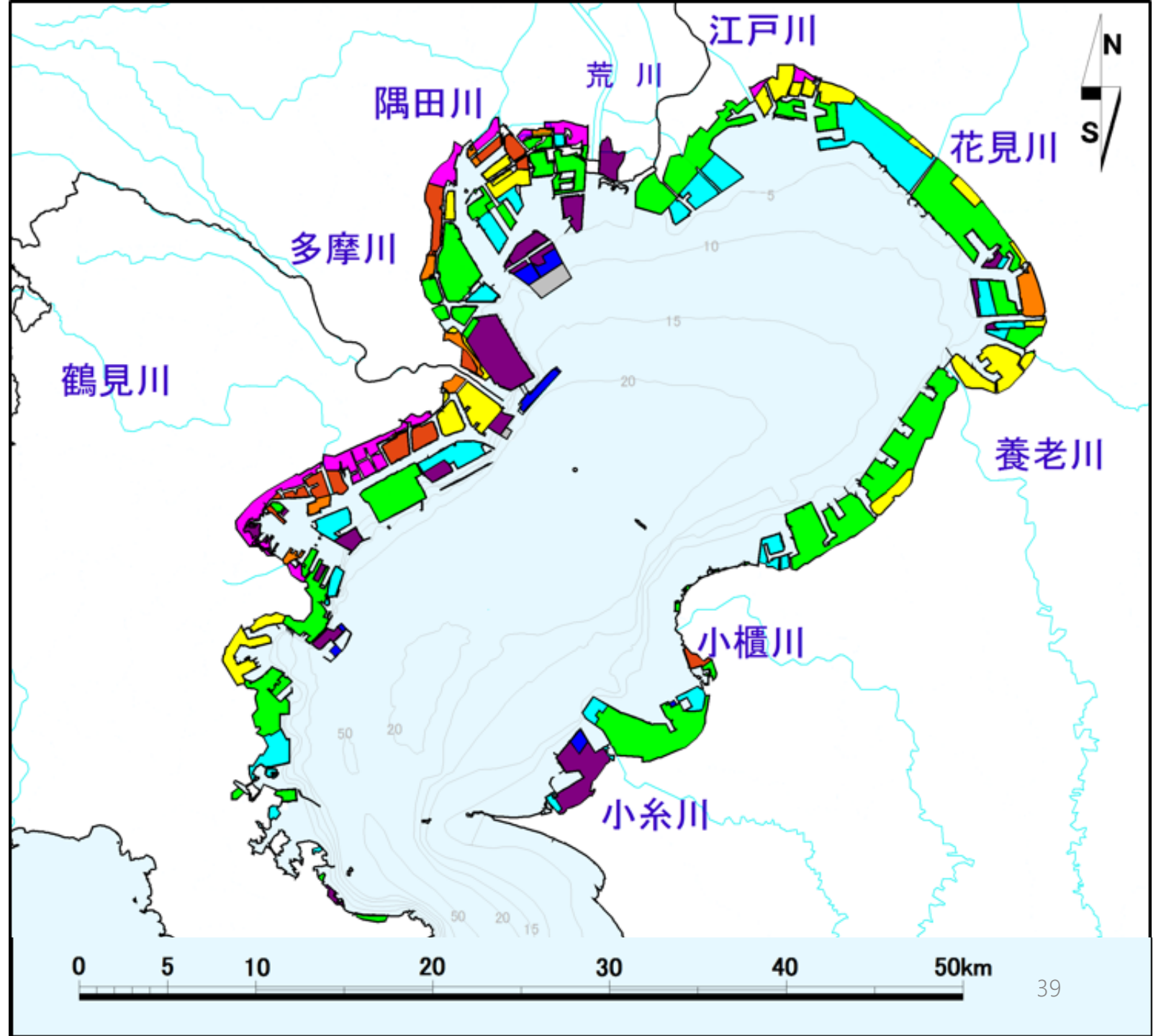
**Pollution control / TDL management by  
MOE**

**Tokyo Bay Renaissance Project**

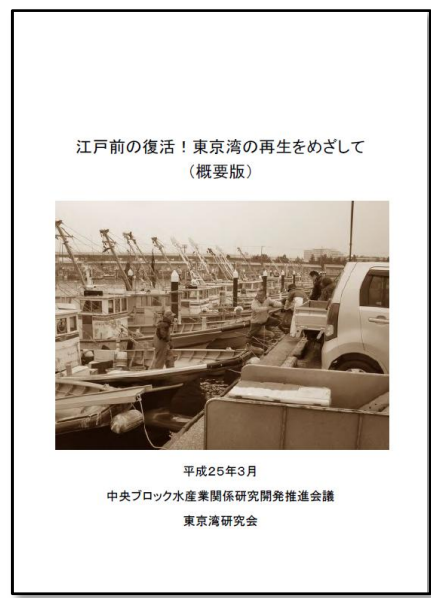
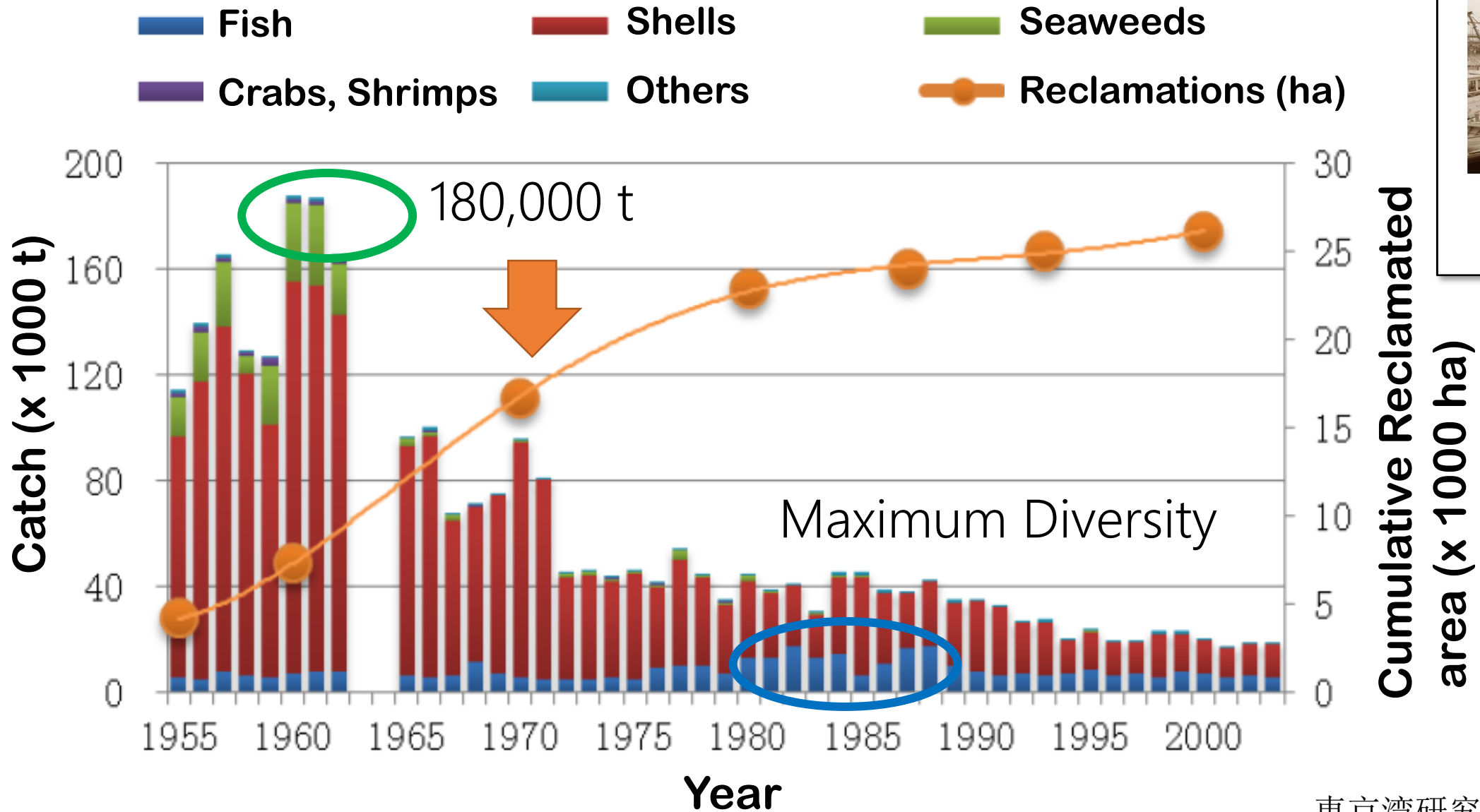




- 免許認可・施行中
- 2005年～2015年
- 1986年～2004年
- 1976年～1985年
- 1966年～1975年
- 1956年～1965年
- 1946年～1955年
- 1926年～1945年
- 明治・大正期



# Fish catch in Tokyo Bay





**Basic Policy for Areawide Total Pollutant Load Control  
(the Minister of the Environment)**

Target fiscal year,  
Reduction target amount,  
Related basic items for reduction

**Total pollutant load control plans  
(Prefectural governors)**

Reduction objectives and methods  
for respective sources

Total pollutant load control  
on discharge load amount



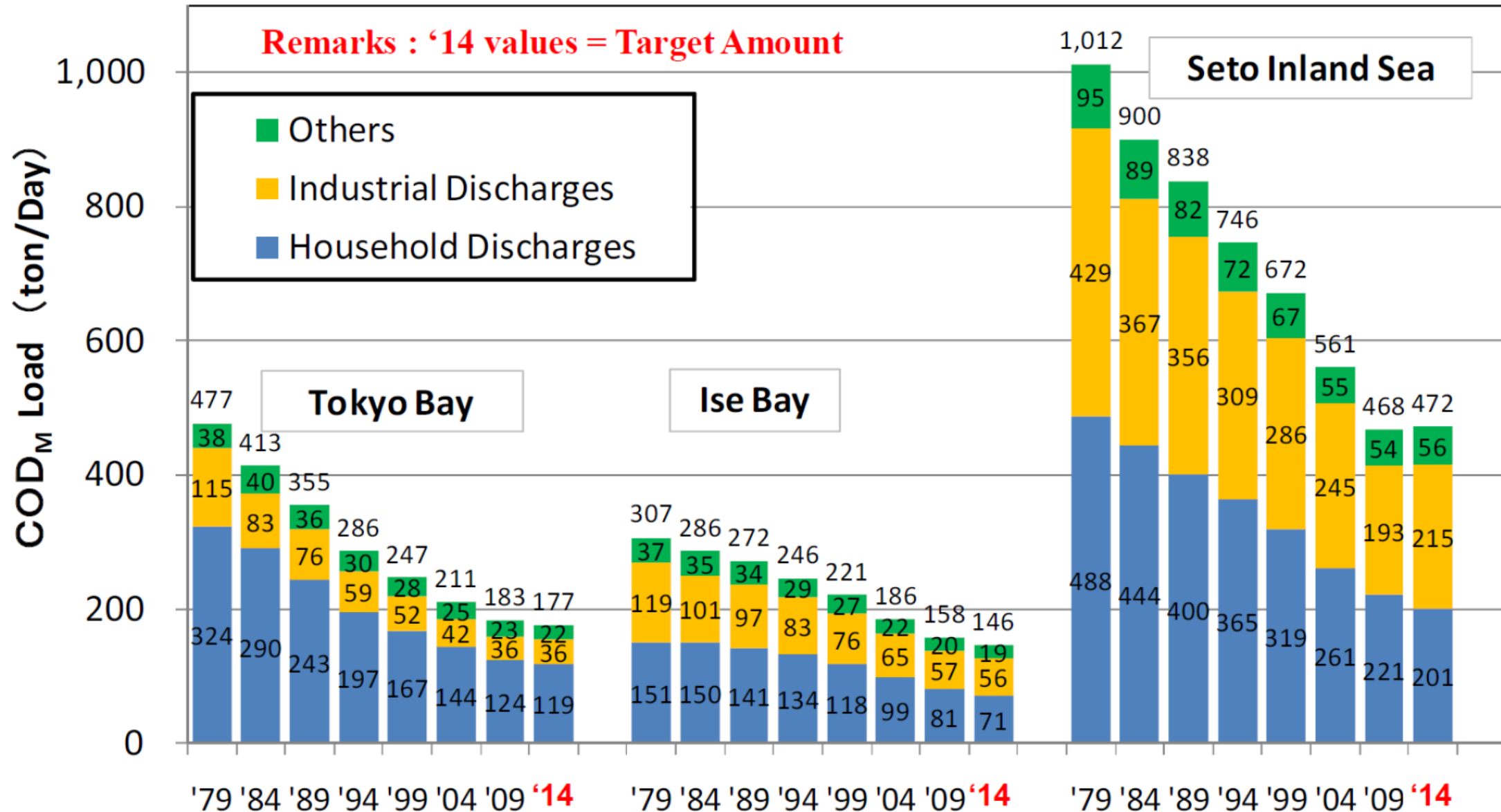
Reduction guidance



Project implementation



# Improvement of Water Quality







アユ

コノシ  
ロ

シラウオ

ヘビ

コウイ  
カ

シャコ

マナゴ

マコガレイ

イシガレイ

シバエビ

サヨリ

タチウオ

マナマコ

マダコ

マハゼ

ガザミ

クルマエ  
ビ



# Tokyo Bay Renaissance Project



Conference  
(Decision Making)

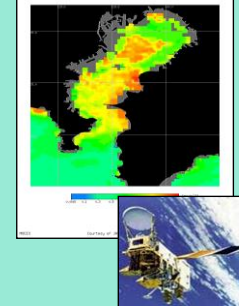
Organizing Committee

**2003-2012**  
**10 years plan**

## 参加機関

内閣官房地域活性化統合事務局、  
国土交通省、海上保安庁、農林  
水産省、林野庁、水産庁、環境  
省、埼玉県、千葉県、東京都、  
神奈川県、横浜市、川崎市、千  
葉市、さいたま市、相模原市

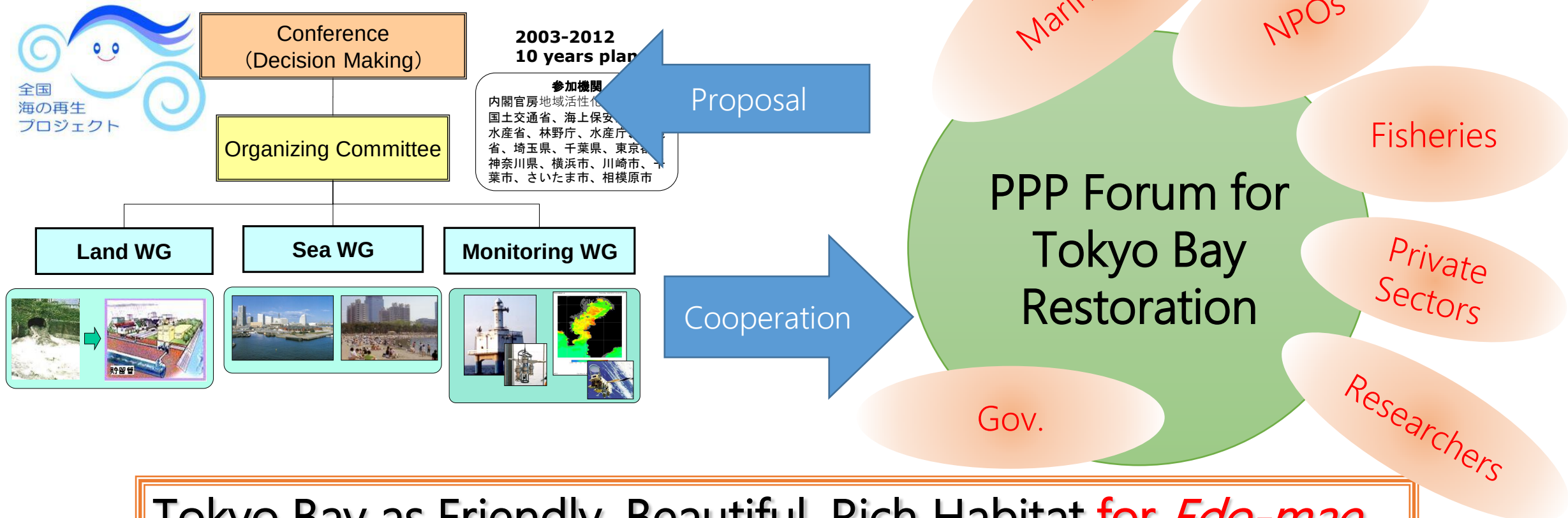
Tokyo Bay as Friendly, Beautiful, Rich Habitat and  
Comfort Play ground





# Tokyo Bay Renaissance Project

## The 2<sup>nd</sup> Phase





# Tokyo Bay Festival 2014 (1,400) , 2015 (92,000), 2016 (98,000) 2017 (34,000), 2018 (105,000)



2016年オープニングセレモニー



来賓・菅 内閣官房長官、石井 国土交通大臣



司会・榎太一 東京湾再生アンバサダー





Global

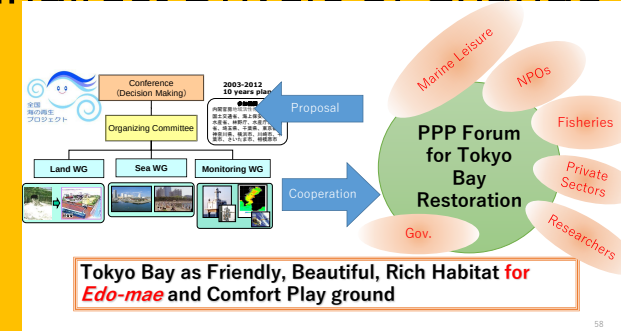
Regional

Local

## Human Well-being &



## Indirect Drivers of Change



## Ecosystem Services



## Direct Drivers of Change

