Ariake Bay - Present Conditions of Fisheries and Research for its Restoration

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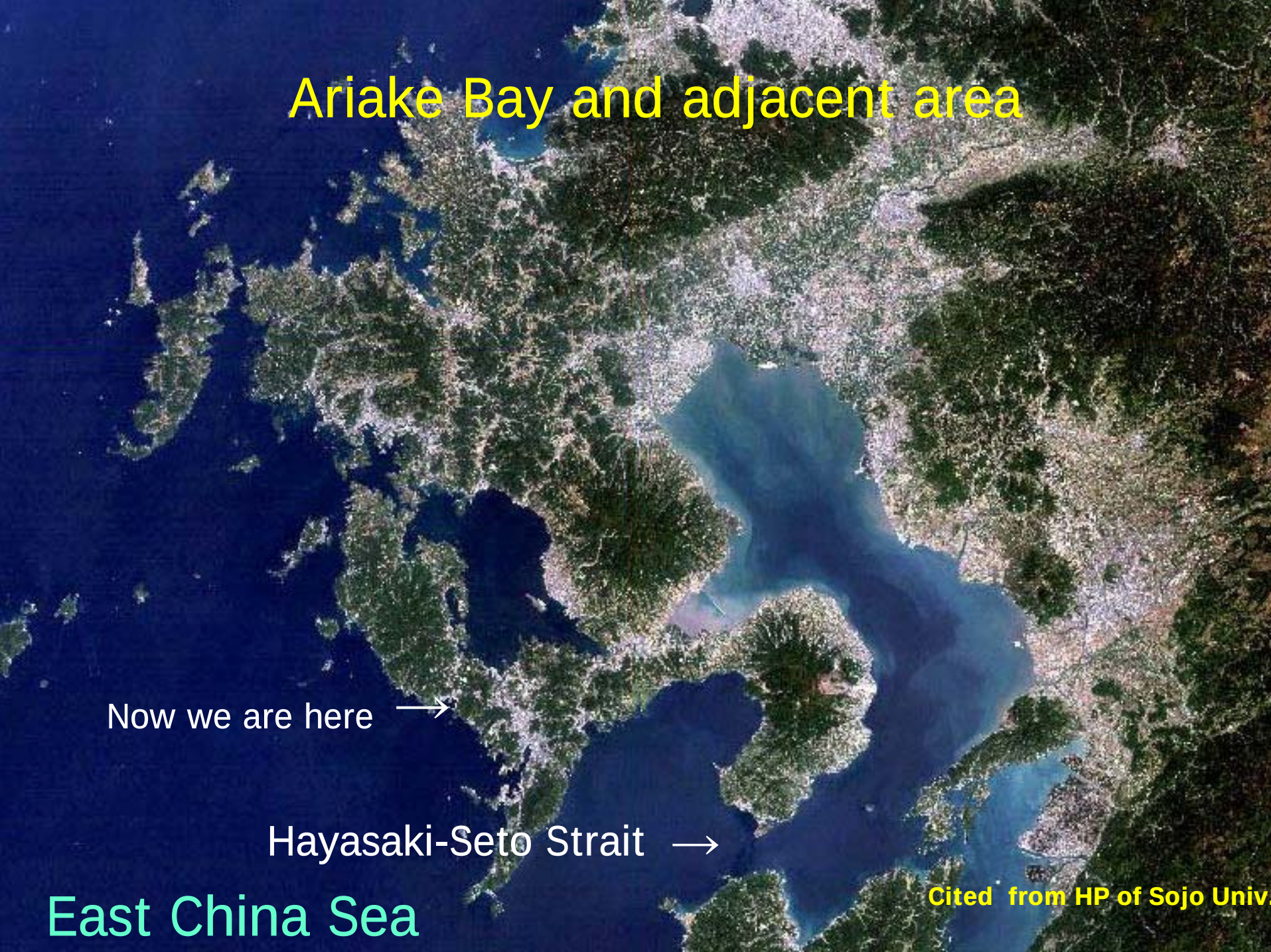
- What is Ariake Bay ?
  - Environmental characteristics
- Fisheries in Ariake Bay
- Research for Restoration


Ariake Bay and adjacent area
Now we are here
Hayasaki-Seto Strait
East China Sea
Cited from HP of Sojo Univ

Tidal flats Ariake Bay 20,000 ha

Total in Japan < 48,000 ha

Photo by Toranosuke Hatiya

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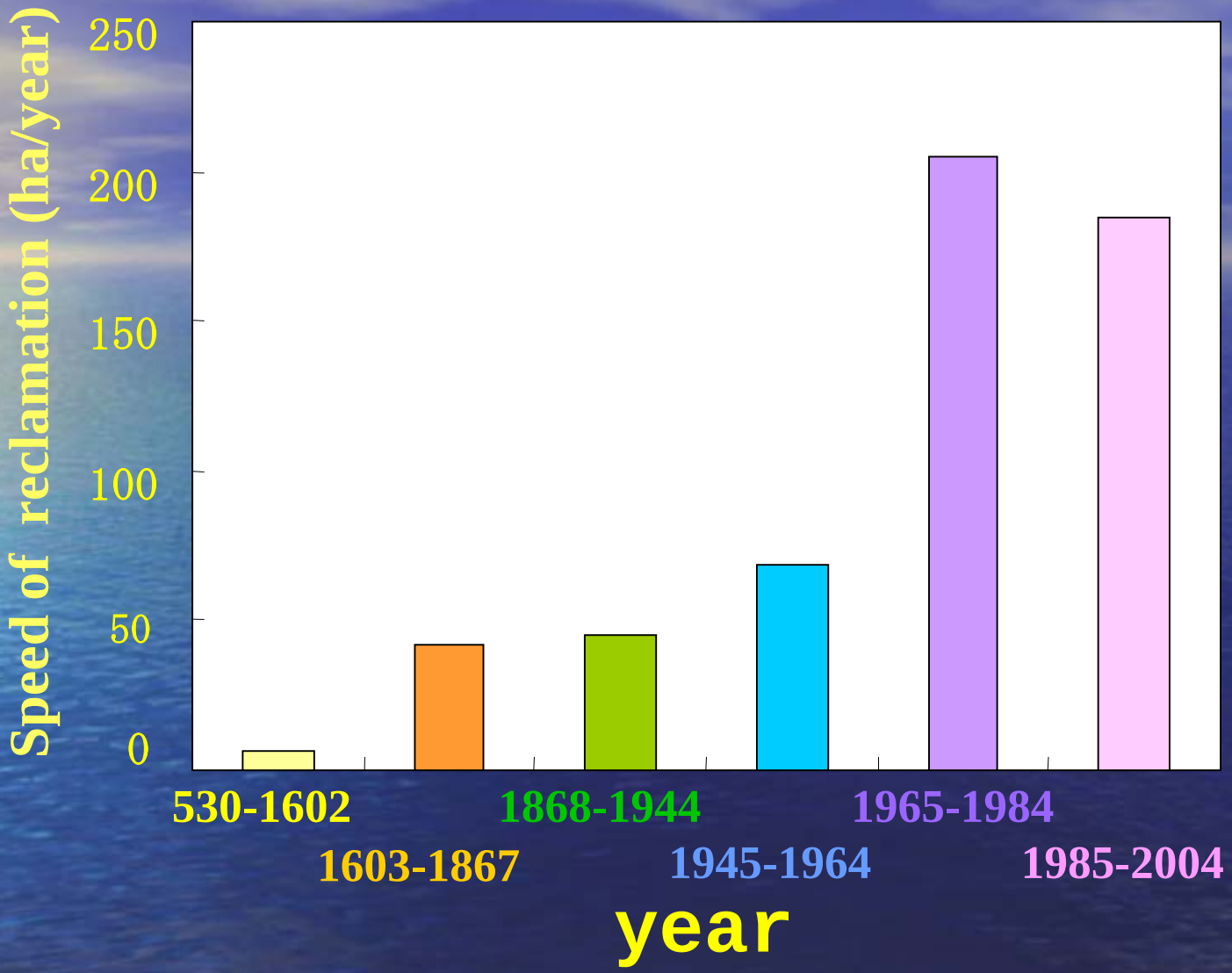
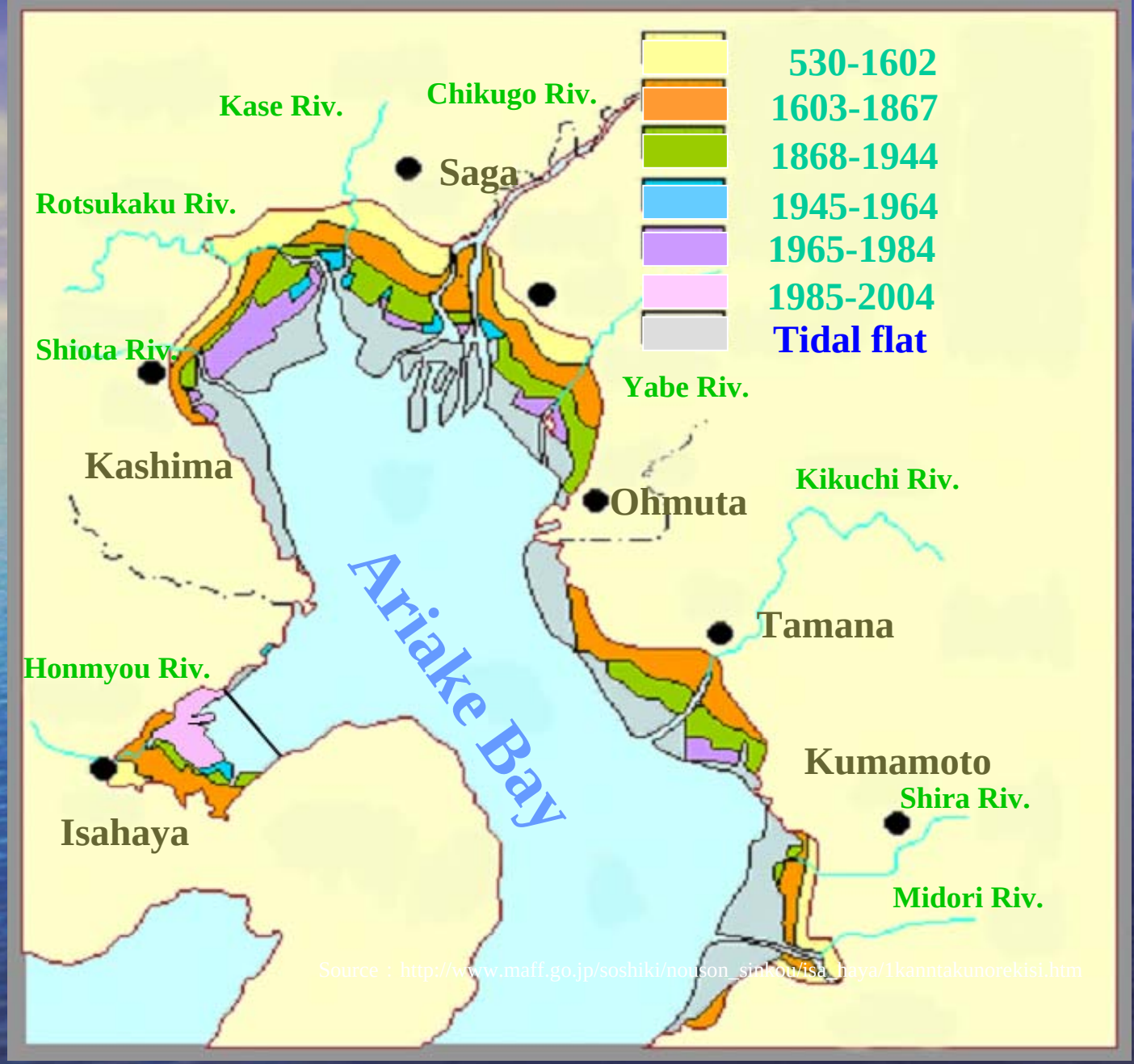


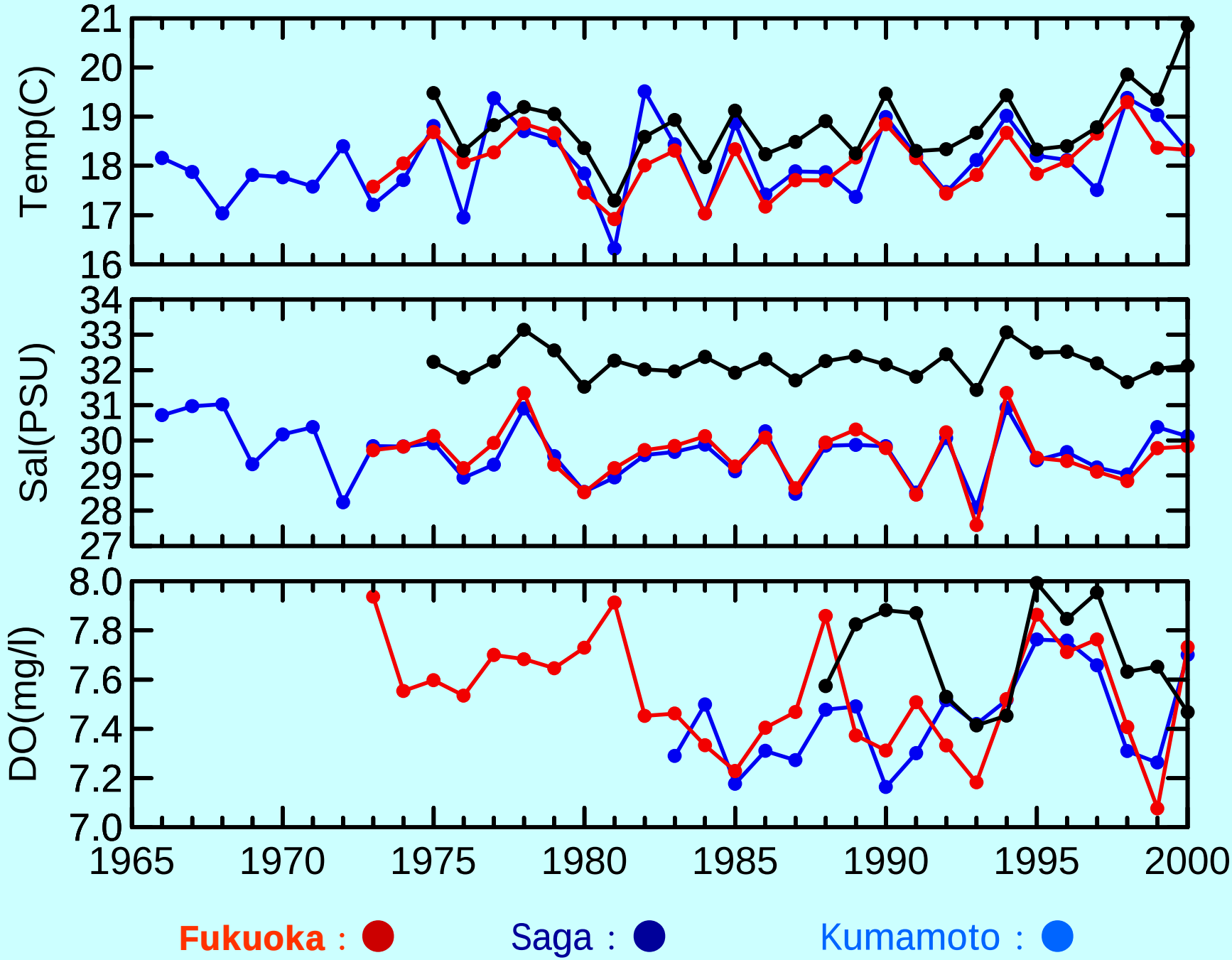
Speed of reclamation in each historic period in Ariake Bay

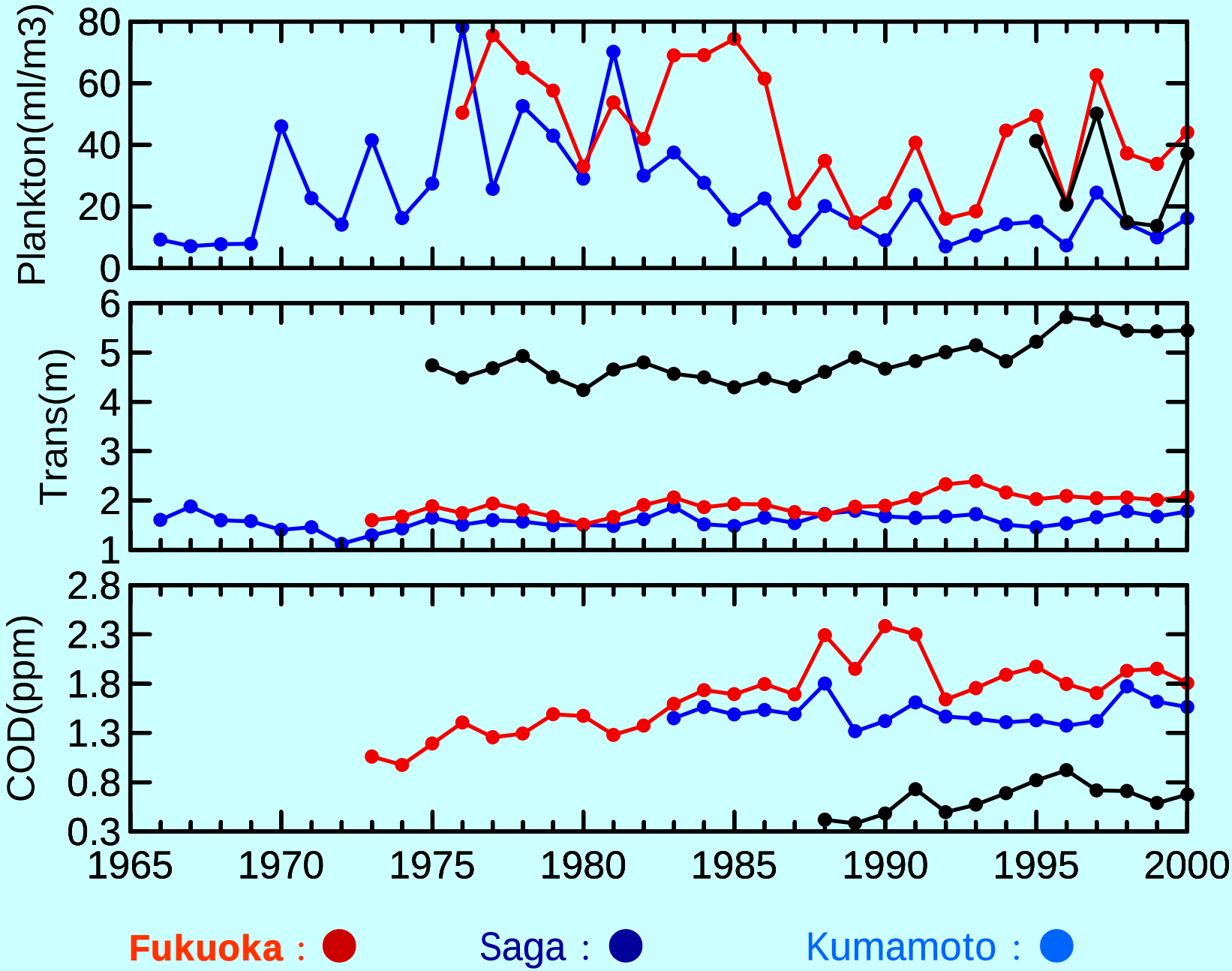


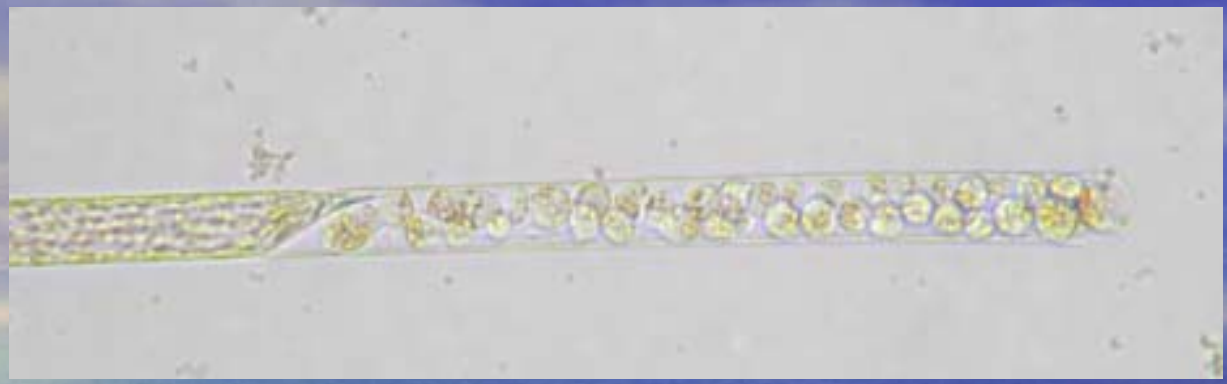
The history of reclaimed land in Ariake Bay

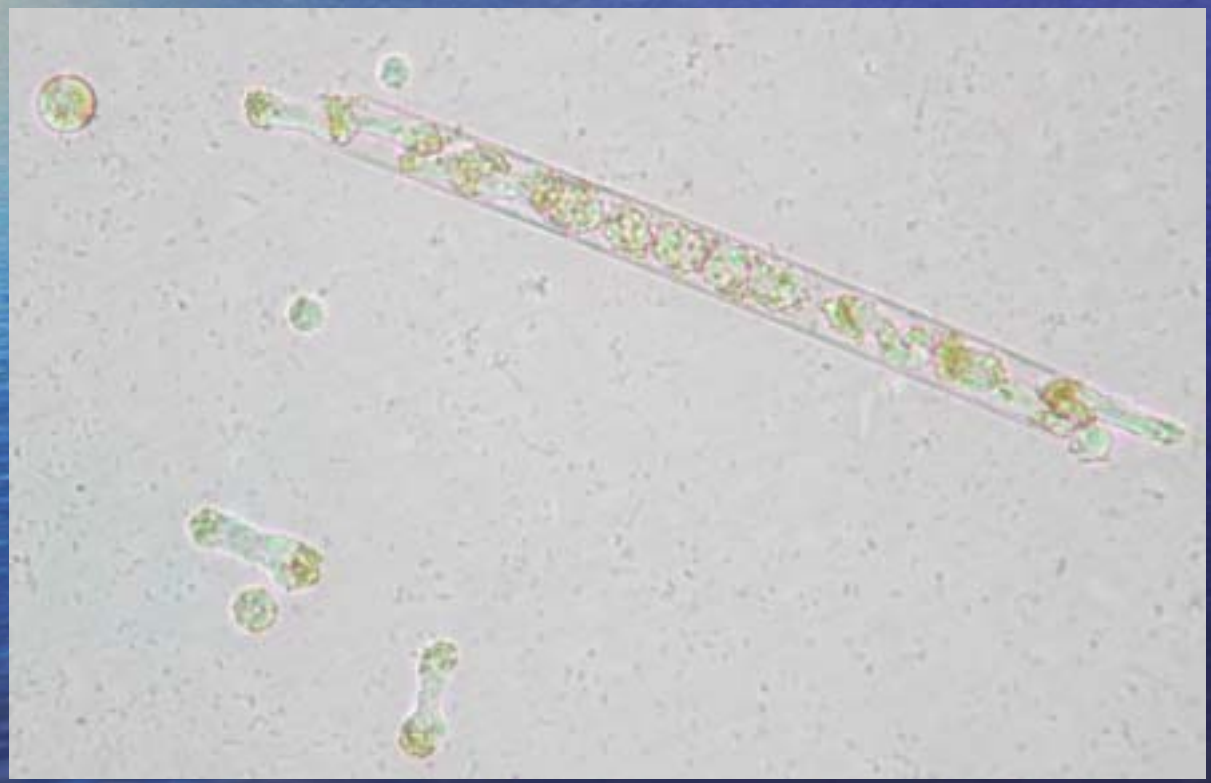
Cited from HP of Kashima City

Pleasure on tidal flats in Ariake Bay

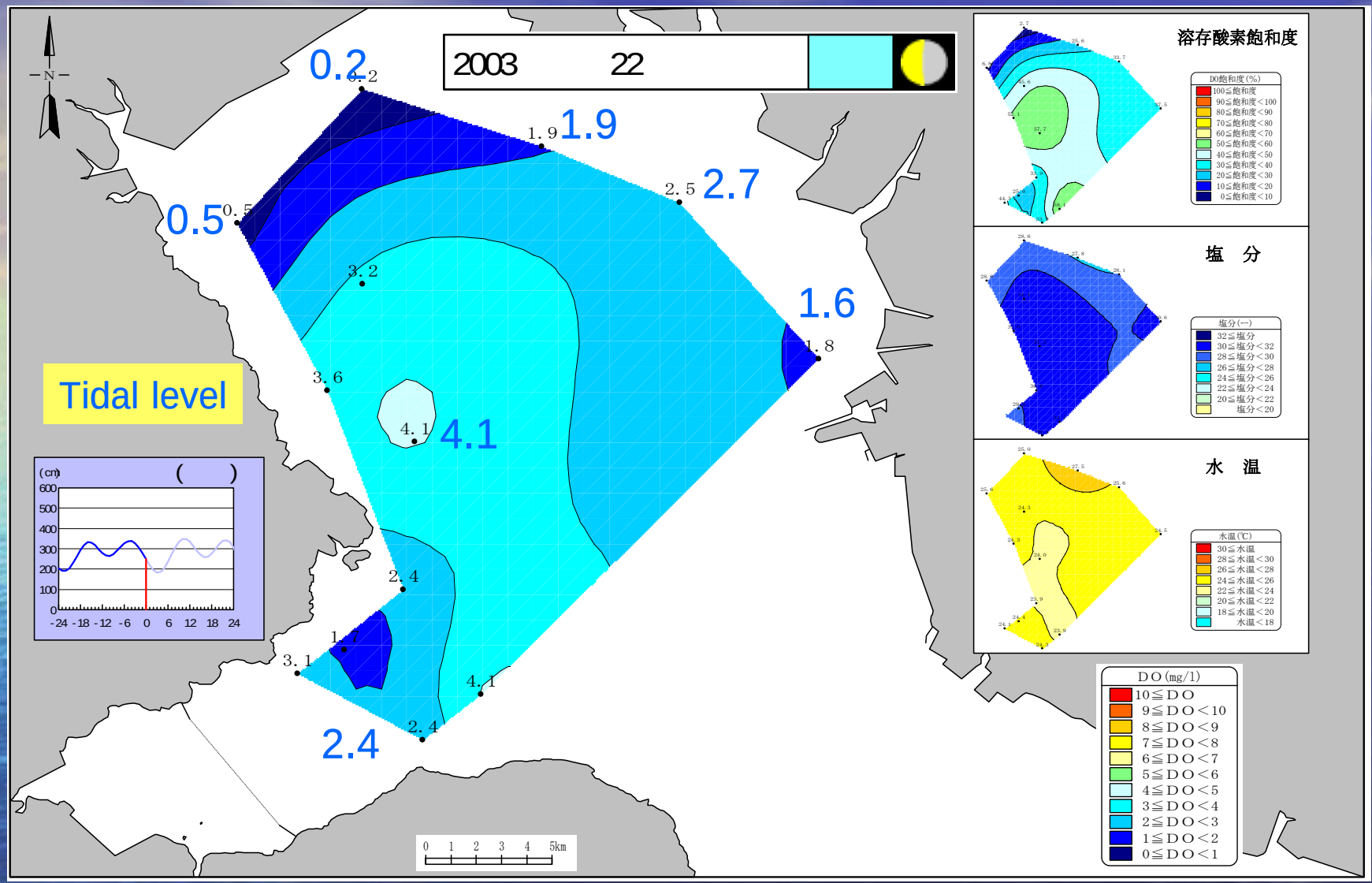

Temp(C)
21
20
19
18
17
16
Sal(PSU)
34
33
32
31
30
29
28
27
DO(mg/l)
8.0
7.8
7.6
7.4
7.2
7.0
1965
1970
1975
1980
1985
1990
1995
2000
Fukuoka :
Saga :
Kumamoto :


Plankton(ml/m3)
80
60
40
20
0
Trans(m)
6
5
4
3
2
1
COD(ppm)
2.8
2.3
1.8
1.3
0.8
0.3
1965
1970
1975
1980
1985
1990
1995
2000
Fukuoka :
Saga :
Kumamoto :



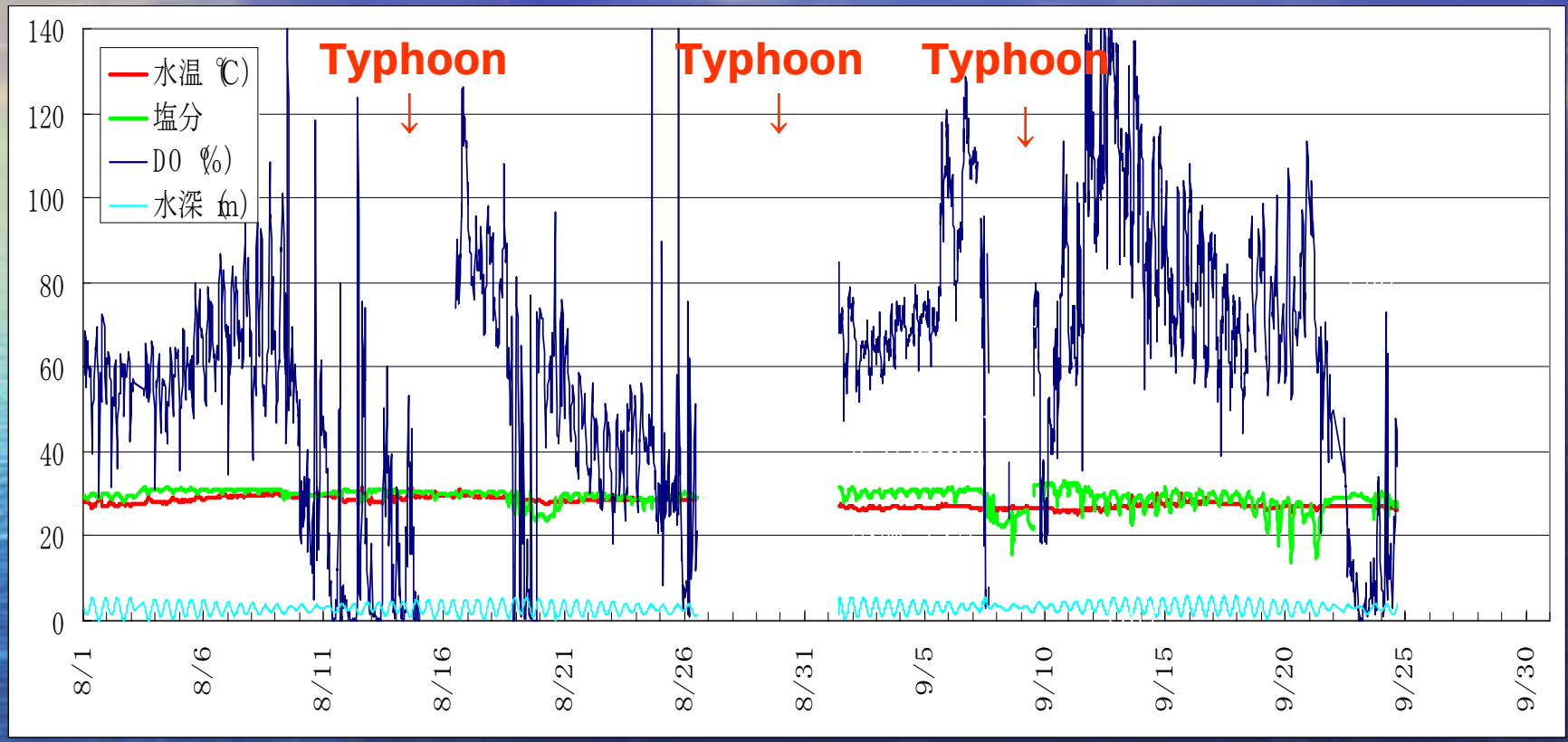


Rhizosolenia imbricata



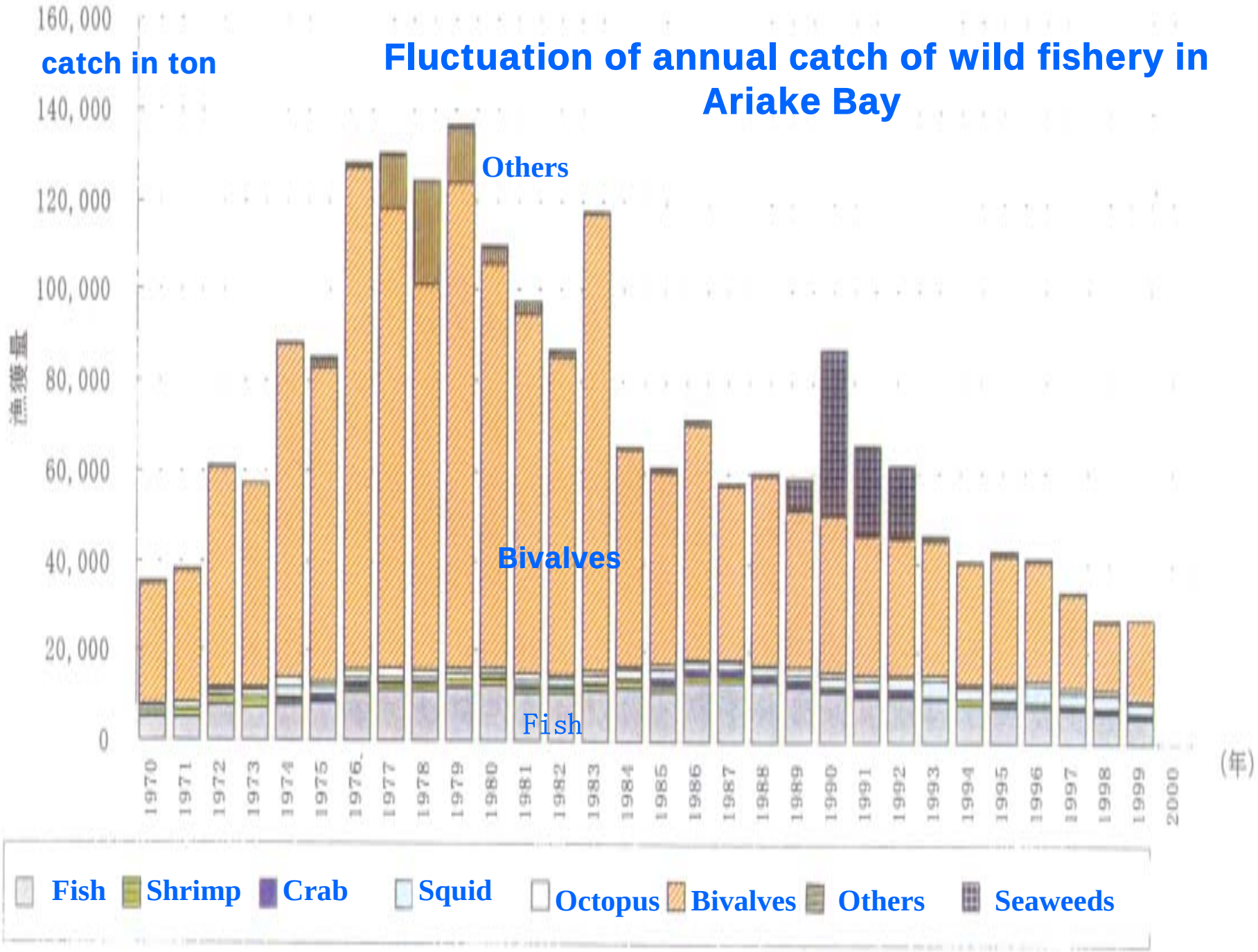
Distribution of concentration of dissolved oxygen (mg/L) of bottom layer(-0.2～0.5m) at neap tide

Fluctuation of DO observed at St. T2, bottom of Ariake Bay, in 2004



—W.T(℃) —Sal (PSU) —DO(%) —Depth (m)

Fluctuation of annual catch of wild fishery in Ariake Bay



Jack-knife clam
Sinonovacula constricta

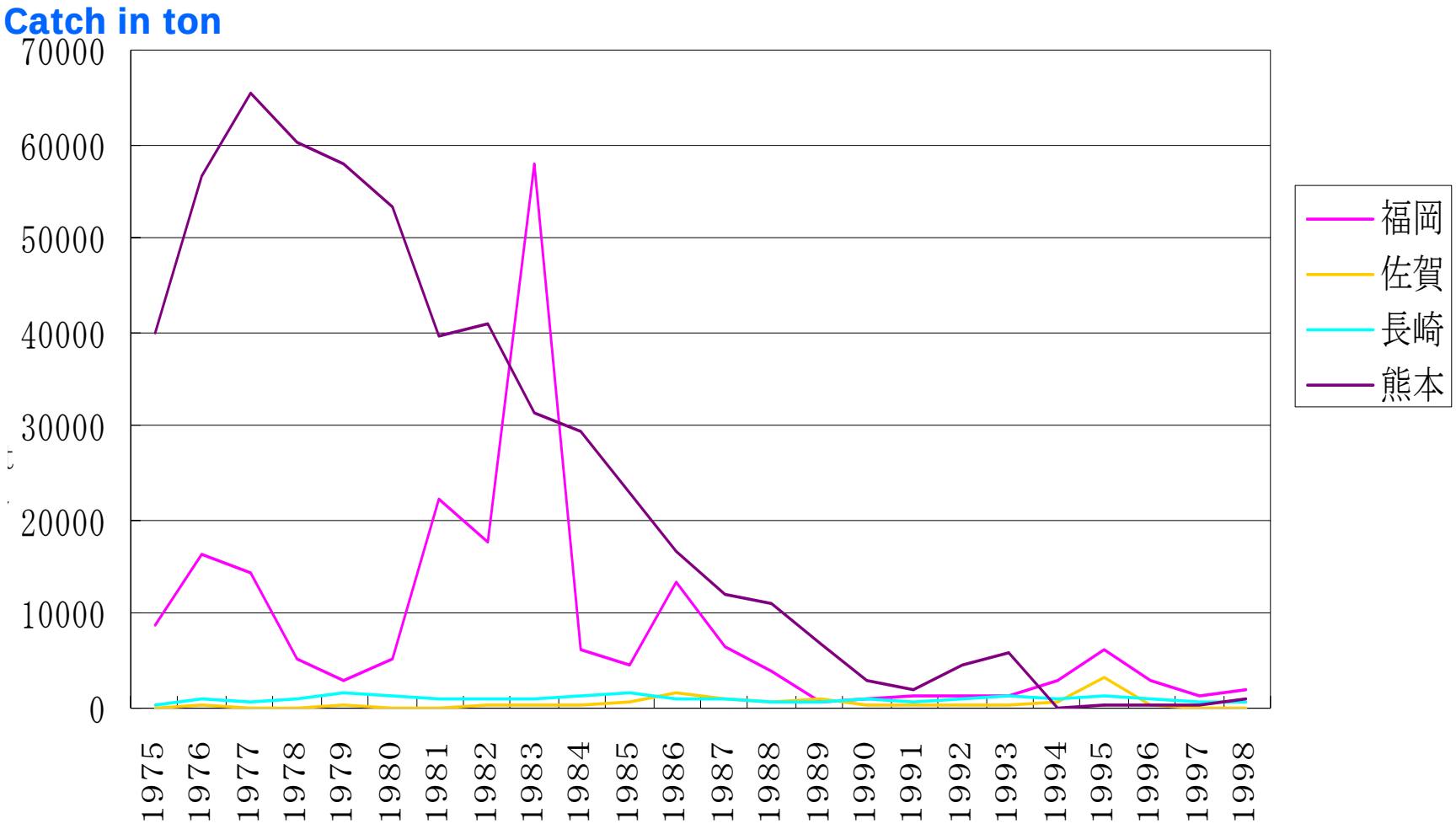
Short-necked clam
Ruditapes philippinarum

Pen shell
Atrina pectinata

Barnea dilatata japonica
Umitake

あさり類

Annual change of catch of short-necked clam



Causative Factors for Decreasing Yields of Bivalves in Ariake Bay

1) Over fishing

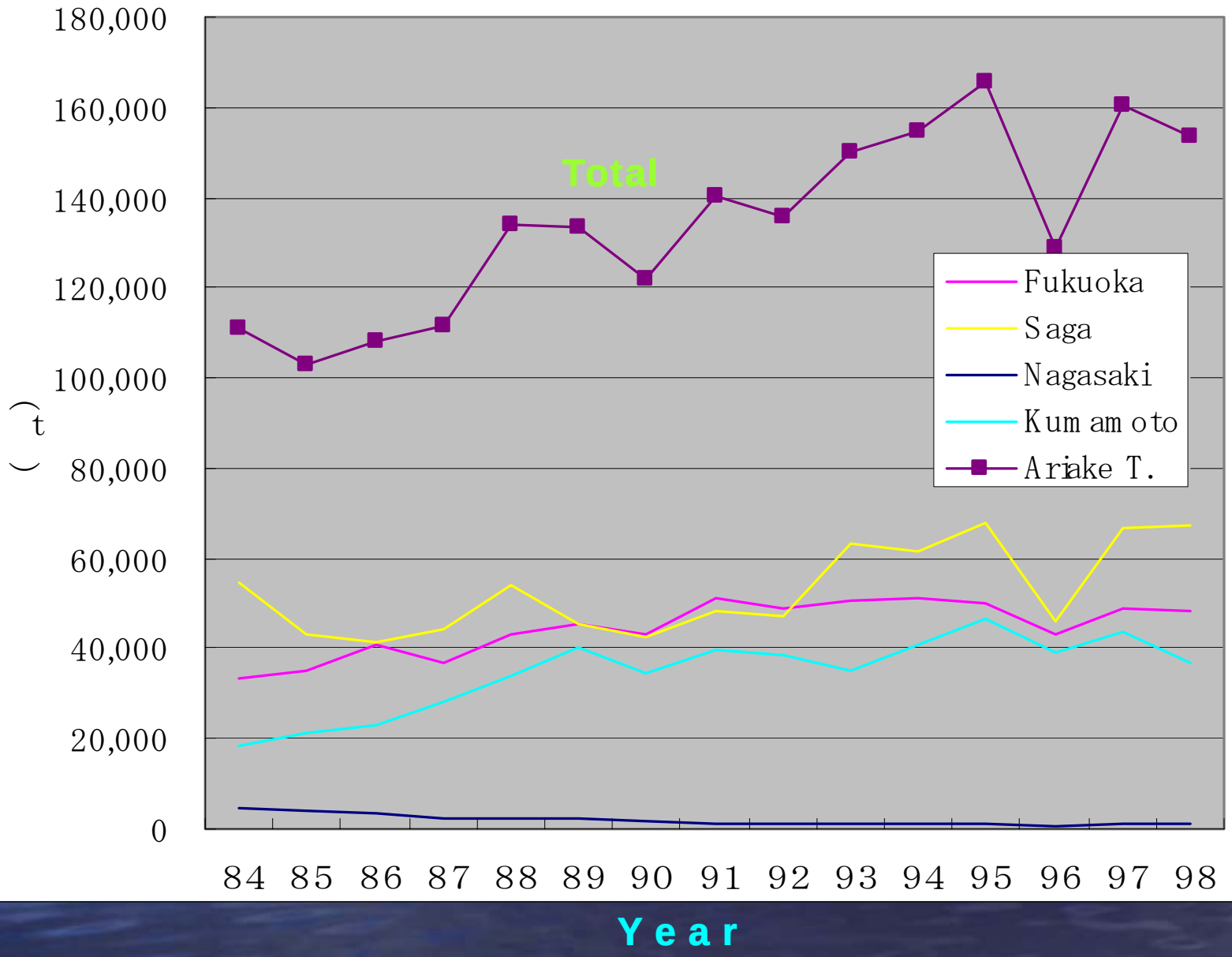
2) Environmental deteriorations
   a. Reductions in dissolved oxygen contents in water column
   b. Blooms of toxic micro algae
   c. Unsuitable sediment conditions for larval settlement

3) Impact of predation
   a. Predator such as crabs and rays

4) Outbreak of diseases
   a. Protozoan and viral diseases

Photo by Toranosuke Hatiya
撮影 蜂谷虎之助氏

Annual change of Nori Production in Ariake Bay



squillas

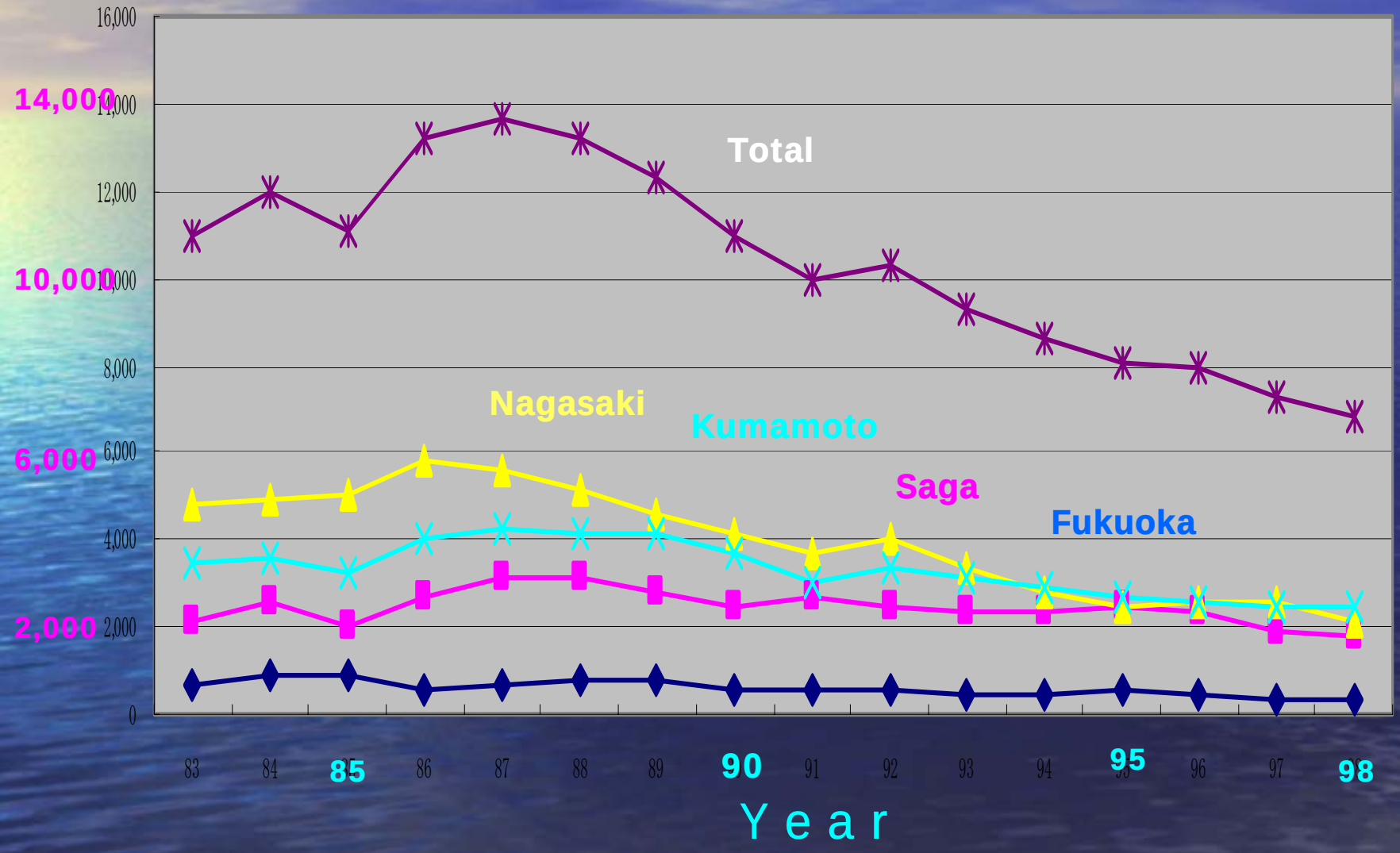
Zebrias zebrinus ?

Pleuronichthys cornutus

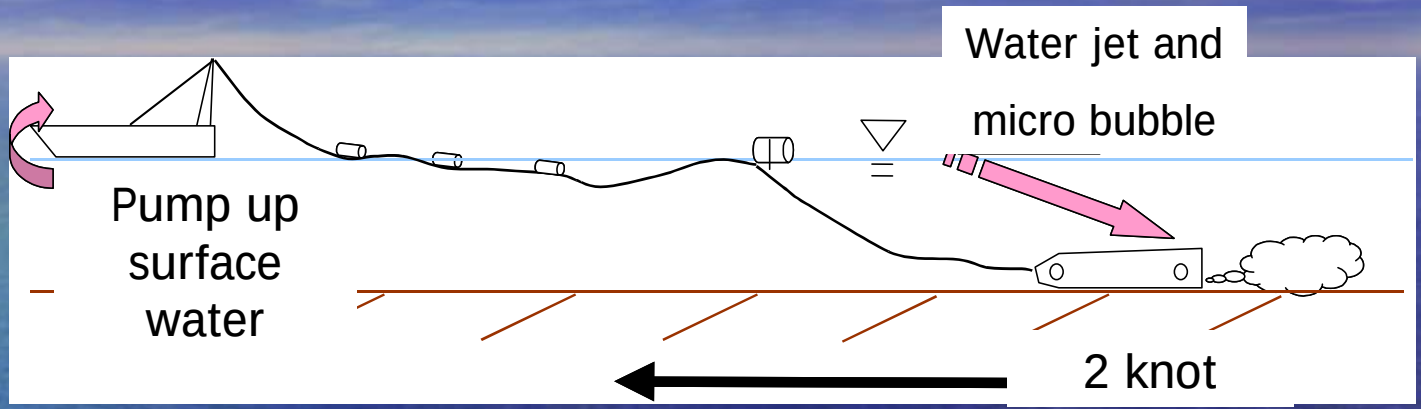
Photo by Toranosuke Hatiya

撮影 蜂谷虎之助氏

Annual change of catch of fish in Ariake Bay

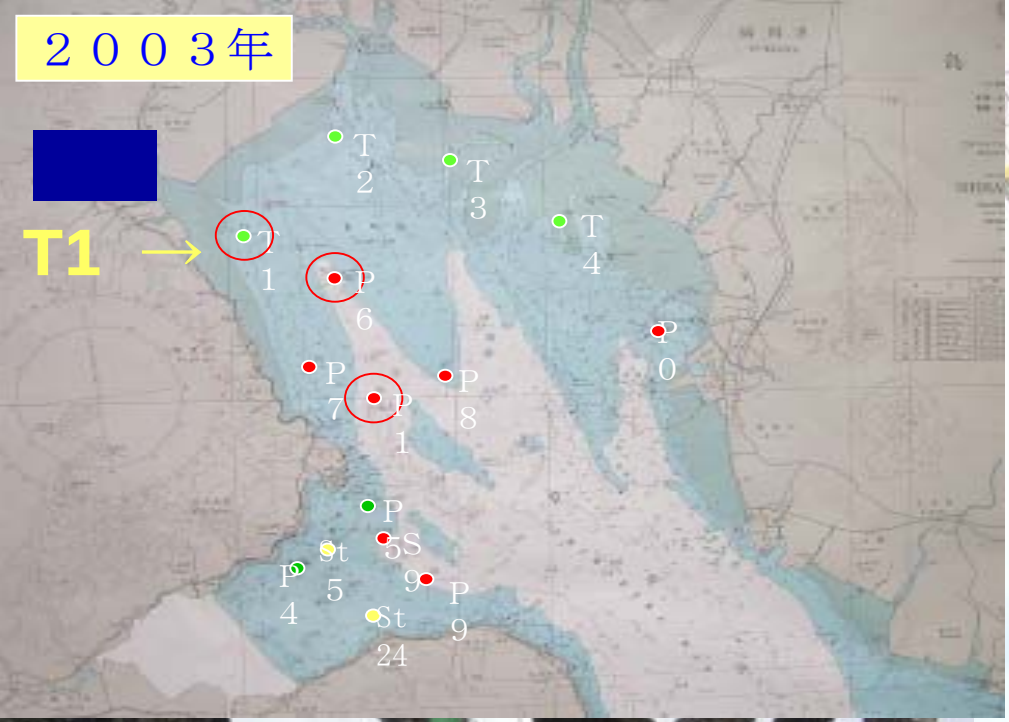


Water jet micro bubbler



Under water unit

Compressor



Observation tower
settled at station T1

Current and Future Program

- **Monitoring**
  - Ocean environment (physical, chemical and plankton data)
  - Harmful algal bloom （resting spore)
  - Egg and larvae distribution
  - Hypoxia
- **Restoration**
  - Release of seeds (fish, bivalve, shrimp, crab)
  - Breeding (algae)
  - Sediment quality(irrigation, covering by sand)
  - Hypoxia Mechanism of trigger
    Technique of elimination

◎synthesis of carrying capacity and production

Sagemon in Yanagawa City, Fukuoka