

Water Environment Administration of Lakes in Japan

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Seiji Tsutsui

Director of Water Environment Division,
Environmental Management Bureau,
Ministry of the Environment

1. The current status of lake water quality and the issues
2. Development of water environment administration for lakes
3. The Law Concerning Special Measures for the Conservation of Lake Water Quality (Lakes Act)
4. Response to the new issues concerning lakes in Japan
5. Act for the Conservation and Restoration of Lake Biwa (Lake Biwa Act)
6. Present measures for Japanese lakes and the future direction
7. The domestic legal framework and Integrated Lake Basin Management (ILBM)

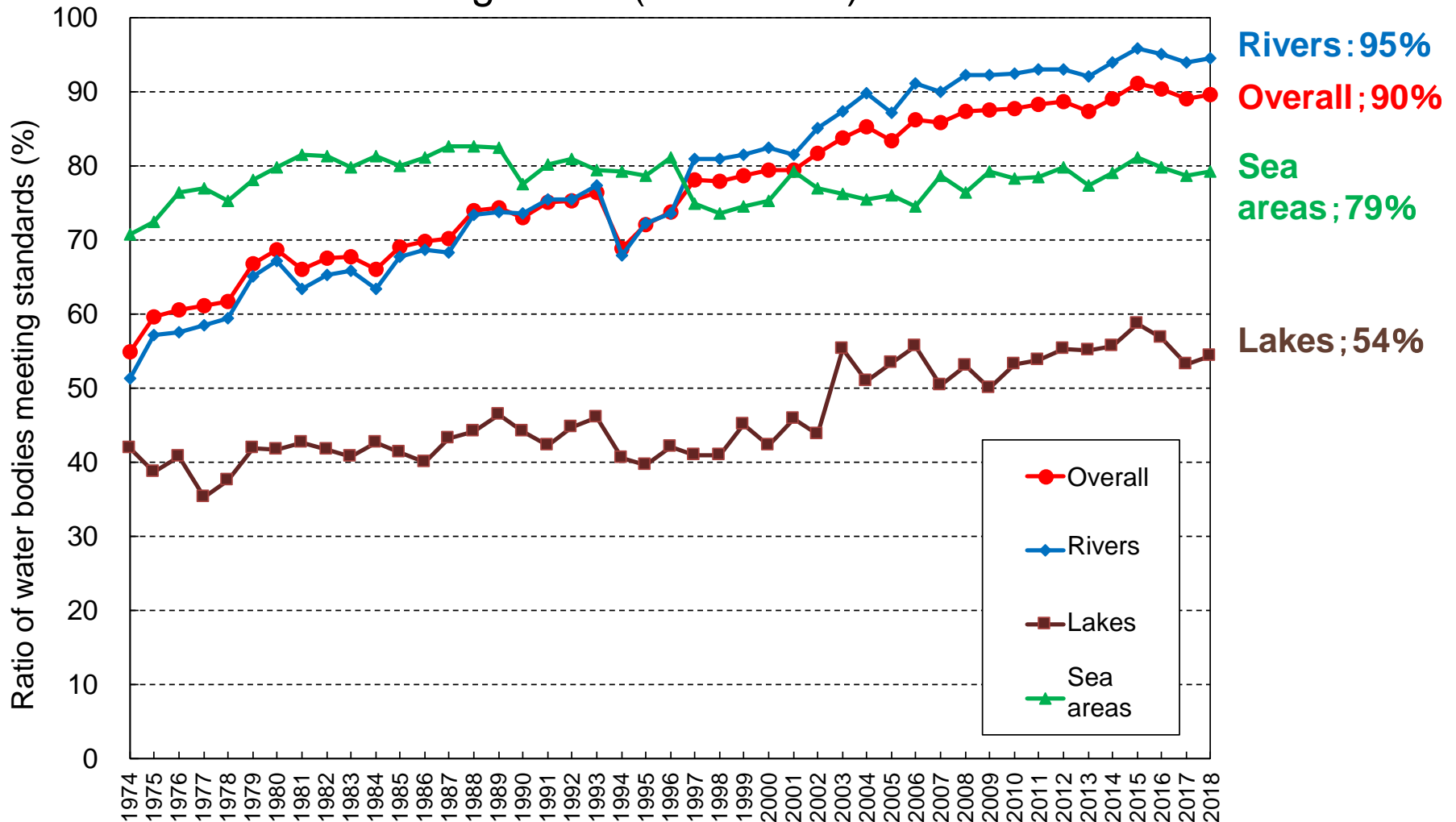
- Approx. 90% of surface water is lake water
- Water resource for human life and activities
→ for drinking, household, industrial, agricultural etc.
- Flood control
- Fisheries
- Ecosystem
etc.

- Better basin governance through integration of the six factors:
 - ① Organization/Structure
 - ② Policies
 - ③ Participation
 - ④ Technologies
 - ⑤ Information
 - ⑥ Finance

The current status of lake water quality and the issues

In Japan, preservation of water quality is pursued through environmental quality standards (EQSs) set up for each river, lake and sea area. The EQSs are poorly achieved in lakes due to their enclosed nature.

Trends in meeting EQSs (BOD/COD)



1970 Water Pollution Control Act

Uniform Wastewater Standard

While river water quality improved, eutrophication occurred in lakes:
(blue/green algal blooms, red tides)

1982 EQSs for Lake Nitrogen and Phosphorus

1984 Lakes Act

Basic Policy for Conserving Lake Water Quality
Designated lakes (Plans to conserve lake water quality)
Load regulation

2005 Revised Lakes Act

Corrective measures for non-point runoff
Protection of environment around lakes

2015 Act for the Conservation and Restoration of Lake Biwa

Basic Policy for Conservation and Restoration of Lake Biwa (National)
Lake Biwa Conservation and Restoration Plan (Shiga prefecture)



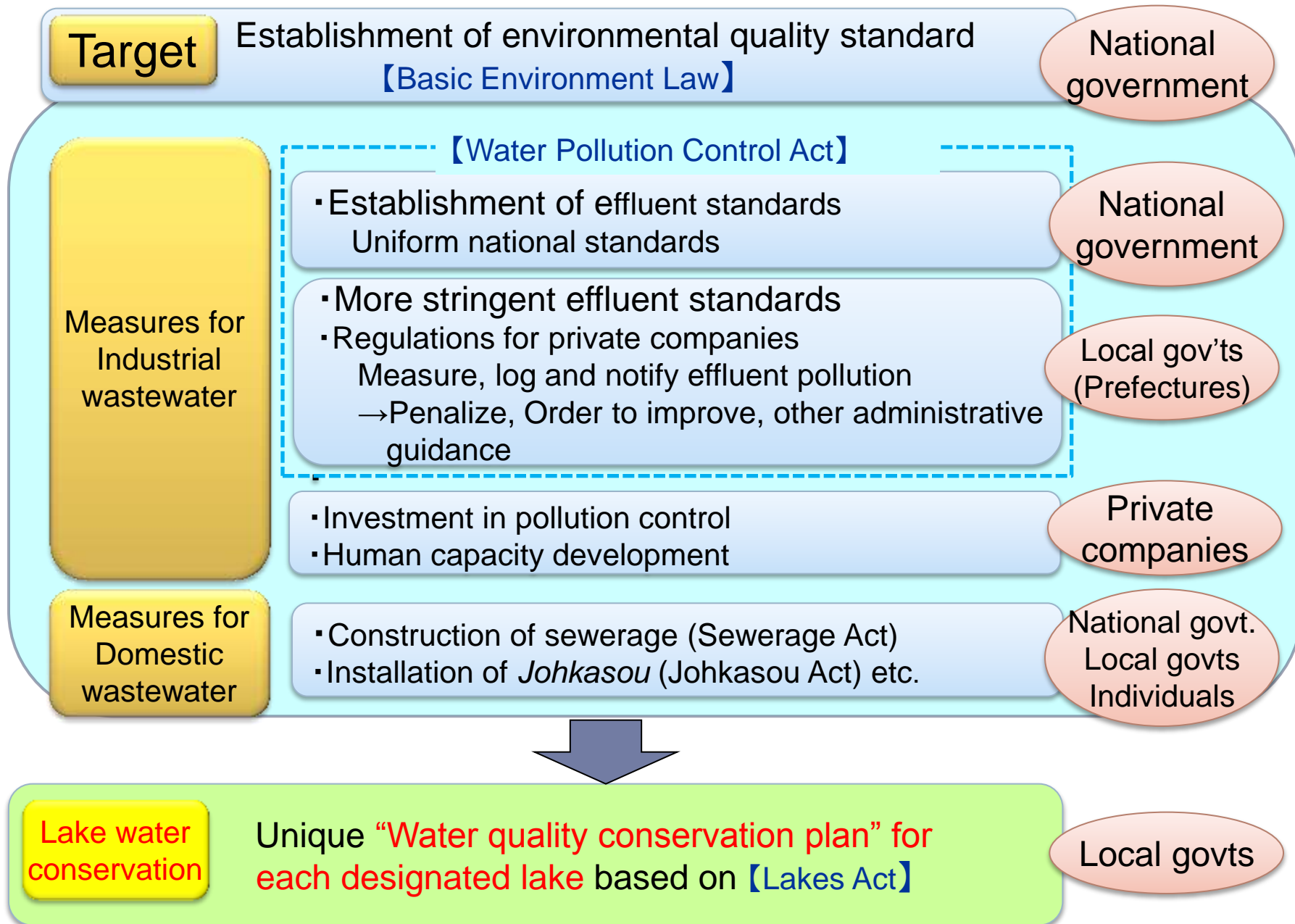
Fish death due to hypoxia (Lake Nakaumi)

Source: Shimane Prefecture website



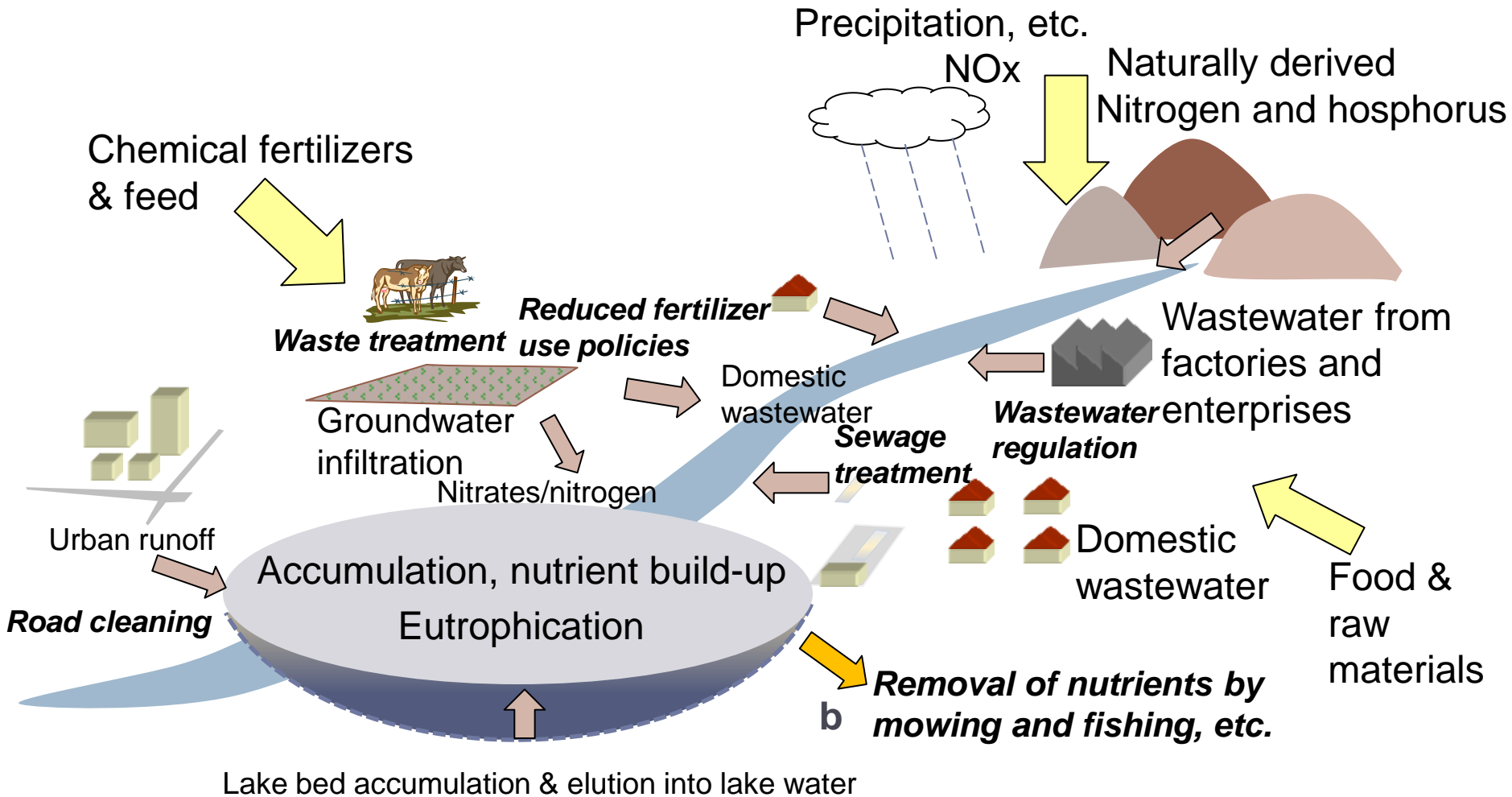
Algal bloom in Lake Hachiro (2010)

Source: Akita Prefecture website



Schematic:

Factors causing algal blooms, putrefaction odors, damage to water quality, and poor bottom layer oxygenation



Basic conservation policy for lake water quality

(For all lakes)

Local governments request Cabinet to designate lakes

(Total 11 lakes have designated incl. Lake Biwa and Kasumigaura)



Lake Water Quality Conservation plan for each designated lake (by local governments)

Pollution load regulation

Implementation of infrastructure construction such as sewerage system

Regulation of small-scale animal husbandry & aquaculture

Guidance, etc. to other agents than regulated facilities

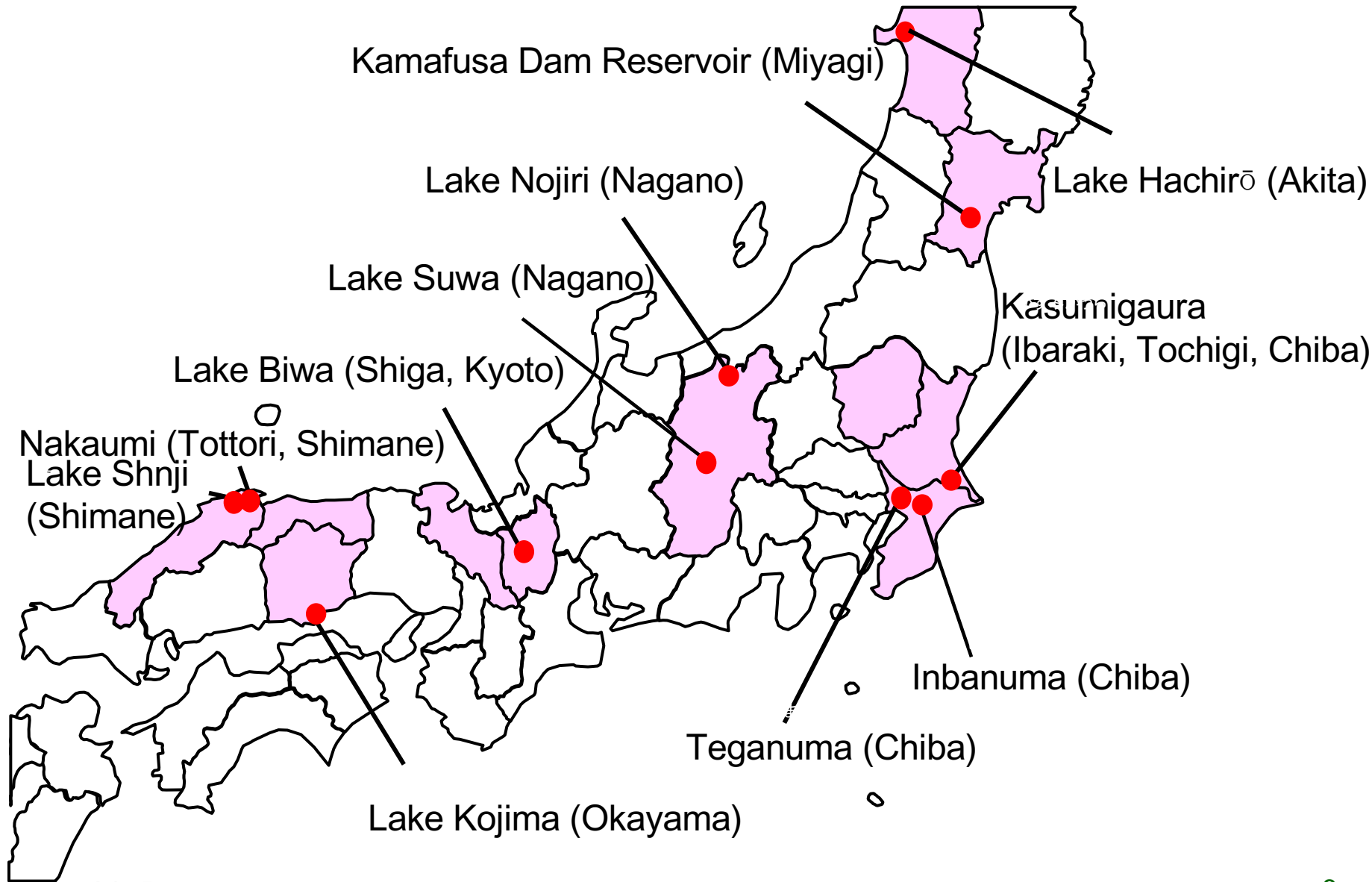
Promotion of research & development of technologies

Designation and conservation of protected areas around lakes

Designation of non-point runoff countermeasures areas

(If necessary) Regulation of total pollution load control

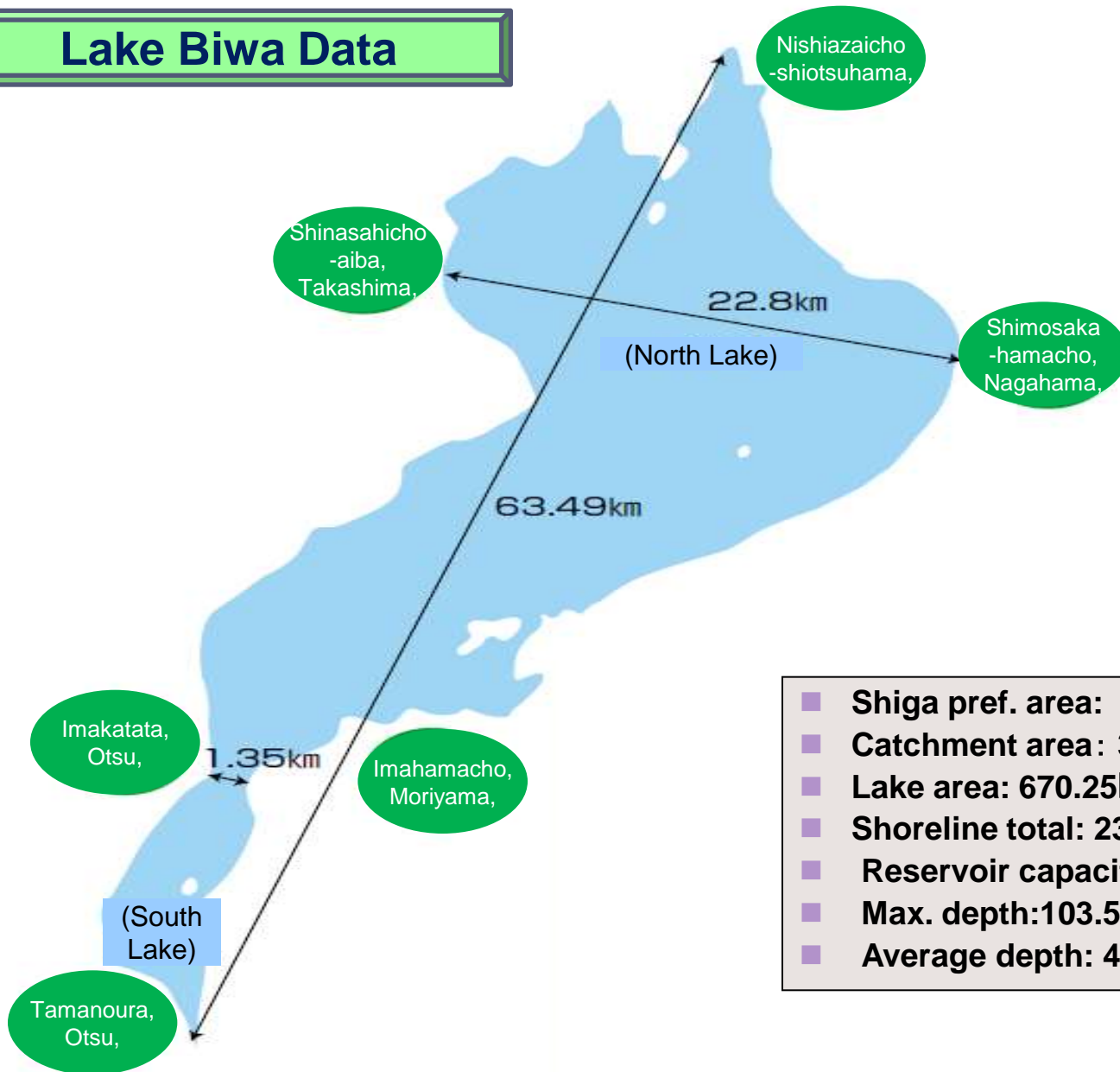
Location of Designated Lakes



(Emerging issues)

- Pollution load flowing into the lakes is declining by water quality preservation measures up to now.
- However, new challenges in the ecosystem have emerged such as massive overgrowth of aquatic plants and reduction of native fish and shellfish species

Lake Biwa Data



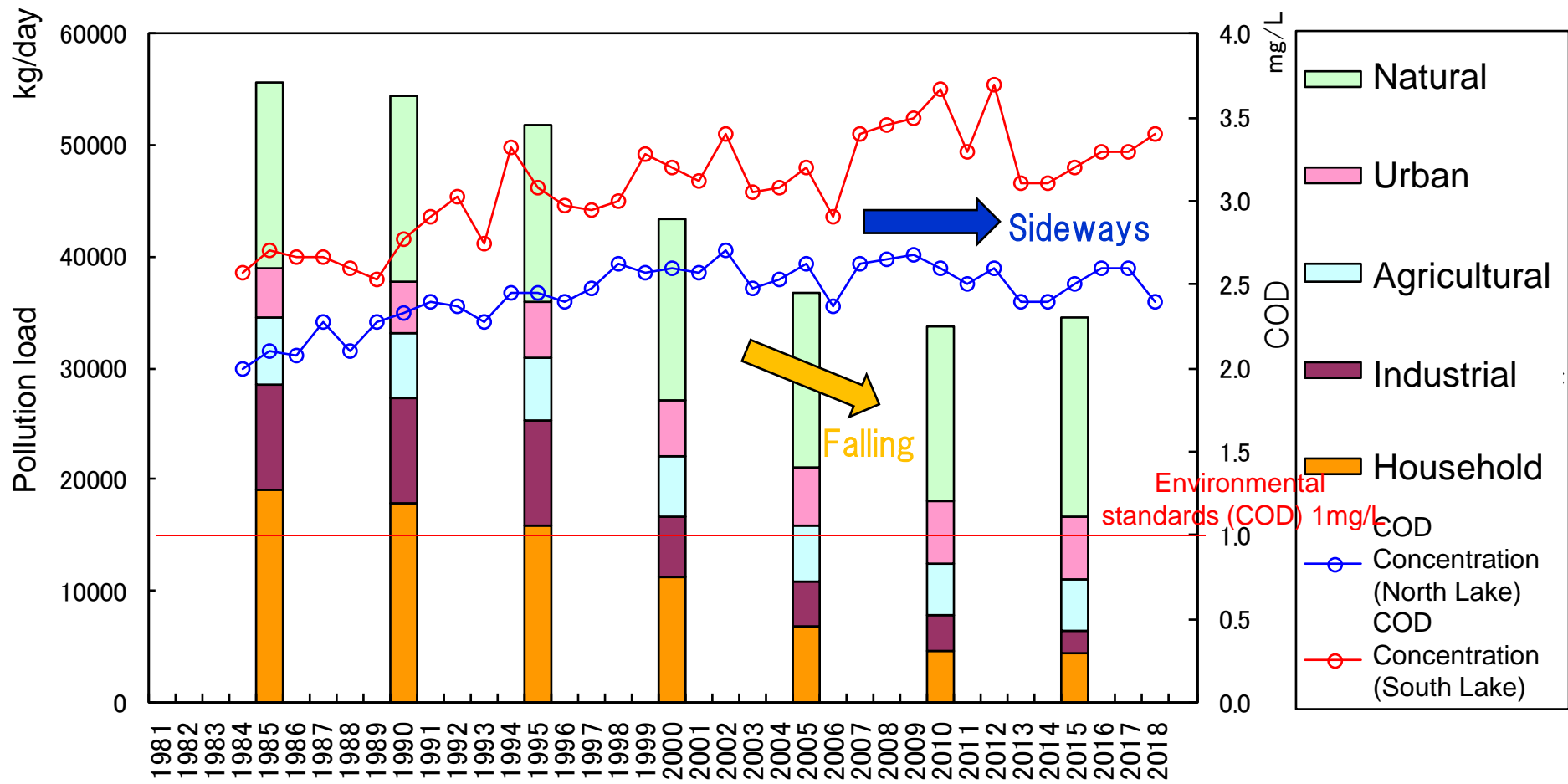
(Resources)

- Source of water supply
- Rich natural environment
- Fishery
- Resources for tourism

- Shiga pref. area: 4017km²
- Catchment area: 3174km²
- Lake area: 670.25km²
- Shoreline total: 235.2km
- Reservoir capacity: Approx. 27.5 bil m³
- Max. depth: 103.58m
- Average depth: 41.2m

Prevention of water pollution

Trends in inflow load and COD in Lake Biwa

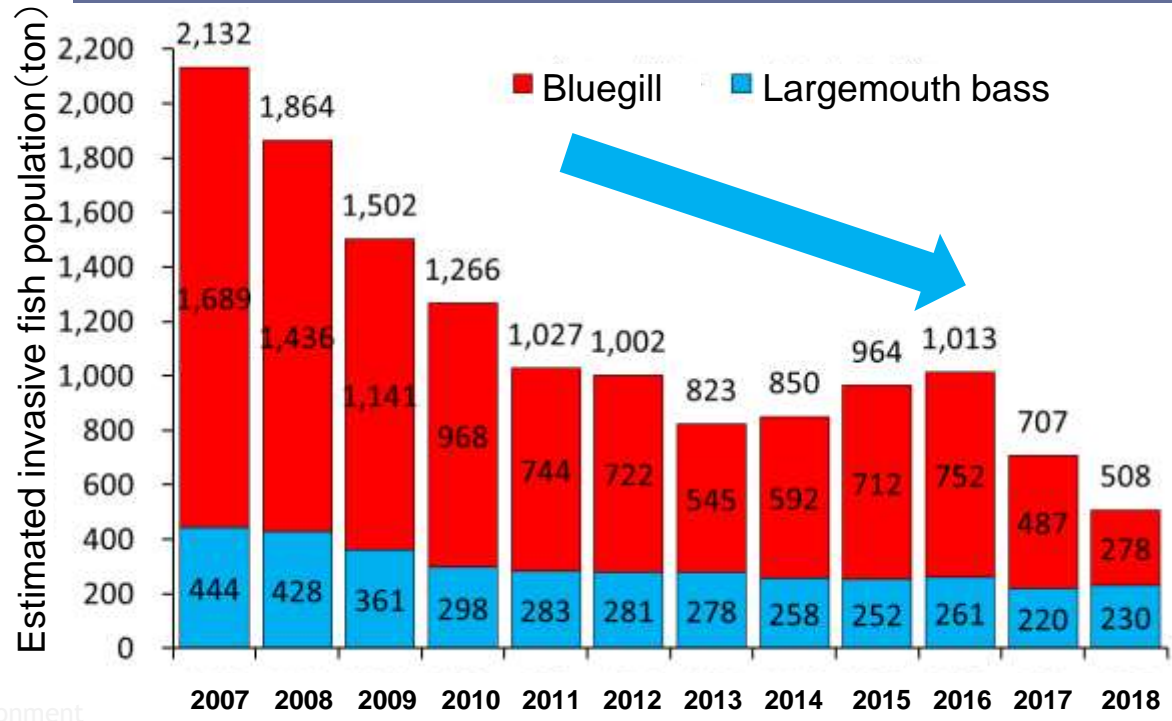


Removal of invasive alien species (fish)

How foreign invasive fishes (Bluegill, Largemouth bass) are being eliminated



◆ Trends in the estimated population of invasive fishes

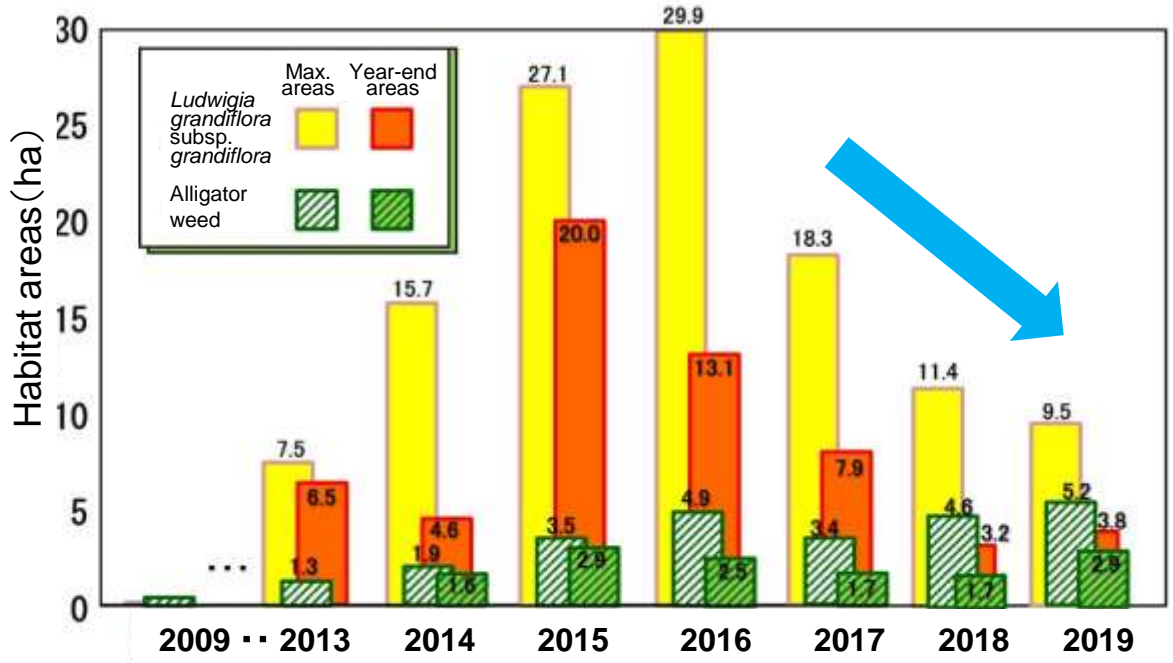


Removal of invasive alien species (plants)

Invasive aquatic plants (*Ludwigia grandiflora* subsp. *grandiflora*, etc.)

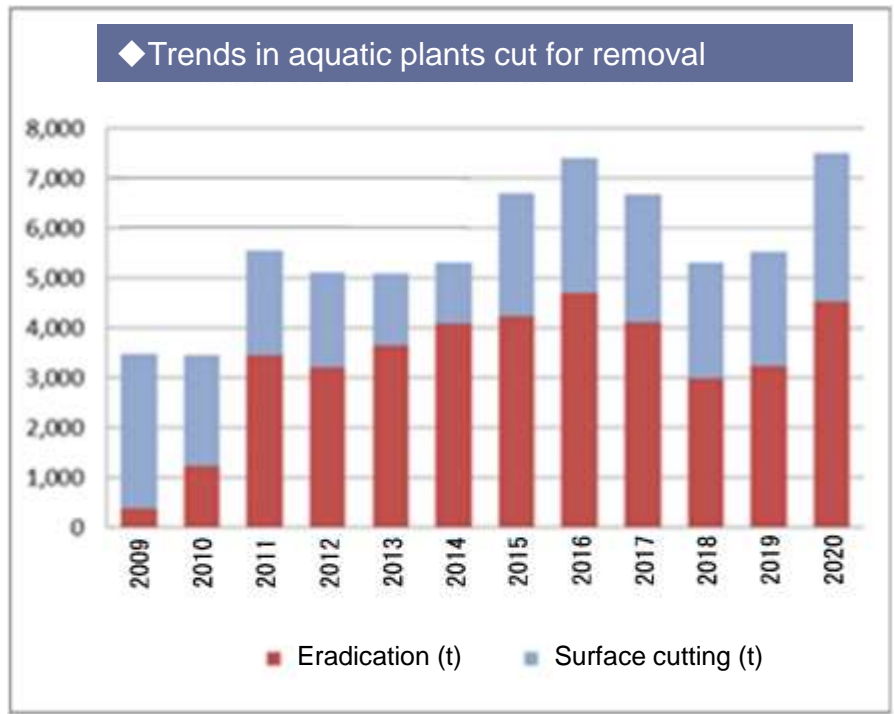
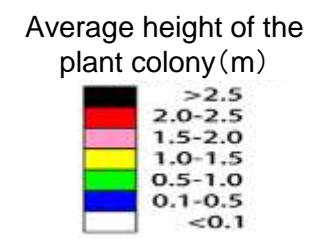
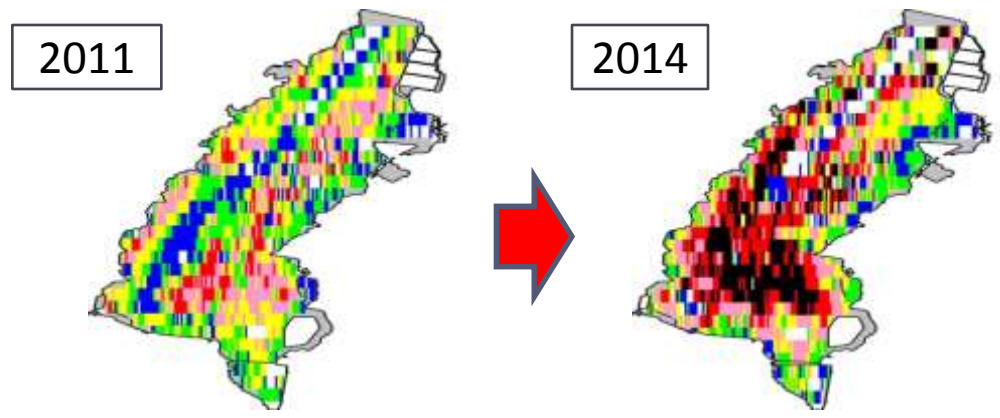


◆ Trends in habitats of invasive plants



Removal of aquatic plants

Growth of aquatic plants (South Lake)



Eradiation



Surface cutting

Reduction of fish catches

Fish and shellfish species inhabiting in Lake Biwa



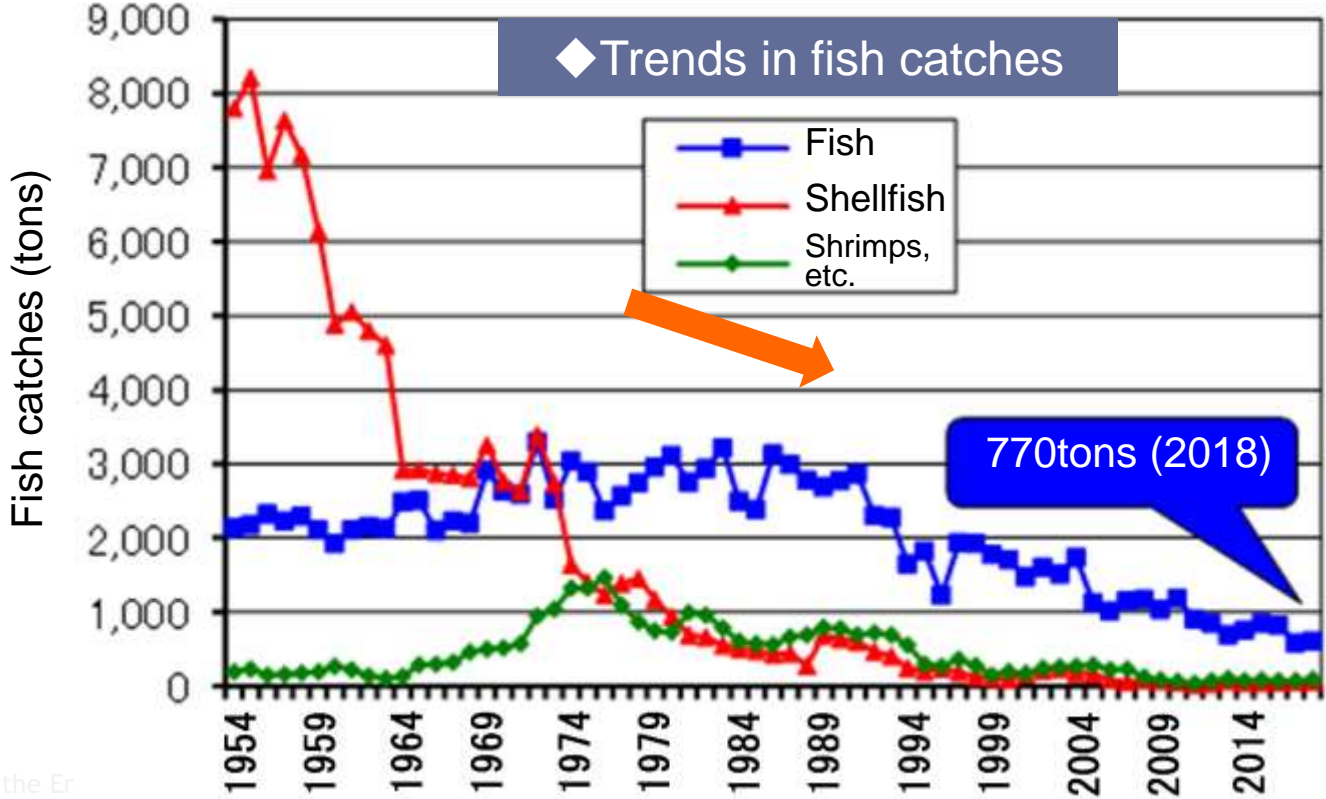
(*Carassius auratus grandoculis*)



(*Gnathopogon caerulescens*)



(*Corbicula sandai*)



○ PURPOSE

To help create a society that is symbiotic with nature through conservation and rebirth of the lake that is healthy and bountiful.

○ Basic policies (Prescribed by the national government)

Basic guidelines concerning conservation and rebirth of Lake Biwa

○ Lake Biwa Conservation and Restoration Plan (Prescribed by Shiga prefecture)

Measures for conservation and rebirth of Lake Biwa

Harmony

Lake Biwa water quality conservation plans

Measures for water quality conservation in Lake Biwa

○ Measures by the national/local governments

- Water pollution prevention measures
- Conservation and rebirth of lakeside environment
- Promotion of environmentally conscious agriculture
- Landscape management and conservation
- Improvement of education, etc.

○ Financial support from the national government

○ Coordination between the national and local governments

○ Collaboration with parties concerned

1 Implementation of **lake basin water quality/environment management**

- ◎ Management of basic data through monitoring of pollution load/water quality
- ◎ Integrated approach to effluent regulations and public works construction such as domestic waste water measures
- ◎ Enhancement of measures for non-point pollution

2 **Target setting based on the characteristics of each lake** and implementation/enhancement of measures

- ◎ Bespoke plans made for each lake (Long-term vision/improvement target, unique indicators)
 - Indicator examples: transparency, evaluations from lake environmental research based on the five senses
- ◎ Improvement of lakeside environment

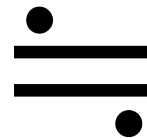
3 **Promotion of collaborations** with various stakeholders regarding lakes

- ◎ Continuous engagement between the local governments managing lakes and the stakeholders (local residents, fishermen, farmers, educational institutions, etc.)

[Domestic Legal Framework]

Water Cycle Act, Water Pollution Control Act, Lakes Act, Lake Biwa Act, etc.

- ① Responsibilities of the national and local governments
- ② Philosophy, Policies, Plans, Measures
- ③ Coordination/cooperation between parties concern
- ④ Implementation of research, development of science and technology
- ⑤ Reporting on the measures taken
- ⑥ Financial initiatives



[Implementing ILBM]

Better basin governance through integration of the six factors:

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- ③ Participation
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Thank you for your attention.

Ministry of Environment website

<http://www.env.go.jp/water/>