

A large flock of waterfowl, including swans and ducks, is gathered in a shallow body of water. In the background, a wooden pier structure extends into the water, with many birds perched on it. The water is calm, and the sky is clear. The overall scene is a natural habitat for these birds.

Outline of Lake Kasumigaura Management Project

Tonegawa-karyu integrated water resources management office
Incorporated administrative agency japan water agency (JWA)

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- Outline of Lake Kasumigaura Water Quality
- Outline of Facilities Maintenance

Outline of Lake Kasumigaura

(1) Location

The Lake Kasumigaura is located about 60km from Tokyo, in the south-east of Ibaraki Pref..

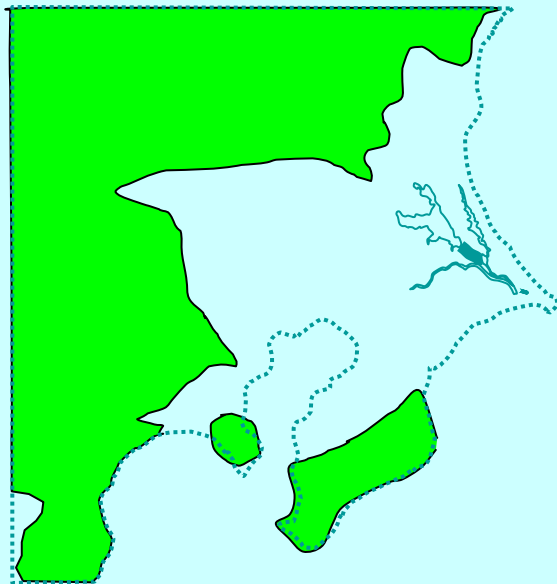


The Lake Kasumigaura consists of 3 rivers and 3 lakes.

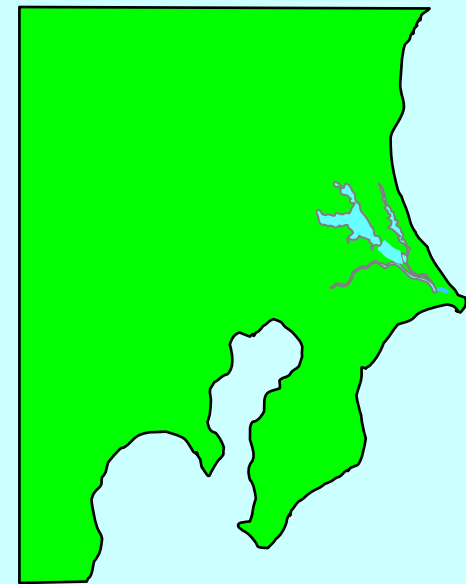
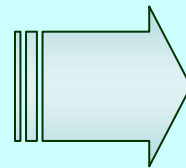
Outline of Lake Kasumigaura

(2) History of Lake Kasumigaura

About 200,000 years ago, the Lake Kasumigaura was a part of the ocean referred to as Old Tokyo Bay that extended across the Kanto region. Over time the shallow sea floor that accumulated in Old Tokyo Bay changed into land.



200,000 year ago



At present

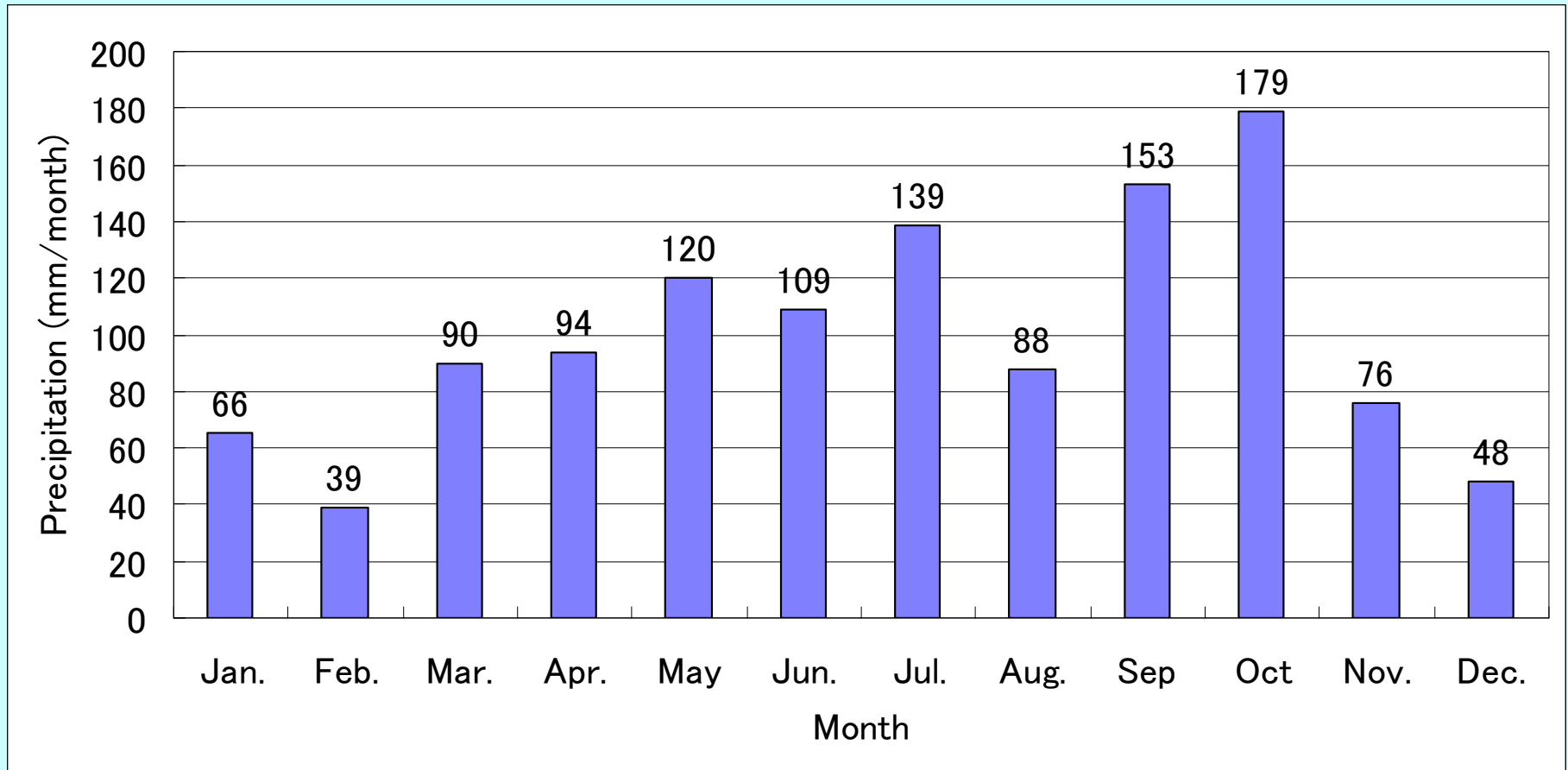
Outline of Lake Kasumigaura

(3) Parameters

Lake Area	219.9km ²	Nishiura: 171.5km ² Kitaura: 36.2km ² Other: 12.2km ²
Lake Coastal Line	252km	Nishiura: 122km Kitaura: 75km Other: 55km
Lake Capacity	850 million m ³	
Deepest Point	10m	Nishiura: 7m Kitaura: 10m
Number of Feeder River	56 Rivers	
Annual Inflow	approximately 1,400 million m ³	
Catchment Area	approximately 2,157 km ²	

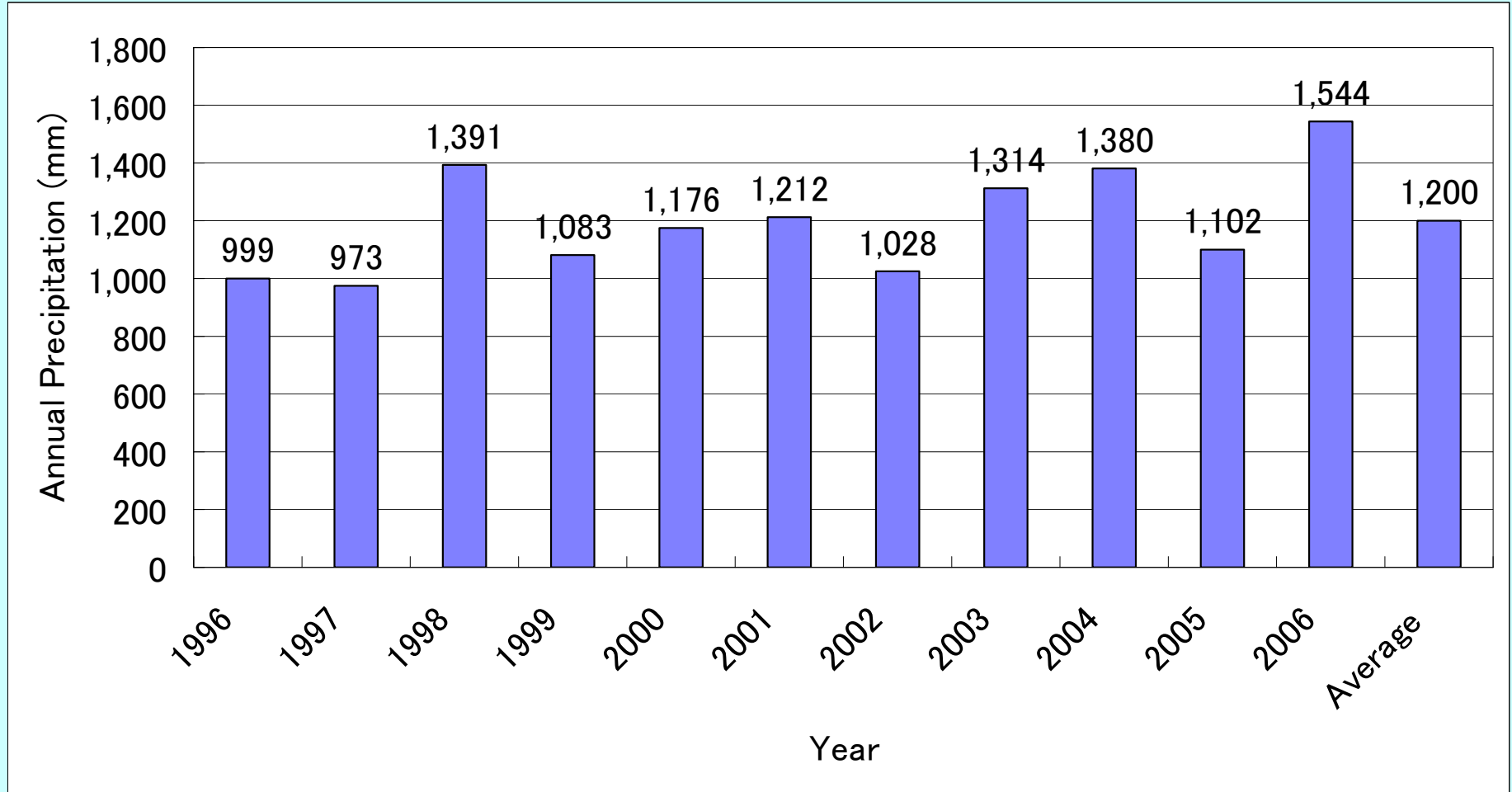
Outline of Lake Kasumigaura

(4) Climate



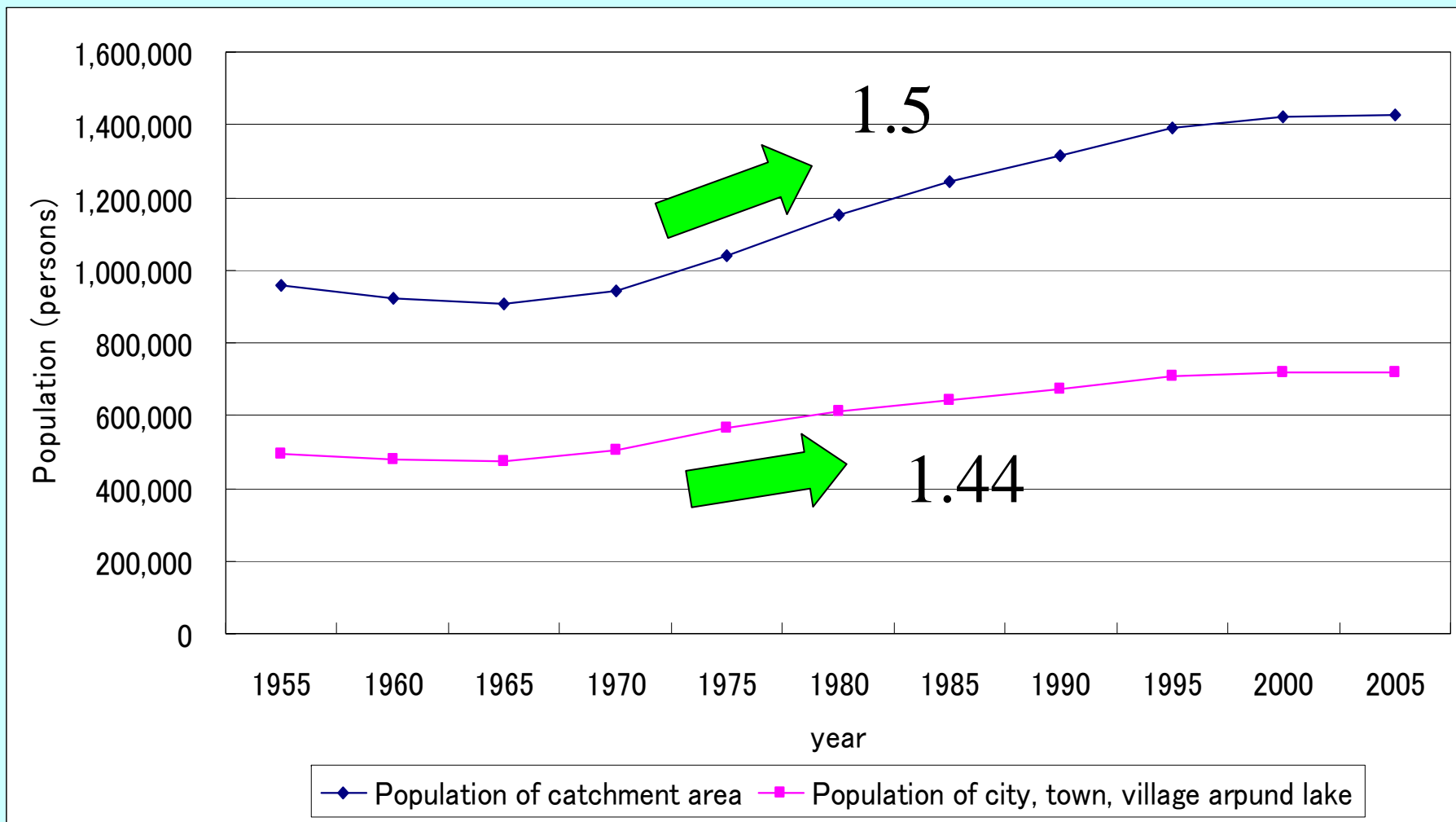
Outline of Lake Kasumigaura

(4) Climate



Outline of Lake Kasumigaura

(4) Population



Outline of Lake Kasumigaura Development Project

Project Objectives

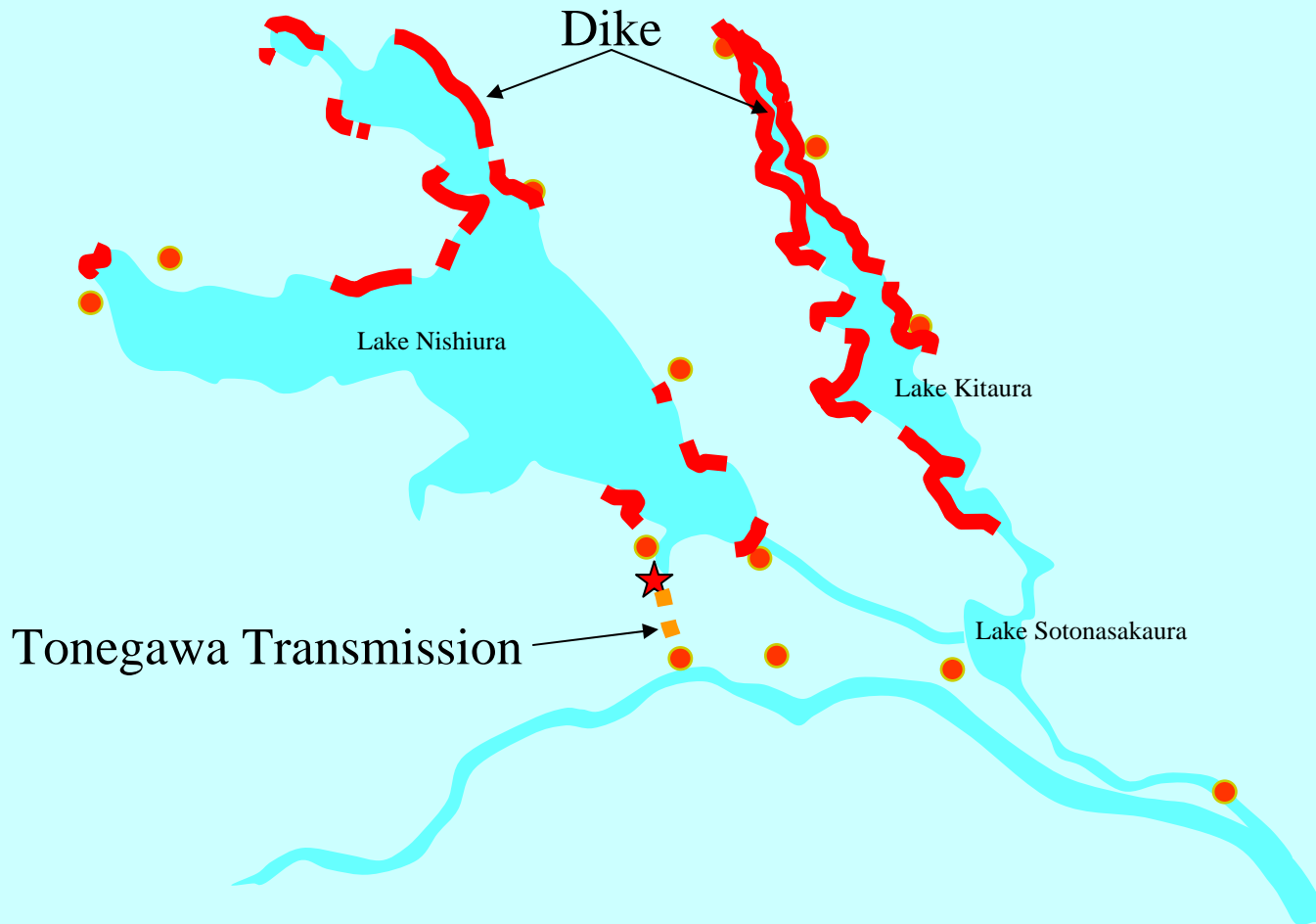
(1) Flood Control

To mitigate around the Lake Kasumigaura from flood by the dikes, pump stations, gates and the Hitachigawa Estuary Barrage.

(2) Water Supply

To supply the water to irrigation, domestic water and industrial water in Ibaraki pref., Tokyo and Chiba pref..

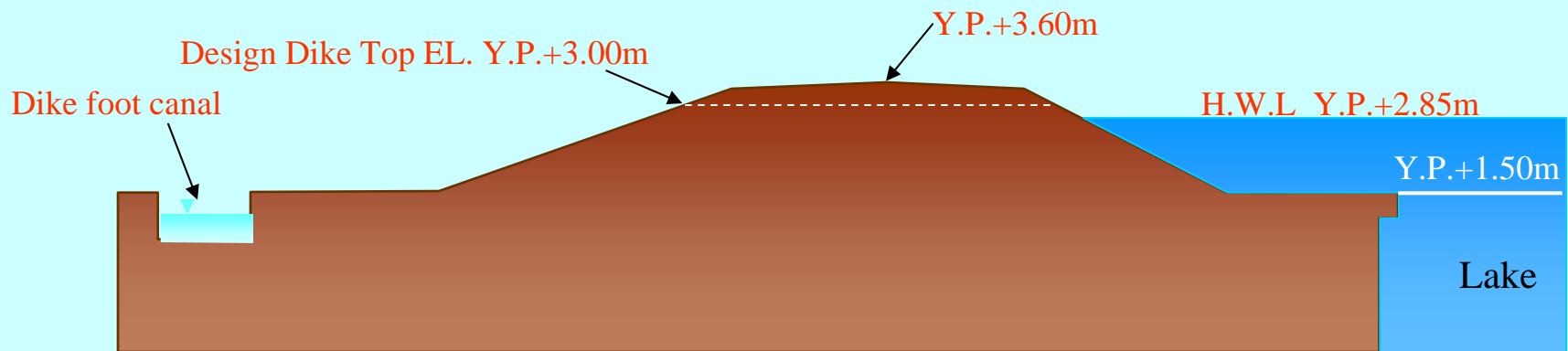
Outline of Lake Kasumigaura Development Project



Outline of Lake Kasumigaura Development Project

Flood Control Facilities

- Construction of new dikes: $L \doteq 78\text{km}$
- Reinforcement work of dikes: $L \doteq 103\text{km}$
- Inflow river works: 52 rivers



Cross section of dike

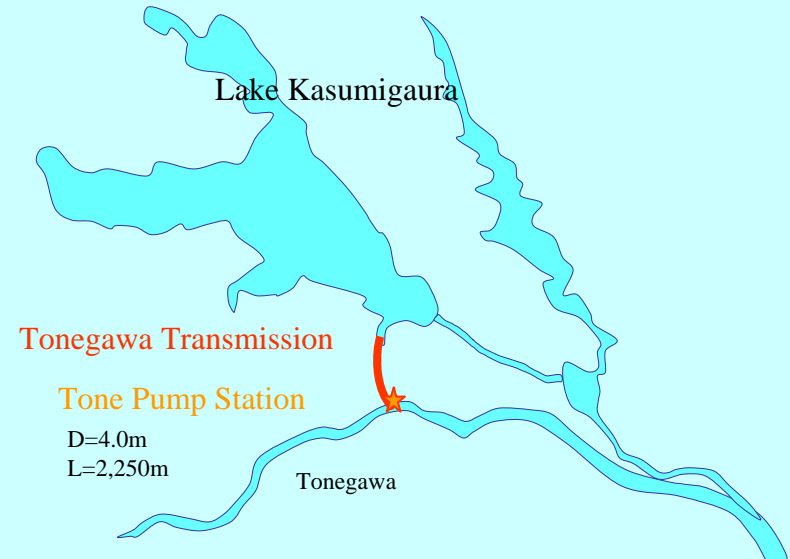
Outline of Lake Kasumigaura Development Project

Water Utilization Facilities

Rehabilitation of Hitachigawa Estuary Barrage for storage water and salinity intrusion

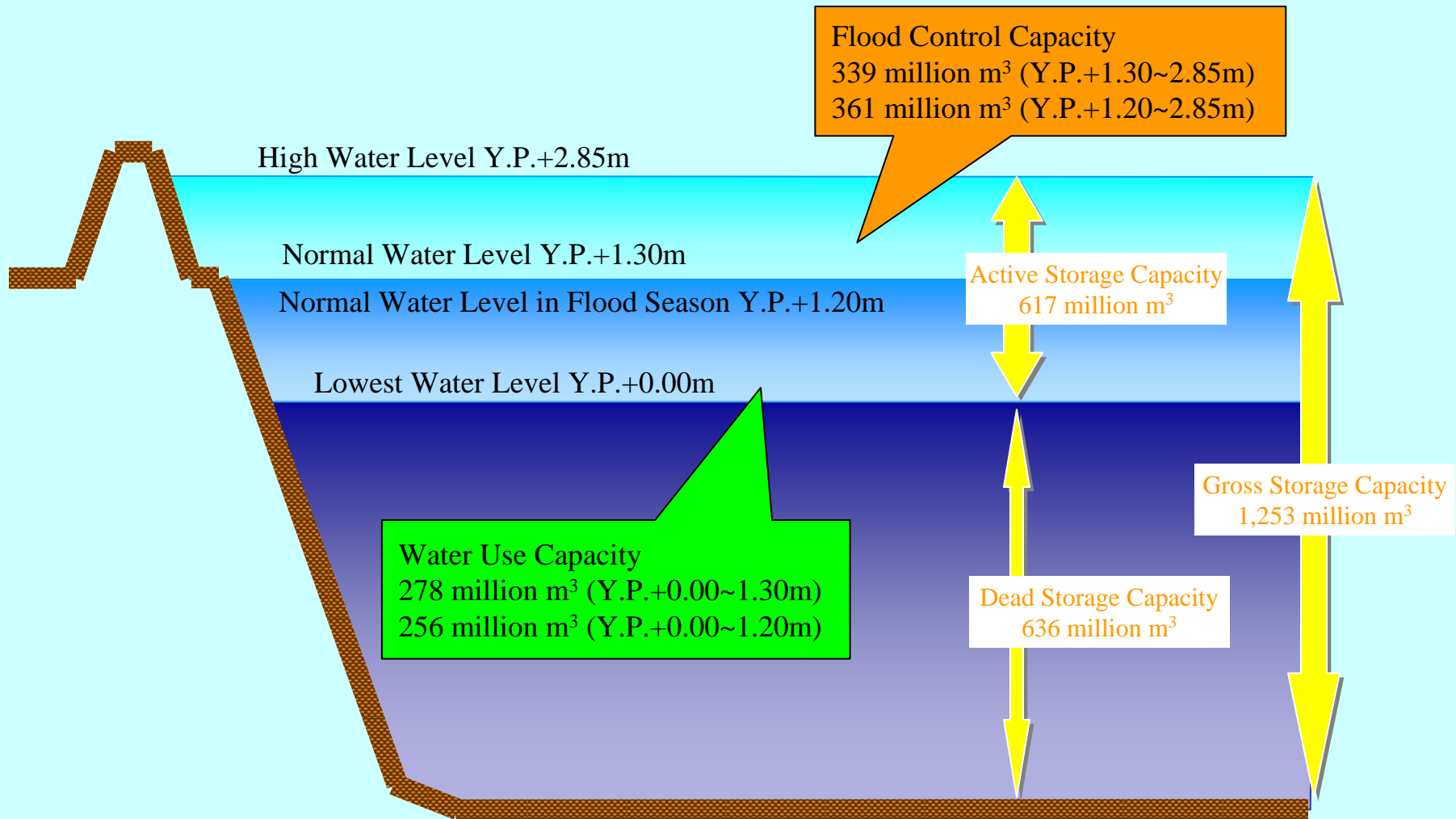


Tonegawa Transmission distribute water to Tokyo and Chiba Prefecture



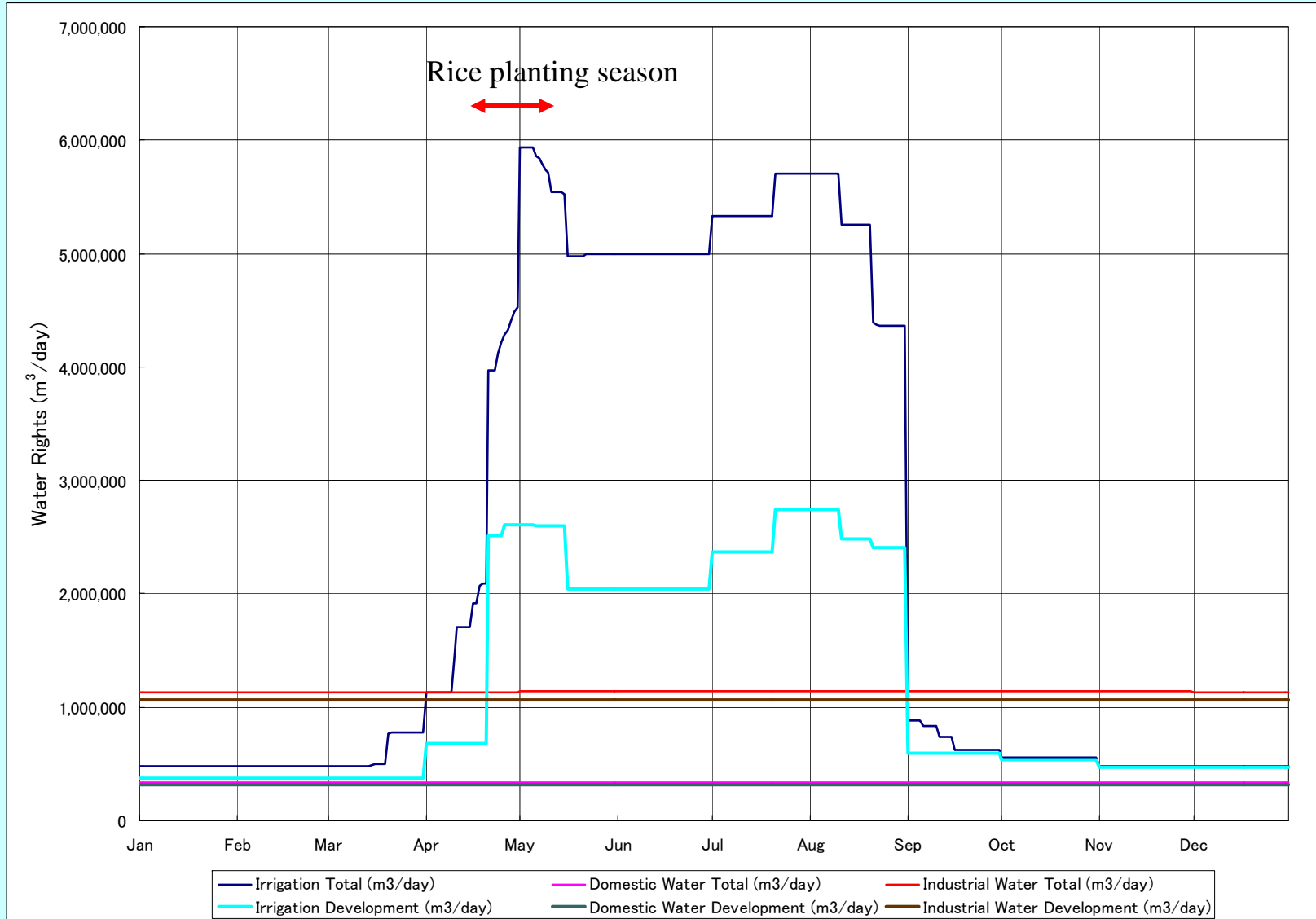
Outline of Lake Kasumigaura Development Project

Storage Volume



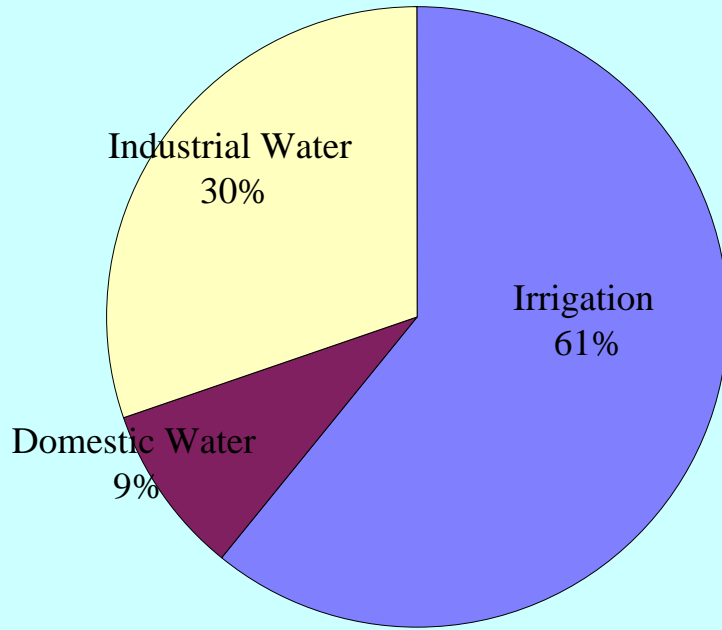
Outline of Lake Kasumigaura Development Project

Water Rights around Lake Kasumigaura

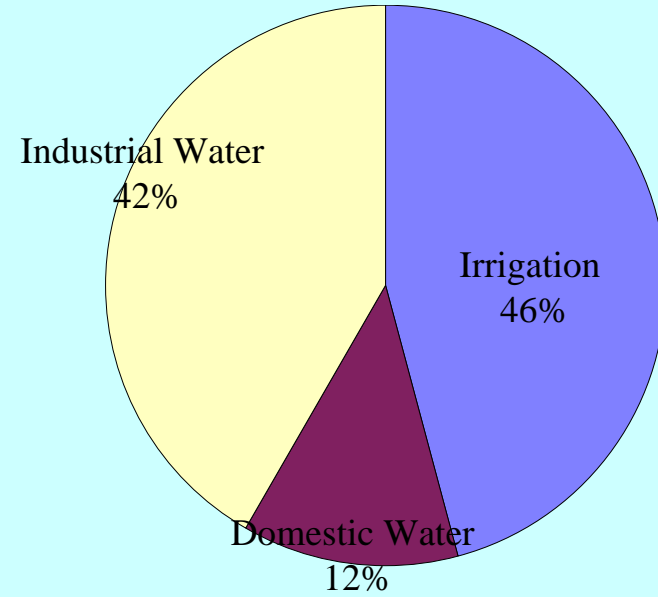


Outline of Lake Kasumigaura Development Project

Water Rights around Lake Kasumigaura



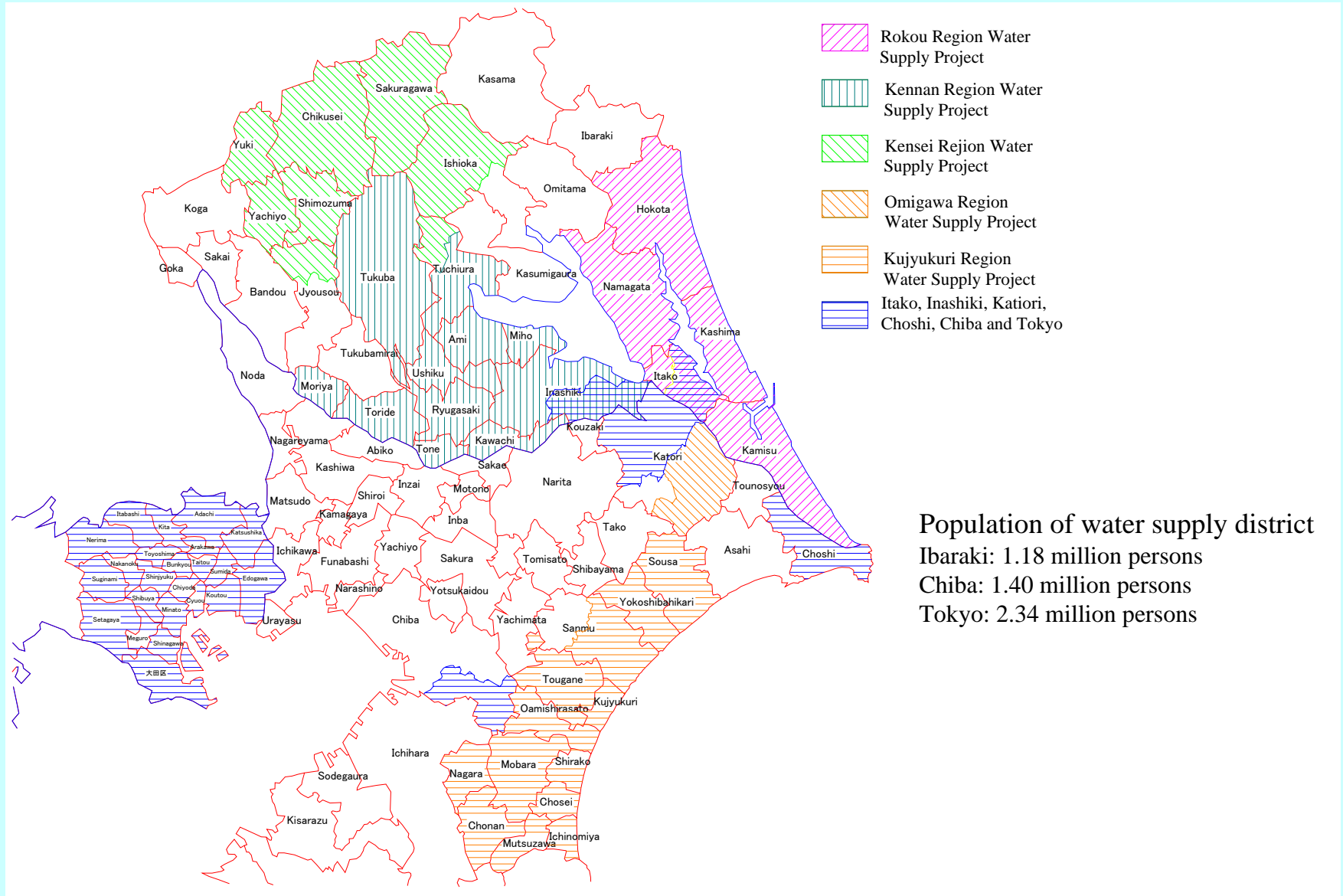
Ratio of Total



Ratio of Development

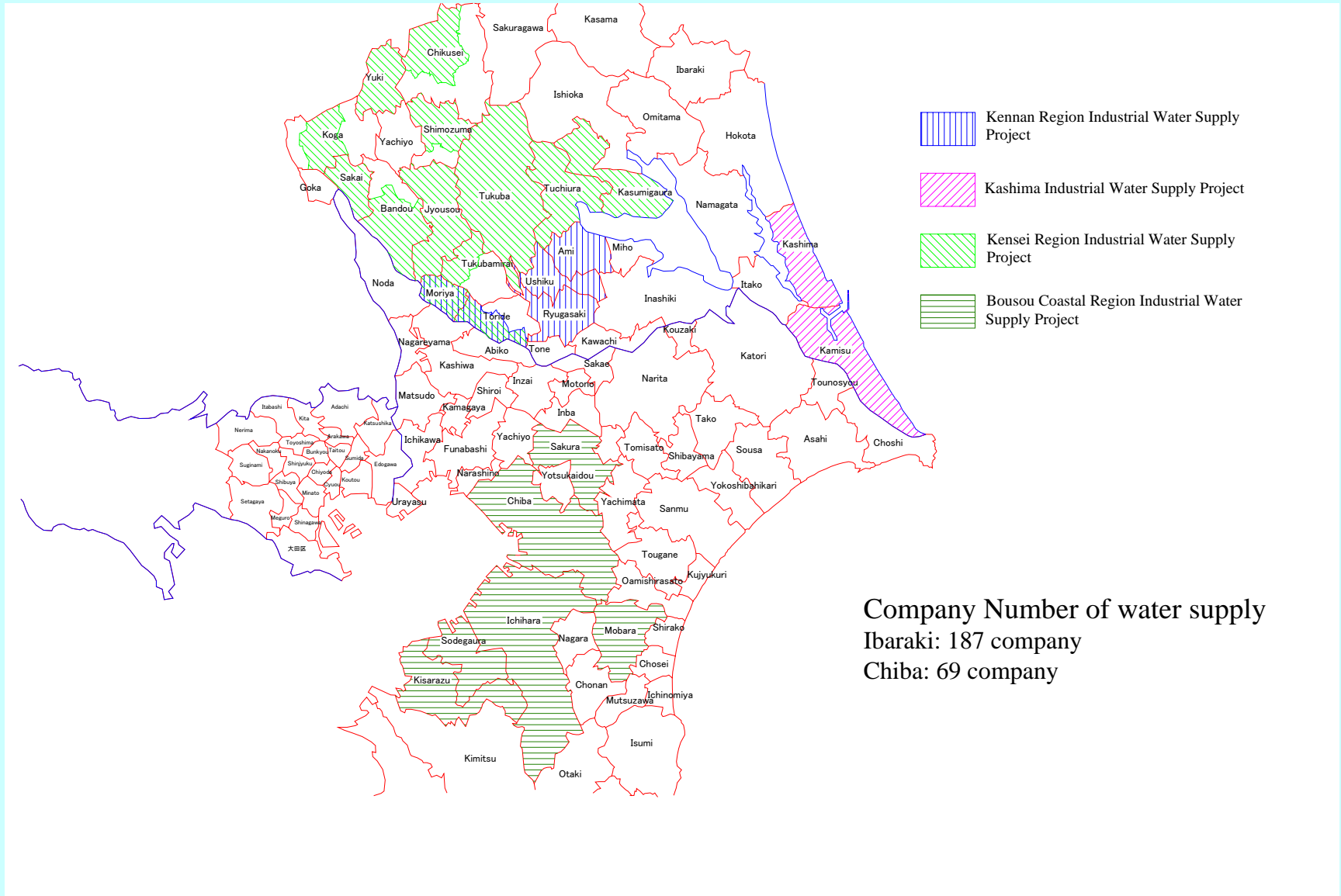
Outline of Lake Kasumigaura Development Project

Domestic Water



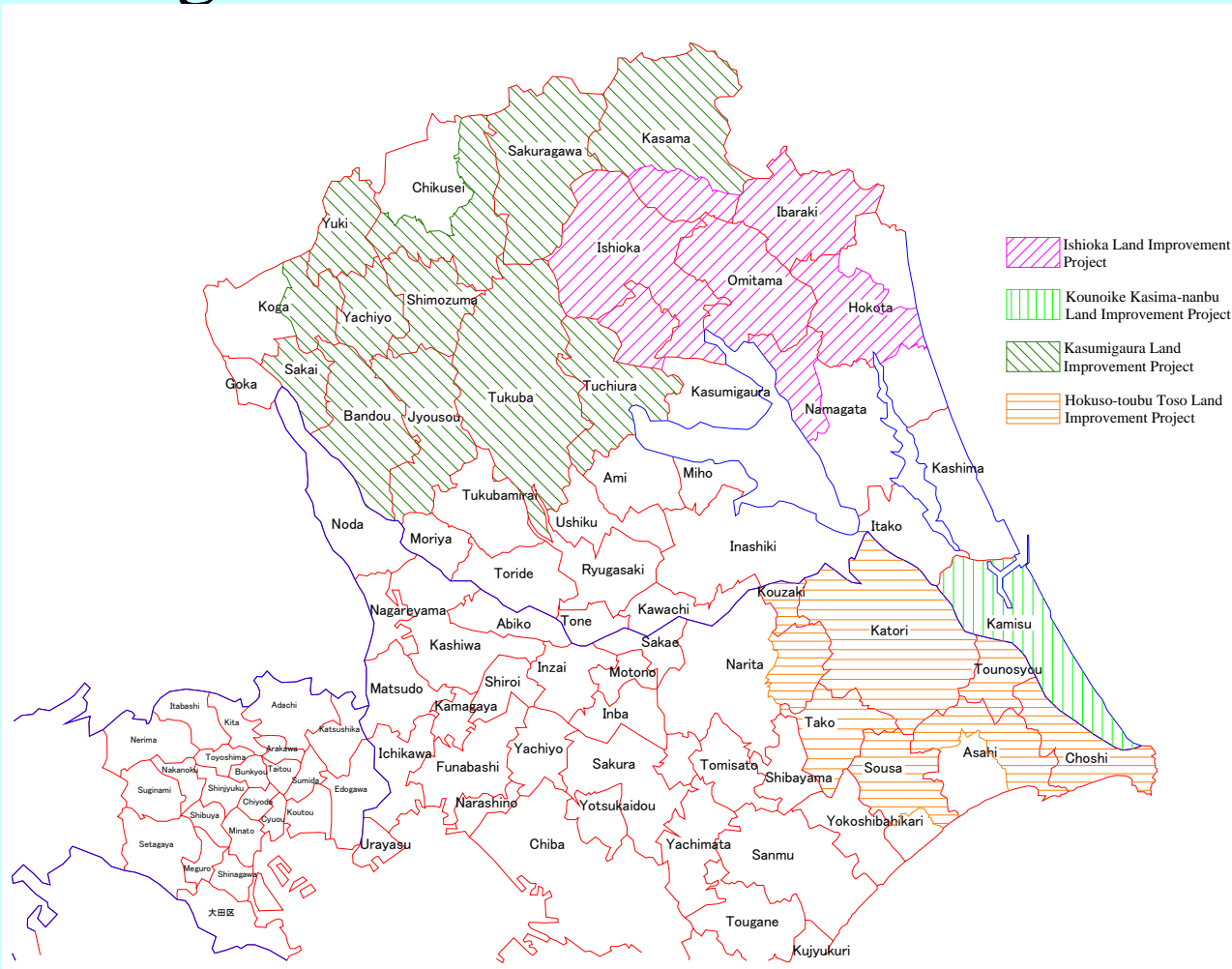
Outline of Lake Kasumigaura Development Project

Industrial Water



Outline of Lake Kasumigaura Development Project

Irrigation



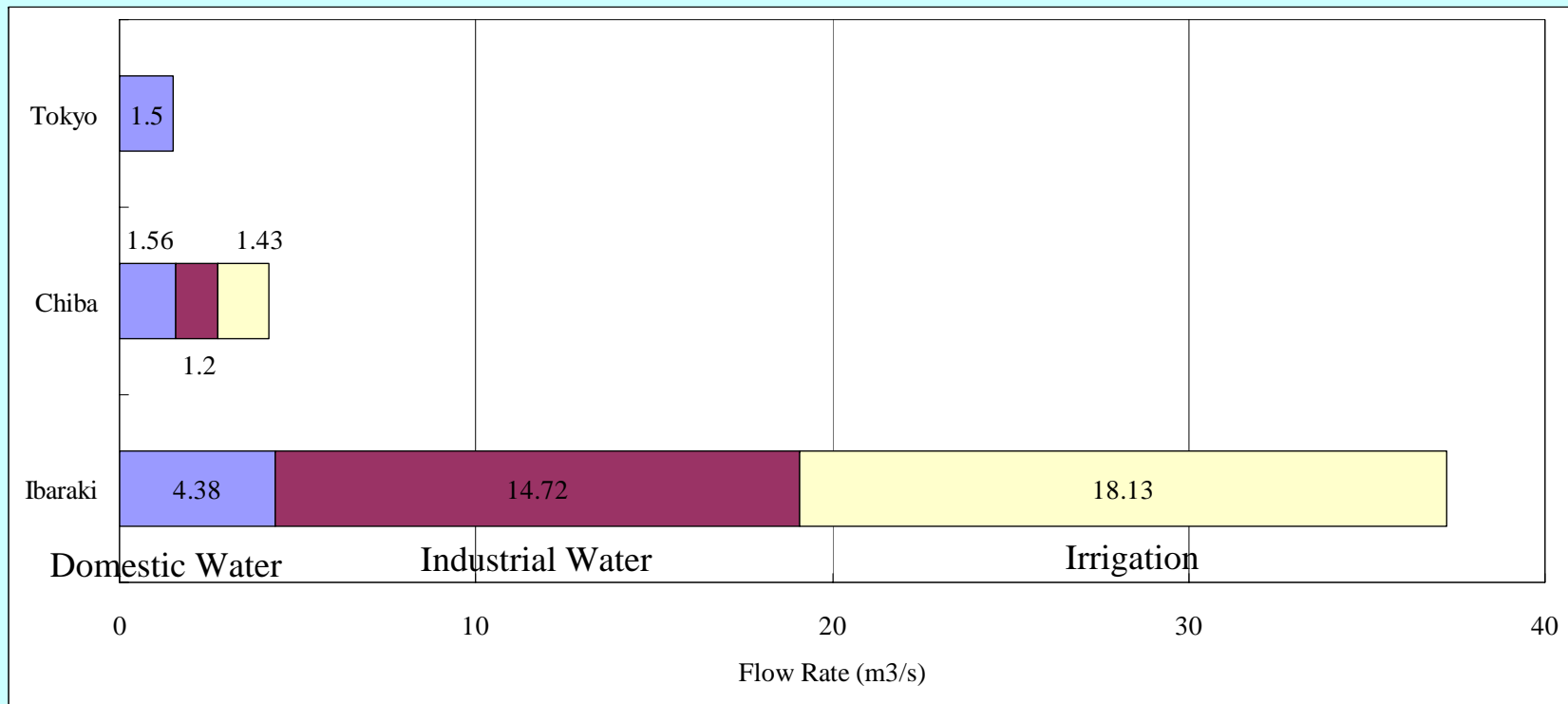
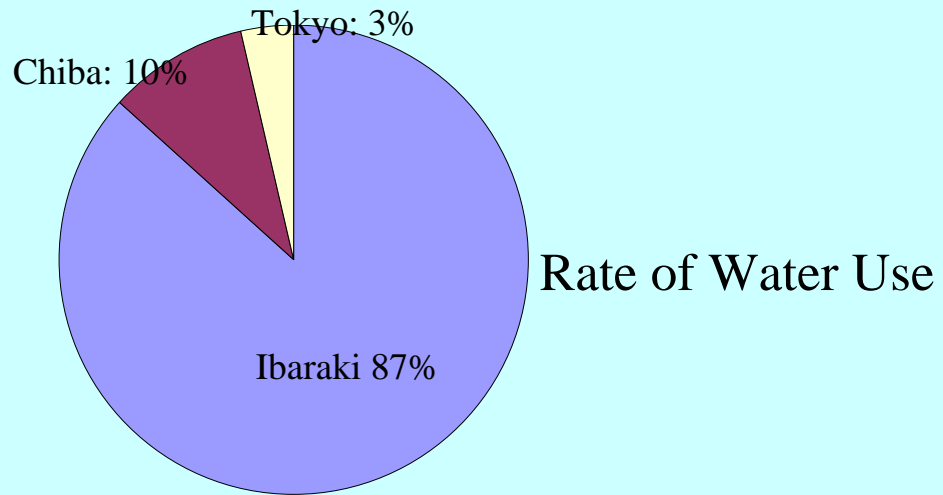
Irrigation Area

Ibaraki: Total 28,998ha
 Paddy 16,150ha
 Field 12,848ha

Chiba: Total 7,076ha
 Paddy 2,728ha
 Field 4,348ha

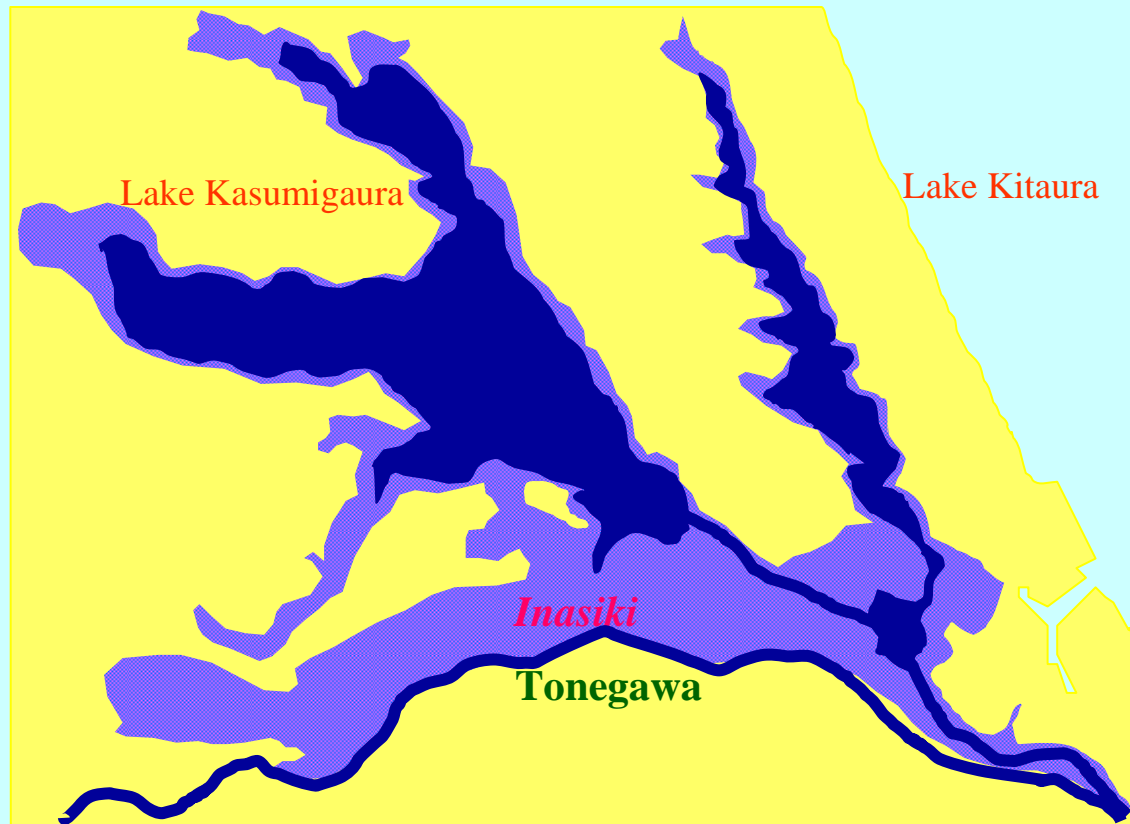
Outline of Lake Kasumigaura Development Project

Water Use



Outline of Lake Kasumigaura Development Project

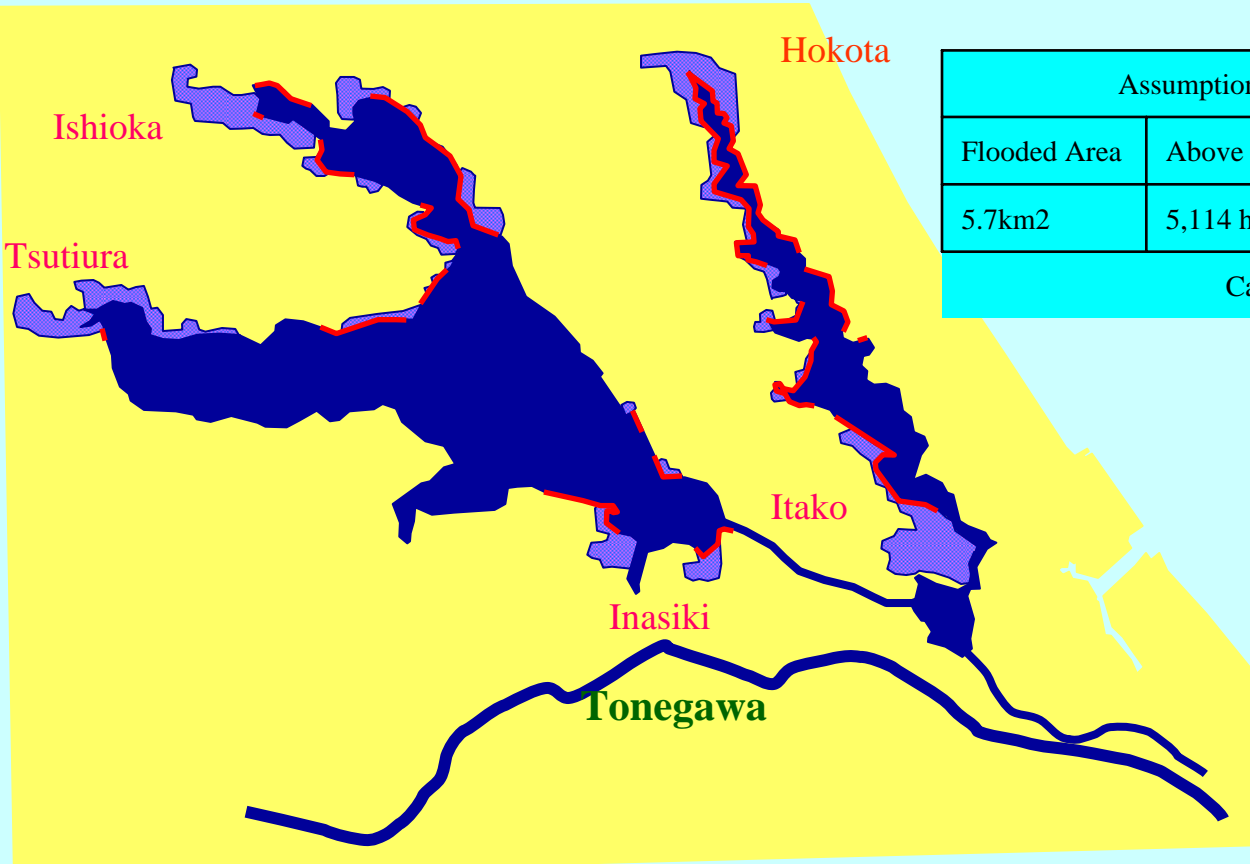
Flood Mitigation (around Lake Kasumigaura)



Flood Mitigation Area
24,856ha

Outline of Lake Kasumigaura Development Project

Flood Mitigation (New Dikes)



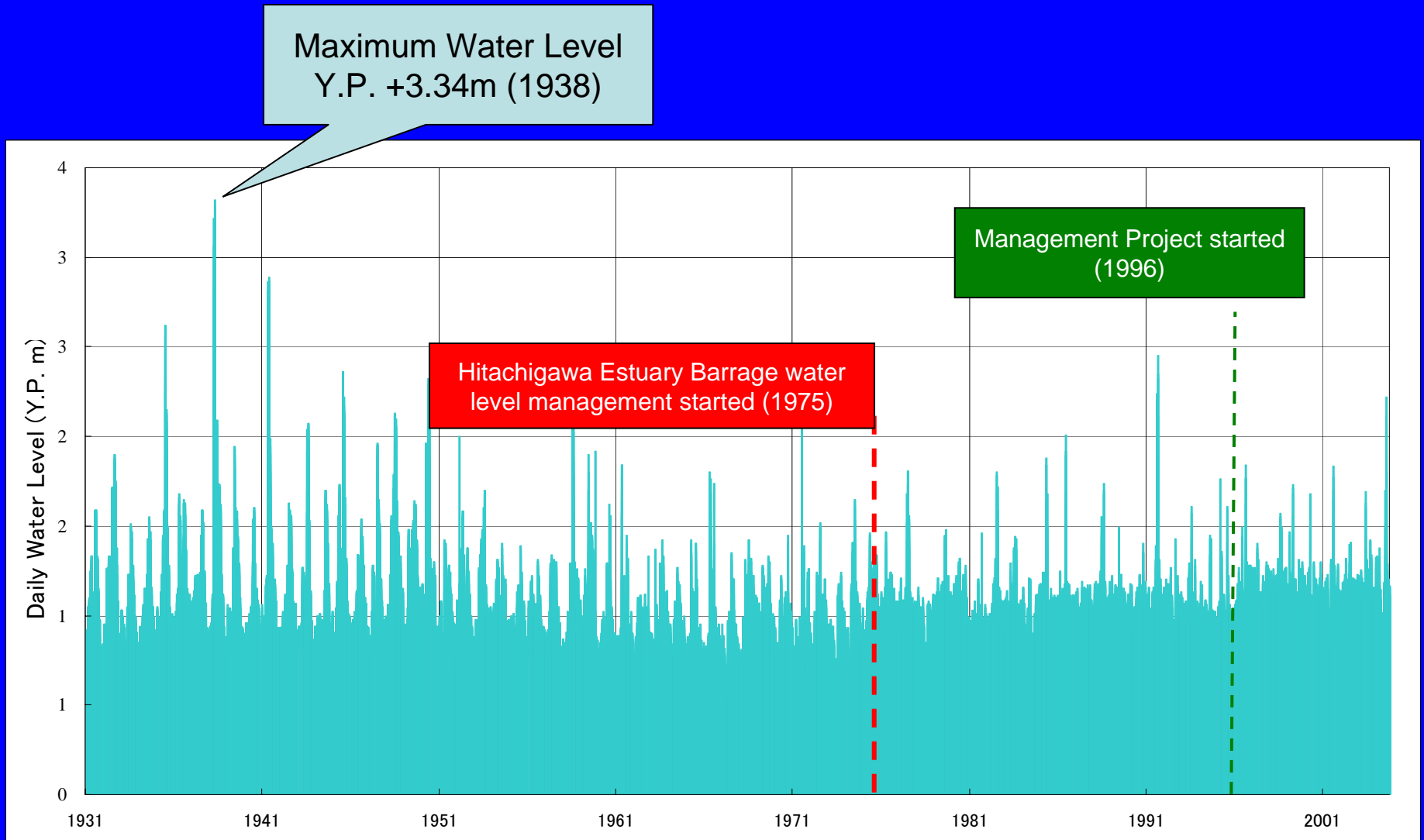
Assumption Damage			Damage Potential
Flooded Area	Above Floor	Under Floor	
5.7km ²	5,114 houses	3,458 houses	214,000 million JPY

Case of Typhoon 21 in 1991

 : Flood Mitigation area
  : JWA Construction Section

Outline of Lake Kasumigaura Water Level Management

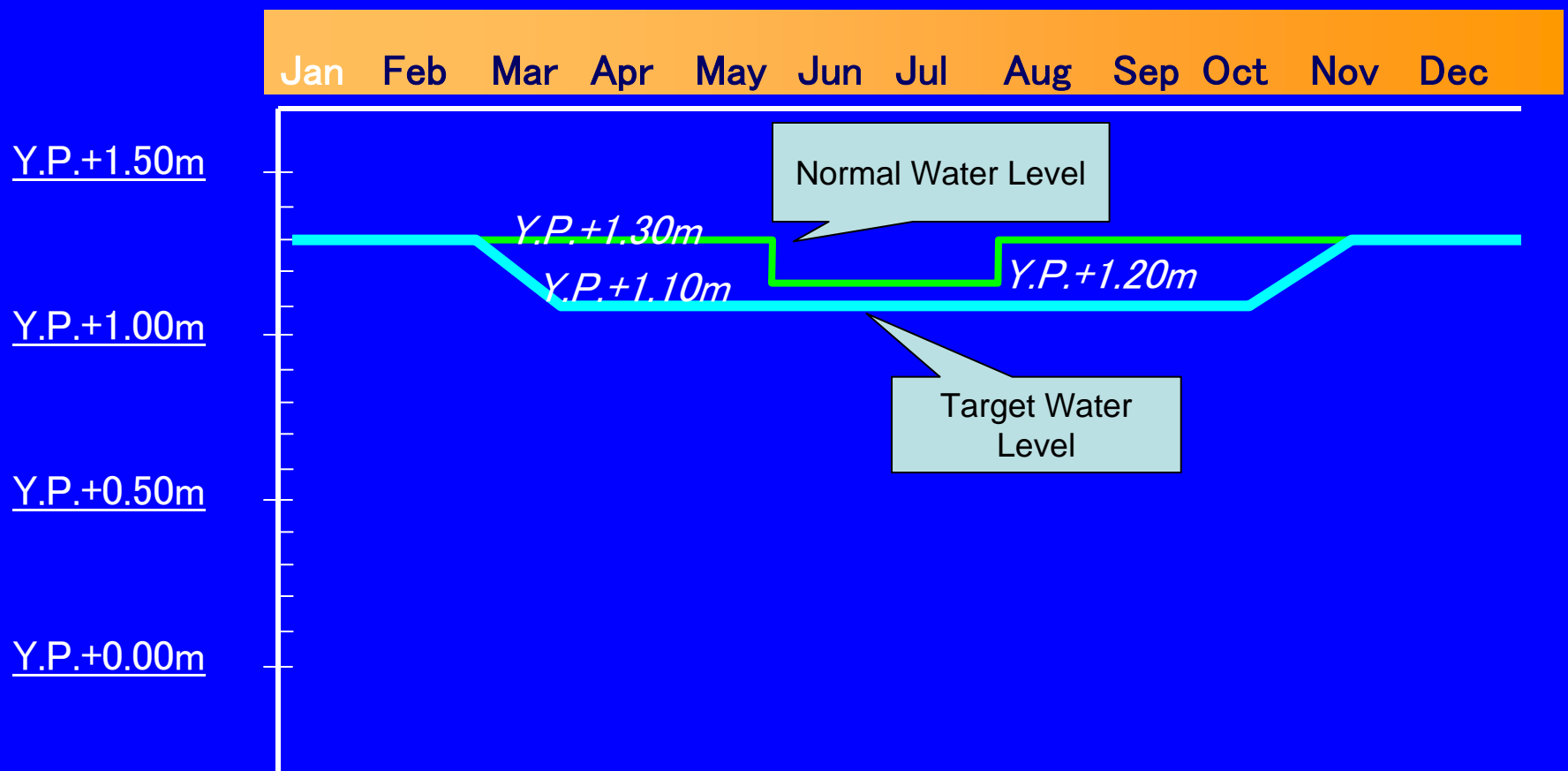
Trend of Water Level (1931~2004)



Outline of Lake Kasumigaura Water Level Management

Water Level Management

Water Level Management



Outline of Lake Kasumigaura Facilities Management

Dike Management

- Dike Patrol (everyday)
- Maintenance work

Bank line length

Lake Nishiura: 171.5 km

Lake Kitaura: 36.2km

Other: 12.2km



— New Dike :78km

Outline of Lake Kasumigaura Facilities Management

Facilities Maintenance



Gate inspection



Pump Maintenance



Pump inspection

Outline of Lake Kasumigaura Facilities Management

Facilities Maintenance



Power Supply Equipment inspection



Emergency Generator Equipment inspection

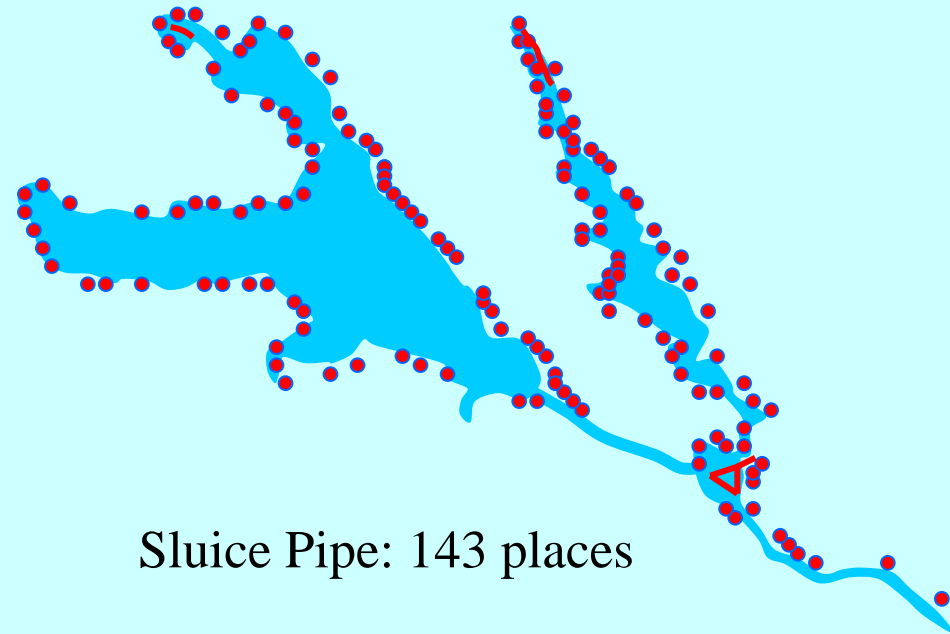


Communication Equipment inspection

Outline of Lake Kasumigaura Facilities Management

Dredging

Dredging maintain the function of compensation works (water way, sluice pipe)



Outline of Lake Kasumigaura Facilities Operation

Hitachigawa Estuary Barrage

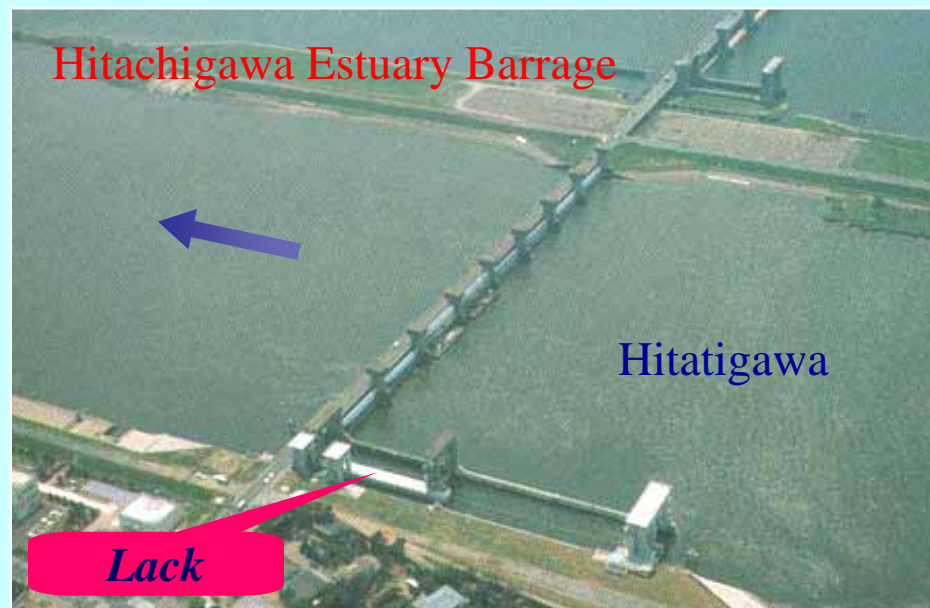
Objectives

Flood Control

salinity intrusion prevention

Water Level Control

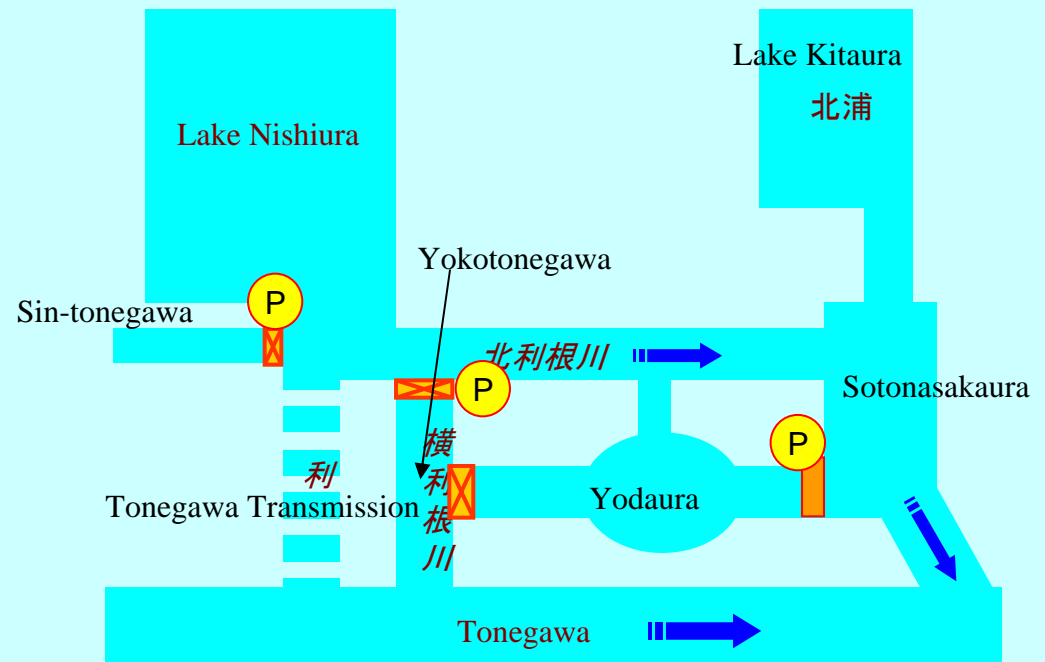
Navigation



Outline of Lake Kasumigaura Facilities Operation

Water Level Control Facilities Operation

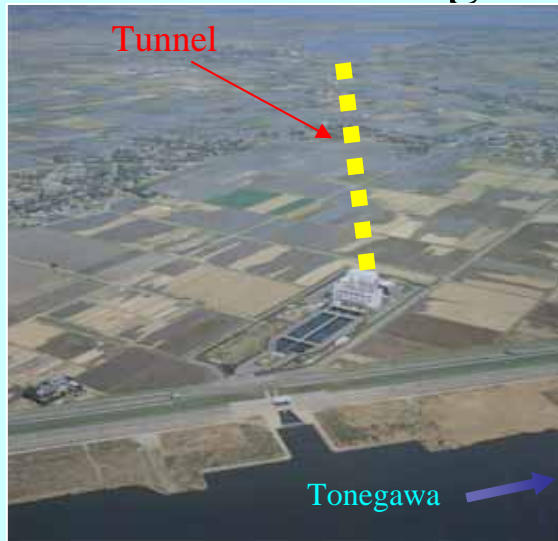
Shin-tone, Yokotone and Yodaura water level maintain previous water level by gates and pump stations



Outline of Lake Kasumigaura Facilities Operation

Tonegawa Transmission Tunnel

Tonegawa Transmission Tunnel supply water to Tonegawa from Lake Kasumigaura in case of the drought condition at Tonegawa.



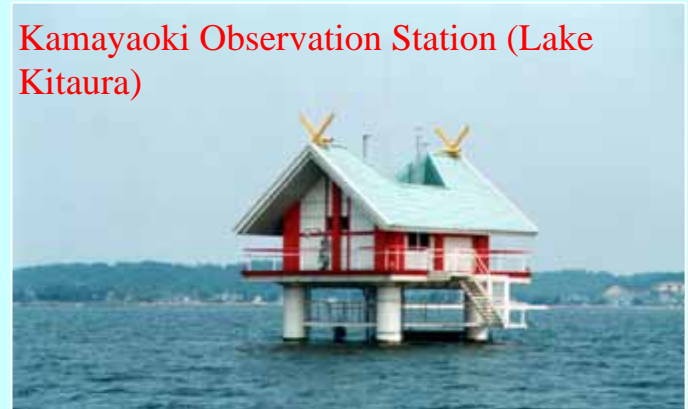
Outline of Lake Kasumigaura Facilities Operation

Monitoring

JWA observes the Hydrological, meteorological and water quality data in catchment area and lake surface.



Kamayaoki Observation Station (Lake Kitaura)



Kakeumaoki Observation Station
(Lake Nishiura)

Outline of Lake Kasumigaura Facilities Operation

Data Management

Observation Data Management Center have 3 function

- collects
- arranges
- distributes



Outline of Lake Kasumigaura Facilities Operation

Others



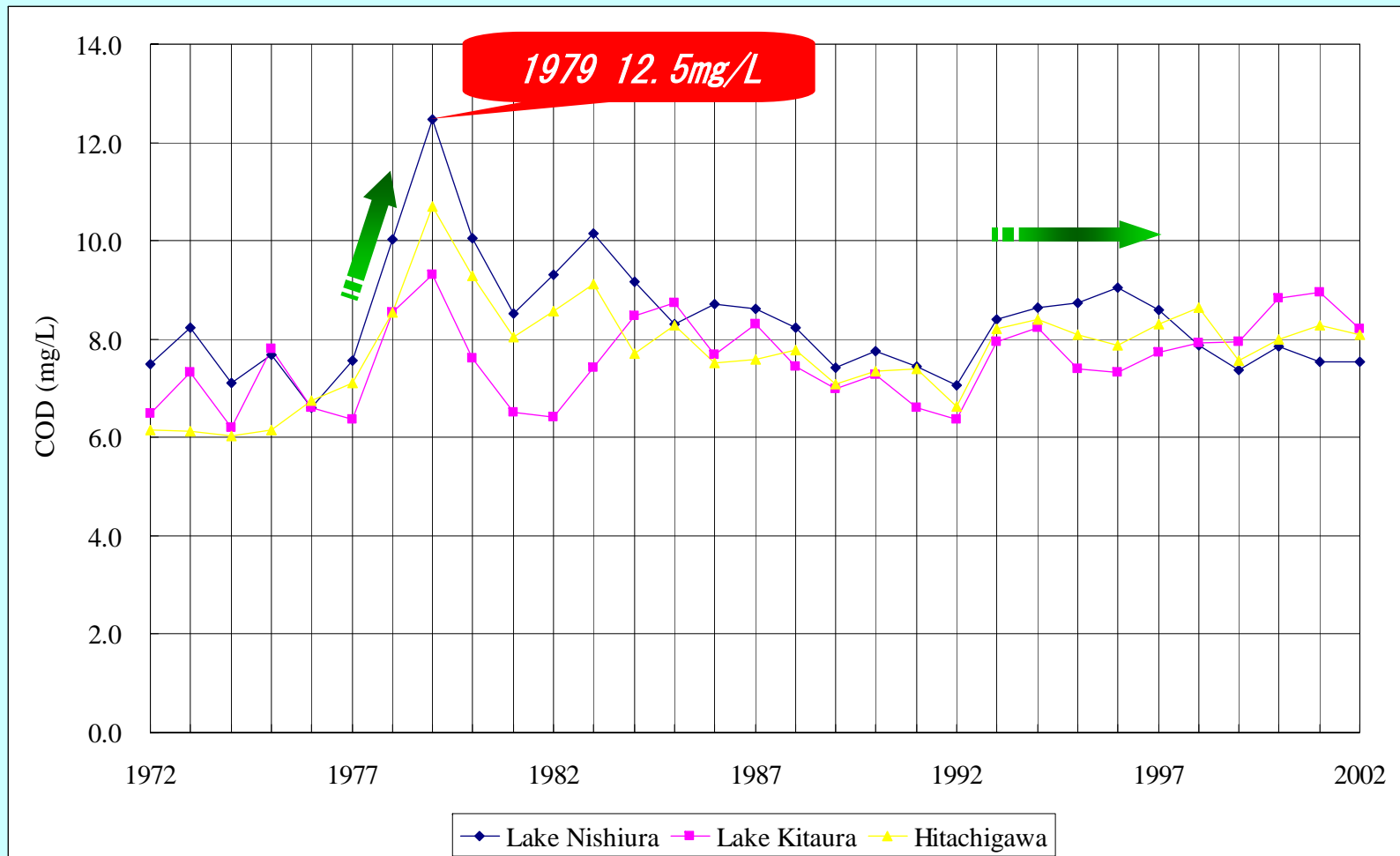
Water Science Museum



Water Quality Education Room

Outline of Lake Kasumigaura Water Quality

Trend of Water Quality (1972~2002)



Outline of Facilities Maintenance

In case of Shintone Gate Facility

- Initial cost of gates: 650 million JPY (1985)
- Rehabilitation cost of gates: 241.4 million JPY (2006~2012)

