

EXCURSION MAP  
FOR THE KASUMIGAURA LAKES  
— a new kind of environment map —

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**ABSTRACT**

Geographical Survey Institute(GSI) and Kasumigaura Construction Office, Ministry of Construction, have published the combined map of the Kasumigaura lakes and their catchment area. This map containing geographic, hydrographic and environmental information, is designed to educate a visitor or excursion in the lake area.

**KEY WORDS:** Kasumigaura lakes, Lake Survey, Map Compilation,  
Geographic Information, Bathymetry

**1 BACKGROUND:MAP COMPILATION**

In recent decades this planet's lakes and wet-lands have experienced serious environmental problems such as changes in water level, deposition, acidification, eutrophication and pollution.

In acknowledgement of these problems the International Conference on the Conservation and Management of Lakes was held 1984. This Conference is now held at intervals of 2 to 3 years and is promoted by local governments and the International Lake Environment Committee. Remarkably, not only researchers and administrators participate in this conference, many citizens and NGOs also attend.

The 6th International Conference on the Conservation and Management of Lakes-Kasumigaura '95 will be held at Tsuchiura-shi and Tsukuba-shi in Japan during October 1995. Discussions on the Kasumigaura lakes and field excursions in and around the lakes will be planned during the conference.

GSI has collected geographic information and published topographic maps in Japan for more than 100 years. In the last 50 years, the GSI has

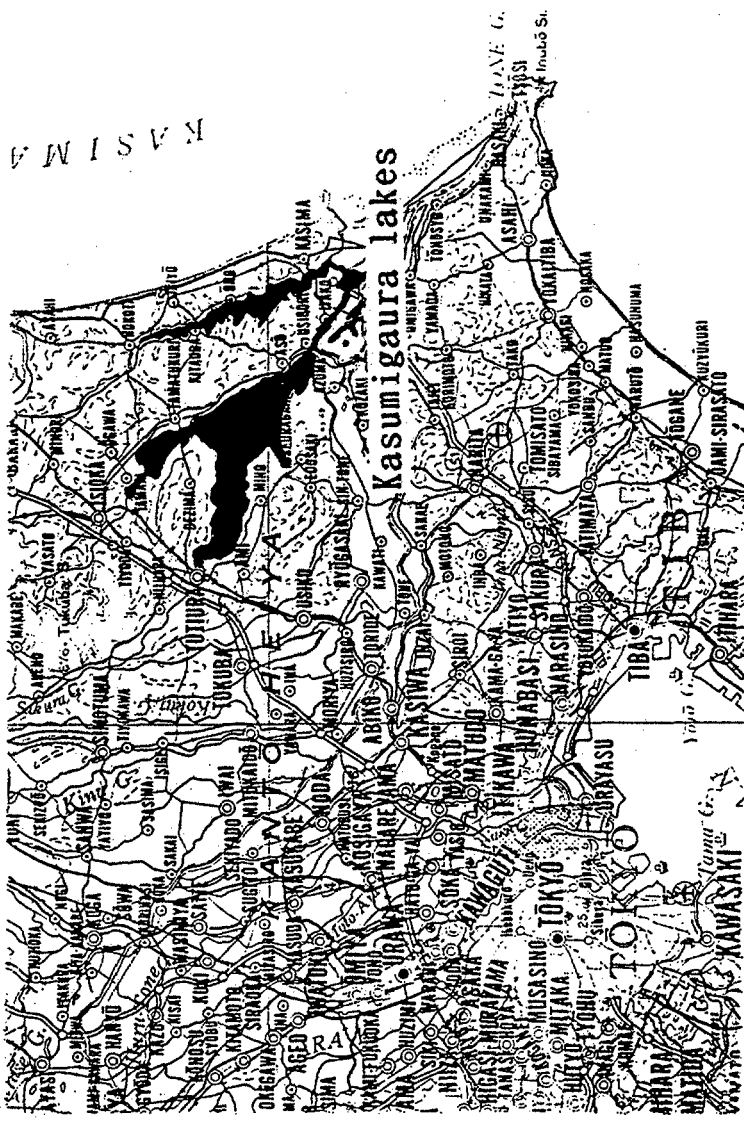


Figure.1 Location of Kasumigaura lakes

surveyed most lakes in Japan and published lake charts. Since 1967 the Kasumigaura Construction Office, Kanto Regional Construction Bureau, Ministry of Construction(KCO in this paper) has also contributed to data collection by spectically collecting various types of information concerning Kasumigaura lakes.

With the advent of the 6th International Conference on the Conservation and Management of Lakes Kasumigaura'95, the GSI and KCO have used their extensive data resources, publishing the combined map of the lake area to depict geographic, hydrographic, and environment conditions.

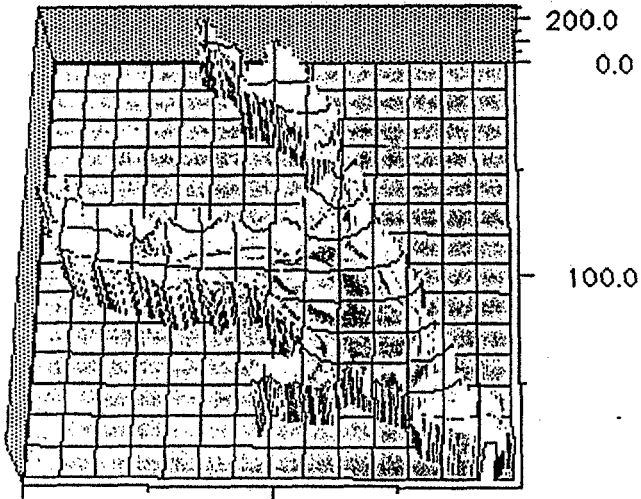
Table.1 Quantities of Kasumigaura lakes

<u>catchment area</u>		2.157km <sup>2</sup>
<u>surface water area</u>	total	220km <sup>2</sup>
	Nishiura lake	172
	Kitaura lake	36
	Sotonasakaura lake	6
	Hitachi-Tone River	6
<u>altitude of water surface</u>		1m
<u>average depth</u>		4m
<u>maximum depth</u>		7m
<u>average precipitation in catchment aere</u>		1.251mm/y
<u>volume of reserve</u>		8 × 10 <sup>8</sup> m <sup>3</sup>

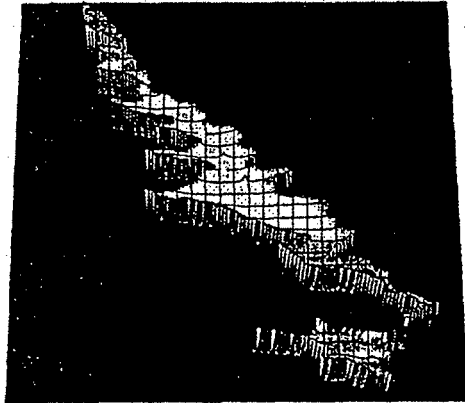
## 2 KASUMIGAURA LAKES

Kasumigaura lakes consist of Nishiura Lake, Kitaura Lake, Sotonasakaura Lake, and numerous rivers. The lakes are located in the northeastern part of the Kanto Plain, central Honshu Island. The total area of these lakes is 220km<sup>2</sup>, following Lake-Biwa in Japan. The catchment area of the lakes is 2.157km<sup>2</sup>. The lakes amount for approximately 35% of Ibaraki Prefecture. The lakes and their catchment area deeply influence the living of the local residents.

Recently water pollution and other environmental problems have manifested in the lakes. The KCO and the local government in the catchment area of these lakes are making efforts to solve these problems.



[Nishiura lake]



[Kitaura lake]

Figure.2 3-D view of bathymetry of Kasumigaura lakes

### 3 THE OUTLINE OF THE EXCURSION MAP

In this map, named the "Hydrographic Excursion Map; Lakes-Kasumigaura", information such as geographic and hydrographic condition (past and present), landscape and human activity within the lakes and their vicinity is presented. This map aims to enhance understanding on the lakes for the participants in the conference and citizens in the area.

Information presented in the map is:

1) Transition of the Kasumigaura lakes area from 1880s to 1990s; spatial changes between this 100 year period is clarified by comparing the recent aerial photographs to the first topographic maps published in the 1880s.

2) Hydrographic condition; catchment areas, channel networks, lake bottom landforms, public works for flood control and water resource management facilities.











3) Landscape; landform, land-cover, structures for flood control, lake/river shore conditions, and specific landmarks.






4) Tourists information; traffic system, parks, museums, historical architecture, and facilities of culture and sports.

5) Statistics for understanding the area around the Kasumigaura lakes.






Table. 2 Legend of the map

凡例 Legend

-  県庁  
Prefecture office
-  市役所  
City office
-  町村役場  
Town or Village office
-  工事事務所  
Construction office
-  出張所  
Branch office
-  水位観測所 (自記・テレメーター)  
Water level gauging station
-  雨量観測所 (自記・テレメーター)  
Rainfall gauging station
-  水質観測所 (自記・テレメーター)  
Water quality gauging station
-  流量観測所  
Discharge gauging station
-  波高観測所  
Wave height gauging station
-  機場  
Pumping station
-  浄水場  
Filter plant
-  下水処理場  
Sewerage plant

-  高速自動車道及び有料道路  
Expressway and Toll road
-  主要道路  
Main road
-  JR及び駅  
JR line and Station
-  JR以外の鉄道及び駅  
Private railway and Station
-  特殊軌道  
Cableway
-  県界  
Boundary of prefecture
-  市・郡・町・村界  
Boundary of county or city or town or village
-  流域界  
The basin of the Lake Kasumigaura
-  霧ヶ浦導水路  
Kasumigaura water conveyance channel
-  霧ヶ浦用水路  
Kasumigaura water channel

土地利用 Land use

-  住宅地・工場用地等  
Residential or Industrial district
-  畑地  
Upland field
-  水田  
Paddy field
-  森林  
Forest
-  ゴルフ場  
Golf course
-  その他  
Other field

## Format of the map

<u>Size</u>	78cm × 109cm
<u>Print</u>	Multicolored on both sides
<u>Shape</u>	Folded
<u>Language</u>	English and Japanese.
<u>The surface side</u>	1:100,000 Map of the catchment area of Kasumigaura lakes River system and water area are emphasized Landcover classified with colors Landform is indicated with shading Facilities or water management, such as conduits, pumping stations, and others are symbolized
<u>The reverse side</u>	1:70,000 Map of Kasumigaura lakes Contour of depth Bottom materials Condition of shores Reclamation history Facilities of culture and sports Comparison of topographic maps published in the 1880s and the latest aerial photographs for some points along the shore of Kasumigaura lakes. A List of geographical data for some typical lakes in Japan. A Bird's eye view of the Kanto area 3-D view of bathymetry of Kasumigaura lakes.

## References

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