

1. RIVER SYSTEMS

2. MAIN LAKES

LAKE TYPES

1. River Systems

As rivers in Japan are restricted by the long, narrow land area and steep landforms, the paths of river are short and slopes of river beds are steep in general; rivers deposit transported pebbles when they pass through lowlands from mountains, and flow into the sea. The river system is well-developed throughout the country and the regional difference in river system density is not large. The area of drainage basin of a river is generally small.

River discharge is greatly influenced by climate and shows great seasonal variation. By district, the discharge is largest in rivers on the Pacific side during the rainy season and typhoon season. It is largest in rivers on the Japan Sea side during the thaw, as well as during the rainy season. It becomes smallest in both regions during the winter. The discharge of rivers in Hokkaido becomes temporarily small from June to July.

Many artificial changes are carried out to the Japanese rivers for the purpose of water supply, irrigation and flood control, such as the construction of dams in the mountains, conservation of river courses on the plains, construction of banks, and so on.

[Salient Points of the Legend and Map Compilation]

Rivers: rivers of more than eight km in length are shown.

Lakes: as a rule, only lakes of more than five km² in area are shown.

Intermittent streams: rivers which flow only when it is raining.

Irrigation canals: large scale portions of open irrigation channels are shown.

Watershed: drainage systems with a drainage basin of more than 500 km² in area are shown. Plains with an unclear watershed are not shown. Names of drainage systems are indicated at river mouths.

2. Main Lakes

There are more than 600 lakes in Japan, a country of violent volcanic activity and tectonism.

The number of lakes formed as a result of volcanic activity is large, and accounts for many of the mountain lakes. Among these volcanic lakes are Okama on Mt. Zaō and Ōnami Ike on Mt. Kirisima, which are crater lakes, Towada Ko and Masyū Ko, which are caldera lakes, and Taisiyō Ike and Urabandai Lakes, which are lakes formed by a dam of lava flow or volcanic mud flow. These lakes are generally deep and mostly oligotrophic with high transparency. There are also highly acidic lakes and those rich in iron content.

Most lakes on the plains were formed by erosion and sedimentation of rivers. Naka Numa in Ibaraki Prefecture is a swamp formed by flood flow which eroded the inside of a bank and is called "Oppori". Many crescent lakes formed in meander traces of rivers exist on the lower reaches of Isikari Gawa. Inba Numa and Tega Numa are lakes formed when soil and sand carried by a main stream closed the valley exit of a tributary. Lakes on plains are generally shallow and eutrophic with low transparency.

Seaside lakes which were formed by the development of spits and bars and are isolated from the open sea are called Lagoons, most of which are brackish.

Apart from the above lakes, there are many others such as those made in depressions formed by tectonism, for example, Biwa Ko and Suwa Ko, and those formed as the result of landslides damming valleys. Few lakes formed by glacial erosion can be found in Japan; those existing are very small.

Lakes lying north of a line joining Asino Ko and Biwa Ko generally freeze during winter, whereas large, deep lakes such as Tyūzenzi Ko, Tazawa Ko, Towada Ko, Tōya Ko and Sikotu Ko do not freeze.

2. Lake Types

[Salient Points of the Legend and Map Compilation]

Harmonic lake type: lakes whose amount of organic nutrients are in harmony, and show no great imbalance in production content. They are divided into eutrophic, mesotrophic and oligotrophic lakes according to the quantity of nutrients and production. A eutrophic lake is commonly found among shallow lakes on plains; its water color is green-yellow and the transparency is generally less than four meters. An oligotrophic lake is commonly a deep mountain lake whose water color is dark blue or blue-green, with transparency is generally more than eight meters. A mesotrophic lake has features between these two types.

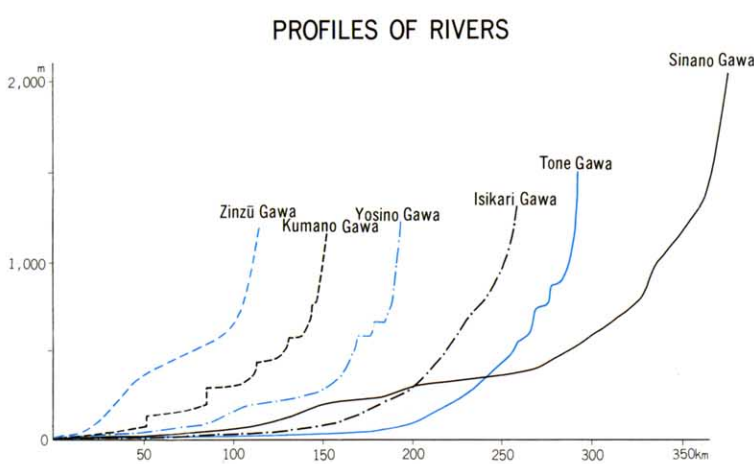
Disharmonic lake type: lakes whose nutrients are not harmonized and which show an imbalance in production content, containing only limited organisms. This type can be divided into various types according to the components which disharmonize production. Acidotrophic lakes are acid, and are common in active volcanic regions. Dystrophic lakes are rich in humus, poor in nutrients and are found in alpine regions or peaty regions on plains north of Aomori Prefecture. They have brown water color and acid nature.

Brackish lake: lakes into which sea water flows and whose salt content generally exceeds 500 mg per liter.

This map shows lakes of more than three km² in area or greater than ten meters maximum depth.

[Sources]

- Geographical Survey Institute, 1:50,000 scale Topographic Map
- Geographical Survey Institute, 1:200,000 scale Regional Map
- Ministry of Construction, *Annual Report of Discharge, 1976-1985*
- Japan River Association, *Handbook of Rivers, 1988*
- Geographical Survey Institute, 1:10,000 scale Lake Charts
- Environment Agency, *Report of Natural Environment Conservancy Survey - Lake Survey -*, 1987
- Geographical Survey Institute data



MAJOR LAKES (1989)

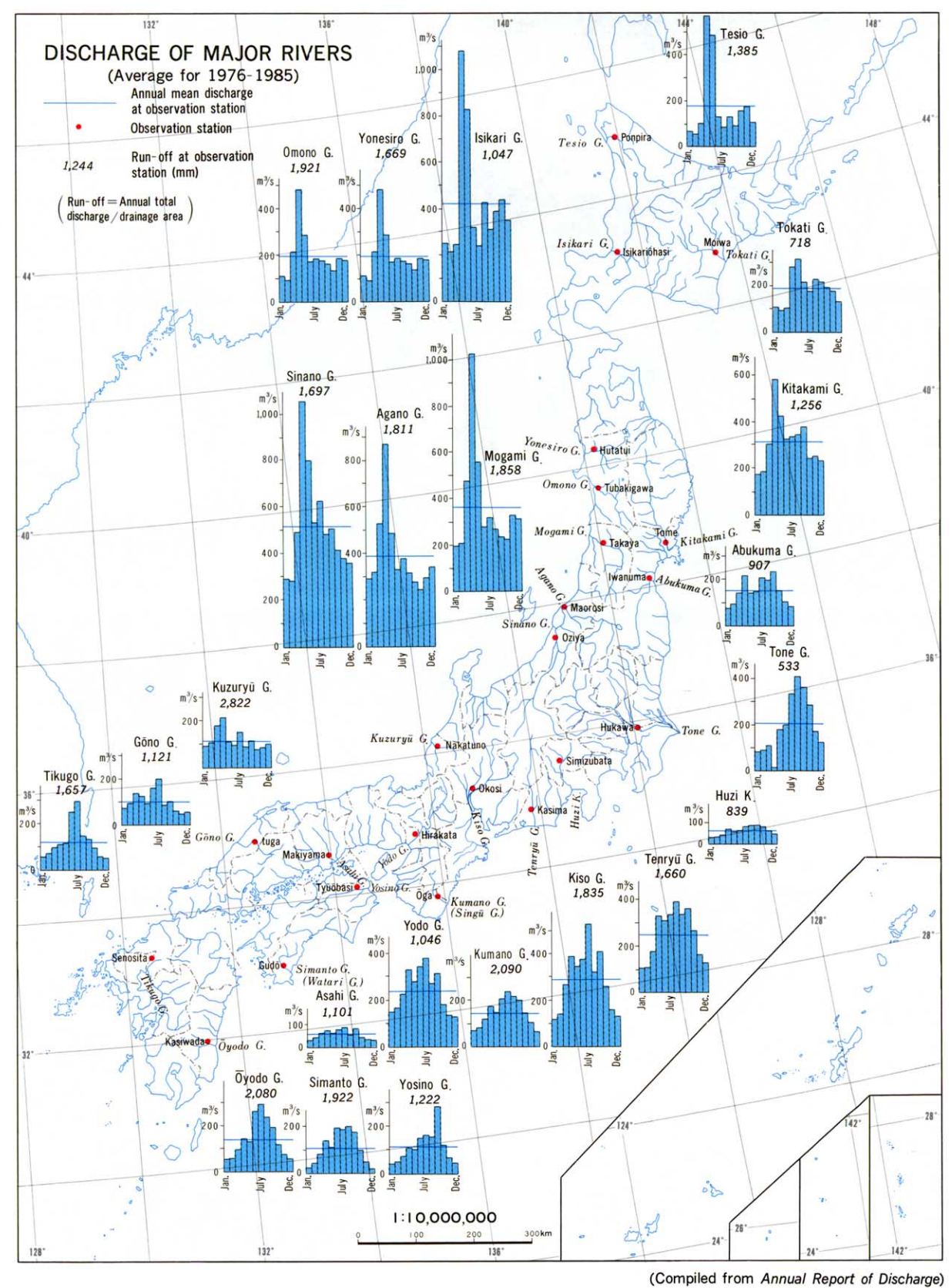
Name	Area	Length of shoreline	Maximum depth	Surface elevation
Biwa Ko	672.3km ²	277km	103.8m	85m
Kasumiga Ura	167.7	137	7.3	0
Saroma Ko	151.6	90	19.6	0
Inawasiro Ko	103.9	63	93.5	514
Naka Umi	97.7	183	17.1	0
Kussayaro Ko	79.7	58	117.5	121
Sinzi Ko	79.7	103	6.0	0
Sikotu Ko	77.3	42	360.1	248
Tōya Ko	69.4	52	179.7	84
Hamana Ko	68.8	141	16.1	0
Ogawara Ko	62.3	52	24.4	0
Hūren Ko	60.5	96	13.0	0
Towada Ko	59.8	53	326.8	400
Notoro Ko	57.9	35	23.1	0
Kita Ura	36.1	68	7.0	0
Abasiri Ko	34.1	42	16.1	0
Akkesi Ko	31.8	30	11.0	0
Hatiro Gata	27.7	36	11.2	0
Tazawa Ko	25.5	21	423.4	249
Zyūsan Ko	20.6	30	1.5	0
Masyū Ko	19.6	21	211.4	351
Suwa Ko	14.1	18	7.6	759
Kuttyaro Ko	14.0	33	3.3	0
Akan Ko	12.7	31	44.8	420
Tyūzenzi Ko	11.5	24	163.0	1,269
Ikeda Ko	11.1	15	233.0	66
Inba Numa	10.7	46	1.8	1
Hibara Ko	10.4	47	30.5	822
Motosu Ko	5.1	12	121.6	900
Kuttara Ko	5.0	8	148.0	258

Over 10.0km² in area or over 100m in maximum depth.
(Compiled from Geographical Survey Institute data)

MAJOR RIVERS (1988)

Name	Area of drainage basin (A)	Length of main river course (L)	Average width(A/L)
Tone Gawa	16,840km ²	322km	52.3km
Isikari Gawa	14,330	268	53.5
Sinano Gawa	11,900	367	32.4
Kitakami Gawa	10,150	249	40.8
Kiso Gawa	9,100	227	40.1
Tokati Kawa	9,010	156	57.8
Yodo Gawa	8,240	75	109.9
Agano Gawa	7,710	210	36.7
Mogami Gawa	7,040	229	30.7
Tesio Gawa	5,590	256	21.8
Abukuma Gawa	5,400	239	22.6
Tenryū Gawa	5,090	213	23.9
Omono Gawa	4,710	133	35.4
Yonesiro Gawa	4,100	136	30.1
Huzi Kawa	3,990	128	31.2
Gōno Gawa	3,870	194	19.9
Yosino Gawa	3,750	194	19.3
Naka Gawa	3,270	150	21.8
Ara Kawa	2,940	169	17.4
Kuzuryū Gawa	2,930	116	25.3
Tikugo Gawa	2,860	143	20.0
Zinzū Gawa	2,720	120	22.7
Takahasi Gawa	2,670	111	24.1
Iwaki Gawa	2,540	102	24.9
Kusiro Gawa	2,510	154	16.3
Kumano Gawa	2,360	183	12.9
Simanto Gawa	2,270	196	11.6
Ōyodo Gawa	2,230	107	20.8
Hii Kawa	2,070	153	13.5
Yosii Gawa	2,060	133	15.5
Mabeti Gawa	2,050	142	14.4
Tokoro Gawa	1,930	120	16.1
Yura Gawa	1,880	146	12.9
Kuma Gawa	1,880	115	16.3
Yahagi Gawa	1,830	117	15.6
Gokase Gawa	1,820	106	17.2
Asahi Gawa	1,800	142	12.7
Ōta Gawa	1,700	103	16.5
Sagami Gawa	1,680	109	15.4
Kino Kawa	1,660	136	12.2
Siribetu Gawa	1,640	126	13.0
Sendai Gawa	1,600	137	11.7
Niyodo Gawa	1,560	124	12.6
Kuzi Gawa	1,490	124	12.0
Ōno Gawa	1,460	107	13.6
Abasiri Gawa	1,380	115	12.0
Saru Gawa	1,350	104	13.0
Ōi Gawa	1,280	160	8.0
Mu Kawa	1,270	135	9.4
Tama Gawa	1,240	138	9.0
Hizi Kawa	1,210	103	11.7
Syō Kawa	1,180	115	10.3
Naka Gawa	874	125	7.0

Drainage basin of over 2,000km² or main course of over 100km.
(Compiled from Handbook of Rivers)



(Compiled from Annual Report of Discharge)



