PRINCIPAL RIVERS & LAKES OF THE WORLD

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National Ocean Survey

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INTRODUCTION

This report was prepared to provide nontechnical information on lakes and rivers of the world. The contents are a compilation of data from many sources developed primarily to answer inquiries often received by the National Ocean Survey for general information on lakes and rivers.

Many State agencies issue informative material concerning lakes and rivers within their States. Generally, requests for such information should be addressed to the Department of Conservation, State Capital. Other Federal agencies who play an active role in development or preservation of our natural resources as they affect our environment include the U.S. Army Corps of Engineers; Department of Health, Education, and Welfare; and the Department of the Interior.

We live in an age when man's environment is being threatened by many factors to such an extent that not only does it affect the quality of our lives, but life itself. We must understand the origin of our natural resources and assure their future development without further contamination being made to our oceans and air.

As the population of the earth grows, the danger to lakes and rivers as a natural resource increases. Water pollution and environmental studies have escalated in recent years from an accepted ecological science to a position of social involvement and genuine concern for all of us to take a defensive position in protecting our lakes and rivers from total extinction.

Water is one of the basic commodities common to our way of life. It rises from oceans to atmosphere and from atmosphere back to earth. This exchange is known as the hydrologic cycle. As the moisture falls back on the land, replenishment is made by a unique system of natural channels known as rivers and basins carved from the land which we call lakes. Both rivers and lakes provide sources of pure water to our planet.

RIVERS

Because rivers and their tributaries are so numerous and widespread, they are among the most common place phenomena of our natural resources. Rivers have provided the main supply of pure water for man's needs since earliest times. Primitive man depended on rivers for potable water, food, transportation, and other similar needs.

It is rather difficult to define the word "river" as applied to the enormous variety of physical characteristics rivers exhibit. There are large rivers like the Nile, Amazon, and Mississippi and little rivers such as the Juniata in Pennsylvania. Governed by the quality of precipitation, some rivers in areas of the world flow only after heavy rains, whereas Arctic rivers like the Yukon and Mackenzie are frozen two-thirds of the year.

The modern study of rivers began in the latter part of the 19th century. Although rivers had been classified before on the basis of length and other criteria, the first effort to classify them on the basis of flow was made by an Englishman, Dr. H. B. Guppy, around 1880. While engaged in activities as a naturalist in China, Dr. Guppy became interested in the Yangtze River. He wanted to determine how much water flowed by in that very fast-moving stream and was particularly fascinated with the variation of flow. Using floats and sounding lines to make his measurements, he calculated in gallons per second the discharge at the mouth of the river at different times. His interest increased and in collaboration with his contemporaries, he gathered comparable data for 17 other large rivers in the world.

In appendix (A) we have attempted to illustrate the character of the world's largest rivers as they are intricately related to other aspects of world geography, physiography, and climate. The list derived from several sources portrays the 10 major rivers of the world selected on the basis of length, size of drainage area, and flow. The fact that half of the rivers are in Asia reveals their association with the physiographic characteristics of that huge continent--broad plains sloping gradually to the oceans on the relatively humid northern and eastern sides.

PRECIPITATION

The physical development of rivers results from rain and snow that fall on the land and water flowing downhill under the influence of gravity. In its travels from highlands to the sea, water collects in channels that converge downstream to make progressively larger rivers, forming thereby an integrated network of water courses

Figure 1 - Apalachicola River, Florida.   C&GS Photo.

(Figure 1) carried out by the flowing water. It is interesting to note that if there were no rain or snow, and if the land was always at a level plane, or if the temperature was always below freezing, there would be no rivers.

Temperature regulates the evaporation and is the first essential factor of water flow. The temperatures in some parts of the world influence the amount of annual flow and its monthly distribution to a greater extent than precipitation is involved with the hydrologic cycle. A long period of below-freezing temperatures would determine the amount of snow accumulated in river basins thus affecting its flow during the spring thaw. Because of this continuous change of season, daily river discharges vary with temperature and precipitation.

EROSION

Erosion and transportation of rock debris by channels of flowing water gradually carve out river valleys. Some of them, such as the Grand Canyon, are narrow, deep, V-shaped gorges. Others, like the lower Mississippi, are flat-bottomed and very wide. Extremes in this pattern (Figure 2) reflect differences in either the speed or duration of the eroding water. In general, valleys are deep and narrow near their headwaters but gradually widen downstream. Erosion caused by rivers constantly modifies the land features of the earth. Given sufficient time and provided no additional uplift occurred, the land would eventually erode to a level plane surface. This means simply the ultimate base level is sea level. The area in which a river drains as it runs off is called a drainage basin. Drainage basins are normally rectangular, ovoid, or pear-shaped. The channel networks that cut through them are arranged in more or less distinctive patterns which are controlled by the shape and structure of the rocks in the basin.

Rivers have considerable influence on many phases of human life. River valleys commonly exhibit dense populated areas (Figure 3). They hold fertile soil, a smooth terrain, and an inherent capacity as a bowel for nature to continue its ever ending cycle. On some rivers, such as the Nile and Euphrates, the population pattern and drainage pattern essentially coincide. The location of many cities was originally determined by the economic advantages and physical limitations associated with rivers. An example of this is Washington, D.C., and

Figure 2 - Columbia River at Portland, Oregon. C&GS Photo.

Figure 3 - Mississippi River at New Orleans, Louisiana. C&GS Photo.

Philadelphia, which are both near flow centers on the Potomac and Delaware Rivers, respectively. New York City, one of the largest cities in the world, owes much of its growth to the Hudson River. From its beginning under Dutch control, New York City has grown steadily due to its advantage with water commerce. Although their function as transportation arteries has diminished in developed parts of the world, rivers have become increasingly important to agriculture, industry, defense, and urban concentrations.

RIVERS AS BOUNDARIES

Many rivers possess international stature because they either flow through the sovereign territory of more than one country or form boundaries between countries. Since water runs the course of least resistance without respect to man's civil domain, the hydrographic features of continents cannot be expected to conform to political patterns. Only when boundary markers take rivers or watersheds into consideration in delimiting sovereignty, can there be any positive correlation between the two systems. One can see from a world map, rivers do act as international boundaries. This function, however, is a paradoxical one since rivers unite rather than divide. A river's valley generally provides the easiest transportation route from one point to another. As mentioned earlier, commerce is drawn to such locations; thus, a river valley tends to be a homogeneous area in which common regional interests seem to warrant unified political control.

Of the 50 some rivers in the world that have a length of 1,000 or more miles, 32 may be classed as international. Many shorter streams also fall into this category including such examples as the Yarmuk and the Niagara which measure only 50 miles and 36 miles, respectively. International rivers range in complexity from the Danube, which touches the territory of eight European states, to streams like the Red River of the North which flows from the United States into Canada.

CHARTING WATERWAYS

A vast amount of information is needed for the proper evaluation of the development potential of rivers. Surveys and charts of river systems are indispensable in present and future planning.

With the exploration of outer space well on its way, accurate geographic knowledge of the earth is still largely in a data processing stage; much basic information concerning rivers in certain parts of the world is vague, sketchy, or even nonexistent. Contradictions exist in the lengths of some of the major rivers, and the precise area of their drainage basins is not always certain.

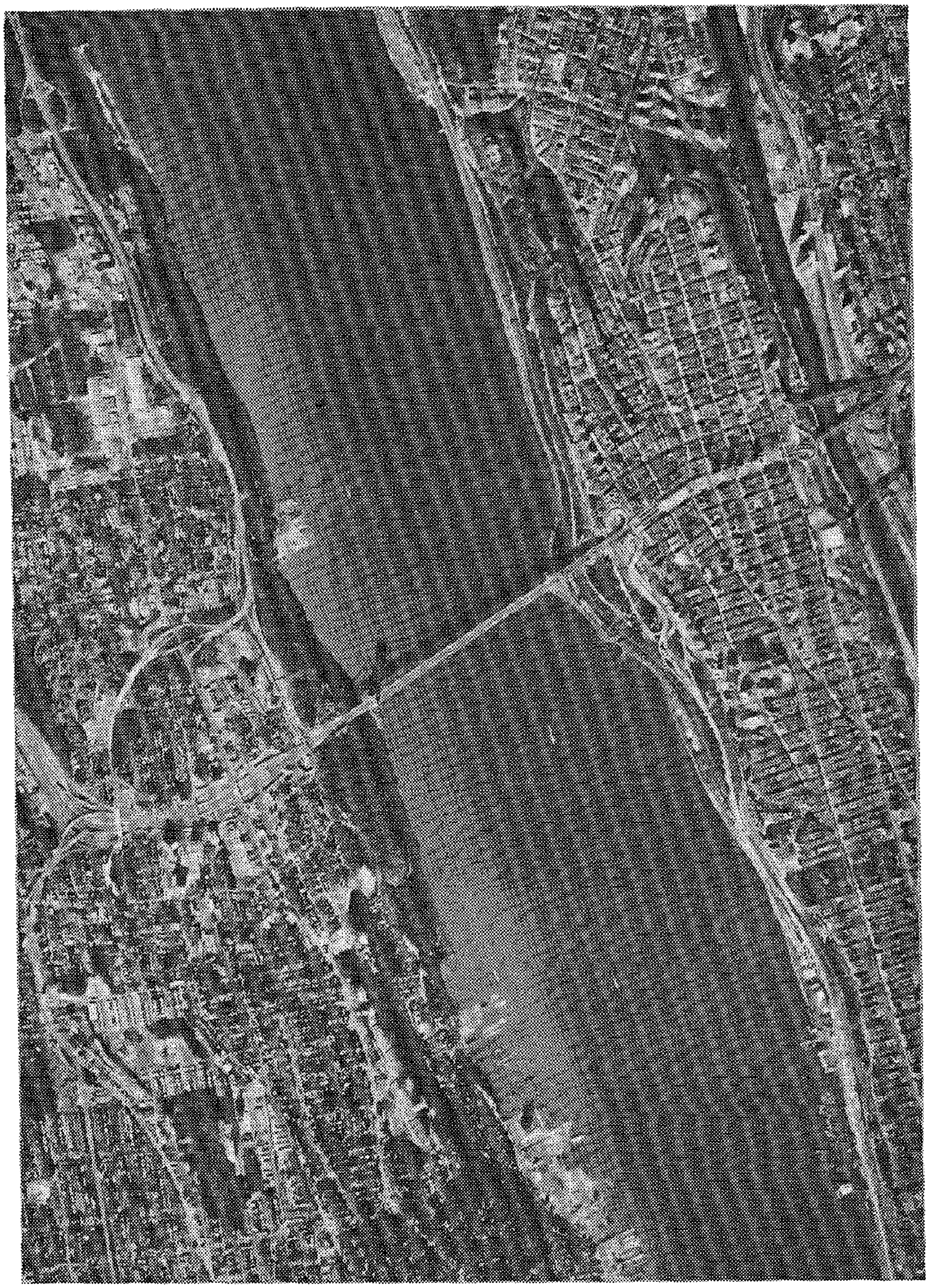
The National Ocean Survey (formerly the U.S. Coast and Geodetic Survey) has surveyed and accurately charted the depths of the tidal portions of major rivers including the Mississippi to New Orleans, the Hudson River to Troy, New York, and the Columbia River to the Dalles. Yet there is much to be learned about the great rivers if they are to be used effectively.

The Geological Survey, Department of the Interior, has determined the length, drainage area, and average flow near the mouth of many major rivers in the United States and the Corps of Engineers, U.S. Army, has determined navigable depths of rivers included in their rivers and harbors program.

Perhaps the most significant aspect of a river in a highly productive country like the United States is its flow, for this is what supplies the vast amount of water needed by cities for industry and transportation, and to aid in solving potential environmental problems resulting from pollution. At present, the National Oceanic and Atmospheric Administration is concerned with water circulatory problems as they relate to the transport of pollutants of all types.

In addition to river flow, much remains to be learned about the river stages from drought to flood, chemical and salt content, and the movement of silt. Since the topography and vegetation of all parts of a river's basin affect the flow and general nature of the river, these factors must be surveyed and mapped. In fact, maps and charts of nearly every kind are important in the study of rivers. Meteorological data showing cyclic fluctuations are necessary, as well as other essential data, to supplement surveys required in comprehensive river studies.

Intensive research must continue as an integral part of national concern with our environment to provide essential geographic data for future development of the nation's waterways. The results are best portrayed in surveys, maps, and charts.



Hudson River at George Washington Bridge, New York

LAKES

Born from ice, shaped by the ages, and mellowed by the elements for millenmiums are the lakes of the world. They delight the eye, inspire the poet, and encourage the soul with their magnificent beauty. A gift from nature to be considered a treasured possession of our environment are these basins of shimmering liquid. Unfortunately, this has not entirely been the case. Our lakes have become polluted to such dangerous proportions that they pose a threat to man's health and well being. An example of this pollution problem is the Great Lakes which will be discussed a little later. To say simply that the lakes of the world are magnificently beautiful, or to quote poetic phases, does not explain the vital link the lakes forge between a source of recreation and civilization's growing obligation to preserve lakes as a natural resource.

ORIGIN

In order for one to enjoy a lake for its beauty and as a national resource, we must first understand and appreciate the origin and environmental affect it has on our society. A lake may be defined as an inland body of still water, either salt or fresh. Lakes are nearly universally distributed over our planet but are most abundant in high altitudes and in mountainous regions of the globe.

Lakes may form in any undrained depression or in any basin that has an outlet somewhat above the lowest part of the depression where there is an adequate supply of water to keep the basin filled. Lakes act as natural reservoirs collecting water from river, snow, springs, and other forms of surface runoff. In some cases a lake develops from exposing the underground water table.

Natural lakes are associated with glacial action, volcanic displacement, warping of the earth's crust, or other phenomena. Unquestionably more of the world's present lakes were produced by glacial action than any other single agent. The glaciers that covered the North American continent during the Ice Age gouged out undrained depressions in bedrock, thereby producing tens of thousands of rock-shored lakes in Canada, northern United States, Finland, and parts of Sweden.

Glaciers also created lakes by depositing across preexisting drainage patterns rock debris that dam up the streams, creeks, and thereby form lakes that develop behind the natural dams. Oftentimes glacial debris, spread indiscriminately over the landscape, leave scattered small shallow swales or depressions, and these would then slowly develop into lakes through the runoff associated with the glacier.

There are some lakes which appear and disappear. This phenomenon is mostly found in mountains that have been formed by landslides or mud flows which block the drainage pattern. They are short lived, however, because the outlet at the lower end is quickly cut down through the relatively unrestricted material which formed the blockage. As a glacier melts, it sometimes leaves deep pits called "Kettle Holes" which fill with water and in some instances become lakes, depending on the drainage pattern and geologic structure. Mountain glaciers also produce lakes in valleys by the same processes of erosion and deposition. Most, though not all, mountain lakes have had a glacial beginning.

Lakes are constantly being subjected to destruction by drainage, fill caused by sediment, or evaporation of lake water. The very substance, that being precipitation, which replenishes a lake's water supply eventually will destroy it. In arid regions of the world where precipitation is slight and evaporation great, lake levels rise and fall with the seasons and sometimes dry up completely for long periods. In lakes where evaporation prevents the water from overflowing the basin rims, substances dissolved in the water become concentrated as more water enters the basin. The dissolved matter, brought into the lakes by tributary streams, varies in composition with the nature of the rocks in the local drainage system. The principal mineral constituent of salt lakes is common salt; bitter lakes contain sulfates; alkali lakes contain carbonates; borax lakes contain borates; and some lakes contain a combination of several of the above minerals.

Lakes in the United States which are saline in nature are normally found in the Great Basin that includes nearly all of Nevada, the western half of Utah, and parts of California, Idaho, Oregon, and Wyoming. In this region there are no outlets to the ocean. The rivers and drainage patterns that originate in the Great Basin eventually empty into lakes from which the water has no escape except by evaporation.

FORMATION & SIZE

Lakes occur at all altitudes; an example would be the Dead Sea at 1,292 feet below sea level in comparison to the lakes of the Himalayan region at more than 16,000 feet above sea level. In Appendix (B) we provide a list of natural lakes of the world by continent and depth to illustrate the variety of locations and size. The Great Lakes of the United States and Canada constitute the world's greatest array of large lakes. In fact, because of their enormous size, the Great Lakes are tabulated separately. The Lakes are, in effect, inland seas and cannot be compared with other world lakes of similar overall size. Lake Superior has the greatest fresh-water surface area (31,820 sq. mi.), but by volume it is not the largest lake in the world. That honor goes to Lake Baikal in southern Siberia which has a considerably smaller surface area (12,162 sq. mi.) but is so deep that its total volume is greater than that of Lake Superior.

Spread across North America are at least eight lakes with areas larger than 7,000 sq. mi.--Lakes Ontario, Erie, Huron, Michigan, Superior, Winnipeg, Great Slave, and Great Bear. Several hundred miles west of Lake Baikal in southwestern Siberia there is located yet another very large lake, Lake Balkhash.

In east Africa there is a group of large lakes, one which has a surface area second only to Superior--Lake Victoria. Others in the region include Rudolph and Tanganyika. South America, too, contains large lakes. Lake Titeaca, located on the Peru-Bolivian border, is one of the largest in the world. Lake Maracaiho, a shallow arm of the sea in northern Venezuela, can be considered second only to Lake Titeaca in South America.

GREAT LAKES

The Great Lakes have provided a means of water commerce to the midsection of our nation and play an important role in the industrial development of the United States. The industrial centers which have sprung up along the shoreline with the completion of the St. Lawrence Seaway have afforded one of the greatest industrial concentrations in our history. Seagoing vessels of up to 25,000 tons can sail between the Atlantic Ocean and Duluth, Minnesota, a distance of around 2,300 miles.

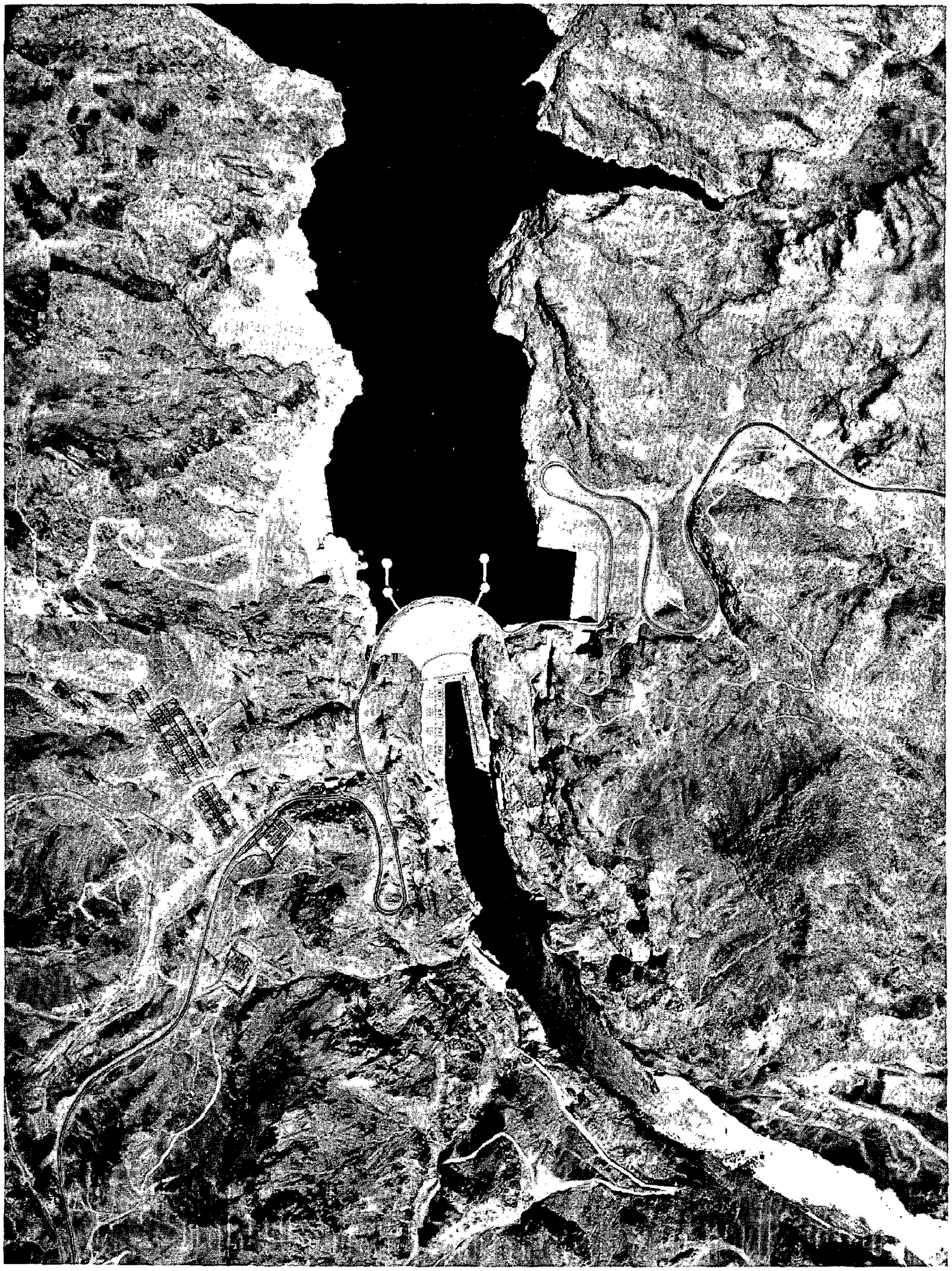


Figure 4 - Hoover Dam, Boulder Basin-Lake Mead. C&GS Photo.

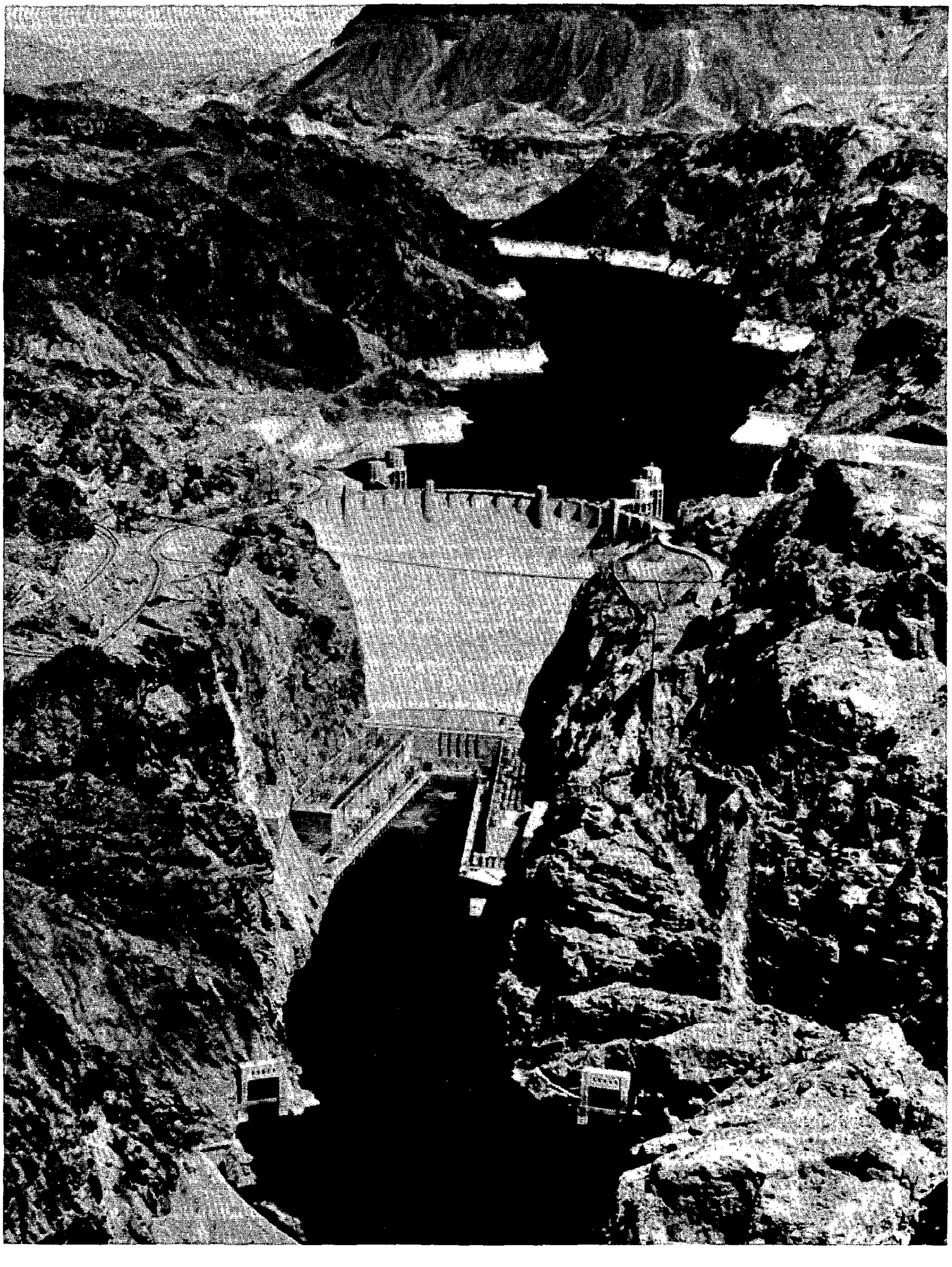


Figure 5 - Hoover Dam, Arizona-Nevada. Courtesy: National Park Service.

This tremendous growth has brought to the Great Lakes an environmental crisis. Pollution of various types threaten to destroy the recreational and service abilities of the lakes. However, in recent years the municipalities and industrial interests that utilize the lakes' waters are making some effort to correct this danger before it becomes a national dilemma.

GEOLOGIC FEATURES

Geologic factors associated with lakes are by far the most important area one should consider while engaged in lake study. Such geological features as craters of extinct or dormant volcanoes commonly contain lakes. Crater Lake in Oregon is one of the best known examples. At various places the earth's crust has been moved or broken into fallen sections which fill with water. Lake Michigan may be attributable partly to this warping effect. Lake Superior may claim origin as well to this seismological experience.

Viewed by a geological time scale, lakes are short-lived features of the earth's crust. As we have already reviewed, lakes begin in several ways, but as soon as they are formed, there are three processes which begin their eventual destruction. First, as lakes fill with water, the inflowing streams bring with it sediment, thereby starting the process of filling the basin. Second, if sufficient amounts of water fill the depression to overflowing, the water runoff will tend to erode a notch through the lip of the basin and slowly enlarge it until it is drained. Finally, the sediment deposits which have steadily been flowing in may include vegetation that would change small lakes into swamps and eventually dry up.

Limnology is the science that deals with the physical, chemical, and biological properties of lakes. Limnologists have found lakes to be prime factors in our environment. Because lakes constitute the major areas of fresh water found on the earth's surface, they afford a highly specialized type of environment for both plants and animals. Limnologists have noted many world lakes exhibit current flow. One particularly interesting type of current allows some of the material brought into a lake to be carried through the standing water and flow directly back out its drainage pattern.

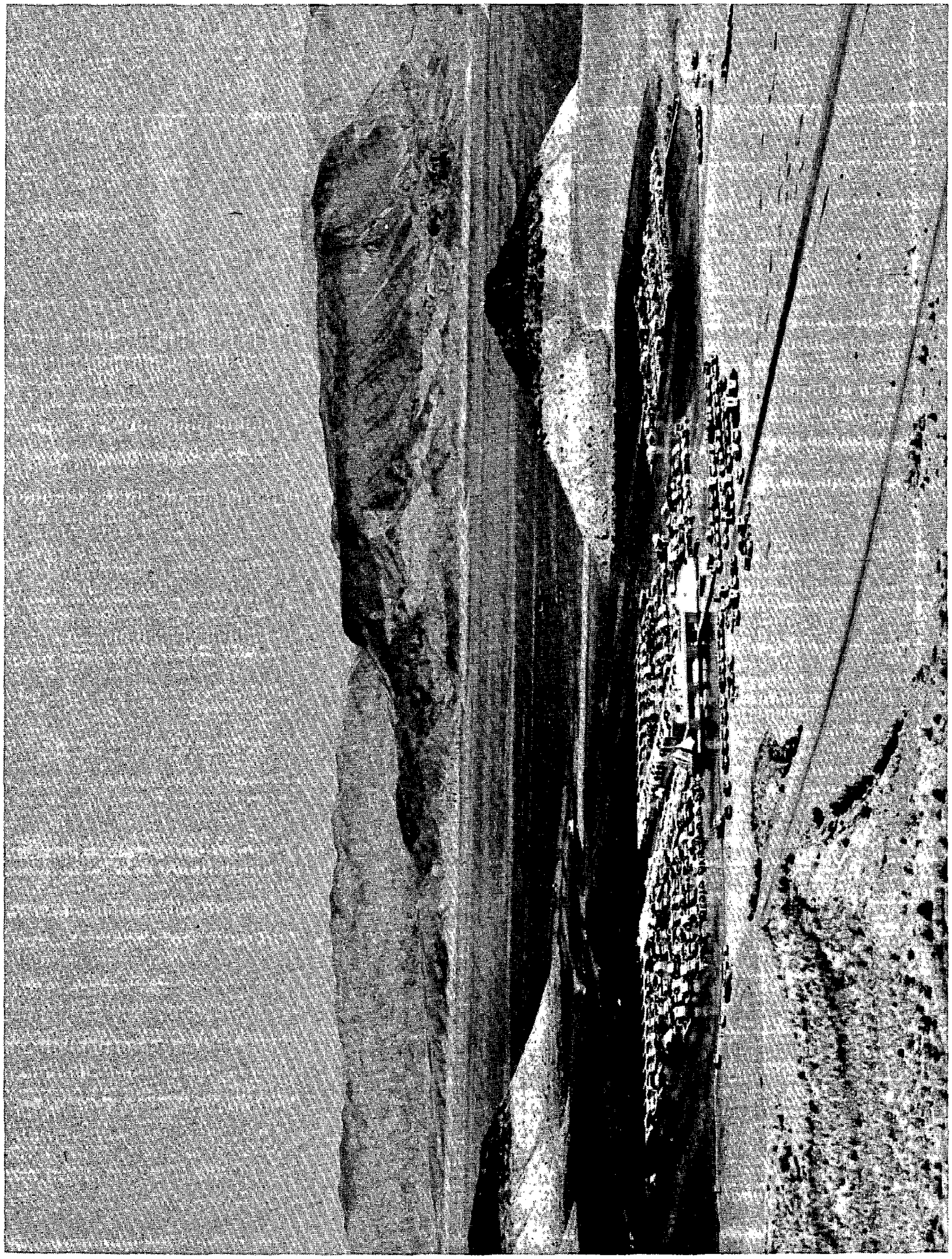


Figure 6 - Lake Mead, Arizona-Nevada. Courtesy: National Park Service.

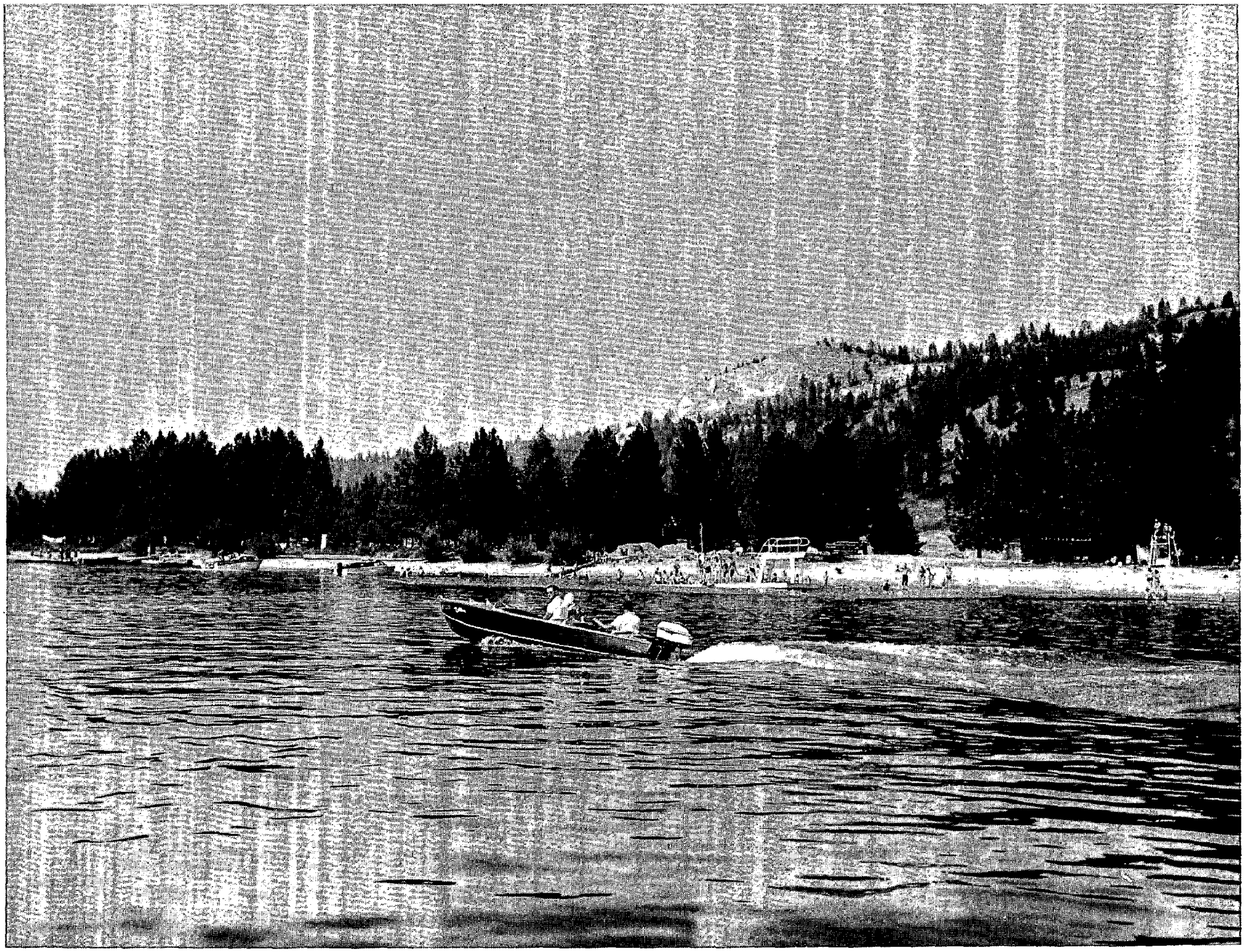


Figure 7 - Camp Evans located on Roosevelt Lake, Washington. Courtesy: Bureau of Reclamation.

RECREATION

Lakes have for centuries provided vistas that enhance man's environment and are among the most beautiful natural features that man enjoys. It is not unusual then that we find today lakes as a prime attraction for summer and winter sports or for a Sunday outing. The beauty and the recreational qualities of lake regions attract sightseers as well as seasonal residents.

Lakes demonstrate ways in which the splendor of nature is revealed through eons of geological change. But in today's world, the appeal and attractiveness of lakes in many cases may be degraded by the pollution of man. Lake Powell, located in Glen Canyon, has in recent years developed into a haven for recreational interests. Though the region is still under development and for the most part remote from large population centers, nearly 360,000 people swarmed to its shores last year. At the height of the season, 1,200 boats were launched weekly. Visitors who are drawn to Lake Powell's crystal waters may also see its multicolored, canyon-carved walls, unrivaled by any other large lake in the world.

According to the Army Corps of Engineers, reservoir basins alone last year registered over 250 million visitors in the United States. The recreation boom has developed areas in our country that previously were isolated sections and now are major commercial centers (Figure 6) for all types of outdoor activities. Over 400 state, county, and municipal parks under the Corps of Engineers reservoir program have a combined size of more than a quarter million acres. The reverberations of the recreation boom to lakes will grow as our population grows and, with this move, increased public interest should go far to assure environmental protection to these priceless gifts of nature.

APPENDIX (A)

List of Principal Rivers of the World

Name	Continent	Length (Miles)	Drainage Area (Thousands Sq.Mi.)	Flow (Thousands CFS)
	(Major Rivers of the World)			
Nile	Africa	4,132	1,293	110
Amazon	S. America	3,915	2,722	4,200
Mississippi-Missouri	N. America	3,892	1,243.7	620
Yangtze	Asia	3,434	756.5	770
Congo	Africa	2,900	1,425	2,000
Amur	Asia	2,900	711	390
Lena	Asia	2,650	963	530
Yenisei	Asia	2,566	1,003	614
La Plata-Parana	S. America	2,450	1,198	2,800
Ob	Asia	2,287	1,431	441

Amazon	S. America	3,915	2,722	4,200
Amu Darya (Oxus)	Asia	1,500	115	
Amur	Asia	2,900	711	390
Amur-Shilka-Onon	Asia	2,700	711	390
Araguaia	S. America	1,367		
Arkansas	N. America	1,450	157.9	45
Brahmaputra	Asia	1,800	361	500
Churchill	N. America	1,000	140	
Colorado	N. America	1,450	244	23
Columbia	N. America	1,214	258	235

Name	Continent	Length (Miles)	Drainage Area (Thousands Sq.Mi.)	Flow (Thousands CFS)
Congo	Africa	2,900	1,425	2,000
Danube	Europe	1,760	347	200
Dnieper	Europe	1,420	202	59
Don	Europe	1,224	107.8	32
Euphrates	Asia	1,700	295	
Ganges	Asia	1,540	188.8	470
Hwang Ho	Asia	2,903	400	116
Indus	Asia	1,800	377	300
Irrawaddy	Asia	1,425	158	
Irtysh-Black Irtysh	Asia	2,640	616	106
Kasai	Africa	1,338	350	380
Kolyma	Asia	1,600	248.7	13
La Plata-Parana	S. America	2,450	1,198	2,800
Lena	Asia	2,650	936	530
Limpopo	Africa	1,100	170	
Mackenzie	N. America	2,635	682	450
Madeira	S. America	2,013		600
Mekong	Asia	2,600	350	600
Mississippi-Missouri	N. America	3,892	1,243.7	620
Mississippi	N. America	2,348	1,243.7	620
Missouri	N. America	2,466	529.4	64
Murray	Australia	1,609	414.2	14
Murray-Darling	Australia	3,371	414.2	14
Niger	Africa	2,600	584	250
Nile	Africa	4,132	1,293	110

Name	Continent	Length (Miles)	Drainage Area (Thousands Sq.Mi.)	Flow (Thousands CFS)
Ob	Asia	2,287	1,431	441
Ob-Irtysh-Black Irtysh	Asia	3,416	959.5	441
Ohio	N. America	976	203.9	231
Orange	Africa	1,300	400	12.6
Orinoco	S. America	1,700	350	600
Paraguay	S. America	1,584		160
Parana	S. America	2,796	1,198	550
Purus	S. America	1,995		
Rhine	Europe	820	85	78
Rio Grande	N. America	1,885	172	2.7
Salween	Asia	1,770	62.7	
Sao Francisco	S. America	1,811	252	120
Saskatchewan	N. America	1,660	360	
St. Lawrence-Great Lakes	N. America	2,100	565	360
Syr Dar'ya-Naryn	Asia	1,660	84	15.2
Tigris	Asia	1,181	145	
Tocantins	S. America	1,677		
Ural	Europe	1,575	84	13
Volga	Europe	2,292	532.8	286
Volta	Africa	710	139	
Yangtze	Asia	3,434	756.5	770
Yellow	Asia	2,901	486	116
Yenisei	Asia	2,566	1,003	614
Yenisei-Angara	Asia	3,100	1,003	614
Yukon	N. America	1,979	334	216.5
Zambesi	Africa	1,700	513.5	300

APPENDIX (B)

Natural Lakes of the World

Name	Continent	Depth-Feet	Sq.Mile Area	Length-Miles
Albert	Africa	54	2,075	100
Aral Sea	Asia	223	25,300	280
Athabasca	N. America	407	3,120	208
Balkhash	Asia	85	6,720	373
Baykal	Asia	5,315	11,780	395
Caspian Sea	Asia/Europe	3,264	143,550	760
Chad	Africa	24	5,300	175
Dubawnt	N. America	(N.A.)	1,600	69
Erie	N. America	210	9,910	241
Eyre	Australia	4	2,970	90
Gairdner	Australia	(N.A.)	1,840	90
Great Bear	N. America	1,356	12,275	192
Great Slave	N. America	2,015	10,980	298
Great Salt Lake	N. America	48	1,500	75
Huron	N. America	750	23,000	206
Issyk Kul	Asia	2,303	2,355	115
Kariba	Africa	390	2,050	175
Khanka	Asia	33	1,700	55
Koko (TSing)	Asia	125	1,625	68
Kyoga	Africa	25	1,710	50
Ladago	Europe	738	6,835	120
Lake of the Woods	N. America	69	1,695	72
Manitoba	N. America	12	1,817	140
Maracibo	S. America	115	5,127	96

Name	Continent	Depth-Feet	Sq.Mile Area	Length-Miles
Michigan	N. America	923	22,400	307
Mweru	Africa	84	1,770	76
Nettilling	N. America	(N.A.)	1,870	72
Nicaragua	N. America	230	3,100	102
Nipigon	N. America	540	1,870	72
Nyasa	Africa	2,226	11,430	360
Omega	Europe	361	3,710	145
Ontario	N. America	802	7,600	193
Pend Oreille	N. America	1,200	148	(N.A.)
Reindeer	N. America	(N.A.)	2,467	143
Rudolf	Africa	200	2,473	154
Superior	N. America	1,333	31,800	350
Tahoe	N. America	1,645	193	(N.A.)
Tanganuika	Africa	4,710	12,700	420
Titicaca	S. America	922	3,200	122
Torrens	Australia	(N.A.)	2,230	130
Tungting	Asia	(N.A.)	1,430	75
Urmia	Asia	49	1,815	90
Vanern	Europe	328	2,156	91
Van Golu	Asia	82	1,419	80
Victoria	Africa	265	26,828	250
Volta	Africa	(N.A.)	3,276	250
Winnipeg	N. America	60	9,464	266
Winnipegosis	N. America	38	2,103	141

APPENDIX (C)

MAP AND CHART PUBLISHING AGENCIES

Information on maps and navigational charts of lakes and rivers some illustrating water depths, navigation aids, and related publications are listed below and may be obtained from the agencies indicated:

Agency	Lakes	Rivers
National Ocean Survey Washington Science Center Rockville, Maryland 20852	Franklin D. Roosevelt Mead Nitinat Okeechobee Pend Oreille Tahoe	Caloosahatchee Columbia Connecticut Delaware Hudson James Kennebec Neuse New Pamlico Penobscot Potomac Rappahannock Savannah St. Johns York and others
National Ocean Survey Lake Survey Center 630 Federal Building Detroit, Michigan 48226	Cayuga Champlain Great Lakes Minnesota-Ontario border lakes Oneida Seneca	St. Lawrence to Cornwall New York State Barge Canal
Corps of Engineer 315 Main Street P. O. Box 1159 Cincinnati, Ohio 45201	--	Ohio and tributaries
Corps of Engineers 536 South Clark Street Chicago, Illinois 60605	--	Middle and upper Mississippi River and Illinois Waterway to Lake Michigan

Agency	Lakes	Rivers
Corps of Engineers P.O. Box 80 Vicksburg, Mississippi 39181	--	Atchafalaya Big Sunflower Calcasieu Lower Mississippi River from Cairo, Illinois to Gulf of Mexico
Corps of Engineers P. O. Box 1216 Downtown Station Omaha, Nebraska 68101	--	Missouri
Tennessee Valley Authority 110 Pound Building Chattanooga, Tennessee 37401	Cherokee-Douglas Nolichucky Chickamauga Fontana Guntersville-Hales Bar Hiwassee Kentucky Norris Pickwick Landing Upper Holston Watts Bar-Fort Laudoun Melton Hill Wheeler-Wilson	Tennessee and tributaries
Chart Distribution Office, Canadian Hydrographic Service 615 Booth Street Ottawa, Ontario, Canada	Canadian Great Lakes	Coastal waters
Defense Mapping Agency Hydrographic Center Washington, D. C. 20390	(Foreign waters)	