CHINA LAKE

Introduction

During ice ages, snow accumulates in the high mountains faster than it melts. After it becomes several hundred feet deep, the weight compresses the lower layers of snow into ice. The increasing pressure of further snowfall eventually becomes so heavy that the lower ice is unable to support the weight, causing the ice to flow downhill--following the paths of streams. These rivers of flowing ice are called glaciers, and move anywhere from one meter to one kilometer annually. Over the course of the millennia, the ice scours away the bedrock and carries away the debris suspended in the ice. The original stream valleys are transformed into deep, wide, flat-bottomed valleys. All of the drainages in the Uintas are such glacial valleys.

As an ice age ends, glaciers begin to melt faster than they advance. As the toe of the glacier melts, it leaves its load of debris in irregular deposits called moraines. The

Characteristics and Morphometry

Lake elevation (meters / feet)	2,868 / 4,498
Surface area (hectares / acres)	13 / 31
Watershed area (hectares / acres)	935 / 2,311
Volume (m^3 / acre-feet)	
capacity	766,000 / 621
conservation pool(original lake volume) (m^3 / acre-feet)	496,000 / 402
Annual Inflow	not measured
Retention time (years)	unknown
Drawdown (m^3 / acre-feet)	270,000 / 219
Depth (meters/feet)	
maximum	14 / 45
mean	6 / 20
Length (meters / feet)	850 / 2800
Width (meters / feet)	122 / 400
Shoreline (meters / feet)	1,760 / 770

Location

County	Summit
Longitude / Latitude	110 24 15 / 40 56 25
USGS Map	Bridger Lake, UT / WY 1967
DeLorme's Utah Atlas and Gazetteer™	Page 55, A-5
Cataloging Unit	Black's Fork (14040107)

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bottoms of glacial valleys are partly filled by these morainal deposits, creating areas of irregular, poorly drained topography. China Lake is one of many lake basins created by irregular deposition of glacial deposits. It is notable in that it is impounded by a lateral moraine, rather than the terminal moraineChina Lake is a small lake in the Smiths Fork glacial valley, on the north slope of the Uintas four miles from the Wyoming state line. In 1954, the lake was raised nine feet by the construction of an earth-fill dam. The reservoir shoreline is 100% publicly owned by the Wasatch-Cache National Forest. Public access is unrestricted. Water is consumed for irrigation, but also used for recreation and cold-water aquatic habitat. No changes in water use are expected.

Recreation

China Lake is in the Smith's Fork drainage, 30 miles east of U-150 on the North Slope Road (FS-058). It is also accessible from Mountain View, Wyoming. Go south from Mountain View on U-410, a paved road, towards Robertson (not towards Lonetree). About 5 miles from Mountain View, leave the highway, and continue south on a gravel road that becomes FS-072.

FS-072 and FS-058 join at China Meadows Campground. Access to China Lake is from FS-058, 1/4 mile west of the campground. The lake is 1/4 mile north of the road, accessible by trails and an old jeep road which is closed to motor vehicles. The route to the China Meadows area is well marked, but there are no signs to the lake itself.

The lake offers fishing and solitude. The water is too cold for most swimmers. Fishing is popular, and small boats can be carried in from the road.

The area immediately around the lake offers primitive camping. China Meadows Campground, administered by the Forest Service, has 13 campsites, with latrines. There are several other USFS campgrounds in the vicinity, including Trail Head, Marsh Lake, Bridger Lake, and Smiths Fork Trail Head. This area is a popular access route to the High Uinta Wilderness, so campgrounds are heavily used in the summer.

Watershed Description

China Lake is on the east side of the valley floor in the western area of glacial valley. The valley is about two miles wide and 800' deep. The lake's watershed itself is only a very small portion of the valley floor, extending about one mile to the southwest. The watershed consists entirely of a fairly steep slope draining from the edge of the valley floor into the lake.

The watershed high point, one mile southwest of the lake, is 2,969 m (9,740 ft) above sea level, thereby developing a complex slope of 7.0% to the reservoir. Inflow is from snowmelt and springs, with no perennial streams. While the 1967 USGS map shows a canal capturing water from the valley floor to the north, irrigation company president Claude Walker says "There's no canal a'tall."

The outflow is a small stream that joins Smiths Fork 1/2 mile downstream.

The soil in the watershed is entirely glacial till and alluvium. It is comprised primarily of debris from the scouring of upstream valleys, so the till is chemically similar to the Precambrian rocks of the High Uintas. See Appendix III for a complete soil description.

The vegetation community is comprised of lodgepole pine and marshlands. The watershed receives 51 - 64 cm (20 - 25 inches) of precipitation annually with a frost-free season of 20 - 40 days.

Land use is 100% multiple use.

Limnological Assessment

The water quality of China Lake is very good. It is considered to be very soft with a hardness concentration near 15 mg/L (CaCO3). The only parameter that has

Limnological Data

Data sampled from STORET site: 593945

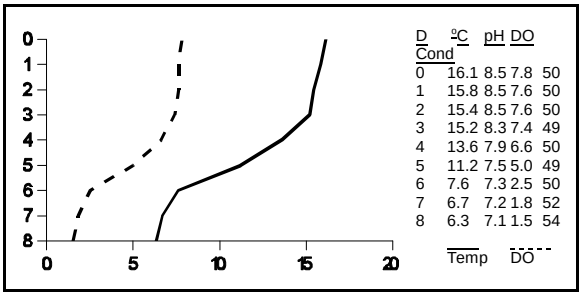
Surface Data	1981*	1992
Trophic Status	E	M
Chlorophyll TSI	-	44.68
Secchi Depth TSI	-	39.15
Phosphorous TSI	53.20	52.95
Average TSI	53.20	45.59
Chlorophyll a (ug/L)	-	4.2
Transparency (m)	-	4.25
Total Phosphorous (ug/L)	30.0	29.5
pH	7.6	8.2
Total Susp. Solids (mg/L)	<5	<3
Total Volatile Solids (mg/L)	-	0
Total Residual Solids (mg/L)	-	3
Temperature (°C / °f)	20/68	14/57
Conductivity (umhos.cm)	29	52
Water Column Data		
Ammonia (mg/L)	0.10	0.11
Nitrate/Nitrite (mg/L)	0.11	0.01
Hardness (mg/L)	20	15
Alkalinity (mg		
Silica (mg/L)		
Total Phosph		
Miscellaneo		
DO (Mg/l) at		
Stratification		
Limiting Nutri		
Depth at Dee		

* Period 1 da

Information

Management Agencies	
Wasatch-Cache National Forest	524-5030
Mountain View Ranger District	307-782-6555
Mountainlands Association of Governments	377-2262
Division of Wildlife Resources	538-4700
Division of Water Quality	538-6146
Recreation	
Mountainland Travel Region (Provo)	377-2262
Reservoir Administrators	
China Lake Reservoir Company	307-782-6793

exceeded State water quality standards for defined beneficial uses is phosphorus. The average concentration of total phosphorus in the water column in 1992 was 0.028 mg/L which is slightly higher than the recommended pollution indicator for phosphorus of 0.025 mg/L. The phosphorus concentrations near the bottom of the lake in August was almost three times the standard at 0.072 mg/L. Dissolved oxygen concentrations in late summer indicate water quality impairments which may be even more limiting during the winter season. In 1981 and 1992 the system was characterized as a phosphorus limited system. Although a TSI value of 53.20 (total phosphorus only) was reported in 1981, current TSI values indicate the lake is mesotrophic. It does not appear that there has been a significant rise in the concentrations of nutrients in the lake since it was originally surveyed in 1981. However, there is insufficient data to determine if the lake is stable or there is a eutrophication trend in the lake. The lake has a maximum depth of 14 meter. The profile of August 11, 1992 shows a thermocline present. The lake was only 8 meters deep but stratification was evident beginning at the 3 meter depth. Consistent with the stratification there was a noticeable decline in the concentration of dissolved oxygen in the water column. Below 4 meters the concentration declines to a low of 1.5 mg/L at the bottom. When shallow conditions are present in the lake, the stratification is probably weak and may be broken down by wind and wave action. These conditions are probably more critical to the overwintering of fish in the lake but according to DWR no fishkills have been reported at the lake. Although macrophyte are present in the upper end of the reservoir their coverage is considered to be minimal.



China Lake is filled by snowmelt runoff in the spring. During the growing season, the irrigation company releases the water for irrigation, draining the lake down to its pre-1954 size. Drawdown typically is about nine feet.

Upon completion of the dam in 1954, the lake was chemically treated by the DWR to control rough fish competition. In the 1980s, the DWR stocked the lake annually with 7,800 fingerling brook trout (*Salvelinus fontinalis)*. In 1991, they switched to 7,800 arctic grayling (*Thymallus arcticus)* fry.

Phytoplankton in the euphotic zone include the following taxa (in order of dominance)

Species	Cell Volume (mm^3/liter)	% Density By Volume
Anabaena spiroides var. crassa	20.238	45.49
Sphaerocystis schroeteri	10.564	23.74
Anabaena macrospora v. robusta	7.979	17.93
Botryococcus braunii	2.224	5.00
Staurastrum sp.	1.668	3.75
Quadrigula lacustris	1.112	2.50
Pennate diatoms	0.366	0.82
Haematococcus lacustris	0.262	0.59
Oocystis sp.	0.034	0.07
Centric diatoms	0.023	0.05
Ankistrodesmus falcatus	0.022	0.05
Ankyra judayi	0.003	0.01
Total	44.495	
Shannon Weaver Index	1.46	
Species Evenness	0.59	
Species Richness	0.45	

As observed the phytoplankton community is dominated by the presence of blue-green algal species and a significant portion of the green algae *Sphaerocystis schroeteri*. This population does support the trophic status of mesotrophic to eutrophic conditions that are present.

Pollution Assessment

Nonpoint pollution sources are recreation and domestic livestock grazing. Cattle graze in the watershed and around the reservoir.

There are no point pollution sources in the watershed.

Beneficial Use Classification

The state beneficial use classifications include: boating and similar recreation (excluding swimming) (2B), cold water game fish and organisms in their food chain (3A) and agricultural uses (4).