

# Flathead Lake Facts



**FLATHEAD LAKE  
BIO STATION**  
UNIVERSITY OF MONTANA

Compiled by: Flathead Lake Biological Station

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Webcams and weather data can be found at the FLBS website  
Websites: <http://flbs.umt.edu/newflbs> [www.facebook.com/UMFLBS](http://www.facebook.com/UMFLBS)  
Email: [flbs@flbs.umt.edu](mailto:flbs@flbs.umt.edu)

- The Flathead Lake Biological Station (FLBS) is a year-round University of Montana Center of Excellence that conducts ecological research with an emphasis on fresh water, particularly Flathead Lake and the Flathead watershed. FLBS also provides field ecology courses for college students, natural resource professionals and educators from around the nation; trains graduate students for professional and teaching careers; and provides scientific data, interpretation and outreach to help resolve environmental problems and inform public policy.

- FLBS is one of the oldest active biological stations in the US. It was established in 1899 by Dr. Morton Elrod, the first Biology Professor at the University of Montana. Dr. Elrod played a role in the creation of Glacier National Park, where he was the first naturalist, wrote its first guide book as well as Glacier's first scientific papers. FLBS was originally located in Bigfork, but was moved to Yellow Bay in 1908.

- Flathead Lake is the 79th largest of the natural freshwater lakes in the world, and it is one of the cleanest.

- Flathead Lake's high water quality results from its watershed being mainly National Park, Wilderness and managed forest lands (>60%); having a relatively low human population (~100,000); being dominated by very old, low nutrient geology; receiving high amounts of precipitation (mostly as mountain snow); and rapid flushing of the Lake (about 2.2 years for all the water to be replaced). In contrast, Lake Tahoe's flushing time is about 650 years.

- FLBS serves as the "Sentinel of the Lake", having collected samples and data on Flathead Lake ecology and water quality for over 100 years, and provides insights into ecological conditions and changes over time. Since 1977, FLBS researchers have conducted a rigorous scientific monitoring program, which has shown declining water quality (e.g., increases in algal growth and algal blooms, declines in oxygen in bottom waters). These changes appear to be due to increases in nutrient pollution from human sources, shoreline erosion, changing climate and introduced species (particularly *Mysis* shrimp); and would have gone unnoticed if FLBS researchers were not conducting long-term monitoring. Currently, FLBS researchers are developing biological and physical models to better understand the influence of increasing nutrients and temperatures plus highly complex community interactions on Flathead Lake's water quality.

- Decreases in water quality have led Federal and State agencies to classify Flathead Lake as "Impaired" due to human caused increases in nutrients, and to work on creating a long-term plan for water quality protection.

- Flathead Lake is currently described as oligotrophic which means lacking in plant nutrients, but FLBS monitoring indicates that nutrient inputs are increasing.

- Flathead Lake is the largest natural freshwater lake in the western US (by surface area) outside of Alaska. Lake Tahoe has more water than Flathead because it is significantly deeper (nearly 1650 ft vs. 380 ft). The Great Salt Lake in Utah is significantly larger than Flathead but is salt, not fresh water. And there are numerous larger man-made reservoirs.

- Average surface temperatures of the Lake range from 2.3°C (36°F) in mid-January to 13.5°C (56°F) in mid-June to 20.3°C (68°F) in mid-August. Maximum surface temperature has recently surpassed 80 °F.

- The Lake's major tributaries are the Flathead and Swan Rivers. There are numerous small streams that flow into the Lake, particularly on the wetter East Shore.

- Maximum river flow in the Flathead generally occurs between May 15 and June 15 during peak snowmelt, creating a sediment plume that can cover the entire lake surface.

## Statistics

Maximum Length	26.9 miles	43.3 km
Maximum Breadth	15.3 miles	24.7 km
Maximum Depth	379.9 feet	115.8 m
Mean Depth	143.0 feet	43.6 m
Area of Lake	191.5 sq miles	500.2 sq km
Area of Islands	5.5 sq miles	14.2 sq km
Volume of Water	5.23 cu miles	21.8 cu km
Length of Shoreline		
Mainland	165.9 miles	267.0 km
Island	24.2 miles	38.9 km
Total	190.1 miles	305.9 km
Flushing Time		2.2 years

See other side for more Flathead Lake facts. ↘

## More Flathead Lake Facts...

- Flathead Lake's biological community is much different today than when FLBS was founded. The Lake originally had 11 native fish species, notably westslope cutthroat trout (Montana's official state fish) and bull trout (top predator). However, between 1890 and 1960, fisheries managers introduced 19 nonnative fishes to "enhance" the Lake and its angling opportunities. These fish introductions, along with the arrival of the nonnative *Mysis* (opossum) shrimp in the mid-1980s, changed the biological community dramatically. Today, the fish community is more similar to the Great Lakes than Rocky Mountain lakes, as it is dominated by nonnatives, particularly lake trout, lake whitefish and yellow perch.

- Flathead Lake may be a remnant of Glacial Lake Missoula, which covered much of Western Montana until roughly 15,000 years ago. Periodic rupturing of the ice dam that created the lake resulted in cataclysmic floods that swept across Washington and Oregon, removing and transporting huge amounts of sediments, creating the scablands of Eastern Washington, and carving out the Columbia River Gorge.

Power Company and generates 194 megawatts of electricity. It is now owned and operated by the Confederated Salish and Kootenai Tribes. Regulation by the dam results in the Lake level fluctuating seasonally 10 feet between 2,883 and 2,893 feet above sea level. If snowpack conditions in the mountains do not threaten flooding, lake level is brought to 2,890 feet by the end of May and to full pool by June 15 for summer recreation.

- Due to its large volume and fetch (distance of water across which wind blows), Flathead Lake requires very cold and calm conditions to freeze entirely. Therefore, most winters it does not freeze over, although some bays and margins have ice cover. FLBS historic observations show that the Lake froze over about once each decade, however the Lake has not entirely frozen since March 1989 and December/January 1989–90, perhaps reflecting warmer climatic conditions.

- Public lands around the Lake include a National Wildlife Refuge on the North Shore, six units of Flathead Lake State Park (including Yellow Bay which is on FLBS property) managed by Montana Fish, Wildlife & Parks (FWP), and nine Fishing Accesses managed by FWP or the Confederated Salish and Kootenai Tribes.

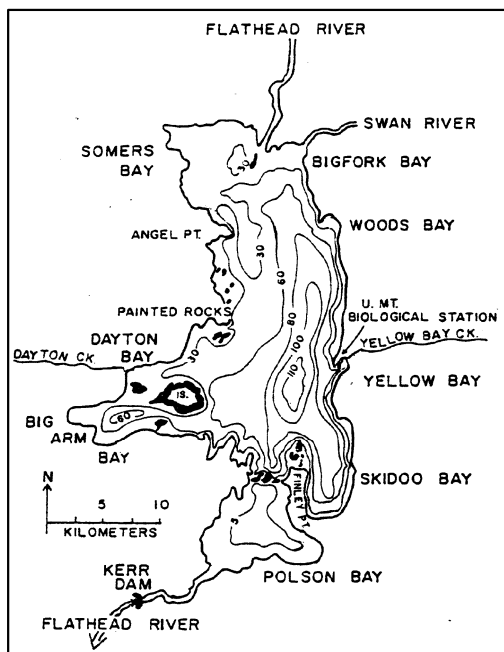
- Wildhorse Island, one of the units of Flathead Lake State Park, is the largest island in the lake at 2,100 acres, and rises 850+ feet above the Lake. It is noted for herds of wild horses and Rocky Mountain Bighorn sheep. Native grasses and flowers are abundant.

- The first wagon trail (1880s) from Polson to Somers followed the West Shore of the Lake and was steep and hazardous. In places, wagons were lowered by ropes.

- In 1911, work started from the south end of the Lake to build an East Shore road. The road, which was primarily built by convict labor, was not completed until 1946. Until then, FLBS students and researchers arrived by horse or steamboat.

- Economists estimate that Flathead Lake boosts shoreline and nearby property values by \$1.6 – \$2.2 billion, nature based tourism (which depends upon a healthy Flathead Lake-River System) accounts for roughly 20% of the \$7.8 billion annual economy of Flathead and Lake Counties, and ecological services (e.g., water supply and purification, flood and drought mitigation) contribute another \$20+ billion in benefits to human society.

**Flathead Lake**



Depth contours are in meters

- The Lake level and its outflow are regulated by Seli's Ksanka Qlispe' Dam (formerly Kerr Dam), which is located on the Lower Flathead River near Polson. Kerr Dam was completed in 1938 by the Montana