

## Priest Lake Data Bases

John Abelson

The most comprehensive scientific information about Priest Lake comes from a 1993-1995 study done by the Idaho Department of Environmental Quality by Glen Rothrock and David Mosier. This study can be downloaded from our website. Shown below is a useful compilation of morphological data collected in that study.

Upper Priest Lake	Metric	English
Shoreline length .....	12.9 km	8 miles
Surface area .....	5.4 km <sup>2</sup>	1,338 acres
Volume .....	0.1 km <sup>3</sup>	80,000 acre-ft
Maximum depth .....	34.1 m	112 ft
Mean depth .....	18.3 m	60 ft

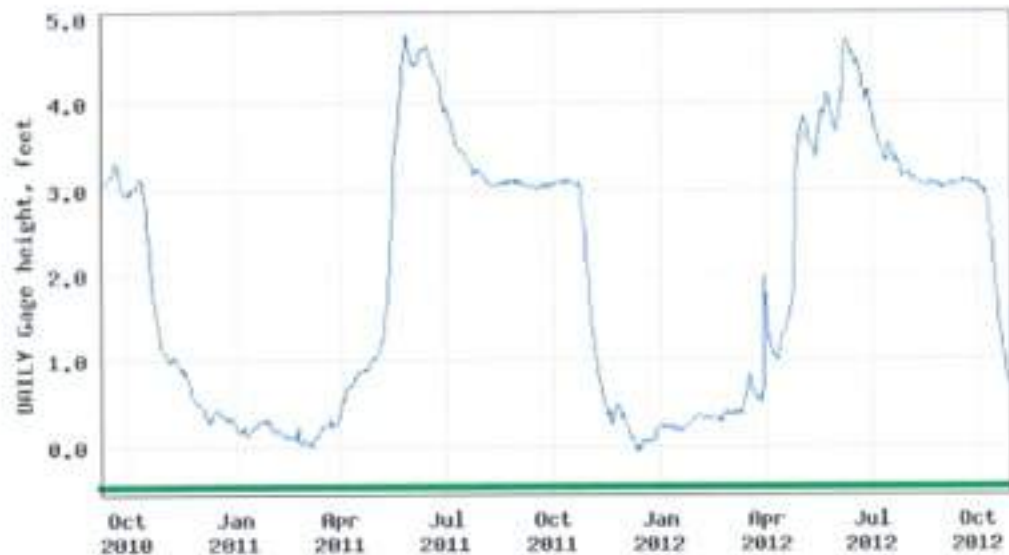
Priest Lake	Metric	English
Shoreline length .....	115.9 km	72 miles
Surface area .....	94.4 km <sup>2</sup>	23,300 acres
Volume .....	3.7 km <sup>3</sup>	3,000,000 acre-ft
Maximum depth .....	112.5 m	369 ft
Mean depth .....	39.0 m	128 ft

Volume and depth values are based on the mid-summer pool elevation, 2,438 ft above sea level.

For many years the US Geological Survey has kept detailed records of lake height and outward flow at Priest Lake. We have collected this data and it is available on our website. It is interesting to see what can be derived from these data:

Since 1928 the USGS has measured the gage height of the lake daily. This measurement is made at the Outlet Bay. In figure below we show the daily gage height for the years 2010 to 2012.

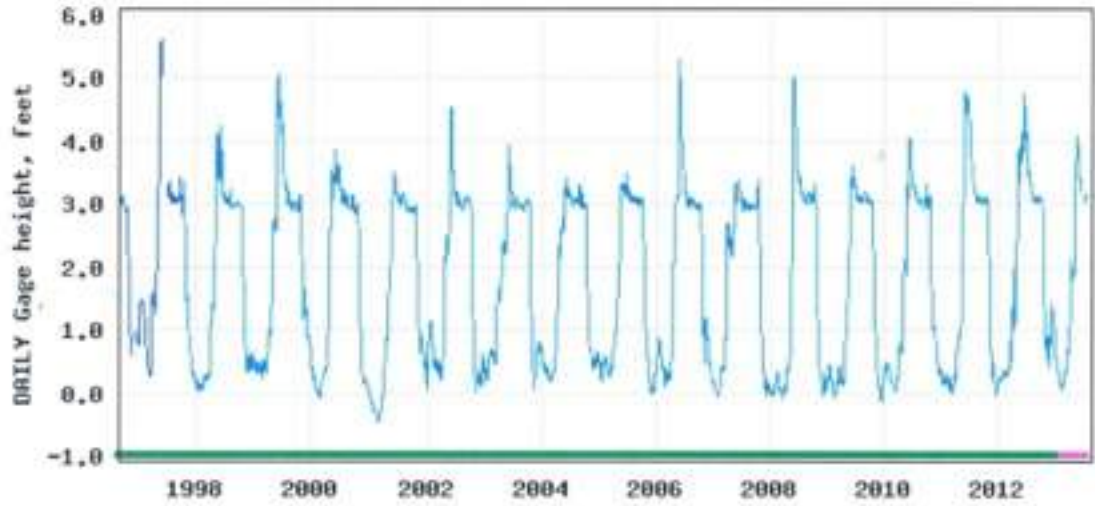
## USGS gage height 2010-2012



The peak flow occurs during the spring run-off and during this period the lake levels are not controlled by the outlet dam. When the lake level has dropped to 3 ft. in the summer the level is kept constant until October or November when the gates are again opened allowing the lake level to fall.

A graph of the lake levels over a longer period shows the variation in peak gage heights that occurs as a result of variable snow packs.

USGS gage height 1996-2012

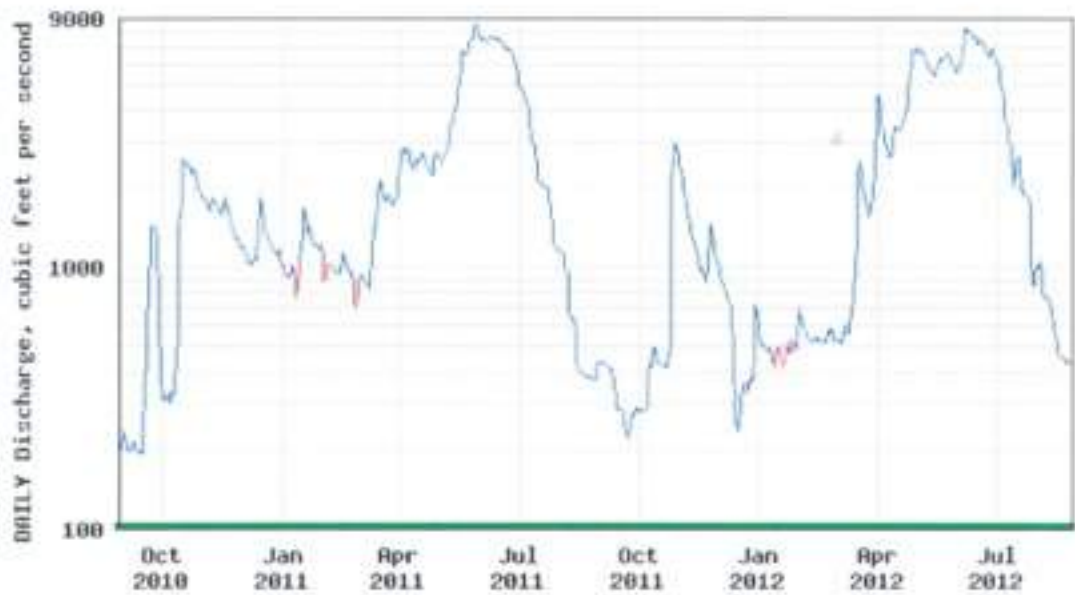


The outlet dam was built in about 1950 and it is interesting to see the difference it made by looking at earlier gage height records. Here we show the gage heights for the year 1940-41.

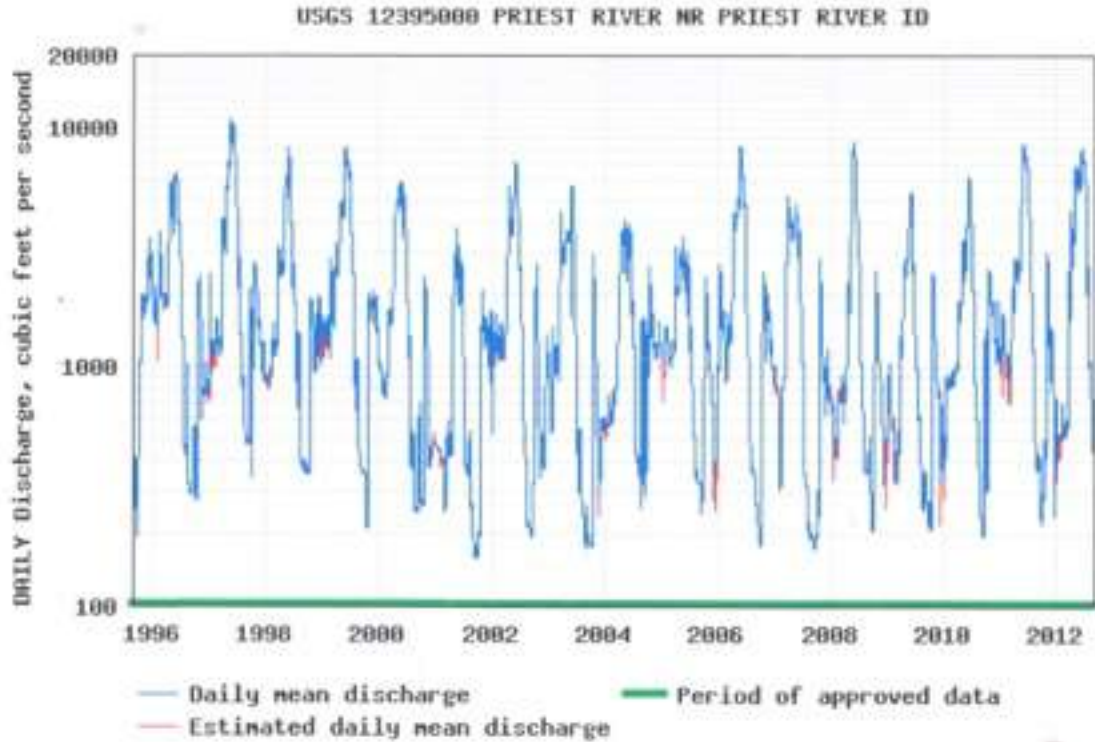


As it is now, the lake falls to low levels in the winter, rises to a peak level in the spring run-off but then by late summer is again down to a low level.

Since 1903 the USGS has measured the daily efflux flow rates at the Dickensheet Bridge five miles south of the outlet. Shown below is a graph of the measurements taken during the year 2011-2012:



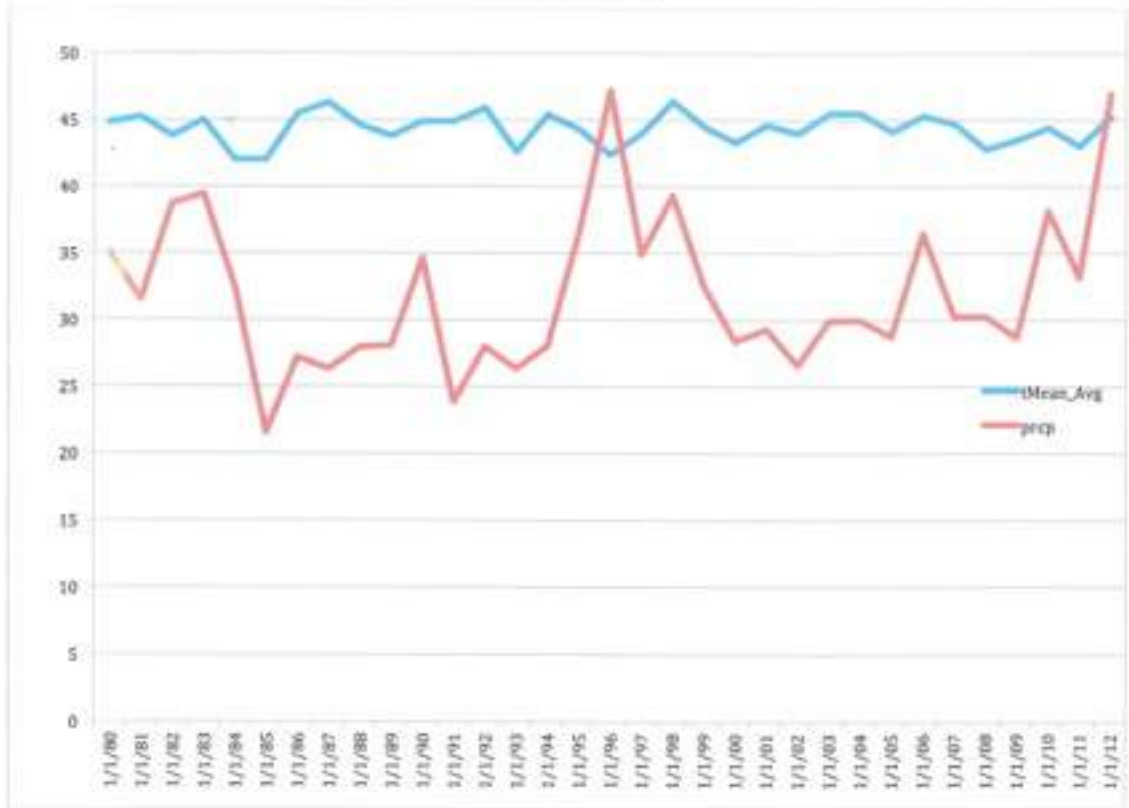
From this data it can be calculated that the mean flow for 2011 was 2400 cu. ft./sec. So the total volume for 2011 was 1.68 million acre-feet. Since the total volume of the lake is 3 million acre feet it follows that the water lake turns over in about two years. Seen below is the record for the period 1996-2012.



It can be seen that the peak out-flow is quite variable corresponding variations in the snow pack.

There is a continuous record of the weather as measured by the US Weather Service at the Priest Lake Experimental Forest. Shown below is the record for the average temperature and total precipitation for the years 1980 to 2012.

## US Weather Service Station at Priest River Experimental Forest 1980-2012



The mean temperature has been quite steady during this period but there have been large variations in total precipitation. In particular the high level of precipitation in 1996 is reflected in the high outflow rates for that year.

These measurements do not in any way convey the beauty of Priest Lake. However, it is our conviction that in order to conserve the beauty of the lake for future generations we must take a scientific approach and that is what we have been doing.

