



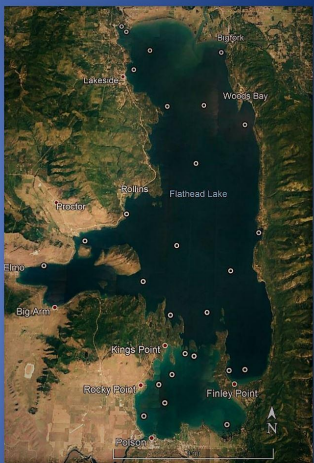
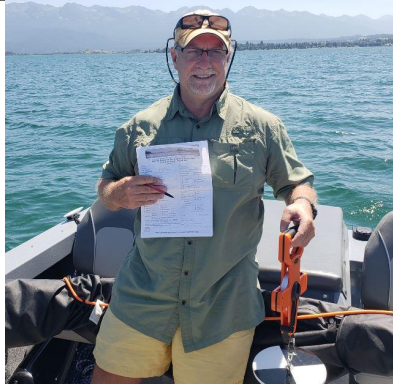
Flathead Lake Citizen Science Seeing Flathead Clearly



For three summers, the Flathead Lake Citizen Science (FLCS) program has had a team of volunteers around Flathead Lake monitoring water clarity with a simple scientific instrument called a Secchi disk. Volunteers lower their black and white disks into the water on a sunny July day, until it is no longer visible and note the depth it disappeared. The annual Flathead Lake Secchi Dip-in is part of an international effort to track changes in water quality around North America since 1994, and is in partnership with the Flathead Lake Biological Station's Flathead Monitoring Program (FLBS FMP).

The Secchi depth is a measure of water transparency, or clarity. It can be an indicator of how human activities are impacting the watershed. Transparency can be affected by the color of the water, algae, and suspended sediments, and be influenced by nutrients coming into the lake from nonpoint source pollution.

Regularly monitoring transparency can help find water quality issues before they turn into real threats to our clean water.



Three years of Secchi observations

In three years, we've had 37 volunteers collect 173 Secchi observations around Flathead Lake during summer. These data have supported the effort for a new FLBS FMP monitoring site in Polson Bay, documented the clearest water in 25 years, and were entered into a national monitoring database.

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FIGURE 1

Proportional distributions of water clarity measurements collected by citizen scientists across Flathead Lake in July of 2018-2020 compared to the distribution of water clarity measured by FLBS FMP at a single site from 1977-2020. Secchi observations taken in a single month by our volunteers showed a similar range of water clarity to that of 40 years of measurements at a single site. FLBS FMP data demonstrate that water clarity varies with time.

The FLCS Secchi Dip-In data inform us that water clarity is spatially variable as well. The bimodal distributions (double peaks) observed in 2018 and 2020 reflect the dynamic nature of water clarity within a single month.

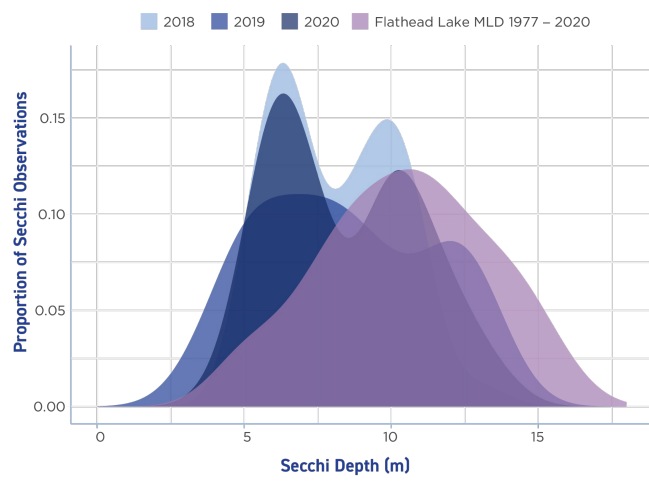


FIGURE 2

Distributions of all measurements of the FLCS program's Flathead Lake Secchi Dip-In 2018-2020 by month. The seasonal patterns shown here correspond to seasonal patterns observed by FLBS FMP. June observations are low because of the lingering effects of the spring runoff and sediment plume. Water clarity increases in July as particles in the plume begin to settle out. As plume particles continue to sink, primary production of algal biomass maintains similar water clarity in August. In September, rates of primary production decrease as nutrients are depleted, and phytoplankton biomass accumulation no longer exceeds sinking rates, increasing water clarity.

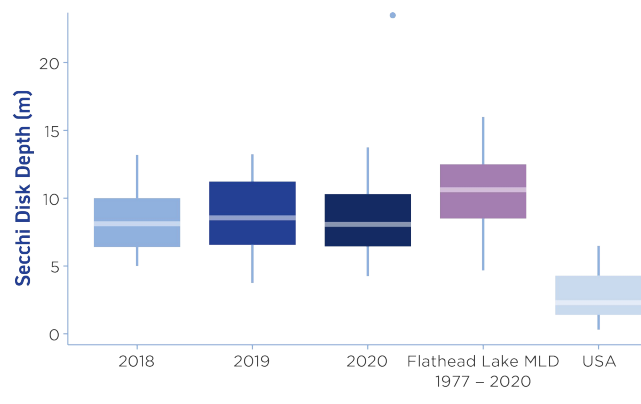
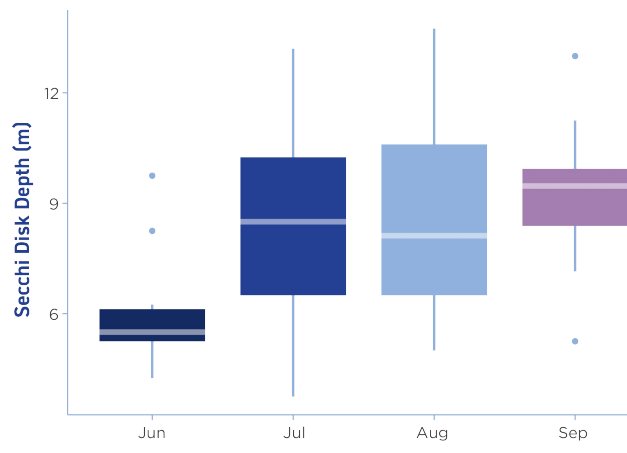


FIGURE 3

Distributions of all measurements of the FLCS program's Flathead Lake Secchi Dip-In 2018-2020 by month. The seasonal patterns shown here correspond to seasonal patterns observed by FLBS FMP. June observations are low because of the lingering effects of the spring runoff and sediment plume. Water clarity increases in July as particles in the plume begin to settle out. As plume particles continue to sink, primary production of algal biomass maintains similar water clarity in August. In September, rates of primary production decrease as nutrients are depleted, and phytoplankton biomass accumulation no longer exceeds sinking rates, increasing water clarity.



**FLATHEAD
LAKERS**
DEFENDERS OF THE WATERSHED

The Flathead Lakers, with over 1,500 members, has been working to protect clean water in Flathead Lake and its watershed since 1958.

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