

River Watch Items for May 2021 UWP Board Meeting

- UWP River Watch volunteers completed water quality sampling and testing at our six sites between May 2nd and 4th, 2021. April and May metals samples were shipped to CPW on May 5th. Sent in a supply request for June and July.
- Streamflow stats:
 - Warm days in early May pushed flow on the Unc to >350 cfs below Ouray. On 10 May flow at the USGS gauge near Ouray was back down to 210 cfs, right at the 20-yr median.
 - The USGS gauge near Ridgway was at 150 cfs on 10 May (median = 214 cfs).
 - Discharge from Ridgway Reservoir was raised to about 150 cfs on 4 May, well below the median of 300 cfs. Inflow and outflow seem to be matched.
 - Diversions appear to be taking nearly all the water out of Dallas Creek. At the beginning of the irrigation season flow at the USGS gauge just above the reservoir dropped from about 15 cfs to < 0.2 cfs between 4 and 17 April. Steady low flow near 0.2 cfs (median = 30 cfs) has continued through 10 May. This matches the lowest flow measured on this date. With the extremely low flow the River Watch crew measured hardness at > 500 on 3 May.
 - On 10 May Cow Creek was flowing at 17 cfs and had been as high as 70 cfs on 8 May.
- Snowpack and precipitation update: On 10 May the Gunnison Basin was at 49% of the 30-year median snowpack, a large drop from the 86% shown in early April. The Idarado SNOTEL site at 9,800 ft indicated no SWE remaining on 10 May. At 11,200 ft the Red Mtn Pass SNOTEL had 15" of SWE remaining, about 71% of the median for the date.
- I participated in the latest meeting regarding TMDLs in the upper basin, with CDPHE and River Watch, on April 21st. The latest TMDL group leader (Molly Bruno) from CDPHE announced her departure, and no word yet on who will be leading the group in the future. I confirmed that UWP volunteers will add four sampling sites on Red Mtn Creek, Commodore Gulch, Gray Copper Gulch, and Imogene Creek where data are deemed insufficient for the TMDL study. Station information sheets have been developed for these new sites and were sent to River Watch for creation of RW site names and numbers. The plan is to begin sampling these new locations in June 2021.
- There was considerable discussion (again) during the TMDL meeting regarding a bias in data sampling dates in the upper parts of the basin, mainly the Sneffels and Canyon Creek regions. The argument is that samples collected mainly during higher flow periods, when streams are accessible, might not attain metals' standards due to lower hardness values. There is a lack of samples during winter when hardness might be much higher, and metals' concentrations could potentially fall below hardness-dependent standard values.

The argument could be valid. Water samples from the upper sections of streams like Sneffels, Imogene, Governors Basin, etc., have mainly been collected between May and September, with a few in October. Figure 1 shows how hardness affects water quality standard attainment. Dissolved cadmium and zinc concentrations from Sneffels Creek are plotted versus coincident hardness values. The red lines are the hardness-based aquatic life chronic standard curves for each metal. Standards would not be attained for either metal based on this data set where more than 15% of the concentrations lie above the standards curves. However, if only September and October data are used, none of the cadmium points and only one zinc point would lie above the TVS curves. This happens because for September-October samples, average hardness increased by about 1.5 times and average dissolved concentrations decreased by about 2.2 times for both cadmium and zinc.

In reviewing Sneffels, Imogene, and Canyon Creek hardness data an interesting increase in hardness was found to occur immediately below Camp Bird. Figures 2 and 3 show hardness values from the three creeks where SC-04 and IC-05 are directly above Camp Bird and CC-01 is about 0.25 mi below Camp Bird. Below, a recent Google Earth image of Camp Bird and vicinity shows the positions of the IC-05 and SC-04 sampling sites from Figures 2 and 3 and the pond at Camp Bird that drains into Imogene Creek just above the confluence of Sneffels Creek and Imogene Creek. In both 2012 and 2013 September and October hardness values in Canyon Creek below Camp Bird were more than three times the hardness values in Sneffels and Imogene Creeks above Camp Bird. The change is likely due to the hardness of the water coming into the creeks from Camp Bird. (Note that the configuration of the Camp Bird pond and drainage flows in the 2019 image may not be the same as they were when the data were collected in 2012 and 2013.) Nevertheless, the increased hardness below Camp Bird could have a marked effect on the attainment of water quality standards in Canyon Creek.

View to the southwest over Camp Bird. Imogene Creek flows in from the upper left (IC-05 near the upper left corner) and Sneffels Creek from the upper right (SC-04 at the bridge) with the confluence marked by the yellow pin. Water from Camp Bird is noted by the red arrows, flowing from the pond into Imogene Creek just above the confluence. The Canyon Creek site (CC-01) is about a quarter mile below the confluence.



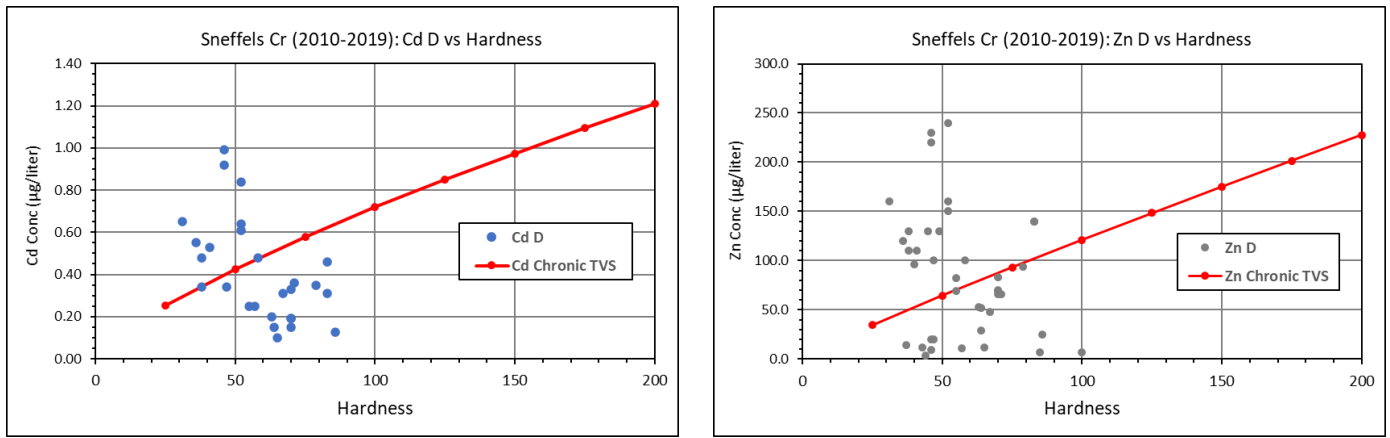


Figure 1. Scatter plots of dissolved Cd concentrations vs hardness (left) and dissolved Zn concentrations vs hardness (right). Data are from Sneffels Creek samples collected between 2010 and 2019. Red curves are hardness-based Chronic Table Value Standards for Aquatic Life.

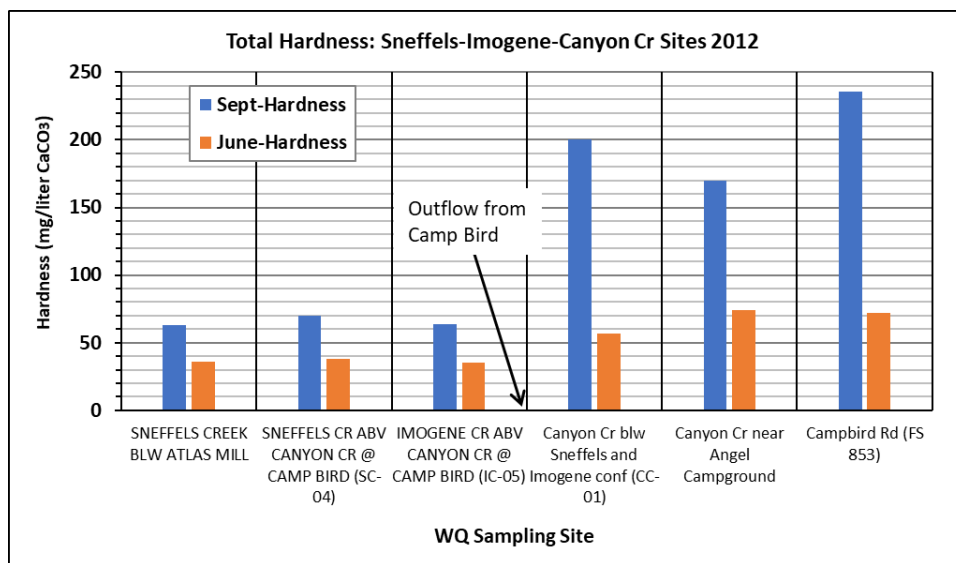


Figure 1. Hardness values from Sneffels, Imogene and Canyon Creeks in June and September 2012. Arrow shows where water from Camp Bird flows into Imogene Creek below Camp Bird and above Canyon Creek.

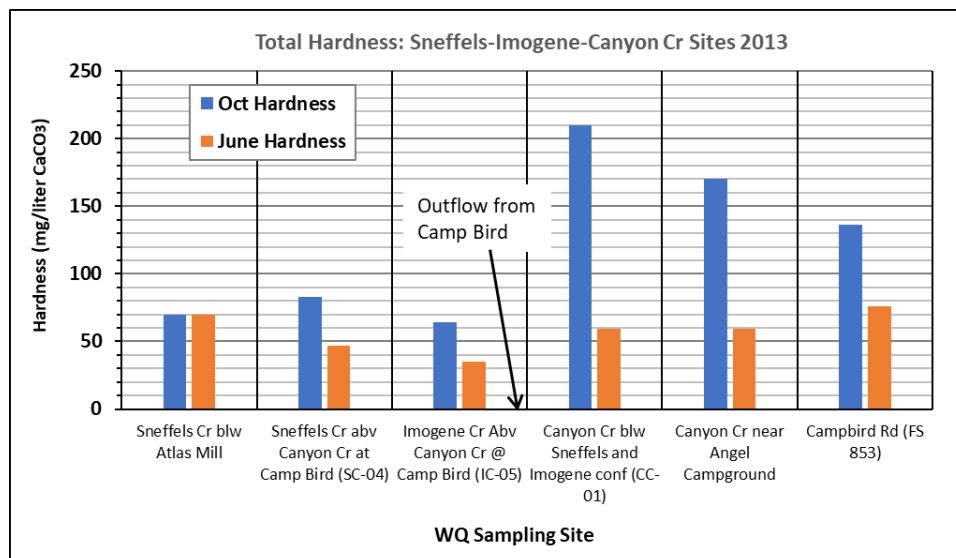


Figure 3. As in Figure 2, except showing hardness data from June and October 2013.