West Fork Carson Flow Monitoring

Winter/Spring 2017-18
Monitoring Overview

July 11, 2018

Alpine Watershed Group (AWG) has been working with American Rivers since 2011 to monitor water depth (level) and flow (discharge) of the upper West Fork Carson River through Hope Valley near its source in Alpine County, CA. Until the 2016-17 winter, the Solinst® Leveloggers were taken out every fall and installed when the water was low enough to access the monitoring sites. Before the 2016-17 winter, we installed the loggers in the water over the winter to capture spring runoff. We installed a winterized logger at again for the 2017-2018 winter and spring. AWG also measures flow (discharge) at the logger sites using the USGS midsection method and a Swoffer® 2100 Current Velocity Meter.

As 2017 came to a close, we placed a levelogger at one location in the West Fork Carson River (WFC) near its confluence. Unfortunately, when we went out on May 3, 2018 to collect the data from the levelogger, the device was not retrievable. We were able to retrieve the device and re-installed the system on July 10th. It seems that the device had fallen from where it hung in the system and landed at the bottom of the pipe while covered in sediment.

This is the second season we left the loggers in over the winter. We hope to catch the spring runoff by winterizing the loggers by adding marine (water-safe) antifreeze in a narrow latex balloon, putting the logger in the balloon, and duct taping it to create a waterproof seal.

This year we installed a logger at one site: Lower Hope Valley (Pickett's.) We installed the Barologger at Pickett's and the Solinst® Levelogger under the pedestrian bridge in Lower Hope Valley on December 05, 2017. With the help and support with two incredible volunteers, we were able to brave the freezing water and install the Levelogger as well as perform the USGS midsection method.

Figure 1: Winterizing the Levelogger

The Barologger at Pickett's collected data for the entire time period 12/5/17 – 8/24/17.

The graphs below (Figures 2 and 3) show stage (water depth) *uncorrected* for barometric pressure so the numbers are not actual water depths. The water level numbers on the graph are actually pretty close to the actual water depth because the barometric pressure and the gauges' locations above the streambed nearly cancel out. The spikes and trends are easy to see though. According to the raw data, the maximum peak level was on April 30th; however, the value recorded by the logger is an anomaly. This may be due to the device falling to the bottom of the pipe. The subsequent maximum level in early April corresponds to the spring run-off from the march storm events. The maximum level of conductivity ranged from 130 to 150 µS/cm and date within several days of March 10-12th. This line up to date with the winter storms of early March.

- A peak and maximum level recoded, was early morning on April 30th:
  - 300.269 ft at 6:00 am on April 30th with temperature 141.1°C and conductivity at 30µS/cm
- Another peak and maximum level recorded was around noon on April 7th:
  - 9.219 ft at 12:15 pm on April 7th with temperature 0°C and conductivity at 15µS/cm

- The visible peak of conductivity was at maximum on march 12th:
    - 4.39 ft at 4:00 pm on March 12th with temperature 3°C and conductivity at 150 µS/cm

On the graphs: the blue line is water level, red is water temperature, and green is conductivity.

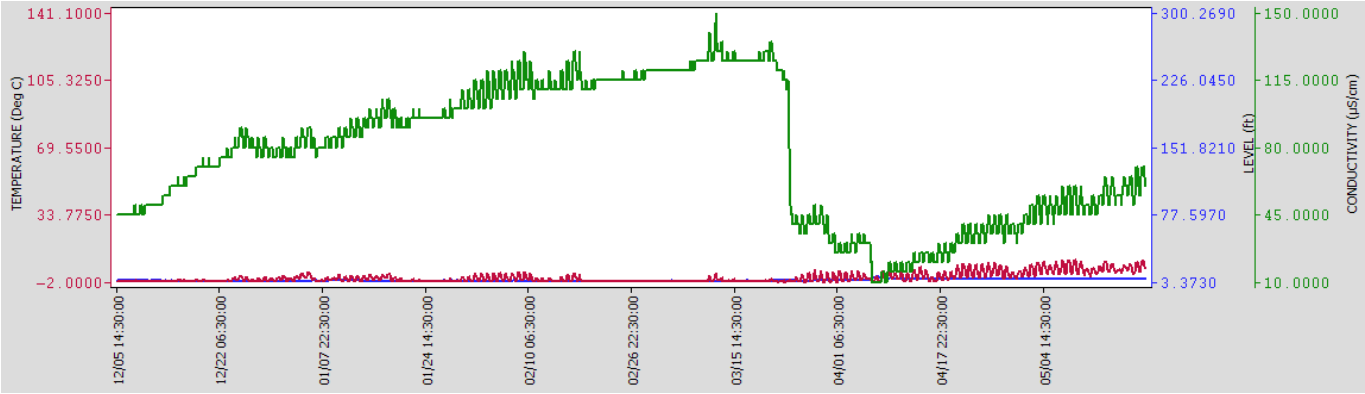

Figure 2: West Fork Carson at Pickett's Junction

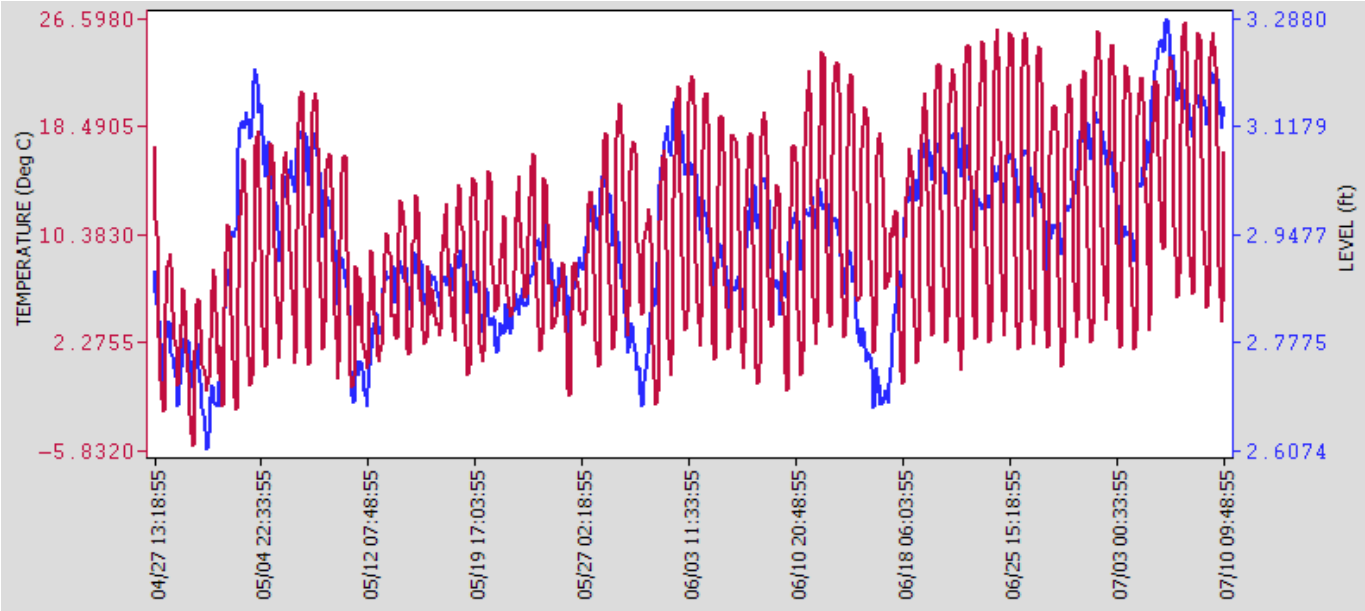

Figure 3: BaroLogger at West Fork Carson at Pickett's Junction for Summer 2018 (May to July)

AWG Staff and two volunteer also measured flow (discharge) at the two sites using the USGS midsection method.

All of the logger data, including pervious data (seasonally back to 2011) is available on the shared Dropbox folder in Solinst (company that makes the loggers) and Excel formats: https://www.dropbox.com/s/bevfuk0lmpr5t1s/HV%20Data_Log_Master%202011%20to%20current.xlsx?dl=0