

Report 7

Additional Water Level Recorders

2012 Mid-Year Technical Report

SAN JOAQUIN RIVER
RESTORATION PROGRAM

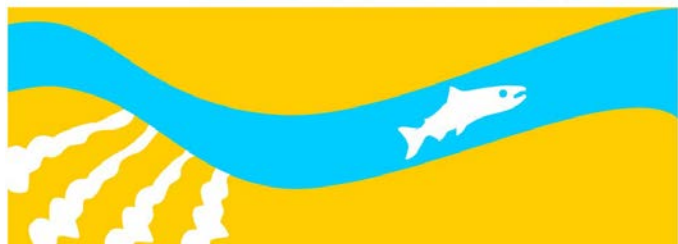


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Abbreviations and Acronyms

ATR	Annual Technical Report
CDEC	California Data Exchange Center
USGS	U.S. Geological Survey
WLR	Water Level Recorder
WSE	Water Surface Elevation

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7.0 Additional Water Level Recorders

7.1 Introduction

The data reported in this section is related to the study “Additional Water Level Recorders” that specifically address needs related to Problem Statement 5 in the 2011 Agency Plan, San Joaquin River Channel Capacity Management, and indirectly address certain aspects of other problem statements by providing a continuous record of water surface elevations at key locations during interim flow releases to calibrate hydraulic models being used to assess channel capacity, fishery habitat, channel bed stability and many other aspects of Restoration Planning and Design.

Five water level recorders (Recorders 1 through 5) were installed at Reach 1A prior to the start of the 2009 Interim Flow releases and another one (Recorder 6) was installed at Reach 1B prior to the start of the 2010 Spring Interim Flow release. The stage data are continuously being collected from the dates of installations.

7.2 Methods

As shown in Figure A-7-1, this particular type of Water Level Recorder (WLR), Global Water-WL16U, is an integrated unit consisting of a submersible pressure transducer (pressure sensor) connected to the data logger with a standard 25-foot cable (longer cable lengths are available). Refer to the 2009 Annual Technical Report (ATR) for more detailed information about installation methods.



Figure A-7-1.
Water Level Recorder

The data from the recorders were downloaded periodically and used to compute Water Surface Elevation (WSE). The necessary calculation methods were described in detail in the 2010 ATR.

7.3 Results

Stage data collected from December 2011 through April 2012 are presented in this report and the data collected prior to that were reported in the 2011 ATR.

The data from the additional WLRs located in Reach 1A are presented in Figure A-7-2 and Figure A-7-3. In addition, the data from U.S. Geological Survey (USGS) gages located in the same reach are extracted on-line from California Data Exchange Center (CDEC) website and presented in Figure A-7-4 for comparison purposes.

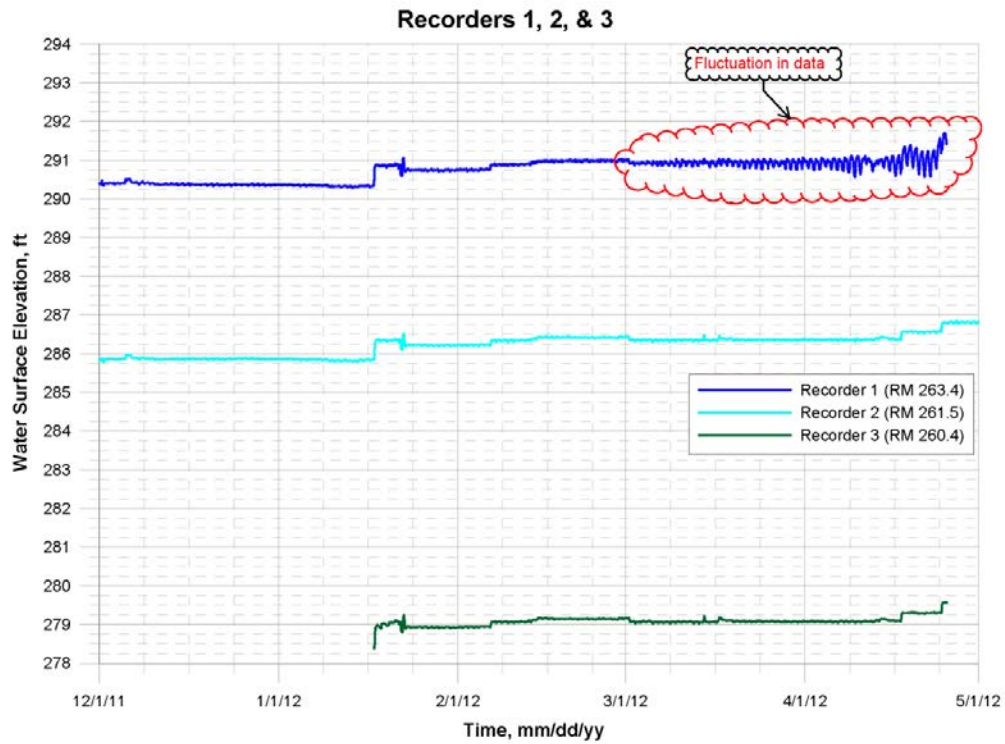


Figure A-7-2.
Water Level Recorders 1, 2, and 3 Elevation Data

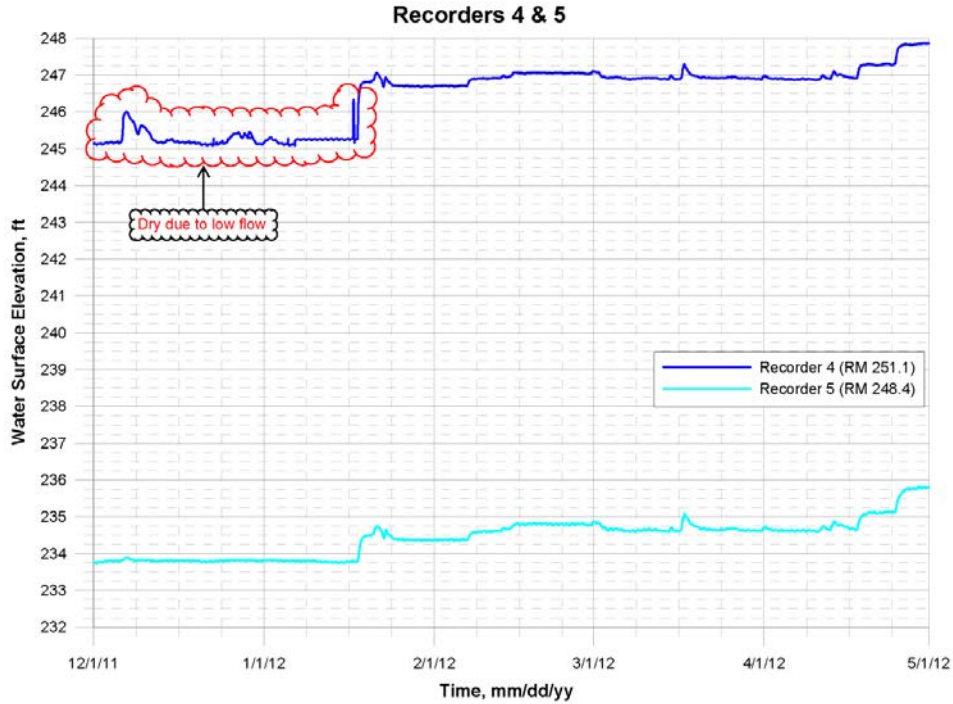


Figure A-7-3.
Water Level Recorders 4 and 5 Elevation Data

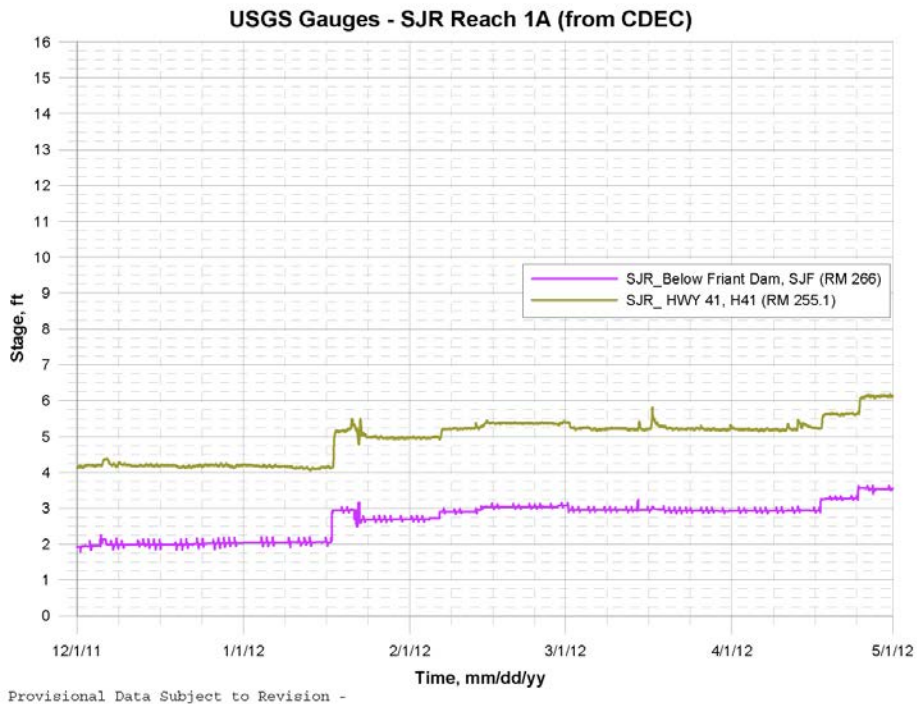


Figure A-7-4.
USGS Gage at Reach 1A Elevation Data

Similarly, the data from WLR 6 located in Reach 1B and the USGS gage located in the same reach at Donny Bridge is presented in Figures A-7-5 and A-7-6.

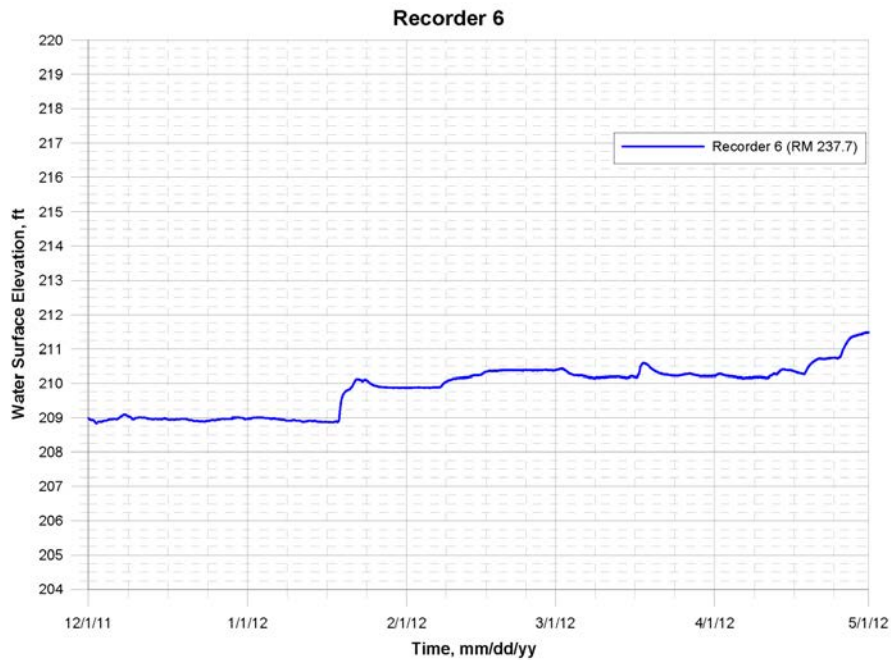
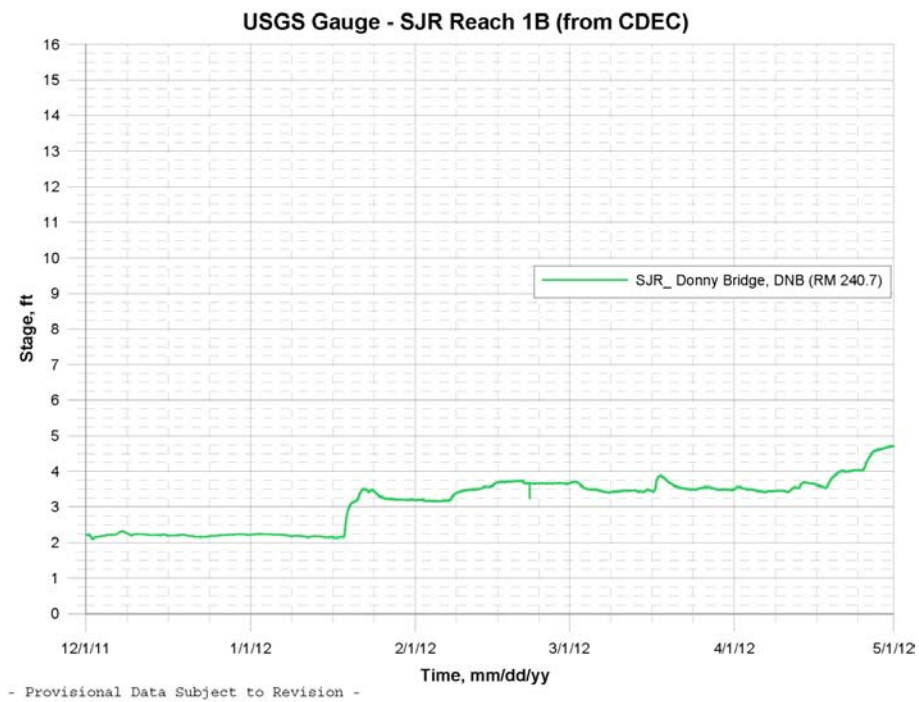


Figure A-7-5.
Water Level Recorder 6 Elevation Data



- Provisional Data Subject to Revision -

Figure A-7-6.
USGS Gage at Reach 1B Elevation Data

7.4 Discussion

According to Figure A-7-2, Recorder 1 indicates water level fluctuations from the beginning of March 2012 (see red markups). However, Recorder 2 and 3 located downstream from Recorder 1 did not show any significant fluctuation in the data during the same period. As a result, the accuracy of the data for Recorder 1 during this period of time is suspect. Similar fluctuations in the data from the same recorder were observed in 2009 and 2011. A field investigation performed on August 25, 2011 identified that accumulated debris loosened one of the anchors and caused the pressure transducer to fluctuate about 2-3 inches due to water force. This issue was rectified on the same day and no fluctuation in the data was observed until the end of February 2012 (see Figure A-7-2).

The data logger of Recorder 3 was over-topped during the flood flow release that occurred July 7 and 8, 2011. Even though this recorder was functioning after flooding, an unusual battery exhaustion and significant fluctuation in the data were observed. Therefore, the data collected in Recorder 3 between July 7, 2011 and January 17, 2012 was suspect. This WLR unit was replaced with a new one on January 17, 2012 and the respective data are presented in Figure A-7-2.

Recorder 4 was replaced with a new one on February 10, 2011 due to flooding and the data logger mount was elevated to prevent future inundation. This recorder was found dry during the winter low flows (approximately 100 cfs), since it is located in an area that is surrounded by sand/gravel bars. As a result, data from Recorder 3 during low flow period starting from November 7, 2011 through mid of January 2012 (see red markups in Figure A-7-3) is unreliable.

The data from Recorder 6 matches with that of the USGS gage at Donny Bridge, which is about 3 miles upstream (see Figures A-7-5 and A-7-6).

7.5 Conclusions and Recommendations

Data from the transducers will be compared to model results, and adjustments will be made to the models, as necessary, to better match the data. This data will also be cross checked with WSE data measured during water surface profile surveys for quality control.

The existing recorders should continuously be monitored and the data collection should be done periodically. Necessary action should be taken to investigate and rectify the issue (fluctuation of readings) in Recorder 1.

It is recommended to evaluate the possibility of moving a recorder from Reach 1A or to install a few additional recorders in Reach 2 to provide wider spatial distribution of calibration data. We are currently reviewing possible options for relocation.

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