

Water Temperature Monitoring in the San Joaquin River Restoration Area

2012 Summary and Available Data

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Introduction

The California Department of Fish and Wildlife (CDFW, formerly the California Department of Fish and Game) began collecting water temperatures for the SJRRP during the fall of 2009. Thermographs are installed throughout the Restoration Area to measure and record temperature in the mainstem San Joaquin River and in some tributaries. This report summarizes data from the 2012 calendar year.

Methods

Thermographs record temperature hourly at locations throughout the Restoration Area to evaluate instream temperature conditions in migration pathways and potentially suitable adult holding, spawning, and juvenile rearing habitat. A map of temperature monitoring locations is provided in **Figure 1**. Thermographs are deployed, managed, and calibrated as described in *Standard Operating Procedures for the San Joaquin River Restoration Program Temperature Monitoring Study* (CDFW, 2013).

Data management procedures are designed promote data integrity and validity. Thermograph data is managed with a database equipped with a QA/QC utility that flags any data points that seem questionable when compared to adjacent points or historical monthly averages. Based on knowledge of river conditions and professional judgment of CDFW staff, flagged points are then either accepted or nullified and removed from the dataset. Accepted data remain flagged in the final dataset, and original data are retained for review. **Table 1** describes QA/QC flags and their meaning.

Available Data

CDFW currently maintains, operates, and manages data from 45 temperature monitoring sites in the Restoration Area. An additional 7 sites in the Restoration Area are maintained by consultants due to site access restrictions. Data is available for all sites for the 2012 calendar year, although there are some data gaps due to vandalism or equipment malfunction. A description of monitoring sites and available data for each site is available in **Table 2**. Hourly temperature data for each monitoring location are available as an attachment to this report. These data are preliminary and subject to revision.

Reporting

The 2012 Annual Report for this study is in development and will include analysis of temperature data in the Restoration Area and a comparison to SJRRP temperature targets for different life stages of Chinook salmon. The expected completion date of the report is March, 2013, at which time it will be made available to interested parties.

References

California Data Exchange Center; <http://cdec.water.ca.gov>

CDFW (California Department of Fish and Wildlife). 2013. Draft Standard Operating Procedures, San Joaquin River Restoration Program Temperature Study. In development.

CDFG (California Department of Fish and Game). 2006. Lower San Joaquin River Basin-Wide Water Temperature Modeling Project Data Collection Protocol. 29 pages

FMWG. 2010a. Conceptual models of stressors and limiting factors for San Joaquin River Chinook salmon. 178 pages.

FMWG. 2010b. Fisheries Management Plan: A framework for adaptive management in the San Joaquin River Restoration Program.

Fry, F.E.J. 1971. The effects of environmental factors on the physiology of fish. Pages 1-98 in W.S. Hoar and D.J. Randall, editors. Fish Physiology. Academic Press, New York.

Table 1: QA/QC Flag Interpretation

<i>Code</i>	<i>Comments</i>
10	Value was flagged because its difference from previous or following values was greater than a specified tolerance. Value checked and accepted.
100	Value was flagged because its difference from mean monthly stream temperatures was greater than a specified tolerance. Value checked and accepted.
1000	Value was flagged because its difference from mean monthly stream temperatures was greater than a specified percent. Value checked and accepted.

Table 2: SJRRP Temperature Monitoring Sites and 2012 Data Availability

Site ID	Site Name	Site Type	River Mile	Latitude	Longitude	Database Period of Record		Notes about 2012 Data
						Begin Date	End Date	
SJRFD	SJR Friant Dam	Stream	267.4	37.0003	-119.7058	No Data	No Data	
SJRFP	SJR Friant Pool	Stream	267.2	36.9970	-119.7079	7/26/2007	12/4/2012	
SJRCC	SJR Cottonwood Creek	Stream	267.0	36.9976	-119.7076	12/15/2009	12/4/2012	Data lost 7/6/2012-9/12/12 due to equipment malfunction
SJRFB	SJR Friant Bridge	Stream	266.6	36.9900	-119.7150	5/24/2002	11/21/2012	
SJRLL	SJR Lost Lake	Stream	264.7	36.9690	-119.7404	4/30/2002	11/14/2012	
SJRBRB	SJR Ball Ranch Bridge	Stream	262.2	36.9442	-119.7388	3/16/2010	11/16/2012	
SJRWU	SJR Willow Unit	Stream	260.9	36.9290	-119.7510	7/2/2007	11/14/2012	
SJRRB	SJR River Bend	Stream	259.5	36.9198	-119.7593	8/13/2008	11/16/2012	
SJRR1	SJR Rank Island	Stream	259.5	36.9170	-119.7558	8/13/2008	11/16/2012	
SJRV2	SJR Vulcan	Stream	258.0	36.9101	-119.7747	9/29/2009	11/16/2012	Data lost 7/6/12 - 9/12/12 due to equipment malfunction
SJRSC	SJR Sportsman Club	Stream	256.4	36.8871	-119.7871	5/29/2002	11/14/2012	
SJRGPA1	SJR Gravel Pit A1	Gravel Pit, Surface	254.1	36.8662	-119.8029	8/29/2011	12/19/2012	
SJRGPA2	SJR Gravel Pit A2	Gravel Pit, Depth	254.1	36.8662	-119.8029	8/29/2011	12/19/2012	
SJRGPB1	SJR Gravel Pit B1	Gravel Pit, Surface	254.1	36.8670	-119.8076	8/29/2011	12/19/2012	
SJRGPB2	SJR Gravel Pit B2	Gravel Pit, Depth	254.1	36.8670	-119.8076	8/29/2011	12/19/2012	
SJRGPAB	SJR Gravel Pit AB	Stream	254.0	36.8654	-119.8072	8/29/2011	12/19/2012	
SJRGPC1	SJR Gravel Pit C1	Gravel Pit, Surface	253.5	36.8614	-119.8122	8/30/2011	12/19/2012	Data lost 5/31/12-9/19/12 due to vandalism
SJRGPC2	SJR Gravel Pit C2	Gravel Pit, Depth	253.5	36.8614	-119.8122	1/5/2012	12/19/2012	Installed 1/5/12; formerly one thermograph (C1) mid-depth; Data lost 5/31/12-9/19/12 due to vandalism
SJRGPCD	SJR Gravel Pit CD	Gravel Pit	253.5	36.8613	-119.8099	10/11/2011	12/19/2012	
SJRGPD1	SJR Gravel Pit D1	Gravel Pit, Surface	253.5	36.8609	-119.8082	9/19/2012	12/19/2012	
SJRGPD2	SJR Gravel Pit D2	Gravel Pit, Depth	253.5	36.8609	-119.8082	9/19/2012	12/19/2012	
SJRGPE1	SJR Gravel Pit E1	Gravel Pit, Surface	253.2	36.8557	-119.8073	8/29/2011	12/19/2012	
SJRGPE2	SJR Gravel Pit E2	Gravel Pit, Depth	253.2	36.8557	-119.8073	8/29/2011	12/19/2012	
SJRGPDE	SJR Gravel Pit DE	Stream	253.1	36.8575	-119.8078	10/11/2011	12/19/2012	
SJRGPF-US1	SJR Gravel Pit F-upstream 1	Gravel Pit, Surface	252.5	36.8507	-119.8182	8/29/2011	7/16/2012	Data lost 7/16/12-12/19/12 due to vandalism
SJRGPF-US2	SJR Gravel Pit F-upstream 2	Gravel Pit, Depth	252.5	36.8507	-119.8182	8/29/2011	7/16/2012	Data lost 7/16/12-12/19/12 due to vandalism
SJRGPF Outlet	SJR Gravel Pit F River Outlet	Stream	252.4	36.8490	-119.8211	9/29/2012	12/19/2012	
SJRGPF-DS1	SJR Gravel Pit F-downstream 1	Gravel Pit, Surface	252.4	36.8506	-119.8211	1/5/2012	12/19/2012	Data lost 2/12/12-7/16/12 and 8/15/12-9/19/12 due to equipment malfunction
SJRGPF-DS2	SJR Gravel Pit F-downstream 2	Gravel Pit, Depth	252.4	36.8506	-119.8211	1/6/2012	12/19/2012	Data lost 2/26/12-7/16/12 due to equipment malfunction.
SJRSIDS	SJR Downstream Sycamore Island	Stream	251	36.8550	-119.8365	9/19/2012	11/15/2012	Site established 9/19/12
SJRSCI	SJR Scout Island	Stream	249.9	36.8583	-119.8387	7/20/2010	11/15/2012	
SJRMU	SJR Milburn Unit	Stream	247.5	36.8568	-119.8795	6/7/2007	11/15/2012	
SJRSP	SJR Skaggs Park	Stream	234.0	36.8215	-120.0605	10/6/2010	12/17/2012	Data lost 1/3/12-9/11/12 due to vandalism
SJRGF	SJR Gravely Ford	Stream	231.2	36.8174	-120.0964	5/20/2008	10/9/2012	
SJRTHOMAS	SJR Thomas	Stream	229.1	36.8093	-120.1360	4/10/2012	12/11/2012	
SJRDSALISO	SJR Aliso Canal	Stream	222.1	36.7865	-120.2214	4/17/2012	12/11/2012	
SJRDSBIFUR	SJR Bifurcation	Stream	215.7	36.7734	-120.2835	4/10/2012	12/11/2012	
SJRSM	SJR San Mateo	Stream	211.9	36.7815	-120.3119	4/19/2011	9/13/2012	
MWA	Mendota Wildlife Area (Fresno Slough)	Slough	NA	36.7327	-120.3428	6/16/2011	1/4/2012	
SJRDSM	SJR Downstream Mendota	Stream	203.5	36.8105	-120.3692	10/3/2011	6/14/2012	
CBAVE12	Chowchilla Bypass @ Ave 12	Bypass	NA	36.8720	-120.3185	10/13/2011	12/22/2011	
CBAVE14	Chowchilla Bypass @ Ave 14	Bypass	NA	36.9525	-120.3506	10/13/2011	12/22/2011	
SJRFIRE	SJR at Firebaugh Bridge	Stream	195.1	36.8581	-120.4491	4/10/2012	12/11/2012	
SJRUSHWY152	SJR Highway 152	Stream	174.0	37.0552	-120.5482	4/19/2012	6/12/2012	
ESB	Eastside Bypass	Bypass	NA	37.2057	-120.6980	4/15/2011	10/13/2011	
ESBWB	Eastside Bypass at Washington Bridge	Bypass	NA	37.1133	-120.5625	1/20/2012	9/7/2012	
SJRSS	SJR Sand Slough Control Structure	Stream	168.3	37.1134	-120.5877	3/26/2009	9/7/2012	

Site ID	Site Name	Site Type	River Mile	Latitude	Longitude	Database Period of Record		Notes about 2012 Data
						Begin Date	End Date	
MB	Mariposa Bypass	Bypass	NA	37.2019	-120.7057	4/15/2011	9/7/2012	
SJRUSCBC	Bear Creek Confluence	Stream	136.4	37.2750	-120.8276	4/17/2012	6/12/2012	
BCCSJR	Bear Creek	Stream	NA	37.2779	-120.8241	4/17/2012	6/12/2012	
SJRSTV	SJR Stevenson Bridge	Stream	132.8	37.2954	-120.8513	7/31/2008	12/20/2012	Data lost 1/19/10-3/2/12 when bridge was replaced
SJRASALT	SJR Above Salt	Stream	131.0	37.2947	-120.8948	3/2/2012	12/20/2012	
SALTS	Salt Slough	Slough	NA	37.2940	-120.8988	7/13/2009	12/20/2012	
SJRBSALT	SJR Below Salt Slough	Stream	130.0	37.2941	-120.8988	7/18/2011	5/15/2012	Data lost 1/31/12-3/2/12 due to equipment malfunction
SJRFFB	Ford Fremont Bridge	Stream	127.0	37.3185	-120.9349	10/25/2010	12/20/2012	Data lost 1/31/12-3/2/12 due to equipment malfunction
SJRAMUD	Above Mud Slough	Stream	125.0	37.3316	-120.9498	7/25/2011	12/20/2012	Data lost 2/18/12-5/15/12 and 6/2/12-12/20/12 due to equipment malfunction
MUDSL	Mud Slough	Slough	NA	37.2940	-120.8988	7/25/2011	12/20/2012	
SJRNW	SJR Newman Wasteway	Stream	121.0	37.3339	-120.9526	9/3/2008	12/20/2012	Data lost 1/31/12-5/15/12 due to equipment malfunction
SJRHF	SJR Hills Ferry	Stream	118.5	37.3470	-120.9761	4/28/2009	1/4/2013	