UNITED STATES OF AMERICA
BEFORE THE
FEDERAL ENERGY REGULATORY COMMISSION

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|---|---|---|
| Turlock Irrigation District | ) | |
| | ) | |
| and | ) | Project No. 2299 |
| | ) | |
| Modesto Irrigation District | ) | |

# 2007 LOWER TUOLUMNE RIVER ANNUAL REPORT

Report 2007-6

Flow, Delta Export, Weather, and Water Quality Data Report:
2003-2007

Prepared by

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# Flow, Delta Export, Weather, and Water Quality Data Report: 2003-2007

## Introduction

This report presents graphs of flow, delta export, weather, and water quality in the lower Tuolumne River and San Joaquin River system, primarily over the past 5 years (Years 2003-2007); in some cases the period presented extends back to 1998. The report updates information provided in reports that covered the previous 5-year period of 1998-2002. Those reports were FERC Report 2002-6 for flow and delta export and FERC Report 2002-7 for water temperature, air temperature, and conductivity data.

Included are additional conductivity, turbidity, and dissolved oxygen data collected by the Turlock and Modesto Irrigation Districts (TID/MID) or U.S. Geological Survey (USGS) and the weather data now includes precipitation. However, data tables are not included in this report.

## Data Sources

The recording sites for water temperature, conductivity, and flow data, obtained from the USGS and California Department of Water Resources (DWR), are shown in Figure 1. Flows for the Tuolumne River at La Grange and Modesto were graphed by water year (WY) as were San Joaquin River (SJR) basin flows for various locations. Daily average flow at Vernalis (SJR) and combined SWP and CVP delta exports were also graphed for the WY 2003-2007 period. In addition, the difference of Vernalis flow minus the combined delta export was graphed for the WY 2003-2007 period.

Water temperatures have been collected by TID/MID at sites along the Tuolumne River from below the La Grange Dam [River Mile (RM) 52.1] to the confluence with the San Joaquin River (RM 0.0) beginning in the spring of 1987 and continuing to the present. Some sites have varied over the years, but the entire Tuolumne reach has been represented by a minimum of five sites. There are currently nine sites located on the Tuolumne River. The two San Joaquin River sites are at Gardner Cove (RM 79.1) and Dos Rios Ranch (RM 86.2) - the sites are shown in Figure 2.

Water temperature data was originally collected by TID/MID using Ryan TempMentor (RTM) temperature recorders (thermographs). In November 2001 and June 2002, those were replaced with Optic Stowaway recorders and in August 2007 those were replaced by Hobo Pro V2 recorders. The thermographs are housed in protective cases and are placed in the water near shore in areas deep enough to prevent them from being dewatered. All thermographs used in the study were programmed to collect and store water temperatures at one-hour intervals. Data from the thermographs was typically downloaded twice a year. Other water temperature data was recorded by USGS or DWR.

The hourly water temperature data was converted to daily average, minimum, and maximum temperatures. Daily average water temperatures for groups of monitoring locations were graphed for the water year (WY) period of 2003-2007. The nine Tuolumne River sites and the

two San Joaquin River sites were also graphed by location using daily minimum and maximum temperatures. In addition to the TID/MID water temperature data, three USGS locations with water temperature recorders were also graphed using daily min/max data. Temperatures known or suspected to be inaccurate were omitted from the graphs.

Air temperature data was graphed by water year using daily minimum and maximum temperatures recorded by MID. Precipitation data recorded by MID at Modesto was graphed from January 1998 to January 2008.

Conductivity data was obtained from the (USGS) for Patterson and Vernalis on the San Joaquin River and for Modesto on the Tuolumne River and were graphed for WY 2003-2007. Additional measurements were taken during the TID/MID fishery studies along with turbidity and dissolved oxygen readings.

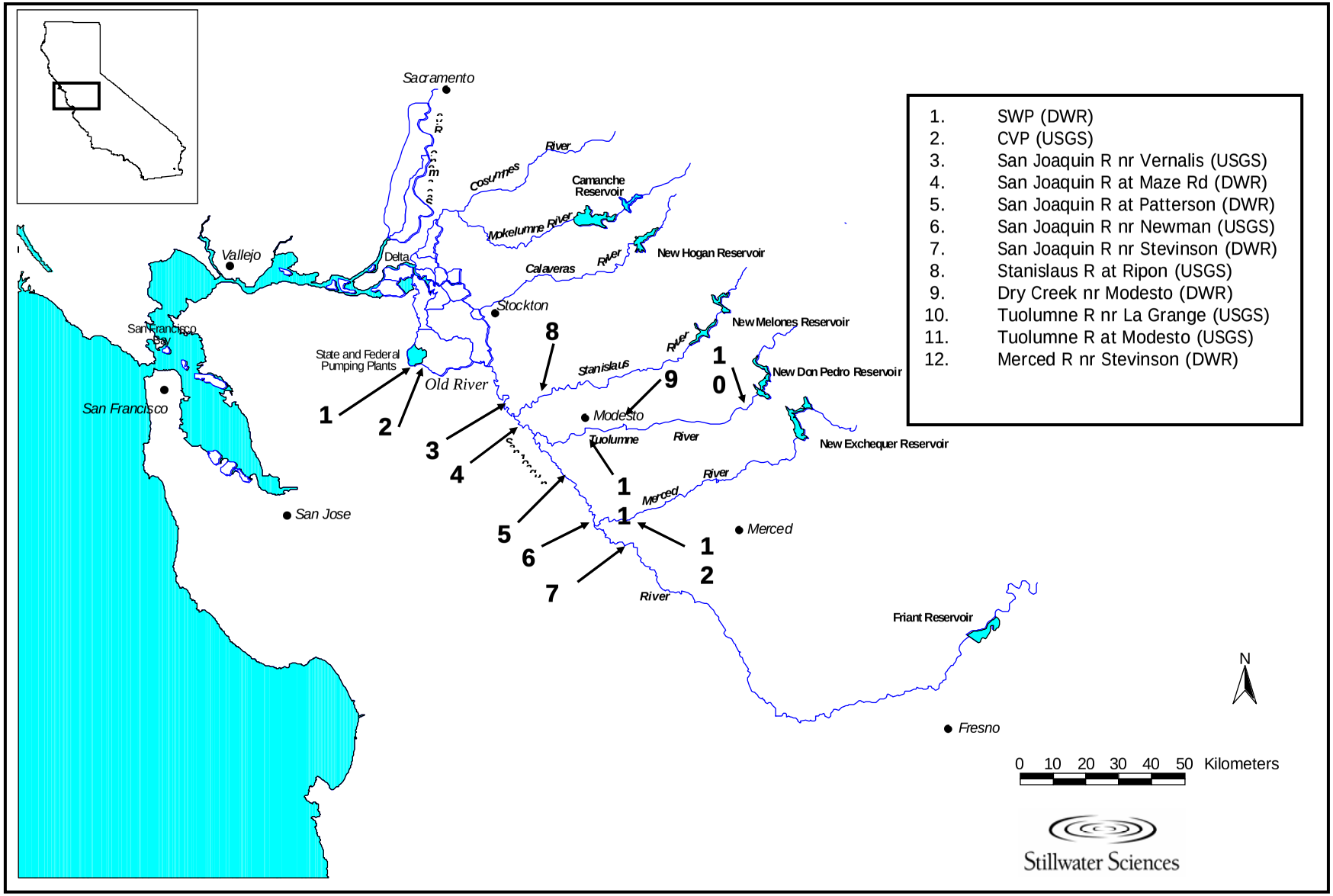



**Figure 1. San Joaquin Basin measurement sites.**

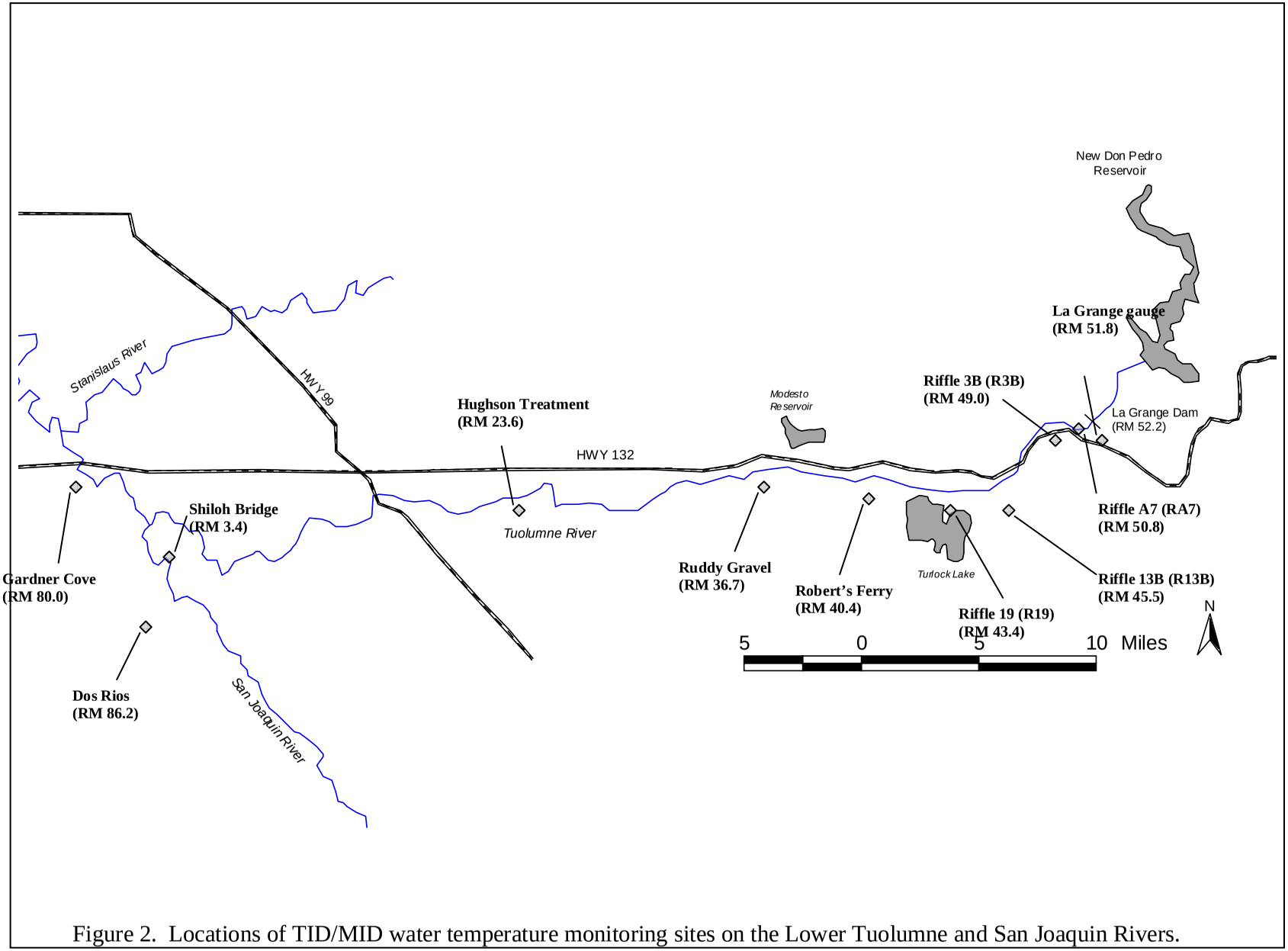



Figure 2. Locations of TID/MID water temperature monitoring sites on the Lower Tuolumne and San Joaquin Rivers.

## APPENDICES

APPENDIX A – Daily Average Flow and Delta Export for Water Years 2003-2007
- Tuolumne River at La Grange and Modesto
- Other San Joaquin Basin Locations
- Daily average flow at Vernalis (SJR) and state and federal delta export
- Daily average flow at Vernalis (SJR) minus combined delta export

APPENDIX B – Water Temperature for Water Years 2003-2007
- Daily average water temperature for TID/MID recorders
  - La Grange gage to Riffle 3B
  - Riffle 13B to Roberts Ferry Bridge
  - Ruddy Gravel to Shiloh Bridge
  - Dos Rios (SJR) and Gardner Cove (SJR)
- Daily minimum and maximum water temperature
  - All TID/MID locations
  - USGS locations: La Grange, Modesto, and Vernalis

APPENDIX C – Air Temperature and Precipitation
- Daily minimum and maximum air temperature at Modesto, CA
  - Water Years 2003 to 2007
- Daily precipitation at Modesto, CA
  - January 1998 to January 2008

APPENDIX D – Conductivity
- USGS locations: Tuolumne River at Modesto, San Joaquin River near Patterson and Vernalis
  - Water Year 2003 to 2007:
- TID/MID data recorded during seining studies
  - January 1998 to March 2008:

APPENDIX E - Turbidity
- TID/MID data recorded during seining studies
  - January 1998 to March 2008

APPENDIX F – Dissolved Oxygen
- TID/MID data recorded during seining studies
  - January 2005 to March 2008

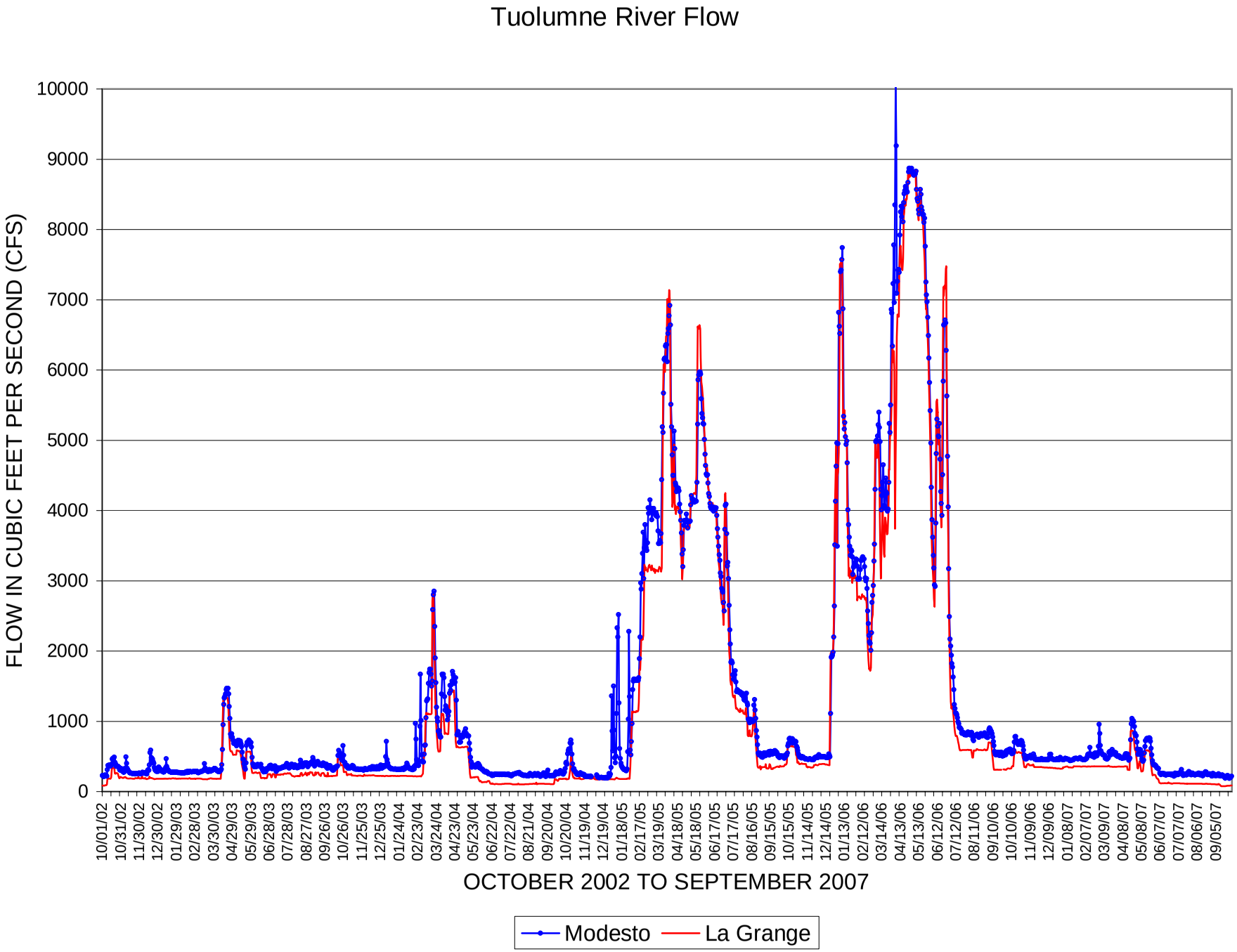
APPENDIX A – Daily Average Flow and Delta Export for Water Years 2003-2007

Tuolumne River at La Grange and Modesto

Other San Joaquin Basin Locations

Daily average flow at Vernalis (SJR) and state and federal delta export

Daily average flow at Vernalis (SJR) minus combined delta export


Tuolumne River Flow
FLOW IN CUBIC FEET PER SECOND (CFS)
10000
9000
8000
7000
6000
5000
4000
3000
2000
1000
0
10/01/02
10/31/02
11/30/02
12/30/02
01/29/03
02/28/03
03/30/03
04/29/03
05/29/03
06/28/03
07/28/03
08/27/03
09/26/03
10/26/03
11/25/03
12/25/03
01/24/04
02/23/04
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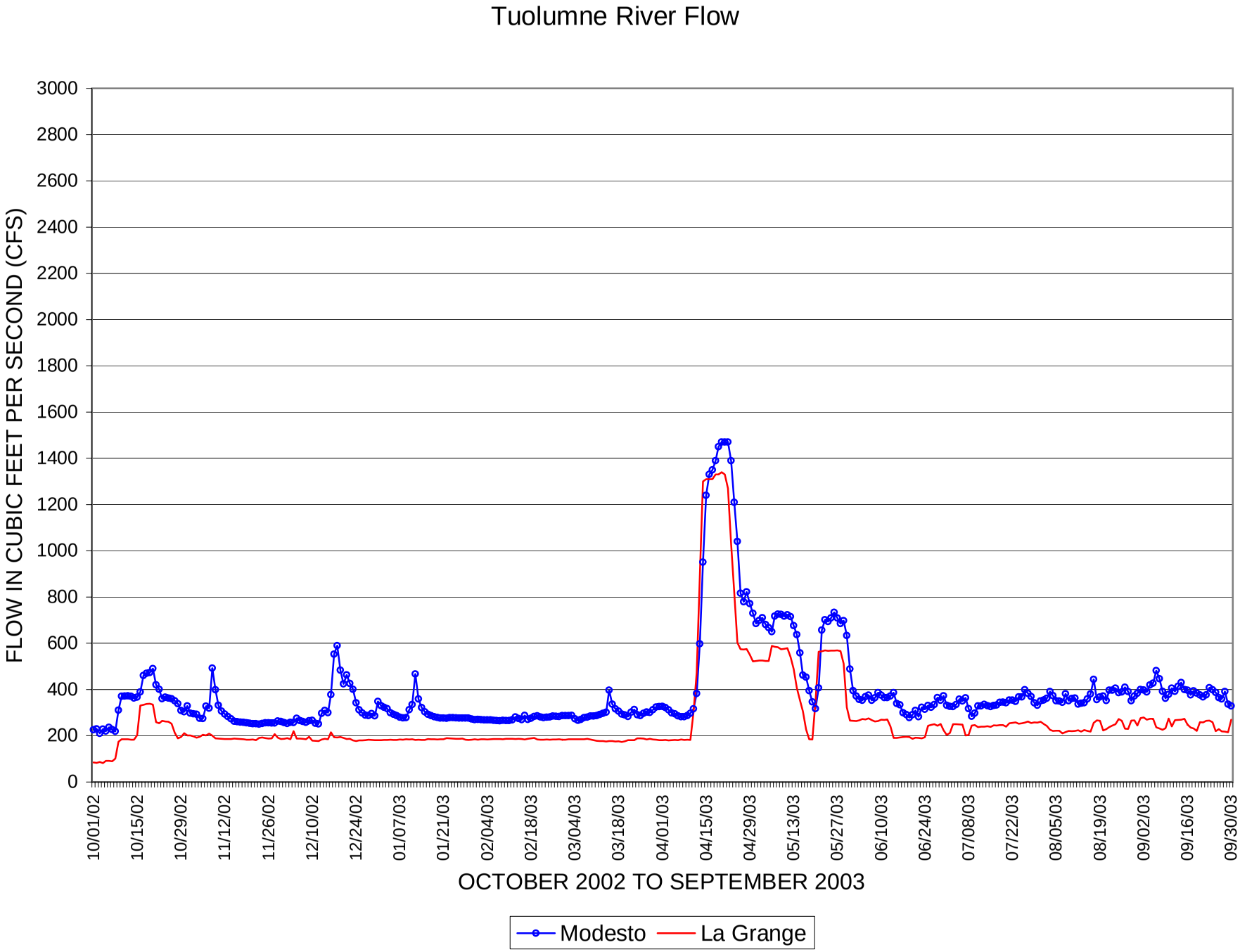
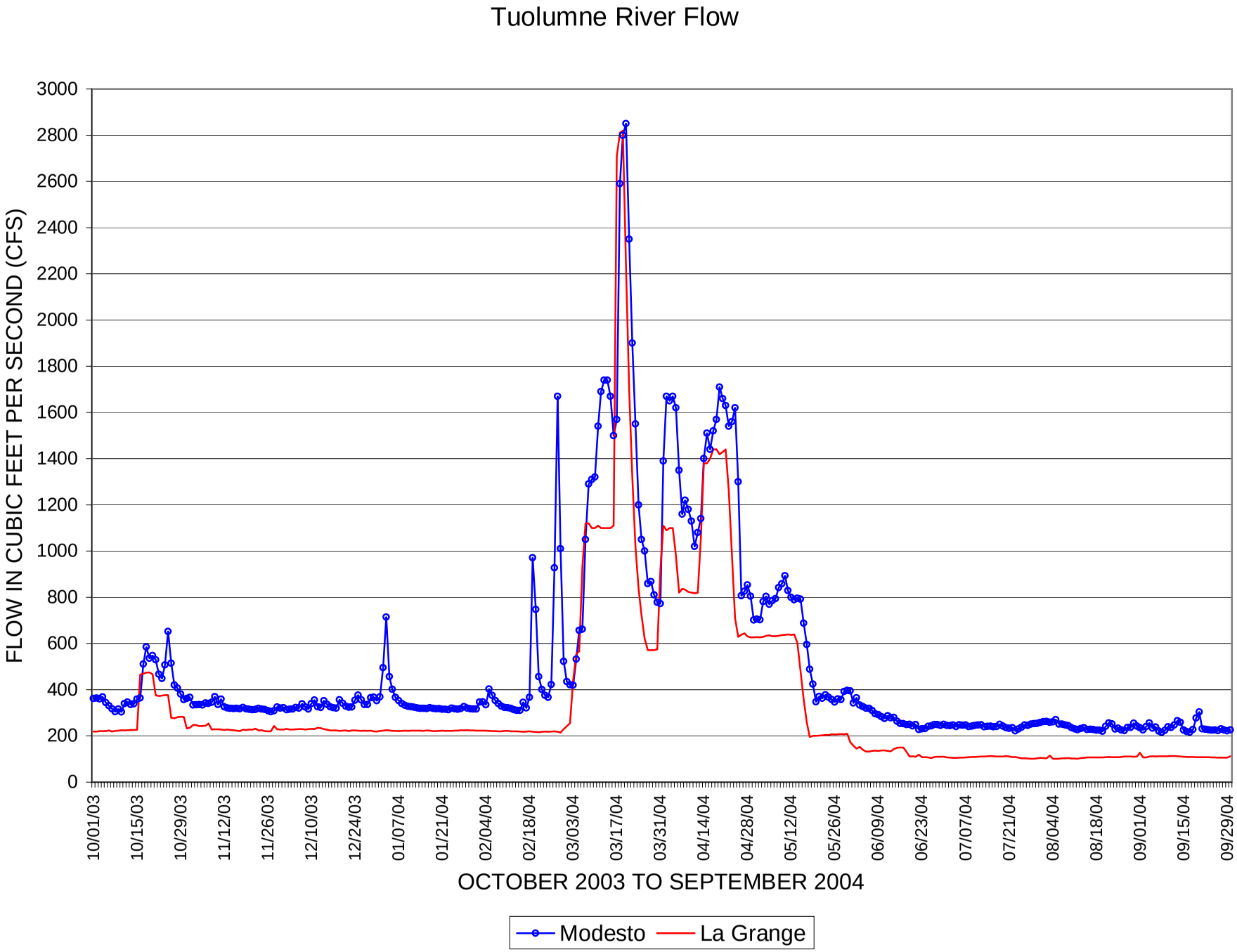
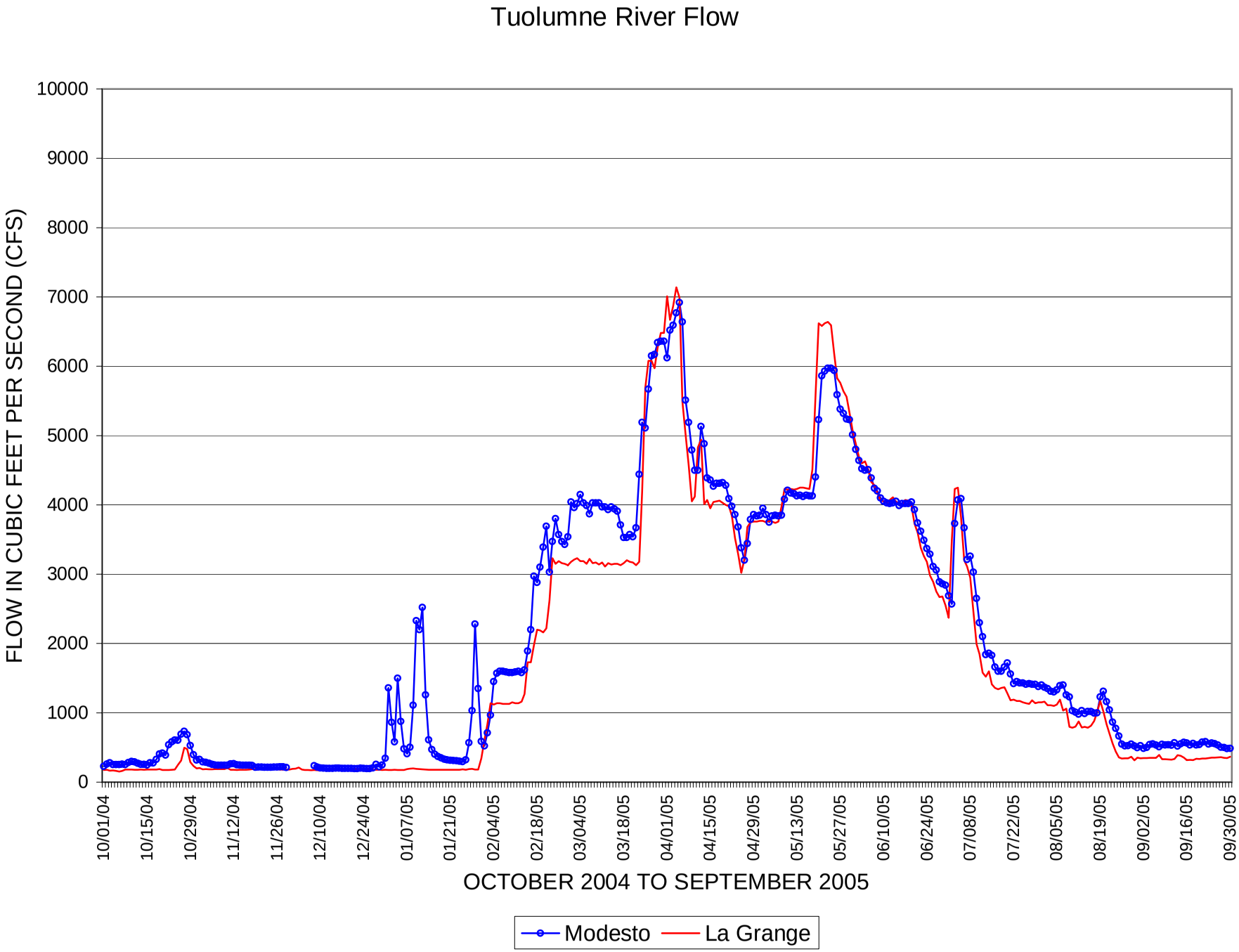
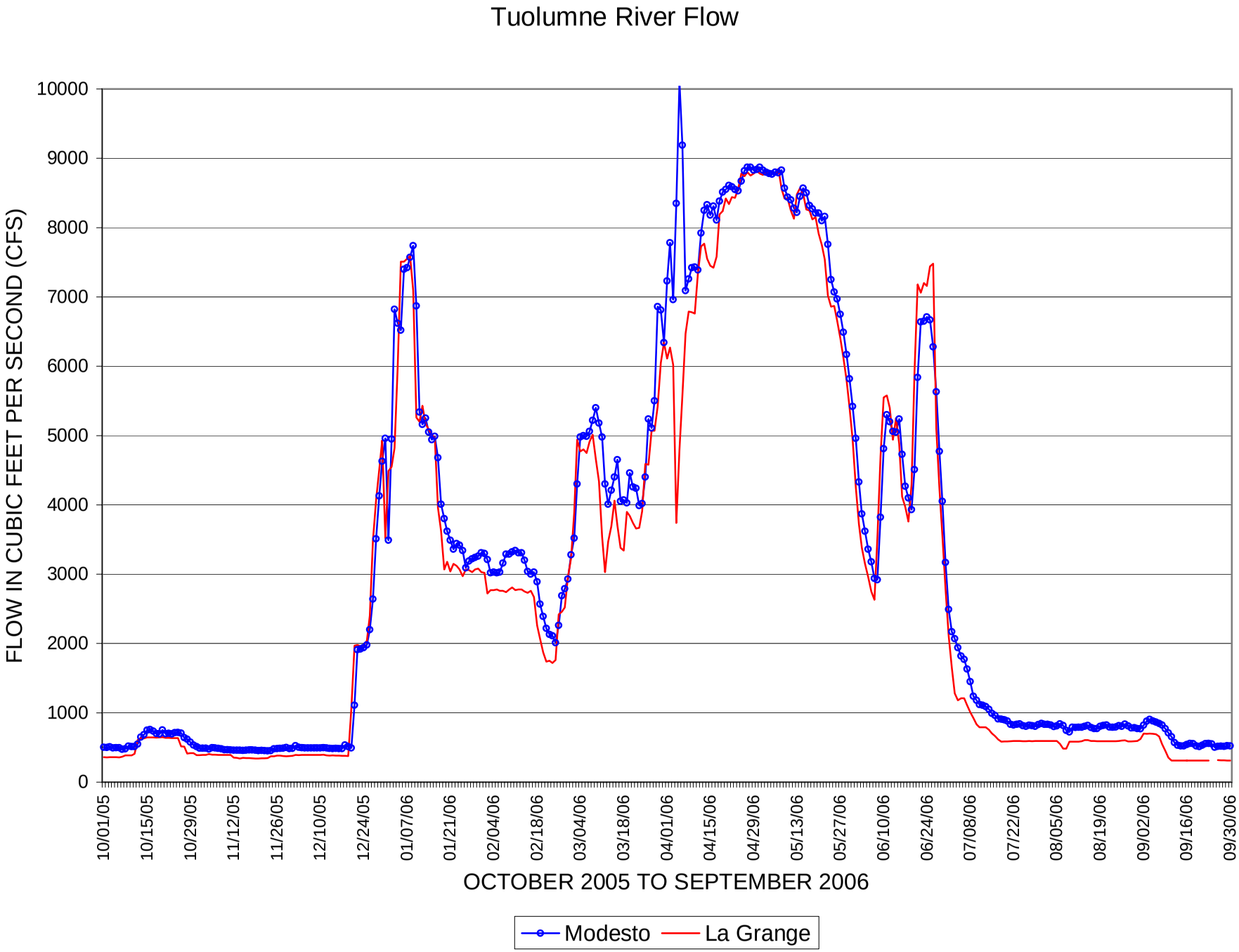
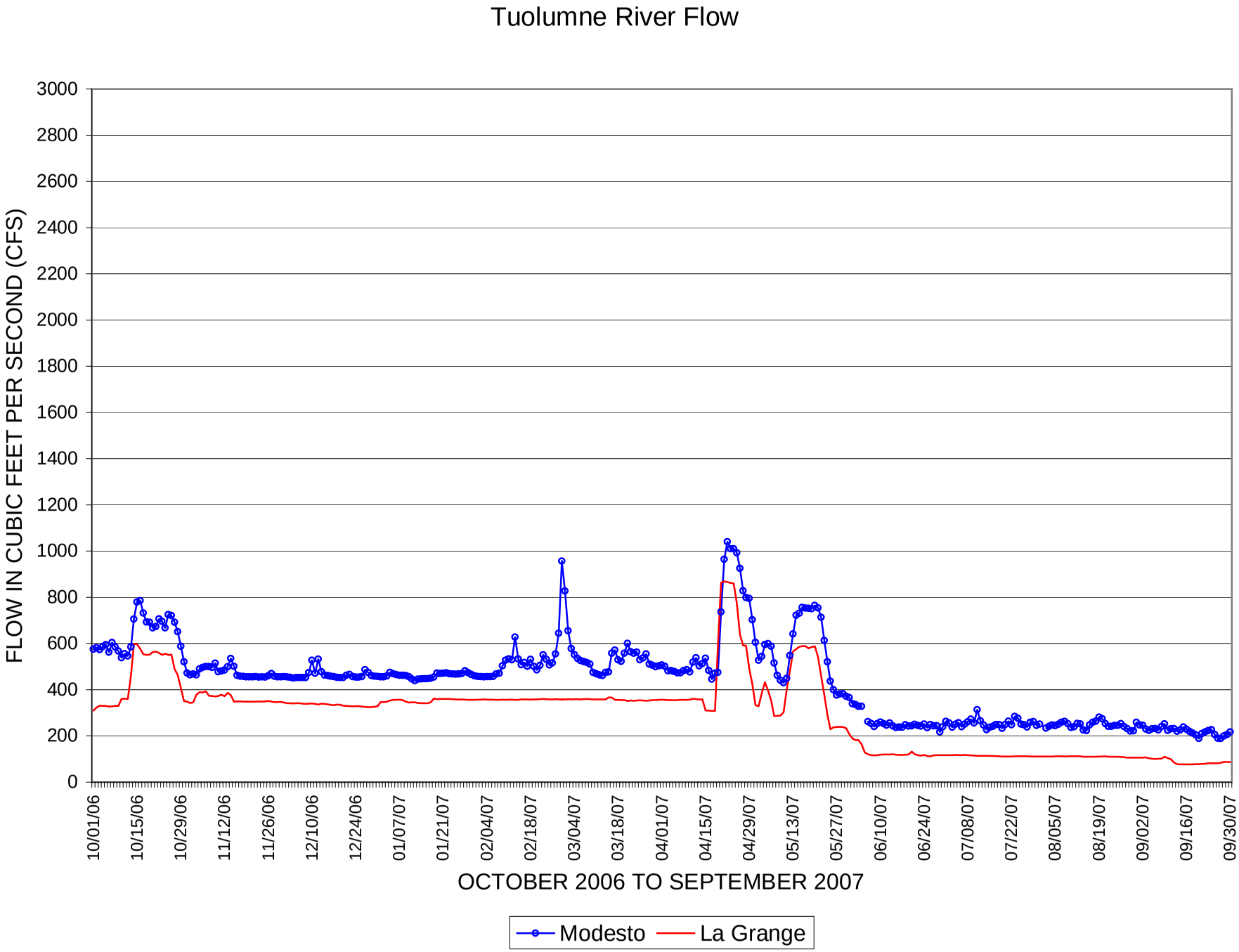
09/10/06
10/10/06
11/09/06
12/09/06
01/08/07
02/07/07
03/09/07
04/08/07
05/08/07
06/07/07
07/07/07
08/06/07
09/05/07
OCTOBER 2002 TO SEPTEMBER 2007
Modesto
La Grange


Tuolumne River Flow
FLOW IN CUBIC FEET PER SECOND (CFS)
3000
2800
2600
2400
2200
2000
1800
1600
1400
1200
1000
800
600
400
200
0
10/01/02
10/15/02
10/29/02
11/12/02
11/26/02
12/10/02
12/24/02
01/07/03
01/21/03
02/04/03
02/18/03
03/04/03
03/18/03
04/01/03
04/15/03
04/29/03
05/13/03
05/27/03
06/10/03
06/24/03
07/08/03
07/22/03
08/05/03
08/19/03
09/02/03
09/16/03
09/30/03
OCTOBER 2002 TO SEPTEMBER 2003
Modesto
La Grange


Tuolumne River Flow
FLOW IN CUBIC FEET PER SECOND (CFS)
3000
2800
2600
2400
2200
2000
1800
1600
1400
1200
1000
800
600
400
200
0
10/01/03
10/15/03
10/29/03
11/12/03
11/26/03
12/10/03
12/24/03
01/07/04
01/21/04
02/04/04
02/18/04
03/03/04
03/17/04
03/31/04
04/14/04
04/28/04
05/12/04
05/26/04
06/09/04
06/23/04
07/07/04
07/21/04
08/04/04
08/18/04
09/01/04
09/15/04
09/29/04
OCTOBER 2003 TO SEPTEMBER 2004
Modesto
La Grange


Tuolumne River Flow
FLOW IN CUBIC FEET PER SECOND (CFS)
10000
9000
8000
7000
6000
5000
4000
3000
2000
1000
0
10/01/04
10/15/04
10/29/04
11/12/04
11/26/04
12/10/04
12/24/04
01/07/05
01/21/05
02/04/05
02/18/05
03/04/05
03/18/05
04/01/05
04/15/05
04/29/05
05/13/05
05/27/05
06/10/05
06/24/05
07/08/05
07/22/05
08/05/05
08/19/05
09/02/05
09/16/05
09/30/05
OCTOBER 2004 TO SEPTEMBER 2005
Modesto
La Grange


Tuolumne River Flow
FLOW IN CUBIC FEET PER SECOND (CFS)
10000
9000
8000
7000
6000
5000
4000
3000
2000
1000
0
10/01/05
10/15/05
10/29/05
11/12/05
11/26/05
12/10/05
12/24/05
01/07/06
01/21/06
02/04/06
02/18/06
03/04/06
03/18/06
04/01/06
04/15/06
04/29/06
05/13/06
05/27/06
06/10/06
06/24/06
07/08/06
07/22/06
08/05/06
08/19/06
09/02/06
09/16/06
09/30/06
OCTOBER 2005 TO SEPTEMBER 2006
Modesto
La Grange


Tuolumne River Flow
FLOW IN CUBIC FEET PER SECOND (CFS)
3000
2800
2600
2400
2200
2000
1800
1600
1400
1200
1000
800
600
400
200
0
10/01/06
10/15/06
10/29/06
11/12/06
11/26/06
12/10/06
12/24/06
01/07/07
01/21/07
02/04/07
02/18/07
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03/18/07
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05/13/07
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06/24/07
07/08/07
07/22/07
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09/16/07
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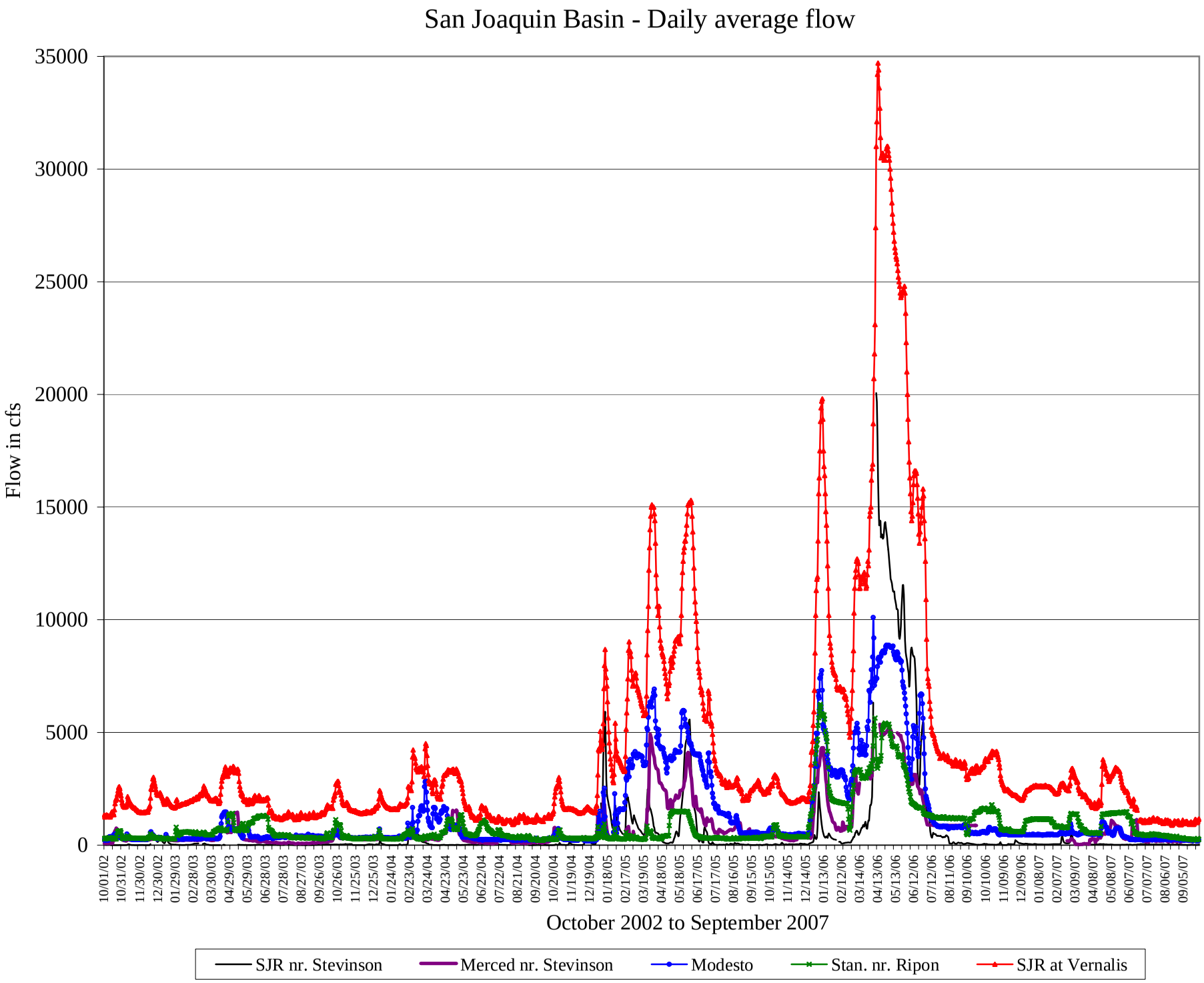
OCTOBER 2006 TO SEPTEMBER 2007
Modesto
La Grange


San Joaquin Basin - Daily average flow
Flow in cfs
35000
30000
25000
20000
15000
10000
5000
0
10/01/02
10/31/02
11/30/02
12/30/02
01/29/03
02/28/03
03/30/03
04/29/03
05/29/03
06/28/03
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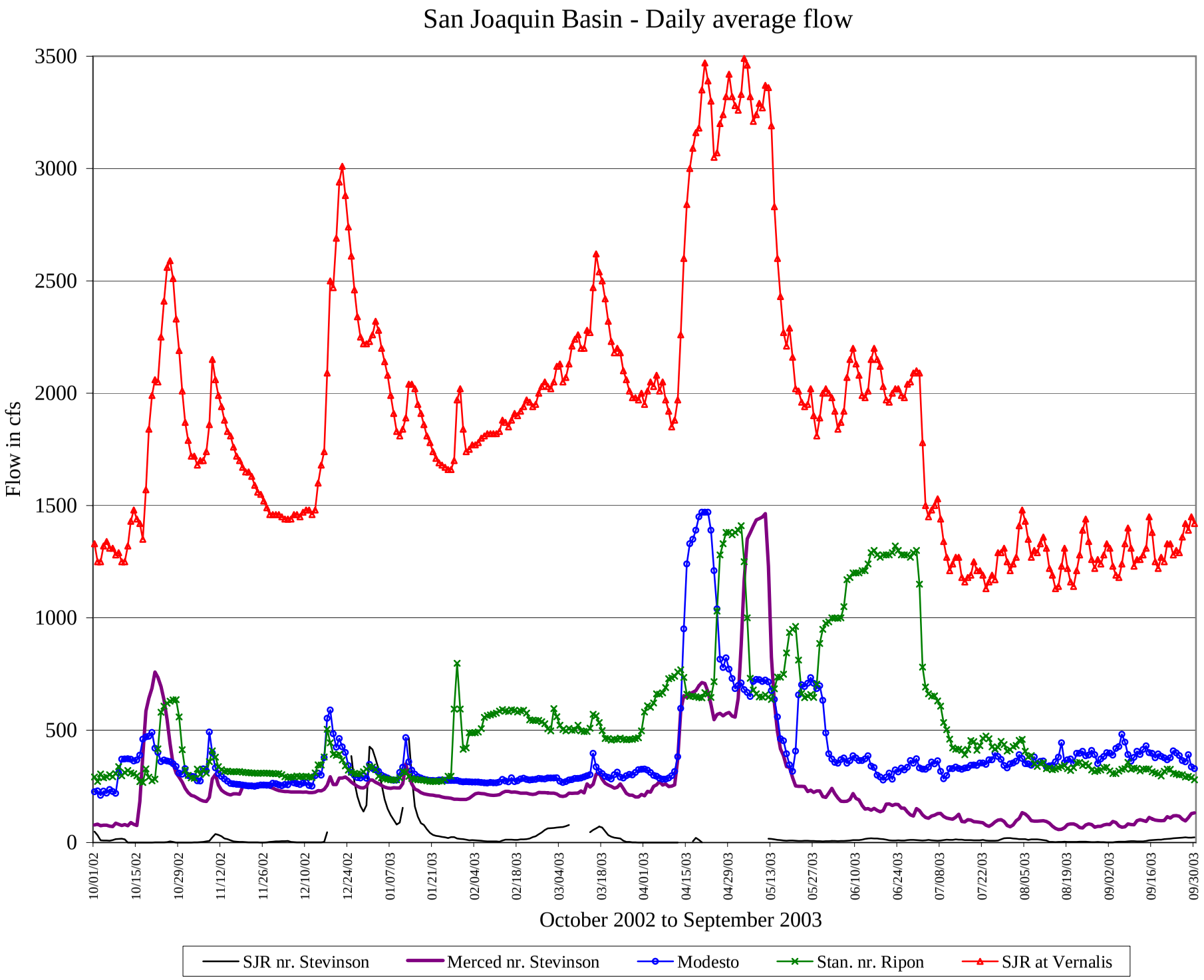
01/08/07
02/07/07
03/09/07
04/08/07
05/08/07
06/07/07
07/07/07
08/06/07
09/05/07
October 2002 to September 2007
SJR nr. Stevinson
Merced nr. Stevinson
Modesto
Stan. nr. Ripon
SJR at Vernalis


San Joaquin Basin - Daily average flow
Flow in cfs
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3000
2500
2000
1500
1000
500
0
10/01/02
10/15/02
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11/12/02
11/26/02
12/10/02
12/24/02
01/07/03
01/21/03
02/04/03
02/18/03
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06/10/03
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07/08/03
07/22/03
08/05/03
08/19/03
09/02/03
09/16/03
09/30/03
October 2002 to September 2003
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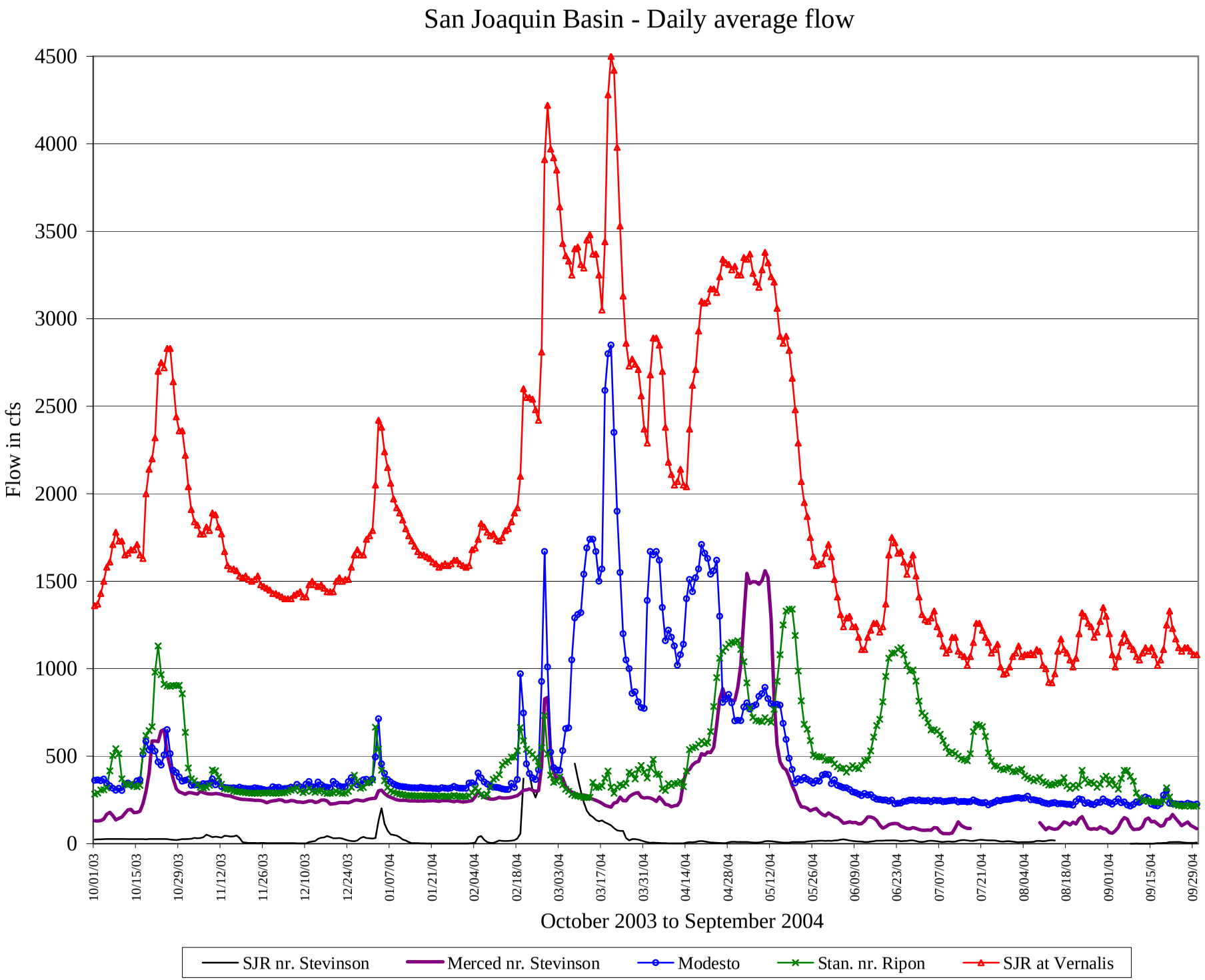
Merced nr. Stevinson
Modesto
Stan. nr. Ripon
SJR at Vernalis


San Joaquin Basin - Daily average flow
Flow in cfs
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4000
3500
3000
2500
2000
1500
1000
500
0
10/01/03
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10/29/03
11/12/03
11/26/03
12/10/03
12/24/03
01/07/04
01/21/04
02/04/04
02/18/04
03/03/04
03/17/04
03/31/04
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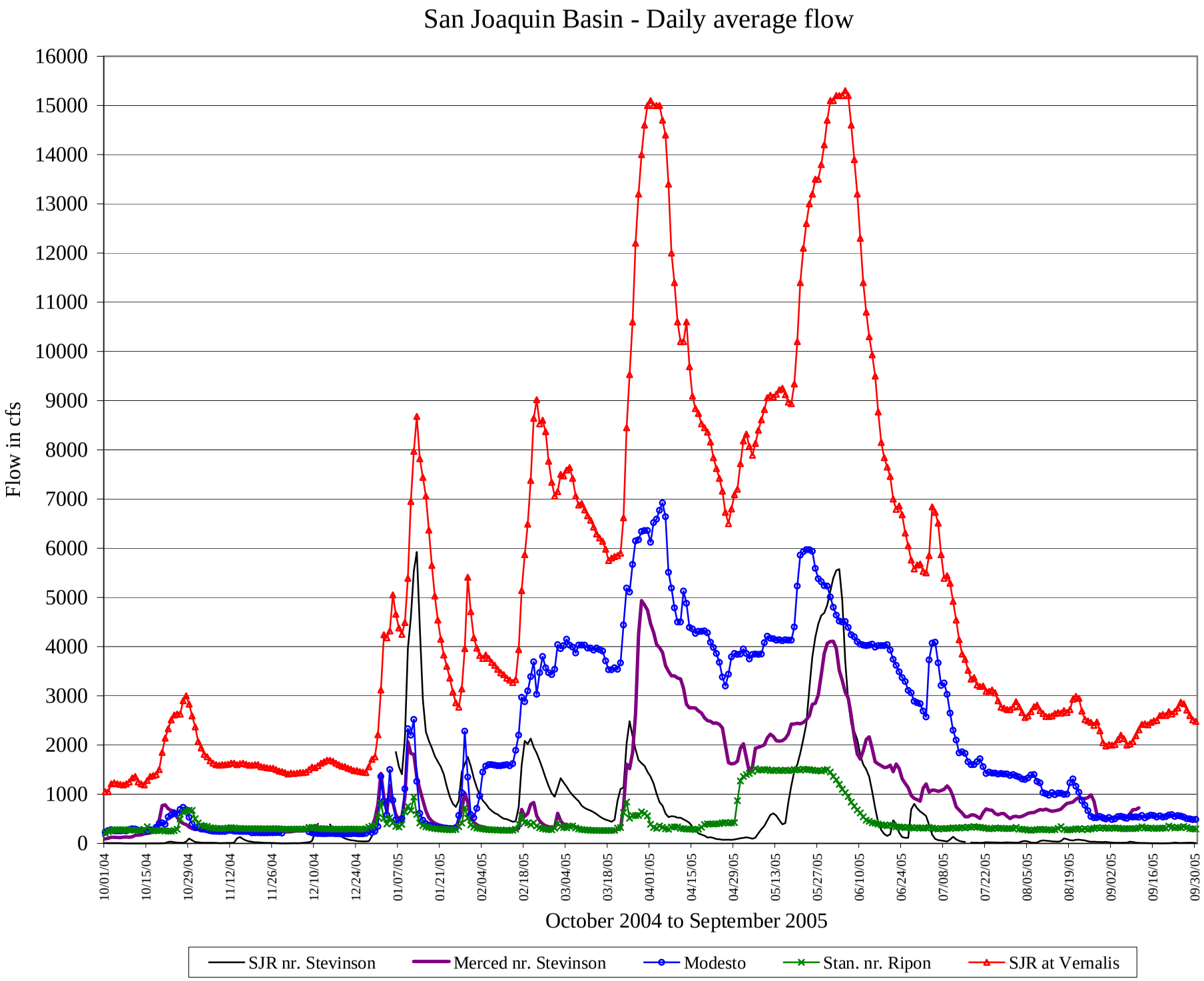
04/28/04
05/12/04
05/26/04
06/09/04
06/23/04
07/07/04
07/21/04
08/04/04
08/18/04
09/01/04
09/15/04
09/29/04
October 2003 to September 2004
SJR nr. Stevinson
Merced nr. Stevinson
Modesto
Stan. nr. Ripon
SJR at Vernalis


San Joaquin Basin - Daily average flow
Flow in cfs
16000
15000
14000
13000
12000
11000
10000
9000
8000
7000
6000
5000
4000
3000
2000
1000
0
10/01/04
10/15/04
10/29/04
11/12/04
11/26/04
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12/24/04
01/07/05
01/21/05
02/04/05
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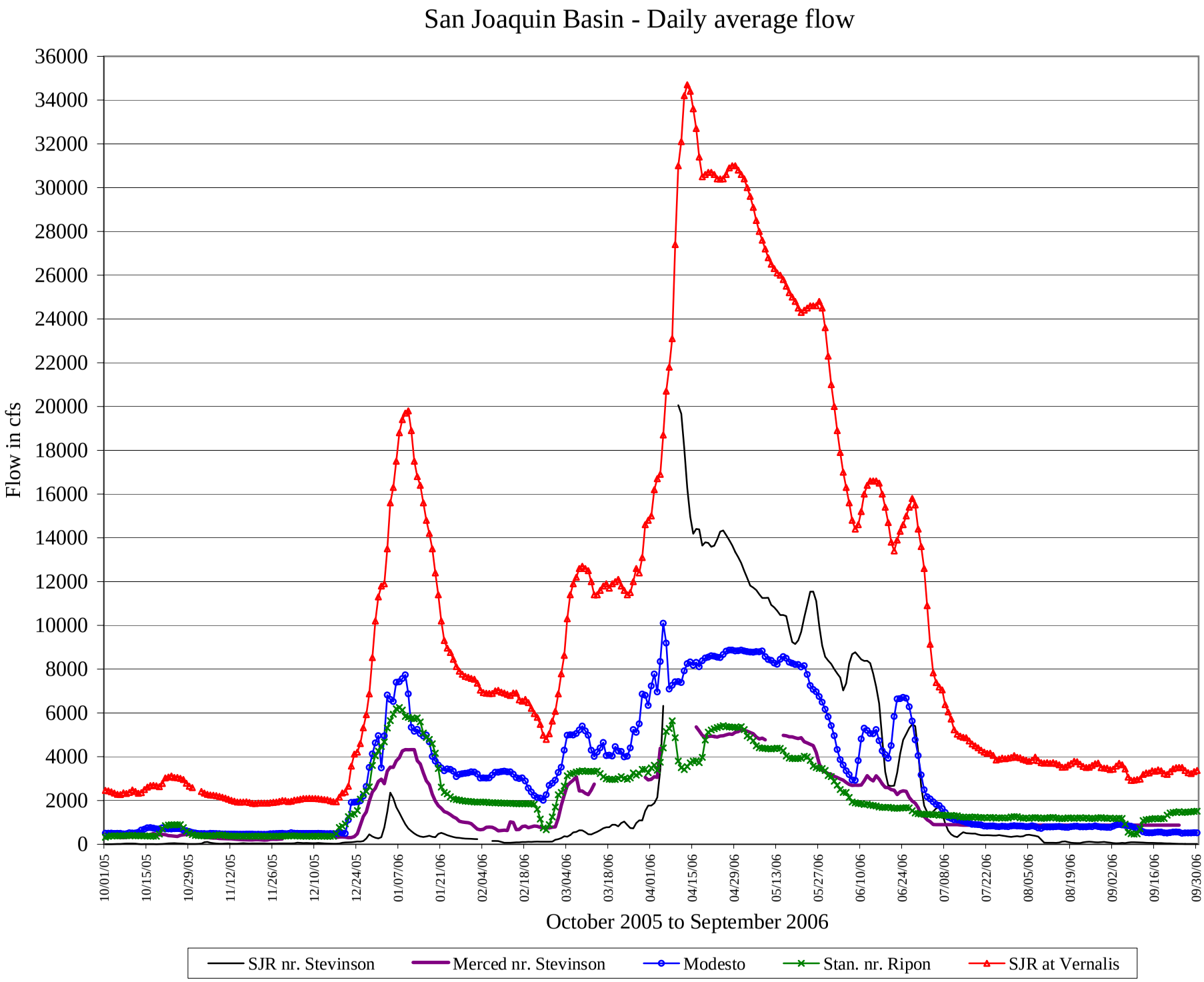
06/10/05
06/24/05
07/08/05
07/22/05
08/05/05
08/19/05
09/02/05
09/16/05
09/30/05
October 2004 to September 2005
SJR nr. Stevinson
Merced nr. Stevinson
Modesto
Stan. nr. Ripon
SJR at Vernalis


San Joaquin Basin - Daily average flow
Flow in cfs
36000
34000
32000
30000
28000
26000
24000
22000
20000
18000
16000
14000
12000
10000
8000
6000
4000
2000
0
10/01/05
10/15/05
10/29/05
11/12/05
11/26/05
12/10/05
12/24/05
01/07/06
01/21/06
02/04/06
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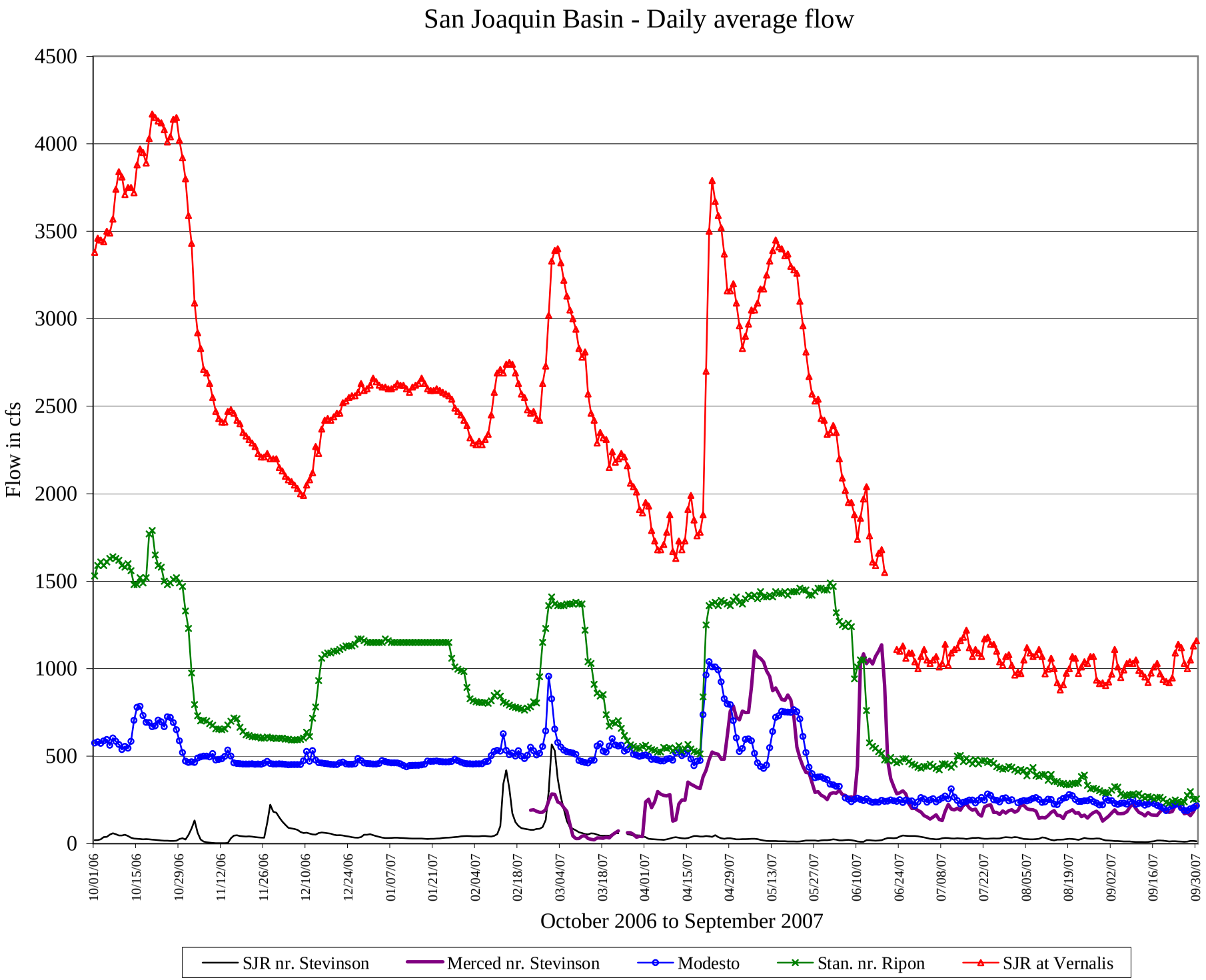
05/27/06
06/10/06
06/24/06
07/08/06
07/22/06
08/05/06
08/19/06
09/02/06
09/16/06
09/30/06
October 2005 to September 2006
SJR nr. Stevinson
Merced nr. Stevinson
Modesto
Stan. nr. Ripon
SJR at Vernalis


San Joaquin Basin - Daily average flow
Flow in cfs
4500
4000
3500
3000
2500
2000
1500
1000
500
0
10/01/06
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10/29/06
11/12/06
11/26/06
12/10/06
12/24/06
01/07/07
01/21/07
02/04/07
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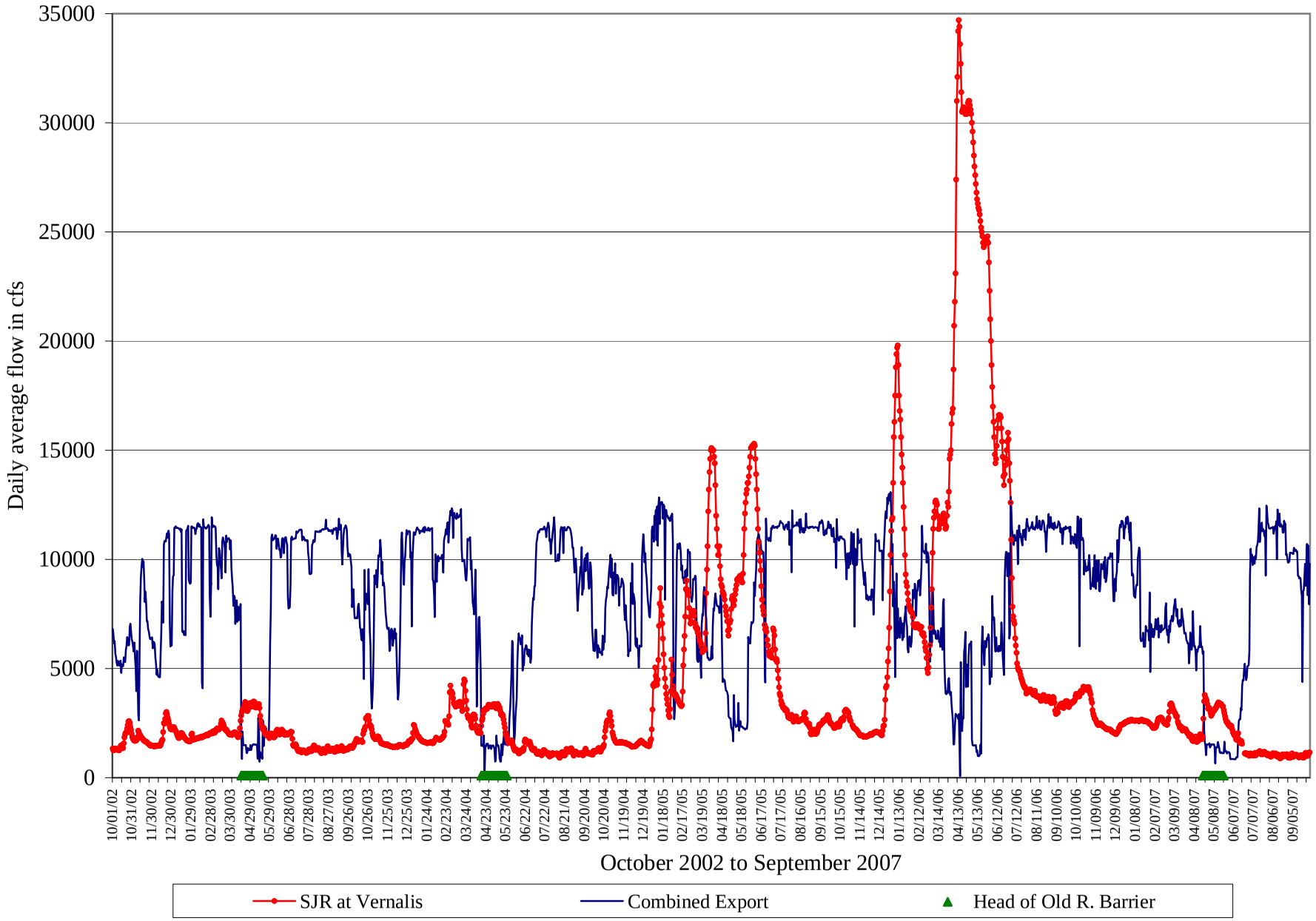
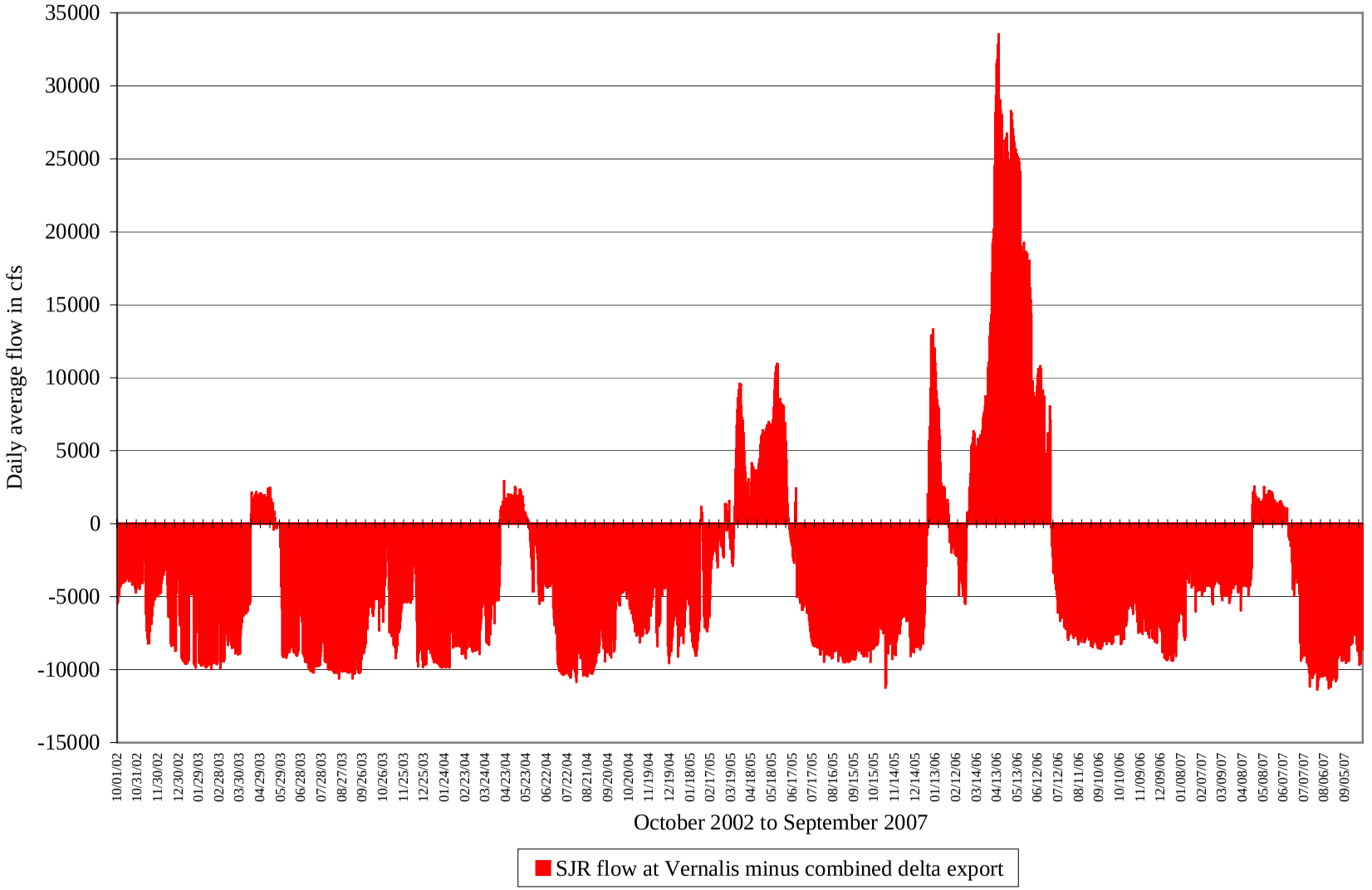
06/24/07
07/08/07
07/22/07
08/05/07
08/19/07
09/02/07
09/16/07
09/30/07
October 2006 to September 2007
SJR nr. Stevinson
Merced nr. Stevinson
Modesto
Stan. nr. Ripon
SJR at Vernalis

Daily average flow at Vernalis (SJR) and combined CVP and SWP delta export



Daily average flow at Vernalis (SJR) minus combined CVP and SWP delta export



APPENDIX B – Water Temperature for Water Years 2003-2007

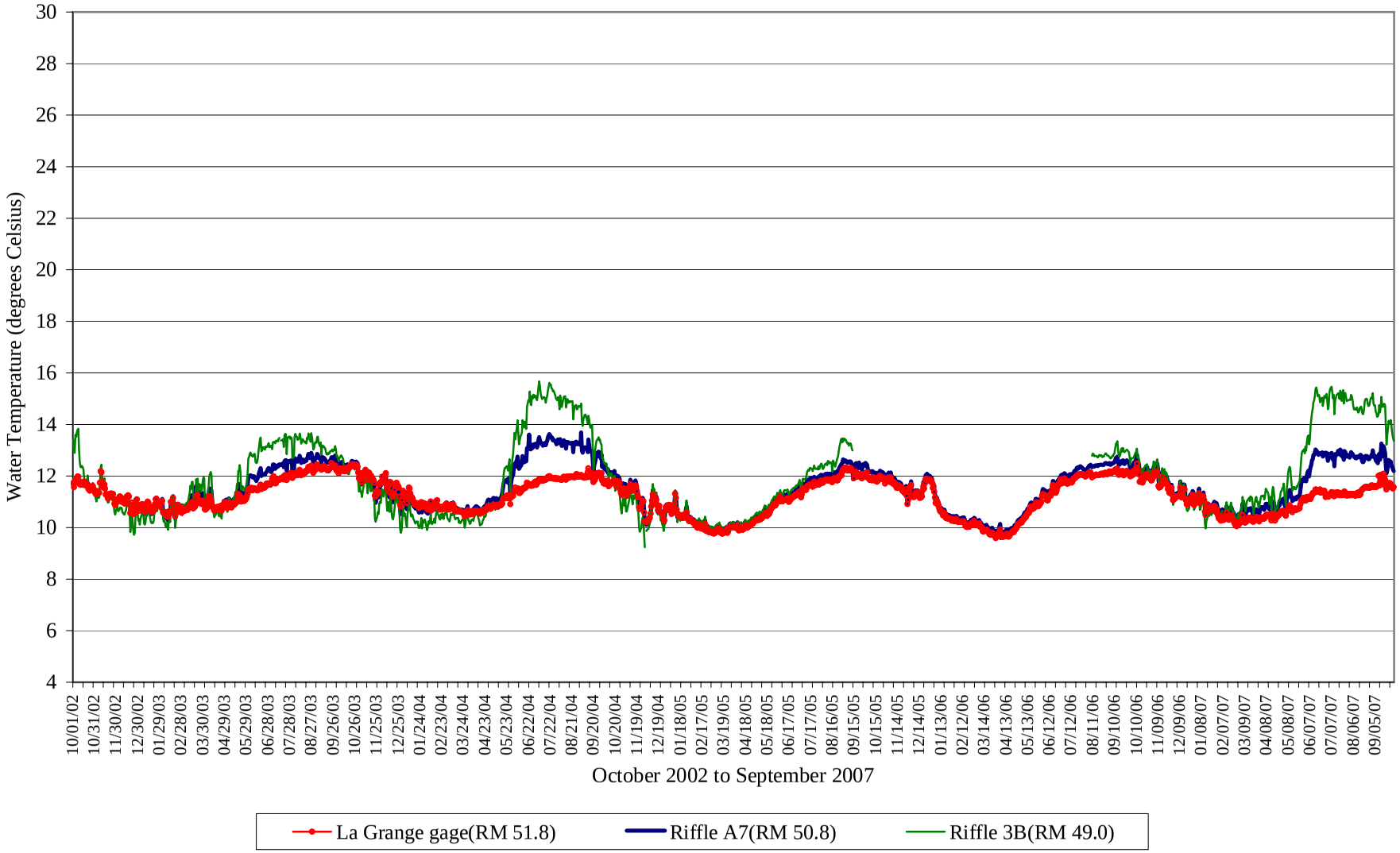
Daily average water temperature for TID/MID recorders

- La Grange gage to Riffle 3B
- Riffle 13B to Roberts Ferry Bridge
- Ruddy Gravel to Shiloh Bridge
- Dos Rios (SJR) and Gardner Cove (SJR)

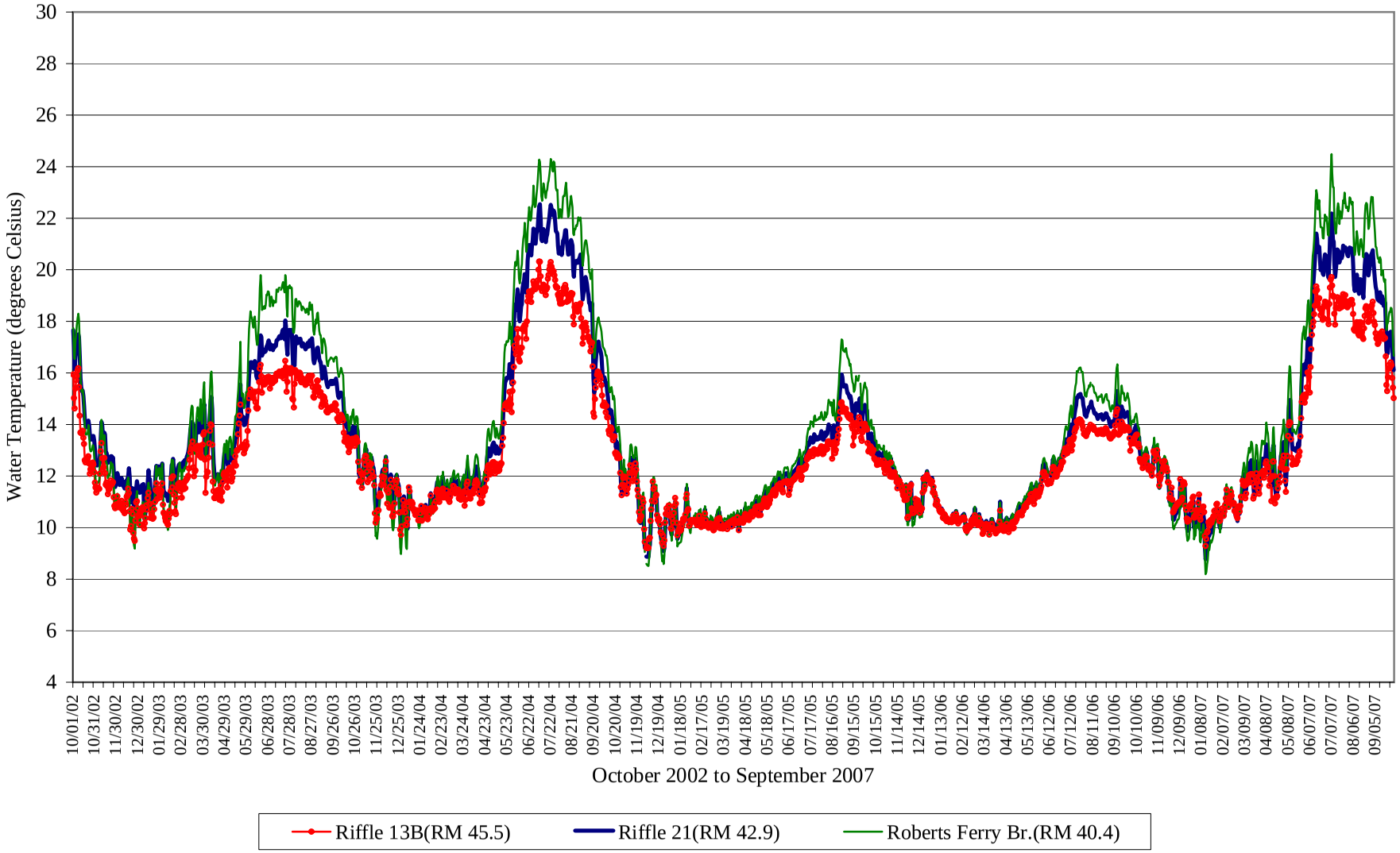
Daily minimum and maximum water temperature

- All TID/MID locations
- USGS locations: La Grange, Modesto, and Vernalis

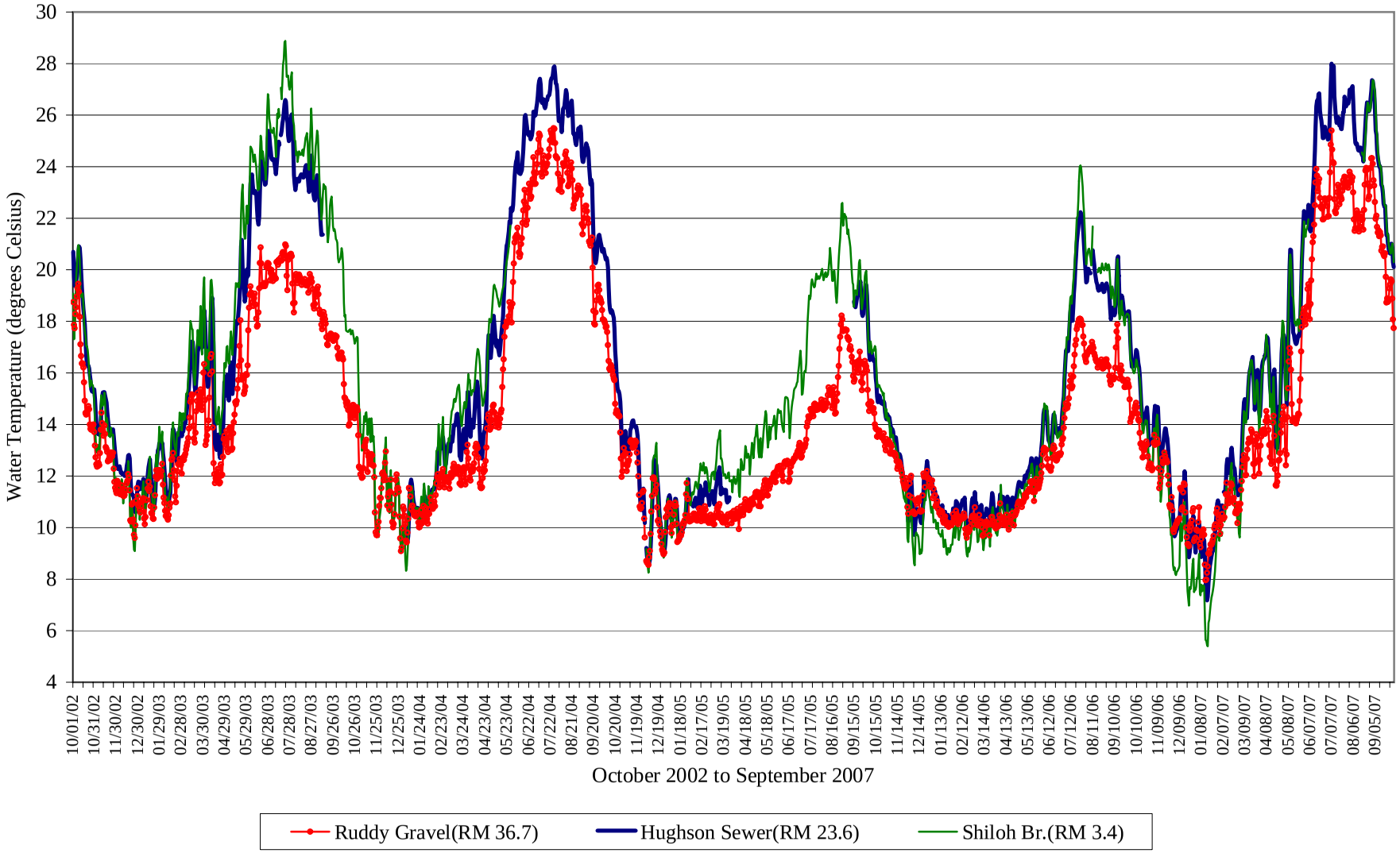
Tuolumne River Daily Average Water Temperature from La Grange gage to Riffle 3B



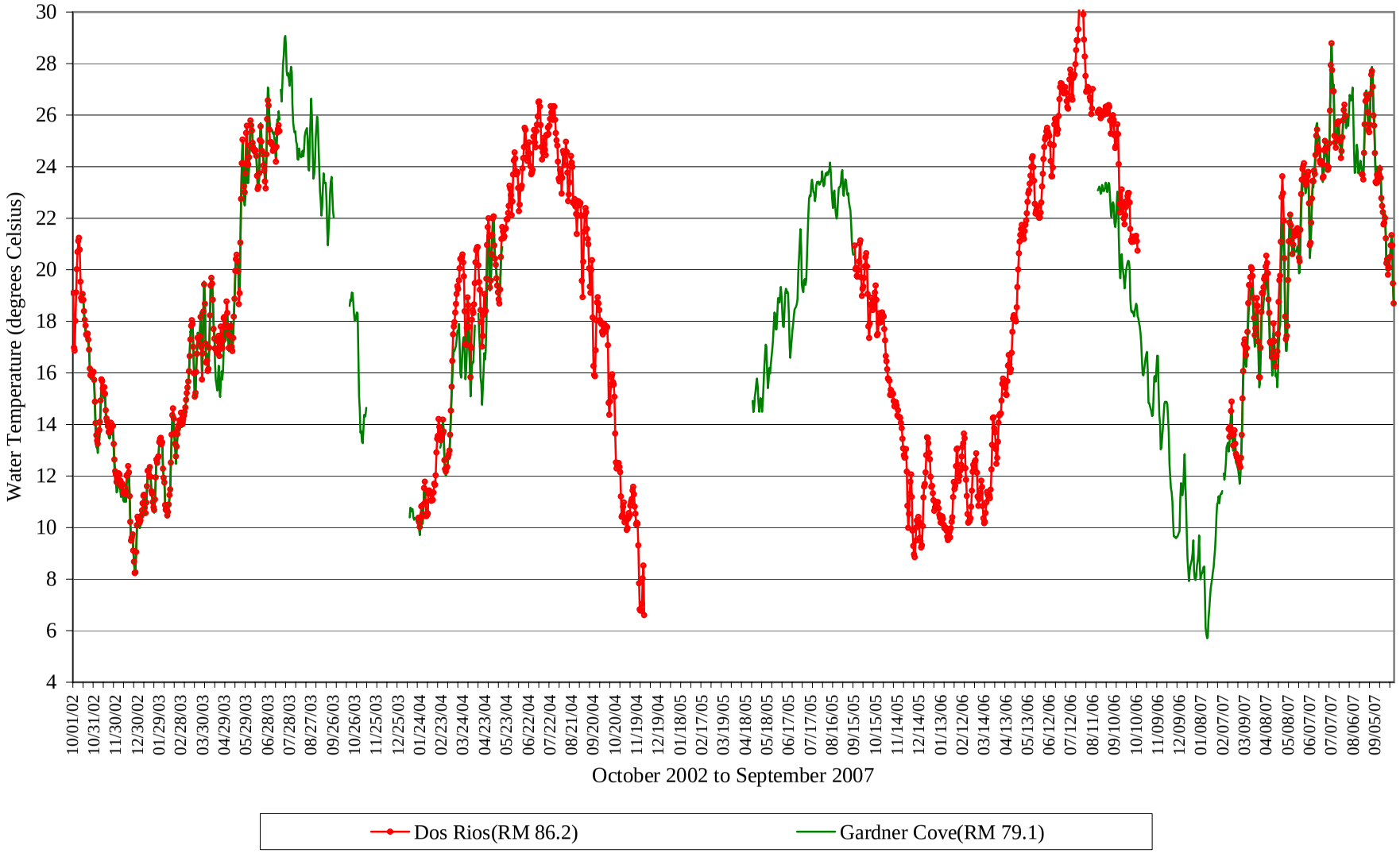
Tuolumne River Daily Average Water Temperature from Riffle 13B to Roberts Ferry Bridge



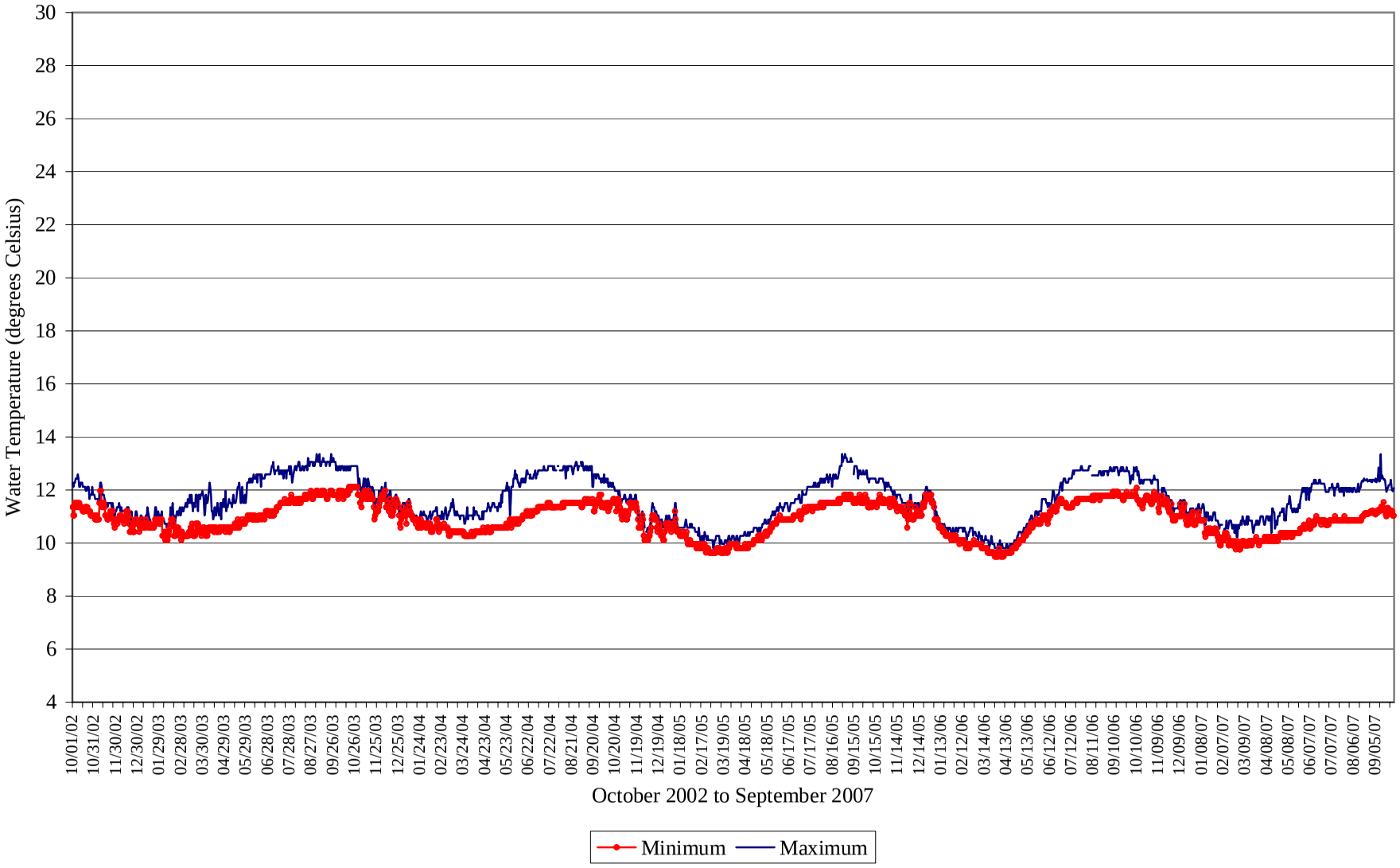
Tuolumne River Daily Average Water Temperature from Ruddy Gravel to Shiloh Bridge



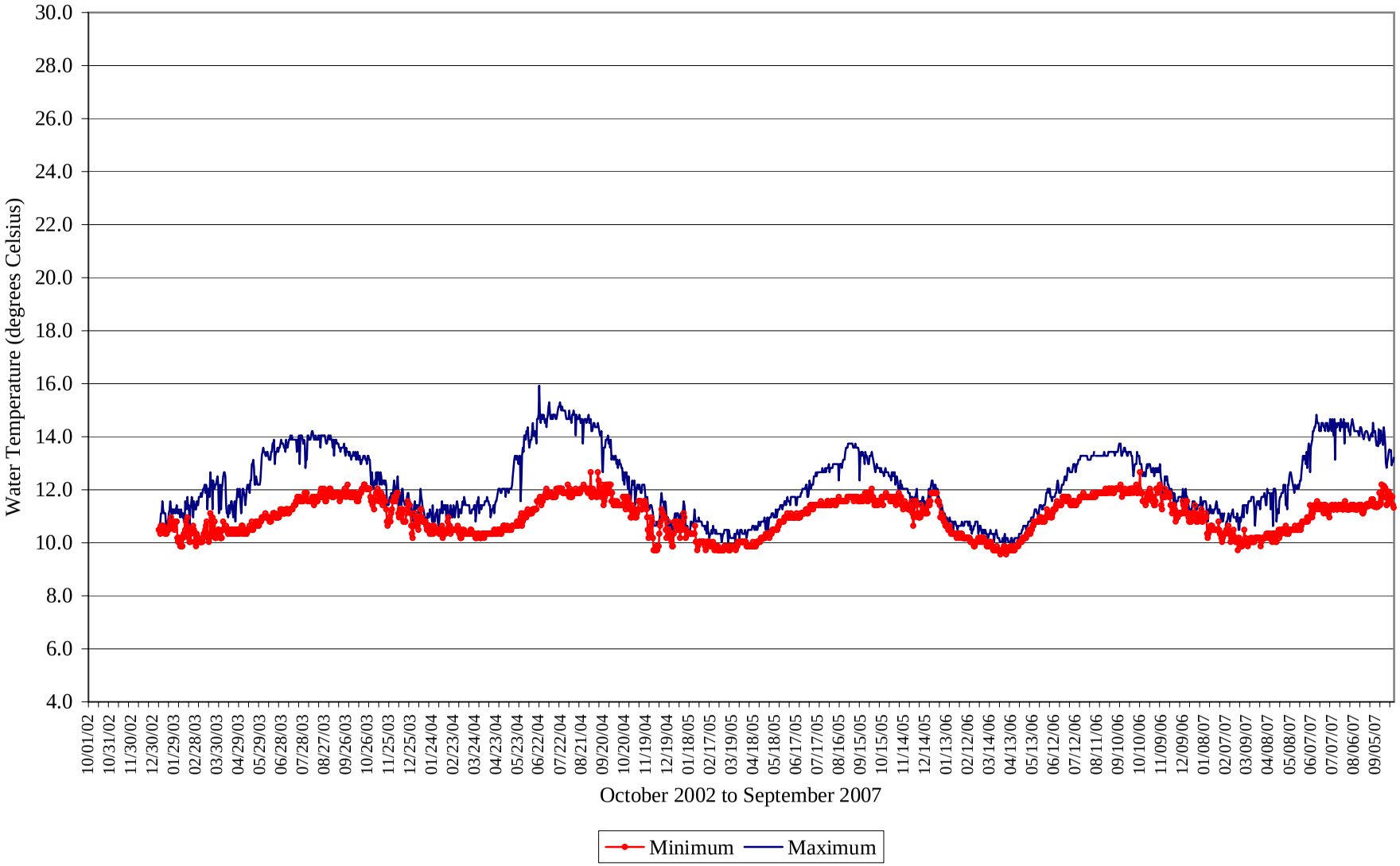
San Joaquin River Daily Average Water Temperature from Dos Rios Ranch to Gardner Cove



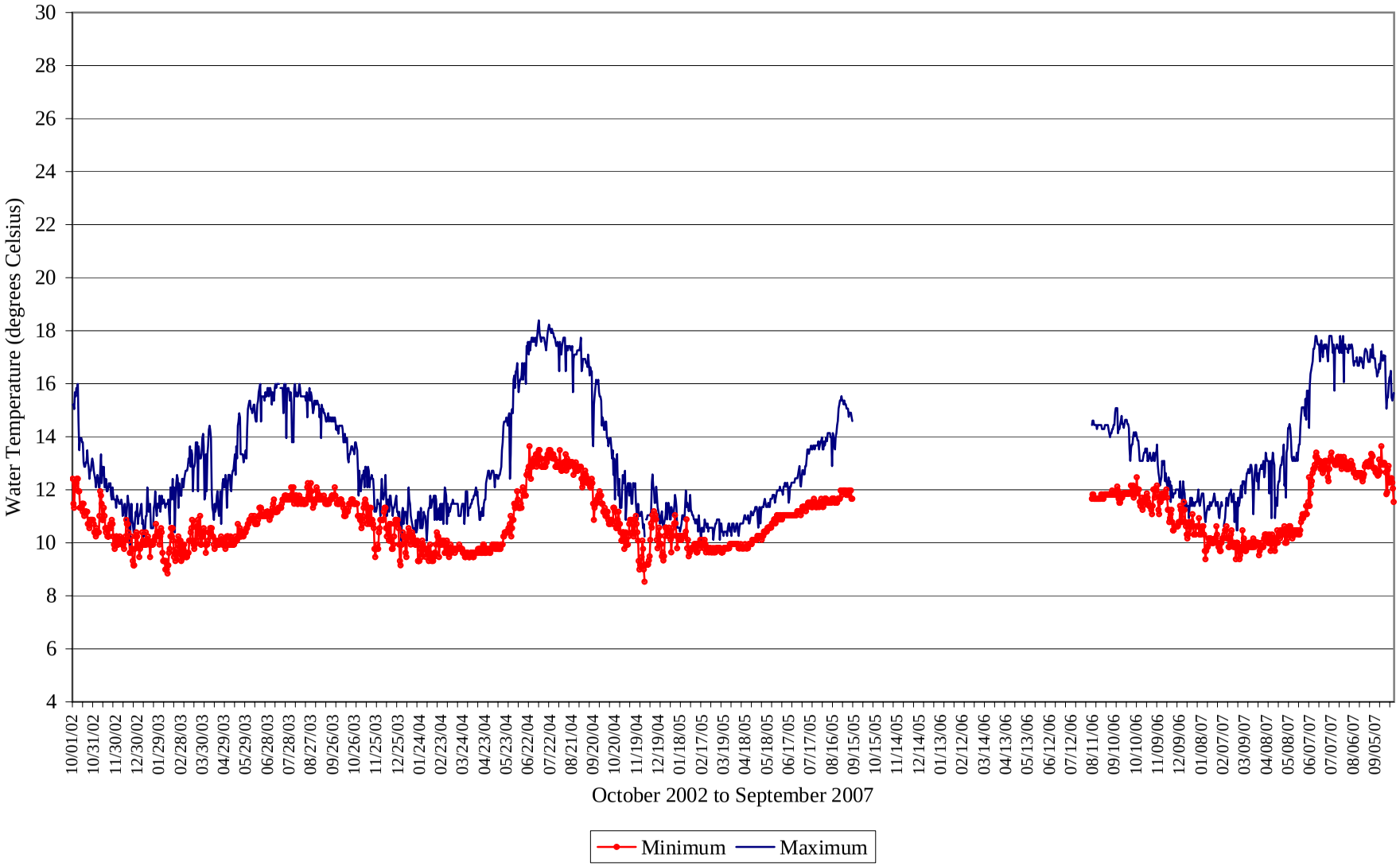
Tuolumne River at the La Grange gage (RM 51.8)

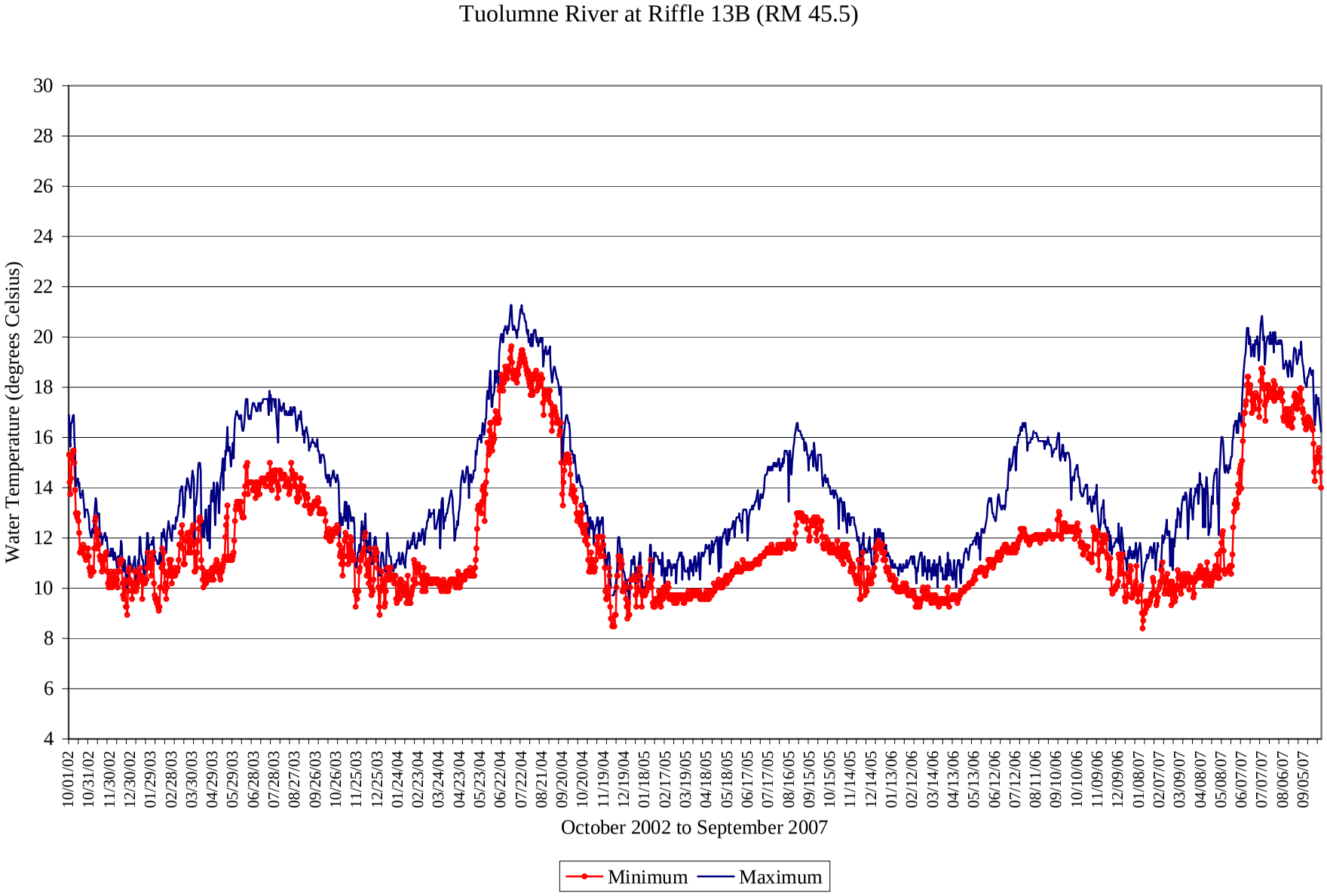


Tuolumne River at Riffle A7 (RM 50.8)

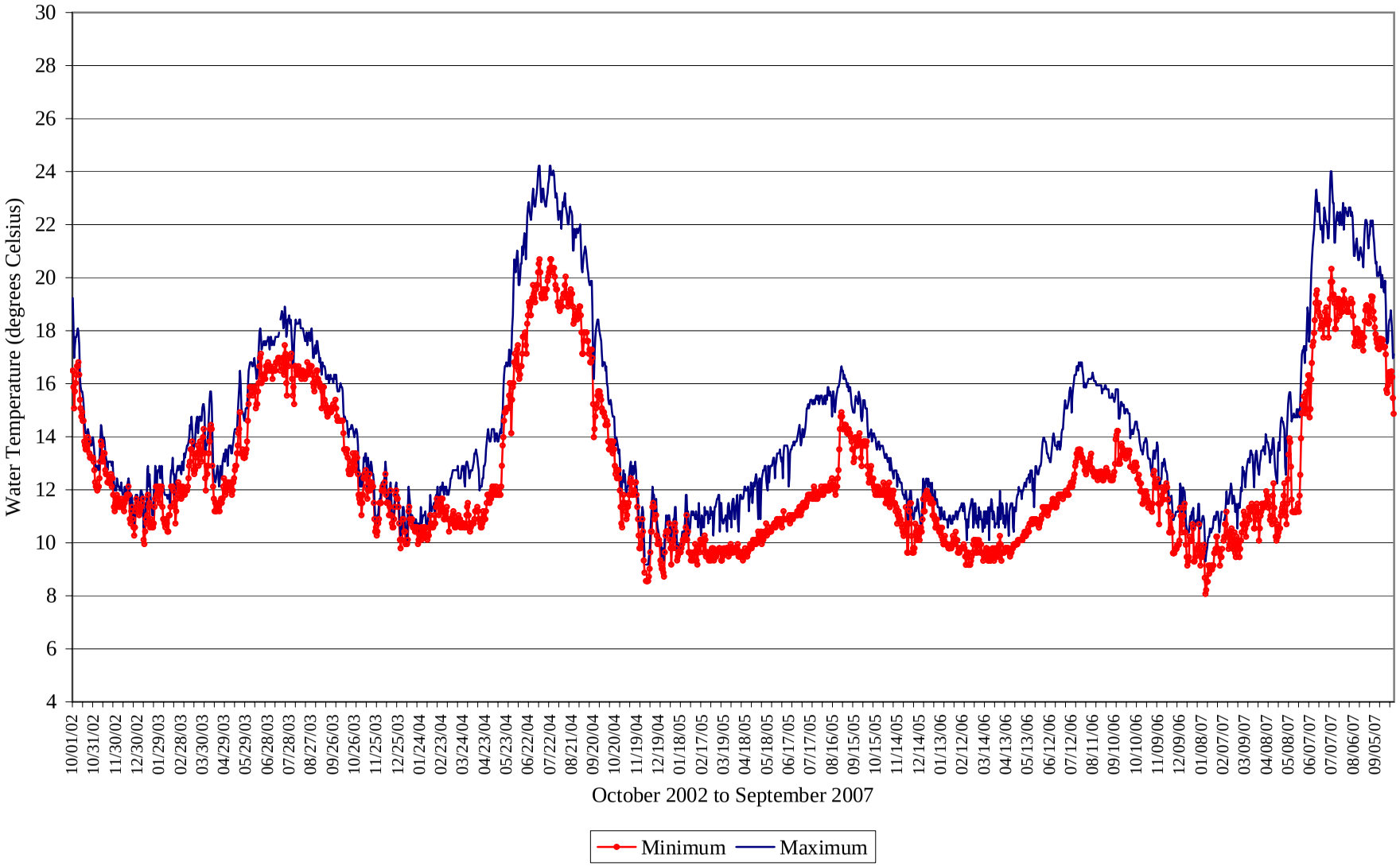


Tuolumne River at Riffle 3B (RM 49.0)

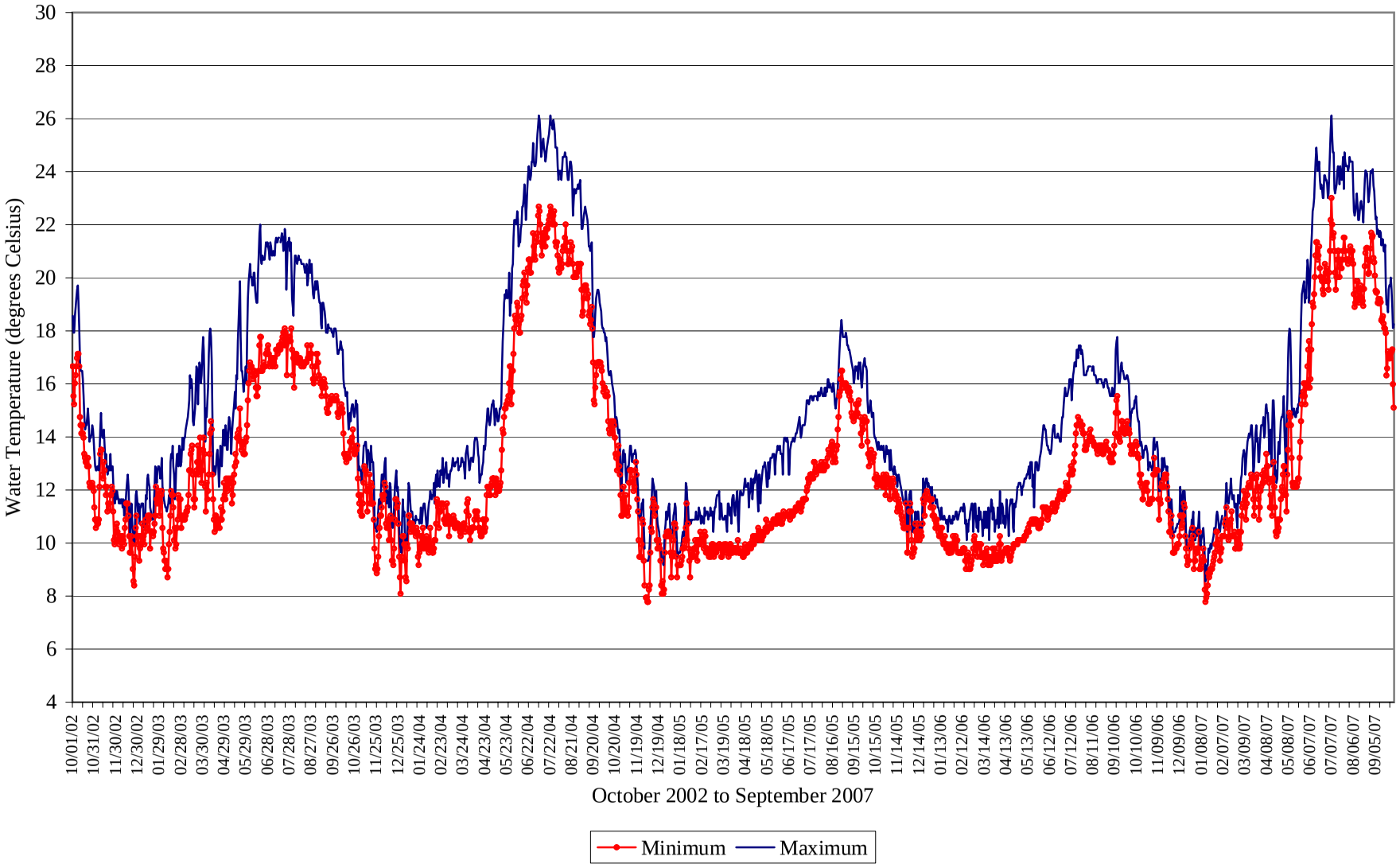


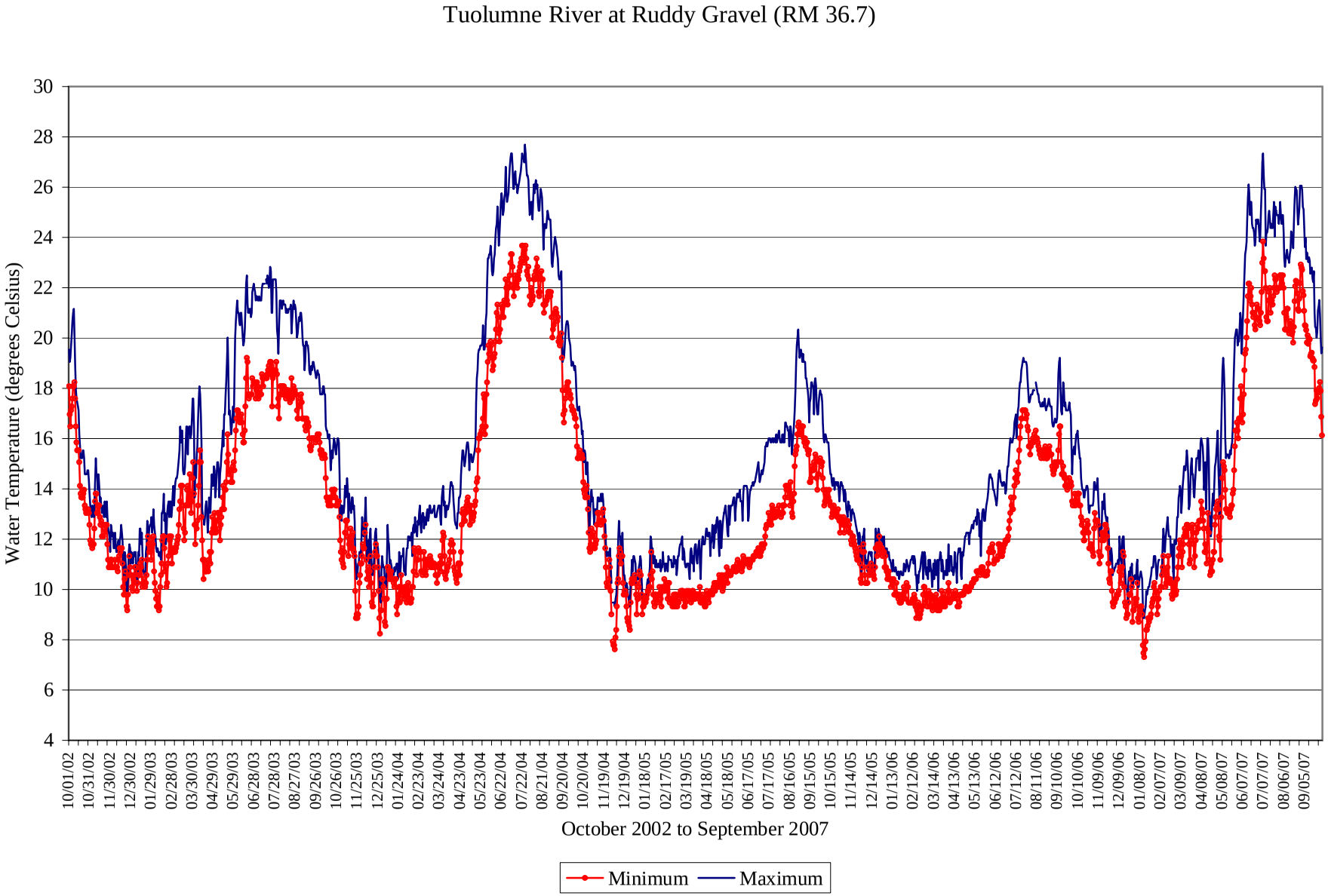

Tuolumne River at Riffle 13B (RM 45.5)
Water Temperature (degrees Celsius)
30
28
26
24
22
20
18
16
14
12
10
8
6
4
10/01/02
10/31/02
11/30/02
12/30/02
01/29/03
02/28/03
03/30/03
04/29/03
05/29/03
06/28/03
07/28/03
08/27/03
09/26/03
10/26/03
11/25/03
12/25/03
01/24/04
02/23/04
03/24/04
04/23/04
05/23/04
06/22/04
07/22/04
08/21/04
09/20/04
10/20/04
11/19/04
12/19/04
01/18/05
02/17/05
03/19/05
04/18/05
05/18/05
06/17/05
07/17/05
08/16/05
09/15/05
10/15/05
11/14/05
12/14/05
01/13/06
02/12/06
03/14/06
04/13/06
05/13/06
06/12/06
07/12/06
08/11/06
09/10/06
10/10/06
11/09/06
12/09/06
01/08/07
02/07/07
03/09/07
04/08/07
05/08/07
06/07/07
07/07/07
08/06/07
09/05/07
October 2002 to September 2007
Minimum
Maximum

Tuolumne River at Riffle 21(RM 42.9)

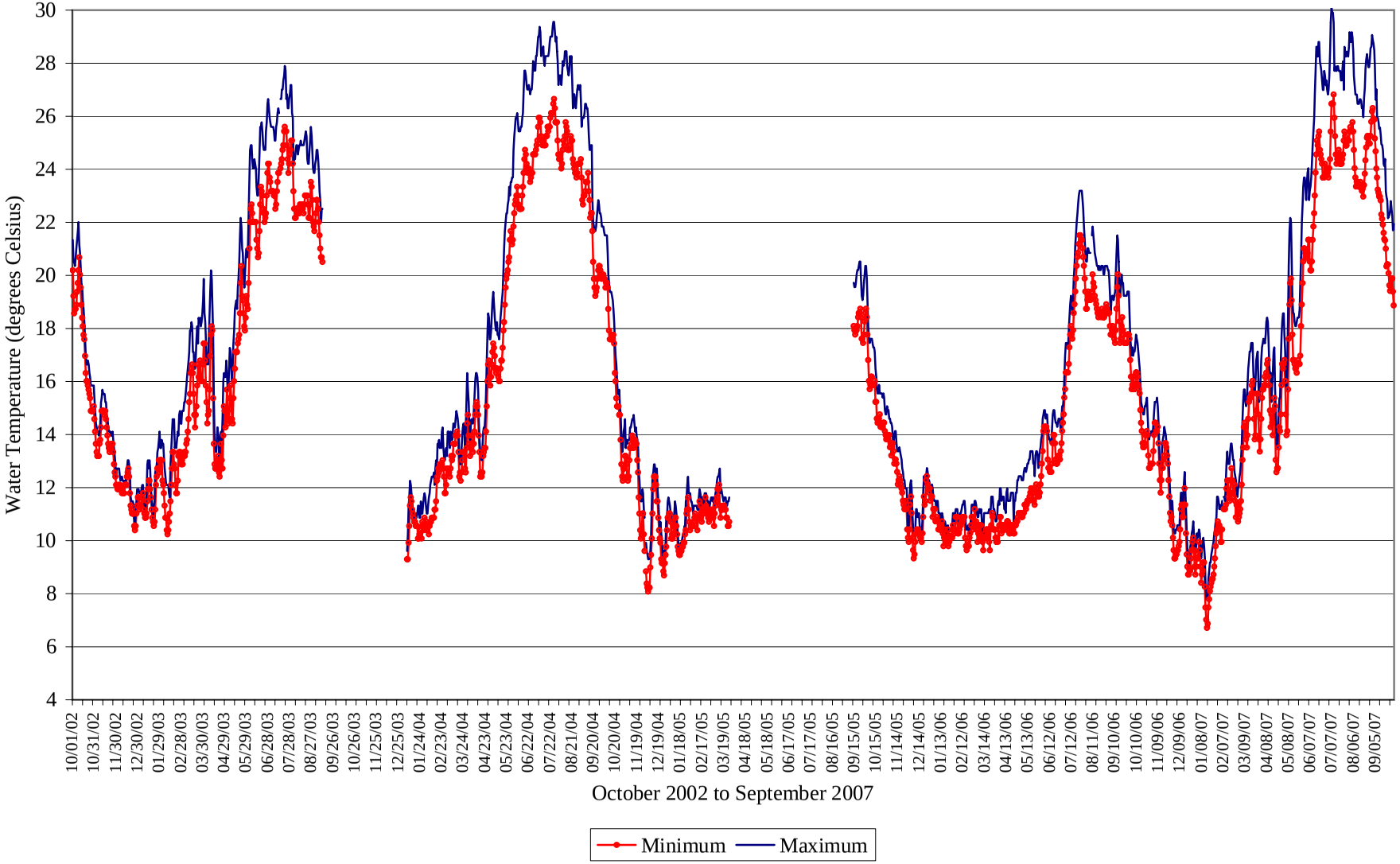


Tuolumne River at Roberts Ferry (RM 40.4)

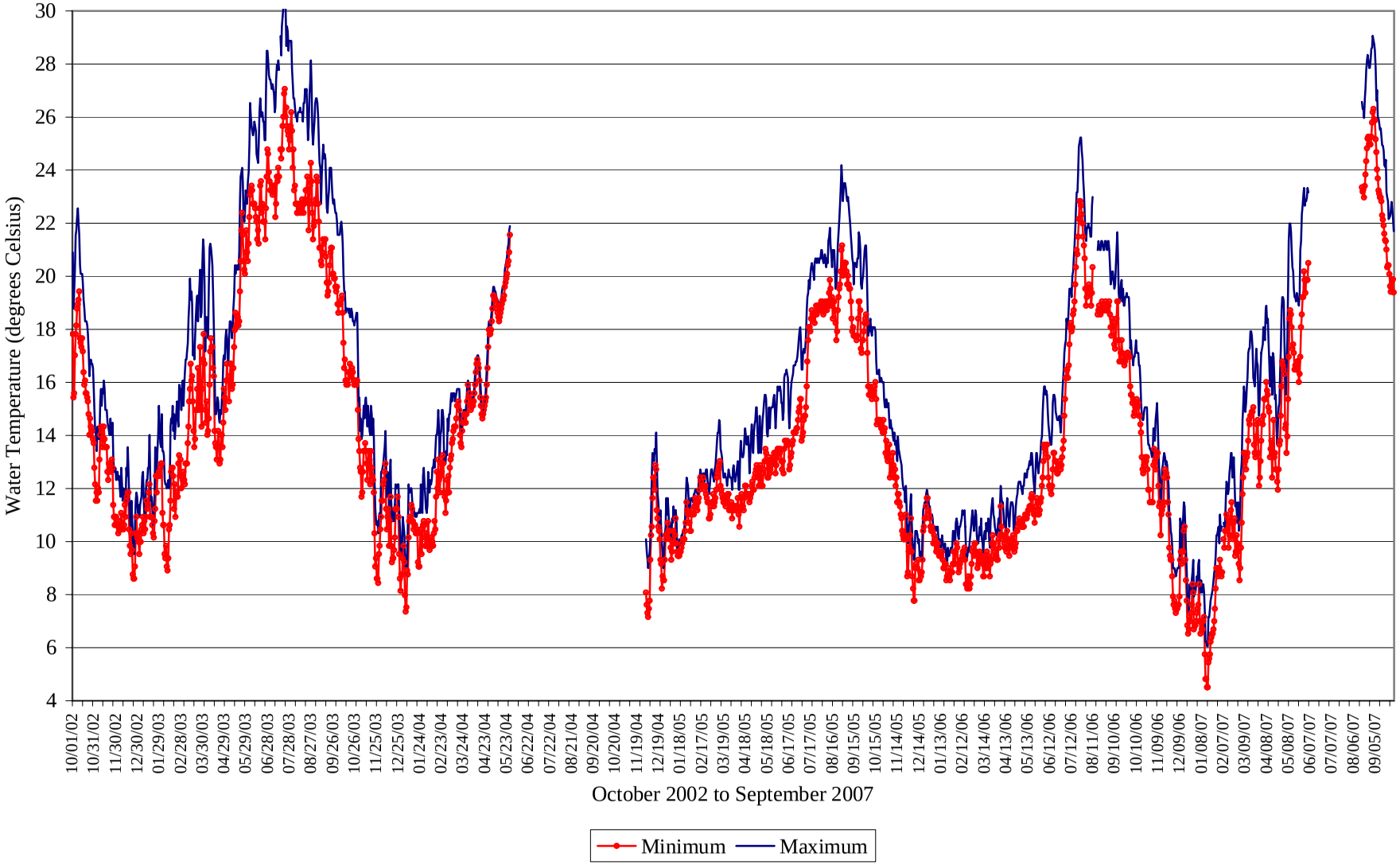



Tuolumne River at Ruddy Gravel (RM 36.7)
Water Temperature (degrees Celsius)
30
28
26
24
22
20
18
16
14
12
10
8
6
4
10/01/02
10/31/02
11/30/02
12/30/02
01/29/03
02/28/03
03/30/03
04/29/03
05/29/03
06/28/03
07/28/03
08/27/03
09/26/03
10/26/03
11/25/03
12/25/03
01/24/04
02/23/04
03/24/04
04/23/04
05/23/04
06/22/04
07/22/04
08/21/04
09/20/04
10/20/04
11/19/04
12/19/04
01/18/05
02/17/05
03/19/05
04/18/05
05/18/05
06/17/05
07/17/05
08/16/05
09/15/05
10/15/05
11/14/05
12/14/05
01/13/06
02/12/06
03/14/06
04/13/06
05/13/06
06/12/06
07/12/06
08/11/06
09/10/06
10/10/06
11/09/06
12/09/06
01/08/07
02/07/07
03/09/07
04/08/07
05/08/07
06/07/07
07/07/07
08/06/07
09/05/07
October 2002 to September 2007
Minimum
Maximum

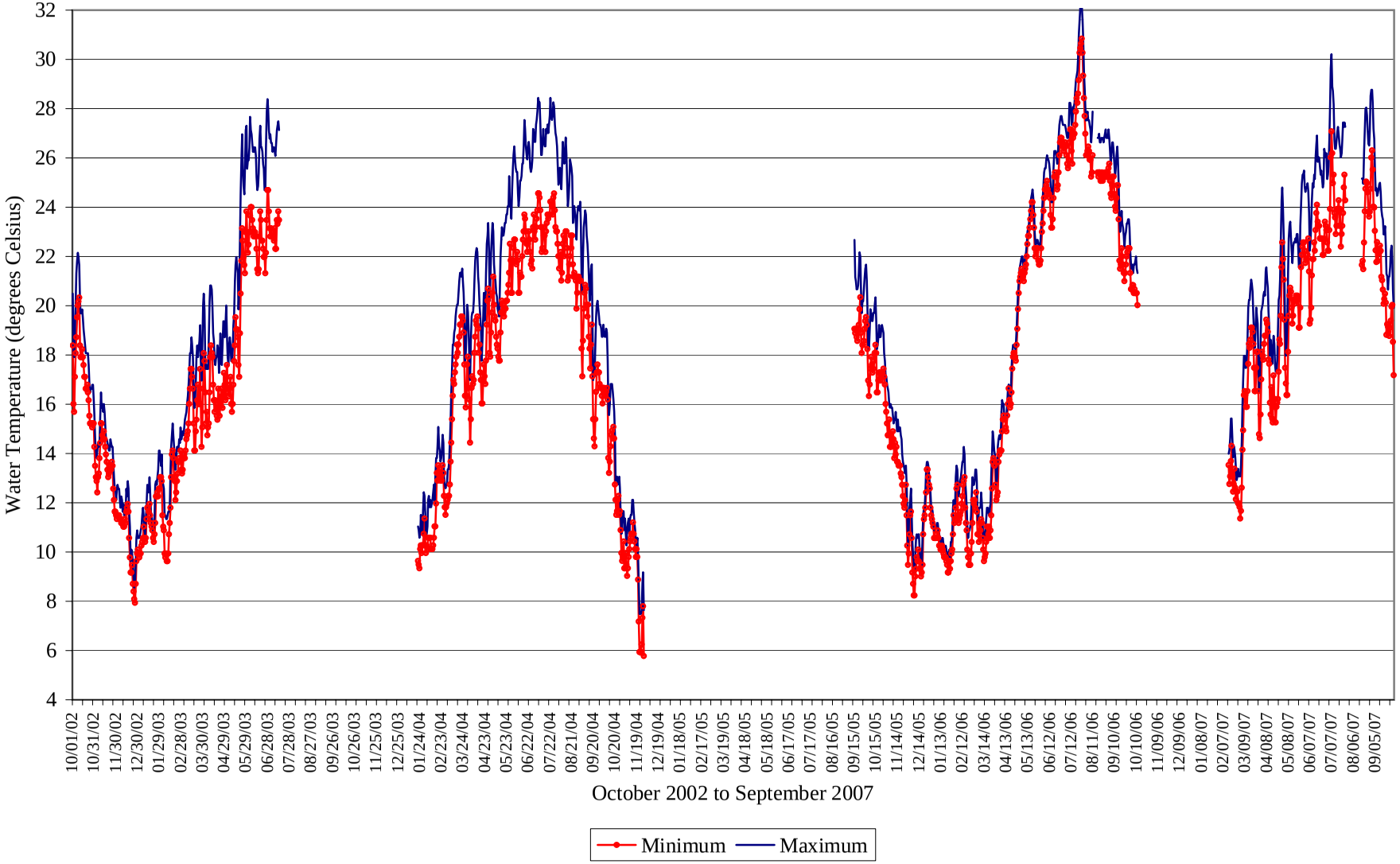
Tuolumne River at Hughson Sewer (RM 23.6)



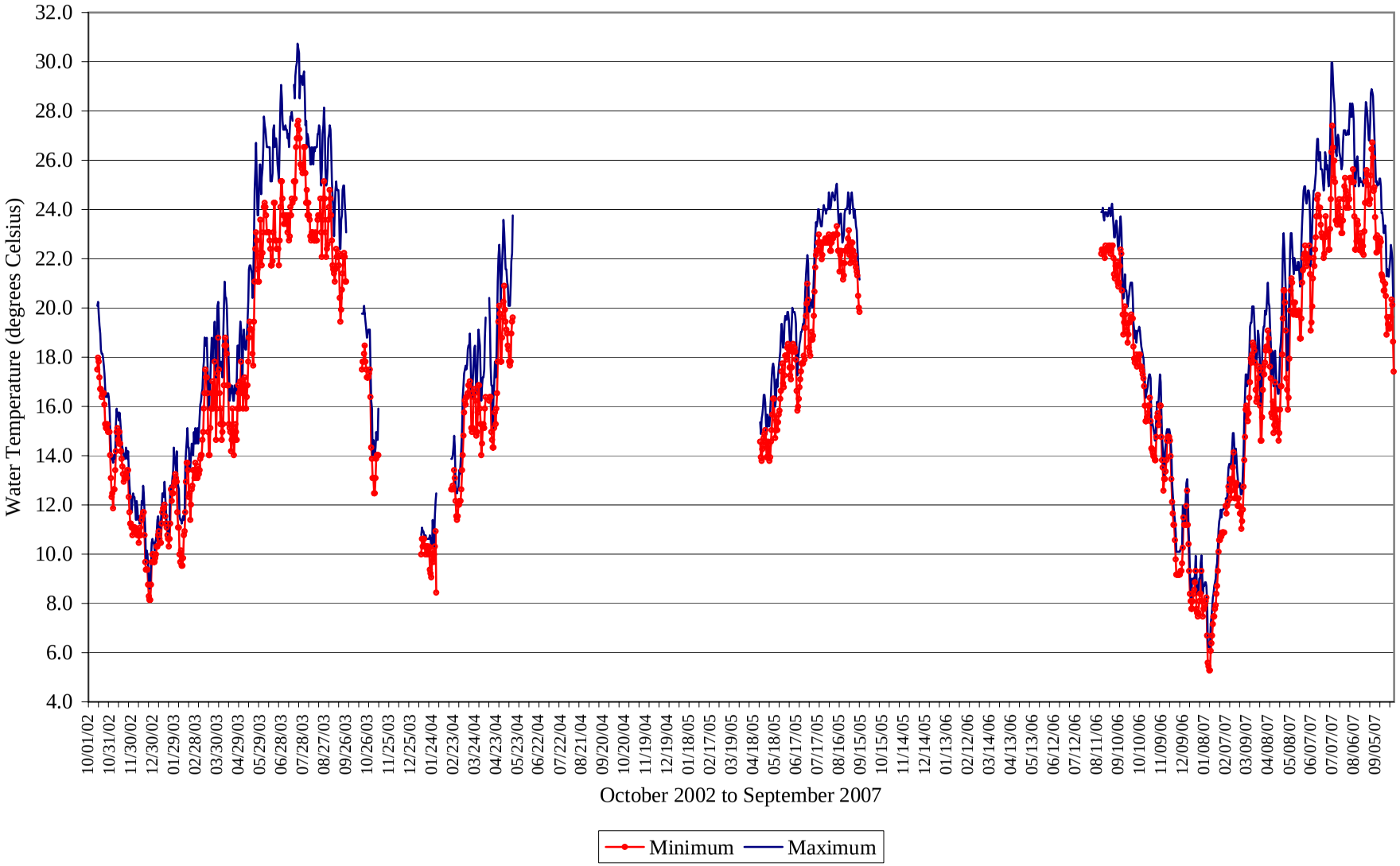
Tuolumne River at Shiloh Rd. (RM 3.4)



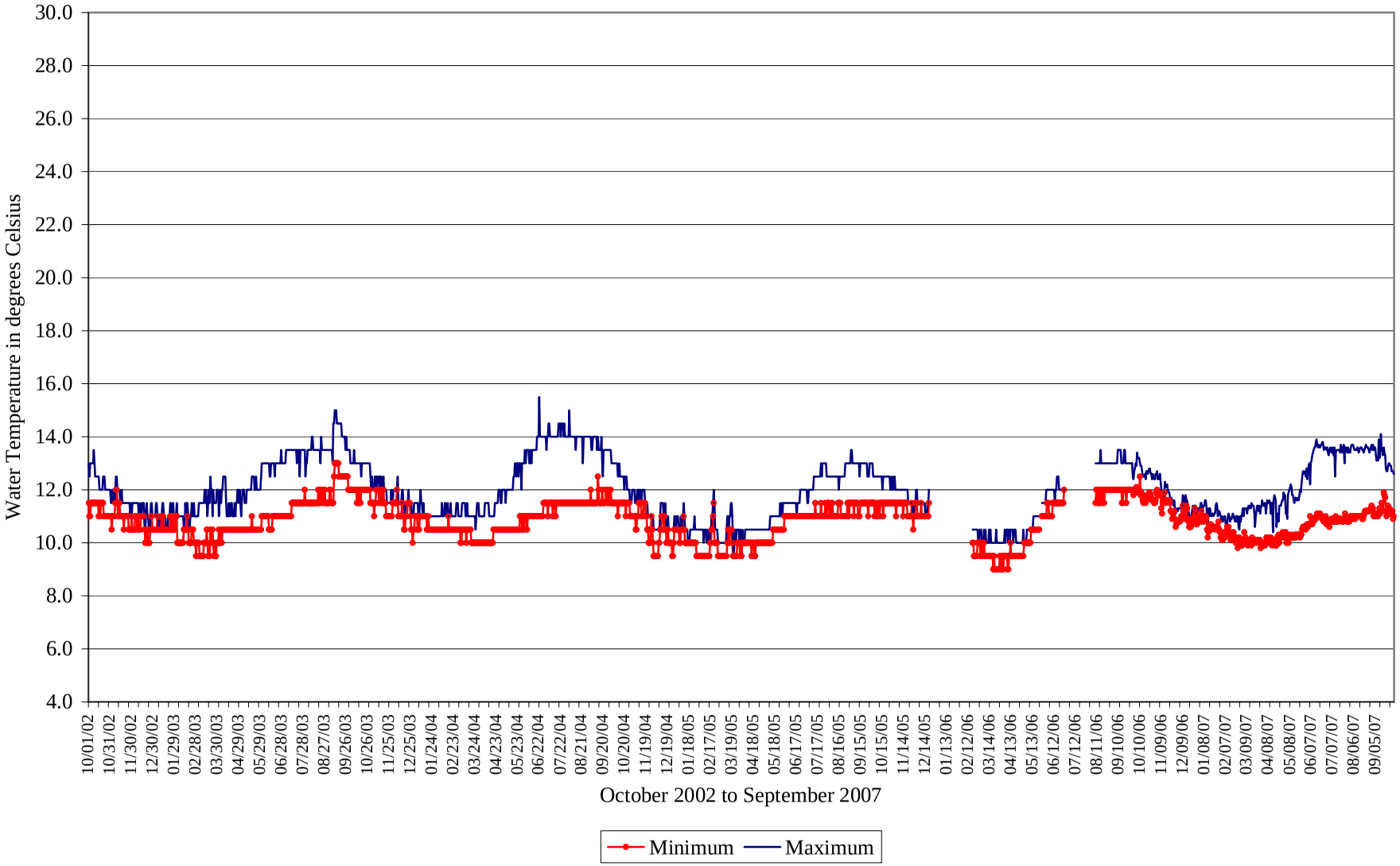
San Joaquin River at Dos Rios Ranch (RM 86.2)

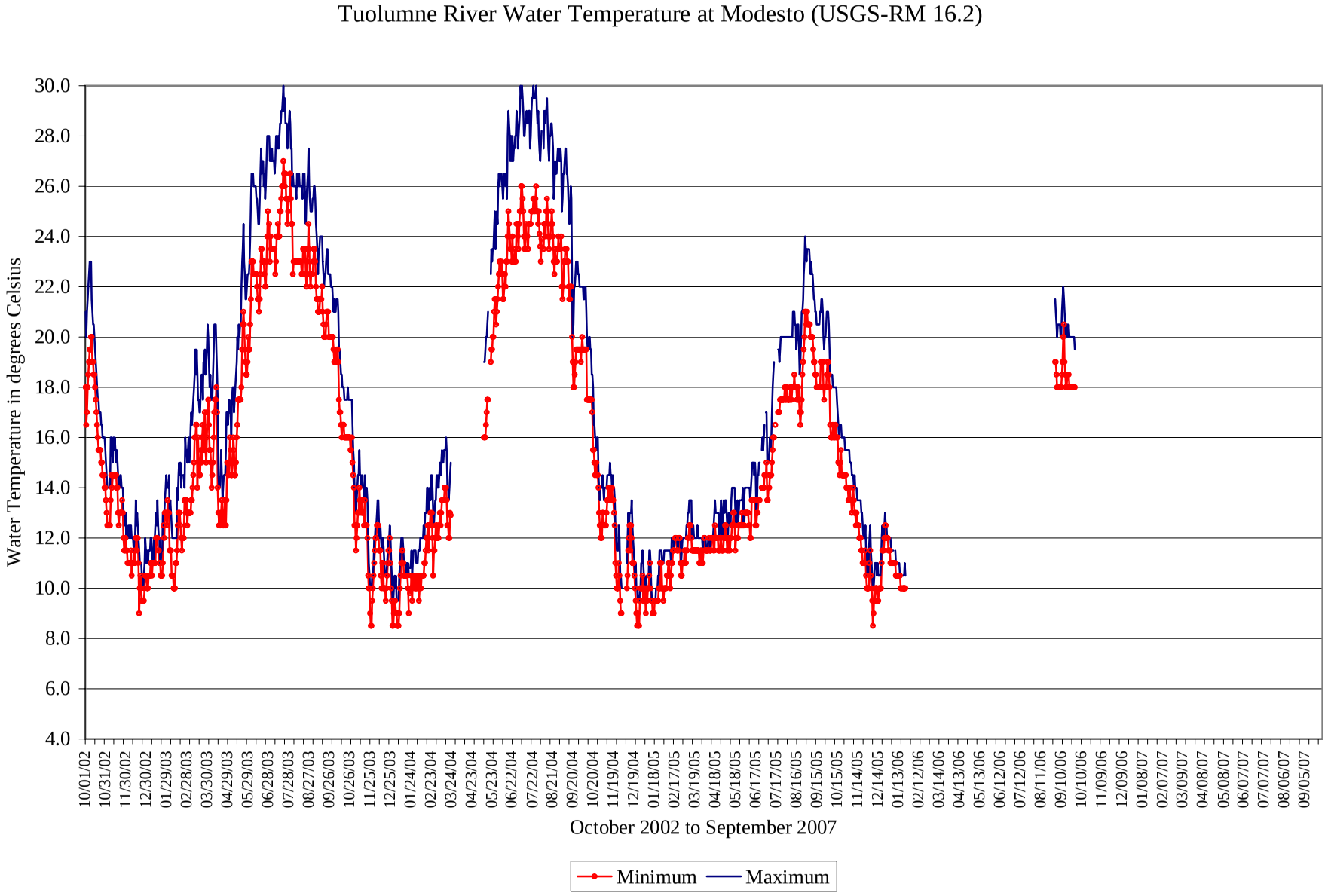


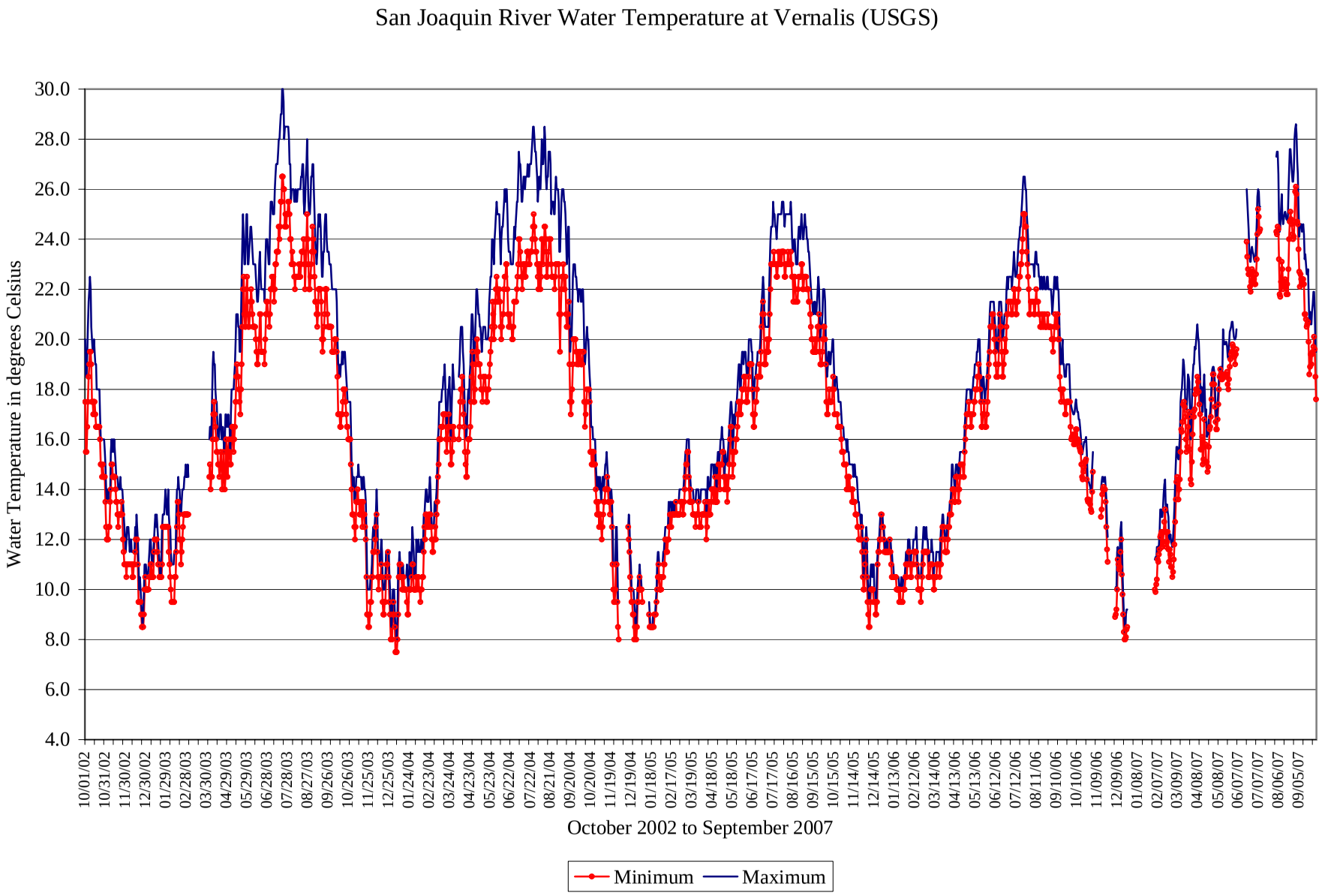
San Joaquin River at Gardner Cove (RM 79.1)



Tuolumne River Water Temperature at La Grange (USGS-RM 51.8)




Tuolumne River Water Temperature at Modesto (USGS-RM 16.2)
Water Temperature in degrees Celsius
30.0
28.0
26.0
24.0
22.0
20.0
18.0
16.0
14.0
12.0
10.0
8.0
6.0
4.0
10/01/02
10/31/02
11/30/02
12/30/02
01/29/03
02/28/03
03/30/03
04/29/03
05/29/03
06/28/03
07/28/03
08/27/03
09/26/03
10/26/03
11/25/03
12/25/03
01/24/04
02/23/04
03/24/04
04/23/04
05/23/04
06/22/04
07/22/04
08/21/04
09/20/04
10/20/04
11/19/04
12/19/04
01/18/05
02/17/05
03/19/05
04/18/05
05/18/05
06/17/05
07/17/05
08/16/05
09/15/05
10/15/05
11/14/05
12/14/05
01/13/06
02/12/06
03/14/06
04/13/06
05/13/06
06/12/06
07/12/06
08/11/06
09/10/06
10/10/06
11/09/06
12/09/06
01/08/07
02/07/07
03/09/07
04/08/07
05/08/07
06/07/07
07/07/07
08/06/07
09/05/07
October 2002 to September 2007
Minimum
Maximum


San Joaquin River Water Temperature at Vernalis (USGS)
Water Temperature in degrees Celsius
30.0
28.0
26.0
24.0
22.0
20.0
18.0
16.0
14.0
12.0
10.0
8.0
6.0
4.0
10/01/02
10/31/02
11/30/02
12/30/02
01/29/03
02/28/03
03/30/03
04/29/03
05/29/03
06/28/03
07/28/03
08/27/03
09/26/03
10/26/03
11/25/03
12/25/03
01/24/04
02/23/04
03/24/04
04/23/04
05/23/04
06/22/04
07/22/04
08/21/04
09/20/04
10/20/04
11/19/04
12/19/04
01/18/05
02/17/05
03/19/05
04/18/05
05/18/05
06/17/05
07/17/05
08/16/05
09/15/05
10/15/05
11/14/05
12/14/05
01/13/06
02/12/06
03/14/06
04/13/06
05/13/06
06/12/06
07/12/06
08/11/06
09/10/06
10/10/06
11/09/06
12/09/06
01/08/07
02/07/07
03/09/07
04/08/07
05/08/07
06/07/07
07/07/07
08/06/07
09/05/07
October 2002 to September 2007
Minimum
Maximum

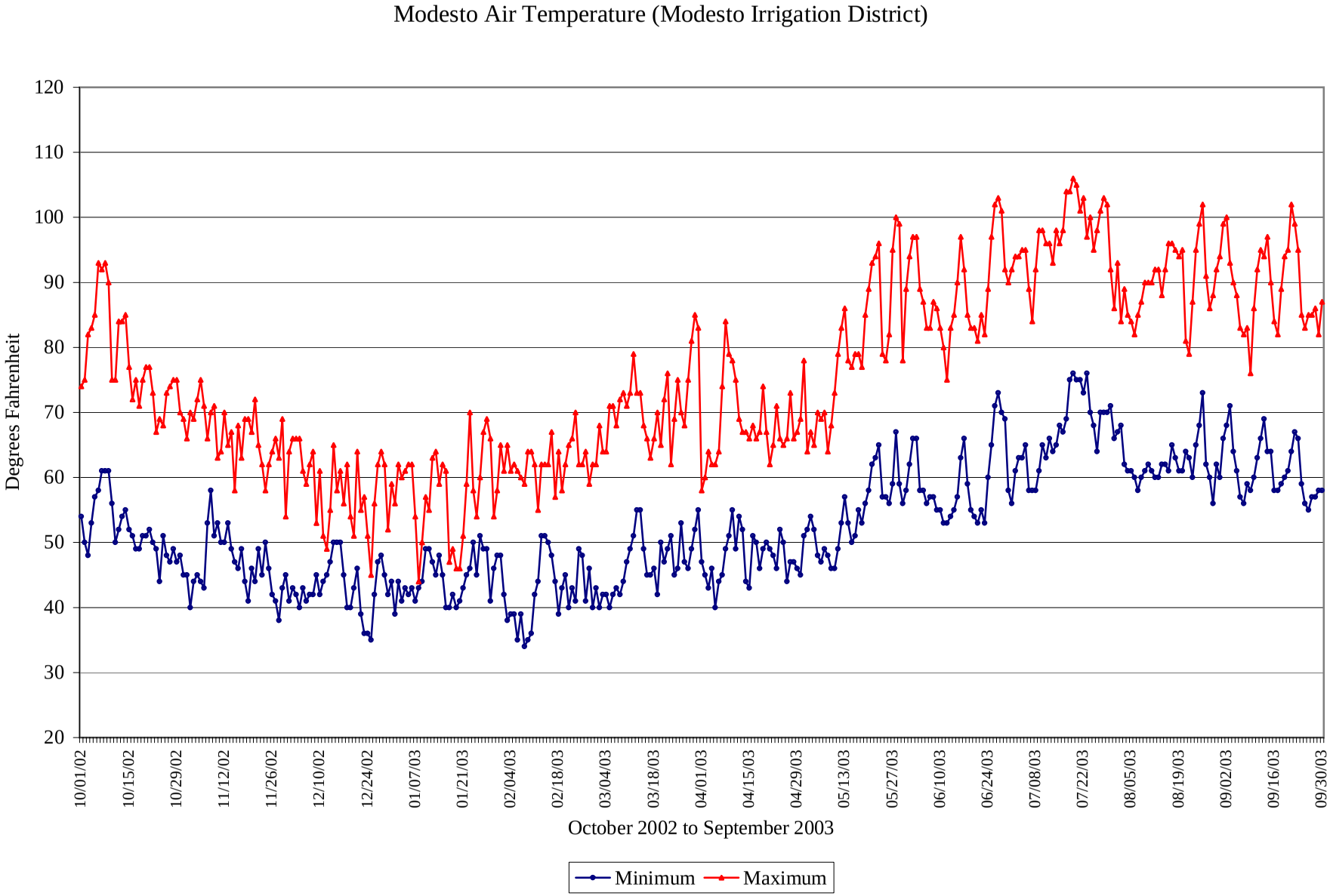
APPENDIX C – Air Temperature and Precipitation

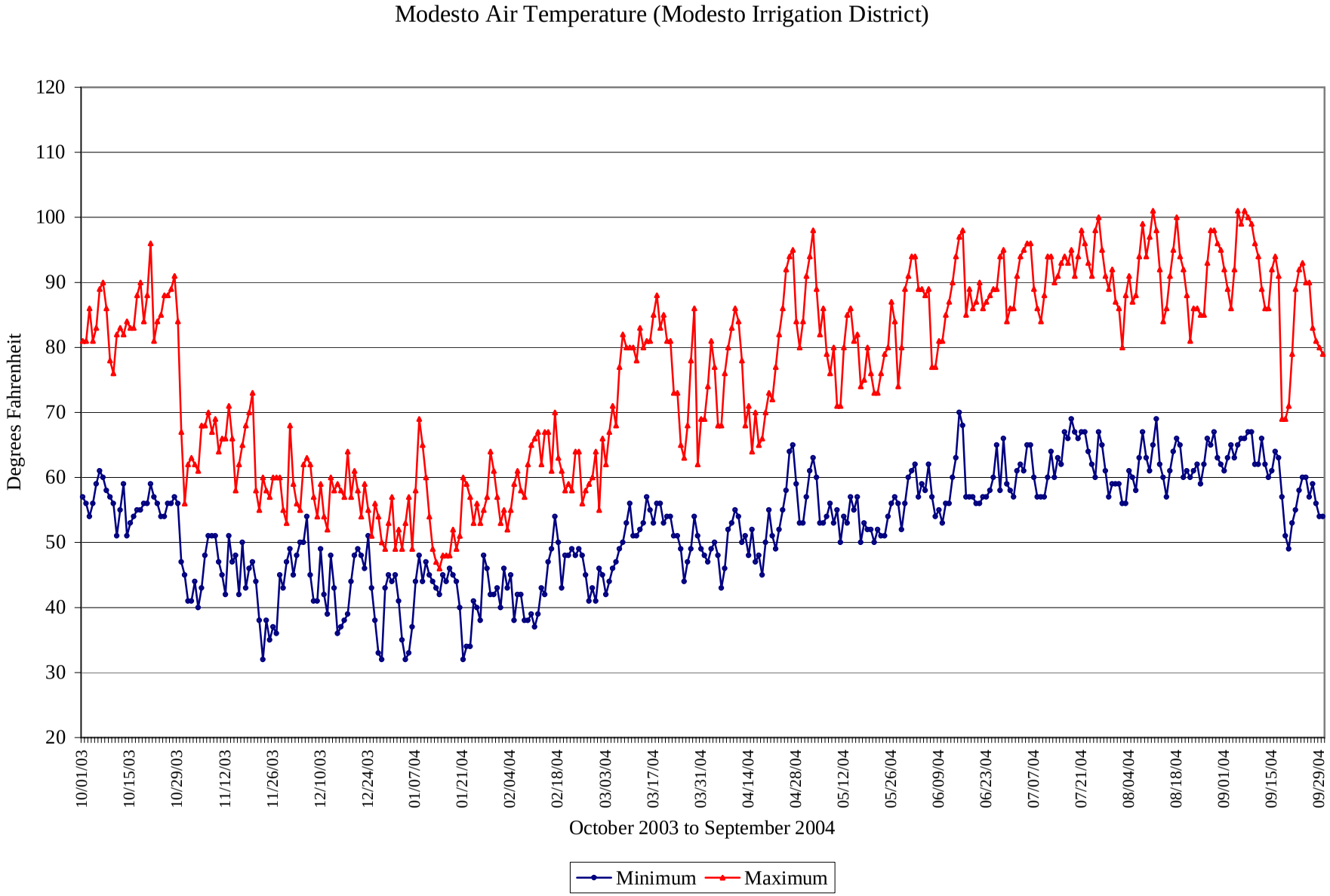
Daily minimum and maximum air temperature at Modesto, CA

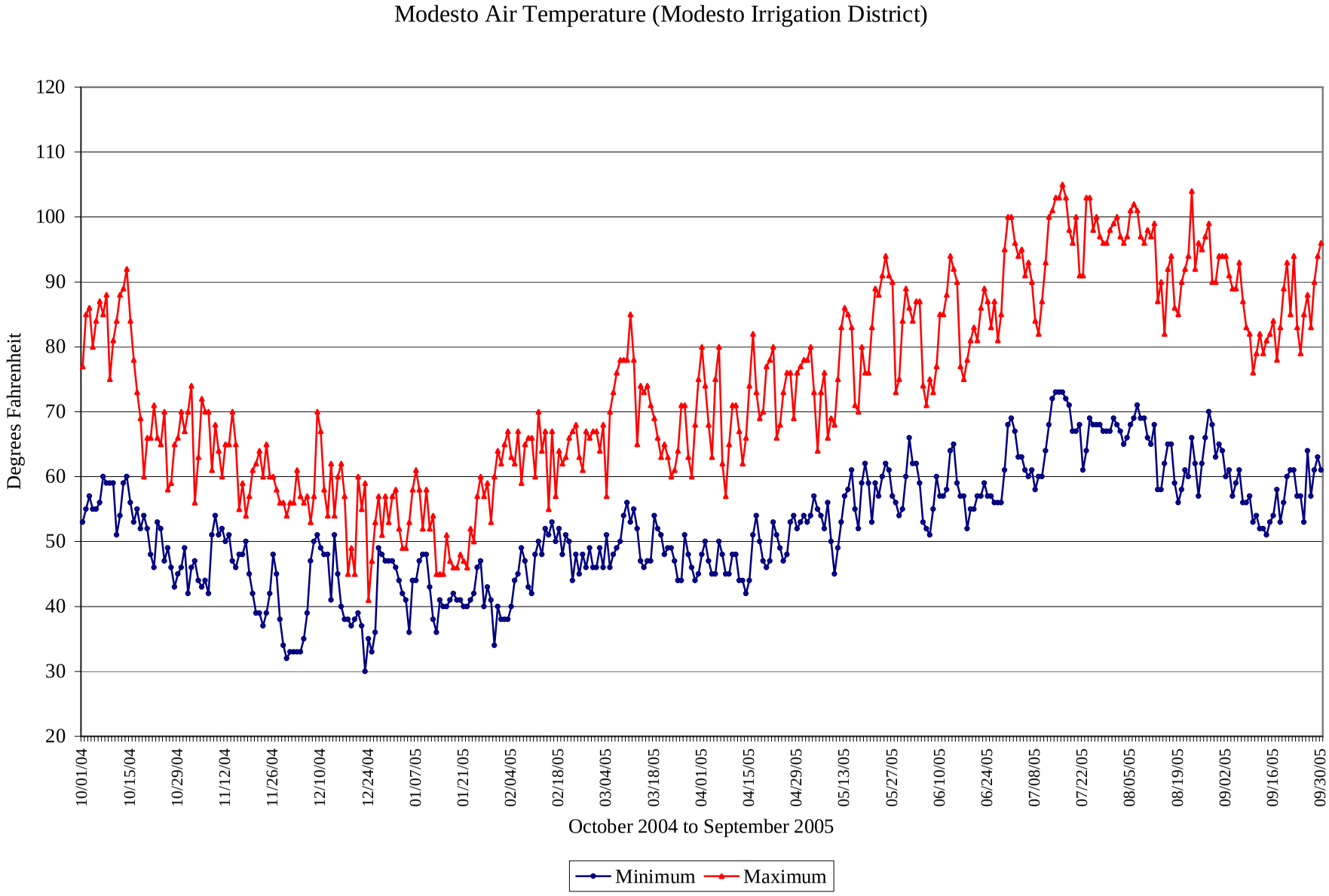
Water Years 2003 to 2007

Daily precipitation at Modesto, CA

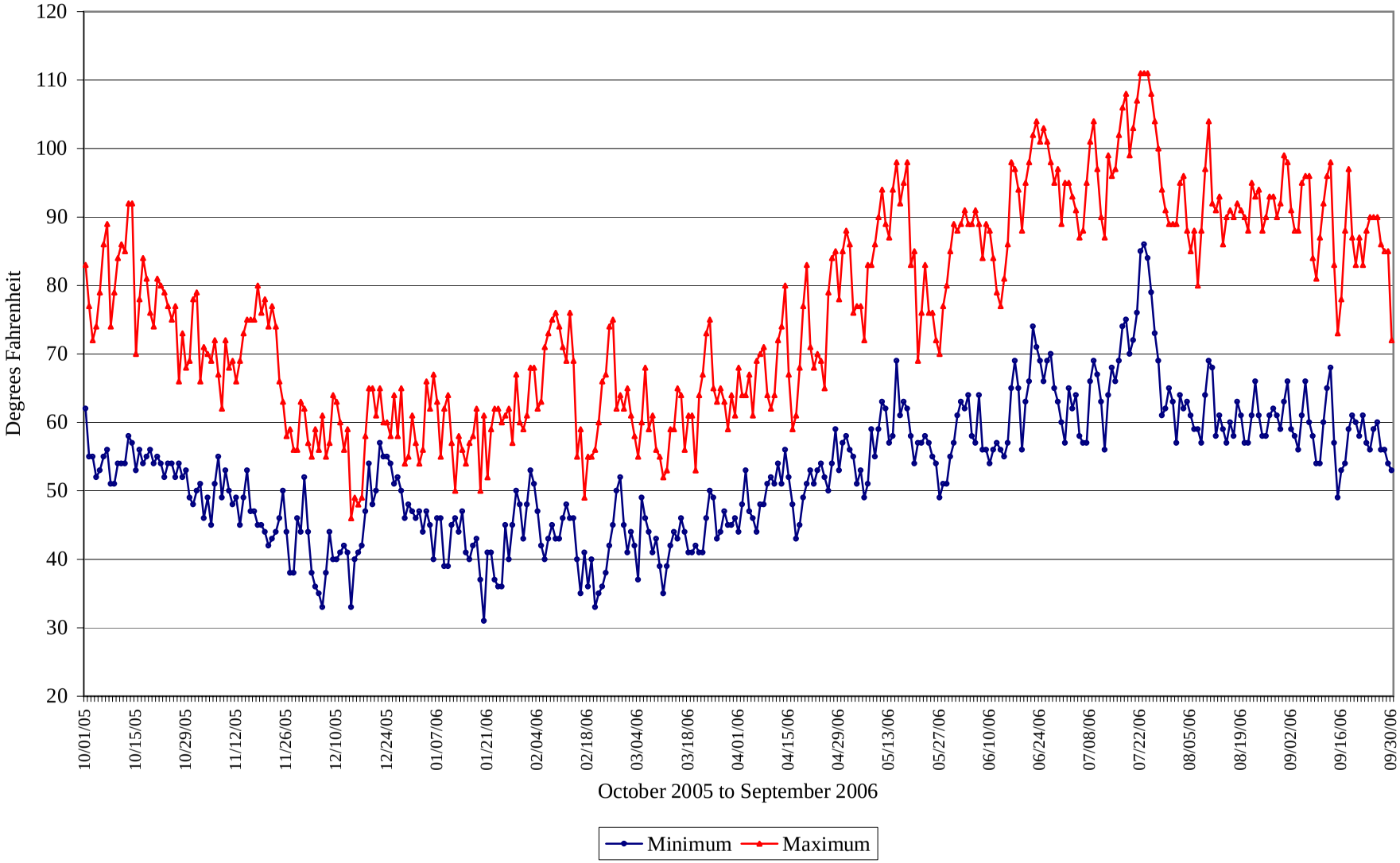
January 1998 to January 2008

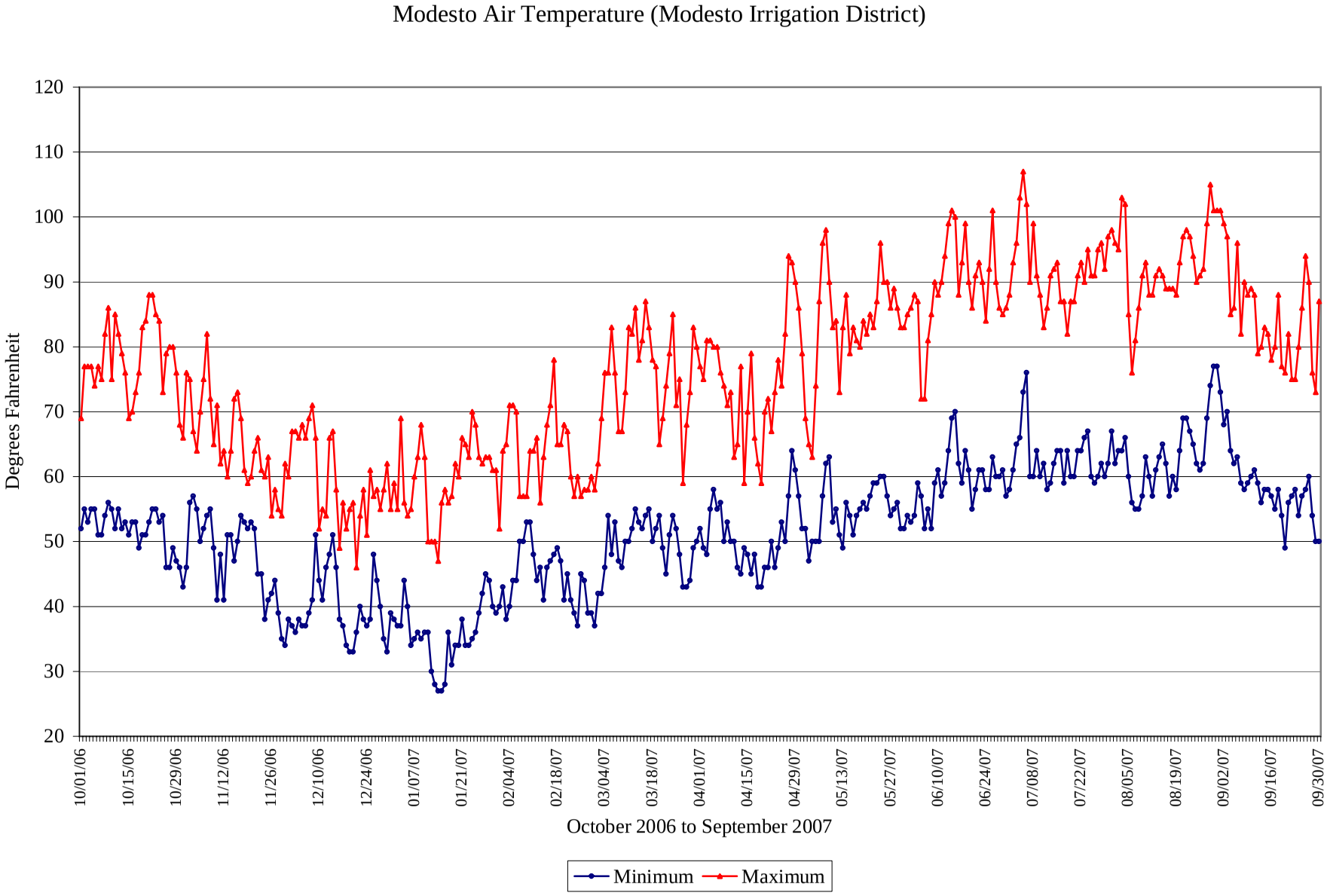

Modesto Air Temperature (Modesto Irrigation District)
Degrees Fahrenheit
120
110
100
90
80
70
60
50
40
30
20
10/01/02
10/15/02
10/29/02
11/12/02
11/26/02
12/10/02
12/24/02
01/07/03
01/21/03
02/04/03
02/18/03
03/04/03
03/18/03
04/01/03
04/15/03
04/29/03
05/13/03
05/27/03
06/10/03
06/24/03
07/08/03
07/22/03
08/05/03
08/19/03
09/02/03
09/16/03
09/30/03
October 2002 to September 2003
Minimum
Maximum


Modesto Air Temperature (Modesto Irrigation District)
Degrees Fahrenheit
120
110
100
90
80
70
60
50
40
30
20
10/01/03
10/15/03
10/29/03
11/12/03
11/26/03
12/10/03
12/24/03
01/07/04
01/21/04
02/04/04
02/18/04
03/03/04
03/17/04
03/31/04
04/14/04
04/28/04
05/12/04
05/26/04
06/09/04
06/23/04
07/07/04
07/21/04
08/04/04
08/18/04
09/01/04
09/15/04
09/29/04
October 2003 to September 2004
Minimum
Maximum

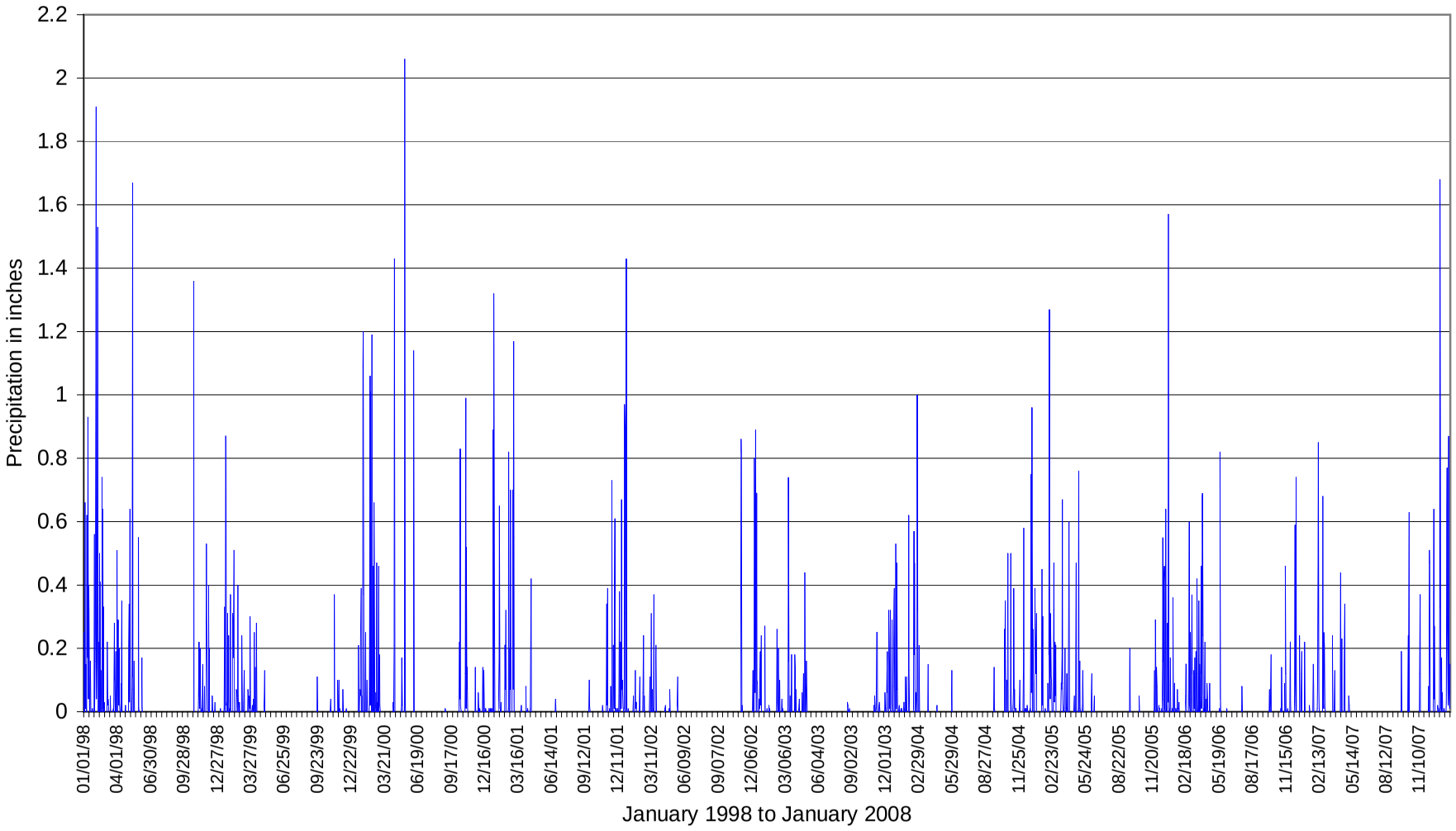

Modesto Air Temperature (Modesto Irrigation District)
Degrees Fahrenheit
120
110
100
90
80
70
60
50
40
30
20
10/01/04
10/15/04
10/29/04
11/12/04
11/26/04
12/10/04
12/24/04
01/07/05
01/21/05
02/04/05
02/18/05
03/04/05
03/18/05
04/01/05
04/15/05
04/29/05
05/13/05
05/27/05
06/10/05
06/24/05
07/08/05
07/22/05
08/05/05
08/19/05
09/02/05
09/16/05
09/30/05
October 2004 to September 2005
Minimum
Maximum

Modesto Air Temperature (Modesto Irrigation District)




Modesto Air Temperature (Modesto Irrigation District)
Degrees Fahrenheit
120
110
100
90
80
70
60
50
40
30
20
10/01/06
10/15/06
10/29/06
11/12/06
11/26/06
12/10/06
12/24/06
01/07/07
01/21/07
02/04/07
02/18/07
03/04/07
03/18/07
04/01/07
04/15/07
04/29/07
05/13/07
05/27/07
06/10/07
06/24/07
07/08/07
07/22/07
08/05/07
08/19/07
09/02/07
09/16/07
09/30/07
October 2006 to September 2007
Minimum
Maximum

Precipitation at the Modesto Irrigation District



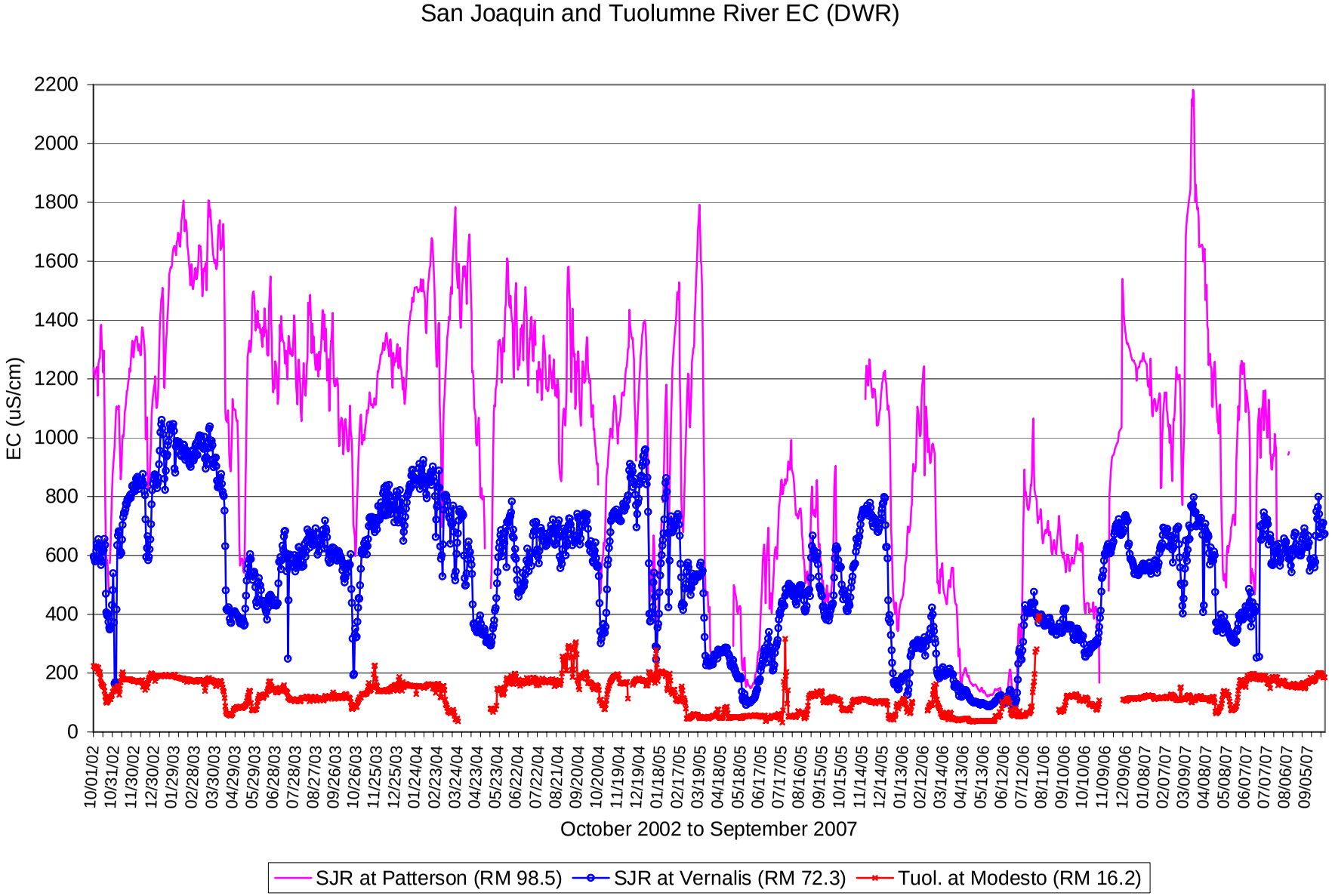
APPENDIX D – Conductivity

USGS locations: Tuolumne River at Modesto, San Joaquin River near Patterson and Vernalis

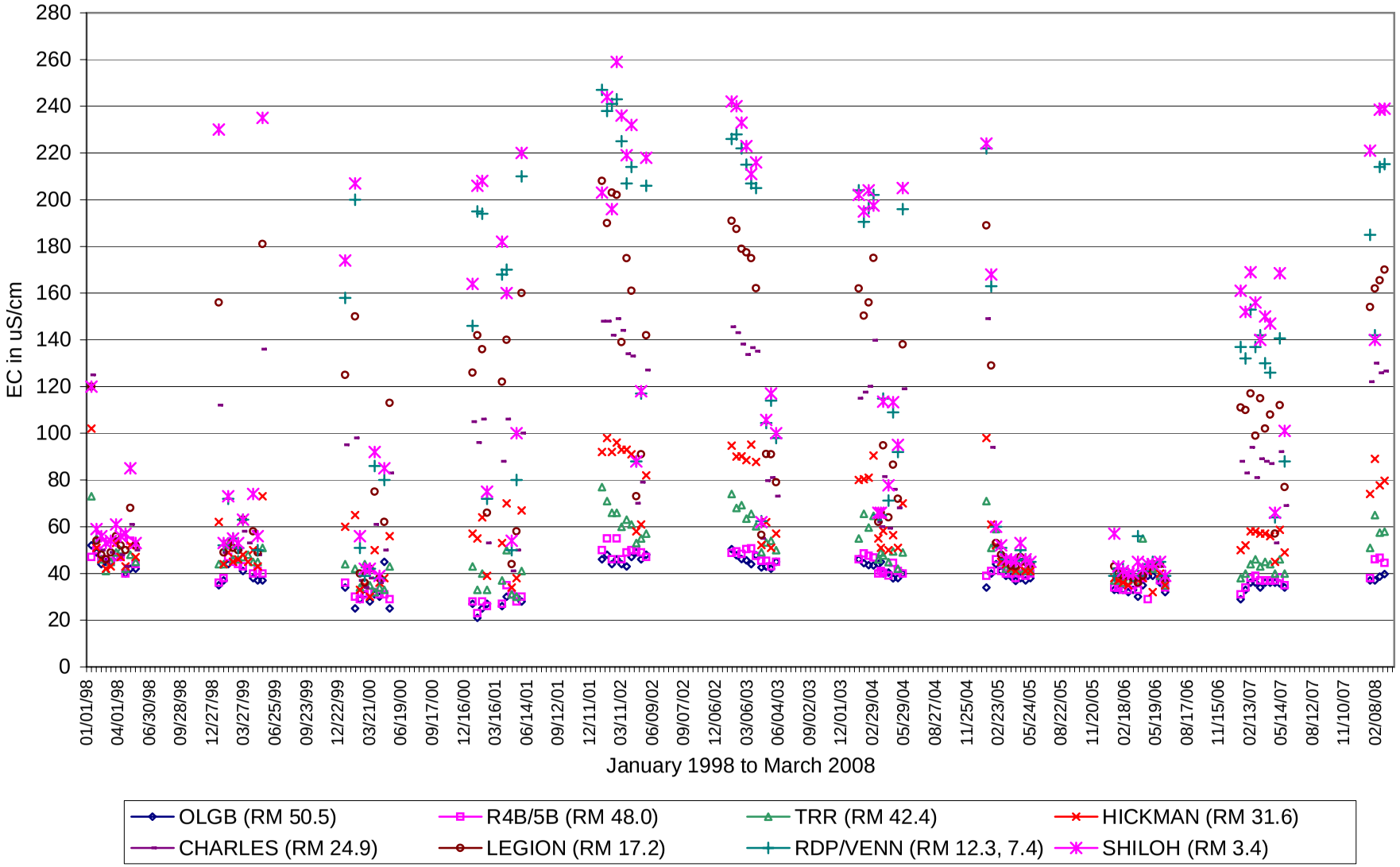
Water Year 2003 to 2007:

TID/MID data recorded during seining studies

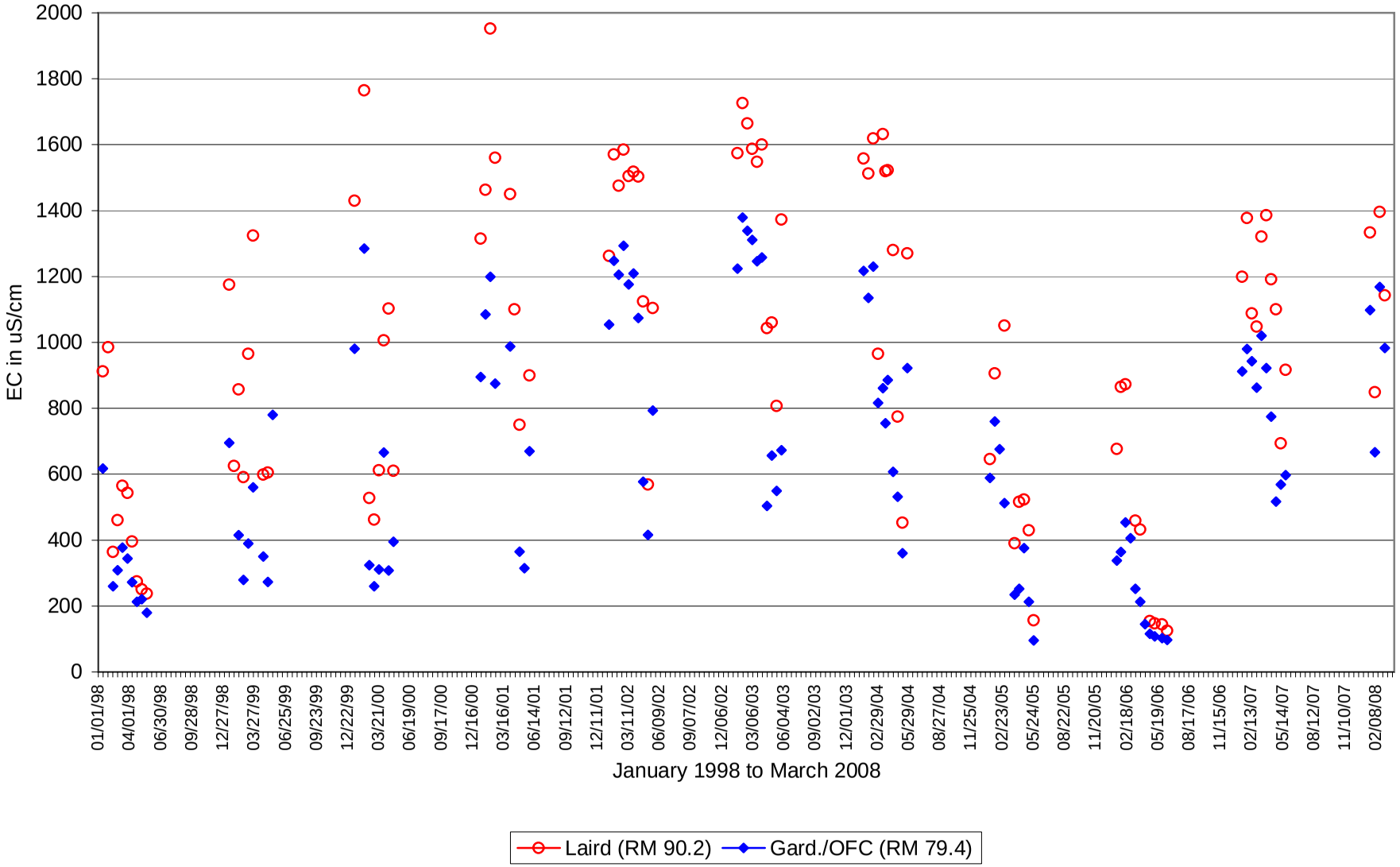
January 1998 to March 2008:


San Joaquin and Tuolumne River EC (DWR)
EC (uS/cm)
2200
2000
1800
1600
1400
1200
1000
800
600
400
200
0
10/01/02
10/31/02
11/30/02
12/30/02
01/29/03
02/28/03
03/30/03
04/29/03
05/29/03
06/28/03
07/28/03
08/27/03
09/26/03
10/26/03
11/25/03
12/25/03
01/24/04
02/23/04
03/24/04
04/23/04
05/23/04
06/22/04
07/22/04
08/21/04
09/20/04
10/20/04
11/19/04
12/19/04
01/18/05
02/17/05
03/19/05
04/18/05
05/18/05
06/17/05
07/17/05
08/16/05
09/15/05
10/15/05
11/14/05
12/14/05
01/13/06
02/12/06
03/14/06
04/13/06
05/13/06
06/12/06
07/12/06
08/11/06
09/10/06
10/10/06
11/09/06
12/09/06
01/08/07
02/07/07
03/09/07
04/08/07
05/08/07
06/07/07
07/07/07
08/06/07
09/05/07
October 2002 to September 2007
SJR at Patterson (RM 98.5)
SJR at Vernalis (RM 72.3)
Tuol. at Modesto (RM 16.2)

Tuolumne River EC taken during the seining studies.



San Joaquin River EC taken during the seining studies.

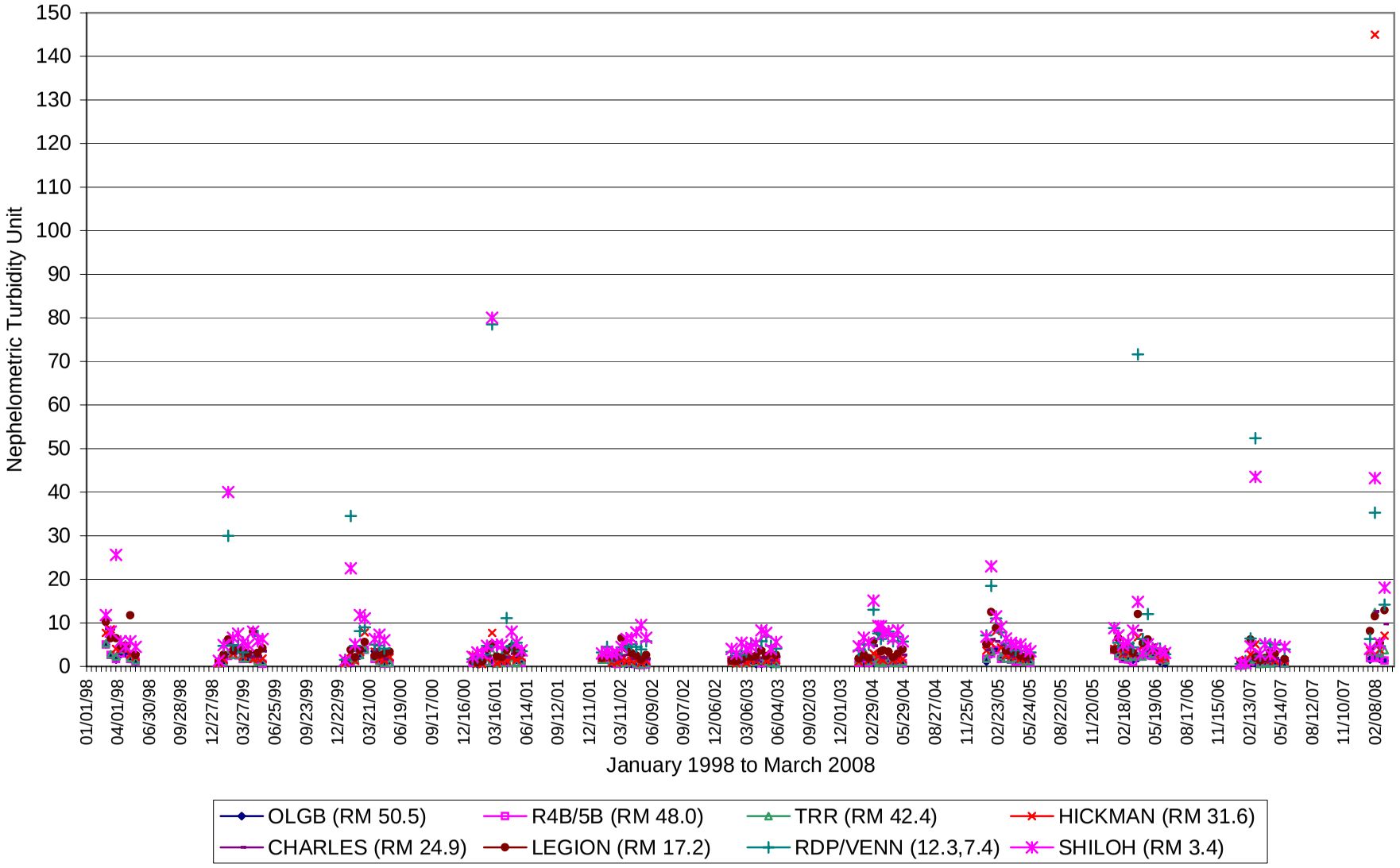


APPENDIX E - Turbidity

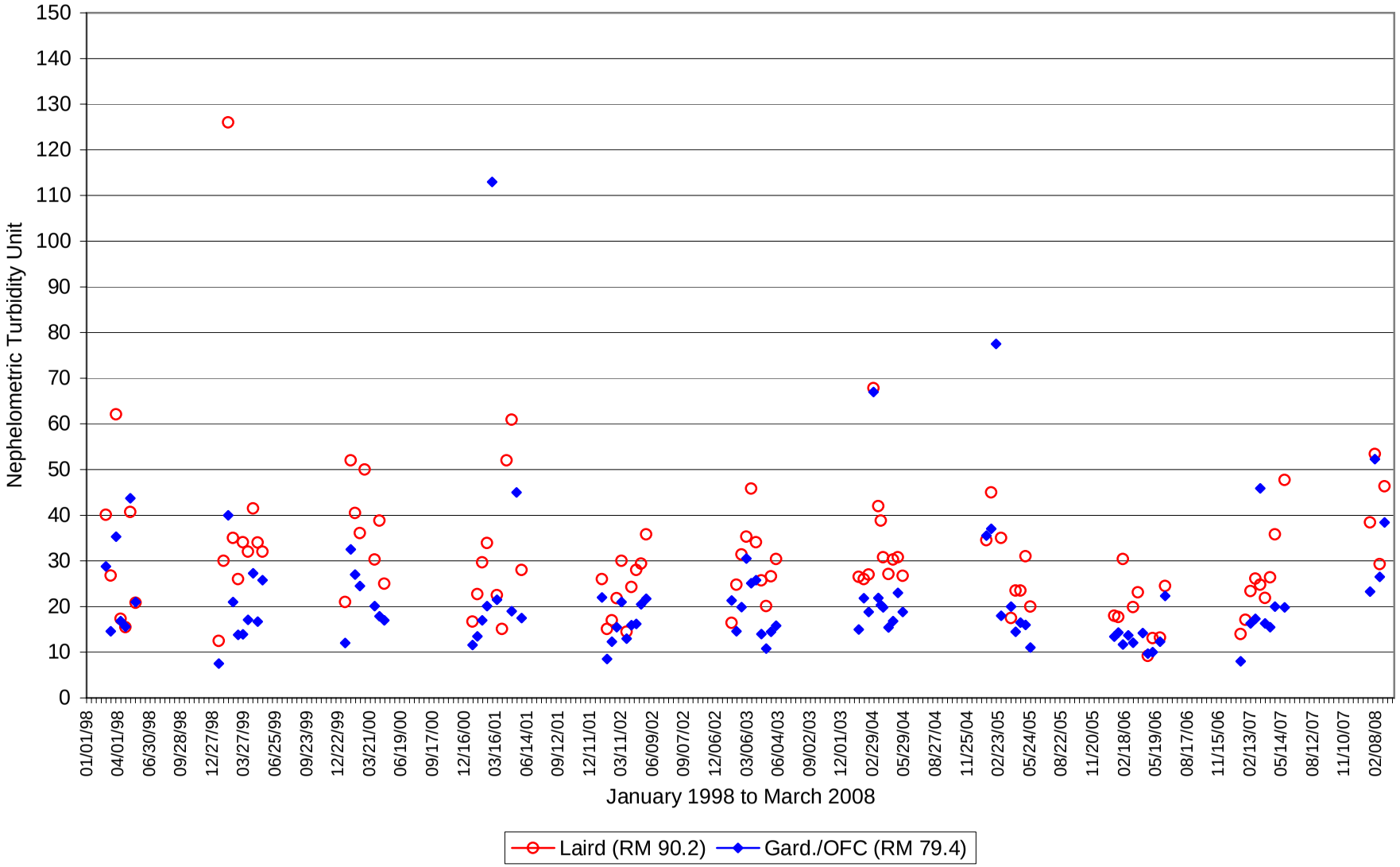
TID/MID data recorded during seining studies

January 1998 to March 2008

Tuolumne River turbidity taken during the seining studies.



San Joaquin River turbidity taken during the seining studies.

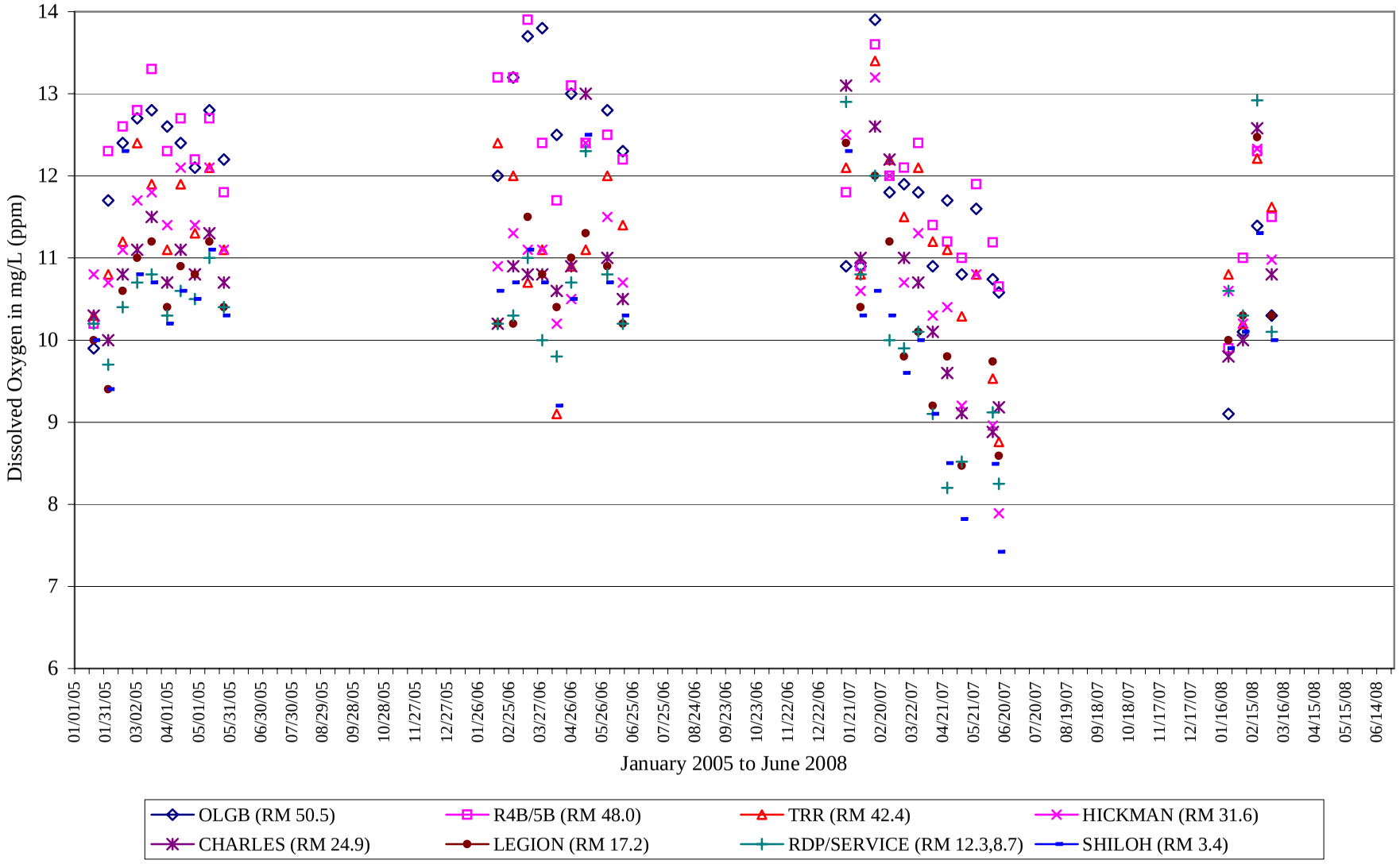


APPENDIX F – Dissolved Oxygen

TID/MID data recorded during seining studies

January 2005 to March 2008

Tuolumne River Dissolved Oxygen measured during the seining studies



San Joaquin River Dissolved Oxygen measured during the seining studies