

# NOTE

- This is preliminary data and not to be used without permission of the UFRW team.

# Upper Feather River Watershed Monitoring Program: 2007 Data Summary

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- American Valley (AV)  
UFRW UFRW
- Indian Valley (IV)  
UFRW UFRW UFRW
- Sierra Valley (SV)  
UFRW UFRW
- Goodrich Creek (GC)  
UFRW UFRW

# Sierra Valley

- Outlet site changed this year
  - from site 11 to site 11.5

## Further downstream

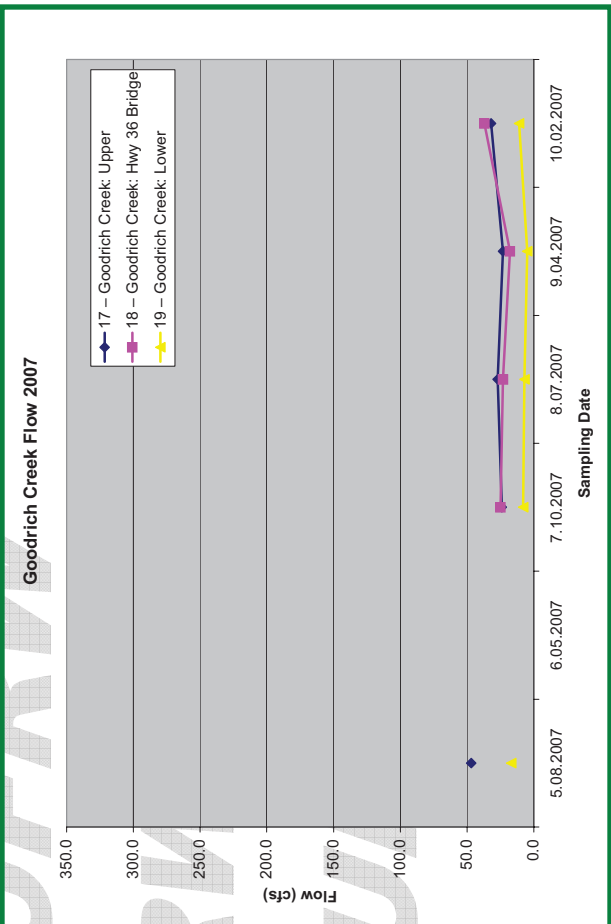
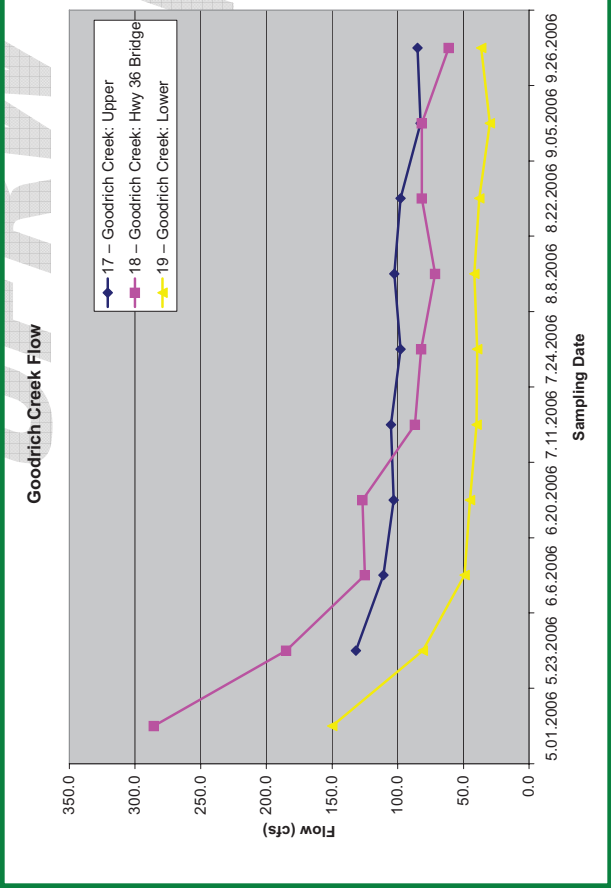
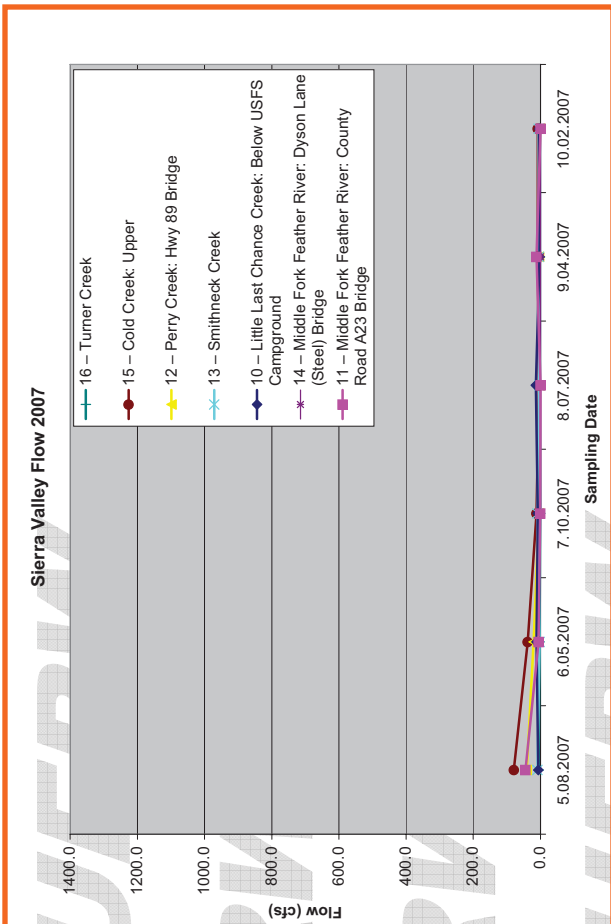
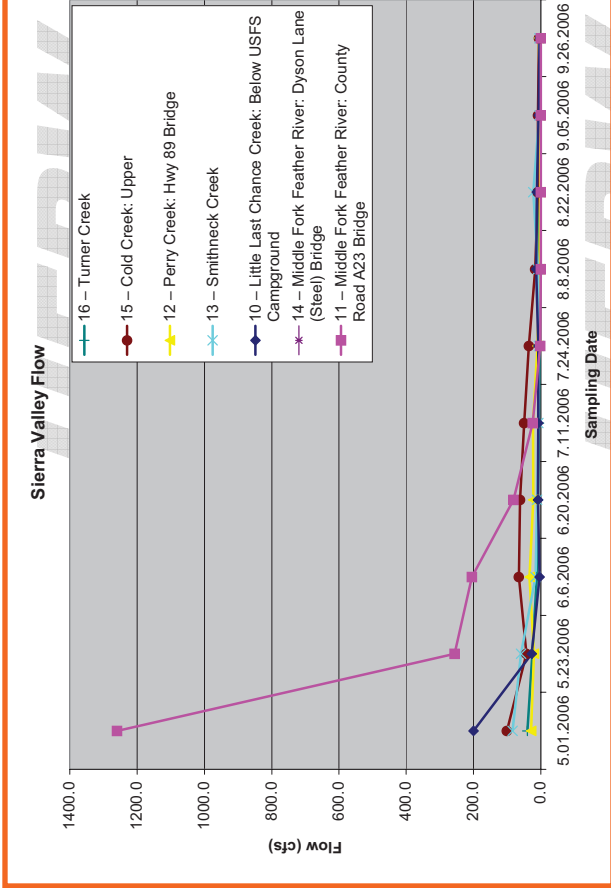
Includes water coming from USFS grazed plots  
Allows more time for incorporation/degradation

Some graphs will include BOTH sites 11 and 11.5 to illustrate differences in water quality related to outlet sampling location



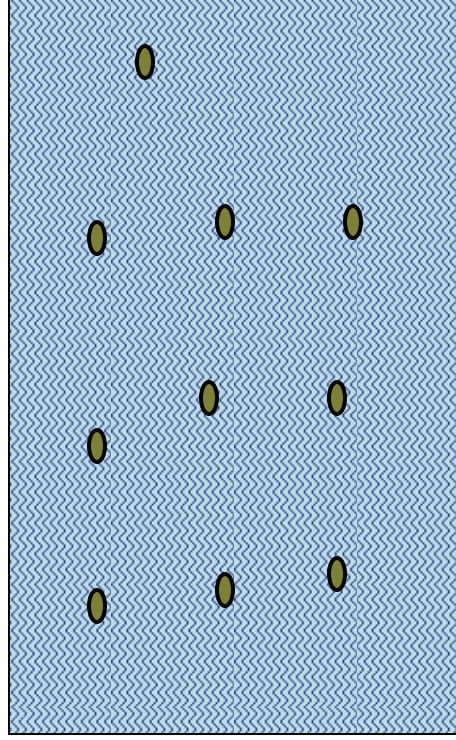


# Instantaneous flow data



# Concentration vs. Load

- We use concentrations and flow to calculate loads



- Water quality objectives are typically based on concentrations

- Loads illustrate how constituents are balanced – retained by the valley or exported from the valley

# Constituents monitored: Nutrients

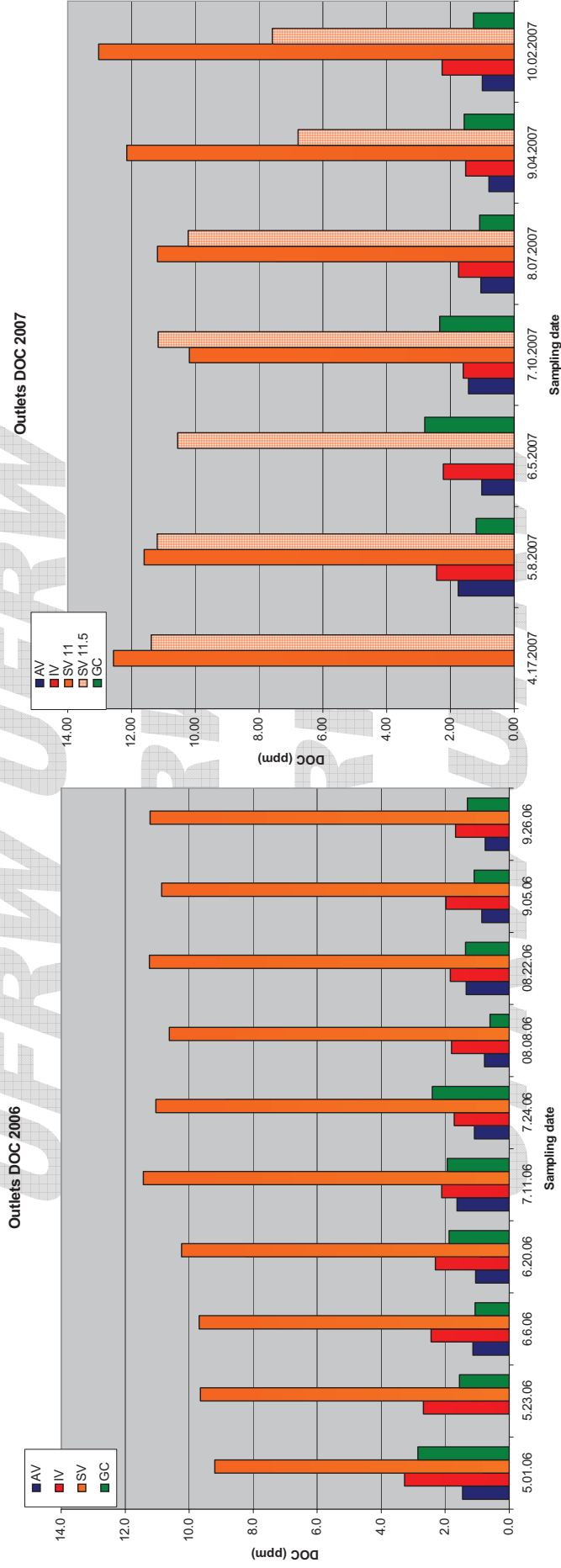
Constituent	Water Quality Limit	Remarks
Total Nitrogen	NA	Mean= 0.21 mg/L (2006); 0.22 mg/L (2007)      Max= 1.2 mg/L (2006) 2.2 mg/L (2007)
Nitrate-N	10 mg/L	All samplings below std. Mean= 0.025 mg/L (2006)      Max= 0.20 mg/L (2006) 0.099 mg/L (2007)      3.6 mg/L (2007) (0.65)
Ammonia-N	25 mg/L	All samplings below std. Mean= 0.012 mg/L (2006)      Max= 0.17 mg/L (2006) 0.016 mg/L (2007)      0.15 mg/L (2007)
Total Phosphorous	NA	Mean= 0.036 mg/L (2006);      Max= 0.23 mg/L (2006) 0.026 mg/L (2007)      0.14 mg/L (2007)
Phosphate-P	NA	Mean= 0.009 mg/L (2006);      Max= 0.10 mg/L (2006) 0.025 mg/L (2007)      1.68 mg/L (2007)
Dissolved Organic Carbon	NA	Mean= 2.5 mg/L (2006);      Max= 11.6 mg/L (2006) 3.16 mg/L (2007)      28.0 mg/L (2007)

# Dissolved Organic Carbon

- Typically associated with:
  - dissolved oxygen content

- nutrients

# DOC concentrations



2007: DOC in all valleys similar to 2006 values throughout season

**SV:** 2006-2007 Site 11 and 11.5 tend to be very high DOC relative to other valleys, but site 11.5 trends to lower DOC concentrations later in the season than at site 11

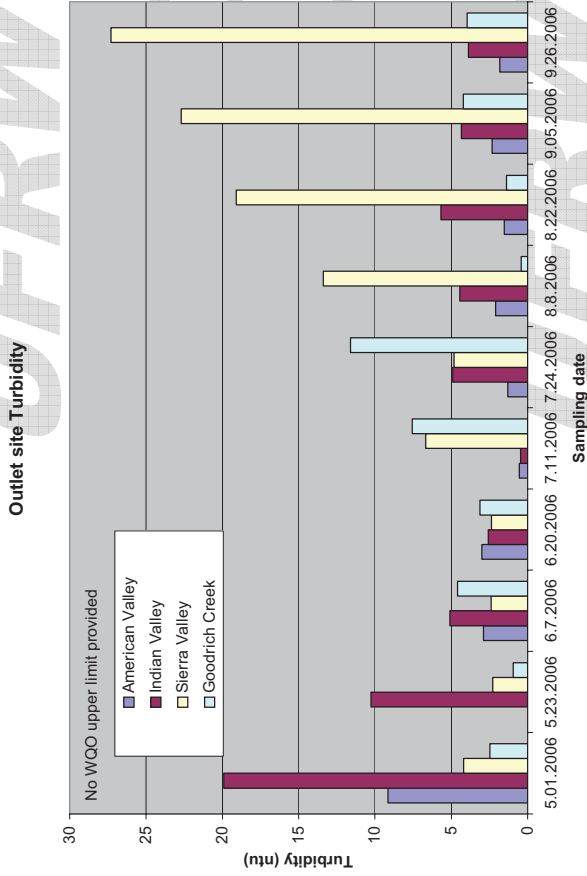
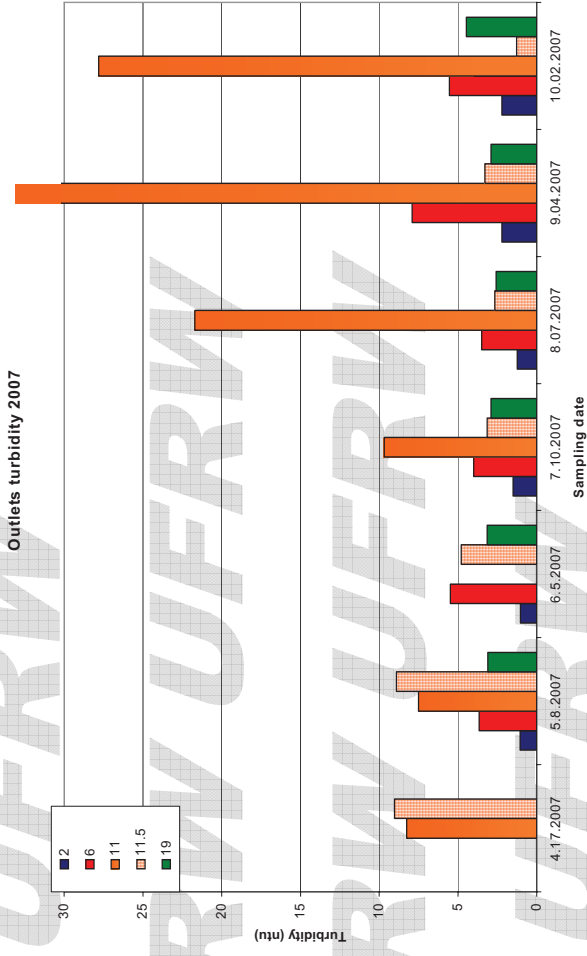
# Constituents monitored:

## Non-nutrients

Constituent	Water Quality Limit	Remarks
Turbidity	NA (relative to background)	Mean= 3.96 mg/L (2006); Max= 31.1 mg/L (2006) 6.70 mg/L (2007)
Total Suspended Solids	NA (relative to background)	Mean= 11.2 mg/L (2006); Max= 85.9 mg/L (2006) 15.6 mg/L (2007) 625 mg/L (2007)
Electrical Conductivity	150 Feather River; 700-900 for Ag. Program	Mean=92.5 mg/L (2006); Max=178 mg/L (2006) 130 mg/L (2007) 267 mg/L (2007) See summary slide for exceedances.
pH	6.5-8.5	See summary slide
Dissolved Oxygen	7 mg/L (coldwater fisheries)	See summary slide
Temperature	NA; (For Rainbow Trout <75°F)	See summary slide
<i>E. coli</i>	235 cfu/100mL	See summary slide
Metals		Not monitored in 2007
Toxicity		Not monitored in 2007



# Turbidity



2007: Turbidity in all valleys similar to or lower than in 2006 throughout season

AV, IV: Early season much lower in 2007 than 2006

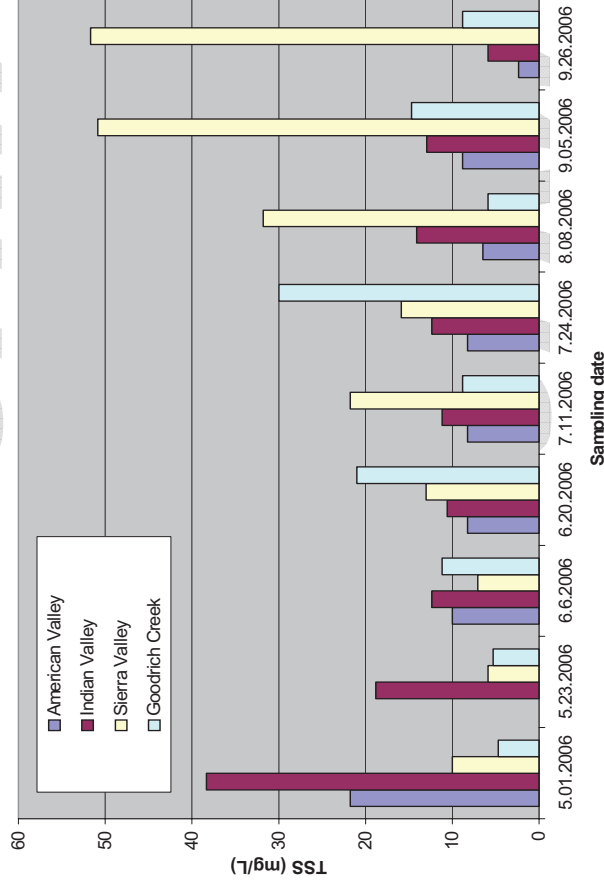
SV: 2006-2007 Site 11 late season turbidity very high, but site 11.5 very low

GC: 2006-2007 Consistently low turbidity

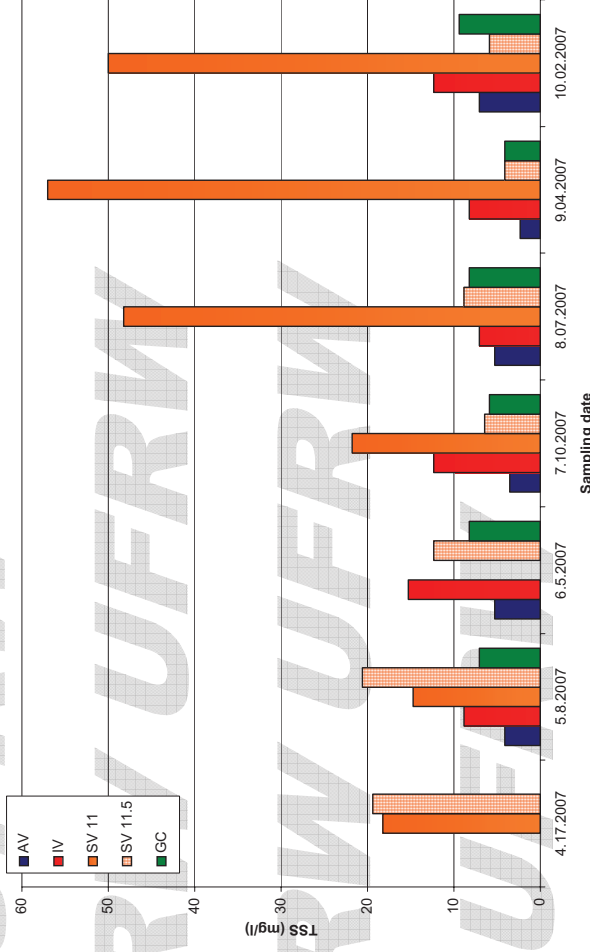


# Total Suspended Solids

Outlet Sites TSS



Outlets TSS 2007



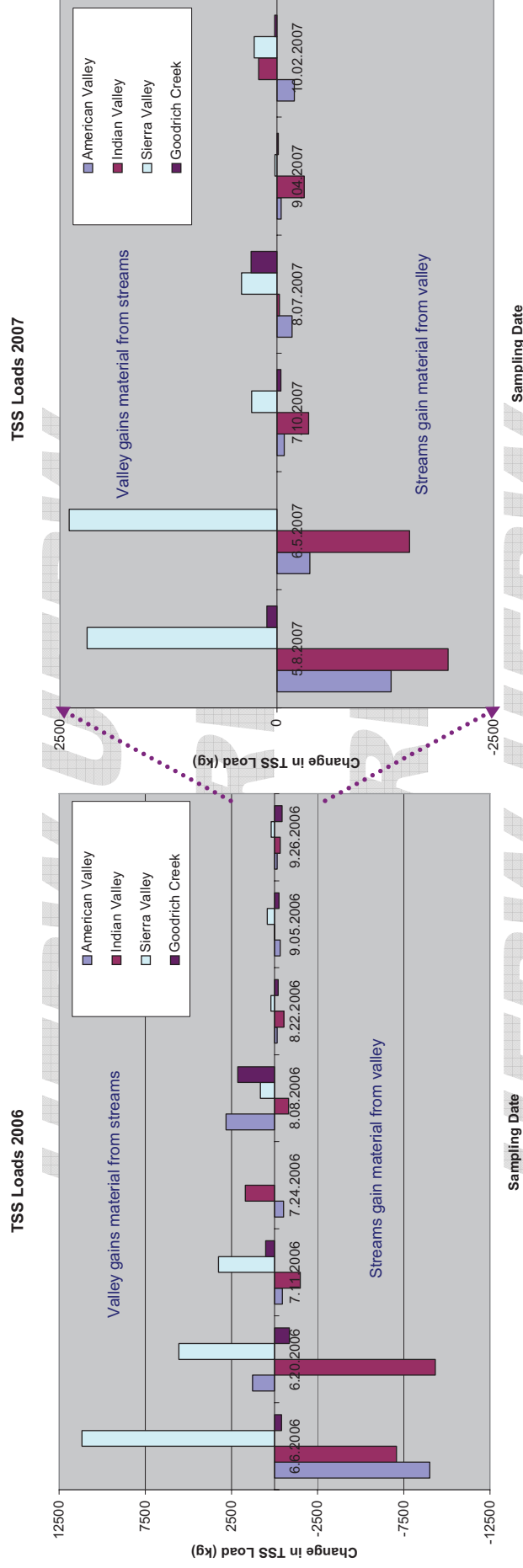
2007: TSS concentrations in all valleys are similar to or lower than in 2006 throughout season

AV, IV, GC: No important trends in concentration throughout season in 2007

## Sierra Valley

In 2007 TSS concentrations increase throughout the season at site 11, but decrease at site 11.5

# TSS as Loads



2007: TSS Loads in all valleys are much lower than in 2006 throughout season

**AV, IV:** 2006-2007 Stream is typically gaining material from the valley

**SV:** 2006-2007 Valley is typically gaining materials from the streams

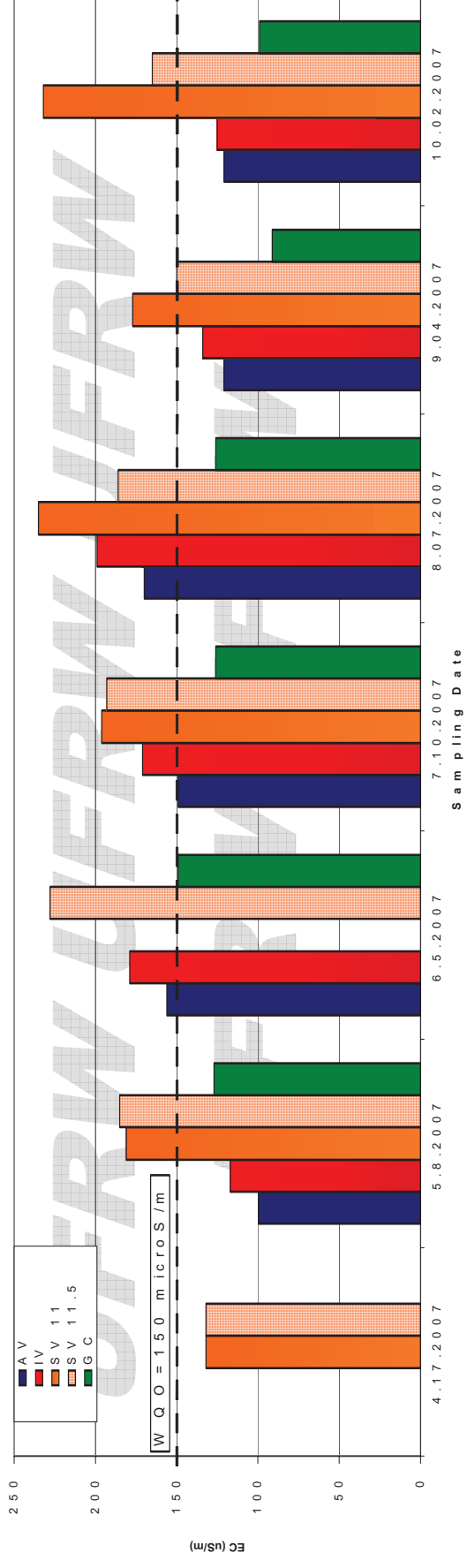
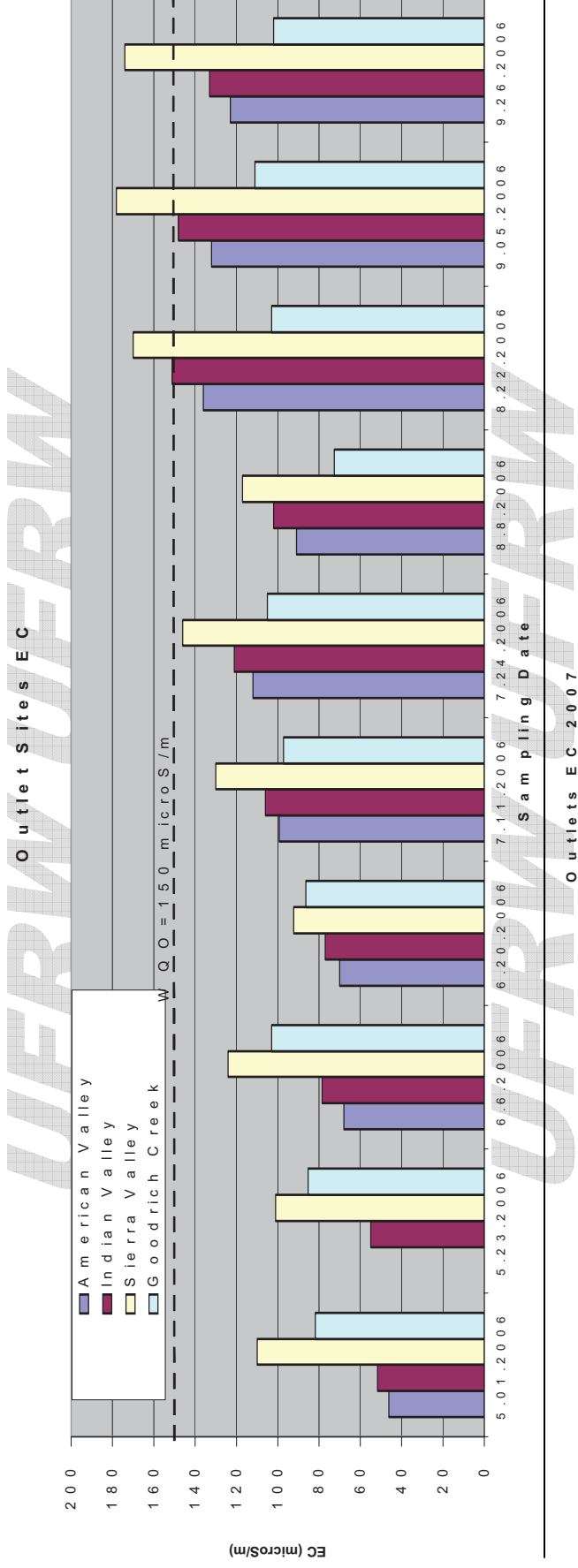
**GC:** 2006-2007 Very little material being carried in/out of valley throughout season

# Constituents monitored:

## Non-nutrients

Constituent	Water Quality Limit	Remarks
Turbidity	NA (relative to background)	Mean= 3.96 mg/L (2006); Max= 31.1 mg/L (2006) 6.70 mg/L (2007)
Total Suspended Solids	NA (relative to background)	Mean= 11.2 mg/L (2006); Max= 85.9 mg/L (2006) 15.6 mg/L (2007) 625 mg/L (2007)
Electrical Conductivity	150 Feather River; 700-900 for Ag. Program	Mean=92.5 mg/L (2006); Max=178 mg/L (2006) 130 mg/L (2007) 267 mg/L (2007) See summary slide for exceedances.
pH	6.5-8.5	See summary slide
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Temperature	NA; (For Rainbow Trout <75°F)	See summary slide
<i>E. coli</i>	235 cfu/100mL	See summary slide
Metals		Not monitored in 2007
Toxicity		Not monitored in 2007

# Electrical Conductivity

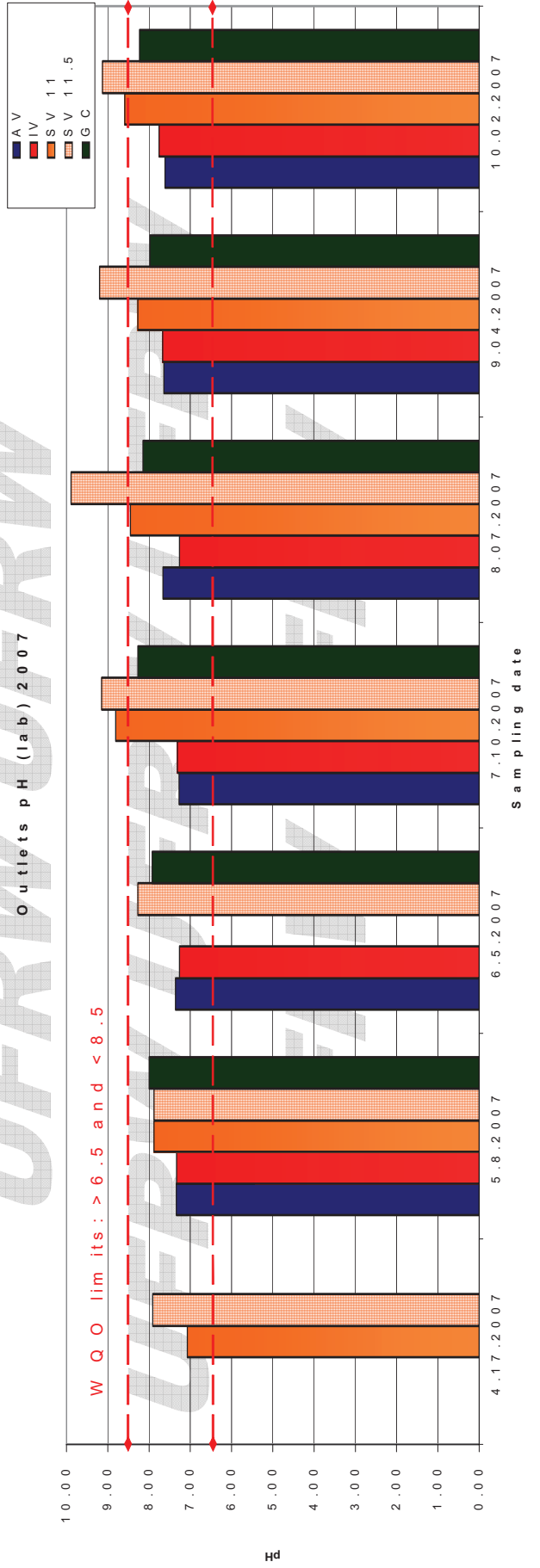
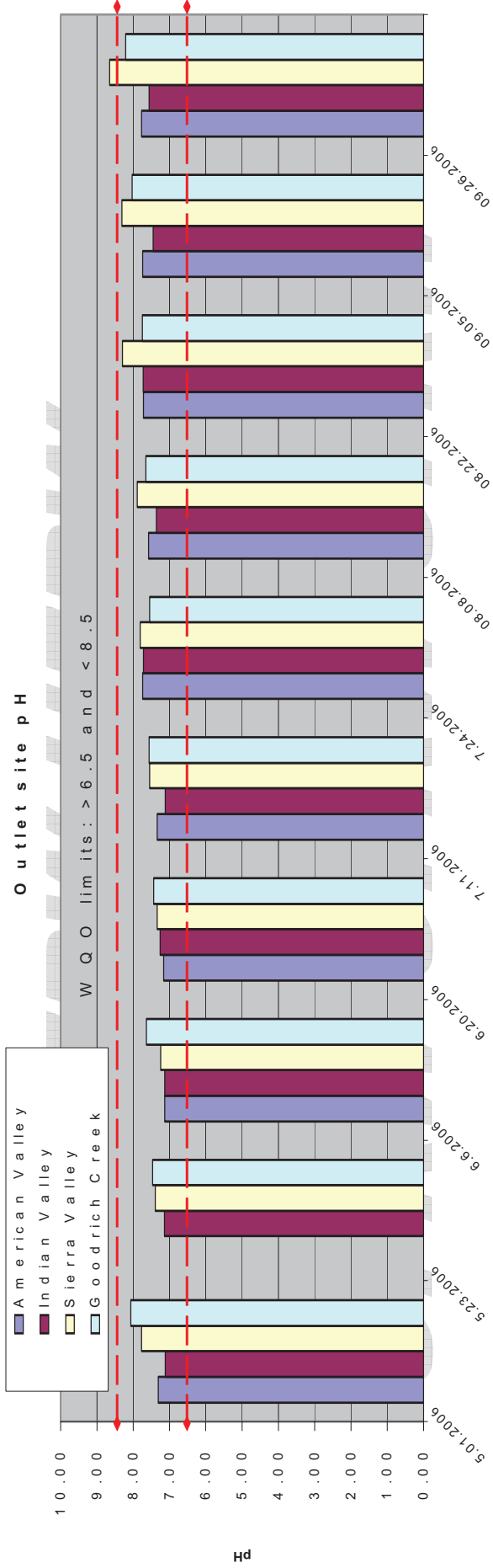


# EC Exceedance Summary

UFRW (Outlets) RW

- 2006
  - IV: 1 /10 Aug
  - SV: 3 /10 Aug-Sept
- 2007
  - AV: 3 /6 Jun-Aug
  - IV: 3 /6 Jun-Aug
  - SV: 6 /7 May-Oct

# pH

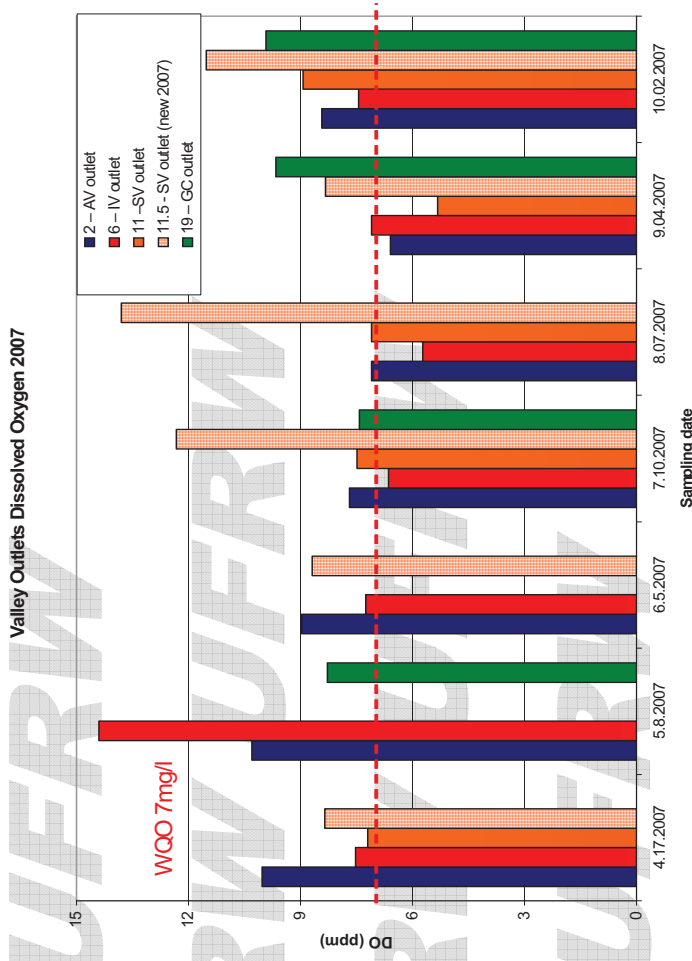
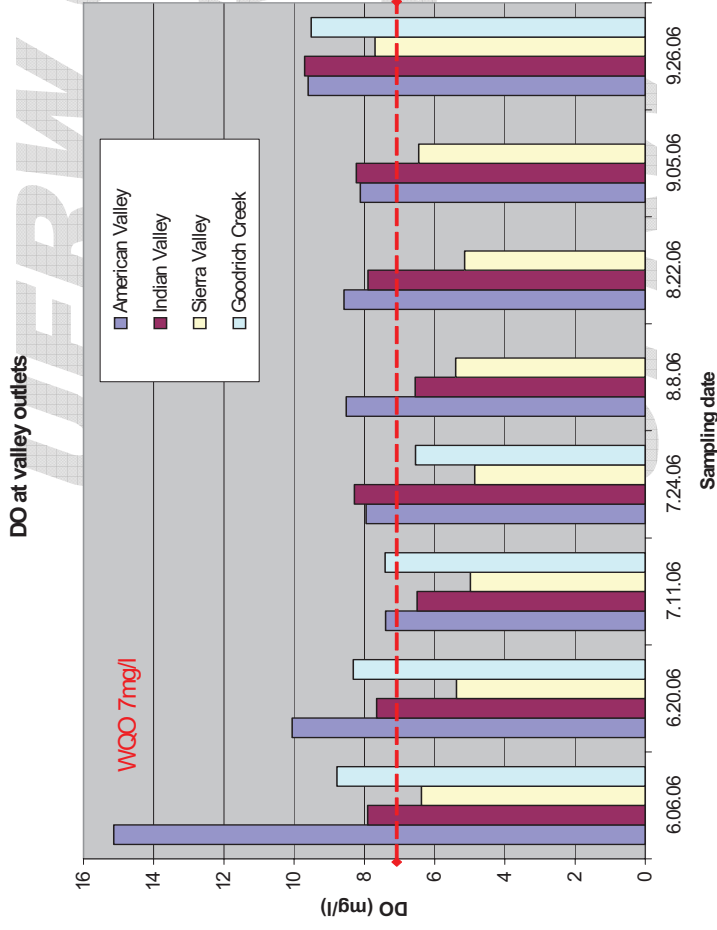


# pH Exceedance Summary

UFRW (Outlets) RW

- 2006  
– SV: 1 / 10 Sept  
UFRW UFRW UFRW UFRW
- 2007  
– SV: 4 / 7 Jul-Oct  
UFRW UFRW UFRW UFRW  
UFRW UFRW

# Dissolved Oxygen - Outlets



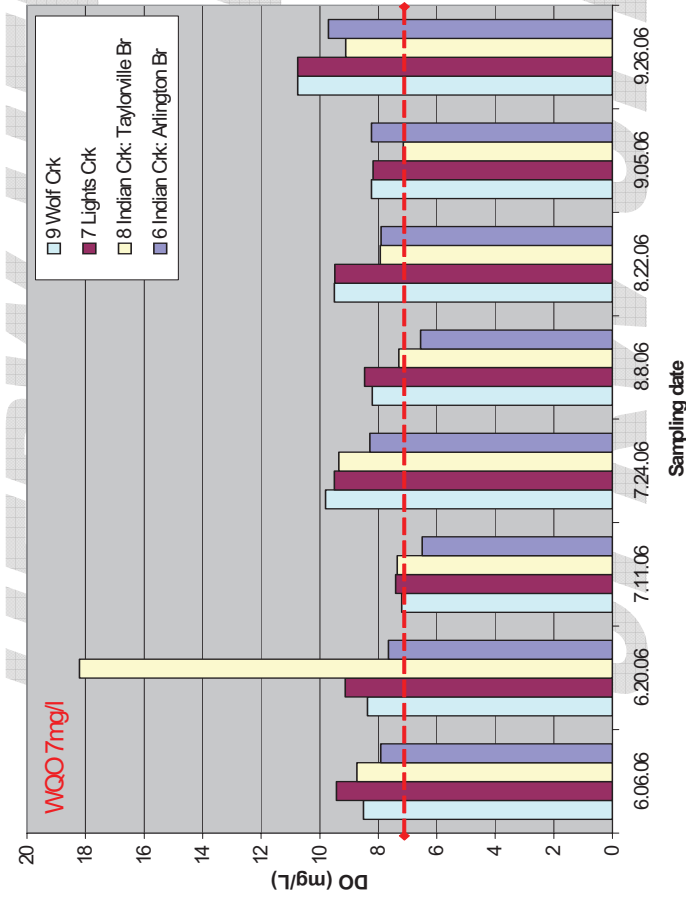
2007: DO in all valleys similar to 2006 values throughout season

SV: 2006-2007 Site 11.5 tends to be higher in DO than site 11

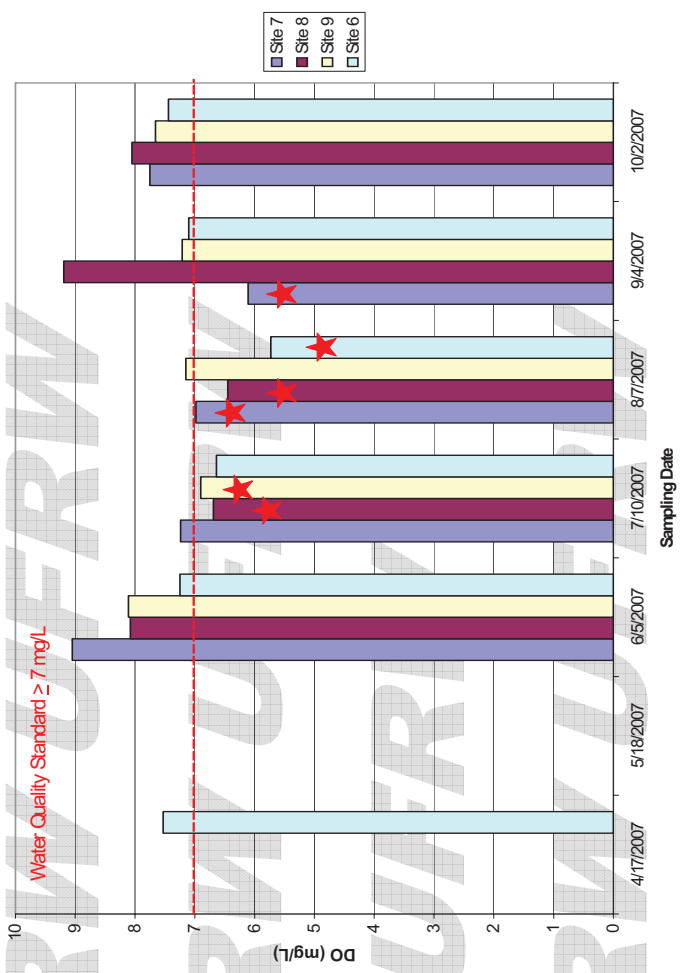


# Indian Valley DO

Indian Valley DO



Indian Valley Dissolved Oxygen 2007



Typically, valley outlet DO exceedances are associated with low values in inflowing streams

# DO Exceedance Summary

UFRW (Outlets) RW

- 2006

- IV: 2 / 8

Aug

- SV: 7 / 8

Jun-Sept

- GC: 1 / 5

Jul

- 2007

- AV: 2 / 7

Aug-Sept

- IV: 2 / 7

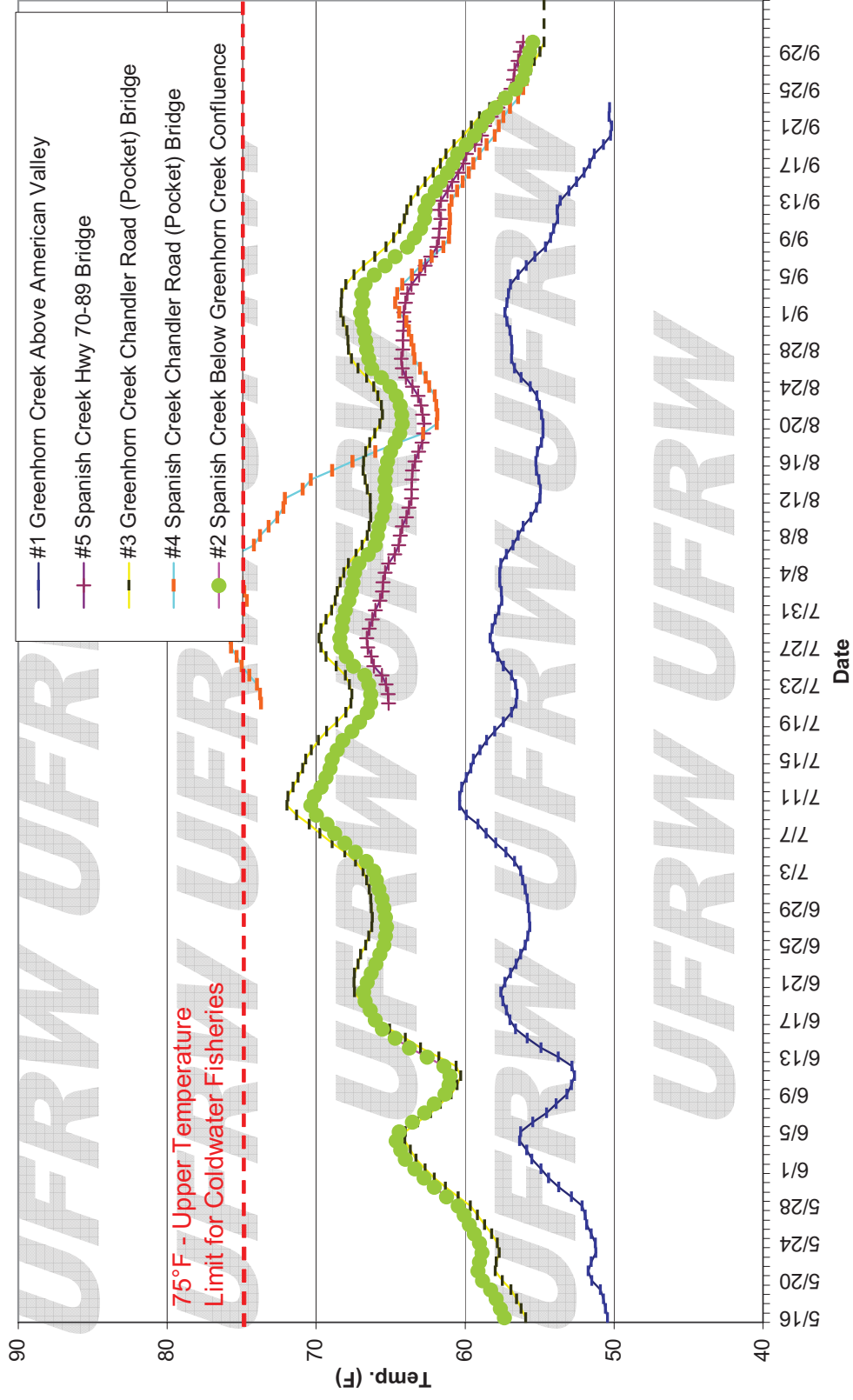
Jul-Aug

# Temperature

- Higher temperature = lower dissolved oxygen content
- Warm, stagnant waters encourage bacterial growth
- Maximum temperature for Rainbow Trout (coldwater fishery) is  $\sim 75^{\circ}\text{F}$
- What's important?
  - Running Weekly Average
  - Daily Average
  - Daily Maximum?

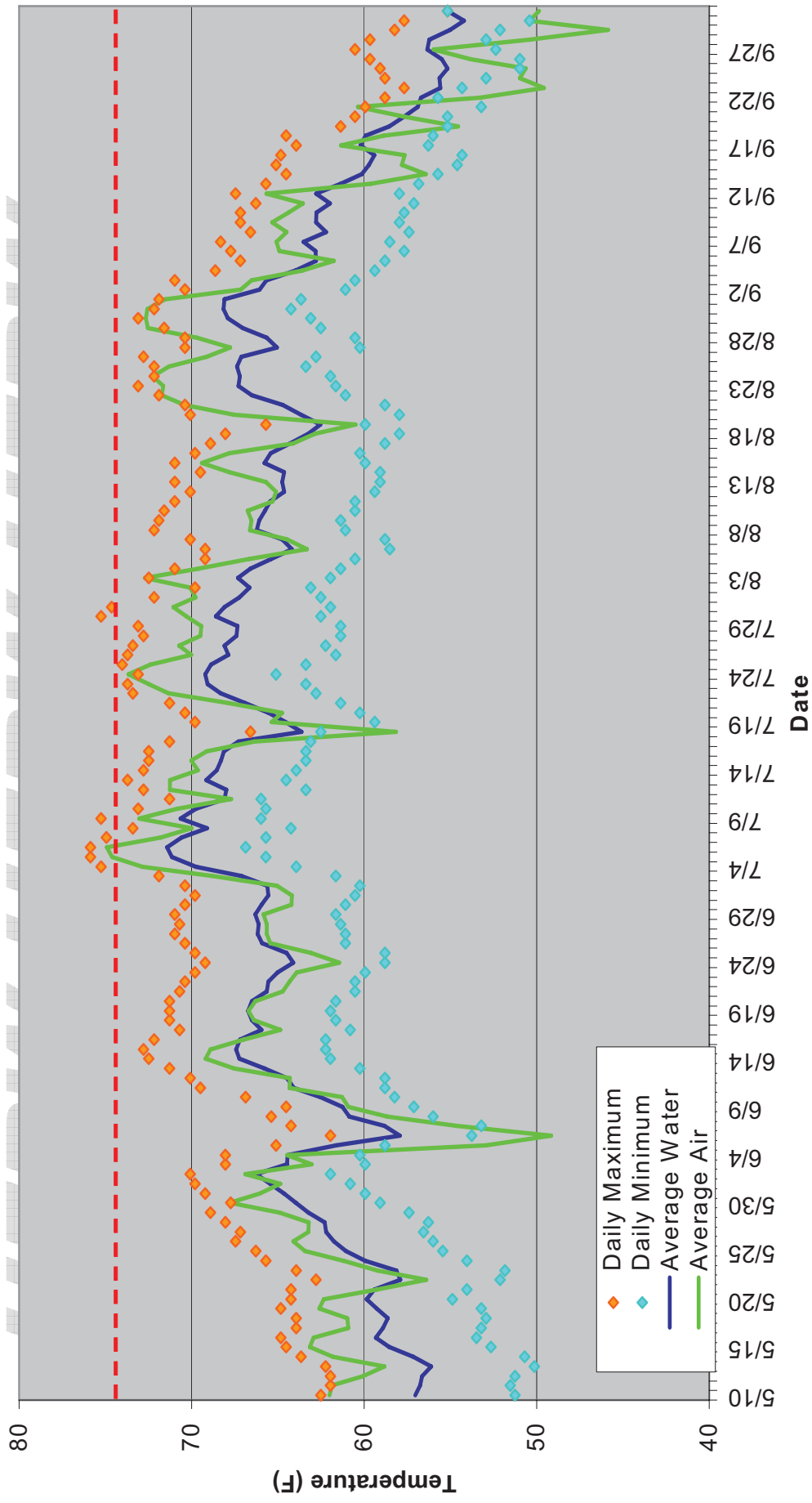
# Temperature: American Valley

American Valley 2007 Running weekly average water temperature



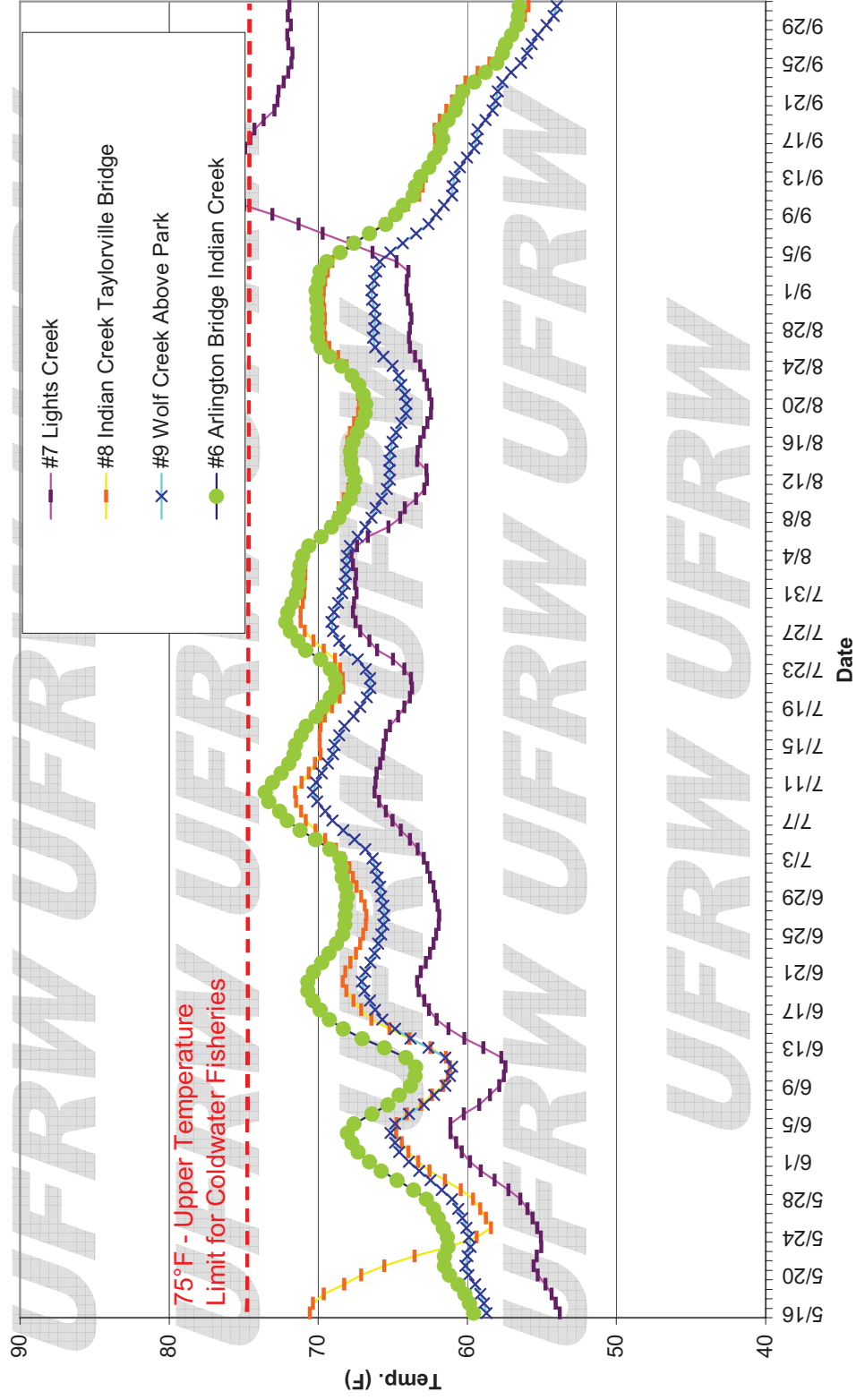
# Temperature: American Valley

## 2. Spanish Creek 2007 Daily Temperatures



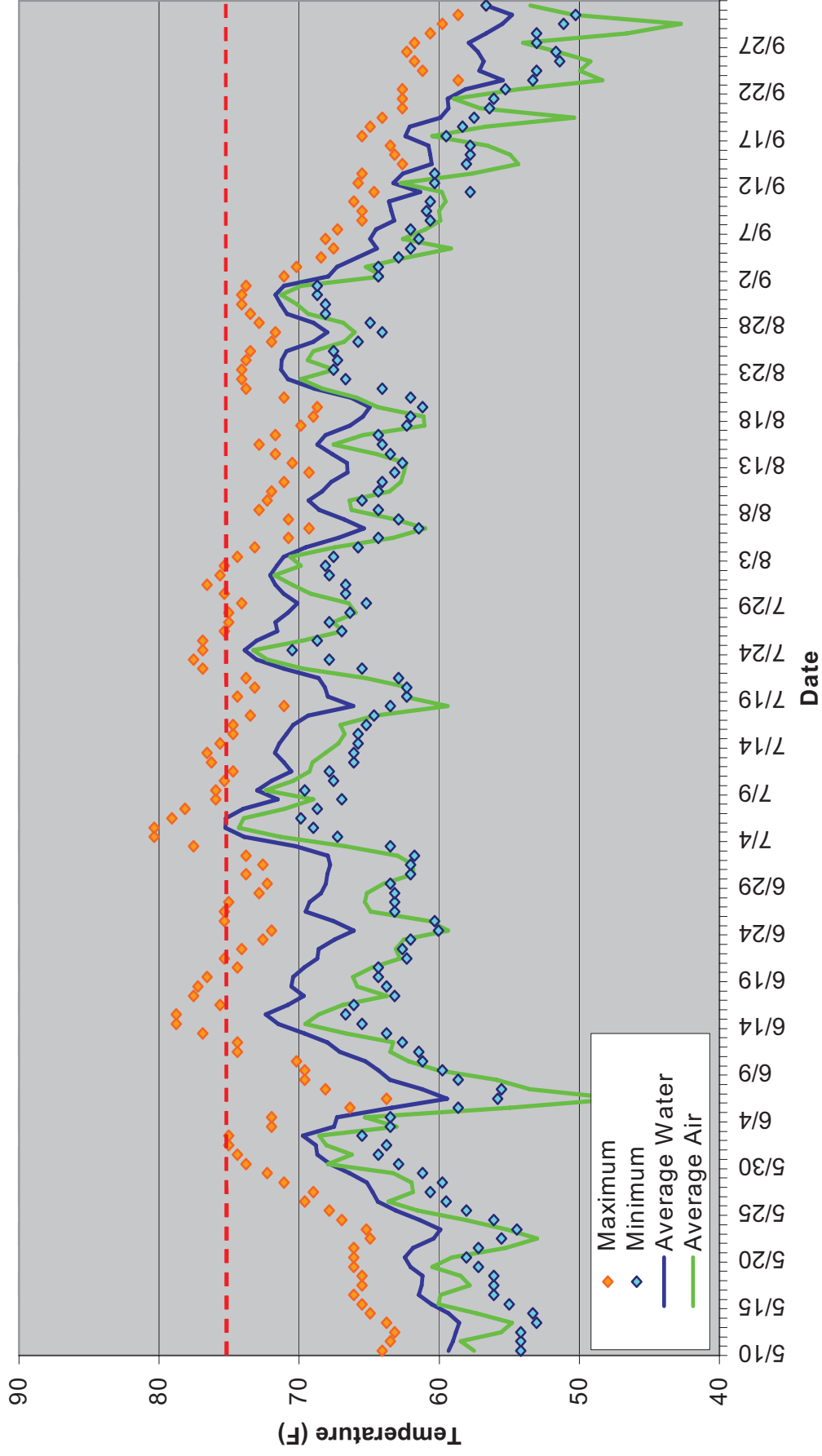
# Temperature: Indian Valley

Indian Valley 2007 Running weekly average water temperature



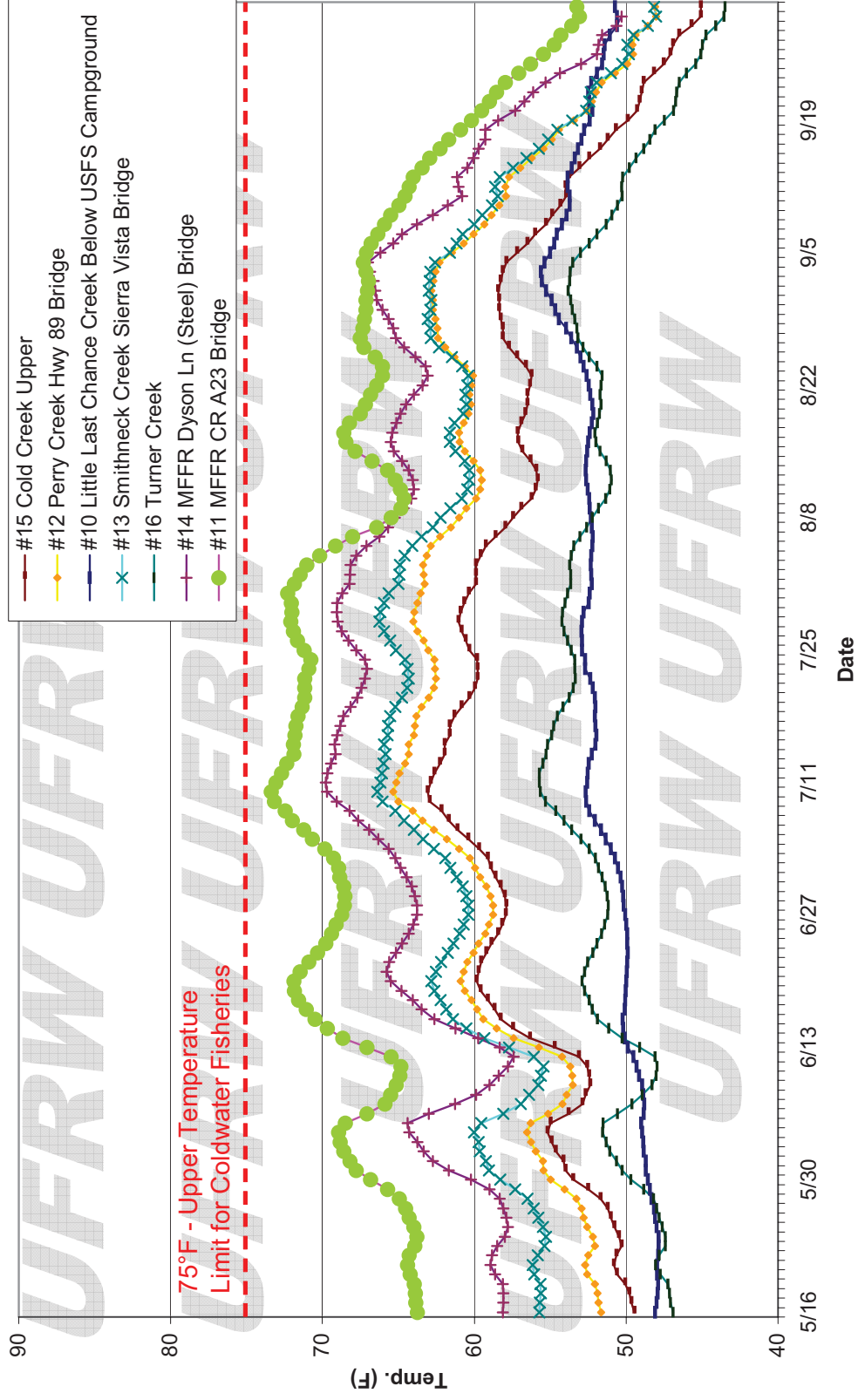
# Temperature: Indian Valley

6. Indian Creek 2007 Daily Temperatures



# Temperature: Sierra Valley

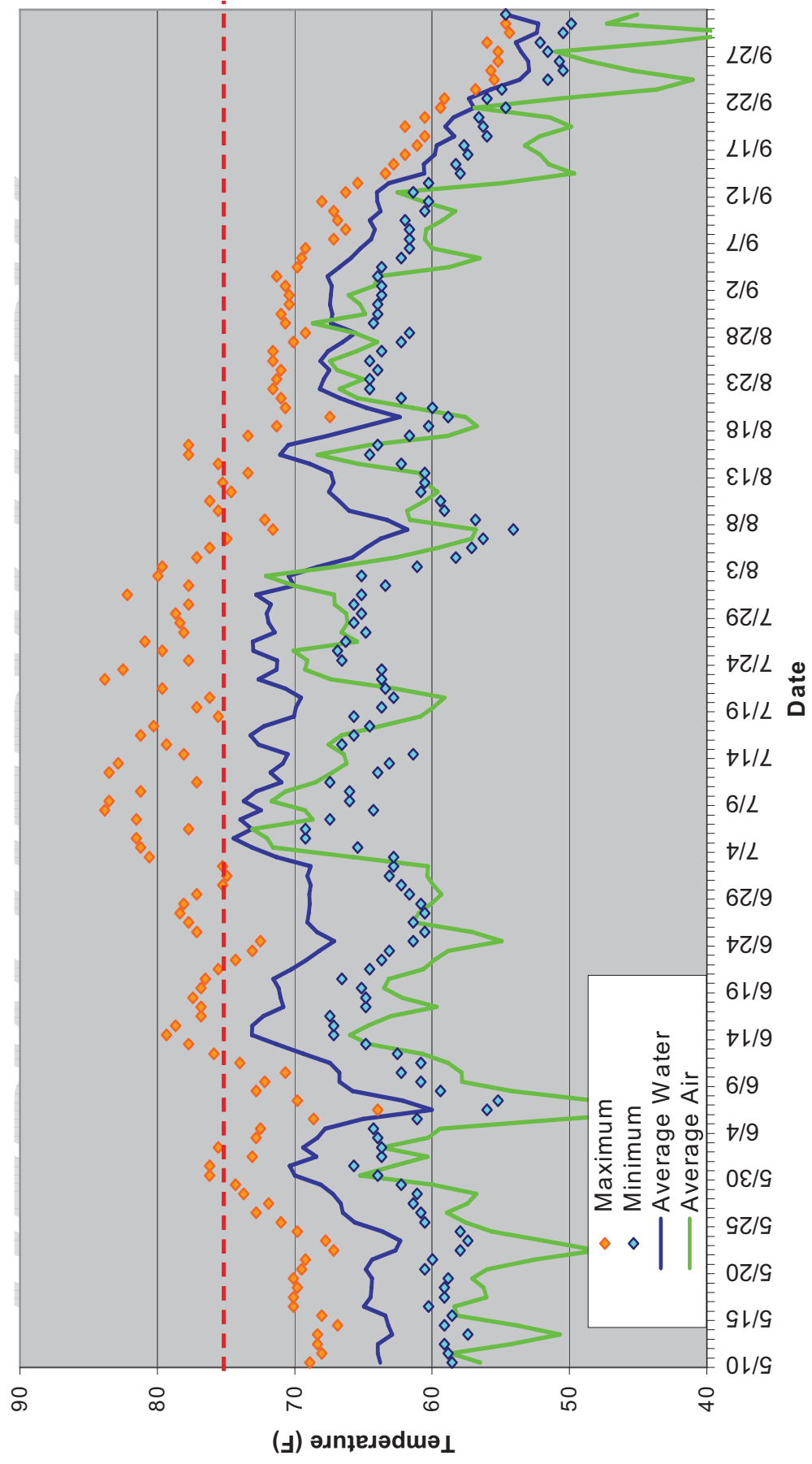
Sierra Valley 2007 Running weekly average water temperature





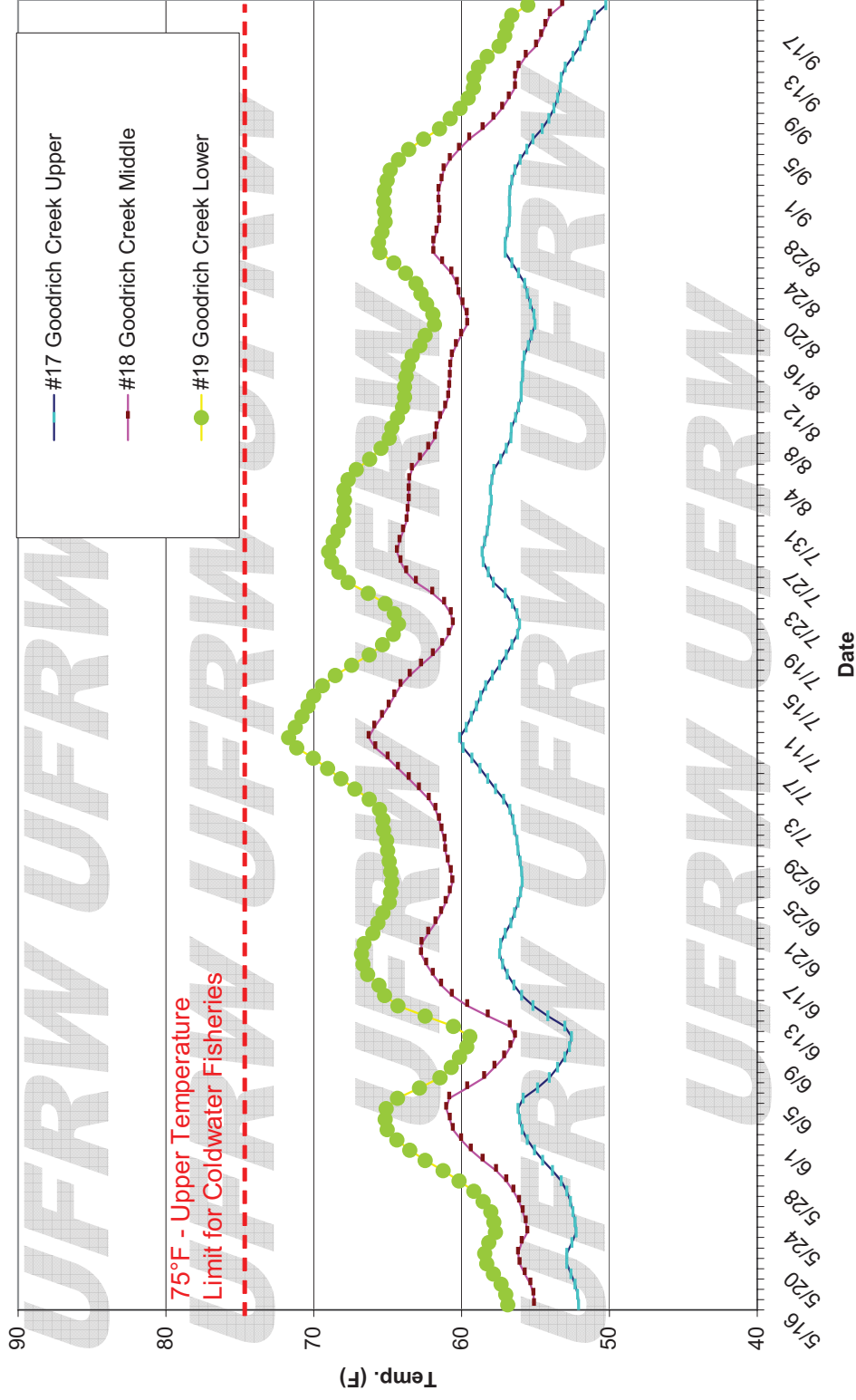
# Temperature: Sierra Valley

11.5 MFFR 2007 Daily Temperatures



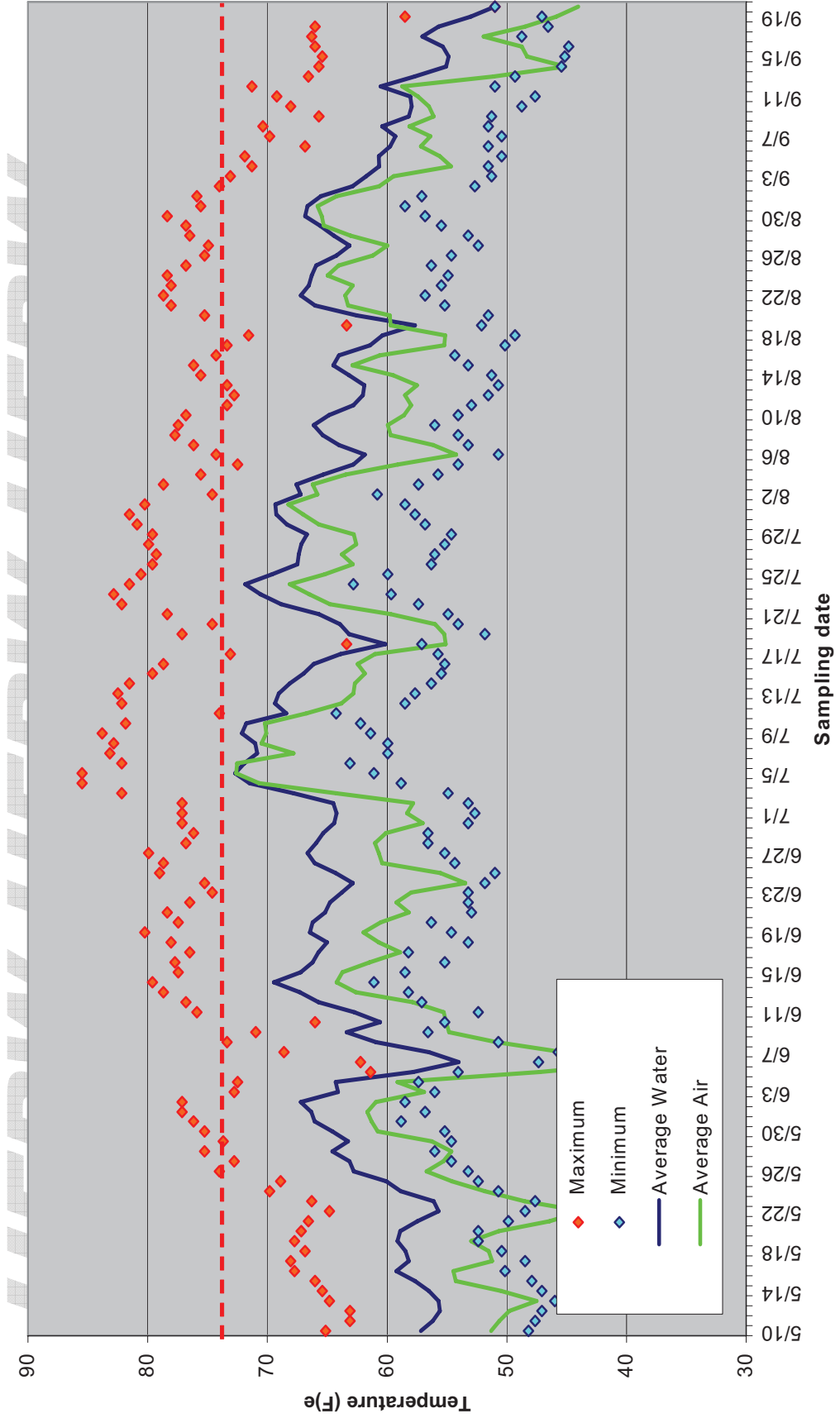
# Temperature: Goodrich Creek

Goodrich Creek 2007 Running weekly average water temperature



# Temperature: Goodrich Creek

19. Goodrich Creek Daily Temperatures



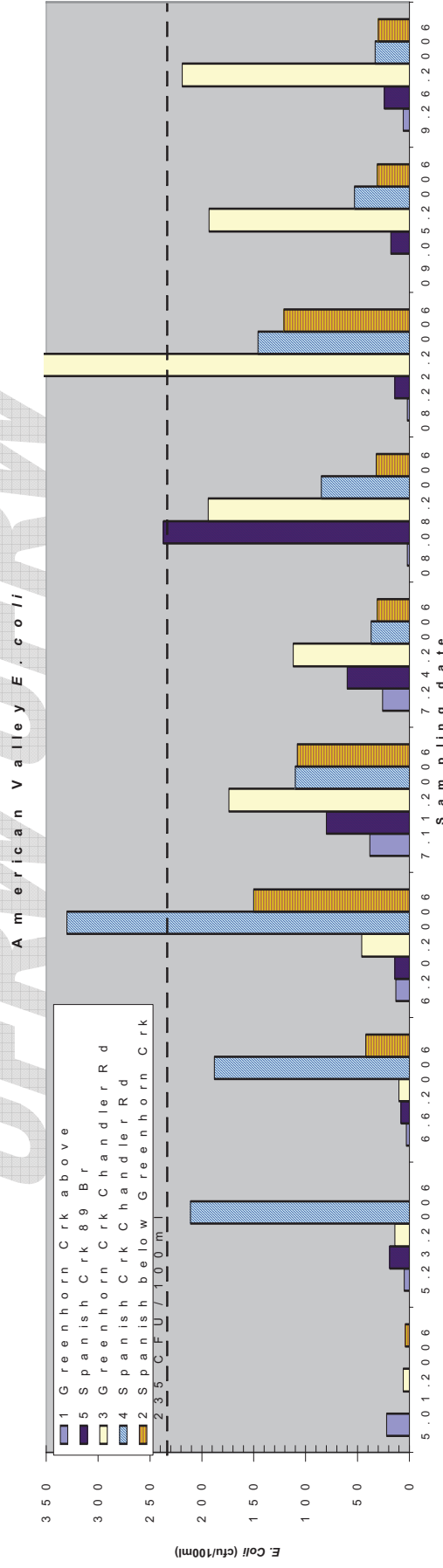
# Temperature summary

- Running weekly average stream temperatures in all valleys do not exceed 75°F in 2007 (IV and SV running weekly average both exceeded in mid-July 2006)
- Daily Maximum does exceed 75°F in all valleys at some time during season

# *E. coli*

- Grab sample standard (contact recreation):  
– **235cfu/100ml**
- Repeated sampling standard (contact recreation):  
– average of **126 cfu/100ml**

# E. coli: American Valley



# E. coli Exceedance Summary (AV)

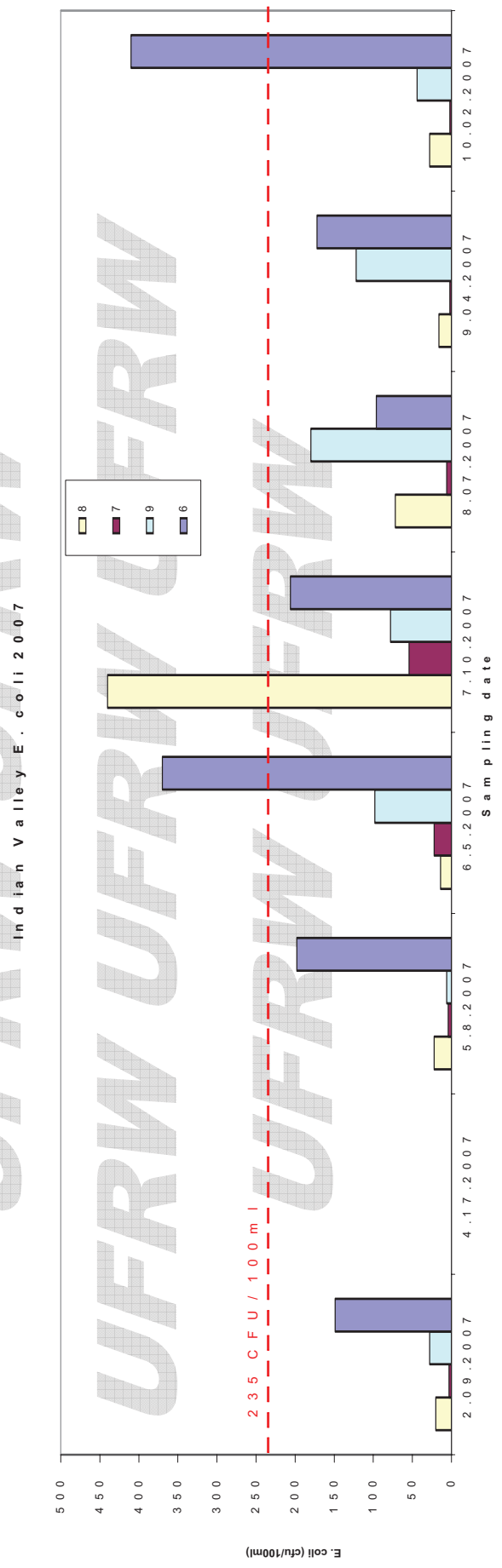
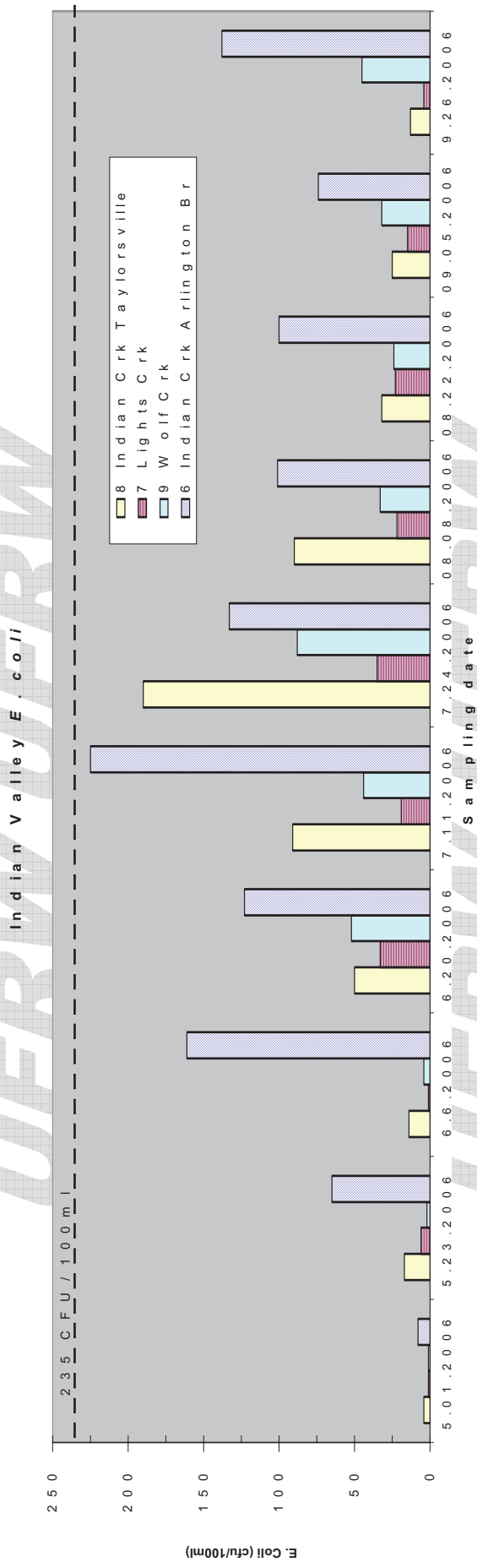
- 2006

<sup>-3</sup>  
(10 sampling events)

- 2007

<sup>-9</sup>  
(7 sampling events)

# E. coli: Indian Valley





## E. coli Exceedance Summary (IV)

- 2006  
 $10^{-0}$   
(10 sampling events)
- 2007  
 $10^{-3}$   
(7 sampling events)



# E. coli Exceedance Summary (SV)

- 2006 UFRW UFRW UFRW

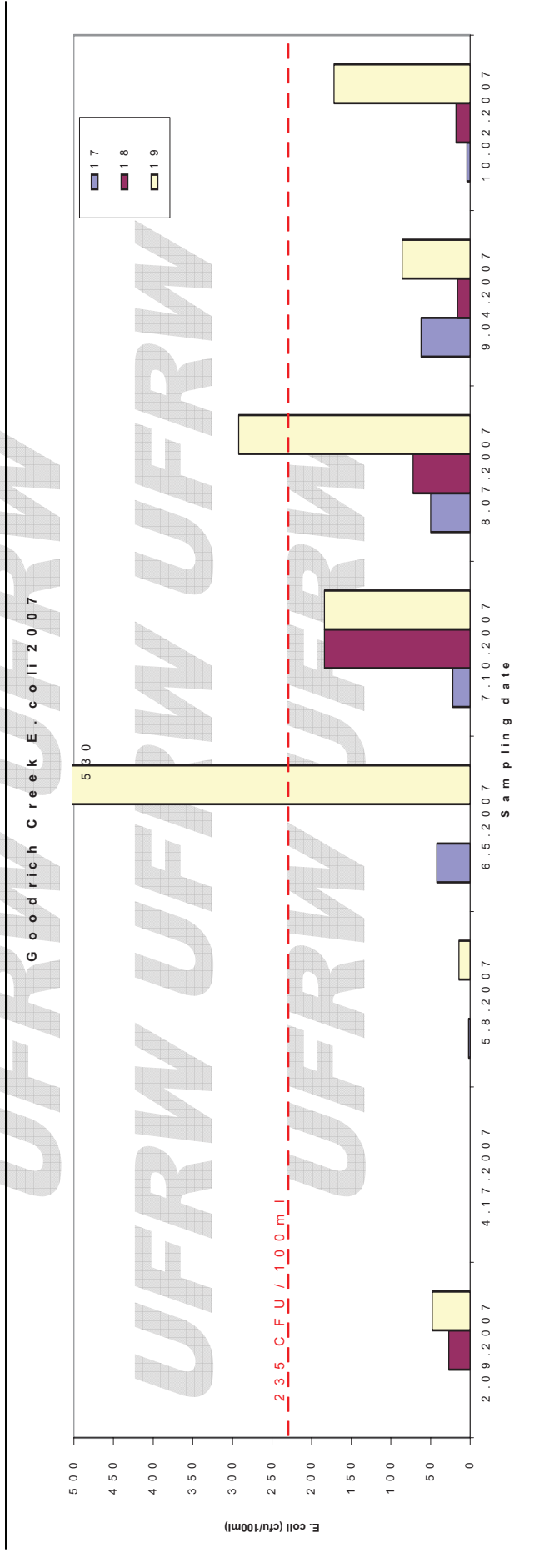
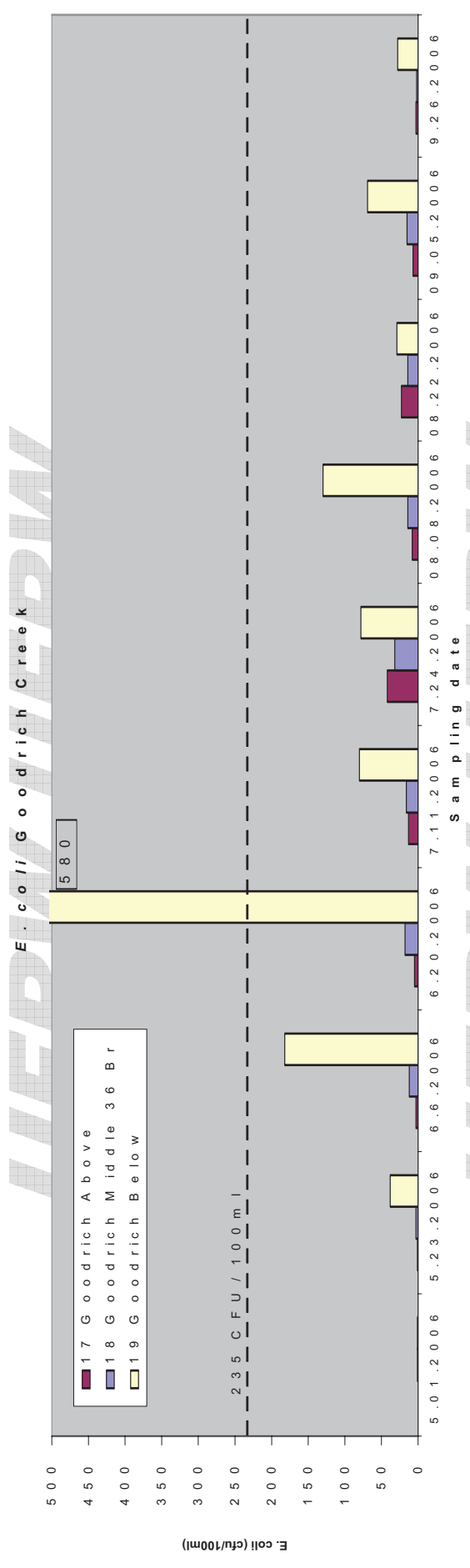
- <sup>8</sup> UFRW UFRW UFRW  
(10 sampling events)

- 2007 UFRW UFRW

- <sup>9</sup> UFRW UFRW UFRW  
(8 sampling events)

- UFRW UFRW

# E. coli: Goodrich Creek



# E. coli Exceedance Summary (GC)

- 2006 **UFRRW UFRRW UFRRW**

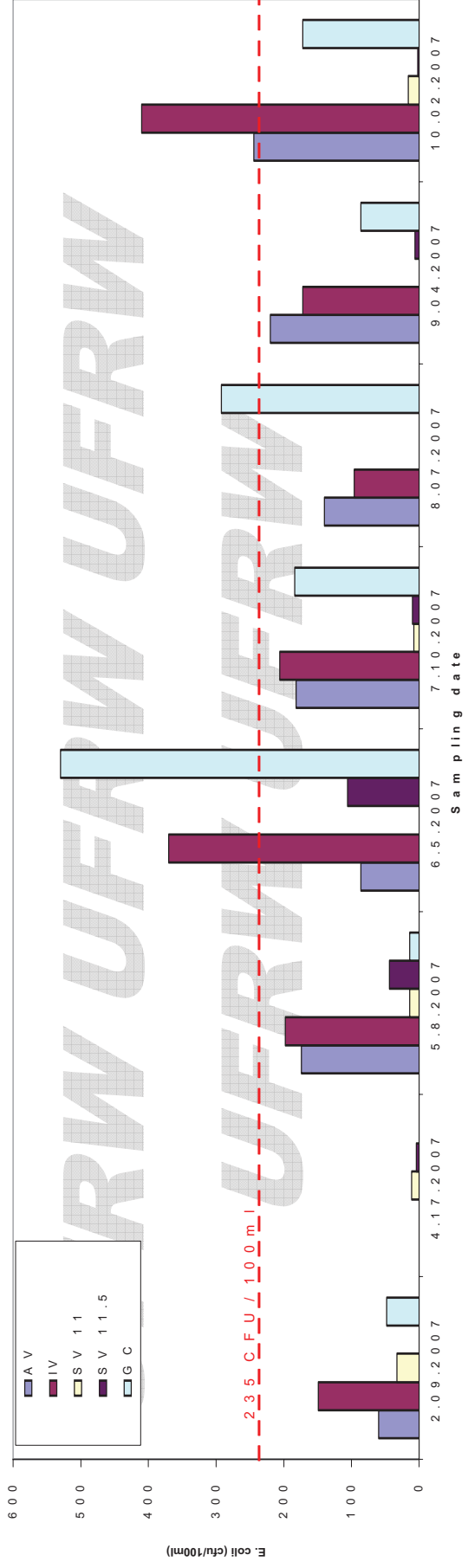
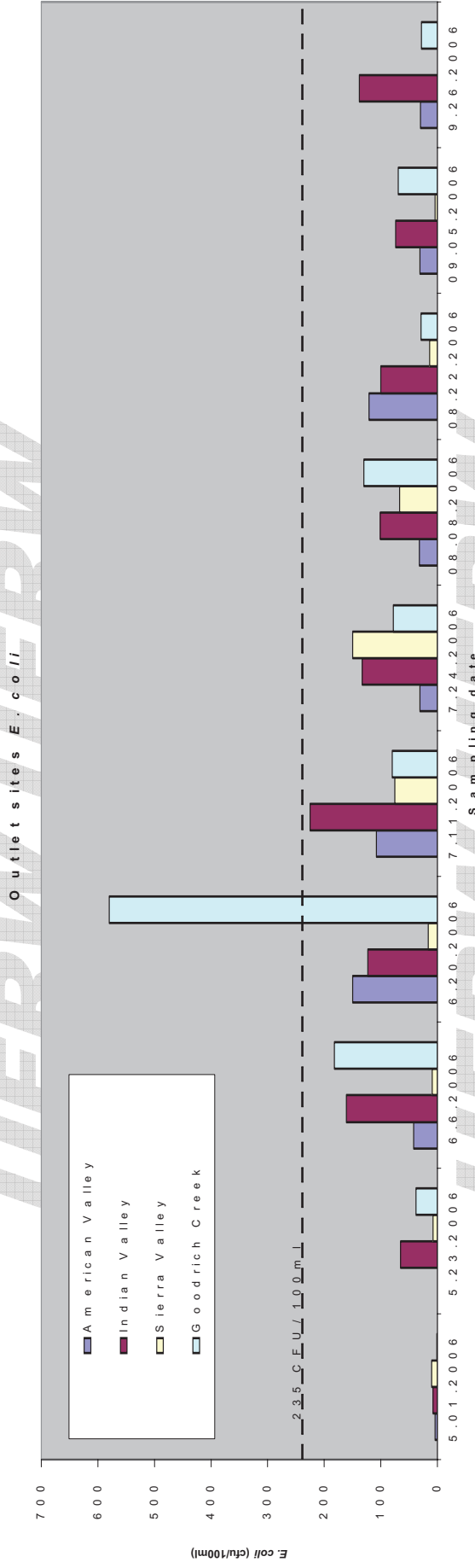
- <sup>1</sup> **UFRRW UFRRW UFRRW**  
(10 sampling events)

- 2007 **UFRRW UFRRW**

- <sup>2</sup> **UFRRW UFRRW UFRRW**  
(7 sampling events)

- UFRRW UFRRW**

# E. coli Outlets



# E. coli Exceedance Summary

## UFRW (Outlets)

- 2006 UFRW UFRW UFRW  
– GC: 1/5 Jul
- 2007 UFRW UFRW UFRW  
– AV: 1/7 Oct  
– IV: 2/7 Jun, Oct  
– GC: 1/7 Jun

*UFRW UFRW*

# Questions and discussion

*UFRW UFRW UFRW*

*UFRW UFRW*

*UFRW UFRW UFRW*

*UFRW UFRW*