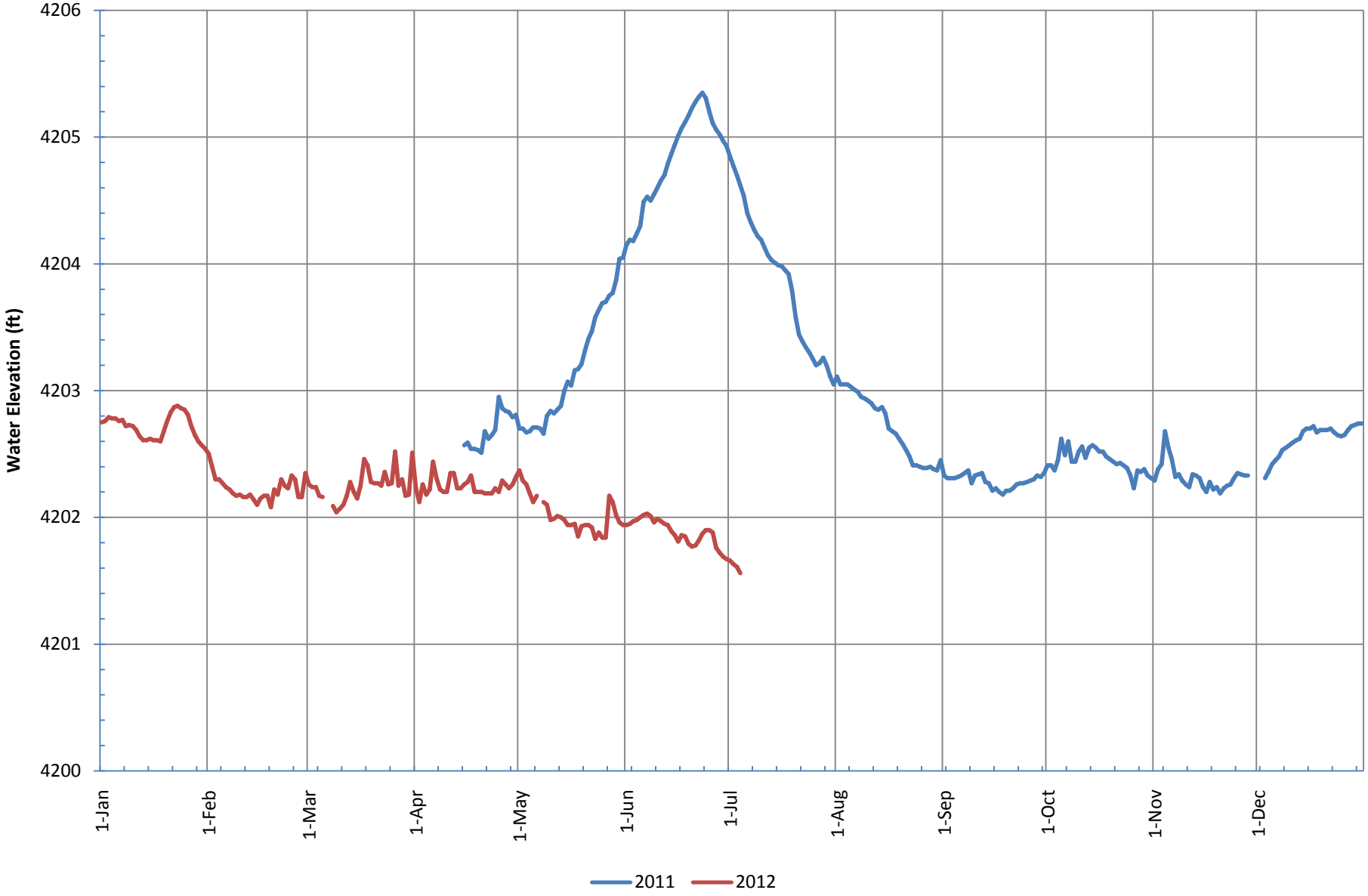
Willard Spur: Science Panel

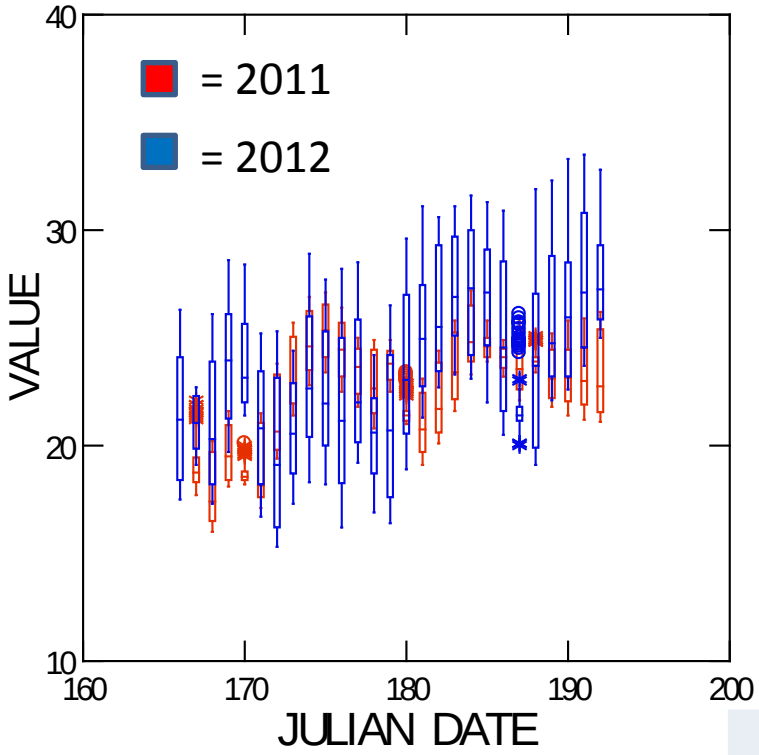
Summer 2012

Willard Spur Water Elevation

(USGS Sta. 412522112053801
near BRMBR 5C Outlet)

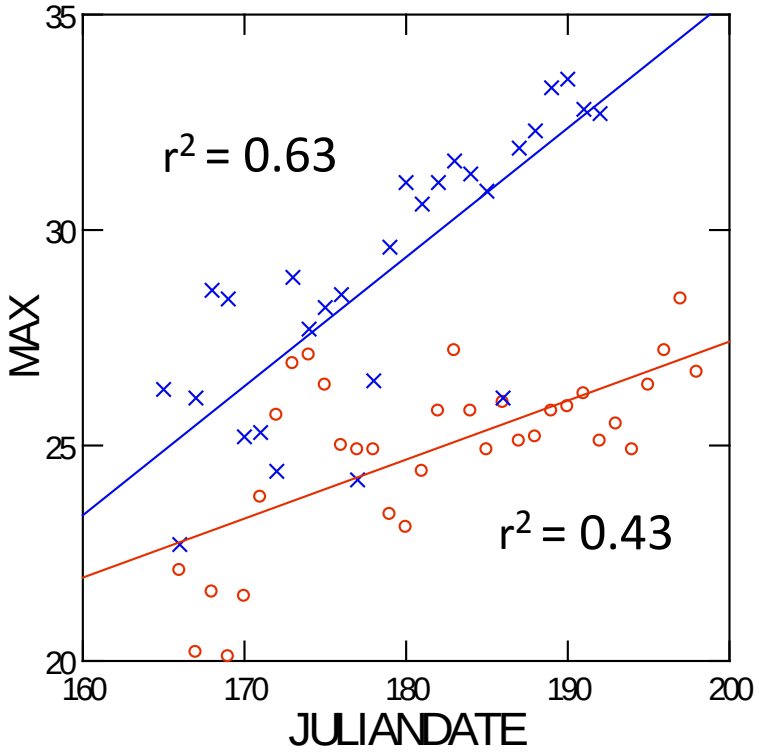



USGS/USBR Measured Inflows to Willard Spur
Approximate Total Inflow from USGS/USBR Gages (cfs)
Water Elevation (ft)
6000
5000
4000
3000
2000
1000
0
4206
4205
4204
4203
4202
4201
4200
1-Jan
1-Feb
1-Mar
1-Apr
1-May
1-Jun
1-Jul
1-Aug
1-Sep
1-Oct
1-Nov
1-Dec
2011 Inflow
2012 Inflow
2011 Water Level
2012 Water Level



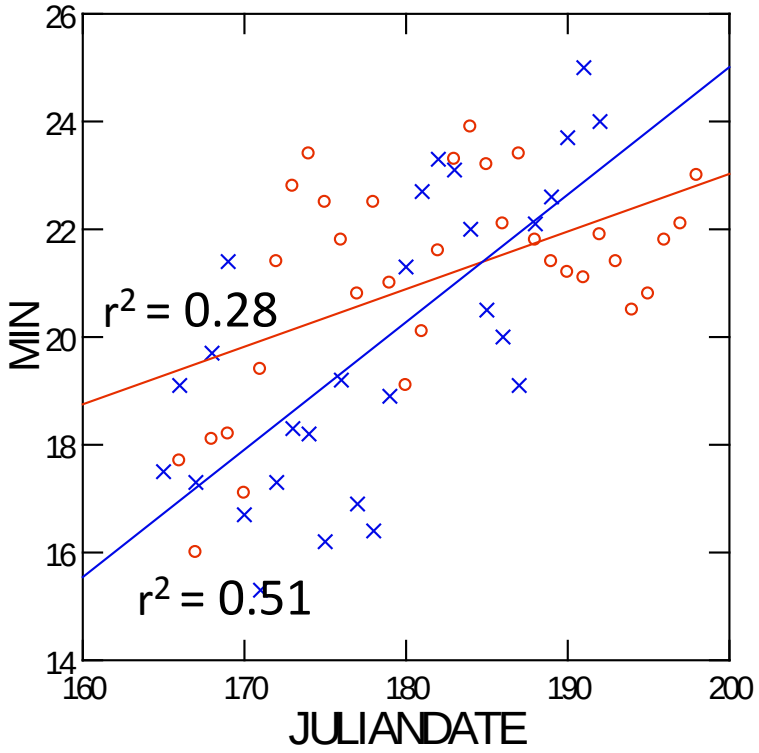
- 2012 water temperatures were higher and more variable that in 2011.
- 2012 maximum daily water temperatures were greater the second week of July than the maximum value observed over the 2011 water year.

	June, 2011	June, 2012	July, 2011	July, 2012	Aug, 2011
N of Cases	1,440	1,632	1,728	1,056	1,729
Minimum	16	15.3	20.1	19.1	20
Maximum	27.1	31.1	**28.4**	**33.5**	**29.1**
Arithmetic Mean	21.759	22.299	23.78	26.078	25.171
Standard Deviation	2.68	3.367	1.627	3.345	1.988
Coefficient of Variation	0.123	0.151	0.068	0.128	0.079



- Both maximum and minimum daily temperature significantly ($p<0.05$) increased from early June through early July in both 2011 and 2012.
- These relationships were stronger in 2012 and in 2011, particularly for daily minimum temperatures.

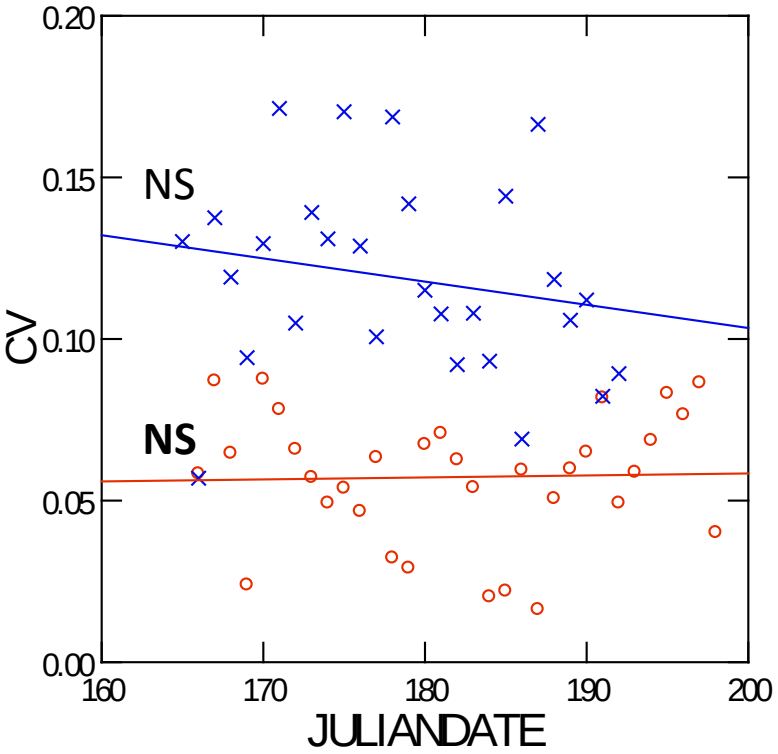
X = 2012
O = 2011



- Rates of change were greater in 2012(MAX m = 0.30; MIN m = 0.24) than in 2011 (MAX ,m = 0.14, MIN, m = 0.11).

Significant differences ($p<0.001$) among years in the absolute daily temperature fluctuation.

However, within-year trends in were not significant.



X = 2012
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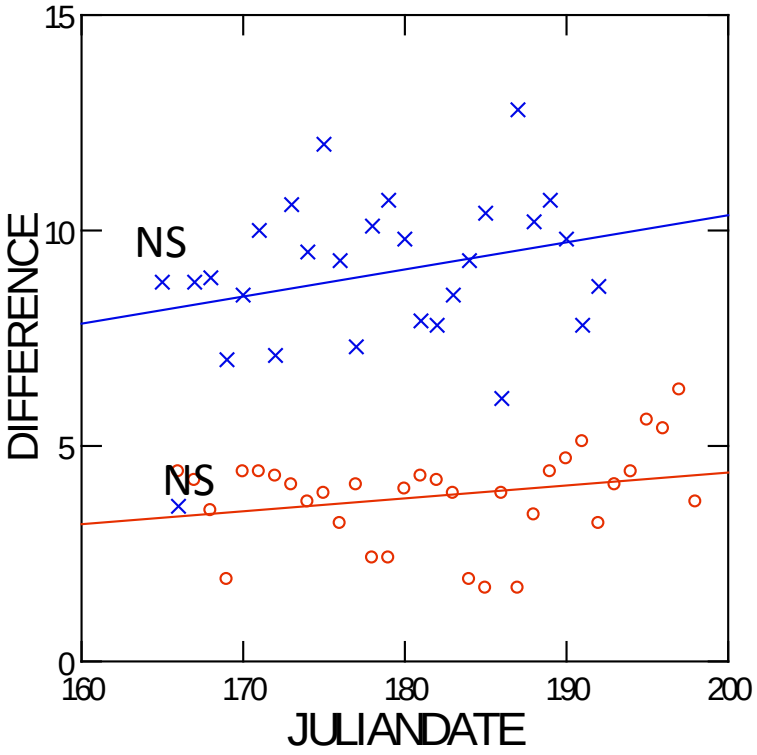


A similar pattern was observed for CV, which indicates that among year differences in daily temperature variation are not strictly an artifact of greater 2012 temperatures.

Site 4: 2011

STORET: ---------**5984680**
Site Name: **WS-4** Trip ID ---------- **WS08082011**
Date & Time: **----------8/11/2011** Sampler(s): **JAH**
Algal Mat Cover ≤50 m of sampling location (%): 25%
Regular Measurement:
[1]SAV condition: 1 = Decomposing/senescing, 2 = Intact, but stressed, 3 = Healthy
[2]Filamentous algae: Extent of algae on SAV and/or surface of pond (%)

Quadrant number	1	2	3	4	5	Average
Quadrant location along transect (m)	11	37	51	78	91	
Water depth (cm)	75	73	80	80	80	77.6
Height of SAV (cm)	45	65	50	80	50	58
SAV cover (%)	100	100	100	100	100	100
[1]SAV condition	3	3	3	2	3	2.8
[2]Filamentous algae cover (%)	2	5	5	2	5	3.8
Duckweed cover (%)	0	0	0	0	0	0

Site 4: 2012

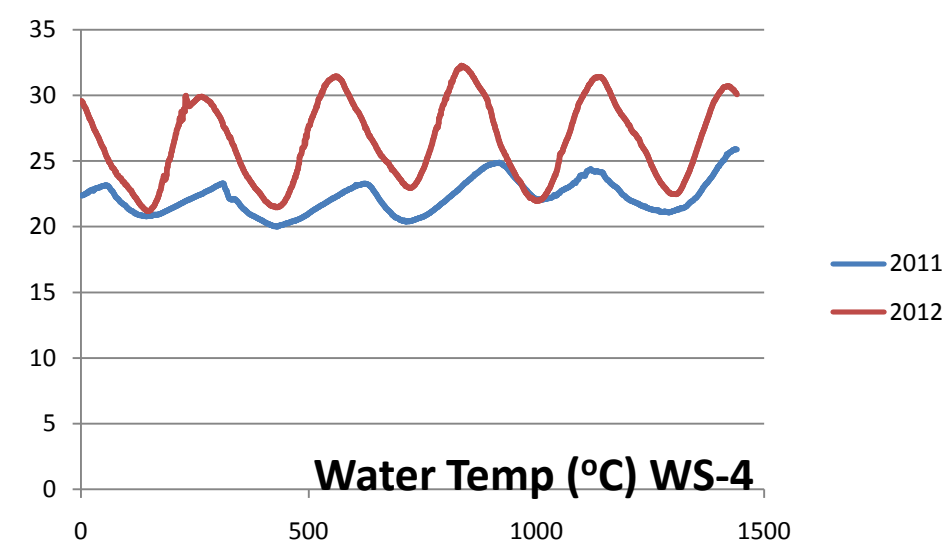
STORET: ---------**5984680**
Site Name: **WS-4** Trip ID ---------- **WS061812**
Date & Time: **----------6/20/2012** Sampler(s): **S.T**
Agal Mat Cover ≤50 m of sampling location (%): 0%
Regular Measurement:
[1]SAV condition: 1 = Decomposing/senescing, 2 = Intact, but stressed, 3 = Healthy
[2]Filamentous algae: Extent of algae on SAV and/or surface of pond (%)

Quadrant number	1	2	3	4	5	Average
Quadrant location along transect (m)	12	27	40	59	74	
Water depth (cm)	50	48	48	45	47	47.6
Height of SAV (cm)	50+	48+	48+	45+	47+	47.6
SAV cover (%)	100	100	80	95	20	79
[1]SAV condition	3	3	3	3	3	3
[2]Filamentous algae cover (%)	25	10	3	4	1	8.6
Duckweed cover (%)	0	0	0	0	0	0

Two Pictures = Two Thousand Words

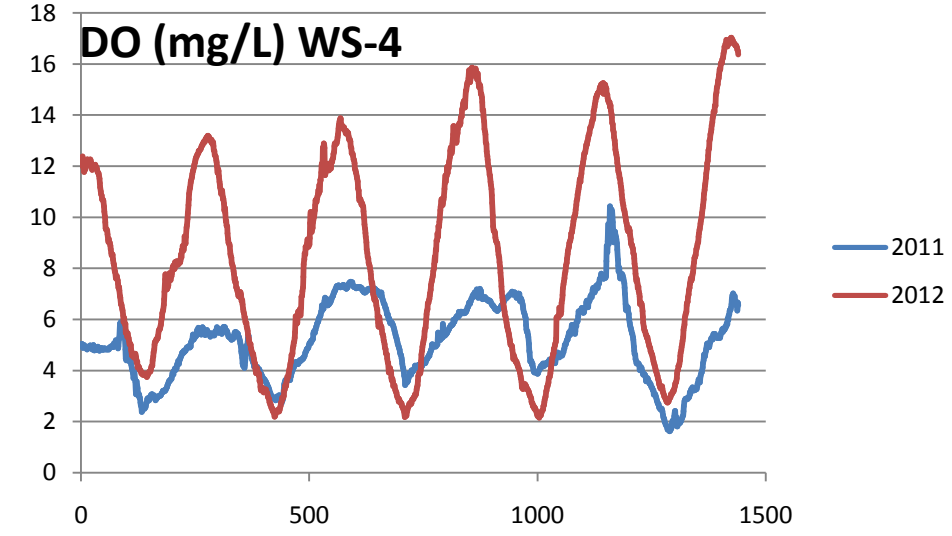
2011

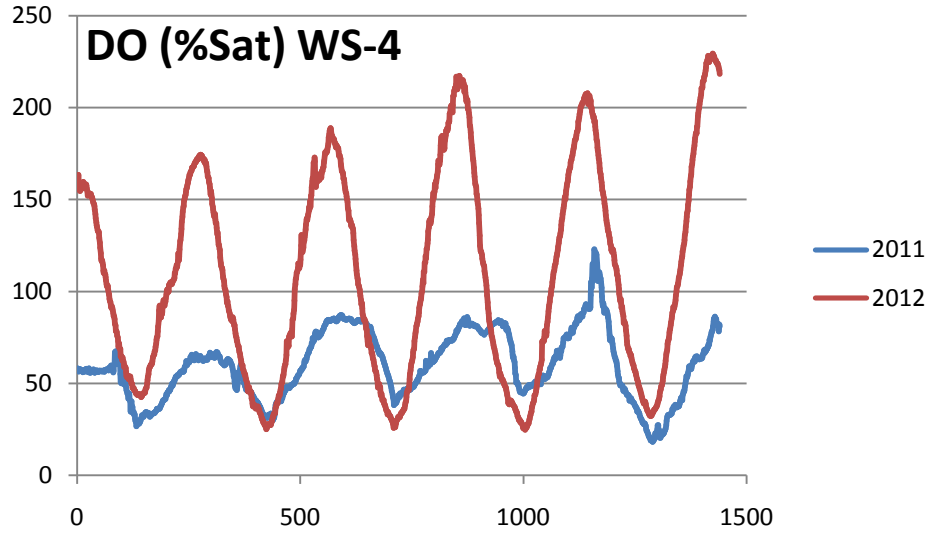
2012



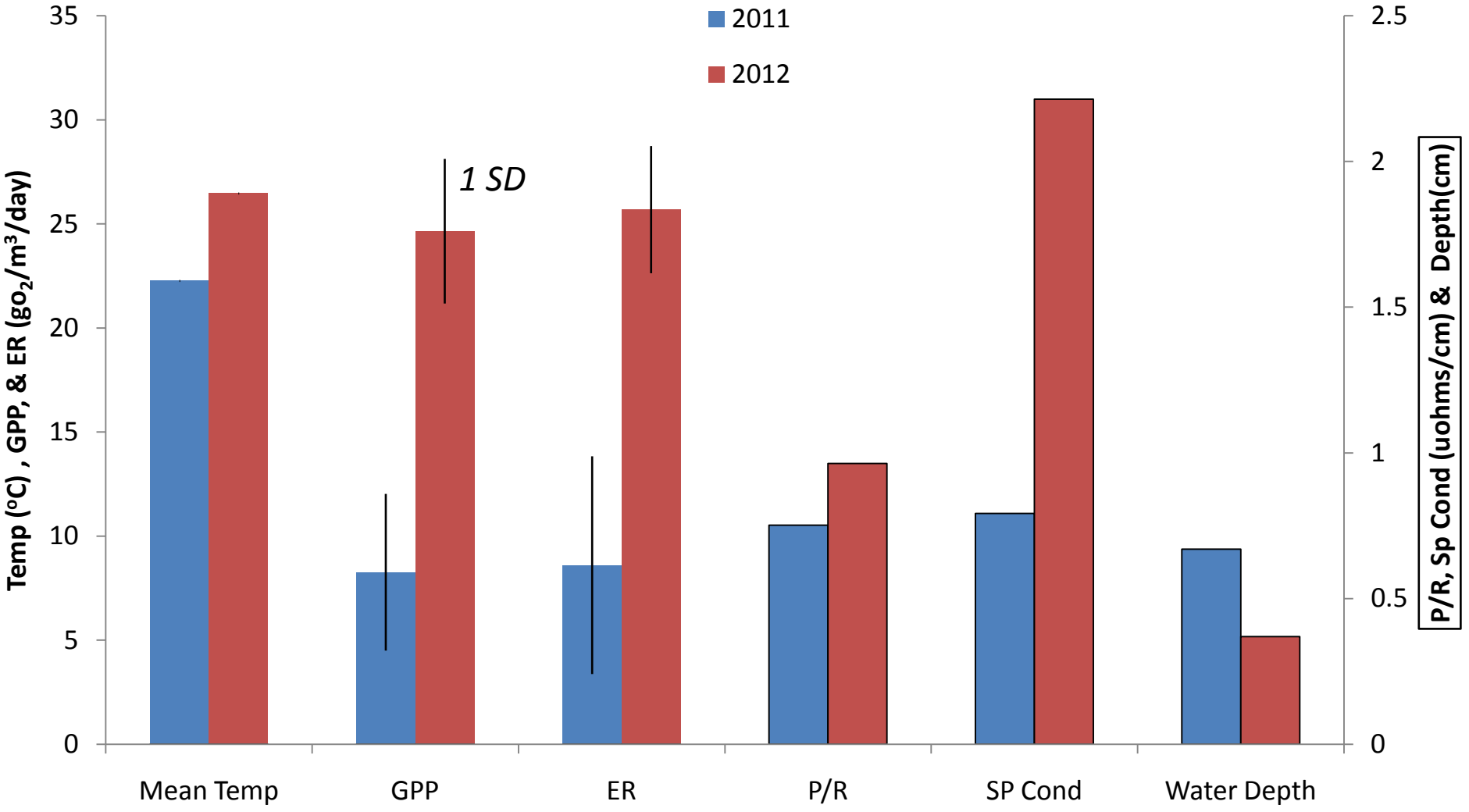
- Among year differences in DO were also observed.
- In 2012, DO peaks were generally much higher, whereas lower DO values (i.e., valleys) do not seem to be affected.

2011 – Start Date 07/21
2012 – Start Date 06/28





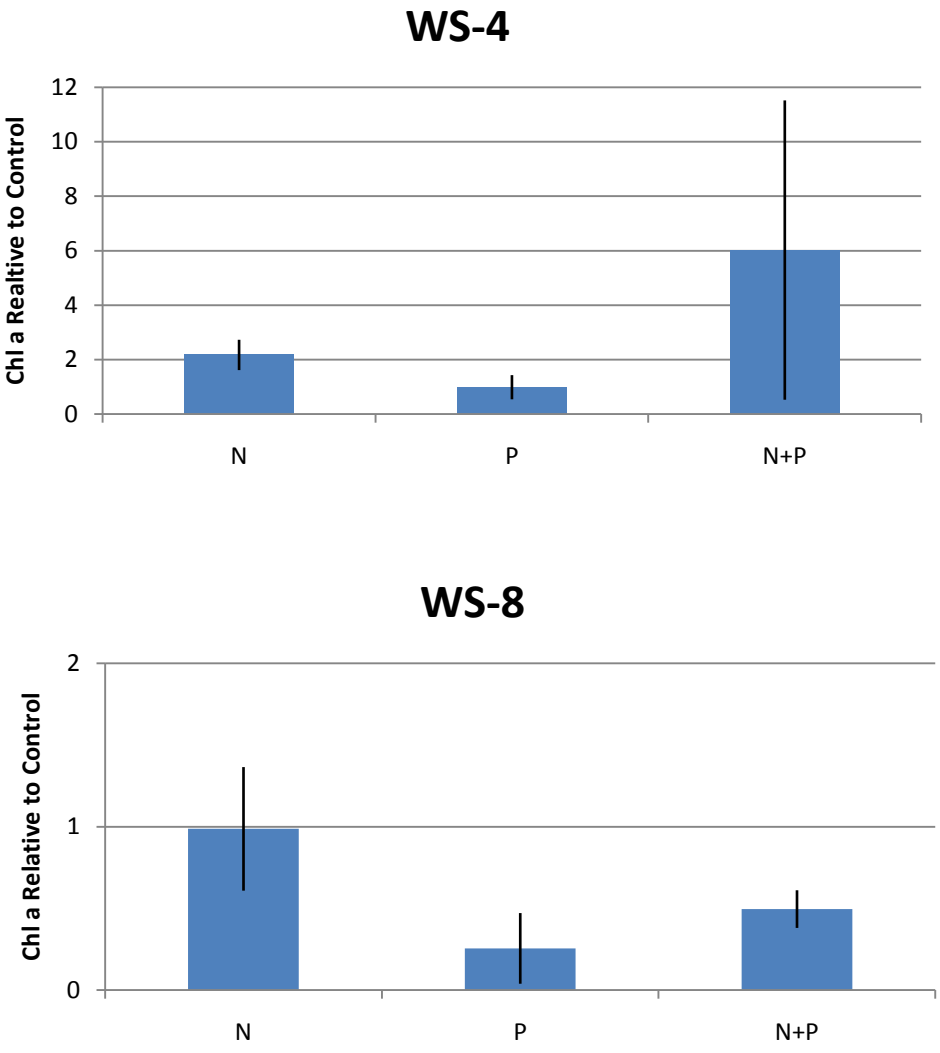
All values are means of 5 days/year.



Nutrient Diffusing Substrates: 2012

- Compare controls with agar media that is spiked with N (nitrate), P (phosphate) & both.
- 3 Sites: End of reservoir release channel, WS4, & WS8
- 5 replicates at each site
- Samples were placed on two cinder blocks to minimize SAV shading
- Treatments were randomly placed on trays.
- June 20th through July 12th (22 Days)

NDS Results



- The experiment near the channel failed due to extremely high sedimentation (despite the elevated treatments).
- Variance among samples was pretty high, especially among the N&P treatment in Willard Spur (2 @ ~50 and 2 @ ~200 mg/m^2).
- Responses of algae growth to nutrient additions were mostly pretty small.
- Significant increases at WS-4 were N or N&P.