

2011

Presumpscot River 2010-11 Lower Main Stem Monitoring (Presentation)

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FB Environmental Associates

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2010-11 Presumpscot River Lower Main Stem Monitoring

Cayce Dalton

FB Environmental Associates

97A Exchange St, Portland ME 04101

Project Overview

- Coalition interested in reclassification C to B.
- Monitored dissolved oxygen in Presumpscot R. lower main stem, with help from CBEP and Sarah Hayes (USM student).



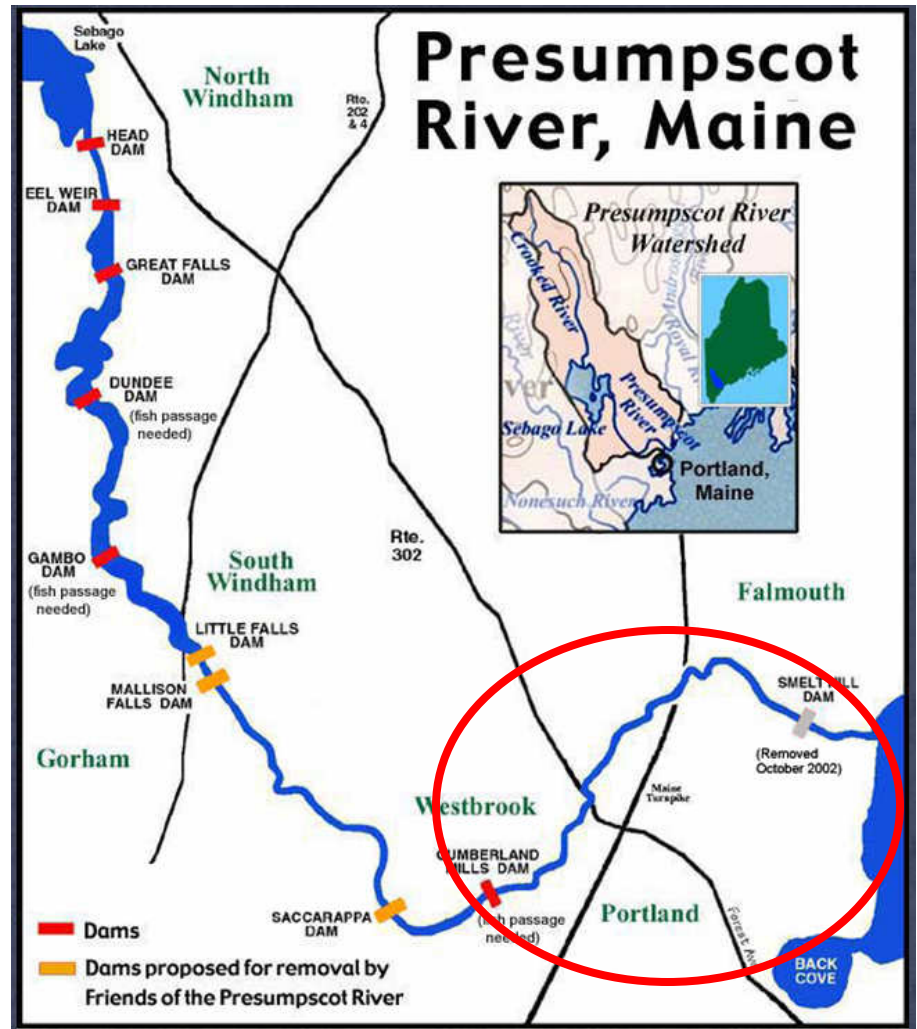
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Watershed Overview

- Sampling between Cumberland Mills Dam and head of tide / falls.

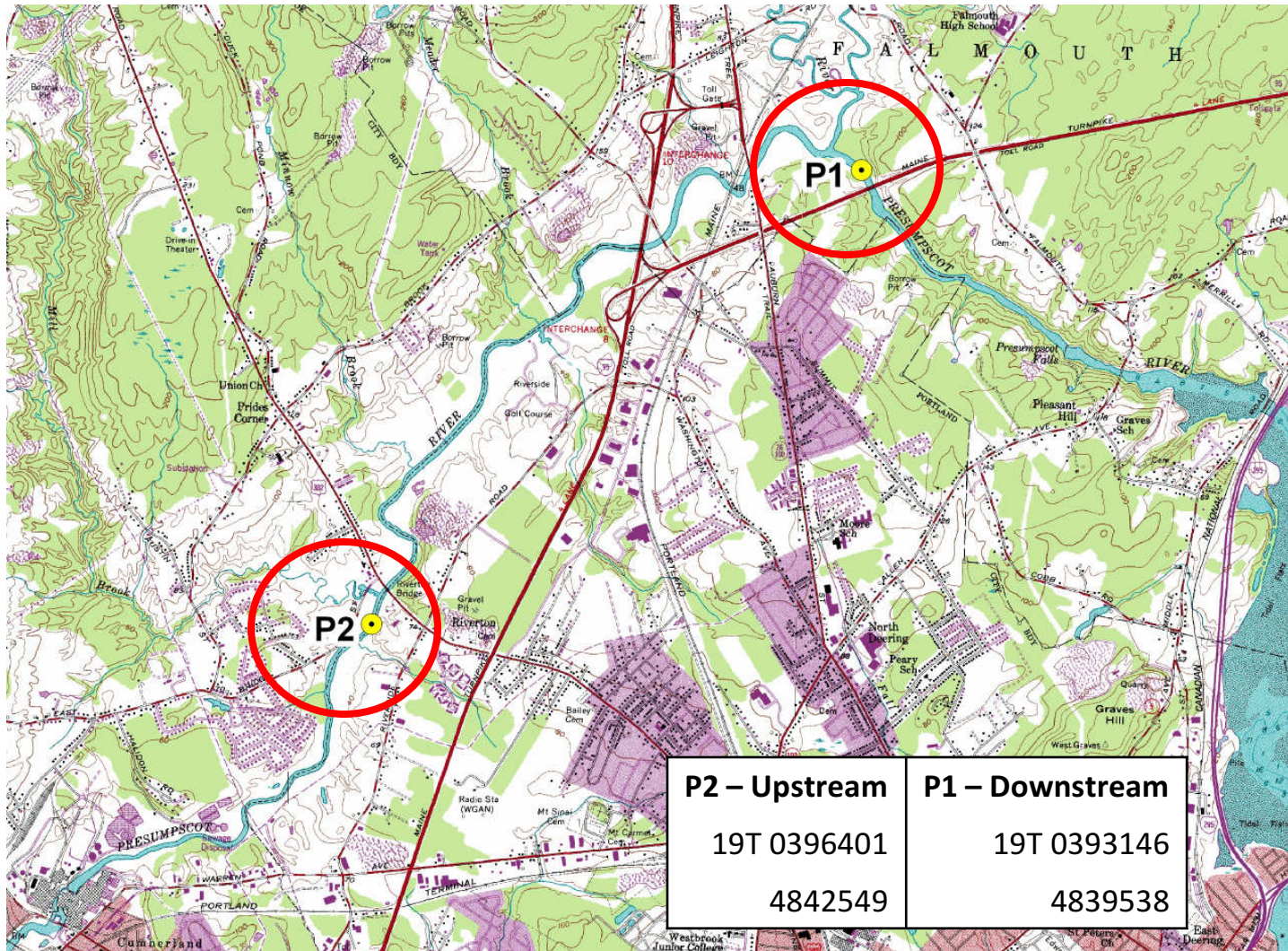


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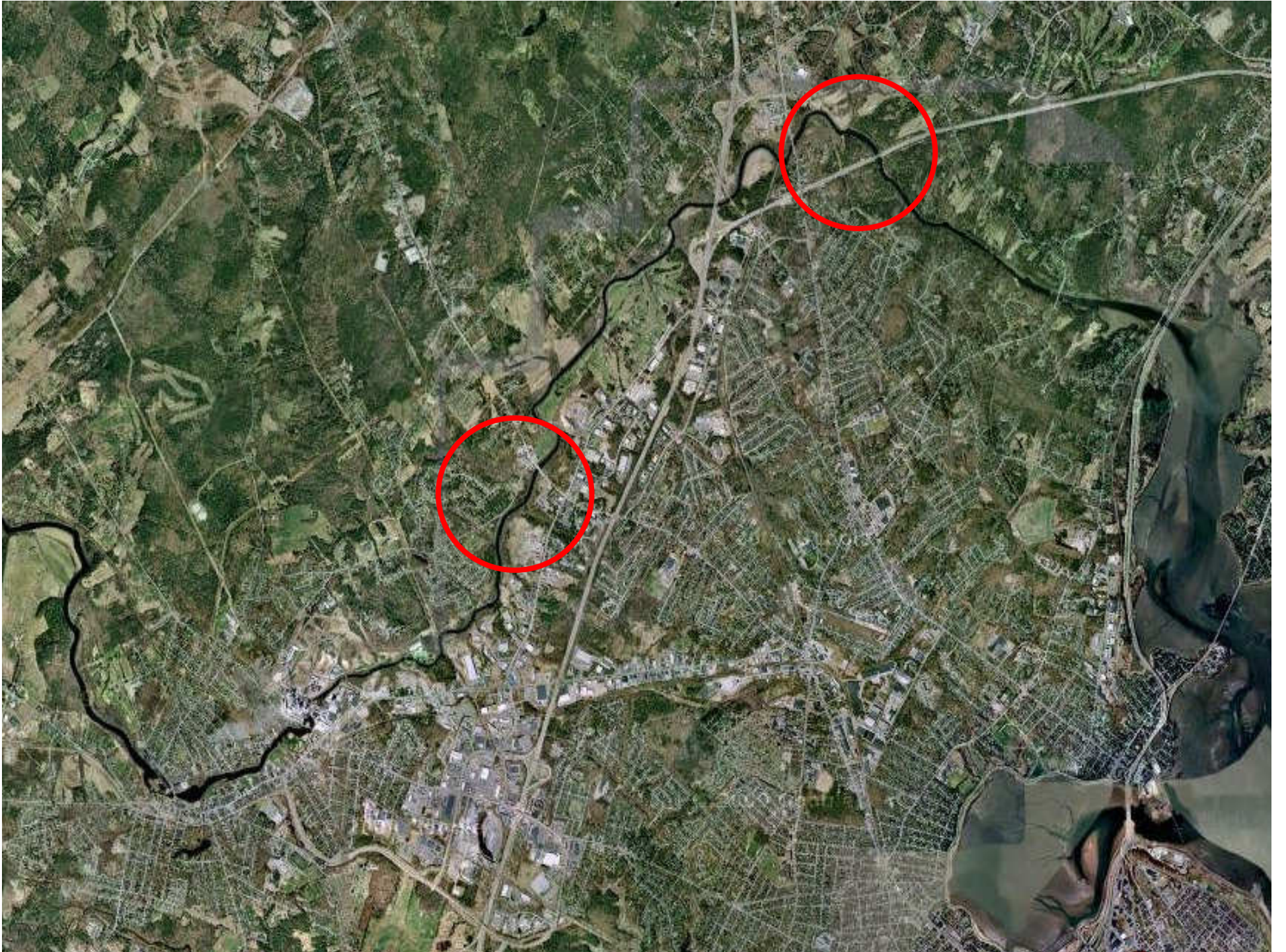
Monitoring Locations



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Site P2 (US 302 Bridge)



Site P2, upstream from US Route 302 bridge (seen at extreme right) at the Portland-Westbrook municipal boundary. Marker float for deployment site at lower left of photo.

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Site P1 (Falmouth Spur, Turnpike)



Looking downstream to site P1, with deployment site marked by a small float. Maine Turnpike Falmouth Spur bridge in background.

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Monitoring Methods

- Sondes deployed near stream bottom
- 15 min frequency
- DO (conc. & %)
- Temp & sp. cond.
- Approx. depth



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Monitoring Timeline

- 3 deployments
- 2 sites
- **2010:**
Late July –
Early Oct.
- **2011:**
Mid July –
Late Sept.

Action	P1 - Downstream	P2 - Upstream	Duration
Deployed	7/30/2010 17:45	7/30/2010 16:00*	25 days
Retrieved	8/25/2010 12:30	8/25/2010 10:45*	
Deployed	8/25/2010 12:45	8/25/2010 11:15	22 days
Retrieved	9/16/2010 11:30	9/16/2010 10:00	
Deployed	9/16/2010 12:15	9/16/2010 10:45	22 days
Retrieved	10/8/2010 15:00	10/8/2010 14:00	

* DO membrane punctured during deployment

Action	P1 - Downstream	P2 - Upstream	Duration
Deployed	7/13/2011 15:02	7/13/2011 13:17	22 days
Retrieved	8/4/2011 12:17	8/4/2011 10:02	
Deployed	8/4/2011 14:17**	8/4/2011 11:17	20 days
Retrieved	8/24/2011 13:32**	8/24/2011 11:32	
Deployed	8/24/2011 14:17	8/24/2011 12:32	34 days
Retrieved	9/27/2011 11:47	9/27/2011 10:32	

** DO probe failure during deployment

2010 Data

Table 3: Summary statistics for site P1 (downstream).

	Temperature (C)	Specific Conductivity (mS/cm)	DO % saturation	DO mg/L	Depth (m)	pH
<i>Number of samples</i>	6705	6705	6705	6705	6705	4581
Maximum	26.1	0.13	117.9	10.9	1.81	7.41
75 th percentile	24.3	0.09	107.8	9.68	1.26	7.11
Average	21.5	0.09	103.7	9.17	1.21	7.02
25 th percentile	18.6	0.08	99.3	8.63	1.11	6.92
Minimum	14.7	0.06	86.9	7.26	0.81	6.71

Table 4: Summary statistics for site P2 (upstream).

	Temperature (C)	Specific Conductivity (mS/cm)	DO % saturation	DO mg/L	Depth (m)	pH
<i>Number of samples</i>	6709	6709	4234	4234	6709	6709
Maximum	26.3	0.11	115.5	10.6	2.49	7.97
75 th percentile	24.5	0.08	104.7	9.63	1.77	7.31
Average	21.9	0.07	101.9	9.22	1.66	7.23
25 th percentile	18.7	0.07	98.9	8.81	1.49	7.11
Minimum	14.8	0.06	54.7*	5.14*	1.24	6.59

* Only a single reading was below 7 mg/L, and it is believed to be a measurement error. See Discussion.

2010 Data

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2011 Data

Summary statistics for site P1 (downstream).

	Temperature (C)	Specific Conductivity (mS/cm)	DO % saturation	DO mg/L	Depth (m)
<i>Number of samples</i>	5357	5357	5357	5357	5357
Maximum	27.85	0.27	110.00	10.01	3.05
75 th percentile	25.08	0.22	101.00	8.76	2.31
Average	22.44	0.14	96.99	8.43	2.14
25 th percentile	20.17	0.08	93.00	7.94	1.94
Minimum	17.09	0.06	76.80	6.35*	1.58

* 14 measurements (0.26%) were below 7 mg/L

Summary statistics for site P2 (upstream).

	Temperature (C)	Specific Conductivity (mS/cm)	DO % saturation	DO mg/L	Depth (m)
<i>Number of samples</i>	7279	7279	7279	7279	7279
Maximum	28.21	0.31	121.70	10.90	2.67
75 th percentile	25.08	0.26	105.70	9.44	1.65
Average	22.87	0.17	101.16	8.73	1.46
25 th percentile	20.70	0.08	96.60	8.04	1.15
Minimum	17.21	0.06	82.20	6.71**	0.81

** A single reading (0.01%) was below 7 mg/L.

2011 Data

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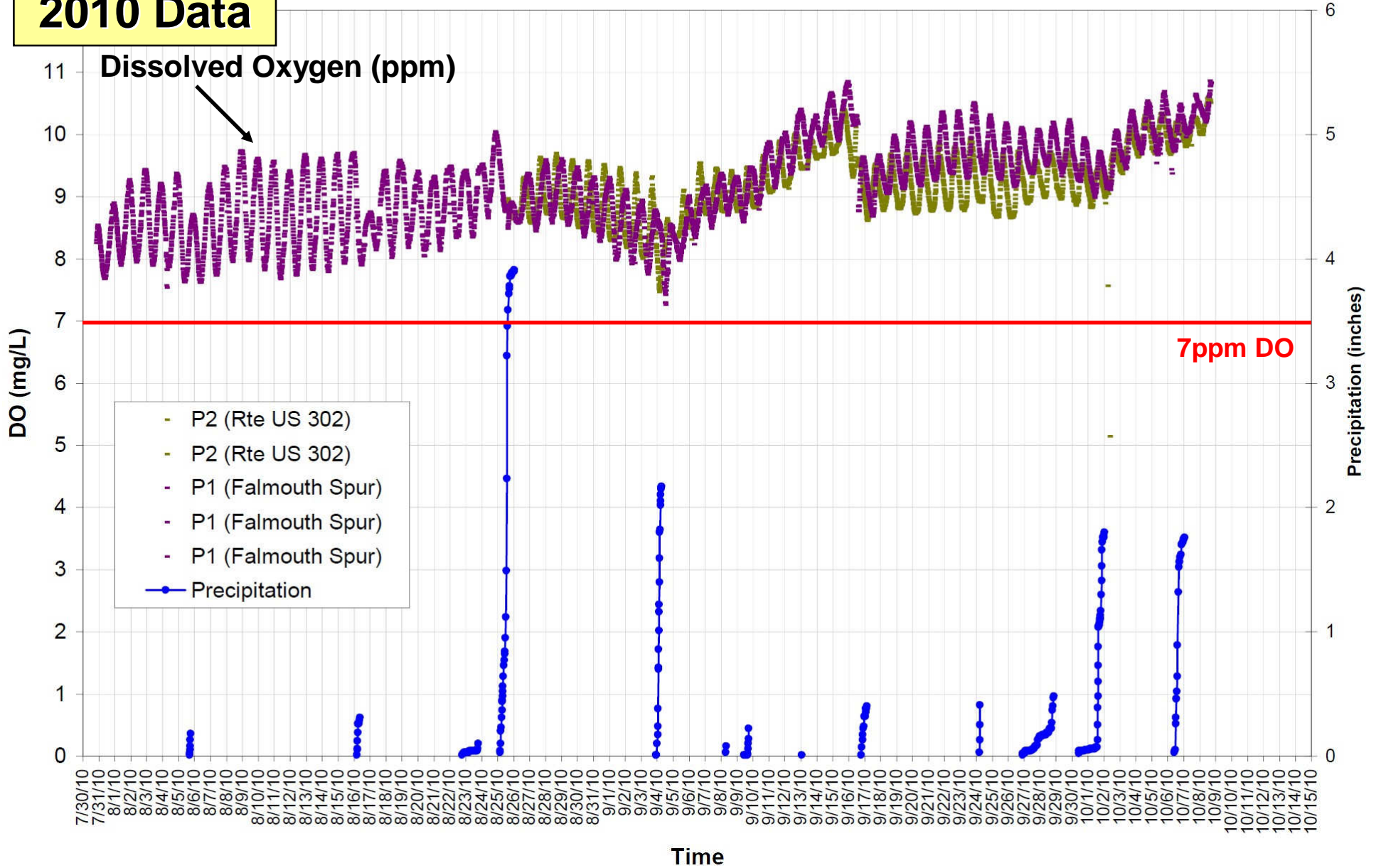
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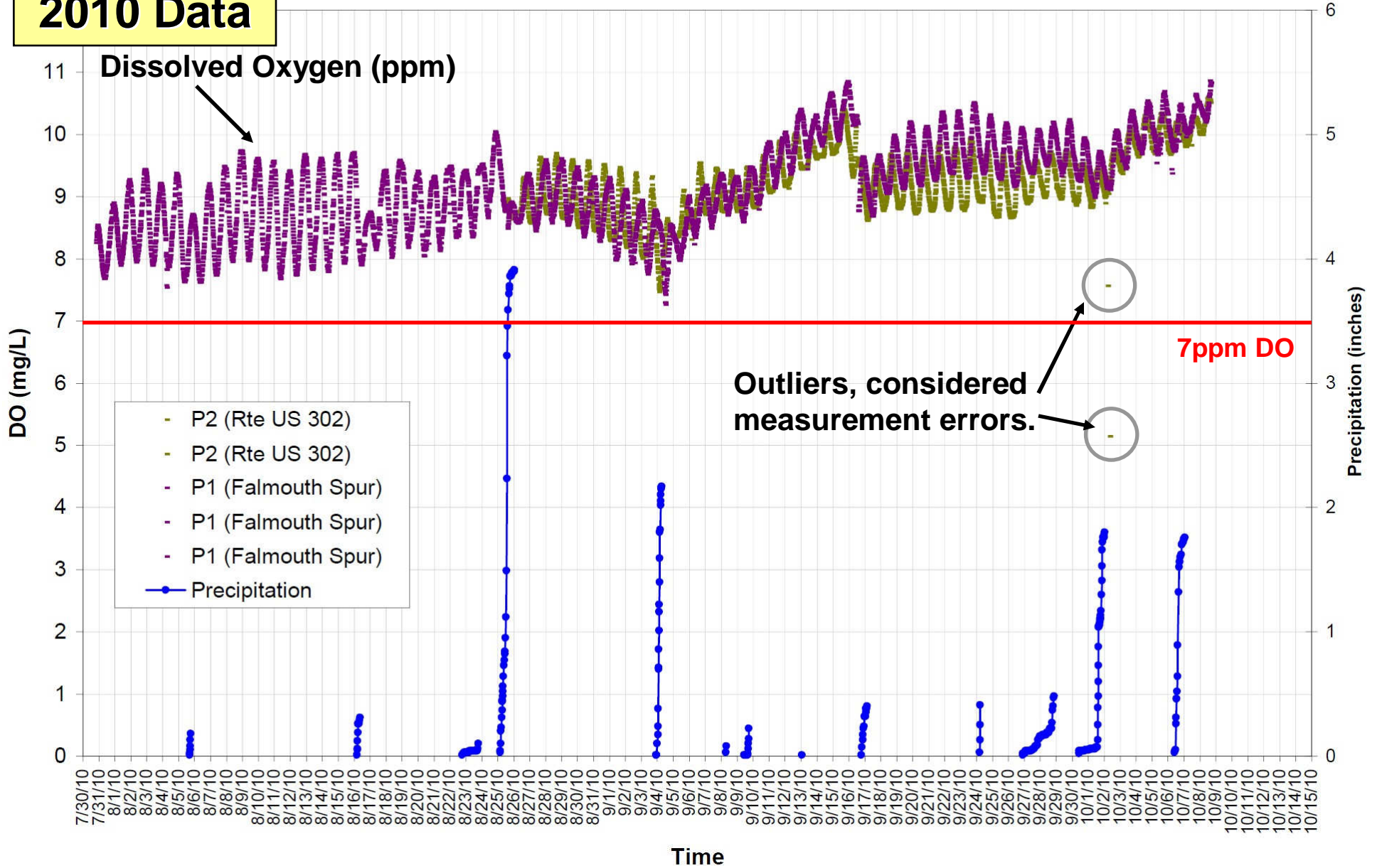


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2010 Data

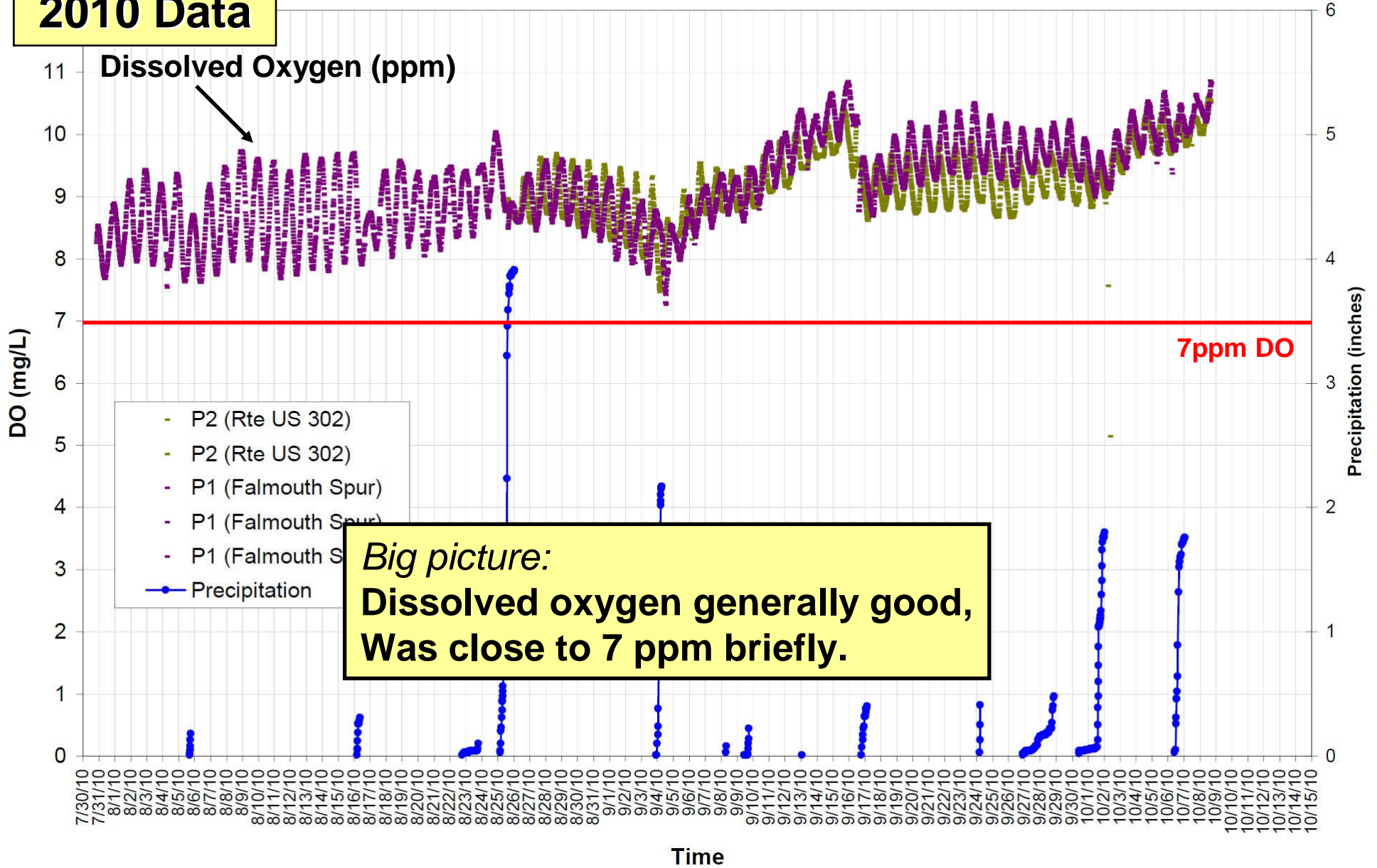


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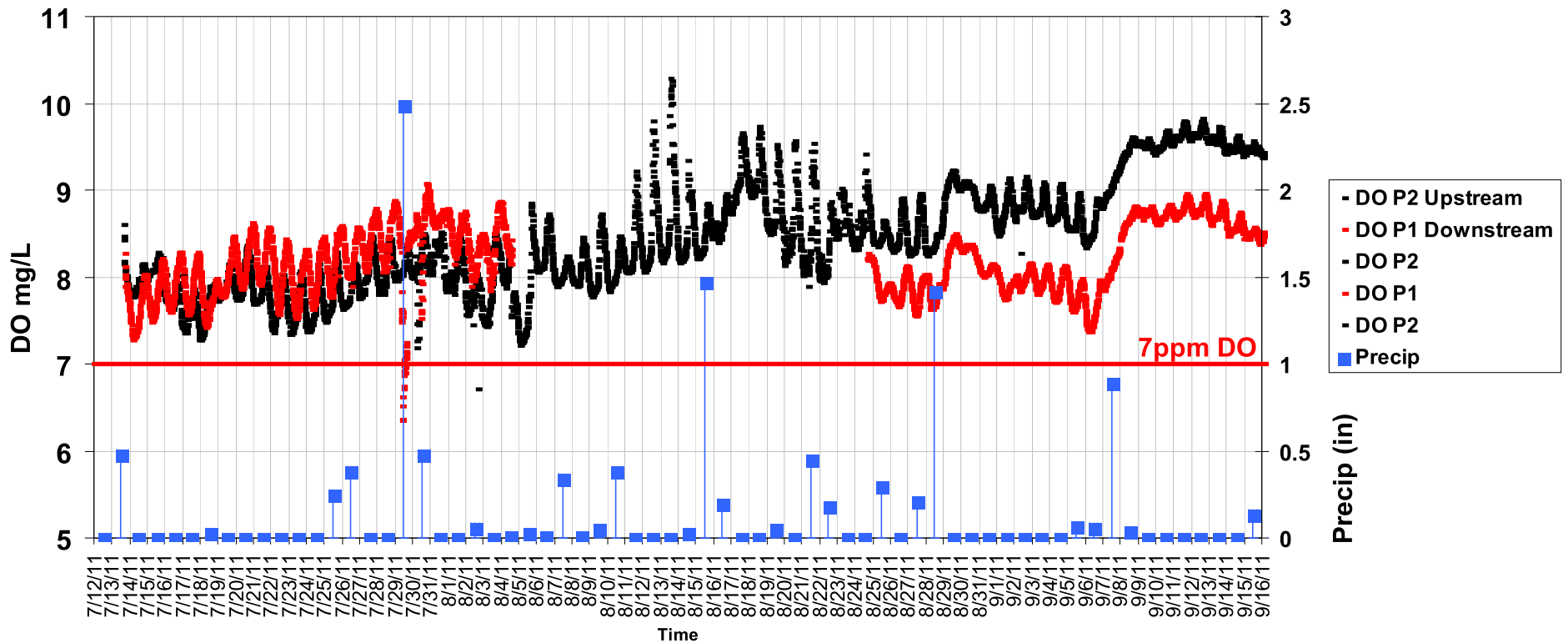
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2010 Data



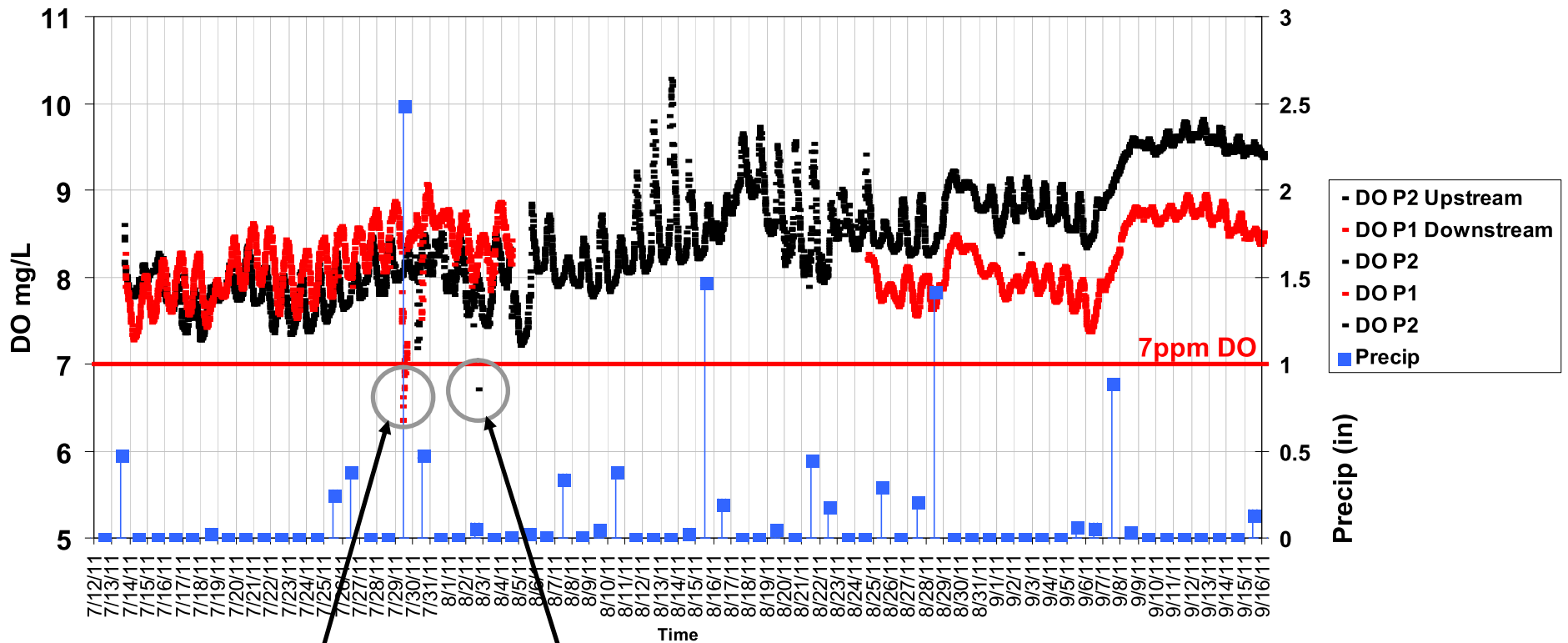
2011 Data

2011 Lower Presumpscot River Dissolved Oxygen and Precipitation - DRAFT



2011 Data

2011 Lower Presumpscot River Dissolved Oxygen and Precipitation - DRAFT



Downstream, possibly stormwater-related?

Upstream, possibly outlier?

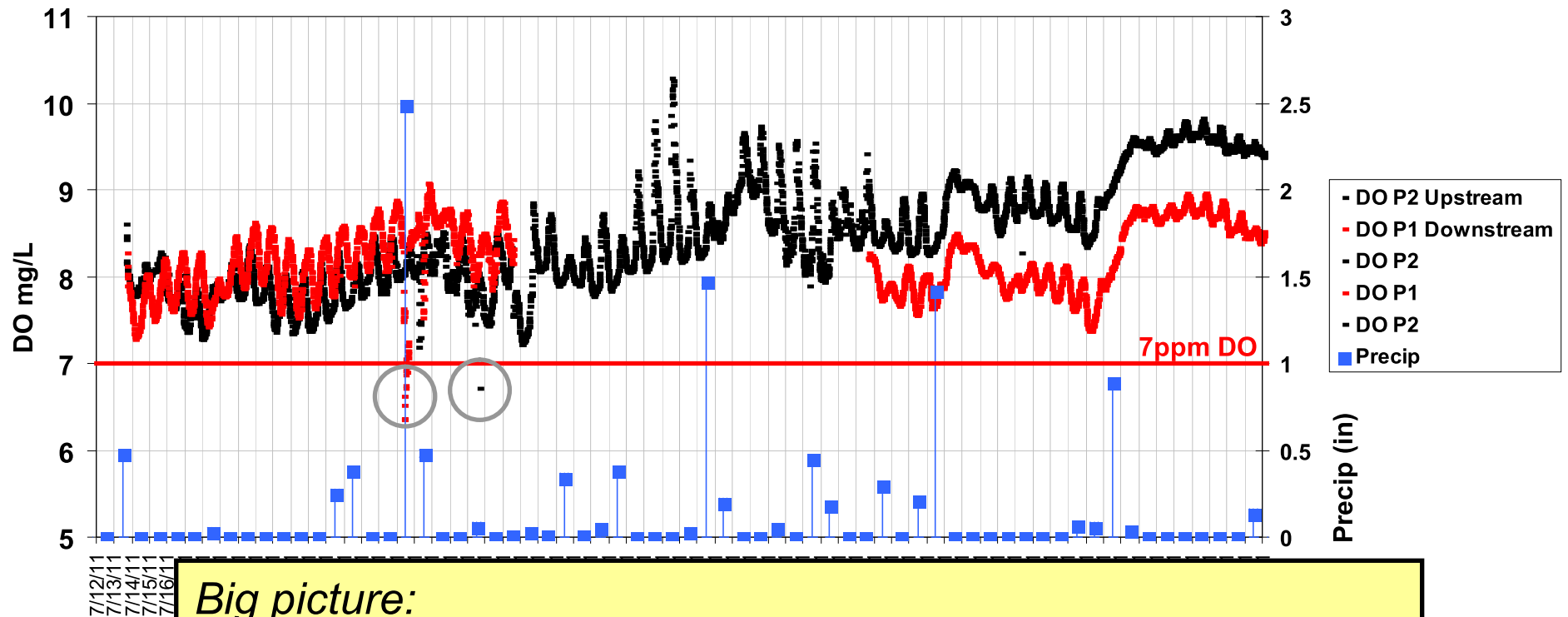
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2011 Data

2011 Lower Presumpscot River Dissolved Oxygen and Precipitation - DRAFT

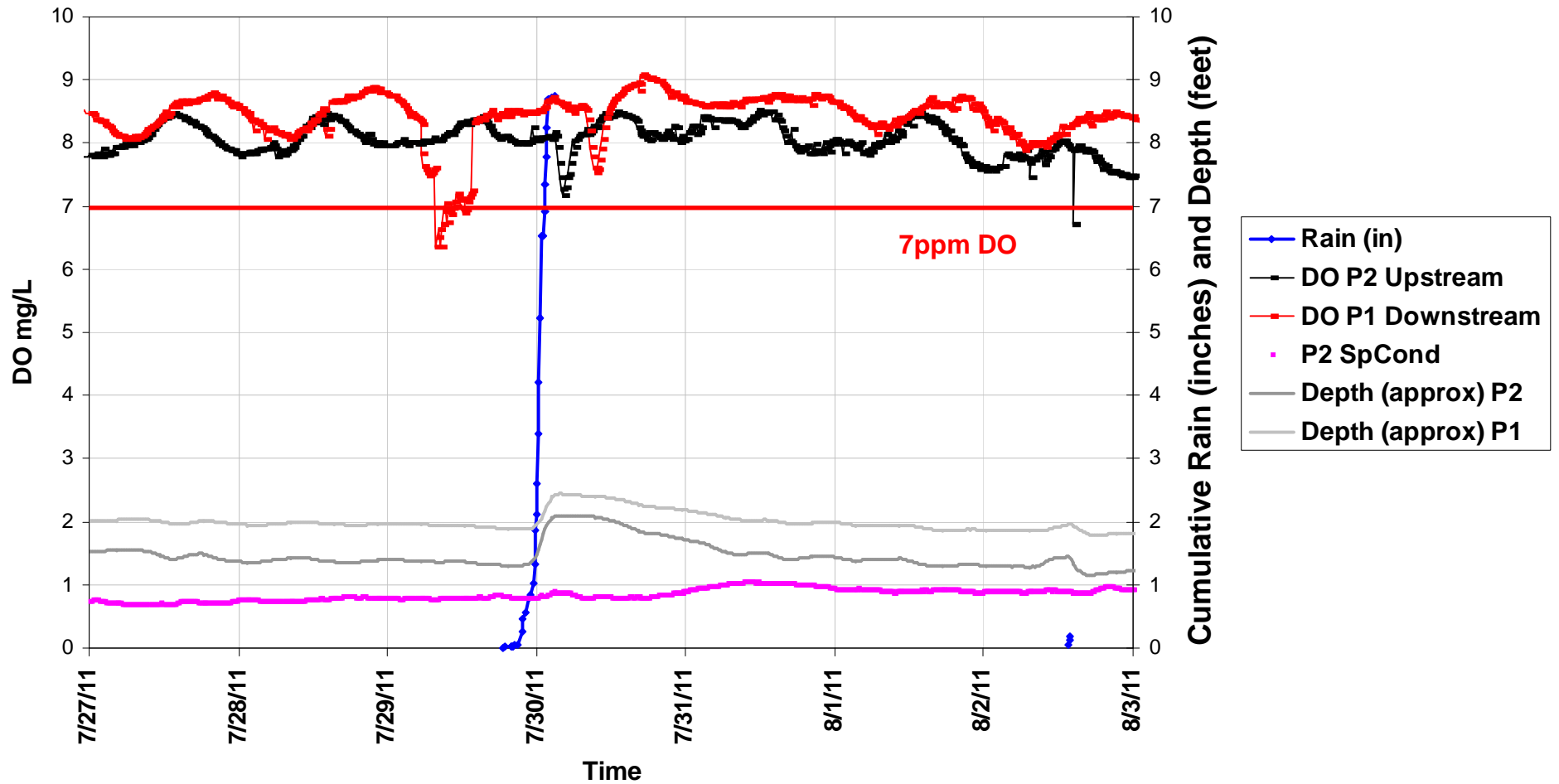


Big picture:

**Dissolved oxygen generally good,
Was under 7 ppm at downstream site for about 3.5 hours.**

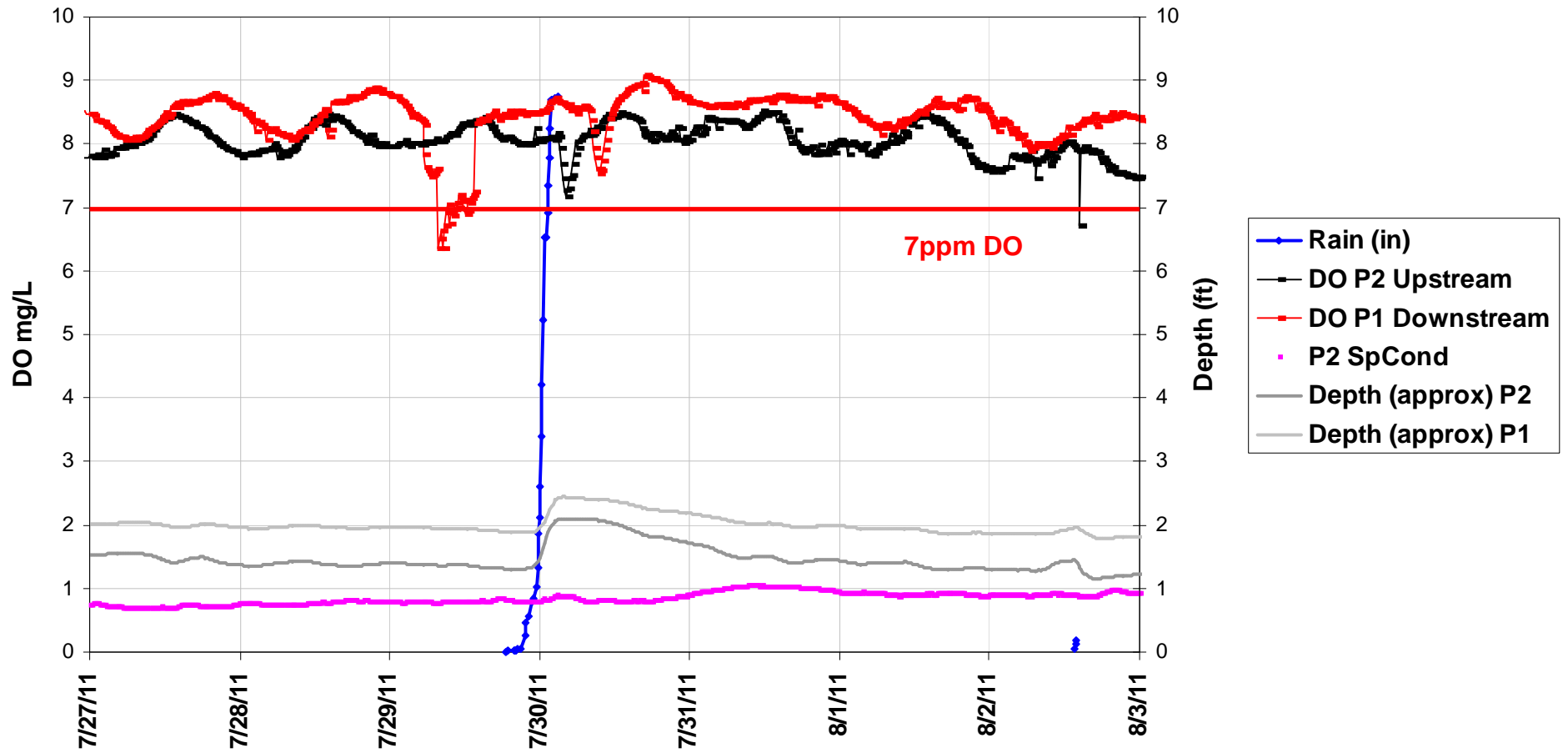
2011 Data

2011 Lower Presumpscot River DO, Depth, Rain, Sp. Conductivity DRAFT



2011 Data

2011 Lower Presumpscot River DO, Depth, Rain, Sp. Conductivity DRAFT



DO drops on July 29 approx 12 hours before intense storm
A smaller DO drop happens right after storm.

Next Step

- If oxygen is relatively OK, why are macroinvertebrates scoring so low?





Thoughts, comments, questions?

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