

Spokane County Receiving Water Sampling and other Spokane River Studies

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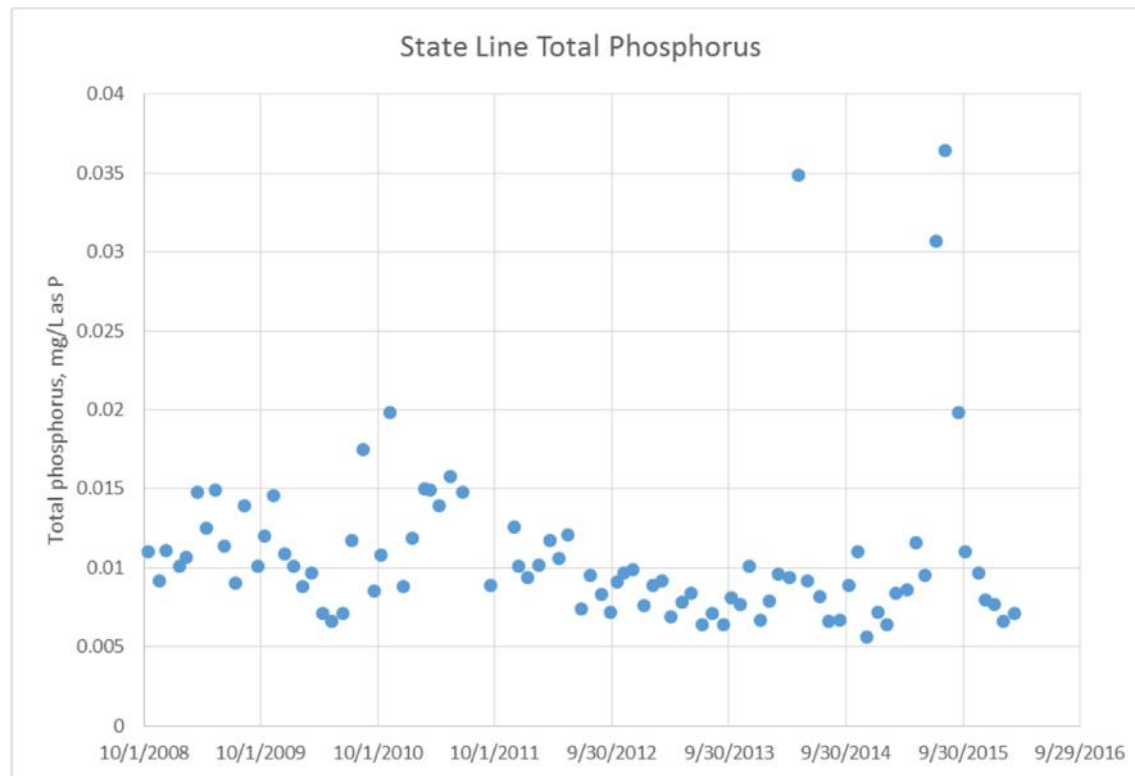
Spokane County Environmental Services

June 16, 2016

Sources, Transport, and Trends

- Sources, transport, and trends for selected trace metals and nutrients in the Coeur d'Alene and Spokane River basins, northern Idaho, 1990-2013, 2014, G.M. Clark and C.A. Mebane, USGS Scientific Investigations Report 2014-5204
- Finding:
 - WY 2009-13
 - Spokane River near outlet of CdA Lake – flow weighted TP: 0.008 mg/L
 - Spokane River near Post Falls – flow weighted TP: 0.009 mg/L

Ecology State Line Site, monthly sampling



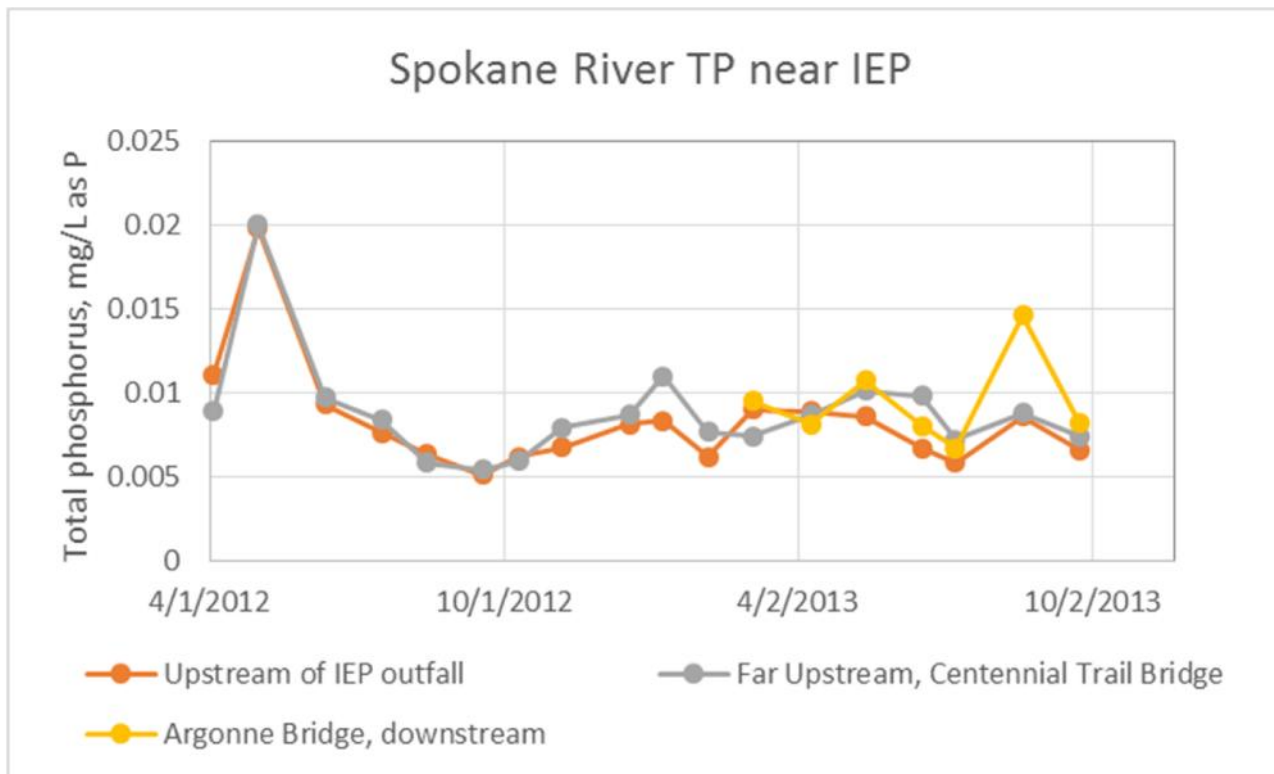
Water year 2009 through March 2016

- Number of samples: 87
- Median: 0.0095 mg/L
- Average: 0.011 mg/L

- Notes:

- Data below the detection limit are shown as the detection limit
- Data from WY 2015 and 2016 are preliminary

Ecology Groundwater Study in vicinity of IEP



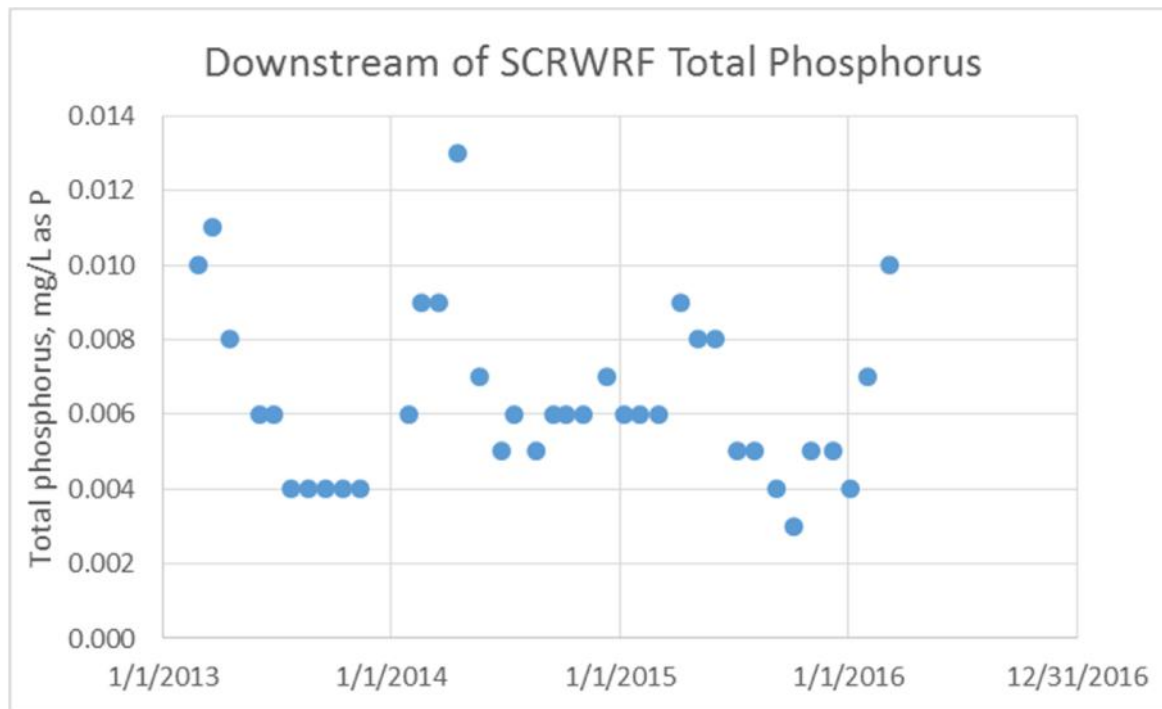
April 2012 through September 2013

- Number of samples: max. 22 per site
- Median: 0.0082 mg/L
- Average: 0.0085 mg/L

• Notes:

- Data below the detection limit or estimated are shown as the detection limit and or estimated value
- Duplicate samples are averaged
- Report is not final

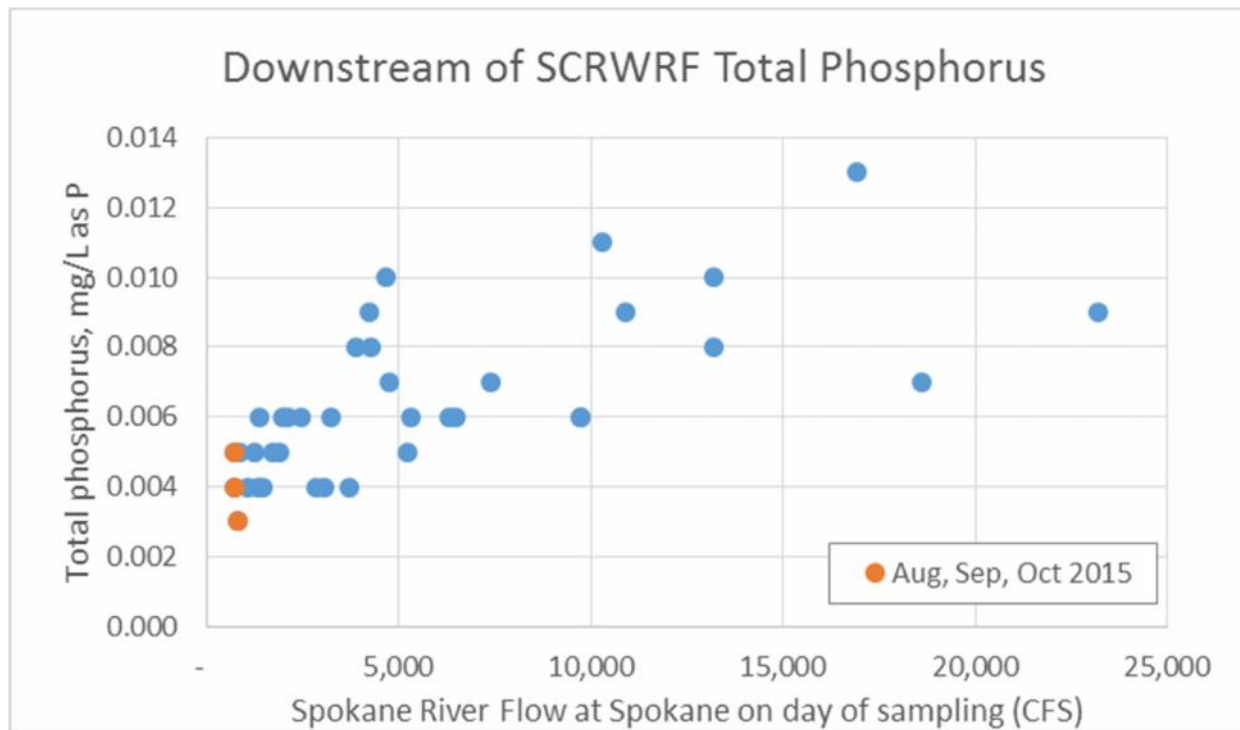
Spokane County sampling site, downstream of SCRWRF & upstream of Greene St



February 2013 through March 2016

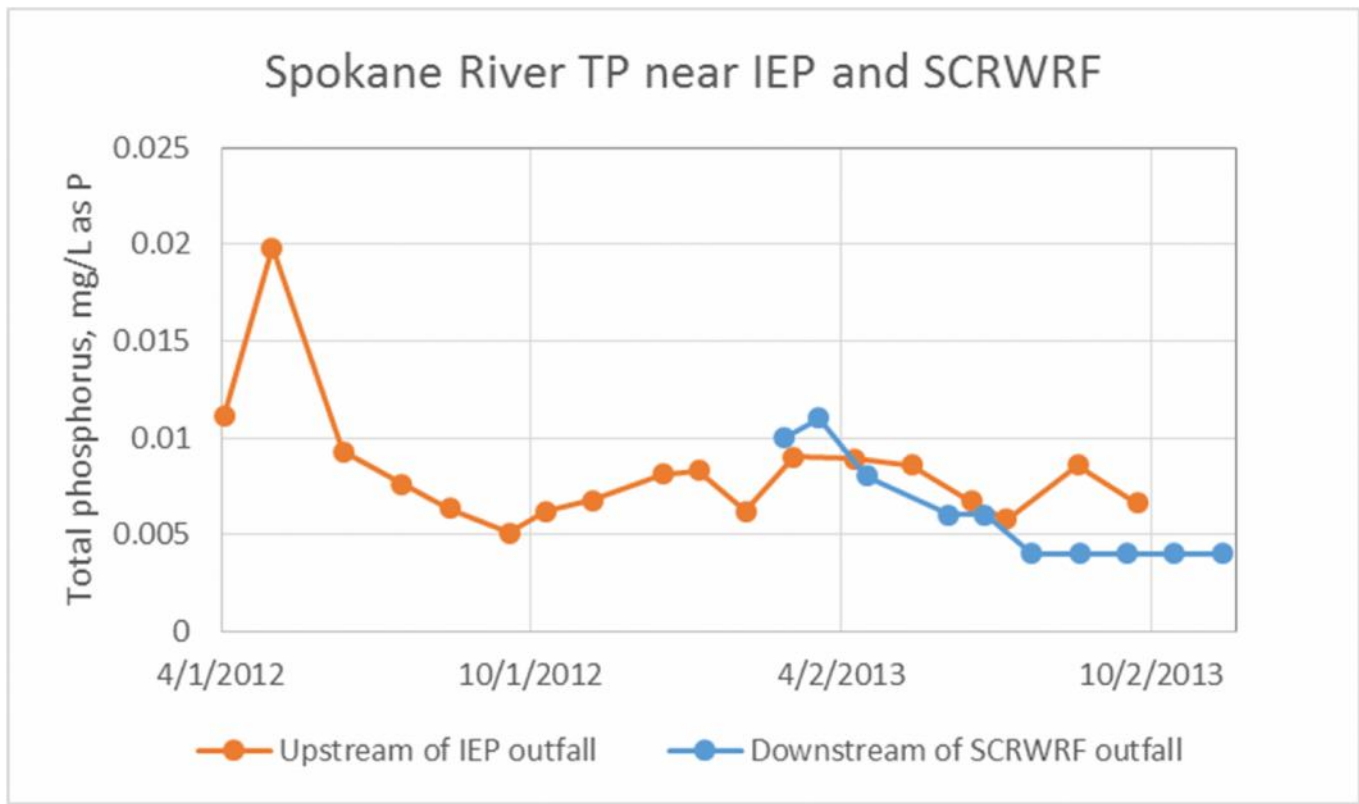
- Number of samples: 37
- Median: 0.006 mg/L
- Average: 0.006 mg/L

Spokane County sampling site, approximately monthly sampling



As river flow decreases, phosphorus concentration generally decreases

Comparison of IEP Study with Spokane County Receiving Water Sampling

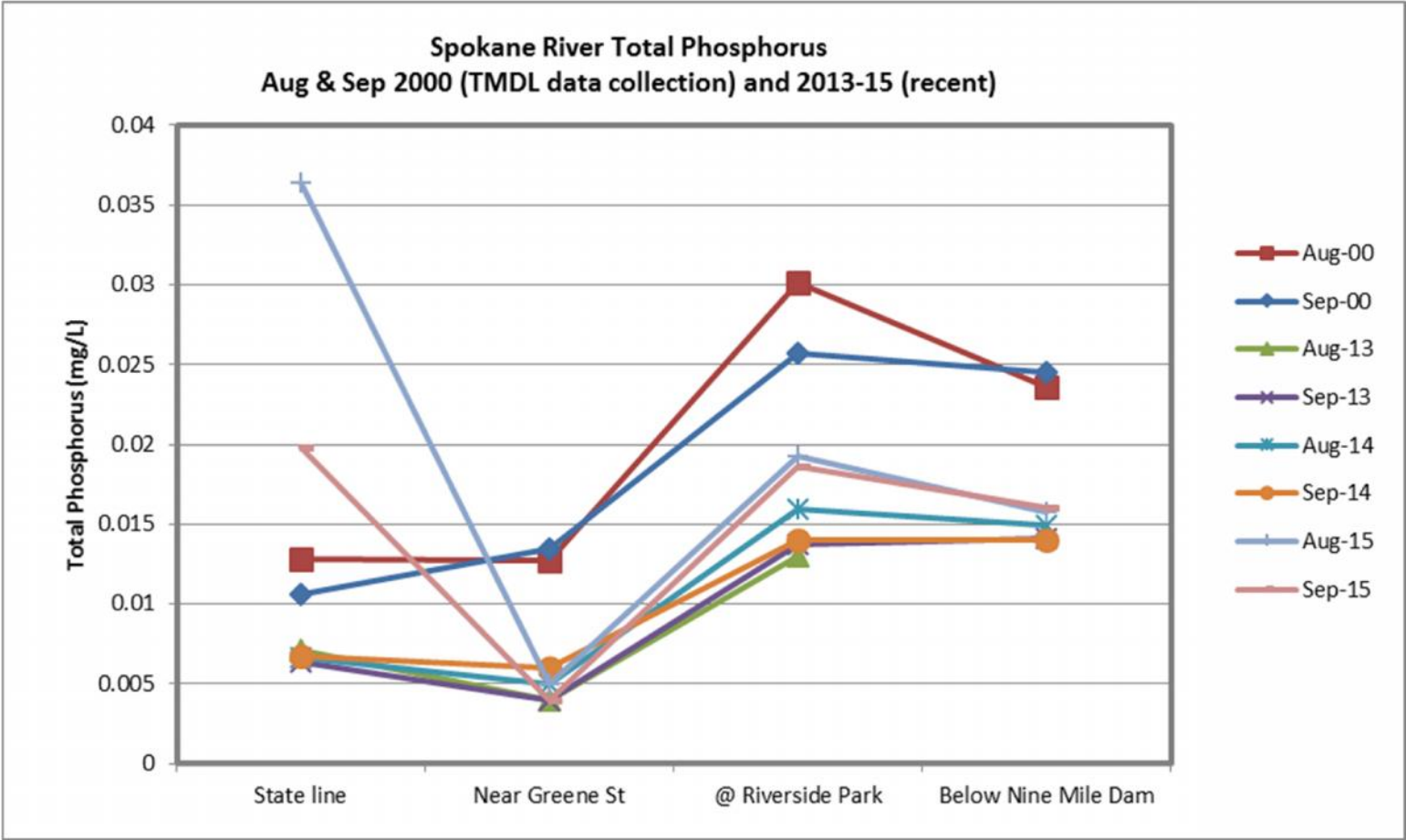


Overlapping monthly sampling from Feb 2013 to Sep 2013

- Two NPDES discharges between these locations
- Similar concentrations
- Lower concentrations downstream of SCRWRP may be cause by low TP groundwater inflows

- Notes:
 - Samples not collected on the same day
 - Data below the detection limit or estimated are shown as the detection limit and or estimated value
 - Duplicate Ecology samples are averaged
 - Report is not final

Longitudinal Sampling



Update Figure 21: Spokane River and Lake DO TMDL 2010-2014 Implementation Report, Ecology, publication no. 15-10-038
 Attenuation of TP prior to Greene and Nine Mile, even during low 2015 flows

Additional recent studies

- A dramatic recovery of Lake Spokane water quality following wastewater phosphorus reduction, E.B. Welch, S.K. Brattebo, H.L. Gibbons, R.W. Plotnikoff, 2015, Lake and Reservoir Management
- Preliminary Characterization of Nitrogen and Phosphorus in Groundwater Discharging to Lake Spokane, Northeastern Washington, Using Stable Nitrogen Isotopes, A.S. Gendaszek, S.E. Cox, & A.R. Spanjer, USGS Open-File Report 2016-1029
- The modeled and observed response of Lake Spokane hypolimnetic dissolved oxygen concentrations to phosphorus inputs, M.T. Brett *et. al.*, 2016, Lake and Reservoir Management