

Spokane Dissolved Oxygen TMDL 10-Year Effectiveness Study

Tighe Stuart

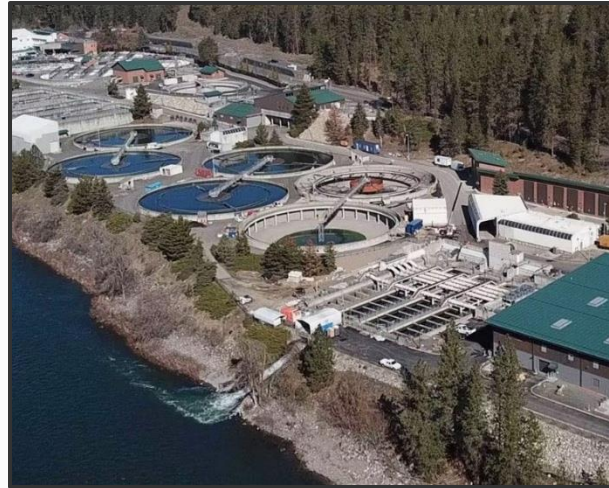
Environmental Assessment Program, Eastern Regional Office

Spokane River Forum, 4/23/2025

Spokane River & Lake Spokane DO TMDL (2010)

Placed limits on:

5 Point Source Facilities



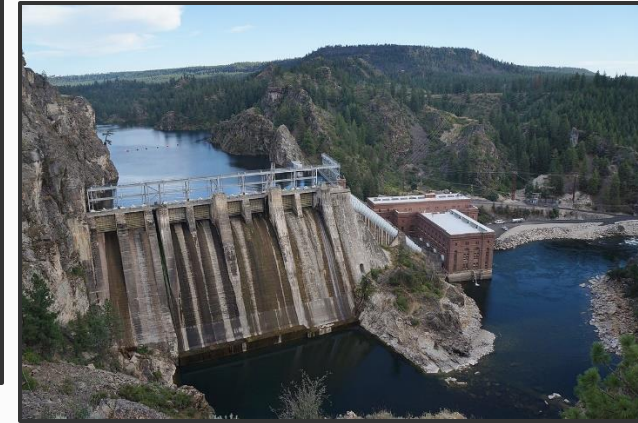
Stormwater & CSOs



3 Tributaries (nonpoint)



Avista DO responsibility



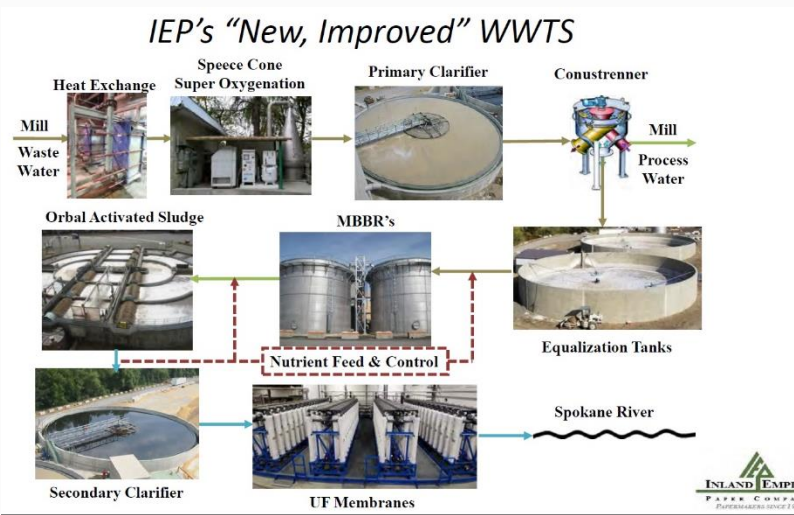
With levels set to achieve:

Total Phosphorus (TP) ★
CBOD
Ammonia-N

TP levels ~10 ug/L
flowing into
Lake Spokane



(Way more than) 10 years of progress



Spokane TMDL 10-Year Assessment

- TMDL has 20-year implementation timeframe
- 10-Year Assessment is “halfway check”

Relies on a large variety of data sources

- Ecology data sources
- Non-Ecology data sources
 - Avista/Tetra Tech Lake Spokane monitoring
 - Spokane County groundwater data
 - City of Spokane stormwater & CSO data
 - Discharger Monitoring Reports (DMR)
 - USGS streamflow data
 - USGS Lake Spokane groundwater studies



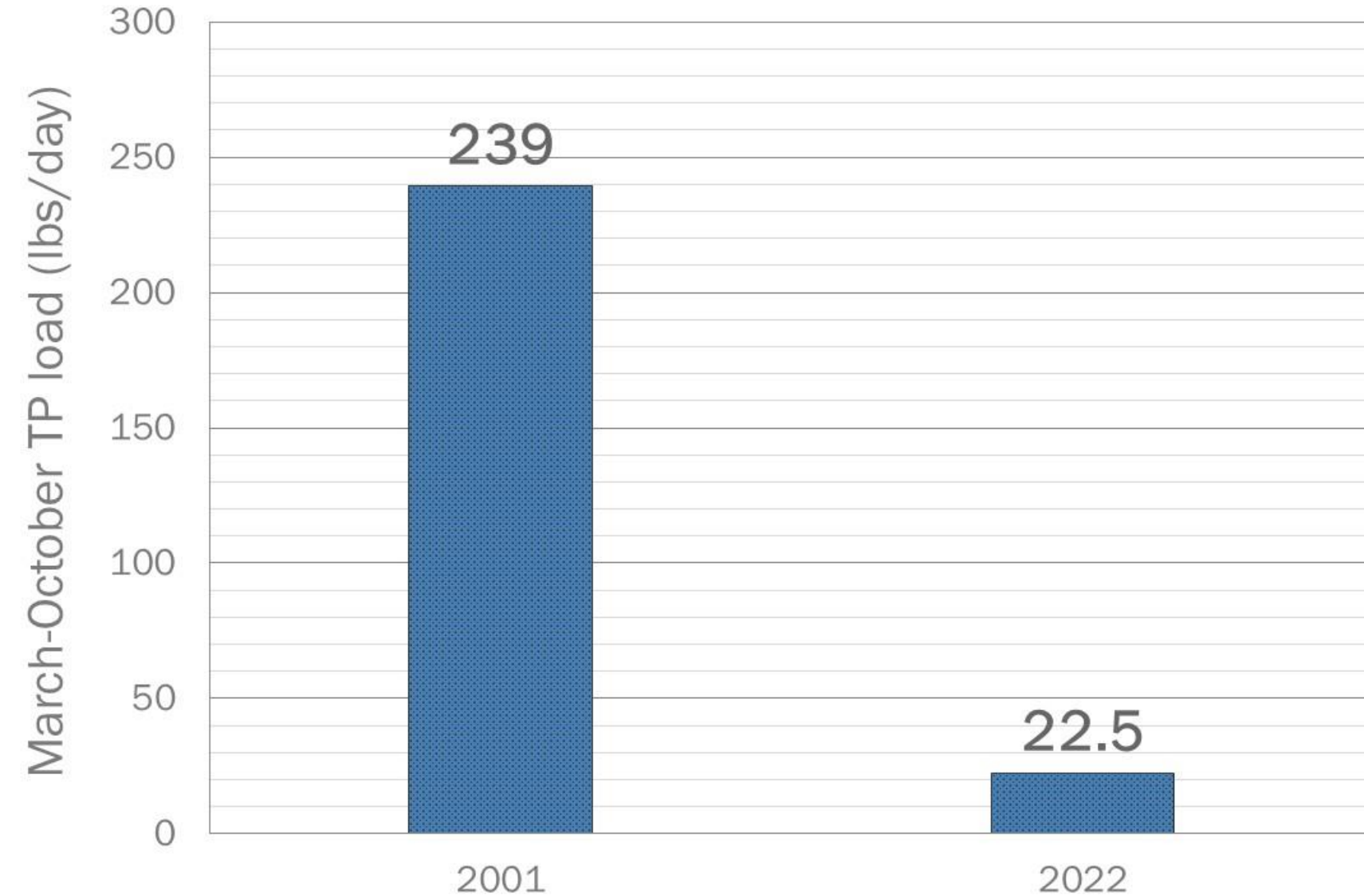


Phosphorus Reduction: Point Sources

Photo credit: The Spokesman-Review



Spokane River Actual Point Source Loads



91% reduction!

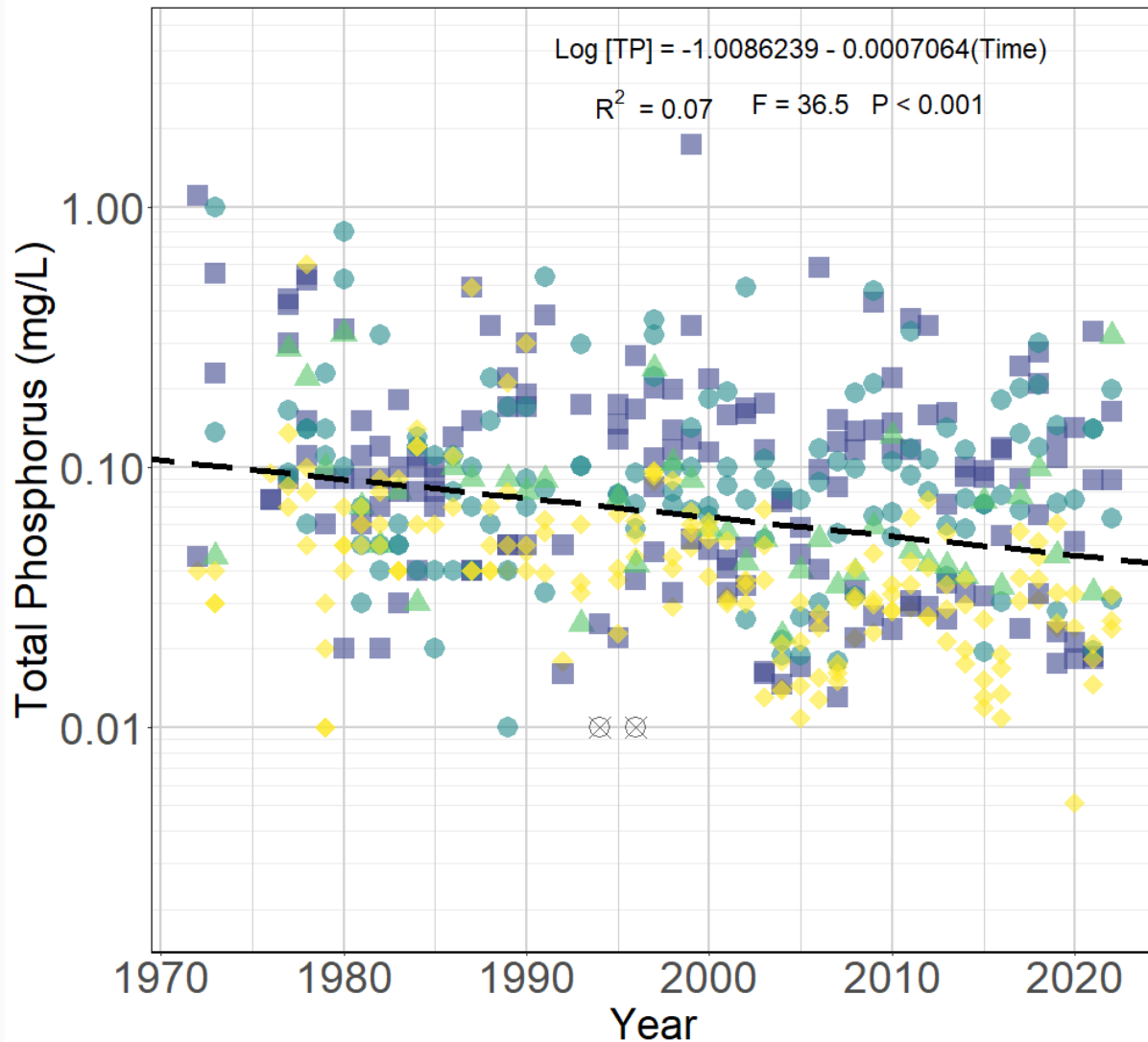


Phosphorus Reduction: Nonpoint Sources



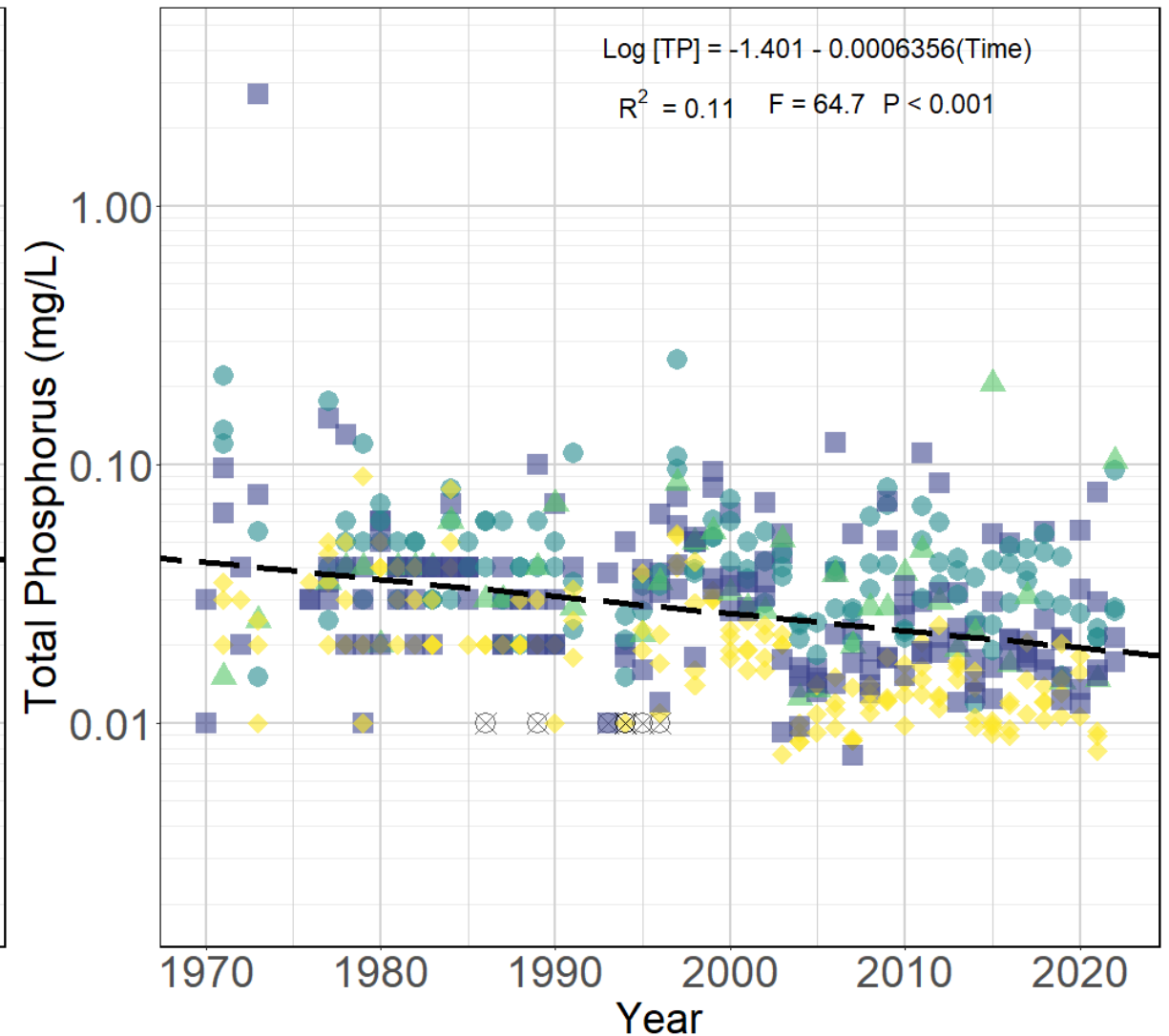
■ NOV-FEB ● MAR-MAY ▲ JUN ◆ JUL-OCT ⊗ NON-DETECT

Hangman Creek @ Mouth: Total Phosphorus



67% reduction (since the 1970s)

Little Spokane River @ Mouth: Total Phosphorus



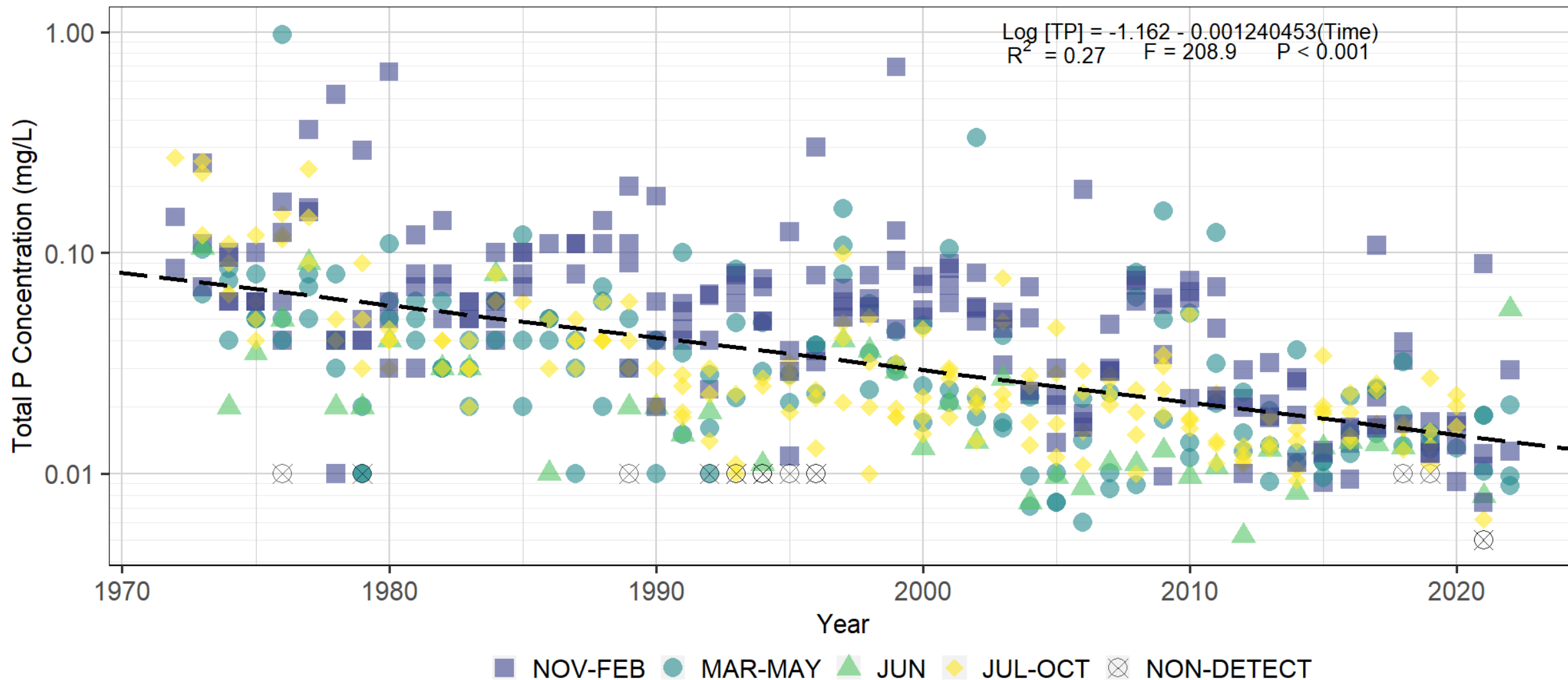
46% reduction (since the 1970s) ⁹



Phosphorus Reduction: Overall effect of point and nonpoint reductions

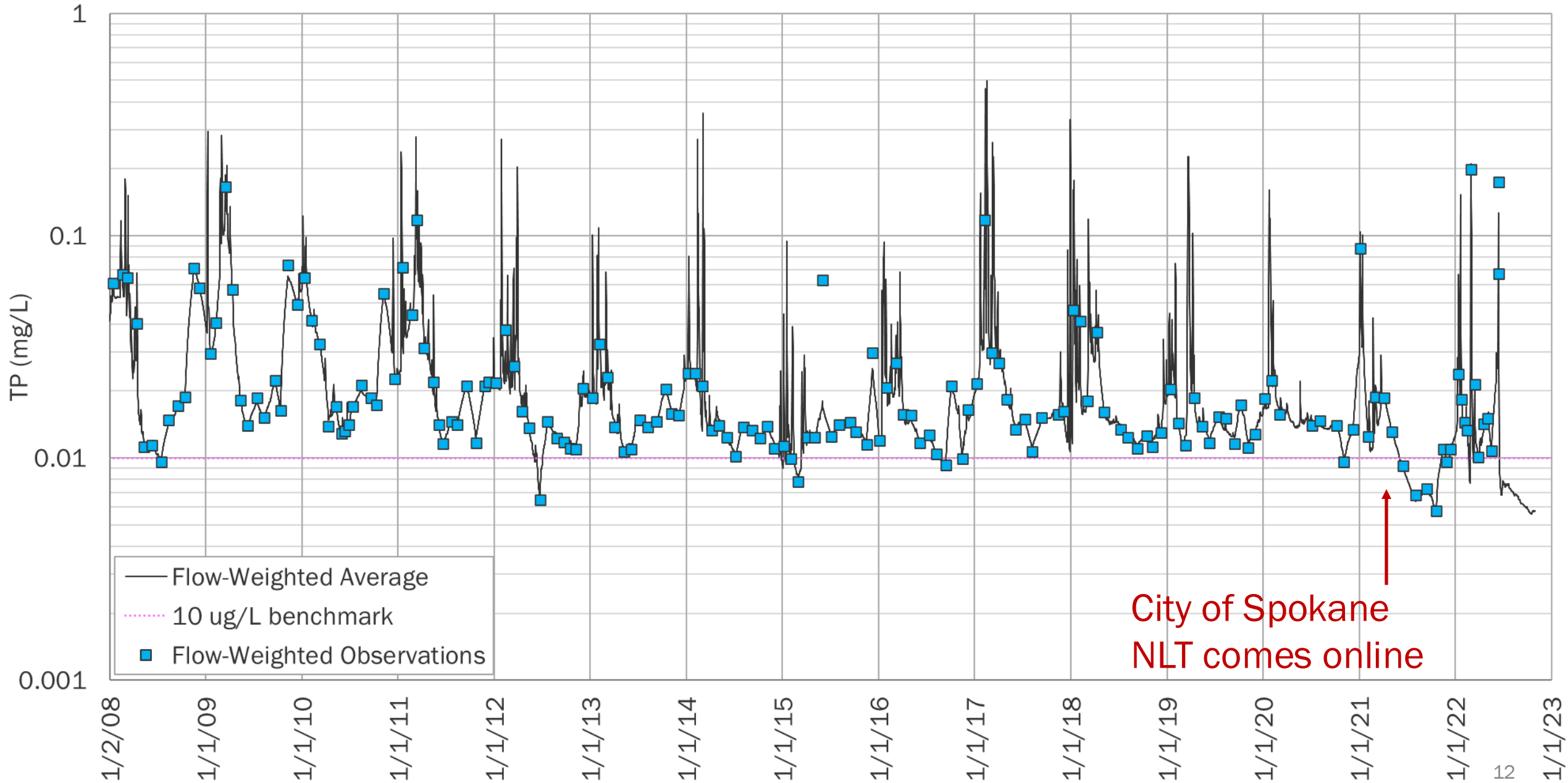


Spokane River @ Riverside St. Park: Total Phosphorus



84% reduction (since the 1970s)

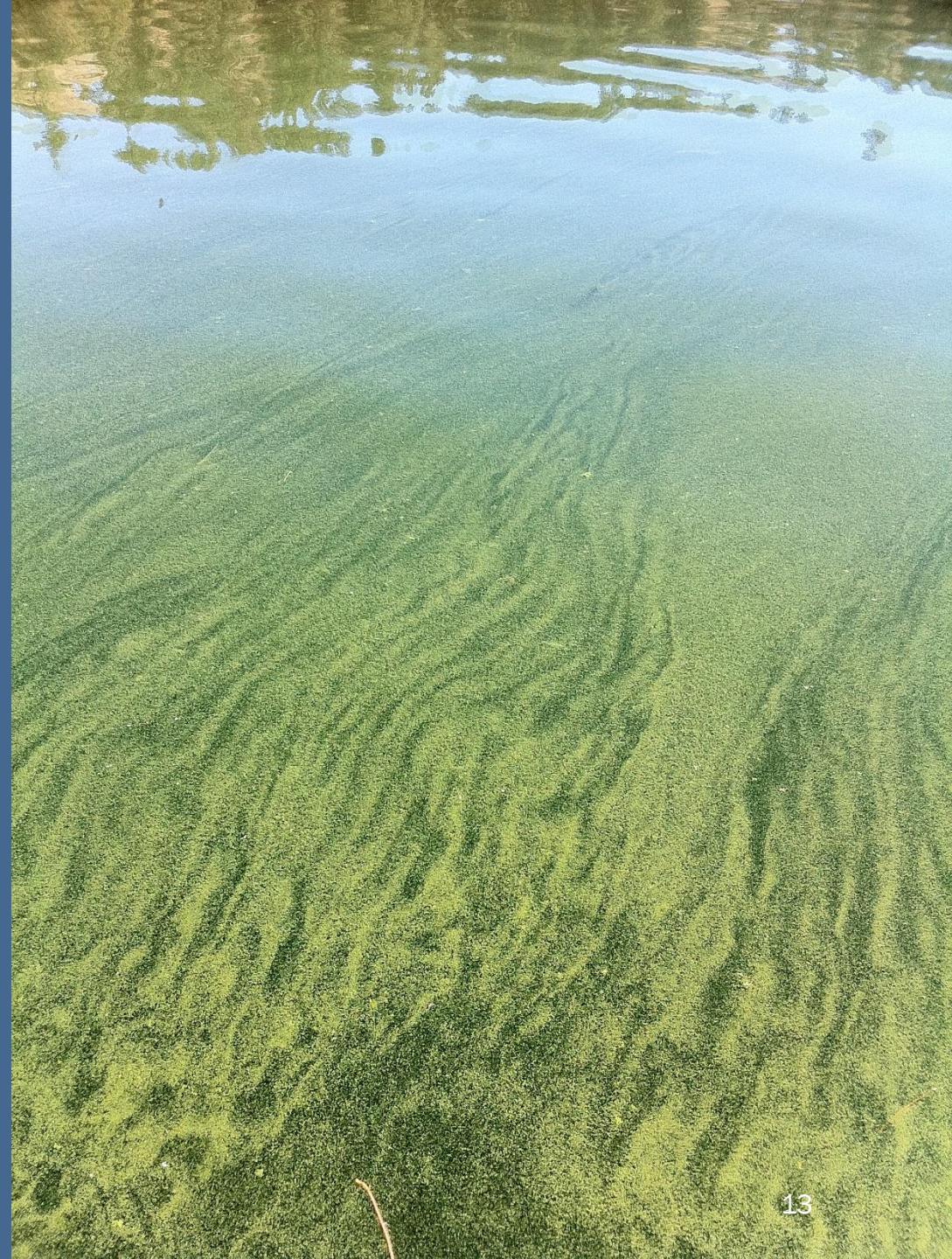
Estimated Total Phosphorus -- Riverine Assessment Point, 2008-2022





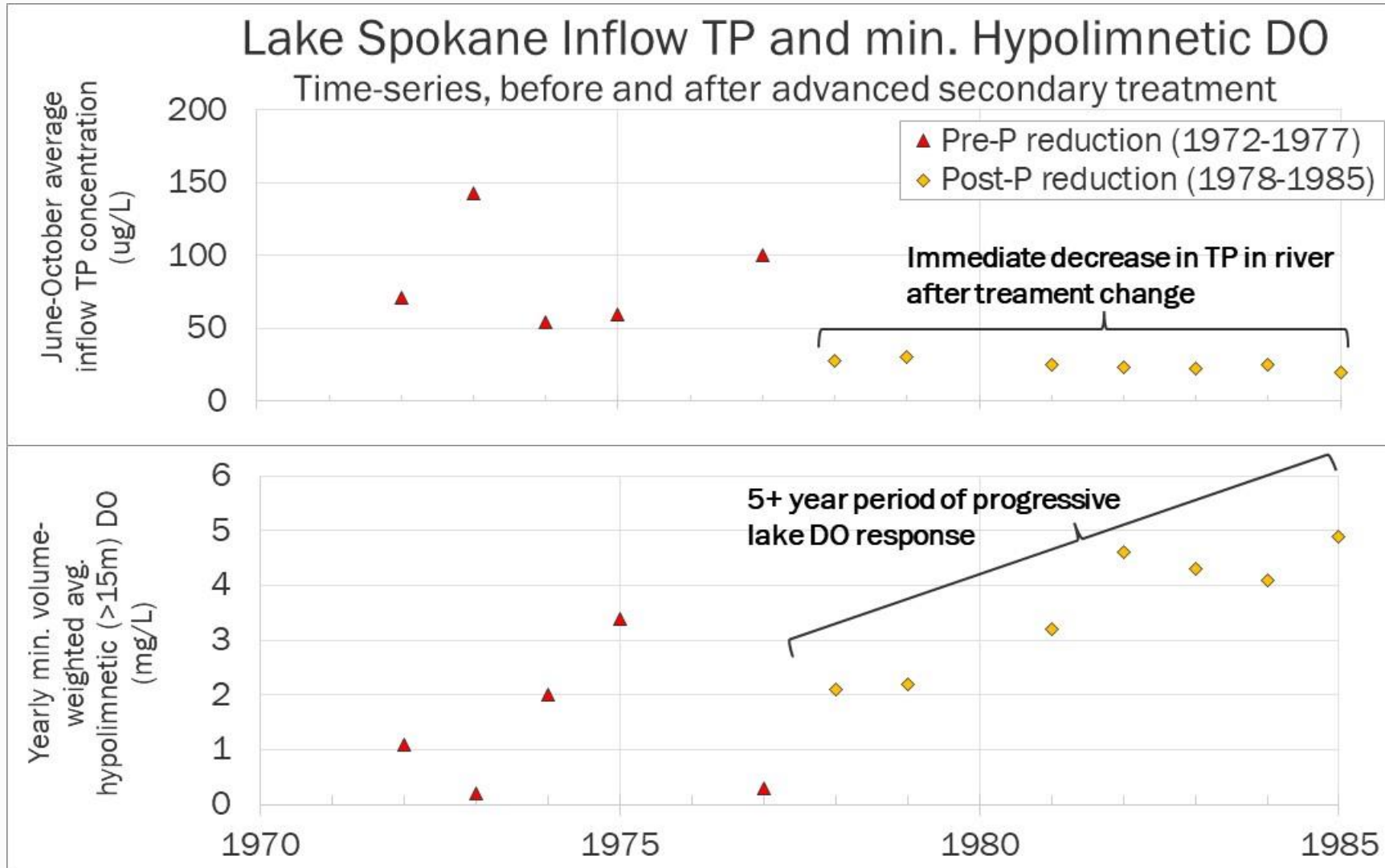
Lake Response

(Dissolved Oxygen and
Harmful Algae Blooms)



First, a bit of historical context

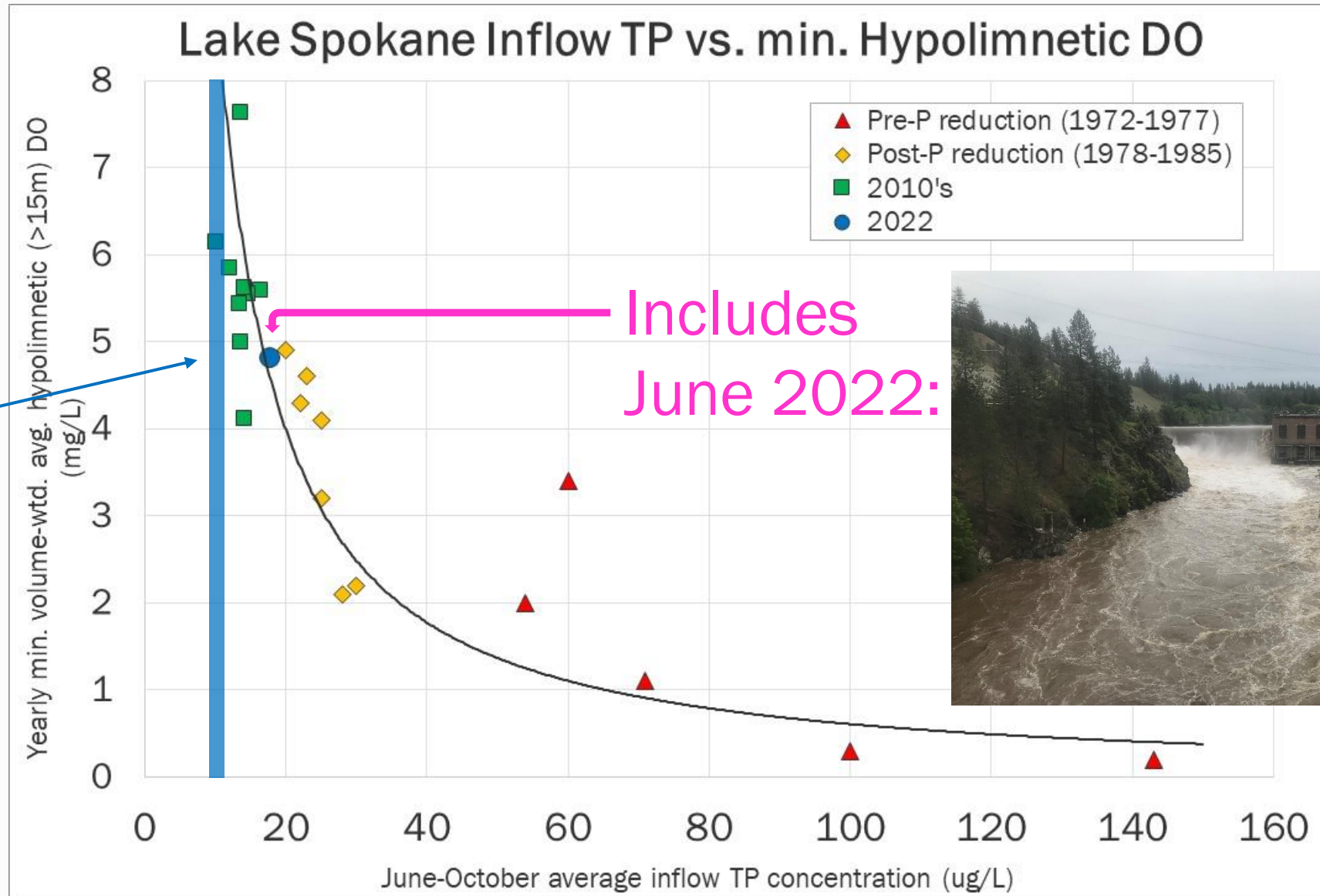
What happened the last time we did this, back in the 1970's?



Data from:
Patmont et al., 1987
Welch et al., 2015

So where are we now (as of 2022)?

Approx range
of normal
expected Jun-
Oct inflow
TPs w/ NLT
operational
at all pt. src.
facilities



What about Harmful Algae Blooms?

Recorded Toxic Algae Blooms, Lake Spokane





Let's talk
more about
nonpoint...

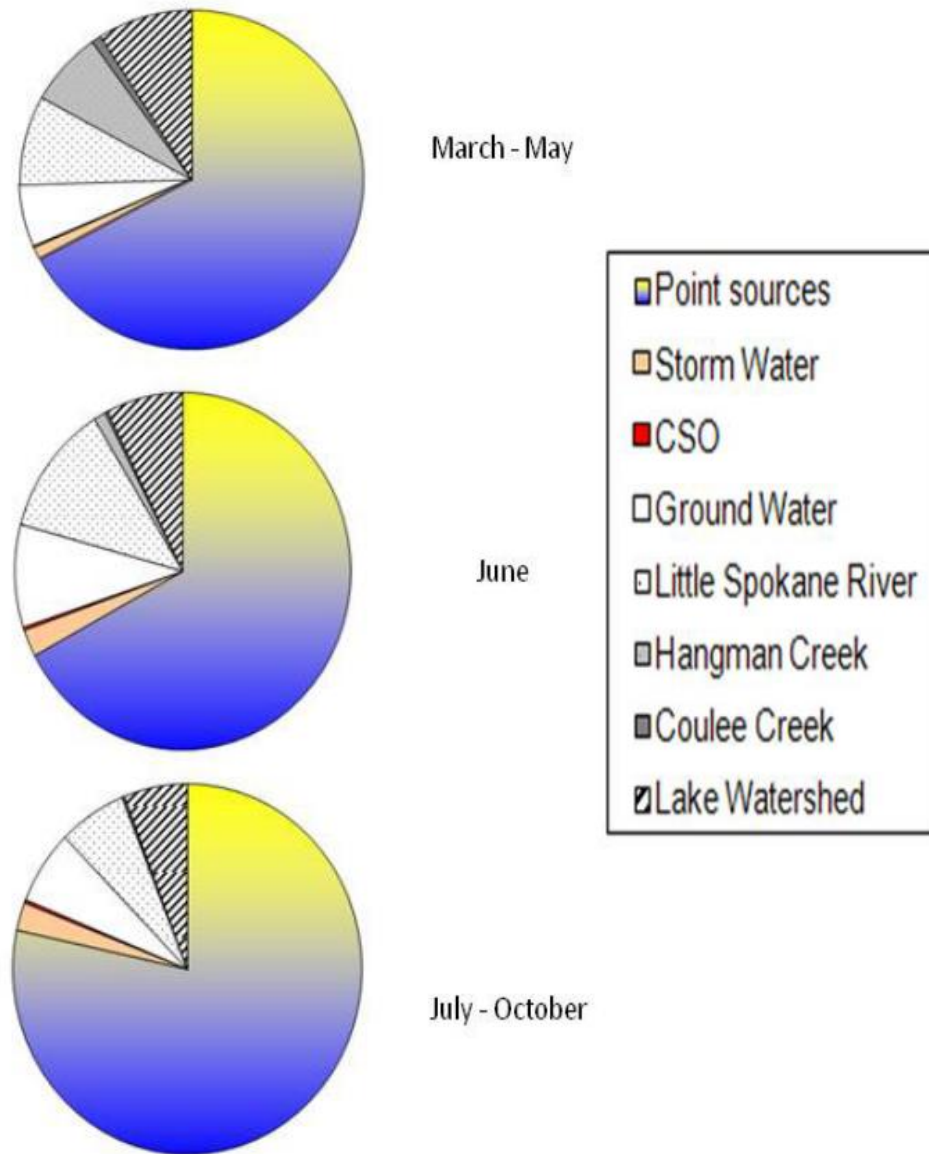




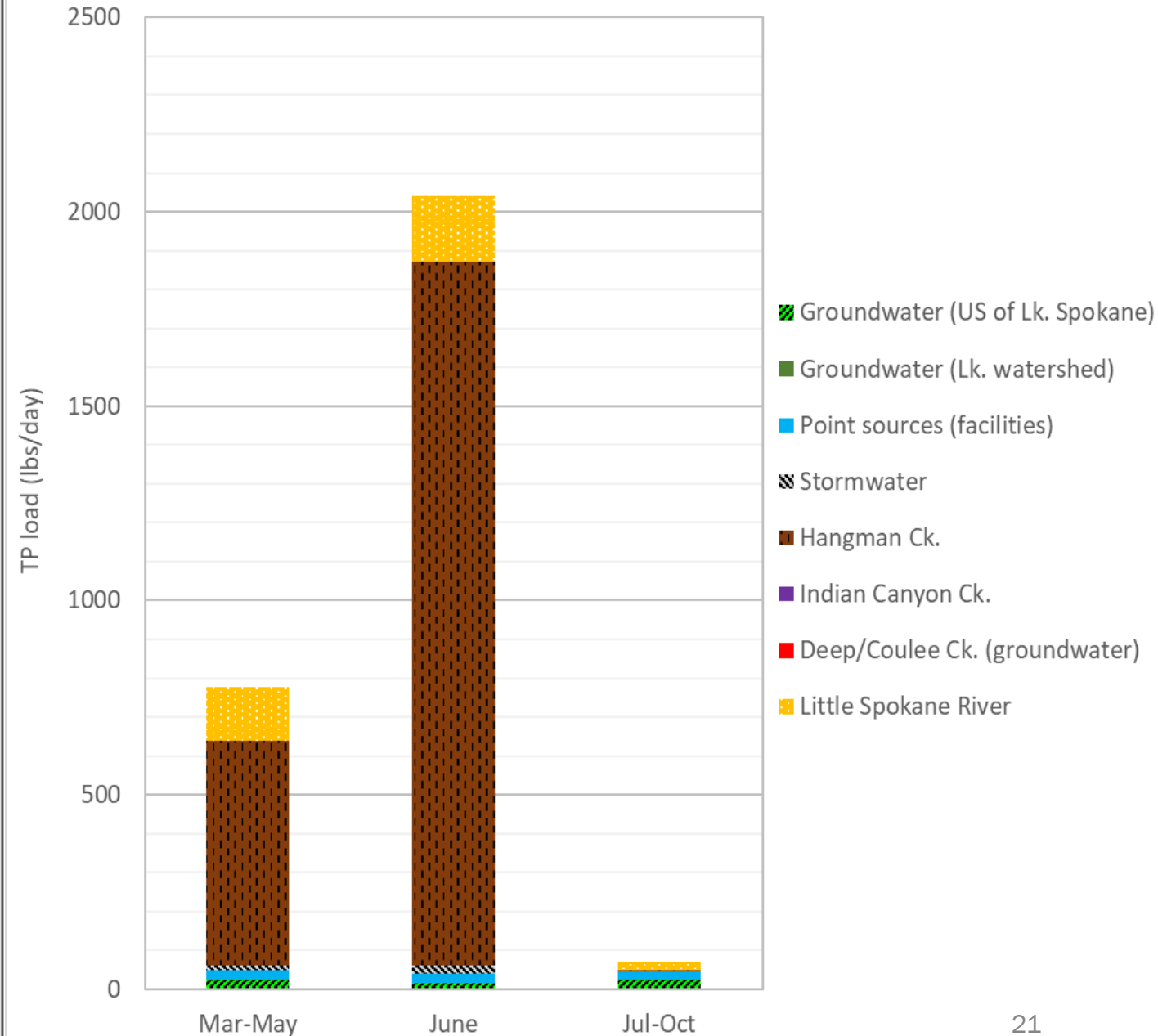
Photo credit:
Spokane Riverkeeper/
Cutboard Studios



2001 Anthropogenic Loadings



2022 Total Phosphorus Loads to Spokane River



What needs to be done next?

- Focus on nonpoint pollution
 - Especially sediment-laden runoff in Hangman and Little Spokane
- Keep monitoring Lake Spokane
 - Track DO response as lake re-equilibrates to reduced TP inflows
- Fulfill remaining TMDL requirements



Questions?

Spokane 10-year Effectiveness Study Report URL:

<https://apps.ecology.wa.gov/publications/SummaryPages/2503001.html>

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