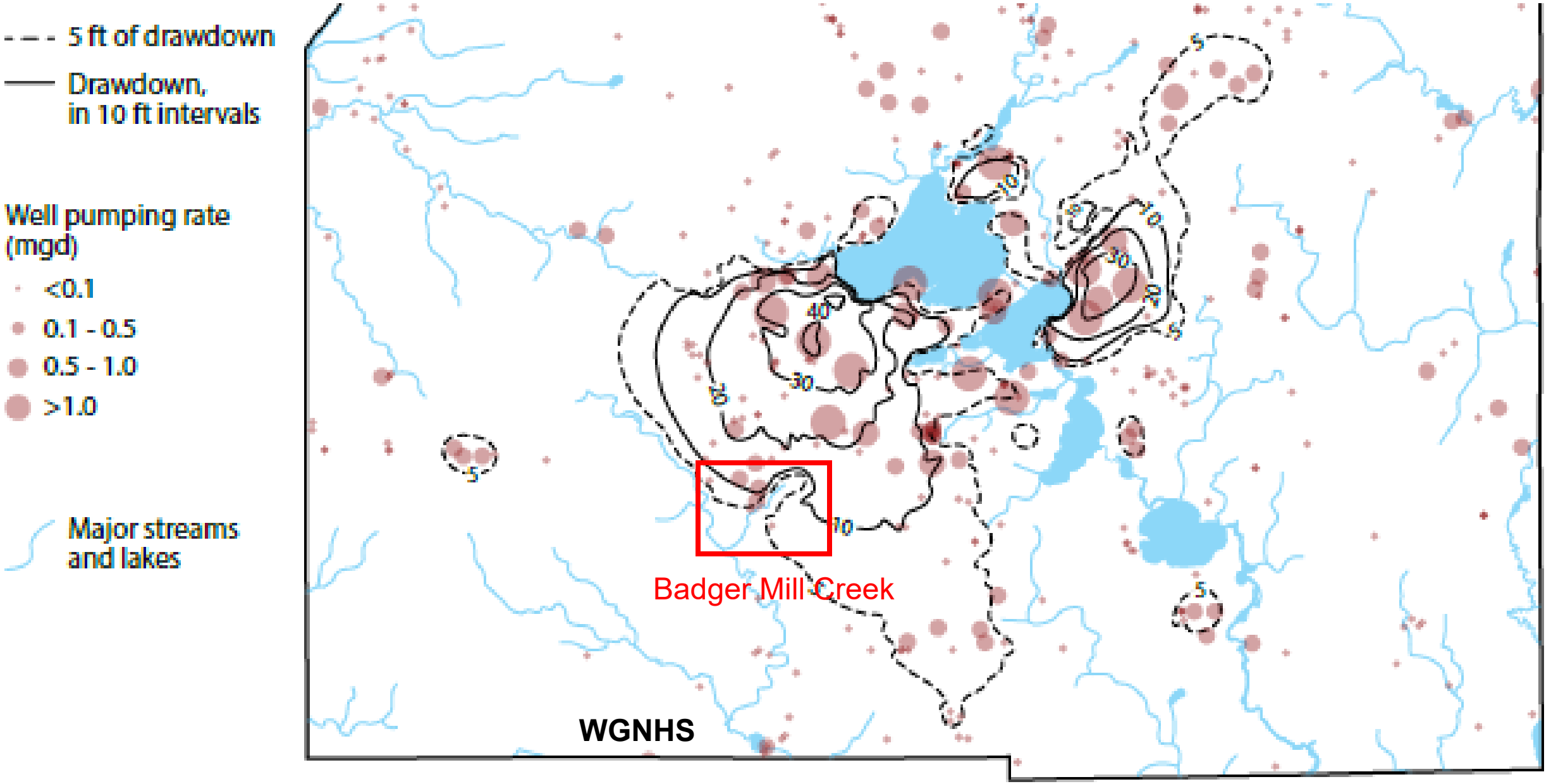
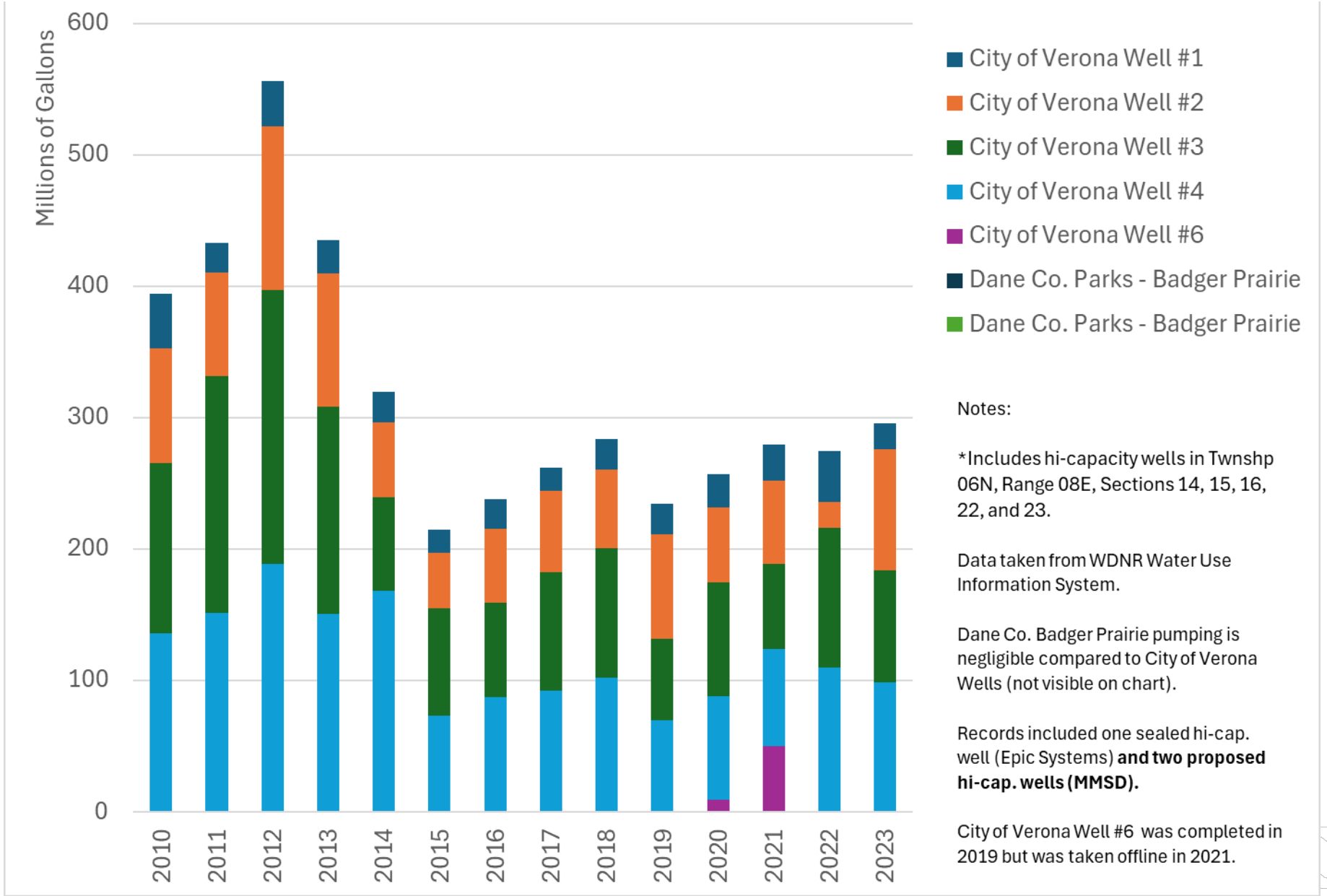
Badger Mill Creek Groundwater Analysis

Regional Groundwater Drawdown



Annual Groundwater Withdrawals near Badger Mill



Notes:

*Includes hi-capacity wells in Twnshp 06N, Range 08E, Sections 14, 15, 16, 22, and 23.

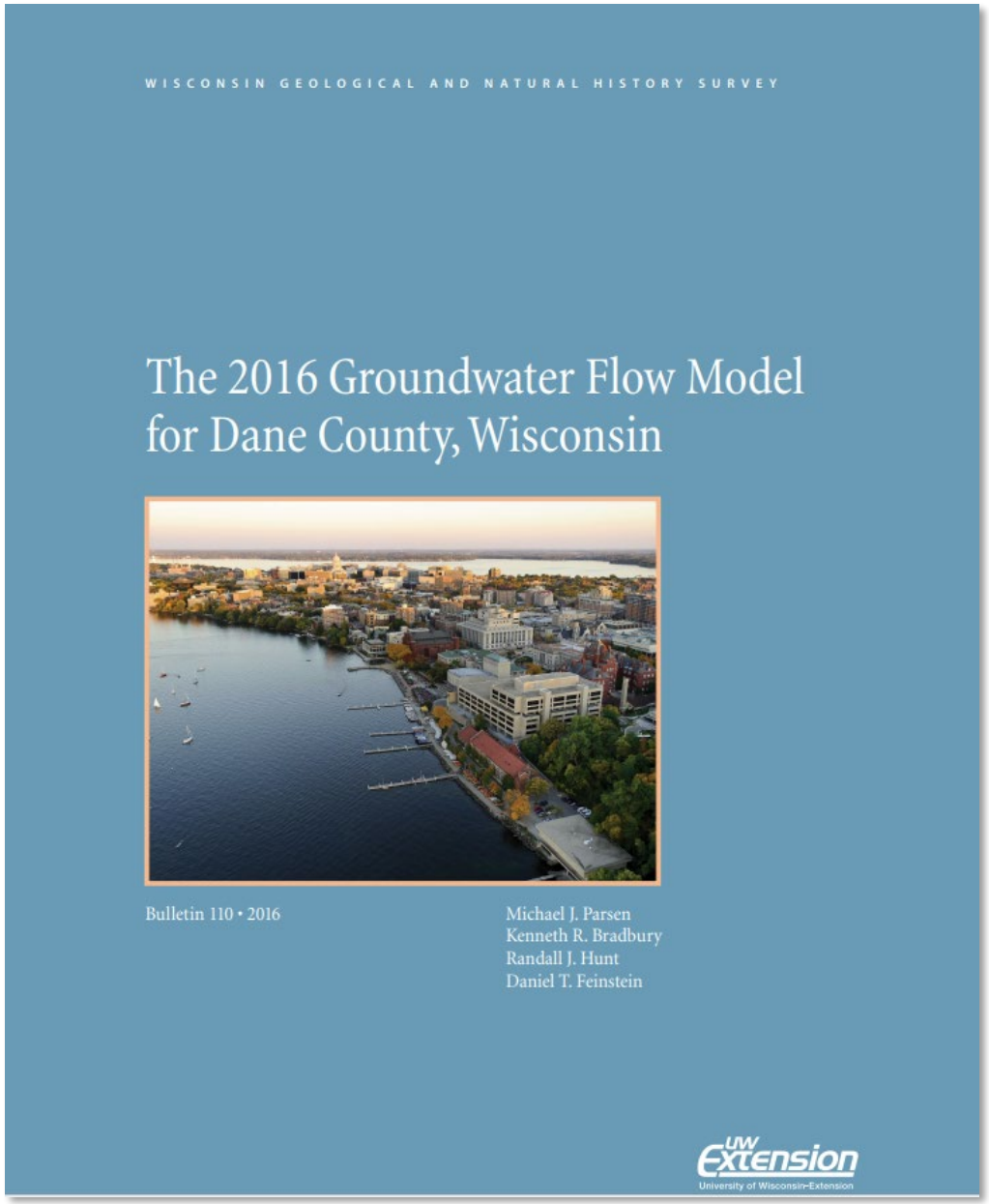
Data taken from WDNR Water Use Information System.

Dane Co. Badger Prairie pumping is negligible compared to City of Verona Wells (not visible on chart).

Records included one sealed hi-cap. well (Epic Systems) **and two proposed hi-cap. wells (MMSD).**

City of Verona Well #6 was completed in 2019 but was taken offline in 2021.

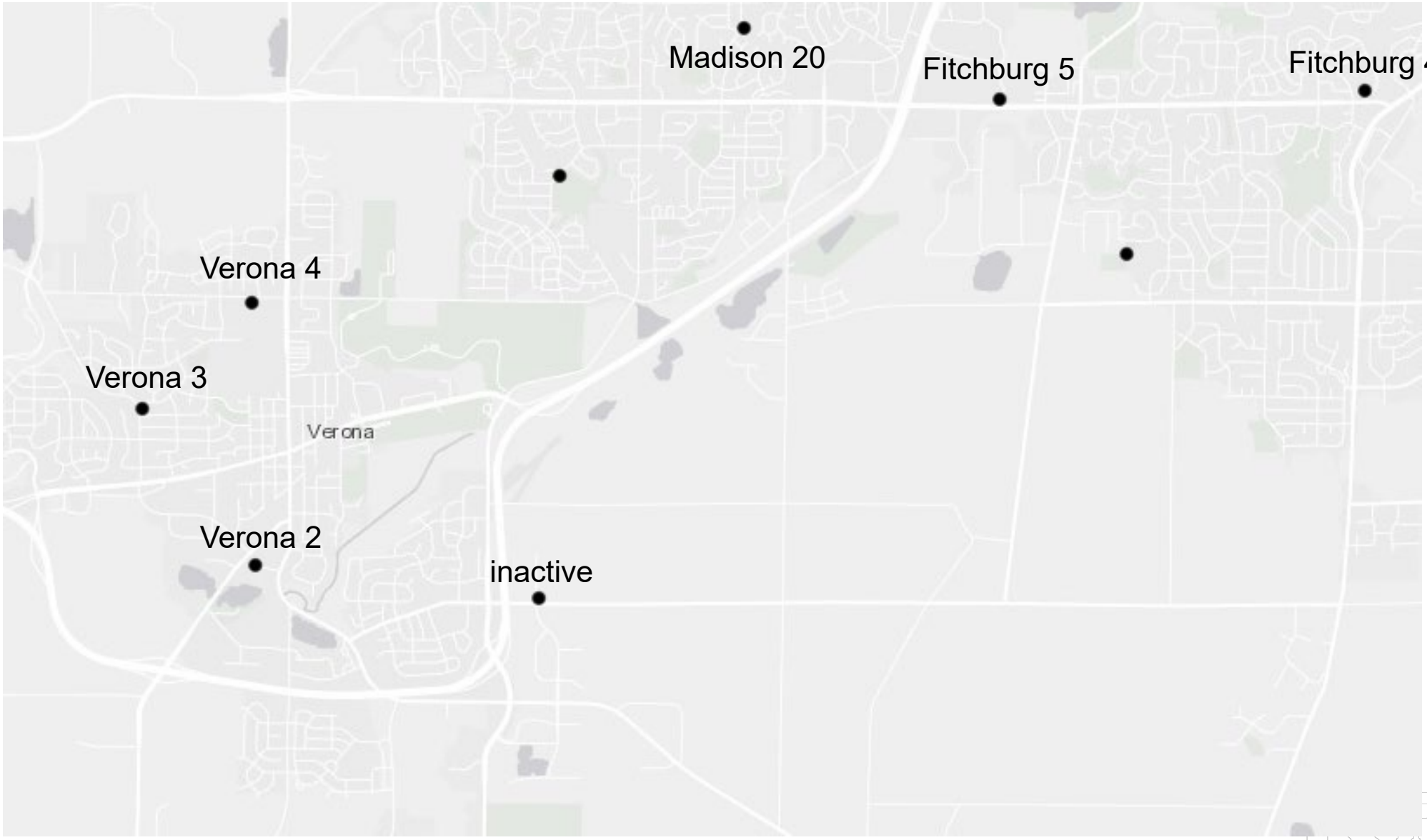
Regional Groundwater Model Analysis



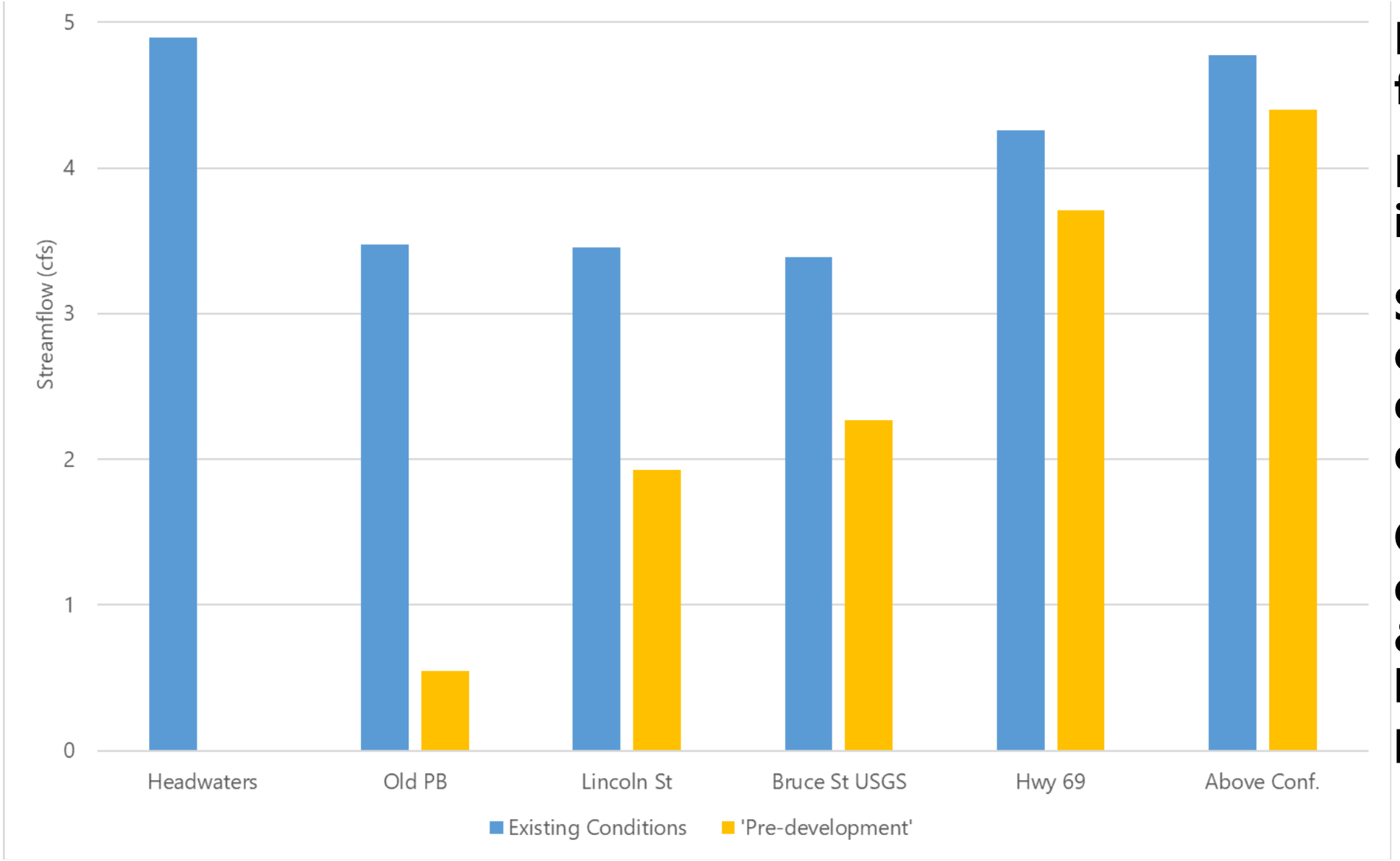
Simulations

- **No pumping or effluent (~pre-development conditions)**
- **Wells near creek shifted to deep aquifer**
- **Verona wells turned off**

Regional Groundwater Model Analysis



"Pre-development" Conditions (No pumping or effluent)



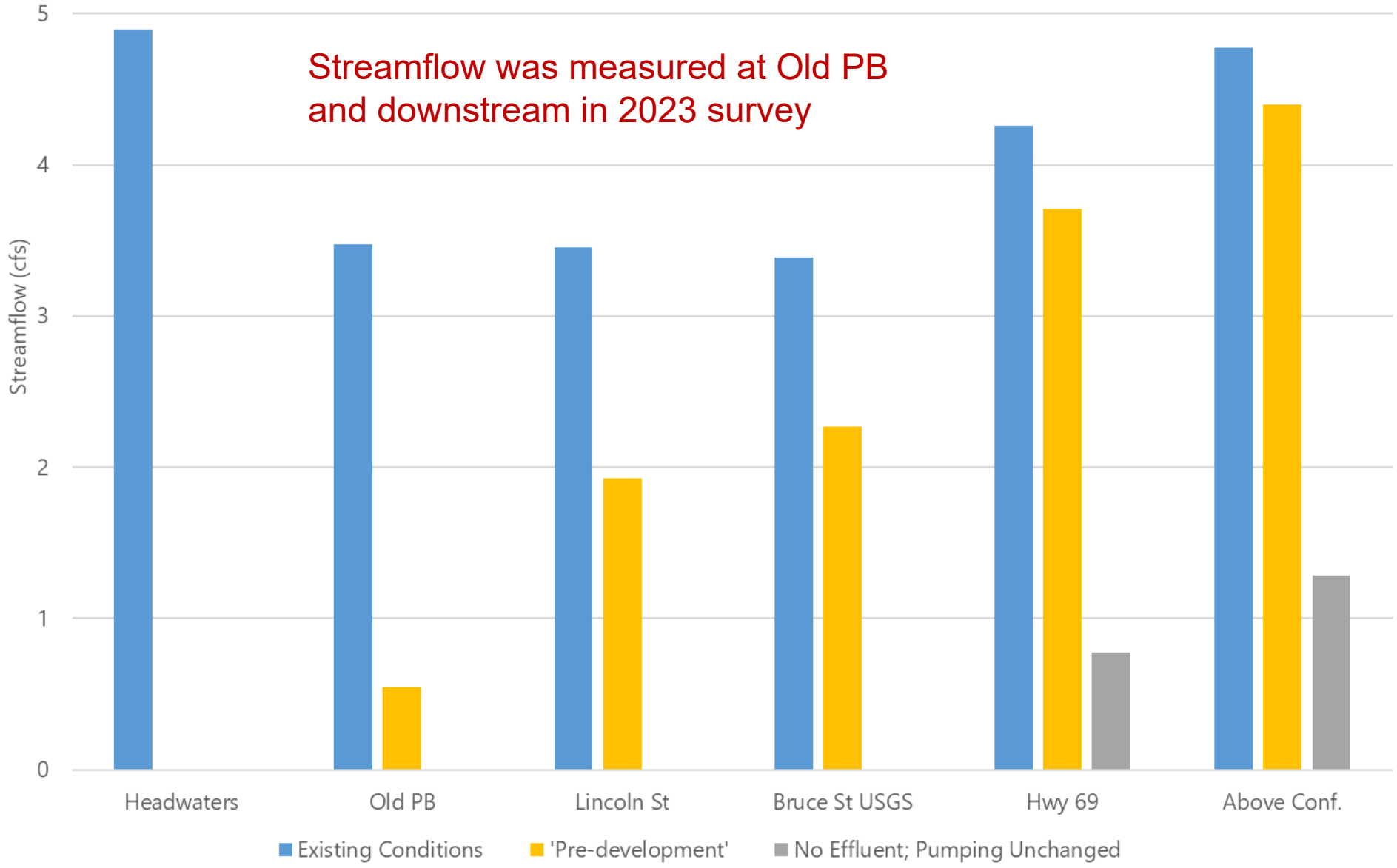
Little/no headwater flow

Downstream flow increase

Similar flow at confluence for existing & pre-development

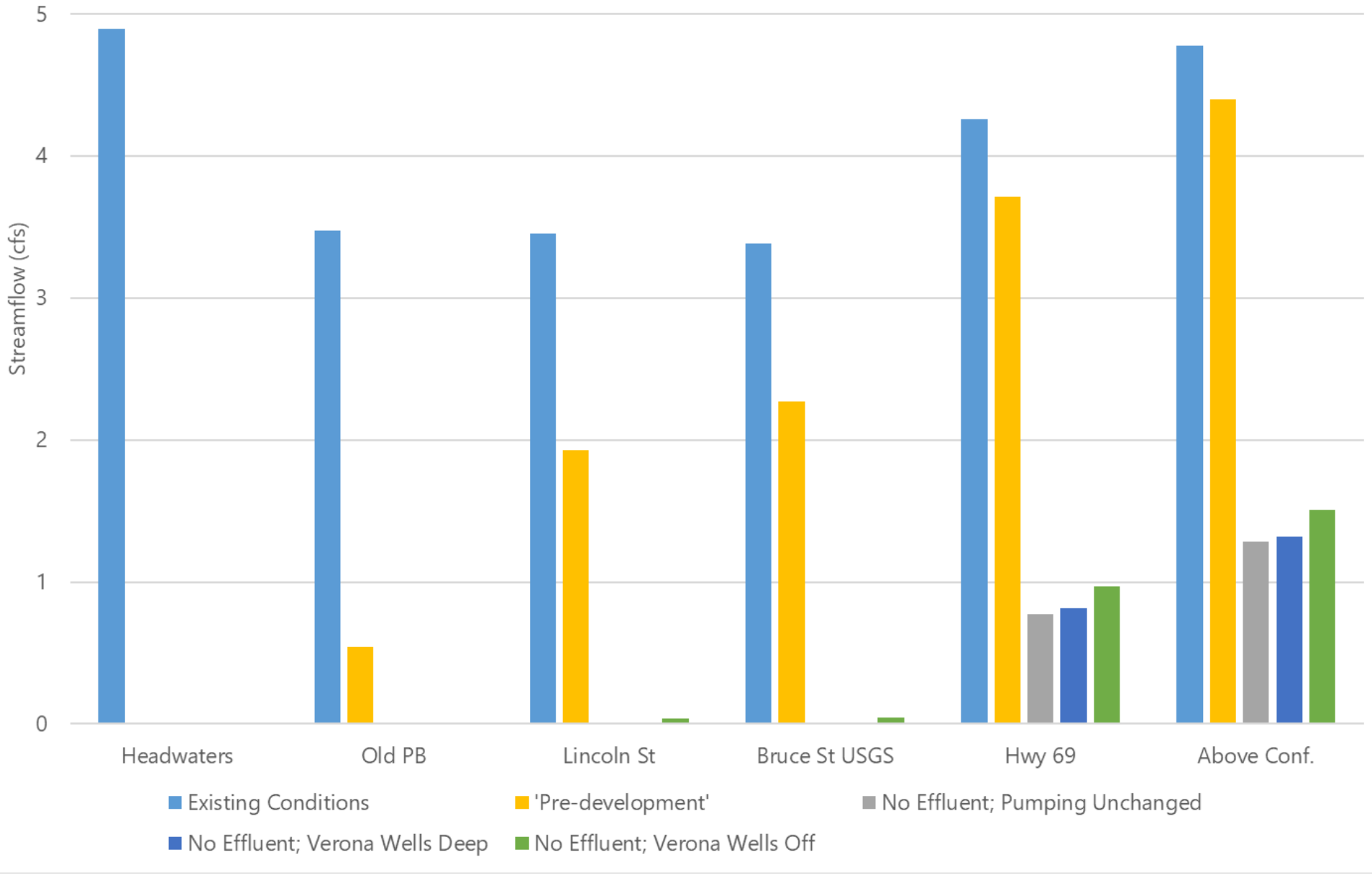
Caveat: evapotranspiration & recharge would have been different pre-development

No Effluent Return with Existing Pumping



Model underestimates streamflow compared to 2023 measurements

Changes in Verona wells

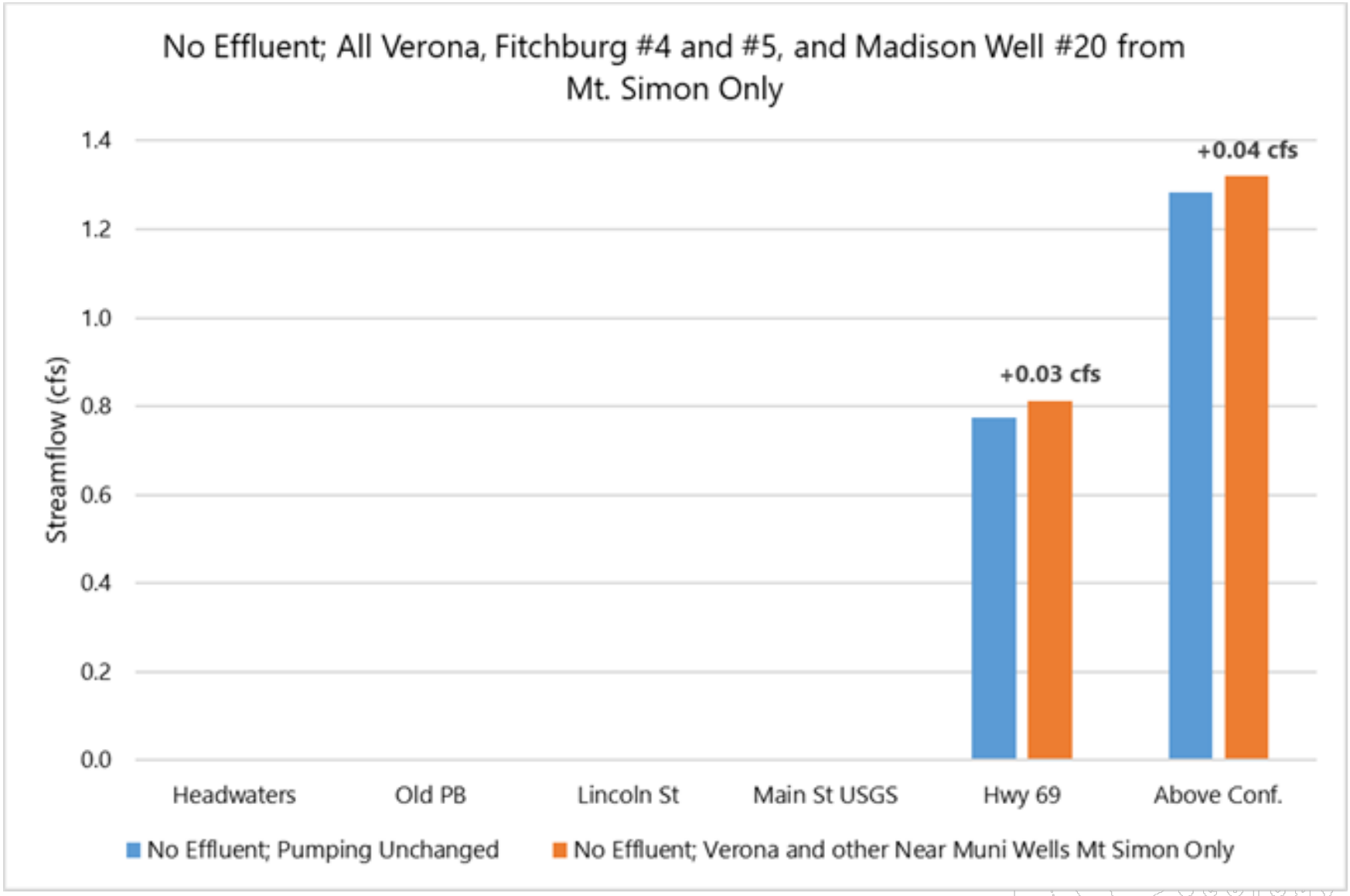


Small gains from reconstructing local wells in deep aquifer or turning them off.

Illustrates pumping impact of many wells in region.

Changes in local Verona, Fitchburg & Madison wells

Small streamflow gain from reconstructing local municipal wells to pump only from deep aquifer



Take Aways

- Model is a useful tool to evaluate groundwater management effects.
- In pre-development conditions, flow gradually increased from the headwaters to the confluence.
- Reducing pumping or changing construction of municipal wells near Badger Mill Creek is predicted to increase baseflow by a fraction of a CFS.
- Baseflow is impacted by the cumulative effect of regional pumping.