COON CREEK
WATERSHED DISTRICT

SWAT Water Quality Model

March 12, 2026

What is SWAT?

Watershed model that simulates quality and quantity of surface and ground water and predicts the environmental impact of land use, land management practices, and climate change.

Used for over 30 years to simulate landscape processes in rural and semi-urban watersheds.

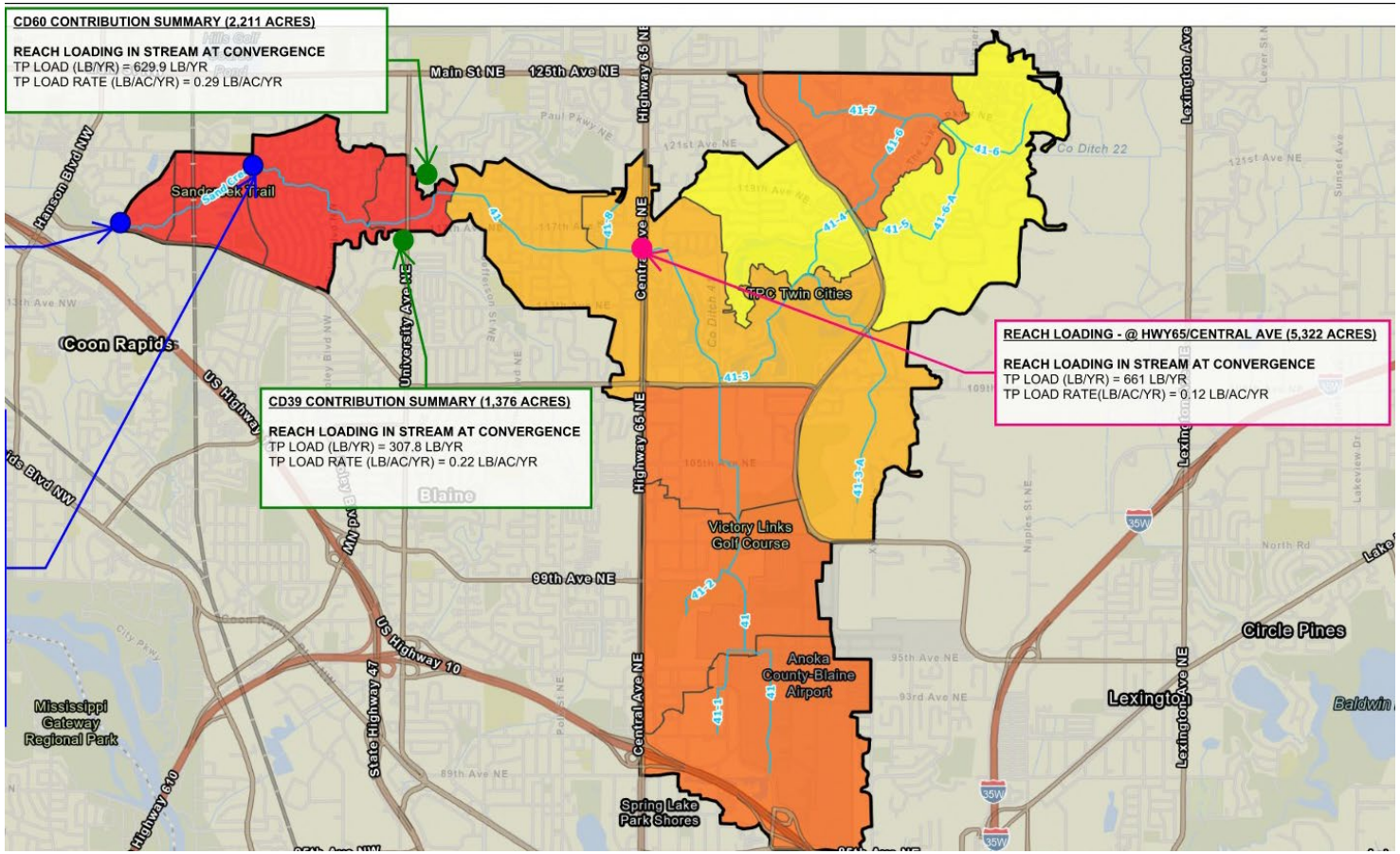
More complex and holistic water quality model compared to P8, Winslamm, and Simple Estimator that can be calibrated using monitoring data.

Why SWAT?

- ✓ Ability to identify pollutant loading hotspots.
- ✓ Refinement of initial TMDL loading goals.
- ✓ Distinguish between pollutant sources (ie. watershed vs. in-channel)

Preliminary Results

- ✓ Pollutant loading heatmaps.
- ✓ Targeted approach.



Preliminary Results

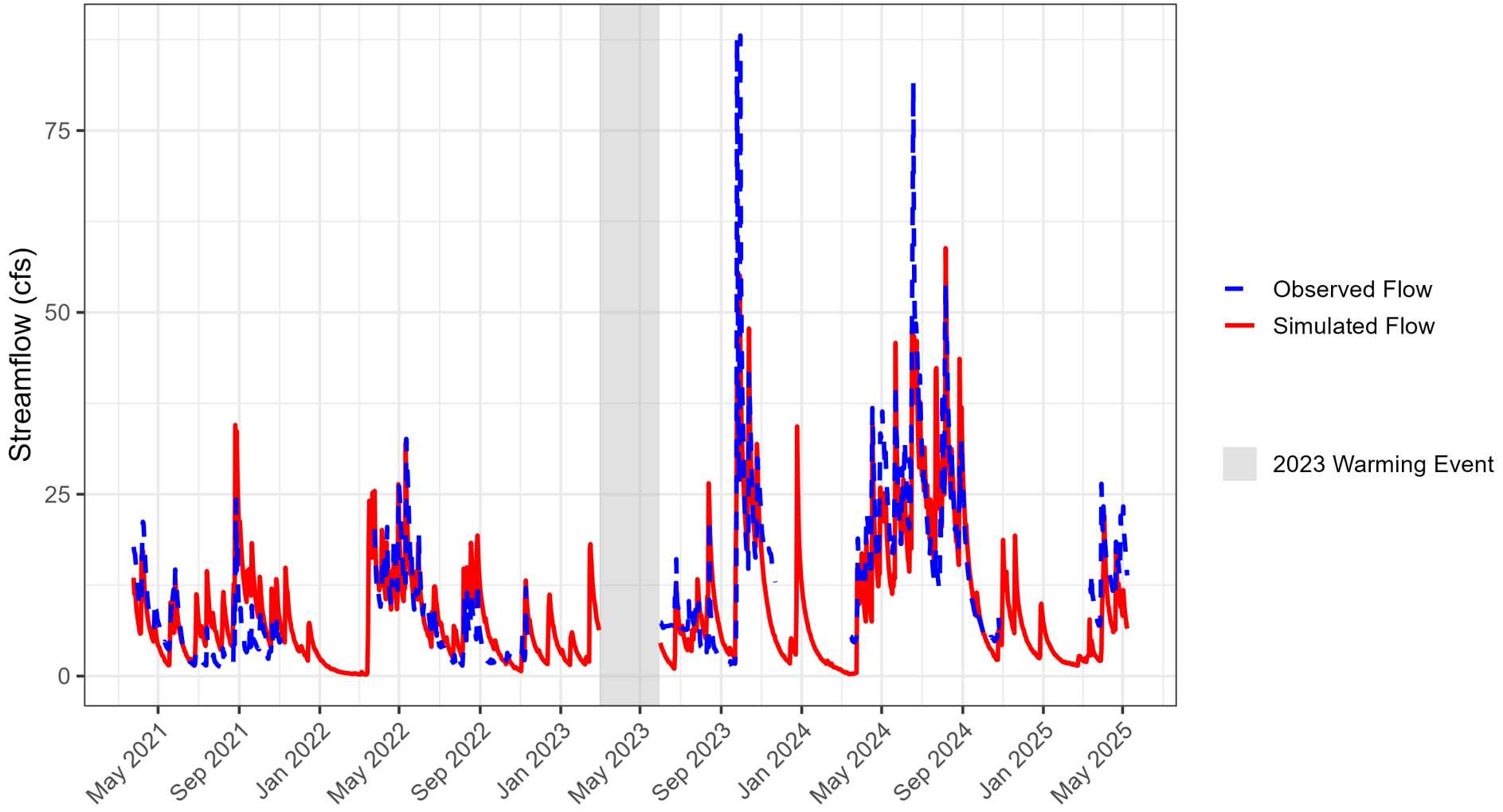
Sand Creek SWAT Phosphorus Reduction Goal is **80%** Lower Than TMDL Goal

Implications

- ✓ Improved identification of pollutant hot spots.
- ✓ More targeted, cost-effective projects.
- ✓ More accurate, calibrated TMDL goals.
- ✓ Potentially lower cost to achieve TMDL goals.

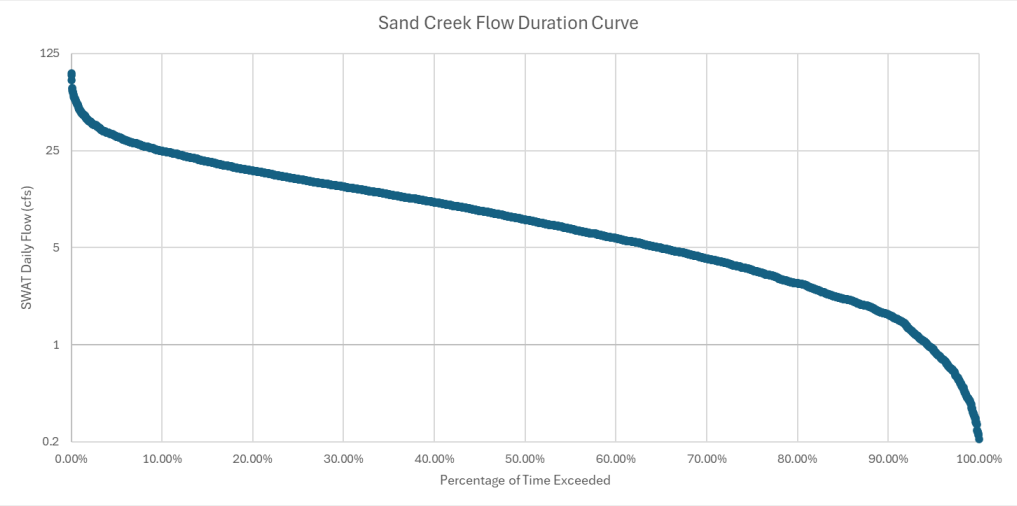
Questions?

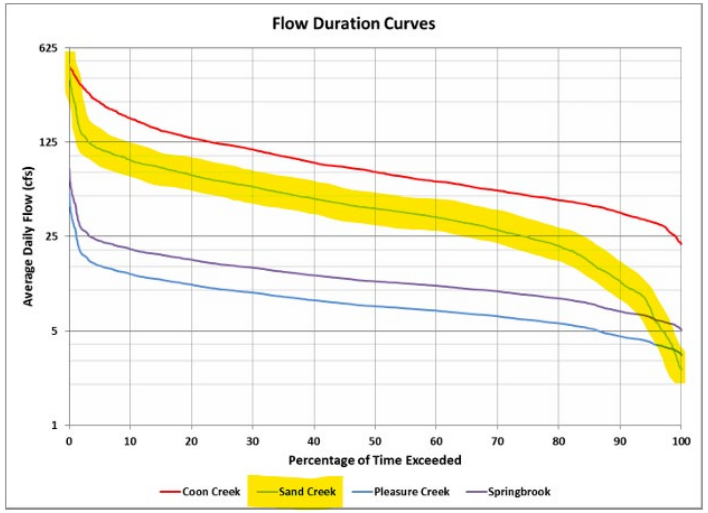
Sand Creek – Model Performance



Mean daily flow simulated performed well during evaluation period.

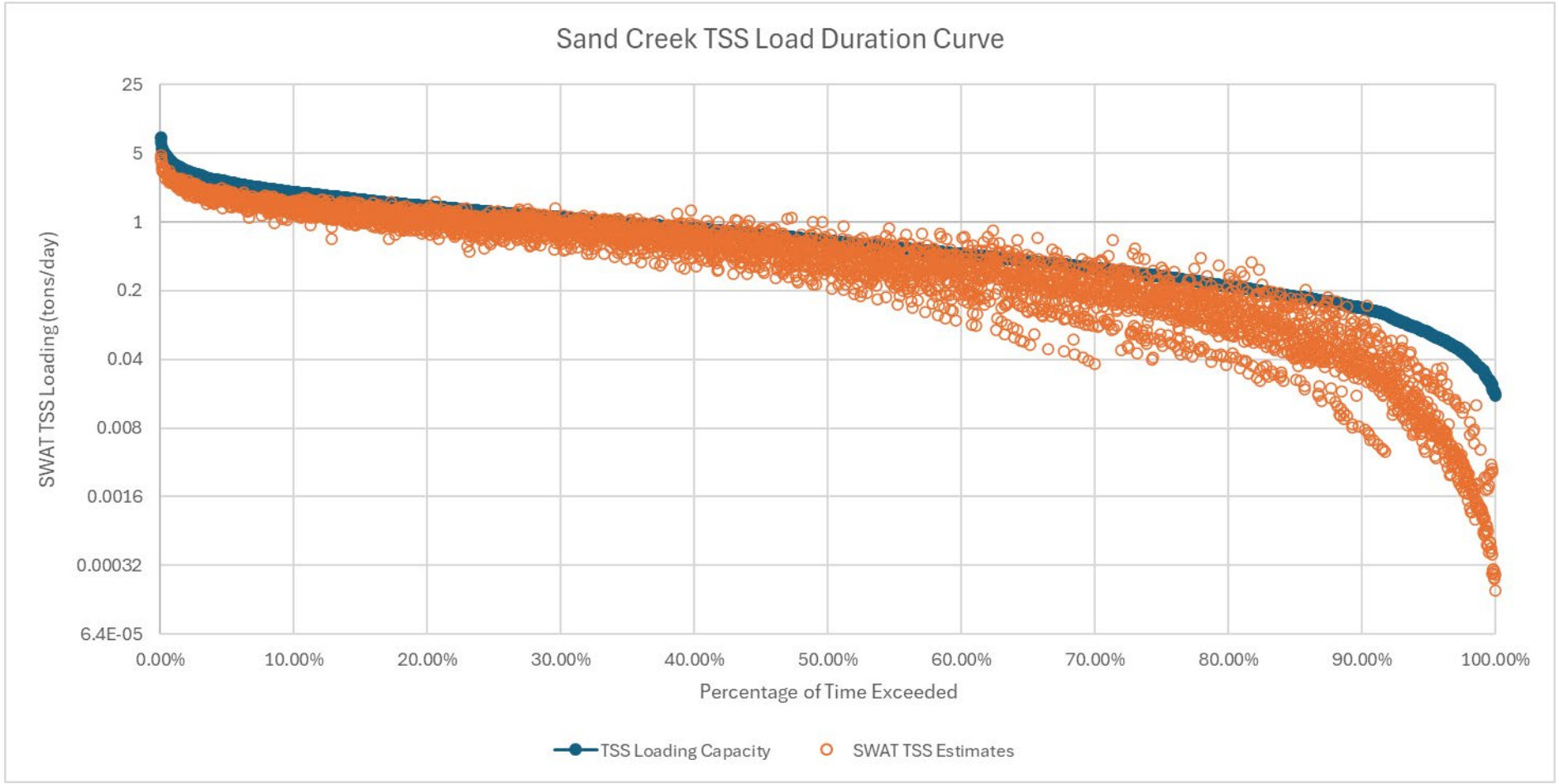
Sand Creek Flow Duration Curve Comparison





- 10% exceedance
  - calibrated model ~25 cfs
  - 2016 TMDL ~95 cfs
- 50% exceedance (median)
  - calibrated model ~10 cfs
  - 2016 TMDL ~35 cfs

Sand Creek TSS Load Duration Curve with SWAT TSS estimates



Orange dots represent every daily load simulated from 2015-2025.