## Northwestern McCORMICK SCHOOL

OF ENGINEERING

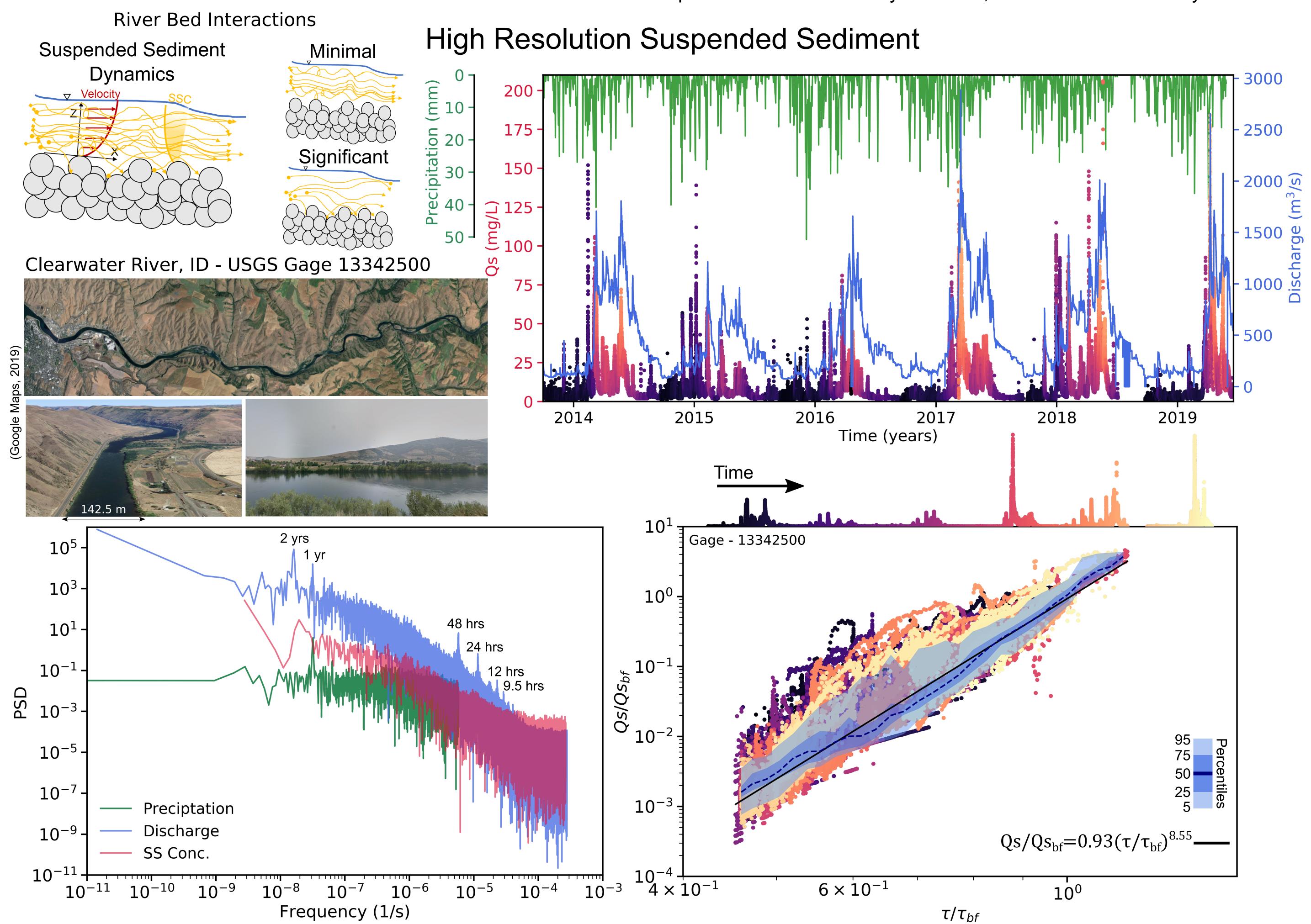
# Exploring the signature of climate, catchment, and internal variability on river suspended sediment dynamics Colin B. Phillips<sup>1</sup>, Carlos. A. Rogéliz Prada<sup>2</sup>, Daniel E. Horton<sup>3</sup>, Aaron I. Packman<sup>1</sup>

<sup>1</sup>Civil and Environmental Engineering, Northwestern University. <sup>2</sup>NASCA Program, The Nature Conservancy <sup>3</sup>Dept. of Earth and Planetary Sciences, Northwestern University









### Key Points

### **Suspended Sediment & Fine Particles represent**

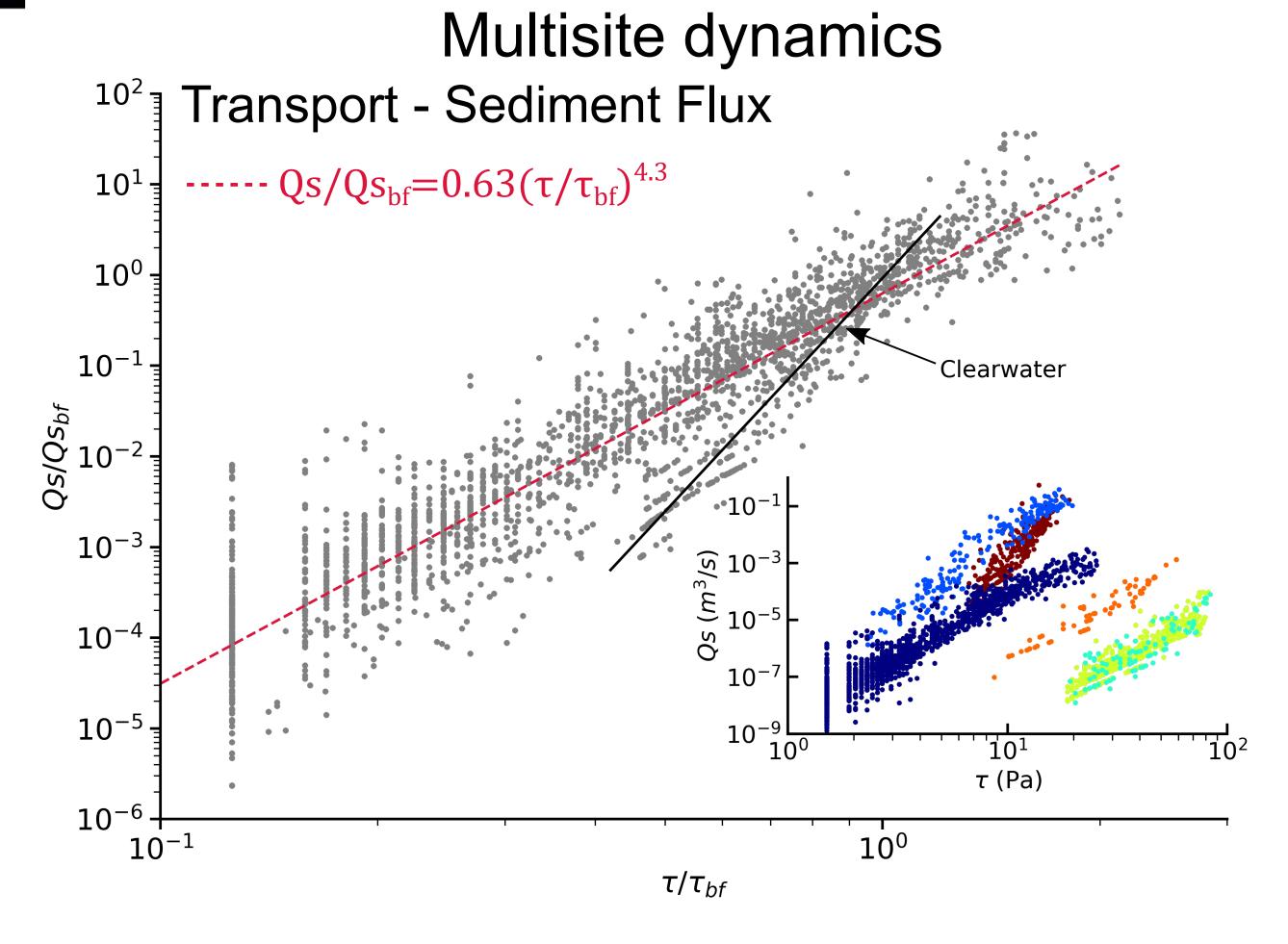
- 1. A substantial (>50%) fraction of the mass leaving a watershed.
- 2. Water quality concern.
- 3. Potential to both degrade and enhance local ecosystem services.
  4. A significant carrier of environmental nutrients & contaminants.

Minimal interaction leads to a more direct signal of external factors (e.g. land use, climate, and storm recurrence).

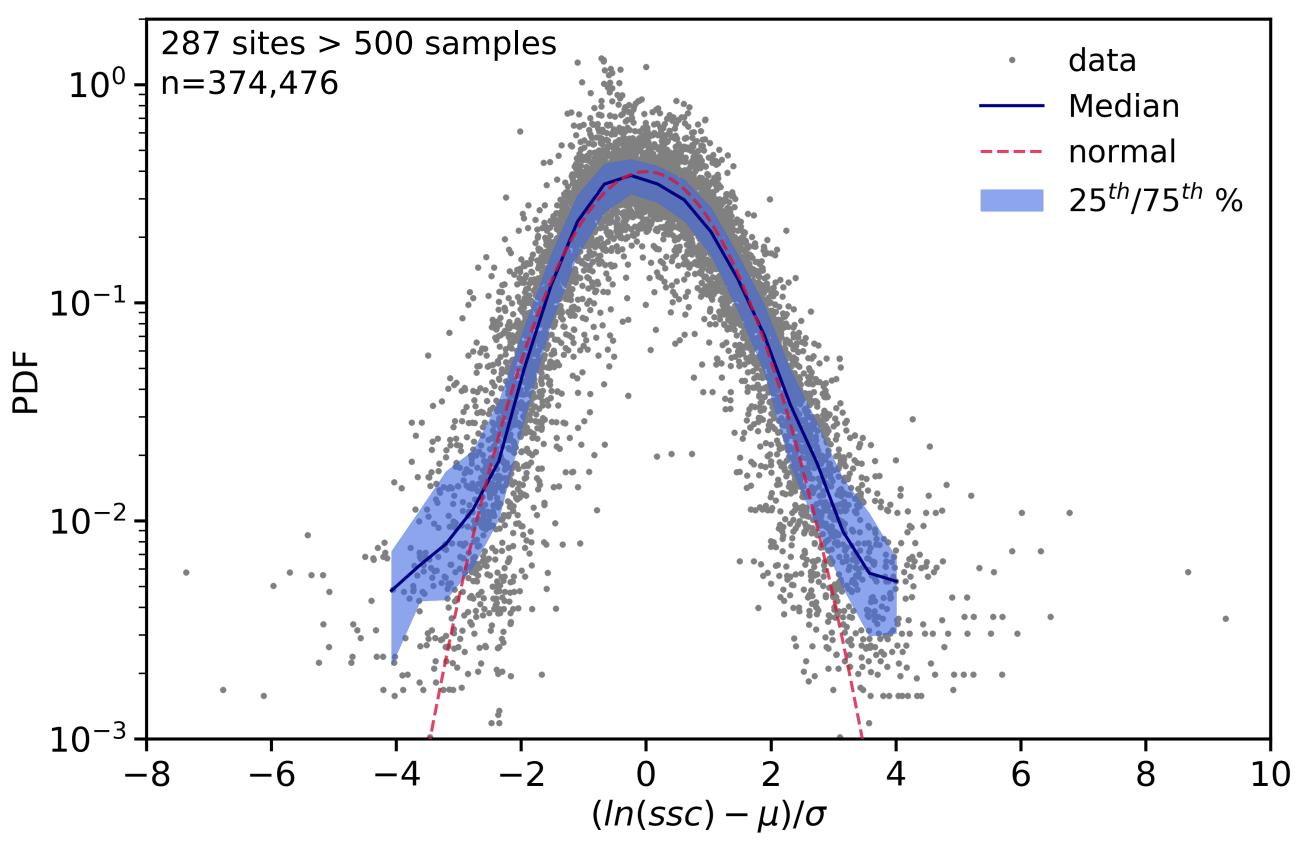
Significant interaction with the river bed leads to shredding of these signals. Placing a larger role on bed storage, resuspension, and bank erosion.

- 1. Remove signal of river self-organization to disentangle autogenic processes from external phenomena.
- 2. Strong scaling with local hydraulic variables indicates a larger role for channel morphology and instream storage for fine particle transport.

  3. Further, these relations provide a strong basis for estimating suspended sediment transport in ungauged or minimally monitored catchments.



## Probability - Concentration



colinbphillips@northwestern.edu

