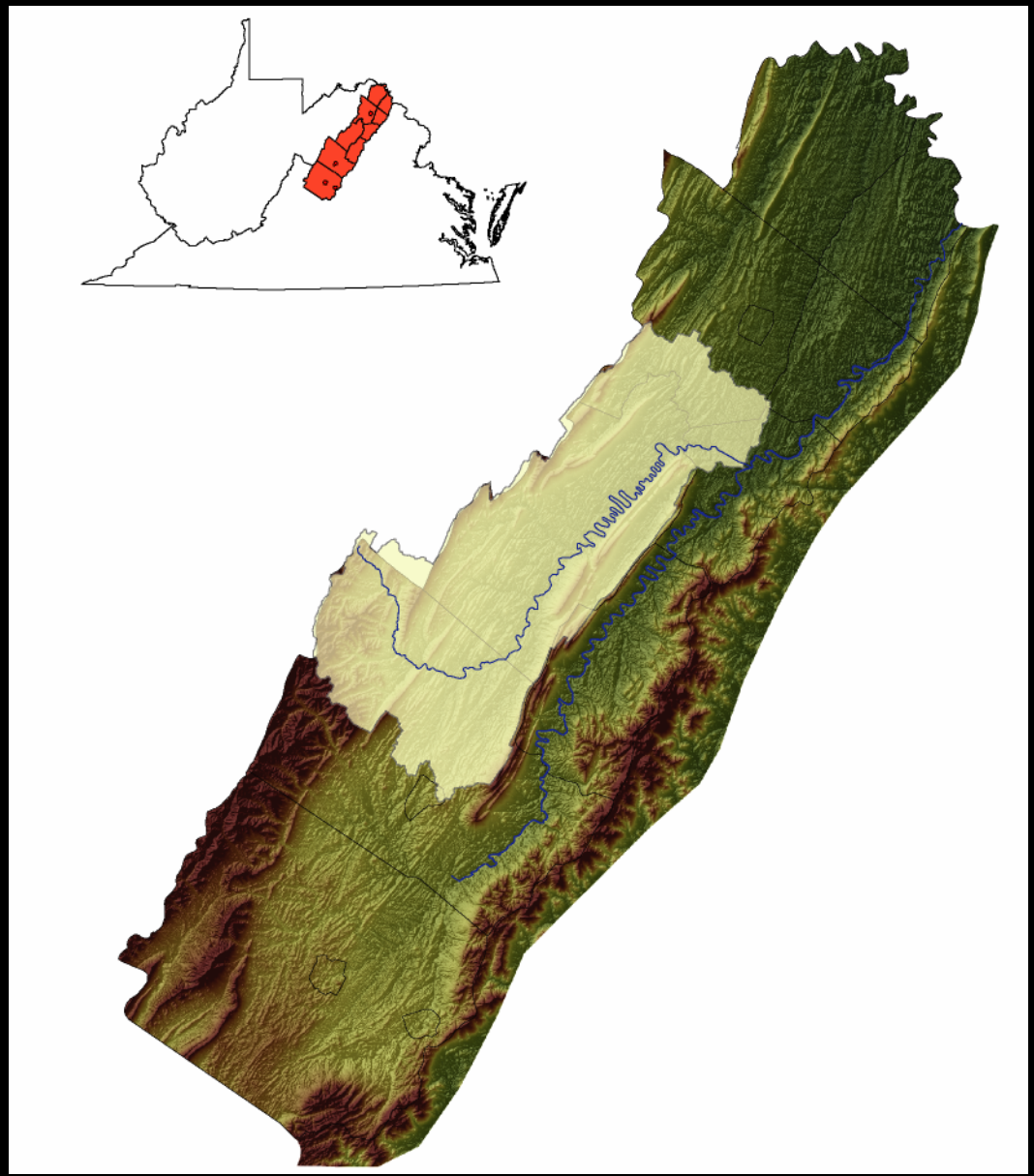
Instream-Flow Study North Fork Shenandoah River

Jennifer L. Krstolic and
Donald C. Hayes

USGS



Knowledge Gained

Physical Habitat Classified

Fish Species Documented

Low-Flow Water Quality

http://water.usgs.gov/pubs/sir/2004/5153/

Stage-Discharge Relation

Habitat-Flow Relation

USGS

Water-Quality During Low-Flow Periods

Diurnal patterns of DO showed large fluctuations

pH values higher than State standard found only at downstream end

Water temperatures within State standards

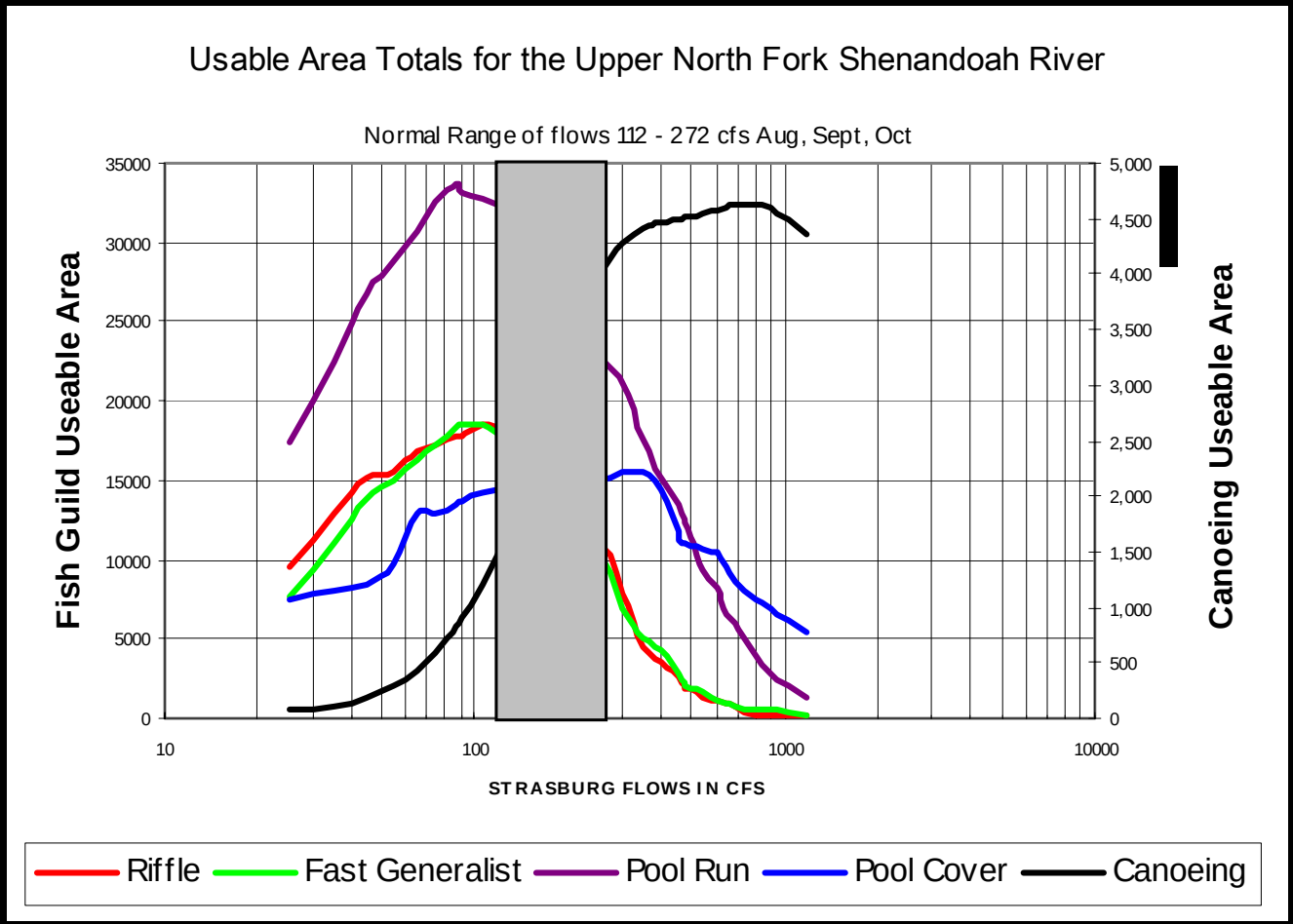
Water-Quality Questions Raised

How does DO fluctuate during normal summer flows?

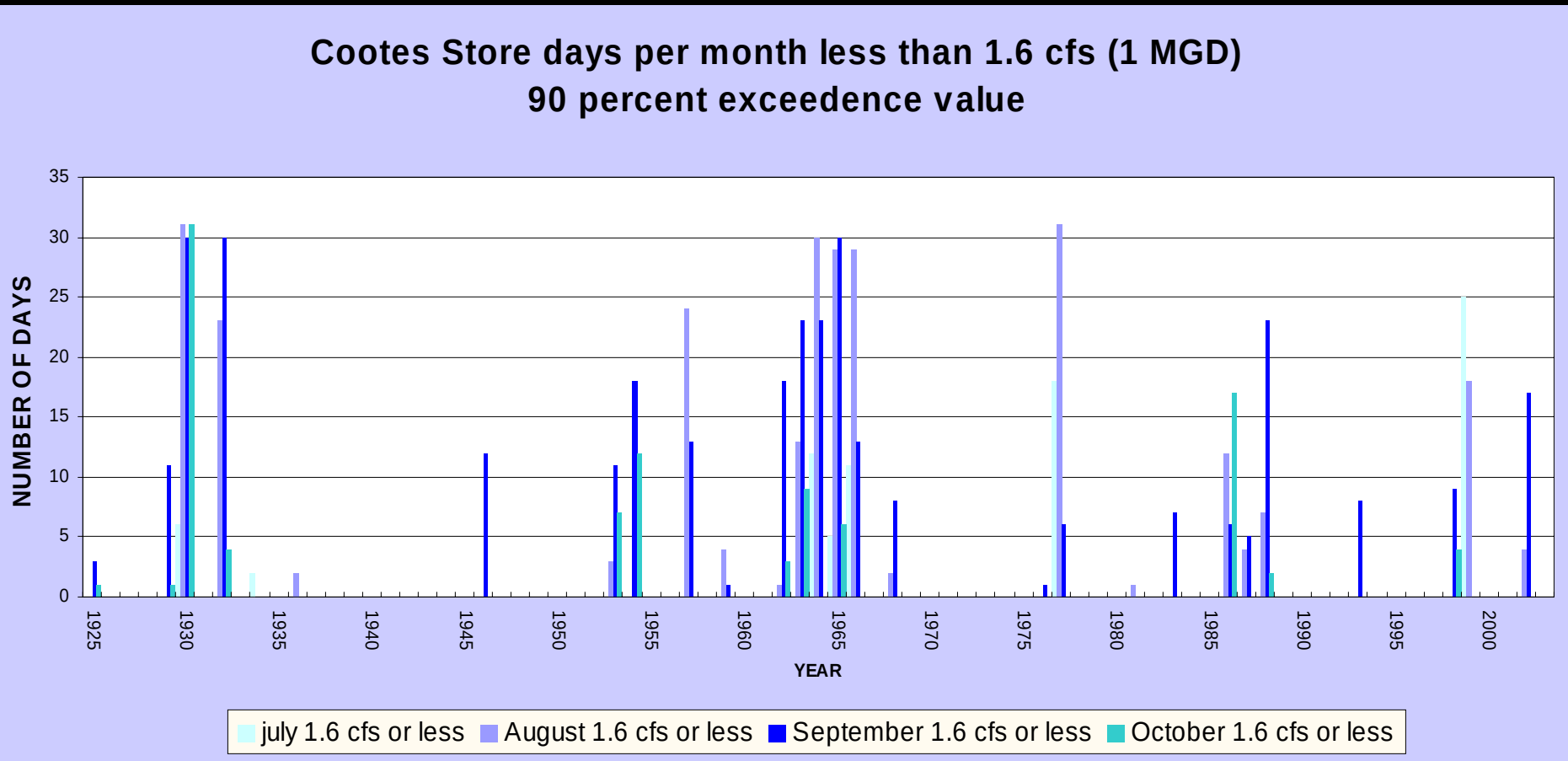
What processes most influence pH values?

How does ground-water discharge affect water temperature?

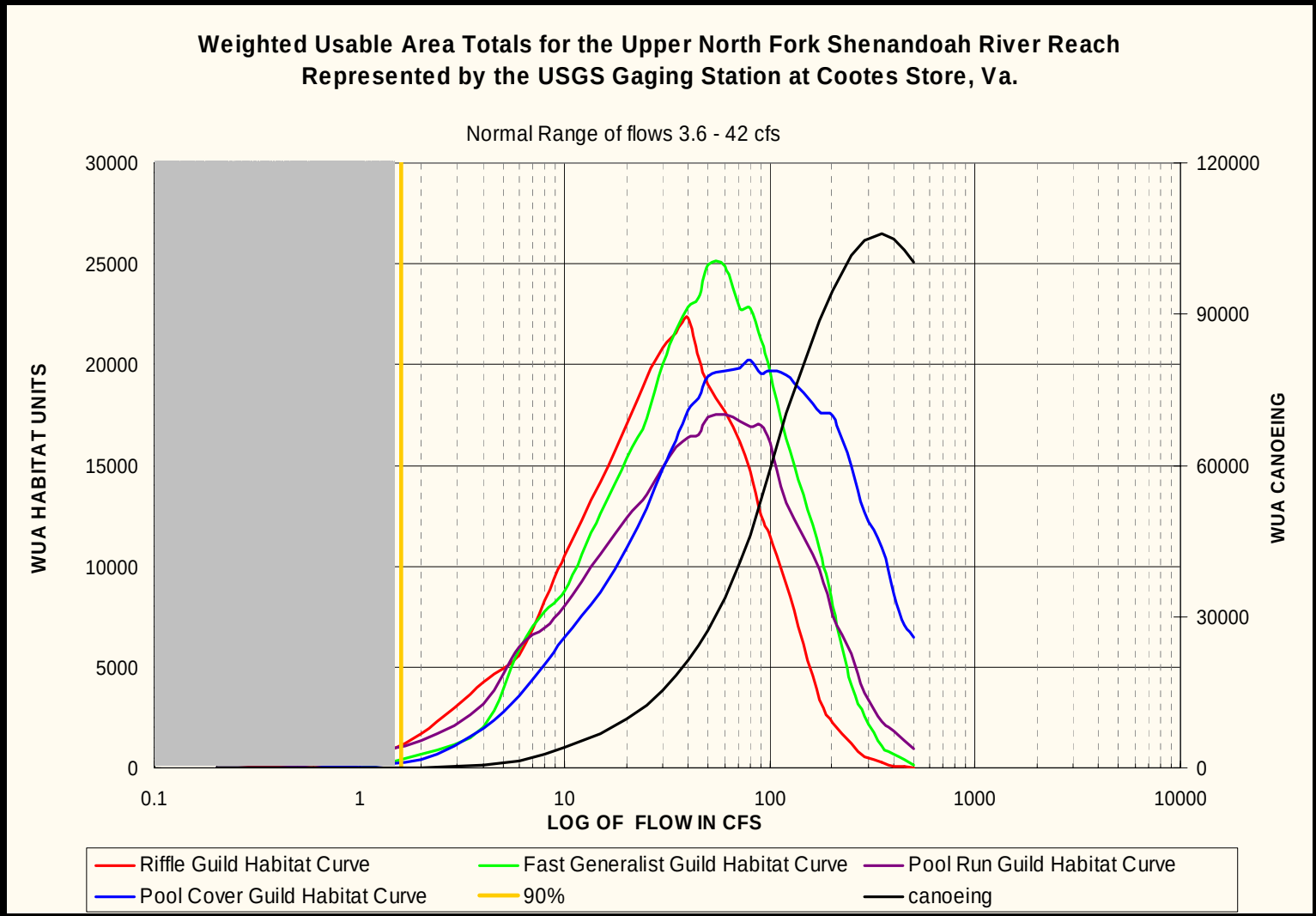
Modeling Results



Interpretation



Application: Drought Flows and Habitat



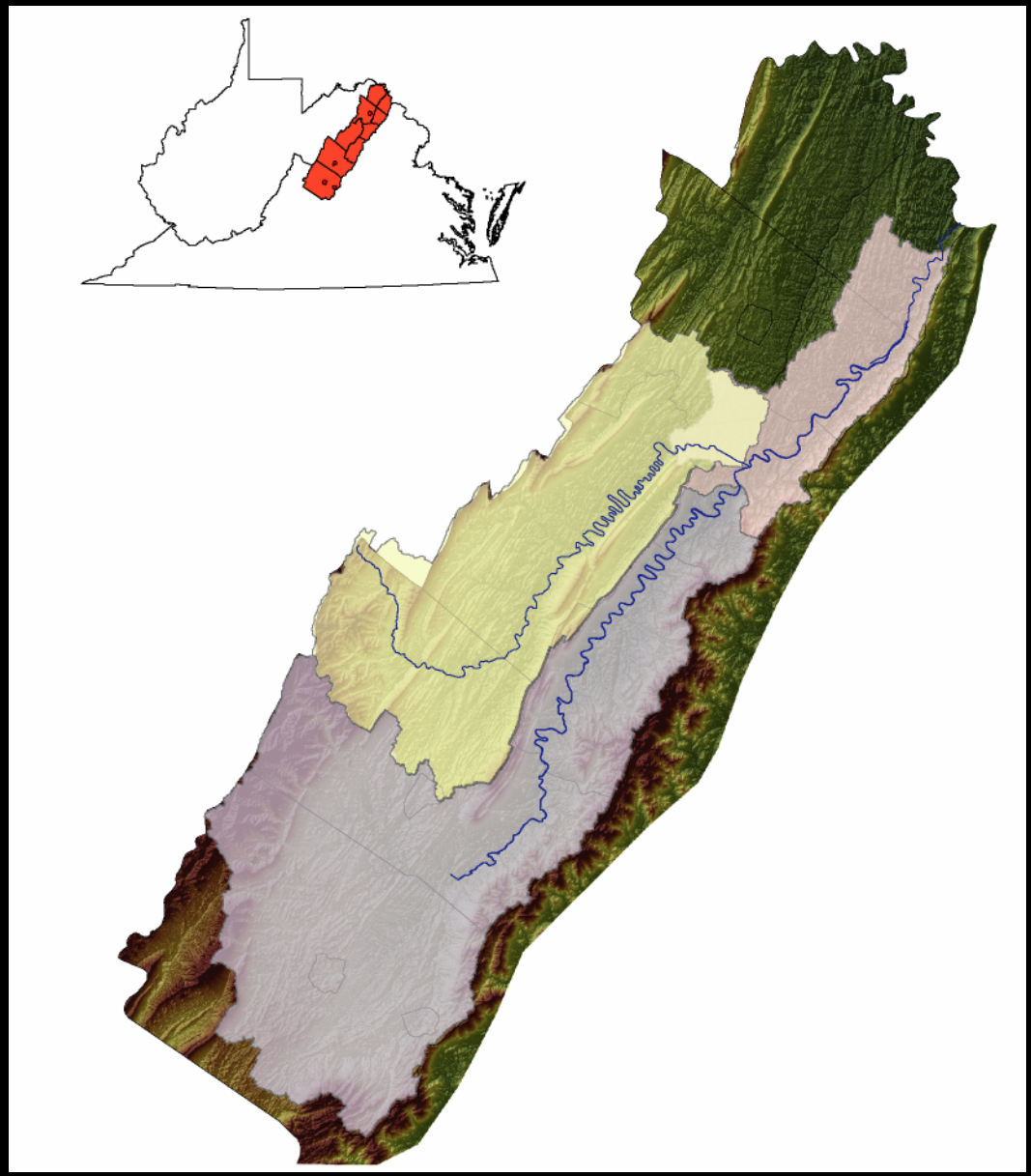
Next Steps for the North Fork

Adoption of Thresholds and proposal to policy makers

Un-permitted Water Withdrawal Study

Further investigation into water quality on the North Fork

Instream-Flow Study South Fork Shenandoah River



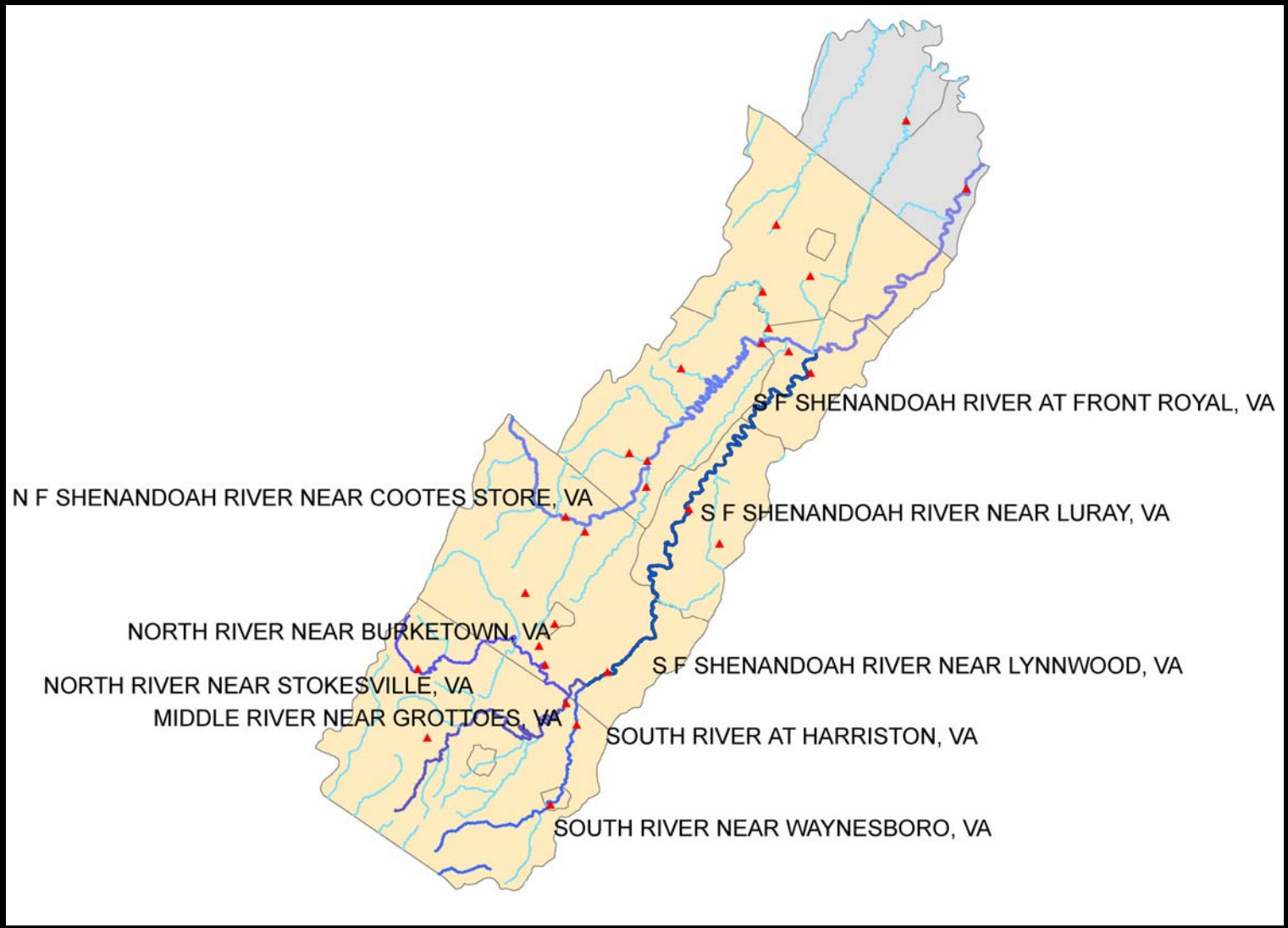
Proposed South Fork Research

Sister study with similar research components

PHABSIM modeling with additional water-quality monitoring

Connecting surface-water and ground-water research efforts

Proposed South Fork Research



Proposed South Fork Research

Physical Habitat Classification with more geomorphology

Low-Flow and Normal-Flow Water-Quality studies

Habitat-Flow Relation tied to stream gages for three sections of the South Fork Shenandoah River

Transfer of North Fork basin and flow characteristics to the South Fork tributaries

Proposed South Fork Research Timeline

2005 - 2007

Physical-Habitat Mapping, Water-Quality Survey, Reach Selection, Transfer Basin Characteristics, Publications

2008 - 2010

Hydraulic-Data collection, Modeling, Analysis, Publication

South Fork Companion Investigations

Fish Habitat Needs-Assessment

Estimated Un-permitted Water Withdrawal Study

Shenandoah Valley Water Withdrawals Pilot Study

Identify and document actual use by permit holders

Locate unregulated water users

Apply methods to measure and estimate water use

Questions?