Opequon Creek Ground-water Simulation Model

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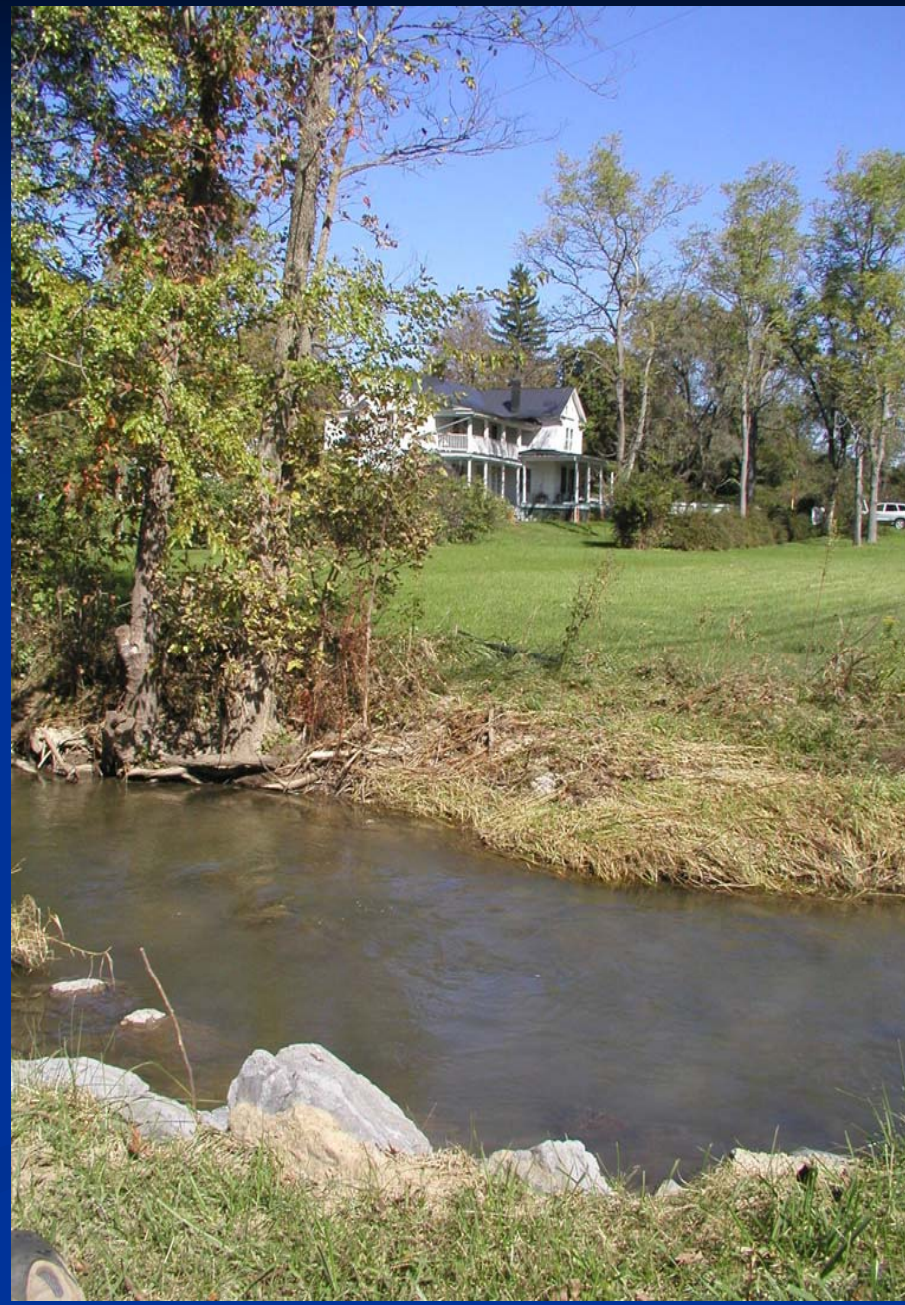
West Virginia & Virginia



Jack Eggleston

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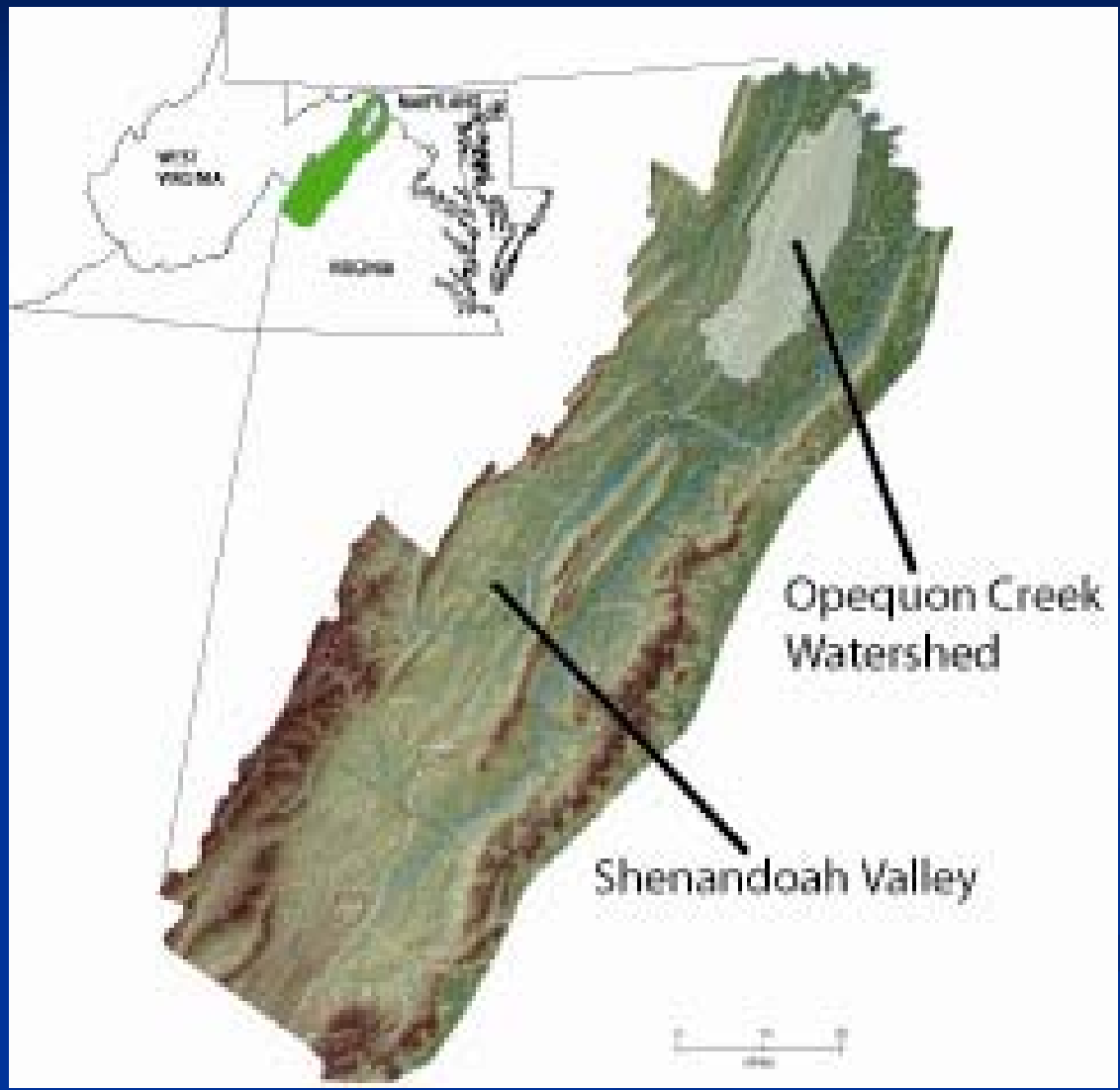
Study Area



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Goals of Study

Better understand the regional hydrology system:

- What is the available ground-water supply?
- How do streams and groundwater interact?
- How does drought affect streams/springs/gw?
- How will population growth affect hydrology and water availability?

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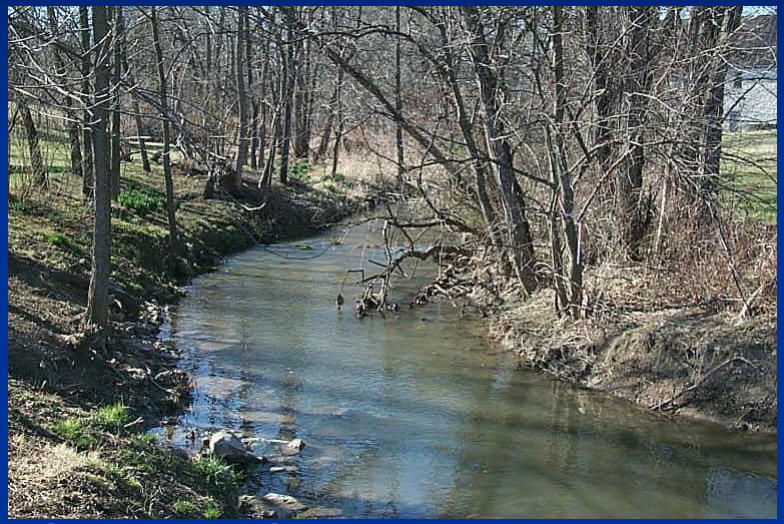
Hydrologic Features

Streams



Opequon Creek

Springs

Fay Spring

Groundwater

Drilling a new residential well

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Study Area Facts

Area (sq. miles) : 344

2000 Population : ~82,000 *(+19% since 1990)*

Average Year :

Rainfall	=	~39 in/yr
Evapotranspiration	=	~27 in/yr
Streamflow	=	~12 in/yr

Water supply primarily is from groundwater withdrawals.

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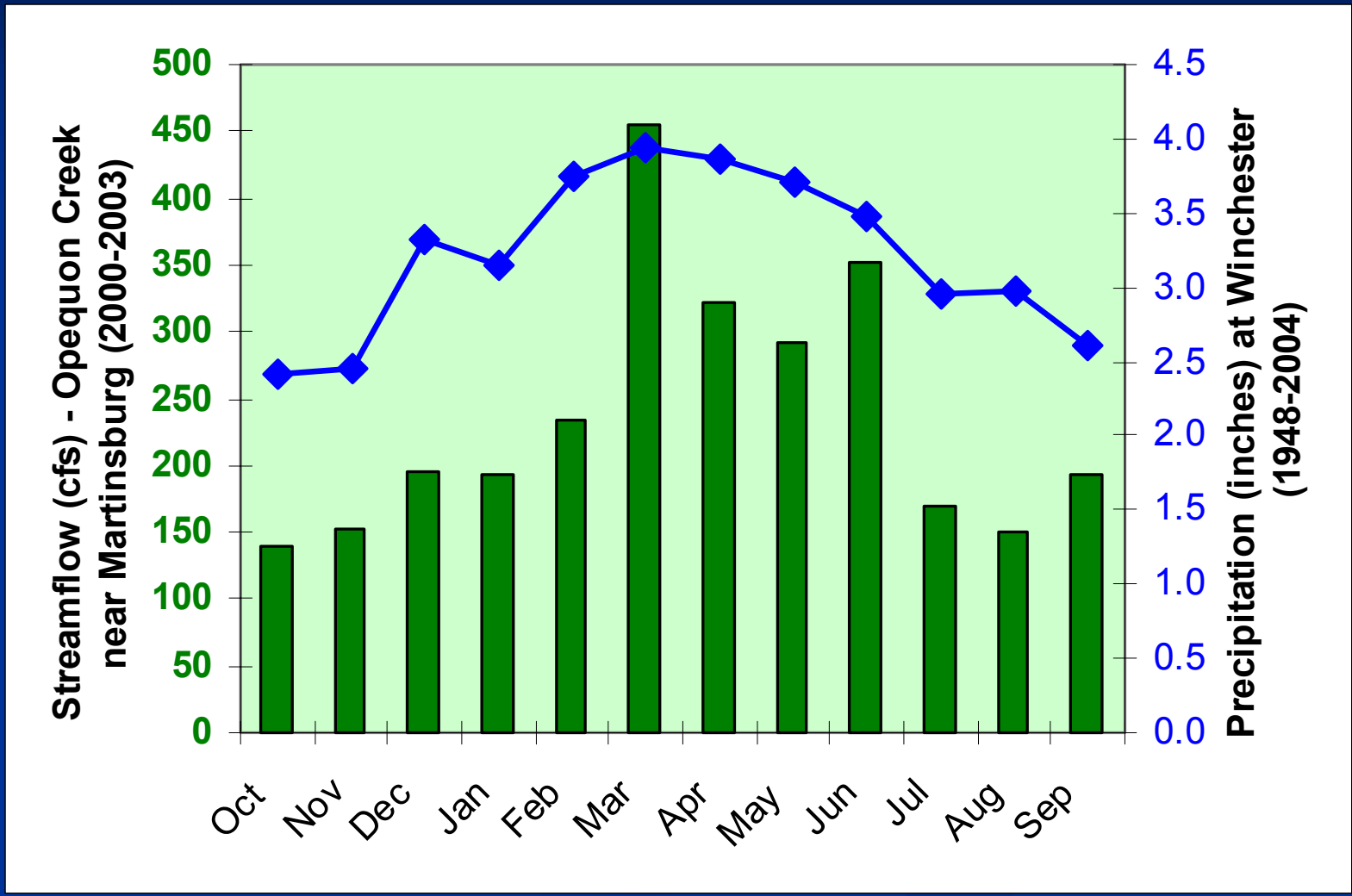
Monthly Streamflow & Precip



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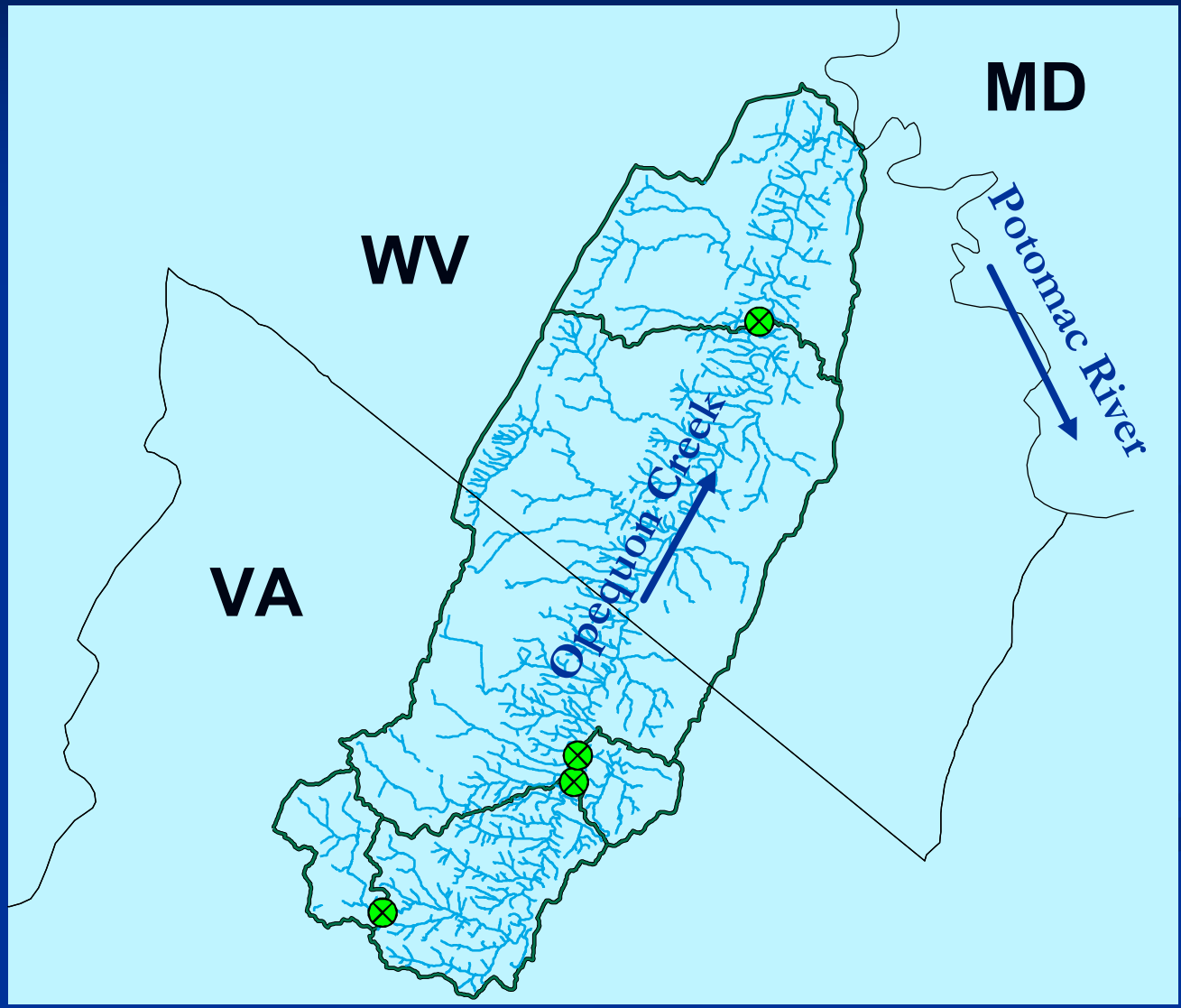
Opequon Stream Network



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Opequon Streamflow

- Baseflow is the portion of stream flow that comes from groundwater discharge
- 68% of Opequon Creek flow is baseflow (*Martinsburg WV gage, annual average 1948-2002*)
- The groundwater model will simulate baseflow in streams.
- The model will be calibrated using baseflow data from the four stream gaging stations.

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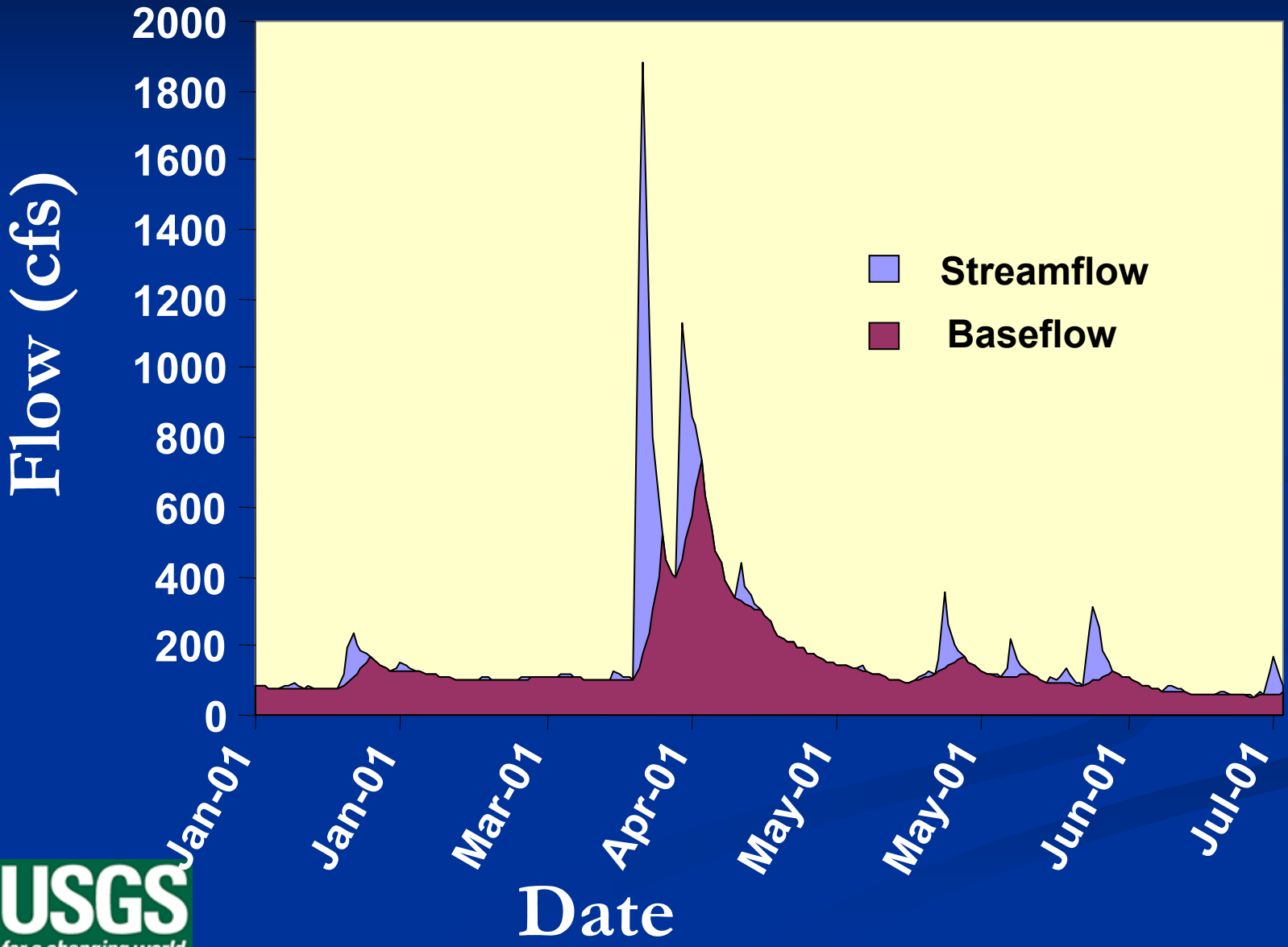
Hydrograph Separation



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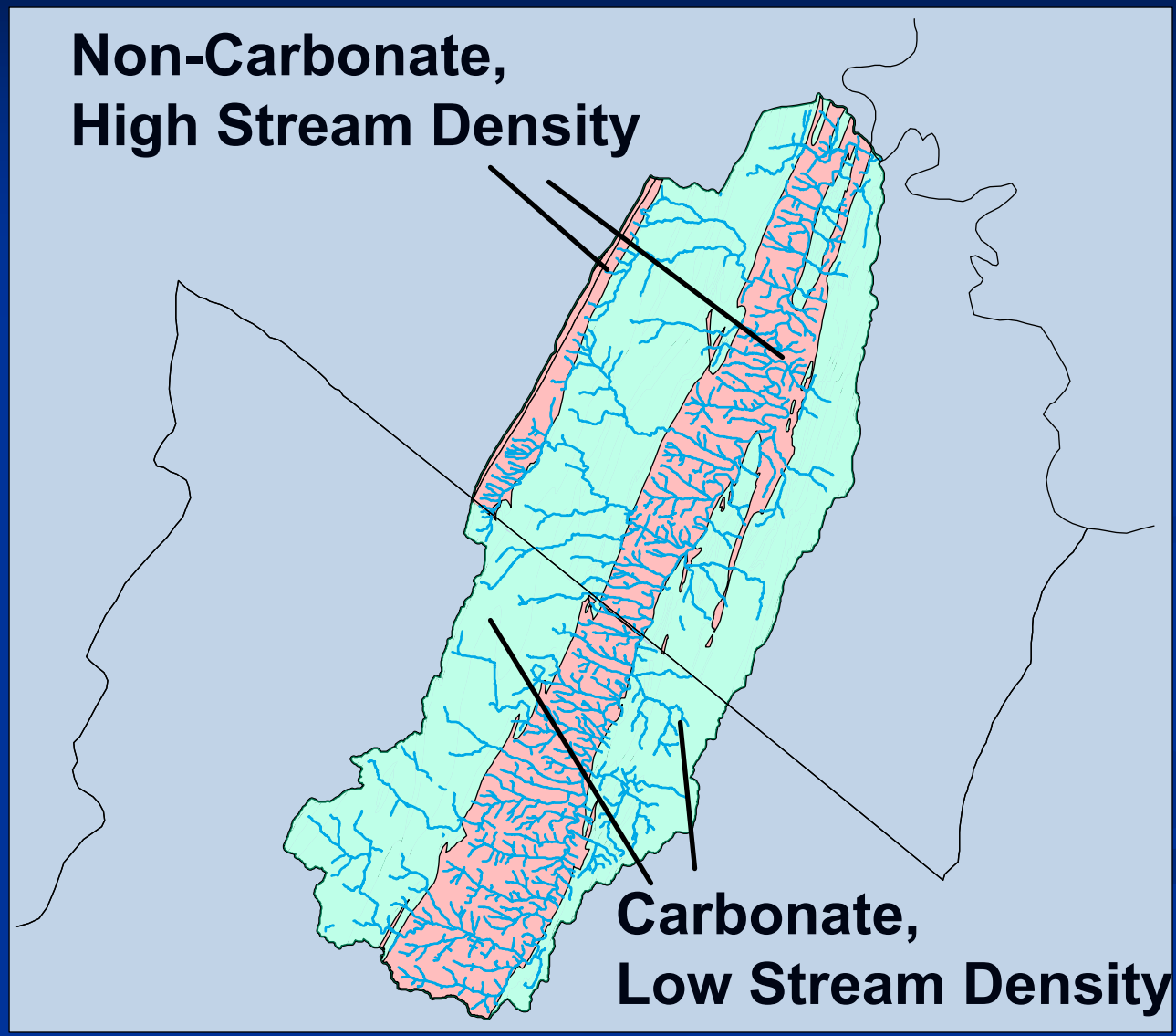
Geologic Control on Stream Network



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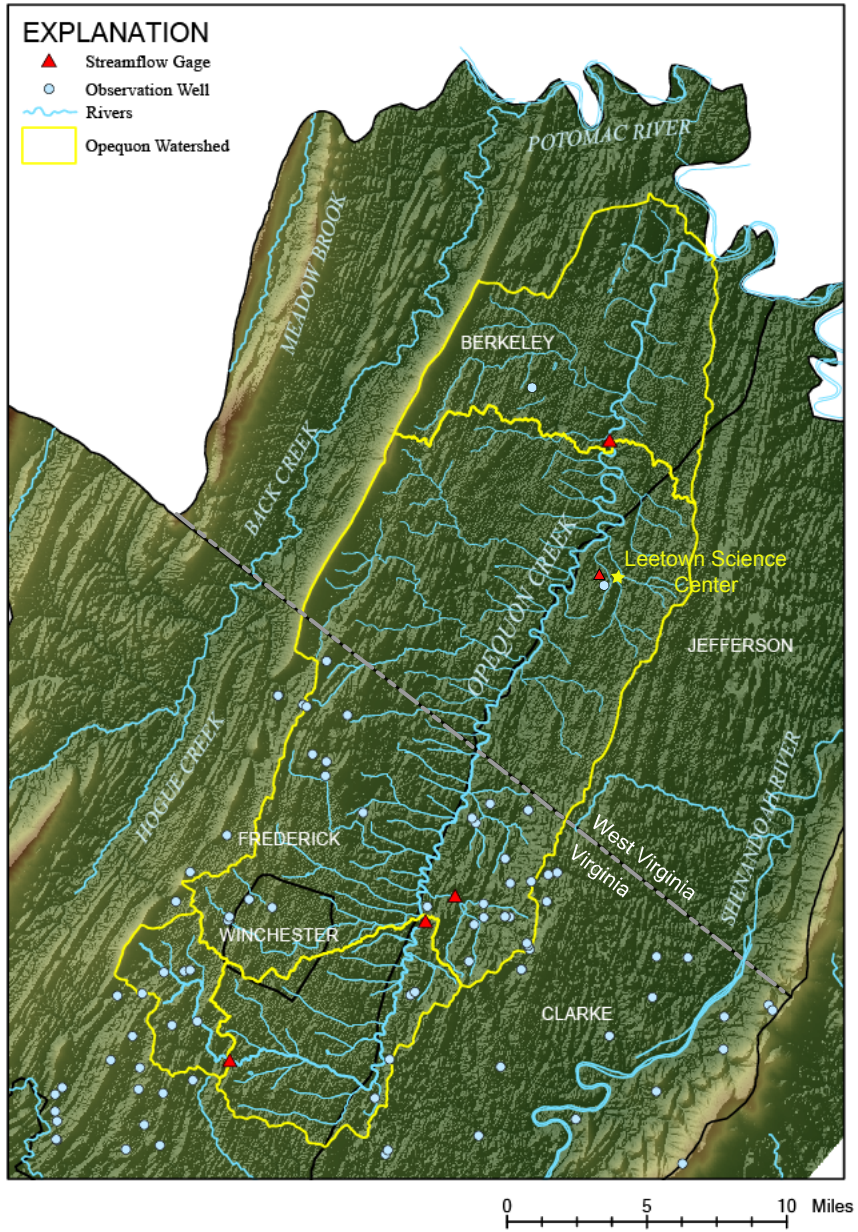
Groundwater Observation Wells



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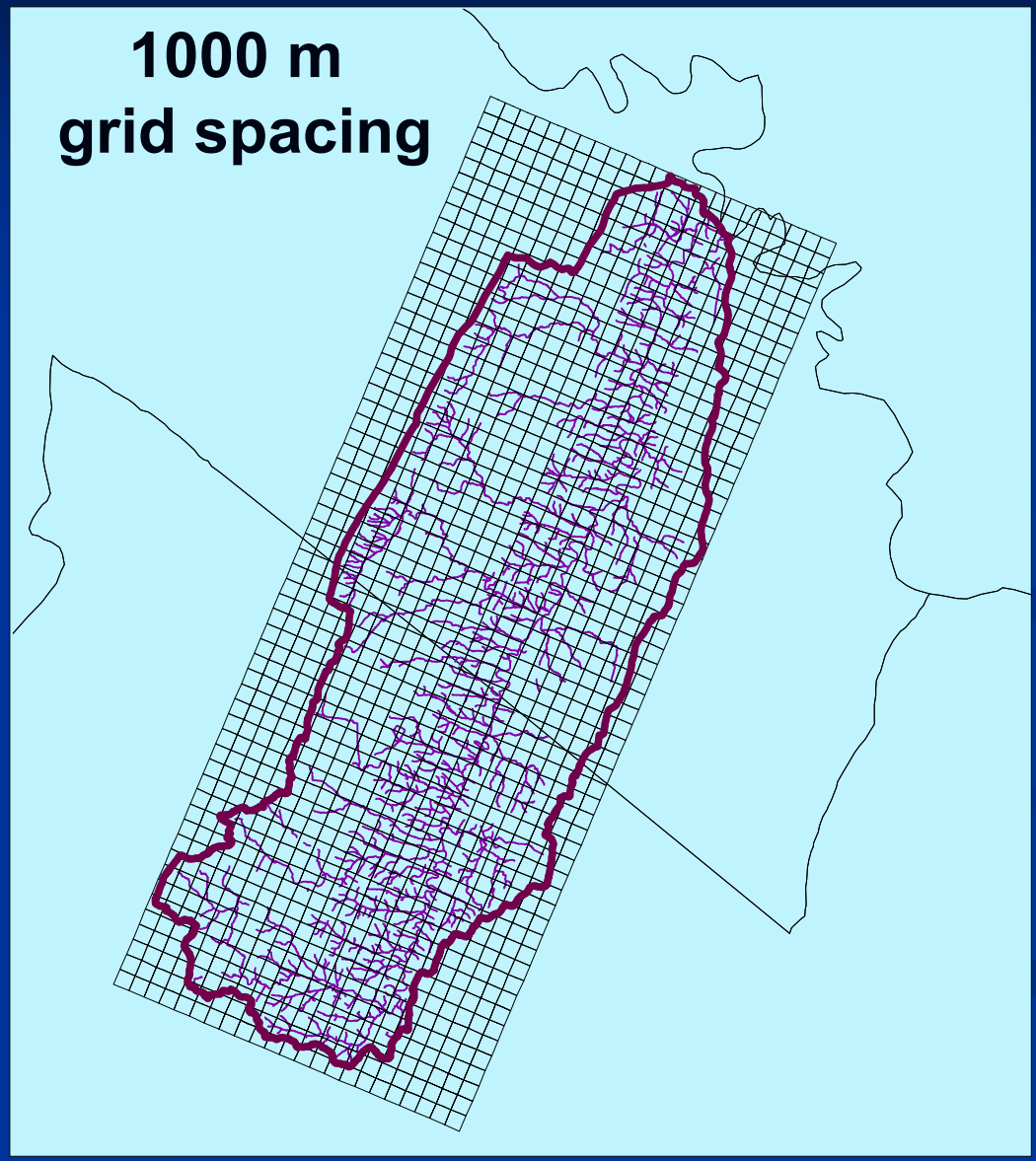
Model Grid



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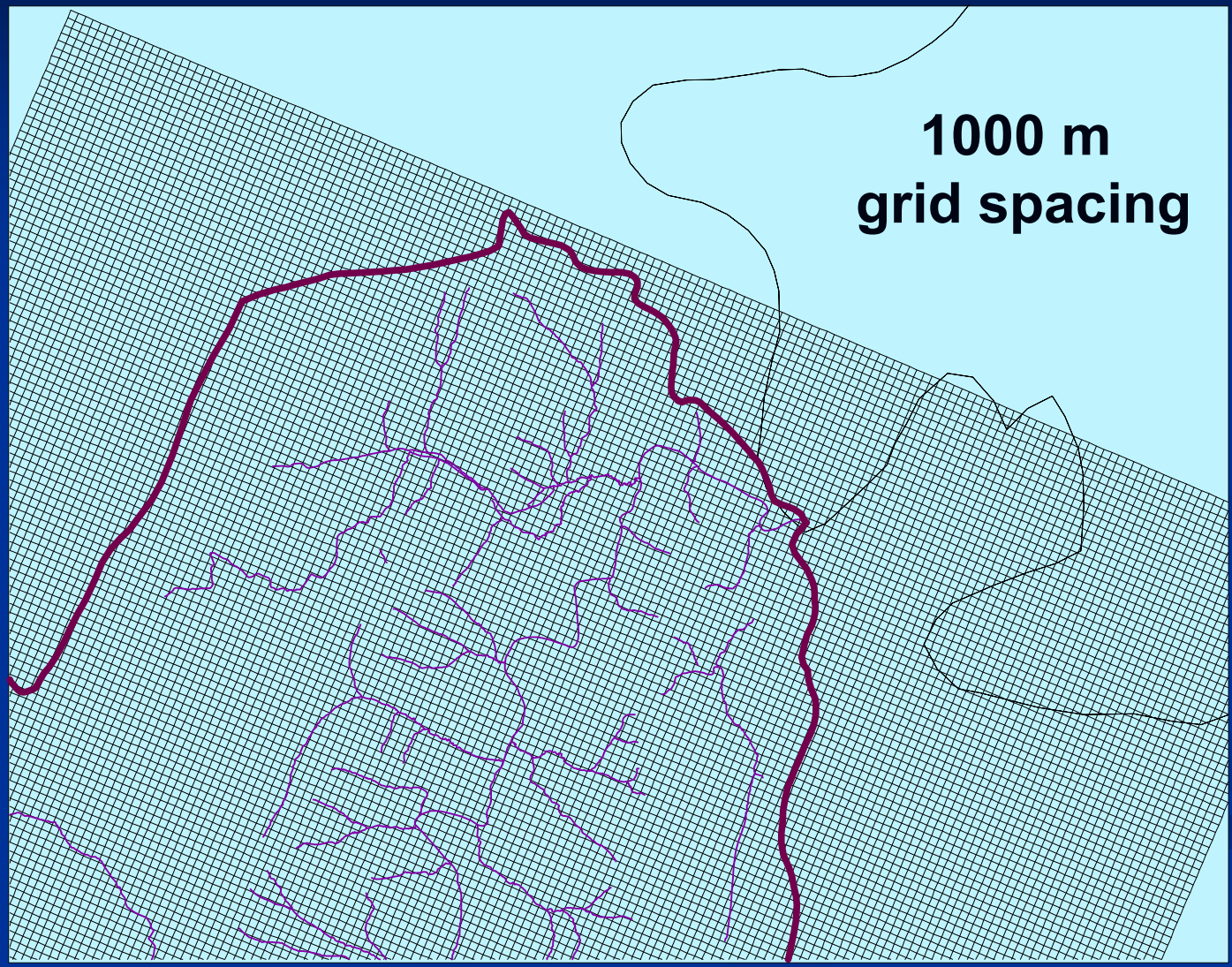
Model Grid



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Current Tasks

- Develop conceptual model in conjunction with Shenandoah models at different scales
- Compile geospatial data
- Compile streamflow and gw level data
- Compile hydrogeologic data
- Compile water use data
- Monitor streams and wells

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Future Work

- Continue current tasks
- Develop steady-state model input files

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