




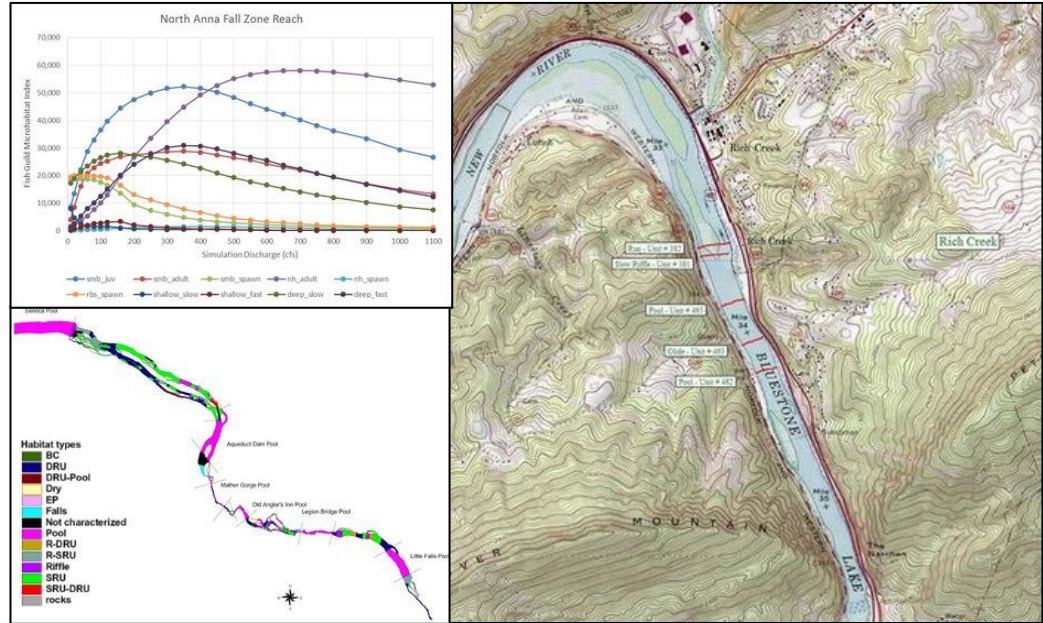
VAHydro: Evolving Methods

Integrated Modeling & Analysis for
In-stream Beneficial Uses in
Virginia



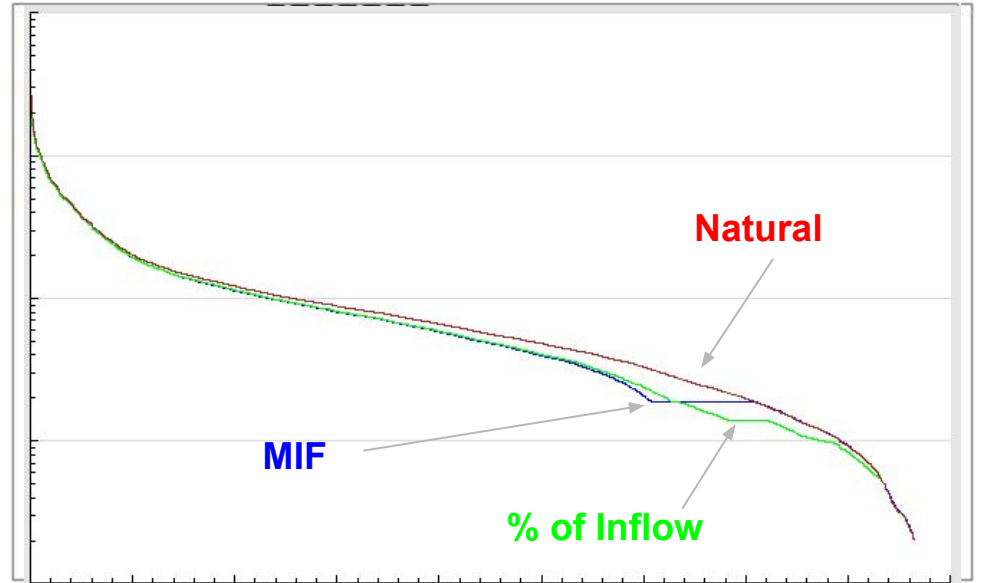
20th Century Flows: From MIF to IFIM

- Pre-1980s: MIFs (Tenant method, etc.) prevailed.
- 1980s-2000: IFIMs began to come into play
 - Site specific
 - Extensive/Expensive
 - Some question their longevity
 - Don't consider habitat forming/maintenance flows



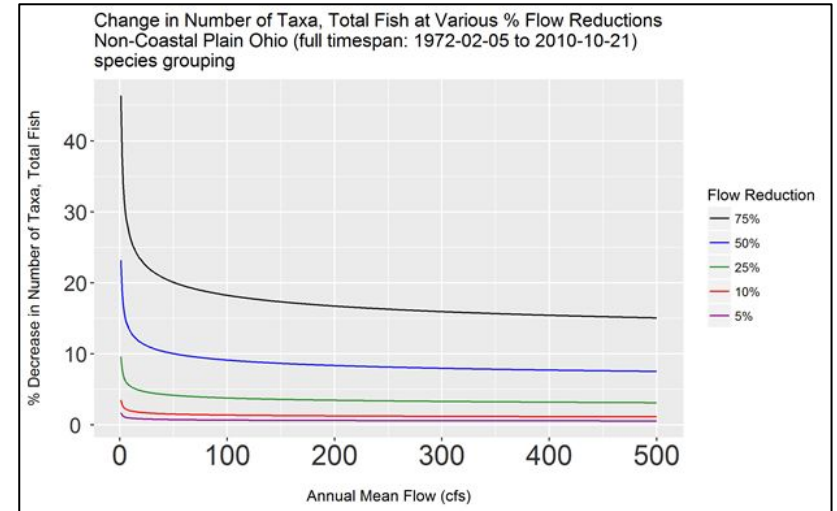
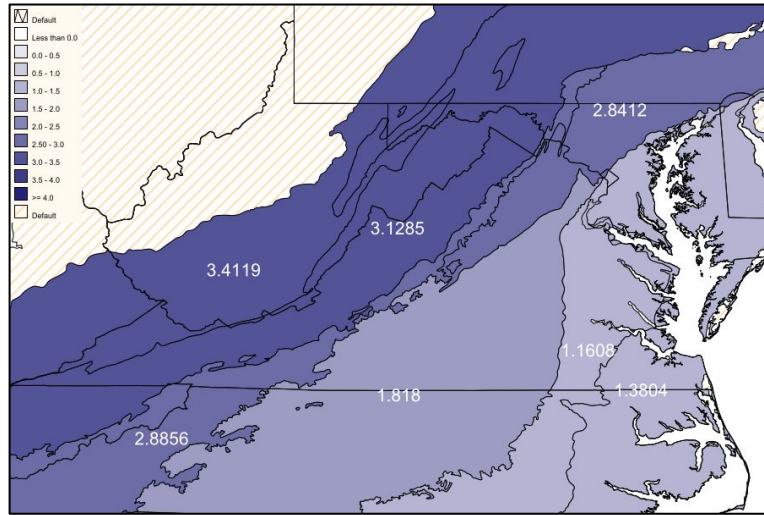
Millennials: % of Instantaneous Flows

- From analysing IFIM curves general flow:habitat responses were gleaned.
 - At 10% reduction in flow, median habitat loss \leq 10%.
- Concept of “Natural” Flow Variability gains traction
 - Mimic pre-operation shape of hydrograph.
 - Considers drought, floods, daily variation as necessary.



One Percentile Fits All?

- Species richness increases with river size/mean flow (RCC).
- Rates vary geographically & predictably by eco-region and w/in a stream.



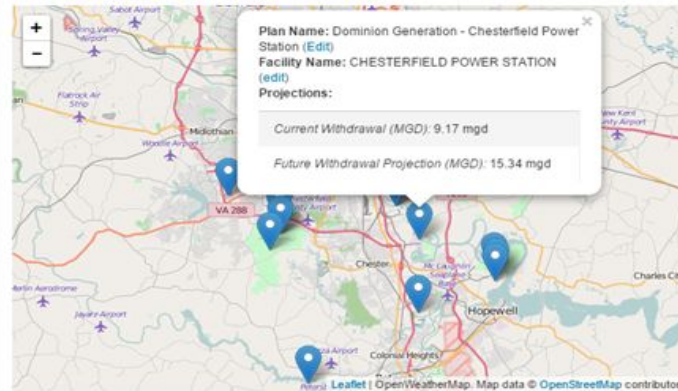
Web CMS: Decision Support Systems and Modeling

- Web-Based CMS integrates:
 - Withdrawal reporting
 - Water supply planning
 - Hydrology
 - Water Quality
- Data API's
 - Analysis with R
 - Data sharing
 - GIS / ArcHydro

Locality Planning Dashboard

Home > Appomattox River Water Authority (ARWA) + Hopewell Regional WSP > Chesterfield

WATER SYSTEMS WITHIN LOCALITY



SYSTEM SUBMITTALS

System Name	System Type	Hydrocode
Dupont E. I. DeNemours & Company - James River Plant	manufacturing	vwuds_1321
Dupont E. I. DeNemours & Company - Spruance Plant	manufacturing	vwuds_1322

WSP LOCALITY MENU

- Overview
- Systems
- Water Uses
- Water Sources
- Drought Planning
- Summary Reports

COMPLIANCE CHECKLIST

Checklist of WSP components received

WATER SOURCES

Aggregate water sources for locality - # of GW & SW sources

WATER USES, PROJECTIONS & DEFICITS

Table of water uses, projections, and deficits for locality