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 ≤ 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