

Assessing headwater streams: linking landscapes to stream networks

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Headwater streams are the smallest, but most abundant streams that drain our landscape.

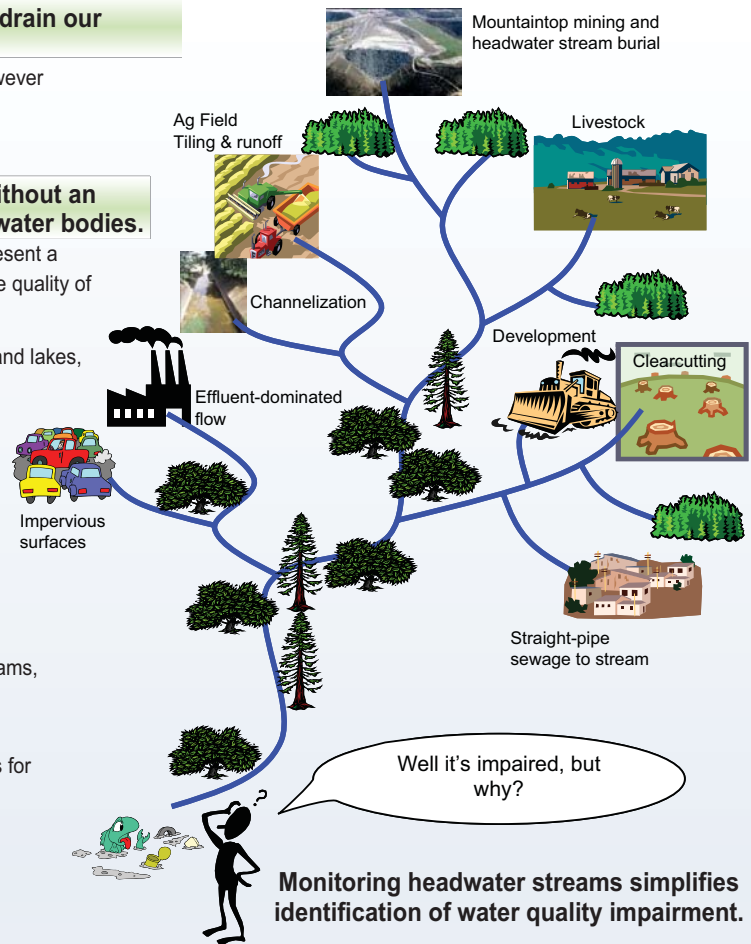
- 75% of the total stream miles in the U.S. are documented as headwater streams, however this is an underestimate because as much as 80% of headwater streams are undocumented.

Widespread alteration and loss of headwater streams has occurred without an understanding of the consequences to larger navigable downstream water bodies.

- Because headwater streams are located at the tops of the stream network, they represent a significant land-water boundary. Thus, landscape alteration in headwaters impacts the quality of downstream rivers and lakes.
- Improperly managed headwater streams transfer impairments to downstream rivers and lakes, making them analogous to point-sources of pollutants.
- Headwater streams drain smaller watersheds with more homogeneous land use than larger streams.

Headwater Intermittent Streams Study

- Headwater streams are prone to natural drying each year.
- Streams that regularly dry are commonly referred to as intermittent or temporary streams, whereas streams that flow continuously are called perennial streams. The gradient representing the duration and frequency of drying is called the permanence gradient.
- The effect of natural drying confounds our ability to use existing assessment methods for majority of stream miles in the U.S. We need to (1) develop appropriate methods for identifying permanence and (2) determine what characterizes unimpaired headwater streams across the permanence gradient.



Objective: Develop field protocols and identify physical and biological indicators of permanence for headwater streams.

Approach:

- Evaluate novel and existing physical and biological measures for assessing permanence of headwater streams found within intact forested ecosystems ("least disturbed" landscapes).
- 2003-2004: Pilot study sampling in Indiana, Kentucky, and Ohio.
- 2004-2005: Additional states added in Northeastern, Midwestern, and Northwestern U.S.

Funding: Regional Methods Program

- Research money specifically designated for methodological needs of states, regions & tribes.
- Funding 2003-2005

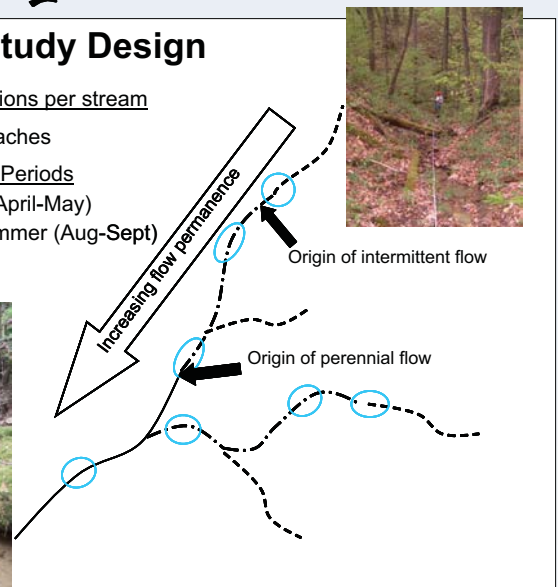
Study Design

3 - 4 locations per stream

- 30 m reaches

Sampling Periods

- Spring (April-May)
- Late Summer (Aug-Sept)



Expected Outcomes

- Provide states, regions, and tribes with scientifically-sound protocols for assessing condition of the majority of streams and stream miles in the United States.
- Protect and improve the health of headwater streams which will result in better water quality in downstream water bodies.

