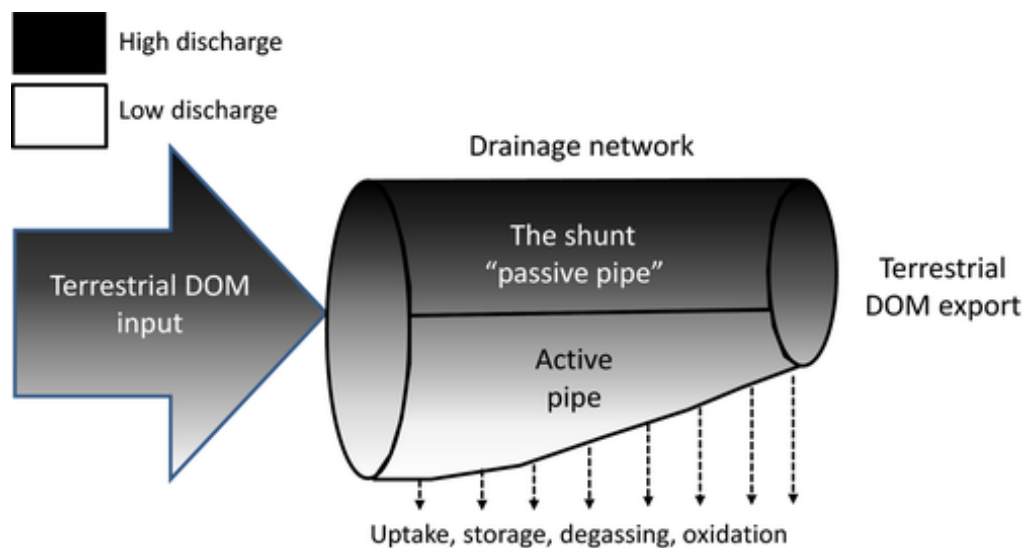


## Monitoring headwater stream impact in Guilford's East River Preserve

Storms and droughts cause headwater streams to expand and contract. Expansion during and after large storms pulses organic matter into streams and then shunts it to larger, downstream rivers. These downstream rivers may experience changes to their water quality and health as a function of what is happening far upstream in the headwaters (as illustrated in the figure below).



Raymond, P. A., Saiers, J. E., & Sobczak, W. V. (2016). Hydrological and biogeochemical controls on watershed dissolved organic matter transport: Pulse-shunt concept. *Ecology*, 97(1), 5-16.

Despite decades of scientific studies showing that flowing headwaters expand and contract in response to storms and droughts (influencing downstream water quantity and quality across temporal scales), we still do not explicitly integrate this phenomenon into regional budgets. This limits our ability to understand how much headwater expansion/contraction is influencing the movement of organic matter, sediments, and nutrients through the environment (and in turn, our ability to sustainably manage freshwater health).

One reason is we still lack sufficient measurements of headwater temporal variability- both flowing length and width- because of the time consuming nature of manual stream surveys. For example, at present there are only around 20 watersheds in the United States with these types of surveys and even then, most have no repeat surveys over time or across the full flow regime. And none have the strong wetland influence that streams in the East River Preserve have. To address this, we are doing weekly headwater surveys (measuring stream width and length) in the East River Preserve, during droughts, storms, and everything in between. In conjunction with experiments

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we are running in other New England watersheds, our goal is to contribute to improved understanding of the effect of stream wetting and drying on downstream river health.

If you have any questions about the experiment or its impact on the East River Preserve, do not hesitate to contact the project lead, Dr. Craig Brinkerhoff, at [craig.brinkerhoff@yale.edu](mailto:craig.brinkerhoff@yale.edu).