

[USGS Maryland-Delaware-District of Columbia Water Science Center](#)
[Seminar Series](#)

Wednesday, October 12, 2016 11:00 a.m.

Water age, storage and discharge in headwater streams: How does recharge to uplands become baseflow?

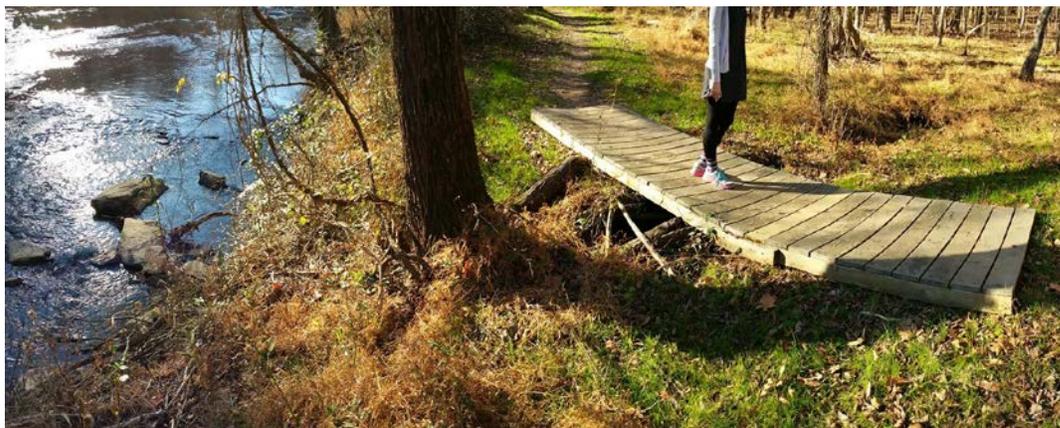
Ciaran Harman, Johns Hopkins University

The transit time of water through hydrologic systems is a fundamental control on the biological and chemical transformations that occur within them. New approaches to characterizing these transit times are changing the way we interpret hydrologic tracer dynamics, and are generating more detailed insights into transit times through complex, time-variable hydrologic systems. However these analyzes have typically been separated from analyzes of the hydraulics that drive flow responses. In this talk I will introduce the current methods, and show how it is possible to extend them to generalize relationships between total storage and discharge (which underlie many hydrologic models) into a more nuanced relationship between the age distribution of storage and the age distribution of discharge. This unifies spatially-lumped representations of flow and transport into a single representation that captures the emergent result of interactions between celerity and velocity in hydrologic systems.



Ciaran Harman is Assistant Professor of Landscape Hydrology in the Department of Environmental Health and Engineering at Johns Hopkins University. He received a PhD in Civil Engineering from the University of Illinois at Urbana-Champaign in 2011, and in 2016 he was awarded the Hydrology Section Early

Career Award from the American Geophysical Union. His research group studies hydrologic flow and transport in the landscape across spatial and temporal scales, including experimental lab studies, field research, and numerical modeling.



This presentation will also be available remotely via Webex:

<https://usgs.webex.com/usgs/j.php?MTID=mcf7aec46034e44bc58959b6d7139fa0e>

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