

# Experimental Watersheds, Nutrient Dynamics and Collaborative Research

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## **Abstract**

Experimental watersheds can be a focal point for collaborative research across multiple disciplines. For over 50 years, research at the H.J. Andrews Experimental Forest, Oregon, has examined hydrologic, nutrient and sediment responses to forest harvest. Core measurements of hydrologic and climatic parameters from eight small basins, two large basins and four complete climatic stations continue to provide a foundation of high resolution, environmental data that attract multiple interdisciplinary research projects. Today, research in our small watersheds is exploring complex physical and biological pathways that control the availability, movement, and export of nutrients from basins. Due to the complexity of C and N cycles through time and space, it is difficult to predict nutrient transformations and fluxes through the terrestrial and aquatic environments. Part of the difficulty is due to the historical tendency of scientists to focus on separate aspects of these cycles. Hydrologists have traditionally considered nutrients to be transport limited, where physical processes control the availability of dissolved N and C from soils to streamwater, while ecologists generally consider nutrient concentrations to be production and uptake limited, where biological processes respond to and modify nutrient availability. In N-limited systems of the interior Pacific NW, instream uptake can sequester 30-50% of available ammonium over short distances, raising questions to what extent nutrient fluxes from basins may be representing local instream processes rather than whole basin dynamics. Results from our collaborative research show that interdisciplinary teams can stimulate learning in each discipline and are necessary to tease apart these questions.

**Keywords:** interdisciplinary research, hydrology, nutrients, temporal variability

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