
Introduction

This special issue of *Hydrologic Processes* contains eight papers pertaining to biogeochemical studies in watershed science. These papers were presented as part of a session on 'Interrelationships Between Atmospheric Deposition and Landscape Features of Forest Catchments in Regulating Surface Water Biogeochemistry' at the American Geophysical Union meeting in Boston, Massachusetts, 29 May through to 2 June 2001. Watershed studies provide important understanding of the biogeochemistry of both terrestrial and aquatic ecosystems. Such studies include long-term monitoring, short-term measurements associated with events, including storms and snowmelt, material balances, process-level research, modelling, stable isotopic analyses, cross-site investigations and watershed manipulations. The papers included in this special issue use many of these approaches to address problems in watershed biogeochemistry, with particular focus on the interrelationships between atmospheric deposition and landscape features. For example Eimers *et al.* examine long-term patterns of sulphate loss in watersheds in Ontario, Canada, in response to changes in atmospheric deposition and climatic conditions. Chen *et al.* used the model PnET-BGC to compare factors regulating the acid-base status across five forested watersheds in the Adirondack and Catskill regions of New York. Two of the papers examine regulation of stream chemistry during hydrologic events: Inamdar *et al.* investigate controls of nitrate and dissolved organic carbon in the Archer Creek Catchment at the Huntington Forest in the Adirondack region of New York; Wellington and Driscoll study changes in hydrologic flowpaths regulating stream concentrations of dissolved organic carbon at the Hubbard Brook Experimental Forest, New Hampshire. In four papers, the biogeochemistry of nitrogen was investigated. Hurd and Raynal conduct process-level studies to investigate the role of nitrogen-fixing vegetation in supplying nitrate in stream water in the Adirondacks. Pardo *et al.* use stable isotopic analyses of nitrate ($\delta^{18}\text{O}$ and $\delta^{15}\text{N}$) to evaluate the relative contributions of atmospheric versus watershed nitrification to nitrate of surface waters in two watersheds in New Hampshire. Two of these papers examine the role of biotic disturbances. Eshleman *et al.* develop a model to estimate nitrogen loss across many watersheds that have experienced disturbance by defoliating insects across the mid-Atlantic region of the USA. Finally, Tokuchi *et al.* study the effect of disturbance by pine wilt disease on watershed biogeochemistry in a watershed in Japan, with particular focus on factors affecting nitrogen losses.

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