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Breakthroughs in the biogeochemistry of Nordic aquatic systems: Lessons from Water's Journey from Rain to Stream

Kevin Bishop
Uppsala University, Department of Earth Sciences, Uppsala, Sweden (kevin.bishop@geo.uu.se)

A sustainable society has been said to require knowledge of the limits placed by nature. Whatever one's views on the know-ability and significance of such limits, science strives to improve our understanding of these limiting factors, of which water is recognized to be one of the most important. Despite the centrality of water, the water cycle is maddeningly difficulty to pin down with the level of detail that is desired for resolving issues about the fate of pollutants, nutrient cycling and the global carbon balance, etc. But there is hope lurking in the Swedish landscape. The simplicity of hydrology in many Fennoscandian till soils, combined with applications of the only true tracers of water (isotopes of the water molecule) that were pioneered by Uppsala University hydrologists – provide a hydrological basis for breakthroughs in the biogeochemistry of critical earth support systems. This talk will explore some recent advances in understanding both pollutants and natural cycles, with linkages back to the concepts presented in the Water's Journey from Rain to Stream by Harald Grip and Allan Rodhe. The examples will include the mercury, acidity, and biogenic carbon of relevance to the "aquatic conduit" in the global carbon cycle. The talk will finish with thoughts about where to go next with the power that a well-characterized hydrology can provide.