

## **Water-quality monitoring and process understanding in support of environmental policy and management**

**Norman E. Peters**, U.S. Geological Survey, Atlanta, Georgia, USA

**Abstract** The quantity and quality of freshwater at any point on the landscape reflect the combined effects of many processes along hydrologic pathways within drainage basin. Primary drivers for the availability of water are landscape changes and the patterns and processes affecting the timing, magnitude, and intensity of precipitation, including global climate change. The degradation of air, land, and water in one part of a watershed can have negative effects on users downstream; the time and space scales of effects are determined by the residence time along various hydrological pathways. Hydrology affects transport, deposition, and recycling of inorganic materials and sediment. These components affect biota and associated ecosystem processes and the biota rely on sustainable flows throughout a drainage basin. Human activities on all spatial scales affect both water quantity and quality and some human activities can have a disproportionate effect on an entire drainage basin. Aquatic systems have been continuously modified since early development of agriculture, through land-use change, irrigation and navigation, the disposal of urban, mining, and industrial wastes, and engineering modifications to the environment. Interdisciplinary integrated basin studies within the last several decades have provided a more comprehensive understanding of the linkages among air, land, and water resources. This understanding coupled with environmental monitoring has evolved a more multidisciplinary integrated approach to resource management, particularly within drainage basins.