



Review Paper

Effects of Ground Water Exchange on the Hydrology and Ecology of Surface Water

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Abstract

Ground water exchange affects the ecology of surface water by sustaining stream base flow and moderating water-level fluctuations of ground water-fed lakes. It also provides stable-temperature habitats and supplies nutrients and inorganic ions. Ground water input of nutrients can even determine the trophic status of lakes and the distribution of macrophytes. In streams the mixing of ground water and surface water in shallow channel and bankside sediments creates a unique environment called the hyporheic zone, an important component of the lotic ecosystem. Localized areas of high ground water discharge in streams provide thermal refugia for fish. Ground water also provides moisture to riparian vegetation, which in turn supplies organic matter to streams and enhances bank resistance to erosion. As hydrologists and ecologists interact to understand the impact of ground water on aquatic ecology, a new research field called "ecohydrology" is emerging.