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Nutrient loading in high alpine lakes of the Sierra Nevada: Sources of elevated phosphorus

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Phosphorus loading to Sierra Nevada lakes has been identified as a prevalent and increasingly detrimental problem. As a key limiting nutrient for primary productivity, small increases in phosphorus loads boost the occurrence of algal blooms which over time can result in eutrophication. Instances of excessive phosphorus enrichment are commonly associated with agricultural and urban runoff, however, given the remoteness of most Sierra lakes, recent studies have identified other sources as potential explanations for the increased phosphorus; these sources include non-native stocked fish, atmospheric deposition, and wetlands. The introduction of salmonoid fishes into historically fishless lakes of the Sierra Nevada is a common practice to enhance recreational fishing. Recent scientific studies have shown that these stocking programs can drastically alter phosphorus recycling within naturally fishless ecosystems. Significant phosphorus contributions can be transported from the atmosphere to lake ecosystems via wet or dry deposition. Organophosphate pesticides can be an important source of atmospherically transported nutrients to Sierra lakes. Adjacent wetlands may also be contributing to phosphorus loading in Sierra lakes. The dynamics of nutrient release from wetlands is relatively complex given the ecosystems' ability to also act as a nutrient sink for solutes discharged from upstream environments. Hydrologic condition and biological activity are major determinants of whether a wetland functions as a nutrient sink or source. In this study three Sierra lakes were sampled and analyzed for phosphorus content. Seasonal and between-lake trends are presented. Atmospheric samples and those collected near a development on one lake contained significantly higher phosphorus concentrations.

Biography

Blodwyn M McIntyre completed her PhD at the University of Virginia in Environmental Science. She is the Chair of Environmental Studies at the University of Redlands. Her previous work includes being the manager of a Mountain Cloud Chemistry Project in the Shenandoah National Park and studying Common Raven predation on the Threatened Desert Tortoise in the Mojave Desert. She received her Master's degree in Forestry from Duke University and her Bachelor's degree from Colorado College.

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Qualitative assessment of groundwater from southern part of Mor Basin of Jalgaon district, Maharashtra

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The present study area is located in the northeastern parts of the Jalgaon District. Water is a prime natural resource and is a basic human need. It is a part of ecological system, and preservation of the quality of environment and ecological balance is a prime consideration in planning, implementation and operation of water resources projects. It is also a vital element in all developmental planning programmes. As the developmental process gathers momentum and the demand of water for domestic, agricultural and industrial purpose increases day by day. This may lead to over-exploitation of the water and may have an adverse impact on the environment. The environmental degradation caused due to groundwater development and utilization may be visible in terms of groundwater depletion, groundwater contamination, saline water intrusion, waterlogging and salinity. The area under study is facing a major problem of groundwater depletion mainly in summer season due to excessive pumping of groundwater for banana/sugarcane plantation and changes in groundwater chemistry due to excessive irrigation, industrial effluents and natural salinity problems. The qualitative characteristics of groundwater were studied by collecting samples from fifteen locations. The chemical parameters included pH, electrical conductivity, total hardness, total alkalinity, chloride, calcium, magnesium, sodium, potassium, sulphate, phosphate and nitrate have been determined. The concentration of abundant cations and anions was employed to describe and assess the temporal variations in the groundwater quality in the lower part of the basin. Cations show an increase towards the lower part of the basin. In the present investigation an attempt has been made to study the suitability of groundwater for domestic and irrigation purposes. The water from the area is moderately to very hard. SAR, KR, SSP ratios were calculated for irrigation suitability of groundwater. These ratios indicate that the quality of groundwater is quite good for irrigation purposes.

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