

Relating Surface-Water Nutrients in the Pacific Northwest to Watershed Attributes Using the USGS SPARROW Model

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The USGS SPARROW model (SPATIally Referenced Regression On Watershed attributes) was used in combination with the 1:500,000 scale River Reach File 1 (RF1) stream network to predict the long-term, average loads, yields, and concentrations of total nitrogen and total phosphorus for stream reaches located in the Pacific Northwest (the Columbia basin, Puget Sound basin, and Pacific drainages of Oregon and Washington), and to identify the important sources and watershed properties that control the transport of nutrients through these stream reaches. The modeling results were used to identify stream reaches that exceeded the suggested U.S. Environmental Protection Agency reference concentrations for nutrient enrichment, to compare the locations of these reaches with those that have been identified by state regulatory agencies as impaired because of nutrient enrichment (based on the state 303(d) lists), and to determine the relative contribution of different source categories to the annual nutrient load in these impaired reaches. The results from this analysis will be linked to an online decision support system that regional water-quality managers and other stakeholders can use to predict changes in water-quality conditions under different management scenarios, assess water-quality conditions where no water-quality results are available, and design water-quality monitoring programs.

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