



United States Department of the Interior

U. S. GEOLOGICAL SURVEY
Oregon Water Science Center
2130 SW 5th Avenue
Portland, Oregon 97201
<http://or.water.usgs.gov/>

October 6, 2010

Dear Sir/Madam:

The enclosed report describes results from a recent U.S. Geological Survey study that used stable isotopes of carbon and nitrogen to identify the sources of organic matter to bed sediments of the Tualatin River in northwestern Oregon. The study was done in collaboration with Clean Water Services of Washington County, and helped to address some long-standing questions about the sources and management of materials that consume large quantities of oxygen in the river.

As organic matter in bed sediments of the Tualatin River decomposes, it acts as one of the largest consumers of dissolved oxygen in the river. Reducing this oxygen loss is an important goal for the enhancement of the river's water quality, but the source of that organic matter must be identified to create effective management plans. This study used an advanced chemical analysis method to aid in that source identification—the analysis of carbon and nitrogen isotopes in a wide variety of sediment samples and potential source materials.

Major findings from this study include the following:

- Algae are not the primary source of organic matter to river bed sediments, and are only important as a secondary overlay in the lower part of the river. Therefore, controlling the size of the algae population is not likely to have a significant effect on oxygen consumption in the river sediments.
- Based on the isotopic data and the carbon to nitrogen ratios of many samples, it appears that the primary source of organic matter to river sediments is terrestrial leaf litter and soil. Strategies to improve oxygen conditions in the Tualatin River, therefore, are likely to be more successful if they target sources of soil, leaf litter, and other terrestrially derived organic materials to the river.

The report is available online at <http://pubs.usgs.gov/sir/2010/5154/>. I hope that the information in this report is useful to you. If you have any questions or require further information, please don't hesitate to contact me at 503-251-3280 or by email at sarounds@usgs.gov.

Sincerely,

Stewart Rounds
Hydrologist