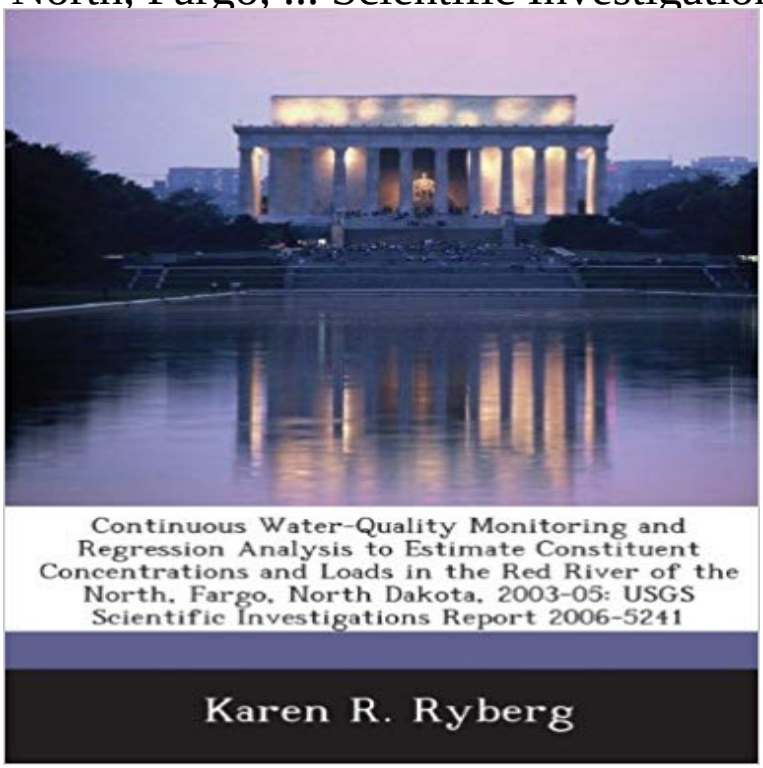
Continuous Water-Quality Monitoring and Regression Analysis to Estimate Constituent Concentrations and Loads in the Red River of the North, Fargo, ... Scientific Investigations Report 2006-5241



This report presents the results of a study by the U.S. Geological Survey, done in cooperation with the Bureau of Reclamation, U.S. Department of the Interior, to estimate water-quality constituent concentrations in the Red River of the North at Fargo, North Dakota. Regression analysis of water-quality data collected in 2003-05 was used to estimate concentrations and loads for alkalinity, dissolved solids, sulfate, chloride, total nitrite plus nitrate, total nitrogen, total phosphorus, and suspended sediment. The explanatory variables examined for regression relation were continuously monitored physical properties of water-streamflow, specific conductance, pH, water temperature, turbidity, and dissolved oxygen. For the conditions observed in 2003-05, streamflow was a significant explanatory variable for all estimated constituents except dissolved solids. pH, water temperature, and dissolved oxygen were not statistically significant explanatory variables for any of the constituents in this study. Specific conductance was a significant explanatory variable for alkalinity, dissolved solids, sulfate, and chloride. Turbidity was a significant explanatory variable for total phosphorus and suspended sediment. For the nutrients, total nitrite plus nitrate, total nitrogen, and total phosphorus, cosine and sine functions of time also were used to explain the seasonality in constituent concentrations. The regression equations were evaluated using common measures of variability, including R2, or the proportion of variability in the estimated constituent explained by the regression equation. R2 values ranged from 0.703 for total nitrogen concentration to 0.990 for dissolved-solids concentration. The regression equations also were evaluated by calculating the median relative percentage difference (RPD) between measured constituent concentration and the constituent

concentration estimated by the regression equations. Median RPDs ranged from 1.1 for dissolved solids to 35.2 for total nitrite plus nitrate. Regression equations also were used to estimate daily constituent loads. Load estimates can be used by water-quality managers for comparison of current water-quality conditions to water-quality standards expressed as total maximum daily loads (TMDLs). TMDLs are a measure of the maximum amount of chemical constituents that a water body can receive and still meet established water-quality standards. The peak loads generally occurred in June and July when streamflow also peaked.

Scientific Investigations Report 20125111 . Graphs showing streamflow and estimated daily suspended-sediment loads for the Red River of the North and selected tributaries near Fargo, . 2011) to examine sediment concentrations, loads, and particle- Regression analysis and real-time water-quality monitoring. **Continuous Water-Quality Monitoring and Regression Analysis to** The Honeymoon Effect: The Science of Creating Heaven on Earth .. Continuous Water-Quality Monitoring and Regression Analysis to Estimate Constituent to Estimate Constituent Concentrations and Loads in the Red River of the North, Fargo, North Dakota, 2003-05: Usgs Scientific Investigations Report 2006-5241. **1 IN-STREAM WATER-QUALITY ESTIMATION - ResearchGate** This report presents the results of a study by the U.S. Geological Survey, done in to estimate water-quality constituent concentrations in the Red River of the North at Regression equations also were used to estimate daily constituent loads. North Dakota, 2003-05: Usgs Scientific Investigations Report 2006-5241 by **PK - The Ecoscan** Mar 8, 2012 Regression analysis of water-quality data collected in 2003-05 was used to estimate Continuous Water-Quality Monitoring and Regression Analysis to Estimate Constituent Concentrations and Loads in the Red River of the North, Fargo, North Dakota, 2003-05. Scientific Investigations Report 2006-5241. **NDGS Database NDSU Libraries** Open-File Report 20121168 For more information on the USGSthe Federal source for science about the Earth, its natural and .. flow data and anomalies, these continuous physical property streamflow, in regression analysis for water-quality monitoring .. tions and loads in the Red River of the North, Fargo, North. **Buy Continuous Water-Quality Monitoring and Regression Analysis** Nov 3, 2011 Scientific Investigations Report 20125111 . of the North selected tributaries near Fargo, North Dakota, in 20 . Regression analysis and real-time water-quality monitoring to estimate constituent concentrations, loads, and yields in

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