



# Water Quality Trends Of Selected Variables In The South Thompson River At Kamloops

Prepared For:

Environment Canada And  
BC Ministry Of Environment, Lands And Parks

Prepared By:  
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## Introduction

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This report summarizes the statistical analyses of two water quality variables sampled at the South Thompson River at Kamloops monitoring site. The two variables analyzed were:

- Non-filterable Residue; and
- Total Phosphorus.

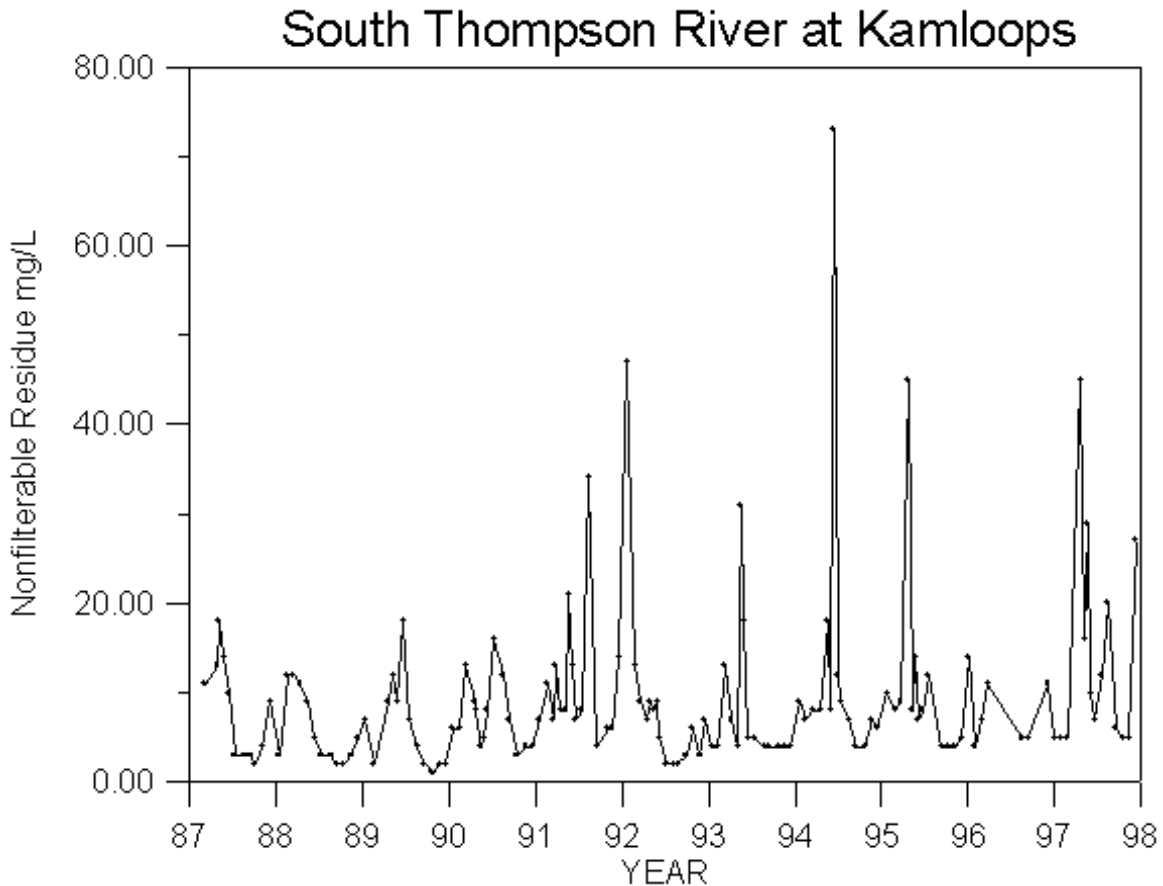
Details of the statistical methods and procedures used within this analysis can be found in the report *Water Quality Trends at Selected Sites in British Columbia (draft)*.

## Non-filterable Residue

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Non-filterable residue data collected from 1987 through 1997 were used for statistical analyses (Figure 1).

**Figure 1 Time series plot of non-filterable residue in the South Thompson at Kamloops, 1987 - 1997.**



Non-parametric tests for trend indicated evidence of a significant **linear increasing trend**. Subsequent regression modeling also fit an **increasing-trend** model. Table 1 presents the statistics for the non-parametric results while Table 2 contains the regression findings. One item of note that should be taken into consideration is that the regression-modeling trend may be a reflection of the increase of the minimum detection limit that appears to occur circa 1993. However, the non-parametric tests are robust against the change in detection limit.

**Table 1 Non-parametric results for non-filterable residue in the South Thompson River at Kamloops.**

	<i>Statistic</i>	<i>P-value</i>
<b>SK</b>	3.0468	0.002
<b>MSK</b>	2.0684	0.039

<b>Sen</b>	0.25	NA
<b>LCL</b>	0.0656	NA
<b>UCL</b>	0.3611	NA

**Table 2 Regression modeling results for non-filterable residue in the Salmon River at Salmon Arm. Note that both non-filterable residue and flow data were log transformed before modeling.**

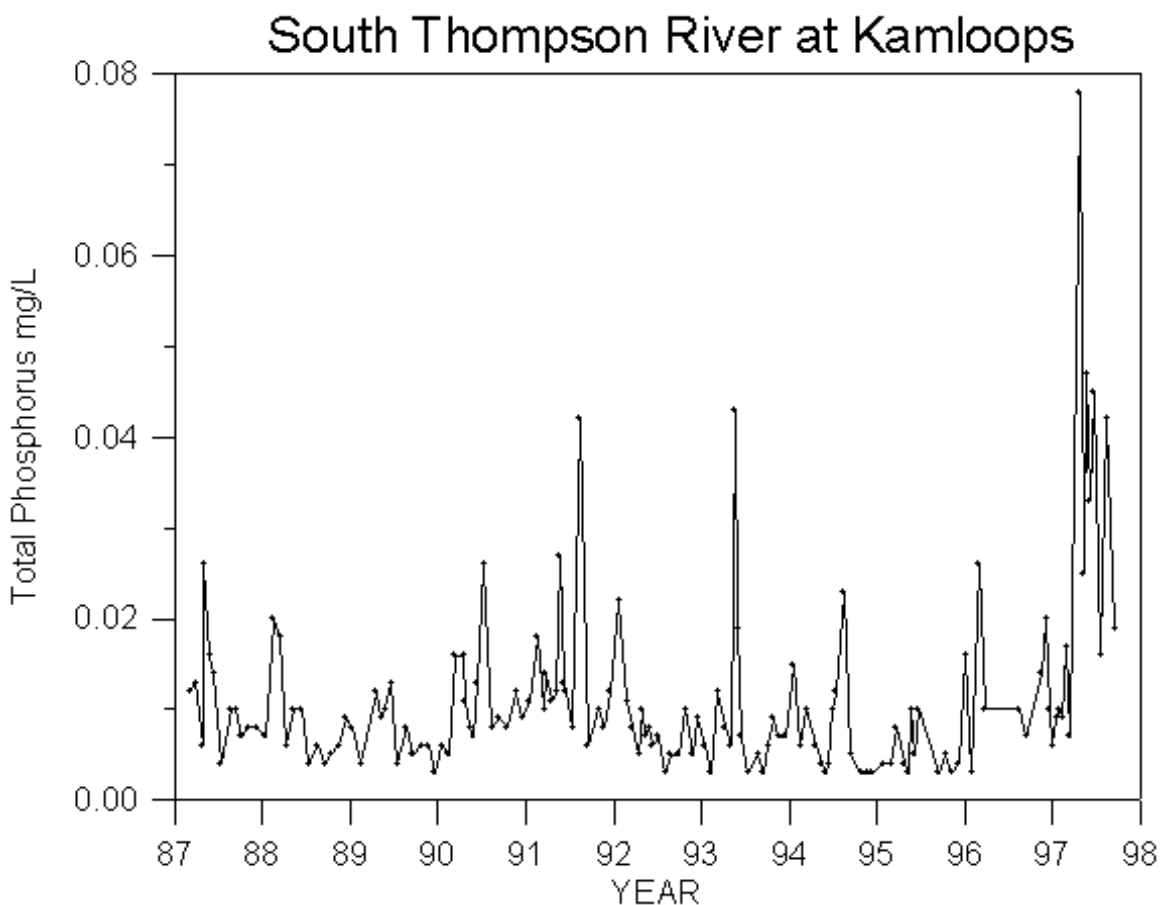
<b>Coefficient</b>	<b>Statistic</b>
<b>b<sub>0</sub></b>	0.4762
<b>b<sub>1</sub></b>	0.2082
<b>b<sub>2</sub></b>	0.0536
<b>b<sub>3</sub></b>	----
<b>a<sub>1</sub></b>	NS
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<b>r<sup>2</sup></b>	0.11

### **Total Phosphorus**

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Total phosphorus data collected from 1987 through 1997 were used for statistical analyses (Figure 2).

**Figure 2** Time series plot of total phosphorus in the South Thompson River at Kamloops, 1987 - 1997.



Non-parametric tests for trend indicated **no evidence of any trend**. Subsequent regression modeling, however, fit a **positive-quadratic (U-shaped)** model. Previous analysis of total phosphorus data that did not include samples from 1996-1997 detected decreasing trends. The results obtained in the current analysis emphasize the effect that the elevated additional 1996-1997 data had in relation to previous years. Table 3 presents the statistics for the non-parametric results while Table 4 contains the regression findings.

**Table 3** Non-parametric results for total phosphorus in the South Thompson River at Kamloops.

	<i>Statistic</i>	<i>P-value</i>
<b>SK</b>	0.159	0.874
<b>MSK</b>	0.085	0.932
<b>Sen</b>	0	NA
<b>LCL</b>	-0.0002	NA

<b>UCL</b>	0.0003	NA
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**Table 4 Regression modeling results for total phosphorus in the South Thompson River at Kamloops. Note that both total phosphorus and flow data were log transformed before modeling.**

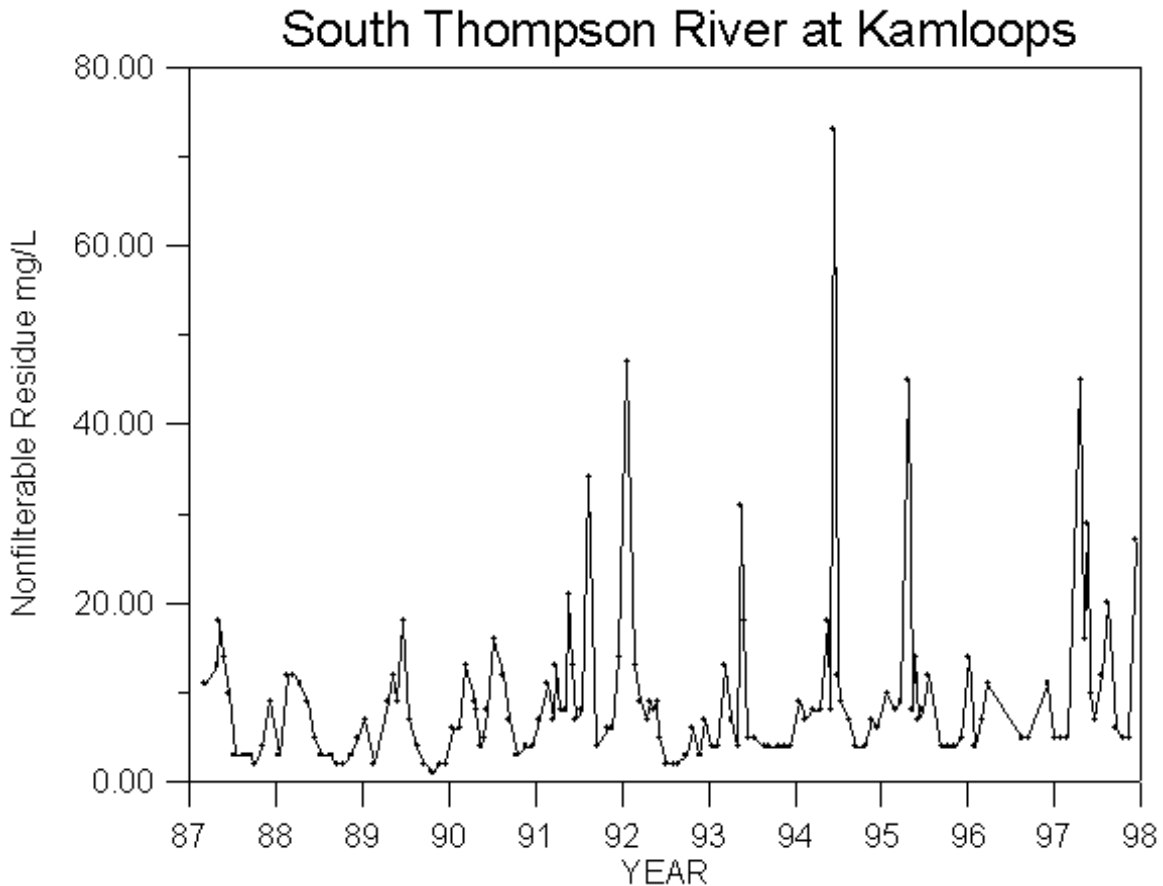
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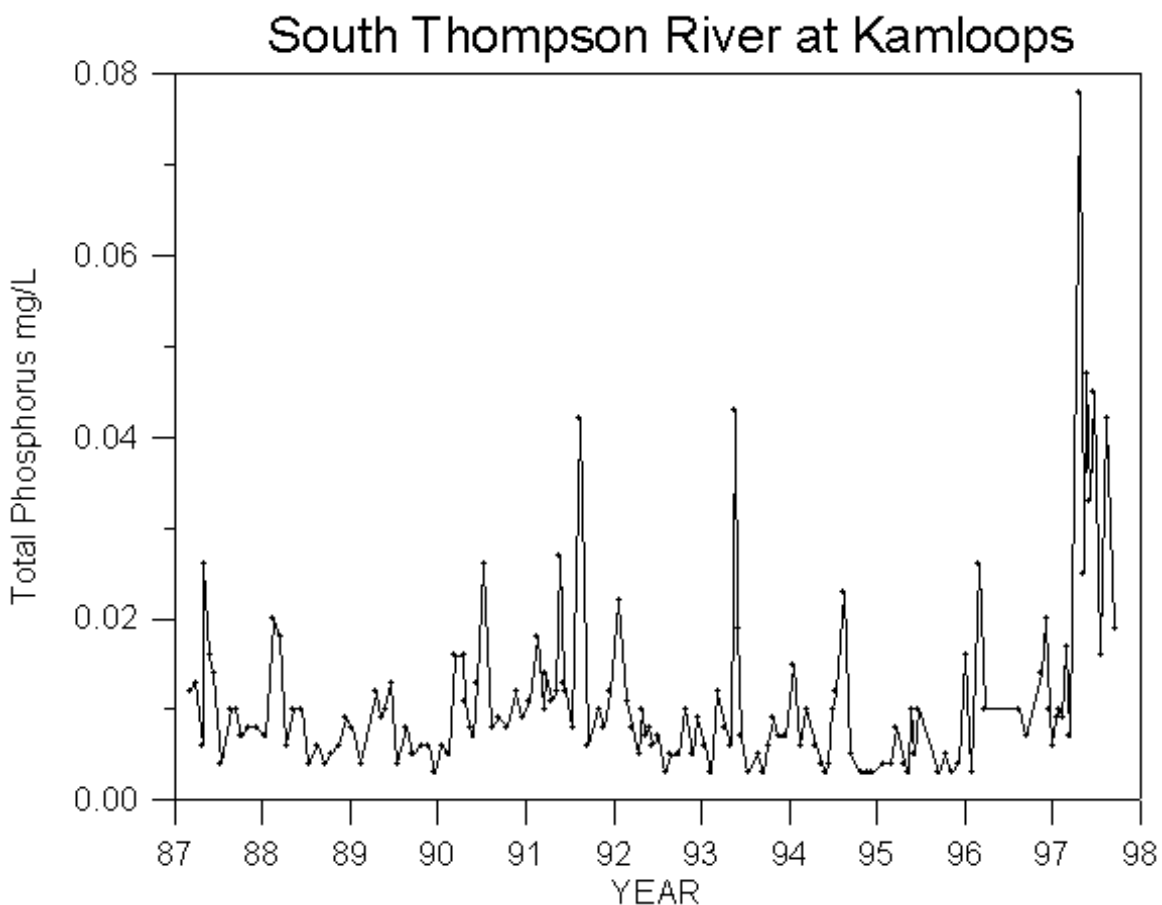
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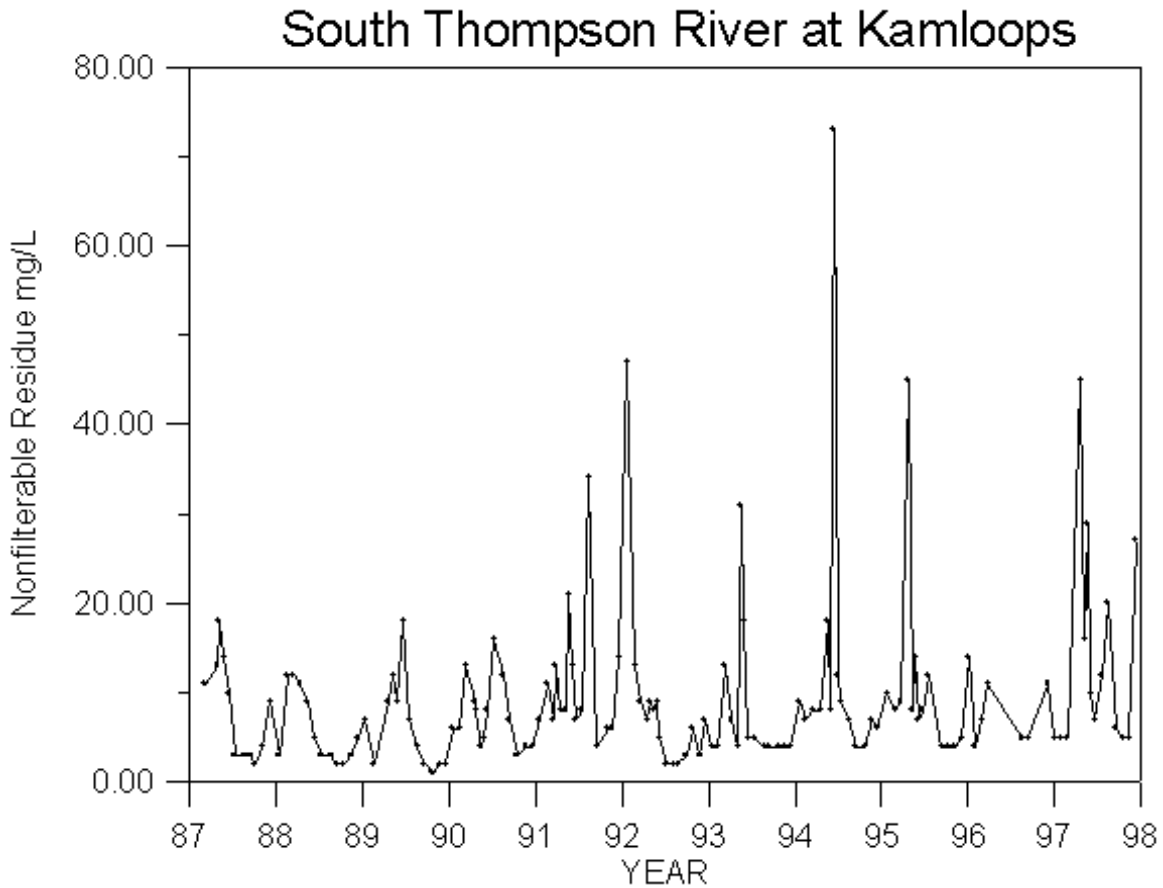
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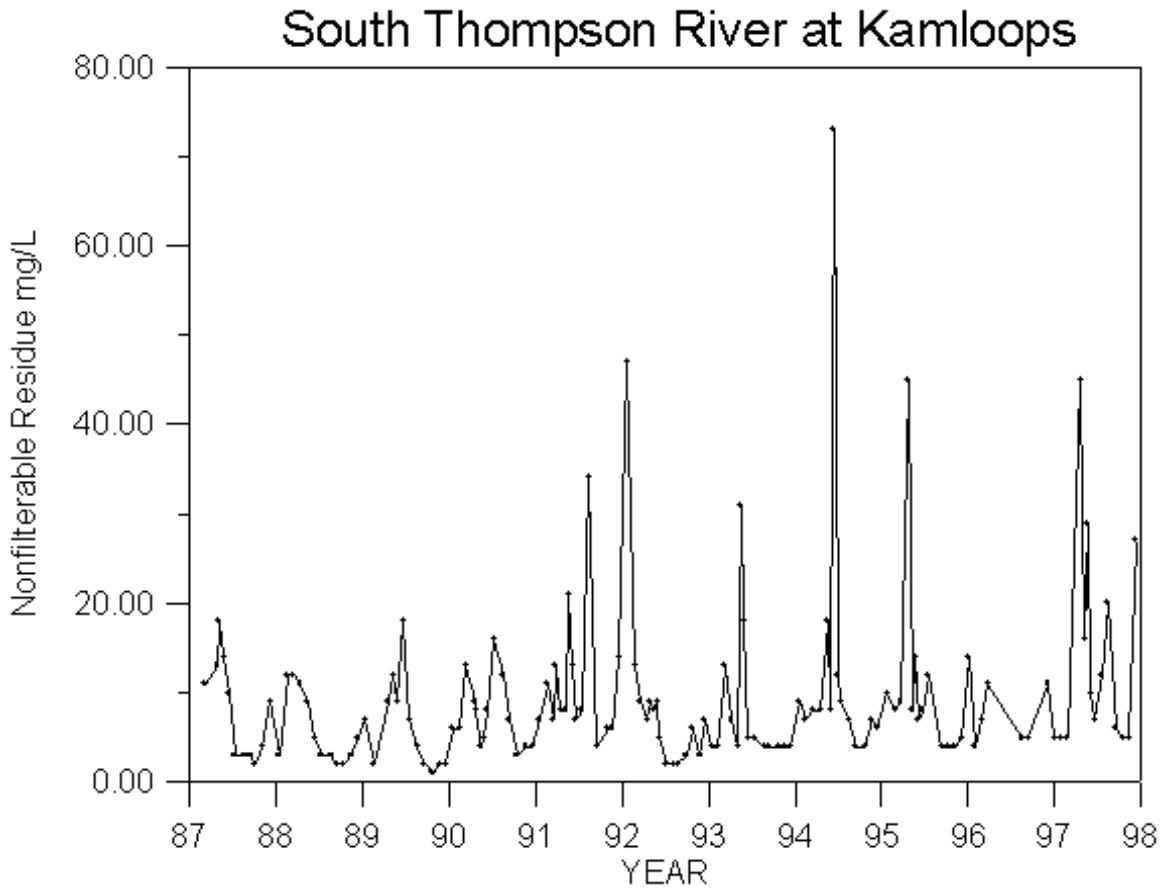
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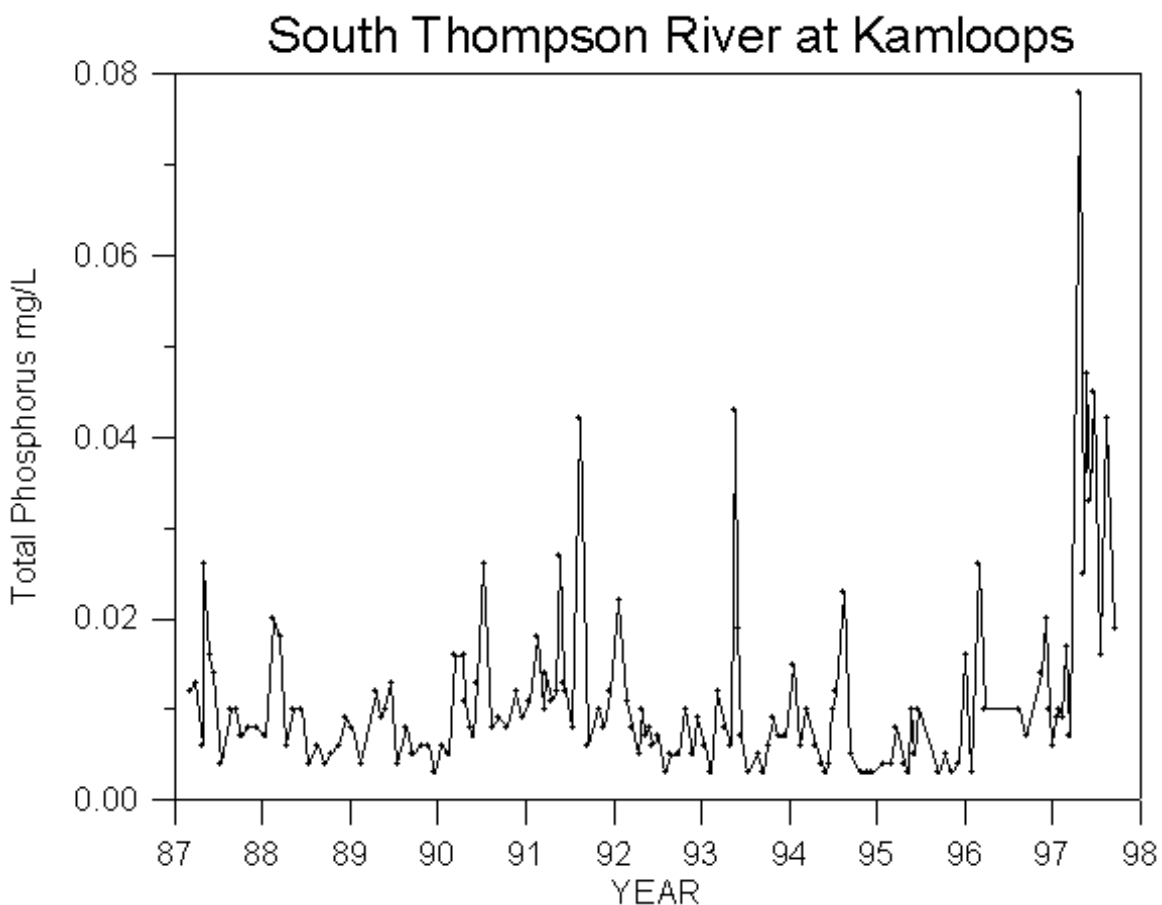
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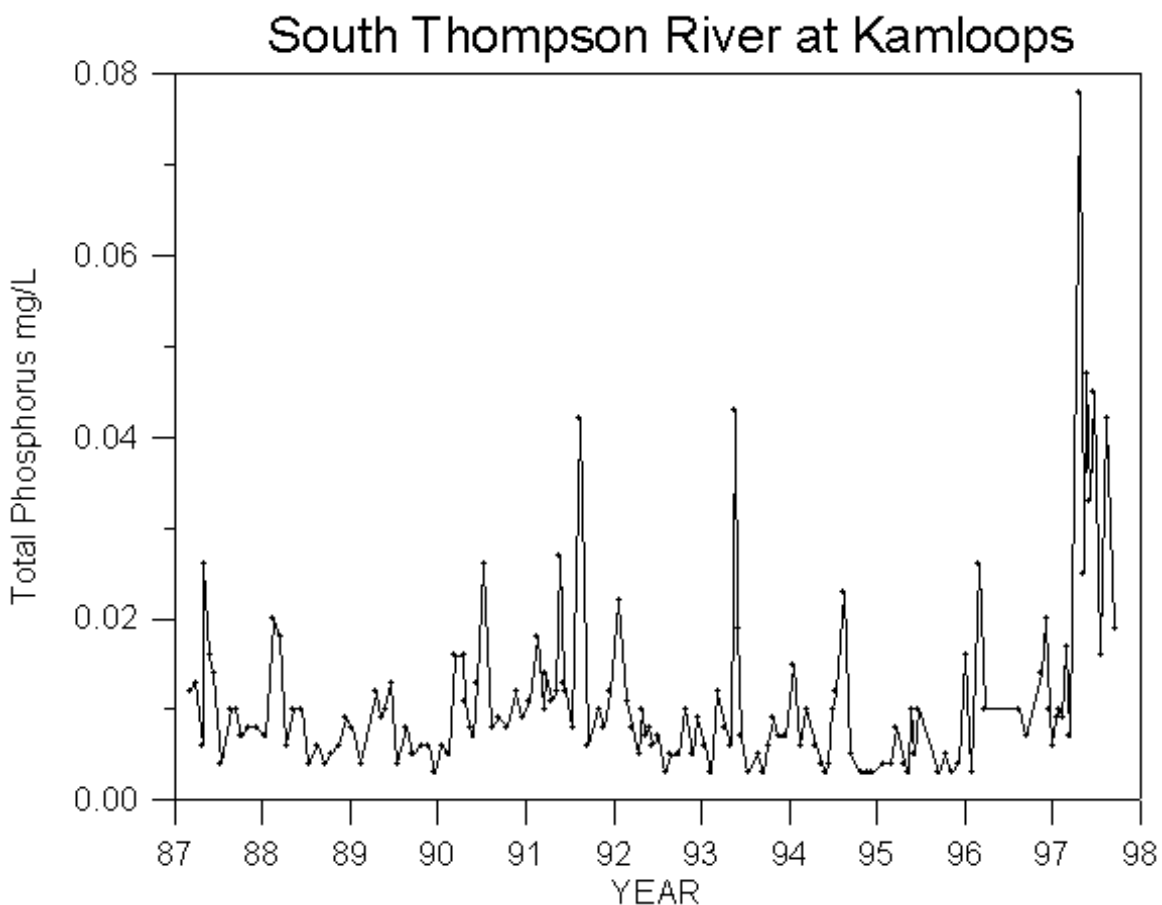
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