**CoSWAT-WQ v1.0: a high-resolution community global SWATplus water quality model**

Albert Nkwasa1,2, Celray James Chawanda2,3, Maria Theresa Nakkazi1, Ann van Griensven2,4

1 Water Security Research Group, Biodiversity and Natural Resources Program, International Institute for Applied Systems Analysis (IIASA), Schlossplatz 1, A-2361, Laxenburg, Austria

2 Department of Water and Climate, Vrije Universiteit Brussel (VUB), 1050 Brussel, Belgium

3 Texas A&M AgriLife Research, Blackland Research & Extension Center, Temple, TX 76502, USA

4 Water Science & Engineering Department, IHE Delft Institute for Water Education, 2611 AX Delft, The Netherlands

\*Corresponding author: Albert Nkwasa ([nkwasa@iiasa.ac.at](mailto:nkwasa@iiasa.ac.at))

**S1: Time series for observed and simulated river concentrations for TN**

Note that the station IDs correspond to the IDs used in the Global Environment Monitoring System for Freshwater (GEMS/Water) database (GEMStat), a prominent repository of in-situ freshwater quality measurements. The station IDs and the corresponding station name and country of location are in Supplementary Material B.

A graph with a line and dots

Description automatically generated

A graph with blue lines and pink dots

Description automatically generated

A graph with numbers and dots

Description automatically generated

A graph with blue and red lines

Description automatically generated

A graph with blue and red lines

Description automatically generated

A graph with a line and dots

Description automatically generated with medium confidence

A graph with blue lines and red dots

Description automatically generated

A graph with blue lines and red dots

Description automatically generated

A graph with red dots

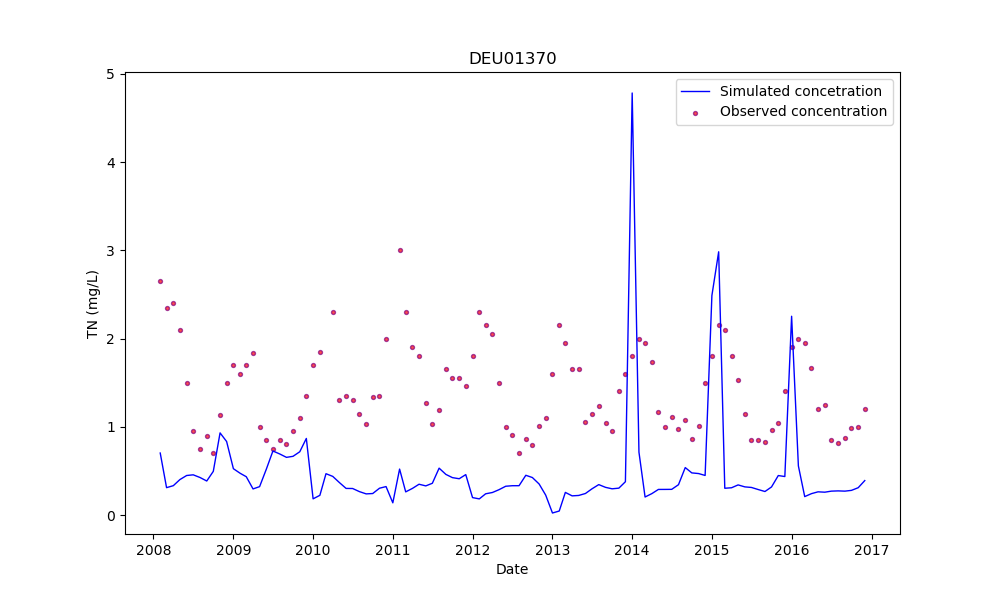
Description automatically generated

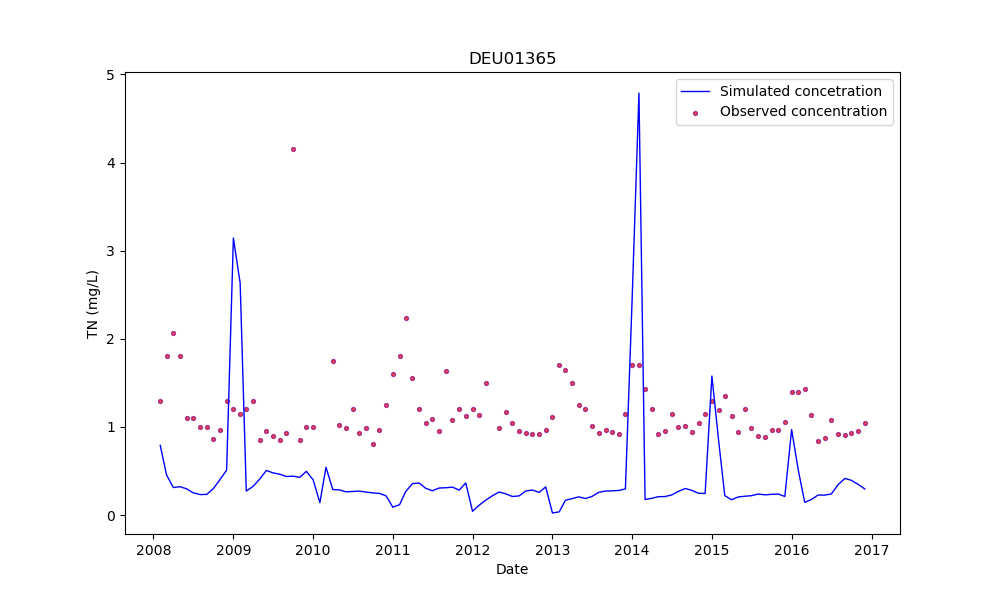
A graph with purple and blue lines

Description automatically generated

A graph with red dots

Description automatically generated



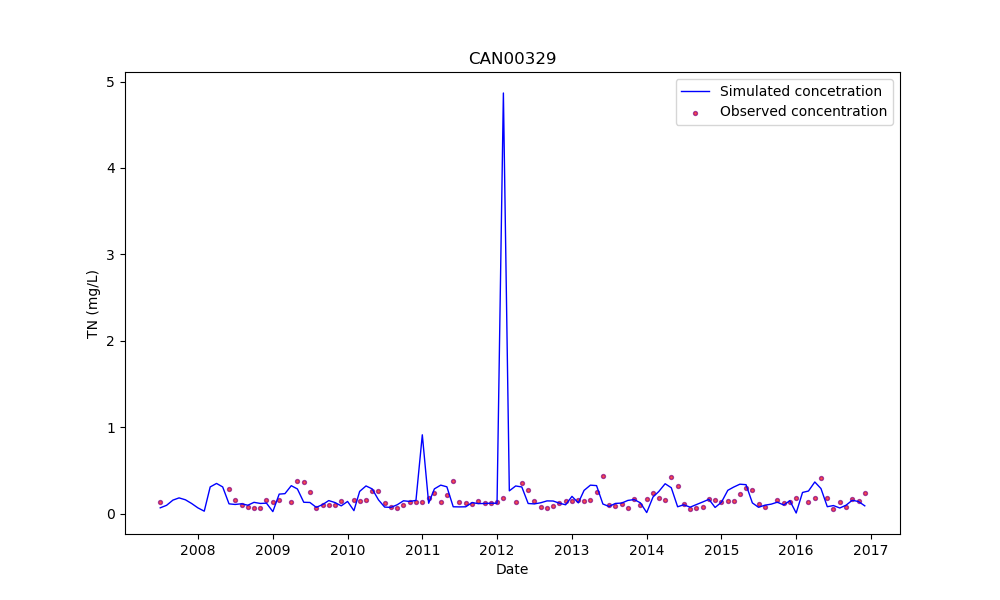


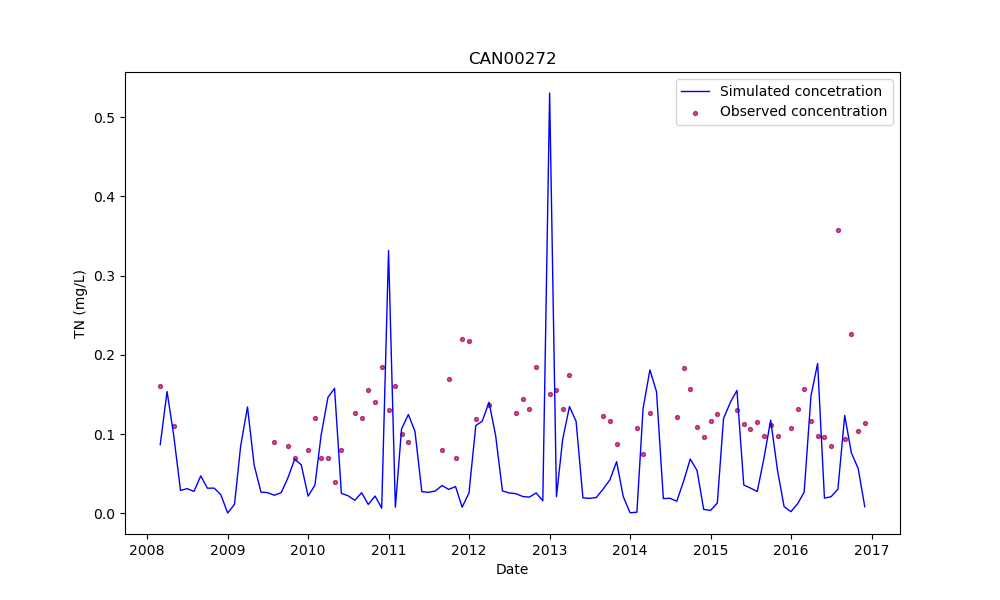
A graph with blue lines and red dots

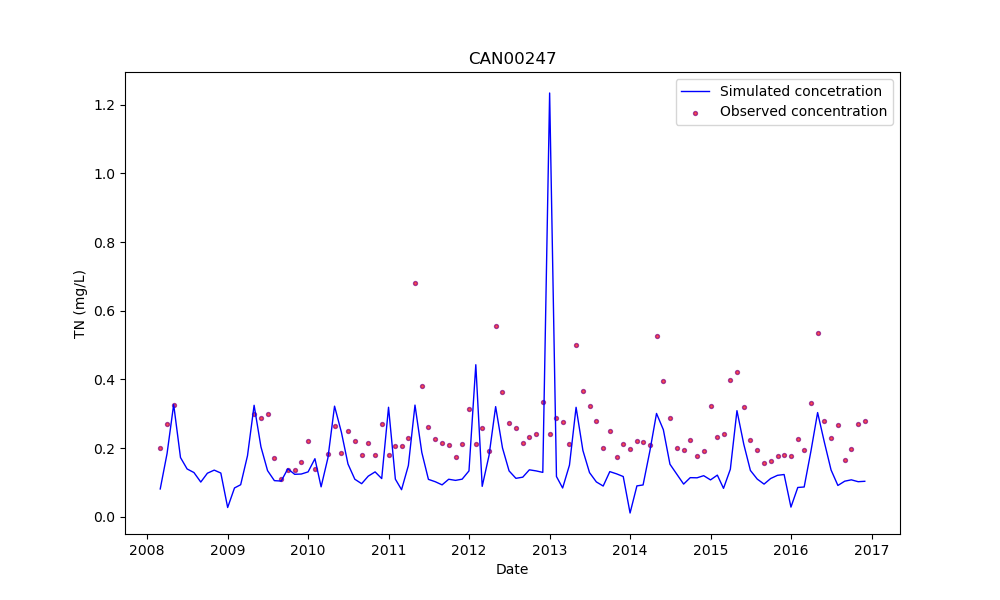
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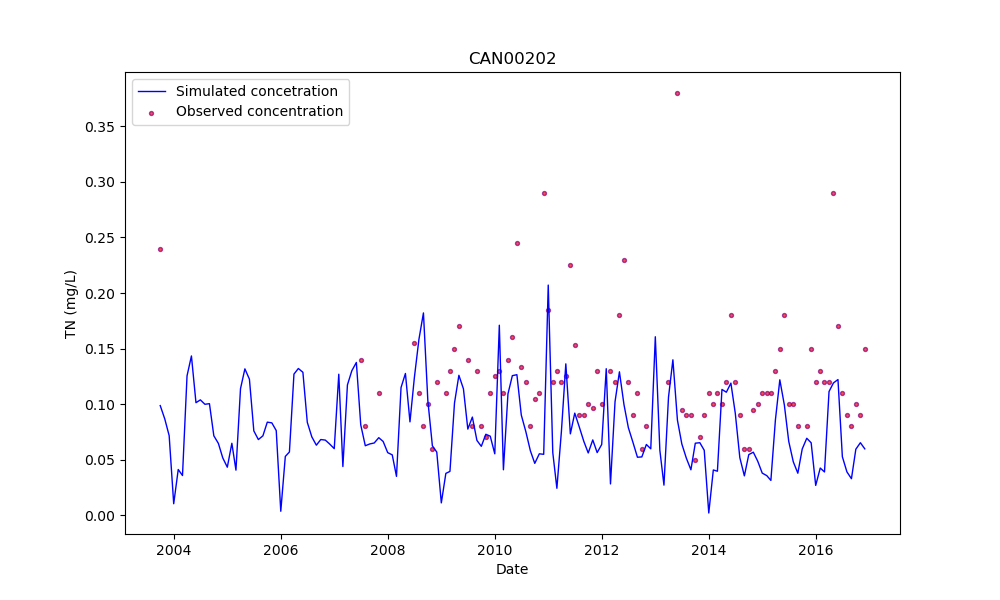
A graph with red dots

Description automatically generated









A graph with blue lines and red dots

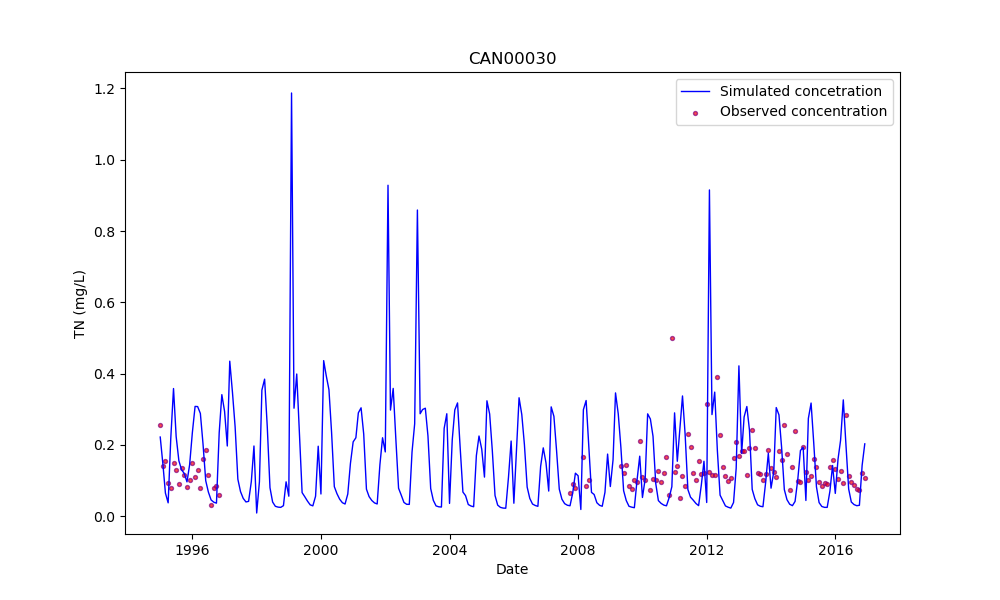
Description automatically generated

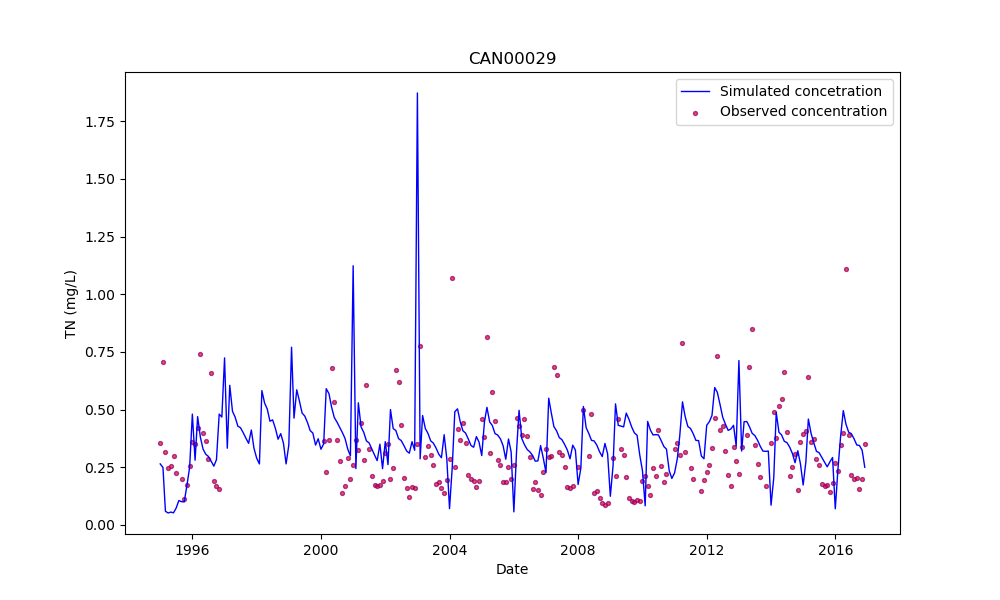
A graph with blue lines and red dots

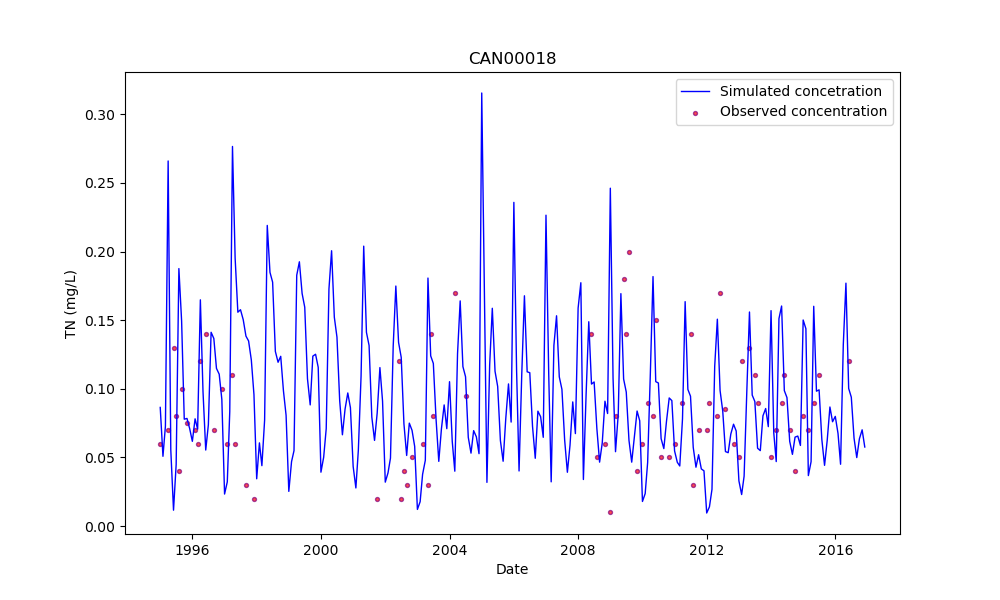
Description automatically generated

A graph with numbers and lines

Description automatically generated







**S2: Time series for observed and simulated river concentrations for TP**

A graph with a line

Description automatically generated

A graph with a line and dots

Description automatically generated with medium confidence

A graph with blue lines and pink dots

Description automatically generated

A graph with numbers and lines

Description automatically generated

A graph with blue lines and red dots

Description automatically generated

A graph of a graph

Description automatically generated

A graph showing a number of data

Description automatically generated

A graph showing a number of data

Description automatically generated

A graph with blue lines and red dots

Description automatically generated

A graph with blue lines

Description automatically generated

A graph with blue lines

Description automatically generated

A graph with numbers and a line

Description automatically generated

A graph showing a graph

Description automatically generated

A graph with blue and red lines

Description automatically generated

A graph showing a number of different levels of concentration

Description automatically generated with medium confidence

A graph showing a graph

Description automatically generated with medium confidence

A graph with blue lines and red dots

Description automatically generated

A graph showing a number of data

Description automatically generated with medium confidence

A graph with numbers and a line

Description automatically generated with medium confidence

A graph of a graph

Description automatically generated

A graph of a graph

Description automatically generated

A graph with numbers and dots

Description automatically generated

A graph with blue lines and red dots

Description automatically generated

A graph with blue and red dots

Description automatically generated

A graph of a graph with red dots

Description automatically generated with medium confidence

A graph with blue lines and red dots

Description automatically generated

A graph with numbers and a line

Description automatically generated

A graph with numbers and dots

Description automatically generated

A graph with blue and purple lines

Description automatically generated

A graph with blue lines and red dots

Description automatically generated

A graph showing a number of data

Description automatically generated

A graph with numbers and dots

Description automatically generated

A graph with purple and blue lines

Description automatically generated

A graph with a line and a line

Description automatically generated with medium confidence

A graph with blue lines and red dots

Description automatically generated

A graph with numbers and a line

Description automatically generated

A graph with blue lines and red dots

Description automatically generated

A graph with numbers and a line

Description automatically generated with medium confidence

A graph with numbers and a line

Description automatically generated

A graph with a line and dots

Description automatically generated with medium confidence

A graph with numbers and a line

Description automatically generated

A graph with a line and numbers

Description automatically generated with medium confidence

**S3: Irregularities in observational data**

A graph with a line

Description automatically generated