

Monitoring of the physico-chemical composition of the Seine River based on the MeSeine network.

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Introduction

In Europe, the management of freshwater ecosystem is governed by the Water Framework Directive (2000/60/CE) and its transposing legislation in France (2006-1772 of December 2006). The good ecological status of water are evaluated using a combination of several indicators such as biological and physico-chemical parameters. The Seine River crosses several important urbanized areas of France, including the Parisian conurbation (9 millions inhabitants). To ensure the good ecological status of the Seine River, the Greater Paris Conurbation Sanitation Authority (SIAAP), has constructed and operated the MeSeine network since 1990. MeSeine constitutes a tool for evaluating the quality of the Seine river and its tributaries (Marne, Oise) in terms of physico-chemistry, bacteriology, micro-contamination and faunal diversity.

The MeSeine network extends along 125 km of the Seine River (from Choisy to Méricourt) and over 13 km along the Marne River (from Champigny to Alfortville). It is structured around three pillars:

- Real time monitoring of the physico-chemical composition of the Seine river using in situ sensor, in particular dissolved oxygen and temperature sensors
- Sampling and laboratory analysis campaigns to monitor watercourses quality and comply with the quality standards as defined by the Water Framework Directive (good ecological and chemical parameters)
- Biota monitoring to appreciate the diversity of fish populations, macro-invertebrates and diatoms.

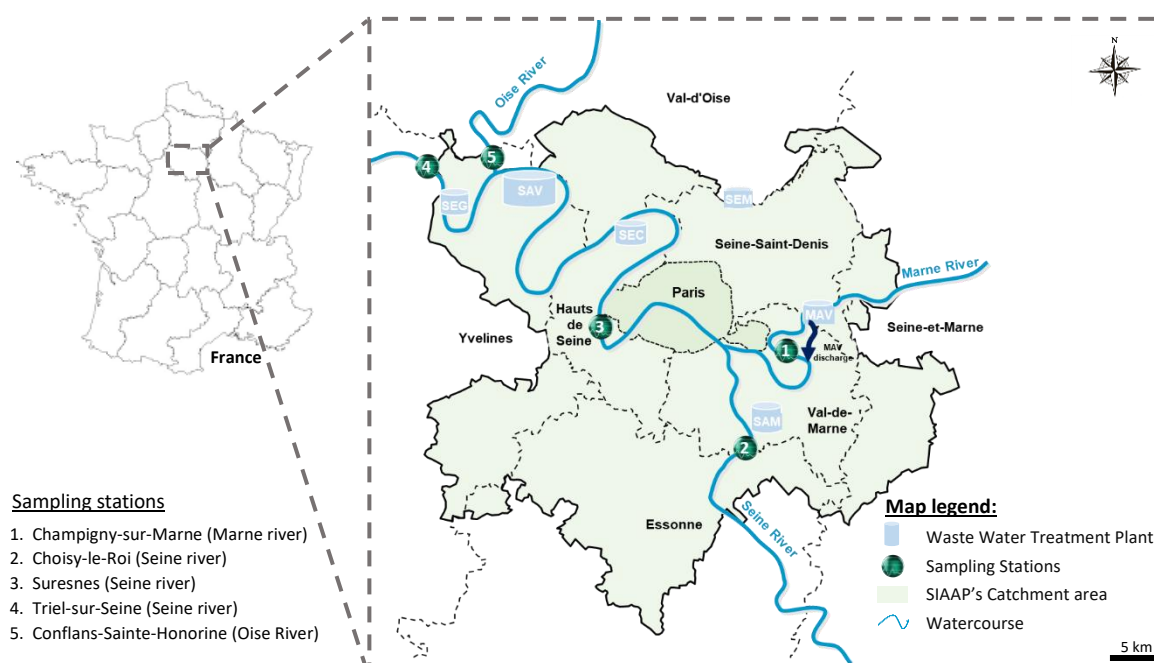
The aim of this work is to provide data on the physico-chemical quality of the Seine generated by the MeSeine observatory via the open platform Zenodo. Another work including high frequency data will be published via the same open platform using the following keywords: MeSeine network, Seine river, in-situ monitoring, sensors (*DOI: 10.5281/zenodo.7229783*).

Network description

The MeSeine monitoring network, coordinated by the Innovation Department of SIAAP since 1990, measures physico-chemical parameters at **5 key** stations in Seine, Marne and Oise. Sampling sites (Table 1) have been distributed, over **110 km** from upstream to downstream of Paris conurbation, to provide a representativeness of aquatic habitats in urban areas. Sampling stations have been selected in order to monitor the quality of several water bodies with a logical focus on those into which SIAAP's treatment plants discharge. The location and characteristics of the sites and the treatment plants are shown in figure 1.

Table 1. Sampling stations and water bodies monitored by the MeSeine network for physico-chemical quality

River	Water body	Sampling station	Location	Hydrographic KP	Data
Marne	HR154A	Champigny-sur-Marne	D130 bridge	986,379	3378
Seine	HR73B	Choisy-le-Roi	Choisy bridge	622,440	5436
	HR155A	Suresnes	Puteaux bridge	652,379	5296
	HR230A	Triel-sur-Seine	D2 bridge	719,073	5841
Oise	HR228A	Conflans-Sainte-Honorine	D48 bridge	999,630	5923



MAV: Marne Aval Plant, 75 000 m³/d; SAM: Seine Amont Plant, 600 000 m³/d; SEM: Seine Morée Plant; 50 000 m³/d; SEC: Seine Centre Plant; 240 000 m³/d; SAV : Seine Aval Plant 1 500 000 m³/d ; SEG : Seine Grésillons Plant, 300 000 m³/d.

Figure 1. MeSeine monitoring network for physico-chemical quality of the Seine, Marne and Oise rivers

Dataset description

The dataset “Dataset_Phys_MeSeine.xlsx” includes the weekly and bi-weekly analysis of common physico-chemical parameters (pH, conductivity, dissolved organic carbon (DOC), biological oxygen demand in 5 days (BOD₅), NH₄⁺, NO₂⁻, NO₃⁻, total phosphorus (TP), PO₄³⁻, chlorides and sulphates) and covers the period from 2010 to 2021.

Details on analytical methods are provided in the “Dataset_Analyticalmethods_Phys_MeSeine.xlsx”.

The following files are available:

- Dataset_Phys_MeSeine.xlsx
- Dataset_Analyticalmethods_Phys_MeSeine.xlsx