





NILU is an independent, nonprofit research institute established in 1969. All profits go back to the operation and development of research services that are useful to society.



NILU has 180 employees, 75 of which has a PhD. One third of our employees are born outside Norway.



More than one third of our income comes from international financing such as the EU, EEA, WHO, WMO, UNEP, UNECE and The World Bank.

Vision

Create sustainable development through internationally leading climate and environmental research

Values

Integrity
Competance
Benefit to society



A holistic approach

Atmosphere and Climate

- Air pollution at regional and global level
- Climate system and climate drivers
- Volcanic ash and radioactivity
- Ozone layer and UV

Urban Environment and Industry

- Urban air quality and planning
- Health effects of energy systems in urban environments
- Effects on cultural heritage
- Indoor air quality
- Air monitoring

Environmental Chemistry

- Dispersion and conversion of new and old environmental pollutants
- Chemical analysis
- Effects of environmental pollutants on human health

Environmental Impacts and Sustainability

- Sustainability assessment
- Circular economy
- Effects on the environment, health, economy
- Safe and sustainable by design

Monitoring and Instrumentation Technology

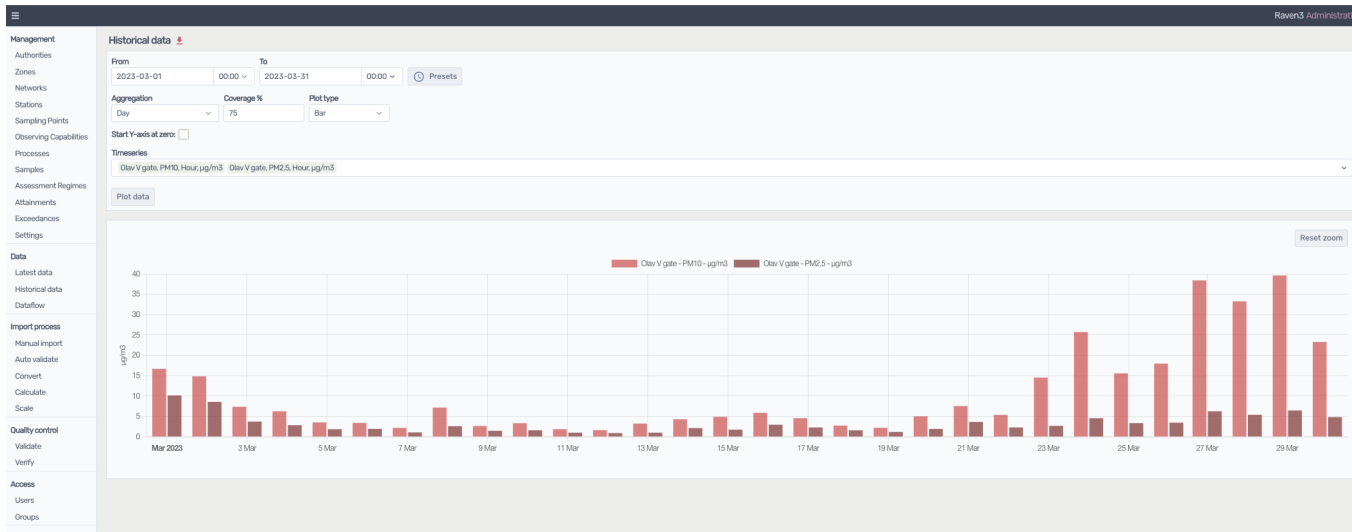
- Operation of field measurements
- Sampling equipment and instrumentation in the field
- Calibration and maintenance of instruments

Digital Technologies

- Database modelling
- Web, app and client/server tech
- Visualization
- Data parsing and geoprocessing
- Machine Learning
- Electronic design, embedded development

RAVEN

an Open Source Air Quality Data Validation and e-Reporting System



European Environment Agency



What is RAVEN

RAVEN is an Open Source Web based Air Quality Data Validation and e-Reporting System, comprising multiple modules that are designed to give you total control over your monitoring data, including a complete metadata inventory.

Further it enabling you to report your data to EEAs Air Quality e-Reporting mechanism in correct data format and structure; fully compliant with the “User Guide to XML & Data Model v3.4” and fulfil the AQ eReporting quality checks.

RAVEN is financially supported by the European Environmental Agency (EEA).

RAVEN is coordinated and developed by Norwegian Institute for Air Research (NILU) with support from 4sFera Innova.



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RAVEN Features

- Data import with csv files via GUI or API
- View and compare data module
- GUI for editing the following meta data:
 - Responsible authorities
 - Zones
 - Networks
 - Stations
 - Sampling Point
 - Process
 - Samples
 - Observation Capabilities
 - Assessment Regimes
 - Attainments
 - Exceedance Description
- Scaling, including unit conversion and calculate data (needed for NO-NO2-NOX)
- Validation module
- Verification module
- XML-generation via download or API for the following dataflows:
 - information on zones and agglomerations (data flow B)
 - information assessment methods (data flow D)
 - information assessment regimes (data flow C)
 - information on attainment of environmental compliance (data flow G)
 - primary validated data (data flow E1a)
 - primary Up-To-Date data (data flow E2a) NB! Only available through API
- Users/groups read/write access on network level



Technical frameworks

RAVEN is developed using the following main technologies/frameworks:

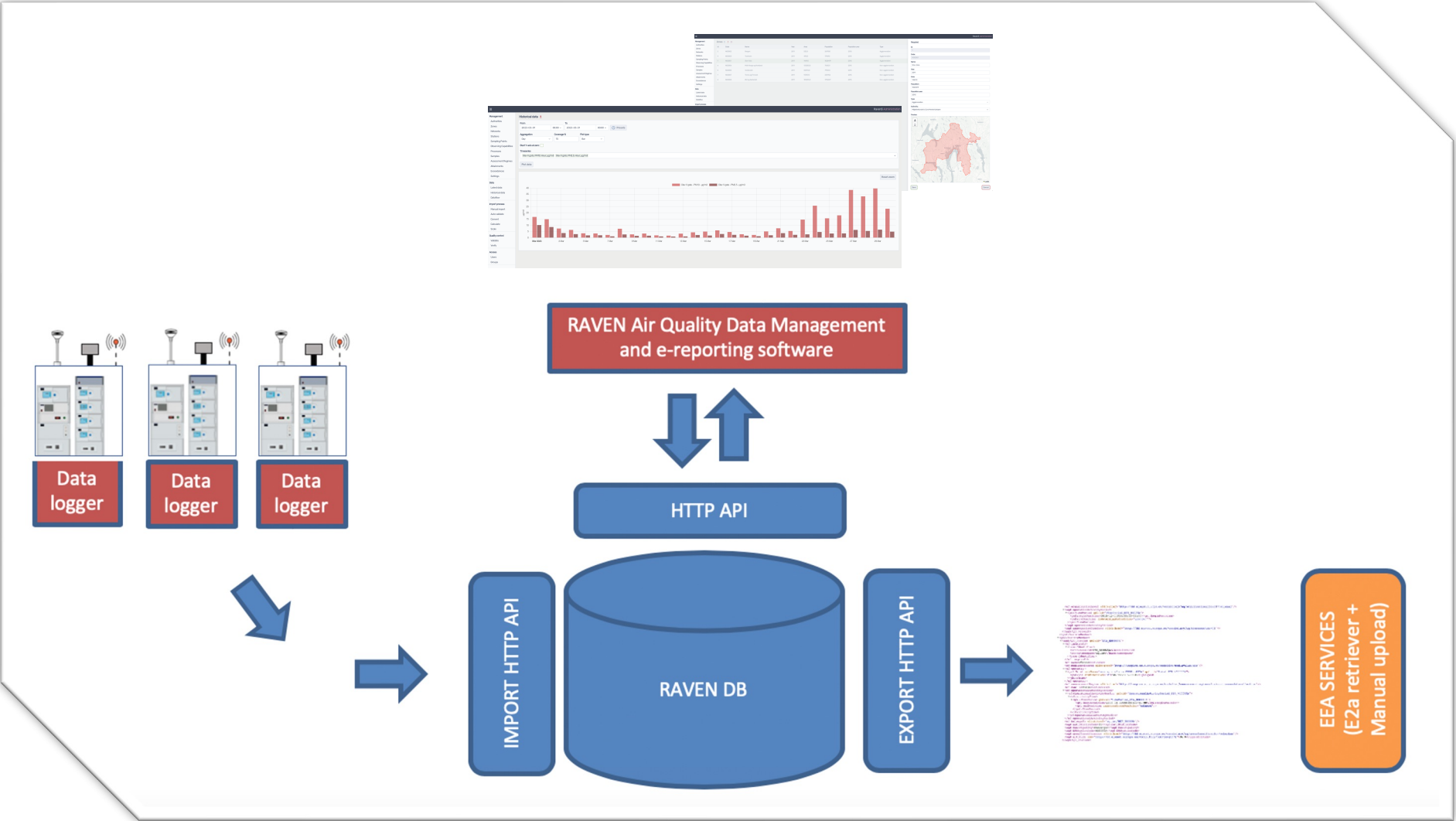
- Database framework: PostgreSQL (<https://www.postgresql.org>) with PostGIS extension for processing and storage of spatial information)
- Backend framework: Python 3 (<https://www.python.org/>)
- Frontend progressive framework: Vue.js (<https://vuejs.org/>)
 - RAVEN is a cross-platform independent, and is tested on Windows, Linux and Mac OS.
 - Available as Docker
 - RAVEN source code and documentation can be found in the Git repository: <https://git.nilu.no/raven/raven-administration>
 - RAVEN demonstration version, populated with Norwegian measurement data can be found at: <https://raven.nilu.no/>



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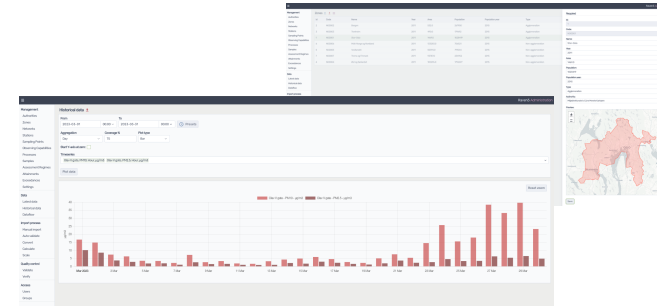


RAVEN data flow



RAVEN 2 vs 3

- **New and improved Graphical User interface**
- **New features:**
 - Latest data
 - Zones (import using GeoPackage file)
 - Auto validation
- **Improved database table structure**
- **Optimalisation of import of observation data**
- **Improved installation – supporting Docker**
- **Upgrade of Javascript Framework from Vue 2 to Vue 3:**
 - Improved performance
 - Improved scalability



Demonstration

- **Live demonstration with focus on:**
 - Upload of historical data
 - Data visualisation
 - Download of data
 - Aggregation
 - Validation and verification of data
- **Demonstrate how to create new module**

