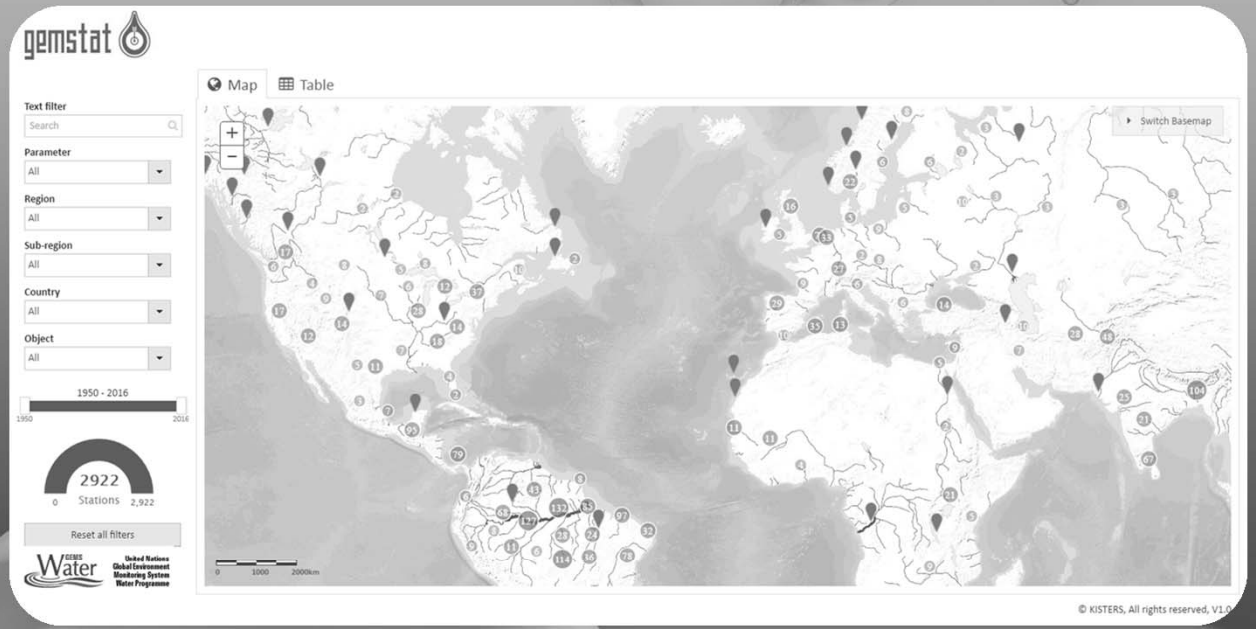
KISTERS

Solutions for Water Industries

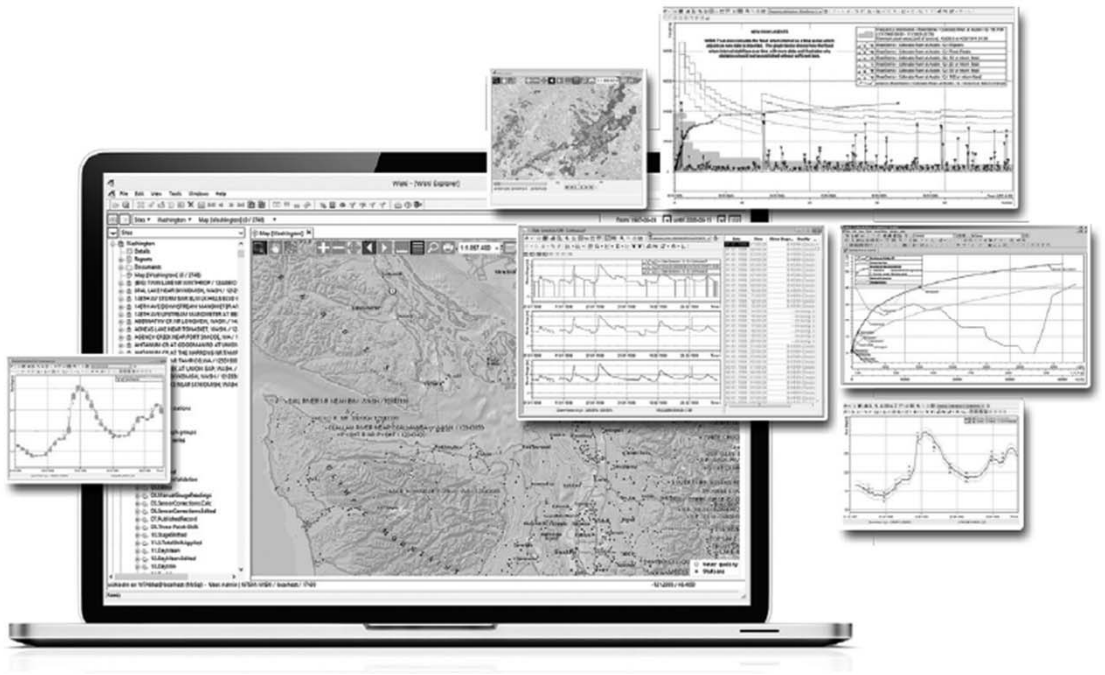


GEMStat -
The New Global Water-Quality Web-Portal

KISTERS

Contents

- KISTERS Introduction
- What is GEMStat?
- GEMStat project
- GEMStat portal solution (phase 1)
- Phase 2 requirements
- Outlook



Introduction

KISTERS

A few words about KISTERS

- Software Developers specializing in Time Series and Environmental Data Management
- Headquartered in Aachen Germany, with NA offices in Sacramento, Colorado, Ohio, & Toronto
- 30+ years of commercial off the shelf implementations in over 50 countries

Alberta Environment and Parks

Ontario
Ministry of Natural Resources

BC Hydro
Power smart

Ontario
Ministry of the Environment and Climate Change

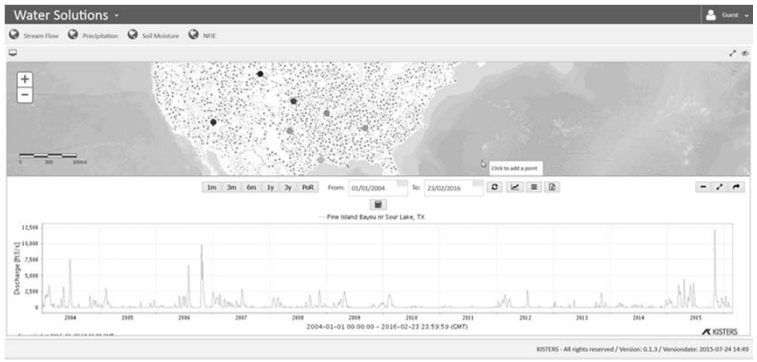
OCWA
ONTARIO CLEAN WATER AGENCY
AGENCE ONTARIENNE DES EAUX

Conservation ONTARIO
Natural Champions

Manitoba Hydro

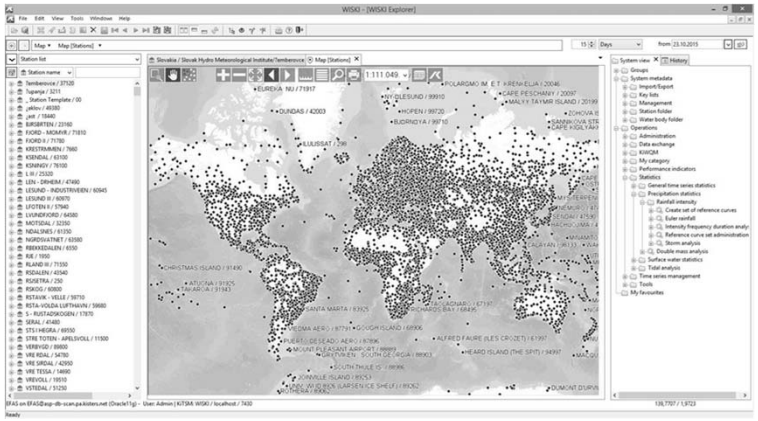
Partners and cooperations

KISTERS



esri

THE UNIVERSITY OF TEXAS AT AUSTIN



CUAHSI
universities allied for water research

IBM

Microsoft Research

MeteoGroup

JRC
EUROPEAN COMMISSION

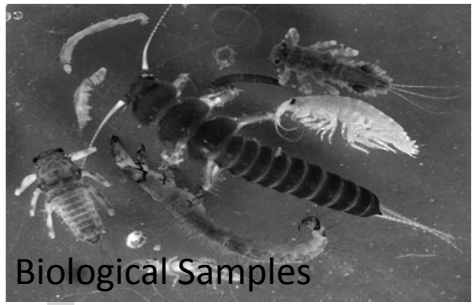
DHI

DWD

Water Solution Area

KISTERS

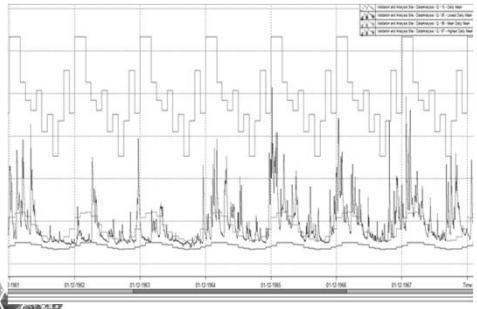
- All-in-one system

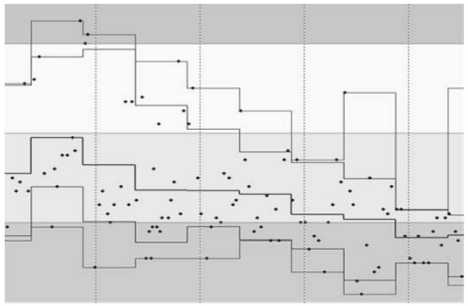


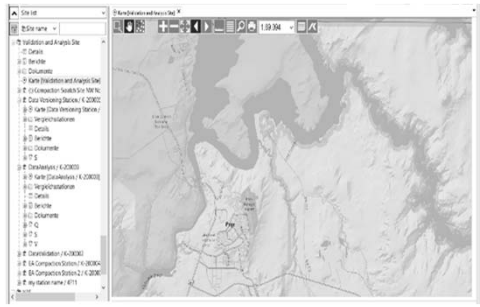
WISKI
Managing of continuously measured environmental data

KiWQM
Managing of physical-chemical sampling data

KiECO
Managing of biological observation data





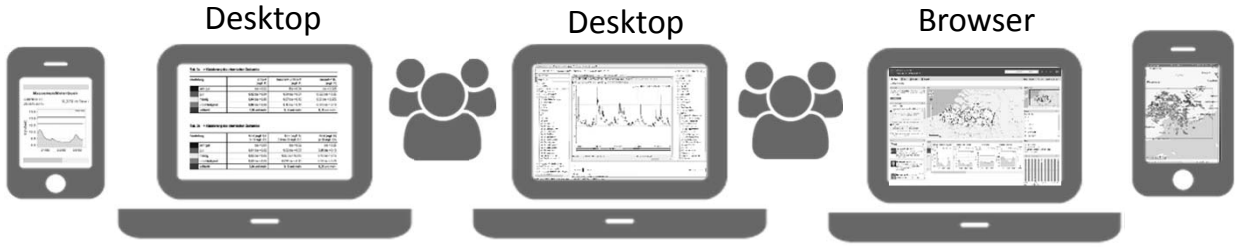


KISTERS Technology Stack

KISTERS

Water data management for experts

Specialists
Government, Authorities,
Flood centers,
Power plant operators



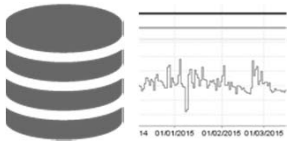
Interfaces
Open standards, Industry standards

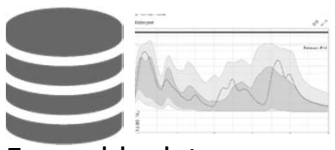
Calculations
Time series statistics
Polygons statistics
Raster to point calculations
Load calculations

Interfaces
Open standards, Industry standards

Products
Water quality reports, Year books, Extreme-value statistics, Retention periods, Base flow, Water quality maps, Alarm maps, Forecasts

Meta data


Time series data

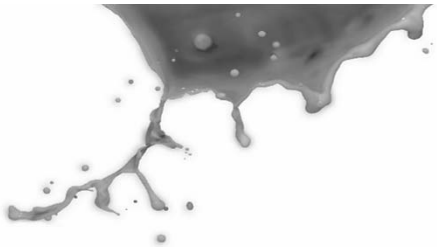

Ensemble data

Raster data/“Gridded Data”

Samplings

Observations

What is GEMStat?

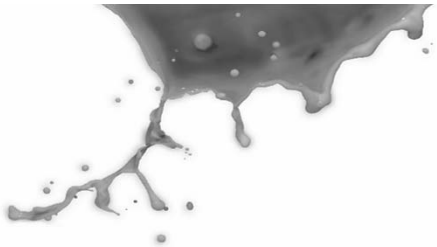


KISTERS

- United Nations Global Environment Monitoring System Water Program (GEMS/Water)
- Mission is to support global, regional, and national environmental assessment and reporting processes on the state and trends of water resources
- Providing access to quality-assured data and information on water quality in freshwater ecosystems worldwide
- These data are used in water assessments and capacity building initiatives around the world.

- GEMS/Water is committed to maintaining a database of consistent and reliable quality. This database is called GEMStat.

What is GEMStat?



KISTERS

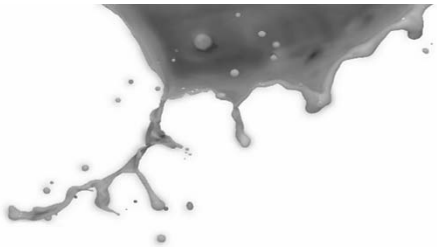
gemstat

- GEMStat is designed to share surface and ground water quality data sets collected from the GEMS/Water Global Network.

bfg
Bundesanstalt für Gewässerkunde

- The GEMStat component will be hosted by the German Federal Ministry for the Environment, Nature Conservation, Building and Nuclear Safety (BMUB) through the German Federal Institute for Hydrology (FIH).

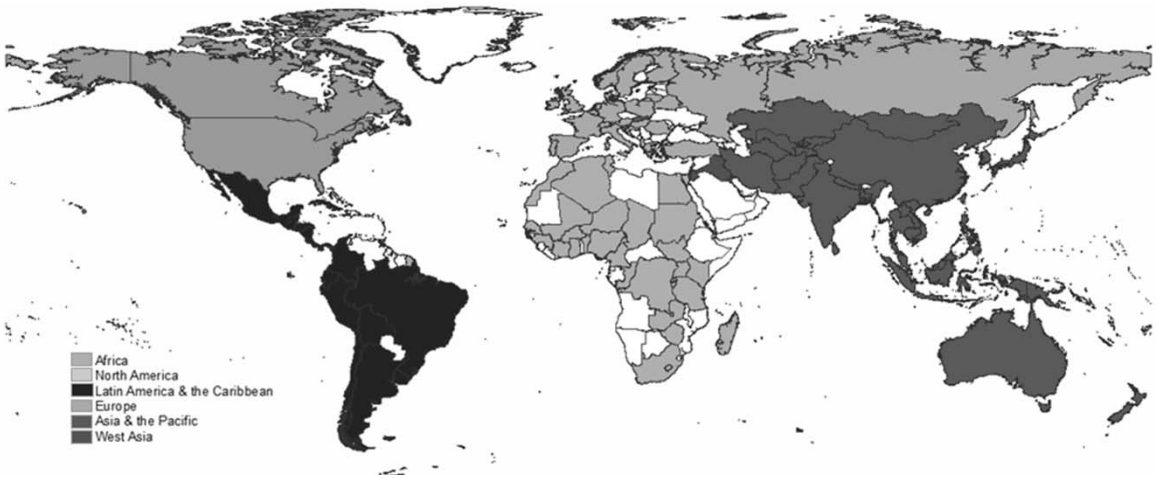
What is GEMStat?



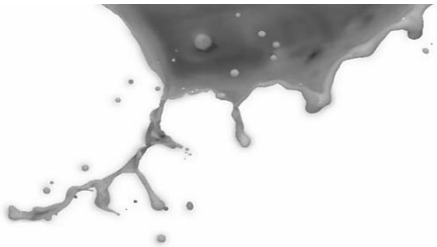
KISTERS

- More than 100 countries participate in GEMS/Water, providing data for more than 3,700 stations, over 100 determinands and close to 4.3 million data records. Data records range from 1977 to the present.

- The water quality data and associated information is submitted to GEMStat by national focal points of governmental agencies, and collaborating focal points of non-governmental agencies.



GEMStat goals



KISTERS

- Quality assurance (QA) and quality control (QC) are integral components of all aspects of GEMStat.

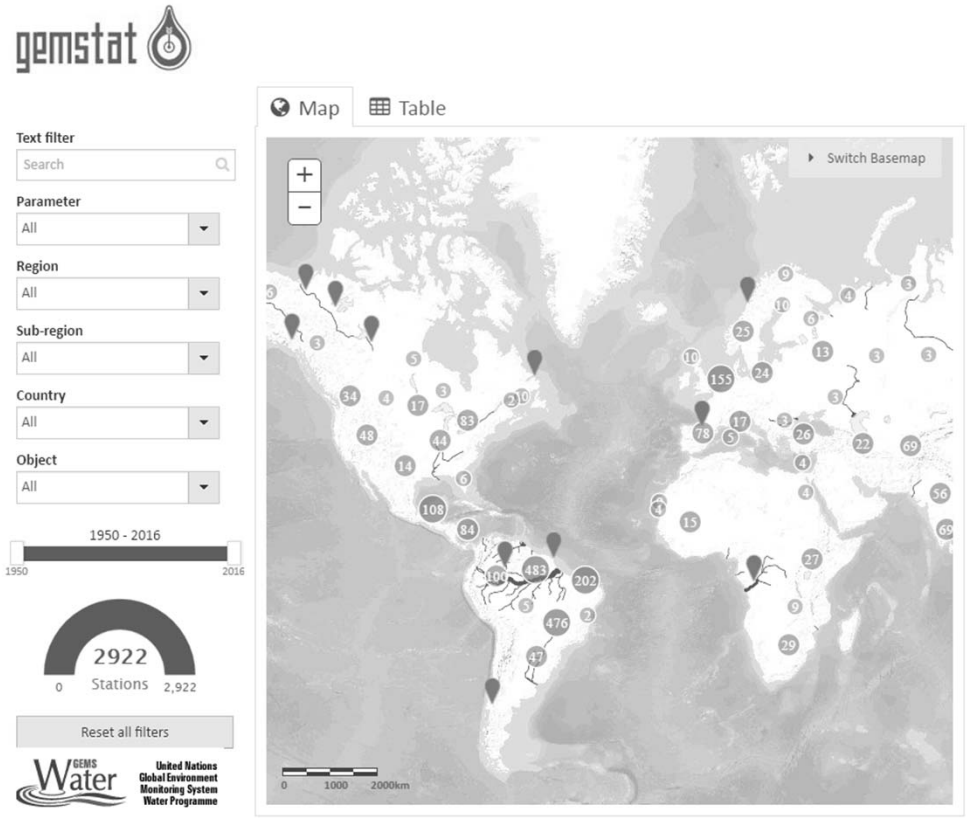
- GemStat has to ensure the validity and reliability of the data and information being provided to UN water quality assessments or other users by

    - *verifying the integrity of existing data,*
    - *verifying the quality of incoming data and*
    - *providing appropriate selection and use of the data.*

The GEMStat project

- After 35 years of successful operation of the global water quality database GEMStat in Canada, the German Federal Institute for Hydrology (FIH) took over supporting the operation of GEMStat as of April 1st, 2014.

- FIH decided to update the data storage and management component as well as the representation of the data, including the data download portal.



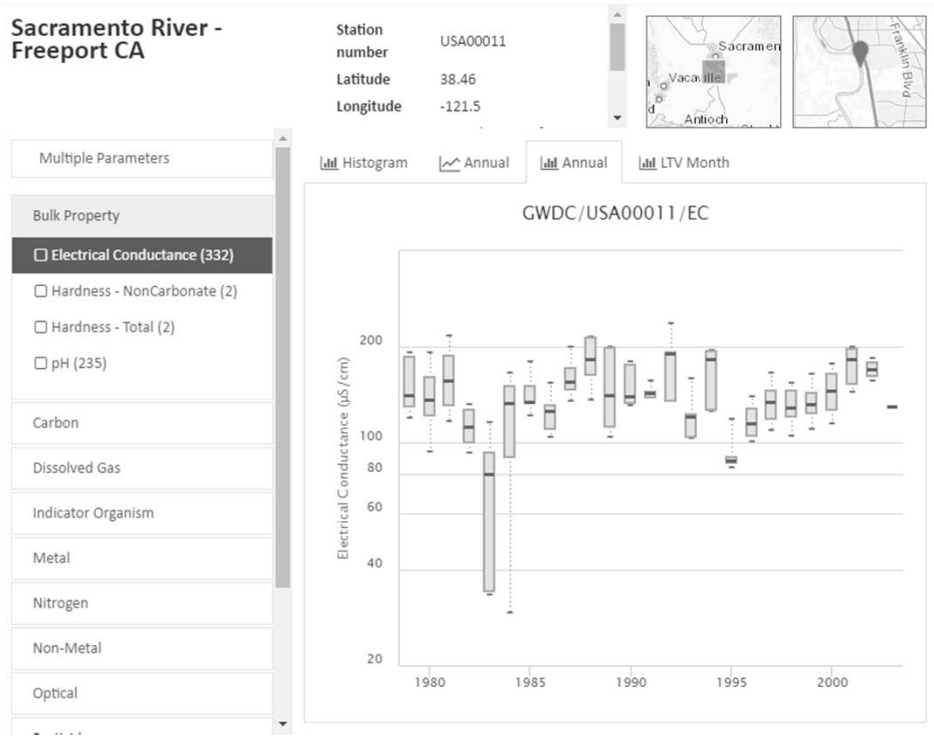
© KISTERS, All rights reserved, V1.0.2

The GEMStat project

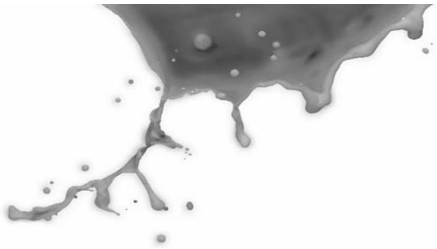
- The data storage, management and analysis system should be replaced by an Off-the-Shelf water quality software, which is designed

  - *to manage, validate and analyze discrete sampling data along with continuously measured real time sensor data,*
  - *takes advantage of flexible data structuring, calculations, scripting and graphing functionalities and*
  - *offers an advanced user administration.*

→ KISTERS 'off-the-shelf' Water Quality Solution



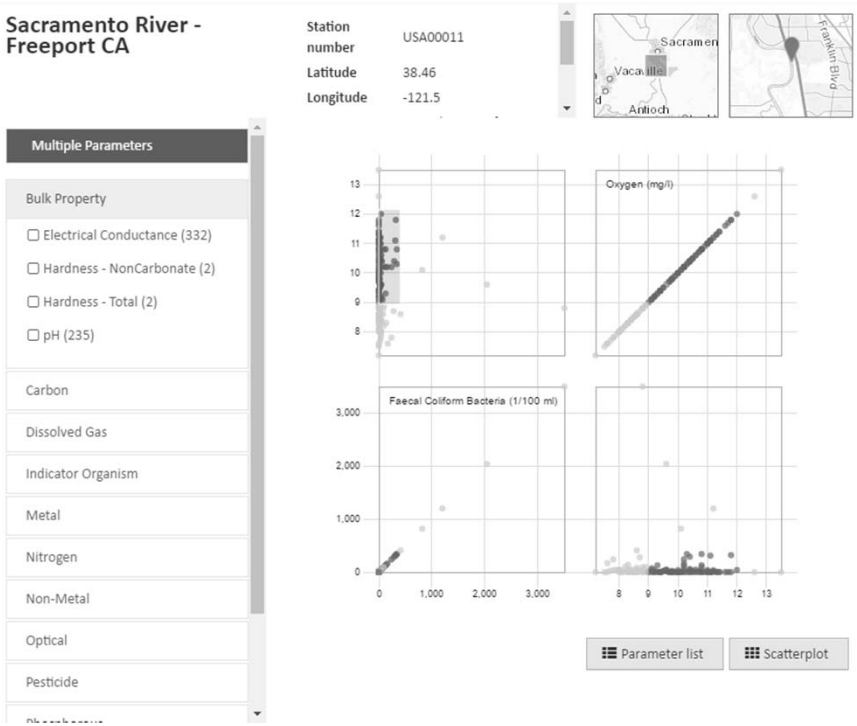
The GEMStat project



KISTERS

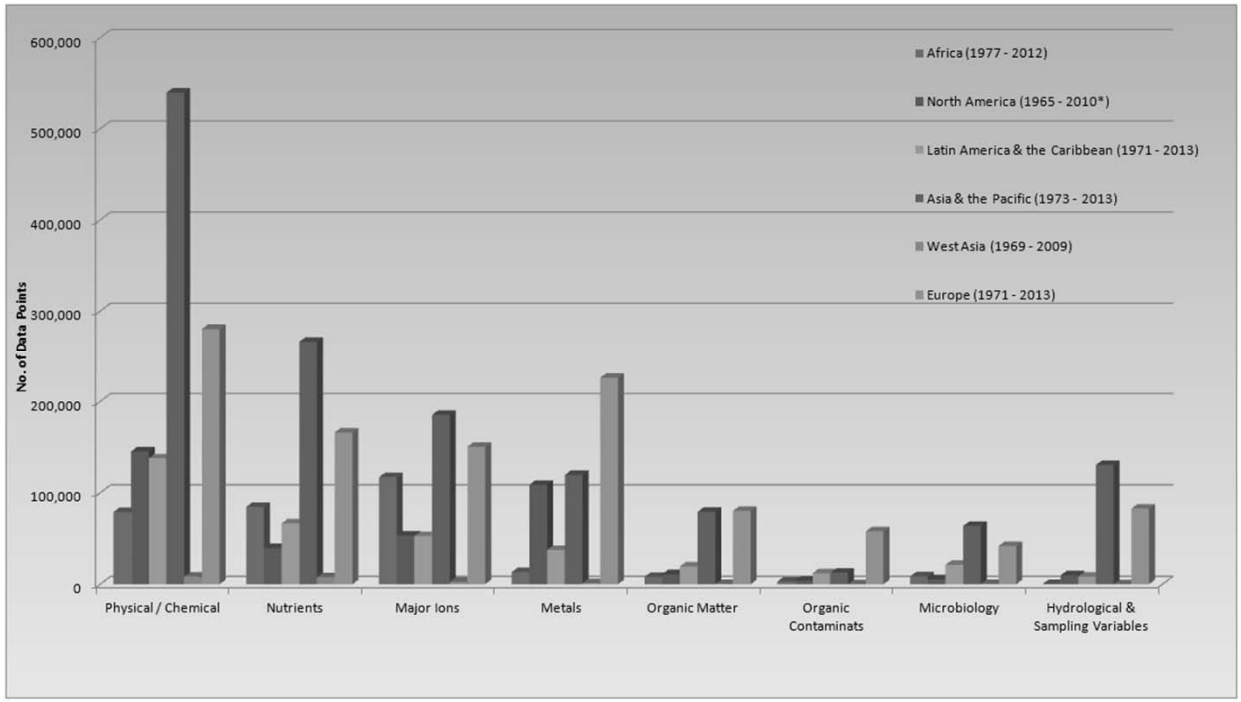
- The GEMStat portal has to
  - *provide a user-friendly, intuitive and high performant solution for serving the public with standard data products (e.g. statistics or reports) and*
  - *data suppliers and experts with advanced functionality (e.g. index calculation on station, catchment or country levels).*

→ Development of the KISTERS Water Quality Web Portal

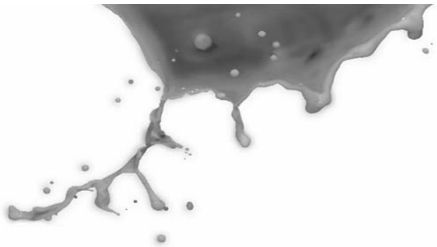


The GEMStat project

- Data from the legacy system has been migrated
- 3,700 stations world-wide
- approx. 4.3 million records representing more than 100 sampling parameters



The GEMStat project



KISTERS

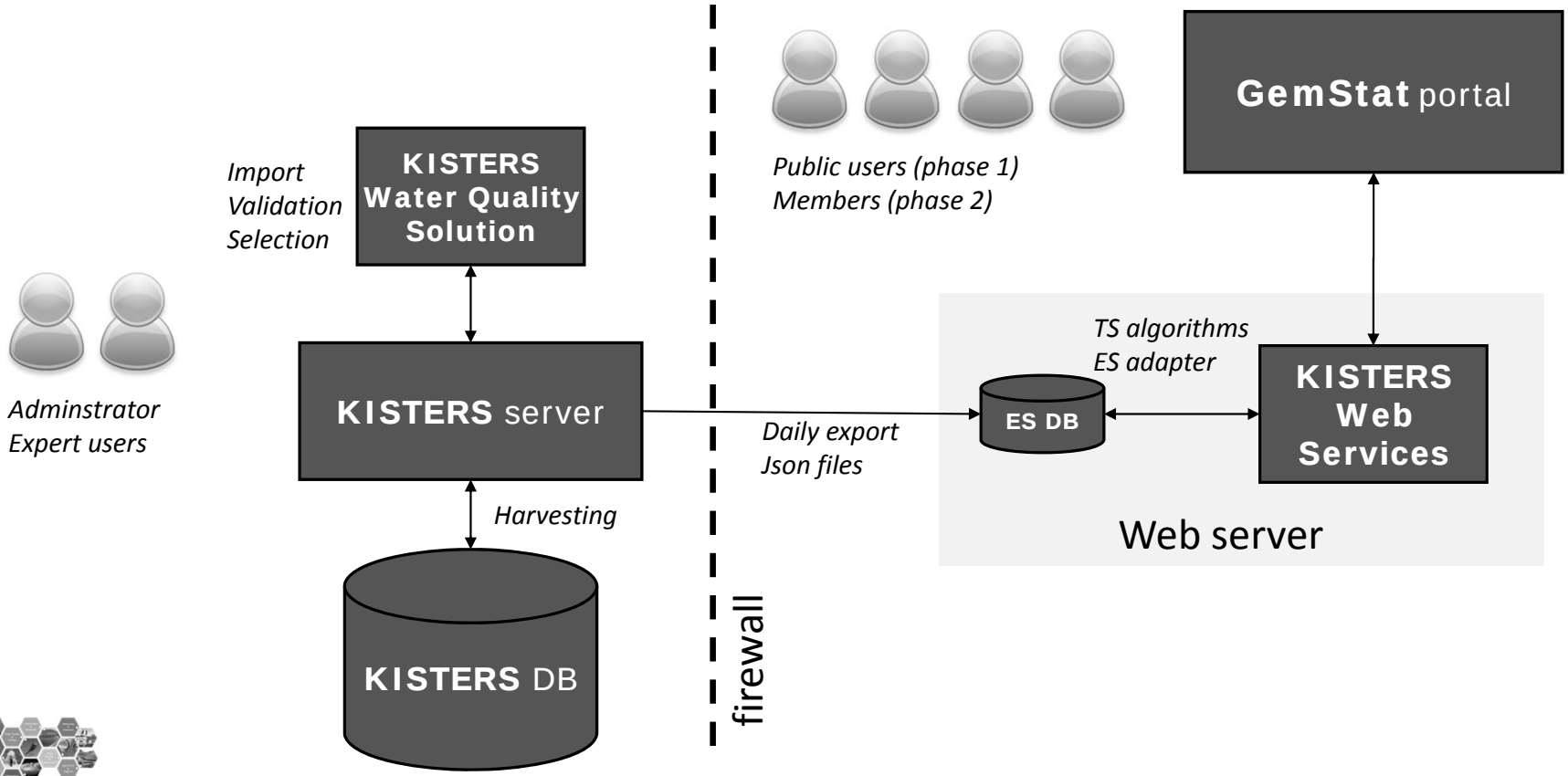
- The project for redesigning the GEMStat portal started with phase 1 in September 2015.
- Phase 1 comprised the establishment of the GEMStat database (data migration) and the development of a free accessible portal solution for the public.
- The new GEMStat portal (phase 1) was completed mid May 2016 and presented during the United Nations Environment Assembly on 23rd May 2016 in Nairobi.

UNEA
United Nations Environment Assembly of the United Nations Environment Programme

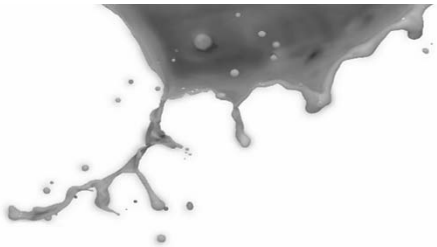
- GEMStat portal (phase 1) public was launched in late 2016, and is accessible via www.portal.gemstat.org

The new GEMStat portal solution

- System structure



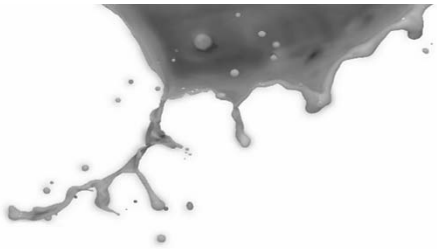
The GEMStat phase 2 requirements



KISTERS

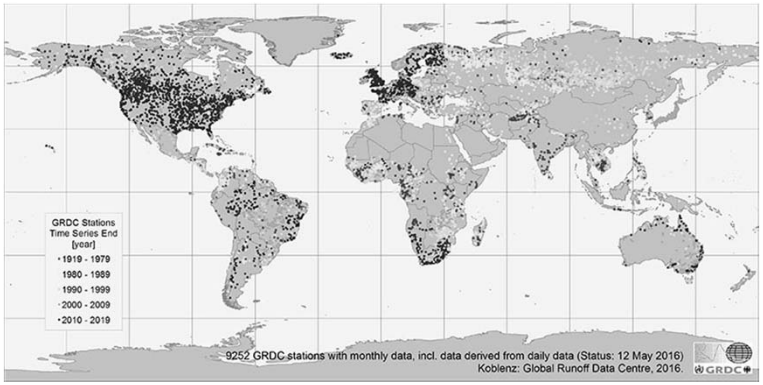
- Introduction of member area which allows access to raw data
- More sophisticated data analytics (Water Quality Index, loads…)
- Further export format options
- Data exchange via web services by applying open and OGC conform standards (Water ML2, WQX..)
- Support of UN languages (Arabic, Chinese, English, French, Russian and Spanish)

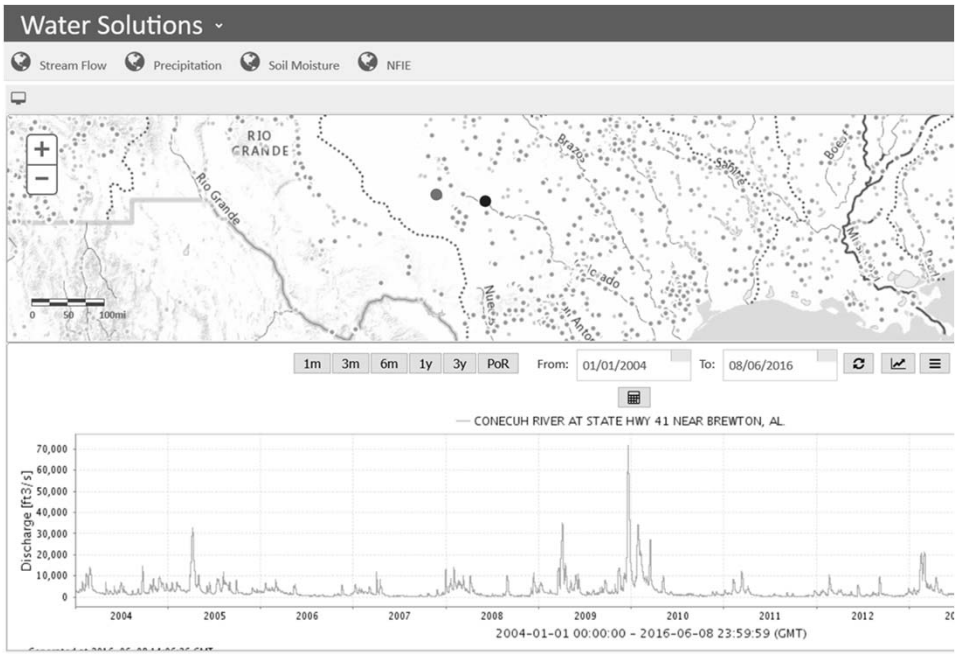
Outlook



KISTERS

- Technical integration of GEMStat and Global Data Runoff Center (GRDC)
- GRDC is a public repository for the world's river discharge data and associated metadata
- 160 countries contribute nearly 10.000 stations and 400.000 discharge years on daily or monthly level
- Currently Live and Available





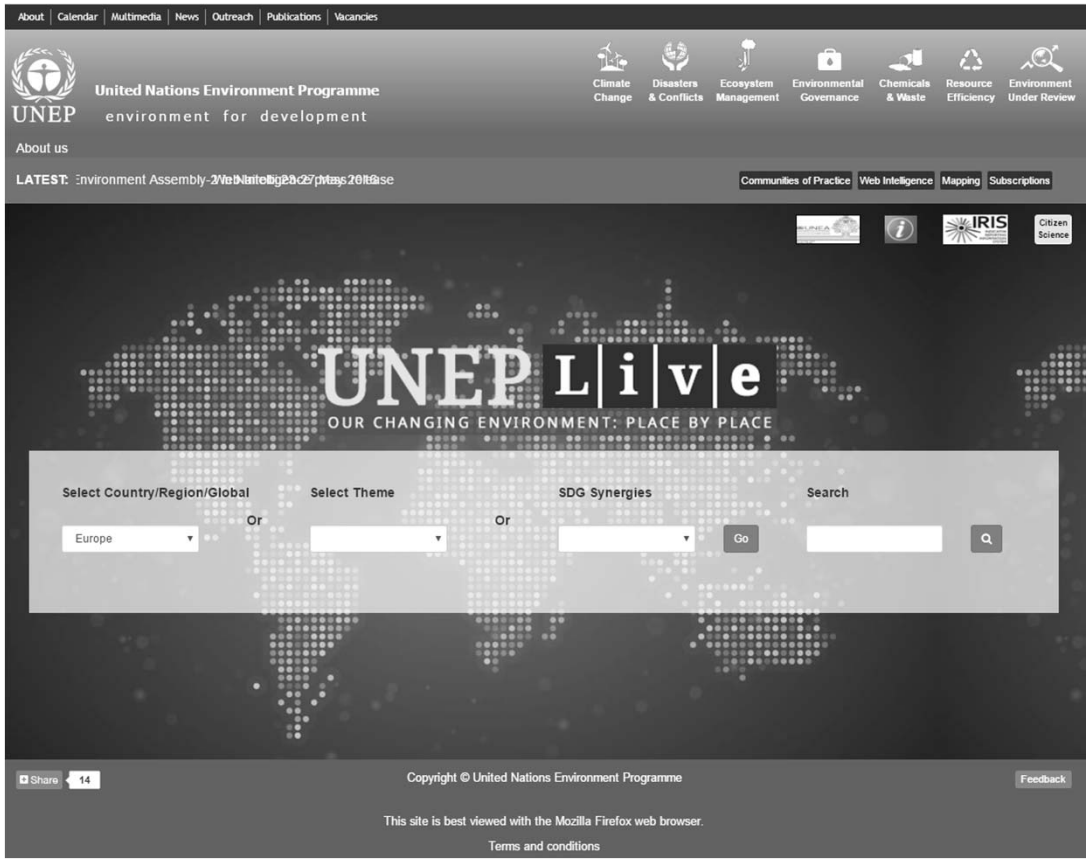
GRDC

bfg Bundesanstalt für Gewässerkunde

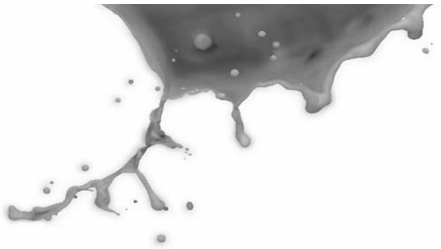
WORLD METEOROLOGICAL ORGANIZATION

Outlook

- Integration in global environmental data systems:
  - Global Earth Observation System of Systems (GEOSS)
  - UNEP Live
  - …



Questions?



KISTERS

KISTERS NA

7777 Greenback Lane, Suite 209
Citrus Heights, CA 95610

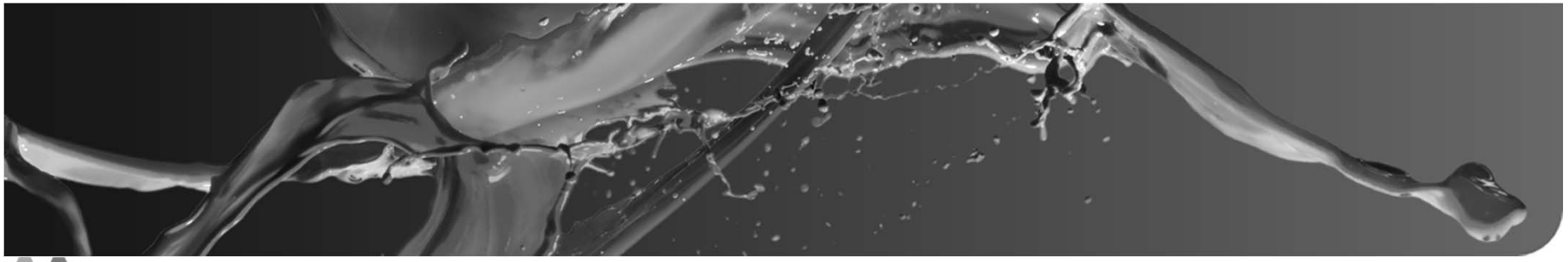
Phone 916-723-1441
kna@kisters.net

www.kisters.net

Presentation date: 2016/07/13

Author: Dr. Frank Schlaeger

Speaker: Steve Elgie



Thank you very much for your attention

gemstat
Global Water Quality Database
Station
Country
Catchment
Map
Table
Text filter
Search
Parameter group
All
Parameter
All
Catchment
All
Region
All
Sub-region
All
Country
All
Station type
All
01.01.1950 - 10.06.2016
1950
2016
2922
Stations
0
2,922
Reset all filters
Switch Basemap
River
Lake
Reservoir
Wetland
Groundwater
No class
© KISTERS, All rights reserved, V1.1.3