



The FREEWAT platform

Key Policy Messages

- ✓ The FREEWAT platform: a free and open source solution for data-driven decision making in Water Resource Management
- ✓ FREEWAT capabilities allow exploration and exploitation of several data sources, for effective analysis of water availability and quality issues
- ✓ The additional advantage of the free and open source license makes FREEWAT an effective tool to support capacity building

WHAT H2020 FREEWAT is

FREEWAT is an HORIZON 2020 project financed by the EU Commission, aiming at promoting water resource management through innovative ICT tools and participatory approach.

Main result of the project is the free and open-source FREEWAT software: a QGIS integrated environment, where several simulation codes, based on the hydrological cycle, hydrochemical or economic-social processes, are integrated in a unique GIS project for conjunctive use of surface- & ground-water.

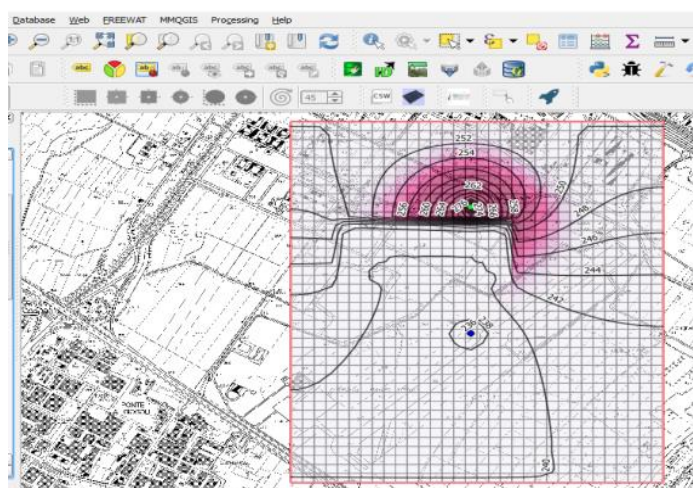
This Policy Brief is part of series of seven whose goal is to illustrate the FREEWAT approach and achievements.



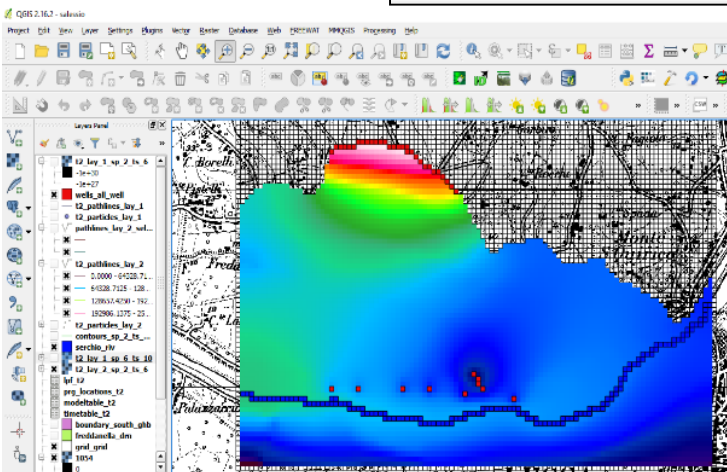
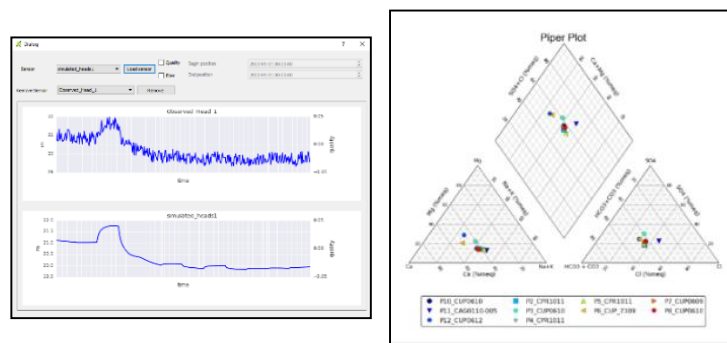
FREEWAT: an effective ICT tool for data-driven decision making

When a Water Resource Management (WRM) analysis is carried out, the usage of GIS tools is a must, because of the inherent spatial nature of all the input data needed. Being a plugin of the well-known QGIS platform, FREEWAT inherits several tools for processing raw data, with the possibility to import a lot of different formats, also from remote servers and services.

Furthermore, for the post-processing activity, QGIS allows to produce maps and presentations with limitless options, guaranteeing visualization of model results. The latter is a crucial point whenever models are used as effective tools to boost data-driven decision making: results of modelling can be “translated” in suggestions and decision guidelines only if they are readable and understandable also by non-technical people.



Examples of FREEWAT capabilities concerning visualization of model results.



FREEWAT capabilities

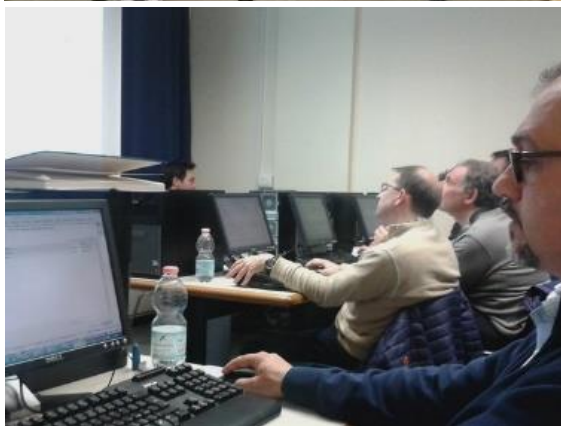
Version 1.0 of FREEWAT allows exploration and exploitation of several data sources, to get effective analysis of water availability and quality processes. By using FREEWAT, you may deal with several issues like:

- ✓ data pre-processing to harmonize, collect, store, manage, analyze, interpret and pre-process the hydrological and hydrogeological data;
- ✓ importing data from sensors, to perform various operations with data, display and compare sensors data;
- ✓ running coupled surface-/ground-water flow numerical models dealing with several water stresses, and get water budgets;
- ✓ defining well capture zones;
- ✓ solving problems of groundwater contamination, to evaluate several scenarios, in landfill/waste disposal, remediation of contaminated sites, salinization of coastal aquifers cases;
- ✓ comparing simulated and observed data, evaluating the effects on the model of selected parameters (sensitivity analysis) and estimating the best values of selected parameters (parameters estimation);
- ✓ analyzing conjunctive use of surface-/ground-water in urban & rural areas, to solve water conflicts and optimize water supply.



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*FREEWAT training: some examples.
From the top: Pisa (Italy), Golden (Colorado, USA),
Florence (Italy).*

FREEWAT: model portability

Another FREEWAT's strength is the model portability: a model made in FREEWAT can be easily ported from one PC to another, just sharing the QGIS project and the archive file including the model database. Using this functionality, model assumptions, settings and results can be shared among different stakeholders involved in the modeling analysis.

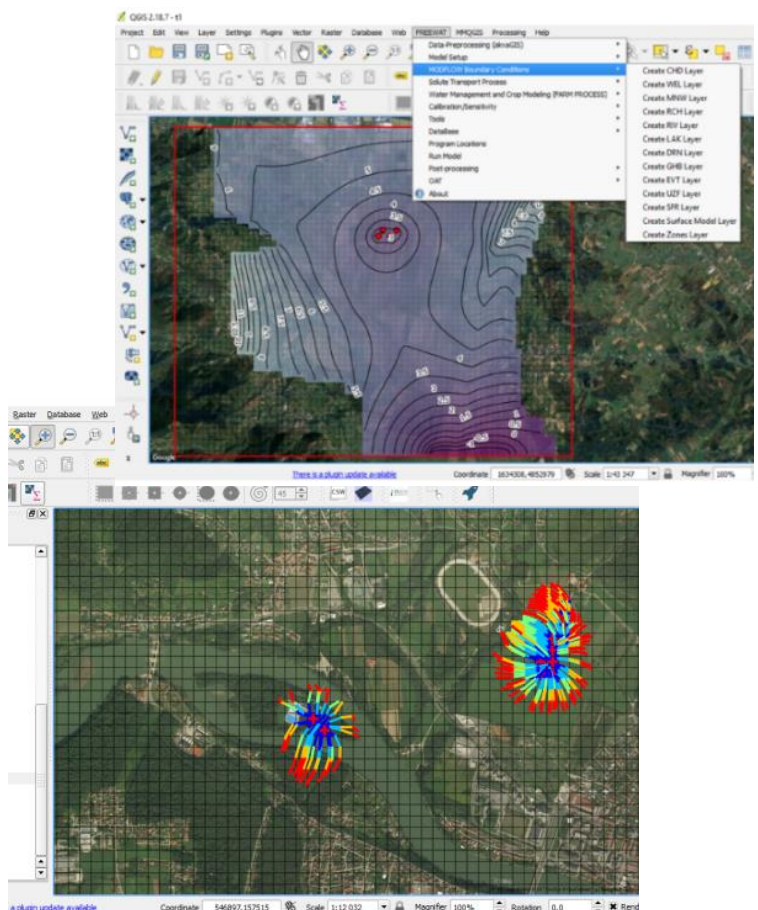
This is an important aspect to ensure an effective usage of model results: cooperation in sharing the model settings is the effective approach to obtain model exploitation, which is in line with real needs of the model final users. In the meantime, it allows to check/update model assumptions and to run post-audit sessions.

FREEWAT may support capacity building

Besides the software itself, FREEWAT is distributed with an accompanying set of training materials, including:

- a User's Manual organized in 6 volumes (each one addressing a specific capability of the platform);
- a Reference Manual to help Users in understanding technical issues and to guide potential developers in browsing the code to facilitate further development;
- thirteen Tutorials covering all the principal issues addressed by FREEWAT, ranging from the basic groundwater modelling, to solution of advanced solute transport problems in contaminated sites.

The aim of this material is to support capacity building for a successful application of advanced ICT tools, such modelling tools, and to drive towards a knowledge-based decision making process. The huge number of people trained during the FREEWAT project proved that the coupling of free license, open distribution of the code and a multi-disciplinary team is a winning approach to boost the concept of shared visions in WRM.





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How to get FREEWAT

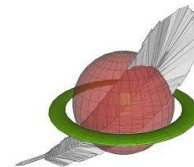
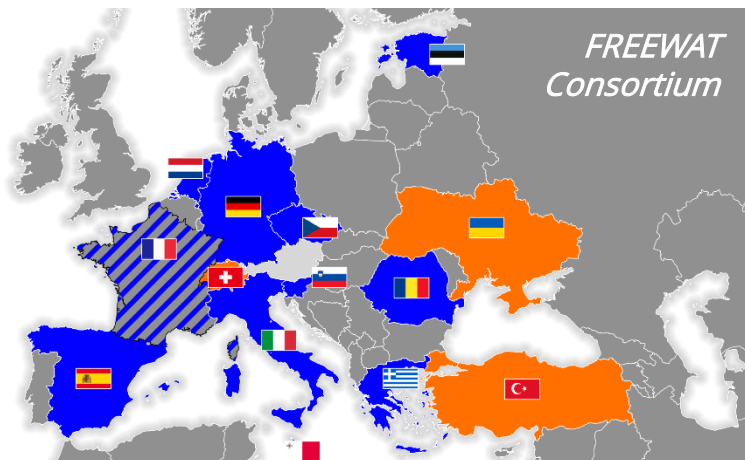
FREEWAT is available for free download through three main channels:

- ✓ from the FREEWAT website:
www.freewat.eu
- ✓ using the Plugin Manager tool within the QGIS desktop software or via the Official Plugin webpage:
<http://plugins.qgis.org/plugins/freewat/>
- ✓ as source code in the public repository GitLab:
<https://gitlab.com/freewat/freewat>

The choice of using various channels allows reaching several Users (beginners, advanced technicians, potential developers, ...) and greatly boosts the diffusion of FREEWAT and its ecosystem, a crucial point to make FREEWAT a living initiative also beyond the achievements of the H2020 FREEWAT project.

A FREEWAT Users Group and a FREEWAT Developers Group can be accessed through the following links:

- ✓ <https://groups.google.com/forum/#!forum/freewat-users-group>
- ✓ <https://groups.google.com/forum/#!forum/freewat-developers-group>



FREEWAT Consortium and friends at the Final Meeting in Barcelona (Spain), September 20th, 2017.

REFERENCES

QGIS Development Team (2017). QGIS Geographic Information System. Open Source Geospatial Foundation Project. <http://qgis.osgeo.org>
Rossetto, R., Borsi, I., & Foglia, L. (2015). FREEWAT: FREE and open source software tools for WATer resource management. Rendiconti Online Della Società Geologica Italiana, 35, 252–255. <http://doi.org/10.3301/ROL.2015.113>

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