

The GAUSS logo consists of the word "GAUSS" in a bold, white, sans-serif font, enclosed within a thin white circular border. A small red dot is positioned at the top of the circle.

# GAUSS

GENERATING ADVANCED USAGE  
OF EARTH OBSERVATION FOR SMART STATISTICS

# DROUGHT INDICATORS IN FINLAND

CASE STUDY  
3

The Finish Environment Agency, SYKE, supports Statistics Finland by providing hydrological measurements using a network of 1690 in situ sensors measuring water levels across the country. However Finland has an extensive and complicated set of lakes and rivers, so even this network only covers a fraction of the country.

In this case study the GAUSS project has shown how these in situ sensors can be augmented using satellite altimeters, such as the one about the European Sentinel-3 mission, as “virtual tide gauges”.

Results show that such methods give a good assessment of the water level, giving country wide measurements of water level even where no in situ sensors exist.

The next step is to incorporate such measurements, together with other parameters, into a hydrological indicator that can be used by statistics agencies to assess the state of drought at a regional level.



## Satellite altimetric data

Request of satellite data from [Copernicus Global Land Operations](#)



## In-situ data

Request of in-situ data to SYKE [Finnish Environment Institute](#)

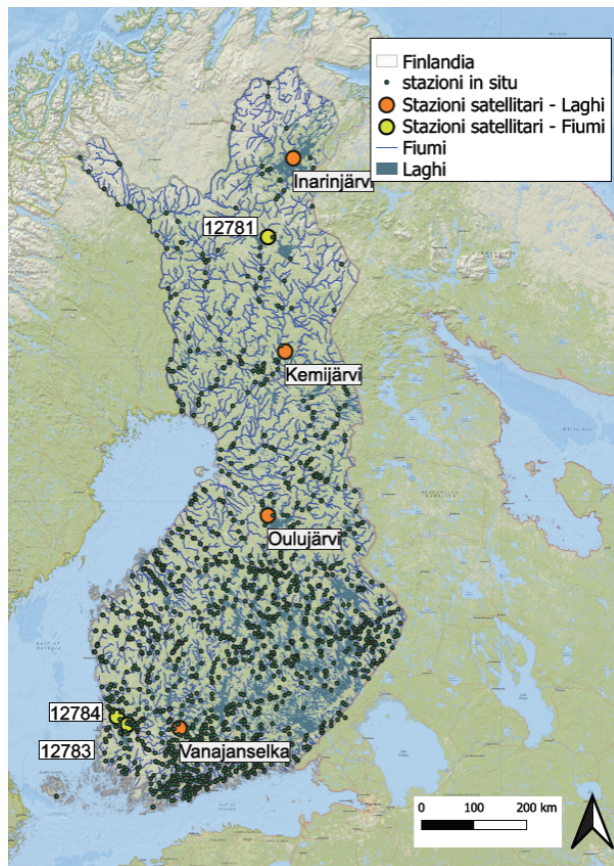


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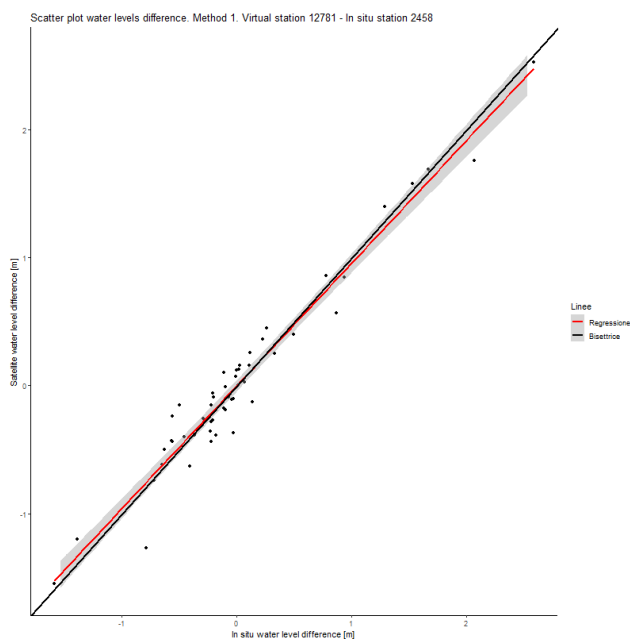
## Development of algorithm for data comparison and validation

R-Cpde developed from Politecnico di Milano

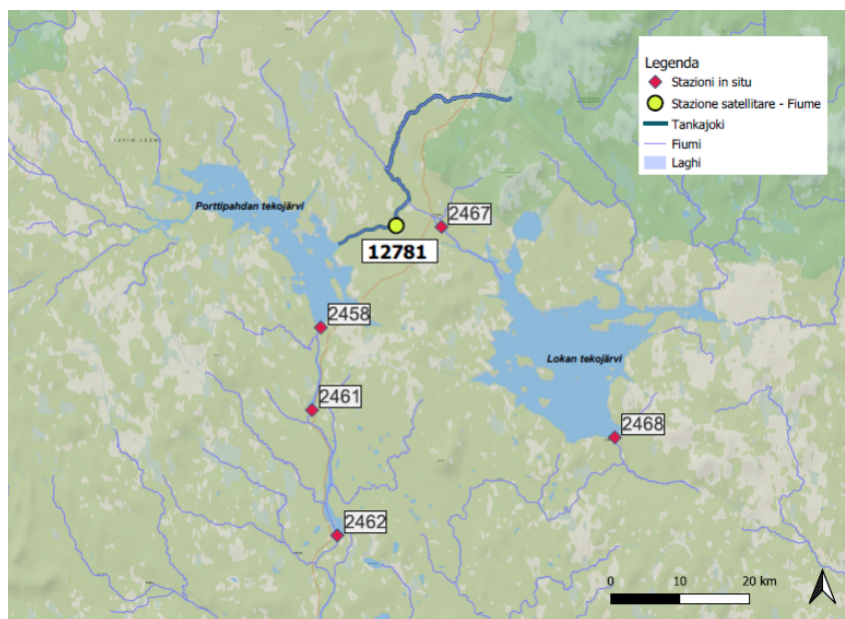
 *Data and Model Sources.*



Satellite virtual stations and in-situ data in Finland



Example of a couple analyzed. Satellite 12781 (green on the map) and in-situ 2458, among couples that performs better



Scatterplot of in-situ satellite measures for the couple satellite 12781 (green on the map) and in-situ 2458, among couples that performs better

