

Outsourcing hydrological measurements and station maintenance in Finland

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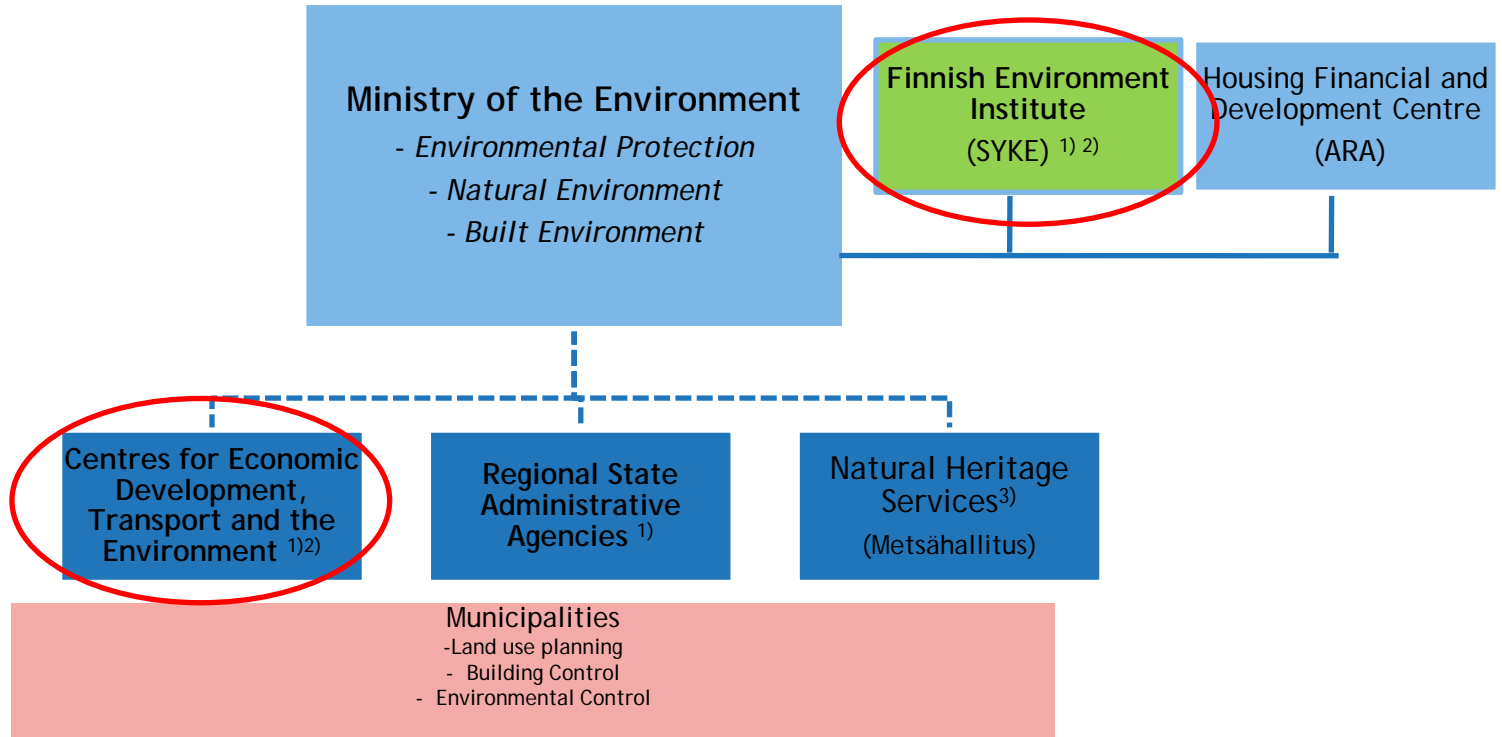
Freshwater Centre

2nd April 2019



S Y K E

Environmental administration in Finland



1) Ministry of Environment guides the work related to environmental issues

2) Ministry of Agriculture and Forestry guides the work related to water resources management

3) Ministry of Environment guides the work related to the nature conservation and recreational use

Hydrological monitoring in Finland

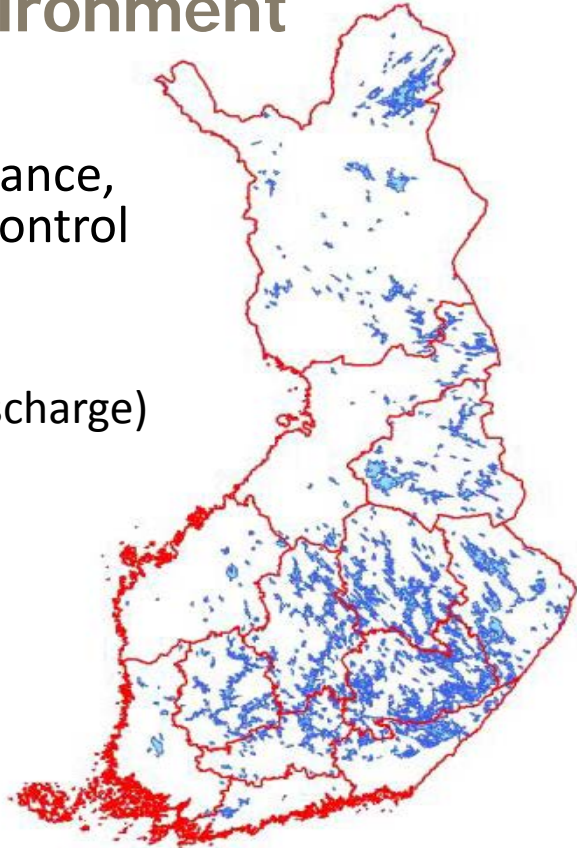


Finnish Environment Institute (SYKE) is the National Hydrological Service and responsible for:

- designing and planning monitoring network
- giving instructions concerning observations and measurements (standards),
 - guidelines, training, certification
- collecting the results into a database (data processing, quality control, archives)
- data system operation and development
- information services concerning the water situation
- research and development related to hydrology
- international co-operation

Role of regional centres for economic development, transport and the environment (ELYs)

- 13 centres responsible for field operations – maintenance, measurements, observer engagement, training and control
- field operations based on SYKE guidelines
 - In the past ELYs did all the field work
 - Outsourcing of field work in 2017-18 (water level and discharge)
 - One ELY-centre is responsible for tendering



Changes in operation of hydrological monitoring

- Background for changes: political will to involve private sector in measurements (done earlier with water quality sampling)
- Unequal resources of regional centres for hydrological monitoring
- Regional administration reform (that did not happen) and ministry guidance /funding

-> Funding for SYKE which orders observation services from a regional centre

Regional centre: Owning stations and devices, tendering and contracting consultants and observers

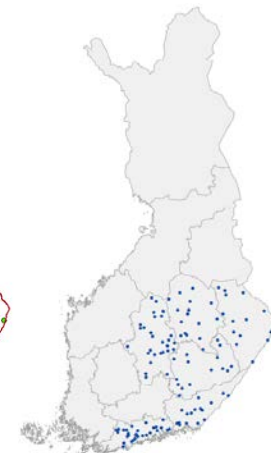
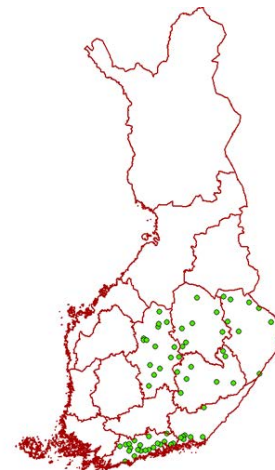
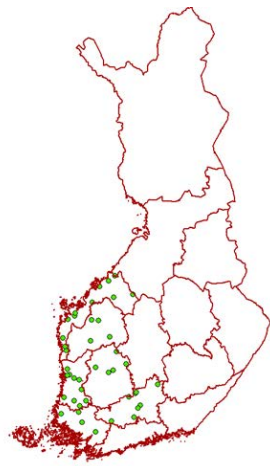
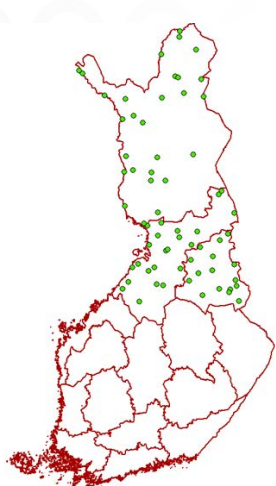
Consultants and observers

- Consultants:
 - discharge measurements (7/2017→)
 - Tender contract 2,5 years with option year
 - water level station maintenance (1/2018→)
 - most of the network stations (308 stations)
 - monthly control measurements, changing batteries e.g., changing broken automatic devices and benchmark levelling
 - Tender contract two years with one option year
- Observers:
 - Control measurements at some sites, manual snow, ice, ground frost, groundwater, evaporation etc. measurements
 - Local citizens, volunteers with small fee

Outsourcing of discharge measurements (gaugings)

- Public procurement for 1.7.2017-31.12.2019 (+ 1 year option) at three areas (north, west, east)
- Total of 441 gaugings (191 open water and 250 ice cover)
- SYKE was responsible for the measurement plan (based on maintenance of the rating curves)
- At least 1 open water gauging at each rating curve station during the procurement period (fixed target year and target water level)
- 1-2 gauging at each ice season at each site where ice correction is needed

Total expenses of contracts per year for water level and discharge measurements: 840 000 €



The Water Protection
Association of the River
Kokemäenjoki (KVVY
Tutkimus Oy)

Water and Environment
Association of River Kymi (Q)

Water protection Agency Savo-Karjala (W)

What did we require?

- Certificate for hydrological field work or at least 15 gaugings during the last three years
- Measurements must be done following the guidelines of "handbook of hydrological field measurements in Finland"
- ADCP not accepted if "measured" is less than 50 %.
- Field notes (wind, vegetation, ice etc., coordinates) and photos
- Water level observation before and after the gauging
- Independent water temperature
- Raw data files but also Qrev-postprocessing for extrapolation
- Response time required to repair of broken water level devices 3 days on critical stations

Trainings

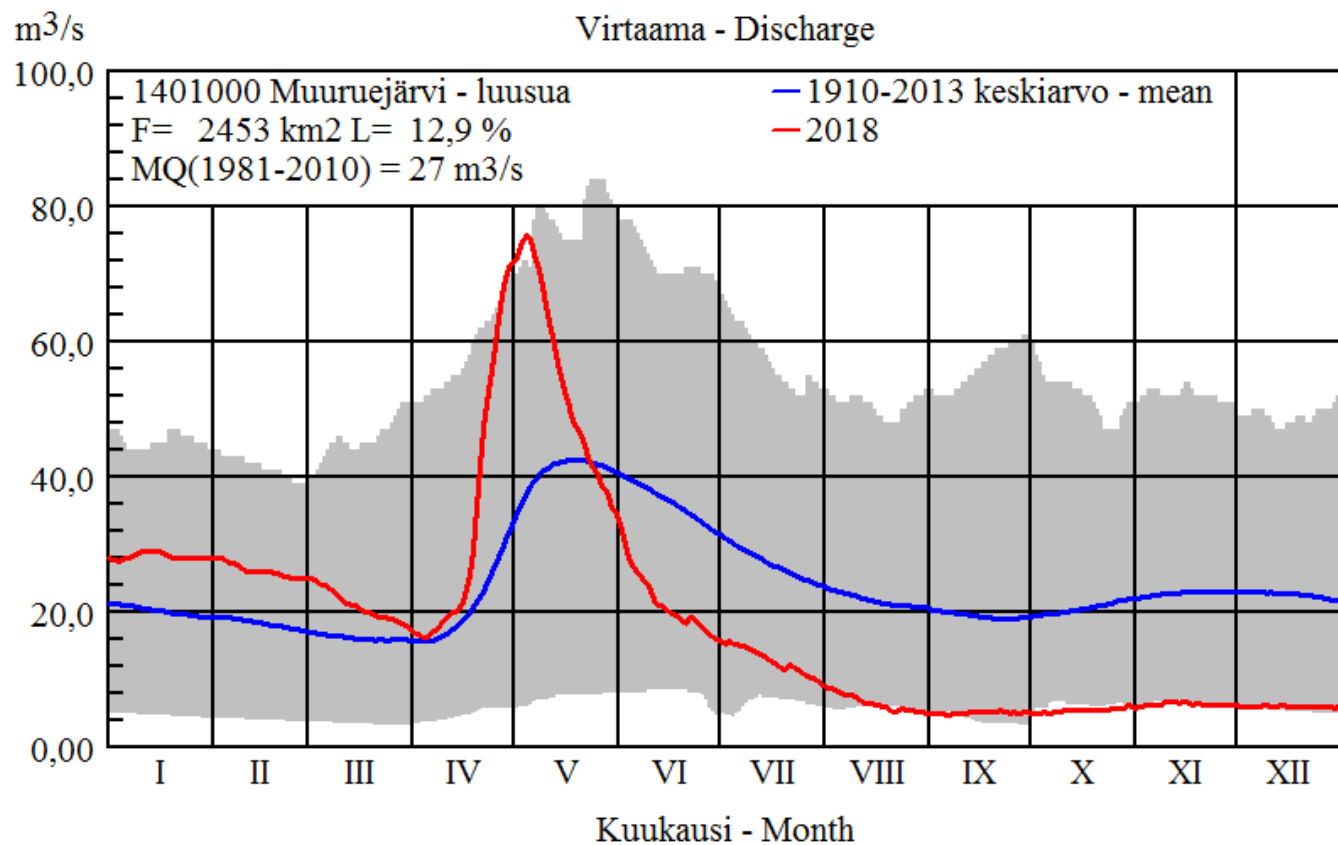
ADCP-workshop, current meters, Flowtracker, levelling, winter measurements



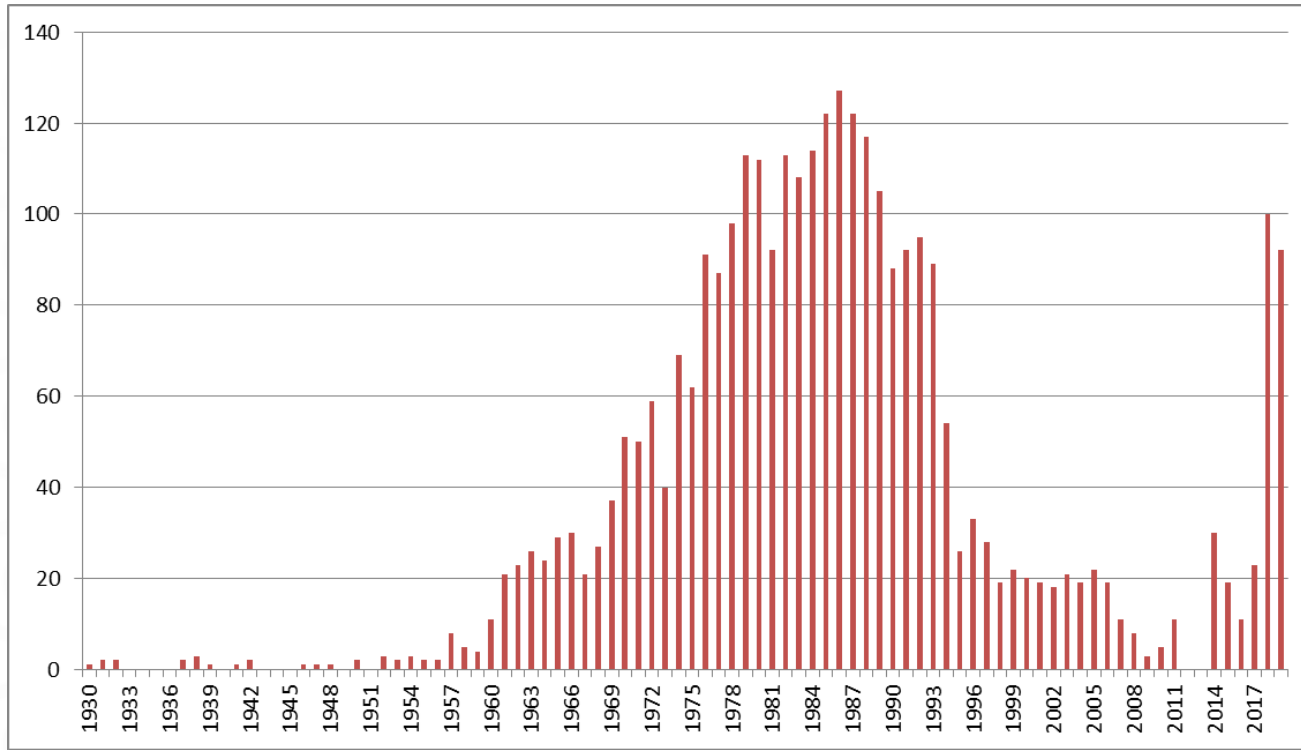
Outcome



- Tendering process went smoothly (e.g. several offers)
- At each area companies have purchased new measuring devices
- Consultants are motivated and eager to build their competence in hydrology
- More ADCP-measurements than before
- Smaller number of people doing more measurements than before
- Quality of the measurements has been mainly good/excellent
- Measurements have been done at target water levels and mainly in time



Number of measurements under ice



Challenges and problems

- Guidance took some time in the beginning
- Missing tests or failed tests, photos, water temperature or something else
- Some poor site and device selections
- Missed measurement opportunities (target water level, target year)

- SYKE, ELYs site knowledge and field know-how becomes weaker
- New tendering, new provider?

Next steps

- Ongoing contract end this year, option year is planned to be used
 - New tender has to be prepared carefully
- Most expenses come from monthly manual control measurements, duplicating water level devices has started
 - Duplication with low-cost IoT devices



**Thank you for your
attention!**

