Floreon+: a web-based platform for flood prediction, hydrologic modelling and dynamic data analysis

Václav Svatoň

Michal Podhoranyi, Radim Vavřík, Patrik Veteška, Daniela Szturcová, David Vojtek, Jan Martinovič, Vít Vondrák

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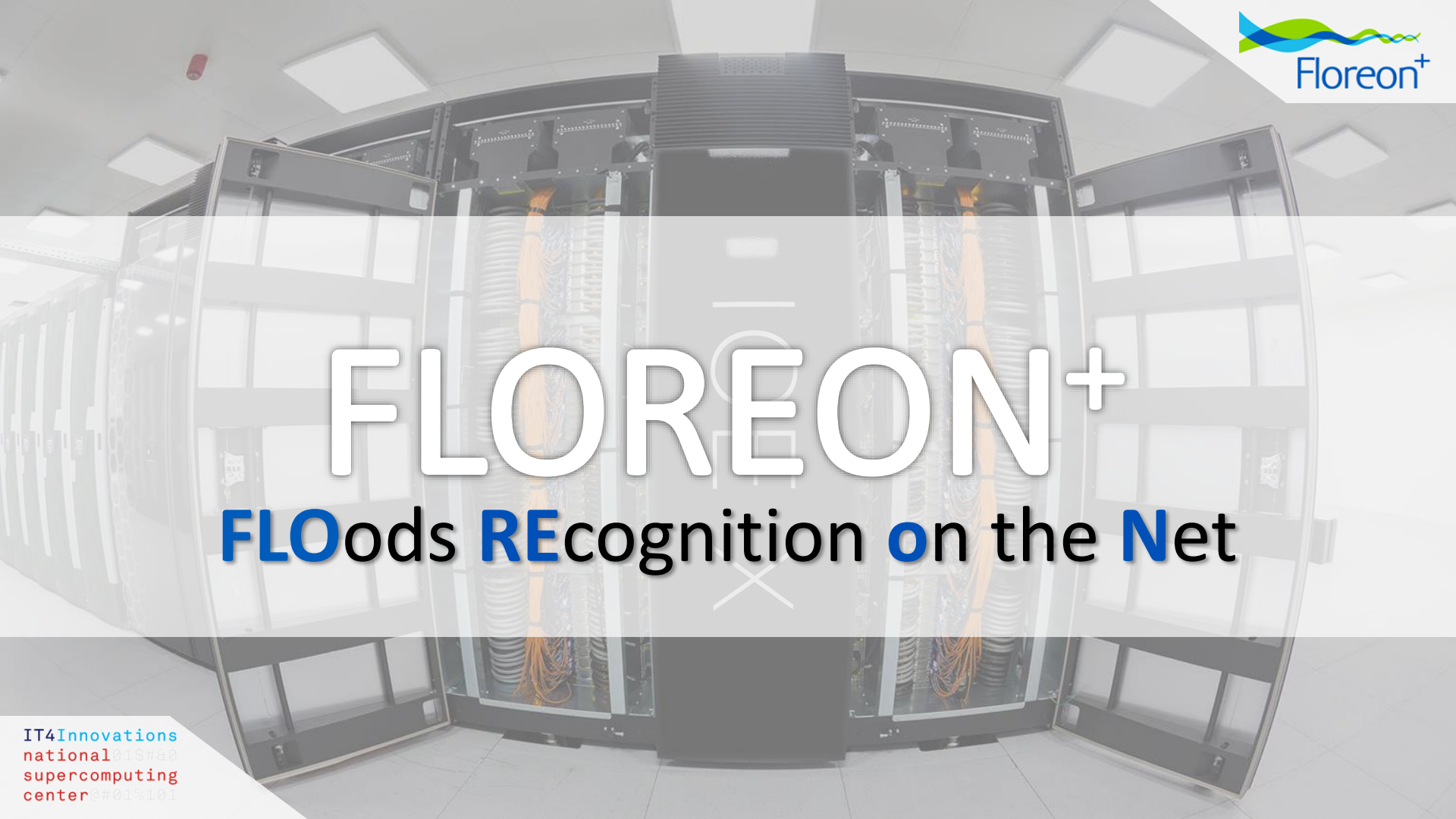

FLOREON+

FLOods REcognition on the Net

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Floreon+

Decision support system for disaster management

Solutions for monitoring, modelling, prediction and crisis management support

Integration of different crisis management domains

Developed for hydrological modelling in Moravian Silesian region

Under development since 2006

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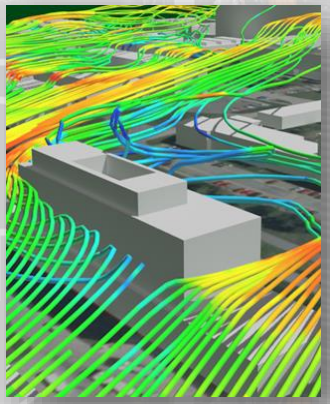
Decision Support System for Disaster Management

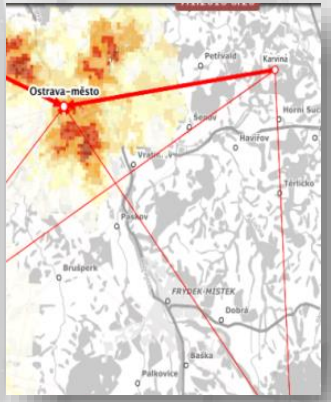
Floreon+

Flood

Traffic

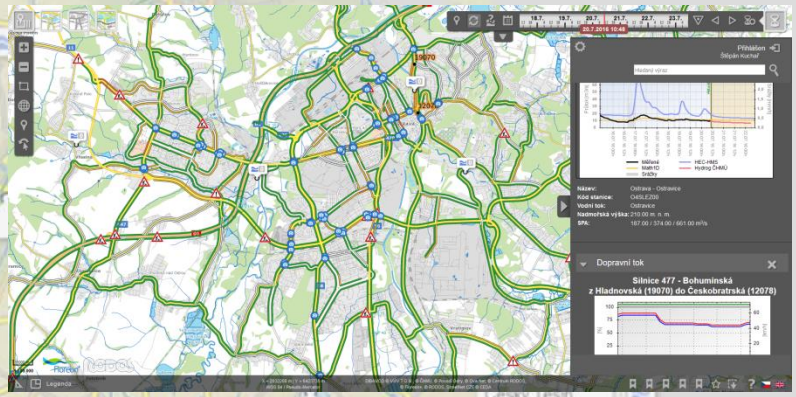


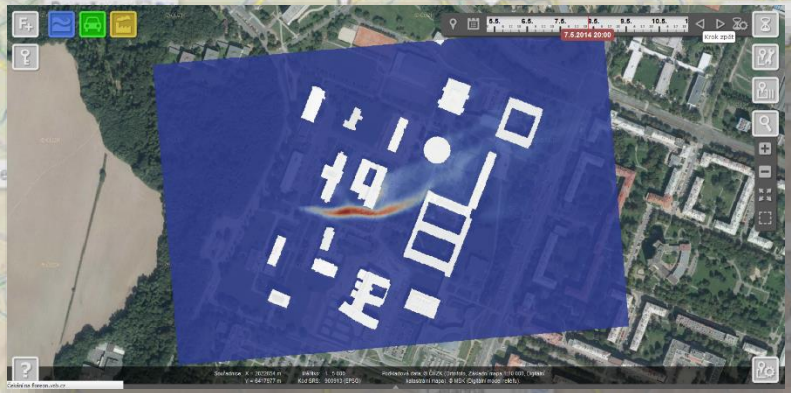
Pollution



Mobility

Floreon+ Web-based User Interface





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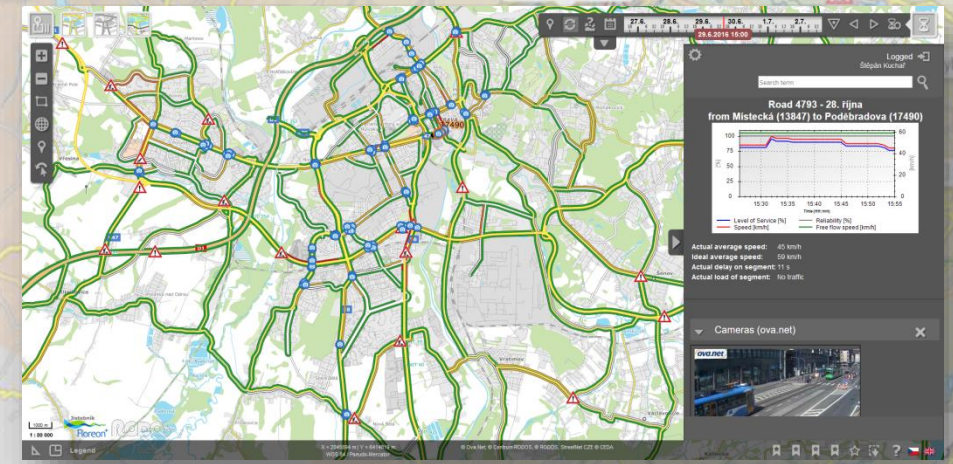
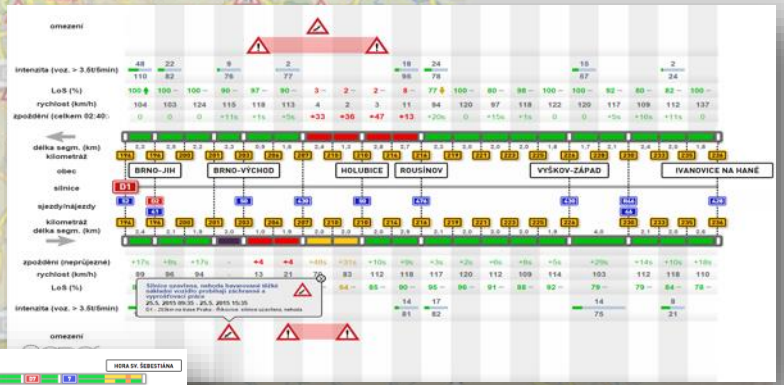
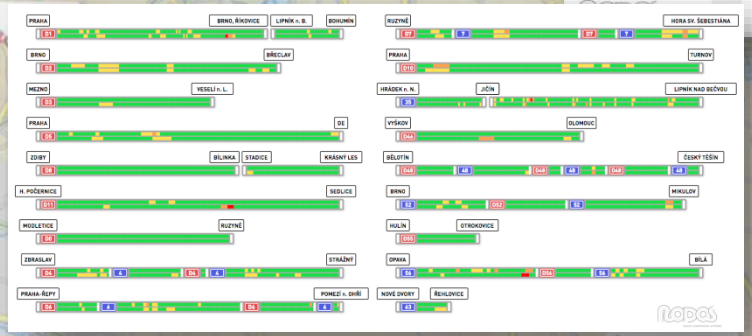
External Data Sources Integration







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Flood modelling

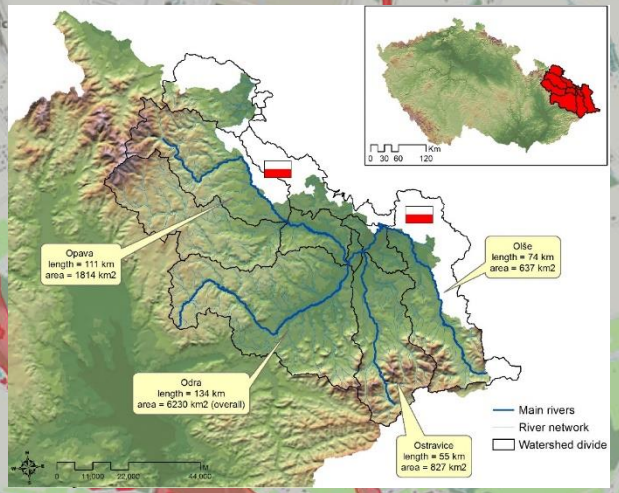
Rainfall-runoff modelling and hydrodynamic modelling for the 4 main catchments in Moravian Silesian region: Opava, Odra, Olše and Ostravice

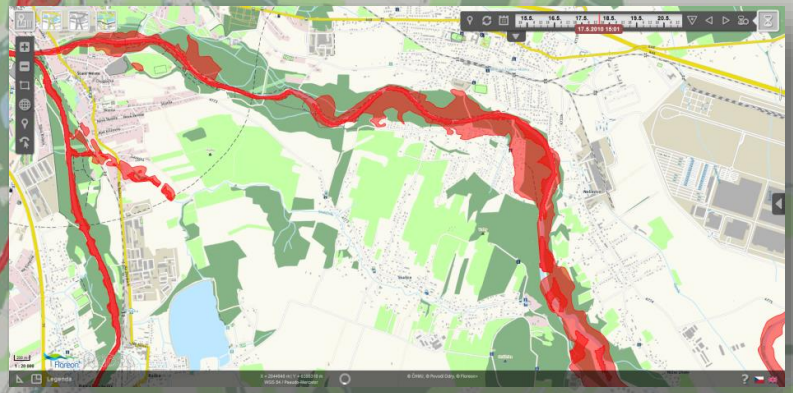
- monitoring and prediction of river flow and floods
- data gathered from the network of measuring stations
- precipitation forecast from Medard model

Used models

- 2 semi-distributed rainfall-runoff models Math1D a HEC-HMS
- 1 hydrodynamic model HEC-RAS

Simulations run automatically every hour with predictions for 2 days





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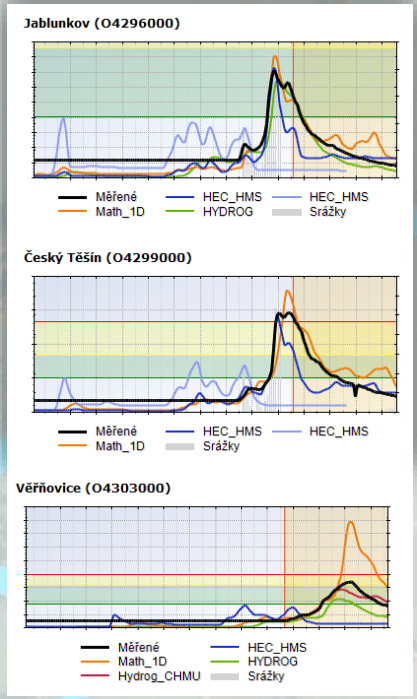
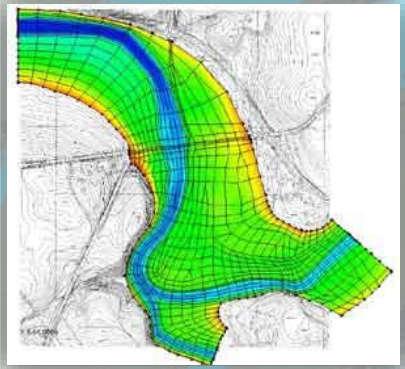
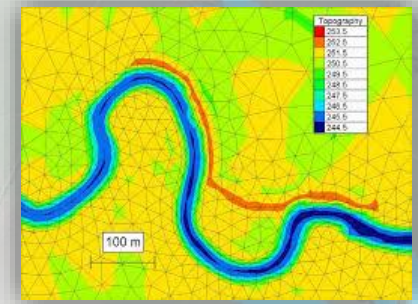
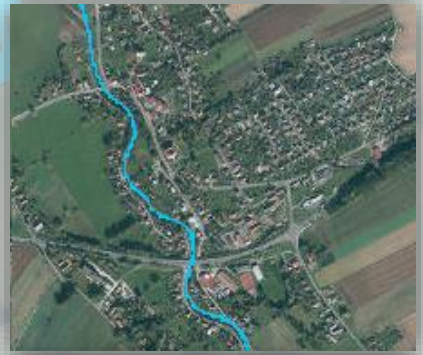
Automatized Hydrologic Modelling Simulations









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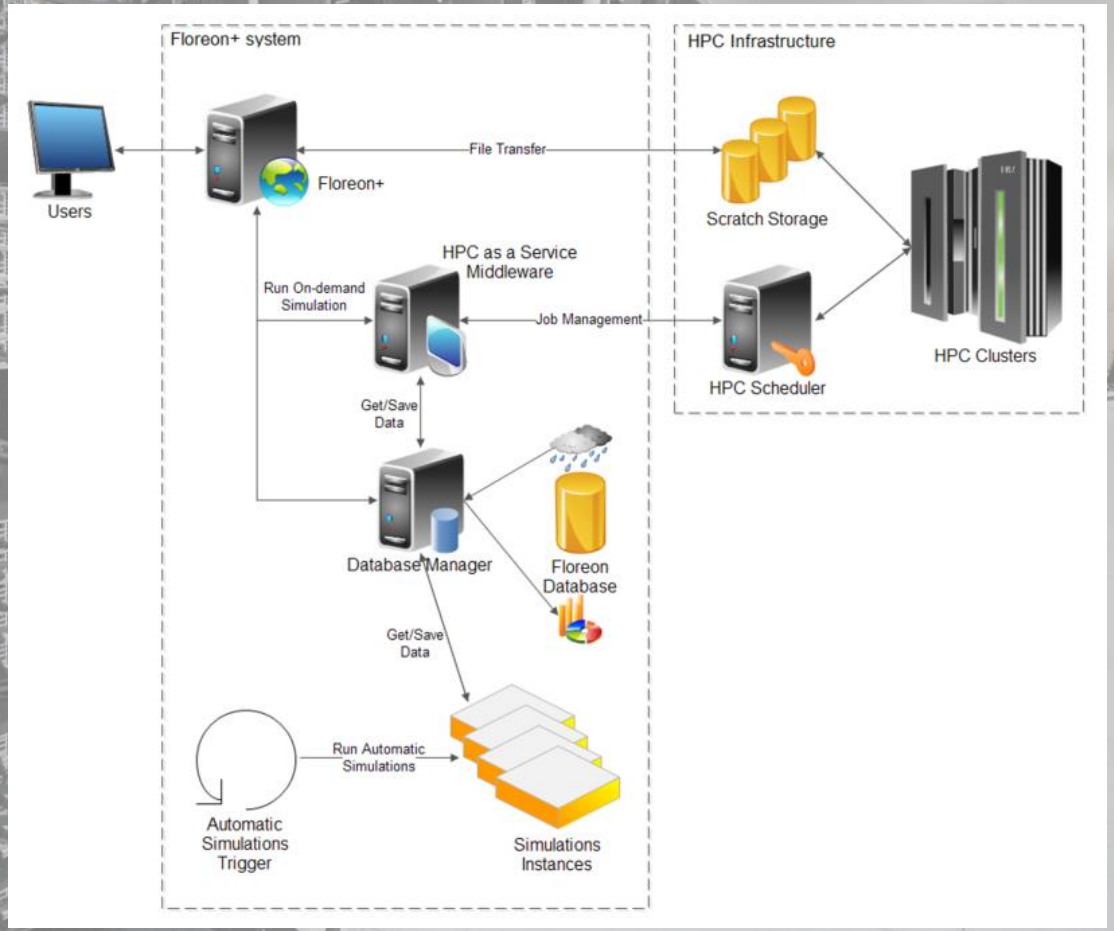
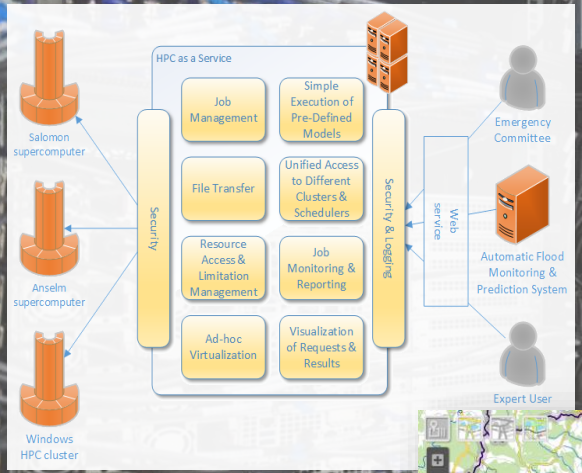
Dynamic data processsing and Floreon+ system architecture

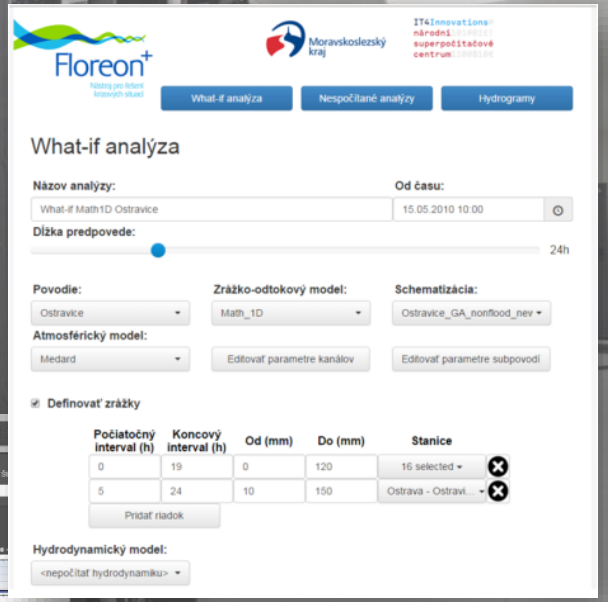
Dynamic data processing

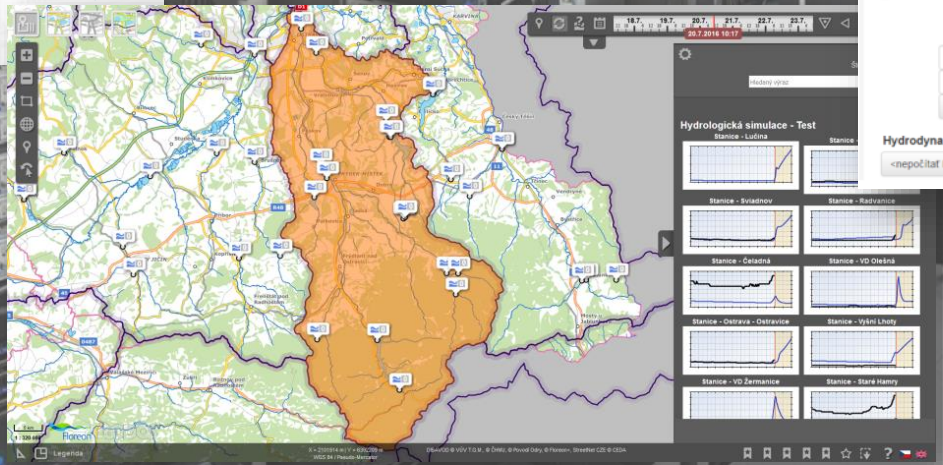
- Import measurement and forecast data from third parties
- Data preprocessing for rainfall-runoff (R-R) models
- Run simulation
  - Automatic simulations
  - On-demand simulation
- Run R-R model
- Transform and save R-R results
- Prepare data for hydrodynamic (HD) model
- Run HD model
- Postprocess and save HD results
- Visualization of floods



HPC as a Service and What-if analysis







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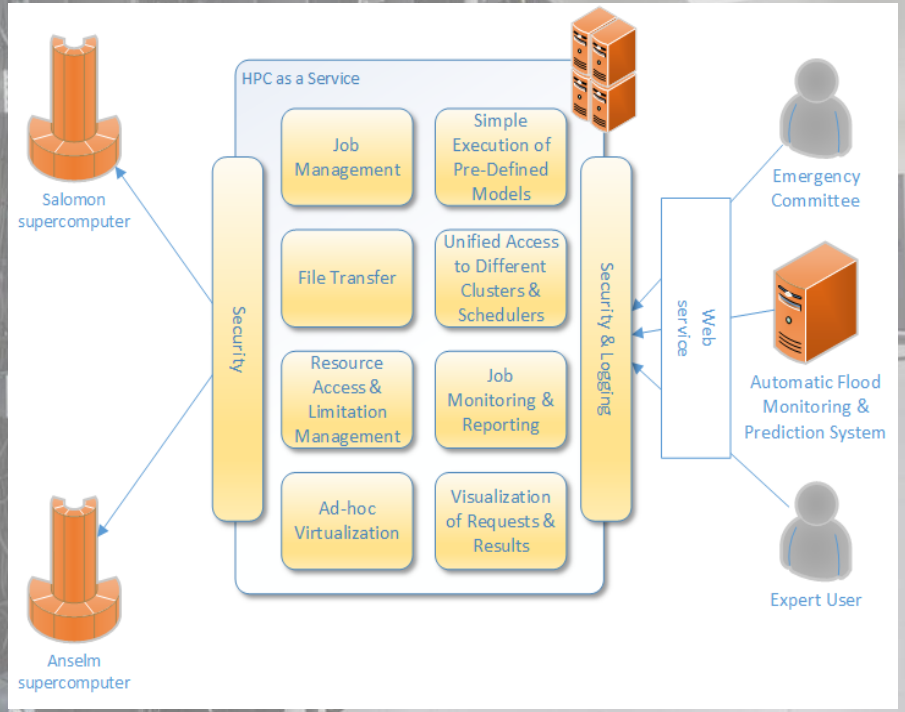
DHI

HPC as a Service

- Developed in cooperation with DHI Denmark
  - Company behind hydrologic software *MIKE powered by DHI*
  - Base office in Denmark with offices worldwide
  - In cooperation with Denmark and Singapur DHI offices

The HPC as a Service further lowers the entry barriers for users who are interested in utilizing massive parallel computers for modelling.
Through this service, SME's can take advantage of the technology without advanced investment in hardware.



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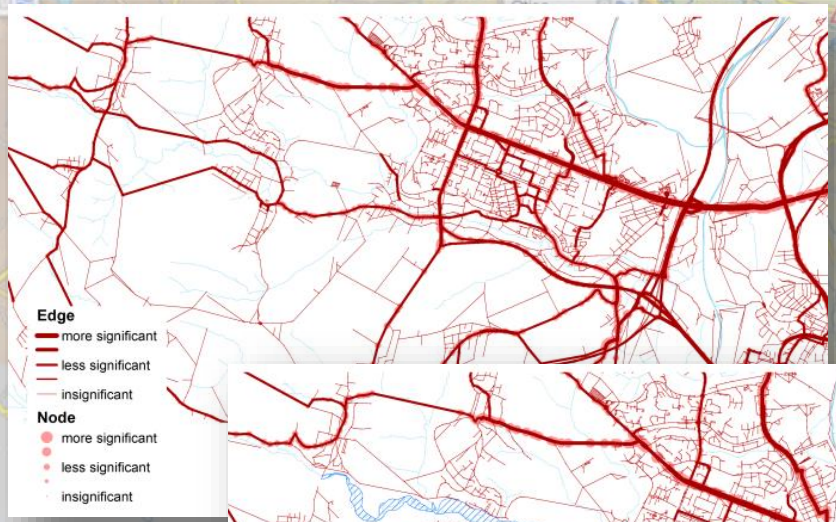
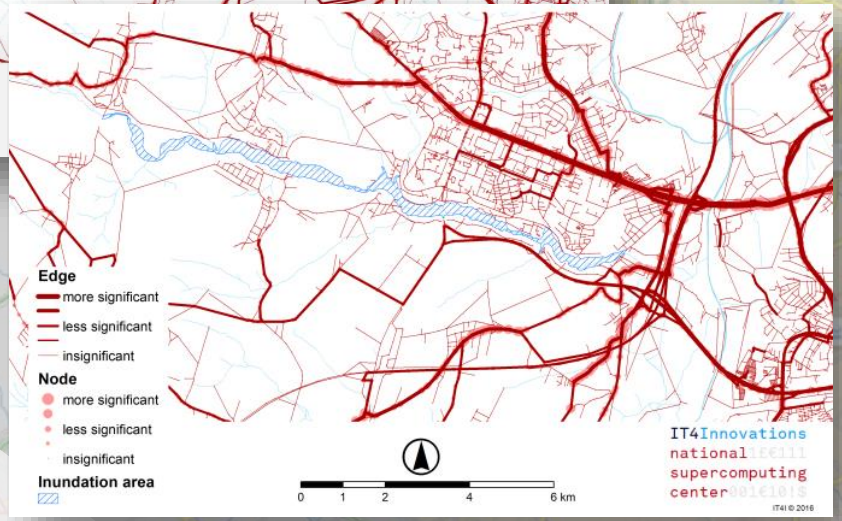
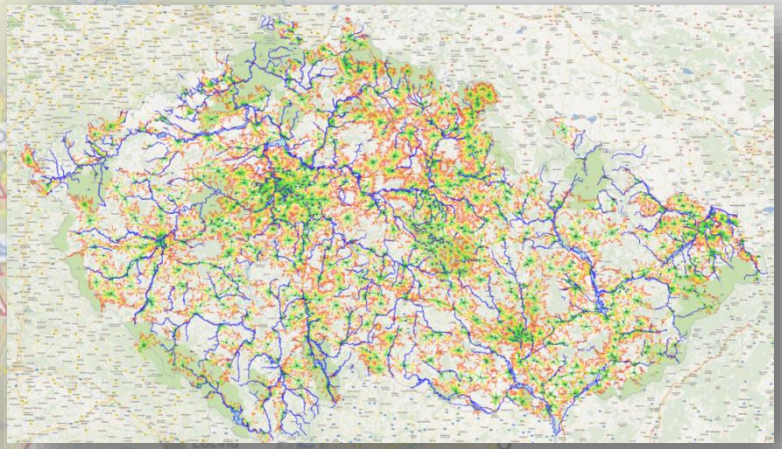
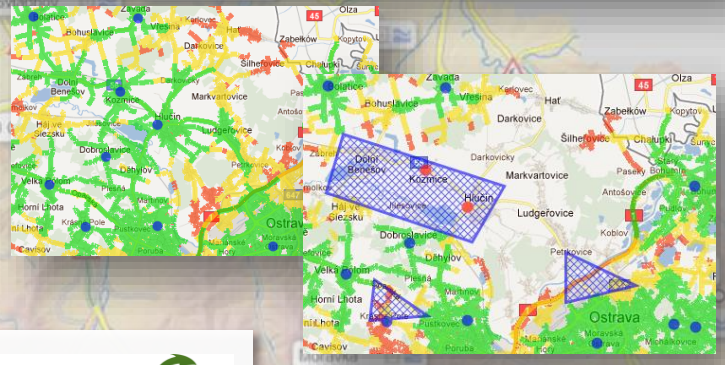
Future work: Different domains interaction









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