

# Success Story

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POVAPSYS  
Flood Warning System  
of Slovakia

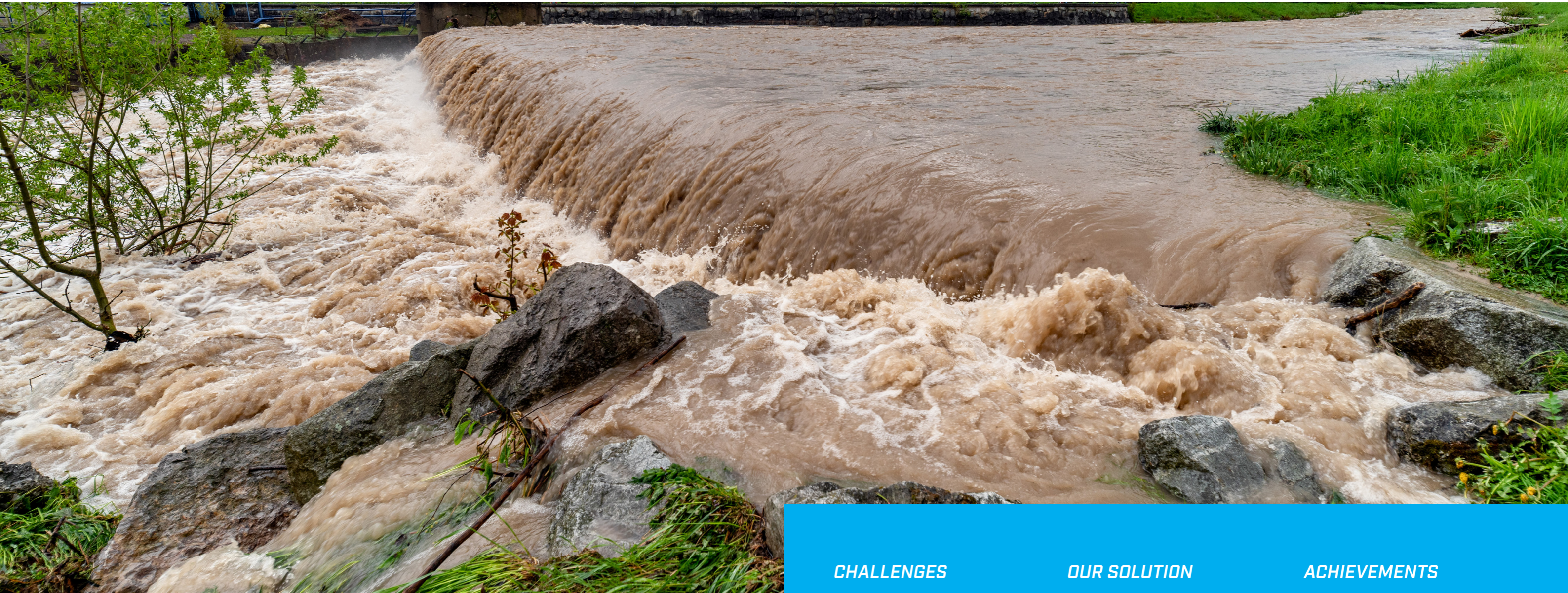


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Regular occurrence of the floods and increased rate Slovak Republic of flash floods triggered long-term effort of the Slovak Republic focused on the flood mitigation.

The flood mitigation program consists of several components - civil engineering, monitoring and research, warning systems. The project POVAPSYS focuses mainly on monitoring infrastructure and facilities for research.



### CHALLENGES

- Integration of many data types
- Complex modeling with ensemble data inputs
- Advanced mapping with complex layers
- Short delivery period

### OUR SOLUTION

- Operational database integrating SQL data and metadata as well as non SQL data
- Hydrological models integrated into IMS Model Suite framework / HYPOS portal· HBV rainfall-runoff model, HEC-HMS rainfallrunoff model and HEC-RAS 1D flow model
- Map server with OGC web services

### ACHIEVEMENTS

- Setup, calibration and validation of hydrological models for territory of Slovakia (49.036 km<sup>2</sup>) and less detailed models for Danube / Morava / Bodrog basins out of Slovakia (131.000 km<sup>2</sup>)
- Model performance validated not only using validation datasets, but in real operation during floods on rivers Ipeľ and Slaná in February 2016
- Fully automated operation of the models

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### Automatic meteorological stations

The network of 78 meteorological stations and 137 rain gauge stations, satellite data receivers, doppler current profilers, geodetic systems and further tools were delivered within the scope of the project.

The central system based on the UDCS/CLDB technology acquires the data from the installed stations in the near-real-time mode. The data are shared with further systems crucial for the flood warning system.



### Hydrological portal HYPOS

Hydrological portal is a modular system for the processing and presentation of hydrological and meteorological data built on the MicroStep-MIS IMS4 Application software platform. The portal integrates range of data types necessary for the flood warning and forecasting – meteorological and hydrological data, radar and satellite images, results of

modeling and station metadata. The portal contains module for visualization of the data – measured as well as modeled, alerting module, and quality control module. The important part of the system is the module for the visualization of the geospatial data.

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**Hydrological portal HYPOS** | Modular system built on the MicroStep-MIS IMS4 EnviDB and Model Suite software platform for the processing and presentation of meteorological and hydrological data.

### Environmental database

The environmental database is the main engine providing the data for the flood warning system. The database integrates data and performs regular data quality checks. The database integrates these data types:

- Hydrological data from water level stations
- Measured hydrological data
- Hydrological forecasts
- Metadata of the meteorological stations
- Measured meteorological data
- Data from the meteorological satellites and radars
- Data from the meteorological models
- Geographic data
- Configurations

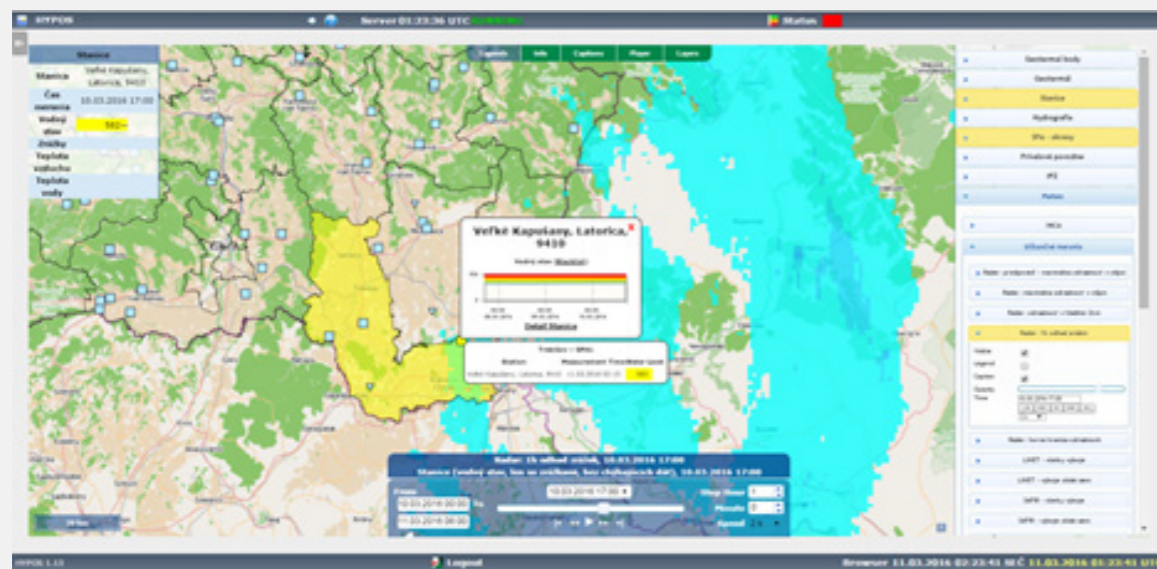
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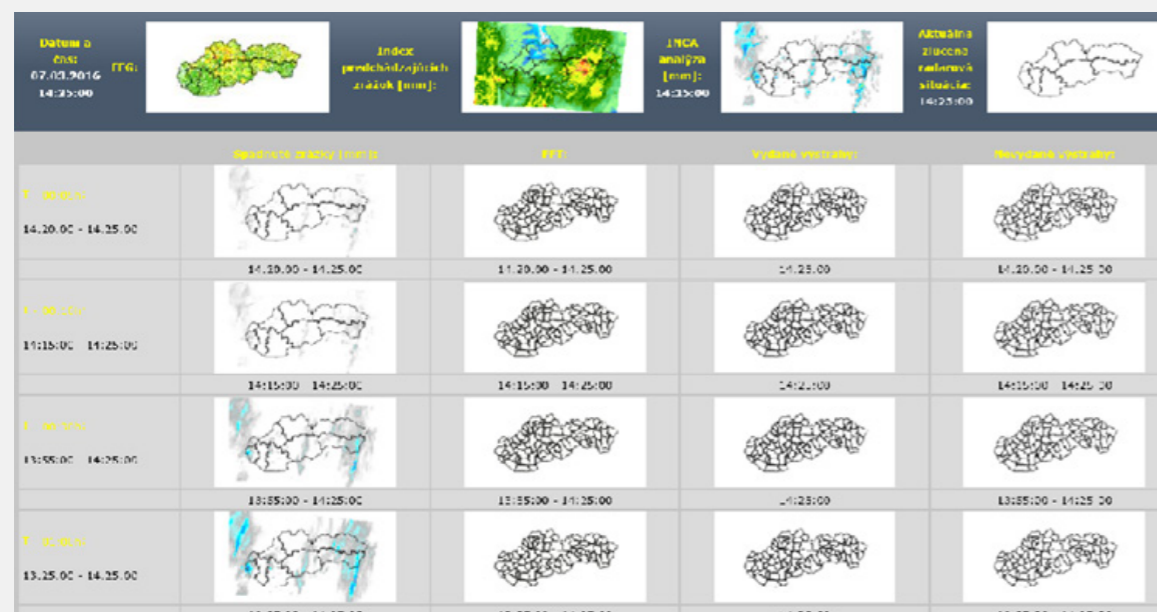
### Hydrological modeling

The complex network of models is used for the water level and discharge forecast. The variety of models is ranging from simple empirical formulas to rainfall-runoff and hydrodynamic models with ensemble data sets. The

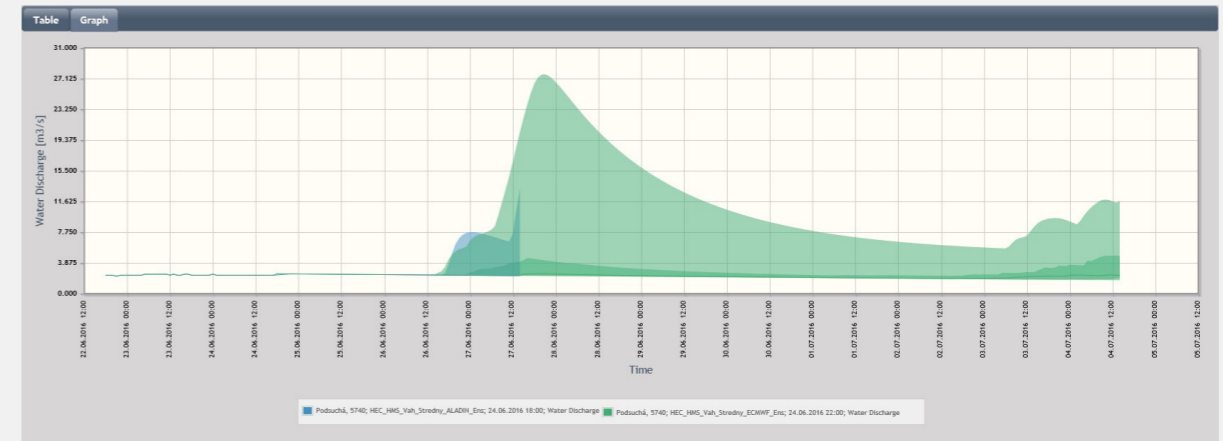
advanced system for models configuration and management is part of the hydrological portal HYPOS. Special part of the system is flash flood warning system based on the flash flood guidance method.



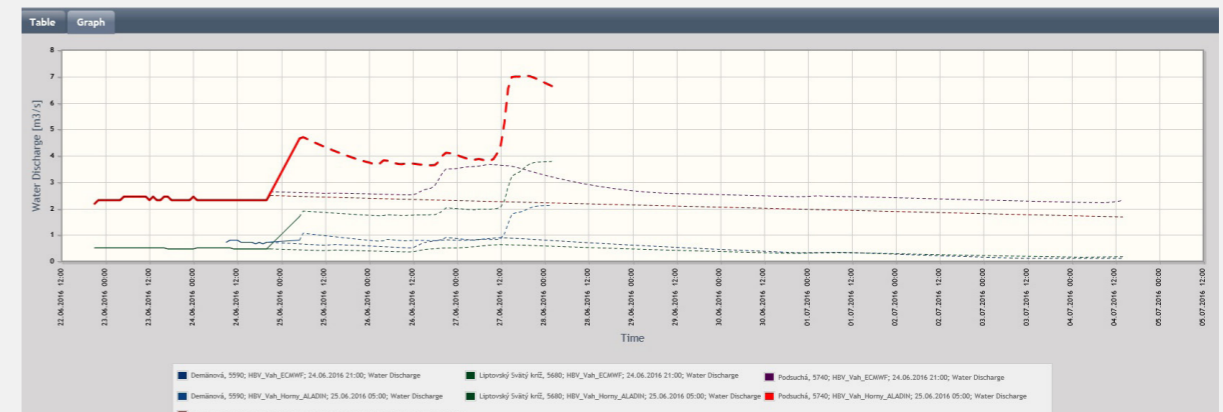
Map portal supports smarter decision making process



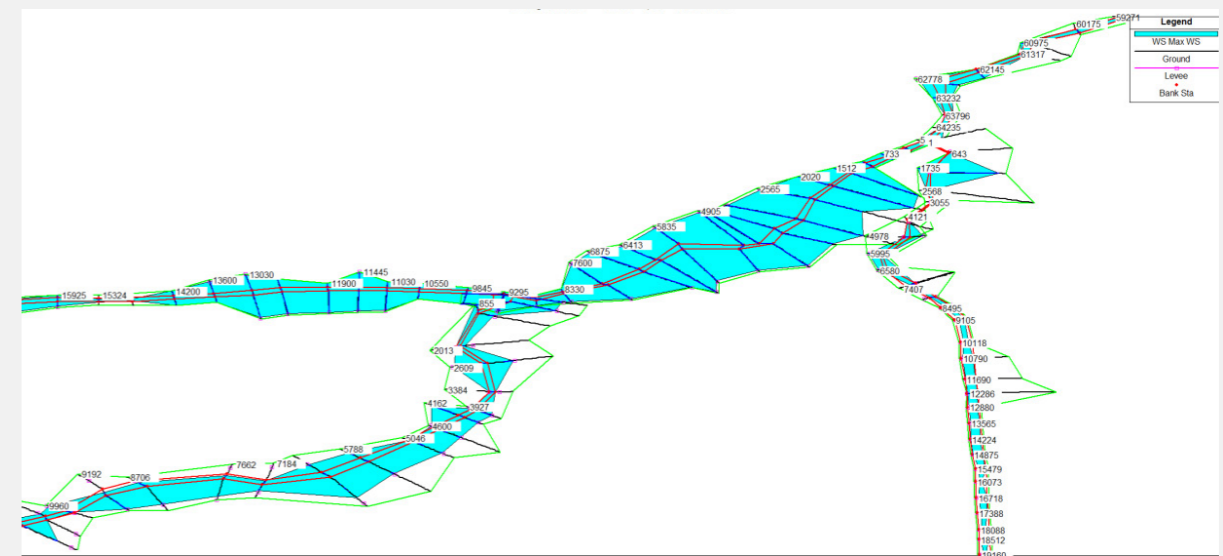
Flash Flood Forecasting module



The output of Rainfall – runoff ensemble model in the forecasting part of hydrological system | The user can set up the statistical parameters, that can be visualized – each ensemble or probability intervals.



Deterministic forecast of hydrological model | User friendly overview enables overlaying and analysis of different model runs, forecasting profile and various models in one graph



Maximal extend of flooding computed by 1D hydrodynamic model HEC-RAS

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# 150+

**talented and dedicated  
professionals working  
together**

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## **CONTACT US**

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