HYPE MODEL PERFORMANCE AND CALIBRATION STRATEGY FOR HYDROLOGICAL COMPONENTS: A CASE STUDY IN LATVIA

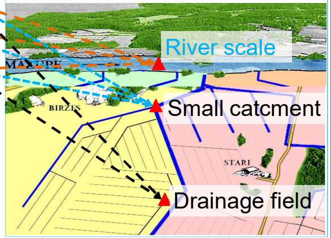
ARTURS VEINBERGS (arturs.veinbergs@llu.lv) (1), Ainis Lagzdins (1), Ritvars Sudars (1), and Didzis Lauva (2)

(1) Department of Environmental Engineering and Water Management, Latvia University of Life Sciences and Technologies, Jelgava, Latvia

(2) Department of Physic, Riga Stradins University, Riga, Latvia

1. STUDY AREA

Example of monitoring scales



Focus on hydrological modeling for the **Berze River** (872 km^2) - situated in the central part of Latvia. In 32% of basin area are implemented tile drains

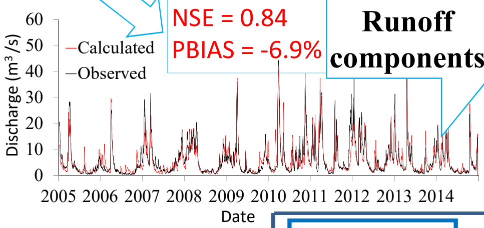
Additionally observations from **small scale** monitoring station (situated in different locations in Latvia for process understanding

Monitoring station	Berze	Mellupite	Vienziemite
	Area (km^2); **Tile drained area (%)**		
Small catchment	3.68; **98**	9.60; **70**	5.92; **70**
Drainage field	0.76; **100**	0.12; **100**	0.77; **100**

2. HYPE CALIBRATION FOR THE BERZE RIVER

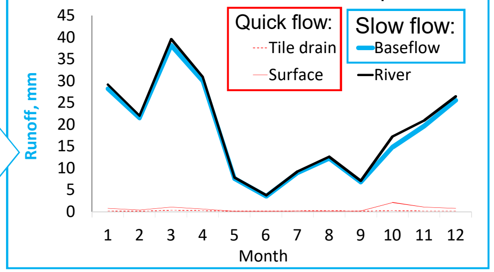
Hydrological predictions for environment (HYPE) model is semi distributed model where spatial distribution based on subbasine level

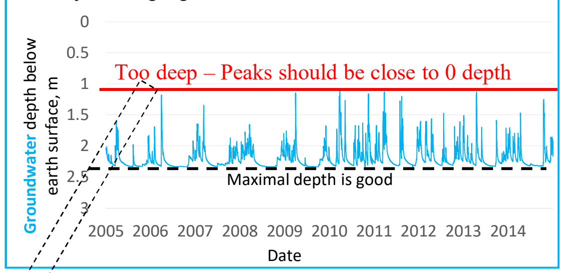
Pre-calibrated model
Is it satisfied result ?

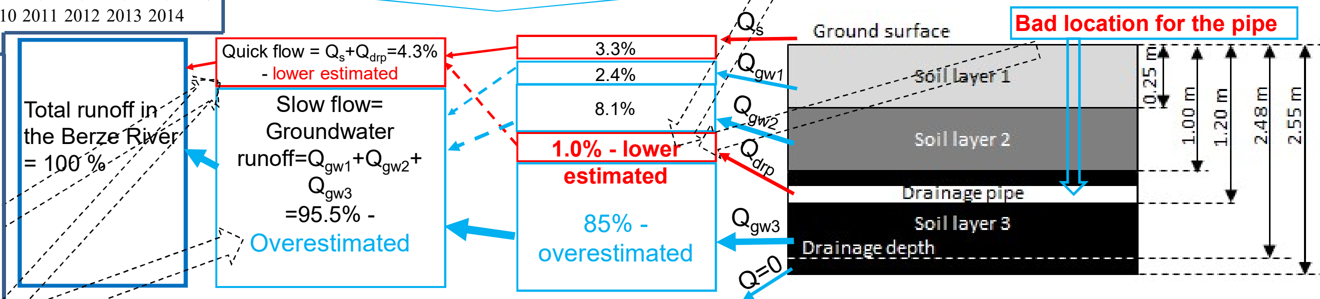


Simulated **Runoff components**

3. HYPE SIMULATED RUNOFF COMPONENTS FOR THE BERZE RIVER







4. RUNOFF COMPONENTS SEPARATED FROM OBSERVED RUNOFF

Runoff was similar or even higher from **drainage field** than it was observed from **small catchment** scale – Possibly the groundwater contribution was insignificant in small catchment

Share of **tile drained** lands in the Berze River basin = **32%**

Quick flow > 32%
Tile drain contribution ≈ 32%

Digital filters of BFI (Wahl and Wahl 1995) and SWAT(Arnold et al. 1995 baseflow separators was applied on daily average runoff data for Berze River.

Slow flow=50...60 %
Quick flow 40...50%
separated by BFI and SWAT baseflow separators respectively

5. FURTHER CALIBRATION STRATEGY

could include stepwise adjustments of main parameters such as: 1) **effective porosity** (and groundwater flow recession; 2) subsurface drainage flow **recession**; 3) recession of surface runoff under saturated conditions and **infiltration capacity** of surface runoff caused by intensive precipitation and snowmelt; 4) **evapotranspiration** as soil water content is expected to change due to the adjustments of parameters previously stated.

References

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MIRACLE

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