Computation of backwater effects in low lying (marshland) catchments

A re-usable and efficient method in an open source hydrological model

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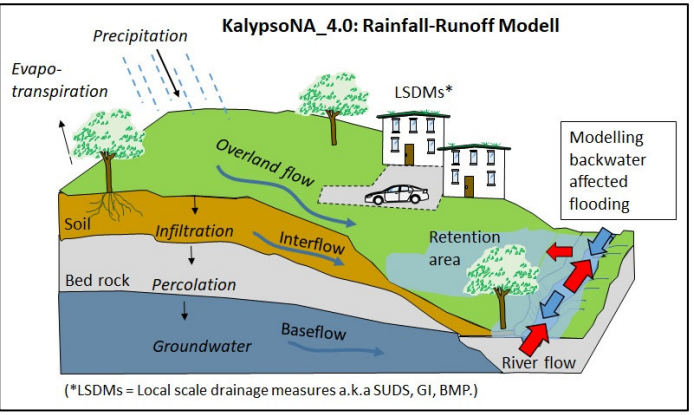
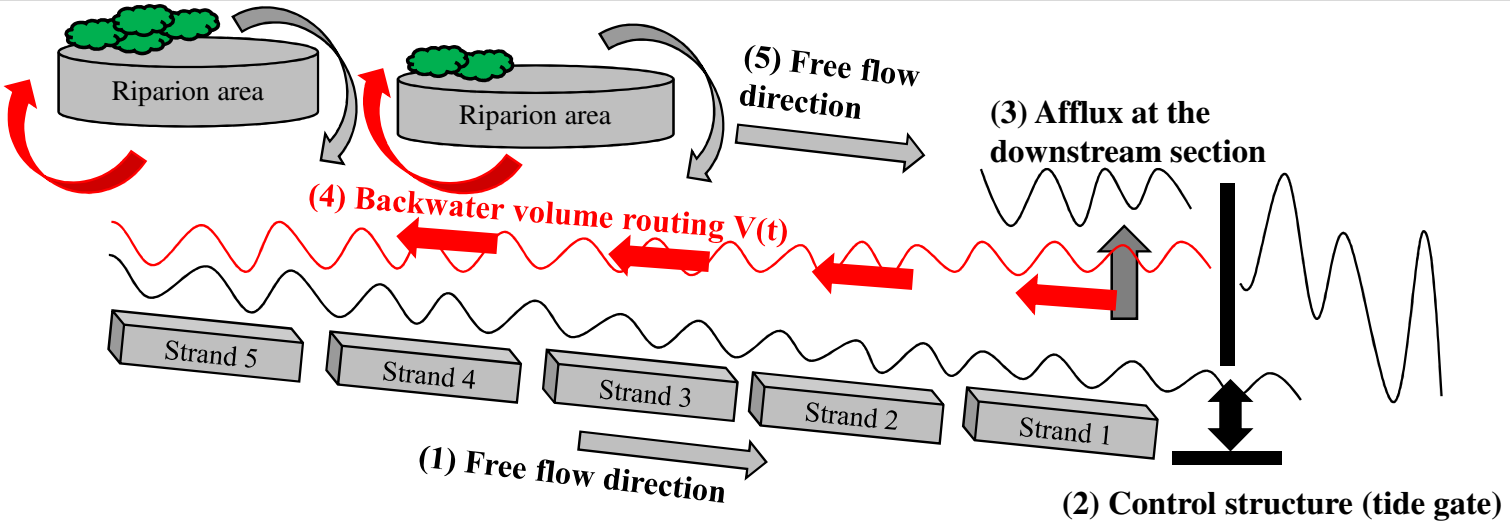
Objectives

Modelling complex drainage systems in lowlands, short runtime (forecast simulation model), open source, re-usable and parsimonious.

Method





Implementation

- Open source hydrological model: **Kalypso-NA 4.0** (released January 2021).
- Backwater effect computation in a secondary space-before-time algorithm.

Evaluation

- Lowland catchment ‚Dove-Elbe' (175km², Hamburg) with complex drainage system.
- Run-time < 3 min. (standard desktop PC, i7-5600U CPU and 2.6 GHz).

Results

- Re-usable for hydrological models using conceptual hydrological flood routing approaches.
- Objectives reached and results show a sufficient range of accuracy.

(see: Dissertation Hellmers, 2020)