

Fish-passable structured ramps Flow depth and stability during floods

Initial situation:

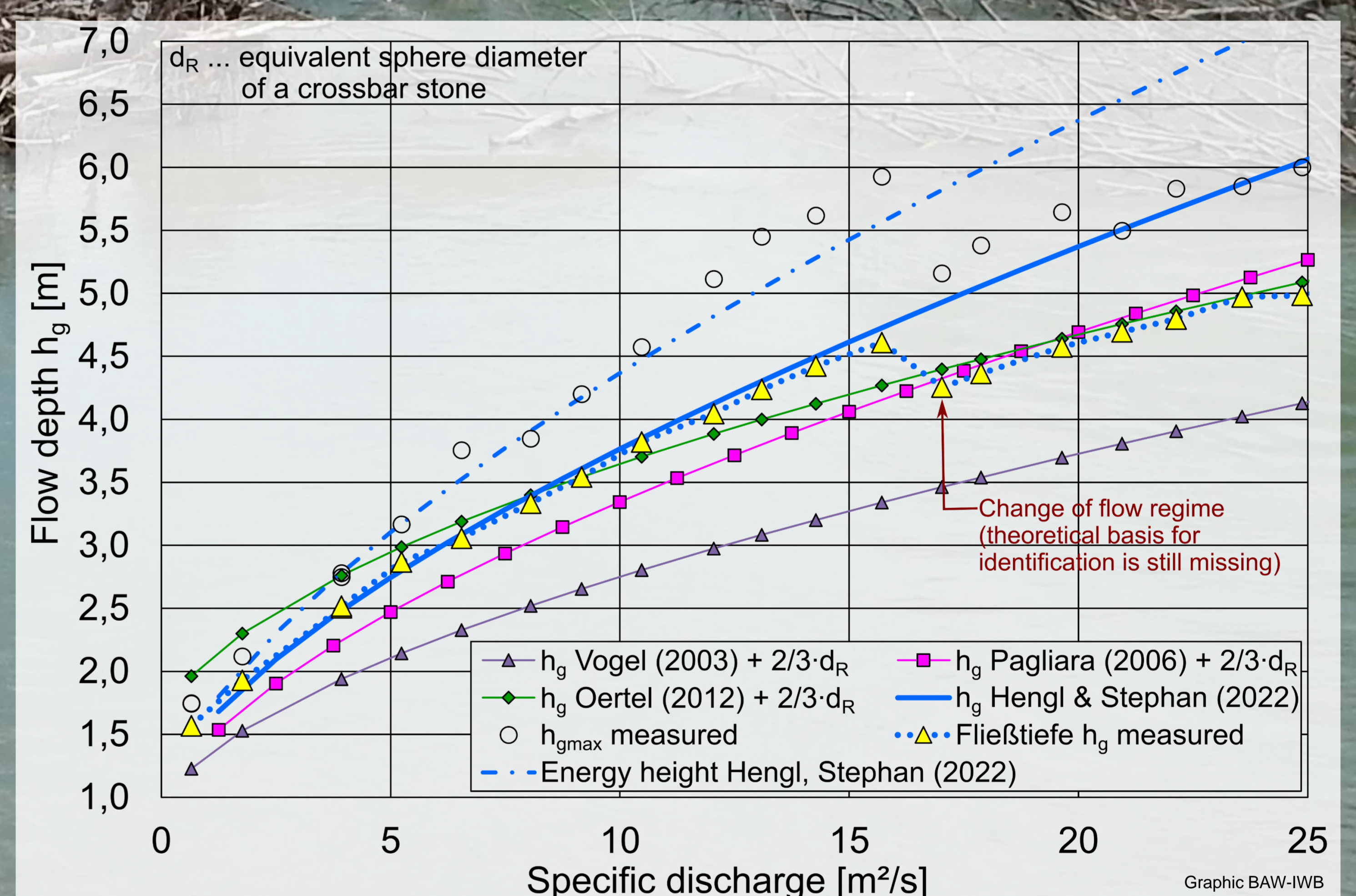
- In cases where hydraulic structures cannot be removed, structured ramps are suitable for enabling fish to migrate upstream.
- These ramps must not only allow fish to travel upstream, but also remain stable during floods and ensure flood protection.

Goals:

1. Calculation of water depth during floods (determination of bank heights, prevention of flooding).
2. Dimensioning of the stone sizes for both river crossbars and basins (stability of the structure during floods).



Method: Develop empirical design formulas based on model tests for specific projects.



Example of a model test for obtaining measurement data for further analysis and development.

Comparison of measured and flow depths calculated using various methods for a ramp.

Result:

- Empirical design formulae have successfully been developed.
- Now the reliable calculation of water depths is possible.
- As well as the economic dimensioning of stone sizes on the structure.
- The design formulae have been published and are thus freely applicable in practice.

Open question:

At what flow depth does the flow regime change so that the flow depths become shallower?

