www.cfLab.eu

Welcome to Germany!

Office presentation

| 07.08.2023
| Dr.-Ing. Florian Pfleger | cfLab GmbH
| Dipl.- Ing. Marius Asenkerschbaumer | cfLab GmbH

Engineering Office cfLab GmbH

Skills and portfolio.:

– hydrologic and hydraulic investigations

– fluvial flood plain analysis

– pluvial flood plain analysis

– discharge measurements

– morphology

Homepage: www.cflab.eu

Team

Dr. Florian Pfleger

- Founder and
  managing director

Marius
Asenkerschbaumer

- Project manager

Dr. Christoph Rapp

- Founder and
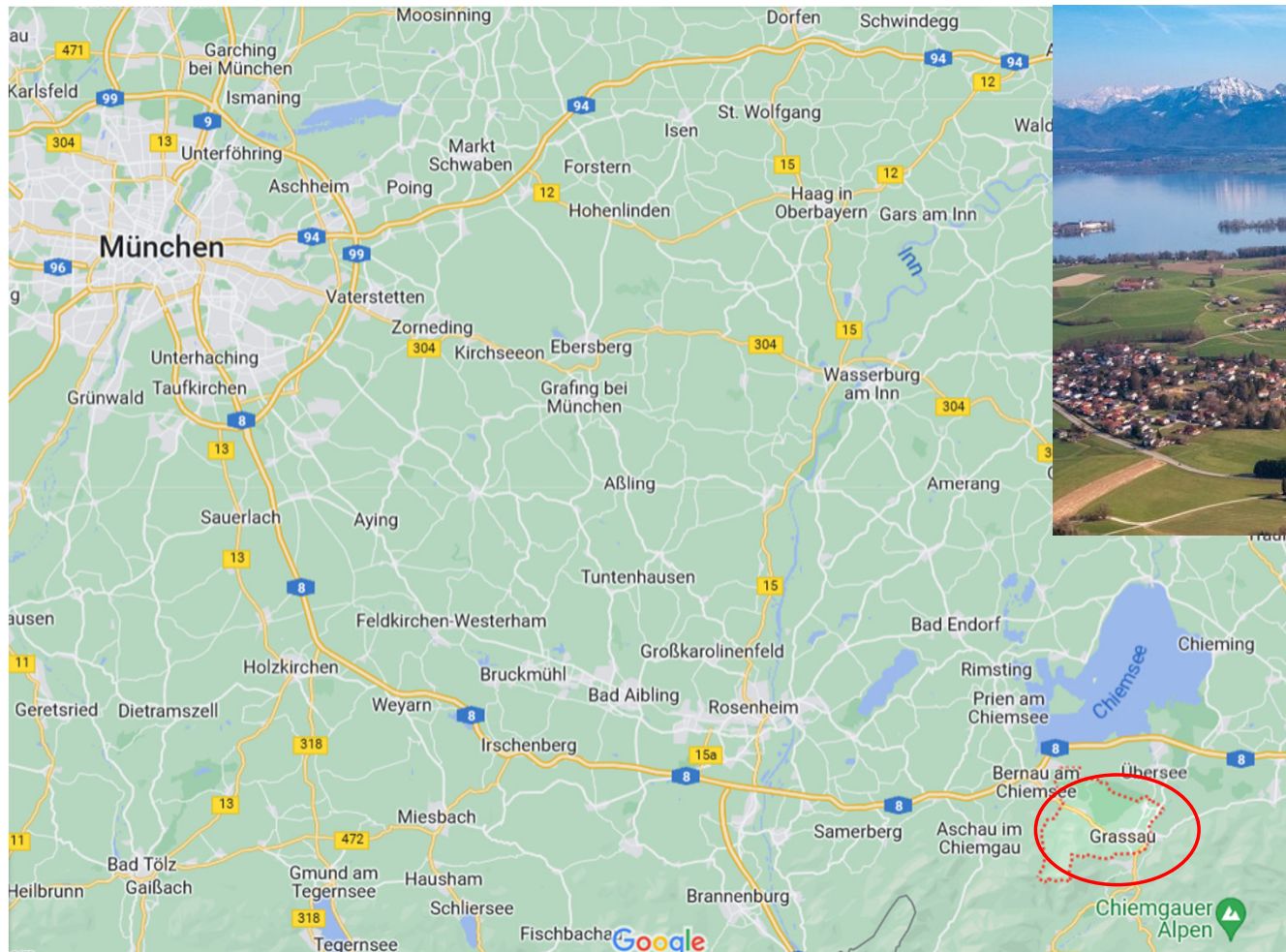 „silent" partner

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Office location

Foto: www.chiemsee-alpenland.de

Hydraulic modelling – our daily business

Basic questions

– How much water to what point of time?   Hydrologie

– Where does the water flow?
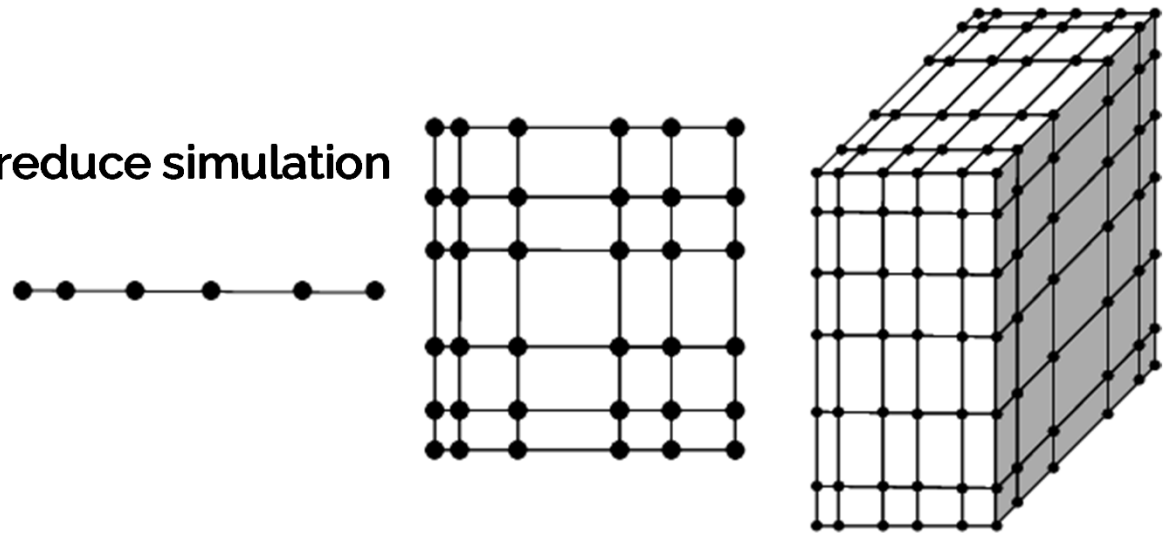– How deep and how fast does the water flow?   Hydraulik
– Are there changes to the flooding situation caused by certain measures?

– How do sediments go with the flow?   Morphologie
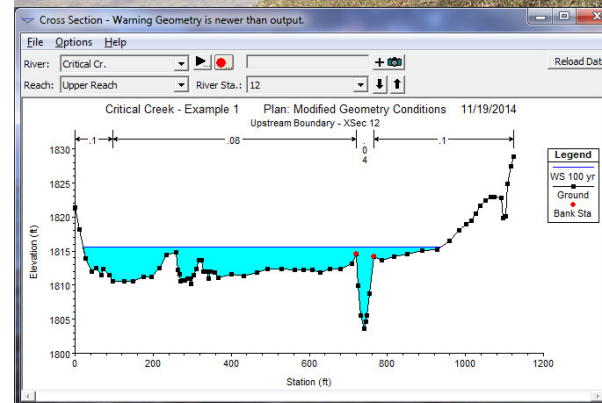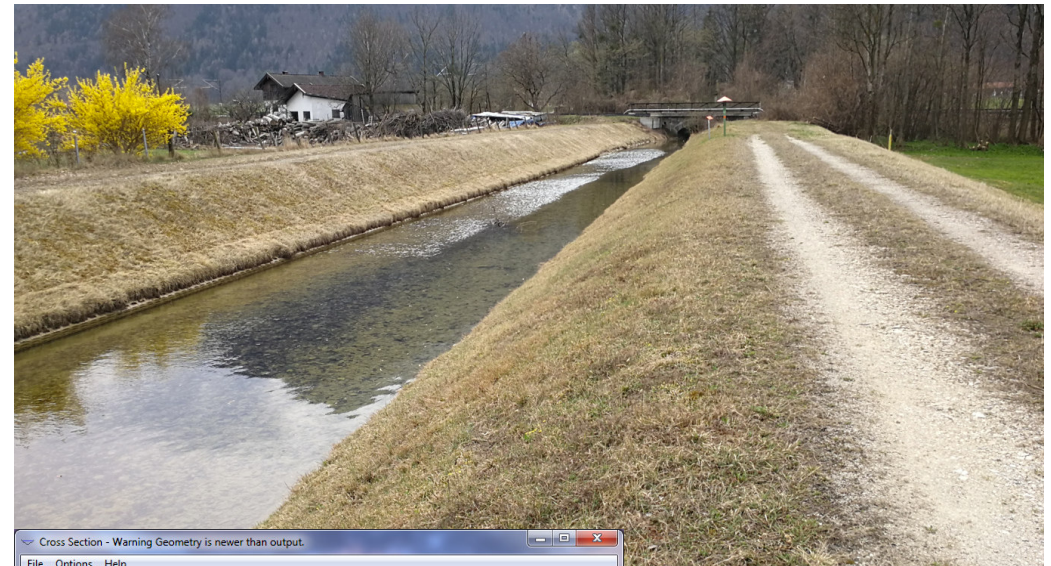
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Hydraulic modelling

– base: Navier-Stokes equations

– Simplyfications of the equations to reduce simulation durations

– 1d-, 2d- und 3d-modelling

Quelle: https://www.researchgate.net/figure/Cartesian-grids-in-1D-2D-and-3D_fig2_301488723
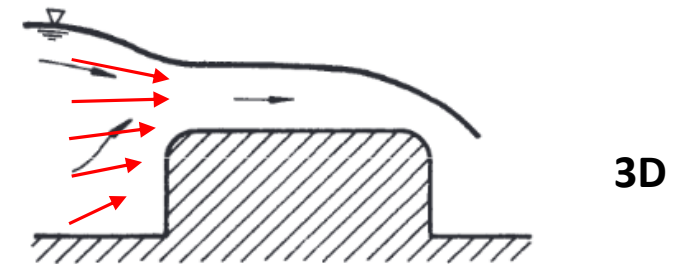
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Hydraulic modelling – 1d

- Profile based modelling

- Result are average values per profile

- Long distance modelling (e.g. river Inn)

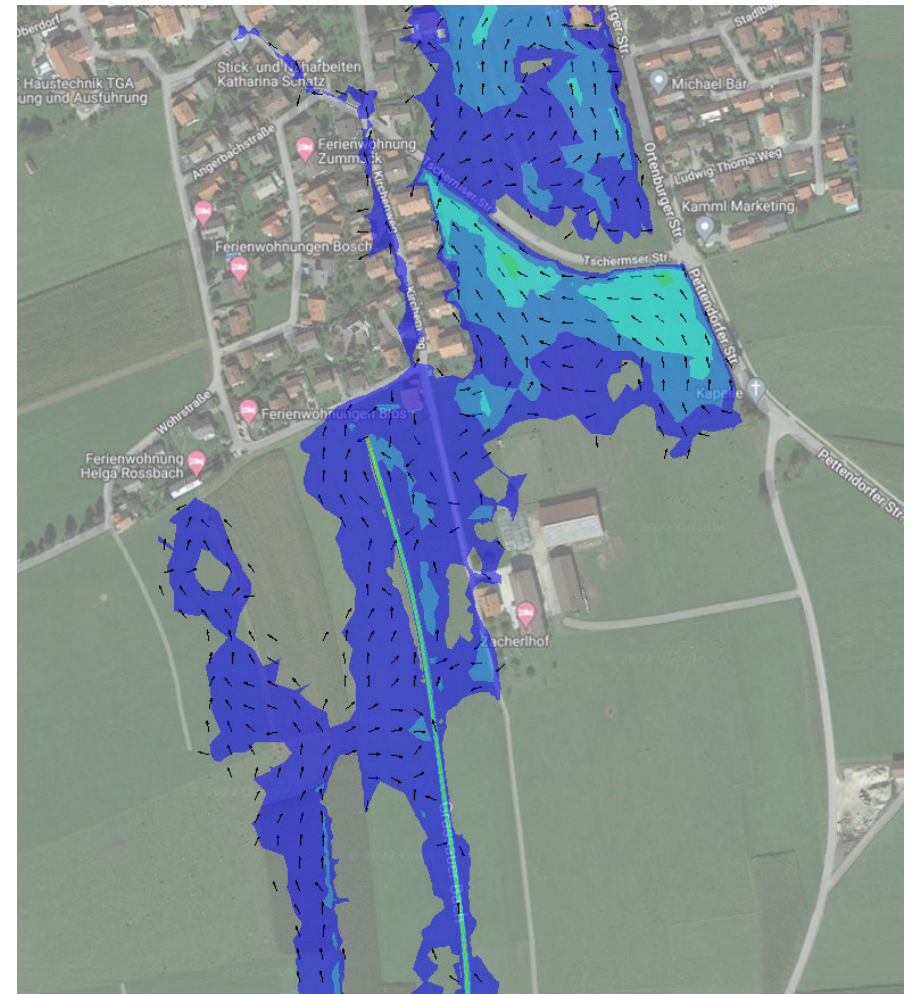- HEC-RAS

- Very coarse

- Very fast

Hydraulic modelling – 3d

— all flow directions and velocity components are simulated and can be analysed

— needed for detailed analysis e.g. of hydraulic structures

— open-foam
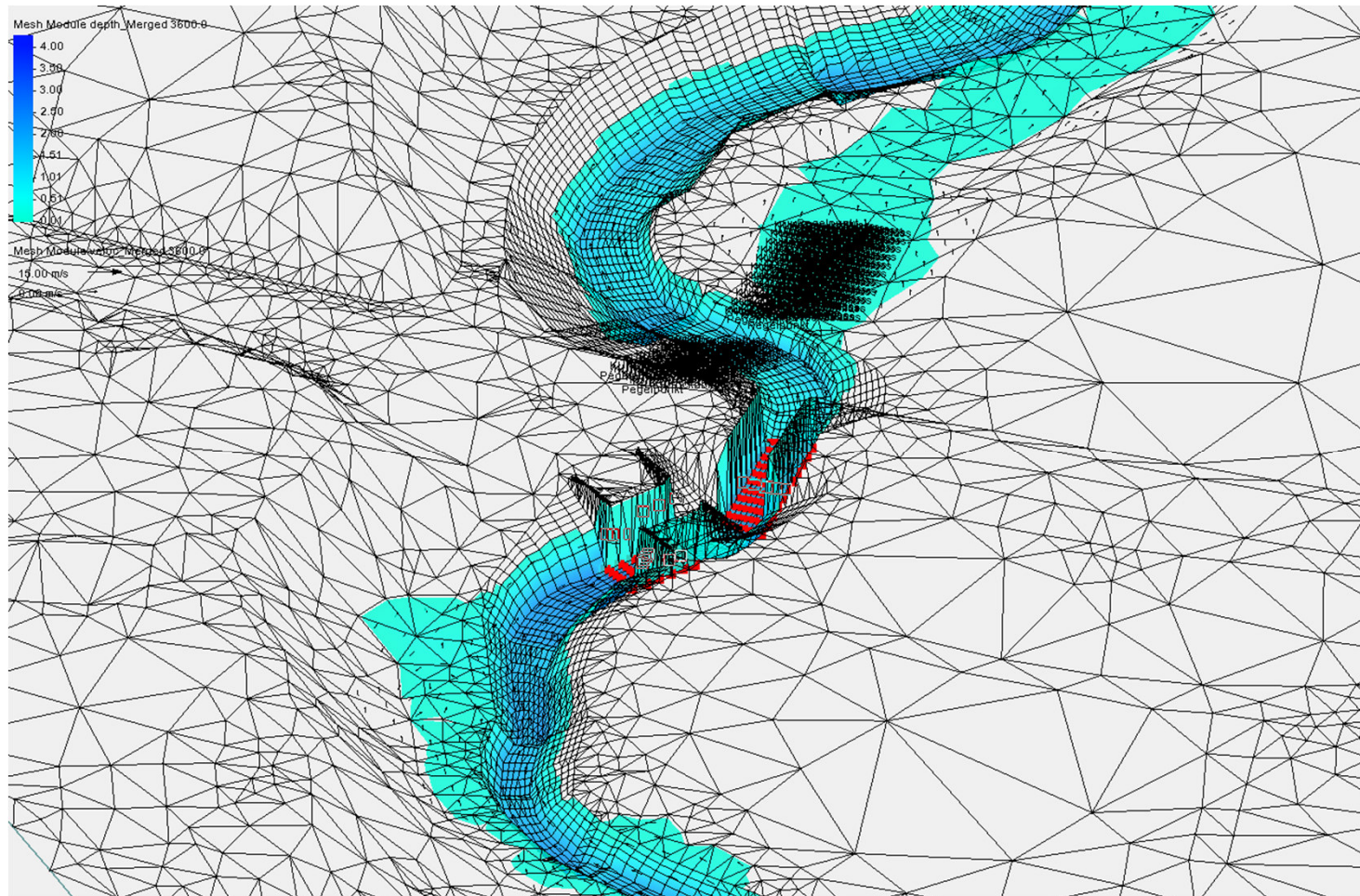
— Very fine

— Very slow

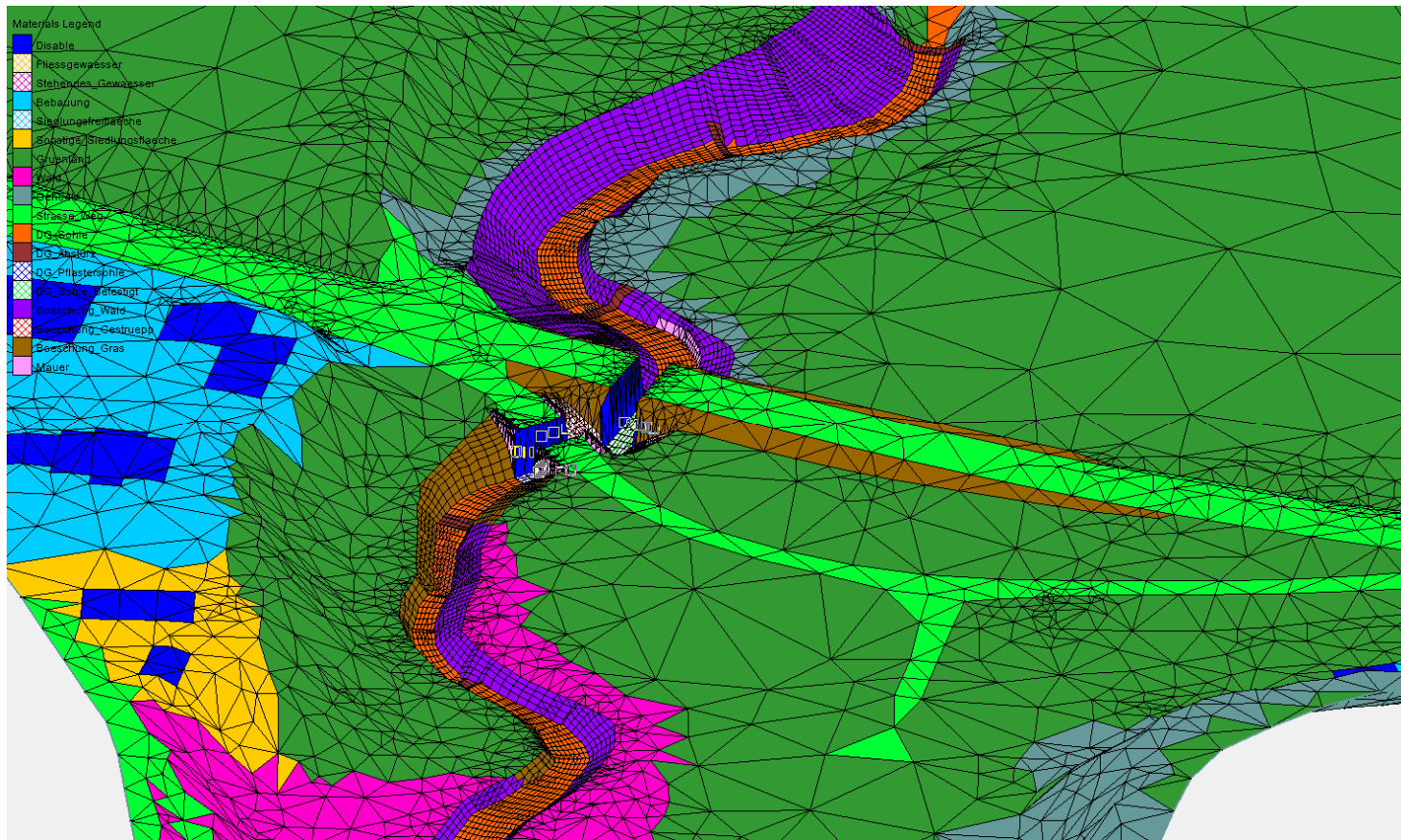
3D

Hydraulic modelling – 2d

- X&Y flow directions and velocity components are simulated and can be analysed

- No dominant velocity components in Z-direction

- Fluvial and pluvial floodplain modelling

- Hydro-as 2D

- medium fine

- medium fast

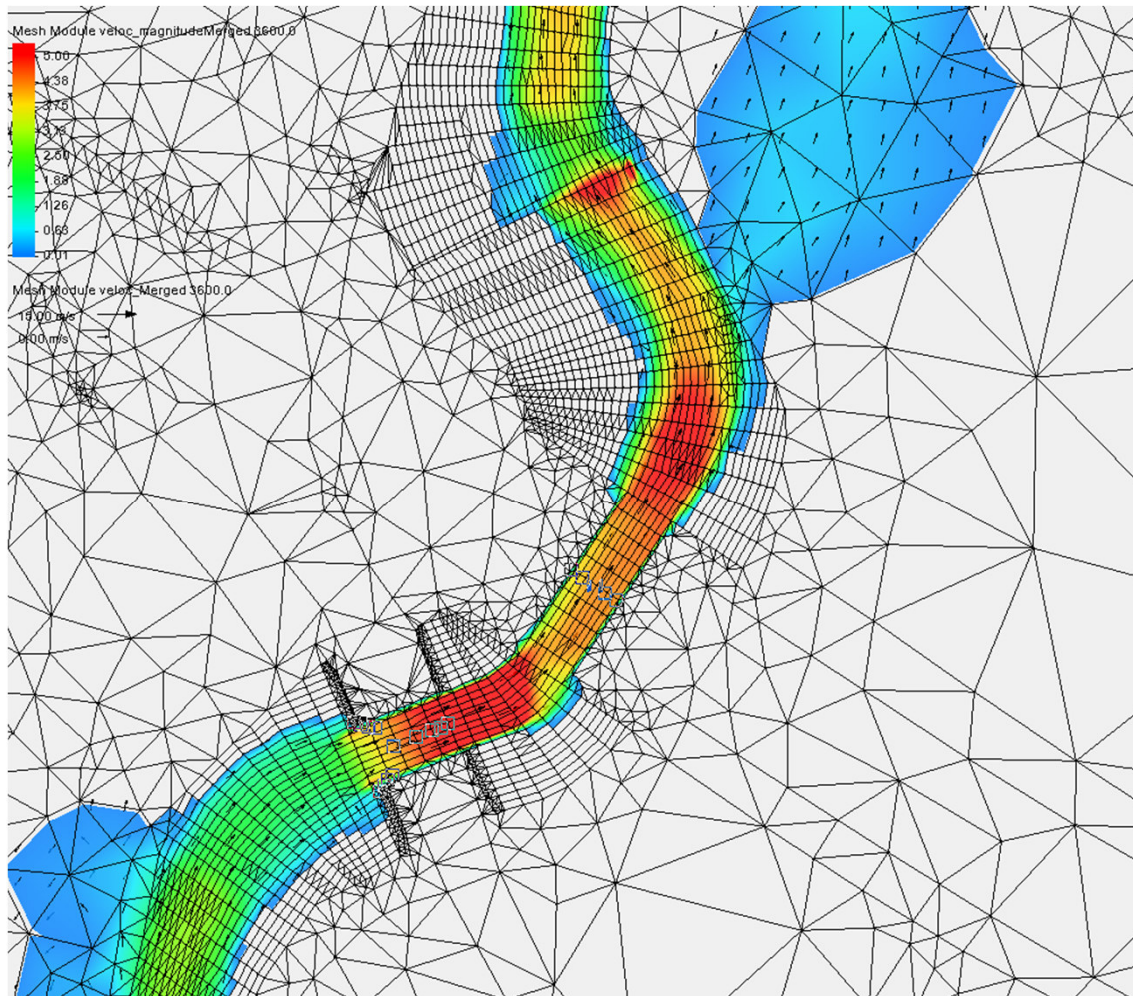- River systems of up to 100 km in one model

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Hydraulic modelling – Hydro_As-2d examples

Numerische Modellierung im Flussbau

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Hydraulic modelling – Hydro_As-2d examples

Hydraulic modelling – Hydro_As-2d examples

Hydraulic modelling – Hydro_As-2d examples

Numerische Modellierung im Flussbau

Hydraulic modelling – 2D Open source solutions

- HEC-RAS: https://www.hec.usace.army.mil/software/hec-ras/
  - 1D and 2D Modelling

- BASEMENT: https://basement.ethz.ch/
  - 1D, 2D and 3D Modelling

- Geoinformation System Qgis: https://www.qgis.org/de/site/

- Hydrologic modelling HEC_HMS : https://www.hec.usace.army.mil/software/hec-hms/

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