MEWS-modelling progress: Ohra reservoir

Tom Shatwell, Muhammed Shikhani

Stakeholder interactions - TFW (Thueringer Fernwasserversorgung)

- Very nice stakeholder interactions with a lot of interest
- Interested in collaboration and “codesign” - tailoring our modelling to their needs

Main questions (“medium term”):

- How will the trophic state (and plankton biomass) react to a change in the phosphorus loading?
- What effect will a change in stratification have?

Variables of interest (influence water treatment costs):

- Plankton, oxygen, iron, mangenese

Expectations:

- Determine whether investments in treatment infrastructure or in catchment management (forestry) are necessary

Master thesis

- We have a new masters student to help with the project:
  Tuan Nguyen Anh (Uni Weimar):

“Determination of phosphorus loads into the Ohra Reservoir under the influence of climate change”

WP3: Work with the data and empirically look at how P loads will change with precipitation and temperature (Tips welcome!)

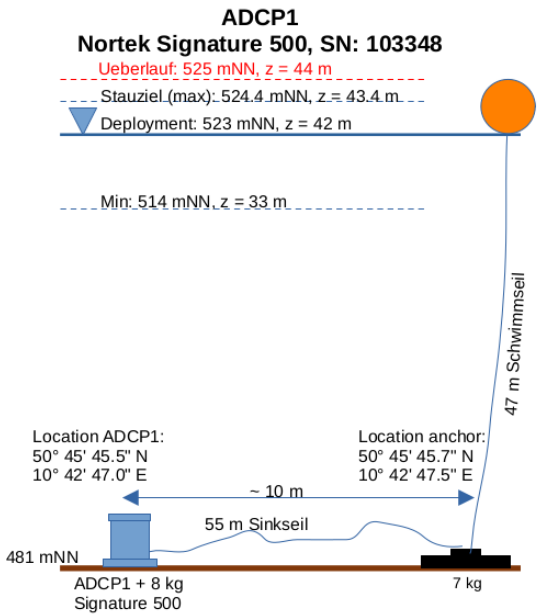
Don’t want to rely on catchment modelling too much

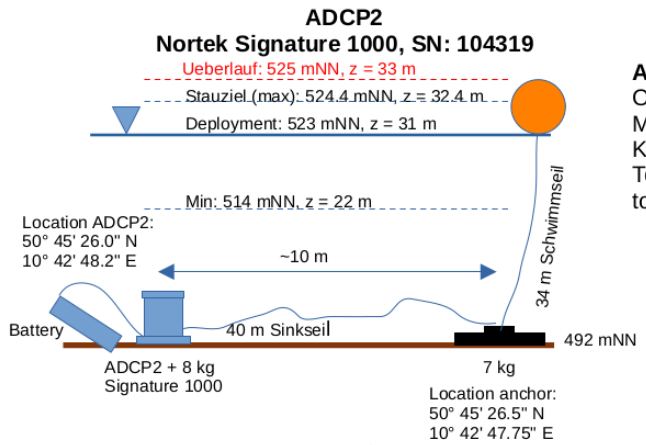
Field campaign

Main reservoir:

- 2 thermistor chains
- 2 ADCPs

- Predams:
- Surface thermistor





ADCP-Aufbau
Ohra-Talsperre
MEWS-Projekt
Kontakt:
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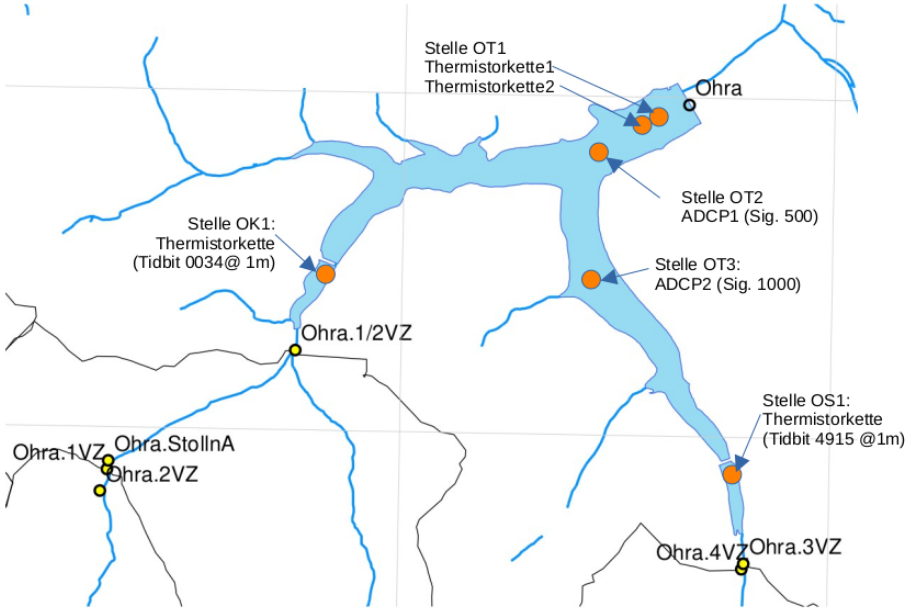
ADCP1 Deployment @OT2:
Start am: 2024-03-14 00:00 MEZ
Gesetzt am: 2024-03-14 13:15 MEZ
Geborgen am:
Stop am:
Tiefe Setzen: ~42 m
Tiefe Bergen:
Staupegel setzen: 523 mNN
Staupegel bergen:
Batterie leer am: 2024-10-10
Speicher voll am: -

ADCP2 Deployment @OT3:
Start am: 2024-03-14 00:00 MEZ
Gesetzt am: 2024-03-14 14:05 MEZ
Geborgen am:
Stop am:
Tiefe Setzen: ~31m
Tiefe Bergen:
Staupegel setzen: 523 mNN
Staupegel bergen:
Batterie leer am: 2025-05-15
Speicher voll am: -



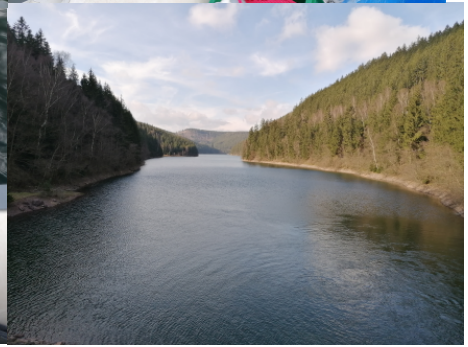
Field campaign

- We installed 2 thermistor chains and 2 ADCPs in the main reservoir and 2 surface thermistors in each predam for model calibration and validation





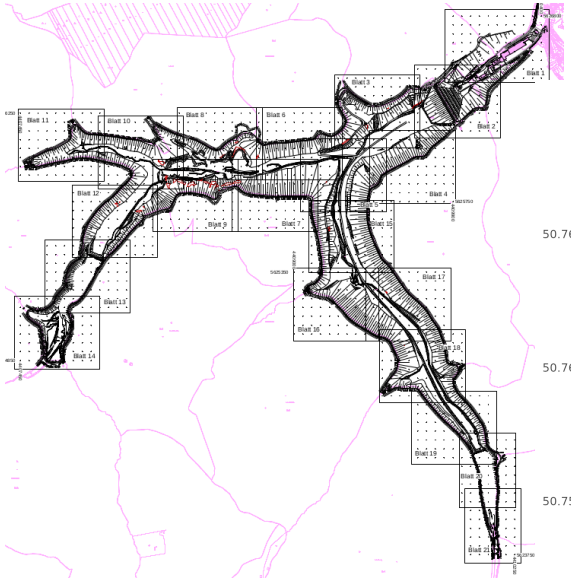


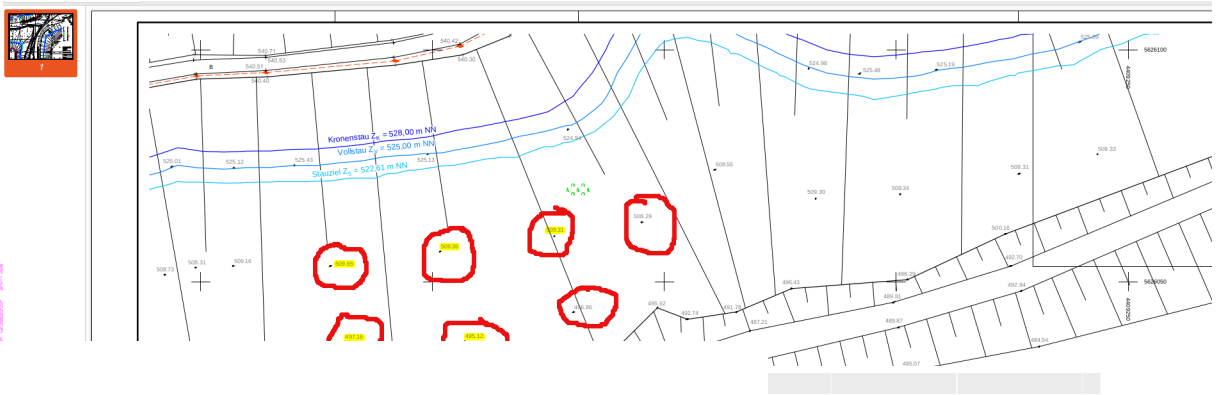



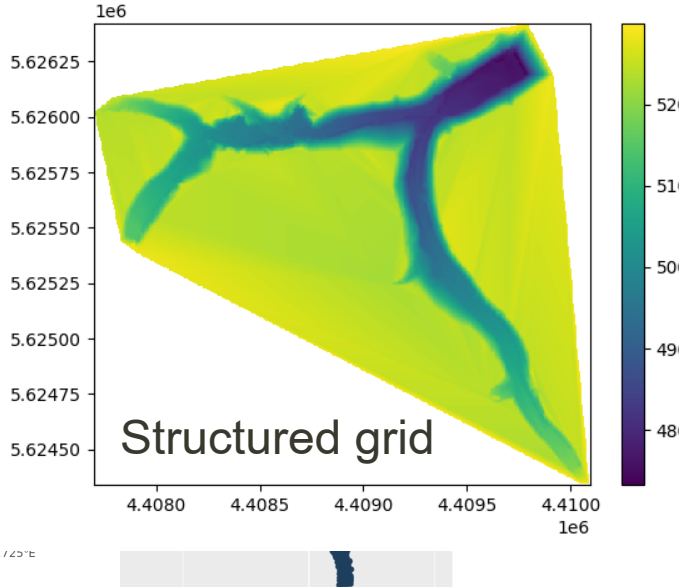
Bathymetry

- Finished!

CAD drawing







Data collection - Meteorology

- ERA5 reanalysis
- ISIMIP3a (GSWP3)
- ISIMIP3b (5-GCM ensemble)
- Local weather

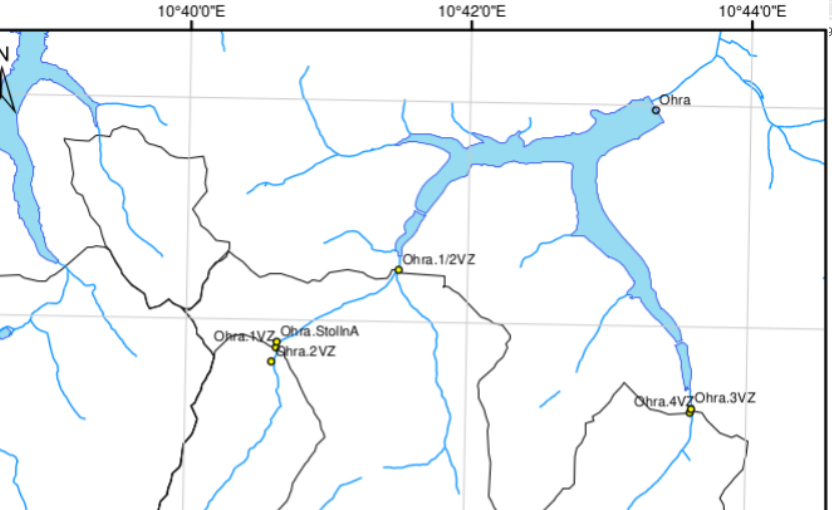
- Still need to compare local met with gridded products

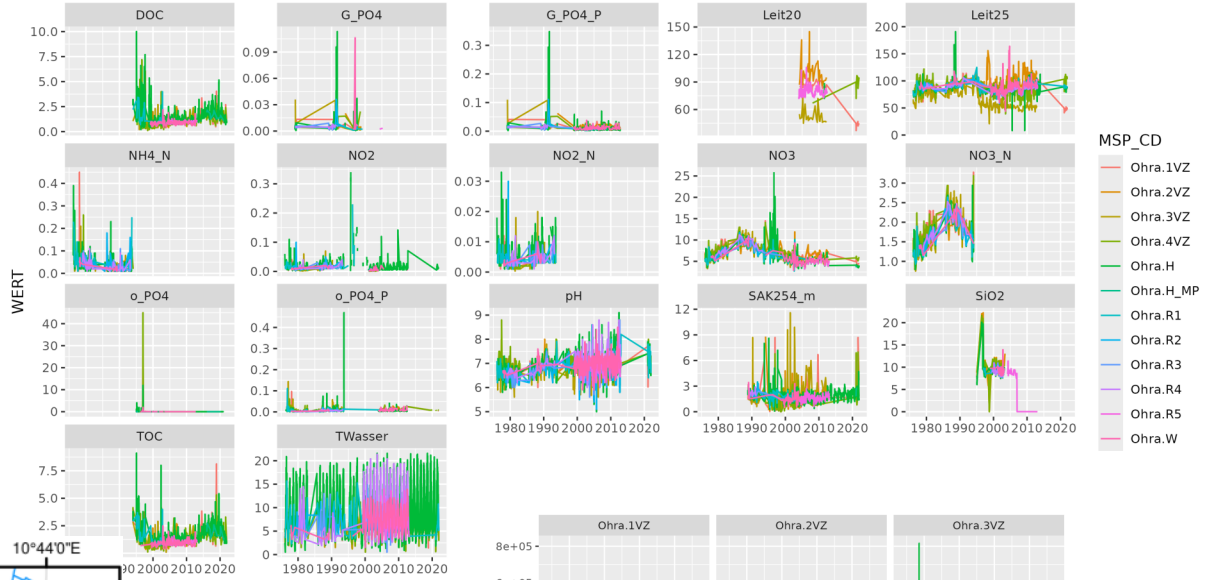
Data collection - in-situ

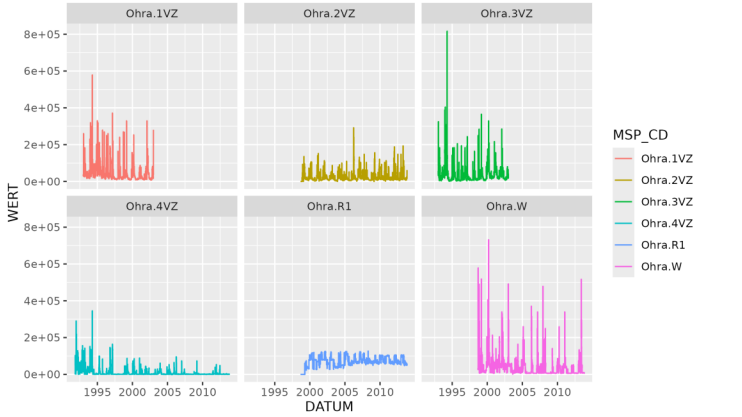
- Inflows and main dam:
- Q, T, SRP, TP, NO3, NH4, DOC, Chla, DO

Sorting out problems with data:

- Sampling locations wrong
- Incorrect conversion of units
- Data incomplete
- –> Go back to original data

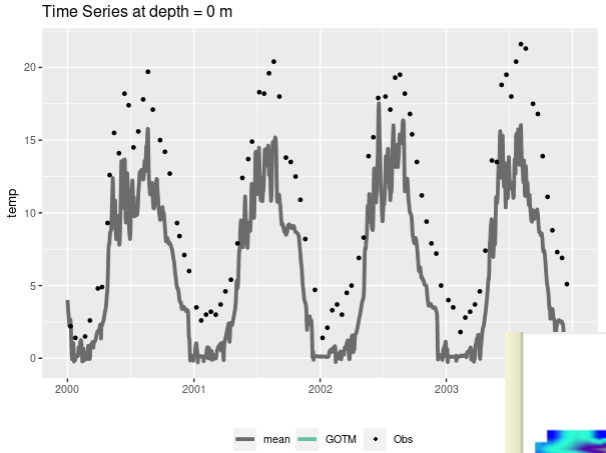


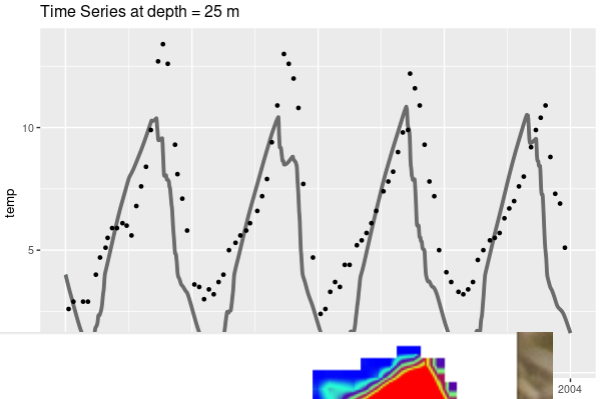


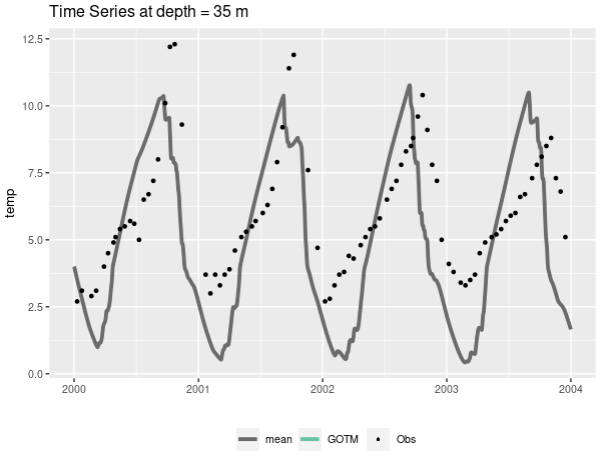


Modelling

- GOTM is running (on ERA5)!







- GETM too?