Bavarian State Research Center for Agriculture
Technical University of Munich

Moving the frontier of comparative erosion measurements under different agricultural schemes

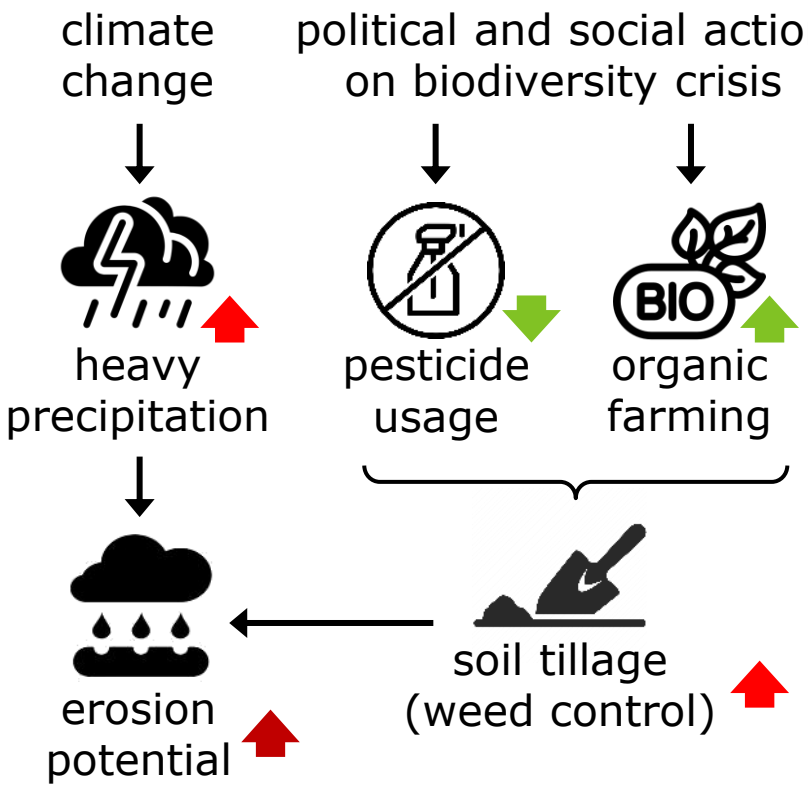
Development of a long-term, high-resolution, 4D erosion measurement site of the Bavarian Agricultural Institute in Lower Bavaria (Germany)

Ebertseder F., **Mitterer J.**, Disse M.

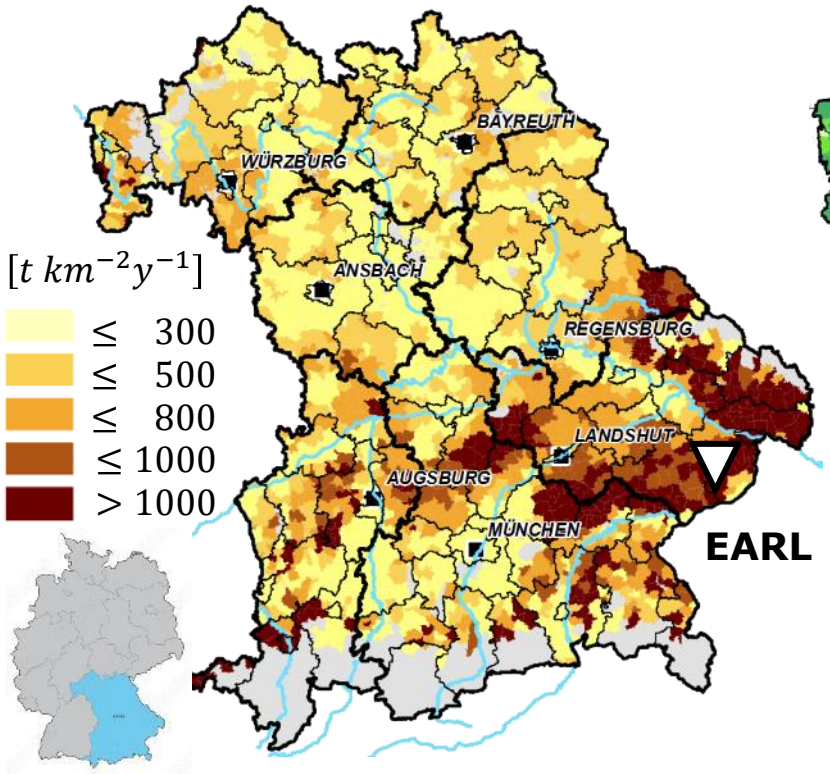
EGU General Assembly 2022, GM 2.1

26th May 2022

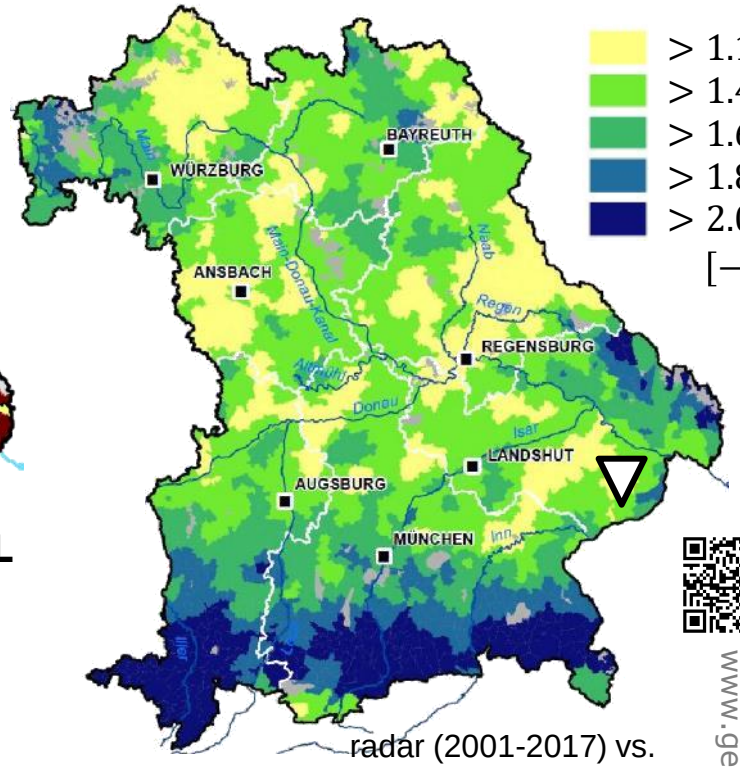
Motivation: Increasing erosion potential



USLE soil erosion potential (2018)



Relative change of the USLE R-factor

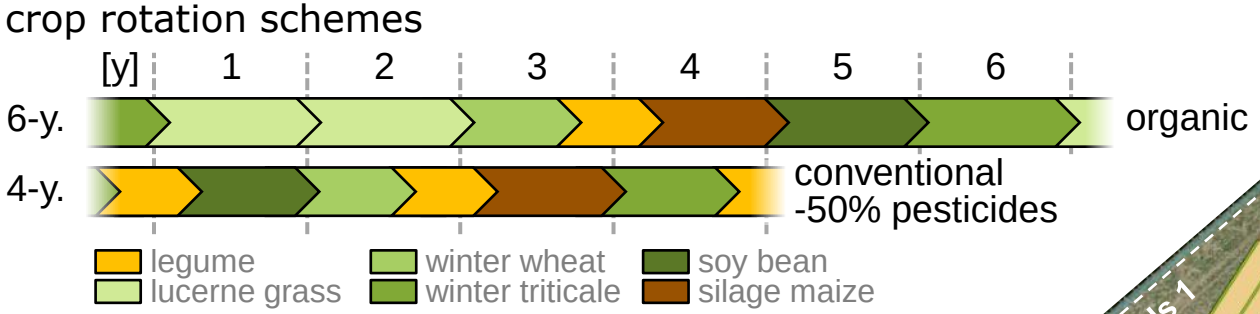


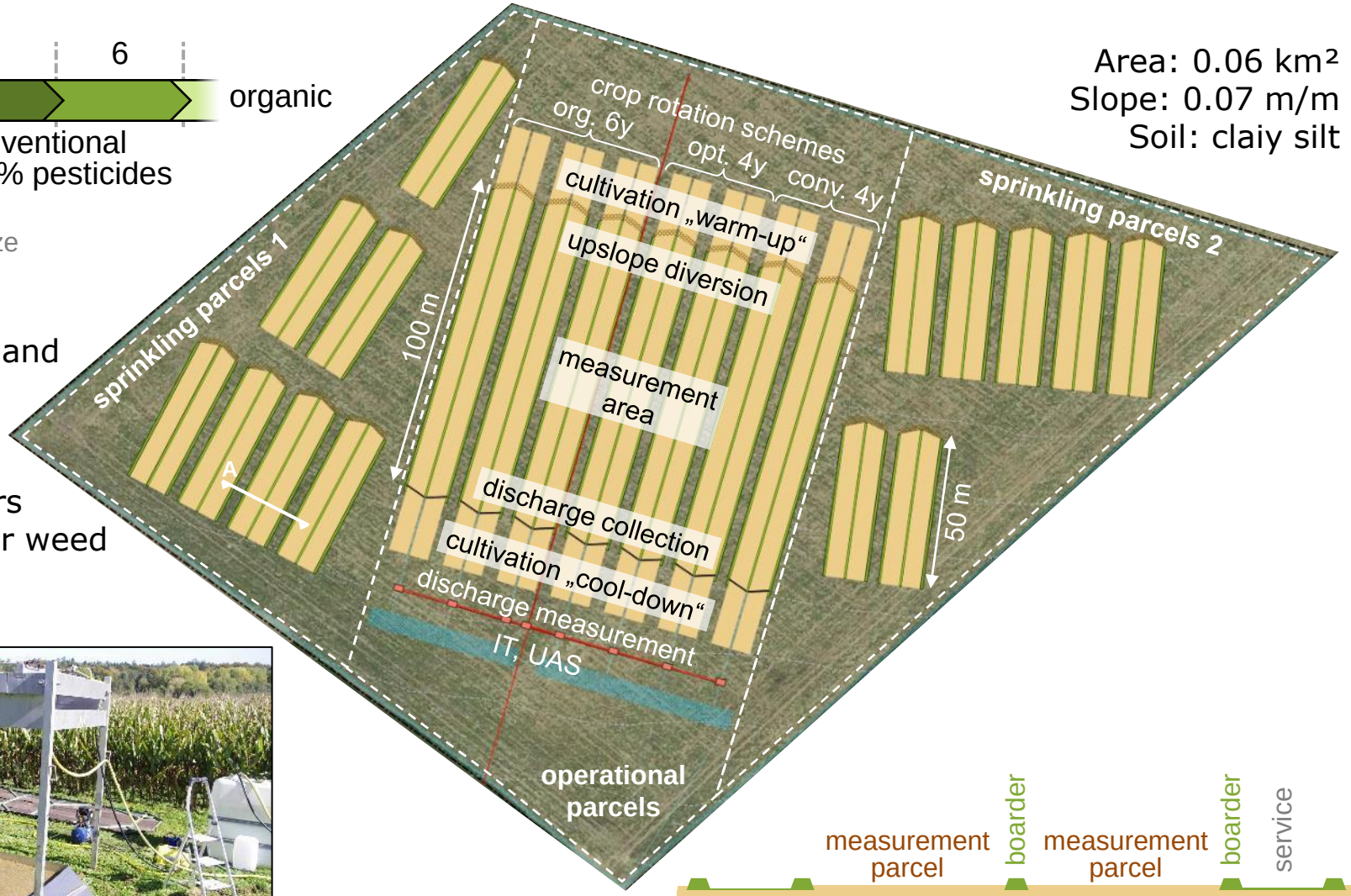
radar (2001-2017) vs. rain gauges (1967-1976)

- How can we reduce soil erosion, nutrient loss, and pesticides simultaneously?
- Long-term (>10a) open-air laboratory to compare erosion potential, water retention, nutrient fluxes and pesticide usage for different crop rotation schemes

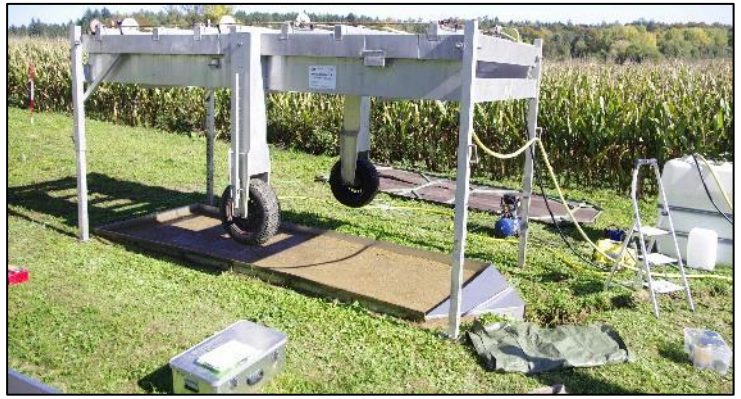
LfL EARL

The Erosion and Runoff Laboratory



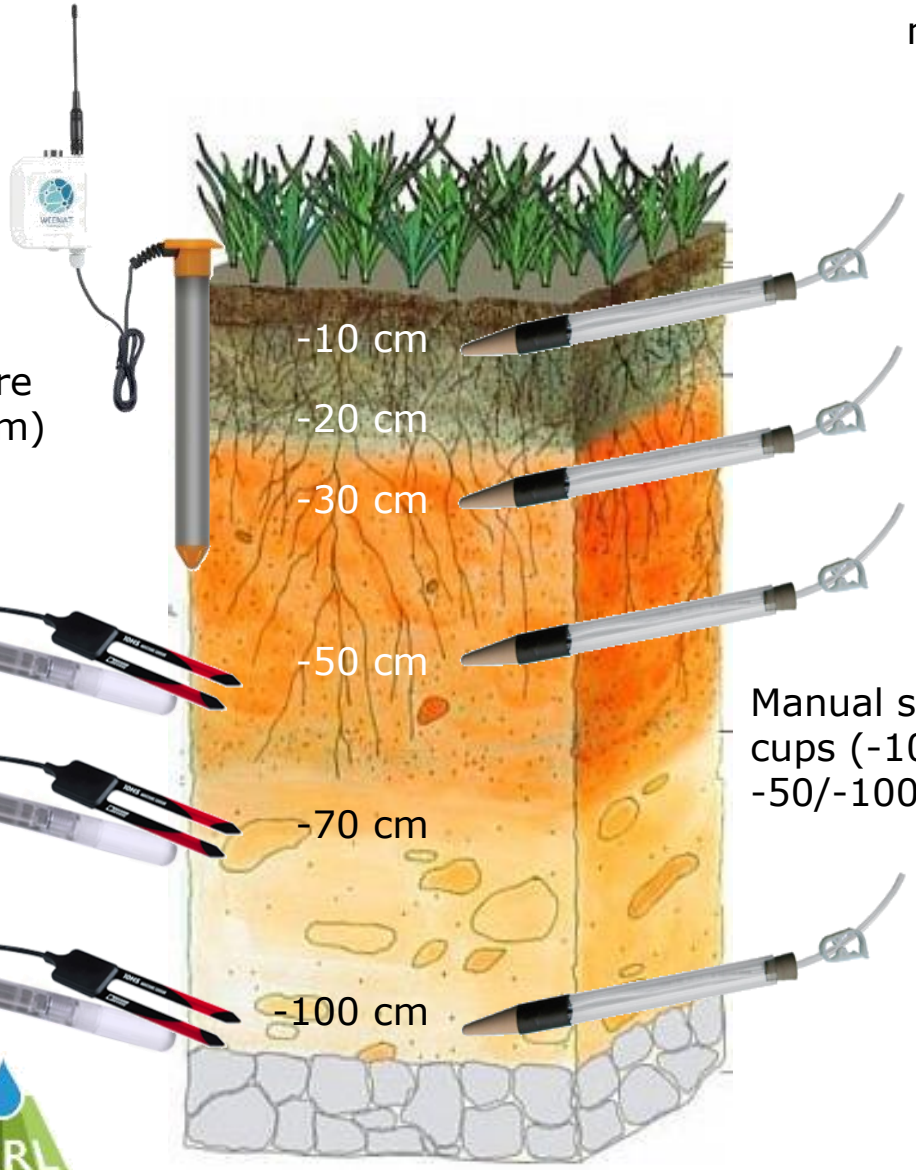


- Ready-to-use parcels with different crops and management
- 2 sprinklers for on-site experiments
- Open web portal for free data download
- Well-established **and** experimental sensors
- Agriculture 4.0 techniques, e.g., robots for weed control



Measurement equipment in each operational parcel

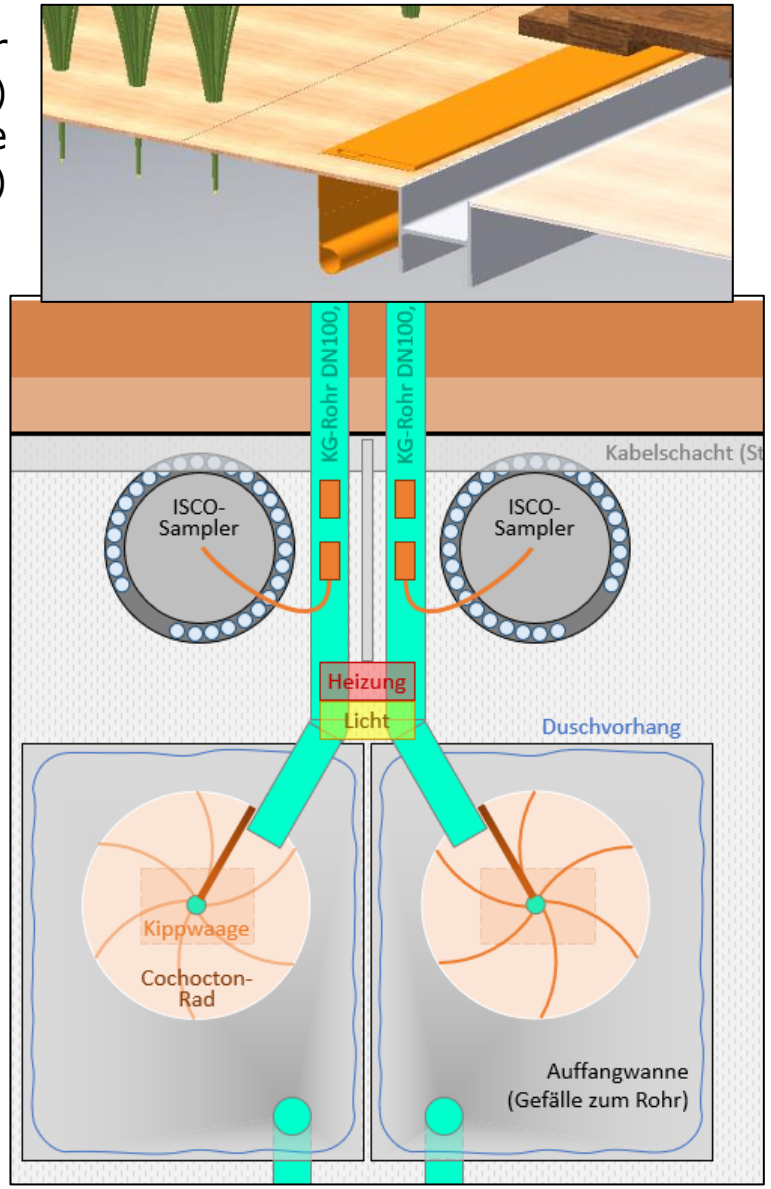
Volumetric soil water content and temperature (-10/-20/-30 cm)



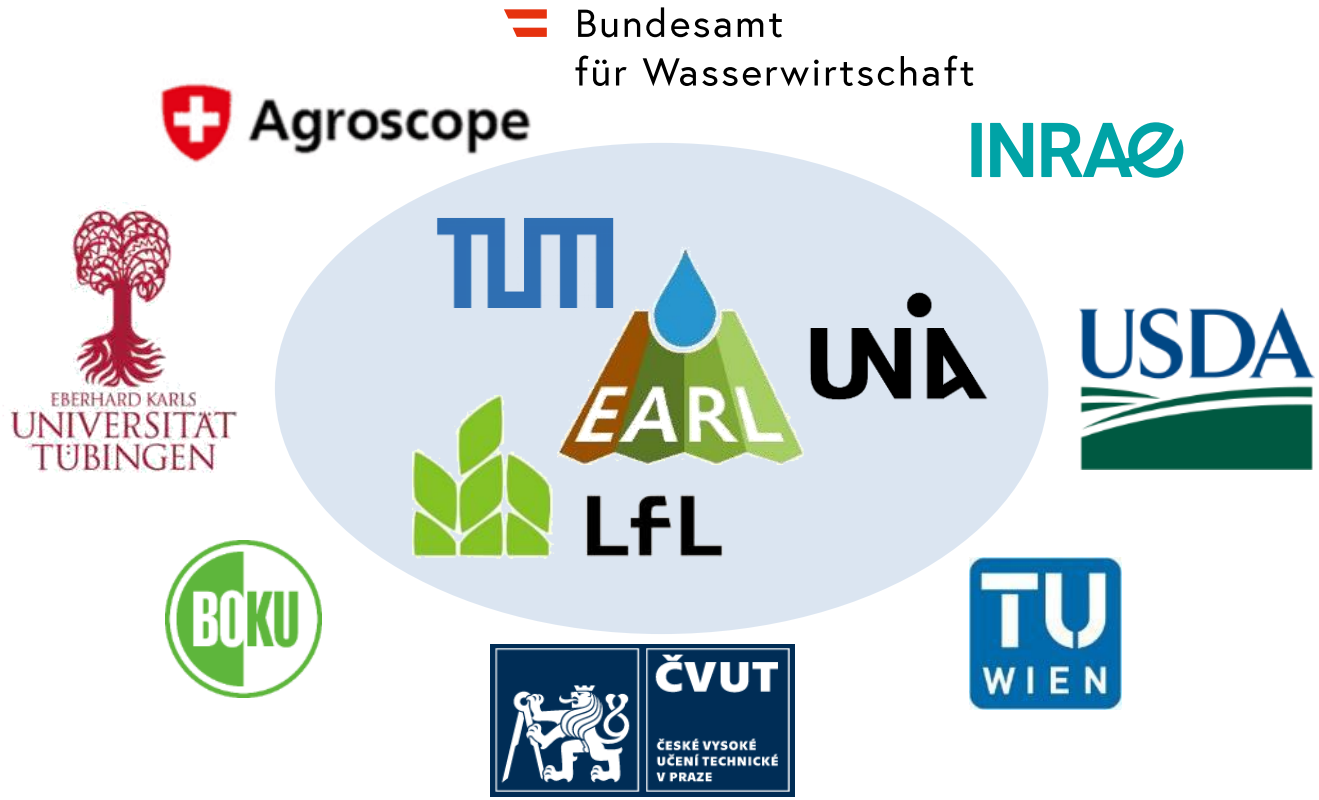
Volumetric soil water content, temperature and suction (-50/-70/ -100 cm)

Manual suction cups (-10/-30/ -50/-100 cm)

meteorology, radar
UAS (VIS, NIR)
discharge
soil(-water)



Building a Scientific Network!



Tag der Hydrologie

EGU General Assembly

ERB-Conference (06/2022)

AGU (12/2022)

ASABE Symposium (01/2023)

…

Scan to Follow!

Webpage

ResearchGate

➧ Interested?

contact: johannes.mitterer@lfl.bayern.de

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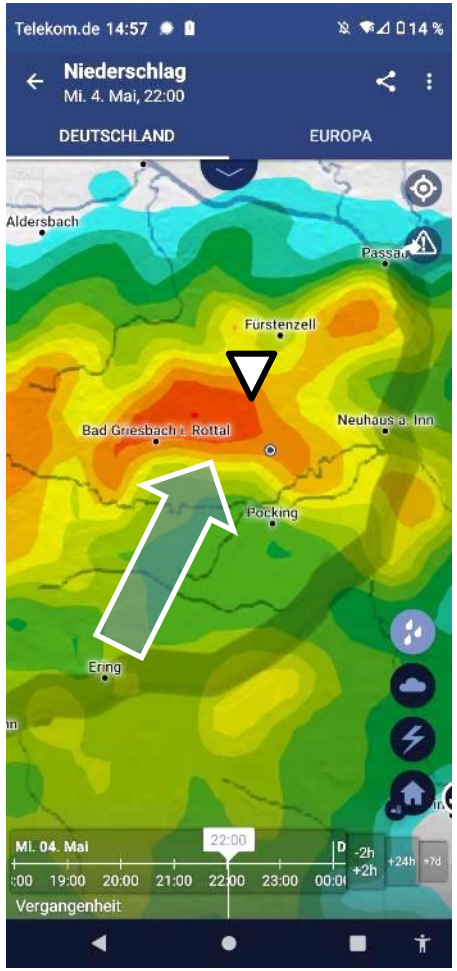
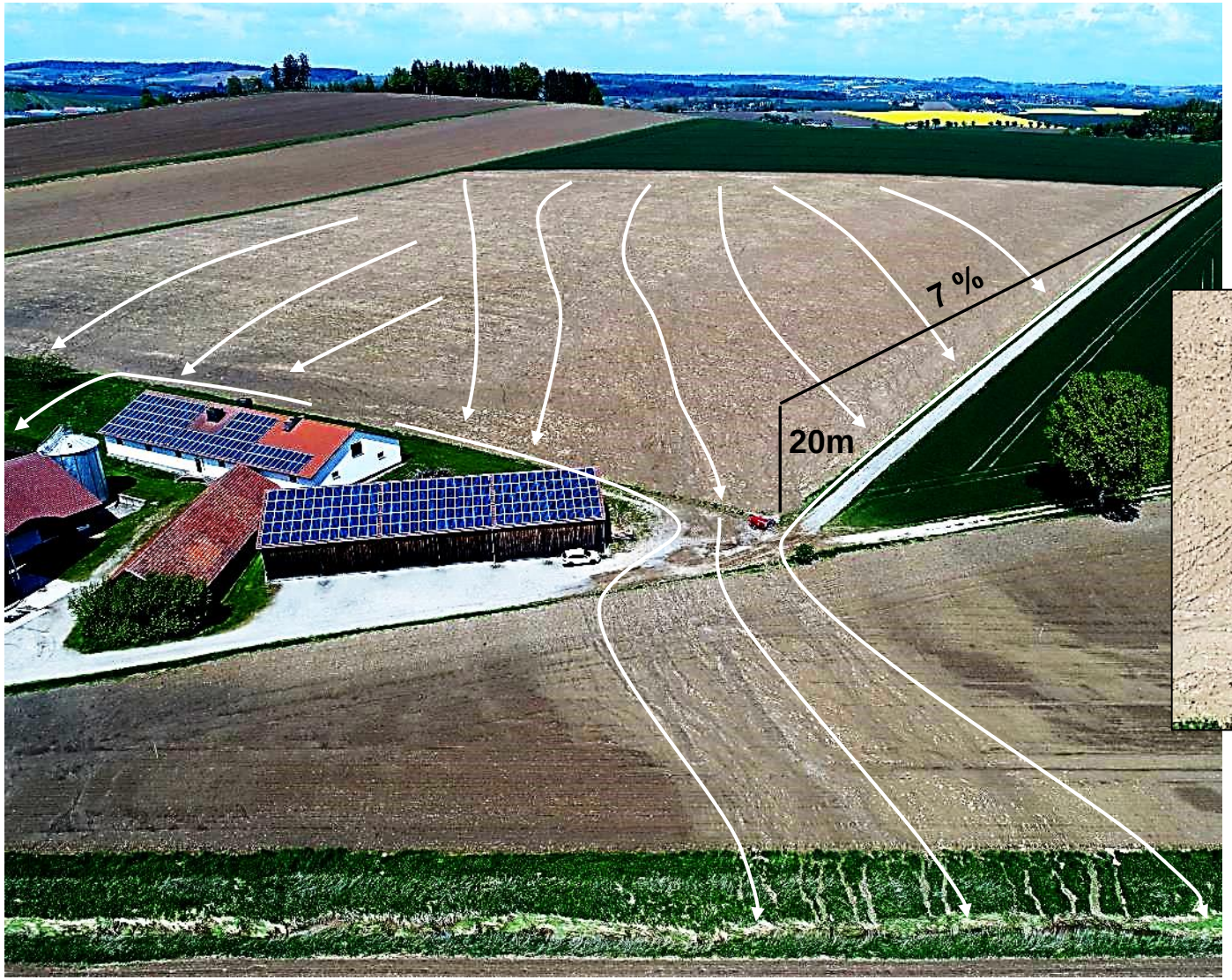
04th May 2022: Proof of location

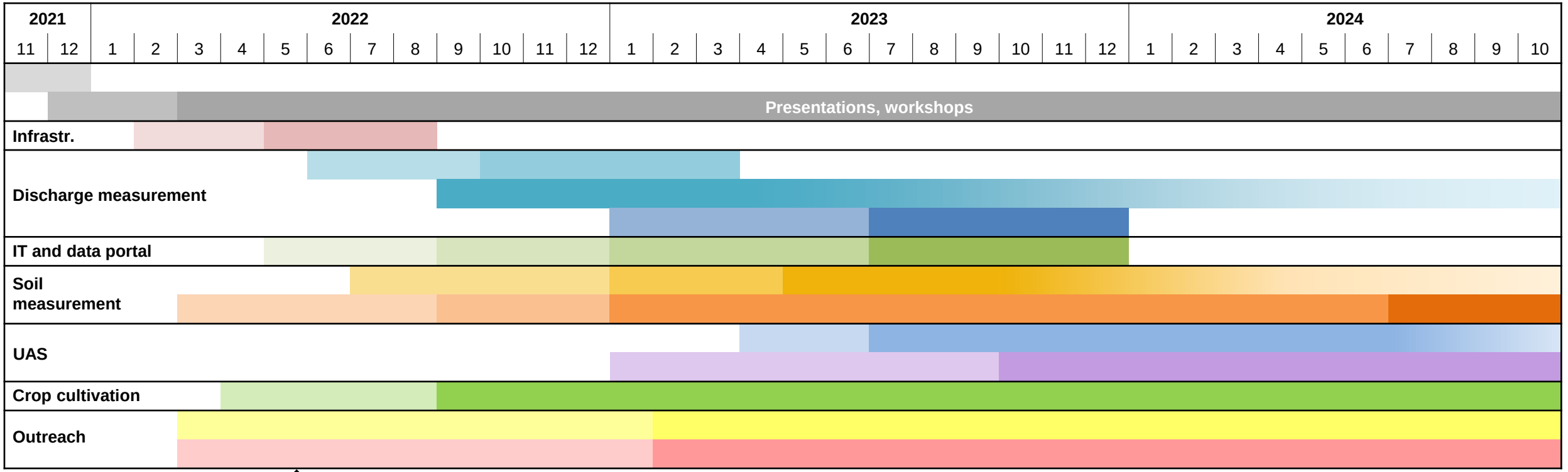


~ 40 mm in 3 h (???)



$USLE$: **3130** $t\ km^{-2}\ y^{-1}$

Time plan


2021
2022
2023
2024
11 12 1 2 3 4 5 6 7 8 9 10 11 12 1 2 3 4 5 6 7 8 9 10 11 12 1 2 3 4 5 6 7 8 9 10
Presentations, workshops
Infrastr.
Discharge measurement
IT and data portal
Soil measurement
UAS
Crop cultivation
Outreach
26.05.
first measurements
test run
fully operational