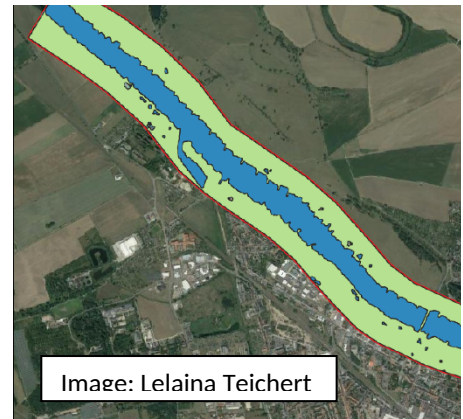


Potential topic for your thesis

Quantification of the water surface area of large rivers from satellite images

Background

The surface area of rivers is a major determinant of the exchange of gases and energy between water and atmosphere. Water level fluctuations lead to permanent changes of the river surface area. This affects greenhouse gas emissions from streams not only by reduced surface gas emissions but also by high CO₂ emissions from dry areas¹. Previous work had shown that it is possible to quantify the surface area of the Elbe, Germany's third largest river, from Sentinel 2 satellite images.



Workplan

Central objective is to develop a workflow which allows for an automatized quantification of the surface of both water and dry sediments of the Elbe river from Sentinel images. The workflow shall be used to establish a time series of the rivers water surface based on continuously available data on the water level. An analysis of the transfer to other rivers is intended.

Experiences with R and basic remote sensing and GIS skills are required as well as the willingness to handle large amount of data.

The remote sensing work will be supervised by Prof. Hanna Meyer (Remote Sensing and Spatial Modelling Research Group), the biogeochemical background by Dr. Matthias Koschorreck (Helmholtz Centre for Environmental Research – UFZ).

Further information:

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¹ Mallast, U., Staniek, M., and Koschorreck, M.: Spatial upscaling of CO₂ emissions from exposed river sediments of the Elbe River during an extreme drought, *Ecohydrology*, 13, ARTN e221610.1002/eco.2216, 2020.