

# Iron and phosphorus cycling in a coastal sediment and a rice paddy soil under flooded conditions

Master's thesis topic with the Soil Chemistry Group



## The Master's thesis project

**Samples:** An acidic rice paddy soil from Thailand and a coastal sediment from Northern Germany

**Objective:** Understand the **fate of iron and phosphorus** in a rice paddy soil and a coastal soil **under flooded conditions**

**Approach:** Analysis of solid and aqueous samples from a soil incubation experiment. With our help, you will define your target questions and design a corresponding analysis setup.

**Timing:** Start in January/February 2020

## Background

Phosphorus (P) is often a limiting nutrient in aquatic and terrestrial ecosystems. However, excessive P acts as a contaminant, frequently leading to eutrophication. Under oxic conditions, P is associated to iron (Fe) oxide minerals such as ferrihydrite. During flooded periods, reducing conditions in the soil lead to reduction/dissolution of Fe oxide minerals. The previously sorbed P is released into solution, potentially causing eutrophication. However, often less P is released than expected based on the amount of iron oxide dissolution. Possible reasons are that P is resorbed to other particles in the soil or is built into minerals (Ca or Fe-containing minerals) forming during flooded conditions. These processes were mainly studied in model experiments without the presence of soils/sediments.

We aim to understand the fate of Fe and P in the presence of soil/sediment under flooded conditions. This contributes to a better understanding of Fe-associated P dynamics in redox active soils, to develop appropriate management techniques and protect vulnerable adjacent ecosystems.

***Are you interested in iron and phosphorus biogeochemistry in soils?***

***Contact us!***

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