Farmed organic soils – greenhouse gas hotspots in Europe

- Peatlands store a major share of the world’s soil organic carbon and are widespread in European countries.
- 80% of Europe’s peat soils have been cultivated for agricultural use in the past centuries.
- Drainage is a precondition for classical agricultural production on organic soils, but fosters soil degradation, land surface subsidence and peat mineralization.
- Managed organic soils are the largest sources of greenhouse gas (GHG) emissions (e.g. CO₂ and N₂O) from agriculture in peat-rich countries.

Wet management systems – benefit from synergies
- Controlled drainage and active water management are climate smart options for agricultural production on organic soils under current and future climatic conditions.
- Wet organic soils can be used as risk insurance for food security in dry periods while active water and soil management will improve trafficability.
- Wetness-adapted crops with stable yield quality and quantity are needed to meet requirements for food, feed and bioenergy.
- Proof by on-farm experiments and historical evidence of successful wet management systems is needed.

Introduction

Project aims & tasks
Derive the knowledge – spread the news

The CAOS project aims to generate the knowledge to design climate smart agricultural systems for organic soils adapted to the diverse regional conditions of Northern and Central Europe. CAOS will provide and distribute evidence that active management aiming at a better control of groundwater levels, improved trafficability and alternative high productivity crops improves yield stability and quality as well as resilience to climate change while providing strong GHG mitigation and improved soil and water quality.

Project tasks – from ecology to economy
- Combining historical agro-economic data with soil quality and water table observations to identify historical evidence of climate smart soil and water management.
- Field experiments with soil and water management testing different techniques of controlled drainage and subirrigation combined with GHG measurements.
- Economic and policy analysis with focus on management options allowing the continuation of agricultural production.
- Quantity and quality analysis of harvested biomass used for food, feed or energy purposes.
- Integration of process-based water dynamic and crop growth models, statistical models of GHG mitigation and water quality and economic models to synthesise results and to evaluate adaptation potential under climate change scenarios.
- Bi-directional involvement of stakeholders and practitioners throughout the entire project to facilitate knowledge exchange across countries.