NEWSLETTER

SeaSoil Project

CONFERENCES

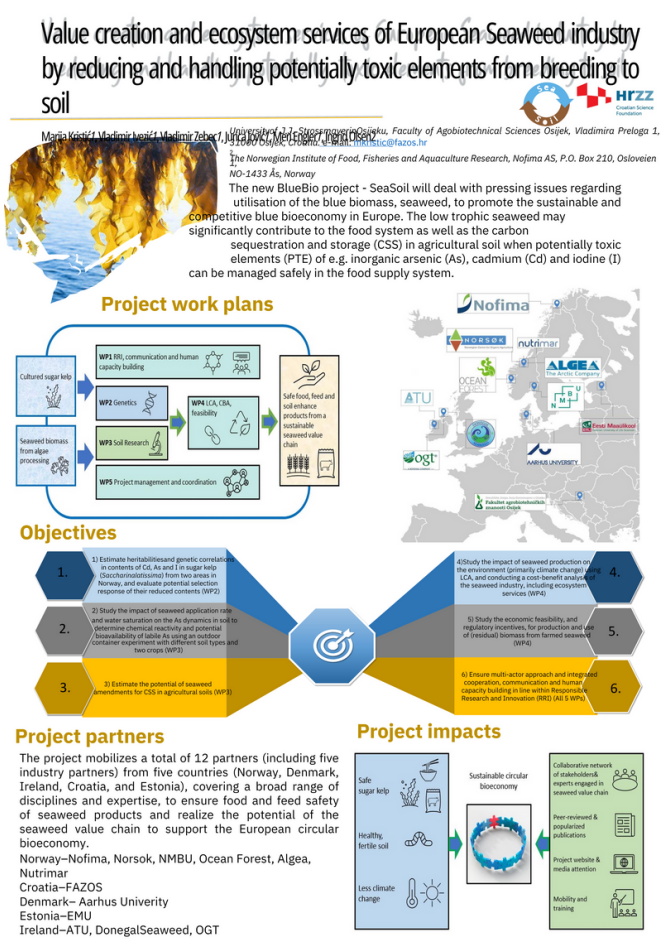
- 1st International Scientific Conference Agricultural Challenges to Climate Change“, which was held in Osijek (Croatia) in the period 19 – 22 September 2023. Where we presented the SeaSoil project
- 59th Croatian & 19th International Symposium on Agriculture, in Dubrovnik, from 11th – 16th February 2024 where FAZOS presented some preliminary results of soil respiration when seaweed is applied on Fluvisol (soil that is low in organic matter).

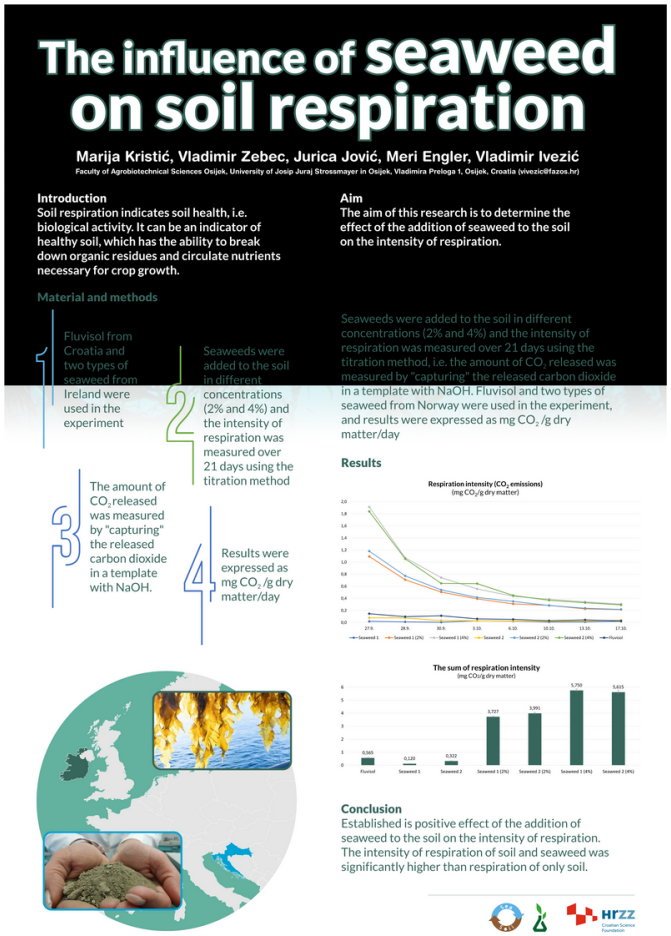
SEASOIL UPDATES

Karin from EMU presented the results of soil sequestration in December 2023, with a poster at a local conference "XIV Soil Day – Soil Has a Voice," organized by EMU and the Estonian Soil Science Society. The focus of her presentation was the initial findings from our soil C sequestration experiment. She presented the results obtained over a short period (14 days), where they assessed the impact of seaweed on soil pH, content of soil carbon, and plant-available nutrients and representation of how the parameters changed following the incorporation of seaweed into the soil.

At FAZOS in Croatia, we have begun some preliminary soil respiration testing. We will study the soil respiration of five distinct seaweed materials blended with four different soils (M1,M3,M4,M5): AF+, AF-, Fucus, Ascophyllum granular, and Fucus granular. Except for soil M2, the soil is the same as that of Estonia. We will only have one combination per month due to the large number of combinations. We have tested Ascophyllum and Fucus granular so far on one Croatian soil type (Fluvisol – M4). Using the titration method, which measures the quantity of CO2 emitted from the soil and seaweed mix by "capturing" the released carbon dioxide, seaweed material was added to the soil at two different concentrations (2% and 4%). The intensity of respiration was monitored over the course of 21 days. soil respiration is measured but it is caused by microorganism activity.

Norsøk updates for the growing season of 2023, oats (Avena sativa L.) were grown in wooden frames (1 m2) with various rates of residues of chemically extracted rockweed (Ascophyllum nodosum) and toothed wrack (Fucus serratus + Fucus vesiculus) extracted by water. The rates were high and affected negatively on plant growth, however the plants survived, and produced ears for harvesting grains in all treatments. Soil and plant material was sampled regularly. Soil samples were analysed at NMBU by diffusive gradient thin film technology (DGT), and plant samples for minerals (N, P, K, Ca, Mg, S) and potentially toxic elements (PTEs; As, Cd). We want to study the risk of plant uptake of PTEs with very high applications of seaweed material to soil. A visiting Postdoc from FAZOS, Marija Kristic, participated in the sampling. The experiment will be repeated in 2024.





use of seaweed, a blue biomass, to support Europe's competitive and sustainable blue bioeconomy. When potentially toxic elements (PTE), such as inorganic arsenic (As), cadmium (Cd), and iodine (I), can be safely managed in the food supply chain, low trophic seaweed may considerably contribute to the food system as well as the carbon sequestration and storage (CSS) in agricultural soil. The objectives of this project are to: a) calculate genetic correlations and heritabilities in the contents of Cd, As, and I in sugar kelp; b) investigate how seaweed application rate and water saturation affect the dynamics of As in the soil to ascertain chemical reactivity and possible bioavailability of labile As; and c) calculate the potential benefits of seaweed amendments for CSS in agricultural settings.

The biological activity, or soil health, is shown by soil respiration. Given its ability to break down organic wastes and distribute the nutrients required for crop growth, it may serve as a sign of good soil. Finding out how adding seaweed to the soil affects respiration intensity is the goal of this study. The titration method was used to assess the respiration intensity over a 21-day period after seaweeds were put to the soil at two different concentrations (2% and 4%). This approach involves "capturing" the released carbon dioxide in a template using NaOH in order to determine the amount of CO2 emitted. The experiment employed fluvisol and two varieties of Norwegian seaweed, and the outcomes were reported as mg CO2/g dry matter/day. In a statistical

(Posters can be found at https://www.seasoilproject.eu/posters)

Ingrid.Olesen@nofima.no https://www.seasoilproject.eu Nofima, Ås, Oslo, Norway.