environments

Editorial

Dynamics of Vegetation and Climate Change

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A set of climatic events that have occurred throughout the Paleolithic ages and all the way up to the present day have led to profound changes in the biosphere, such as periods of glaciation and global warming. In response to these changes, natural systems change. Some species increase their area of distribution, while others decrease theirs, or they end up disappearing. These strong changes are responsible for environmental quality; they influence, and are influenced by, human communities. In this context, knowledge of the potential natural vegetation is key to understanding global changes and identifying possible treats. The value of bioindicator plants is clear, as they can be used as predictive tools to interpret the landscape, and therefore analyze the evolution of vegetation cover, as well as the types of land use that are more suitable to each portion of territory.

This Special Issue on "Dynamics of Vegetation and Climate Change" presents advances related to changing the behavior of plant species to soil and climate conditions in various parts of the globe. Both at the agricultural level and in the conservation of native flora, several impacts are identified that demonstrate that political power must contribute to a better integration between society, economy, and the environment.

Ngoy and Shebitz (2020), in "Potential Impacts of Climate Change on Areas Suitable to Grow Some Key Crops in New Jersey, USA", project the effects of global climate change on New Jersey plantations, where it is expected to have a negative effect on the suitability of many economically valuable crops today, moving into the marginal or very marginal category [1]. This study predicts an increase in 6 °C and 3 °C in the presented scenarios, with the consequent melting of snow during the spring causing flooding in the rivers, which will dry the soil during the summer and autumn, bringing drought during the growing season. Although a similar amount of precipitation is expected throughout the year, its distribution will change, causing flooding in the months of February and March, and a dry season may be evidenced in New Jersey (USA).

Moreover, at the level of the Mediterranean, strong climate changes and changes in the patterns of the distribution of natural vegetation cover are expected, which could impact on human activities, such as tourism sustainability. Nunes et al. (2021) identified the main impacts on the natural environment of the Algarve coast (Portugal) and presented a set of mitigation measures and natural space recovery [2]. A strong change in vegetation cover promoted the expansion of invasive plants that were difficult to control. Despite this, a rare plant was rediscovered in Portugal, *Carrichtera annua* (L.) DC., an indicator of semi-arid environments, which could increase the potential area of distribution in the face of climate change. There was also a worsening of water quality, due to the increase in suspended particles and greater erosion at the base of the cliffs, due to an increase in the average level of sea water, which will increase the risk of rocks collapsing on the beaches.

As a way of mitigating and creating natural solutions for the restoration of biodiversity in the face of climate change, Yousefi et al. (2021) studied the germination responses of *Zygophyllum fabago*, *Salsola kali* L., and *Atriplex canescens* (Pursh) Nutt. to drought stress to assess potential use in recovery in semi-arid and arid zones [3]. In this study, polyethylene glycol (PEG-6000) was used to simulate drought conditions for seed germination. This study concluded that only *S. kali* showed promising behavior for the rehabilitation of degraded soils at risk of desertification.

As a consequence of global temperature increase, greater amounts of ice melt annually at the poles, modifying the average sea level. Nasrawi et al. (2021) studied, for the first time, the modeling of error propagation associated with the assessment of sea level rise in riparian regions. Model output included the probability of inundation for each location in the SARR, and provided a comparison of total inundated areas. The approach was effective for determining and mapping the land that would be inundated in the region from a 1 m rise in the sea level, based on bathtub modelling [4]. It also found that much larger areas were at risk of flooding than would be estimated with the raw SRTM.

Another consequence associated with climate change is the increase in the concentration of CO_2 in the atmosphere, the effects of which are still unknown for some species. As a way of improving this knowledge, Deuchande et al. (2021) studied the effect of increased CO_2 associated with iron deficiency on the growth of agricultural crops, such as soybean (*Glycine max* L.) and common bean (*Phaseolus vulgaris* L.). These results suggest that the mechanisms involved in reduced Fe accumulation caused by eCO_2 and Fe deficiency may not be independent, and an interaction of these factors may lead to further reduced Fe levels. If so, it may negatively affect human population diets, particularly of those dependent on Fe from plant sources, or those which already suffer from Fe deficiency [5].

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