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Editorial: Wetland ecology and biogeochemistry under natural and human disturbance- volume II

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Editorial on the Research Topic
Wetland ecology and biogeochemistry under natural and human disturbance- volume II

Wetlands cover only about 5%–8% of the world's land surface, but they provide essential ecosystem services for humankind, including carbon sequestration, climate mitigation, flood mitigation, coastal protection, water purification, and habitat provision (Mitsch et al., 2013; Xu et al., 2020). Nevertheless, local communities have limited knowledge about wetlands, which influences the implementation of wetland protection programs (Allahyari et al.). In addition, wetlands are highly threatened by climate change and human activities, such as flooding, global warming, grazing, drainage, cultivation, water pollution, and urbanization (Aura et al.; Sieben et al., 2017). Therefore, there is an urgent need to protect wetlands, and investigate the response of wetland ecosystems to these disturbances.

This Research Topic consists of six original papers and one review paper, which attempted to help address the abovementioned issues. Recent findings on the effects of climate change and human disturbances on wetland functions and biochemical processes have been reported.

Wetlands are essential carbon sinks due to their higher productivity than ecosystem respiration (Noumonvi et al.). Ecosystem respiration (ER) is composed of autotrophic respiration (AR) that consists of respiration by plant parts, and heterotrophic respiration (HR) that consists of respiration by microbial bacteria. With climate warming and human drainage, ER could increase (Zhou et al.), and the contributions of HR and AR to the ER can be altered (Rankin et al.). Not only respiration but also methane (CH_4) emission is affected by the climate and human activities. It has been reported that CH_4 emission in wetlands would increase 50%–80% by the year 2,100 under climate change (Koffi et al., 2020) and significantly increase under human disturbances (Benavides et al.).

Besides carbon cycling, nitrogen cycling in wetland ecosystems is also affected by climate change and human disturbances. For instance, climate warming could mitigate the positive effect of nitrogen deposition on nitrous oxide emissions (Gong et al., 2019; Gong and Wu, 2021). Urease and nitrate reductase activities have been reported to increase with climate change and human activities (Chang et al.).

The papers brought together a wide range of aspects related to the impacts of climate change and human disturbances on wetland ecosystems, which helps us better understand the carbon and nitrogen cycling of wetlands. In addition, the dominant drivers and biogeochemical dynamics for disturbed wetlands have been well illustrated, which benefits the development of wetland management and restoration strategies.

Author contributions

JW: Conceptualization, Investigation, Writing–original draft, Writing–review and editing. YG: Writing–original draft, Writing–review and editing. HC: Writing–review and editing. JL: Writing–review and editing. JJ: Writing–review and editing.

Conflict of interest

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

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