High-resolution remote sensing for water quality monitoring in the California Bay-Delta

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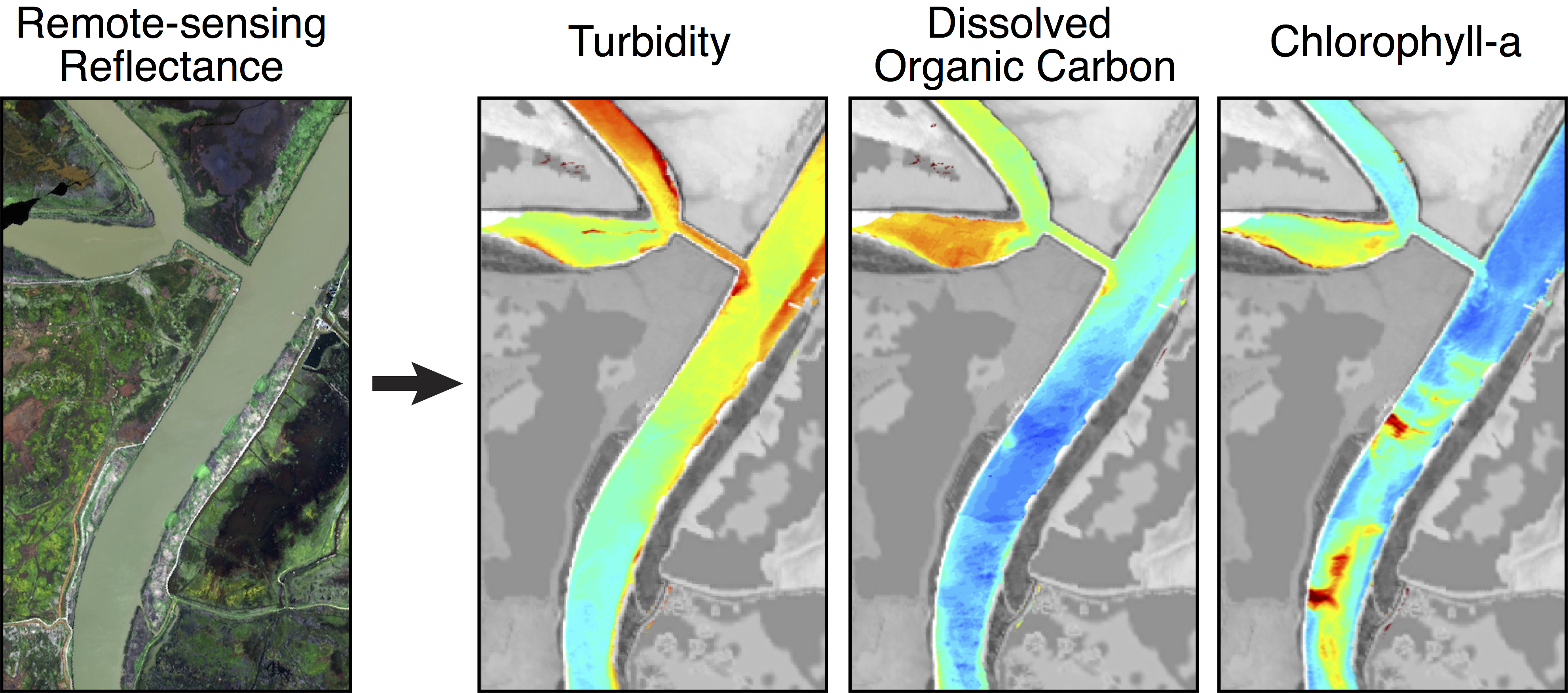
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**ABSTRACT**

The Bay-Delta is a major source of freshwater for California and a profoundly human-impacted environment. Water quality monitoring is critical to the management of this important water resource and ecosystem. State and federal agencies rely primarily on a system of fixed water-quality monitoring stations to understand this system or inform their decisions, but the limited spatial coverage often proves limiting in such an heterogeneous and dynamic ecosystem. Here, we show how the latest remote-sensing technology can facilitate the monitoring of important water quality indicators at high spatial resolution (e.g., meters) over large areas, and enhance our understanding of the Bay-Delta system. Hyperspectral radiometry from the airborne Portable Remote Imaging SpectroMeter (PRISM) was used to derive very detailed and distinct spatial distributions of turbidity, dissolved organic carbon (DOC) concentration, and chlorophyll-a concentration in a Bay-Delta region influenced by wetlands and human activities. The remotely sensed DOC also provided insights on the distribution of methylmercury in the study area. High-resolution remote sensing can facilitate the detection of point-source pollution, help assess the complex, diffuse impacts of wetland restoration and climate change on water quality and ecosystem productivity and health, and inform decision-making about the management of this important natural resource.

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