



GloboLakes: A global observatory of lake responses to environmental change.

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The world's freshwater ecosystems are vital components of the global biosphere, yet are vulnerable to climate and other human-induced change. There is increasing recognition that lakes play an important role in global biogeochemical cycling and provide key ecosystem services. However, our understanding of how lakes respond to environmental change at a global scale, and how this impacts on their status and function, is hampered by limited information on their chemical, physical and ecological condition. There are estimated to be over 300 million lakes globally, of which over 17,000 are greater than 10 km² in surface area. These numbers have limited the systematic study of lake ecosystems. GloboLakes is a five-year UK research programme investigating the state of lakes and their response to climatic and other environmental drivers of change. It will establish a satellite-based observatory with archive and near-real time data processing to produce a time series of observed biogeochemical parameters and lake temperature for over 1000 lakes globally. This will be supported by linked ancillary data on climate and catchment land-use. The ability to monitor a large number of lakes consistently at high frequency and globally will facilitate a paradigm shift in our understanding of how lakes respond to environmental change at different spatial and temporal scales. A key requirement is to validate satellite retrieval algorithms and test the time-series of resulting lake properties such as chlorophyll-a by comparison with in situ data. To support the former extensive bio-optical and constituent data were taken in year 1 of the project in a number of UK lakes with a variety of trophic states. Furthermore, for wider validation activities GloboLakes has established the LIMNADES initiative to create a centralised database of ground bio-optical measurements of worldwide lakes through voluntary cooperation across the international scientific community. This presentation will introduce the GloboLakes project including its scientific ambitions for the next 4 years, present initial results, focussing on in-water optical data and describe the LIMNADES database.