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Data transparency: Moving from grab sample to real-time water quality monitoring

Abstract: Bangalore lakes provide several benefits ranging from recreational such as bird watching to groundwater recharge. At present, 40% of the domestic water demand is met by groundwater pumping, making lakes an essential source for replenishing aquifers. 60% of Bangalore's wastewater is untreated and flows either into the city's lakes or downstream. With the city's many lakes vanishing due to rapid urbanisation and lack of proper underground drainage system and sewage treatment plants, Bangalore is now grappling with issues of the imminent water crisis and public health hazards. Over the period, several efforts have been made by various agencies to restore Bangalore lakes. Despite this, several lakes (restored) face water quality issues such as HAB, invasive species expansion, fish kill and bird death events. Most such events are reported to occur during summer and monsoon seasons. The current water quality monitoring strategy (grab sample) fails capture trends in seasonal and diurnal variability, thereby preventing agencies from making an informed decision about deploying short-term/long-term measures to prevent such events. Real-time monitoring costs are enormous and demand constant maintenance (biofilm formation) to produce accurate data. Citizen science is need driven and plays an important role in capturing the daily as well as seasonal trends in water quality. The water quality parameters selected are indicators of the water quality issues for example high DO variability reflects algal bloom. At ATREE, we are using a citizen-science framework to develop a lake dashboard. The software helps citizen groups that are already working towards the revival of water bodies by giving them real-time data on the lakes' pollution status. It also promotes citizen participation and helps with decentralisation the lake restoration effort. Such data, coupled with the earth observation data, can help with assessing the effectiveness of interventions, providing early warning systems and effective decision-making.