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Dynamics and patterns of water quality and stream metabolism in a low-land Mediterranean urban stream

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Water quality in streams provides fundamental information on ecosystem functioning and status. The use of sensors instead of grab sampling provides near-continuous information on the water quality, which reveals information on hydrological and biogeochemical processes that were unrecognized before. While information from sensors on water quality in temperate climates becomes ubiquitous, it is still rare in semi-arid and Mediterranean climate. The aim of this work was to quantify the dynamics and patterns of water quality and metabolism in a Mediterranean low-land urban stream. Sensors that measure oxygen, carbon dioxide, nitrate, cDOM, chlorophyll a, turbidity, electric conductivity, pH, water level, and light were deployed in July 2019 in the Yarkon Stream, an urban lowland stream in Israel. Preliminary results indicated that seasonal differences were observed under base-flow conditions for parameters that are indicative of biological processes. For example, the average concentrations of nitrate and oxygen were higher in the winter than in the summer. Differences between summer and winter to spring and autumn were less consistent. Seasons also affected the daily fluctuations of the biological-related parameters. For example, oxygen concentrations were roughly stable during the day in the winter but followed a clear peak in the afternoon during the summer. In addition, oxygen consumption was dominant all year long, leading to hypoxic conditions in the stream for most of the year. The driving mechanisms for the observed patterns will be discussed in the presentation, and further comparisons will be made to patterns in streams from temperate climates. It is expected that this work will provide new insights into the water quality dynamics and ecosystem status of Mediterranean streams, which can potentially improve water resources management and future restoration efforts.