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Assessment of lake hydromorphological status within the French territory

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In France, in accordance with the expectations of the European Water Framework Directive, the biological and physico-chemical status of lakes have been assessed thanks to the use of different indicators and threshold values (Argillier et al., 2013; Roubeix et al., 2016). However, the hydromorphological conditions have not been included in the final evaluation of the lakes ecological status yet, due to i) a lack of indicators to evaluate these conditions, ii) a lack of knowledge on the combined impact of hydromorphological changes on the biota, and iii) the difficulties in defining reference conditions for the hydromorphology of lakes. Recently, the LAKe HYdromorphological Conditions tool (LAKHYC tool, Gay et al., in prep) has been developed to overcome this lack and assess the hydromorphological conditions of lakes in Europe.

The tool is successfully applied on the 201 French lakes for which accurate data are available, and which represents 42% of the total number of lakes in France with an area greater than 50ha. The first results indicate that the obtained LAKHYC values cover the entire range of possible values (between 0 and 1). The values are then grouped into 5 classes according to quintile thresholds to highlight lakes presenting a very bad/very high hydromorphological status. No sign of particular geographical distribution patterns is found. This first application of the LAKHYC tool represents an important step in the final evaluation of the ecological status of French lakes considering the biological, the physico-chemical and the hydromorphological compartments altogether. It will certainly help stakeholders to define priority lakes for financial support to implement conservation or restoration practices.

As perspectives to this work, the forthcoming detailed level fluctuations data will ensure a finer and more robust estimation of the lakes hydromorphological quality. Moreover, further investigations on the link between hydromorphological degradation and the biota will allow to improve ecological assessment and to concentrate restoration priorities. Finally, we strongly encourage EU members to use the LAKHYC tool to evaluate their lake hydromorphological conditions in order to improve the LAKHYC tool and to allow for a comparison of the conditions of the European lakes.

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