Project partners:

Universitat de Barcelona

FEHM lab Research Group
Freshwater Ecology, Hydrology & Management

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Agència Catalana de l'Aigua

Generalitat de Catalunya
Departament de Territori i Sostenibilitat

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Ministerio de Agricultura, Alimentación y Medio Ambiente
Confederación Hidrográfica del Júcar

Final results

Implementing the Water Framework Directive to temporary rivers:

tools for the assessment of their ecological status

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Implementing the Water Framework Directive to temporary rivers: tools for the assessment of their ecological status
LIFE13 ENV/ES/000341

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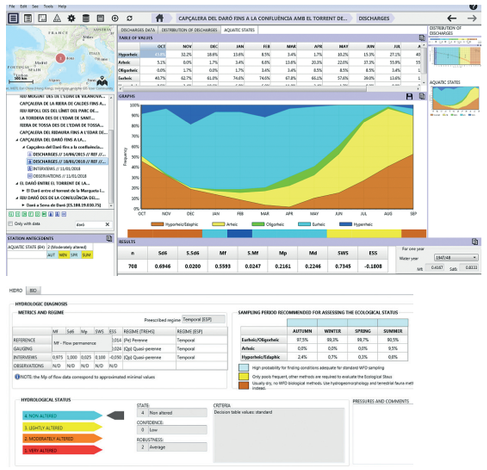
About TRivers

The LIFE + TRivers project created two innovative tools to improve the management of temporary rivers according to the EU Water Framework Directive (WFD) requirements: (1) the TREHS software, to be used by water managers, and (2) the RiuNet App for mobile phones, to be used by the general public. Moreover, a process of citizen participation was carried out to raise awareness about temporary rivers, their diagnosis, and the preparation of a proposal for management measures, referring to the improvement of their current status and their conservation.

The TREHS software

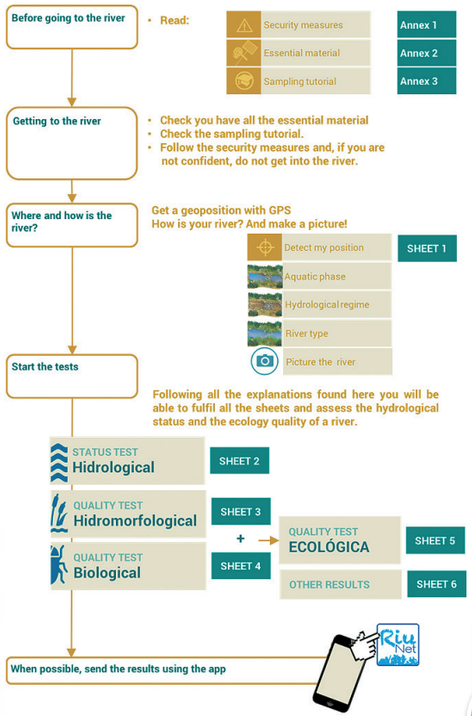
TREHS (Temporary Rivers Ecological and Hydrological Status) is a software developed to assist river basin managers in the implementation of the WFD in temporary rivers. This software allows for the input and storage of hydrological information coming from flow simulations, gauging records, interviews made to local citizens, in situ observations, and of aerial photographs. River regime is classified based on this information, using a categorization that takes into account the frequency of the aquatic states. Up to six metrics describing these frequencies and their temporal patterns of occurrence are used to determine the natural and observed regime. TREHS also characterizes the differences between the natural and observed regimes, performs a diagnosis of the hydrological status (i.e. degree of hydrologic alteration) along with an assessment of the significance and robustness of this diagnosis, and recommends the best period for biological quality sampling. Finally, in order to evaluate the ecological status, TREHS also allows calculating hydromorphological and biological quality of a water body.



Output of the TREHS software. Upper part: Aquatic States Frequency Graph window represented on a monthly basis. The colours represent the different aquatic states: hyporheic/edaphic, arheic, oligorheic, eurheic and hyporheic. Lower part: Summary of the hydrologic diagnosis, best sampling period and assessment of hydrological status.

The RiuNet App

A simplified version of TREHS was developed with the aim to involve the general public in the evaluation of the hydrological and ecological status. Using a simplified and interactive approach, this app allows for the aquatic phase surveillance of the river, the classification of the hydrological regime of a river (e.g. perennial, intermittent, ephemeral), the detection of hydrological impacts, and the evaluation of its hydromorphological status and biological quality. With the combination of new technologies and the phenomenon of citizen science, RiuNet is a pioneer tool to draw attention to the degradation of our rivers, promote scientific engagement and data contribution of the citizens, and improve the level of understanding of river ecosystems, including those with poor social recognition such as temporary rivers.



The participatory process

In addition to the evaluation of ecological status, public participation is also an essential part of the European Water Framework Directive. It contributes to gather information from the general public and stakeholders on the measures necessary to achieve the objective of good ecological status of water bodies. TRivers participatory process was developed between June 2017 and May 2018 organized in six groups considering where the fieldwork took place. In each area, workshops of diagnosis and measures were developed with stakeholders, as well as field visits to the riverside to test the RiuNet App. As a result, participants selected the following priority measures:

- Improve river connectivity
- Social awareness and education on temporary rivers
- Promote public participation in temporary rivers management
- Control of illegal water extractions
- Control of invasive species
- Improve the control of dumping
- Improve sewage treatment
- Forestry management in the whole river basin