Copernicus Tools for Monitoring Global Change Effects in Rivers and Riparian Zones

(Cop.RIVER)

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Deliverable 10: Engagement with end users and stakeholders

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1 BACKGROUND

Cop.RIVER aims to promote the use of Earth Observation (EO) in applications and services related to the ecological status of riverscapes (*i.e.*, rivers and their associated alluvial plains, floodplains and riparian forests). The action will strengthen the Copernicus user uptake by supporting regional and national authorities in the implementation of the EU Biodiversity Strategy to 2020, the Habitats and Birds Directives and the Water Framework Directive by applying GAP analysis, to complement available Copernicus information on the state and characteristics of rivers and riparian zones.

2 ENGAGEMENT WITH END USERS AND STAKEHOLDERS

During the second year of the project, we have expanded and strengthened the initial contacts made with selected end users and relevant stakeholders (*i.e.*, ARG) *via* meetings with focus groups and multiple workshops. First, we have held four national-level meetings to identify needs and opportunities related to the development of Cop.RIVER outputs and products. Second, we have organized an expert workshop where the limitations and challenges related to the academy-administration interaction were presented and discussed. Finally, we have presented the aims and advances of Cop.RIVER in multiple academic and environmental forums, such as scientific meetings, collaboration meetings (*i.e.*, with technicians working for the MITECO) and knowledge transferring meetings (*e.g.*, with decision-makers and practitioners in the Cantabrian region).

These interactions have allowed us to exchange crucial information to refine the selected indicators, to incorporate new needs demanded by end users and to detect potential limitations in our methodologies.

2.1 National meetings with environmental authorities (Spain)

After identifying key agents for the co-design of relevant methodologies and products to be developed in Cop.RIVER, we held four national-level meetings with the following agents of interest:

- The General Directorate for Biodiversity, Forests and Desertification (terrestrial domain), a governing institution of the Spanish Ministry for the Ecological Transition and the Demographic Challenge (MITECO).
- The Cantabrian Hydrographic Confederation (terrestrial and aquatic domains), MITECO
- The National Parks Autonomous Agency
- The TRAGSA Group (terrestrial and aquatic domains), a company owned by the Spanish State General Administration, the Autonomous Communities and Municipalities.

First, the General Directorate for Biodiversity, Forests and Desertification expressed its needs for characterizing ecosystem variables such as vegetation structure and habitat type and conservation status in the riparian zone. Incorporating remote sensing data and innovative methodologies were among their priority objectives. The Cantabrian Hydrographic Confederation was also interested in the assessment of terrestrial vegetation associated with the river environment, including the identification of natural habitats and the monitoring of revegetation actions in the context of amelioration or restoration strategies. This institution was interested in a remote sensing-based tool developed at IHCantabria -using Sentinel data among others- that allow to monitor changes in river and floodplain

biotic (*i.e.*, vegetation) and hydromorphological attributes and dynamics. During the meeting with the National Parks Autonomous Agency, the applications of Copernicus products such as Riparian Zones and the more specific products developed by IHCantabria using Sentinel data and auxiliary environmental data for habitat mapping in the Picos de Europa Natural Park environment was discussed with great interest. Finally, the potential use of remote sensing products for water quality developed by IHCantabria and the different COPERNICUS products for the characterization of watercourses and their riparian vegetation were discussed with the TRAGSA Group.

These meetings allowed us to exchange key information for the development of Cop.RIVER and to identify potential limitations in the selected indicators and proposed methodologies.

2.2 Expert workshop on methodologies for monitoring riparian ecosystems

The expert workshop “Needs and methodologies for riparian vegetation characterisation” was held in mid-September this year. The workshop aimed at evaluating the applicability of remote sensing techniques and the tools provided by the COPERNICUS program (European Space Agency) for monitoring the effects of global change in rivers and riparian zones. For this purpose, key actors in the implementation of regulations such as the Habitats Directive, the Water Framework Directive and the Biodiversity Strategy 2030 were identified, as well as experts in river landscape characterization in other European countries (*e.g.*, identification of riparian species, remote sensing experts).

This event brought together more than 25 experts and professionals in environmental management, public administration and scientific organizations. Five oral communications addressed key topics such as the methodological needs for the reporting process in the public administration, the complex interdependence of *in situ* measurements and remote sensing tools, or the challenges and opportunities for academic research and environmental management. Later, a Q&A session and a round table session allowed for the interaction between speakers and attendees.

During the workshop, we shared a questionnaire to better understand how familiar scientists, the environmental authorities and practitioners are with remote sensing tools, including Copernicus data and services.

2.3 Knowledge transfer to environmental authorities

Under the title “Research actions for the monitoring of the natural environment in Cantabria”, in May 2024 a transfer knowledge meeting was held in which 11 of the lines of work of the researchers of the Coastal Ecosystems and Continental Ecosystems groups of IHCantabria were presented, whose results are applicable to the management of the natural environment of the region.

The meeting, to which technicians from the Ministry of the Environment, National Parks and Regional Ministries of the Government of Cantabria were invited, was carried out in a hybrid form (face-to-face and online) with the aim of favouring the participation and attendance of as many agents as possible. Thus, a total attendance of more than 50 people was achieved, of which 20 participated in person and another 33 attended remotely through the online connection enabled for this purpose.

During this meeting, the work developed in Cop.RIVER and other similar projects was presented. Specifically, the Freshwater Ecosystems group presented their advances in using the spectrophenology, a technique that uses information derived from remote sensors (Sentinel-2) to analyze seasonal patterns in the vegetation (growing seasons, productivity, etc.). This remote sensing technique facilitates the identification and monitoring of riparian vegetation ecological and conservation state. Thanks to these techniques, it is possible to generate a continuous mapping in space and time. In addition, the Freshwater Ecosystems group has developed a methodology based on remote sensing data to map channel and bank structures (water, sediment bars, vegetation), quantifying interannual changes in hydromorphology and riparian vegetation.

3 ACKNOWLEDGMENTS

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