

Flow and sediment regime at headwater streams is dependent on physical variables susceptible to Global Change, i.e. major environmental changes due to climatic fluctuations and land cover changes due to human activities. On one hand, sediment availability and heterogeneity are likely to be affected due to changes in the soil occupation induced by socio-economic adjustment to climatic conditions. For instance, river catchments with snow melt floods may become subject to rainfall floods, with expected higher discharges due to higher temperatures. On the other hand, it is expected that the sediment supply coming from the catchment to the alluvial channel may be significantly reduced due to land abandonment and natural forest expansion at headwater streams. This in turn may cause an abrupt depletion of the river bed downstream, thus affecting the river morphology and eventually the nearby human settlements. The proposed project aims to assess both climate and land cover impact on the flow and sediment regime at headwater streams. Global future climate and land cover scenarios will be evaluated and downscaled to the catchment scale. The downscaled variables will be combined with historical observed data. This will allow to determine the difference between natural variability of the natural processes and the potential Global Change impact. Percentile-based extremes will be calculated and their trends over the period 1950-2100 will be computed to establish projected changes in precipitation, flow rates, sediment rates and related land cover changes (increase or decrease of shrubs, forests or meadows areas).

Responsibilities

- Datasets homogenization and curation
- Preparation of future climate and land cover scenarios
- Statistical data analysis
- Active member of our scientific team and doctoral student group
- Conference talks
- Write scientific publications

The project is funded by the European Research Council for a duration of four years. The start is planned for first (desirable) or second semester of 2023. The salary is fixed according to the established salary level for doctoral students.

We are looking for an enthusiastic and independent person with a passion for science. Candidates for this position should hold (or be in the process of obtaining) a MSc degree in environmental engineering, environmental science (geography, geology), physics, computer science or similar. The person likes to work with the computer and new data-driven technologies, where thoughtful solutions are needed. Ideally, candidates demonstrate knowledge or high motivation to learn programming (e.g. R or Python software); and statistical analysis. Good knowledge of written and spoken English is required, skills in Spanish are an asset.

The position is based at CSIC in Instituto Pirenaico de Ecología (IPE-CSIC). The research centre is located within the Zaragoza metropolitan area. Zaragoza is an enjoyable city in terms of science, culture and quality of life.

Applications should include a concise statement (max. 2 pages) describing your motivation to carry out a PhD project on this topic, curriculum vitae, copies of your academic records and contact information for two references.

The deadline for applications is 28 February 2023 or until the position is filled.

For further information, please contact: Dr. Carmelo Juez (carmelo.juez@ipe.csic.es)

Interested candidates should apply by emailing the required documents to Dr. Carmelo Juez (carmelo.juez@ipe.csic.es)