



**Project acronym:** FIXCLIM

**Project title:** Biological nitrogen FIXation in stream biofilms along a CLIMatic gradient

**Project leader:** Ada Pastor, University of Girona, Spain

**Discipline:** Earth Sciences & Environment: Ecosystems & Biodiversity

**Station(s):** NIBIO Svanhovd Research Station (Norway)

Nitrogen is a key nutrient and its availability defines structure and function of ecosystems. Biological nitrogen fixation (BNF) is the main pathway by which atmospheric N<sub>2</sub> enters into the biosphere. As such, BNF influences the availability of a key limiting nutrient for biological activity and thus even small changes in BNF rates can directly and/or indirectly influence ecosystems. In freshwaters, the information for BNF is elusive, although major changes are expected with warming.

FIXCLIM aims at assessing BNF in pristine streams across a climatic gradient. In particular, we have two objectives: (1) to determine the effects of temperature and N availability on BNF considering other environmental and biological variables, and (2) to evaluate the effect of BNF on aquatic biofilm productivity. With these purposes, we have selected four INTERACT stations along a latitudinal gradient, plus one in the Spanish Pyrenees (sampled by own resources) to cover a wide climate range. At each station, we will select five small streams. Artificial substrates will be deployed in the streams for biofilm colonization and collected after six weeks. Biofilm BNF and extracellular enzyme assays will be run in-situ. Biofilm and water samples will be stored frozen and shipped for further laboratory analyses to University of Girona. The sampling protocol will be conducted following a detailed guide with simplified methods. This coordinate sampling effort will provide novel information on the role of aquatic BNF, thus advancing our understanding on the role of N supporting key freshwater ecosystems functions and the impact of climate change.