

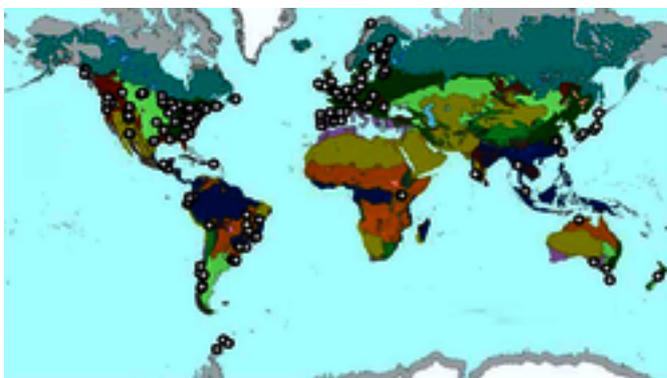


Carbon cycles as a yardstick for climate change

January 15, 2019 | Andri Bryner
Topics: Biodiversity | Ecosystems

Climate factors determine the carbon cycles of river ecosystems. These factors are increasingly influenced by humans. A large-scale study is now for the first time showing globally comparable patterns and thus providing a basis for future assessment of the consequences of climate change.

The study by 153 researchers from 40 countries found that climate factors such as temperature and humidity strongly influence the carbon cycles of river ecosystems. In northern latitudes, temperature plays a major role, while nutrient loads are particularly important closer to the equator. The carbon cycle is crucial for the functioning of systems on all scales, from local food webs to the global climate. "River ecosystems play significant roles in the global carbon cycle by regulating rates of decomposition and transporting organic matter to the oceans, but we have only a rudimentary understanding of how decomposition rates vary from river to river," says former Eawag PhD student Scott Tiegs, now biology professor at Oakland University in Michigan, who led the study.



Global distribution of stream and riparian field sites.

Unlike most previous studies on the carbon cycle in streams and rivers, the methodology in this study was the same for all field sites. The study used a standardized easy-to-use bioassay, that allowed the large number of participants to contribute data. As a result, the researchers quantified decomposition rates in over 500 rivers around the world, including six Swiss waters studied by Christopher Robinson and Frank Burdon of Eawag.

"These data will let future researchers quantify large-scale responses to warming and other aspects of global climate change," says aquatic ecologist Robinson.

Original paper

Global Patterns and Drivers of Ecosystem Functioning in Rivers and Riparian Zones. Science Advances 09 Jan 2019: Vol. 5, no. 1, eaav0486; <http://doi.org/10.1126/sciadv.aav0486>

The research was funded by the Ecuadorian Science Foundation.

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