

River animals just go with the flow

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Like the dark side of the moon, what you cannot see you cannot know. The same holds for floodplains.

Floodplains have long been recognized as an important habitat for a variety of plant and [animal life](#), but what has been known about them is literally above the waterline. Little was previously known about the

[physical properties](#) that allowed for such biotic diversity.

In a recent collaborative effort by Kyoto University, Hokkaido University, and the Colorado State University led by Hiromi Uno, interesting dynamics were observed during and after seasonal flooding on the Butokamabetsu River [floodplain](#) in northern Japan. The combination of the natural flow patterns of rivers and the complex geomorphology of the floodplain supported diverse aquatic biota there.

Of course, going underwater in diving gear just after snow and ice melt in Hokkaido, Japan, is not especially practical as a method of research.

"Getting to the field site was logistically very difficult," notes Uno, "and the dynamic day-by-day changes in the flood environment also made the study both challenging and interesting."

Rather, Uno and her team investigated the role of the flow dynamics during and after the snowmelt flood which had shaped the post-flood aquatic communities. Intensive fieldwork and a 2019 flood-recession survey yielded data in flow dynamics, water chemistry, and animal responses in the floodplain, located in the Hokkaido University Uryu Experimental Forest.

As highly dynamic ecosystems, floodplains are water bodies formed by fluvial processes such as channel migration. Some of these channels are permanently, periodically, or never connected to the river or mainstream.

The team's findings reveal that [seasonal changes](#) cause extensive floods as well as the expansion and contraction of river channels. These allow for spatial and temporal changes to aquatic habitats for a diverse range of animals, such as amphibians, fish, benthos, and plankton.

These results support the team's hypothesis that the observed changes give rise to the distinct responses and adaptations of each biological group to the hydrological dynamics during flood recessions, which in turn give rise to the diversity seen in aquatic communities.

Borrowing from an ancient proverb, a [flood](#) may be a crisis for the danger it poses, but it could also present valuable opportunities.

"People generally do not like floods, but some animals are different," says Hiromi Uno, who suggests floods may be an essential part of many biotic communities.

The research was published in *Freshwater Biology*.

More information: Hiromi Uno et al, Spatially variable hydrological and biological processes shape diverse post-flood aquatic communities, *Freshwater Biology* (2021). [DOI: 10.1111/fwb.13862](https://doi.org/10.1111/fwb.13862)

Provided by Kyoto University

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