

# The effects of climate change on fish reproduction



**Since 2011, the UMR ECOBIOP has been leading a research project on the effects of the hydrological consequences of climate change on the behavior of salmonids.**

The effects of climate change are complex. In collaboration with the NuMeA research team and the biology department of the Basque Country University in Bilbao, the ECOBIOP UMR (INRA/UPPA) has decided to study the effects of extreme hydrological conditions on the reproductive behavior of river fish.

Jacques Labonne, a researcher at the Saint-Pée-sur-Nivelle site, explains:

*"We are particularly interested in the effects of variations in water flow, due to flooding for example, or long drought. We want to understand how sudden changes in water flow affect the fish's reproductive behavior and to evaluate their ability to adapt."*

For this, the researchers use the Lapitxuri experimental site, the only of its kind in Europe: a breeding channel 130 by 3 meters. Water flow can be adjusted and the fish can be observed through underwater viewing ports and video cameras.



A transfrontier border grant given to Zoé Gauthey and completed with help from INTERREG AARC and the MIRA federation allowed a program to study, from 2011 to 2014, sexual selection in the common trout, using experimental protocols and specialized statistical models. With collaboration from NuMeA, new methodologies were developed for measuring the fish's physiological state. Zoé Gauthey's work revealed a drop in female reproductive activity when exposed to varying rates of water flow, and showed that an increasing frequency of extreme hydrological events influenced sexual selection towards certain phenotypes.



In 2014, under the supervision of Agnès Bardonnnet (UPPA) and Aitor Larranaga (UPV), Elorri Arevalo, a PhD candidate, continued Gauthey's work by examining the trophic relations between juvenile trout and their predators. "The idea is to measure the precise impact of spring floods on the nutrition of young fish", explains Jacques Labonne. Elorri Arevalo will get help from Lorea Flores, an INRA post-doctoral researcher who was hired to work in collaboration with the University of Bilboa and the University of Gerona on the theme of "ecosystem services": the impact of floods in terms of gains and losses in aquatic ecosystems.

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