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## Possible changes of the brown trout habitat suitability in the upper Po basin due to global change

**Annalina Lombardi**

University of L'Aquila, Italy

Climatic simulation models predict an increase in temperature and extreme events occurrence. These changes are expected to lead a sensible modification of the hydrological cycle with significant impacts on the ecological integrity of aquatic ecosystems. Changes in temperature regime and in-stream habitat/microhabitat characteristics will also affect the natural distribution of many aquatic species. Within this context it appears strategic to predict the effects of global change on freshwater biodiversity and species distribution in order to propose adequate measures aimed at mitigating the impacts of climate modification on natural systems. To this aim we carried out a simulation based on a chain of deterministic models to predict the distribution of the brown trout in the upper Po River basin (North Italy). A 140-years long simulation, carried out with a Regional climate model, is used to force a hydrological model simulating the hydrological cycle. The results of hydrological simulation, in particular variations in temperature and discharge regimes, are then used to evidence the areas where the target species is expected to occur. The results show how the complex proposed approach is able to reproduce, with a good confidence, the current distribution of the brown trout. The projection for future years indicates a shift of the distribution toward locations of the upper part of the basin, with a sensible decrease of the areas where the brown trout can survive, reproduce and grow. This work also focuses on the potential application of the proposed approach to evaluate the effects of climate changes on more complex ecological systems.

### Biography

Annalina Lombardi has accomplished her PhD in April 2016. She gained scientific and research experience at CETEMPS, University of L'Aquila, Italy, where she obtained several scholarships, aimed at specializing in numerical modeling, especially hydrological modeling. She has taken part in various European projects regarding hydro-meteorological risk prevention and management. During her career at the CETEMPS, she obtained a Post-doc, and has learnt the usage of atmospheric mesoscale models, weather and climate prediction, and the manipulation of a large number of data. At present days, she has collaborated in the publication of two papers on two main journals.

annalina.lombardi@aquila.infn.it

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