

XXV Congresso AIOL – Plenary lectures

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Plenary lecture

The surprising ecology of a perialpine lake: insights from long-term monitoring

Ecological restoration needs ecological theory, but scientists sometimes neglect to consider that restoration helps develop or revise theory. Lake Lugano, a peri-Alpine lake undergoing restoration from eutrophication, showed some surprising changes, prompting us to renew our insights about lake ecology. I will focus on two areas of community ecology—the driver-response relationship and the trophic structure-resource relationship. I will compare textbook models of these relationships with patterns observed in monitoring data for some key ecosystem features, including food-web structure, trophic structure, and primary productivity. The examples will show how some of the patterns appear surprising or even paradoxical when compared to conventional wisdom. These patterns, along with trends observed in other peri-Alpine lakes, are expanding our understanding of lake ecology. In turn, a

better understanding will help us adapt restoration measures and increase the chances of restoration success. A more integrated interrelationship will benefit both ecological theory and ecological restoration.

Biosketch

I am a freshwater ecologist working at the interface between applied ecology and community ecology. After graduating in Natural Sciences in 1996, I pursued graduate education at Cardiff University, Wales, obtaining a Master and a PhD degree in Hydrobiology. I since worked as postdoctoral researcher (Umeå University, Sweden and Colorado State University, USA), Assistant Professor (Lyon University, France), Senior researcher, and Professor (University of Applied Sciences on Southern Switzerland). The consistent threads across this personal and professional path have been a keen interest in the natural history of aquatic organisms and a concern for the state of freshwater ecosystems. Currently I am particularly interested in the responses of lake pelagic communities to restoration and the pressures of global change.

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Selected publications

- Lepori, F. and Capelli, C., 2019. Seasonal variation in trophic structure and restoration effects in a deep perialpine lake (Lake Lugano, Switzerland and Italy). *Journal of Great Lakes Research*, in press.
- Lepori, F. and Roberts, J.J., 2017. Effects of internal phosphorus loadings and food-web structure on the recovery of a deep lake from eutrophication. *Journal of Great Lakes Research*, 43, 255-264.
- Lepori, F. and Malmqvist, B., 2009. Deterministic control on community assembly peaks at intermediate levels of disturbance. *Oikos*, 118, 471-479.
- Lepori, F., & Hjerdt, N. (2006). Disturbance and aquatic biodiversity: reconciling contrasting views. *BioScience*, 56, 809-818.
- Lepori, F., Palm, D., Brännäs, E. and Malmqvist, B., 2005. Does restoration of structural heterogeneity in streams enhance fish and macroinvertebrate diversity? *Ecological Applications*, 15, 2060-2071.