The future decline in lake levels puts an evolutionary giant at risk

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Continental drying in response to global warming will entail declining lake levels all over the world. Falling lake levels will have many far-reaching consequences that are underappreciated, but affect the livelihoods and economies of millions of people. A massive warning signal is the projected twenty-first century water level drop of up to 18 m in high emissions scenarios for the Caspian Sea, the largest lake in the world, which could hit stakeholders unprepared. Such a catastrophic drop in the Caspian Sea level would lead to a surface area decrease of 34% including the loss of the highly productive northern Caspian shelf and important wetlands such as the Volga Delta and other Ramsar sites. The disappearance of the vast shallow shelves, which are major food suppliers for fish and birds, will devastate native and endemic fish species, the Caspian seal and a richness of molluscs and crustacean species unique to the lake. The falling water level will not only threaten the unique ecosystem, but will also have severe impacts on regional economies and geopolitical stability.

In the first part of this presentation, we discuss the extent of twenty-first century projected continental drying on a global scale and its potential effect on worldwide lake levels. In the second part, we focus on the Caspian Sea and discuss the potential impacts of water level fall on biodiversity and ecosystem services. Finally, we address the question to which extent paleoclimates can be used as analogs for future global warming scenarios with respect to changes in the Caspian Sea level.