ANCIENT LAKES UNDER THE PRESSURE OF QUATERNARY CLIMATE CHANGE: HIGH RESILIENCE PREVENTS CATASTROPHIC ECOSYSTEMS COLLAPSES

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- Diatom response: temperature thresholds (wind activity, light, nutrients)
  - Ultra-oligotrophic for the last 92 ka, no indication for lake-level changes
  - Prolonged and gradual transitions (MIS 5/4 and 2/1)

RESISTANT ECOSYSTEM

Fig. 1. Stratigraphic diatom diagram showing species with >2% abundance in Lake Ohrid DEEP site core, P index of Cyclotella fottii, DC and DAR. Diatom zone boundaries are defined by CONISS, Marine Isotope Stages (MIS) boundaries after Lisiecki and Raymo (2005).

Fig. 3. Comparison diagram between Lake Ohrid DEEP site core and Lake Prespa core Col1215 showing the relative abundance data of selected diatom species, and (bio)geochemical data. DZ 1-4 from Lake Ohrid core DEEP, dotted lines mark the six diatom zones of core Col1215 (Cvetkoska et al., 2015).

MODEL PREDICTIONS:

Due to the underground connection through Mt. Galicica, a potential 20 m water-level decrease of Lake Prespa can cause a five-fold increase of its phosphorus concentration, which may lead to a 30% increase of the P load from Lake Prespa to Lake Ohrid.

AIMS:

Assess the potential interconnectivity between the lakes and understand the role of Lake Prespa as possible driver of lake-level and/or nutrient shifts in Lake Ohrid over the past 92.0 ka.

RESULTS:

✓ The comparison provides sufficient evidence to disregard the theory of Prespa-dependent regime shifts in Ohrid.

HIGH ECO SYSTEM RESISTANCE/RESILIENCE ➔ NO CATASTROPHIC EVENTS

Fig. 2. Stratigraphic diatom diagram showing species with >2% abundance in Lake Prespa core Col1215, displaying diatom zones defined by CONISS, lithology and lithofacies (Damaschke et al., 2013). RRD = ice-rafted debris, Marine Isotope Stages (MIS) after Lisiecki and Raymo (2005).