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# Zoobenthic fauna distribution in an Antarctic fjord area under glacier retreat

**Dr. Camila Neder<sup>1,2</sup>, Dr. Kerstin Jerosch<sup>3</sup>, Hendrik Pehlke<sup>3</sup>, Dr. Luciana Torre<sup>1,2</sup>, Dr. Ricardo Sahade<sup>1,2</sup>**

1. Instituto de Diversidad y Ecología Animal (IDEA), Consejo Nacional de Investigaciones Científicas y Técnicas (CONICET).
2. Facultad de Ciencias Exactas Físicas y Naturales, Universidad Nacional de Córdoba
3. Consejo Nacional de Investigaciones Científicas y Técnicas (CONICET).
4. Instituto Antártico Argentino
5. Alfred Wegener Institute, Helmholtz Centre for Polar and Marine Research, Bremerhaven, Germany

presenter: cami.n37@gmail.com

The West Antarctic Peninsula faces a significant increase in temperature and anthropogenic carbon emissions, affecting its marine and terrestrial biodiversity. Species Distribution Models (SDMs) are essential tools for assessing habitat suitability and predicting the responses to these changing conditions. In the coastal fjord ecosystem Potter Cove, glacier retreat exposed new ice-free areas altering the environment through meltwater input and sediment runoff. This research aims to predict the actual distribution of Antarctic zoobenthos in this changing coastal ecosystem and to analyze potential zoobenthic assemblage compositions in areas strongly affected by glacier retreat. Analysis of eight benthic taxa distributions reveals distinct habitat types within a maximum area range of approximately 1.5 km in length. About 60% of the study area (equivalent to 5.45 km<sup>2</sup>) is estimated to be suitable for zoobenthic occurrence. Interpretation of binary transformation thresholds reveals taxa-specific environmental preferences, wherein lower threshold values indicate broader habitat extensions. This suggests potential coexistence in glacier-influenced areas. This study emphasizes the significance of interdisciplinary approaches in understanding benthic responses to environmental shifts resulting from climate change in the Antarctic coastal ecosystem. It highlights the necessity for ongoing long-term research and the development of conservation and management strategies to address the continuing environmental shifts effectively.