

DynAMo - Dynamic impact of ice mass loss in the Andes on terrestrial, limnic and marine ecosystems

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Cooperation partners in Germany, Chile and Argentina: AWI, Carl von Ossietzky University Oldenburg, Friedrich-Alexander University Erlangen-Nürnberg (FAU), Centro Austral de Investigaciones Científicas (CADIC), Centro de Investigación Dinámica de Ecosistemas Marinos de Altas Latitudes (IDEAL), Instituto Argentino de Oceanografía (IADO), Centro de Ecología Aplicada de Neuquén (CEAN).

Starting point for the research cooperation: The southern regions of Patagonia are strongly impacted by climate change. Melting of the Andean tidewater glaciers causes significant freshwater and matter release into the marine coastal areas of the Beagle Channel (BC) and the Chilean estuarine system. Regionally intensifying human use of coastal areas superposes the effects of climate change, exacerbating the environmental consequences. As observational data sets from the area are scarce and often inconsistent, and time-series mainly absent, DynAMo aims at building and testing a first marine-terrestrial observation network in BC. Limited accessibility of changing fjordic ecosystems raises the need for developing automated measuring technology for continuous data collection around the year. The high costs of ship-based research for coastal monitoring underlines the urgent need for automated systems in subpolar regions. Once developed and tested with local stakeholders, such systems will be applicable in marine, limnic and terrestrial environments in other remote regions on earth (including the Arctic).

Research approach, scientific goals and utilization: The cooperation goal is the establishment of an interdisciplinary research group between Germany, Chile and Argentina. In order to monitor environmental change and its consequences, permanent measuring structures will be operated in Beagle Channel and in the southern Andes coastal region. In addition to the automated recordings of oceanographic and biogeochemical parameters, modern bio-optical measurement technology and molecular procedures will be integrated into the coastal observatory. Ongoing research for detection of natural hazards will be intensified, including toxic algal blooms.

Scientists, engineers, and technicians from all three countries are working together to optimize data management processes and systems that can be used in Patagonia and Antarctica. Companies specialized in marine technology are involved in the development, construction and operation of the coastal observing system. In the long-term, the measurement data should allow better analyses and interpretations in glaciology and climatology, as well as provide a basis for future modelling and prediction of risk scenarios.