
PROTEKER: Setting up of an underwater observatory at the Kerguelen Islands (Austral Ocean)

Jean-Pierre Féral*^{†1}, Thomas Saucède*², Elie Poulin³, Romain David¹, Christian Marschal⁴, Gilles Marty⁵, Jean-Claude Roca⁶, Sébastien Motreuil⁷, and Jean-Pierre Beurier⁸

¹Institut méditerranéen de biodiversité et d'écologie marine et continentale (IMBE) – INEE, Université d'Avignon et des Pays de Vaucluse, Institut de recherche pour le développement [IRD] : UMR237, Aix Marseille Université, CNRS : UMR7263, INSB, INSU – Aix Marseille Université, Station Marine d'Endoume, Chemin de la Batterie des Lions, 13007 MARSEILLE, France

²UMR 6282 Biogéosciences, Univ. Bourgogne Franche-Comté, CNRS (1) – Univ. Bourgogne Franche-Comté – 6 bvd Gabriel 21000 DIJON, France

³Laboratorio de Ecología Molecular (LEM) – Universidad de Chile Las Palmeras 3425 Santiago, Chile, Chile

⁴Institut méditerranéen de biodiversité et d'écologie marine et continentale (IMBE) – INEE, Université d'Avignon et des Pays de Vaucluse, Institut de recherche pour le développement [IRD] : UMR237, Aix Marseille Université, CNRS : UMR7263, INSB, INSU – Aix Marseille Université, Aix Marseille Université, Station Marine d'Endoume, Chemin de la Batterie des Lions, 13007 MARSEILLE, France

⁵Réserve Naturelle des TAF (RN TAF) – TAAF, Terres Australes et Antarctiques Françaises – Rue Gabriel Dejean BP 400 97458 Saint Pierre Cedex La Réunion, France

⁶Observatoire océanologique de Banyuls (OOB) – CNRS : UMS2348, Université Pierre et Marie Curie (UPMC) - Paris VI – LABORATOIRE ARAGO BP 44 66651 BANYULS SUR MER CEDEX, France

⁷Biogéosciences – Université de Bourgogne, CNRS : UMR6282 – UMR 6282 CNRS - université de Bourgogne, 21000 Dijon, France

⁸Centre de droit maritime et océanique (CDMO) – Université de Nantes : EA1165 – Faculté de droit de Nantes Chemin de la Censive-du-Tertre BP 81307 44313 Nantes Cedex 3, France

Abstract

Isolated in the southern Indian Ocean, the Kerguelen Islands emerge from the Kerguelen-Heard Plateau on the flow of the Antarctic Circumpolar Current. They are located in a very dynamic oceanographic area positioned at the confluence between several water masses (Antarctic surface waters, Sub-Antarctic and Sub-Tropical waters) near the Antarctic convergence that tend to move southwards. Latitudinal shift of waters with other characteristics will result in environmental changes that may affect coastal biodiversity and ecosystem functioning. To be interpreted and to identify eventual trends, such changes must be recorded through the establishment of a long-term monitoring. The French Polar Institute (IPEV) PROTEKER program aims to implement such an underwater observatory that considers

*Speaker

[†]Corresponding author: jean-pierre.feral@imbe.fr

a multidisciplinary approach: oceanographic measurements, benthic mapping, genetic, ecophysiological, isotopic and environmental analyzes. In addition to the inventory and the monitoring of biodiversity, it also aims at providing with scientific criteria of managers in charge of protection and conservation policies (French Southern Lands National Nature Reserve). Eight sites (four in the Bay of Morbihan, two on the north coast and two on the south one) were chosen that match the following requirements: (i) representative of Sub-Antarctic habitats, (ii) accessibility compliance with the safety standards of scuba diving. Currently, temperature only is continuously measured. Results are posted on the web site *www.proteker.net* and updated after each campaign. The colonization dynamics are estimated from settlement clay plots revised each year (metagenomics analysis). All these results will produce models of biodiversity distribution and sensitivity to environmental changes.

Keywords: long term monitoring, climate change, SubAntarctic marine habitats, environmental management, scientific diving