

Impact of climate induced glacial melting on coastal marine systems in the Western Antarctic Peninsula region

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OVERVIEW

IMCOAST is an international research program that features a multidisciplinary approach involving geo and biological sciences, field investigations, remote sensing and modeling and knowledge into the hydrographical and biological history of the marine coastal ecosystems of the Western Antarctic Peninsula region



OBJECTIVES

- To quantify *variability and changes* in fresh water budgets in coastal ecosystems
 ↳ provide the physical boundary conditions for geochemical, sedimentological and biophysical research
- To understand the *effect of glacial retreat* on sub-glacial and *past and present* melt water run-off dynamics
- To analyze the effects of the *current climate change* on coastal pelagic ecosystems
- To analyze *carbon recycling in the sediment surface* of coastal systems *with and without impact of sedimentation*, and the *benthic-pelagic coupling* in KGI coastal food webs
- To evaluate *impact and strength* of late Holocene warm phases on the KGI coastal system

STUDY AREA

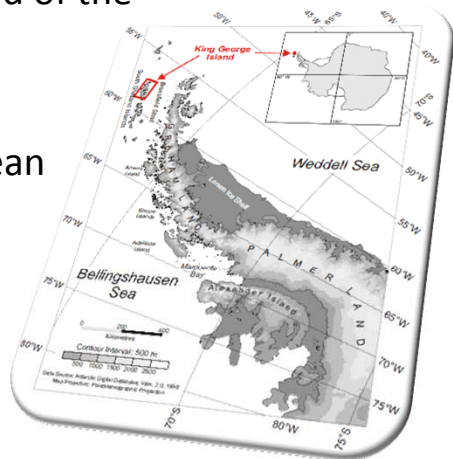
KING GEORGE ISLAND is the largest island of the South Shetland Islands archipelago.

~ 120 kilometers off the coast of the Antarctic continent in the Southern Ocean

~ 95 km long and up to 25 km wide

Rose Peak, with 655 m above sea level, is its highest point

Various big and small bays characterize its appearance

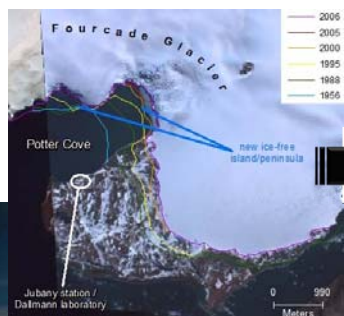


Most of the field work is carried out in Potter Cove, a shallow bay at the Southern side of King George Island.

About 90% of the KGI surface is covered by glaciers



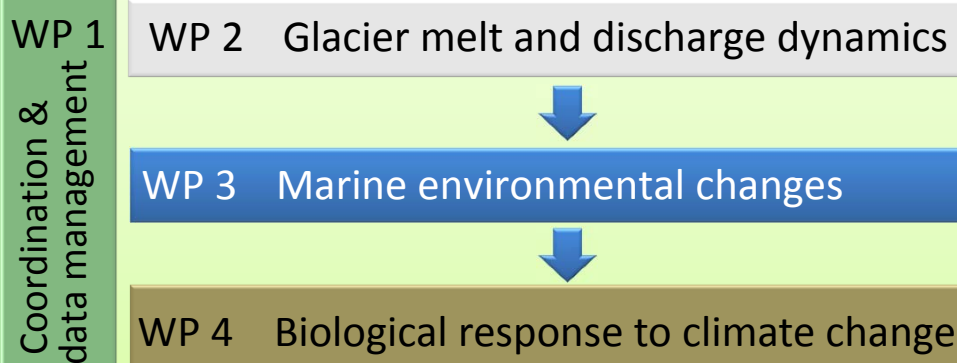
The observed elevated air temperatures at King George Island have resulted in significant glacier retreat, longer annual glacier melt periods accompanied by increased fresh water discharge volumes.



The strong input of sediment containing melt water changes surface seawater properties during summer, leading to shallow salinity stratification and strongly enhanced irradiance attenuation.

PROJECT STRUCTURE

IMCOAST is subdivided in Work Packages (WP) with Individual (IP) and Associated (AP) Projects, each one with more specific objectives.



Field work is carried out in collaboration with the Instituto Antártico Argentino (IAA), The Alfred Wegener Institute for Polar and Marine Research (AWI) and the Department of Antarctic Biology of the Polish Academy of Sciences. The funding comes mainly from the ESF for European partners, and many national funding agencies which support the Associated Projects.

