

Preface

Isla de los Estados is located in the extreme south of South America. It has been described by numerous sailors who have visited it at different times since 1616, categorizing it as one of the most inhospitable but spectacular islands in the world. It is separated by a distance of 30 km from the Mitre Peninsula by the Le Maire Strait to the southeast of the Isla Grande de Tierra del Fuego. Isla de los Estados occupies a strategically important position between the Antarctic Peninsula and the South American continent providing important paleoenvironmental information concerning the weather and impact of climate changes that have taken place since the last glaciation. Botanically, the island is situated in the extreme eastern end of the Subantarctic Evergreen Forest that constitutes the world's southernmost forest, extending down to 56°S only 800 km from the Antarctic Peninsula.

The climate changes that occurred in the far south of Patagonia and the Isla Grande de Tierra del Fuego in the recent geological past have been investigated mainly through geomorphological and paleoecological studies (Coronato et al. 2007).

The Beagle Channel (54° 53'S and between 66° 30' and 70°W) to the south of Tierra del Fuego is an ancient tectonic valley that was completely filled with ice during the last glacial maximum (LGM, ca. 24 ka B.P.; Rabassa 2008). The ancient Beagle Glacier originated from the Darwin Mountain Range ice field, receiving tributary glaciers from the internal cirques and valleys of the mountainous branches of both margins of the range. At its maximum extent during the Last Glaciation, the ice front was located at Moat Point in the northern margin of the Beagle Channel (120 km to the west of Isla de los Estados), where many moraine arcs can be still seen. Judging by the basal ages of the peat bogs found along the Beagle Channel it may be inferred that around 14.6 ka B.P. the ice front had retreated some 100 km to the west of its point of maximum extension. The final retreat of the ice occurred at least around 10 ka B.P., when the first communities of steppe/tundra environment vegetation established themselves (Markgraf 1993a; Heusser 1989a, b).

The Quaternary deposits of the Isla de los Estados constitute an invaluable resource for the investigation of past climate events in the highest latitudes. This is particularly true in those places where the Subantarctic forest and the non-arboreal vegetation make up areas of tension that are sensitive to changing climatic parameters.

This book is the result of 10 years of scientific research made by the authors on Isla de los Estados. The research includes their doctoral thesis and many published scientific papers related to the island. Dr. J. F. Ponce arrived for the first time to Isla de los Estados to carry out fieldwork activities in 2003. Dr. M. Fernández started with diatom analysis in 2006.

This book can be divided into two principal parts. The first part contains different social and natural aspects of this remote island and includes chapters on the scientific and historical background, physiography with topographical and hydrographical descriptions, climate and oceanographic circulation, vegetation and geology (including stratigraphy, structural geology, and geological history).

The second part comprises a reconstruction of the paleoenvironmental, paleoclimatic, and paleogeographic history of the island from the Last Glacial Maximum to the present, correlating with other paleoecological records from the southern part of Isla Grande de Tierra del Fuego and Patagonia. This second part also includes a geomorphological chapter with a characterization of the principal erosive glacial landforms in Isla de los Estados constructed by means of morphometric analysis, inventories, maps, paleogeographic, and glacial models, and a paleoecological chapter evaluating the palaeoenvironment and palaeoclimatic conditions that prevailed during the Late Pleistocene-Holocene times based on pollen and diatom analysis from three ^{14}C -dated peat bogs and lakes. Finally, the book concludes with a review of the island's archaeology and the relationship between the palaeoenvironmental history and human occupation of this island.

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