Final project report

Project ID Title	2003/4.03 Late Quaternary climatic evolution of Magellanic-Fuegian areas (Southernmost South America
Principal investigator	Ester Colizza (ex Antonio Brambati)
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Duration	2 years
Assigned funding	50.000,00 Euro

Activities and results

This project aims to investigate some aspects of the late Quaternary climate evolution related to the deglacial processes, the environmental evolution, and the Holocene climatic fluctuations in selected areas of a Magellanic-Fuegian area. The project involved two lines of research: the first based on the study of marine sediments, the second the integration of geomorphological study of marine terraces.

Investigations along the coasts of several areas of the Strait of Magellan and the Seno Otway, with the main purpose of dating several marine terraces, were made in December 2003. During the **field campaign** a series of stratigraphic sections was mapped. These sections are usually characterized in various sectors by 3 orders of terraces and sometimes by a fourth order at 18-20 m altitude. Over 50 samples of shells and organic material for dating with the ¹⁴C were collected.

Data obtained agree with those previous paper published in 1998. The age of the terraces of second order (6-11 m) is estimated at 6500-7500 years BP, while the terraces of III order (3-5 m) are more young: from 5500 to 6000 years. The terrace sections on the south of Punta Arenas were always rather more recent, about 2500-3000 years compared to the values mentioned above.

These data allow to hypothesize that the terraces of the northern sector (Atlantic) of the Strait are oldest terraces of the area south of Punta Arenas and the Bahia unnecessary in agreement with the retreat of glaciers from the north south.

In may 2005 a **geologic cruise** was performed with the Gran Campo II vessel. The research was focused on 2 sectors corresponding to the depressions occupied by the principal glacial lobes during the Last Glacial Maximum: Seno Otway and Seno Skyring. In particular 5 cores from Seno Otway (OTW), 2 from Jeronimo Channel (JER) and 1 from Seno Skyring (SKR) were collected, X-rayed, opened, described, and subsampled. Analyses on water content, grain size, organic content, bulk/clay mineralogy, microfaunal assemblages were performed. Selected levels were ¹⁴C dated. Cores represent three different environmental situations:

Cores-OTW: the diamicton on the base of long core, the presence of many peat levels, and the microfaunal assemblage typical hypohaline/brackish waters indicate the transition from the phase of glacial retreat to the present environment.

Core-SKR: the comparison with the cores collected in the same area from other Authors suggests that the core records a strictly Holocene sedimentation. Sedimentation took place in a melt water environment.

Cores-JER: the presence of many carbonate fauna indicates the influence of western Magellan Strait waters (characterized by a biogenic carbonate sedimentation) entering in the basin through the Jeronimo Channel. Carbonate fauna is low in the lower part of the core and clearly increases in the upper part. This trend can indicate the transition from a period when the basin was covered by ice to the modern, ice-free, oceanographic conditions.

Products

A – papers in scientific magazines

B – book chapters

C - proceedings of international conferences

- BRAMBATI ANTONIO, DEMURO SANDRO (2004) The last marine ingression in Central Magellan Straits, Southernmost Chile: geological and geochemical evidences. 32nd International Geological Congress, Florence, 20-28 August, 2004
- 2. DEMURO SANDRO, DI GRANDE ANGELO, BRAMBATI ANTONIO (2004) Atlas of the marine and transitional terraces in the Magellan Straits Patagonia and Tierra del Fuego. 32nd International Geological Congress, Florence, 20-28 August, 2004

D – proceedings of national meetings and conferences

1. COLIZZA E., FINOCCHIARO F., MARINONI L., MELIS R., SETTI M., BRAMBATI A. (2009) The "Magellano Project": preliminary results on marine sediment investigations. Geoitalia 2009, VII Forum Italiano di Scienze della Terra, Rimini, 9-11 September 2009.

E – thematic maps

 A. BRAMBATI, S. DE MURO AND A. DI GRANDE: Atlas of the Coast of the Eastern Magellan Strait., 3 mappe geomorfologiche scala 1:200.000, 6 mappe geomorofologiche scala 1:50.0000, edizione 2004. 32nd International Geological Congress, Florence, 20-28 August, 2004

F – patents, prototypes and data bases

G - exhibits, organization of conferences, editing and similar

H - formation (PhD thesis, research fellowships, etc.)

Research units

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Notes