

Final project report

<i>Project ID</i>	2004/4.06
<i>Title</i>	Chronologic-dynamic zoning of the Ross Orogen
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Activities and results

The Ross Orogen in Victoria Land is made up of geologically distinct sectors, characterized by diachronous tectono-magmatic activation. The reconstruction of the convergence process call for an integrated multidisciplinary approach, with two main research lines: (A) internal zone of the active continental margin: intrusion mechanisms in selected key areas of the different sectors, (B) outer zone of the margin: tectonic, igneous, metamorphic and sedimentary evolution of the terrane transitions.

The aim of the project is the reconstruction of the working mechanisms of the active continental margin, comparing the evolution of its inner and outer portions. The methodological challenge of the project was represented by the activation of a multidisciplinary approach: structural geology and AMS, igneous petrology and geochemistry, metamorphic microstructure-petrology, Ar-Ar and U-Th-Pb geochronology, mingling-mixing numerical investigations, analogic models of intrusive processes.

Activities in Antarctica

The Project's field activity has been carried out in the frame of two PNRA scientific expeditions in Antarctica. In the 2004-05 austral summer, two reserchers studied the mafic igneous intrusions in th einternal zone of the margin south of MZS as well as the frontal zones where mafic-ultramfic intrusions crop out. During the 2005-06 expedition, a significant logistic support to the Littell Rocks (Rennick Glacier), allowing a detailed structural and petrographic investigation of the relationships between emplacement of magmatic bodies and the tectonometamorphic evolution of the frontal zones of the margin straddling the Wilson-Bowers Terrane Boundaries in the areas of the USARP Mountains, Daniels Range, Bowers Mountains, Morozumi Range, Lanterman Range. Further investigations, based on MZS, have been carried out on the intrusive and metamorphic history of the transition zone of the Priestley-Reeves glaciers.

Activities in Italy

The samples collected in Victoria Land have been the subject of a multidisciplinary investigation effort. As an example, for the Morozumi Range intrusive complex, structural, petrographic, geochemical, isotopic and geochronological data have been integrated aimed to the reconstruction of the genesis and intrusion-deformation sequence of the whole complex in the mainframe of the active continental margin. The Robertson Bay terrane has been investigated for the nature and provenance of the turbiditic deposits, as well as for the nature of the underlying crust by means of geochemical-geochronological investigations on deep-seated xenoliths.

The transition zones, with particular care devoted to the Priestley Glacier belt, have been studied by the integration multidisciplinary structural-geochronological approaches, with the aim of defining the chronological extent of the ductile-fragile deformational transition throughout the whole Phanerozoic time. In the most internal zone of the margin, the mafic "postcollisional" intrusions have been investigated in detail in the area between the Reeves Glacier and Granite Harbour, as well as in the Dry Valleys area, integrating structural, petrochemical and geochronological data with image analysis and numerical modelling.

Main results

The interpretation of collected data led to the formulation of new models for the geodynamic evolution of the transition zones representing segments of the Gondwana active in Antarctica during the early Paleozoic.

Products

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Research units

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Notes