Metamorphic Development beneath the Vourinos Ophiolite

Advisor: Tim Holland

Aims: The Vourinos Ophiolite is just one of several Hellenic Ophiolites found within Greece and Albania. It is situated in north-central Greece, and was created during Jurassic-age closure of the Neotethys. Plans to flood the area by creation of a hydroelectric dam have necessitated an international project to study the region. Mapping in 2006 revealed a narrow discontinuous amphibolite sole welded to the base of the ophiolite, previously observed by Zimmerman (1972) and others, containing minerals suitable for thermobarometry and dating. The lower ophiolite section has yielded locally rotated, serpentinised shear zones, suggesting gravity-driven extension during emplacement. Underlying the complex, a predominantly greenschist melange lies above Pelagonian basement.
The project will investigate both the structural and metamorphic development of the region. This will involve collection of structural data from within the ophiolite and the underlying melange. Samples collected from the amphibolite (especially from reported garnet-bearing localities) will be analysed for composition and P-T evolution, and may reveal information about earliest obduction. Samples within the melange will also be collected, and pseudosections may be constructed to derive a detailed evolutionary history for the sole. There may also be a study of evidence for the origin of metamorphism - whether from shear heating on emplacement, diffusion from the overlying hot ophiolite postdating emplacement, or advection of heat by convecting fluids.

Methods: The project will involve six to eight weeks fieldwork around the Vourinos Ophiolite, collecting structural data and samples. After this, samples will be either dispatched for whole-rock analysis, or analysed using electron microprobe techniques within the department, depending on the nature of work to be carried out. The Michaelmas Term will consist of interpreting structural data and results from chemical analyses to deduce a detailed history of the development of the ophiolite.

Logistics: Fieldwork will take place from late June, from base in the village of Paliouria. Field risk assessments are much the same as for Part II mapping projects: Assistance and transport has been assured for days far away from base, and other students partaking in mapping and other research will be informed daily of plans. Some samples from the 2006 season are already available, and exposure is more than adequate for the data and sampling required.
Analytical facilities will be available in Cambridge Earth Sciences Department, likely before the start of Michaelmas Term. Further analysis will be funded by resources obtained prior to start of the project (below).

Resources: The majority of fieldwork costs, and funding for some analysis will be provided by *The Public Power Corporation of Greece*, as part of a multinational effort to study the ophiolite sole before it is flooded. Further funding has been requested from Peterhouse, Cambridge.

References:

Zimmerman Jr., J. 1972. Emplacement of the Vourinos ophiolitic complex, northern Greece. *Geological Society of America* **Inc. Memoir 132**, 225-239.