

POST ATTENDANCE SCIENTIFIC REPORT

URBINO SUMMER SCHOOL IN PALEOCLIMATOLOGY 2012

The main goal of my attendance at the Urbino Summer School in Paleoclimatology was to improve my knowledge on paleoceanography and paleoclimatology. This is of basic importance for my PhD project which is focused on the study of deep-sea benthic foraminiferal assemblages to reconstruct paleoenvironmental changes during transient Paleogene climatic perturbations (e.g. the Middle Eocene Climatic Optimum or MECO global warming event).

Other than benthic foraminifera, there are several biotic and abiotic proxy which are common utilized tools to reconstruct paleoceanographic and paleoenvironmental changes related to climatic perturbations. These, and their applicative uses, are one of the main subjects treated at the Urbino Summer School, and my interest in the attendance was particularly focused on.

Thanks to ESF scholarship, which has permitted my attendance at the Urbino Summer School, I not only improved my knowledge about existent paleoceanographic proxy and their application, but I also realized the usefulness of a multi-proxy approach in the study of past climatic perturbations.

For example:

- using together oxygen stable isotopes and Mg/Ca measurements made on foraminifera it is possible to isolate the temperature signal from the $\delta^{18}\text{O}_{\text{sea water}}$, and to reconstruct local variations in evaporation-precipitation (and thus salinity).
- Mg/Ca measurements on planktic foraminifera coupled with Mg/Ca measurements on benthic foraminifera give temperature information on both surface and bottom waters and permit to reconstruct changes in the temperature gradient of the water column.
- Benthic foraminiferal assemblages and higher-plant n-alkans analysis across past global warming events, can highlight links between changes in the nutrient flux, sea-bottom oxygenation, primary productivity and perturbations of the hydrological cycle.

The combined use of diverse and/or independent proxy can make you more confident, highlight the need of further analysis or give information about more than one environmental parameter.

The multi-proxy approach is thus fundamental to better understand past climatic perturbations and it is highly promising to improve our knowledge on their repercussions on the ocean-atmosphere system and on the biota. Thanks to the Urbino Summer School I got this new perspective and since research in the field of paleoclimatology is increasingly moving toward this direction, I think it has been of fundamental importance for my professional education.

My attendance at the Urbino Summer School has been very useful also to meet and discuss with many other students which work in the field of paleoclimatology and paleoceanography leading completely different researches from the mine.

I had discussions with several teachers too, which have been useful to improve my work which is in progress and to create important future collaborations.