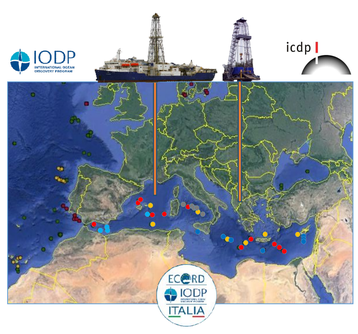


Workshop IODP-Italia "Lo stato delle proposte di perforazione nell'area mediterranea"

Scientific Drilling in the Mediterranean Sea

Roma, 15-16 gennaio 2018

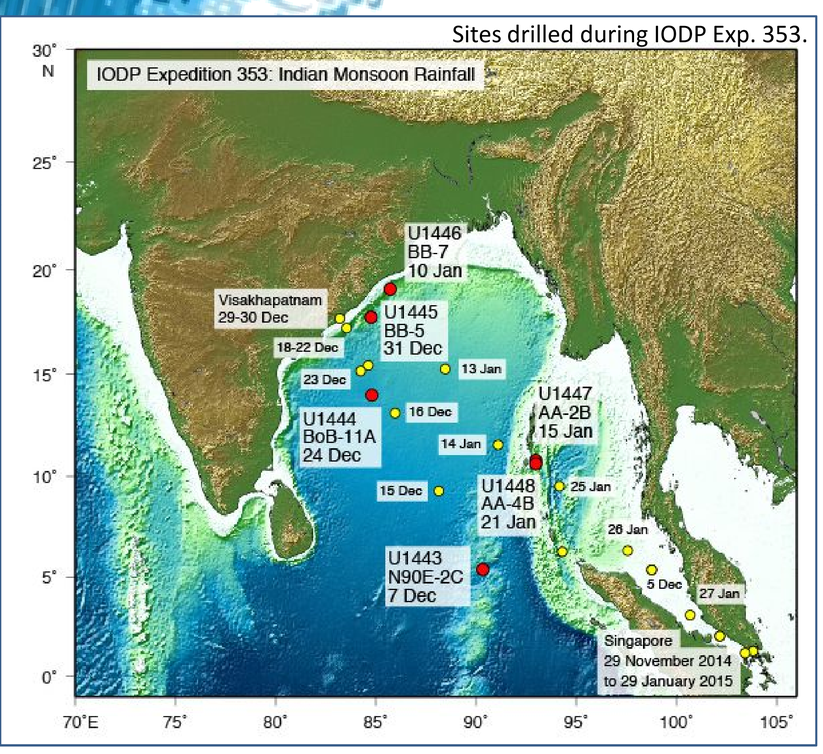
IODP Exp. 353: an occasion of professional enrichment and growth

Spedizione IODP 353: un'occasione di arricchimento e crescita professionale

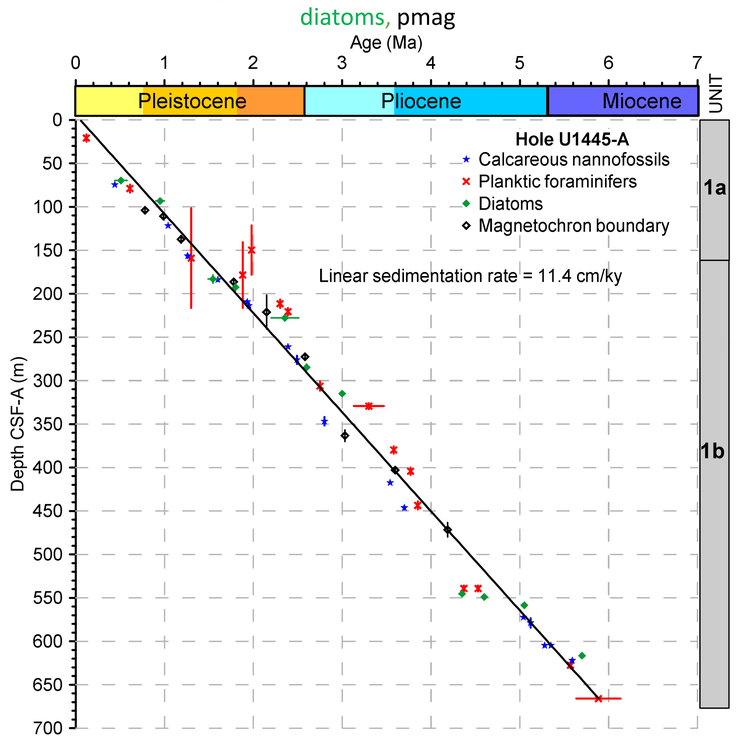
Karen Gariboldi, Dipartimento di Scienze della Terra, Università di Pisa, karengariboldi@gmail.com

DURING THE CRUISE...

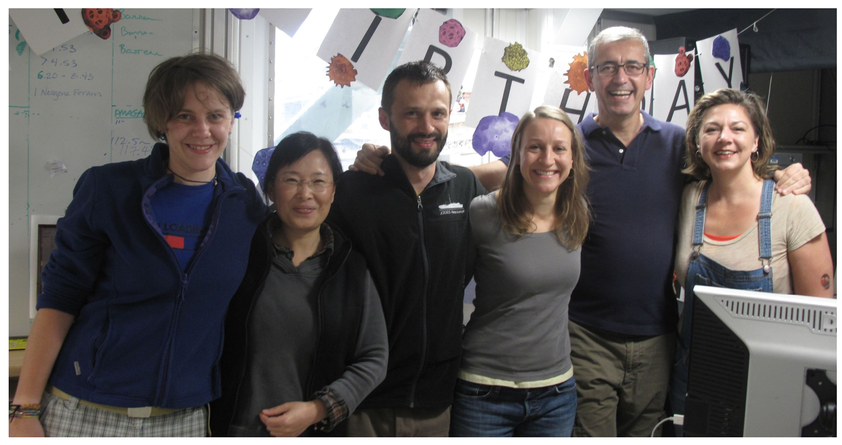
Sites drilled during IODP Exp. 353.



BELOW:on-board Age Model fo Site U1445 based on nannos, forams, diatoms, pmag



BELOW: micropaleontologists of Exp. 353. From left to right: K. Gariboldi (diatoms), X. Ding (forams), M. Bartol (nannoplancton), C. Bolton (nannoplancton), O. Romero (diatoms) and M. Robinson (forams). Photo credit: Liping Zhou.



IODP Exp. 353, "Indian Monsoon Rainfall" (Gulf of Bengal, November 2014 – January 2015), recovered Upper Cretaceous–Holocene sediment sections, with the aim to understand "the physical mechanisms underlying changes in Indian monsoonal precipitation" (IODP Exp. 353 Scientific Prospectus).

I took part to Exp. 353, during my II year of PhD. I was on board of the *Joides Resolution* as a diatom biostratigrapher, and working with the other on-board micropaleontologists increased my knowledge and skills in biostratigraphy.

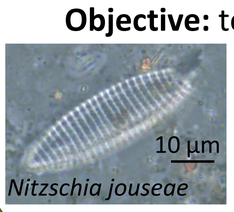
AFTER THE CRUISE...

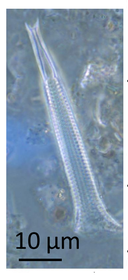
...the Cruise partecipants are required to develop research projects with the material collected during the Cruise. I proposed 3 projects:

1) The Diatom Biostratigraphy Project

Scientific Background: a lack of information regarding diatom stratigraphy is reported for the Bay of Bengal: before Exp. 353 scientific oceanic drilling was never operated north of the 758 ODP Site (Ninetyeast Ridge, 9°N in the Bay of Bengal, IODP Exp. 353 Scientific Prospectus).

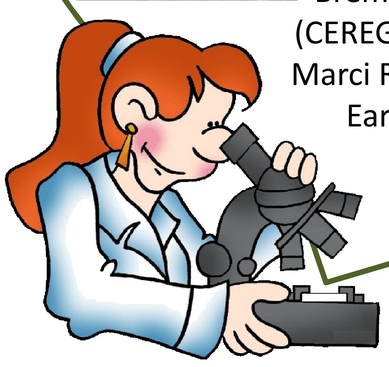
Objective: to realise a diatom biostratigraphic scheme for the Cenozoic of the Indian Ocean.





What: mainly on-board-made smearn slides.

Collaborators: Oscar Romero (MARUM, University of Bremen), Miloš Bartol (University of Sweden), Clara Bolton (CEREGE, France) Xuan Ding (China University of Geoscience), Marci Robinson (USGS), Yoichi Usui (Japan Agency for Marine-Earth Science and Technology), Sam Taylor (Institut de Physique du Globe de Paris).



Alessandra Negri

2) The "Late Miocene Carbon Isotope Shift" event (ca. 7.6 – 6.6 Ma) Project

Scientific Background: sediments of the late Miocene (from ca. 7.6 to ca. 6.6 Ma) globally recorded a negative carbon isotope shift in foraminifera and bulk sediments. This shift is associated to a period of enhanced marine biological productivity (Diester-Haas et al., 2006).

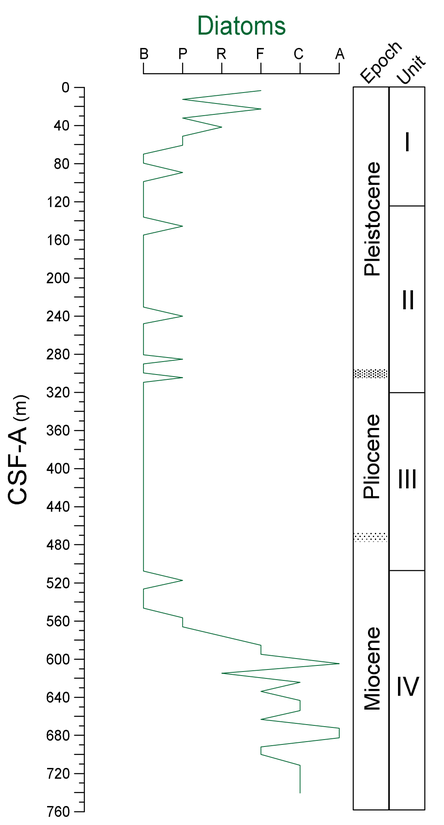
Objective: to study this shift by means of different micropaleontological assemblages with the aim to understand its activation mechanisms.

What: Site U1447A (Andaman Sea) samples from upper Miocene to the bottom of the core with a 50 kyrs resolution.

Collaborators: Caterina Morigi (Dip. Scienze della Terra, Università di Pisa), Alessandra Negri (Dip. di Scienze della Vita e dell'Ambiente, Università Politecnica delle Marche).

Highlights: - the comparison of our data with those obtained by other Cruise Partecipants, working on the late Miocene Carbon shift as well (at different Sites and using different proxies, such as biomarkers) will help us to have a better picture of this climatic event in the Bay of Bengal;

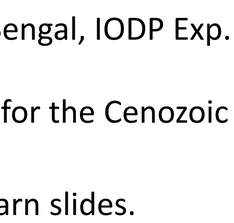
- students will be got involved by developing their thesis on the topics of this project.



ABOVE: on–board diagram of diatom abundance in sediments of Hole U1447A. A drastic shift in diatom abundance is observed in the late Miocene (B = Barren; P = Poor; R = Rare; F = Few; C = Common; A = Abundant). Different units referer to different litjologies recognised on board.

3) The "Role of Volcanic Ashes in Enhancing Primary Production: Evidences in the Deep Time" Project

Caterina Morigi



Anna Gioncada

Matthias Zabel

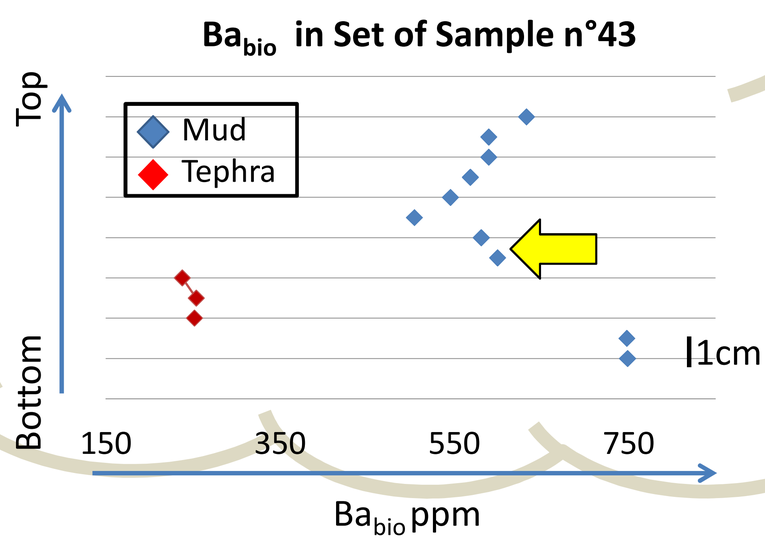
Scientific Background: volcanic ash behaves like a fertilizer: as it reaches seawater, it releases quantities of nutrients high enough to cause huge algal blooms (Duggen et al., 2007).

Objective: to evaluate changes in primary production due to volcanic events recorded in the sediments by measuring different geochemical and micropaleontological proxies for paleoproductivity.

What: sediment samples collected just below and just above tuff layers. Also the tuff layers themselves were collected (see the diagram on the right). Samples are from Sites U1443, U1445, U1447 and U1448.

Collaborators: Anna Gioncada and Caterina Morigi (Dip. Scienze della Terra, Università di Pisa), Matthias Zabel (MARUM, University of Bremen).

BELOW, LEFT: diagram of Ba_{bio} in the sediments above and below the Younger Toba ash layer (blue diamonds) and in the Younger Toba ash layer itself (red diamonds) at Hole U1443A



Ba_{bio} values of sediments above the tephra have a strong negative shift compared to those of the sediments below the tephra: these values reflect the dilution of pelagic mud with the tephra due to bioturbaton.

The yellow arrow highlights values of sediments just above the tuff with Ba_{bio} values with a less negative shift compared to the overlying sediments. These values could be interpreted as a relict of the increase of primary production due to the arrival of the ashes; further evidence is needed to prove this hypothesis.

Highlights: - this project is founded by an ***ECORD RESEARCH GRANT (2015)***;

- students got involved by developing their thesis on the topics of this project;
- some samples are records of the Younger Toba Event (ca. 0.074 Ma);
- I performed part of the ICP-OES analyses myself at MARUM.

Aknowledgments: my partecipation to this Workshop was financed by IODP Italy-CNR. I am particularly thankfull to ***Dr. Annalisa Iadanza*** (IODP Italy-CNR) who always supports me, both from an administrative point of view and as a Friend.