

Why coring in the Philippines seas ?



Cores retrieved from the Philippines internal seas will allow to perform a multiproxy chronological, geochimical and magnetic study of the tephra (volcanic ash) layers and therefore to obtain a reconstruction of the temporal distribution of the Philippines volcanism.

Presentation of the studied area

The Philippines are located in a subduction zone (cf. Figure 1). It is a very active tectonic area : there are more than 400 volcanoes in the archipelago associated with faults and trenches. The volcanoes are distributed into five major and five minor volcanic arcs. They can be classified according to their activity. Indeed, a volcano is considered as active if it had been in eruption since the early Holocene. In the Philippines are, 22 are active (Mayon, Pinatubo, Taal, Bulusan...), 27 are potentially active and all the others are inactive. Different types of eruption exist. In Philippines, most of the volcanoes are explosive (cf. Figure 2), but some of them can be effusive.





Figure 2 : The Bulusan, an active Philippine volcano

What kind of study can we do on these cores?

- Tephra layers (cf. Figure 3) are important geological tools to establish or reconstruct : chronostratioraphic inter-core correlations (relative datation).
- absolute datation (isotopic ratios of K/Ar or ⁴⁰Ar/³⁹Ar), for paleo-volcanism and paleoenvironmental proxies,
- eruption intensity (total erupted mass),
- timing of the eruption,
- eruption magnitude (mass eruption rate),
- syneruptive wind vectors,
- datation of passed Earth geomagnetic field intensity and polarity.

However, there are some difficulties to work on tephras layers : the material is not homogenous, in low quantities and analysis are very minutely detailed because of the small grain size.

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Figure 3 : Photography of a tephra layer in a core of the Philippines Sea.