How to describe cores ?

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Introduction

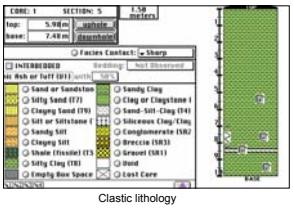
Description and characterisation of the sediment components provide a very precise documentation about the variations in the stratigraphical and lithological variations. It is very useful for scientists who work in various paleoceanographic fields, because they don't always have the opportunity to have a look at the original core. Descriptions show variations in sedimentary features with depth, as follows :

- **climatic events**: changes in lithologic layers (foraminifera, opal, microfossils, ...) → Biological proxy
- **volcanic events**: volcanic minerals like glass which allows to determinate ages → Mineralogical proxy
- **earthquake events** : changes in the facies (turbidite, grains, ...) → Purely sedimentological proxy
- **disturbances in the sedimentological signal** : bioturbation, modification of the deposits structure, diagenesis action, and deformation due to the corer system → Structure proxy

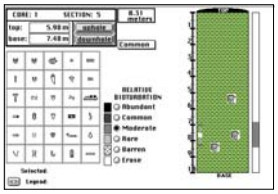
The first step for sediment core description is to look at several parameters and to write all details seen in the core on logging sheets. Then this information is entered in a picture treatment software : Apple core ®, which has lots of links to windows that are filled according to the manual description.

Which are the different parameters in Apple core software?

- Clastic Lithology : sand, clay, silt …
- Physical structures: bioturbation, slump…
- Rock color: • intensity: light, dark …
  • modifier and hue (mixed two colors)
- Fossils contents : foraminifera, diatoms …
- Texture

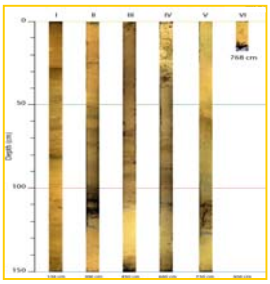


Clastic lithology

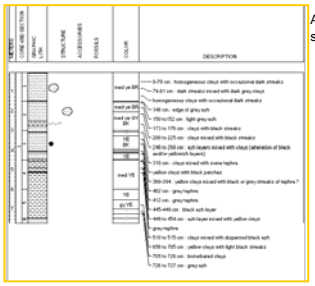


Fossil contents

Results of the software treatment



At the beginning, **the "real" core**

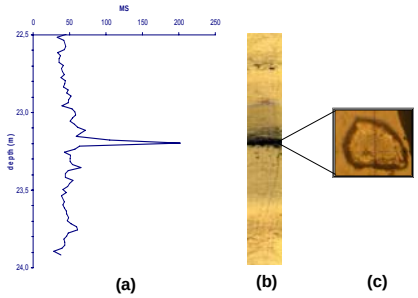


In the end, **the analysed core**

After the picture treatment through the software, it's easier to understand the variations in the sedimentation.

Apple Core (© 1989, 1997) is a software developped by Mike Ranger for the Ocean Drilling Program (ODP)

Conclusion about the use of core description



(a) (b) (c)

Diagram of (a) magnetic susceptibility, (b) its corresponding core portion, and (c) a microscopic focus on a **volcanic glass grain**

A case study : significance of the magnetic susceptibility record

- Core description can also be used to check magnetic susceptibility (MS) data. For example, MS variations can be due to either magnetic minerals, grain size, or lithology.
- Using the description documents, scientists are able to understand the causes of the observed variations. Volcanic tephras increase the magnetic susceptibility, in this case it is a lithologic change and not a magnetic one.
- But this study is very critical, because certain minerals in the cores sometimes may disappear one week after they got out of the sea (eg. greigite).

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