



## **KML (Keyhole Markup Language) : a key tool in the education of geo-resources.**

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Although going on the ground with pupils remains the best way to understand the geologic structure of a deposit, it is very difficult to bring them in a mining extraction site and it is impossible to explore whole regions in search of these resources. For those reasons the KML (with the Google earth interface) is a very complete tool for teaching geosciences.

Simple and intuitive, its handling is quickly mastered by the pupils, it also allows the teachers to validate skills for IT certificates.

It allows the use of KML files stemming from online banks, from personal productions of the teacher or from pupils' works. These tools offer a global approach in 3D as well as a geolocation-based access to any type of geological data.

The resource on which I built this KML is taught in the curriculum of the 3 years of French high school, it is methane hydrate. This non conventional hydrocarbon molecule enters in this vague border between mineral and organic matter (as phosphate deposits). It has become for over ten years the subject of the race for the exploitation of the gas hydrates fields in order to try to supply to the world demand.

The methane hydrate fields are very useful and interesting to study the 3 major themes of geological resource: the exploration, the exploitation and the risks especially for environments and populations. The KML which I propose allows the pupils to put itself in the skin of a geologist in search of deposits or on the technician who is going to extract the resource. It also allows them to evaluate the risks connected to the effect of tectonic activity or climatic changes on the natural or catastrophic releasing of methane and its role in the increase of the greenhouse effect.

This KML associated to plenty of pedagogic activities is directly downloadable for teachers at <http://eduterre.ens-lyon.fr/eduterre-usages/actualites/methane/>.