Geophysical Research Abstracts
Vol. 14, EGU2012-14098, 2012
EGU General Assembly 2012

Water - an inexhaustible resource?

C. Le Divenah and E. Esperou
Lycée Emilie de Breteuil, Montigny le Bretonneux, France

We have chosen to present the topic "Water", by illustrating problems that will give better opportunities for interdisciplinary work between Natural Science (Physics, Chemistry, Biology and Geology) teachers at first, but also English teachers and maybe others.
Water is considered in general, in all its shapes and states. The question is not only about drinking water, but we would like to demonstrate that water can both be a fragile and short-lived resource in some ways, and an unlimited energy resource in others.

Water exists on Earth in three states. It participates in a large number of chemical and physical processes (dissolution, dilution, biogeochemical cycles, repartition of heat in the oceans and the atmosphere, etc.), helping to maintain the homeostasis of the entire planet. It is linked to living beings, for which water is the major compound. The living beings essentially organized themselves into or around water, and this fact is also valid for human kind (energy, drinking, trade. . .).

Water can also be a destroying agent for living beings (tsunamis, mud flows, collapse of electrical dams, pollution...) and for the solid earth (erosion, dissolution, fusion).

I) Water, an essential resource for the human kind
After having highlighted the disparities and geopolitical problems, the pupils will study the chemistry of water with its components and their origins (isotopes, water trip). Then the ways to make it drinkable will be presented (filtration, decantation, iceberg carrying. . .)

II) From the origin of water...
We could manage an activity where different groups put several hypotheses to the test, with the goal to understand the origin(s?) of water on Earth.
Example: Isotopic signature of water showing its extraterrestrial origin..
Once done, we'll try to determine the origin of drinking water, as a fossil resource. Another use of isotopes will allow them to evaluate the drinking water age, to realize how precious it can be.

III) Water as a sustainable energy resource
Water is used to produce energy under different processes like ancient tamed energy such as water mills, locks or more recently tidal energy, marine current power, generators based on swell or osmotic gradients. The pupils will work in groups to present different techniques to the class. We could try to determine if all these energy resources could replace the actual major energy source in France: nuclear.

Conclusion: Liquid water is probably the cradle of life. Since the birth of human kind, its history is closely linked to the presence of water: drinking, fishing, hygiene, and also transport or business is strictly depending on this resource. Described as a fragile and limited resource when it is used for human consumption, we realize that water is also an uneven resource of energy for the next generations. The challenge will then be to reconcile these different aspects: respecting this nourishing resource and preserving it from pollution, overexploitation or wasting, and at the same time, using water as energy for a world that has a growing population.