

Hydrology and Biogeochemistry

Synopsis

The global change due to human activity is increasingly affecting the health of ecosystems and the living conditions for most of living creatures, including human beings. Understanding, predicting and mitigating the response of the global water system in terms of availability, quality and contamination requires to have a bulk knowledge of the water cycle and related hydrological processes.

Aims

To review the main cycles of natural waters across water bodies and atmosphere and document how humans are altering these cycles.

Objectives

At the end of the Unit, you should:

- 1) Be able to understand the temporal and spatial scales involved in the water cycle
- 2) Understand the functioning of the main water bodies, their interaction and couplings with atmosphere
- 3) Be able to quantify the main fluxes of water, and how they drive the cycles of other basic elements (in particular carbon)
- 4) Have a consistent insight on the global change and its consequences on nature and human activities

Key Skills Acquired

At the end of this Unit, you should understand:

- 1) The connections between human activities and water cycle
- 2) The transformation process in which the global water system is engaged

Syllabus

Topics covered include:

- Functioning of main water bodies
- Connection with atmosphere: the coupled climate system
- Global cycles: water and carbon
- The Global Change

Learning & Teaching

- Lectures: 20 hr
- Tutorial classes and seminars for applications: 20 hr

Teaching Staff: D Sous (Coord.)

Semester: 1

Timetable slot: To be advised

ECTS: 4

Level: Optional

Bibliography

- E. K. Berner and R. A. Berner 2012. Global Environment, Water, Air and Geochemical cycles, Princeton University Press.
- Change, I.C., 2007. The physical science basis. Contribution of Working Group 1 to the fourth assessment report of the Intergovernmental Panel on Climate Change, 996.

Assessment

- Written theory examination (50%)
- Case study and oral presentation (50%)

Course Evaluation

By completion of University Unit Evaluation Questionnaire by students, annual assessment by Unit Coordinator.