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Hydrochemistry (3GH2202)

Filières concernées	Nombre d'heures	Validation	Crédits ECTS
Master en hydrogéologie et géothermie	**Cours: 28 pg**	**Voir ci-dessous**	3

ph=période hebdomadaire, pg=période globale, j=jour, dj=demi-jour, h=heure, min=minute

Période d'enseignement:

- Semestre Automne

Equipe enseignante

Daniel Hunkeler

Contenu

This course covers the hydrochemistry of groundwater. We will focus on major hydrochemical compounds in groundwater, most of them of natural origin, but some also influenced by anthropogenic sources. The main objectives of the course are to demonstrate (i) how hydrochemical data can be integrated in hydrogeological studies to understand the origin of groundwater and functioning of flow systems and (ii) how the hydrochemistry of groundwater can make groundwater use challenging. The course will also provide a basis a for second course on the behaviour of contaminants in spring semester.

Forme de l'évaluation

The course will be evaluated with a written exam of 1h duration during the exam session. The exam will consist of several questions on the fundamental hydrochemical processes that control the groundwater composition, some of which require simple calculations, and a case study on the application of hydrochemical data to understand groundwater flow systems.
No documents can be used except for a 3 page summary. A calculator can be used.

Modalités de rattrapage

In case of an insufficient mark, the exam can be repeated in one of the following exam session again in the form of a 1h written exam of the same type as the initial exam.

Documentation

You will receive the following documentation via the moodle platform:
- Script describing the key hydrochemical processes that control the groundwater chemistry
- Power point presentations
- Material describing the case studies
- Descriptions of the hydrochemical codes

Forme de l'enseignement

The course combines theory with hands-on activities in the field and computer room. Early on in the course, we will go to the field to collect hydrochemical data from a diverse range of sampling points (springs, river, lake, boreholes) within the same watershed to understand key hydrochemical processes and discuss how we can use hydrochemistry to identify interactions among the hydrological systems. You will apply sampling and field analytical methods. You will get an introduction to laboratory methods. As a basis for data interpretation, you will follow lecturers on fundamental hydrochemical processes and hands-on exercises with hydrochemical codes to model and visualize hydrochemical data.

Objectifs d'apprentissage

Au terme de la formation l'étudiant-e doit être capable de :

- Analyse hydrochemical field data
- Apply sampling and analytical methods
- Conceptualise hydrochemical processes that control the groundwater chemistry

Compétences transférables

- Present scientific data and insights

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