JUSTUS-LIEBIG-
UNIVERSITÄT
GIESSEN

GGS
Gießener Graduiertenzentrum
Sozial-, Wirtschafts- und Rechtswissenschaften

Lecture as part of the Teaching Assistantship Programme 2018

Introduction to Isotope hydrology: Principles and Applications

Organizational details

Instructor: Amani Mahindawansha

Date: June 6, 2018 from 16.00 to 18.00 h c.t.

Location: Campus Wirtschaftswissenschaften, Licher Strasse 68, D-35390 Giessen, room H 20

Content

Do you know that we could trace the source of the water we drink by analyzing of hydrogen (H) and oxygen (O)? Water (H_2O) is made of H and O, but both of these elements have more than one naturally occurring isotope where three isotopes of hydrogen (^1H, ^2H, ^3H) and three of oxygen (^{16}O, ^{17}O, ^{18}O). Isotopes are atoms that take the same position in the table of elements, but have different number of neutrons and therefore different masses. To form water molecules, these isotopes can be in different combinations and that makes the water identical from place to place. Isotopes are divided into two specific types: stable and unstable (radioactive). The most relevant stable isotopes for atmospheric and hydrologic sciences are hydrogen and oxygen.

Water stable isotopes are a very powerful tool, which can be used to study the global water cycle and establishing connectivity of water resources as a natural tracer. Analyzing isotopes became a more common and effectively used method in research areas such as hydrogeology, hydrology, plant and animal ecology, sedimentology, paleoclimatology, archaeology any many more. These can be used, as an integral fingerprint of water origin, flow path, transport processes, residence times and can thus serve as a tracer in the unsaturated and saturated zone to understand the ground water processes, evaporation processes, recharge rates, subsurface flow processes, mixing processes, plant water uptake etc. Therefore, it is useful and interesting to find out about these natural powerful tracers of hydrological processes.

Target group
Students, Doctoral Candidates and Postdocs of all Faculties

Course language
English

Registration
No registration needed