EGU2020-21532, updated on 31 Oct 2020
https://doi.org/10.5194/egusphere-egu2020-21532
EGU General Assembly 2020
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Presentation and methodology of TRANSKARST project

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TRANSKARST is an interdisciplinary research project with scientists and regional water resource administrators. This 3 years project (2019-2022) is set up on Arcier's karstic watershed used for the drinking water supply of 60 000 inhabitants of Besançon, France. Using this instrumental basin, as a part of Jurassic Karst French observation system, the project aims at defining pathways of mineral, organic and microbiological contamination in karstic system.

The methodology used in the project, combines field expertise with the implementation of analytical tools related to conventional - dissolved phase chemistry (major ions, miners, traces, organic carbon), isotopes (oxygen-18, deuterium, carbon-13) – and prospective analysis - emerging pollutants such as pharmaceuticals and ETM, dissolved organic matter, suspended matter and microbiology (bacteria, fungal species) with a special focus on antibiotic resistance. The TRANSKARST project thus brings together a consortium of researchers from various disciplines: hydrogeology, chemistry, sedimentology, microbiology, geology and geophysic. The project is also highly associated to water managers as Arcier’s spring is used for drinking water supply.

The three main under-objectives following by TRANSKARST could be summarized as follows. First, through geological and geophysical investigation, a conceptual and numerical geological model will be established under geomodeler and will be further used to constrain the pathways of karstic groundwater. The second point focus on the evaluation of karst media contamination: chemical (including emerging molecules) and microbiological. Then we expect to discriminate, by the use of ETM, dissolved, colloidal and particulate pathways of contamination. All the observations will be linked together to identify actions and feedback of different parameters and contaminants within karst hydrosystems.