



Citizen Science in the context of extended international Karst groundwater research collaborations in Tulum/Mexico

Arnulf Schiller (1), Robert Supper (1), and Gonzalo Merediz Alonso (2)

(1) Geological Survey of Austria, Austria (arnulf.schiller@geologie.ac.at), (2) Amigos de Sian Ka'an, Mexico, (gmerediz@amigosdesiankaan.org)

Tulum is a little, but rapidly growing Mexican town located at the Caribbean coast of the Yucatan peninsula, famous for its vast underwater cave systems. The region is characterized by a flat carbonate platform with tropical forest, species rich wetland and lagoons and the Mesoamerican barrier reef, partially protected as UNESCO world heritage for nature within the Sian Kaan biosphere reserve south of the town. There is practically no surface discharge, main water resource of the region is an extended coastal karst groundwater regime, which hosts a complex conduit network. Freshwater is concentrated in a freshwater lens of several meters up to 35 m thickness, laying above the deep saltwater body intruding from the sea and thinning out to the coast. The freshwater is available via cenotes and wells privately or provided by public water supply. Since more than ten years, European-Mexican research collaborations under the lead of Geological survey of Austria and Amigos de Sian Ka'an, NGO, Cancun, investigate the complex conduit network as well as groundwater dynamics and capacity with standard and advanced geophysical methods by helicopter, on ground and directly in the underwater cave system, as well as with innovative approaches for numerical modelling. In the year 2016, a citizen science initiative was started (project TCS-26/Xib_TCS, funded by Austrian Science Fund) for participatory research with the support of local high school students, teachers, divers and private persons. Goal was to establish a long-term citizen groundwater monitoring for a) complementing and extending the existing data base with long time series at different locations, b) observing water quality addressing the problem of suboptimum wastewater management, rapid urban development and rising seawater level, and c) investigate the potential of such public monitoring data for deriving capacity, dynamics, or pollution spreading. Results are interpreted and provided to the public via website and informative events. During the initiative, specific experience could be developed in organizing citizen science campaigns, treating data gathered by non- professionals and combining with professionally acquired data. Furthermore, growing interest, knowledge and problem awareness of citizens could be kicked off and developed – especially with the pupils as essential channels to current and future society. Therefore, besides scientific profit, there is considerable socio-economic profit of such participatory/citizen science initiatives by increasing awareness for importance and problems of sustainable water management as a presumption for preserving nature and culture of the region.