The subterranean estuary: descriptive term or confusing jargon?

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ABSTRACT

The term *subterranean estuary* was proposed by Moore in 1999 (Moore, 1999) as a call of attention to researchers in ocean sciences about the impacts of groundwater in coastal systems. A subterranean estuary is defined as "a coastal aquifer where ground water derived from land drainage measurably dilutes sea water that has invaded the aquifer through a free connection to the sea" (Moore 1999). It is considered analogous to surface estuaries in that water of different density comes together and establishes a saline wedge underlying fresher water. In the past two decades, the use of this term has expanded. Initially limited to studies with an oceanographic viewpoint considering the impact of groundwater on the ocean, it is now common in the literature, competing with classical hydrogeological terminology such as *coastal aquifer* or *saltwater intrusion*, and reaching publications with a traditional hydrogeological theme. The popularity of this terminology could be considered problematic from a hydrogeological perspective, since the use of hydrogeological terms have their root in the study of the saltwater intrusion processes that have a long trajectory in science from the work of Ghyben-Herberg in the nineteenth century. If the objective is to facilitate the understanding for society, it still requires a previous knowledge of how is functioning surface water in estuaries that is perhaps as non-intuitive as the hydrogeological perspective. But can this term represent an advantage for communication with ocean sciences - imbricating saltwater intrusion studies with marine sciences and bringing an opportunity to improve interactions? Or does it carry an element of confusion since surface and subsurface estuaries are both physically and chemically different, and therefore can lead to future misunderstanding, both conceptual and terminological, between the two branches of sciences? In this work we present a review of the use of this terminology and the expansion in scientific publications in a comparison with other well-known hydrogeological terms in saltwater intrusion. We discuss the benefits and potential disadvantages of using this term. It is intended to open a discussion for the saltwater intrusion community about the use of various terminology in future studies of coastal and offshore groundwater systems.

REFERENCES

Moore W.S., 1999. The subterranean estuary: a reaction zone of ground water and sea water. Marine Chemistry 65: 111-125.