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Knowledge hidden in plain sight – Extending article metadata to support meta-analysis and knowledge accumulation

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The number of publications in the field of Hydrology (and in other geoscience fields) is rising at an almost exponential rate. In 2021 alone, more than 25 000 articles were listed in Web of Science on the topic of Water Resources. There is a tremendous wealth of knowledge and data hidden in these articles, which capture our experience in studying places, datasets or models. Hidden, because we currently do not possess (or at least, do not use) the necessary tools to access this knowledge resource in an effective manner. It is increasingly difficult for an individual researcher to build on existing knowledge. New ways to approach this problem are urgently needed.

One approach to address this problem of literature explosion might be to extend article metadata to include geoscience-specific information that can facilitate knowledge search, accumulation and synthesis in a domain specific manner. Imagine one could easily find all studies performed in a specific location/ climate/ land use thus allowing a full picture of the hydrology of that region/ climate/ land use. It is important for any geoscience, a field strongly depending on experience, that knowledge is not “forgotten” in a mountain of publications but can easily be integrated into larger understanding.

So what meta-information would be most useful in knowledge synthesis? Study location? Spatial and/or temporal scale? Models used? Here, we would like to (re-)start the discussion on geoscience-relevant metadata enrichment. With the recent advancement in text mining scholarly literature, it is critical to have this discussion now or fall behind.

The Geosciences strongly depend on experiences we gain, which we largely share through the articles we publish. Knowledge accumulation in our science is hindered if this exchange of knowledge becomes ineffective. We are afraid it already has!