A global bibliometric perspective on soil erosion modelling

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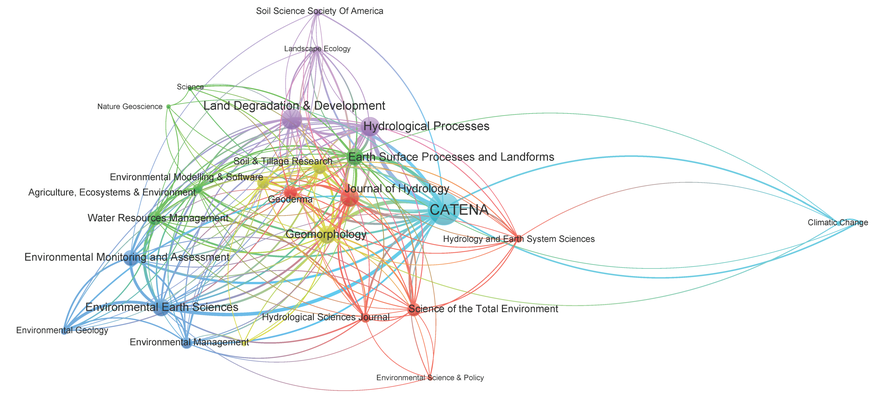
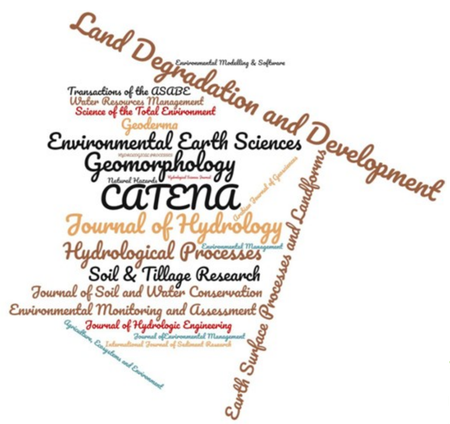
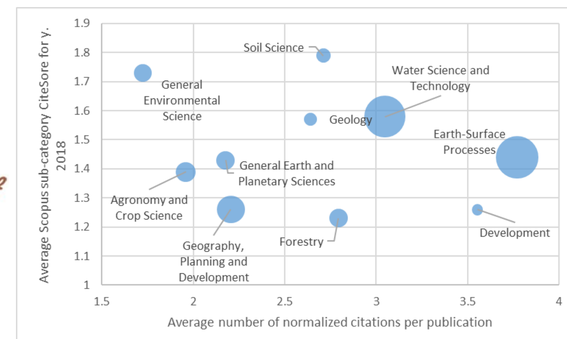
Soil Erosion Modelling Team

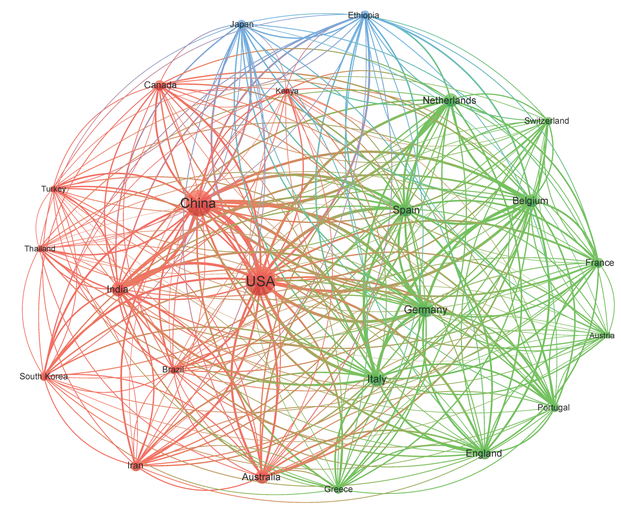


Investigation of citation patterns of journals with more than 250 citations

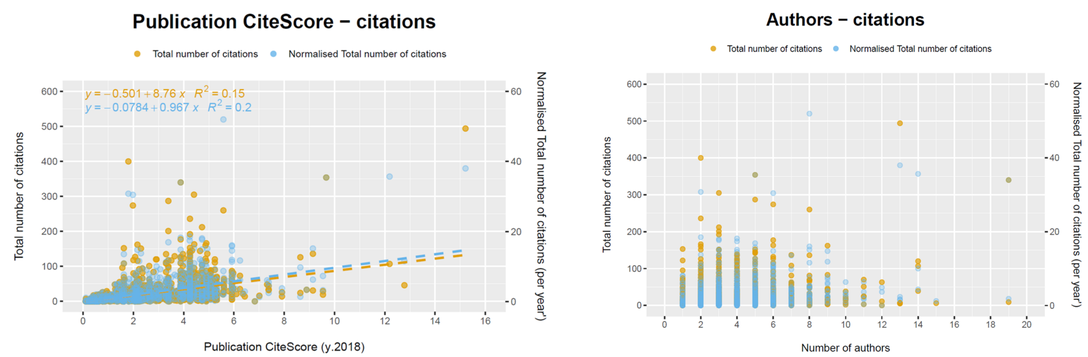




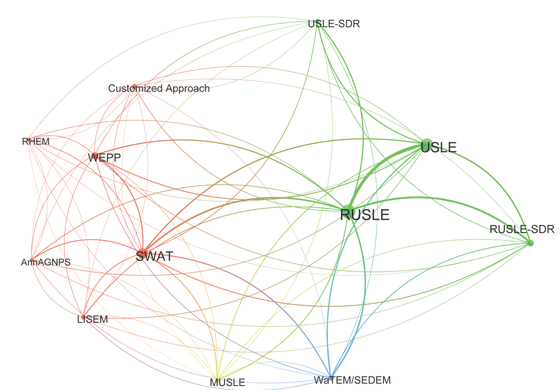
World cloud of most frequently used journals in the soil erosion modelling field (left panel) and relationship between average number of normalized citations per publication and average Scopus sub-category CiteScore (upper panel)



Investigation of bibliographic coupling of countries with more than 12 documents in the database (authors affiliations)



Relationship between CiteScore, number of citations and number of authors (above panels) and BRT model results (below)



Investigation of bibliographic coupling of 12 most frequently applied soil erosion models

Variable	Relative impact using all database entries [%]	Relative impact using only unique entries [%]
Soil erosion model used	48.9	50.9
Modelling scale	20.6	23.0
Publication CiteScore	17.4	22.3
Scopus sub-subject category	9.7	2.5
Continent	3.2	0.2
Number of authors	0.2	1.1
Publication type, erosion agent, modelled area, modelled period, model time resolution, field activity, soil sampling, model calibration, validation	0	0

INTRODUCTION

Systematic bibliometric investigations are useful to evaluate and compare the scientific impact of journal papers, book chapters and conference proceedings. Such studies allow the detection of emerging research topics, the analyses of cooperation networks, and the collection of in-depth insights into a specific research topic. In the presented work, we carried out a bibliometric study in order to obtain an in-depth knowledge on soil erosion modelling applications worldwide. The study was conducted by 65 researchers from 63 research institutions and 25 countries.

METHODS

As a starting point, we used the soil erosion modelling meta-analysis data collection generated by the authors of this abstract in a joint community effort (i.e. Global Applications of Soil Erosion Modelling Tracker (GaSEM)). This database contains meta-information of more than 3,000 documents published between 1994 and 2018 that are indexed in the SCOPUS database. More than 36 attributes were evaluated. The documents were reviewed and database entries verified. The database contains various types of meta-information about the modelling studies (e.g., model used, study area, input data, calibration, etc.). The bibliometric information was also included in the database (e.g., number of citations, type of publication, Scopus category, etc.). We investigated differences among publication types and differences between papers published in journals that are part of various Scopus categories. Moreover, relationships between publication CiteScore, number of authors, and number of citations were analyzed. A boosted regression tree (BRT) model was used to detect the relative impact of the selected meta-information such as erosion model used, spatial modelling scale, study period, field activity on the total number of citations. Detailed investigation of the most cited papers was also conducted. The VOSviewer software was used to analyze citations, co-citations, bibliographic coupling, and co-authorship networks of the database entries.

RESULTS

Some of the most interesting results are provided in this poster. However, detailed investigation will be published in a scientific journal. Therefore, only the preliminary results are shown.

CONCLUSIONS

Our bibliometric investigations demonstrated that journal publications, on average, receive more citations than book series or conference proceedings. There were differences among the erosion models used, and some specific models such as the WaTEM/SEDEM model, on average, receive more citations than other models (e.g., USLE). It should also be noted that self-citation rates in case of most frequently used models were similar. Global studies, on average, receive more citations than studies dealing with plot, regional, or national scales. According to the boosted regression tree (BRT) model, model calibration, validation, or field activity do not have significant impact on the obtained publication citations. Co-citation investigation revealed some interesting patterns. Our results also indicate that papers about soil erosion modeling also attract citations from different fields and better international cooperation is needed to advance this field of research with regard to its visibility and impact on human societies.