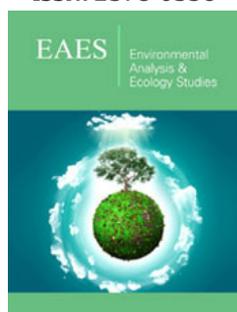


Associated Problems of Soil Erosion, River Degradation and Water Ecology: A Bibliometric Analysis of Publications in the Journal of Regional Geosystems between 2013 and 2023

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Abstract

The possibilities of using bibliometric analysis in scientific research make it possible to identify publication trends using different criteria. This article contains the results of research preferences on problems that integratively reflect the totality of erosion-accumulation processes on the watershed and in the hydrographic network, based on a bibliometric analysis of 429 articles from the Journal Regional Geosystems for the period 2013-2023. The results of bibliometric analysis of Titles and Keywords over the past decade have shown insufficient activity in the development of problems that combine such areas as the hydrology of surface waters, hydrochemistry and hydro-ecology of river waters and water bodies. The results obtained will allow us to adjust the editorial policy of the journal.

Keywords: Bibliometric analysis; Publication trends; Geosciences; Erosion-accumulation processes; Regional geosystems

Introduction

Some authors consider the scientific fields that measure and analyze scientific publications in a certain field to be Bibliometrics (Librametrics) and Scientometrics [1,2], while others [3,4] add Informetrics to them. The methodological proximity of the three indicated "metrics" borders on their indistinguishability, and if this is really the case, then we should talk about a single field of knowledge - bibliometrics, since this field of knowledge had the best (compared to its "relatives") methodological self-awareness when it appeared [4, p. 514]. The possibilities for using bibliometric analysis in scientific research are very diverse, but most often this method is used when writing bibliometric reviews. Searching for articles in bibliometric databases using a set of selected criteria makes it possible to identify publication trends and development trends in individual branches of knowledge [5].

Methodology and Results

This article relied on the resources of the Russian Science Citation Index (RSCI), which operates on the eLibrary.ru portal and is a national bibliographic database of scientific citations. It accumulates more than 12 million publications, as well as information on citations of these publications from more than 6,000 Russian journals. The object of analysis is the Journal "Regional Geosystems" (ISSN 2712-7443; <https://reg-geosystems-journal.ru/index.php/journal>), which from 2020 to the present is monothematic in its profile, as it publishes Articles in general direction 1.6. Earth and Environmental Sciences. Previously, the journal was issued under the title "Belgorod State University. Scientific Bulletin. Series: Natural sciences" (till 2019).

Therefore, for general chronological coverage over 11 years, the author from this journal selected 248 Articles in 10 thematic areas (Geography, Geodesy and Cartography, Geology, Mining, Environmental Protection, Agriculture and Forestry, Demography, Water Management, Space Research, Computer Science). Thus, the initial array of Articles that were analyzed for scientometric purposes for the period 2013-2023 amounted to 429 Articles. Using data from the RSCI scientometric database for the Journal "Regional Geosystems" (2020-2023) and before its renaming (2013-2019 under the Geoscience section in the journal Nauch. Ved. Belgorod. Gos. Univ., Ser. Estestv. Nauki), three main bibliometric indicators.

- A. Number of Articles that were published in the Journal per year (only scientific articles, reviews and short communications were taken into account).
- B. Average length of the list of cited literature in Articles published per year.
- C. The "Years of Citing Publications" indicator, which characterizes the number of citations in a given year from all sources and reflects the demand for scientific publications.

The aim of this study was to perform a bibliometric analysis of Articles from Journal "Regional Geosystems" for the period 2013-2023 to identify publication trends on issues that reflect the manifestation of erosion-accumulation processes.

The unity and interconnection of erosion, movement (transport) and accumulation of sediments constitute the essence of Erosion-Accumulation Processes (EAP) and determine the mechanism of

their manifestations on slopes, as well as within forms of linear erosion and in river channel [6]. Within the framework of the concept of erosion-accumulation process, cause-and-effect relationships are traced in the chain from the separation of soil particles by water flow on the slope subsystem of the landscape to the accumulation of pedosediments or bottom sediments in subordinate elements of the landscape or in river beds and water bodies. Therefore, EAP should be considered as a combination of two paragenetic subsystems "precipitation-water flow-soil erosion" and "solid runoff transport-redeposition-accumulation-formation of bottom sediments (in the presence of rivers and water bodies (ponds, storage reservoir)". Hydrology, hydrogeology, hydrochemistry, water quality and sediment transport in river systems are closely related to geological, geomorphological, soil and plant conditions and the complex influence of various economic details and population settlement systems on a particular watershed [7]. The assessment of the total removal of material from the surface of a river basin includes three main sources: suspended and transported sediments and dissolved substances [8], while in relation to the volume of solid runoff that moves along the watershed, the share of removed material is in the range of 12%-95% [6]. If the intensity of alluvium accumulation in river floodplains is estimated on average at a rate of up to 1mm yr^{-1} , then the accumulation of pedosediments in the bottoms of the erosion network occurs 2.5-3 times more actively [9]. Three bibliometric indicators for the period 2013-2023 (the number of scientific Articles, the average length of the bibliographic list in articles (References) and the total number of references from all sources published per year (N)) are presented in Figure 1.

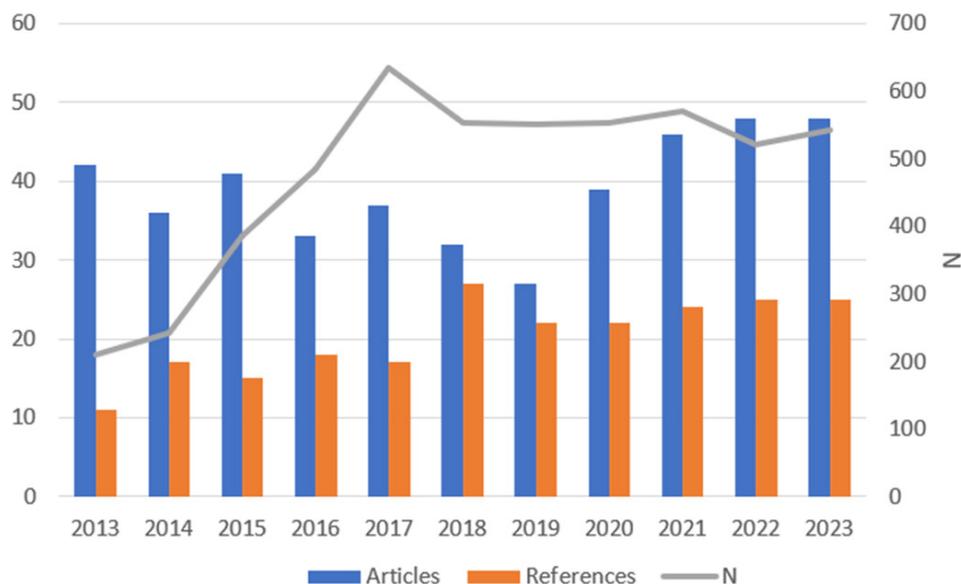


Figure 1: Dynamics of the main bibliometric indicators of the Journal "Regional Geosystems" (number of Articles, number of sources in References and number of citations to articles (N)), according to the RSCI scientometric database.

As data on the dynamics of the main bibliometric indicators of the journal "Regional Geosystems" (Figure 1) show, the transition from a multidisciplinary format to a monothematic one since

2020 has led to an increase in the number of articles and a 32% increase in the number of citations in References, while stabilizing the degree of demand for scientific publications. The number of

articles that were published in the journal in 2013-2023 varied from 27 to 48, with an average of 39 per year. The average number of citations in an article, according to References, was 20 (with a total of 223 over 11 years). For the total period 2013-2023, the number of citations to Articles from this journal from all sources was 5248, or an average of 477 for the year. After a peak in 2017 (635), their number subsequently did not fall below the level of 520. Over the past two years, the share of citations to articles in the journal over the previous 5 years from publications of those journals that are included in the WoS, Scopus or Russian Science Citation Index databases (RSCI) - a separate database hosted on the Web of Science platform, was 34-37%. Over the past five years, out of the top 10 publications on the above topics, four articles have from 16 to 12 citations each [10-13].

The combined search for Articles, both by Title and by Keywords, is justified by the fact that when used correctly, Keywords are terms that facilitate bibliographic searches that are not used in the Title. Over the last decade, judging by the frequency of occurrence of seven keywords and phrases used in Titles and Keywords, the ensembles of words "soil", "soil erosion", "water flow", "river", "river basins", "water" ecology", "bottom sediments" correlate in proportions of 30.2% and 18.4%, respectively, and, thus, research interest in the processes of formation and movement of water masses and solid runoff on a watershed is still 1.6 times higher than the intensity of development of problems that are associated with the hydrology of surface waters, hydrochemistry and hydro ecology. The results of bibliometric analysis on the RSCI bibliographic database made it possible to determine the frequency of occurrence of each of seven keywords and key-phrases based on the sum of data, which are reflected in four options: 1) Title Article; 2) Abstract; 3) Keywords; 4) Full text of the publication. These results are presented summarized in Table 1. They allow one to see the priorities of research interest based on Rank values.

Table 1: Subject scatter (Journal «Regional Geosystems», 2013-2023).

Subject Categories	Frequency	Percentage (%)	Rank
Soil	164	26.45	1
River	114	18.39	2
River basins	98	15.81	3
Soil erosion	85	13.71	4
Water flow	85	13.71	5
Water ecology	39	6.29	6
Bottom sediments	35	5.65	7
Total	620	100	-

The internal life of the journal for 11 years, which was most objectively reflected in the number of Articles in the field of Geosciences (Figure 1), made it possible to determine three chronological periods: 2013-2015, 2016-2019, 2020-2023. Thus, the results of bibliometric analysis by time periods Table 2 created the basis for establishing the main patterns in the manifestation of researchers' interest in certain thematic areas in the general problem of "EAP".

Table 2: Results of bibliometric analysis for periods of publication activity of the journal Regional Geosystems (% occurrence of seven Keywords in Articles in relation to their total number (429)).

Keywords	2013-2015	2016-2019	2020-2023	Average
Soil	45.38	44.96	28.73	39.69
Soil erosion	16.81	32.56	12.71	20.69
Water flow	11.76	28.68	18.78	19.74
River	20.17	38.76	22.1	27.01
River basins	19.33	28.68	20.99	23
Water ecology	18.49	11.63	1.1	10.41
Bottom sediments	7.56	8.53	8.29	8.13

If we consider the dynamics of research interest, using 2013-2015 as a base period, we can note three variants of this dynamics. Over the past 8-10 years, although interest in four problems has been growing, which is reflected by such Keywords as water flow, river, river basins and bottom sediments, in the last 4 years it has decreased slightly in comparison with 2016-2019. Over the past 11 years, the interest of researchers in such a problem as soil has decreased, but especially in relation to water ecology. After growth by 2019, there were subsequently fewer calls to the problem of soil erosion. According to the Table 2, over the last decade, the frequency of occurrence of seven keywords and phrases used as part of such search parameters as Titles, Keywords, Abstract; The full text of the publication is cumulatively distributed across the first three and four remaining parameters in the proportion of 80.1% and 68.5%, respectively, that is, more balanced due to the information contained in abstracts and full texts. However, these data confirm the previously made conclusion that research interest in problems of surface water hydrology, hydrochemistry and hydro ecology is inferior to more active developments in the study of watershed processes.

Conclusion

From the point of view of cause-and-effect relationships, a more representative and comprehensive study of surface runoff water and soil erosion on the watershed as process-drivers of hydro ecological problems seems justified. However, as the results of bibliometric analysis of Titles and Keywords have shown, over the past decade, the activity of developing problems that combines such areas as the hydrology of surface waters, hydrochemistry and hydro ecology of river waters and water bodies should be considered insufficient. The results obtained will make it possible to adjust the editorial policy of the journal, which can be supplemented by the initiation of Special Issues on the hydro ecology of river basins, personal invitations to publish for leading scientists in this field, provision of recommendations based on the results of presentations at international forums, etc.

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