

## Digital Science Report

# Arctic Research Publications

Scholarly Output Trends Using the Russian Index of Scientific Citations

A Working Paper

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#### About Russian Index of Scientific Citations

Russian Index of Scientific Citations (RISC) is a national information-analytical system, accumulating more than 6 million Russian authors of publications, as well as information about the citation of these publications from more than 4,500 Russian magazines. It is designed not only for the operational support of research, reference and bibliographic information, but is also a powerful tool to carry out evaluation of the impact and effectiveness of research organizations, scientists, the level of scientific journals, etc.  
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## An Overview

UArctic recently collaborated with ÜberResearch to produce a report entitled "International Arctic Research: Analyzing Global Funding Trends - A Pilot Report". The nature of the Dimensions database means that that analysis was based upon project funding data. This working paper undertakes a preliminary analysis of how a similar approach could be used with a publications database, utilising the Russian Index of Scientific Citations (RISC) data.

### Methods

Under a special partnership agreement, we received the output from a query of the Russian Index of Scientific Citations (RISC), covering about 6,000 Russian language journals.<sup>1</sup>

The UArctic research query returned about 96,000 articles from the Russian Index of Scientific Citations, 73,000 that were published between 2006 and 2016. This report is a first attempt to analyze this unique dataset; the analyses utilized the entire dataset from RISC (~ 6,000 journals). The analyses were done using RISC instrumental, enabling us to analyze Cyrillic organization names, keywords and journal titles.

Arctic research in Russia is supported not only by the Russian Foundation for Basic Research (RFBR) and Russian Science Foundation (RSF) grants, which are partially analyzed by Dimensions in a separate funding trends report, but also by special governmental programs with state budgetary support. For example, the federal target program "World Ocean" has as a part of it the sub-program "Development and use of the Arctic." Between 2003-2013 the research and development part of that program received more than 390 million rubles in funding. In 2014 the Russian Academy of Sciences (RAS) has a special program of basic research in the development of the Russian Arctic with an approved budget of 300 million rubles.

All of these efforts are leading to an increase in scholarly output on Arctic research both in international sources and Russian-language publications. In figure A we can see the increasing of Russian-language publications in Arctic Research from fewer than 4,000 in 2003-2007 to more than 12,000 articles in 2015.

<sup>1</sup> 652 journals from RISC have been selected for inclusion in a partner project between RISC and Thomson Reuters, called the Russian Science Citation Index (RSCI). We did not use this data, because the uploading of RISC data to RSCI is not yet completed. RSCI will contain publications from the leading Russian journals from 2005 to the present, and once the upload of the archives is done will be the definitive source of Russian-language articles, enabling the comprehensive analysis of Russian science alongside the Russian publications included in the Web of Science Core Collection.

Similar to the other countries output (and funding preferences), the earth sciences rank first in the number of Russian-language publications followed by biological and agricultural sciences (Figure B).

### Arctic Research Output in Russian Journals (RISC)

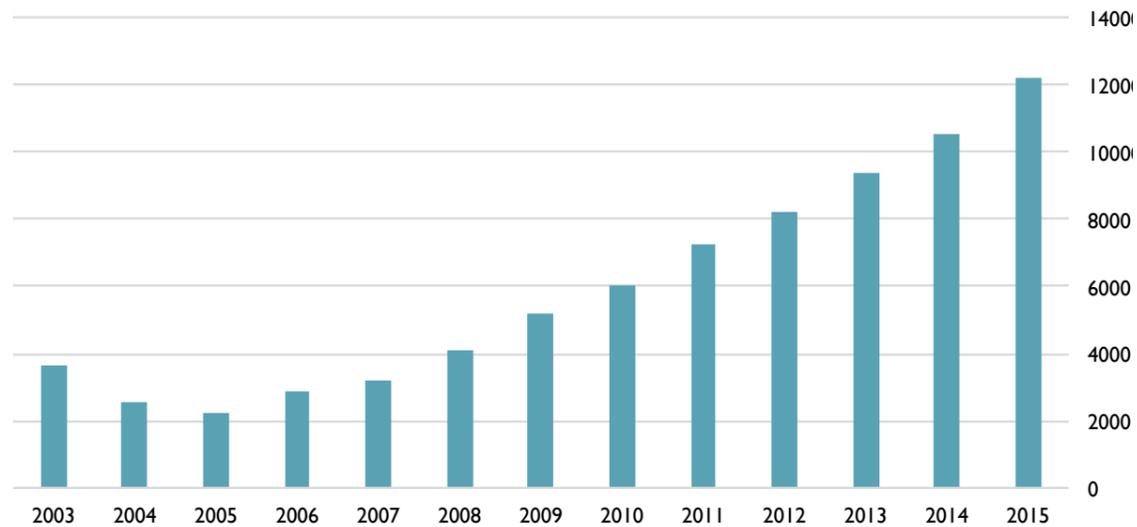


Figure A - The Dynamics of Scholarly Output on Arctic Research in Russian-Language Journals

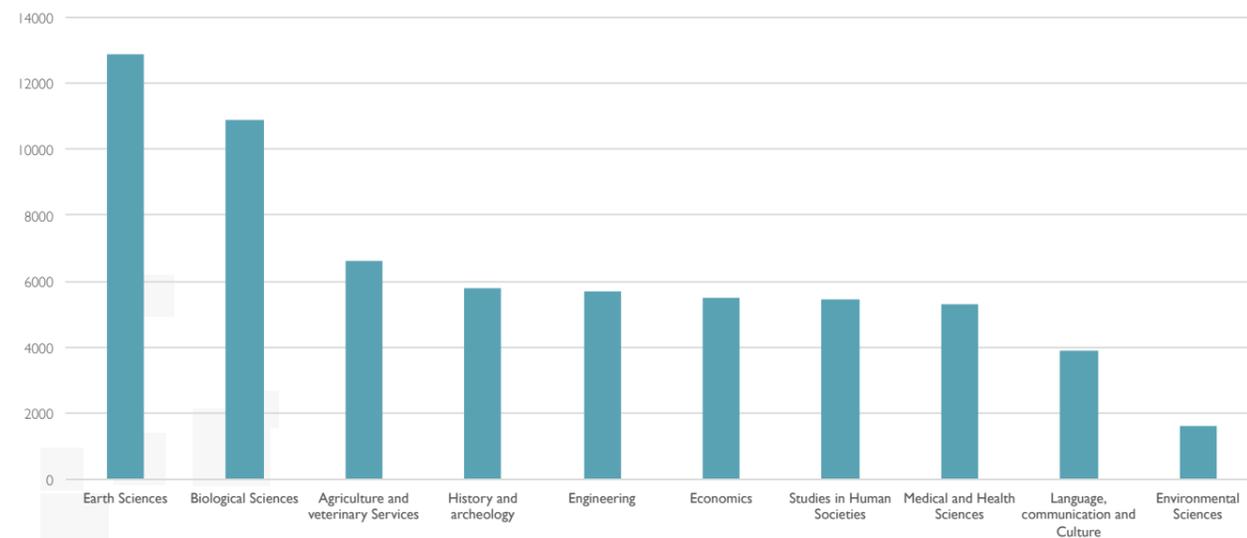


Figure B - Top Ten Fields of Research High Level Areas in Arctic Research 2006 - 2015 by RISC

Looking across figures B and C, the top producing research areas show some interesting variations. There appears to be significant growth occurring in Arctic research among the Humanities fields, with 'Historical Studies' (a subcategory of "History and Archaeology") being the fourth largest total count, with almost 6,000 articles matched in the period from 2006 to 2015. This field has about

the same scholarly output as the fields of engineering, economics and studies in human society. Medical and health sciences in Arctics research produced more than 5000 publications in Russian-language journals. Language, communication and culture Arctic scholars published almost 4,000 articles. The publications in ecology and environmental sciences on this picture is the last of the top 10 because most articles in this field show up in the earth sciences and biological sciences categories. Ecology and environmental sciences in RISC mostly includes those publications not included in Biology and earth sciences.

The highest growth of scholarly output in Arctic research can be seen after 2006-2007 years. History and archeology demonstrates impressive growth from fewer than 100 articles in 2004-2007 to more than 1000 in 2015. Almost the same growth is demonstrated by Arctic studies in human societies and language, communication and culture. Other research areas more than doubled their scholarly output from 2007 to 2015.

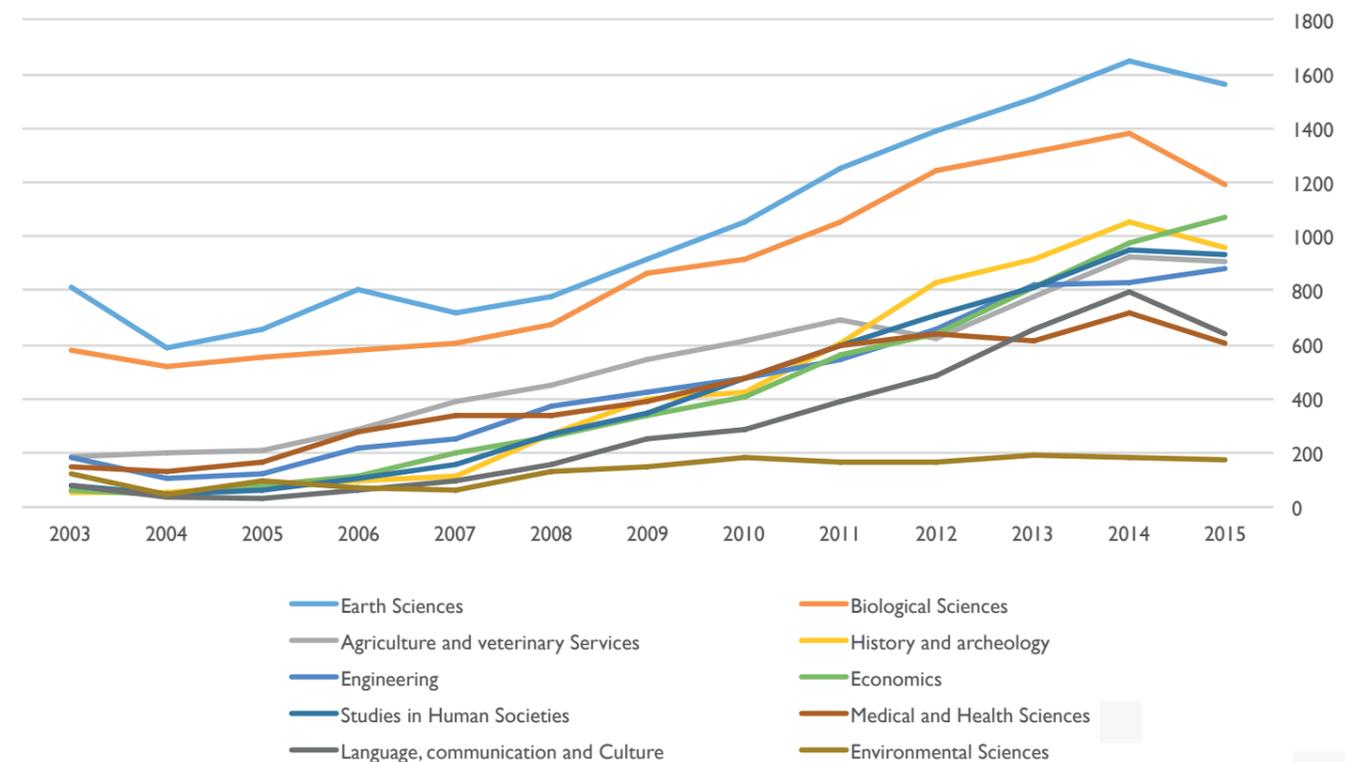


Figure C - The dynamics of publications in different research areas in RISC

The demonstrated dynamics and distribution by discipline of scholarly output in Arctic research in Russian journals is not just an artifact of RISC development itself. The number of journal publications in RISC journals grew from 2006 to 2015 by a factor of 1.64 while Arctic research in the same period expanded by a factor of 4.23. The distribution by research area in Arctic publications also does not show any correlation with the distribution of the number of journals across different content areas in RISC. For example, RISC now includes 542 journals of Economics, 207 journals of History, 194 Biological Sciences journals and 184 journals in Linguistics, while in Arctic research publications biology ranks second, history ranks fourth and economics ranks sixth. So we can conclude that growth trends in Arctic publications in Russian journals are real.

2 Full comparison of institutions can not be performed because of the absence of verified profiles of organizations for many RAS institutions in Scopus. RAS, RAS - Siberian Branch, RAS - Ural Branch, etc. profiles in Scopus consists of many certain institutions and a lot of higher education institutions have no verified profiles at all

The main contributors to Arctic research in Russia are the universities and institutions of the Russian Academy of Science, led by the Siberian and Ural Branches. The top 25 institutions are shown below (Figure D) and almost all of them are also in top 25 Russian contributing institutions in Arctic research in Scopus, where the largest number of Arctic publications belong to RAS and its Siberian Branch, followed by Moscow State University, Saint Petersburg State University, RAS Ural Branch, Irkutsk State University, North-Eastern State University, Novosibirsk State University, Tomsk, Siberian, Ural, Altai Universities, etc (Figure E)<sup>2</sup>. Many Russian universities publish their results mostly in Russian journals, so the ranking by RISC publications differ significantly from ranking by Scopus or Web of Science publications.

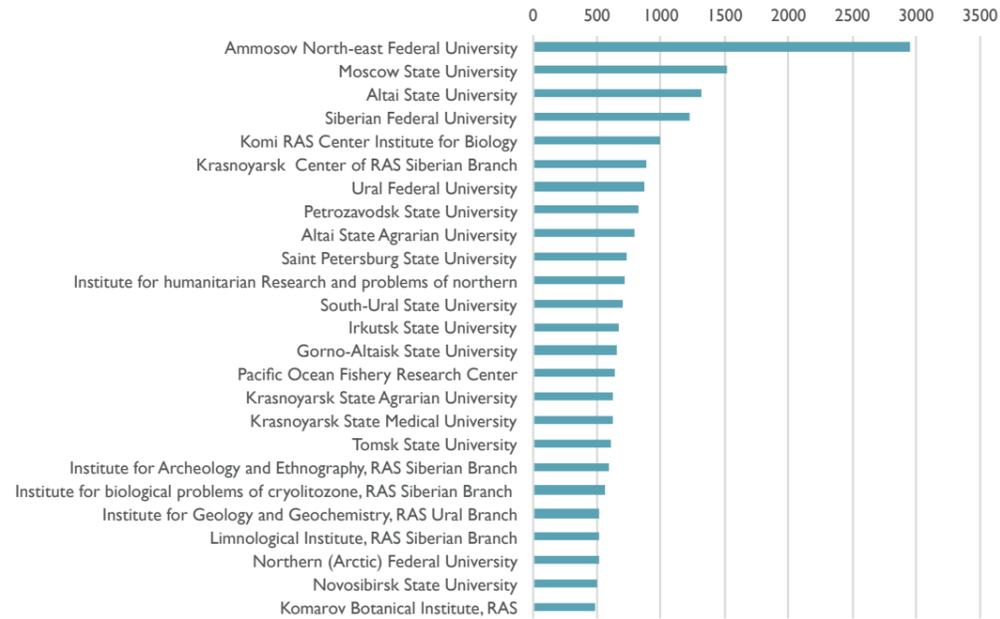


Figure D - Top-25 Institutions by Scholarly Output in Arctic Research 2006 - 2015 RISC Article Data

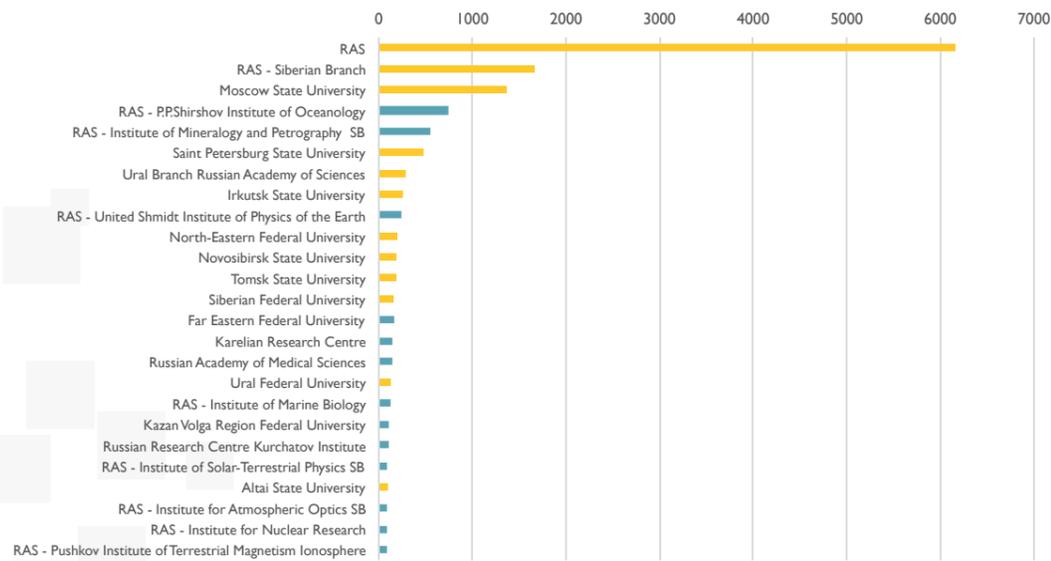


Figure E - Institutions by Scholarly Output in Arctic Research 2006 - 2015 Scopus Data

## Concluding Remarks

Arctic research publications by Russian Federation researchers have increased significantly in the past decade, both in international and Russian journals, and the scholarly output in Arctic research has grown more quickly in Russian-language journals than the total scholarly output in Russian journals. From 2006-2015, the total scholarly output of Arctic research in Russian journals (RISC) was 5 times higher than in international journals (Scopus).

In the RISC database the contribution in Arctic research of the Russian Academy of Science in total is the largest one, which generally corresponds to the Scopus data. We also see increasing influence from research-intensive universities, both those located in the Arctic and those that traditionally have been strong in Arctic research. Several universities (mainly regional universities outside of Moscow and St. Petersburg) produce a lot of publications in Arctic research in Russian-language journals, while their input in international journals is not so significant.

The top two research areas with the largest output and growth in Arctic research publications are Earth Sciences and Biological Sciences. The contributions from the Humanities and Social Sciences are accelerating and there has been particularly significant growth since 2010.

This paper has demonstrated that any comprehensive analysis of Russian scholarly output in Arctic research needs to use both the most comprehensive publication datasets for international scientific research (Scopus, Web of Science) and the most important Russian datasets (RISC and RSCI) in order to produce complete and reliable results.



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