

Seasonal variations of ice-covered lake ecosystems in the context of climate warming: A review

Qianqian Wang ^a, Fang Yang ^{a,*}, Haiqing Liao ^{a,*}, Meichen Ji ^a, Zhiming Han ^b, Ting Pan ^a, Dongxia Feng ^a

^a State Key Laboratory of Environmental Criteria and Risk Assessment, Chinese Research Academy of Environmental Sciences, Beijing, 100012, China.

^b College of Natural Resources and Environment, Northwest A&F University, Yangling, Shaanxi 712100, China

*Corresponding authors:

Prof. Haiqing Liao and Prof. Fang Yang

E-mail: liahq@craes.org.cn; yang.fang@craes.org.cn

This supplementary information contains two tables, one figure and references.

(1) Table S1 TOP 10 most productive countries on seasonal ice-covered lakes research during 1991–2021.

(2) Fig. S1 Research Collaboration between Countries.

(3) Fig. S2 Global Institutional Collaboration.

Table S1 TOP 10 most productive countries on seasonal ice-covered lakes research
during 1991–2021

Rank	Country	Papers	Percent%	Citation	Average citation	h-index
1	USA	403 (1)	35.29%	15667 (1)	38.88 (2)	62 (1)
2	Canada	225 (2)	19.70%	6571 (2)	29.2 (7)	44 (2)
3	China	145 (3)	12.70%	2623 (5)	18.09 (9)	30 (5)
4	Germany	114 (4)	9.98%	4151 (3)	36.41 (6)	38 (4)
5	UK	104 (5)	9.11%	3901 (4)	37.51 (4)	39 (3)
6	Russia	81 (6)	7.09%	1186 (10)	14.64 (10)	20 (10)
7	Finland	71 (7)	6.22%	1571 (9)	22.13 (8)	24 (8)
8	France	61 (8)	5.34%	2249 (7)	36.87 (5)	28 (6)
9	Switzerland	58 (9)	5.08%	2561 (6)	44.16 (1)	27 (7)
10	Sweden	55 (10)	4.82%	2059 (8)	38.09 (3)	23 (9)

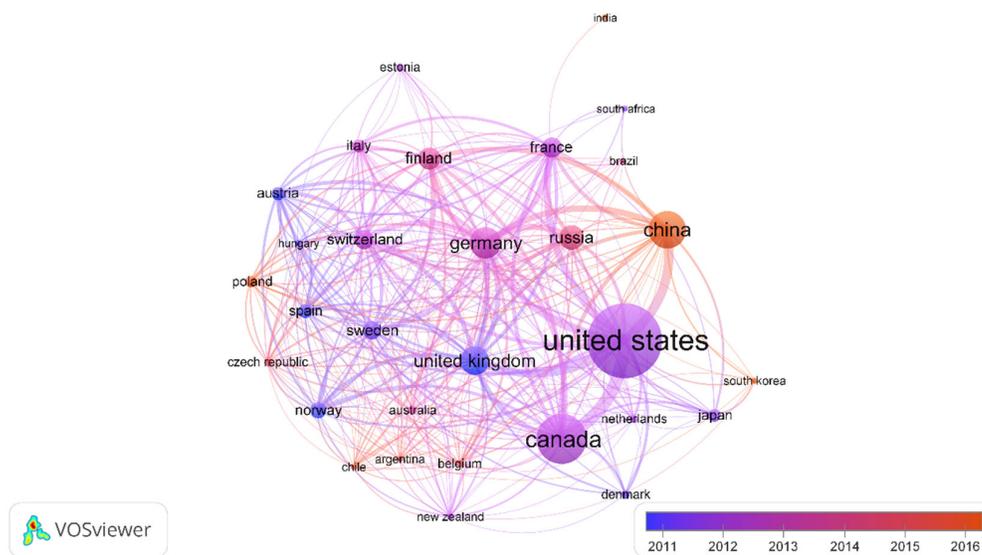


Fig.S1 Research Collaboration between Countries

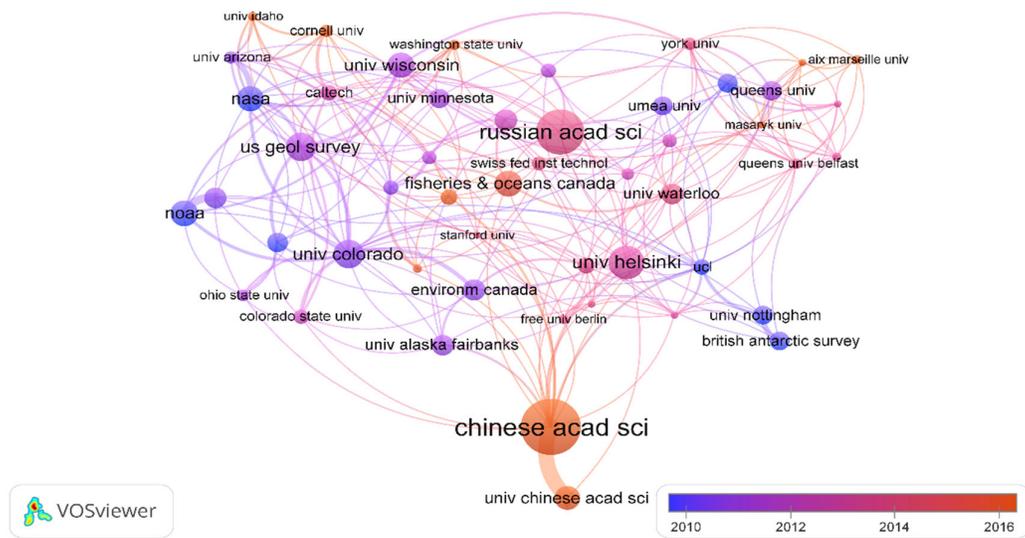


Fig.S2 Global Institutional Collaboration.

The United States has the highest level of collaboration with other countries, such as Canada, China, and the United Kingdom, mainly due to its advanced research technologies and comprehensive research data. The collaboration among institutions is primarily within each country. The most collaborative institutions are the Chinese Academy of Sciences and the University of Chinese Academy of Sciences, followed by the collaboration between the National Oceanic and Atmospheric Administration (NOAA) and the University of Michigan in the United States, and the collaboration between the University of Nottingham and the British Antarctic Survey in the United Kingdom.