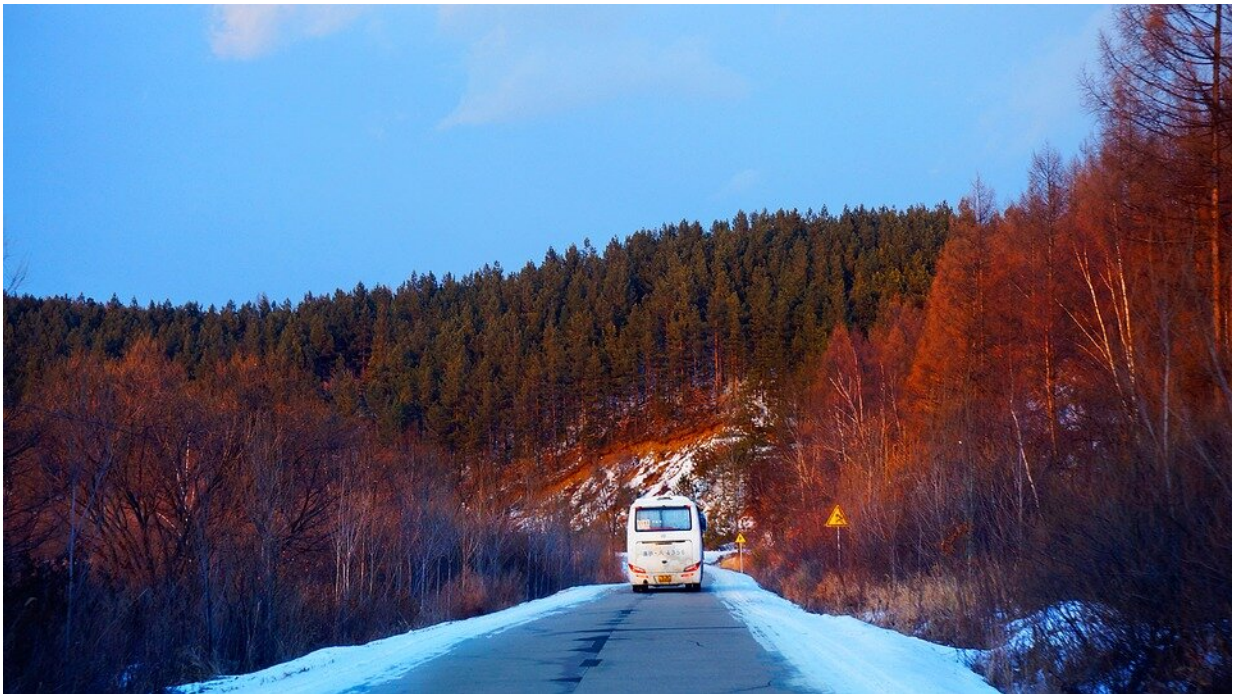


Water security status in northeast China deteriorated from 2005 to 2015

January 10 2022, by Zhang Nannan



Northeast China, Changbai Mountain. Credit: Pixabay

Fresh water is the most important ecosystem service for human society. Its spatial flows establish the linkage between freshwater sources and human demands, and affect interregional water security. This is called "freshwater services flow" by researchers. A related, more general term, "ecosystem service flow," is often used to describe the transmission of a specific ecosystem service.

A recent research assessing [water](#)-related ecosystem services has been done in northeast China by a research team led by Profs. Yu Dapao and Dai Limin from the Institute of Applied Ecology of the Chinese Academy of Sciences.

The Northeast Forest Belt (NFB) covers large land areas of northeast China. With a number of essential ecosystem functions and services, it is vital for the plain areas where populations are concentrated. Considering that natural [ecosystems](#) are undergoing degradation worldwide, the researchers wondered whether water security issue had become severer than ever before in northeast China.

They quantified annual water yield and the water demands by agriculture, industry, livestock and residents and developed a dynamic model algorithm to delineate the [flow](#) path (i.e., spatial flow process) of freshwater services, which was obviously different from the static model algorithm used by previous studies.

In addition, they also evaluated water security status in northeast China by calculating water security indices based on both static and dynamic flow models.

Although the freshwater resources in northeast China were overall sufficient, the researchers found a [downward trend](#) in water security status between 2005 and 2015, largely because of the changes in precipitation and agricultural water consumption.

By quantifying transboundary flows of freshwater services, the researchers highlighted the importance of upstream watersheds as sources of ecosystem [service](#) provision. They also called attention to agricultural and livestock water demands, which may pose a risk of water shortage.

This study may provide technical support for future studies, and its results will be helpful for formulating inter-regional ecological compensation policies, according to the researchers.

The study has been published in *Journal of Environmental Management*.

More information: Qi Zhu et al, A framework of freshwater services flow model into assessment on water security and quantification of transboundary flow: A case study in northeast China, *Journal of Environmental Management* (2021). [DOI: 10.1016/j.jenvman.2021.114318](https://doi.org/10.1016/j.jenvman.2021.114318)

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