

# The meso-scale connectivity of land and sea: an interdisciplinary study with big data science and artificial intelligence

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There have been several scientific studies concerning the interconnectedness between land-surface conditions (e.g., vegetation, land use, and socioeconomic activities) and marine ecosystems (e.g., biodiversity, primary production, and seafood production). This idea of the land-sea connectivity sounded reasonable for many scientists because there is an obvious connection by rivers. However, quantitative estimation of such mesoscale teleconnection has been thought to be difficult due to the size of the target areas, the numbers of possible variables, and the amount of noises in this complex system.

In this study, an interdisciplinary study with big data science and artificial intelligence is presented. Long-term, large-scale observations in terrestrial and marine environmental variables such as satellite data have been accumulated. Statistical analyses concerning causality for those big data will reveal realistic relationships between land and sea in a quantitative manner, instead of the ambiguous knowledge and stereotypes on the system. Moreover, thanks to the progress in artificial intelligence, a novel project of citizen science is now planned. Here, volunteers are encouraged to contribute to the project by using their smartphones. An AI will help volunteers to automatically identify objects, and it will speed up the accumulation of data among the land-sea system.

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