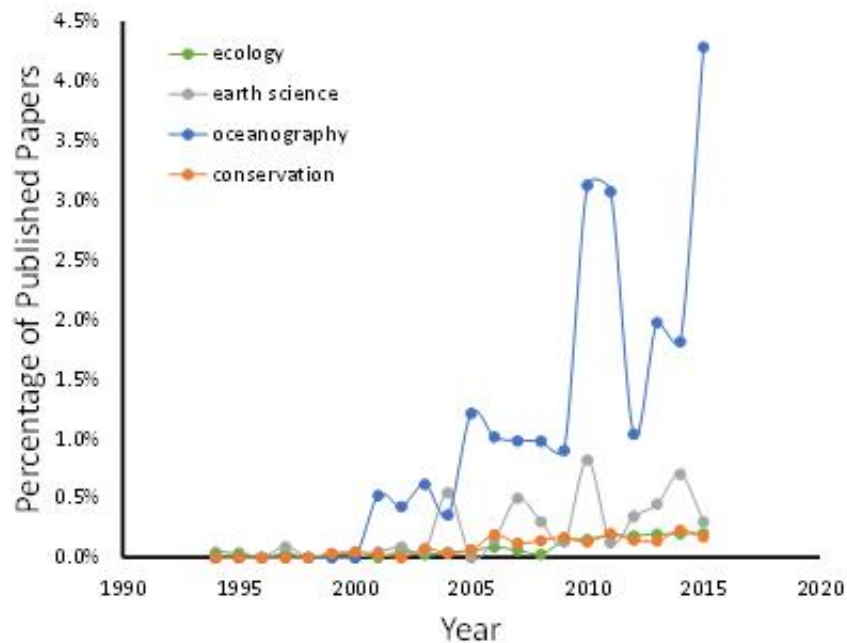


# Machine Learning techniques and the future of Ecology and Earth Science Research

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This plot shows the proportion of articles about machine learning in four natural science disciplines from 1994 to 2015, illustrating the slow penetration of the method in three of four disciplines. Credit: Anne E Thessen

Increasingly becoming a necessity in Ecology and Earth Science research, handling complex data can be a tough nut when traditional statistical methods are applied. As its first publication, the new technologically-advanced Open Access journal *One Ecosystem* features a review paper describing the benefits of using machine learning technologies when working with highly-dimensional and non-linear data.

Natural sciences, such as Ecology and Earth science, focus on the complex interactions between biotic and abiotic systems in order to infer understand these systems and make predictions. Traditional statistical methods can impose unrealistic assumptions that result in unsound conclusions as the era of 'big data' meets [ecology](#) and earth science. Machine-learning-based methods, capable of inferring missing data and handling complex interactions, are more apt for handling complex scientific data.

"A wider adoption of [machine-learning](#) methods in ecology and earth science has the potential to greatly accelerate the pace and quality of science," explains the author of the study, Dr. Anne Thessen, the Ronin Institute for Independent Scholarship. "Despite these advantages, however, machine-learning techniques have not met their full potential in ecology and earth science".

The present gap between the potential and actual use of machine-learning methods is mainly due to to the lack of communication and collaboration between the machine-learning research community and natural scientists; the current deficiency in graduate education in machine learning methods; and the requirement for a robust training and test data set.

However, according to the newly published review paper, these impediments can be overcome through financial support for collaborative work and education.

"For many researchers, machine learning is a relatively new paradigm that has only recently become accessible with the development of modern computing. In this paper I suggest several mechanisms through which this useful method can be quickly introduced within the ecological and earth science fields, to ensure their wider application." adds Dr. Thessen.

"We are extremely happy to pioneer One Ecosystem publications with this particular article. Created as an innovator in the fields of Ecology and Sustainability Sciences, one of the journal's main objectives is to answer the need for Open Access not only to the final research content, but also to all underpinning data. Tackling issues of the 'big data' era, this article provides a perfect match for a first publication in a journal that aims at innovation," comments Benjamin Burkhard, Editor-in-Chief of One Ecosystem.

**More information:** Anne Thessen, Adoption of Machine Learning Techniques in Ecology and Earth Science, *One Ecosystem* (2016). [DOI: 10.3897/oneeco.1.e8621](https://doi.org/10.3897/oneeco.1.e8621)

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