

**To: Research in Ecology**  
**Attn: Editor**  
**Re: Original research article submission**

**22<sup>nd</sup> March 2022**

**Dear Editor,**

With this letter, I am submitting a new manuscript for consideration:  
*“Machine Learning and Regression Analysis Reveal Different Patterns of Influence on Net Ecosystem Exchange at two Conifer Woodland Sites”*

**Brief description of the novelty and importance of the findings**

The study presented in this manuscript compares the abilities of four multi-linear regression and seven machine learning (ML) models to accurately predict the multi-year and weekly averaged net ecosystem exchange of CO<sub>2</sub> (NEE) trends at two evergreen conifer woodland sites in North America. It applies those models to identify the relative contributions of the influential variables to the prediction solutions. It interprets the model results to provide valuable insights to the dynamics of the two conifer woodland sites. The two sites are selected because their NEE and influencing variable data form part of the AmeriFlux dataset pre-processed to the high FLUXNET2015 standards. Consequently, the data is reliable and information for a large number of influential variables is available for the sites (16 variables for one site and 20 variables for the other). The best-performing support vector regression model provides highly accurate and reproducible NEE predictions for both sites.

**Declarations**

**Funding**

No funding was received for this study.

**Conflicts of interest**

The author has no conflicts of interest associated with this study.

**Submissions to Other Journals**

This manuscript nor any significant part of it is under consideration for publication elsewhere or has appeared elsewhere in a manner that could be construed as a prior publication or duplication of the same work.

**Yours Sincerely,**

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