



Interactive  
Comment

# ***Interactive comment on “Artificial neural networks and multiple linear regression model using principal components to estimate rainfall over South America” by T. S. dos Santos et al.***

**T. S. dos Santos et al.**

tthalyssoares@gmail.com

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Referee #1 (Comment 1): Answer: Thanks for the positive comments for this article. We think that the results contribute to reaffirm the importance of downscaling techniques, especially artificial neural networks (which are relatively new) in the study of climate simulations.

Referee #1 (Comment 2): Answer: The Multiple Linear Regression is commonly used in various research areas, and is widely accepted by the scientific community. The Artificial Neural Networks are still being inserted in science, especially when it comes to climate studies. Our intention is to show advantages of using Artificial Neural Networks

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to the weather. The advantages of the Artificial Neural Networks stands out: The nonlinearity inherent Networks that allows this technique can perform functions that a linear program (such as Multiple Linear Regression) can not. In addition, a neural network can be designed to provide information not only about which particular pattern select, but also on the confidence in the decision. Thus, manuscripts are inserted in the advantages of a neural network with respect to Multiple Linear Regression.

Referee #1 (Comment 3): Answer: Understand that the Mann Kendall test is an excellent method to assess significant trends in rainfall. However, the idea of the article is to estimate the rainfall through two methods downscaling in order to make a comparison between these methods. In this context, we identified the Artificial Neural Networks as a promising methodology application in climatology. The use of Mann Kendall test is an excellent idea for a future article.

Referee #1 (Comment 4): Answer: Thanks for the opportunity to review and improve the quality of the figures. The resolution of the figures will be increased from 300dpi to 600dpi.

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Interactive comment on Nonlin. Processes Geophys. Discuss., 2, 1317, 2015.

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