

Review committee
CNRS

5th January 2021

Recommendation letter for Dr Margot Bador

Dear Committee members,

This letter is to highly recommend Dr Margot Bador and her proposed project 'Vers une meilleure compréhension des changements de précipitations extrêmes en Europe au cours du 21^{ème} siècle'.

I have supervised Dr Bador as a postdoctoral researcher from July 2016 to present and have continued to be impressed by her intellect, enthusiasm and commitment to her research over that time. Her work has primarily focussed on a global scale understanding of precipitation extremes from both observations and models and therefore the proposed project fits very well within her skill set while challenging her to acquire some new skills and push some research boundaries.

Her current work requires her to have a good theoretical understanding of precipitation processes, to understand the issues that are inherent in precipitation observations, to be able to run climate models and to understand their output and limitations. She has contributed substantially to international efforts such as the World Climate Research Programme Grand Challenge on Climate Extremes (which I co-chair) producing an important work in the Journal of Climate. This work focussed on how robust future changes in extreme precipitation over land are across climate models. Her results showed that models that share atmospheric physics schemes tend to produce similar results. When this is taken into consideration future annual extreme precipitation intensity increases in the majority of models and over the majority of land areas. Models show more similarities in dry compared to wet regions, in the dry season compared to the wet season and in the extra-tropics compared to the tropics. For each model, the future increase in the wettest day of a season or year exceeds the range of that can be explained by natural variability and this result is particularly robust in the extra-tropics. These are important findings that have fed directly into the WCRP Extremes GC under its 'understand' and 'simulate' research themes. She is also currently working on several other publications on the limitations of precipitation extremes in global observational products which appear in a Special Issue in a leading journal and contribute substantially to the WCRP Extremes GC 'document' research theme, GEWEX Global Data and Assessment Panel (GDAP) and the International Precipitation Working Group (IPWG). Margot is also contributing to the Intergovernmental Panel on Climate Change 6th Assessment Report Chapter on Weather and climate extreme events in a changing climate and is taking on a leadership role in model evaluation at an international level.

Margot's proposal aims to pursue some of the ideas that she has developed during her postdoctoral research but pushes current knowledge further to better understand future changes in extremes by exploring the mechanisms that drive them. In order to do this, she will conduct innovative experiments with a hierarchy of models from global coupled climate models to high resolution convective permitting simulations. She will use the emerging 'storyline' approach to understand future changes in precipitation extremes, which allows an emphasis to be placed on understanding the driving factors involved and the plausibility of those factors rather than the conventional and limited approach of representing uncertainty as probabilistic based on ensembles of climate model simulations. I have no doubt that Margot will be able to perform the research that she has set herself for this project. It is also worth noting that Margot to her credit works on the principle of quality over quantity. This means that she focuses on worthy publications which will be important to the community and have lasting impact. She has obvious leadership potential, taking a leading role in our Centre's Rainfall Extremes Research Programme, coordinating meetings and being an invited speaker to our annual conference.

In summary, I hope this recommendation letter highlights the utmost recognition that I have for Dr Bador and her research ability and that the project she proposes is exciting, timely and innovative.

Sincerely,

A handwritten signature in black ink, appearing to read 'Lisa Alexander', is positioned above a light blue rectangular background.

Prof Lisa Alexander, Climate Change Research Centre
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Leader, Extreme Rainfall Program



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