

Preparing data for climate change analysis using MATLAB

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Title: Preparing data for climate change analysis using MATLAB.

Summary: In this activity, we mainly learn the importance of analyzing data format before applying models to it, with the examples of drought. We use monthly precipitation from the Climate Research Unit (gridded data) and assess if it is suitable for climate analysis. We learn how to be critical with the initial data provided, about the results calculated, and how to ensure the quality of the calculations performed and to put the results calculated with model in perspective to the empirical results.

Learning Goals: Students will learn how to analyze the quality of the large set of data in a fast way and how to deal with low-quality data. They will learn about data cleaning, which is one of the most important and most time consuming task prior to any analysis.

Context for use: This activity is designed for the people who wants to learn how to be critical with climate data analysis and for the students who are working on data analysis, at any academic level (undergraduate or graduate). Students with limited coding experiences will be able to successfully complete this activity since it involves more thinking than coding. However basic experience in Matlab syntax is preferred. Basic knowledge of data analysis is also preferred but not required.

Assessment

At the end of the activity, the student should have a global map of drought intensity within the past decades.

References and Resources

W. Kwak, Y. S. Kim, J. S. Lee, and H. S. Kim, “Analysis of drought characteristics using copula theory,” in Proceedings of the World Environmental and Water Resources Congress, pp. 1762–1771, Albuquerque, NM, USA, May 2012.

J.-T. Shiau, S. Feng, and S. Nadarajah, “Assessment of hydrological droughts for the Yellow River, China, using copulas,” *Hydrological Processes*, vol. 21, no. 16, pp. 2157–2163, 2007.