Review of "Storylines of Future Drought in the Face of Uncertain Rainfall Projections: A New Zealand Case Study" by Lewis et al. 2025.

Summary:

In this work, Lewis et al. use six dynamically downscaled regional climate models (RCMs) from the CMIP6 ensemble and use the soil water budget to explore drought in New Zealand. They particularly focus on two models, ACCESS-CM2 and CNRM-CM6-1, which produce contrasting signs of rainfall changes, and explore the two diverging "dying-wetting" storylines. For the "wetting" storyline, they show how the increase in rainfall in ACCESS-CM2 model mitigates the drying associated with the temperature-driven increases in potential evapotranspiration (PET). For the "drying" scenario, they show how in fact the decrease in rainfall further exacerbates the drying due to temperature-driven increases in PET. The paper is generally well-written, well-organized and has a good flow. I have some minor suggestions and comments below to help further improve some of the aspects of the manuscript.

General questions to the authors:

1. I was wondering why and how the emission scenario used in this study was chosen? In section 1, line 49, and in section 2.1, line 74-75, it is mentioned that a "relatively" high emission scenario was chosen. I was wondering why a more extreme scenario (SSP5-8.5) or a more middle-ground scenario (SSP2-4.5) was not chosen for this study? Perhaps adding one or two sentences in section 2.1 to address this would be useful, as the readers might also find it insightful to learn more about it.

2. Lines 22-23 are a little confusing. In the context of this manuscript, what dose "model internal variability" mean? By looking at the references used there (Deser et al., 2012; Lehner et al., 2020), I immediately think of "internal climate variability". And to address it, large ensembles have been used by the very references mentioned in that line. So, I am not sure if I fully understand the point made here.

3. What approach/variables were used to calculate PET? Some details could be provided in section 2.2.

4. Two models, ACCESS-CM2 and CNRN-CM6-1, were singled out to represent the two diverging storylines. Have you tested an approach in which you use an ensemble of models, similar to Wiel et al. (2024)?

5. In line 126, the six case-study sub-regions are suddenly mentioned in the text, without any introduction beforehand. Maybe it would be better to address this, even briefly, in the Data and Method section? In fact, until Figure 4a, the readers don't actually get to know what sub-regions were studied.

Minor comments:

Line 107: MSLP is mentioned in the text for the first time→ mean sea level pressure (MSLP)

Line 189: omit one "using"

References:

Deser, C., Phillips, A., Bourdette, V., and Teng, H. (2012): Uncertainty in climate change projections: the role of internal variability, *Climate dynamics*, 38, 527–546. https://doi.org/10.1007/s00382-010-0977-x

Lehner, F., Deser, C., Maher, N., Marotzke, J., Fischer, E. M., Brunner, L., Knutti, R., and Hawkins, E.: Partitioning climate projection uncertainty with multiple large ensembles and CMIP5/6, Earth Syst. Dynam., 11, 491–508, https://doi.org/10.5194/esd-11-491-2020

van der Wiel, K., Beersma, J., van den Brink, H., Krikken, F., Selten, F., Severijns, C., et al. (2024). KNMI'23 climate scenarios for the Netherlands: Storyline scenarios of regional climate change. Earth's Future, 12, e2023EF003983. https://doi.org/10.1029/2023EF003983