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**Hydrological Research Letters**

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[\[PDF \(717K\)\]](#) [\[References\]](#) [\[Supplementary Materials\]](#)**Reproducibility of the seasonal cycles of land-surface hydrological variables in Japanese 25-year Reanalysis**[Tosiyuki Nakaegwa](#)<sup>1)</sup>

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**Abstract:**

The present article reports the first investigation on the reproducibility of three land-surface hydrological variables (soil moisture, river discharge, and terrestrial water storage) in Japanese 25-year Reanalysis (JRA-25) by a system consisting of the Land Data Analysis (LDA) of JRA-25 and the modified version of a global river-flow model. JRA-25 well reproduces the seasonal cycles of observed soil moisture, river discharge, and terrestrial water storage. Detailed examinations revealed that the high reproducibility of the seasonal cycle of soil moisture originates from that of precipitation, that the low amplitude reproducibility for river discharge results from insufficient representation of the land-surface hydrology and insufficient reproducibility of the annual mean precipitation in JRA-25, and that the low amplitude reproducibility of terrestrial water storage predominantly results from insufficient representation of the land-surface hydrological model. An additional comparison in the reproducibility of soil moisture between JRA-25 and operational LDA reveals that the better reproducibility of soil moisture in JRA-25 does not always result from reasonable physical processes. The JRA-25 dataset should be used cautiously for studies in hydrology and meteorology, since the reproducibility varies with basins or areas.

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