

Fukui, S., E. Shirakawa, D. Soga, R. Ohara, K. Usui, K. Takiguchi, K. Ono, T. Hirose, S. Matsushima, J. Ito, T. Yamazaki, K. Saito, H. Seko, and T. Iwasaki, 2024: Long-term regional reanalysis for Japan with assimilating conventional observations (RRJ-Conv). *J. Meteor. Soc. Japan*, **102**, <https://doi.org/10.2151/jmsj.2024-036>.

Plain Language Summary: We are conducting a 5-km long-term atmospheric regional reanalysis for Japan with assimilating conventional observations (RRJ-Conv). RRJ-Conv is produced with a system of JMA's nonhydrostatic regional model and local ensemble transform Kalman filter (NHM-LETKF), which is driven by the Japanese 55-year reanalysis (JRA-55). This paper overviews the performance of RRJ-Conv for 20 years from July 2001 to June 2021, mainly focusing on precipitation and exploring added values to JRA-55. RRJ-Conv successfully keeps long-term consistency of analysis quality. RRJ-Conv represents the spatio-temporal distribution of precipitation more realistically than JRA-55.

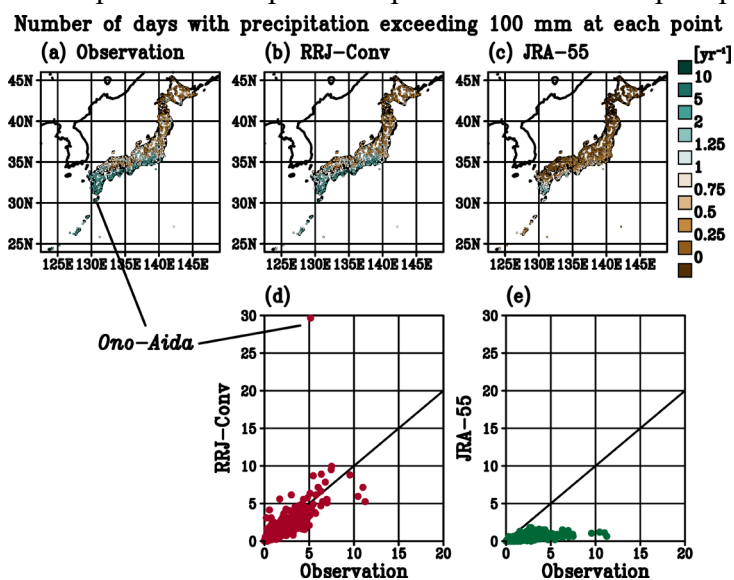


Figure 1. Number of days with precipitation exceeding 100 mm. Spatial distributions of (a) the raingauge observations, (b) RRJ-Conv and (c) JRA-55, and their scatter plots of (d) RRJ-Conv and (e) JRA-55. Note that the overestimation at Ono-Aida is due to insufficient resolution of RRJ-Conv for the small and steep island where the site is located.

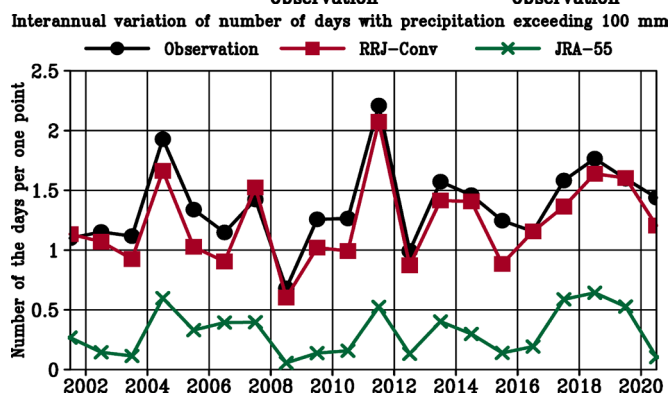


Figure 2. Interannual variation in the number of days with precipitation exceeding 100 mm. The black, red and green lines denote the raingauge observations, RRJ-Conv and JRA-55, respectively.

- RRJ-Conv is conducted by assimilating surface pressure and radiosonde upper-air observations and Tropical cyclone center positions with NHM-LETKF.
- Evaluation of RRJ-Conv for the period from July 2001 to June 2021 confirms long-term consistency of analysis quality.
- Comparison with JRA-55 suggests that RRJ-Conv better represents detailed spatial distribution of monthly precipitation, extreme values for daily precipitation, and their interannual variation.