

Ishii, M., H. Kamahori, H. Kubota, M. Zaiki, R. Mizuta, H. Kawase, M. Nosaka, H. Yoshimura, N. Oshima, E. Shindo, H. Koyama, M. Mori, S. Hirahara, Y. Imada, K. Yoshida, T. Nozawa, T. Takemi, T. Maki, and A. Nishimura, 2024: Global historical reanalysis with a 60-km AGCM and surface pressure observations: OCADA. *J. Meteor. Soc. Japan*, **102**, <https://doi.org/10.2151/jmsj.2024-010>.

**Plain Language Summary:** This study performed a historical atmospheric reanalysis from 1850 to 2015, assimilating only surface pressure observations with an atmospheric general circulation model. The reanalysis is called OCADA (Over-Centennial Atmospheric Data Assimilation), and it provides the evolution of the three-dimensional atmosphere and the quantitative information of the uncertainties. Severe weather events that occurred in Japan before World War II were downscaled to the East Asian region using a regional climate model.

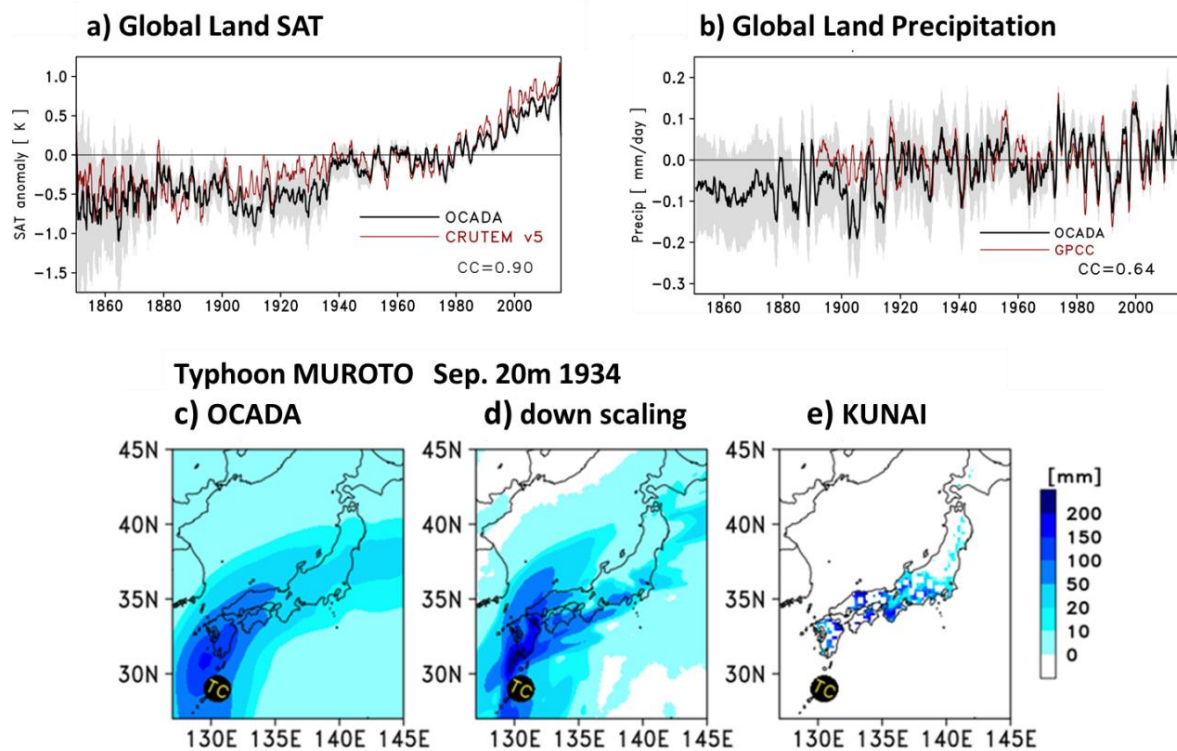


Figure 1. Time series of global land surface air temperature anomaly (K) and b) precipitation anomaly (mm/day) compared with CRUTEM ver. 5 and GPCC, respectively. Bottom panels show c) assimilated precipitation (mm/day) of OCADA and those d) downscaled and e) observed on September 20, 1934, influenced by typhoon MURUTO, marked by TC.

- Surface pressure observations in East and Southeast Asia, which are newly archived and used in this study, account for 15 % of the database in the early 20<sup>th</sup> century.
- OCADA is superior in representing the intensities of observed tropical cyclones in 1979-2015.
- OCADA reproduces several extreme precipitation events in Japan before World War II.