

Kosaka, Y., S. Kobayashi, Y. Harada, C. Kobayashi, H. Naoe, K. Yoshimoto, M. Harada, N. Goto, J. Chiba, K. Miyaoka, R. Sekiguchi, M. Deushi, H. Kamahori, T. Nakaegawa, T. Y. Tanaka, T. Tokuyoshi, Y. Sato, Y. Matsushita, and K. Onogi, 2024: The JRA-3Q reanalysis. *J. Meteor. Soc. Japan*, **102**, <https://doi.org/10.2151/jmsj.2024-004>

Plain Language Summary: The Japan Meteorological Agency (JMA) has developed the third Japanese global atmospheric reanalysis, the Japanese Reanalysis for Three Quarters of a Century (JRA-3Q). The objective of JRA-3Q is to improve quality in terms of issues identified in the previous Japanese 55-year Reanalysis (JRA-55) and to extend the reanalysis period further into the past. JRA-3Q is based on the TL479 version of the JMA global Numerical Weather Prediction (NWP) system as of December 2018 and uses results of developments in the operational NWP system, boundary conditions, and forcing fields achieved at JMA since JRA-55. It covers the period from September 1947, when Typhoon Kathleen brought severe flood damage to Japan, and uses rescued historical observations to extend its analyses backwards in time about 10 years earlier than JRA-55.

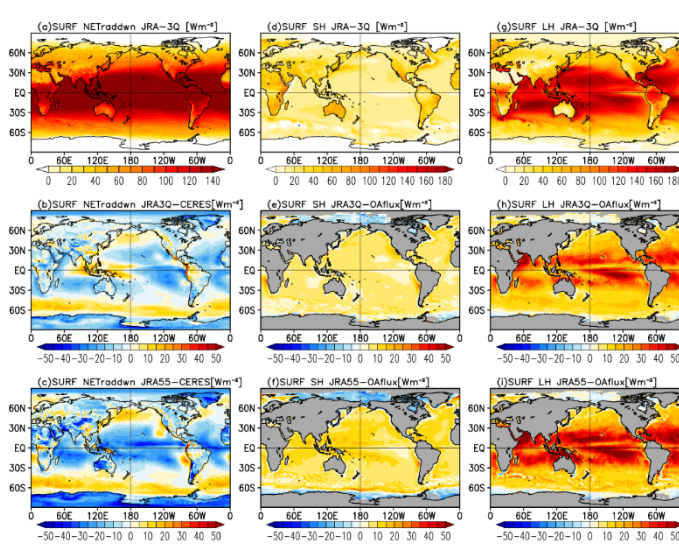


Figure 1 Spatial distributions of (a–c) radiative net heat fluxes, (d–f) sensible heat fluxes, and (g–i) latent heat fluxes at the surface for JRA-3Q (a, d, g), their differences from CERES-EBAF or OAFLUX (b, e, h), and differences of JRA-55 from CERES-EBAF or OAFLUX (c, f, i) averaged over 2002–2008 in units of $W m^{-2}$.

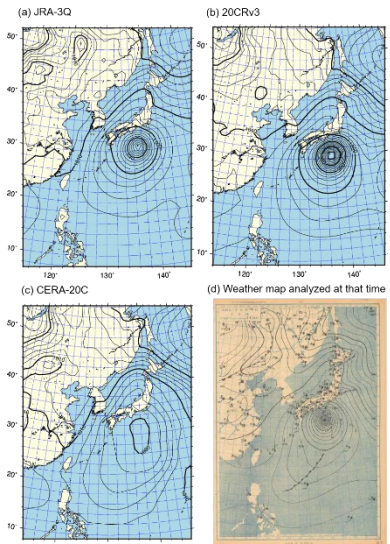


Figure 2 Analysis field of mean sea level pressure (hPa) from (a) JRA-3Q, (b) 20CRv3, and (c) CERA-20C at 06 UTC on 14 September, 1947 and (d) the weather map analyzed at that time (the JMA weather chart).

Highlights:

- The large upward imbalance in the global mean net energy flux at the top of the atmosphere and at the surface, one of the major problems of JRA-55, has been significantly reduced.
- The artificial decrease in the detection of tropical cyclones seen in JRA-55 has been resolved by the use of a tropical cyclone bogus generation method based on the JMA operational system.
- For the pre-1957 period, which is first included in Japanese reanalyses, major typhoons, such as Typhoon Kathleen and Typhoon Marie, are clearly represented in the mean sea level pressure field of JRA-3Q, and the pressure fields are generally consistent with the original weather map analyzed at that time.