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A Reanalysis-Based Global Tropical Cyclone Tracks Dataset for the Twentieth Century (RGTrack-20C)

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Given the large impacts of tropical cyclones (TCs) on human society, the response of TC activity to climate change has widely drawn attention from both society and scientists. However, assessing how historical TC activity, especially intensity, evolved with climate change has proven challenging due to incomplete TC records in the early years. Here, we introduce the Reanalysis-Based Global Tropical Cyclone Tracks Dataset for the Twentieth Century (RGTracks-20C), which is reconstructed from the National Oceanic and Atmospheric Administration (NOAA) Twentieth Century Reanalysis (20CRv3) using two tropical cyclone tracking algorithms. Validations based on observations in the modern satellite era verify the ability of the RGTracks-20C to capture the climatology and long-term variability of TC numbers, tracks, duration, and intensity across various ocean basins. Furthermore, the RGTracks-20C fills the gaps of the incomplete TC track information, including position and intensity, in the early observational data. The RGTracks-20C is the first publicly available reanalysis-based century-long global TC track dataset, providing an alternative data reference for future research about climate change and TC-related disasters.