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Continuing development of climate information records at NOAA's National Climatic Data Center

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The Climate Data Records (CDR) program initiated at NOAA's National Climatic Data Center (NCDC) provides consistent and continuous time series of climate metrics derived from weather satellite data. Climate Information Records (CIR) are derived from CDRs to provide time series targeted toward specific environmental phenomena that are of particular interest. Development of CIRs is a continuing goal at NCDC. Here we motivate and introduce two new CIRs that are presently under development. The existing records of tropical cyclone activity (known as best-track) are known to be highly heterogeneous, and robust detection of trends remains a significant challenge. This is largely because the data used to construct best-track records are taken to support operational forecasting with no mandates in place to assure temporal consistency or provide documentation that could later identify the introduction of new technology and/or protocols. This issue is further compounded when combining best-track data from different regional offices to form a global dataset. Tropical cyclone activity comprises measures such as storm frequency, intensity, duration, and track. Intensity values in the best-track are especially sensitive to changing technology and improving methodology because their estimation requires a series of specifically targeted measurements over the entire duration of each tropical cyclone. Efforts are ongoing at NCDC to construct new and improved tropical cyclone intensity CIRs based on global reanalyses of homogenous satellite records. The latest CIR in development uses a state-of-the-art intensity estimation algorithm that will provide unprecedented accuracy while retaining temporal consistency. The Madden-Julian oscillation (MJO) has frequently been identified with proxies for convection such as outgoing long-wave radiation (OLR). The OLR data are suitable for the Eastern Hemisphere where deep tropical convection is commonplace, but the convective signals become weaker in the Western Hemisphere. The MJO can be observed in the upper troposphere at all longitudes using reanalyses, but the quality of these data varies with time. Inter-satellite calibration techniques have recently produced a 31-year dataset of upper tropospheric water vapor (UTWV), which is being used to generate a new CIR of global MJO activity. In addition to being homogeneous through space and time, the UTWV-based CIR will have the advantage of more consistent global identification of the MJO signal.