Techniques for Analyzing a Long-Term Observational Dataset Using Global Water Vapor Data from the NVAP-M Blended TPW Dataset

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The NASA Water Vapor Project observational water vapor dataset created under the NASA Making Earth Science Data Records for Research Environments (MEaSUREs) program (NVAP-M) is a robust global (land and ocean) water vapor dataset spanning 22 years (1988-2009). It was created by merging multiple satellite and surface sources of atmospheric water vapor to form global gridded fields of total and layered precipitable water vapor that are available at either daily, 1 degree or 6-hourly, or ½ degree resolution. There are three different processing paths that produce data with a global climate, an ocean-only and a weather event focus.

In this paper, we present a water vapor climatology from the NVAP-M Climate and Ocean datasets on daily, monthly, annual, and full-dataset timescales with a focus on the effects of applying thresholds to the data. Additionally, we will discuss the application of the Penalized Maximal F statistical test (*Wang*, 2008) as a means for detecting unavoidable breakpoints in long term observational datasets.

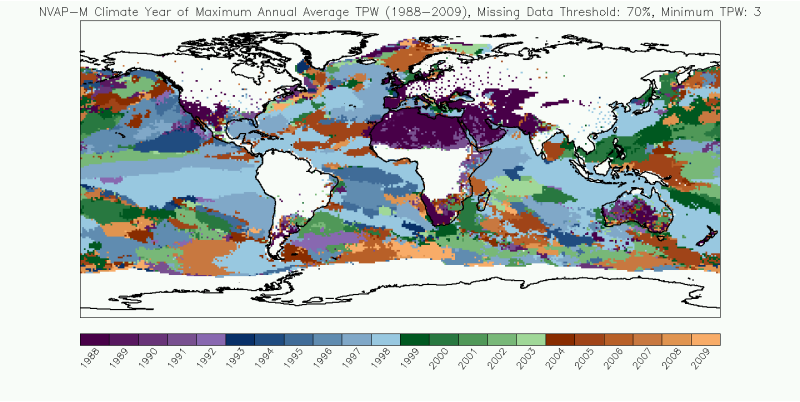

Figure 1. The year of the maximum annual average TPW with from the NVAP-M Climate dataset with a 3mm minimum TPW value and a 70% data availability threshold applied.

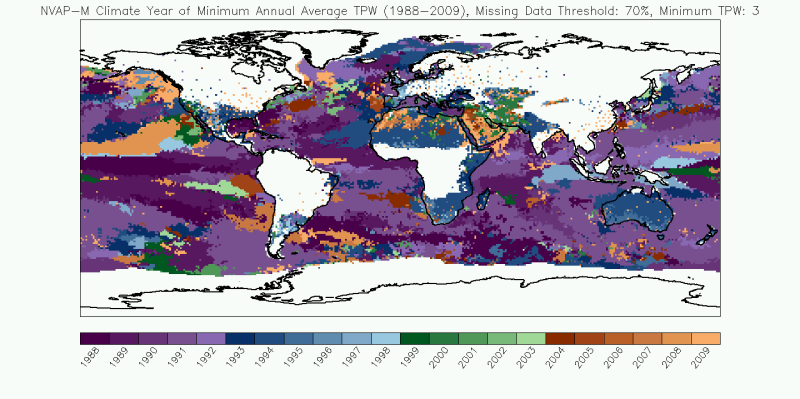

Figure 2. The year of the minimum annual average TPW with from the NVAP-M Climate dataset with a 3mm minimum TPW value and a 70% data availability threshold applied.