Overview of MERRA-2 for Applications, Decision-making, and Climate Assessment

Michael Bosilovich[*1], Allison Collow[2], Paul Stackhouse[3], Natalie Thomas[2], Kanan Patel[4], Helen Amos[5], Ana Prados[6], and Stephanie Schollaert Uz[1]

[1]NASA GSFC – Greenbelt MD, United States
[2]NASA GSFC USRA – Greenbelt, MD, United States
[3]NASA LaRC – Hampton, VA, United States
[4]University of Texas – Texas, United States
[5]NASA GSFC SSAI – Greenbelt MD, United States
[6]NASA GSFC and University of Maryland Baltimore County – Catonsville MD, United States

Abstract

The Modern Era Retrospective-analysis for Research and Applications (MERRA) began development in the early 2000s with intention to provide informed regional climate assessment for decision support. Retrospective-analyses include an abundance of observations so that synoptic-scale weather is faithfully depicted. However, key features in high time resolution (1 hourly), long duration (starting in the late 70s early 80s) and timely near real time data production are particularly useful for decision-making. In addition, attention to useful output diagnostics can also increase the usefulness of the reanalyses (e.g. boundary layer winds for wind energy production). Here, we review some recent efforts that employ reanalyses output in applied uses, including heatwaves, drought, extreme rainfall, renewable energy, sustainable building systems and health (air quality). We also consider lessons learned and potential directions in the future.

Keywords: renewable energy, extreme events, heatwave, health

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[*]Speaker