

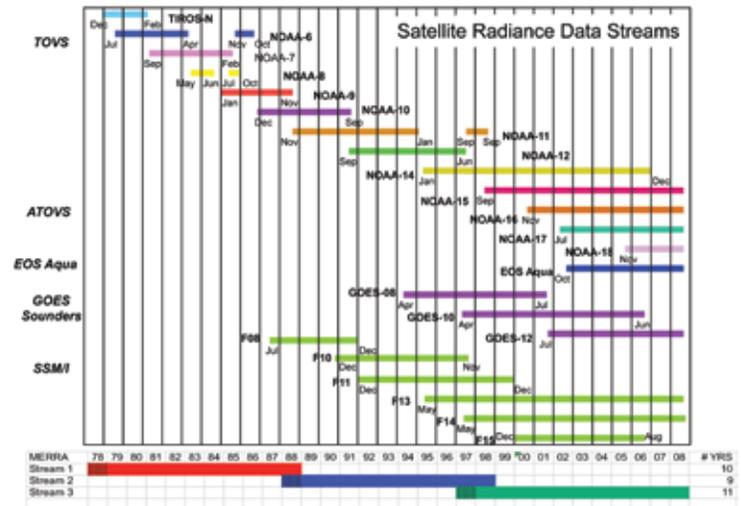
Our Planet

MERRA: The Modern Era Retrospective-Analysis for Research and Applications

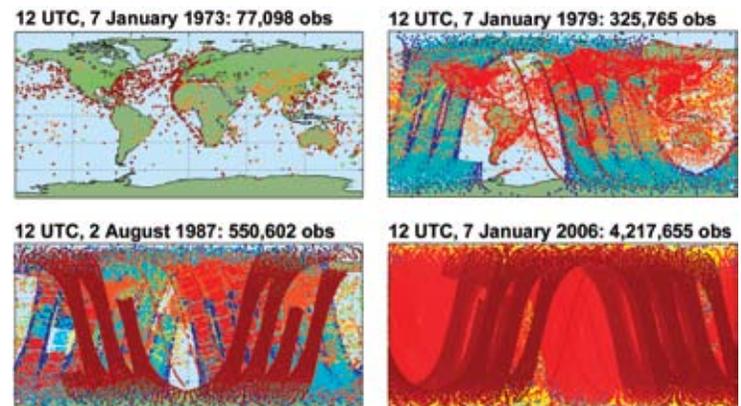
The Modern Era Retrospective-analysis for Research and Applications (MERRA) is NASA's ambitious effort to extract new information from 30 years of satellite observations using the GEOS-5 Data Assimilation System, with a focus on the hydrological cycle. MERRA provides an invaluable data source for model assessment, climate and weather research, and hydrologic studies.

MERRA is a fundamental first step in developing Integrated Earth System Analyses, including aerosol, land, ocean, and cryosphere data assimilation. The data produced by MERRA is useful in addressing a broad range of environmental issues. For example, wind data produced by MERRA is useful in feasibility studies for wind power generation. The results of MERRA will also be used to gain a deeper understanding of Earth's hydrological cycle. This will in turn support water resource planning—a dominant issue in the 21st century.

MERRA supports NASA's mission to advance the science of observing Earth from space. The Global Modeling and Assimilation Office (GMAO) develops techniques to analyze satellite data to develop comprehensive four-dimensional representations of the state of Earth as a system—a process referred to as data assimilation. NASA supercomputing resources are heavily relied upon by MERRA to mine information from archived satellite observations of Earth.



MERRA-assimilated radiances from a broad collection of satellites, additional satellite retrieval products, as well as conventional observations (e.g., sounders, ocean data buoys, commercial aircraft, etc.).



The Changing Observing Systems: This series of images shows the number of assimilated observing system inputs has increased dramatically from the early satellite era to present.