



Land surface estimates using GEOS-5 modeling and remote sensing data: applications

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The land surface plays a key role in the Earth's climate system. This presentation will discuss how global land surface estimates are obtained by combining Goddard Earth Observing System Model, version 5 (GEOS-5) land surface modeling and remote sensing data in some operational products and research applications. Among the operational products, the Modern-Era Retrospective Analysis for Research and Applications, version 2 (MERRA-2) provides global estimates of land surface conditions, using observations-based precipitation data products to correct the precipitation falling on the land surface. This product can be used as input to land surface modeling applications, but it also serves as ancillary information to remote sensing products. The operational Soil Moisture Active Passive (SMAP) Level 4 Soil Moisture product provides global and internally consistent estimates of land surface variables, using satellite-based brightness temperature observations to correct mainly soil moisture and temperature. The latter land surface data assimilation system better constrains model simulations and adds value to the SMAP remote sensing data, which by themselves are only informative of surface soil moisture and limited in space and time. Via research applications, limitations in these land surface estimates can be uncovered and possible venues to improve land surface estimates can be explored, including modeling, observation and data assimilation. This presentation will show a range of land surface applications, their limitations and ongoing efforts for improvements.