Advanced Microwave Scanning Radiometer – Earth Observing System (AMSR-E) Product Overview

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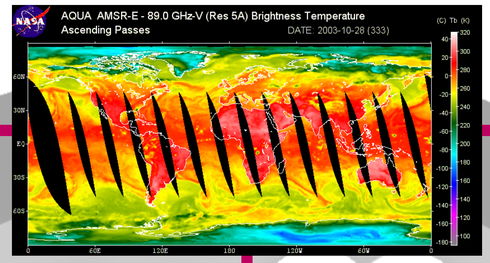
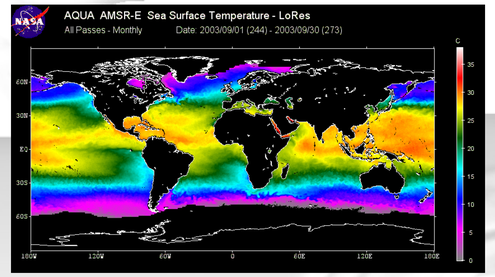
http://nsidc.org/daac/amsr

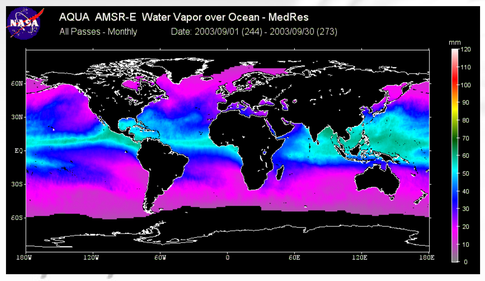
Brightness Temperatures

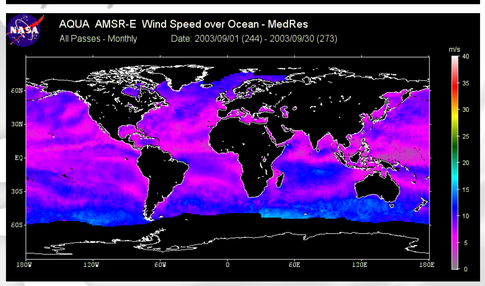
The AMSR-E sensor measures microwave energy radiated from the Earth's atmosphere and surface at six frequencies (6.9, 10.7, 18.7, 23.8, 36.5, and 89.0 GHz) and two polarizations. These radiance measurements are used to compute **brightness temperatures**, which are then resampled to provide data on a set of comon spatial resolutions. Brightness temperatures are then used to produce the other geophysical products shown below.

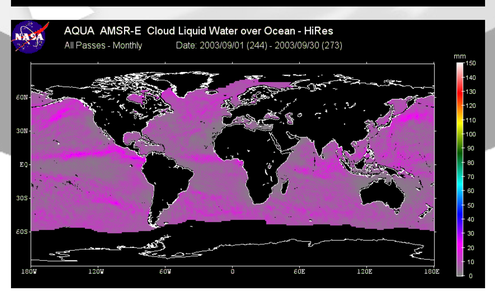


Oceans



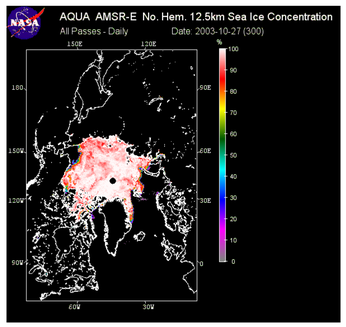


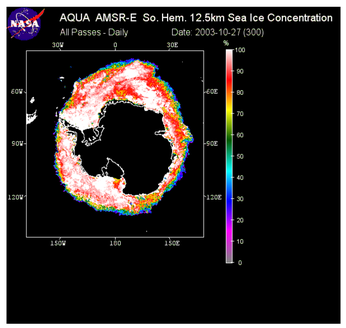




Radiative transfer models are used at and above the ocean surface to relate brightness temperatures to a suite of geophysical parameters based on microwave signals from the surface (**sea surface temperature** and **wind speed**) and the atmosphere (**water vapor** and **cloud liquid water**).

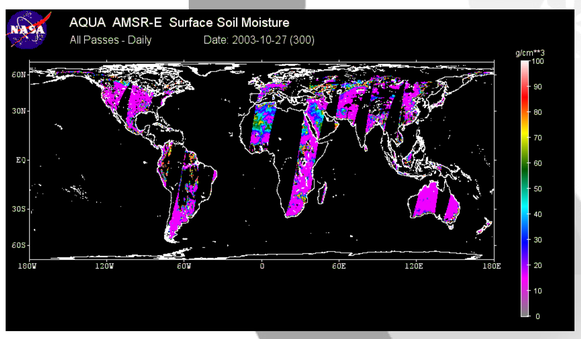
Sea ice





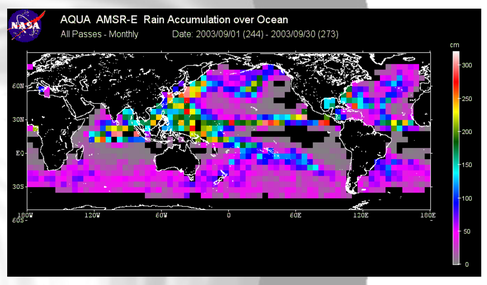
Because Arctic sea ice consists largely of multiyear ice floes while Antarctic sea ice is primarily seasonal, different algorithms for computing **sea ice concentration** are used in these two regions. Ice temperature and snow cover are also computed for sea ice.

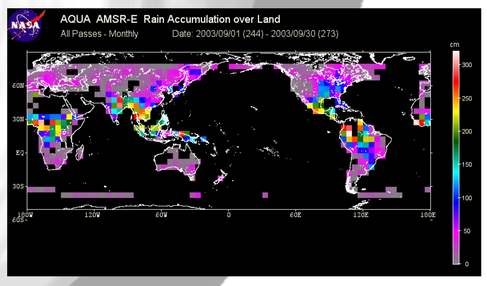
Soil moisture



Microwave observations are sensitive to **soil moisture** through the effects of moisture on the dielectric constant and hence emissivity of the soil. In determining soil moisture, the model inversions include corrections for variable vegetation water content and surface temperature effects.

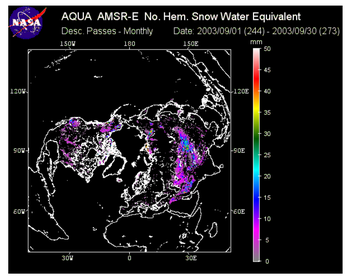
Rain

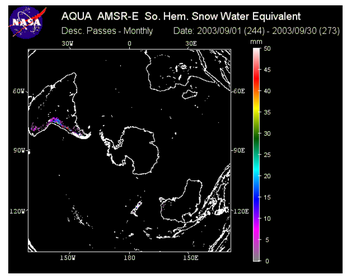




The ocean provides a relatively homogeneous background which is ideal for observing **rainfall** via its emissivity. The high and variable emissivity of land surfaces, however, complicates the observed signal so that rainfall observations are problematic and must be inferred empirically.

Snow





AMSR-E can be used to measure snow cover area as well as its volume, or "**snow water equivalent**" (SWE). Successful estimation of SWE is still at a developmental stage and requires model estimations of snow grain size and density.