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Editorial note for Sea Surface Salinity

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In ocean, the salinity of water is measured as the grams of salt per 1000 grams of water, in which one gram of salt per 1000 grams of water is termed as one PSU or one practical salinity unit. Salinity is a significant parameter for ocean dynamics and can also serve as a proxy for certain biogeochemical processes. Observations of salinity are desired to calculate approximations of oceanic transports of freshwater and additional properties on basin to global scales. Salinity also provides a good pointer to variations in the water cycle as it specifies the change in freshwater because of the difference between evaporation and precipitation. The salinity of seawater at the ocean surface can be distantly detected by means of microwave frequencies. Presently, this method is effective for open ocean measurements, whereas recognizing reduced sensitivity for colder water. Measurements within nearly 50 km of land are influenced by the land contamination and less accurate. Beside with temperature, it is a major factor in contributing to deviations in density of seawater and then ocean circulation. Whereas sea surface temperatures have been measured from space for over 3 decades, the technology to measure sea surface salinity from space has only recently developed. Sea surface density, a driving force in ocean circulation and a function of temperature and salinity will lastly be determinate every month on a global scale. As the oceans require 1100 times the heat capacity of the atmosphere, the ocean circulation becomes serious for understanding the transfer of heat over the Earth and therefore understanding climate change. The Aquarius mission is launched on 10 June 2011. It is the first mission with the main goal for measuring SSS (sea surface salinity) from space. Statistics from Aquarius will play an enormous role in understanding both the global water cycle and climate change. In the open ocean the range of salinity is usually from 32 psu to 37 psu. 97% of the Earth's free water belongs to the oceans. The measurement of sea surface salinity (SSS) from space was first attempted on Skylab (Lerner and Hollinger, 1977) by means of a 1.4 GHz microwave radiometer. Spacecraft remote sensing of SSS by low-frequency microwave radiometry was first suggested by McIntosh and Swift. The AMSR-E was located in orbit on the Aqua satellite in 2002 but for the reason that of its limited ocean salinity measurement accuracy, it was not appropriate for measuring the small salinity gradients of the open ocean. Though, AMSR-E data taken over the Amazon River plume was initially used to determine the feasibility of measuring ocean surface salinity with microwave radiometers from space.

Salinity is the fundamental to understanding the global water cycle. The water cycle is conquered by evaporation and precipitation. Evaporation above the ocean is equivalent to 13 Sv. Precipitation over the oceans account for 12 Sverdrups (Sv = 1 million m3s-1), with an additional Sv flowing into the oceans from terrestrial runoff. In compare precipitation and evaporation over land version for 3 Sv and 2 Sv individually. Sea surface salinity can be used to measure the variance of these two processes, with extra precipitation causing in lower salinity and extra evaporation yielding higher sea surface salinity. SSS is a measure of ice melts at high latitudes with glacial and sea ice melts affecting a freshening of the surface waters.