

AQUARIUS SATELLITE MISSION TO MAP SEA SURFACE SALINITY FROM SPACE

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Scheduled for launch in May 2010, the Aquarius satellite instruments will begin a mission to map the global sea surface salinity (SSS) field and its variability from space. The overarching scientific goal is to provide the essential data to study the interactions between the ocean circulation, global water cycle and climate. Key scientific issues to address are (1) mapping large expanses of the unexplored ocean, (2) understanding the seasonal and interannual SSS variations and the link to precipitation, evaporation and sea-ice patterns, (3) links between SSS and circulation variations in the North Atlantic overturning circulation, (4) air-sea coupling processes in the tropics that influence El Nino, and (4) closing the marine freshwater budget.

The satellite will provide repeat global coverage every 7 days with a footprint resolution ranging from 90 to 150 km over a three-beam about 390 km wide swath. Monthly SSS means will have an average root mean square (rms) accuracy of 0.2 psu at a spatial resolution of 150 km. Accuracies will be somewhat better in the tropics than high latitudes. Coincident microwave measurements of rain, sea ice and surface wind speed will be made with a resolution of about 45 km. The mission duration is initially three years, with probable extensions of two or more years.

The progress and status of the Aquarius mission will be described. A rigorous calibration and validation plan is being developed to ensure that the science accuracy requirements will be achieved. Most critically, the calibration and validation will utilize the existing network of ocean *in situ* surface observations from ships and buoys. The dominant resource will be the Argo array of profiling buoys, which will provide up to 9000 independent upper ocean salinity samples per month. Several emerging *in situ* technologies to measure the upper ocean salinity are described. A possible field experiment during 2011 to systematically validate the Aquarius SSS measurements will also be discussed.