

Sea surface salinity has a massive influence on Earth's climate. With Aquarius, scientists will have a new way to measure that influence in a consistent way. Today's computer models reliably predict global temperatures. But when it comes to ocean salinity, the picture gets fuzzier. Researchers use a wide range of methods to gather data, making it difficult to obtain a true global picture of how sea surface salinity is influencing the ocean. Aquarius is poised to provide a missing link in satellite-Earth observations. Satellites already measure sea surface temperature, rainfall, sea level, surface wind, and ocean color. Aquarius will provide a key to help unlock links between ocean circulation, the global water cycle, and climate. Its data will improve the accuracy of computer models that forecast climate changes and patterns by mapping the entire ice-free ocean every seven days. Aquarius will accomplish this daunting task by using a state of the art radiometer that will detect natural thermal emissions from the ocean surface that are affected in small part by salinity. Aquarius will also employ a scatterometer which will emit energy pulses, then study the return pulses to measure and correct for the effects caused by ocean waves. With its unprecedented accurate and consistent salinity measurements, Aquarius will help climate modelers to better understand the ocean-atmosphere processes that are changing Earth's climate.