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**Title:**

Development of an AQUA based near-surface parameter retrieval

**Abstract:**

The production of a satellite based turbulent surface flux product relies critically upon the near-surface input parameters. Development of retrieval algorithms for the necessary near-surface variables of wind speed, specific humidity, air temperature, and sea surface temperature has proceeded relatively independent of each another until recently. The use of a neural network approach using Special Sensor Microwave/Imager (SSM/I) data in conjunction with a first guess sea surface temperature has led to successful retrieval of all parameters simultaneously. However, SSM/I frequencies lack inherent sensitivity to the sea surface temperature (SST). Recent studies have found improved air temperature and humidity retrievals can be obtained via inclusion of microwave sounding channels weighted in the lower troposphere. The inclusion of SSM/I-like frequencies as well as SST-sensitive microwave channels on AMSR-E along with AMSU-A sounding data onboard the AQUA platform provides a unique opportunity. That is the ability to provide near-simultaneous (in space and time) measurements allowing the retrieval of all the near-surface variables, including SST. This study shows results of a new algorithm designed to take advantage of the unique sampling ability of AQUA based sensors. Results from a neural network based methodology will be shown as compared to in-situ based observations of near-surface variables. Implications for creation of an AQUA based turbulent surface product are also discussed.