

**Title: A Fundamental Climate Data Record of SSM/I, SSMIS and Future Microwave Imagers**

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The data record of operational microwave imager observations from SSM/I currently spans over two decades from 1987 to the present. The follow on to this successful series of sensors is the SSMIS, which is currently operational and will extend this record for at least the next decade. This, in turn, will be followed by the Microwave Imager/Sounder (MIS), which is being developed for the future NPOESS satellite series. The SSM/I sensors have a long history of climate applications from the early detection of the Arctic Sea ice decline to confirmation of the coupling between sea surface temperature and total precipitable water. Indeed, the robust retrievals of water vapor, surface wind speed, cloud water and precipitation from SSM/I make it a cornerstone for global hydrologic cycle research. The current proposal combines efforts from NESDIS and CSU that have experience in dealing with climate quality SSM/I brightness temperature records. NESDIS started in the early 1990s the developments of SSM/I operational products and made the product operational for NOAA and DoD users, and recently created new procedures for climate quality time series. CSU has created a LIC dataset of passive microwave sensors intercalibrated to data from the TRMM microwave imager.

Drawing on the expertise from both of these groups, the goal of this proposal is to identify and use the best approach from each group where this can be identified, or to fully understand and document differences in order to generate a completely transparent and documented Fundamental Climate Data Record (FCDR) of SSM/I and SSMIS brightness temperatures. Key to this effort will be the intercomparison and examination of calibration procedures and results that will provide not only the best possible product, but also an assessment of this product.