Title: Transfer of NOAA/NASA AVHRR Pathfinder SST Processing to NODC

Investigator(s): **Bob Evans (PI)**

Institution: University of Miami

This joint proposal between NOAA-NODC (Dr. Ken Casey) and the University of Miami Rosenstiel School of Marine and Atmospheric Science (UM/RSMAS) to NOAA's Scientific Data Stewardship program (SDS) is structures to transfer processing of the highly successful NOAA/NASA AVHRR Pathfinder sea surface temperature fields (PFSST) to the NOAA National Oceanographic Data center (NODC), where their long term availability, survivability, and provenance will be ensured. These activities will focus on the transfer of the processing framework including code and quality control procedures, maintenance of the Pathfinder in situ, AVHRR satellite match-up database and extending the currently extensive metadata to encompass the requirements of the SDS program. The Pathfinder SST program was originally initiated as a cooperative research project in 1991 between the UM/RSMAS and the NASA JPL Physical Oceanography Distributed Active Archive Center (PO.DAAC). Beginning in 2002, NODC began partnering with RSMAS to improve the Pathfinder CDR, improve its long-term stewardship, and broaden its usage. The PFSST products have been reprocessed several times over the years, as the scientific understanding of the AVHRR instruments and the algorithms and in situ matchup calibration data improved, and now provide a mature archive record of over two decades of global satellite measurements of sea surface temperature (SST) from multiple generations of AVHRR sensors. Many designated communities including climate-change scientists, weather and hurricane research, ecosystem managers, and shipping and maritime interests currently use the PFSST data set. These users are located at US and international academic institutions as well as a wide range of US federal, international, operational, and commercial agencies. Within the existing Pathfinder program framework, RSMAS has been responsible for production of the SST fields using heritage software developed in the late 1980's, generation of algorithm retrieval coefficients, and providing the basis for SST calibration, validation and sensor characterization via generation and analysis of a collocated satellite in situ matchup database. The global fields are then transferred to NODC for additional metadata and quality control and then on to the PO.DAAC to enhance distribution to the ensemble of user communities. Building on the success and maturity of the PFSST and the importance of this thematic climate record for research and industry, it is time to transition the production and quality control from the academic setting to a more stable and sustainable setting at the NODC. This transition will be accomplished by modernizing the current PFSST processing code into a package that will be compliant with the NODC architecture and easily scalable from large institutional data centers to single users that endeavor to continue to evolve the PFSST CDR in the future. The transition also requires a software and analysis package for the continued quality control and associated matchup database, used for calibration and validation, as well as formal documentation to ensure the provenance of the data set is clearly communicated. Formal documented procedure manuals will be developed so new personnel at NODC can be easily trained in the processing methodology and product quality control. The ability to perpetuate the legacy knowledge of the AVHRR processing is significant given that AVHRR are expected to continue to fly until at least 2010 on US platforms and through 2018 on the European METOP platforms. Thus, the Pathfinder SST data set is well positioned to provide an important transfer function and calibration reference standard between multiple SST sensors (e.g., linking AVHRR, MODIS, and VIIRS on NPP/NPOESS).