Merging satellite and in situ sea surface temperature data using DINEOF

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High quality sea surface temperature data sets are needed for various applications, including numerical weather prediction, ocean forecasting and climate research. The coverage, resolution and precision of individual sea surface temperature observations is not sufficient for these applications, therefore merging of complementary data sets is needed to increase the coverage and to reduce the final data set error. DINEOF (Data Interpolating Empirical Orthogonal Functions) is an EOF-based technique to reconstruct missing information -due to clouds, for example- in satellite data sets. A new development of this method consists in its capability to merge different data sources into one estimate. This development is tested using AVHRR data of the western Mediterranean Sea and in situ data from various international databases (World Ocean Database (WOD), MEDAR/Medatlas, Coriolis Data Center, International Council for the Exploration of the Sea (ICES) and International Comprehensive Ocean-Atmosphere Data Set (ICOADS)). An error assessment between the satellite and in situ data is performed first, in order to determine the error statistics between these two data sources. The error is calculated by database, platform type (CTD, XBT, drifters, bottles and ships) and depth. This error assessment is used to merge the in situ and satellite data. The impact of the sensor-specific errors on the quality of the final product will be assessed, and compared to the results obtained when the same error estimate is used for all sensors. The benefit of using in situ data in addition to satellite data will be also discussed.

Additional information can be found at http://modb.oce.ulg.ac.be/mediawiki/index.php/DINEOF and http://gher-diva.phys.ulg.ac.be/DINEOF/