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SIMBIOS Project 2002 Annual Report

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Chapter 3

SIMBIOS Project Data Processing and Analysis Results

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3.1 INTRODUCTION

The SIMBIOS Project is concerned with ocean color satellite sensor data intercomparison and merger for biological and interdisciplinary studies of the global oceans. Imagery from different ocean color sensors (OCTS, POLDER, SeaWiFS, MOS, OSMI and MODIS) can now be processed by a single software package using the same algorithms, adjusted by different sensor spectral characteristics, and using the same ancillary meteorological and environmental data. This enables cross-comparison and validation of the data derived from satellite sensors and, consequently, creates continuity in ocean color information on both the temporal and spatial scale. The SIMBIOS Project Office accomplishments during 2002 year are summarized under (a) MODIS Terra & Aqua activities (SeaWiFS cross-comparison and data merger), (b) diagnostic data set, (c) SeaBASS database, (d) supporting services, (e) sun photometers and calibration activities and (f) calibration round robins. These accomplishments are described below.

3.2 MODIS ACTIVITIES

3.2.1 Level-3 Data Merger

In coordination with MODIS-Terra Collection 4 reprocessing, the SIMBIOS Project initiated an operational process to collect and merge MODIS daily global chlorophyll products with SeaWiFS daily products. The input files to this process consist of MODIS 4.6-km Level-3 binned chlorophyll from the SeaWiFS-analog OC3M algorithm (chlor_a_2 product) and the standard SeaWiFS 9-km binned chlorophyll from the OC4v4 algorithm (chlor_a product). The merging scheme is a simple weighted averaging using standard SeaWiFS time-binning software, however, several changes to the MODIS data are required to enable a bin-for-bin match-up with SeaWiFS. First, new software (modbin2seabin) was developed to convert the MODIS format to a SeaWiFS-like spacebin format. This process is simply a reorganization of the HDF fields, as the SeaWiFS and MODIS formats use the same, sinusoidal binning approach. This conversion step was limited, however, to MODIS quality zero data. The second step was to reduce the MODIS 4.6-km spacebin file to 9-km resolution, equivalent to standard SeaWiFS Level-3 format, using another new software tool (reduce_bin_resolution). This is effectively a 4-to-1 spatial averaging, weighted by the number of observations within each 4.6-km bin.

With SeaWiFS and MODIS in an equivalent, 9-km binned format, the process proceeds using standard SeaWiFS time-binning software to produce the merged SeaWiFS/MODIS-Terra daily global chlorophyll products. Recently, the provisional MODIS-Aqua data became available and the SIMBIOS Project was able to incorporate the new data stream into the merging process within one day. The Project is now producing a complete set of daily, weekly, and monthly merged chlorophyll products, including various perturbations such as MODIS-Terra with MODIS-Aqua, MODIS-Terra with SeaWiFS, MODIS-Aqua with SeaWiFS, and MODIS-Terra/MODIS-Aqua/SeaWiFS. Merged products have been generated for the entire MODIS mission, and they are available through a browser at: <http://seawifs.gsfc.nasa.gov/cgi/level3.pl?DAY=05Mar2000&PER=&TYP=tmsea>. The merging process is fully automated and operational, with new products generated as soon as the MODIS data becomes available. The merged products can be displayed and manipulated with standard SeaWiFS software tools such as SeaDAS.