

MODIS Processing Framework and Match-up Database (MOD 32)

Product Description

This Level 2 product consists of the calibration data set to be used in the generation of all the MODIS Oceans products. It consists of a database which contains *in situ* observations of ocean parameters matched with satellite measurement data. This match-up database will initially be populated with existing ocean-surface data matched temporally and spatially with CZCS and AVHRR data and with SeaWiFS data as they are obtained and then MODIS data post-launch. The product includes the definition of the processing framework in which all the MODIS ocean-product algorithms will operate. It is produced daily and supports ocean products at 1 km, but the product itself does not have a spatial resolution.

Research and Applications

This is a calibration product for MODIS ocean processing. It is used through a vicarious calibration scheme to update MODIS radiometric calibration coefficients, which directly relate MODIS Level 1A raw counts to Level 2 calibrated water-leaving radiances, and to monitor long-term performance of the MODIS instrument. MOD 32, as a match-up database, is also used to validate derived ocean geophysical parameters such as SST and for quality control of the ocean-team retrievals.

Data Set Evolution

Heritage programs provide the basis for MODIS algorithms. A program developed for the Pathfinder ocean SST product forms the framework for analyzing AVHRR-derived SST, algorithm development and validation, and application of the match-up database. Development for ocean-color algorithms is based on experience gained in the transition from CZCS to SeaWiFS algorithms. Development of the SeaWiFS program involves integration of algorithms generated by H. Gordon (atmospheric correction) and K. Carder (chlorophyll). In addition, daily validity tests are being developed through collaboration of the SeaWiFS cal/val team and our group. The *in situ* records are first temporally matched against the AVHRR extrac-

tions. AVHRR data for the match-up database were extracted for 3×3 pixel boxes centered at each *in situ* sea-surface-temperature-measurement location. Sea-surface observations are from two main types of platforms: moored buoys and drifting buoys. After the SeaWiFS and Pathfinder programs are validated using actual sensor data, they will be converted from a scalar to a parallel implementation and coded using the FORTRAN 90 language and EOS coding standards. Code for the MODIS algorithms initially will be based on SeaWiFS and Pathfinder programs. These implementations will evolve to support product production for the MODIS ocean investigators and will be coded using a combination of the C and FORTRAN 90 programming languages and EOS coding standards.

Suggested Reading

- Evans, R.H., and H.R. Gordon, 1994.
- Gordon, H.R., 1987.
- Gordon, H.R., and A.Y. Morel, 1983.
- Slater, P.N. *et al.*, 1987.
- Smith, R.C., and W.H. Wilson, 1981.

MODIS Processing Framework and Match-up Database Summary

Coverage: Global ocean surface

Spatial/Temporal Characteristics: 1 km/daily

Key Science Applications: Ocean chlorophyll, ocean productivity, all ocean products

Key Geophysical Parameters: Match-up databases, water-leaving radiances, *in situ* measurements

Processing Level: 2

Product Type: Standard, at-launch

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