

(MODIS Thermal Anomalies, continued)

toring data sets. The combination of Terra and Aqua data will provide four observations per day, giving a good sampling of the diurnal cycle of fire activity. MODIS will also offer unique spatial and radiometric capabilities for burn-scar detection. Automatic procedures for burn-scar detection will be developed to provide a standard burn-scar product.

Suggested Reading

Andreae, M.O. *et al.*, 1994.

Justice C.O. *et al.*, 1993.

Justice C.O. *et al.*, 1998.

Kaufman, Y.J. *et al.*, 1990.

Kaufman, Y.J. *et al.*, 1998a.

Levine, J.S., 1991.

Penner, J.E. *et al.*, 1992.

MODIS Thermal Anomalies – Fires and Burn Scars Summary

Coverage: Global, daytime/nighttime

Spatial/Temporal Characteristics: 1 km, 10 km, and 0.5°/1-day (MOD 14 only), 8-day, 16-day (MOD 40 only), monthly

Key Geophysical Parameters: Fire occurrence and class, fire selection criteria, fire location, smoldering and flaming ratio, burned area

Processing Level: 2, 3 for MOD 14; 4 for MOD 40

Product Type: Standard, at-launch and post-launch

Maximum File Size: 81 MB (MOD 14), 92 MB (MOD 40)

File Frequency: 1/day (Daily, MOD 14 only), 1/8-day (8-day), 1/16-day (16-day, MOD 40 only), 1/month (Monthly)

Primary Data Format: HDF-EOS

Additional Product Information:
<http://modis-land.gsfc.nasa.gov/products/products.asp?ProdFamID=1>

DAAC: EROS Data Center

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MODIS Sea Surface Temperature (SST) (MOD 28)

Product Description

This Level 2 and 3 product provides sea surface temperature at 1-km (Level 2) and 4.6 km, 36 km, and 1° (Level 3) resolutions over the global oceans. In addition, a quality-assessment parameter is included for each pixel. The Level 2 product is produced daily and consists of global day and night coverage every 24 hours. It is used to generate the gridded Level 3 products daily, 8-day weekly, monthly, and yearly for day and night conditions. A quality parameter is provided for each data set.

Research and Applications

The global distribution and variability of sea surface temperature are key inputs to Earth energy and hydrological balance studies and long-term climate-change studies. In addition, sea surface temperature is required by a number of MODIS algorithms including those for precipitable water, lifted index, water-leaving radiance, productivity, oceanic aerosol properties, and temperature and water-vapor profiles. MODIS sea surface temperature retrievals will be incorporated into a match-up database with radiance and buoy sea surface temperature observations (see MOD 32).

Data Set Evolution

Sea surface temperature determination is based on MODIS-calibrated mid- and far-IR radiances (Bands 20, 22, 23, 31, and 32 from MOD 02), using an algorithm that exploits the differences in atmospheric transmissivity in the different IR bands to enable highly accurate estimation of the atmospheric effects, thereby enabling ancillary input to the algorithm along with a land mask, which is used to mark non-water pixels while an ice-extent mask limits polar sea coverage. A sequence of spatial and temporal homogeneity tests is applied to validate the quality of the cloud-free observations. The AIRS SST estimate will be used as a near-real-time quality assessment of skin temperature. Visible and near-IR radiances (Bands 3, 4, 5, 6) will be used as a secondary cloud flag in the event that the cloud-screening product is not available.

Suggested Reading

- Abbott, M.R., and D.B. Chelton, 1991.
Barton, I.J. *et al.*, 1989.
Brown, O.B., and R.E. Cheney, 1983.
Deschamps, P., and T. Phulpin, 1980.
Edwards, T. *et al.*, 1990.
Llewellyn-Jones, D.T. *et al.*, 1984.
McClain, E.P. *et al.*, 1985.
Minnett, P.J., 1991.
Minnett, P.J., 1995.
Schluessel, P. *et al.*, 1990.
Smith, A.H. *et al.*, 1994.
Smith, W.L. *et al.*, 1996.
Strong, A.E., and E.P. McClain, 1984.

MODIS Sea Surface Temperature Summary

Coverage: Global ocean surface, clear-sky only

Spatial/Temporal Characteristics: 1 km/daily (Level 2); 4.6 km, 36 km, 1°/daily, 8-day, monthly, yearly (Level 3)

Key Science Applications: Energy and hydrological balance, climate-change models

Key Geophysical Parameters: Sea surface temperature

Processing Level: 2, 3

Product Type: Standard, at-launch

Maximum File Size: 33 MB (Level 2); 640 MB binned, 134 MB mapped (Level 3)

File Frequency: 288/day (Daily Level 2), 4/day (Daily Level 3), 4/8-day (8-day Level 3), 4/month (Monthly Level 3), 4/year (Yearly Level 3)

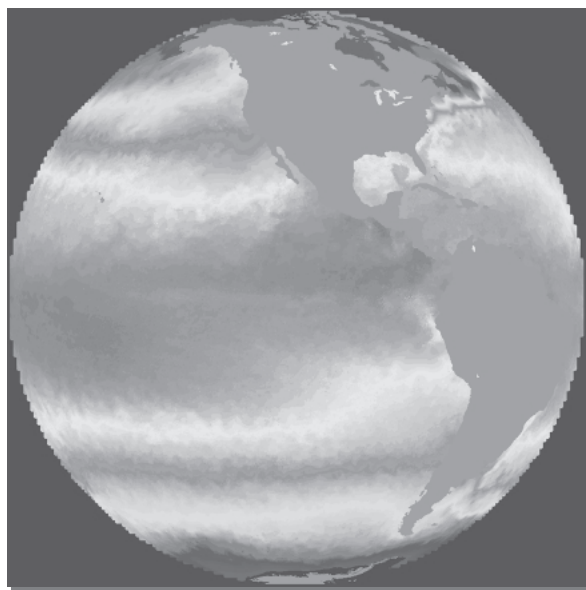
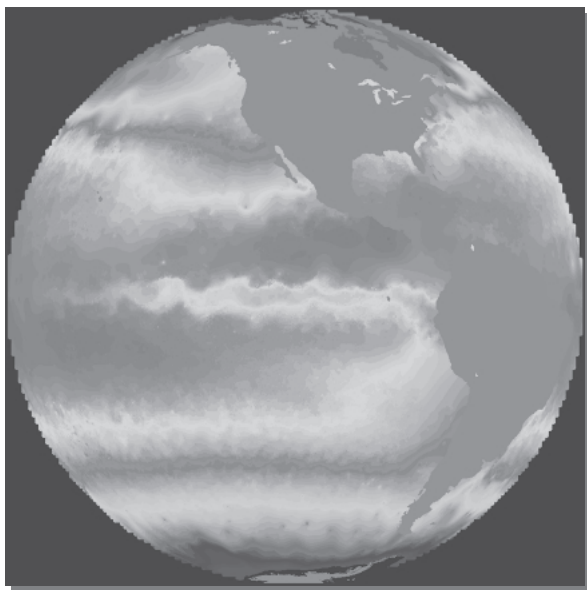
Primary Data Format: HDF-EOS

Browse Available: 36 km sample imagery available at the Goddard DAAC (Level 3 only)

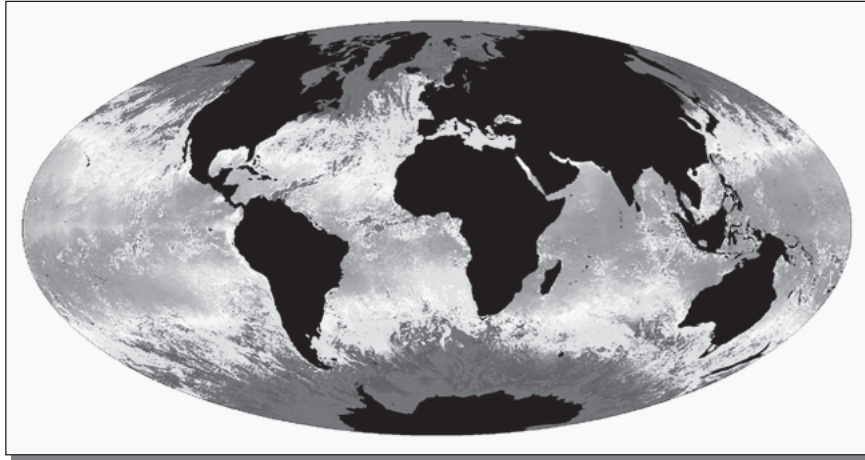
Additional Product Information:
<http://modis-ocean.gsfc.nasa.gov/dataproduct.html>

DAAC: NASA Goddard Space Flight Center

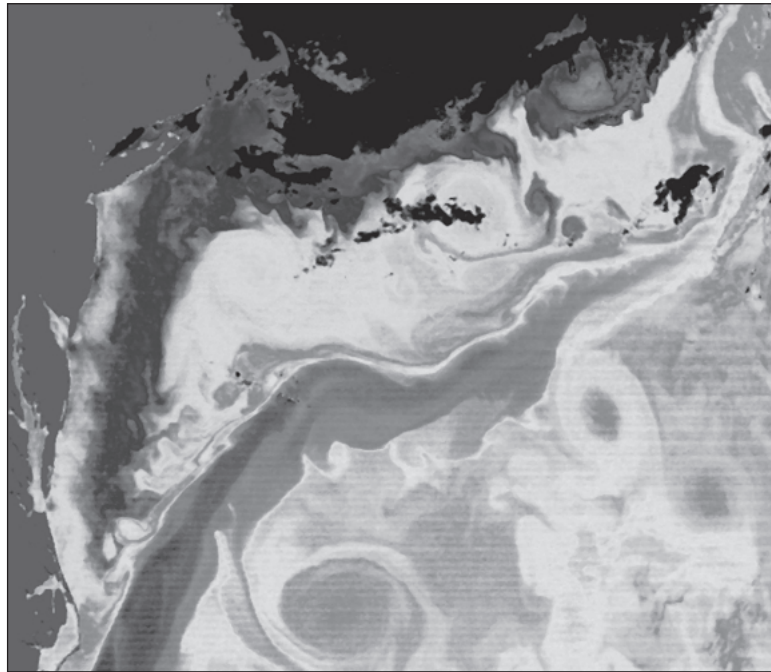
Science Team Contact:
O. Brown



Changes in Pacific Sea Surface Temperature (SST) due to El Niño. SST from the NOAA AVHRR, showing patterns before (left) and during (right) the major 1992 El Niño. The improved accuracy of IR SST products expected from MODIS will enable investigation of the relatively small changes in SST hypothesized to be responsible for triggering El Niño cycles in the Pacific and their ramifications globally. (Note: temperatures range from 20° to 30°C.) (From Brown, O., and G. Feldman, "Reports to the Nation: El Niño and Climate Prediction," Spring 1994, No. 3, University Corporation for Atmospheric Research, Boulder, CO.)



An Example of an 8-day Global Sea Surface Temperature Map generated using data acquired in March 2000 from the MODIS instrument on Terra.



Sea Surface Temperature off the East Coast of North America, May 8, 2000, derived from data of the MODIS instrument on Terra. This is a Level 2, 1-km resolution product and shows entrainment of Gulf Stream, shelf, and Sargasso Sea waters into cold and warm core rings.