Summary of MODIS Ocean Product Status

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http://modis-ocean.gsfc.nasa.gov

1990'S EXPECTATIONS FOR MODIS OCEAN

Produce baseline set of ocean products, with science quality equivalent to, or better than heritage data.

Exceed in accuracy, coverage, variety

Develop independent validation/calibration of observables.

M-AERI and others - in-situ SST uncertainty <0.1K

MOBY time series - in-situ nLw uncertainty <3%

These are the SOA for the international community.

Develop New Ocean Science Capabilities.

Chlorophyll Fluorescence, ONPP, IOP's.

4 mm split window SST

Both SST and Ocean Color depend upon highly precise radiances due to sensitivity of the atmospheric correction.

This requires accounting for radiometric biases (trends) in a retrospective fashion due to instrument configuration and algorithm development changes.

MODIS instrument changes precluded declaring time-series “valid” in a forward sense.

Demands viable reprocessing - would like >10x on occasion.

MODIS Ocean Last Year - Present

SST

1/01 Struggling to make RT approach give acceptable results.
Unable to provide a “validated” date.

April PI decision to fall back to regressive approach.
Began production in July (Complete year)

1/02 Performance exceeds April expectations
ready to declare 11-12 micron SST as “Valid”

Visible

1/01 Instrument effects normalized for a few periods-
results showed tremedous detail, but were time dependent.

April - Decision to splice normalization tables for Complete Year
Expected “valid” status at end of Complete Year (now).

Sept/Oct- Time trends in ocean radiances, need to reprocess identified.

1/02 Reprocessing beginning in spring ‘02 is expected to
produce “valid” data time series for the full mission.

SST

Validation is continuing, and results look excellent:

rms difference ~0.21- 0.26 K for M-AERI vs MODIS 11-12 μm

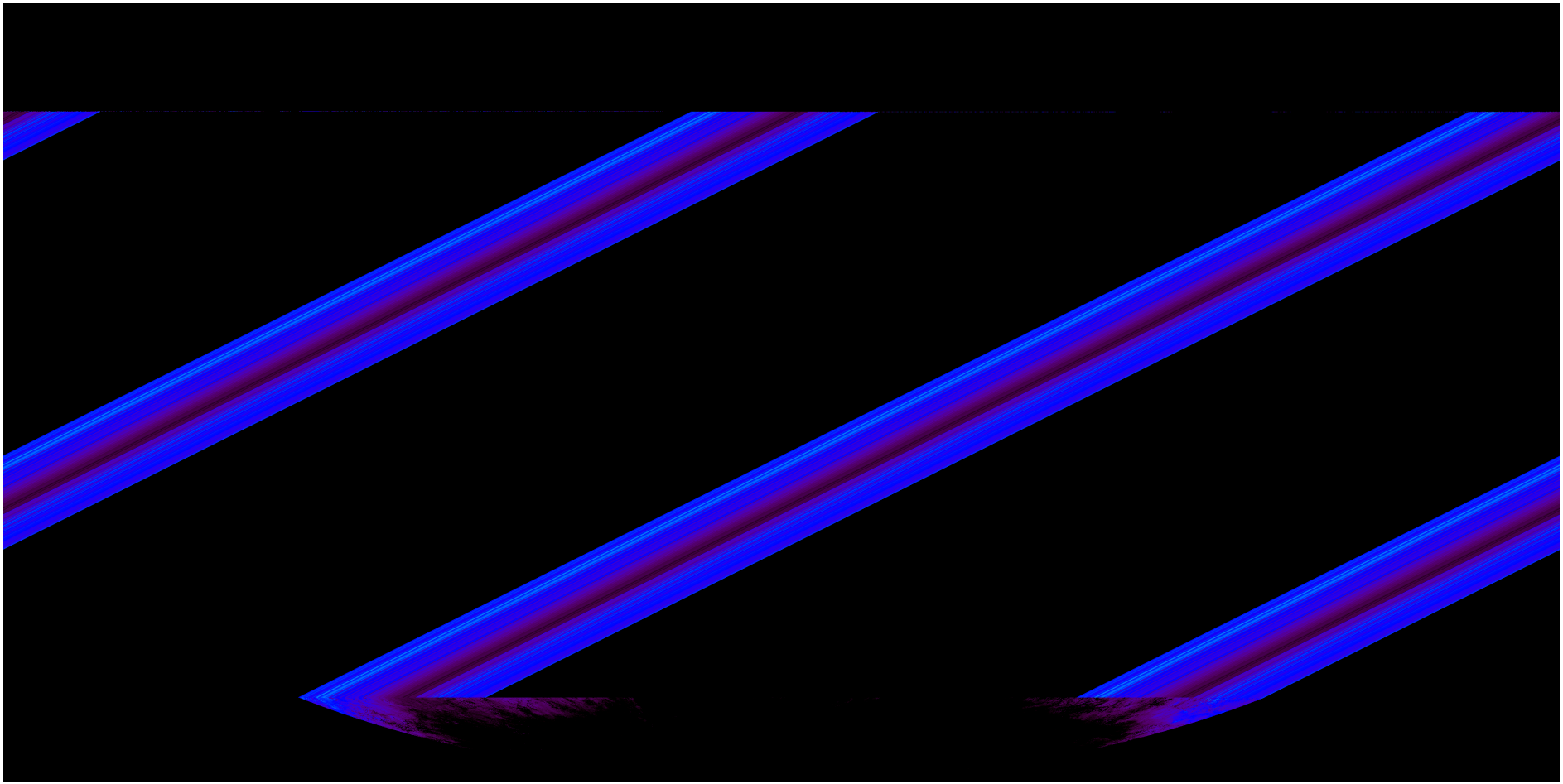
11-12 μm - Version 3.3 products should be declared valid upon examination of complete year ie February 02.

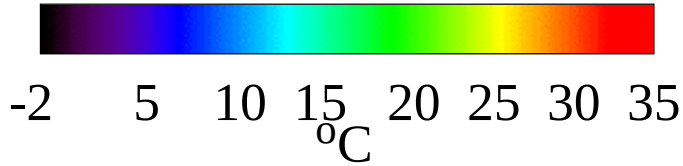
4 μm - Version 3.3 shows some temporal anomalies which are under examination.

0.15 K bias in 11-12 μm SST and temporal bias in 4 μm SST are expected to be removed in the spring/summer reprocessing.

This places MODIS SST within the range of CLIVAR goals!

MODIS TERRA NIGHTTIME 11 μm SST





MAY 2001
V 3.3.1

MODIS Ocean

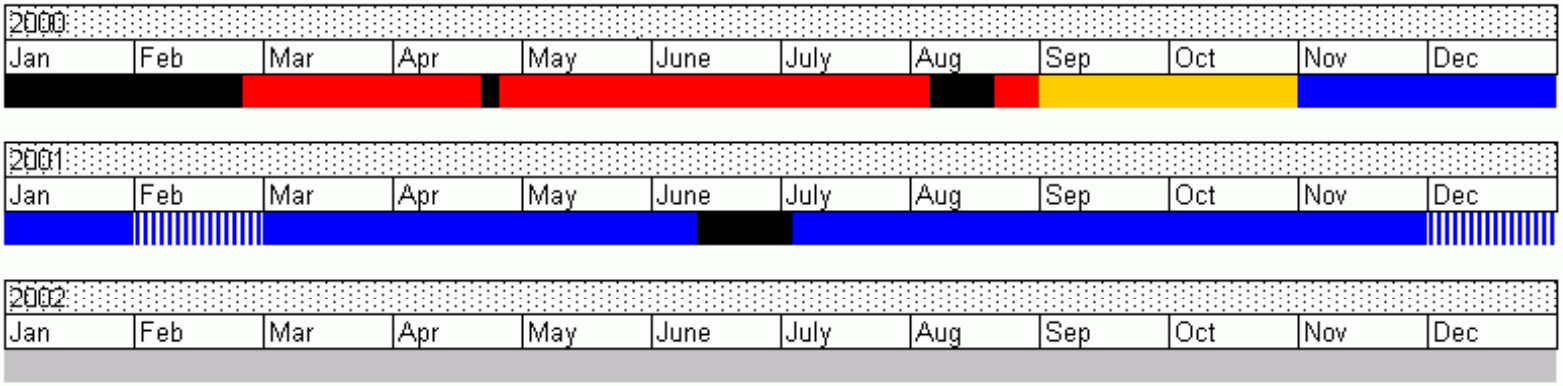
Home Data Products Quality Assurance Validation Data Processing References Links

Processing Status

Last updated: 1/4/2002

Data Maturity

Click on a portion of the timeline to view details and **known problems** about that period:



Data Maturity/Processing Status:

- = Pre-release data, not available to public
- = **Beta** data
- = **Provisional** data
- = **Provisional** data, currently being processed
- = Data to be collected
- = No data collected

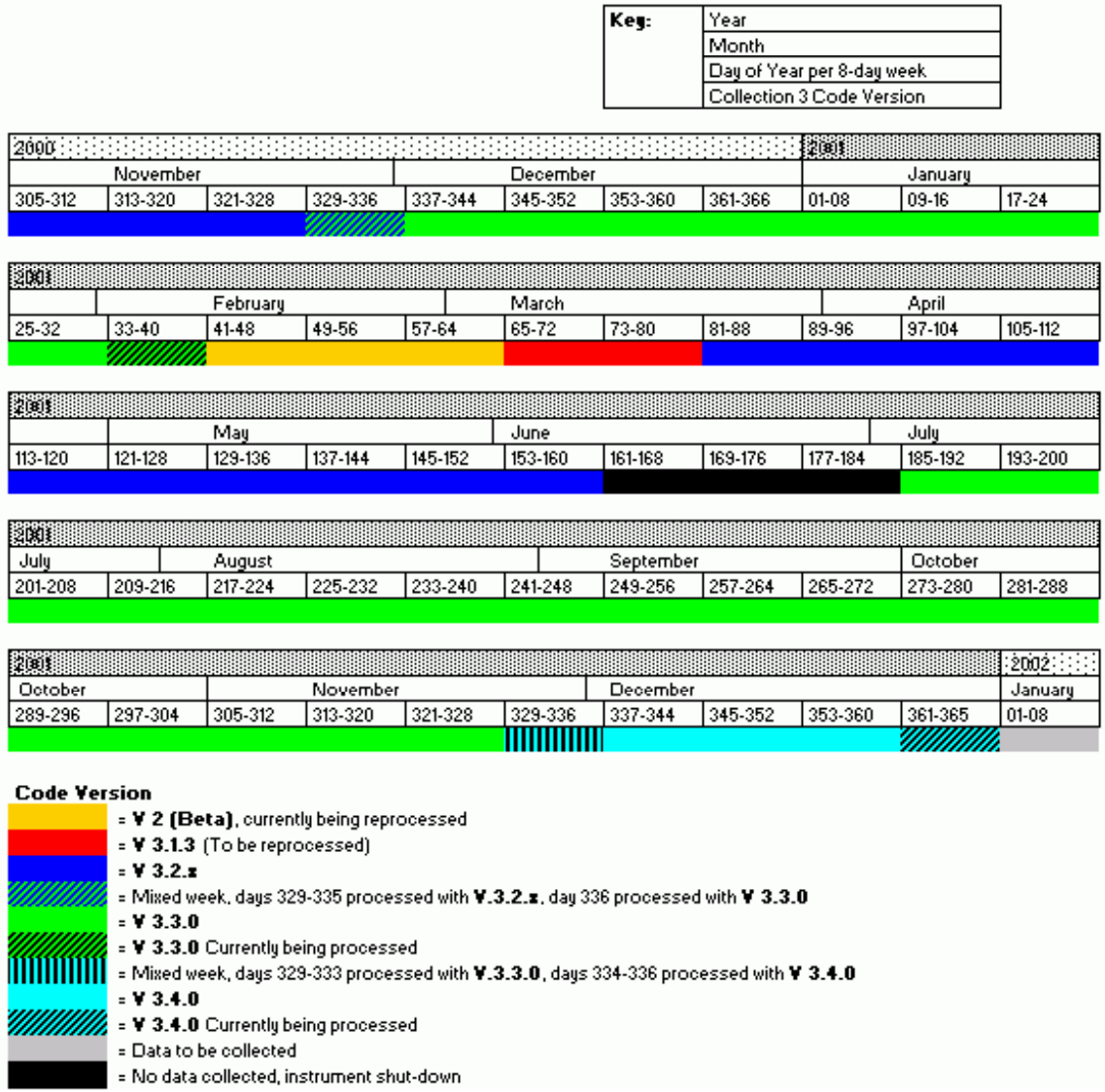
Data Maturity Definitions

Esaias, Vogel

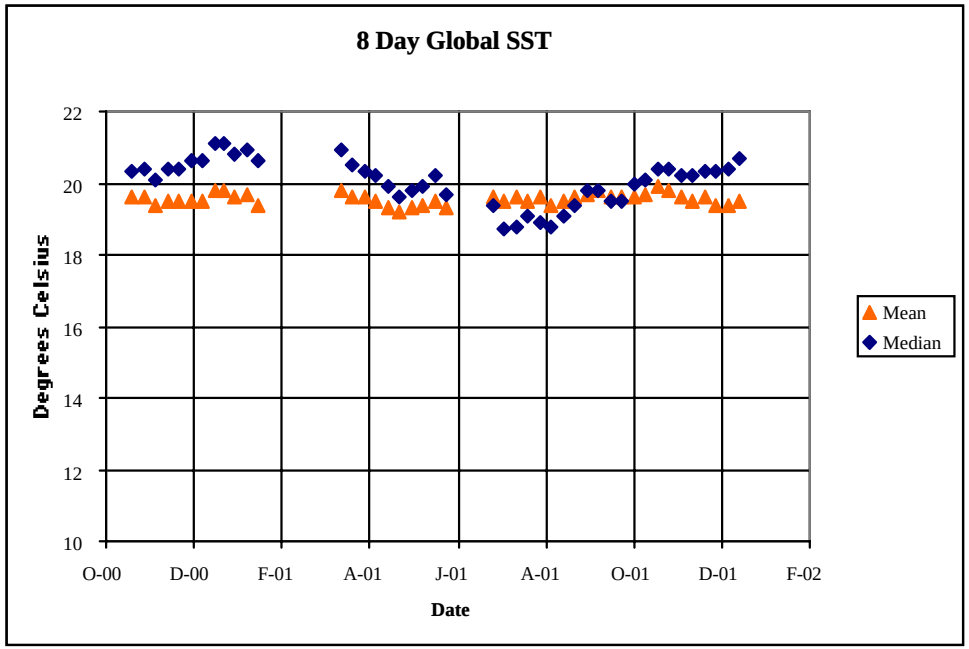
Collection 3 Provisional Products

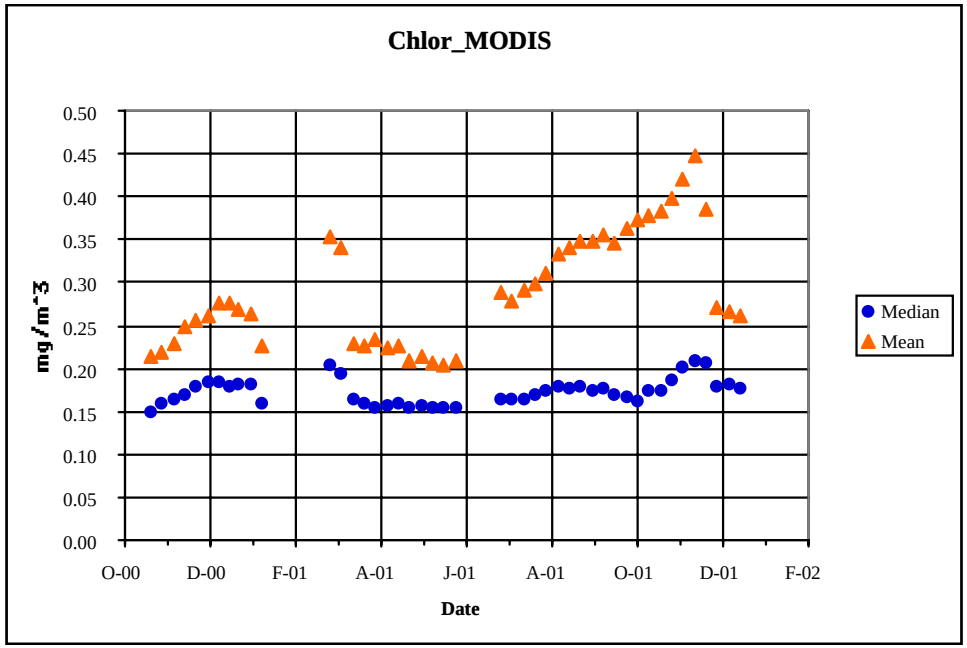
Last updated: 1/4/2002

Code Version Changes

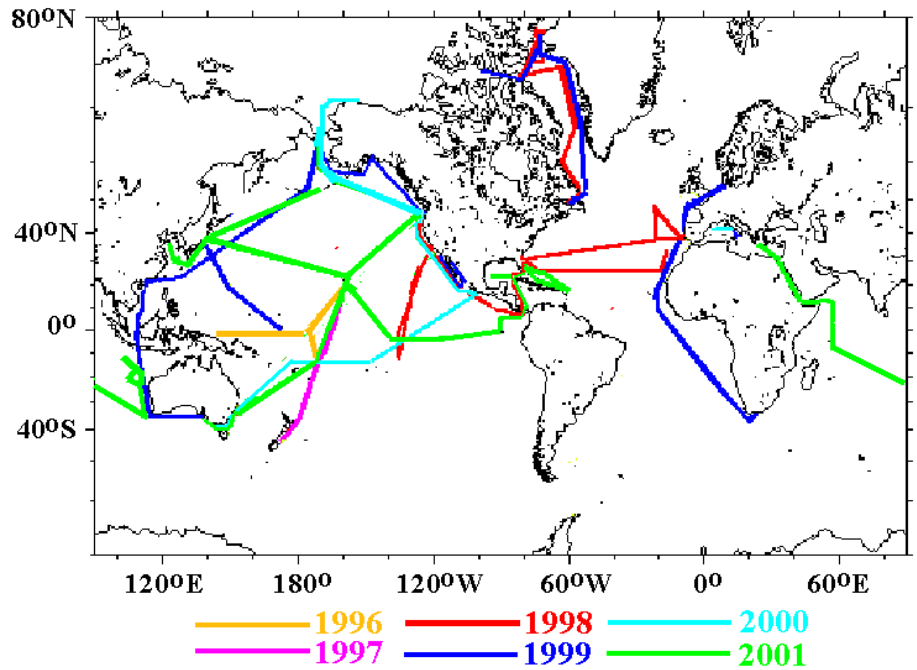


Esaias, Vogel


8 Day Global SST
Degrees Celsius
22
20
18
16
14
12
10
O-00
D-00
F-01
A-01
J-01
A-01
O-01
D-01
F-02
Date
Mean
Median

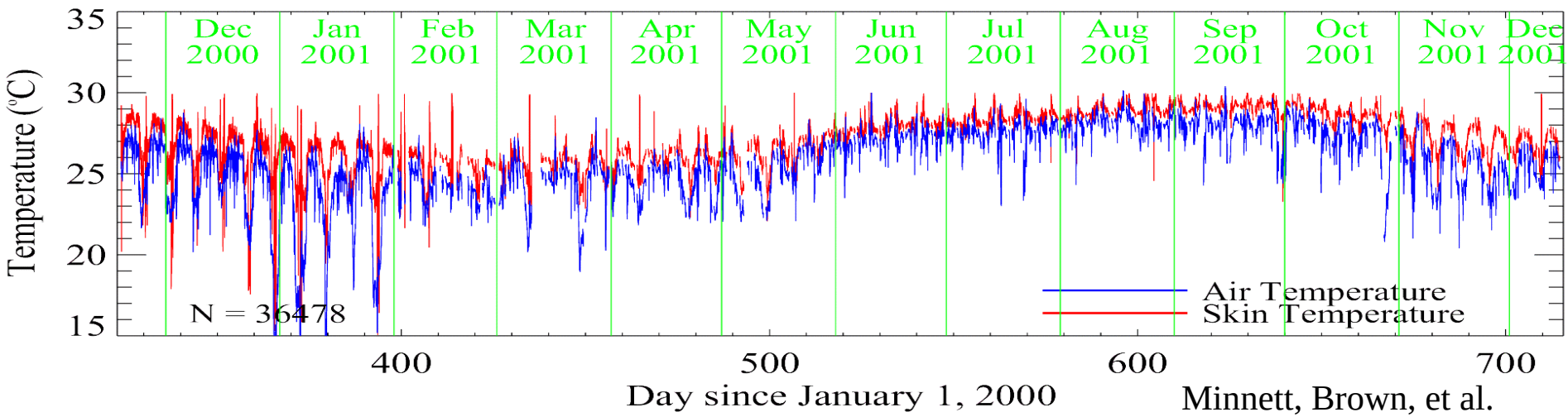

Chlor_MODIS
mg/m^3
0.50
0.45
0.40
0.35
0.30
0.25
0.20
0.15
0.10
0.05
0.00
O-00
D-00
F-01
A-01
J-01
A-01
O-01
D-01
F-02
Date
Median
Mean

Top: M-AERI Cruises



Bottom: M-AERI data

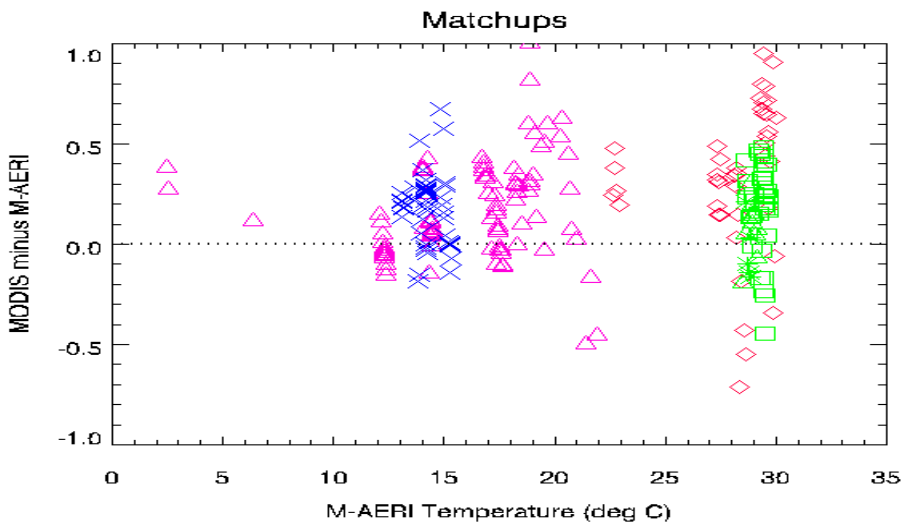
Explorer of the Seas

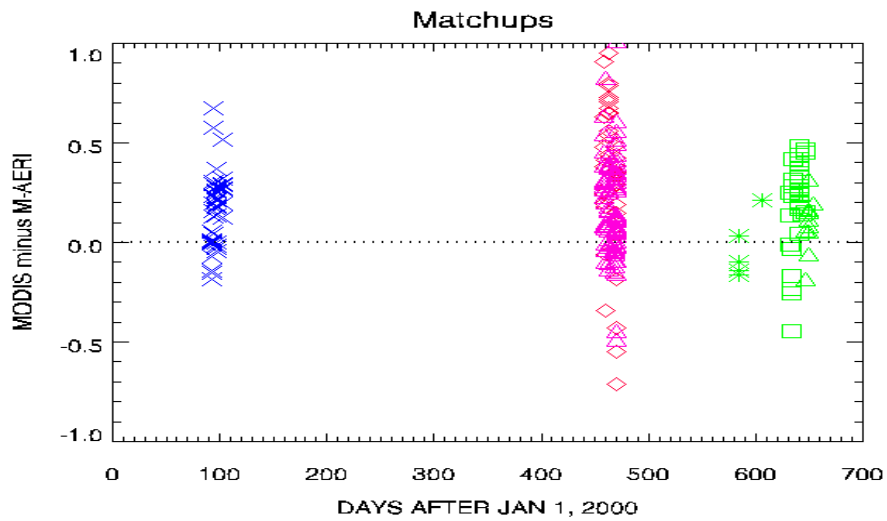


Minnett, Brown, et al.

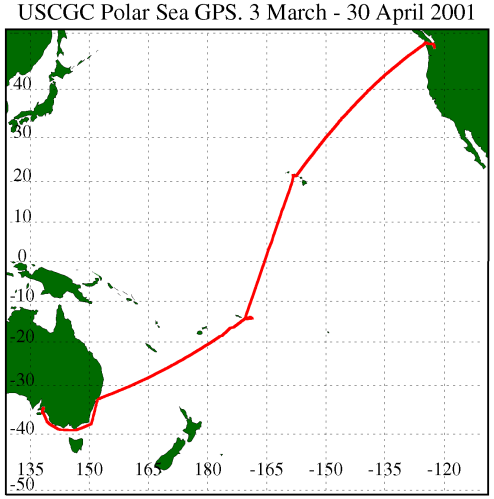
MODIS-M-AERI Matchups

Blue = Mediterranean – April 2000; Red =Pacific – March, April 2001;
Pink = Pacific – March, April 2001; Green = Atlantic - Explorer of the Seas.





USCGC Polar Sea GPS. 3 March - 30 April 2001



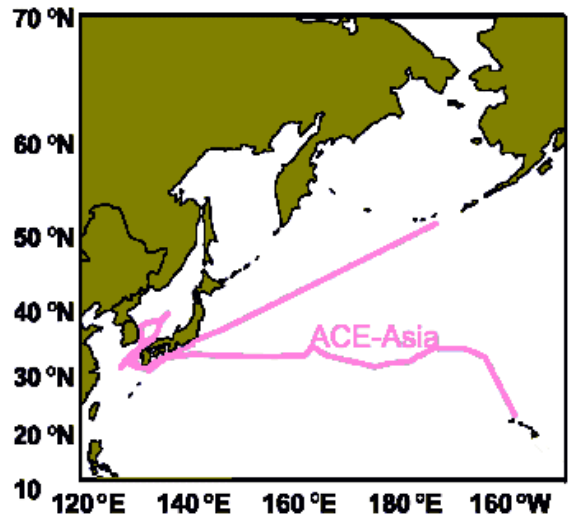
15-Jan-02

All data

M = 0.20K
std= 0.26K
N = 242

Explorer of the Seas

M = 0.15K
std= 0.21K
N = 50



Are MODIS SSTs Validated?

- VALIDATED PRODUCTS: science quality with well defined uncertainties; improvements ~~may still be~~ are ongoing.
- These are high quality products suitable for longer term or systematic scientific studies and publication. There ~~may~~ will be later improved versions.
- Within the limits of current analyses, (temporal and regional) ….. **YES**.

Minnett, Brown et al.