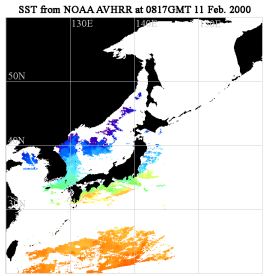
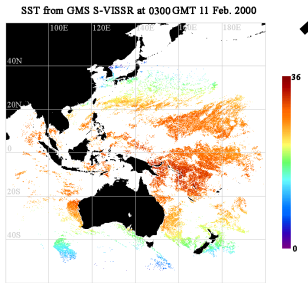
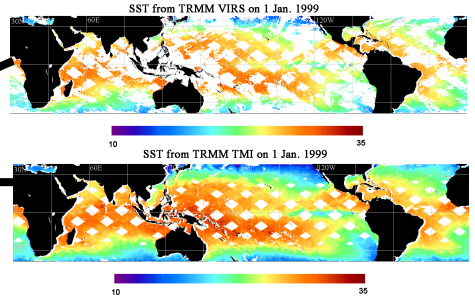
The present status of GLI SST validation and algorithm tuning

Hiroshi Kawamura



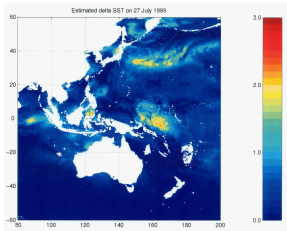


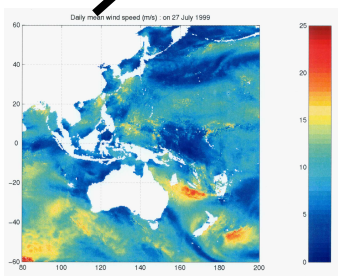


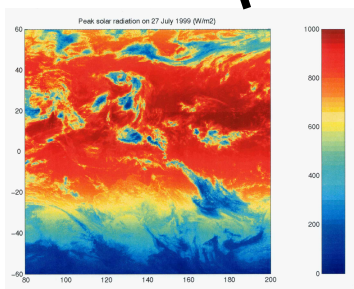
Original SST
AVHRR, VISSR,
VIRS, TMI

Diurnal Variation Correction

Solar Radiation
VISSR
Wind Speed
QSCAR, TMI, SSMI







Daily Min. SST
AVHRR, VISSR,
VIRS, TMI

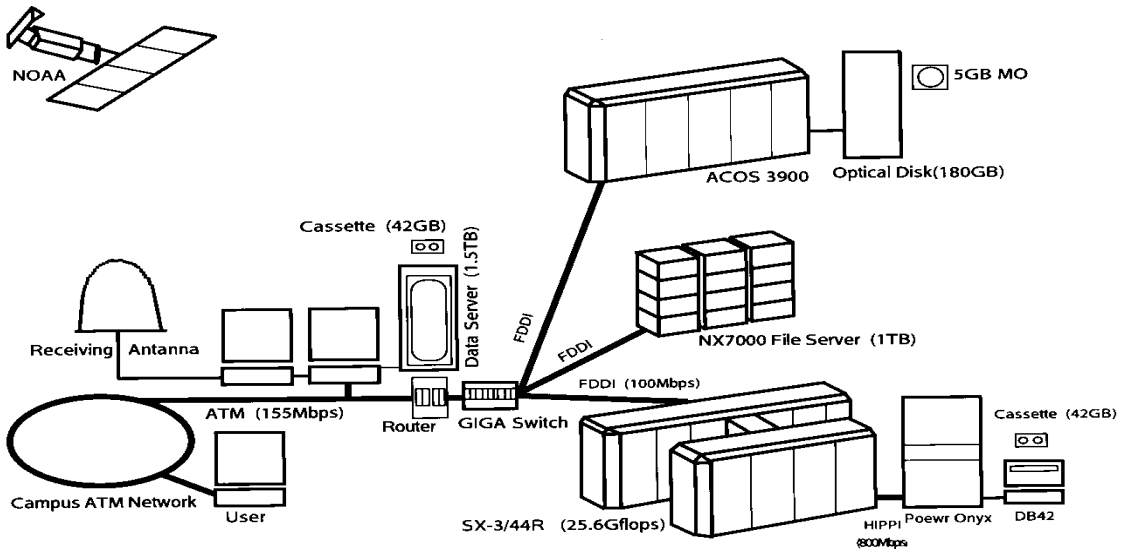
Objective Analysis

Merged SST

SST Merging Strategy

Super computing of AVHRR data

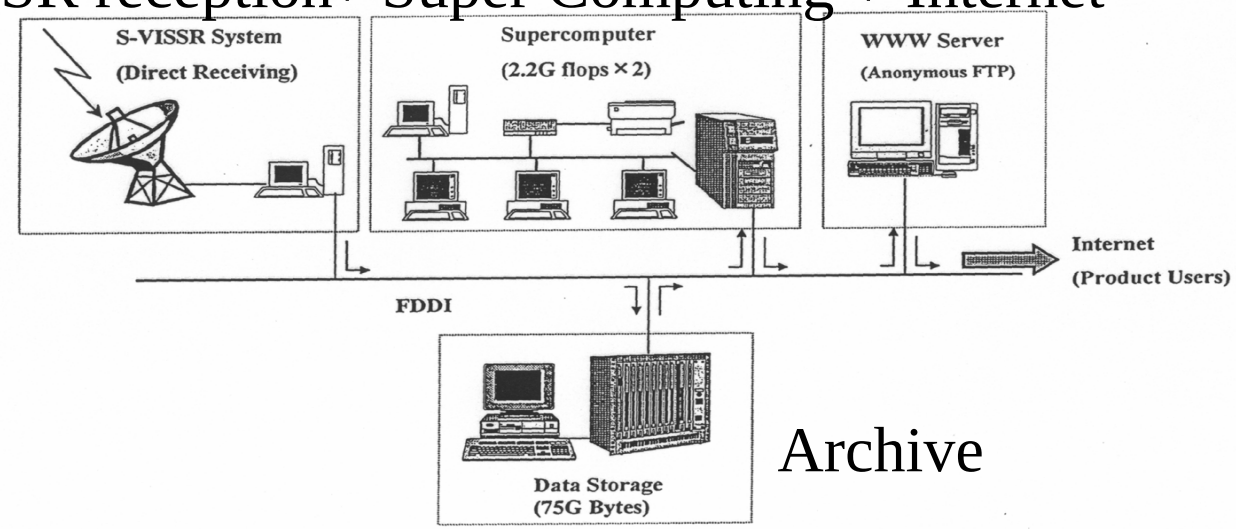
- **Computer Center of the Tohoku University**
- **SX-4 Super Computer**
- **Ver.1.0 15minutes/scene (1997)**
- **Ver.2.0 5minutes/Scene (1999)**
- **Ver.3.0 2minites/Scene(2000)**



GMS Receiving Station (2001 April)

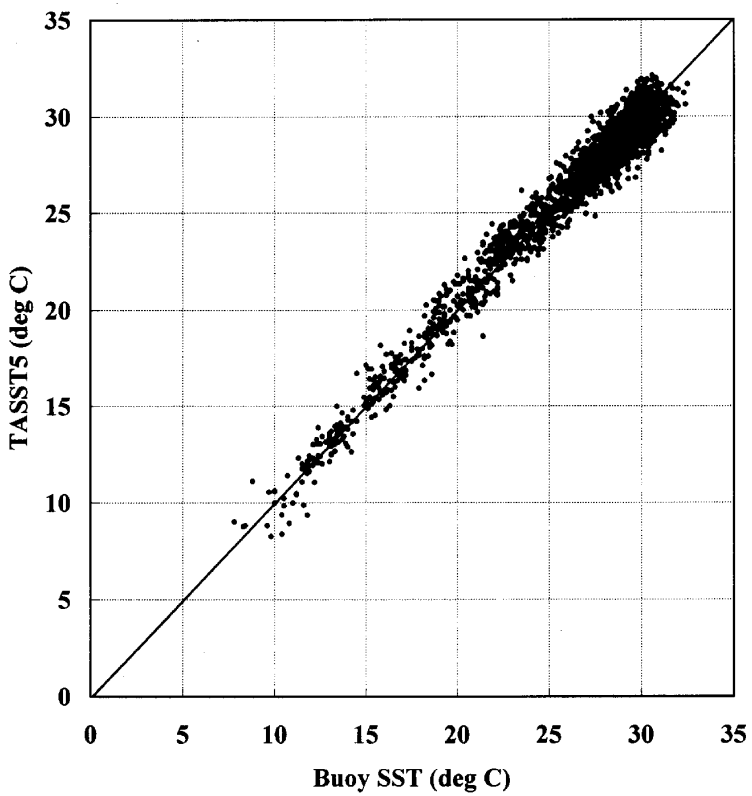
Real time generation of the satellite products and their delivery to user community (agriculture, environment,…

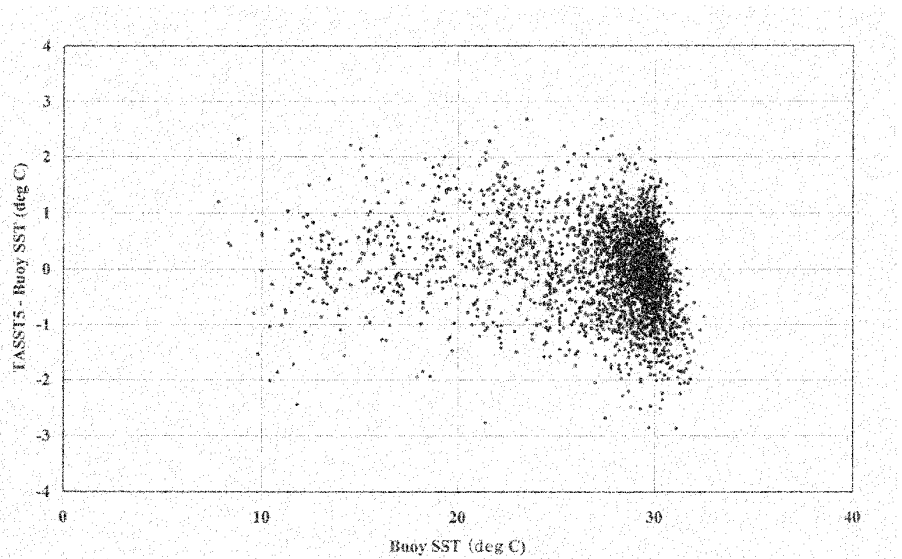
VISSR reception+ Super Computing + Internet



Archive

SST Estimate for Dish Coverage(6)
/TASST5 rmse=0.805K





Solar Radiation Estimate (2)
/Validation of VISSR solar radiation

Validation of Hourly Estimate
rmse=17.05%

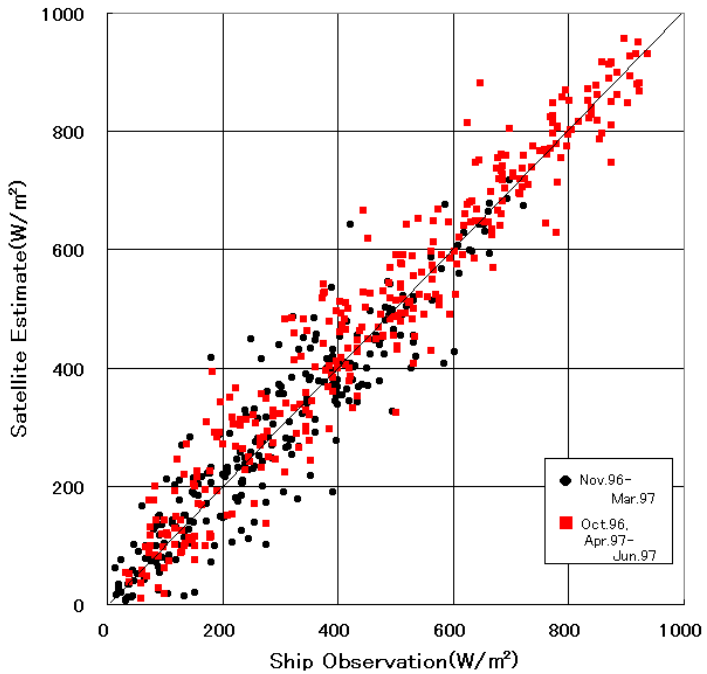


Fig.2 (a) Hourly Solar Radiation Estimate(α=1.3, β=0.1)

Validation of Daily Estimate
rmse=8.13%

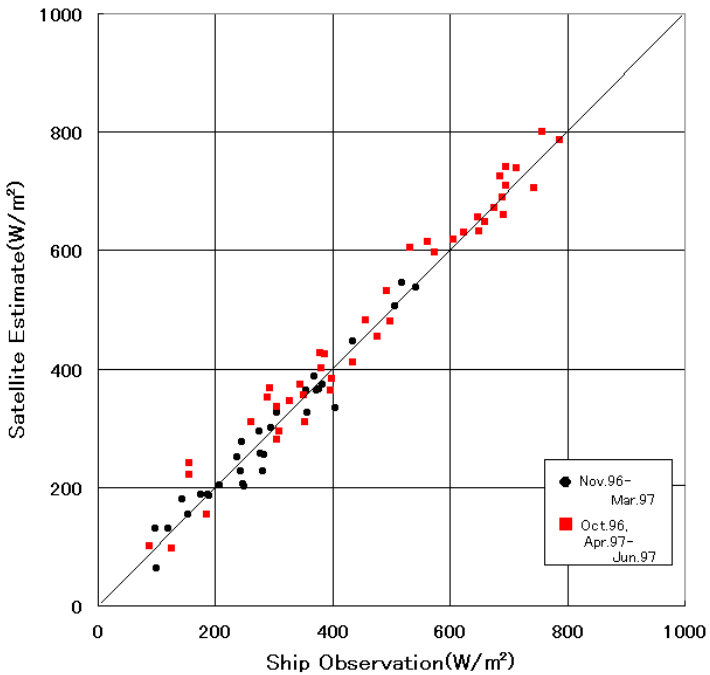
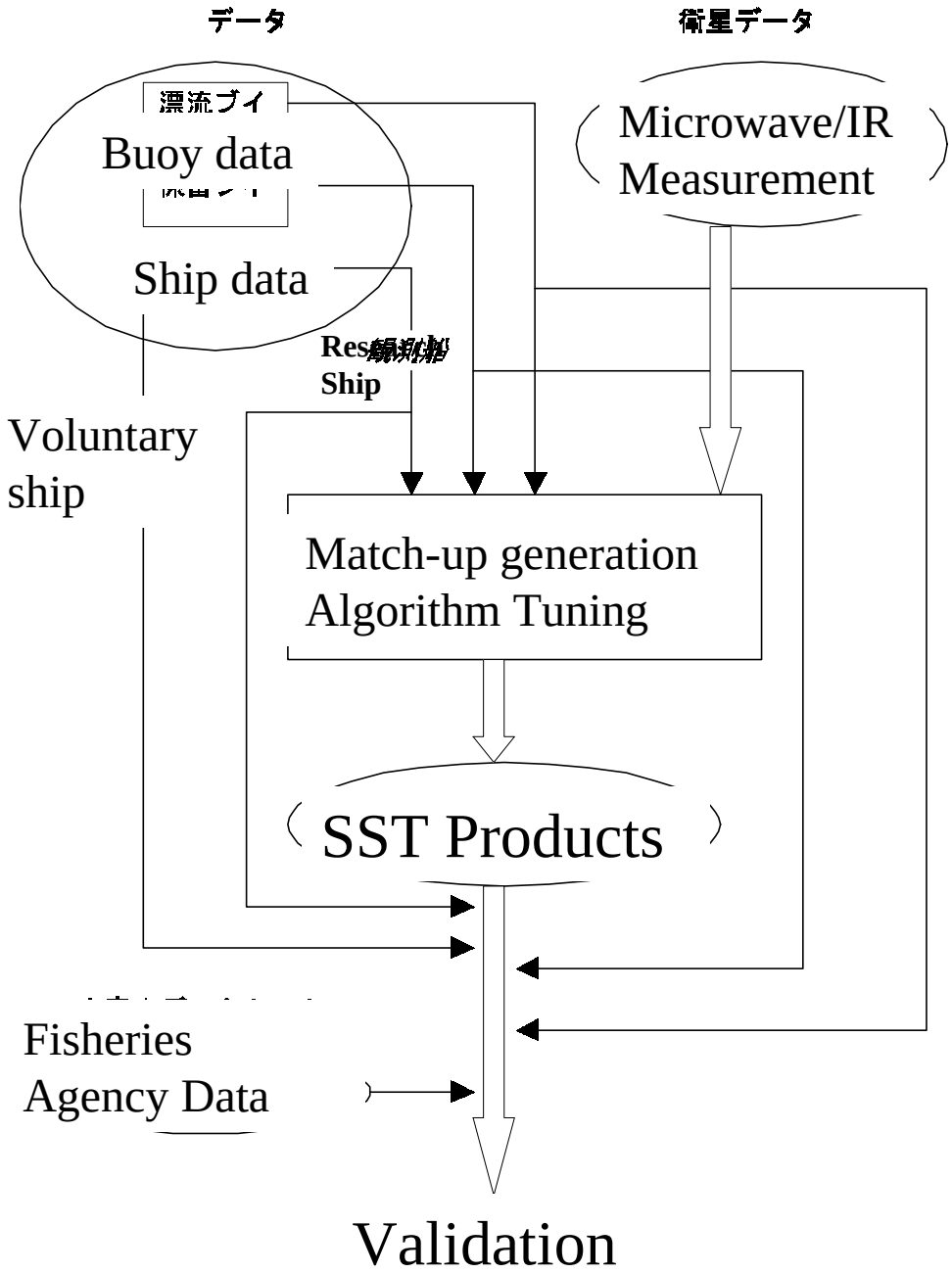


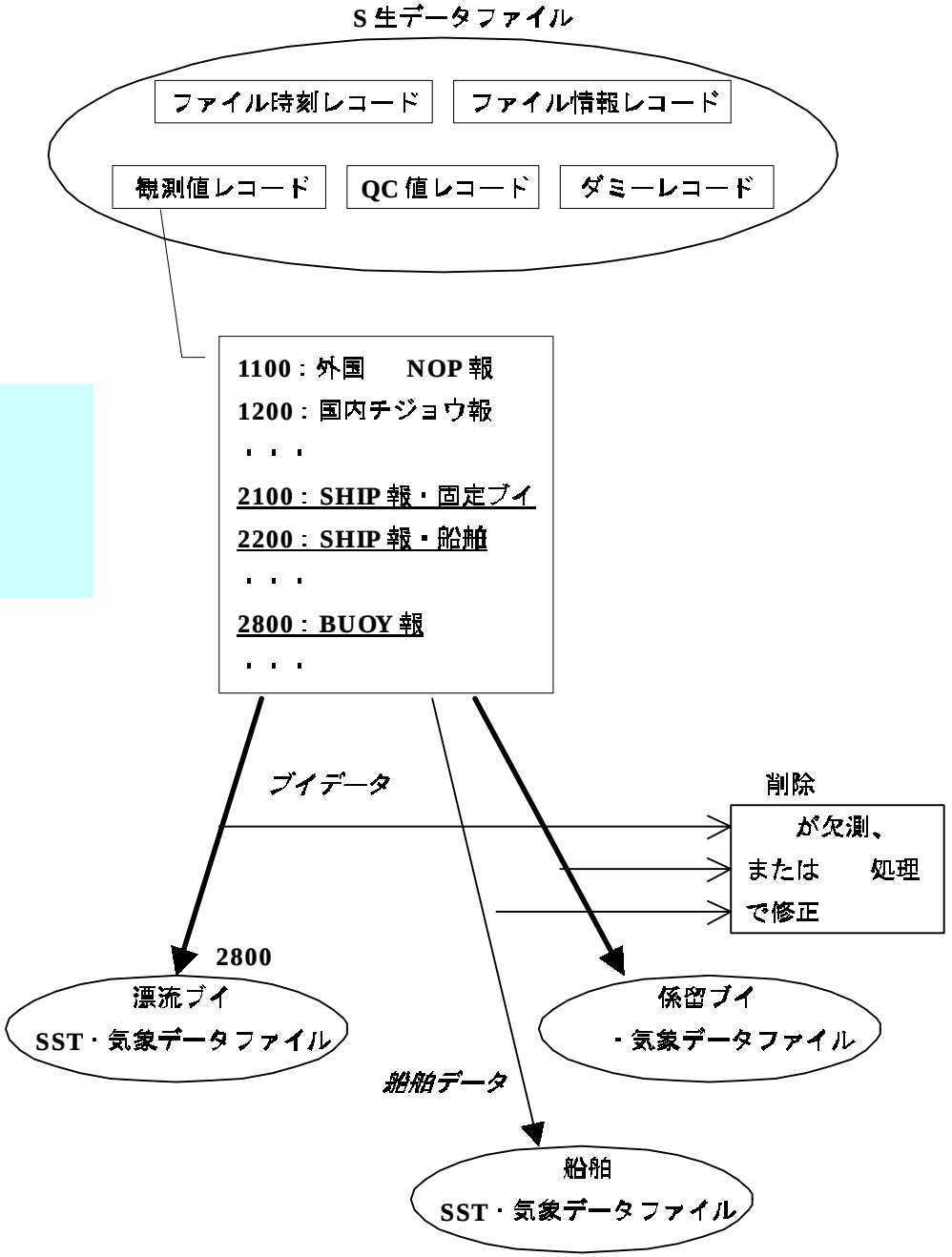
Fig.2 (b) Daily Mean Solar Radiation Estimate(α=1.3, β=0.1)

Tohoku Univ.

SST Validation System



GTS data and Buoy data flow

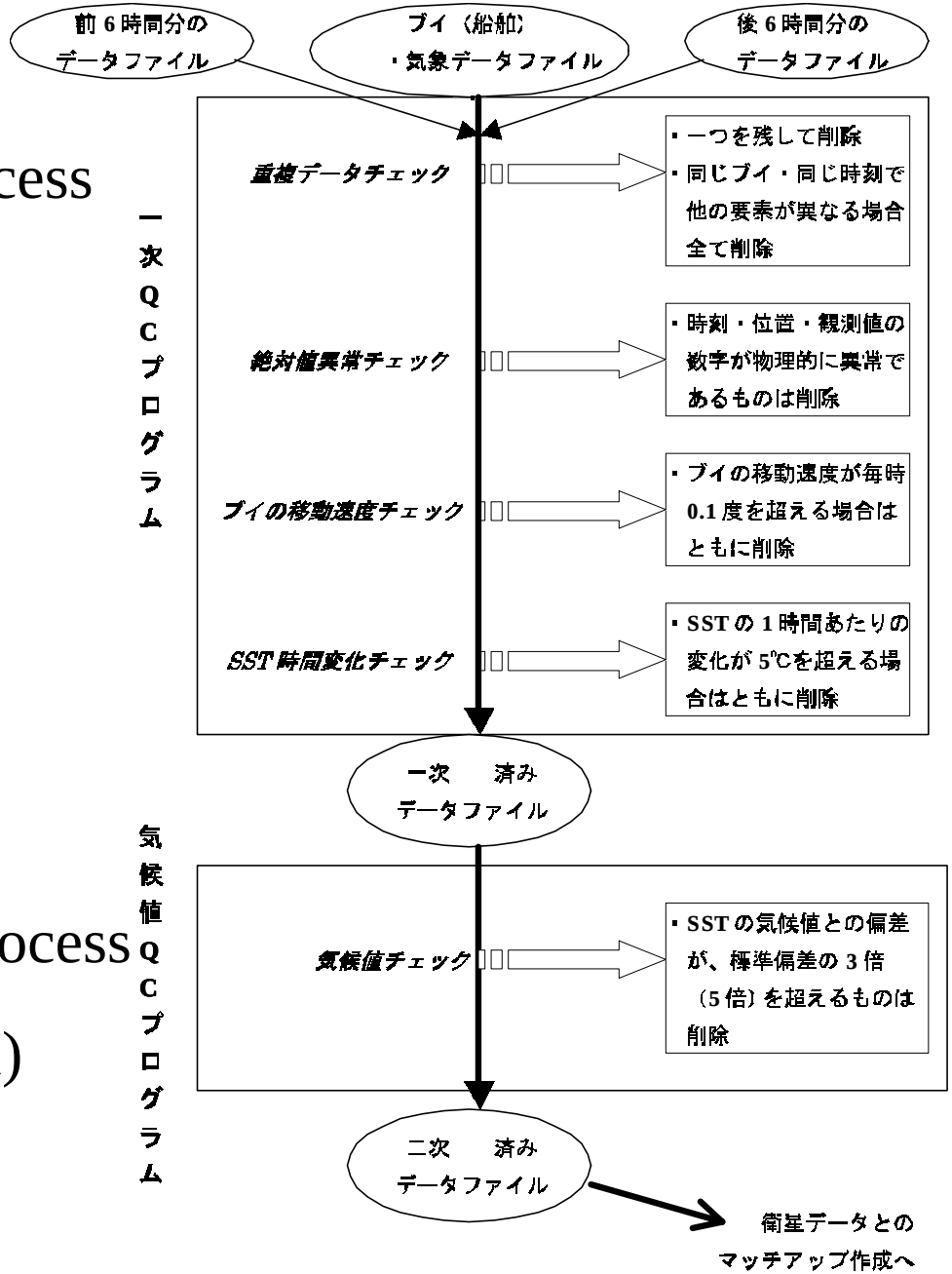


Quality Control Flow of Buoy and Ship SSTs

First QC Process

Second QC Process

(Climatrogical)



Evaluation of the SST Validation/Algorithm Tuning - VIRS High Resolution SST

Present NASDA Global Products (0.25degree spatial Res.)

New Global Product (0.02degree Spatial Res.)

Dec 2000 Transfer the Murakami Code to T.U.

Jan-Feb. 2001 Transfer the VIRS data from EOC to T.U.

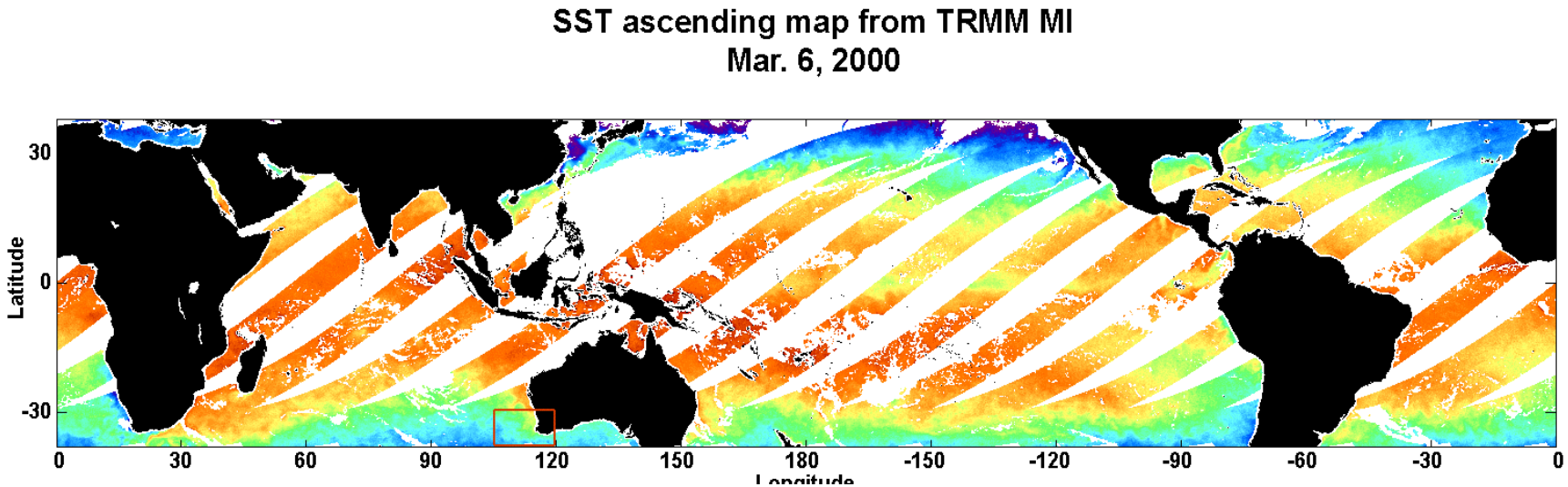
Feb. 2001 New Algorithm Development

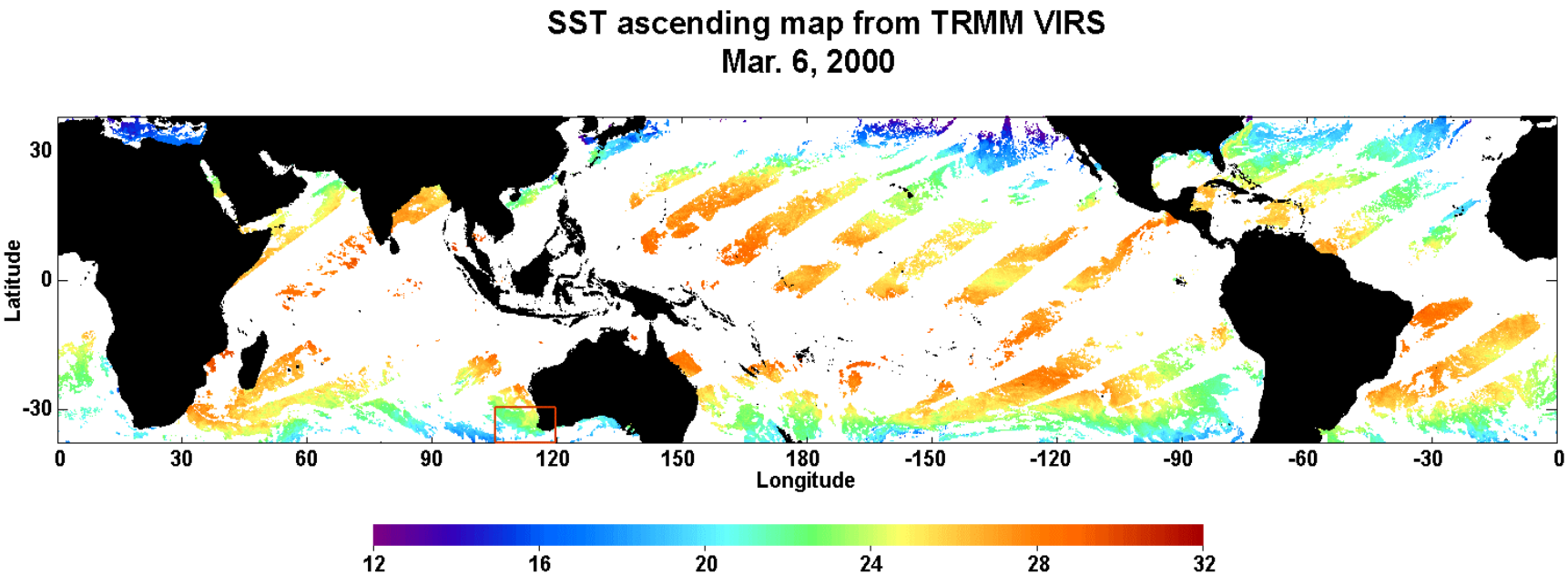
/Match-up Generation

/SST Retrieval Algorithm, New cloud detection

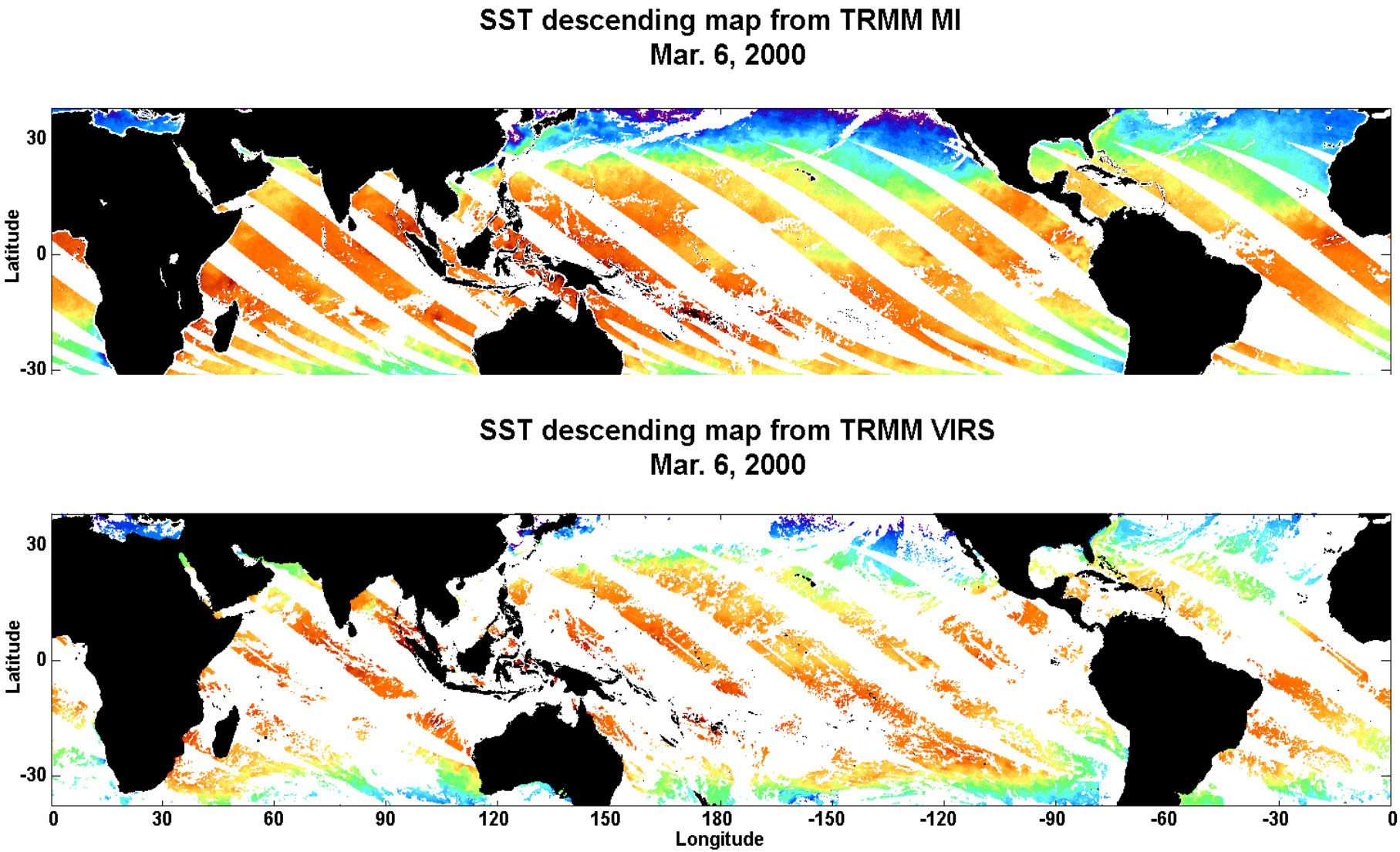
/Reprocessing of High-resolution Global SST
(One-month retrieval/day)

One Day Global SSTs from TRMM TMI and VIRS



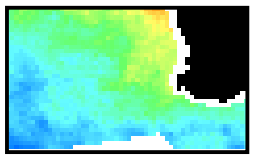


One Day Global SSTs from TRMM TMI and VIRS

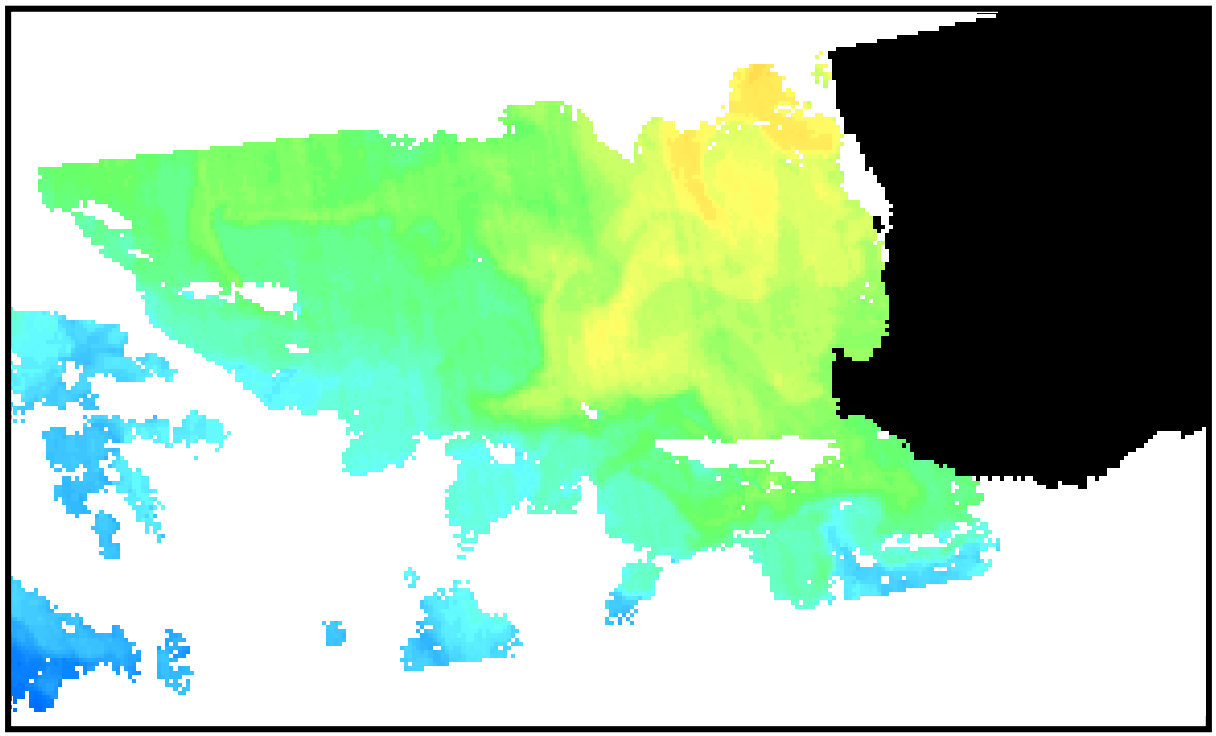


TRMM High Resolution SST Products

TMI 0.25 degree Product



VIRS 0.05 degree Product



VIRS Split and Triple Windows and Stripe Removal

Split Windows: a0 + a1T11 + a2(T11-T12) + a3(T11-T12)(sec θ -1)

Triple Windows: a0 + a1T11 + a2(T3.7-T12) + a3(sec θ -1)

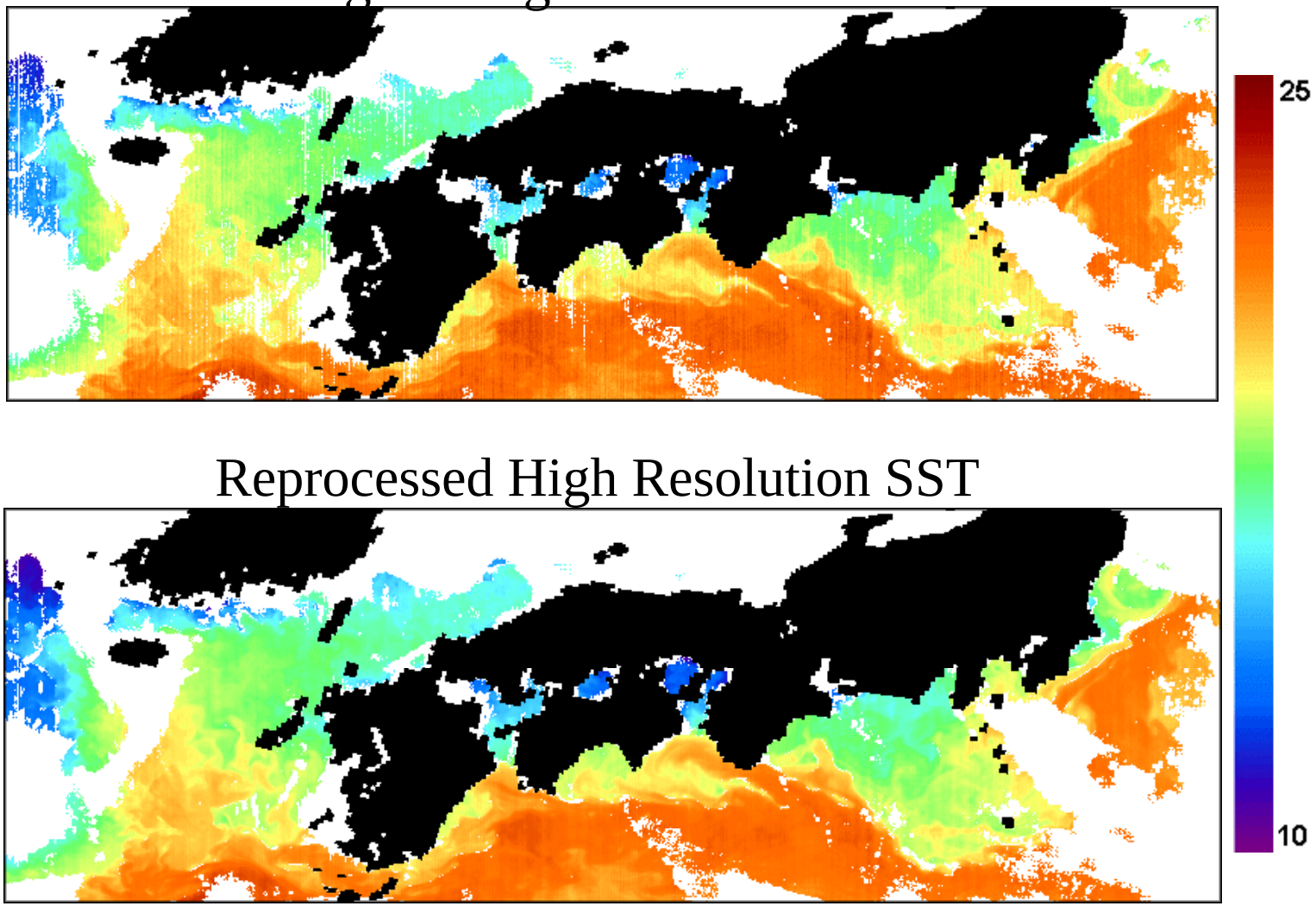
	Number of MTPs	a1	a2	a3	a4
Split-window	2771	-2.9349	1.0113	2.3116	0.8045
Triple-window	1420	-0.7881	1.0026	0.9443	1.8184

Removal of Sprit Noise

$SST = T11 + \overline{(SST - T11)}$

VIRS High Resolution SST : 4 January 2000

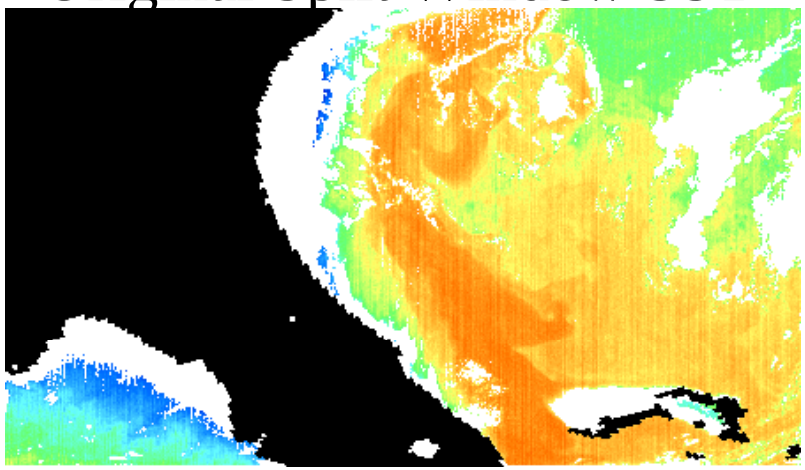
Original High Resolution SST



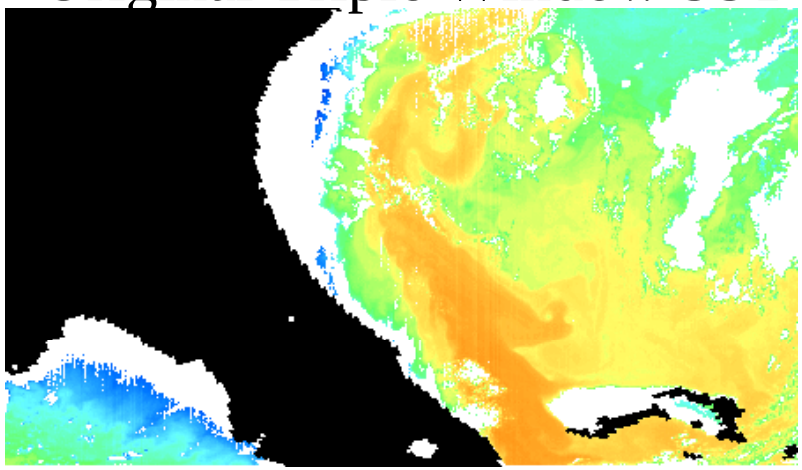
Reprocessed High Resolution SST

VIRS High Resolution SST: 2 January 2000

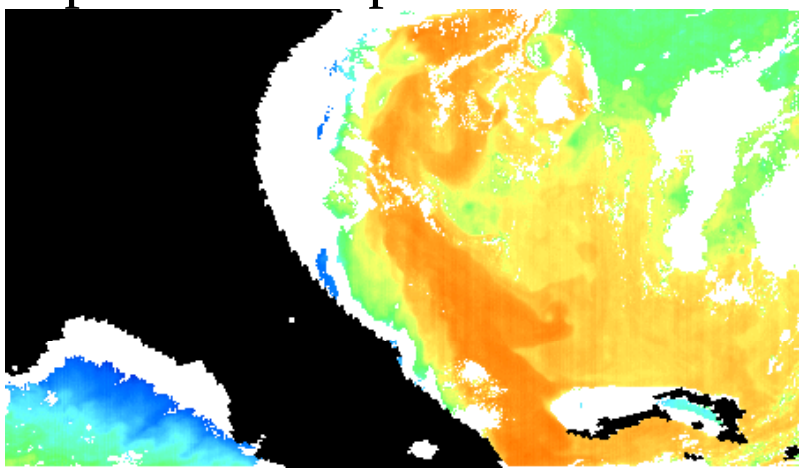
Original Split Window SST



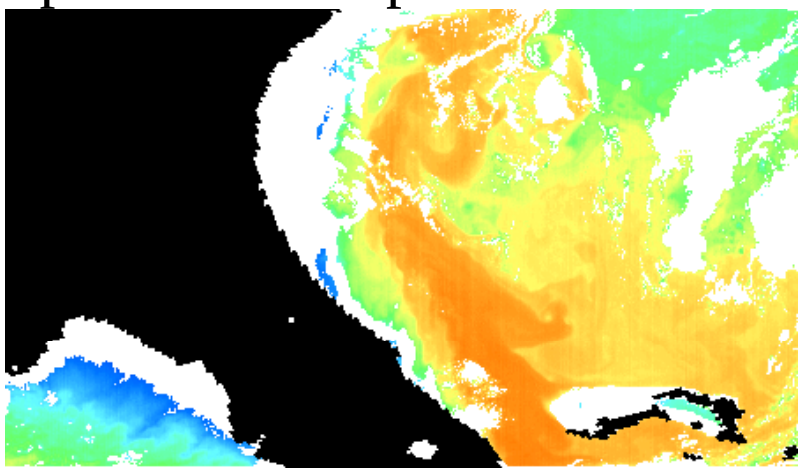
Original Triple Window SST



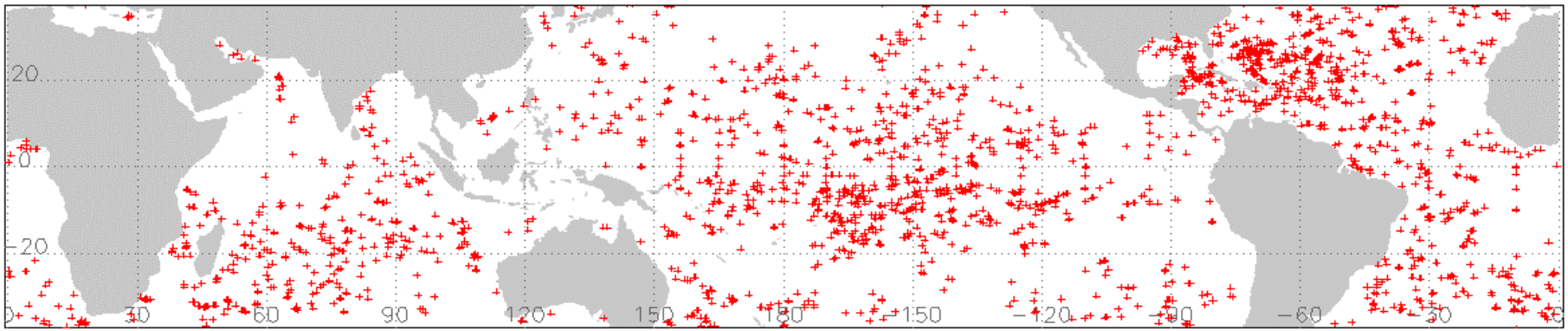
Reprocessed Split Window SST

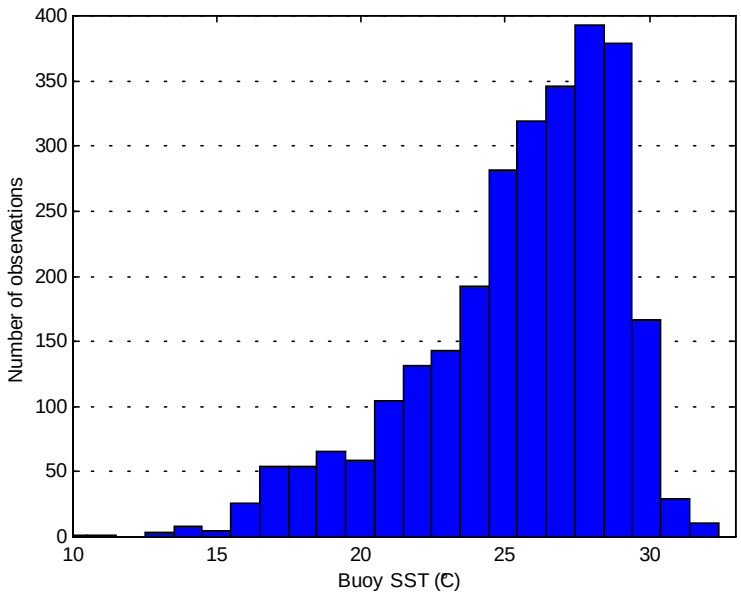


Reprocessed Triple Window SST



VIRS and Buoy Match-ups



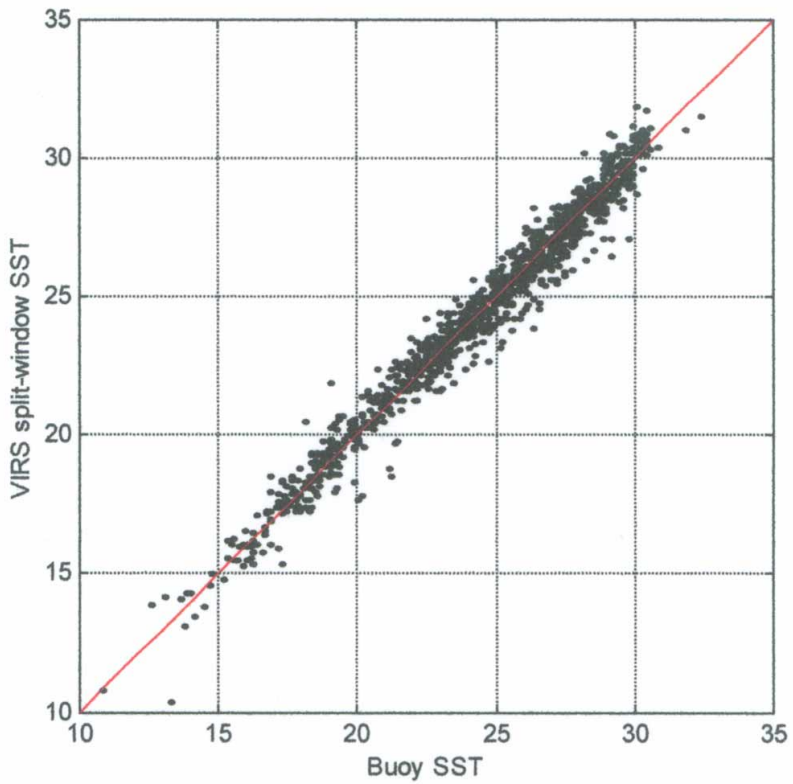


Buoy Temperature Histogram

VIRS Split Window

Number of MTPs: 2771

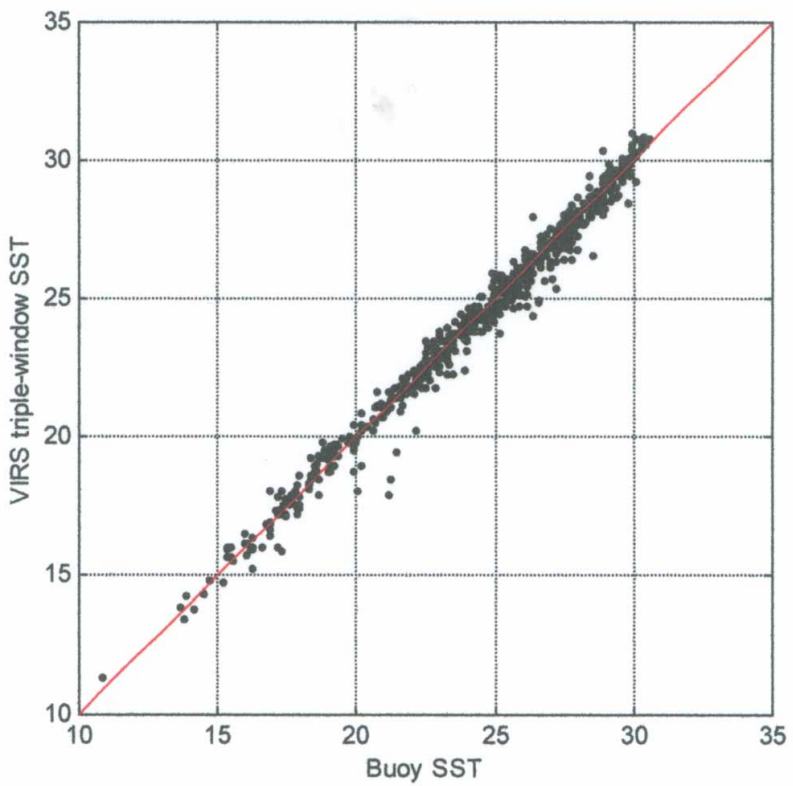
RMSE = 0.65 K



VIRS Triple Window

Number of MTPs: 1420

RMSE = 0.50 K



New In-Situ data for ADEOS-II/New Generation SSTs

JMA : Marine Meteorological Obs. at every 10-minute from 5 research vessels

Fisheries Agency: Marine Meteorogical Obs. at every minute from Shoyou-Maru

JAMSTEC: TRITON Buoy Obs. at every hour

****All include Solar Radiation Obs.**

Summary

/SST Validation/Algorithm Tuning System for ADEOS-II and the other satellite SSTs is established at the Tohoku University

/Its performance has been tested and proved to work well through VIRS high-resolution SST retrieval

Real-time End-To-End Test will be done Dec.2001-Feb. 2002