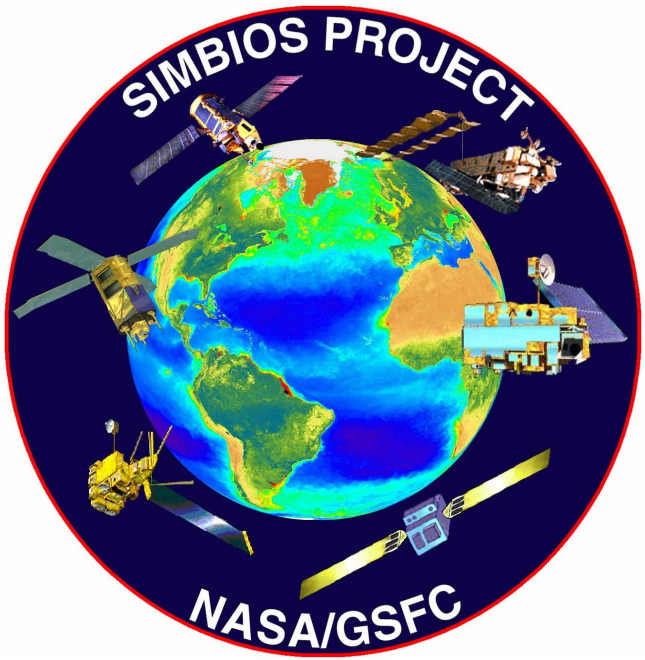
Achievements & Activities FY01 of SIMBIOS Project



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NASA SIMBIOS Project
GSFC Mail Code 970.2
Greenbelt, Maryland, USA

ADEOS-II GLI Workshop,
November 14 - November 16, Tokyo

SIMBIOS Project Achievements 2001

Satellite Data Processing:

- OSMI processing in collaboration with KARI - on going
- OCTS GAC data reprocessing – completed
  A very productive collaboration effort with NASDA and Japanese scientists. Scientific presentation is scheduled for AGU Fall meeting in San Francisco (12/13/2001).

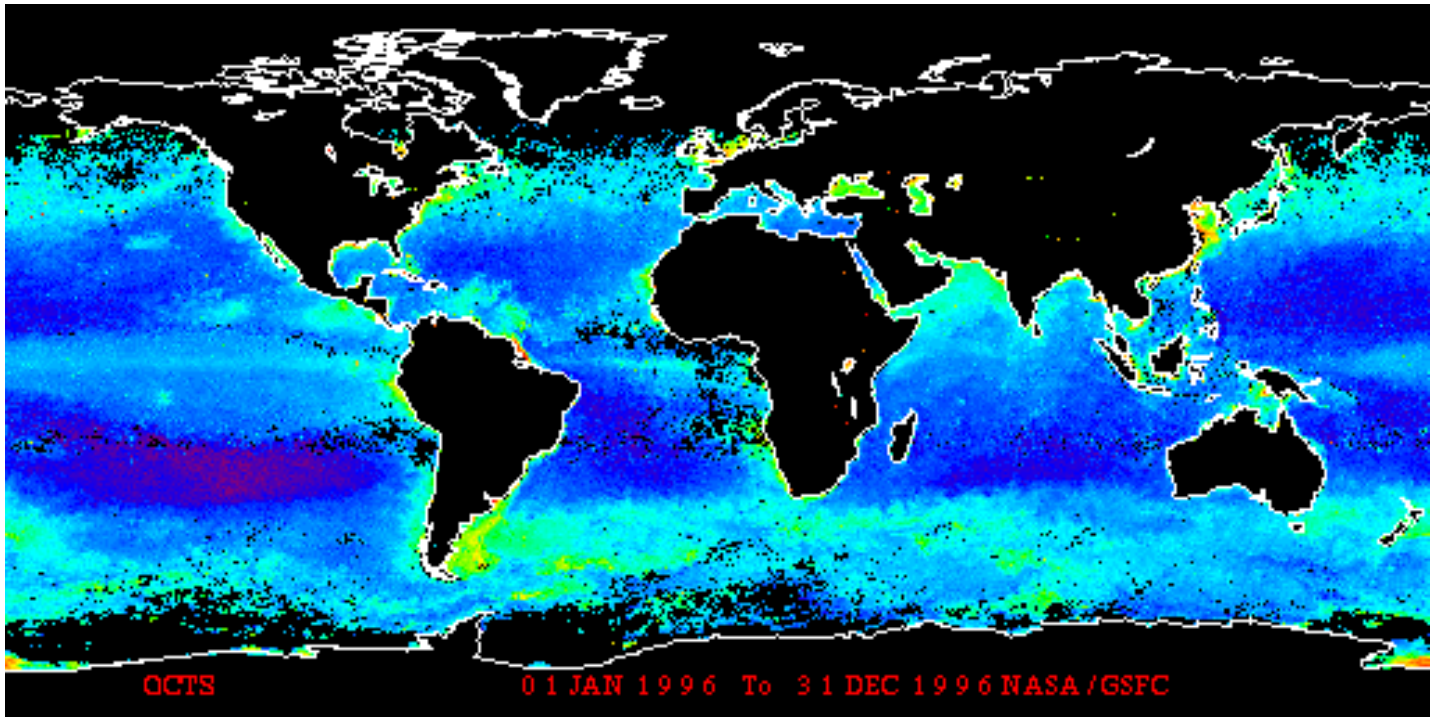
Descriptions of the data processing stream, OCTS-specific modification to the algorithms, and statistical comparison between OCTS and SeaWiFS can be found at:

http://seawifs.gsfc.nasa.gov/SEAWIFS/RECAL/OCTS_Repro1/

SIMBIOS

http://simbios.gsfc.nasa.gov

NASDA & NASA Collaboration: OCTS-GAC



- Web browse and download utility for Level-1, Level-2 and Level-3 products can be found at:

  http://seawifs.gsfc.nasa.gov/cgibrs/octs_browse.pl

- SeaDAS 4.03p released on 11/9/01 - supports OCTS-GAC

SIMBIOS Project Achievements 2001

◆ Data Merging:

• Wavelet and neural network merging techniques applied to SeaWiFS-MOS (level 2) and SeaWiFS-MODIS (level 3), from Project staff. First scientific results are scheduled for Fall AGU and at the IOCCG meeting in France on 01/15/02.

• Approximately 30 SeaWiFS ocean sites implemented as a collaboration of SeaWiFS and SIMBIOS Projects. The sites are intended to facilitate future data merging activities. The regions were discussed at several SIMBIOS Team and IOCCG meetings. MOS and OCTS-GAC diagnostic data sets will be made available in December-January 2002.

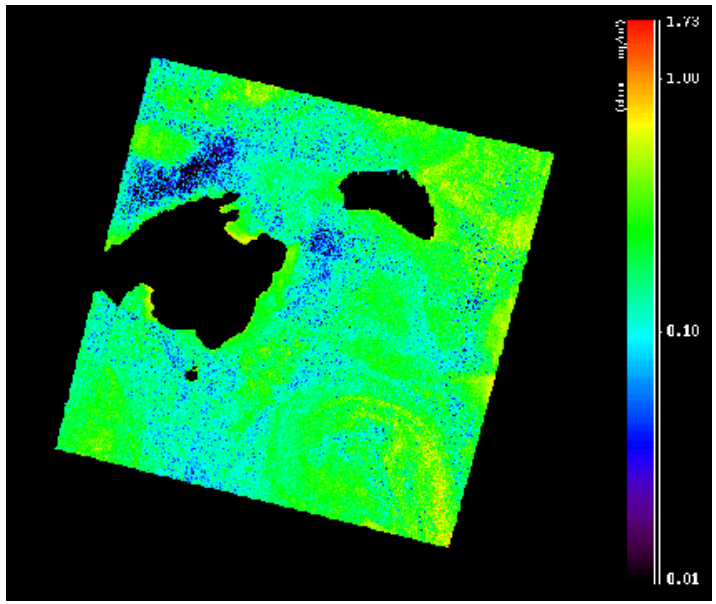
http://seawifs.gsfc.nasa.gov/cgibrs/eos_core_sites.pl

SIMBIOS

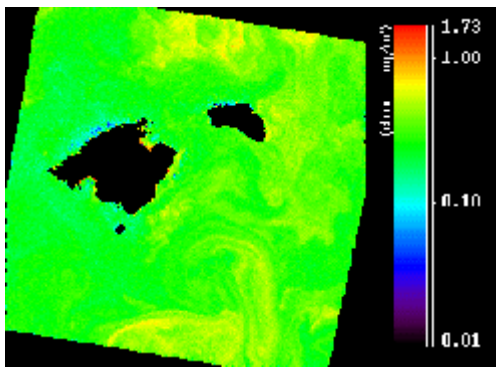
http://simbios.gsfc.nasa.gov

Data Merging: Wavelet-based Merger of Ocean Color Data of Different Spatial Resolutions

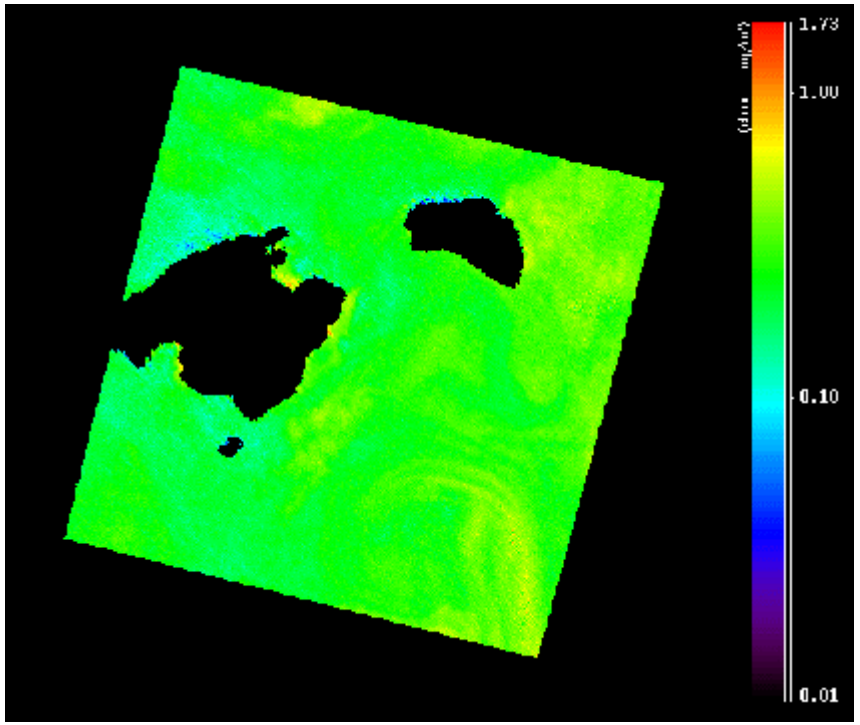
MOS



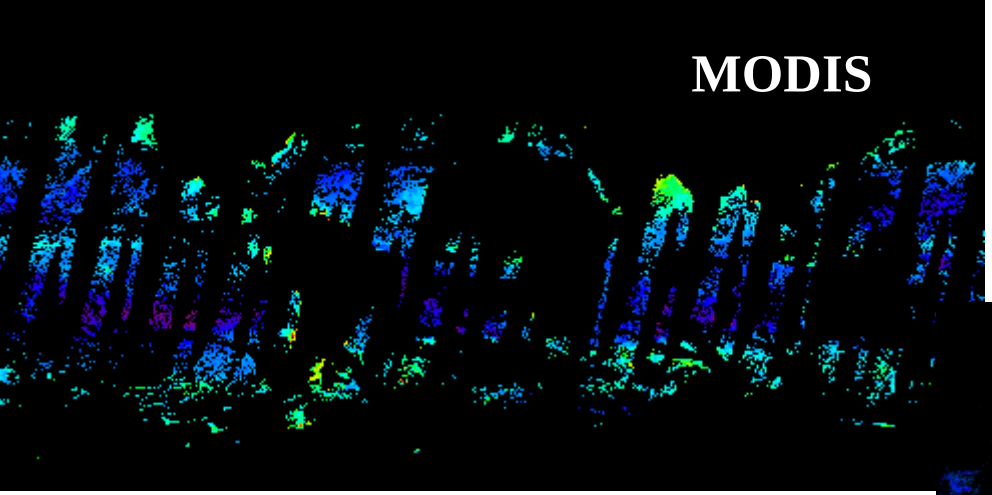
+ SeaWiFS

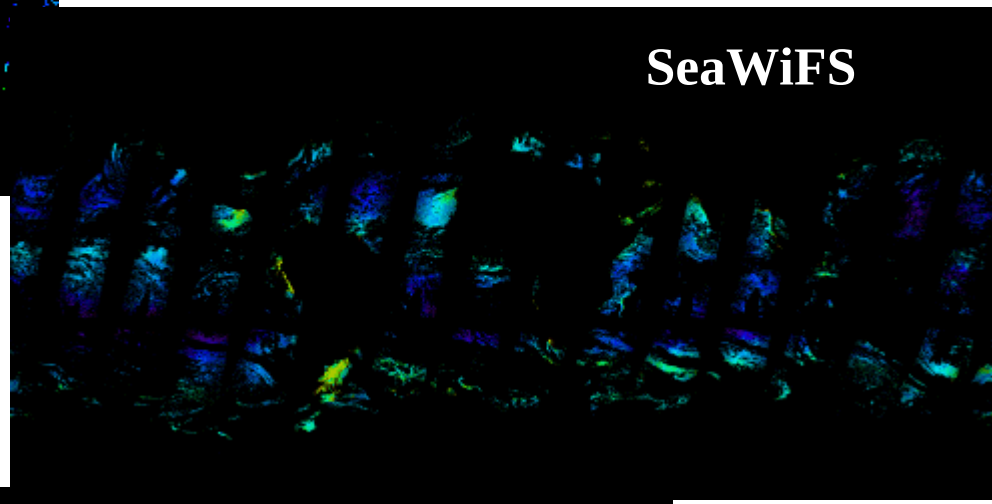


30% MOS + 70% SeaWiFS + MOS denoising

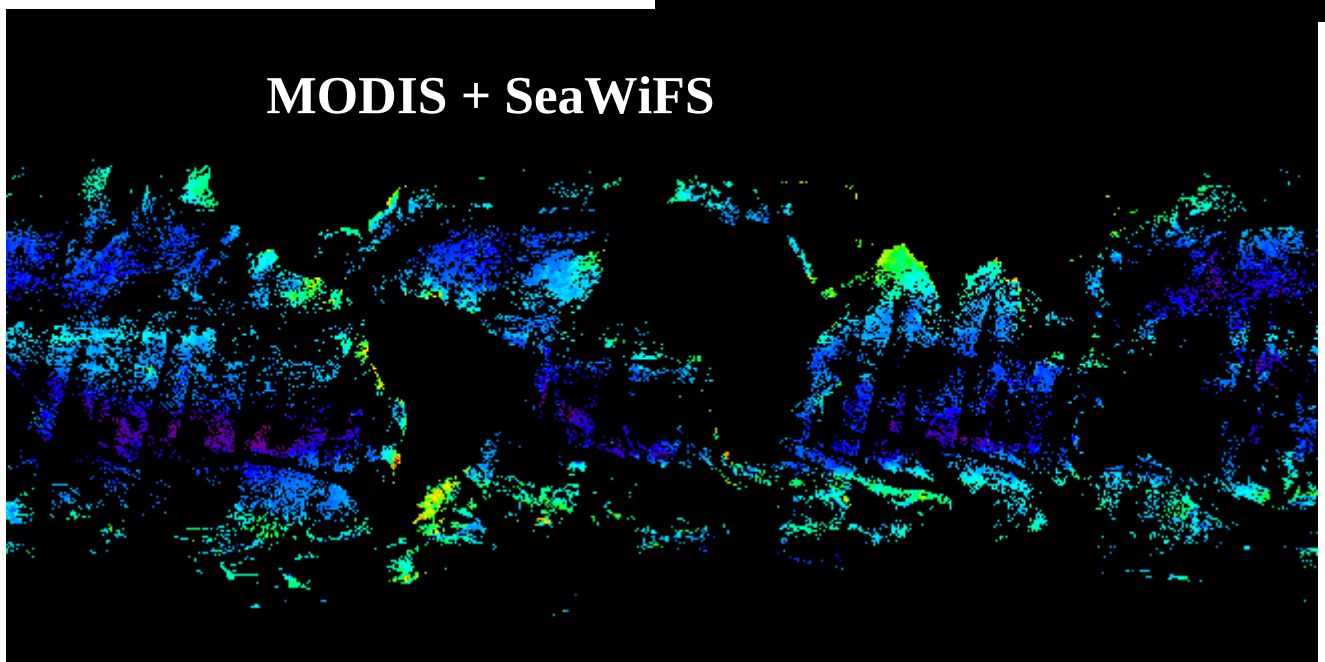


Data Merging:





Merger of L3 Daily Ocean Color Data for Increase in Spatial Coverage



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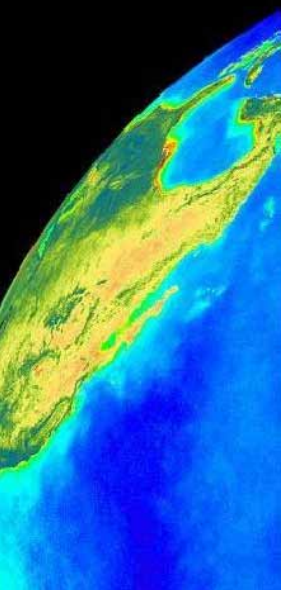
http://simbios.gsfc.nasa.gov



Implemented Diagnostic Data Set:

- Extracts based on geographic location and ”quality” of extracted Level-1 file.
- Subsequent standard or special Level-2 processing performed on extracts.
- Both Level-1 and Level-2 data available for browse and download via the Web for analysis and subsequent reprocessing.
- For 200 km wide extract, average Level-1 file size is 0.5Mbyte

SIMBIOS

http://simbios.gsfc.nasa.gov

Diagnostic Data Set

All extracts can be browsed with a web utility and selected tiles can be downloaded via the Web or FTP for subsequent analysis.

MOBY

S2001007224330.L1A_LAC.Moby.extract

S2001007224330.L2_LAC.Moby.extract

Cloud pixels 0%
Water pixels 89%
Land pixels 10%
Corrupted pixels 0%

SIMBIOS

http://simbios.gsfc.nasa.gov

Diagnostic Data Set

Multiple Satellite Capability

S2000075165409.L1A_HNSG.BBOP.extract

S2000075165409.L2_HNSG.BBOP.extract

MOS (above) and **SeaWiFS** (right) data extracts of Bermuda collected on 15 March 2000

More Diagnostic Data Sets

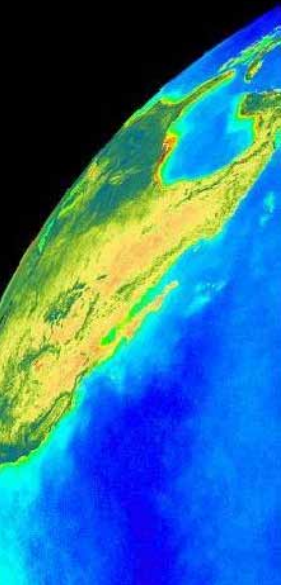
SeaWiFS Project also supports the **EOS Land Validation Core Sites**.

The sites are intended as a focus for land product validation over a range of biome types. The EOS list represents a consensus amongst the instrument teams and validation investigators. Most of the sites build on an existing program of long-term measurements and have an infrastructure to support *in situ* measurements.

http://seawifs.gsfc.nasa.gov/cgibrs/eos_core_sites.pl

SIMBIOS

http://simbios.gsfc.nasa.gov



SIMBIOS Project Achievements 2001

◆ Satellite characterization:

• The Project is hosting a NASDA representative for one year (June 01-June 02) at Goddard Space Flight Center to assist in the GLI preparations. The Project assigned Bob Barnes to work on a document entitled ”Instrument characterization of the GLI”. A GLI/SIMBIOS meeting is planned at the GLI workshop, to finalized the document.

• KOMPSAT/OSMI characterization work was done in collaboration with KARI. Joint scientific papers are scheduled to be presented at Fall AGU meeting in San Francisco (12/13-14/01). In addition, KARI requested assistance from the Project to identify a schedule to record onboard OSMI data. Our recommendation is now implemented.

SIMBIOS Project Achievements 2001

◆ Data Product Validation:

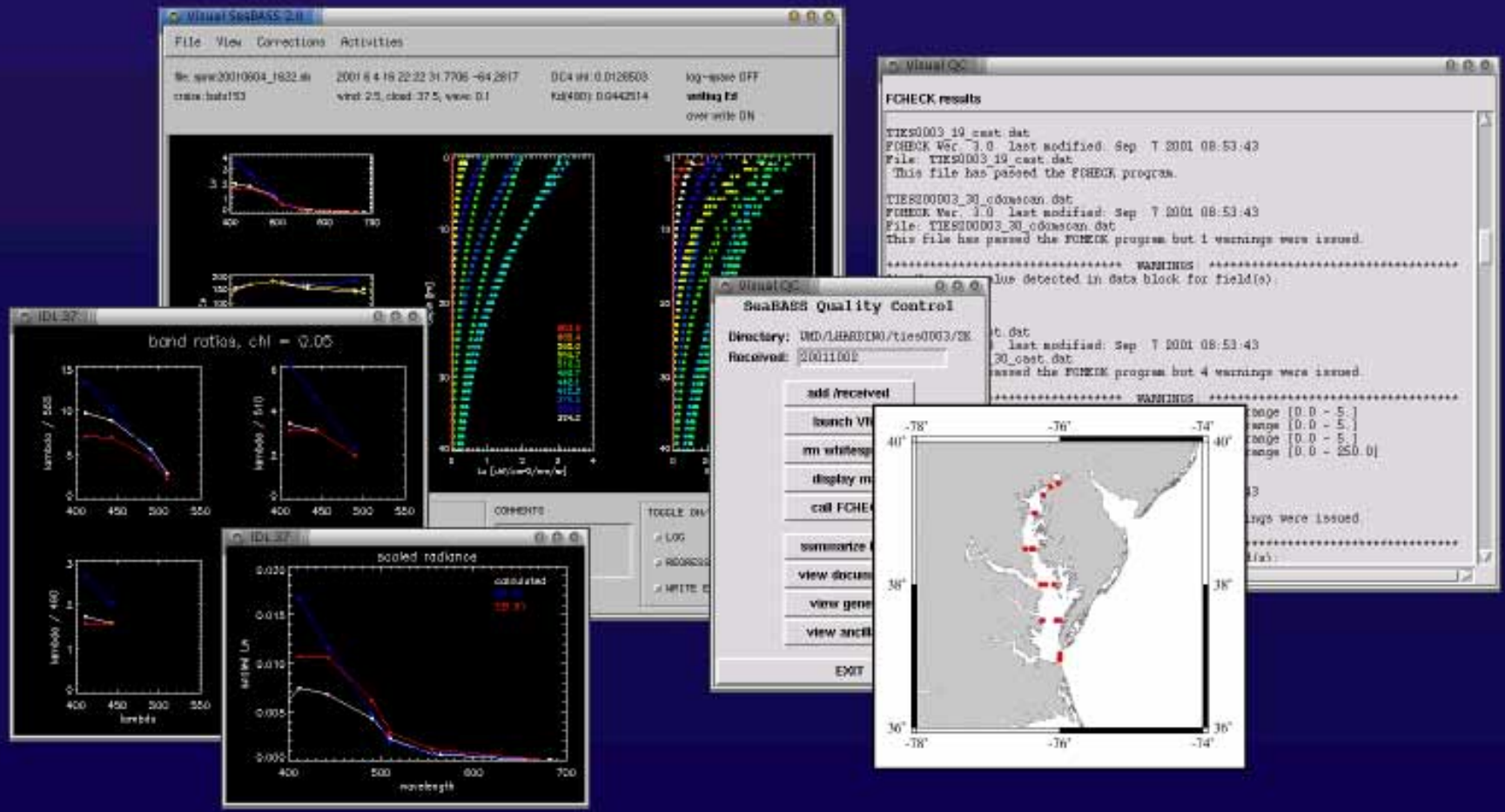
•Multisensor *in-situ* bio-optical and atmospheric match-up analysis routines are in place for MOS, SeaWiFS, OCTS-GAC, OSMI and MODIS.

• Improved QC and diagnostic bio-optical algorithms used prior to archiving *in-situ* data in SeaBASS.

• New SeaBASS data archive and relational database. We now have password-protected and public SeaBASS archive versions. Public data is currently from 1975 to 1999 and includes all data collected by the first SIMBIOS Team.

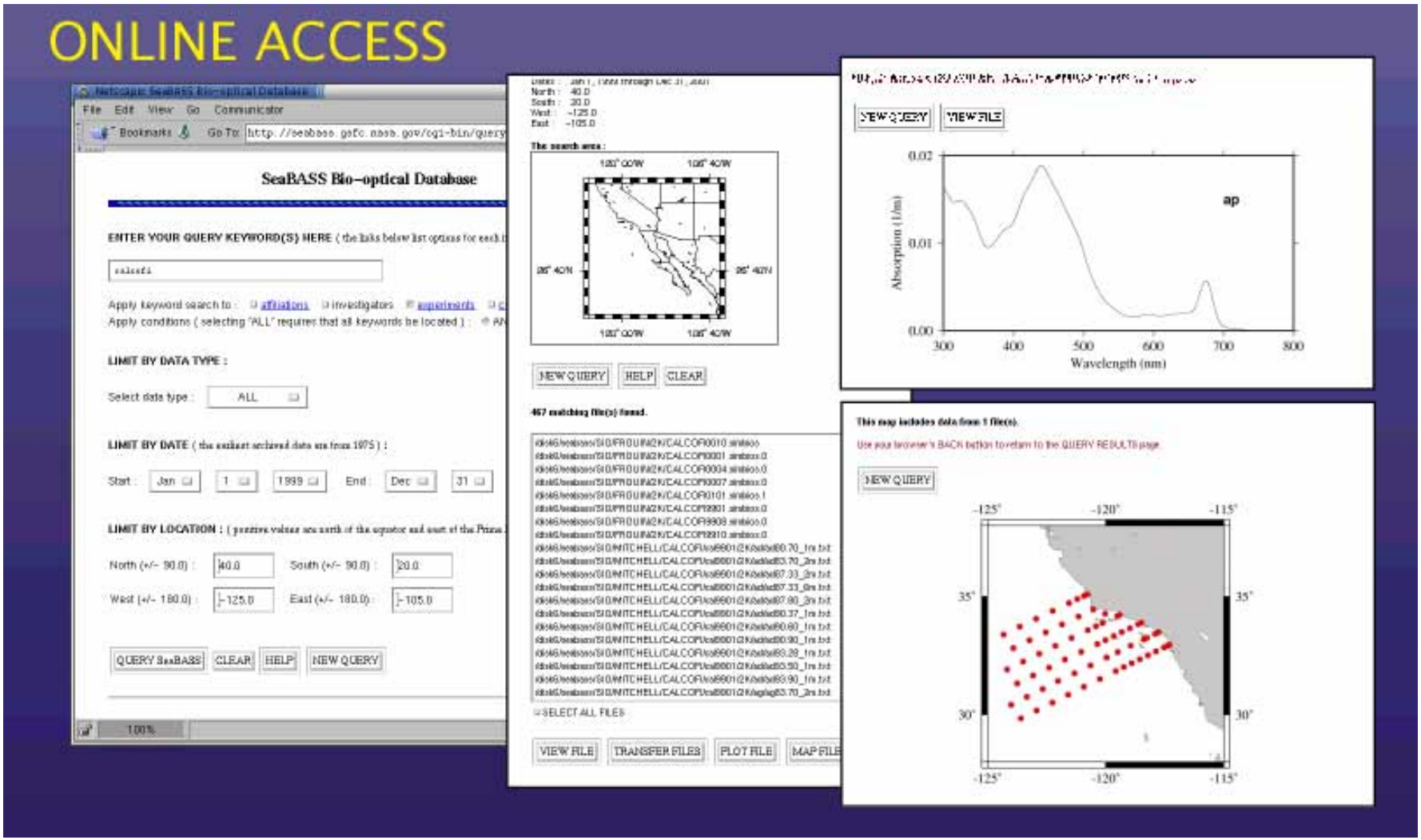
• An agreement is in place between the National Oceanographic Data Center (NODC) and the Project (SeaBASS CD-ROM and data archive depository).

QUALITY CONTROL



Examples of software used to verify SeaBASS data file format and evaluate and analyze radiometric depth profiles are shown. The principle component of the format-verification software is known as FCHECK. Contributors may test a data file for compatibility with the SeaBASS format by electronically mailing the file to *fcheck@seabass.gsfc.nasa.gov*. Additional quality control methods include generation of regional maps and comparison of field data with theoretical and modeled values.

SeaBASS search engines:
bio-optical database, pigment locator and aerosol locator



http://seabass.gsfc.nasa.gov

SIMBIOS Project Achievements 2001

◆ Sun Photometer Activities:

- A total of 14 coastal and island CIMEL stations (1998-2001) were contributed to the NASA AERONET network. This year, SIMBIOS CIMEL sun photometer data were used by the community in more than 20 scientific papers.
- PREDE characterization and instrument hardening ongoing. PREDE and MPL were deployed at ACE-ASIA international campaign.
- All sun photometer calibrations are done at GSFC.

◆ Global Oceanic Database:

Project has started working with Frouin (SIO), Miller (BNL) and AERONET to create an AOT database to develop alternative atmospheric models from those of Shettle and Fenn (1979).

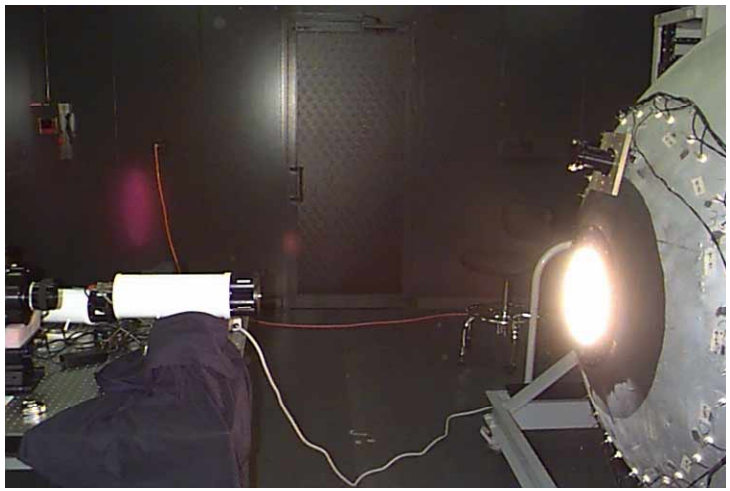
SIMBIOS

http://simbios.gsfc.nasa.gov

Sun Photometer Calibration Activities

- Roof platform at GSFC used for transferring calibration to sun photometers
- Project has done ~ 55 instrument calibrations per year

- Integrating GSFC sphere “Hardy” used to calibrated SIMBIOS radiometers and sky radiometers.



SIMBIOS Project Achievements 2001

◆ Calibration Round Robin Activities:

SIMBIOS Radiometric Intercomparison (SIMRIC-1)

• SeaWiFS transfer Radiometer (SXR-II) was calibrated with SIRCUS at National Institute of Standards and Technology (NIST) in November-December 2000. Yearly calibrations are planned, next December 2001.

• Round robin radiance was measured at 5 laboratories and at 2 companies with the NIST-calibrated SXR-II. First scientific results will be presented at Fall AGU meeting in San Francisco.

• Agreement was always (with one exception) within combined uncertainties (about +/- 2%).

• Spectralon bi-directional reflectance factors are important source of uncertainty.

Calibration Round Robin Activities

- **Chlorophyll Round Robin:**

  Glibert and Van Heukelem- Univ. MD

  • Experiments were designed to investigate the sources of variability among SIMBIOS PIs (i.e., survey methods, instrument performance, extraction techniques, precision/accuracy, etc.).
  • First results have been published in the "SIMBIOS Project 2000 Annual Report" *NASA TM-2001-209976*.
  • Complete round robin document is underway

- **HPLC Pigments:**

Since November 2000, Trees' lab is performing pigment analysis for the US SIMBIOS Team and conducting a small round robin activity with European laboratories collaborating with the Project. Results will be presented at SIMBIOS science team meeting (15-17 January, 2002).

SIMBIOS Project Achievements 2001

◆ Support Services:

- Project provides to the community satellite over-flight prediction support for SeaWiFS, MODIS, MOS, OCI, OCM and OSMI; and near real-time SeaWiFS Level-1, 2 images in support of on-going cruises.
- Image browser may be used with SeaWiFS, MOS, OCTS-GAC or OSMI data sets.
- Sun photometer instrument pool deployment of 12 MicroTops, 2 PREDE, 1 SIMBAD and 2 SIMBADA.
- To date, 270 cruises have been supported by the Project, including ACE-Asia (2-month) and SIMBIOS Validation Study (6-month) in the Atlantic Ocean and Antarctic on the R/V Akademik Ioffe. This campaign is in collaboration with Russian scientists.

SIMBIOS Project Achievements 2001

◆ SIMBIOS TM documentation:

- "In situ Aerosol Thickness Collected by the SIMBIOS Program (19997-2000): Protocols, and Data QC and Analysis" *NASA TM-2001-209982.*
- "SIMBIOS Project 2000 Annual Report" NASA *TM-2001-209976.*
- "Ocean Optics Protocols for Satellite Ocean Color Sensor Validation, Revision 3" in the works.
- "SIMBIOS Project 2001 Annual Report" in the works.
- "SIMBIOS Radiometric Intercomparison (SIMRIC-1) 2001 Report" in the works.

pdf documents are at

http://simbios.gsfc.nasa.gov

SIMBIOS Project Achievements 2001

♦ Project 2001 Meetings:

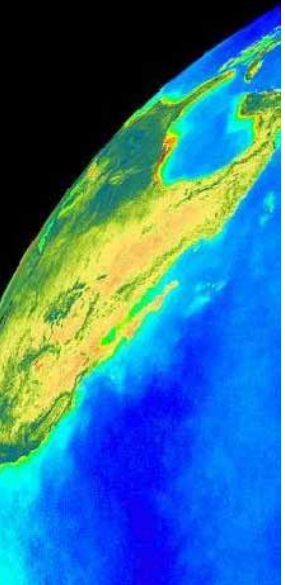
- 4th SIMBIOS Science Team held at GSFC on January 29th through 31st of January 2001. Agenda and recommendations were posted on our web site.
- Project has organized a special session at Fall AGU (13-14 December, 2001) on "*Calibration & Validation Efforts Under Way by the Ocean Color Missions*". We will have a full day oral session and ½ day poster session. Substantial US and international SIMBIOS investigators are participating. For more see:

  http://agu.org/meetings

- 5th SIMBIOS Science Team will be in Baltimore (Maryland) on January 15th through 17th of January 2002.

SIMBIOS

http://simbios.gsfc.nasa.gov



Future Thrusts:

- Begin preparations for the ADEOS-II/GLI and ENVISAT/MERIS missions
- Continuing work on MODIS with the MODIS Oceans Team and GSFC DAAC
- Continuing work on data merger (Project staff and team collaboration)
- Continuing to assist KARI in the calibration and processing of the KOMPSAT/OSMI data
- Begin work with the MOS Science Team on the use of MOS for linking the SeaWiFS with the ADEOS-I OCTS and POLDER time series
- Assist the NASA SeaDAS group on incorporating OSMI processing capabilities into SeaDAS
- Continue work on the SIMBIOS NODC CD-ROM for planned release in Spring 2002

EXTRA