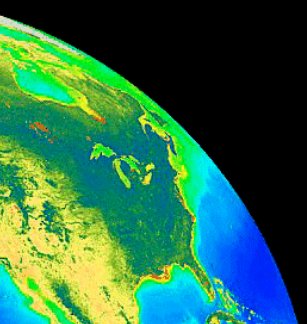
MODIS & Ocean Color Discipline Processing

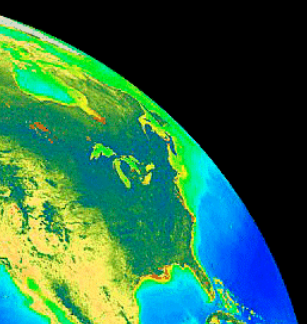
Chuck McClain
NASA/GSFC

NASA Ocean Color Research Team Meeting
April 14-16, 2004
Washington, DC



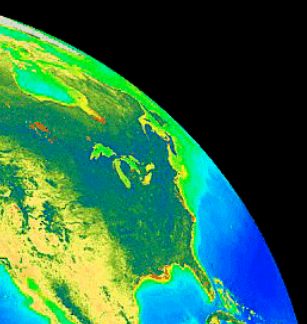
MODIS Data Sources

- MODIS SST (Terra & Aqua): GSFC DAAC
- MODIS Terra
  - OC derived products July 2000 thru December 2003: GSFC DAAC
    - Reprocessed last fall
- MODIS Aqua
  - Initial processing June 2002 thru January 2004: GSFC DAAC
  - Initial Ocean Color Data Processing Group products: complete mission
    - Plan a reprocessing based on recent analysis & concurrence of science community & HQ



MODIS Science Team

- Vince Salomonson: Team Leader
- 24 ocean science investigators
- 27 terrestrial science investigators
- 38 atmospheric science investigators
- 3 sensor calibration investigators
- Team Leader Thrust Areas
  - Data Accessibility
  - Climate Quality Data Products
  - Data Assimilation Application
- Science Team meeting date TBD



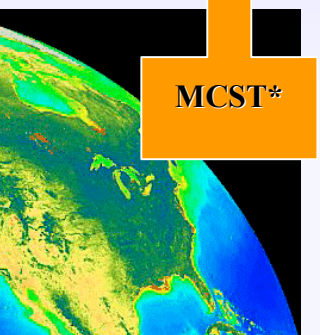
MODIS Ocean Science Team PIs

- I. Barton (CSIRO)
- J. Campbell (UNH)
- K. Carder (USF)
- D. Clark (NOAA)
- R. Evans (U. Miami)
- L. Breaker (MLML)
- J. Ballabrera-Poy (UMD)
- A. Kaplan (Columbia U.)
- P. Minnett (U. Miami)
- W. Balch (Bigelow)
- G. Cota (ODU)
- R. Gould (NRL/SSC)
- W. Gregg (NASA)
- S. Hooker (NASA)
- R. Letelier (OSU)
- S. Maritorena (UC/SB)
- J. Marra (Columbia U.)
- J. Mueller (SDSU)
- C. McClain (NASA)
- N. Nelson (UC/SB)
- J. Parslow (CSIRO)
- D. Siegel (UC/SB)
- B. Uz (UMD)
- K. Voss (Miami U.)

Discipline Processing Rationale

- **Distribute data processing to discipline groups with established processing capabilities & expertise**
  - Service data streams multiple data sources/missions. Avoid duplication of capabilities across missions.
  - Integrate data processing with calibration & validation functions.
  - Promote development and maintenance of Climate Data Records
    - Consistency of products/algorithms across missions
    - Reprocessings as recommended by science community
- **Discipline processing groups provide avenue for community collaboration in product definition, quality evaluation, and algorithm selection**
- **Discipline groups support community enabling activities**
- **Discipline groups provide data access capability**

Ocean Color Discipline Processing System



NPP VIIRS

Aqua MODIS

Terra MODIS

SeaWIFS

CZCS OCTS

Reconfigurable & Scalable

Science Community Interactive

- *Knowledgable Staff*
- *Enabling Activities (SeaBASS, SeaDAS, Calibration RR, etc.)*

Flexible Processing

- *Multiple Missions*
- *Rapid Reprocessing*
- *Parallel Processing Streams (operational, algorithm & calibration testing, evaluation products)*

MAIN PROCESSING SYSTEM

- *Data from multiple satellite and instrument types*
- *In-situ, ancillary, and other data*

OCDP Management & Staff

L1 DATA

L1-L3 DATA

GSFC DAAC

Data Users

Community Agreed Standards and Protocols

MCST*

NASA HQ Program Management

NASA Flight Projects

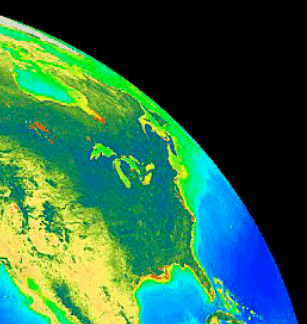
Science Community

In Situ Data

* MODIS Characterization Support Team (NASA/GSFC)

Ocean Color Discipline Processing

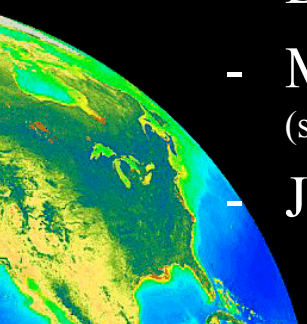
- **Discipline Group Primary Responsibilities**
  - Routine operational data processing & distribution
    - Includes near-realtime data access for MODIS/Aqua
  - Calibration/sensor characterization analyses and assessments
  - Algorithm implementation and evaluation
  - Atmospheric and bio-optical data archive (SeaBASS)
  - Community processing software (SeaDAS)
  - Instrument pool support (currently “inactive” pending redefinition of NASA OC calval program)
  - Calibration round-robin coordination (currently “inactive” pending redefinition of NASA OC calval program)



OCDP Technical Staff

Leaders: Chuck McClain & Gene Feldman

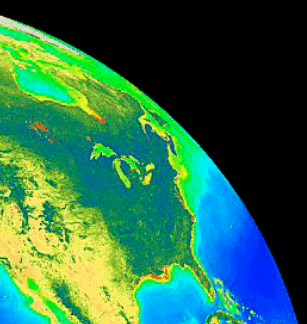
- **Calibration & Validation**
  - Sean Bailey
  - Bob Barnes
  - Gene Eplee
  - Bryan Franz
  - Kirk Knobelspiesse
    (departing this summer for grad school)
  - Ewa Kwaitkowska
  - Gerhard Meister
  - Wayne Robinson
  - Donna Thomas
  - Menghua Wang (UMBC)
    (supported under independent funding)
  - Jeremy Werdell



- **SeaDAS**
  - Mark Reubens
  - Kevin Turpie
  - Xioa-Long Wang
- **Navigation & Geolocation**
  - Fred Patt
  - Steve Bilanow (SeaWiFS part time)
- **Process Control S/W**
  - Jim Chemmanoor
  - Dan Knowles
  - John Wilding
- **System Administration**
  - Sun Lee
  - Chris Moellers
  - Paul Smith
- Mission Ops., Web Interfaces, Formats
  - Joel Gales
  - Norm Kuring
  - Grace Su (SeaWiFS)

Ocean Color Discipline Processing *cont.*

- Science Team/Community Primary Responsibilities
  - Algorithm development and selection
    - Atmospheric correction, bio-optical, data merging
  - Data collection protocol development
  - In situ instrumentation requirements and evaluations
  - Field data collection
  - Earth System Science research



MODIS Ocean Color Processing Strategy

- **Transition operational ocean color processing to dedicated ocean color discipline processing group**
  - MODAPS & DAAC to continue "official" SST processing & distribution until alternative strategy defined by HQ
- **Focus on MODIS/Aqua in near-term**
  - Return to MODIS/Terra once MODIS/Aqua data quality is considered adequate by research community (pending Code Y approval)
- **Concentrate on MODIS/Aqua calibration issues & Lwn's**
  - Work closely with MCST and science team
- **Initial production of SeaWiFS standard products for comparison/evaluation**
  - Expand product suite as required by science community with HQ concurrence
  - Conduct algorithm testing and product evaluations in collaboration with science community