Session #14 - Data Validation
14-1.1

Terminology

Build on the Ocean Validation Initiative

- instrument characterization
- calibration
- vicarious calibration

- *algorithm validation (pre - launch inc. simulation)*

- product qa / qc (inc. quality flags)
- *data product validation* *
  "determine the spatial and temporal error fields associated with the biological or geophysical product"

- verification

* what is acceptable to the PI and by the user community and what is affordable.

14-1.1

OCEANS VALIDATION

FNCTN: DEFINE ACCURACY OF GLOBAL PRODUCTS /PIXEL/TIME

APPROACH: ① BUILD ON SEAWIFS, AVHRR PROGRAMS

② INTERNATIONAL FRAMEWORK

③ SENSOR INTERCOMPARISON, MERGING for BIOLOGICAL INUESTIGATIONS OF OCEAN SYSTEMS

SIMBIOS

PLAN DUE MAY 17 1995

-④ MODIS PLAN IN DRAFT FORM
F. HOGE

⑤ MULTI AGENCY, COUNTRY SHARING OF SFC OBSERVATIONS

OCEAN VALIDATION

IMPLEMENTATION

- FIXED SITES, TIME SERIES
  - NASA FUNDED - MOBY
  - NSF - HOTS BATS LTER
- FOCUSED FIELD STUDIES
  - REGIONALLY IMPORTANT PROBLEMS
    - HIGH LAT.
    - DUST, Aerosol types
    - BIOGEOGRAPHIC REGIONS
- INITIALIZATION CRUISES
- OPPORTUNISTIC, BUOYS
  - DRIFTERS
- JOINT ACTIVITIES WITH JGOFS, ONR, DOE, INTERNATIONAL STUDIES

Land Validation Plans

On-going community activities

- **MODIS Land Test Sites**
  - multi-sensor acquisitions, long term monitoring, strong existing ground data program, infrastructure e.g. LTER network, IGBP BIG Transects
  - initiated linkage to LP Global Land Cover Test Site Project, IGBP-DIS Global 1km land cover confidence sites - (TM, AVHRR, Land Cover, DEM data)
  - need for additional MODIS ground related instrumentation and data collection on surface parameters and at wider range of type sites (parameters include directional reflectance, albedo, surface temperature, fire, LAI/FPAR, NPP) - potential for coordination with other USG programs e.g. ARM, GAP and NGO's
  - need for additional sensor acquisitions e.g. MAS, Polder, SeaWifs
  - larger distribution of low intensity test sites to supplement the small number of NASA intensive field campaigns e.g. FIFE, Boreas, HAPEX, LBA
- **Sunphotometer Network (Aeronet)**
  - for land surface reflectance product validation
- **Airborne Campaigns (MAS / AVIRIS etc.)**
  - need to support contemperaneous ground data collection e.g. LAI, radiometry - focus on MODIS resolution.
  - simulate MODIS spectral bands.
  - opportunity for SWAMP / IDS coordination (e.g. SCAR B)

Sunphotometer Network

- EOS Rationale
  - Land /Ocean /Atmosphere Requirement
  - Multi-instrument EOS needs (MODIS / MISR)
  - Validation of surface reflectance / aerosol products / and developing an aerosol climatology
- Current Status of the International Network
  - 35 robotic CIMEL instruments (NASA funded 15)
  - Satellite communication (GOES / METEOSAT)
  - Data System (P.I. grown and based)
  - Activity growing beyond current capacity

Current Distribution of Photometers in the Network

- Brazil 10
- Boreas 5
- E. Canada 2
- US LTER 4
- W. Africa 10
- Bermuda 1
- Barbados 1
- Hawaii 1
- Miami 1
- Arizona 1
- Zambia 1

»13 instrument requests pending for '96

Sunphotometer Network

- Desired Evolution of 'AERONET '
  - Near Term (96/97)
    - » 60 instruments (13 instrument requests pending for '96)
    - » Data System integration and management within ESDIS and DAAC system inc. archive and distribution
    - » Develop interagency coordination (AEROCE (NSF) / ARM (DOE) / NOAA Regional Monitoring Network)
    - » Explore international linkages (WMO / GAW)
  - Post Launch (1998 - 2000)
    - » 100 instruments distributed globally
    - » EOS instrument validation tool
    - » NASA/EOS contribution to GCRP

c. Justice

Sunphotometer Network

- **Programmatic Issues**
  - Current R&A funding ramping down to close in 1 year (FY 96:100k)
  - 96 / 97 budget needs for maintenance of the network and data system (c. $ 375 k p.a. with no new NASA instrument buys)
  - The need for NASA management to push for interagency coordination (NSF / NOAA / DOE - CENR / Academy Aerosol Panel ?)
  - Need to include GMS for Asian coverage (Japan / NASA : Nakajima)

Kaufman

ATMOSPHERIC GROUP VALIDATION

METHOD:

1. CONTINUES VALIDATION BY GROUND BASED MEASUREMENTS AND OBSERVATION
   * CIMEL-AERONET (SUN/SKY RADIOMETERS): AEROSOL, WATER VAPOR
   * RADIOSONDES - WATER VAPOR, TEMPERATURE
   * FIRE TEMPERATURE, EMISSION, DETECTION
   * DIFUSE/DIRECT FLUX MEASUREMENTS
   * GROUND BASED SAMPLING OF AEROSOL: SIZE, PROPERTIES
   * PROFILER NETWORK - PROFILE RETRIEVALS
   * AERI at ARM site - PROFILE RETRIEVALS

2. FIELD CAMPAIGNS (1-2 / Y)
   * IN SITU AIRCRAFT: CLOUD DROP SIZE, PHASE
     AEROSOL SIZE, CHEMISTRY
     WATER VAPOR
     DETAILED FIRE STRUCTURE
     SPECTRAL RADIANCE
   * GROUND SKY CAMERAS: CLOUD HEIGHT, CLOUD MASK

Kaufman

PROBLEMS

1. INTEGRATION / FUNDING
   * EOS LEAD ON MAIN FACILITIES: AERONET THAT SERVE SEVERAL INSTRUMENTS
   * CENTRAL DATA STORAGE · HANDLING
   * CALIBRATIONS

2. INTERNATIONAL COOPERATION
   * ACCESS TO DATA SETS
   * COORDINATION WITH VALIDATIONS
   * FIELD EXPERIMENTS IN DIFFERENT ECOSYSTEMS

3. FACILITIES, INFRASTRUCTURE:
   * AERONET
   * AIR BORNE SPECTROMETER, SIMULATOR
   * CALIBRATION

4. FIELD EXPERIMENTS
   * ORGANIZING AND FUNDING THE INFRASTRUCTURE OF FOREIGN INTERDISCIPLINARY EXPERIMENTS