IMAPP: Promoting the Knowledge and Use of Remote Sensing Data

Kathleen Strabala, Liam Gumley, Hung-Lung Huang, Elisabeth Weisz, James Davies
Cooperative Institute for Meteorological Satellite Studies (CIMSS)
Space Science and Engineering Center (SSEC)
University of Wisconsin-Madison

Who:

NASA, University of Wisconsin-Madison

What:

International MODIS/AIRS Processing Package (IMAPP)

Freely distributed software that enables X-band direct broadcast antenna owners the capability to navigate, calibrate and create scientific products from MODIS, AIRS and AMSR-E instrument data.

- Builds upon our experience in creating and distributing ITPP and IAPP
- Ease of use and robustness are primary development requirements
- Binary executables and source code available

- Current suite of IMAPP products:
  - **MODIS Level 2 Products**
    - Cloud Mask (MOD35)
    - Cloud Top Properties (MOD06CT)
    - Cloud Optical Thickness, Effective Radius (MOD06OD)
    - Cloud Phase (MOD06 Phase)
    - Atmospheric profiles, TPW and stability indices (MOD07)
    - Aerosol Optical Depth (MOD04)
    - Sea Surface Temperatures
    - Near Infrared Water Vapor
  - **AIRS Products**
    - Level 1B calibration and geolocation software (from JPL)
    - Level 2 Standard JPL retrievals
    - Level 2 UW-Madison single FOV clear sky retrievals
    - Level 2 UW-Madison all sky retrieval package including:
      - MODIS/AIRS collocation software
      - AIRS cloud mask using the collocated MODIS cloud mask
      - All sky single FOV retrieval package
  - **AMSR-E Products**
    - Calibration and geolocation software
    - Level 2 Rain Rate
    - Level 2 Soil Moisture
    - Level 2 Snow Water Equivalence
  - **Utilities**
    - MODIS destriping software to remove artifacts from infrared bands
    - MODIS Google Earth software
      Software that takes MODIS L1B and creates true color imagery in a format compatible with the Google Earth Geobrowser
    - MODIS/AIRS collocation software
    - Tutorial on how to create reprojected 250m true color imagery
    - AIRS L1B HDFEOS to BUFR utility (with Nigel Atkinson)
  - **Numerical Weather Predication and Satellite Data Assimilation**
    - DBCRAS 48 km globally configurable model producing standard meteorological products (temp, dewpoint, winds, heights, precip)
    - Also produces forecast satellite IR imagery
    - Assimilates MOD07 TPW and MOD06CT cloud heights to improve the depiction of clouds and precip in the model
    - DBCRAS 16 km NEST that fits within the larger 48 km grid

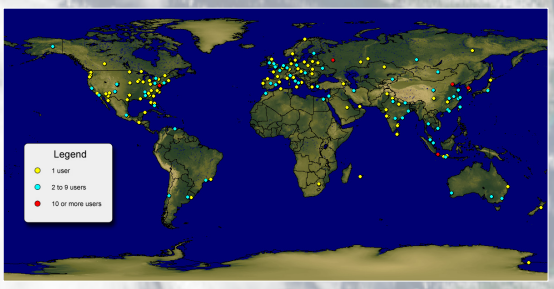
Why:

Promote the use of Aqua and Terra data for local real-time applications.

Where:

IMAPP home page for software downloads:
http://cimss.ssec.wisc.edu/imapp

Where is IMAPP used? 57 different countries:



Workshops:

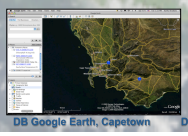
Teach principles of remote sensing and local applications

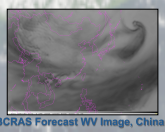
Courses taught in China, Australia, Taiwan, Norway South Africa, and Brazil including 2009 IGARSS South Africa Short Course 4: "MODIS direct broadcast data for enhanced forecasting and real-time environmental decision making."

IMAPP workshop
Sao Paulo, Brazil 2008

Upcoming Releases:

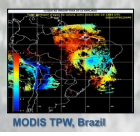
MODIS Bidirectional Reflectance Distribution Function (BRDF) for direct broadcast June 2010
IMAPP Virtual Appliance

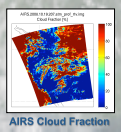

DB Google Earth, Capetown

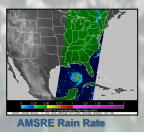

DBCRAS Forecast WV Image, China

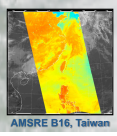

DBCRAS Forecast IR Image, USA


MODIS CTP, McMurdo


MODIS TPW, Brazil


AIRS Cloud Fraction


AMSRE Rain Rate


AMSRE B16, Taiwan


MODIS DB BRDF

International TOVS Study Conference, 17th, ITSC-17, Monterey, CA, 14-20 April 2010. Madison, WI, University of Wisconsin-Madison, Space Science and Engineering Center, Cooperative Institute for Meteorological Satellite Studies, 2011.