AIRS RESEARCH ONGOING…
exciting times ahead

The Pace of AIRS Scientific Progress Since Launch

(AIRS = Daily + Global + All-weather)

- Basic Weather and Climate Parameters (1K/1km) –*Session 4*
- Derivation of Atmospheric Composition O3, CO, CO2, CH4,… (profiles) – *Session 5*
- Clouds radiative and microphysical properties, particle size, shape and scattering – *Session 3*

In Progress

- Resolving the Boundary Layer (1km, 2km?)
  Beginning with Surface Emissivity --See Session 8

Grand Challenge

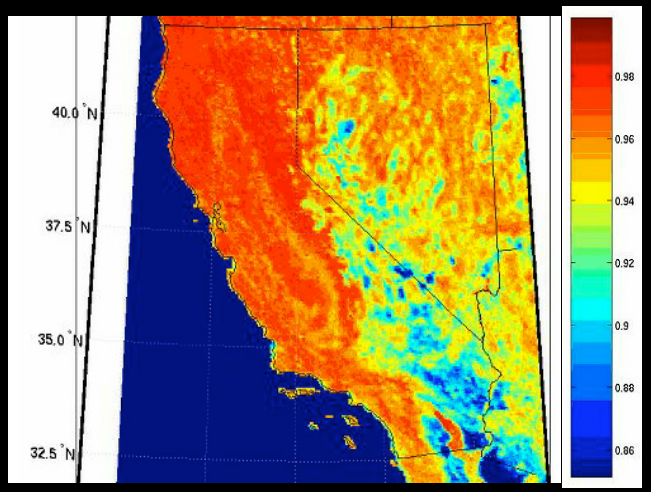
MODIS- ASTER- AIRS Surface Emissivity Maps of California

One Month
August 2003
Cloud-Free Scenes

June-July-August
2000-2005
Cloud-Free Scenes

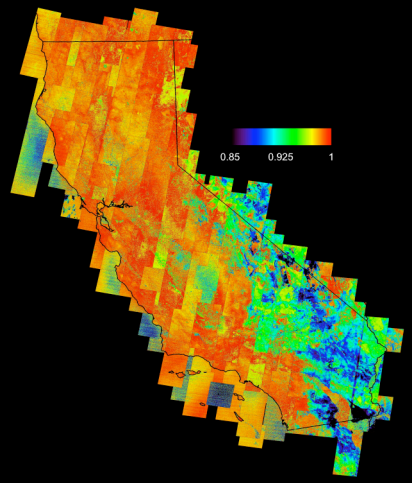
One Month
August 2005
Cloud-cleared

MODIS



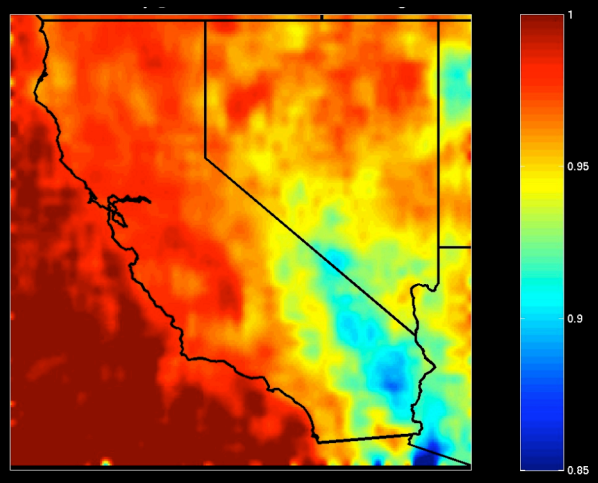
5x5 km

ASTER



100x100 m

AIRS



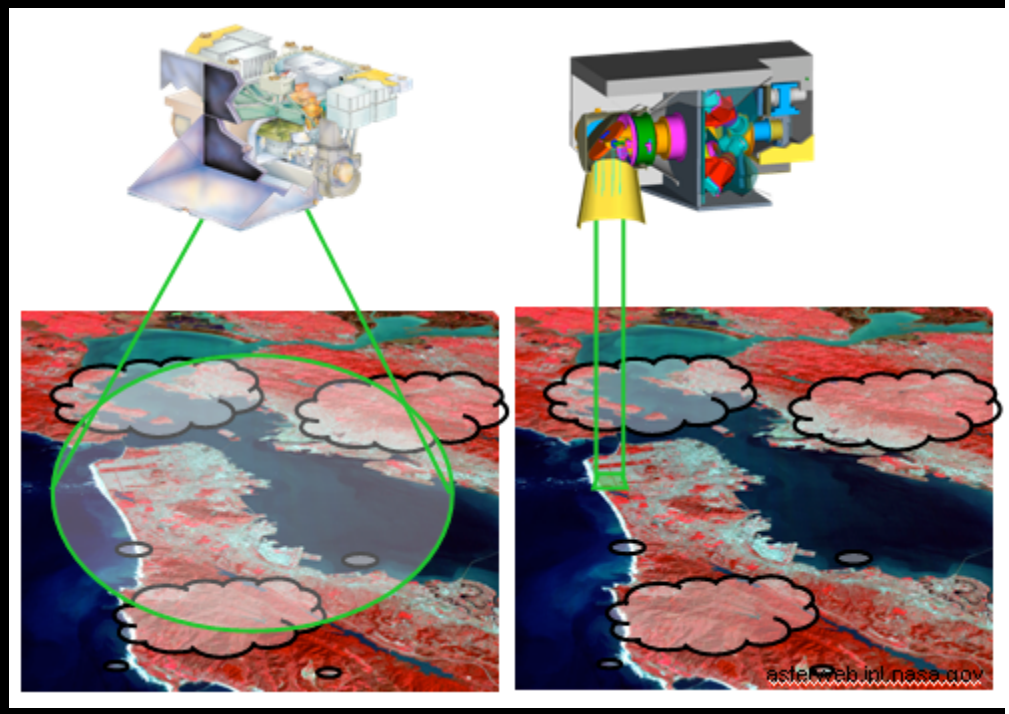
50x50 km

ALWAYS
MAKE
PROGRESS

EVOLUTION *AIRS* → *ARIES*

15x15 km 1x1 km

Advanced Remote-sensing Infrared Emission Spectrometer ARIES



Characteristics:

- **1x1 km Horizontal Resolution**
- **3.0 – 15.4 μm**
- Hyperspectral: Over 3000 Channels
- Global Daily Coverage (±55° Swath)

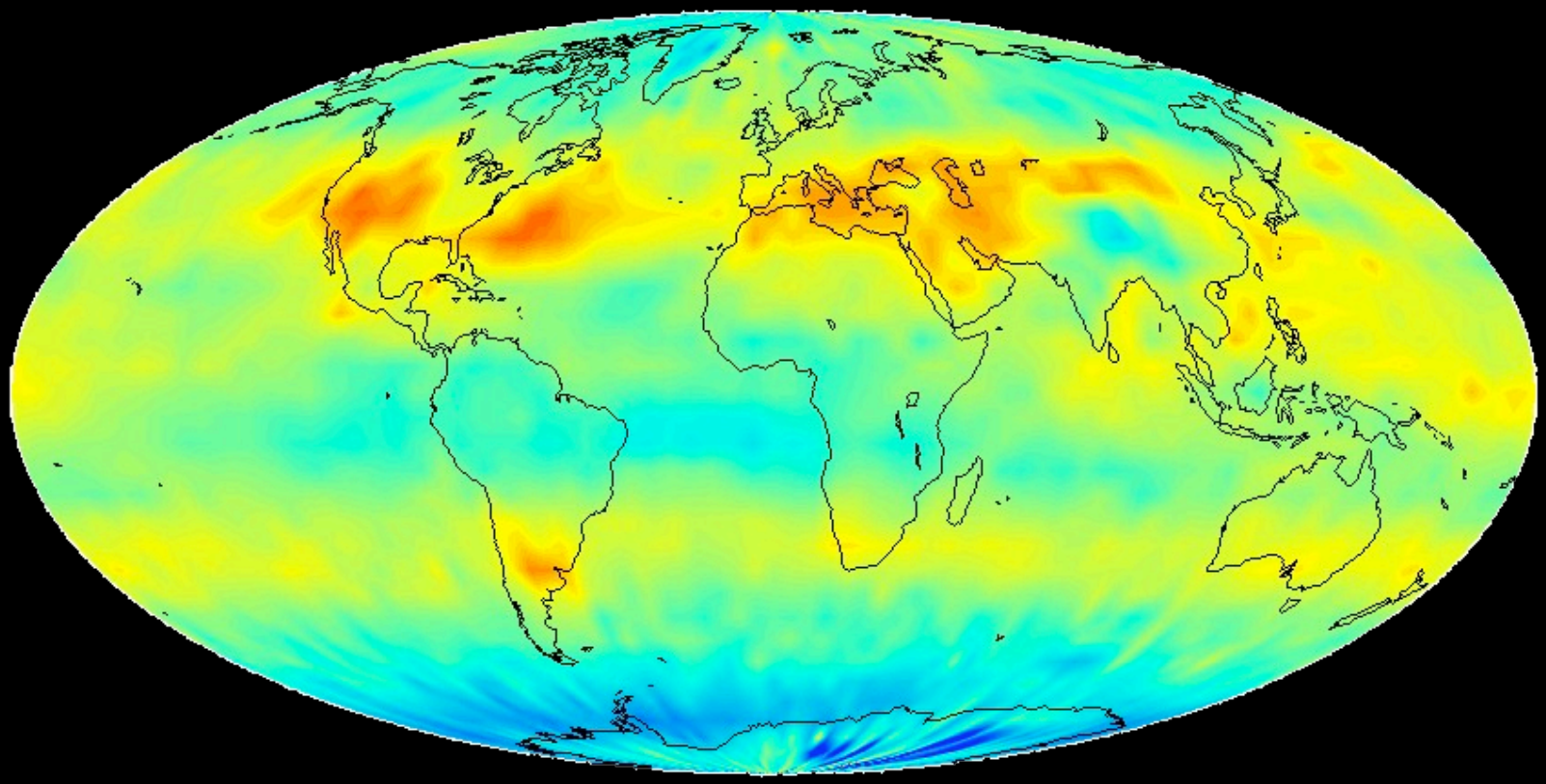
Features

- Higher Spectral Resolution
  - **Resolves Boundary Layer**
  - Improves Vertical Resolution
- Higher Spatial Resolution
  - Improves Cloud Clearing
  - Gives Surface Spectral Emissivity
  - Allows 3D Transport Studies

Band	Spectral Range	Δν	Chans
MW1	2100 - 2950 cm^{-1}	1.0 cm^{-1}	787
MW2	1150 - 1650 cm^{-1}	0.5 cm^{-1}	1000
LW1	880 - 1150 cm^{-1}	0.5 cm^{-1}	637
LW2	650 - 880 cm^{-1}	0.4 cm^{-1}	674

AIRS Maps Global CO_2

AIRS Mid Tropospheric CO_2 Mixing Ratio, July 2003, Version 5



Ed T. Olsen, Luke Chen, Xian Jiang, Qinbin Li, Yuk Yung, Tom Pagano & Mous Chahine