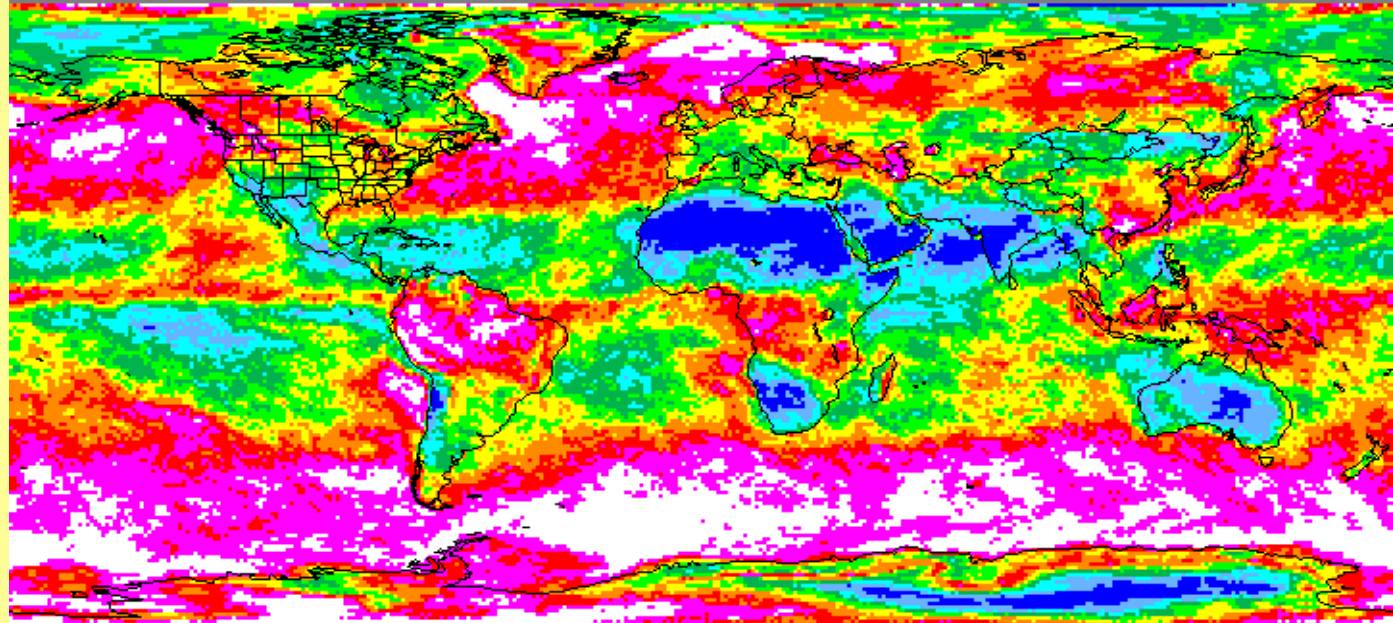


CERES MODIS – cloud products

(P. Minnis)

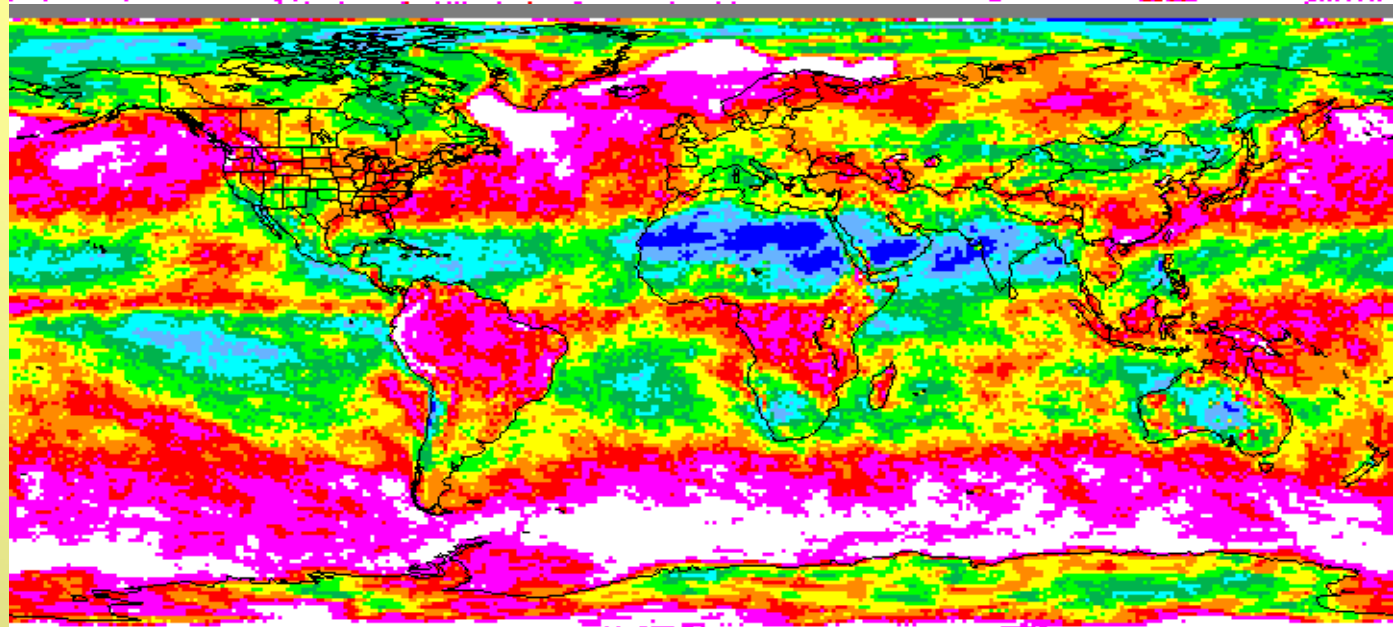
- **available CERES cloud products:**
 - **AMOUNT (or cloud cover)**
 - **OPTICAL DEPTH**
 - **WATER PATH (water and ice)**
 - **SIZE (droplet eff. radius, ice eff. diameter)**
 - **CLOUD TOP LOCATION (height, pressure)**
 - **THICKNESS (geometric)**
 - **EMISSIVITY**
 - **PHASE (water, mixed, ice)**
- **data are available for the year 2000**
at CERES footprint 20-km resolution & 1-deg res

Terra (am)



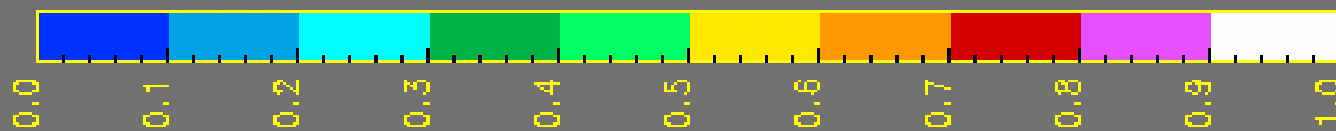
Aqua (pm)

cover ~2%
greater at day

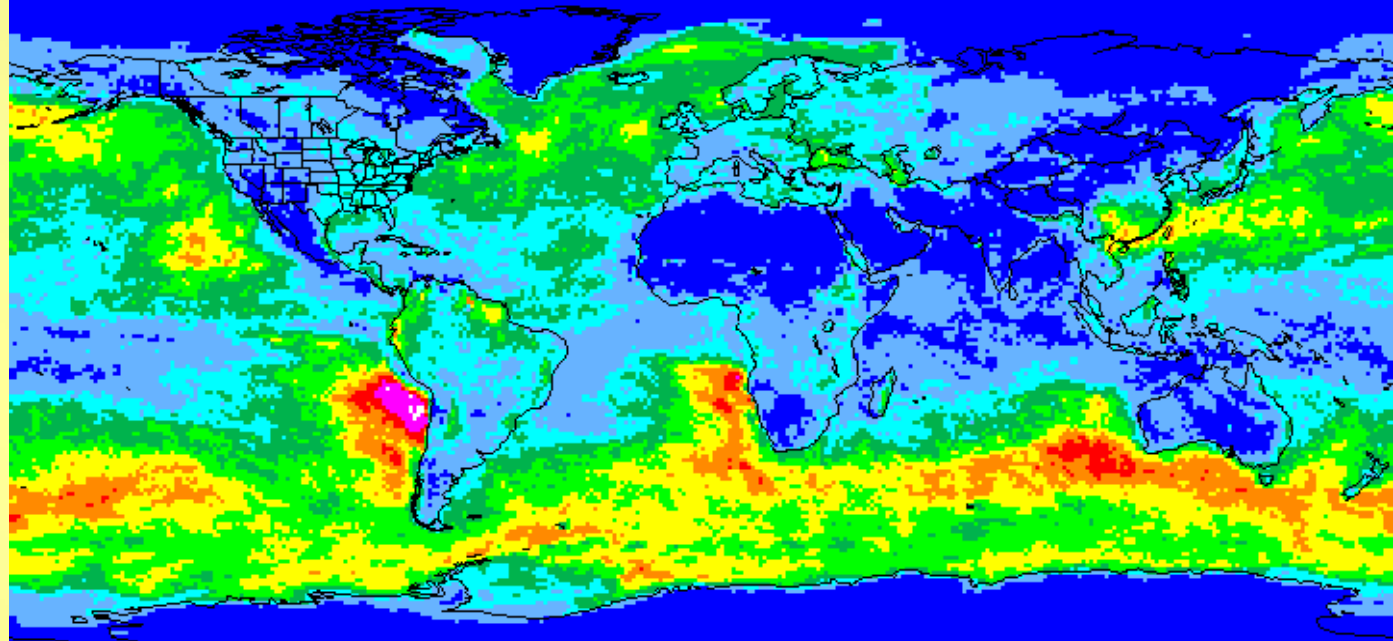


**MEAN CLOUD
COVER**

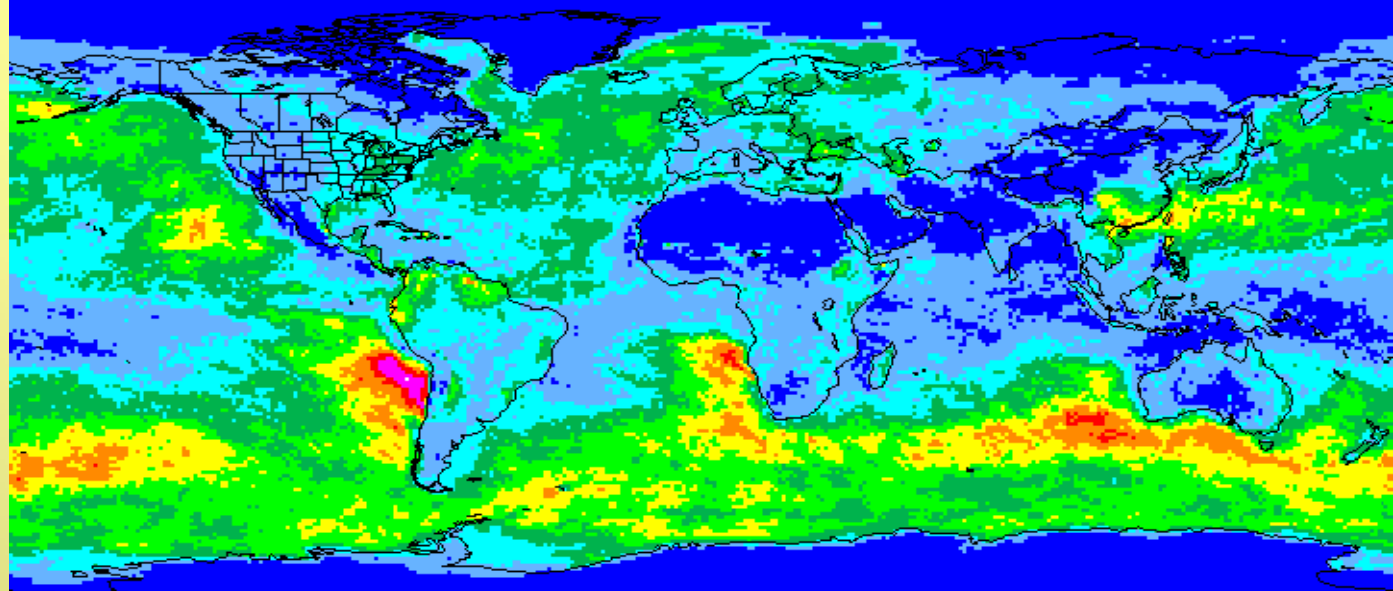
MAR 2003, DAY



Terra (am)

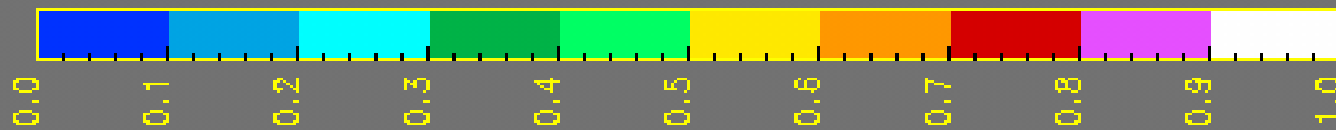


Aqua (pm)

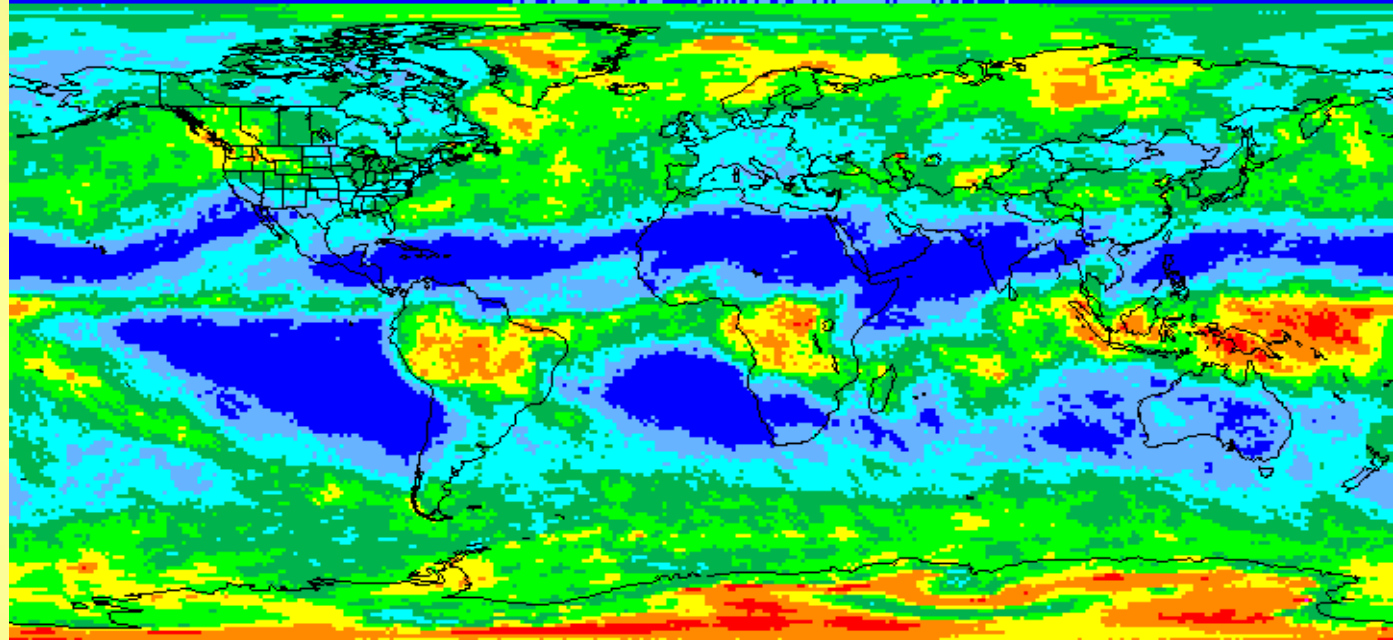


**MEAN CLOUD
COV. WATER**

MAR 2003, DAY

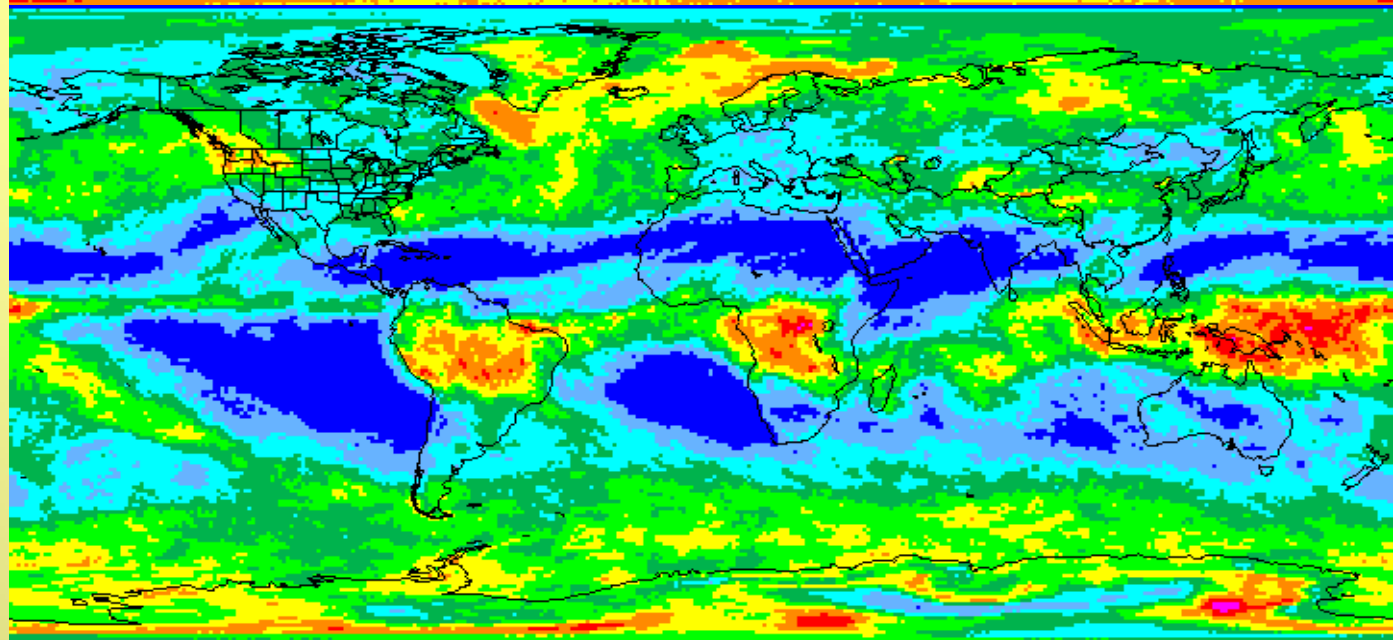


Terra (am)



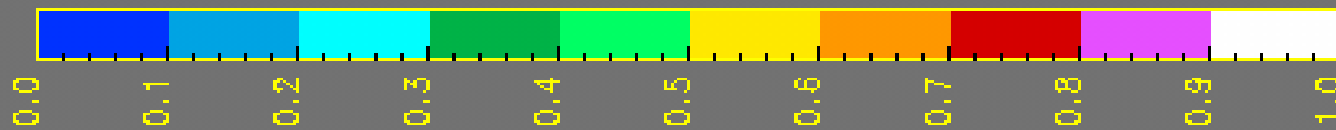
Aqua (pm)

ice fraction ~4%
greater at day

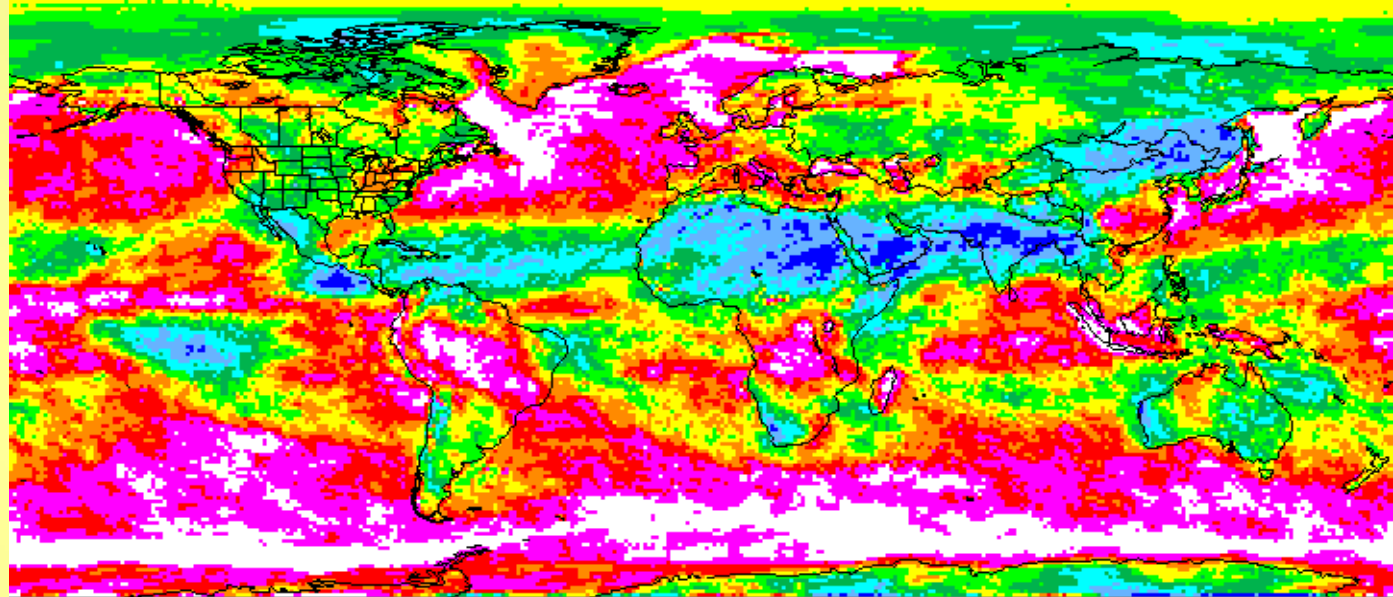


**MEAN CLOUD
COVER ICE**

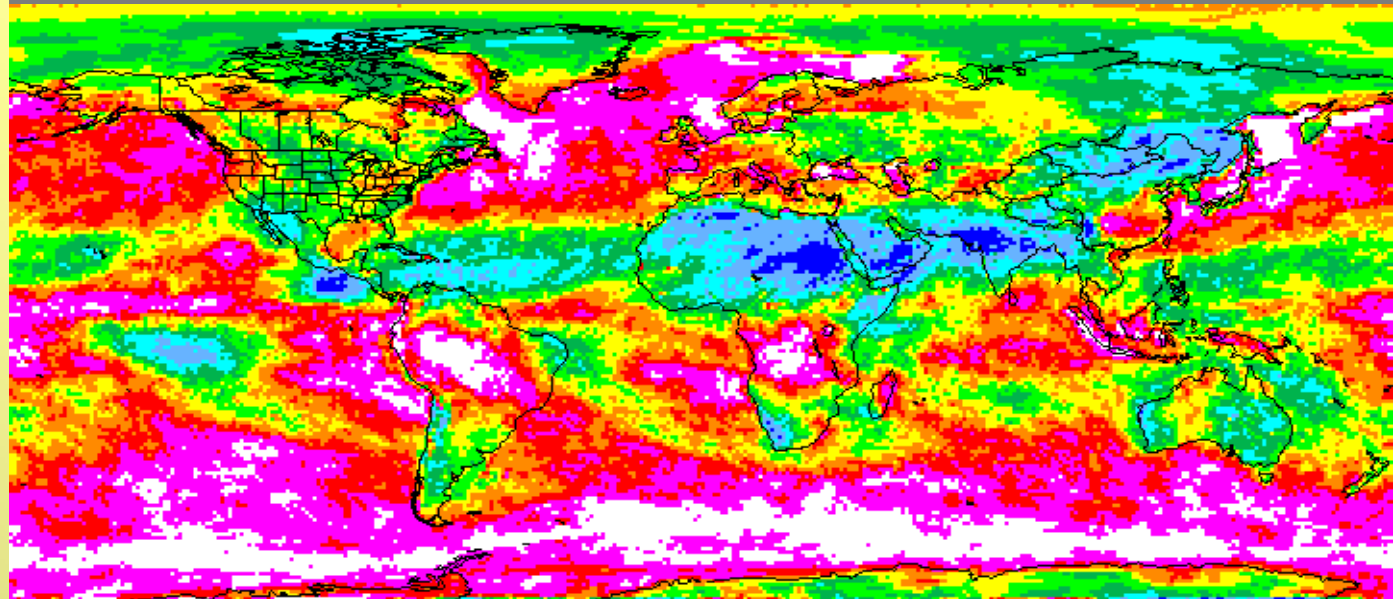
MAR 2003, DAY



Terra (am)

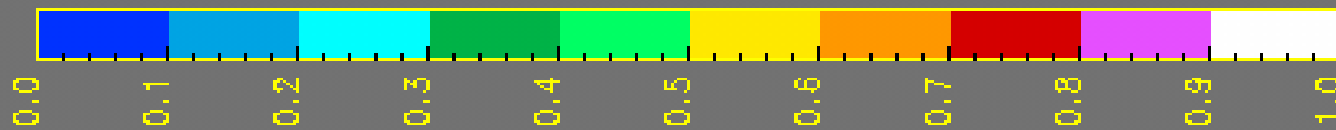


Aqua (pm)

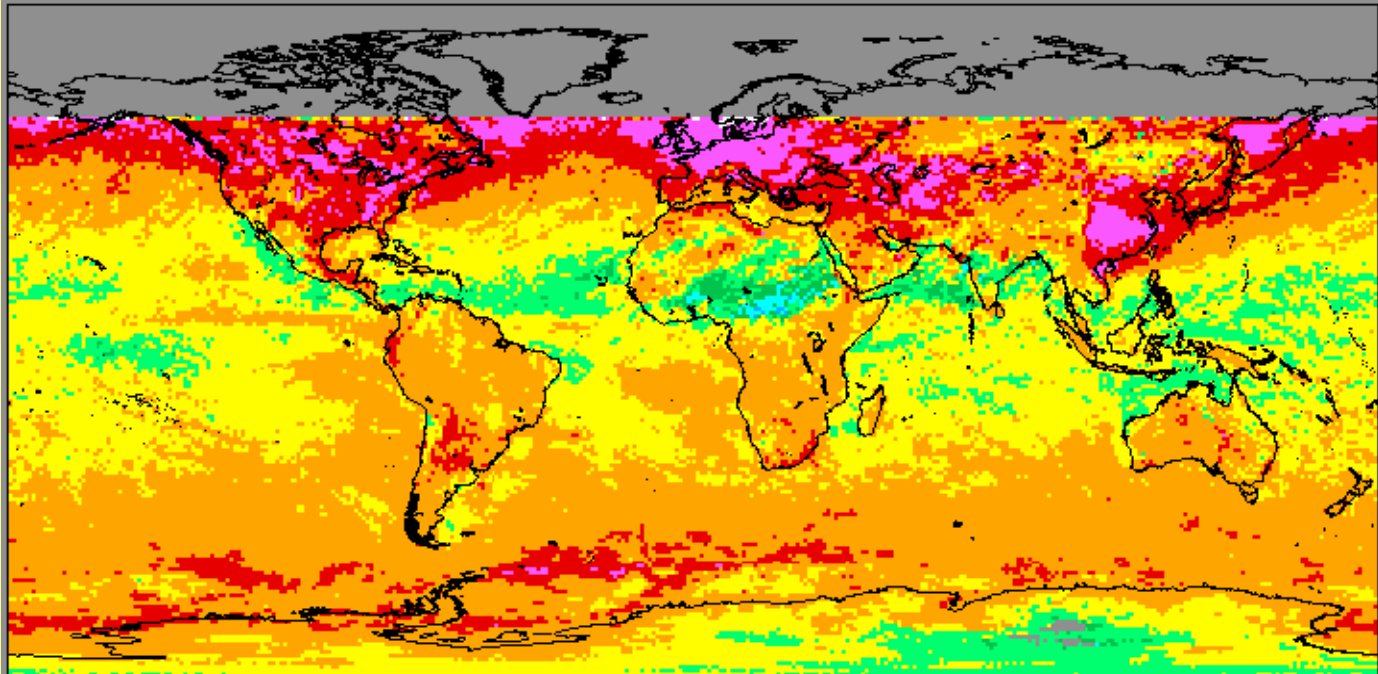


**MEAN CLOUD
COVER**

DEC 2002, NIGHT



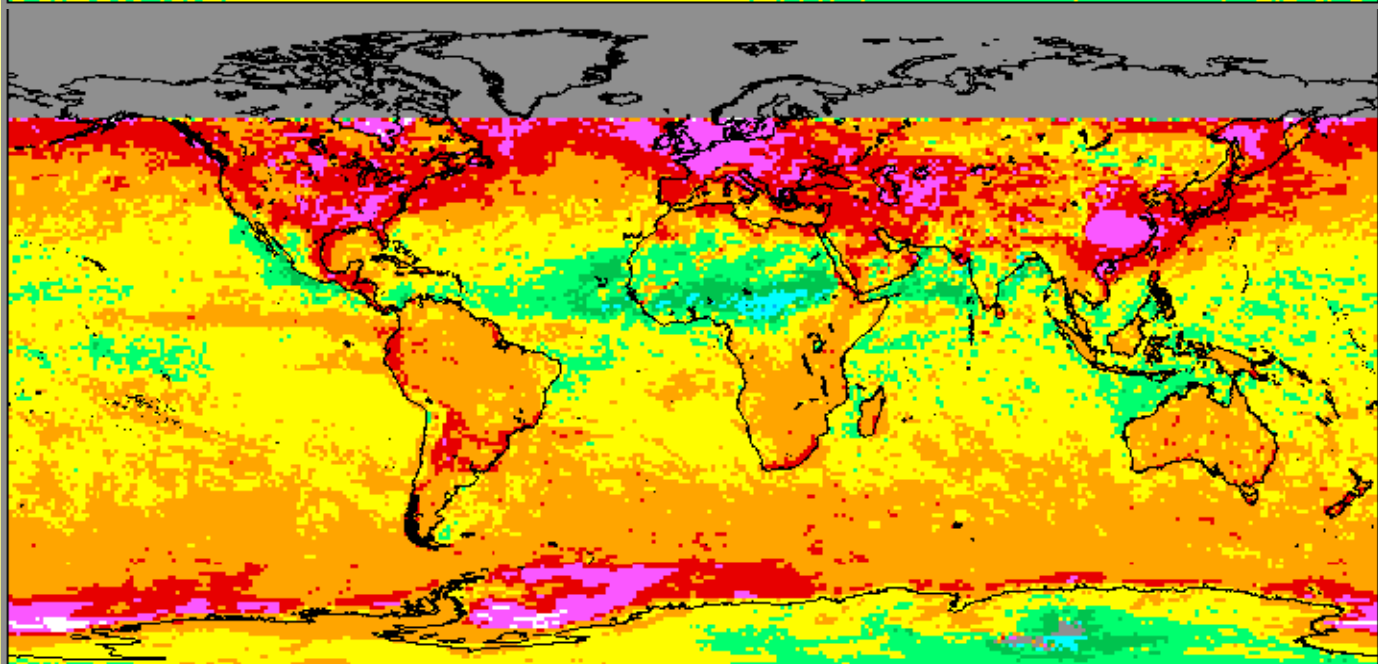
Terra (am)



Aqua (pm)

opt.depth ~8% less

(some diurnal, some
phase class differences
due to use of 2.1 instead
of 1.6 μm channel)

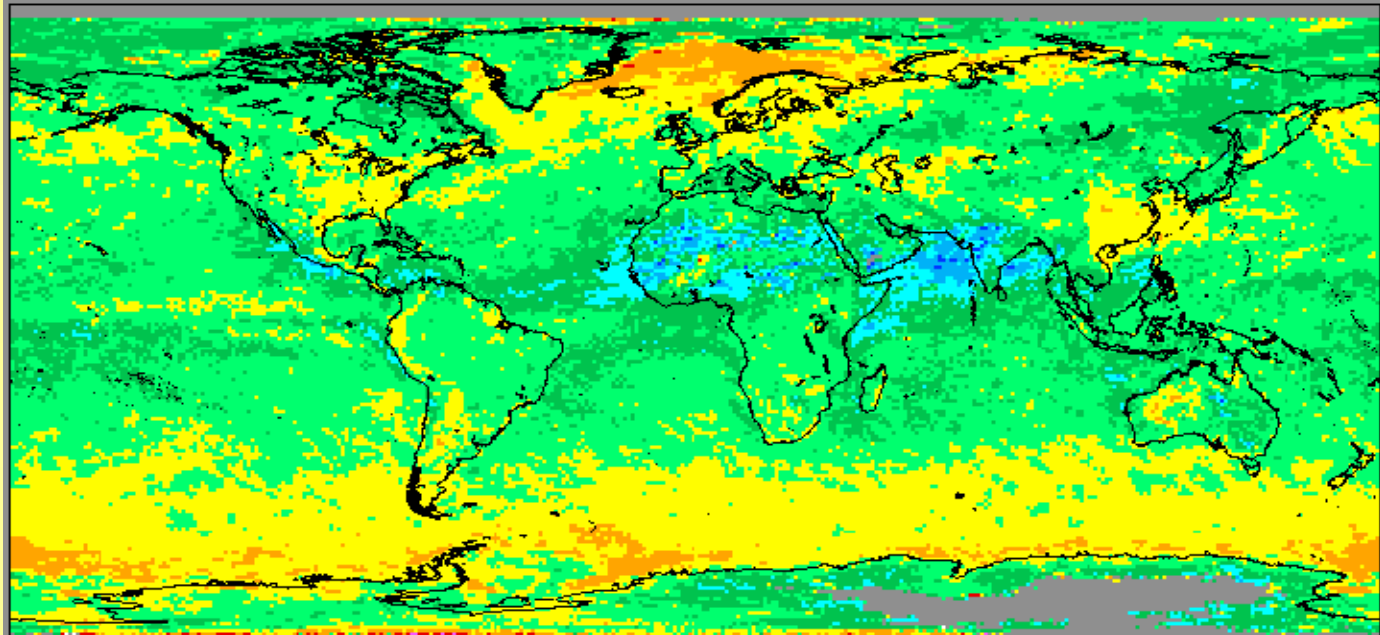


**MEAN WATER
CLOUD OPT. DEPTH
(0.65 μm)**

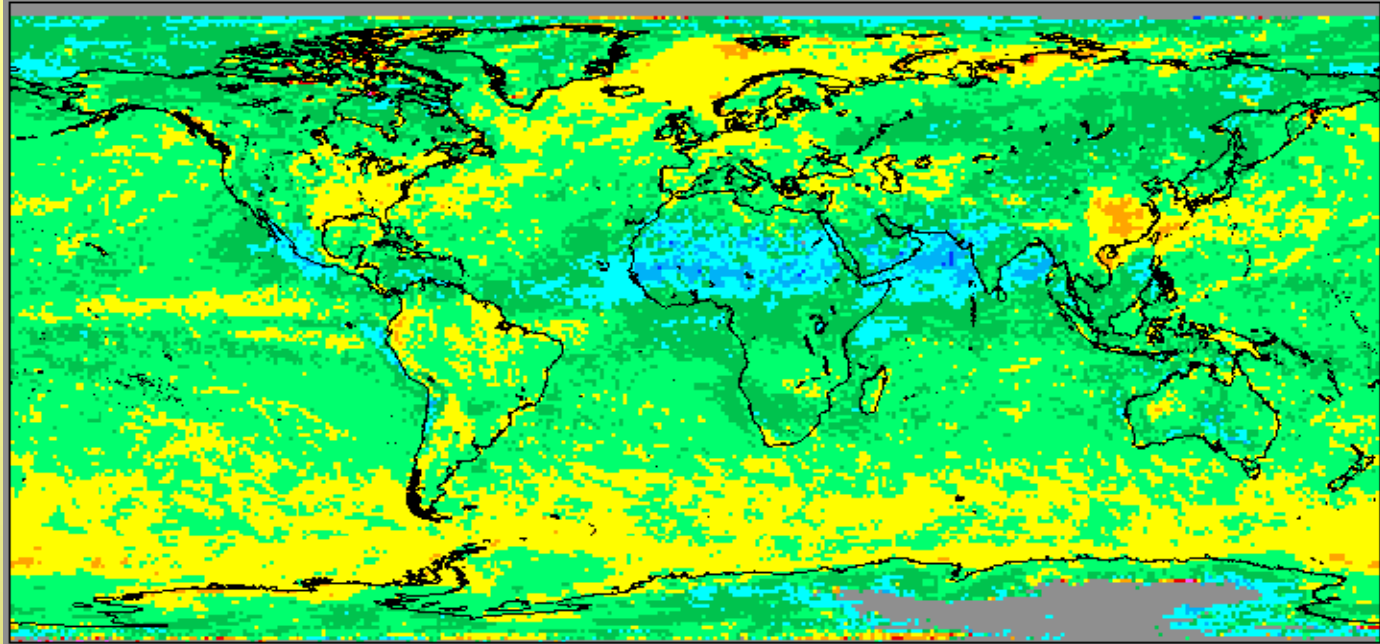
DEC 2002, DAY



Terra (am)

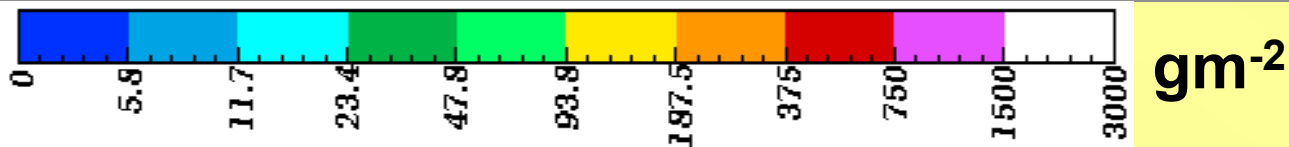


Aqua (pm)

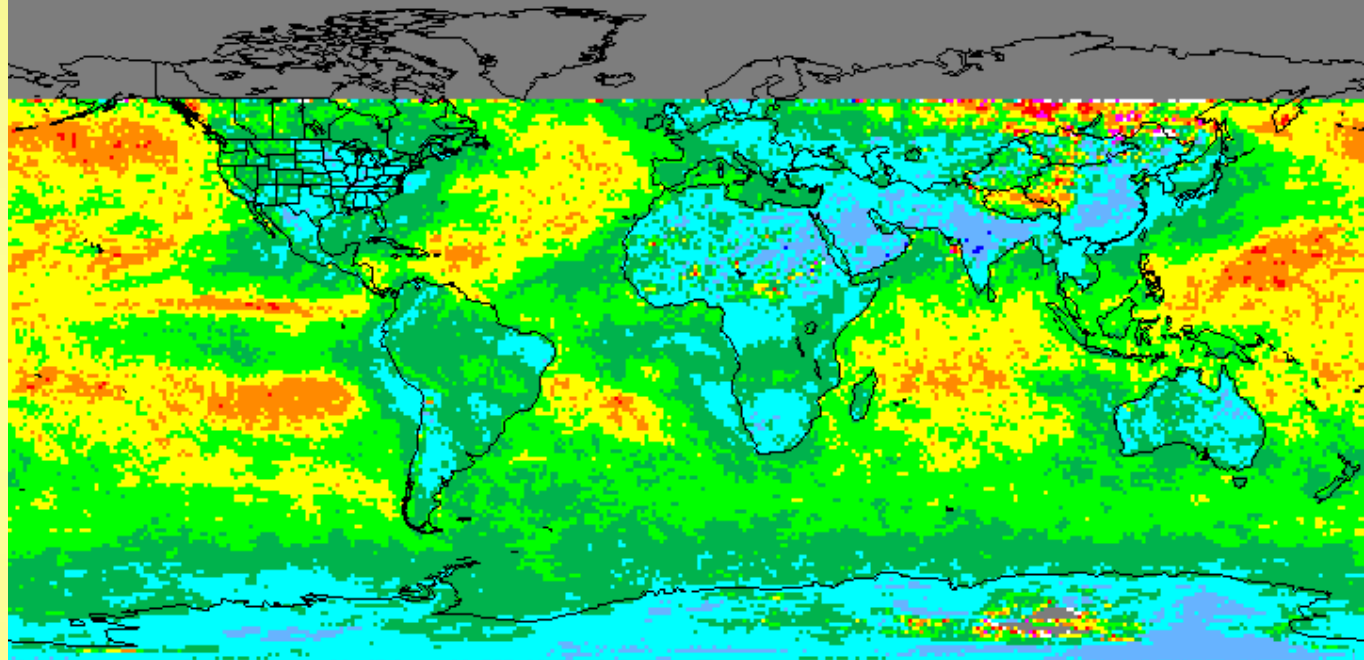


**MEAN LIQUID
WATER PATH**

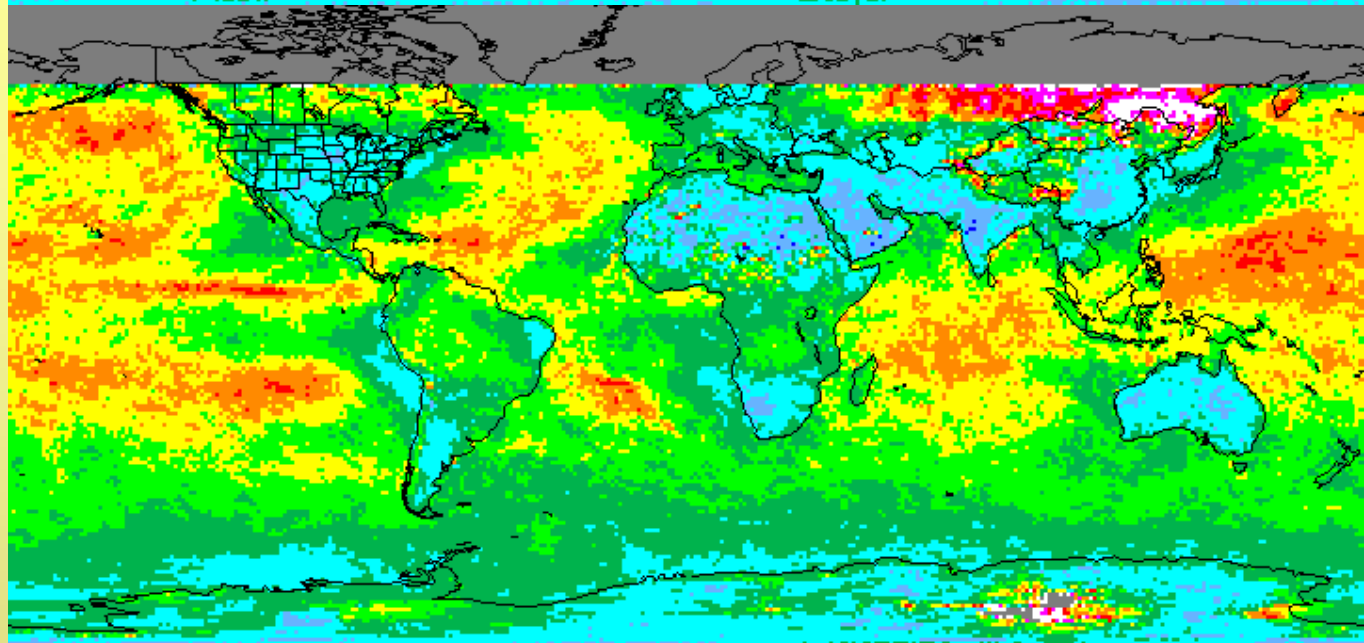
MAR 2003, DAY



Terra (am)



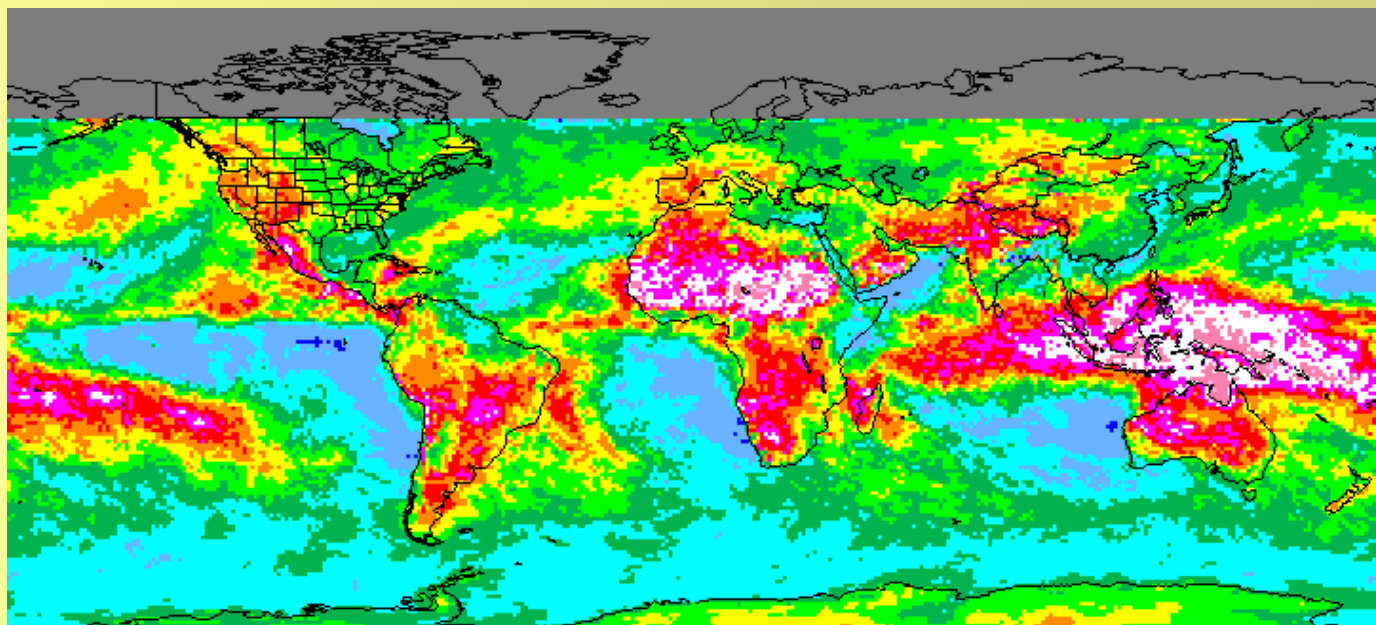
Aqua (pm)



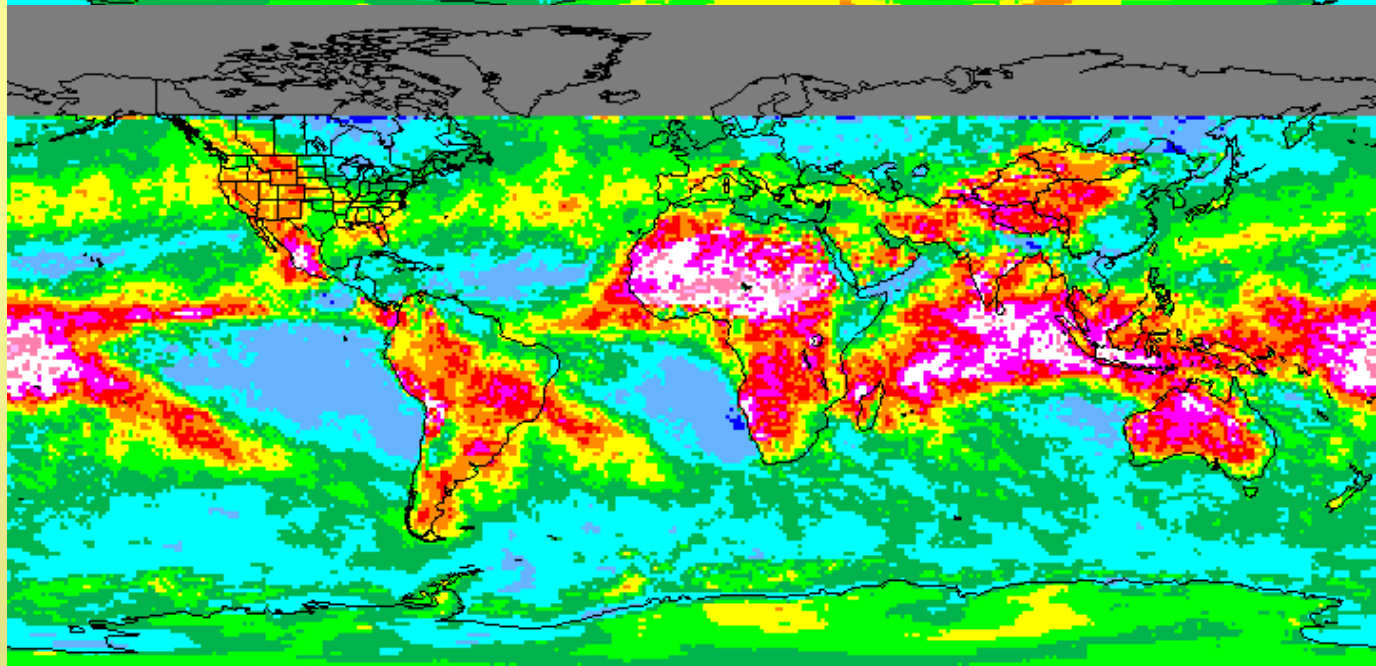
**MEAN EFF.
DROP RADIUS**
MODIS, DEC 2002



yr 2000

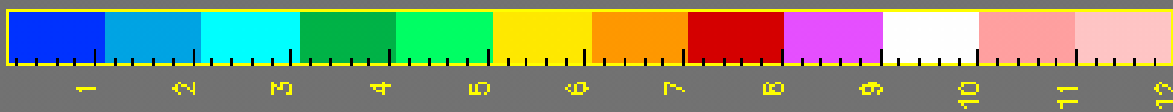


yr 2002



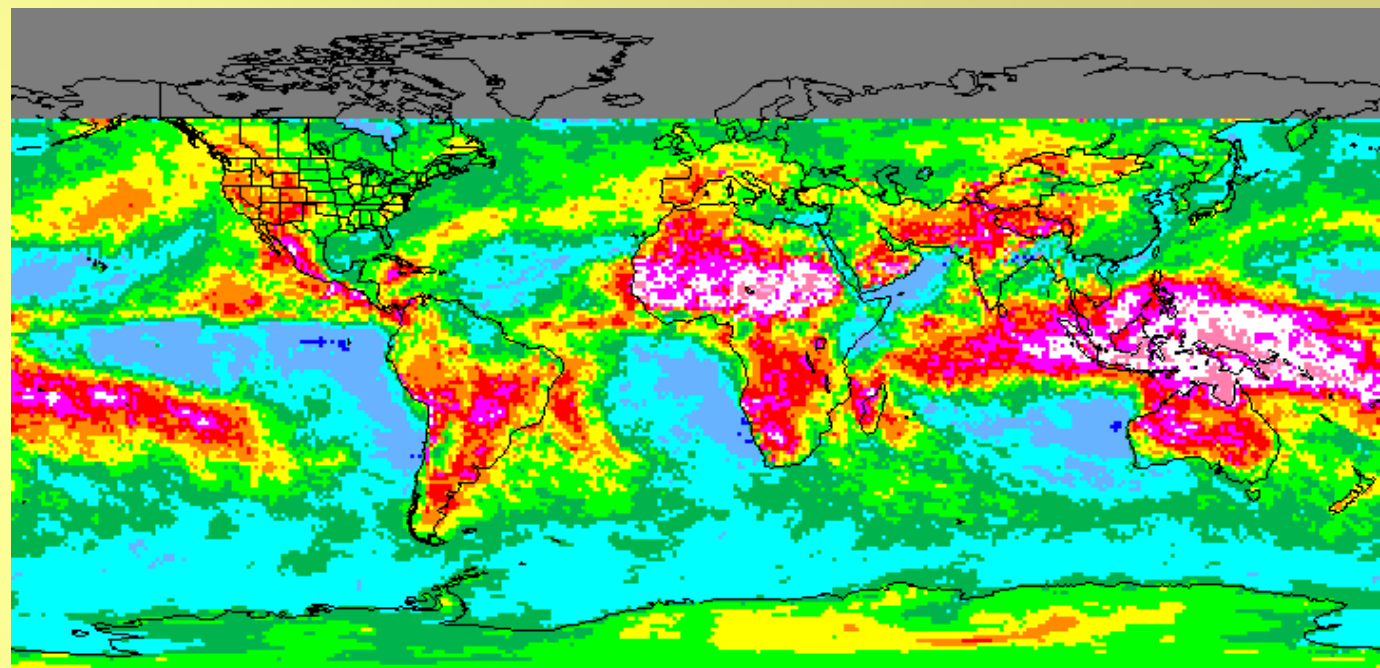
**MEAN EFF.
CLOUD HEIGHT**

TERRA, DEC, DAY

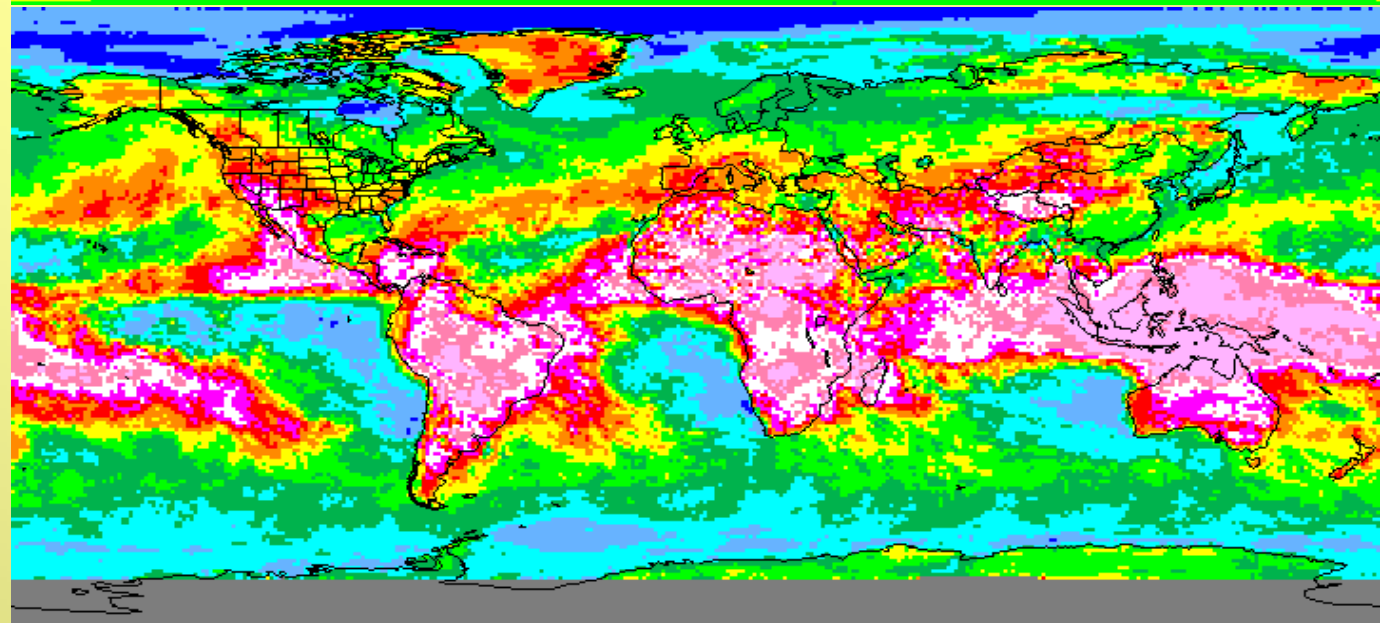


km

day

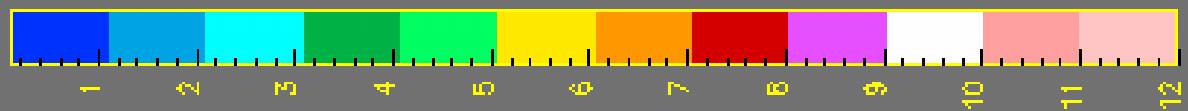


night



**MEAN EFF.
CLOUD HEIGHT**

Terra, DEC 2000



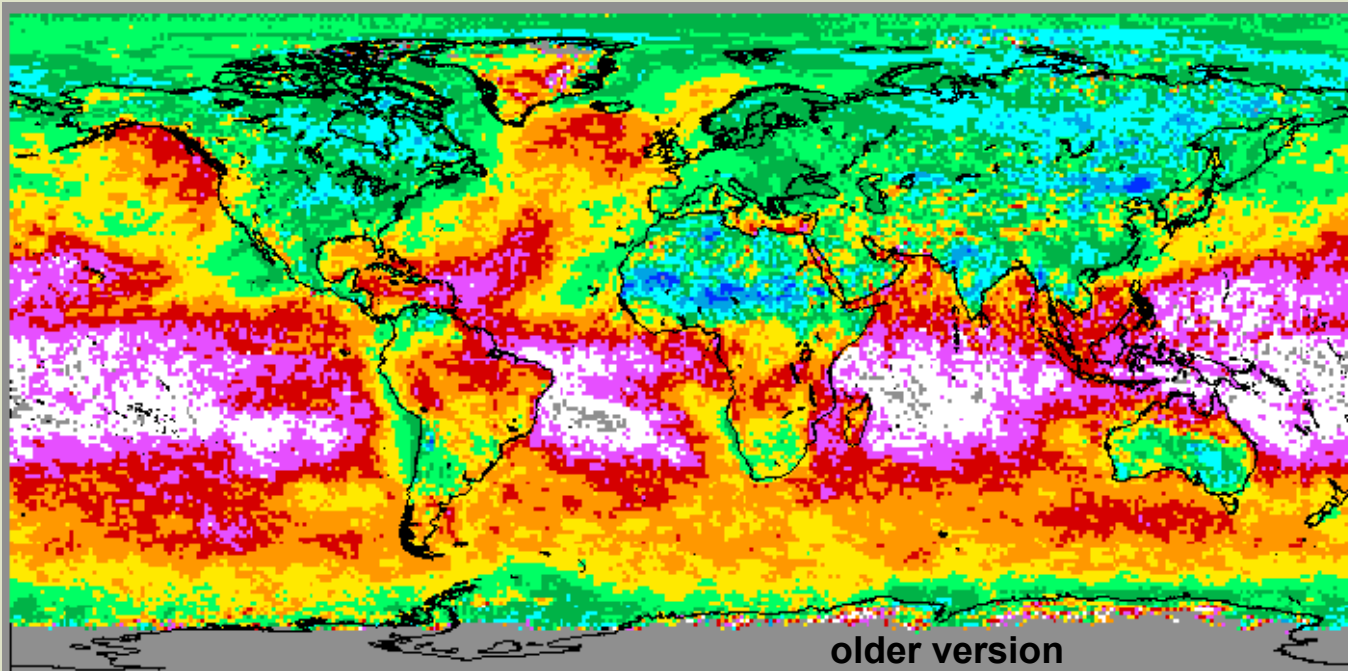
km

CERES MODIS – cloud products

- **high quality products:**
 - r_{eff} (realistic values)
 - low altitude cloud height (realistic over ocean)
 - l_{wp} (good comparison with microwave)
 - i_{wp} (good comparisons to radar)
- **comparisons**
 - cloud fraction less than MODIS (off.) or ISCCP
 - cloud fraction is close to surface observations

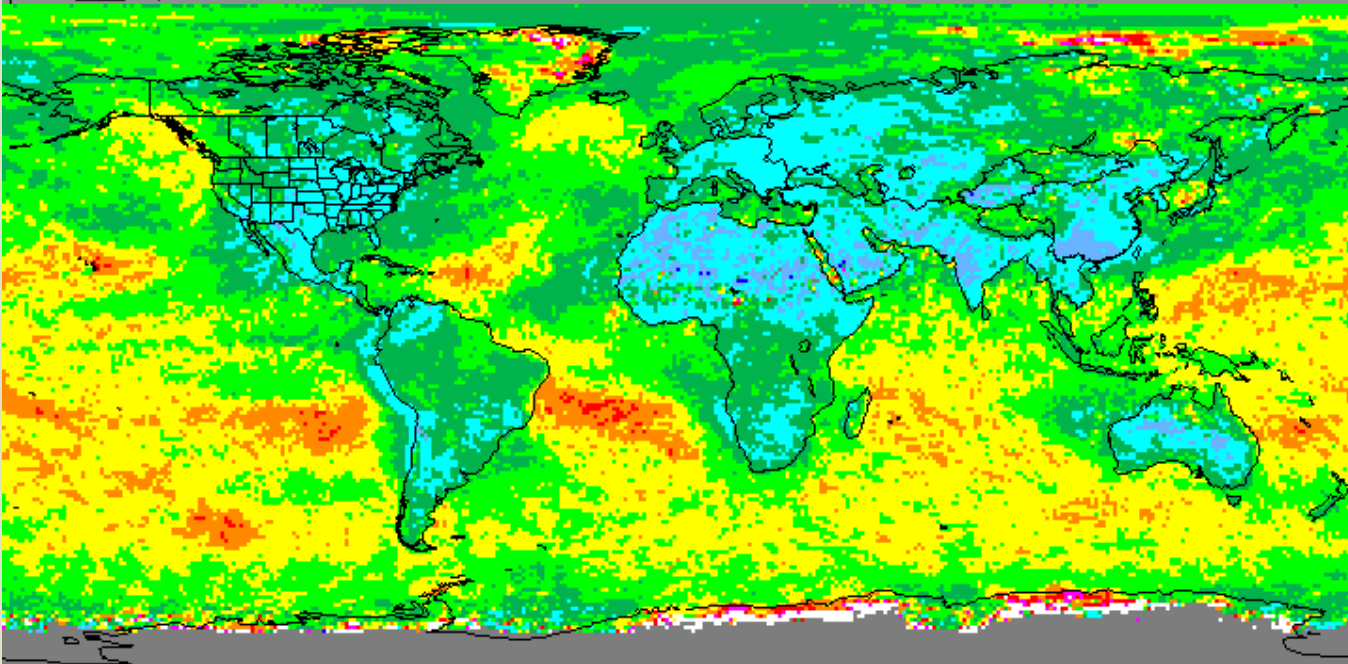
DAYTIME TERRA WATER DROPLET RADIUS, April 2001

MOD08
MODIS
TEAM

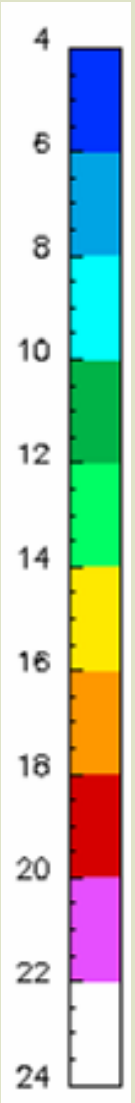


older version

ED2
CERES

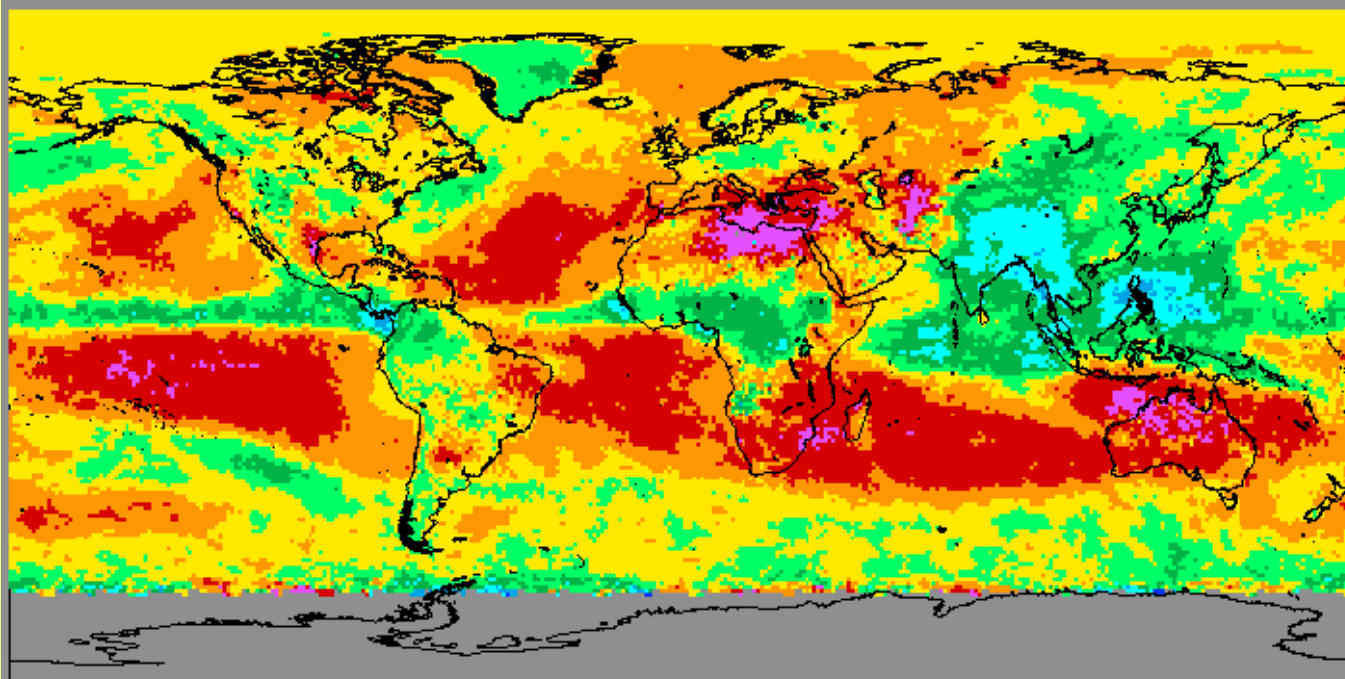


μm

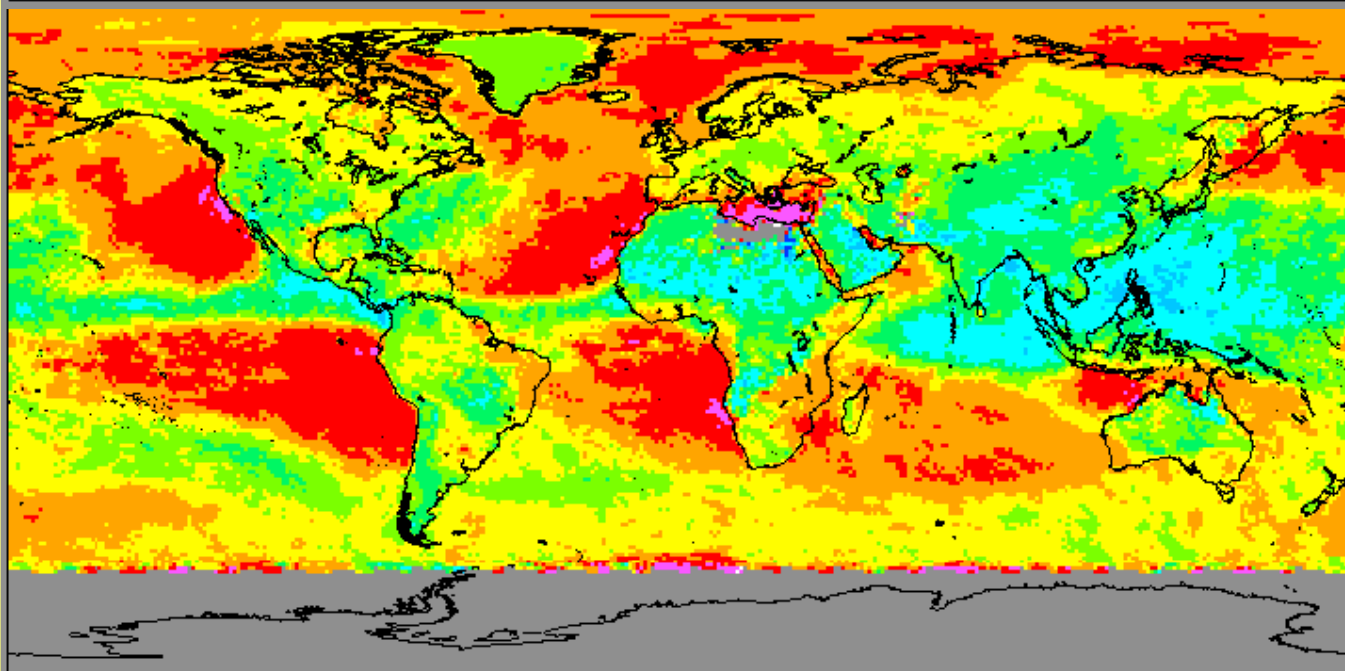


DAYTIME TERRA CLOUD TOP PRESSURE, JULY 2000

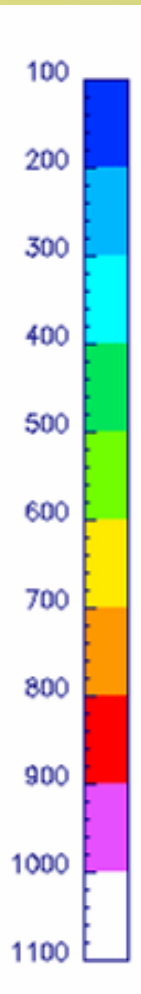
MOD08
MODIS
TEAM



ED2
CERES



hPa



CERES MODIS – cloud products

(P. Minnis)

- **references and PDFs**

<http://www-pm.larc.nasa.gov/ceres/ceres-ref.html>

- **images and summaries**

<http://lposun.larc.nasa.gov/~cwg/>

- **data access (Langley DAAC)**

<http://eosweb.larc.nasa.gov/HPDOCS/>