

# **INTERNATIONAL SAND & DUST STORM WARNING ADVISORY & ASSESSMENT SYSTEM**

**American Society for Photogrammetry  
& Remote Sensing**

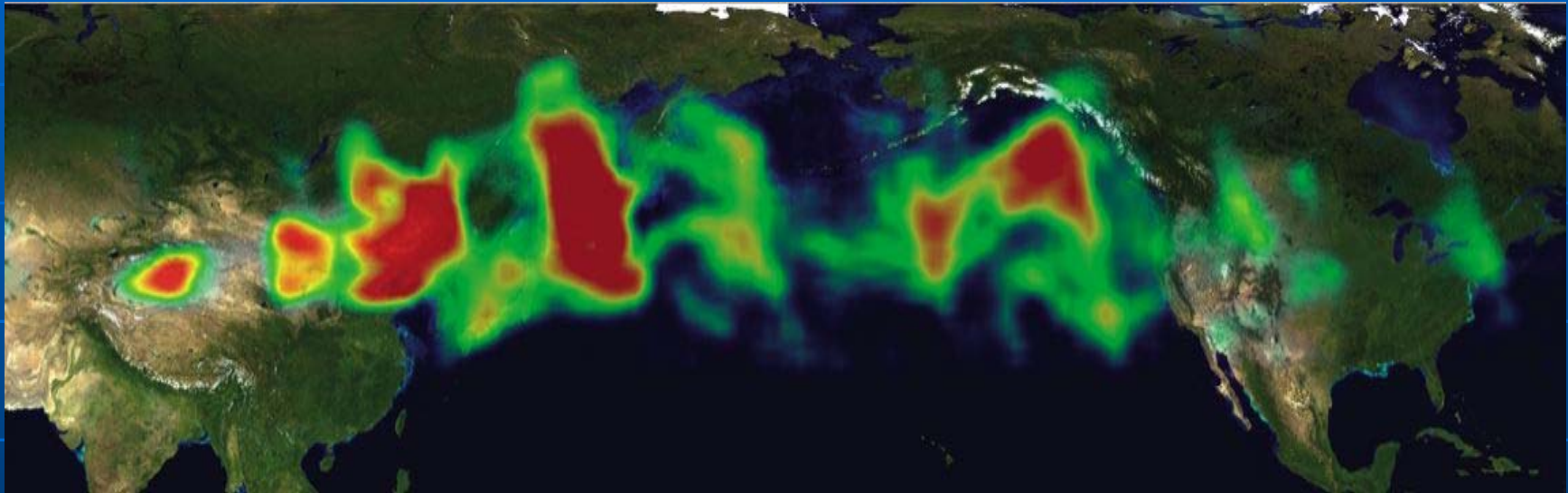
**PECORA 17**

**GEOSS Session on Air Quality & Human Health**

**Denver, Colorado  
18 November 2008  
William A. Sprigg**



# *Asian Dust Over North America*



**Satellite-derived Aerosol Optical Depth Over Several Days  
in April 2001 (a NASA composit)**

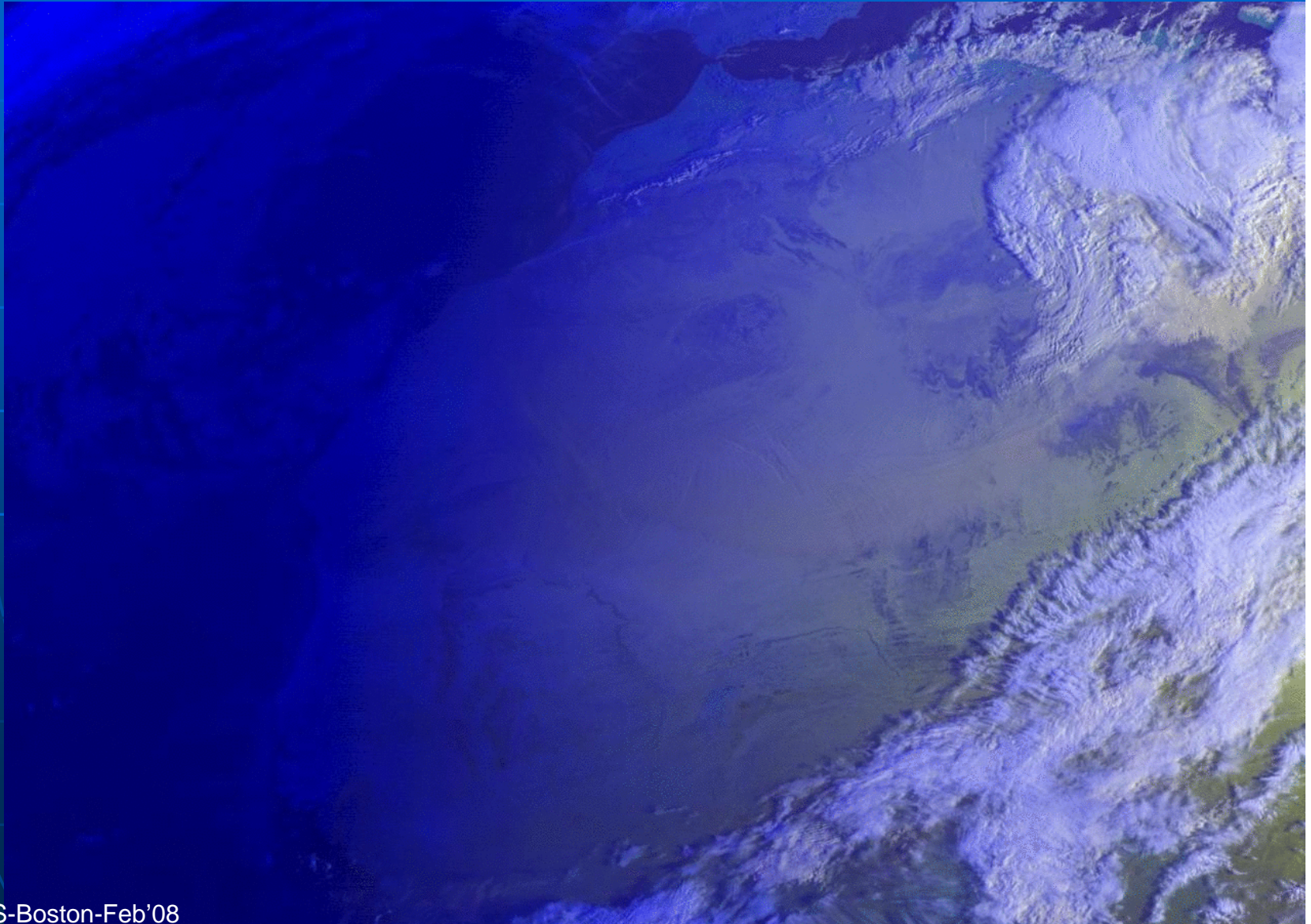
# Saharan Dust Storm

3-4 March 2004

*Courtesy: World Meteorological Organization's Sand & Dust Storm Centre, Barcelona*

EU  
Meteo  
Sat

15-min  
time  
steps



# Meningitis in Africa



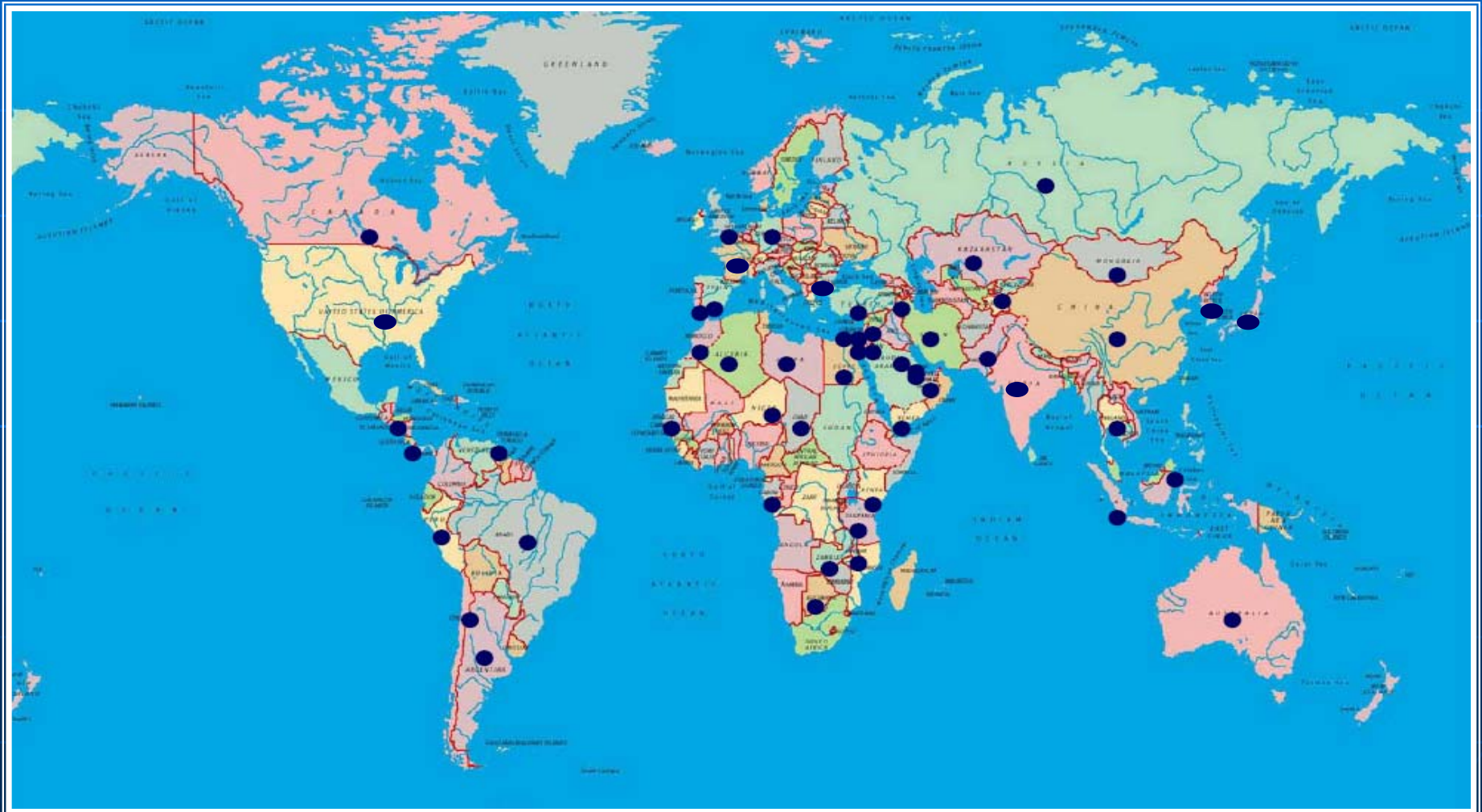
**Meningococcal meningitis occurs worldwide but especially so in dry Sub-Saharan Africa: the "African meningitis belt", including Nigeria, Burkina Faso, Mali, Niger, Chad, Cameroon.... 1996: 300,000 cases reported to WHO – 10.2% fatal**

# Valley Fever Endemic Zone



Hector and Laniado-Laborin, 2002

# WMO Survey of Interest Addressing Sand & Dust Storms



# *The WMO Sand & Dust Storm Warning Advisory & Assessment System*

A Federation to “**Deliver products useful in reducing adverse effects of sand and dust storms.**”

**World-Wide Sand & Dust Storm Detection**

**Model-Based Simulations & Forecasts**

**Measurements & Monitoring**

**Source Characteristics: Mapping & Monitoring**

**Information Access & Dissemination**

**Training & Technology Transfer**

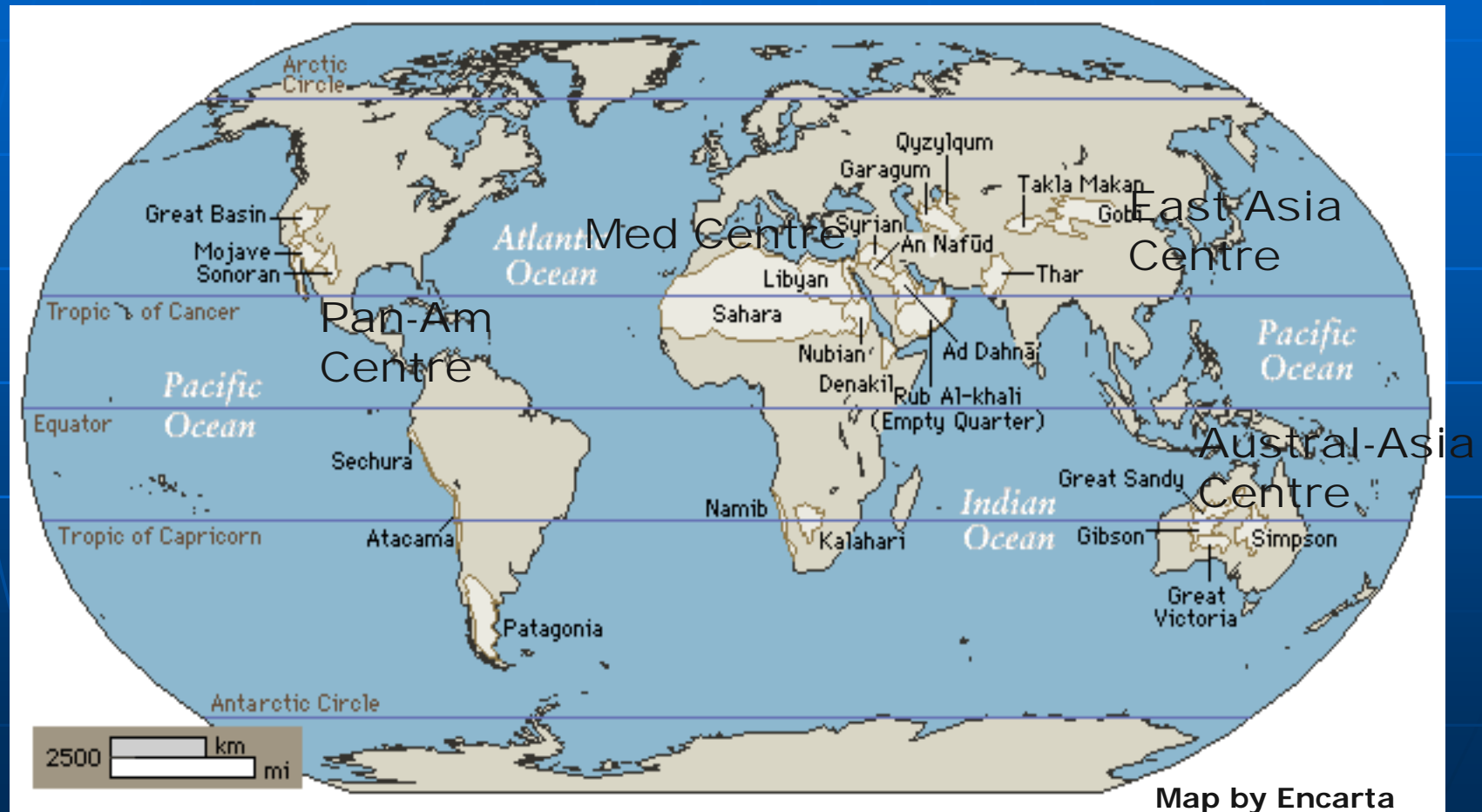
# *The WMO Sand & Dust Storm Warning Advisory & Assessment System*

- WMO Lead: Department of Research with WMO Departments of Weather and Disaster Risk Reduction Services
- Collaborating Agencies & Institutions World-Wide
- Regional SDS-WAS Centres



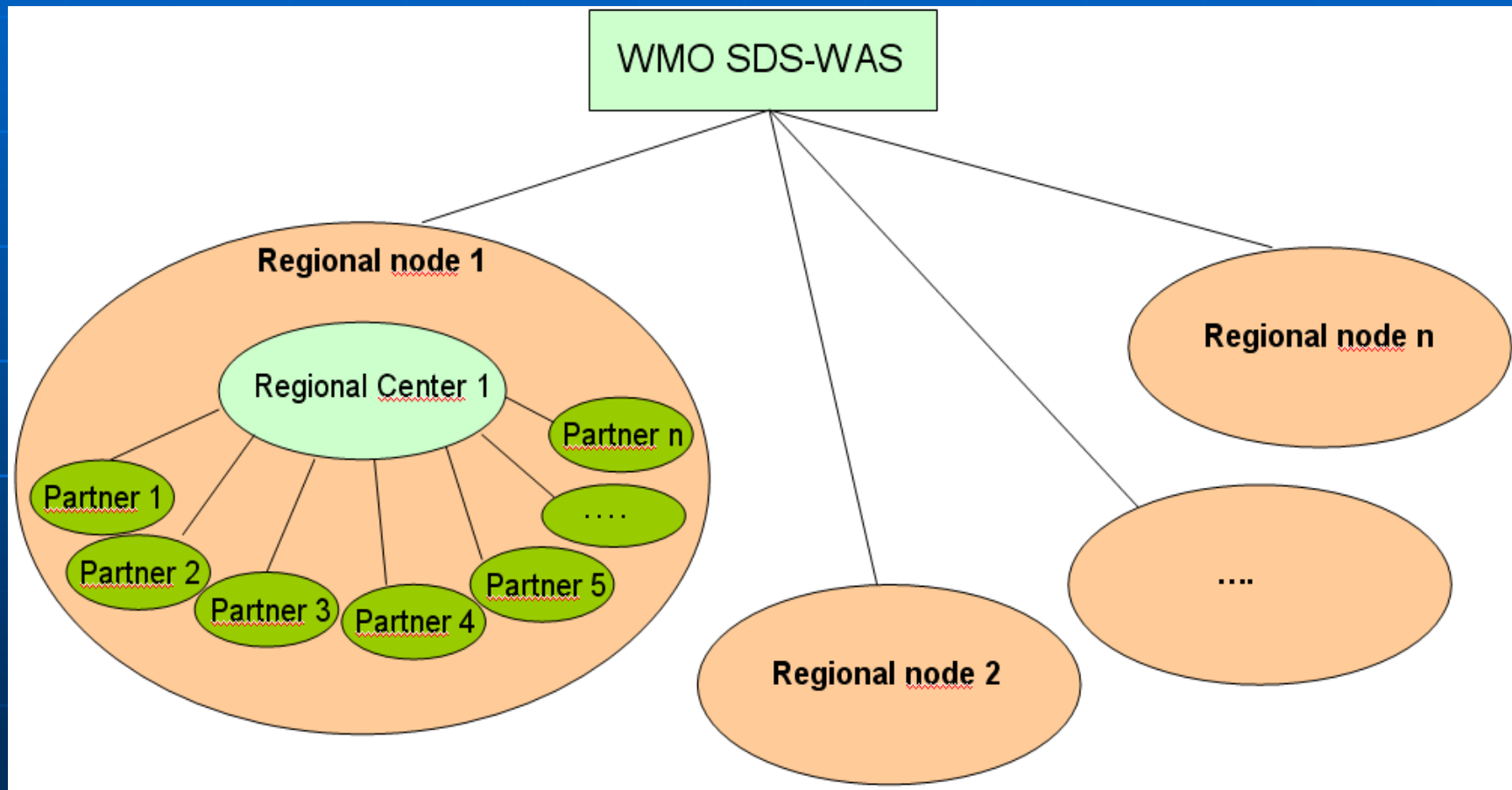
# Regional Centres

Centres Are Hubs for Collaboration



# Regional Centres

## Supporting Nodes of Federated Collaboration



# Regional Centres

- *East Asian Centre* – China, Japan, Korea, Mongolia

- **Host:**

- **China Meteorological Administration**

- **Satellite Meteorological Centre**

- **National Meteorological Centre**

- **Centre for Atmospheric Watch & Services**

- *Mediterranean North Africa, Middle East, Europe Centre*

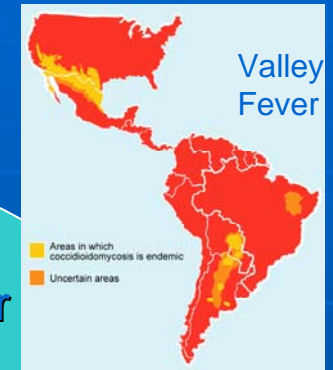
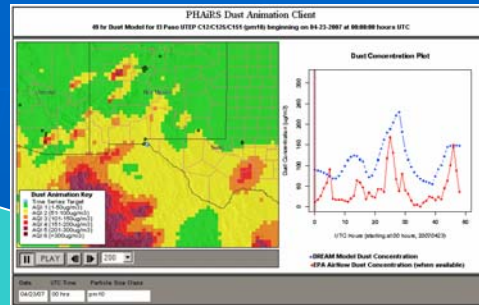
- *Pan-American Centre (proposed)*

- *Austral-Asia Centre (proposed)*

# Regional Centres

- *East Asian Centre*
- *Mediterranean North Africa, Middle East, Europe Centre –*  
**Meteo France, U. of Athens, U. of Tel Aviv,  
Egyptian Meteorological Agency**
  - **Hosts:**
    - **Barcelona Supercomputing Centre**
    - **National Institute of Meteorology**
    - **National Research Council**
- *Pan-American Centre (proposed)*
- *Austral-Asia Centre (proposed)*

# Pan-American SDS-WAS Centre (Proposed)



**Simulations & Experimental Forecasts**  
 NOAA/NCEP  
 USN/NRL  
 NASA Earth Science

**Client Base**  
 Practitioner & Policy Maker  
 Health, Air/Water Quality,  
 Transportation, Agriculture  
 State Health & AQ Offices  
 Valley Fever Center of Excellence

**Information Portal**  
 Public & Partner  
 NCDC

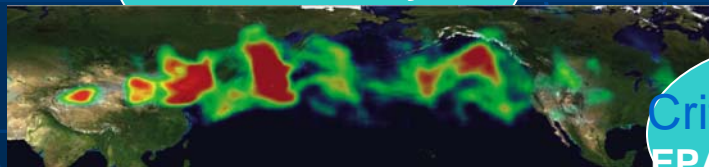
WMO Sand/Dust  
 Warning System  
 GEONETCast  
 Public Access

**Atmospheric Observations & Modeling**  
 NOAA/GFDL/NCEP/NESDIS  
 NASA, Navy

**Surface Source Mapping & Monitoring**  
 NASA, USGS, NPN

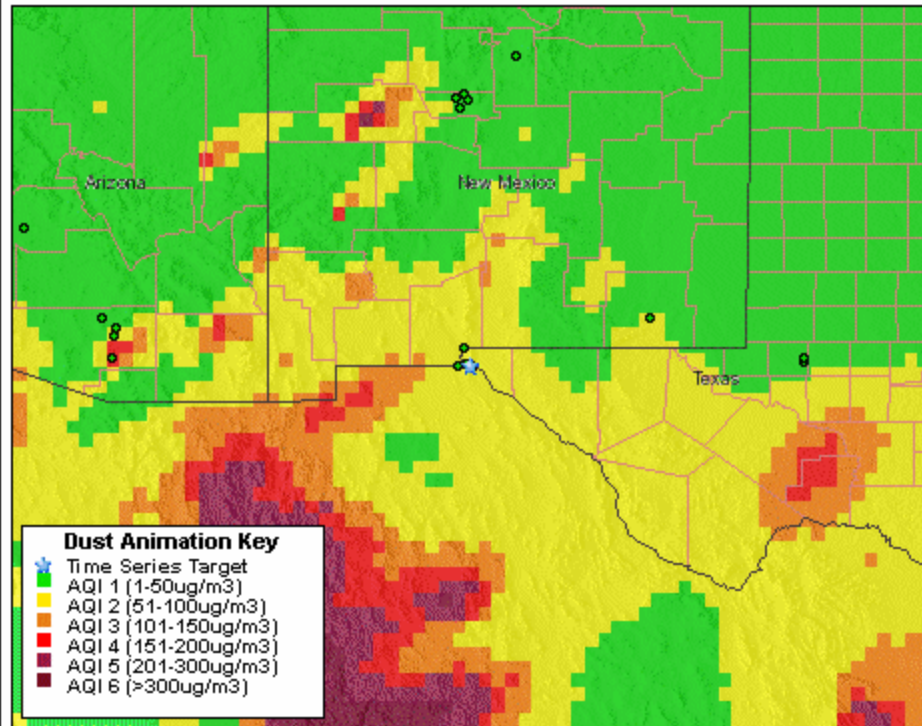
**Critical Sources**  
 EPA, USGS, USDA

Climate Change  
 AirQuality  
 Assessments



# PHAIRS Dust Animation Client

49 hr Dust Model for El Paso UTEP C12/C125/C151 (pm10) beginning on 04-23-2007 at 00:00:00 hours UTC

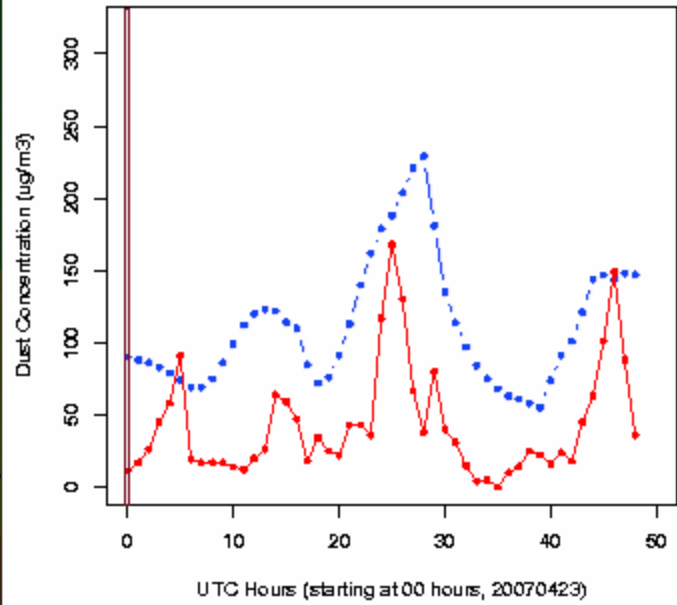


- Dust Animation Key**
- Time Series Target
  - AQI 1 (1-50ug/m3)
  - AQI 2 (51-100ug/m3)
  - AQI 3 (101-150ug/m3)
  - AQI 4 (151-200ug/m3)
  - AQI 5 (201-300ug/m3)
  - AQI 6 (>300ug/m3)

Control panel with buttons for Play, Stop, and a speed slider set to 200.

Date	UTC Time	Particle Size Class
04/23/07	00 hrs	pm10

## Dust Concentration Plot



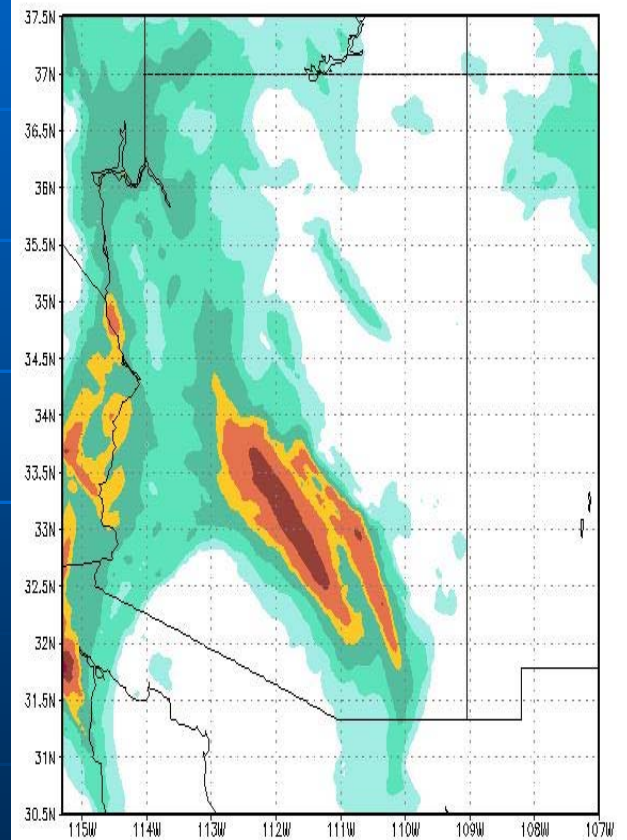
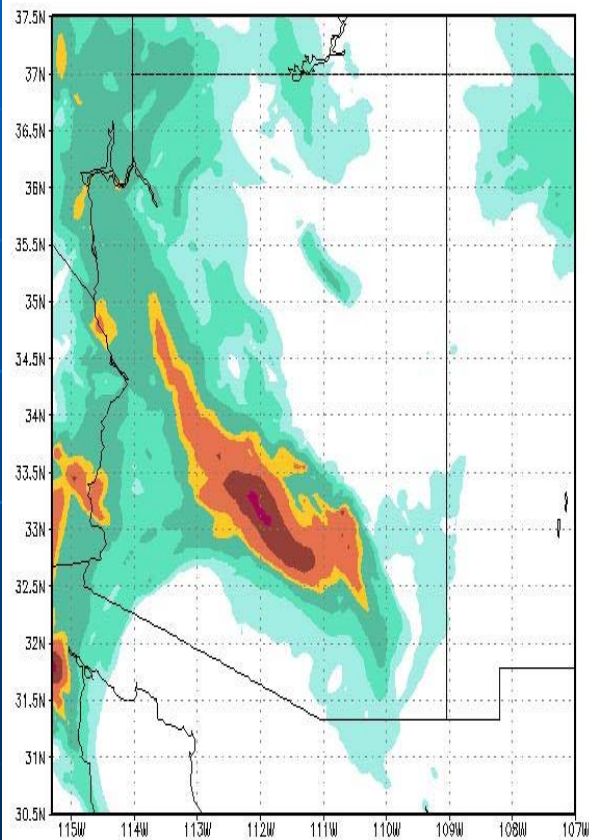
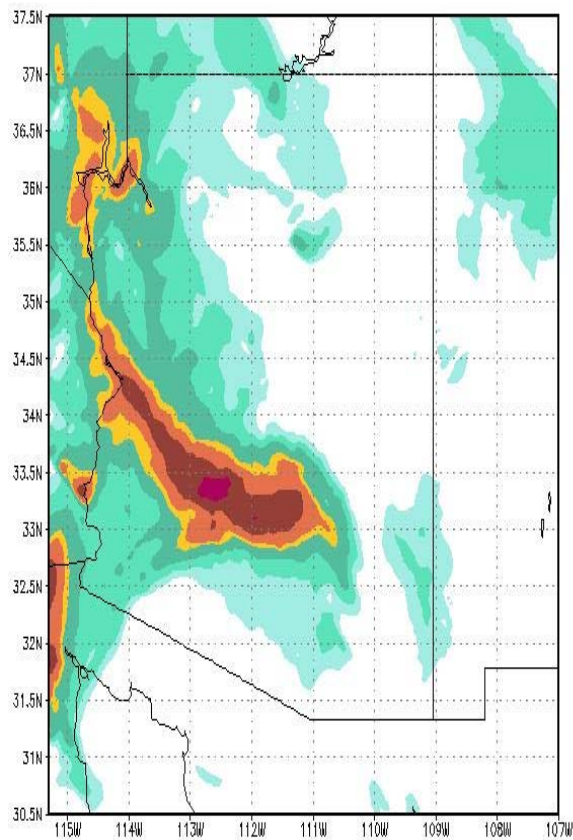
- DREAM Model Dust Concentration
- EPA AirNow Dust Concentration (when available)

PM 10 DREAM (1:8,000,000 scale)  
48-Hour Animation begins April 23, 2007, 00 hours UTC  
El Paso (EPA AIRNOW Station), Texas (31:46:11N, 106:30:00W)  
Animation prepared by W. Hudspeth, EDAC/UNM

..and, in July '07



# 18 July 2007 Early Morning in Phoenix 5 km Resolution Near Surface Dust Concentration



**With Acknowledgements**

**To my colleagues on the WMO SDS-WAS  
Implementation Plan Drafting Group:**

**Jose Baldasano (Spain)**

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**Menas Kafatos (USA)**

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- Karl Benedict
- Bill Hudspeth
- Tom Budge

UA

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- Goran Pejanovic
- Brian Barbaris
- Patrick Shaw

.. and to NASA Earth Science Applications

*Thank You!*