

Session 12: Climate records

- *Merging aerosol optical depth from multiple satellite missions, L. Sogacheva*
- *OMI record of AOD above clouds , H. Jethva*
- *GCOS aerosol requirements/statement of guidance, O. Kalashnikova*

Climate data record (CDR) : ***time series of long-term, high quality, consistent and continuous measurements to determine climate variability and change***

In remote sensing in general, and satellite remote sensing in particular, we collect the ***fundamental climate data record*** (FCDR)

FCDR = $f(\text{counts}, K_{\text{cal}})$ = calibrated and quality controlled sensor data

calibrated and quality controlled sensor data
that have been improved over time



Thematic CDR (TCDR): “geophysical variables derived from the FCDRs, Total Ozone Content, Aerosol Optical Thickness,...”

Sensors with at least ten years of observations

Sensor	Platform	Period	Length (yrs)	Parameter	Reference
AVHRR	NOAA-series	1980-Present	38	AOD	Stowe et al. (1997), Mishchenko et al.(1999)
MODIS	TERRA/AQUA	1999-Present	19/17	AOD,AE	Remer et al. (2005)
MISR	TERRA	1999-Present	19	AOD,AE,SSA	Kahn et al. (2005)
TOMS	Nimbus-7/EP	1978-93/1996-2001	17	AOD,SSA,AI	Torres et al.(2002), Herman J. et al (1997)
ATSR2/AATSR	ERS/ENVISAT	1995-2012	17	AOD	Multiple
OMI	AURA	2004-Present	14	AOD,SSA,AI,ACAOD	Torres et al. (2007;2012)
POLDER-3	PARASOL	2004-Present	14	AOD,ACAOD	Herman et al., (1997)
CALIOP	CALIPSO	2006-Present	12	Att. Bcksct., AOD	Winker et al., (2009)

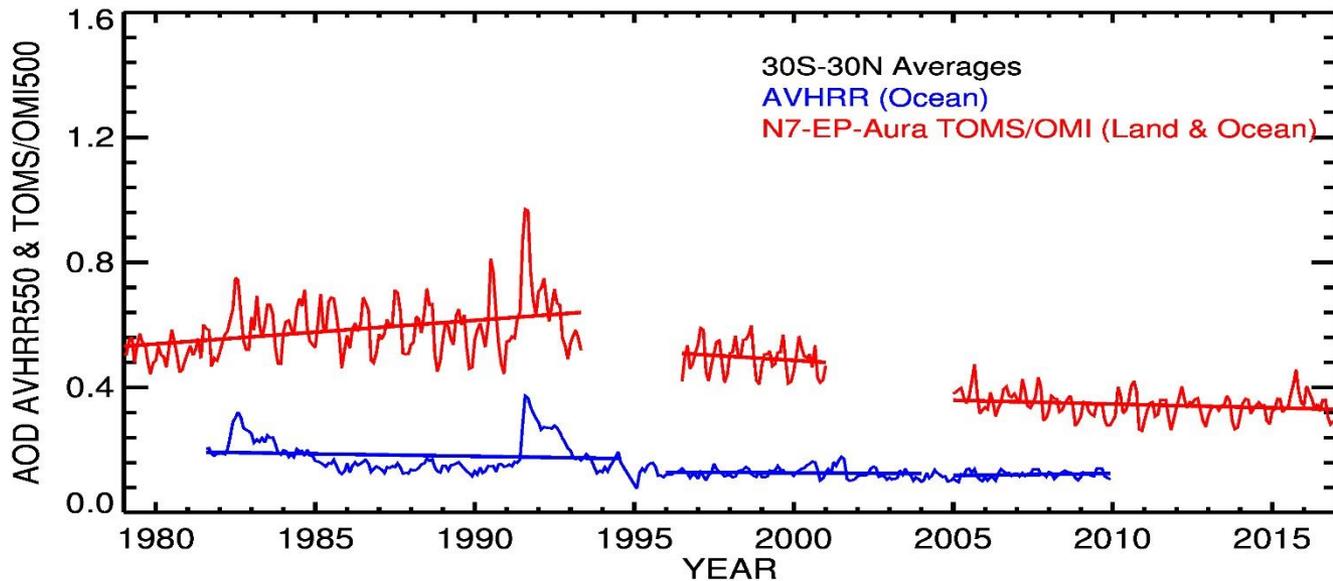
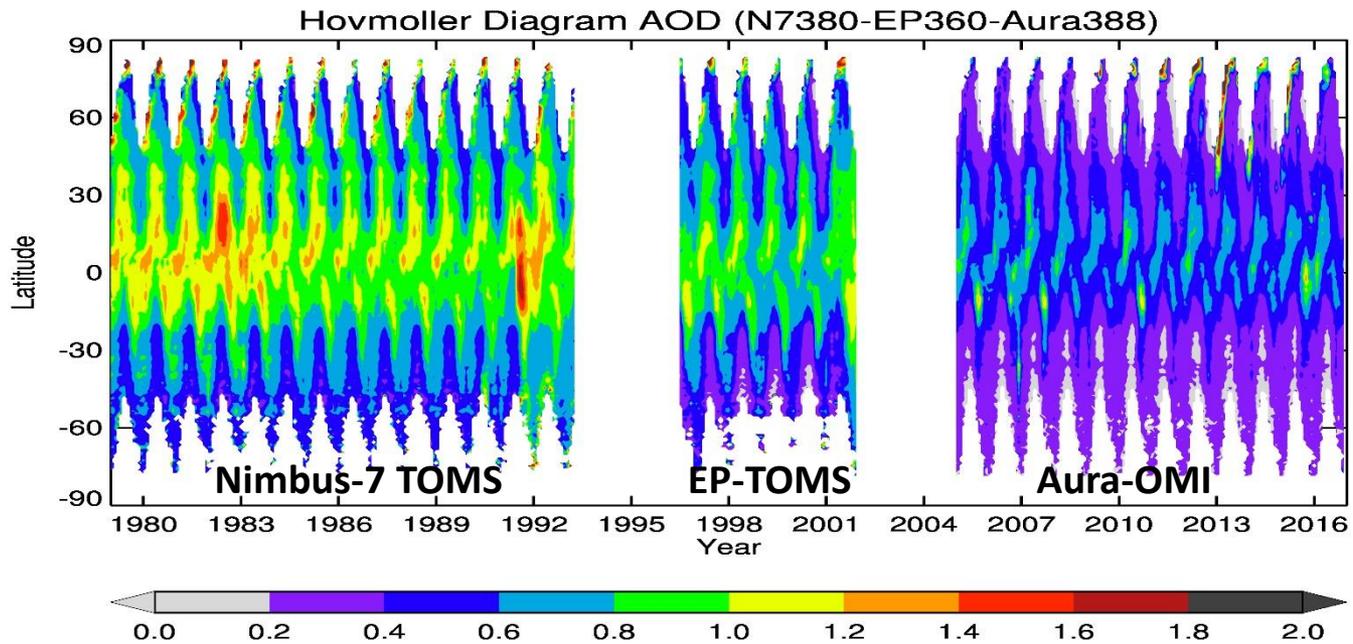
-Not all were specifically designed for aerosol retrievals

-AVHRR is the longest available record

-TOMS/AVHRR are the oldest (since late 70's)

In spite of the inherent uncertainty of these records they provide important information about a time period where significant changes in atmospheric aerosol may have occurred.

- Most commonly retrieved aerosol parameters: AOD, AE





Multi-decadal aerosol variations from 1980 to 2009: a perspective from observations and a global model

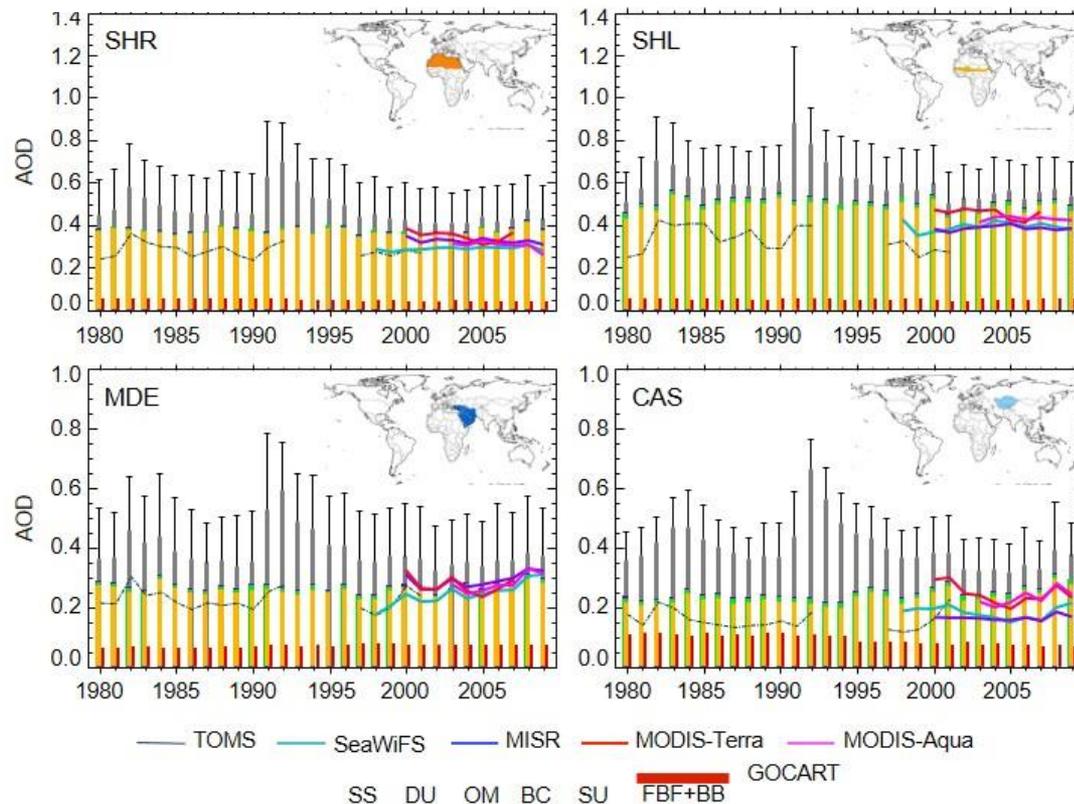
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Questions:

- To what extent is the available *multi-instrument* AOD data set a continuous and consistent record?
- What specific coordinated activities should be carried out towards that goal?

Discussion Topics:

- Feedback on GCOS requirements and stamen of guidance
- Merging methods
- Quality assessment