

AERONET

AEROSOL ROBOTIC NETWORK

30 Years of Observations

(<https://aeronet.gsfc.nasa.gov/>)

AERONET Updates

Principal Investigators: Pawan Gupta, & Elena Lind

AERONET Emeritus – Brent Holben

Thomas Eck , GESTAR II GSFC Code 618

Alexander Smirnov, SSAI GSFC Code 618

Ilya Slutsker, SSAI GSFC Code 618

Mikhail Sorokin, SSAI GSFC Code 618

Joel Schafer, SSAI GSFC Code 618

Alexander Sinyuk, SSAI GSFC Code 618

Jason Kraft, Fiber Tech GSFC Code 618

Amy Scully, SSAI GSFC Code 618

Giuseppe Zibordi, GESTARII, GSFC, Code 618

Petar Grigorov, SSAI, GSFC, Code 618

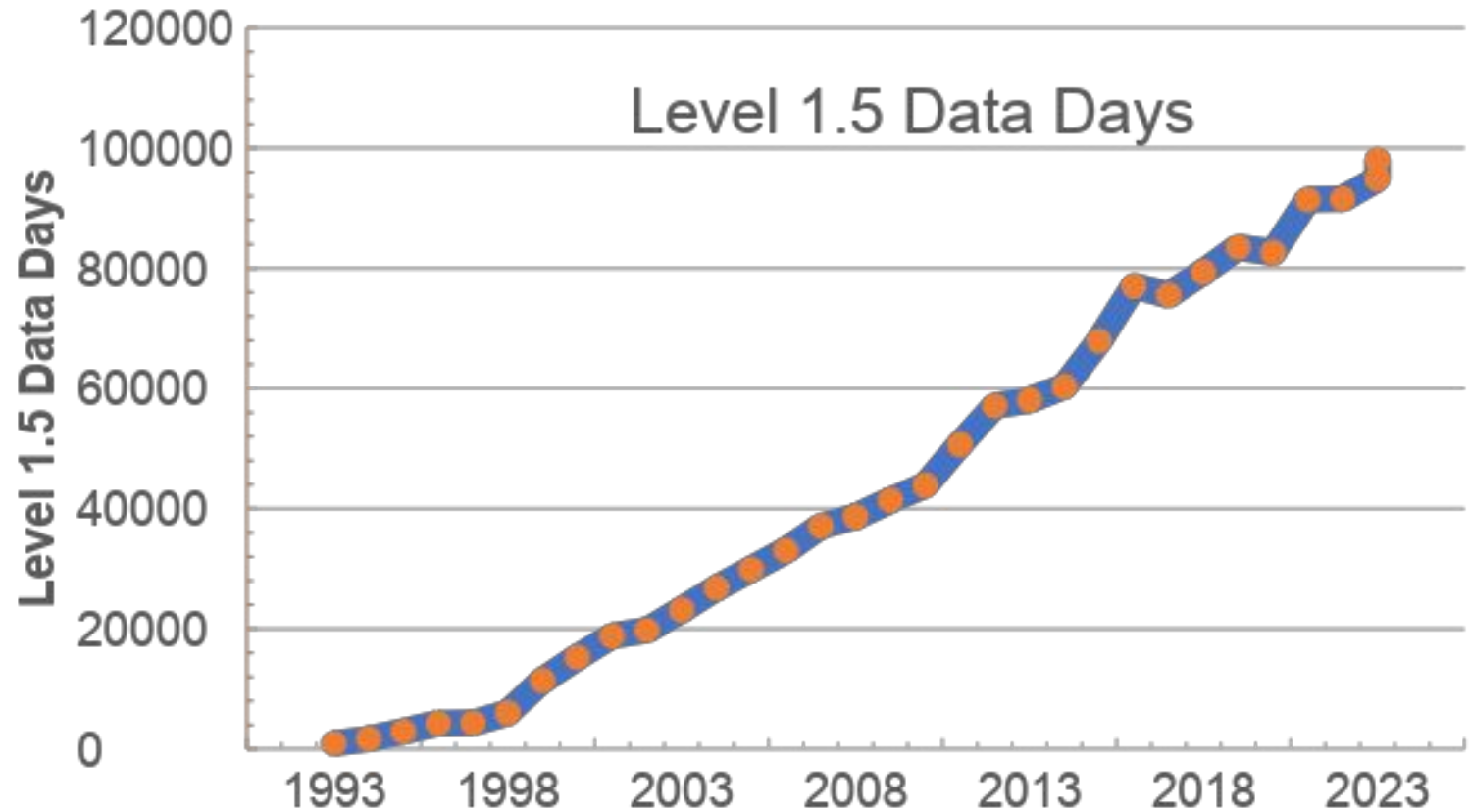
Alexander V. Kelly, SSAI, GSFC, Code 618



AERONET Exchange Update – Sep 17-19, 2024

Network Growth

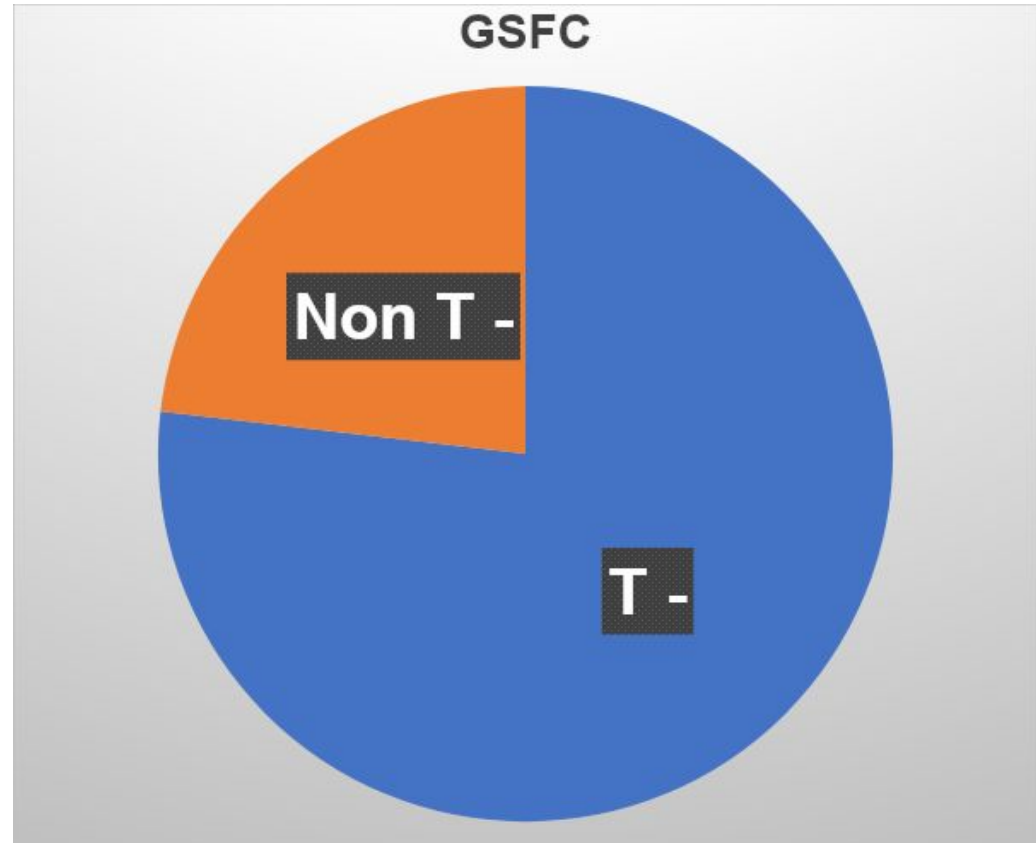
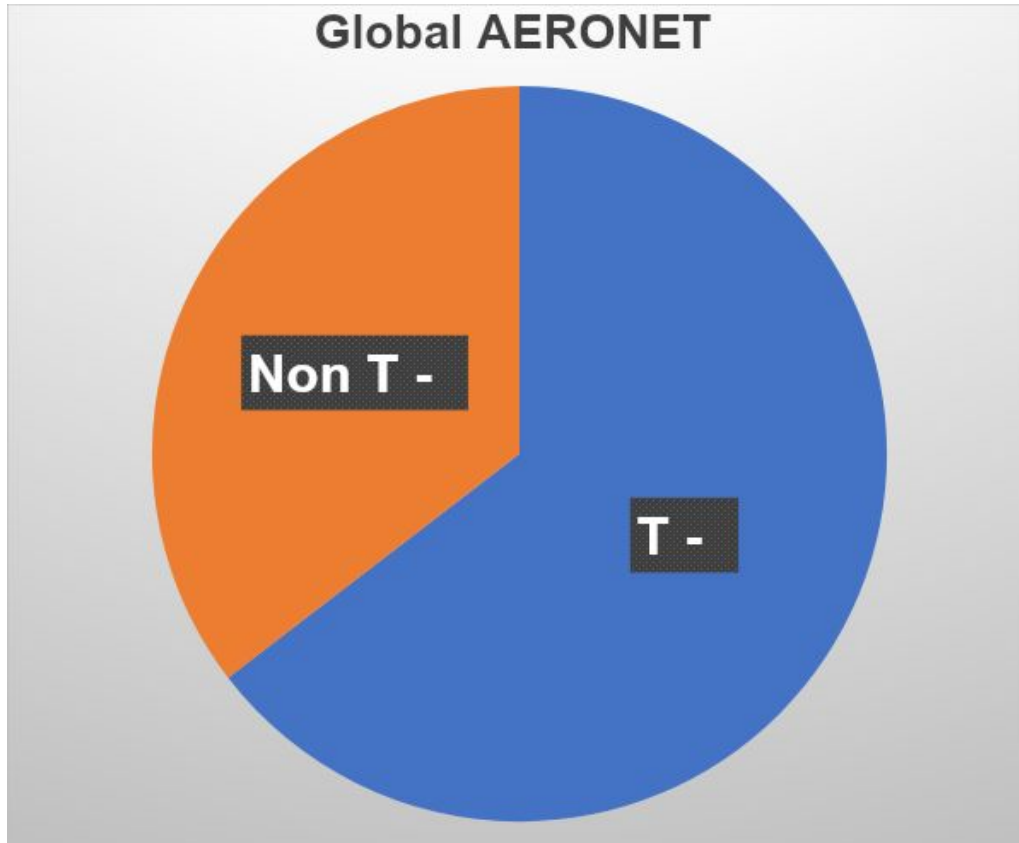
- Per year on average
 - 40 new sites
 - 26 becomes inactive
 - effectively 16 added
 - 100 new sites in last 3 years
- Total 1800 all time deployments, 1200 by GSFC
- Across 135 countries
- 10 new sites at Minority Serving Institutions in US



1.4 Millions days of Level 1.5 data across network

1.2 Millions days of Level 2.0 data across network

Instrument Transition

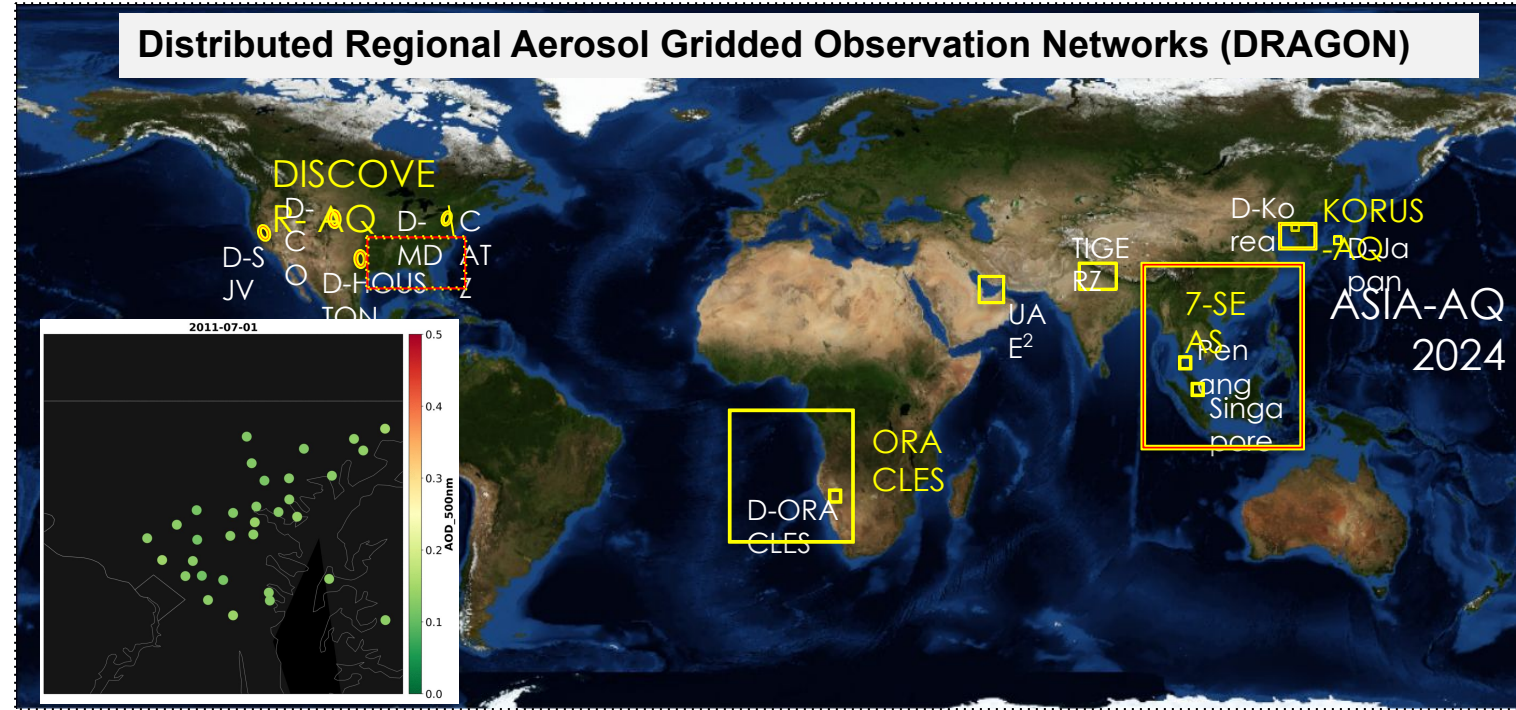


- Total 573 Active Site (as of Aug 29, 2024)
- 367 operated by GSFC (64%), 206 operated by partners (36%)
- 370 – T, 203 – non T
- 85 – non T in GSFC

Field Campaigns

Supporting NASA and other federal/non federal agencies missions

Year(s)	Project
1993-1995	Smoke/Sulfates, Clouds And Radiation (SCAR)
1996	Tropospheric Aerosol Radiative Observational eXperiment (TAROX)
1997	The Zambian International Biomass Burning Emissions Experiment (ZIBBEE)
1997	North Atlantic Regional Aerosol Characterization Experiment (ACE-2)
1998-1999	Indian Ocean Experiment (INDOEX)
2000	SAFARI
2000-2001	Argentine Commission on Space Activities (CONAE)-SAC-C
2001	Asian-Pacific Regional Aerosol Characterization Experiment (ACE-Asia)
July-August 2001	Chesapeake Lighthouse & Aircraft Measurement for Satellites (CLAMS)
1993-2004	Hazemeter Campaigns
2003 - Present	Base Asia - Thailand (Power Point presentation)
2004-Present	African Monsoon Multidisciplinary Analysis (AMMA)
2004	United Arab Emirates Unified Aerosol Experiment (UAE ²)
2005-Present	Atmospheric Brown Cloud (ABC)
2006	Megacity Aerosol Experiment in Mexico City (MAX-MEX)
2007	CALIPSO and Twilight Zone (CATZ) - Ground-based Validation
2008-2011	TIGERZ (India)
2011	DRAGON-USA (Washington, D.C./Baltimore Metropolitan Region)
2012	DRAGON-Asia (Japan and South Korea - Osaka and Seoul Metropolitan Regions)
2012	DRAGON-Asia (Southeast Asia) and 7-SEAS
2012-2013	DRAGON-USA (San Joaquin Valley of California)
2013	DRAGON-Germany (HD(CP)2 Observational Prototype Experiment- HOPE)
2013	DRAGON-USA (Houston Metropolitan Region)
2013	DRAGON-USA (SEAC4RS-Southeast US)
2014	DRAGON-USA (Colorado Front Range Urban Corridor)
2016	DRAGON-KORUS-AQ (South Korea, Japan, China)
2019	DRAGON-USA (FIREX-AQ; Idaho and Montana, USA)
2024	ASIA-AQ (South Korea, Philippines, Taiwan, Thailand)
2024	PACE-PAX (California, Nevada, Arizona)



Training, Visualization and Tools



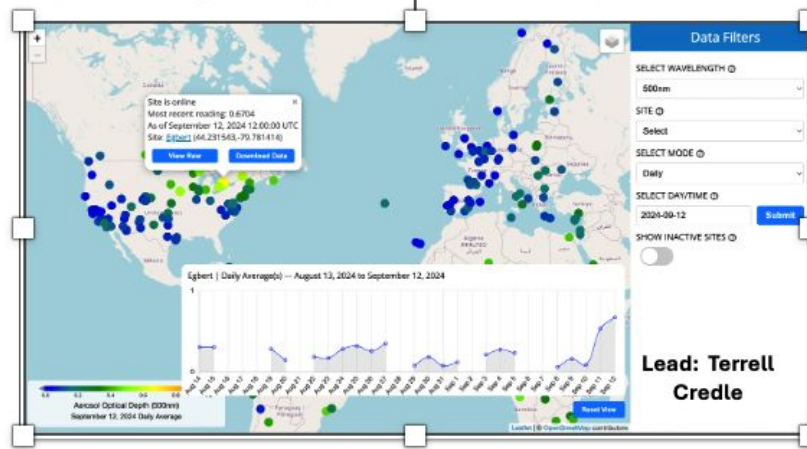
Attended by

- 979 participants
- 105 countries
- 39 US states
- 475 unique organizations
- Python Tools are developed and available

AOD Mapping

Lead: Terrell Credle

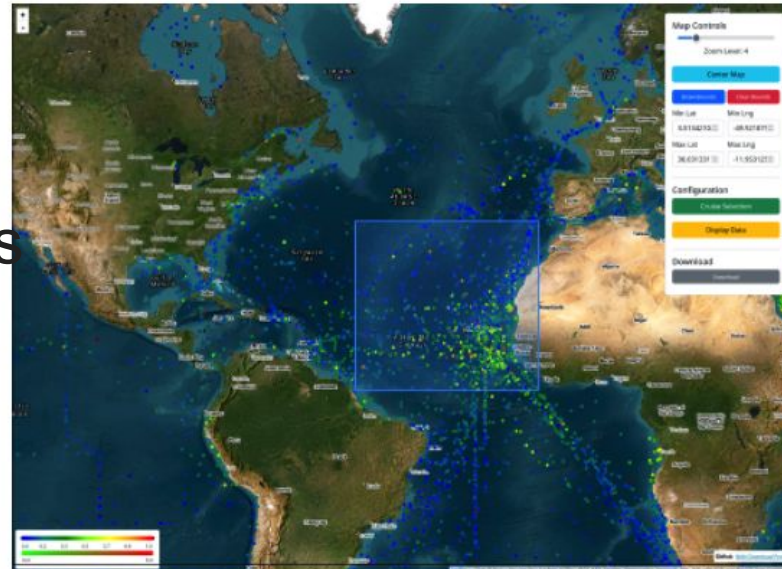
https://aeronet.gsfc.nasa.gov/new_web/aeronet_map_tool/index.html



Lead: Terrell Credle

MAN Data Visualization and Download – under development

Lead: Terrell Credle



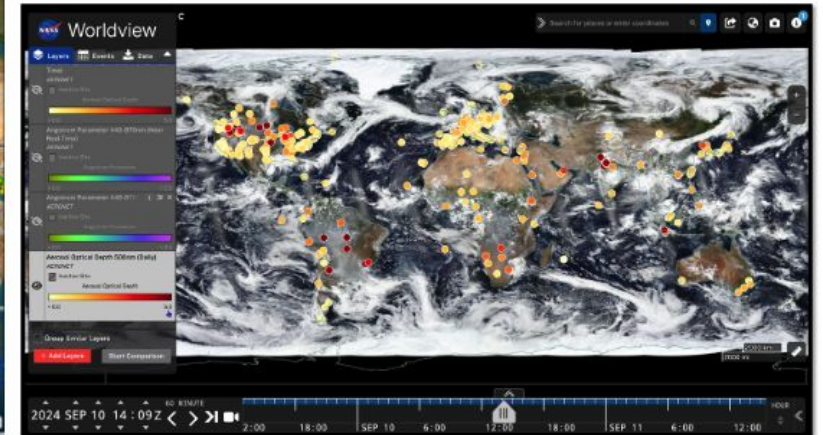
NetCDF format

```

Variable "AOD_550_Estimated"
In file "AERONET_AOD_L15.20210624V1.2024137180328.nc4"
short AOD_550_Estimated(sites:2000, times:1440);
:FillValue = -99995; // short
:long_name = "Aerosol Optical depth at 550nm wavelength estimated using AODs measured in the 448 - 675 nm";
:standard_name = "optical_thickness_of_atmosphere_layer_due_to_ambient_aerosol_particles";
:scale_factor = 0.0011; // float
:add_offset = 0.0f; // float
:units = "1";
:_ChunkSizes = 10000, 7200; // uint
    
```

Map AERONET along with Satellite Imagery

NASA Worldview - <https://worldview.earthdata.nasa.gov/>



Science Updates

- Night time data – provisional status removed for Level 1.5
- Expansion in UV channels
 - Evaluating calibration/retrievals using radiances from 6 channels during Sep 2020 fire season in USA: 380, 440, 500, 675, 870, 1020
 - Operating 3 sites with 340 and 380 nm scanning (almucantar and hybrid) since April 2024
 - Deployed 7 more sites for PACE-PAX (Sep 2024 – Sep): all wavelengths inversions
 - Deployed 2 sites for aerosol concentration profiling
- New datasets coming with more strict cirrus cloud clearing – T inst.
- New air quality data measurements and data product research - Poster
- Increasing sites with polarized measurements
- Continue to advance radiance calibration processes and improvements

