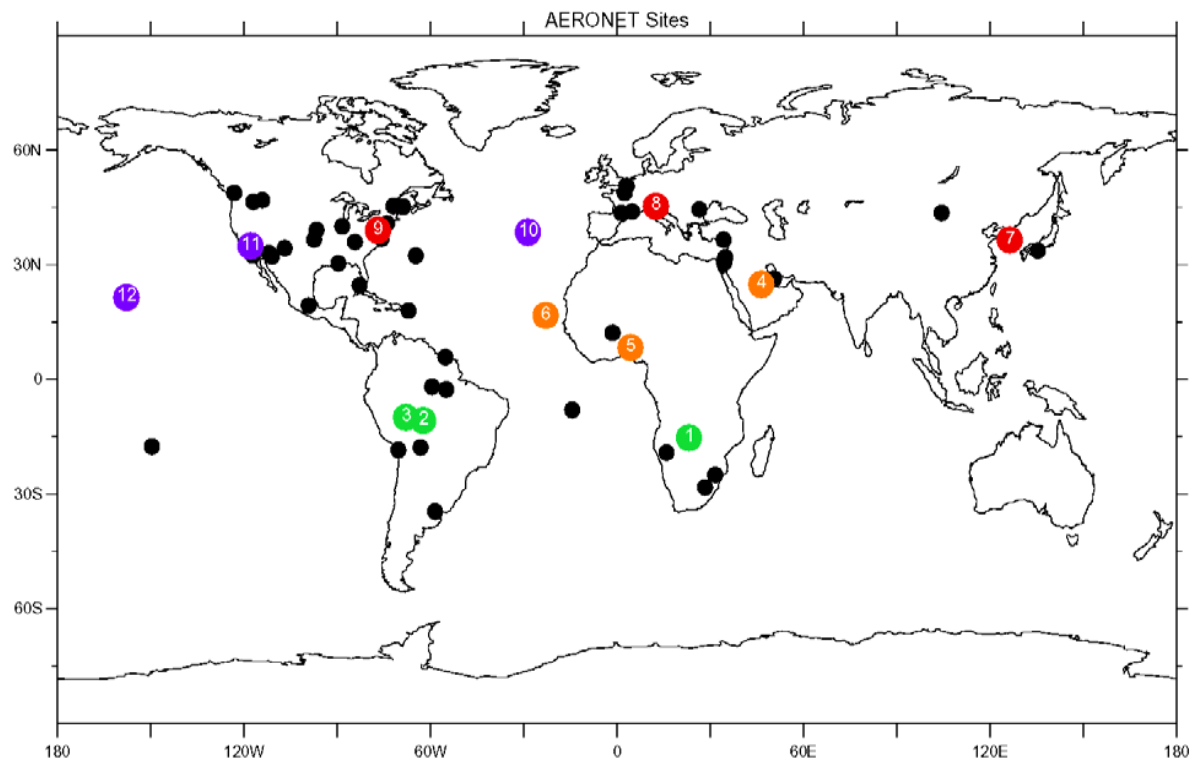


# Aerosol absorption –

## Comparing GOCART results with AERONET data

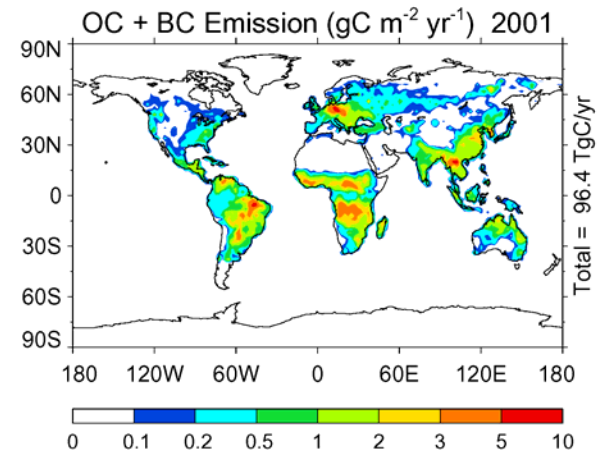
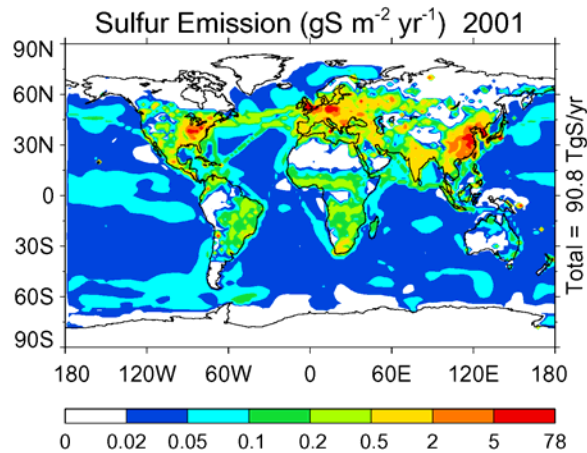
- 57 sites in 2001
- Total aerosol extinction and absorption at 440 and 870 nm (model 450 and 900 nm)
- Absorption Fraction
- Comparisons with daily data at 12 sites
  - 3 smoke (green)
  - 3 dust (brown)
  - 3 pollution (red)
  - 3 mixture (purple)
- Correlations of monthly averages



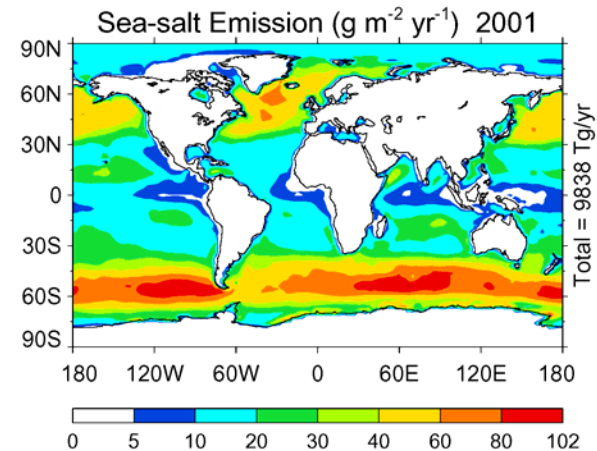
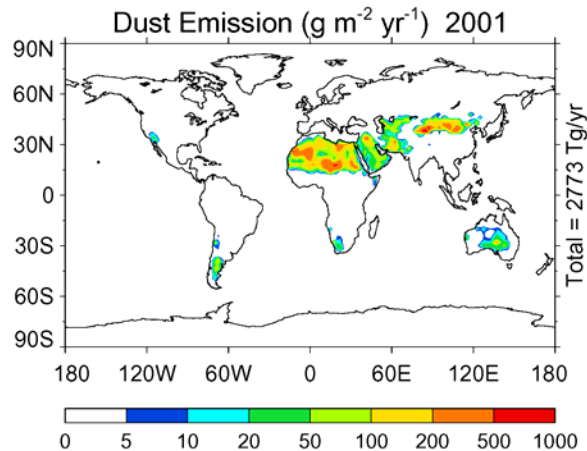
# Microphysical and optical parameters

<b>Aerosol Type</b>	<b>Density (g cm<sup>-3</sup>)</b>	<b>Dry <math>r_m</math> (μm)</b>	<b>Dry <math>r_e</math> (μm)</b>	<b><math>\sigma_g</math> (μm)</b>	<b>Dry <math>\beta</math> (MEE) at 550 nm (m<sup>2</sup> g<sup>-1</sup>)</b>	<b>Refractive Index at 550 nm</b>
Sulfate	1.7	0.0695	0.156	2.03	3.143	1.43 – 10 <sup>-8</sup> <i>i</i>
OC	1.8	0.0212	0.087	2.20	2.668	1.53 – 0.006 <i>i</i>
BC	1.0	0.0118	0.039	2.00	9.284	1.75 – 0.44 <i>i</i>
Dust	2.6	0.0421	0.14	2.00	2.432	1.53 – 0.0014 <i>i</i>
	2.6	0.0722	0.24	2.00	2.578	1.53 – 0.0014 <i>i</i>
	2.6	0.1354	0.45	2.00	1.830	1.53 – 0.0014 <i>i</i>
	2.6	0.2407	0.80	2.00	1.015	1.53 – 0.0014 <i>i</i>
	2.6	0.4212	1.40	2.00	0.497	1.53 – 0.0014 <i>i</i>
	2.6	0.7220	2.40	2.00	0.271	1.53 – 0.0014 <i>i</i>
	2.6	1.3540	4.50	2.00	0.138	1.53 – 0.0014 <i>i</i>
	2.6	2.4070	8.00	2.00	0.075	1.53 – 0.0014 <i>i</i>
	Sea Salt	2.2	0.228	0.80	2.03	1.152
2.2		1.64	5.73	2.03	0.128	1.50 – 10 <sup>-8</sup> <i>i</i>

# Emissions 2001

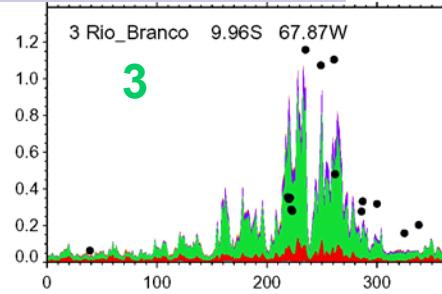
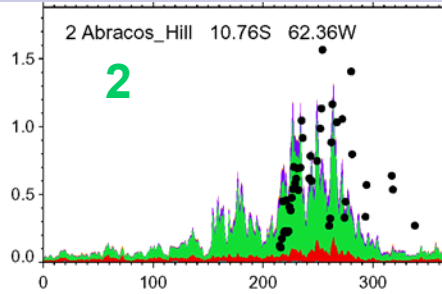
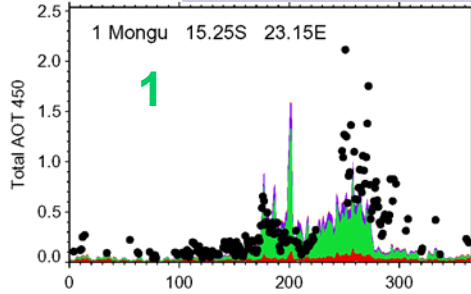


OC: 82.3 TgC/yr  
BC: 14.1 TgC/yr

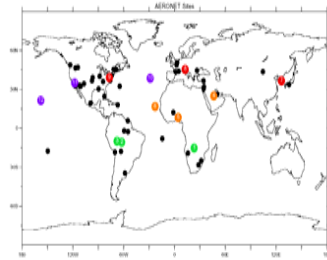
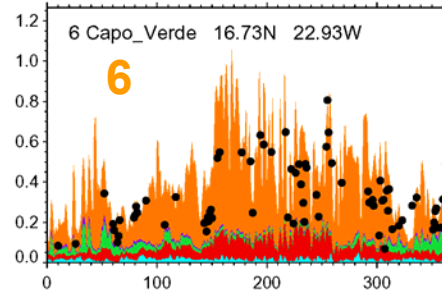
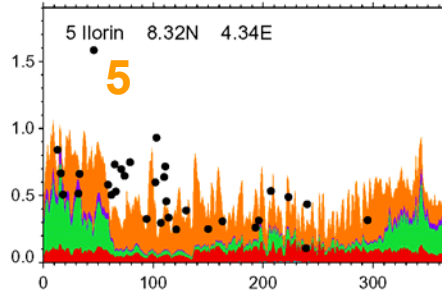
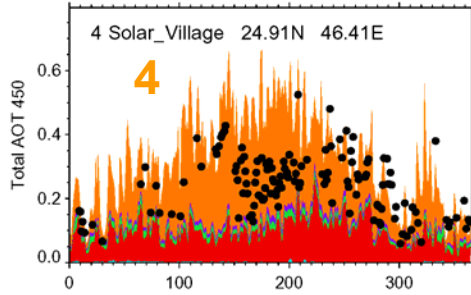


# Total Extinction Optical Thickness 440 nm

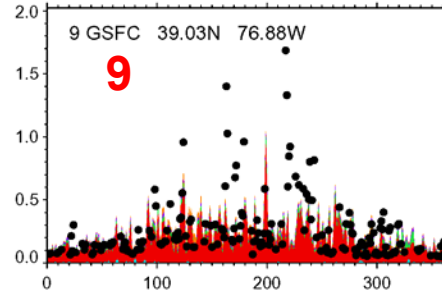
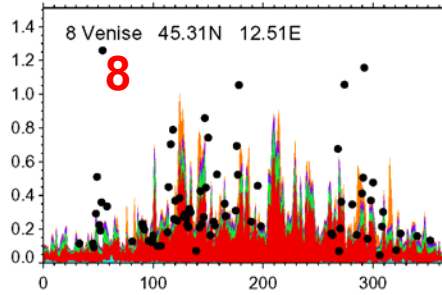
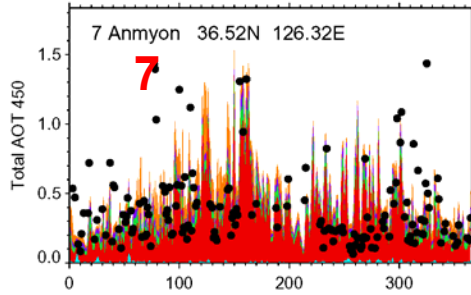
Smoke



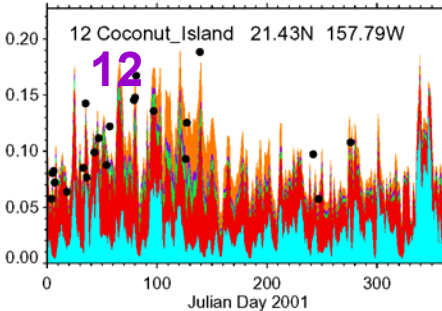
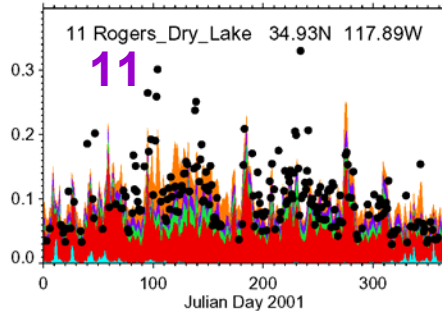
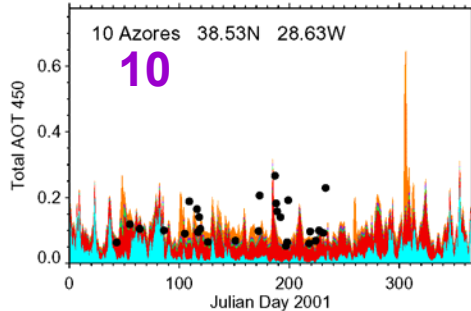
Dust



Pollution

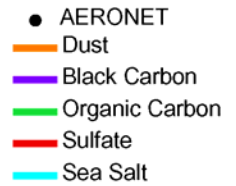
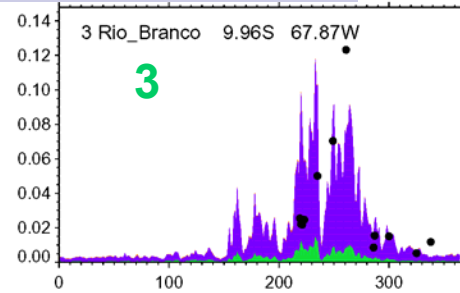
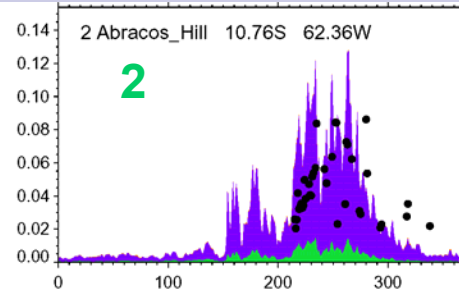
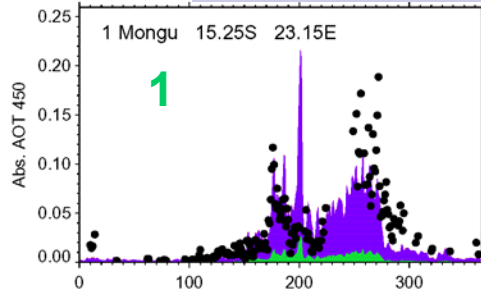


Mixture

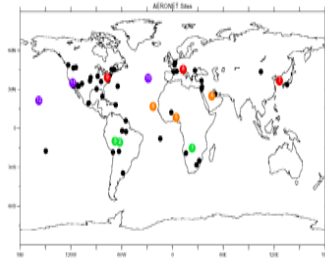
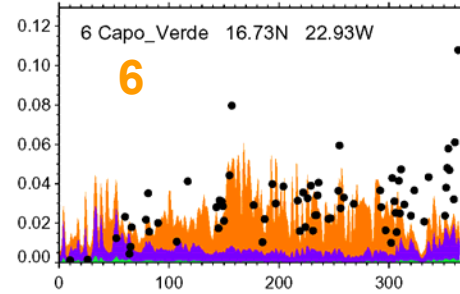
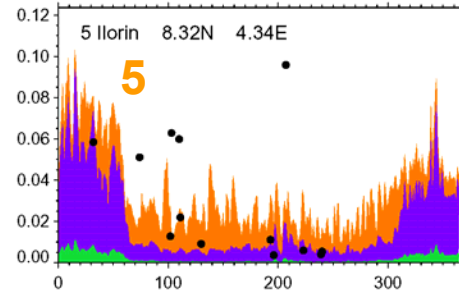
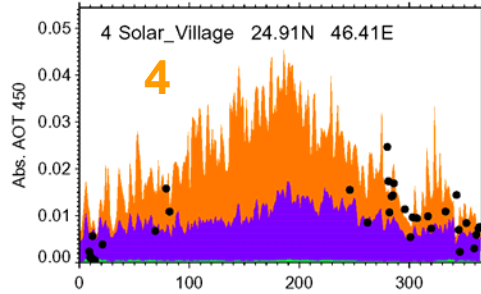


# Total Absorption Optical Thickness 440 nm

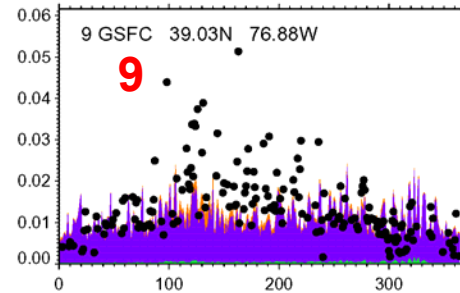
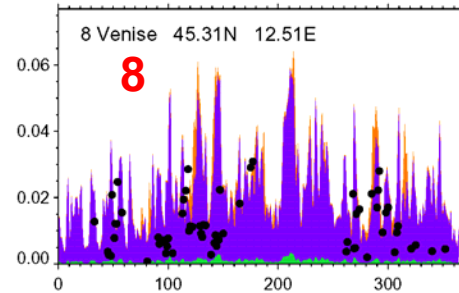
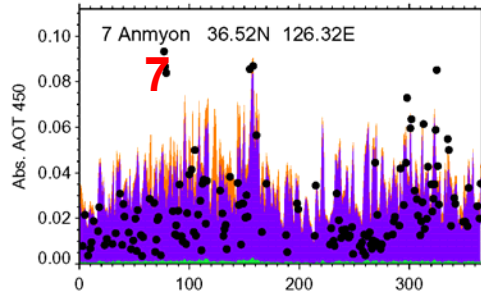
Smoke



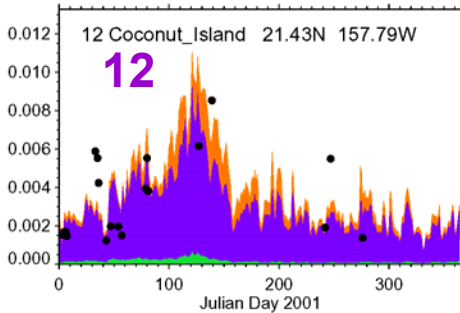
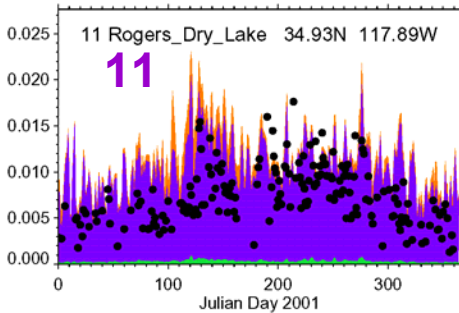
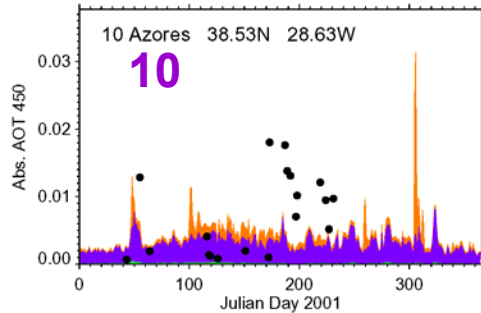
Dust



Pollution

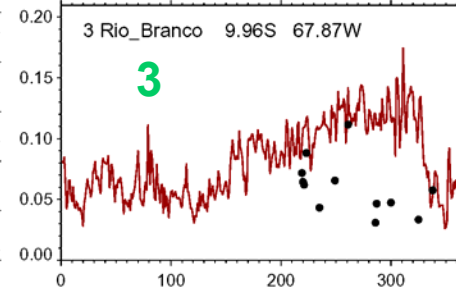
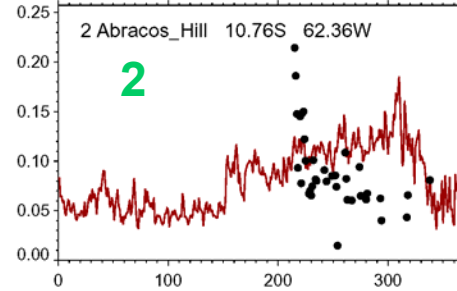
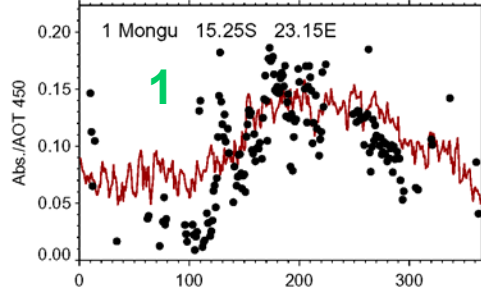


Mixture



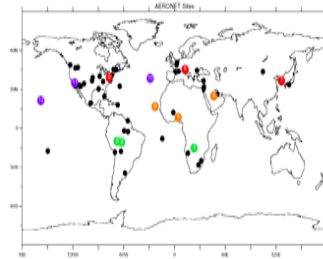
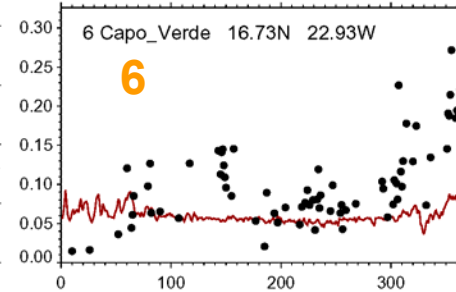
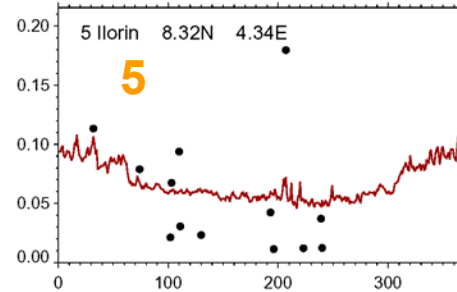
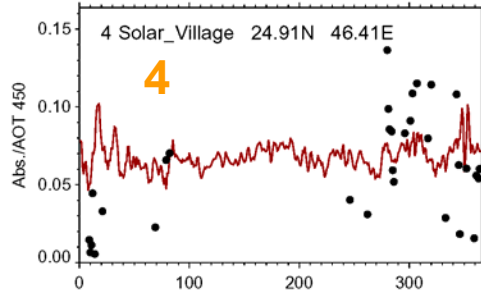
# Fraction of Absorption Optical Thickness 440 nm (= 1 - SSA)

Smoke

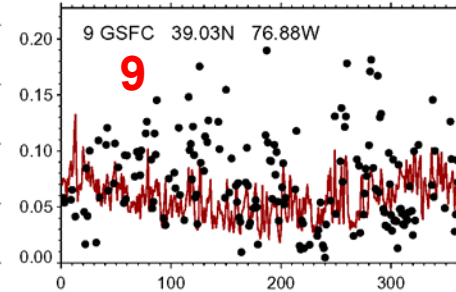
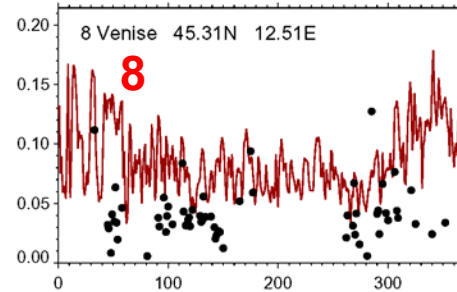
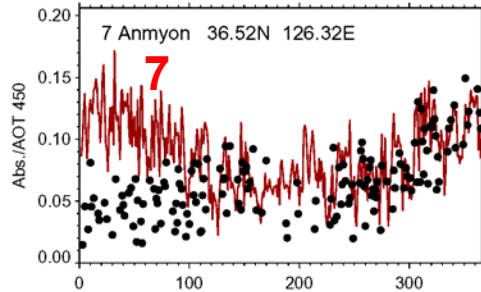


● AERONET  
— Model

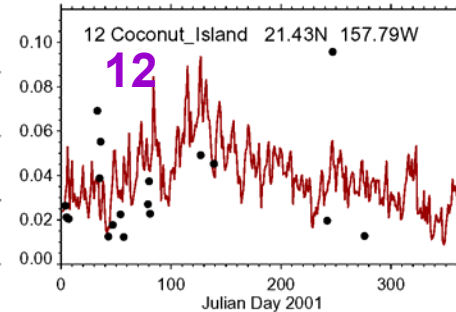
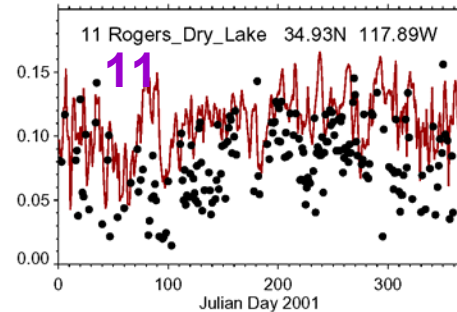
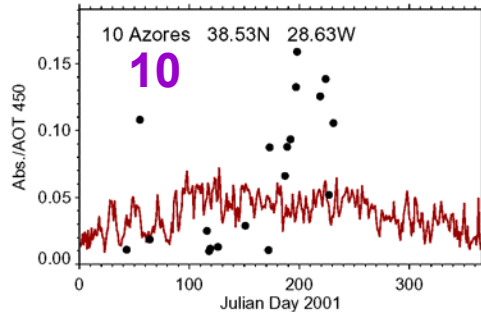
Dust



Pollution

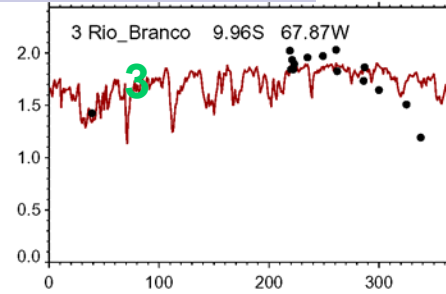
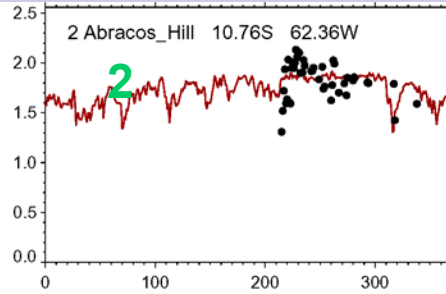
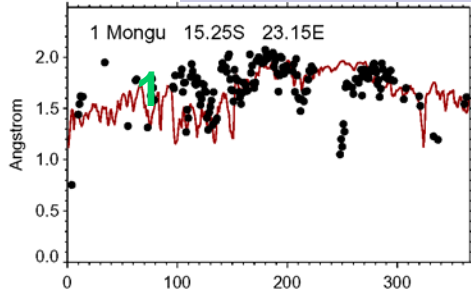


Mixture



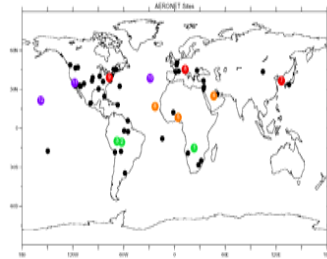
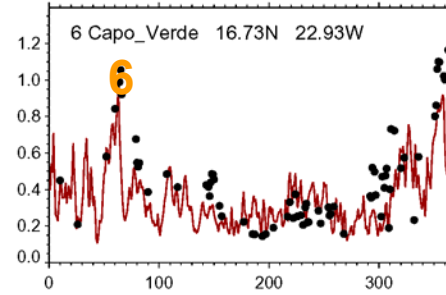
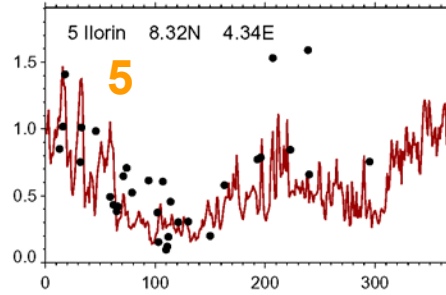
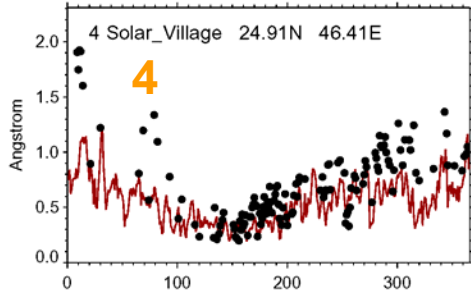
# Angstrom exponent (450-900 nm pair)

Smoke

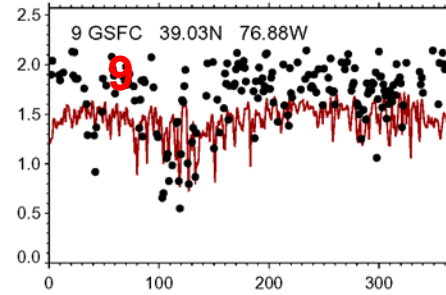
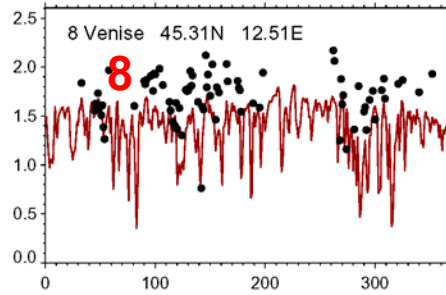
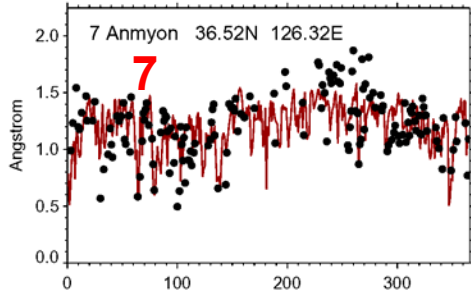


● AERONET  
— Model

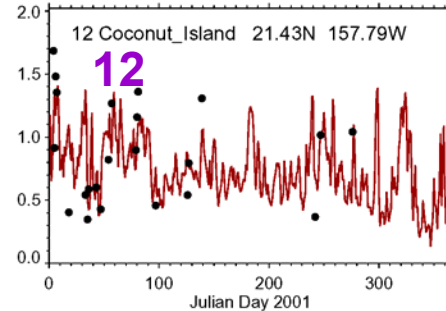
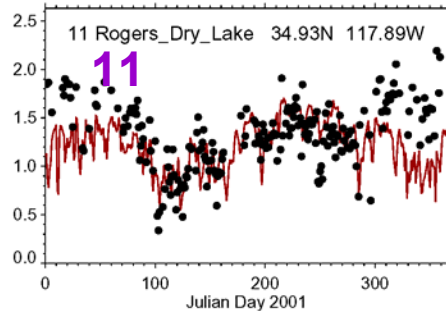
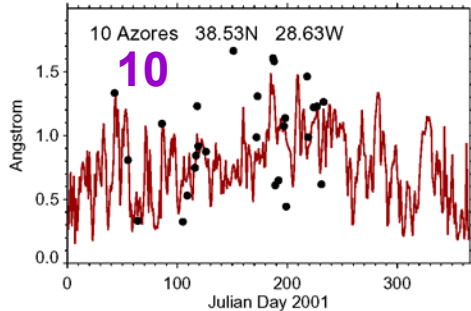
Dust



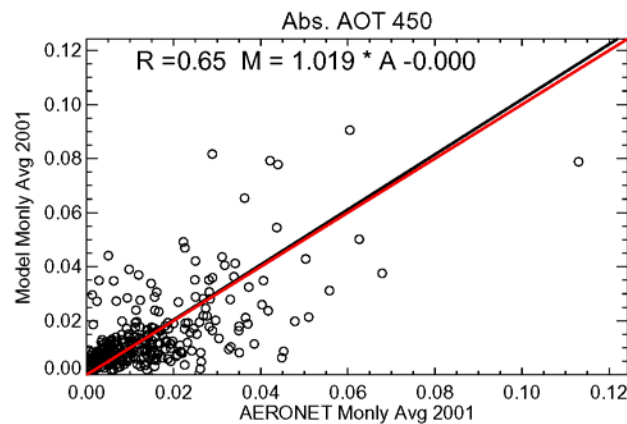
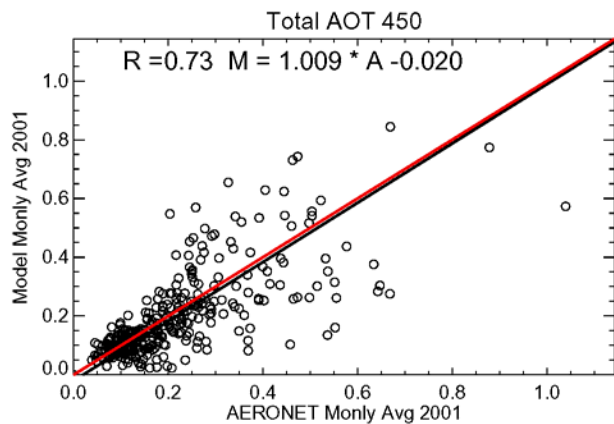
Pollution



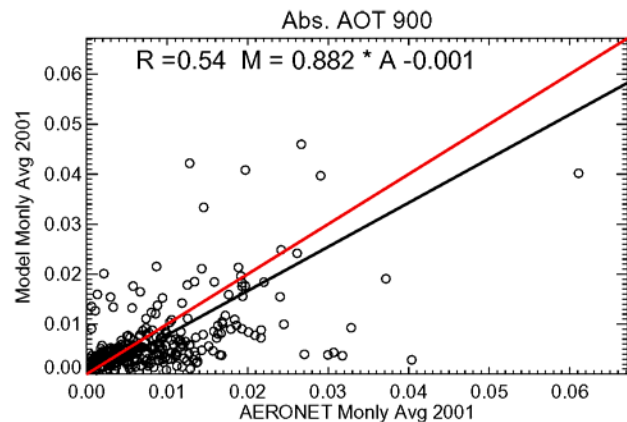
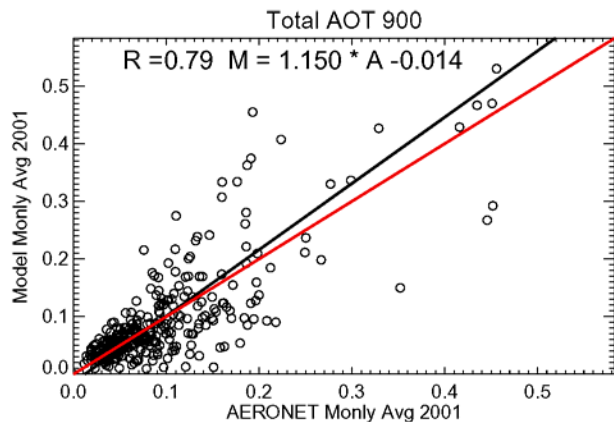
Mixture



# Comparisons of monthly average values at 57 sites

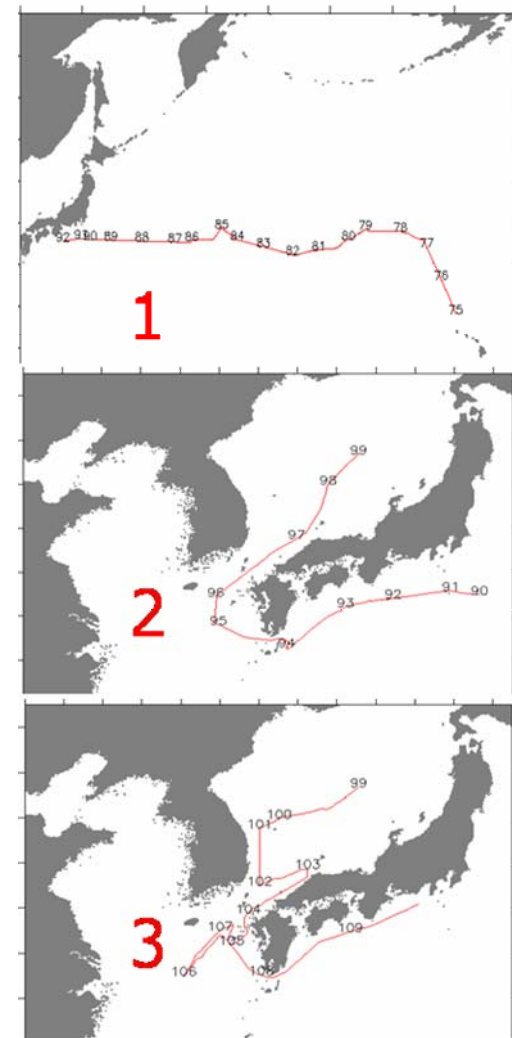
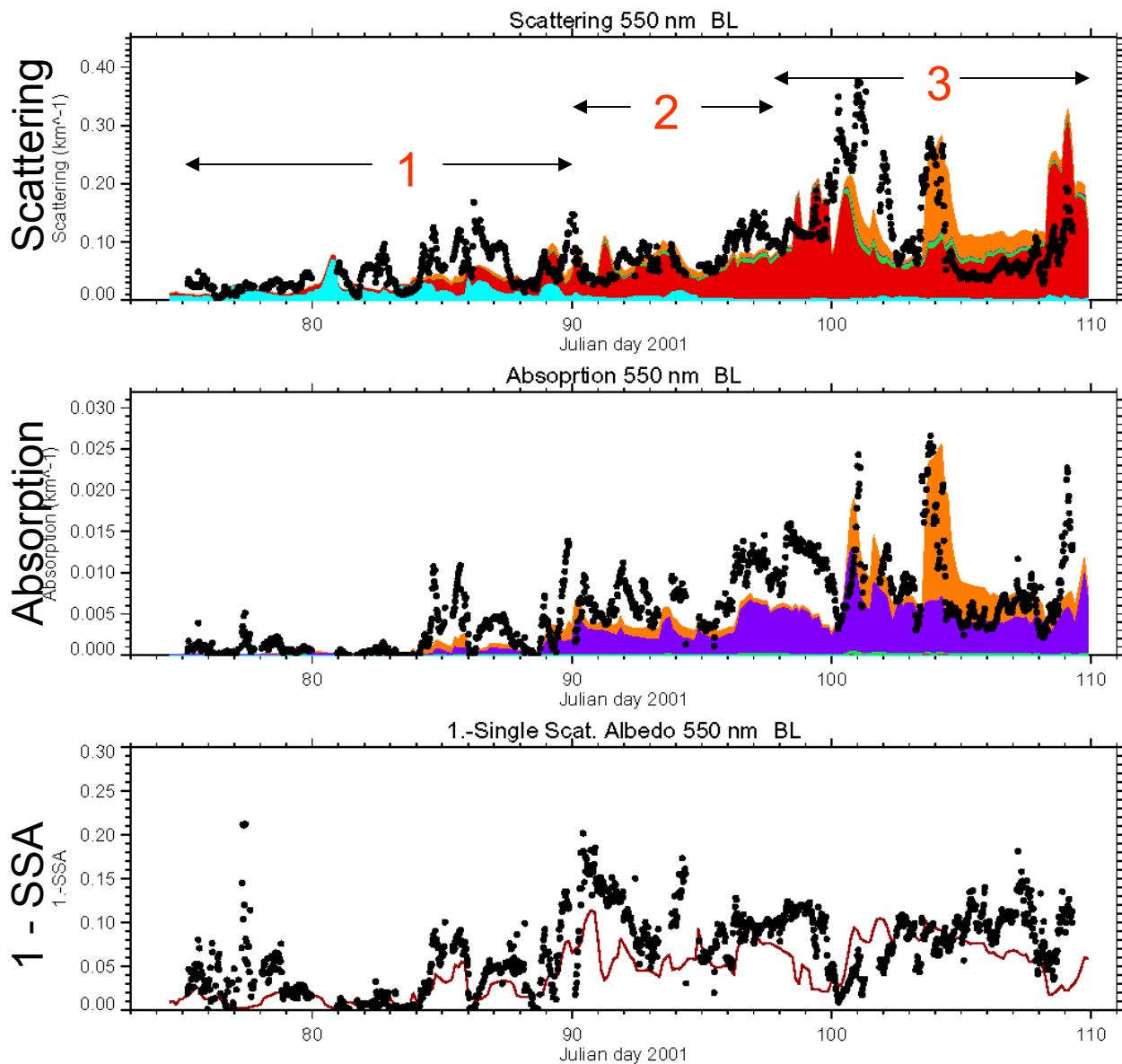


Red line:  
1:1 ratio  
Black line:  
Best fit



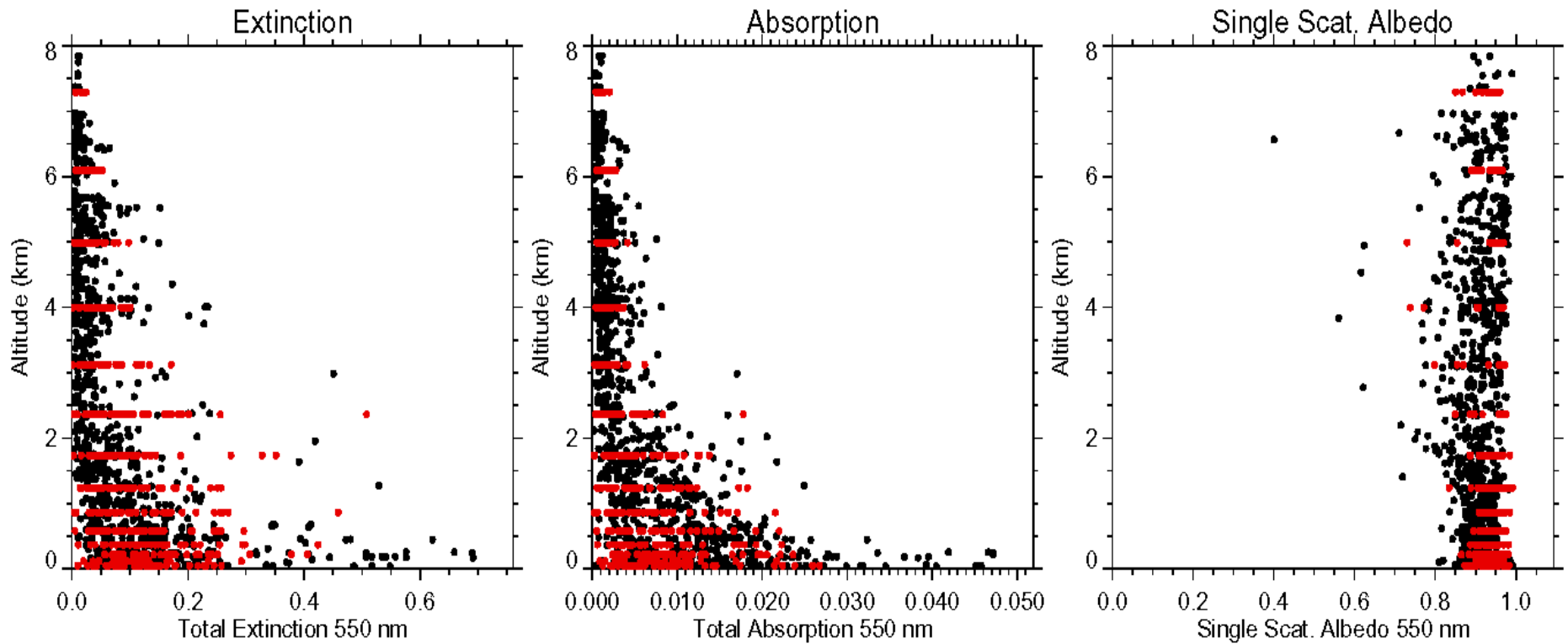


# Comparison with ACE-Asia Ron Brown ship measurements (Data from Patricia Quinn, NOAA/PMEL)



# Comparison with ACE-Asia C-130 Measurements

(Data from Tad Anderson & Sarah Masonis, U. Washington)



Red: Model Black: Obs.

# Global Distributions of Absorbing Aerosol (visible wavelength)

