

APPENDIX E:

Hawaii Class I Area Monitoring Data Summary Tables and Charts

Includes the following subsections:

Subsection	IMPROVE Monitor	Class I Area(s) Represented
E.1	HACR1	Haleakala NP
E.2	HALE1	Haleakala NP
E.3	HAVO1	Hawaii Volcanoes NP

E.1. HALEAKALA NP (HACR1)

The following tables and figures are presented in this section for the Haleakala NP represented by the HACR1 IMPROVE Monitor:

- **Table E.1-1: Annual Averages, 5-Year Period Averages, and Trends:** Table of averages and other metrics for the 20% least impaired days, the 20% most impaired days, and all sampled days is presented.
- **Figure E.1-1: Annual and 5-Year Period Averages for the 20% Most Impaired Visibility Days:** Line graphs depicting annual and period averages by component are presented.
- **Figure E.1-2: Annual and 5-Year Period Averages for the 20% Least Impaired Visibility Days:** Line graphs depicting annual and period averages by component are presented.
- **Figure E.1-3: 20% Most Impaired Visibility Days:** Pie charts depicting period averages and stacked bar charts depicting annual averages by component for the 20% most impaired days are presented.
- **Figure E.1-4: 20% Least Impaired Visibility Days:** Pie charts depicting period averages and stacked bar charts depicting annual averages by component are presented.
- **Figure E.1-5: 2000-2004 Monthly Average Aerosol Extinction, All Monitored Days:** Line graphs depicting monthly averages by year and component for the baseline period are presented.
- **Figure E.1-6: 2005-2009 Monthly Average Aerosol Extinction, All Monitored Days:** Line graphs depicting monthly averages by year and component for the progress period are presented.
- **Figure E.1-7: 2000-2004 Progress Period Extinction, All Sampled Days:** Stacked bar charts depicting daily averages by year and component for the baseline period are presented.
- **Figure E.1-8: 2000-2004 Progress Period Extinction, All Sampled Days:** Stacked bar charts depicting daily averages by year and component for the progress period are presented.

Table E.1-1
Haleakala NP, HI (HACR1 Site)
Annual Averages, 5-Year Period Averages and Trends

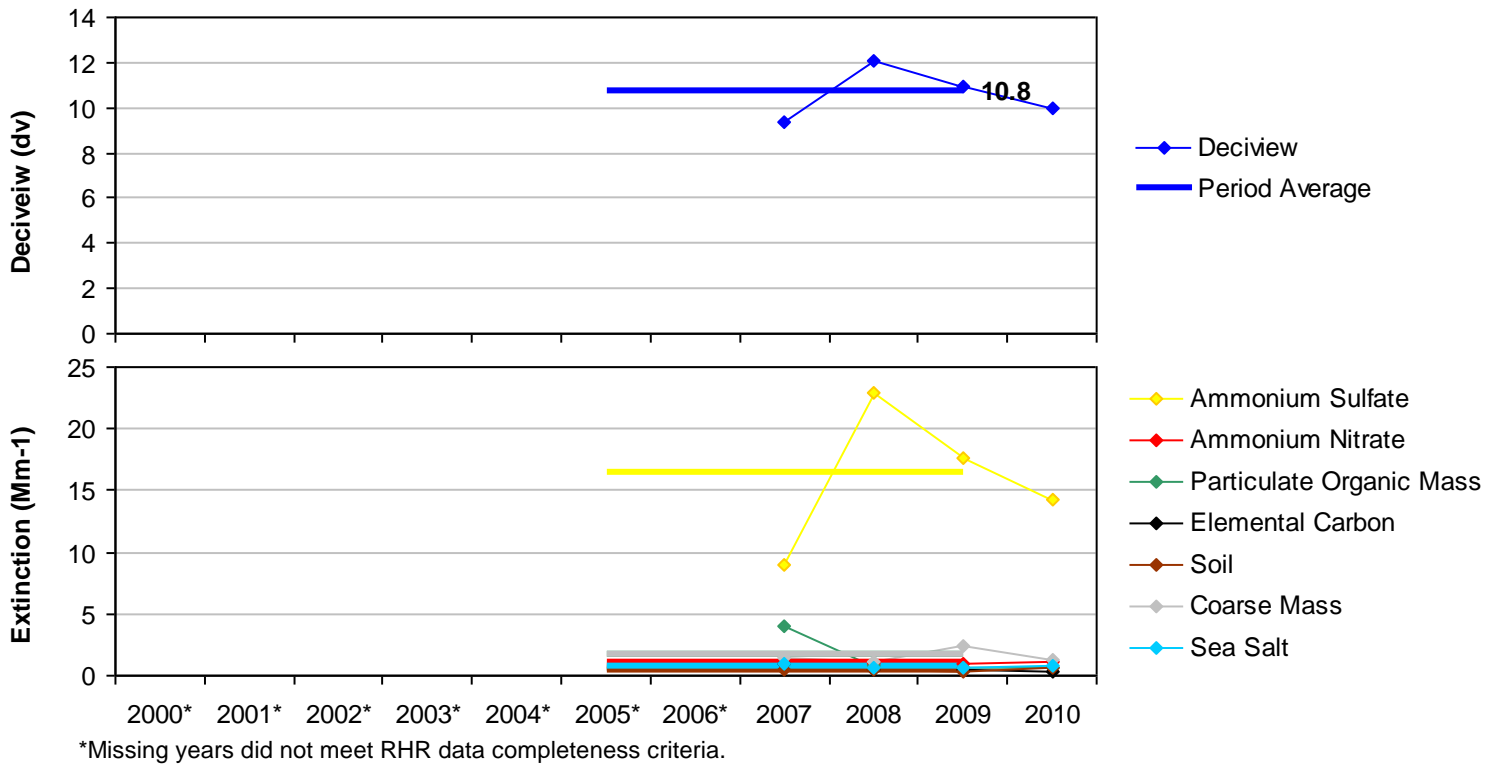
Group	Baseline Period					Progress Period					2010	2000-2009 Trend Statistics*		Period Averages**			
	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009		Slope (change/yr.)	p-value	Baseline (B)	Progress (P)	Difference (P-B)	Percent Change
Deciview (dv)																	
Best 20% Days	---	---	---	---	---	---	---	0.8	0.6	1.3	0.4	N/A	N/A	1.0	0.9	-0.1	-10%
Worst 20% Days	---	---	---	---	---	---	---	9.3	12.1	10.9	9.9	N/A	N/A	9.5	10.8	1.3	14%
All Days	---	---	---	---	---	---	---	4.4	5.3	5.2	4.5	N/A	N/A	4.6	5.0	0.4	9%
Total Extinction (Mm-1)																	
Best 20% Days	---	---	---	---	---	---	---	10.9	10.6	11.4	10.4	N/A	N/A	11.1	11.0	-0.1	-1%
Worst 20% Days	---	---	---	---	---	---	---	27.3	36.3	32.3	28.1	N/A	N/A	27.7	32.0	4.3	16%
All Days	---	---	---	---	---	---	---	16.6	19.1	18.4	16.8	N/A	N/A	17.2	18.0	0.8	5%
Ammonium Sulfate Extinction (Mm-1)																	
Best 20% Days	---	---	---	---	---	---	---	1.0	1.0	1.2	0.8	N/A	N/A	1.1	1.0	-0.1	-9%
Worst 20% Days	---	---	---	---	---	---	---	9.0	22.9	17.6	14.3	N/A	N/A	10.9	16.5	5.6	51%
All Days	---	---	---	---	---	---	---	3.7	7.3	6.2	5.1	N/A	N/A	4.5	5.7	1.2	27%
Ammonium Nitrate Extinction (Mm-1)																	
Best 20% Days	---	---	---	---	---	---	---	0.2	0.1	0.2	0.1	N/A	N/A	0.2	0.1	-0.1	-50%
Worst 20% Days	---	---	---	---	---	---	---	1.3	1.0	1.0	1.1	N/A	N/A	1.4	1.1	-0.3	-21%
All Days	---	---	---	---	---	---	---	0.7	0.6	0.6	0.6	N/A	N/A	0.7	0.6	-0.1	-14%
Particulate Organic Mass Extinction (Mm-1)																	
Best 20% Days	---	---	---	---	---	---	---	0.1	0.0	0.1	0.0	N/A	N/A	0.1	0.1	0.0	0%
Worst 20% Days	---	---	---	---	---	---	---	4.1	0.7	0.7	0.7	N/A	N/A	2.4	1.8	-0.6	-25%
All Days	---	---	---	---	---	---	---	1.2	0.4	0.3	0.3	N/A	N/A	0.8	0.6	-0.2	-25%
Elemental Carbon Extinction (Mm-1)																	
Best 20% Days	---	---	---	---	---	---	---	0.0	0.0	0.1	0.0	N/A	N/A	0.1	0.0	-0.1	-100%
Worst 20% Days	---	---	---	---	---	---	---	0.9	0.5	0.5	0.4	N/A	N/A	0.8	0.6	-0.2	-25%
All Days	---	---	---	---	---	---	---	0.3	0.2	0.2	0.2	N/A	N/A	0.3	0.2	-0.1	-33%
Soil Extinction (Mm-1)																	
Best 20% Days	---	---	---	---	---	---	---	0.0	0.1	0.1	0.1	N/A	N/A	0.1	0.1	0.0	0%
Worst 20% Days	---	---	---	---	---	---	---	0.5	0.4	0.4	0.7	N/A	N/A	0.4	0.4	0.0	0%
All Days	---	---	---	---	---	---	---	0.2	0.2	0.2	0.3	N/A	N/A	0.2	0.2	0.0	0%
Coarse Mass Extinction (Mm-1)																	
Best 20% Days	---	---	---	---	---	---	---	0.2	0.2	0.5	0.2	N/A	N/A	0.4	0.3	-0.1	-25%
Worst 20% Days	---	---	---	---	---	---	---	1.4	1.2	2.5	1.2	N/A	N/A	2.3	1.7	-0.6	-26%
All Days	---	---	---	---	---	---	---	0.8	0.7	1.3	0.8	N/A	N/A	1.2	0.9	-0.3	-25%
Sea Salt Extinction (Mm-1)																	
Best 20% Days	---	---	---	---	---	---	---	0.3	0.3	0.3	0.2	N/A	N/A	0.2	0.3	0.1	50%
Worst 20% Days	---	---	---	---	---	---	---	1.0	0.6	0.6	0.7	N/A	N/A	0.5	0.7	0.2	40%
All Days	---	---	---	---	---	---	---	0.7	0.6	0.6	0.6	N/A	N/A	0.4	0.6	0.2	50%

*Values highlighted in blue (red) indicate statistically significant decreasing (increasing) annual trend. Significance is measured at the 85% confidence level (p-value ≤0.15).

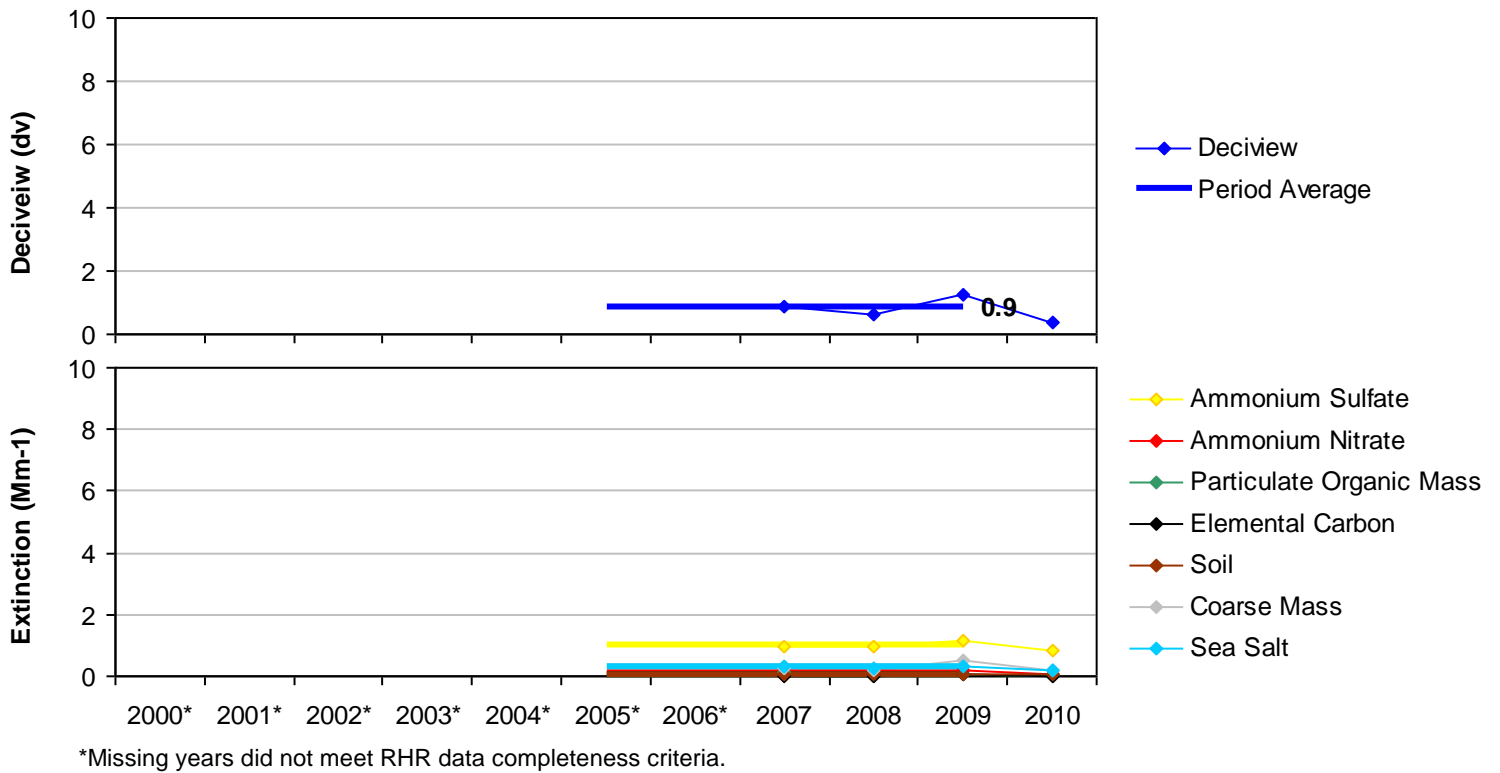
**Values highlighted in blue indicate a decrease in the 5-year average, values highlighted in red indicate an increase.

---" Indicates a missing year that did not meet RHR data completeness criteria.

**Figure E.1-1
Haleakala NP, HI (HACR1 Site)
Annual and 5-Year Period Averages
20% Most Impaired Visibility Days**

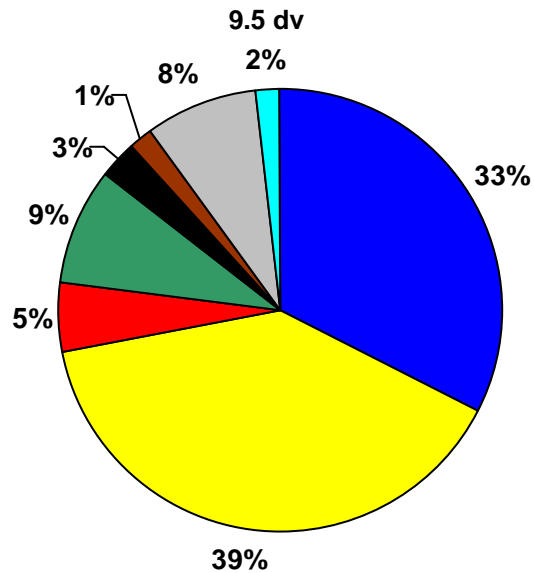


**Figure E.1-2
Haleakala NP, HI (HACR1 Site)
Annual and 5-Year Period Averages
20% Least Impaired Visibility Days**

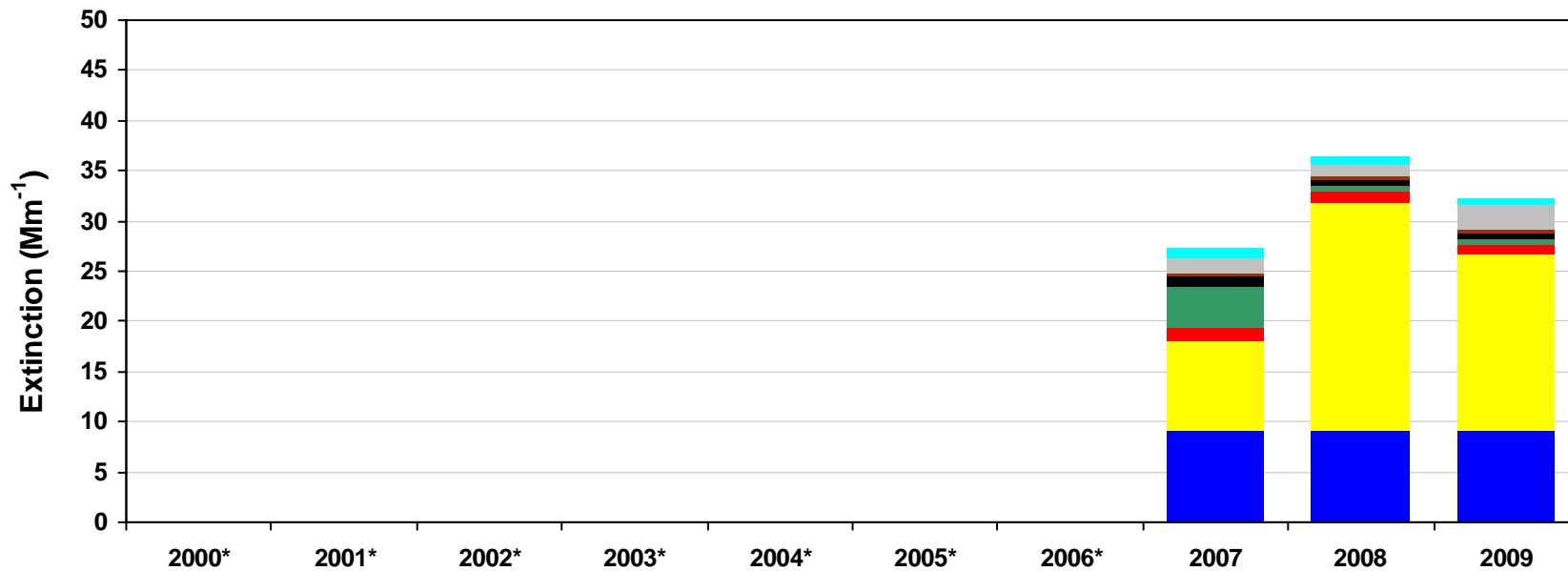
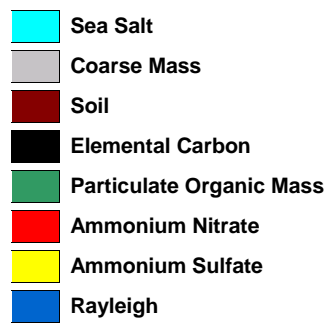
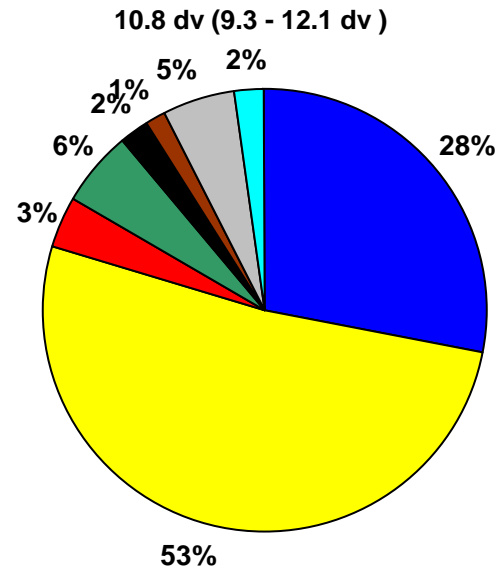


**Figure E.1-3
Haleakala NP, HI (HACR1 Site)
20% Most Impaired Visibility Days**

2000-2004 Baseline Average Estimate*



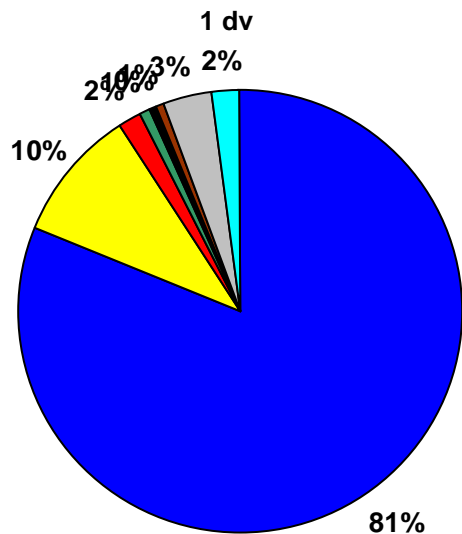
2005-2009 Progress Period Average



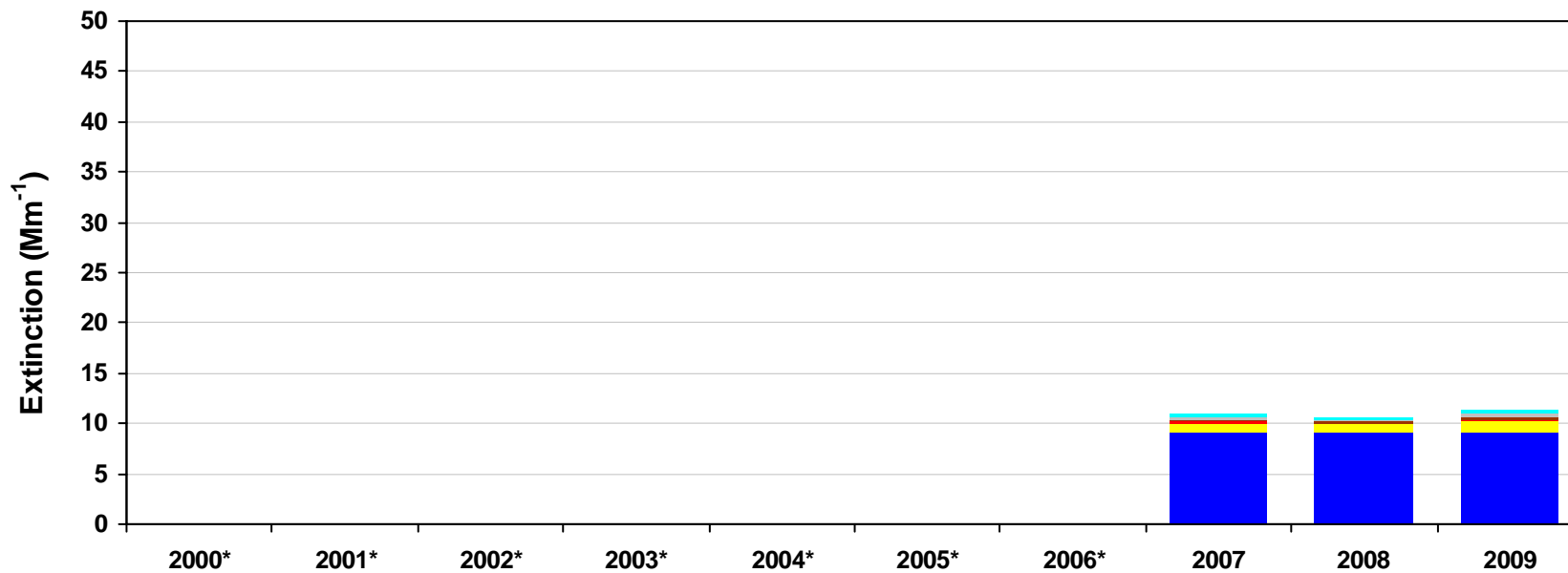
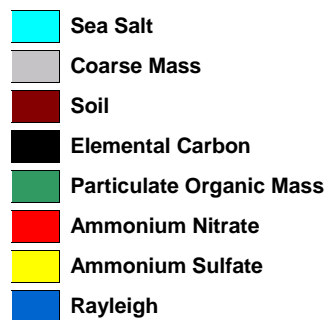
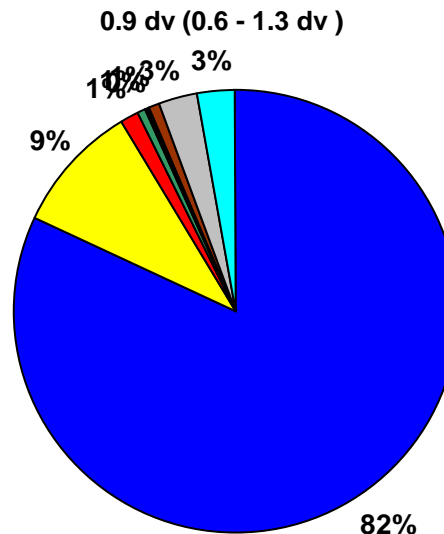
*Baseline years did not meet RHR data completeness criteria. The 5-year baseline average represents an approximation based on methods described in text.

**Figure E.1-4
Haleakala NP, HI (HACR1 Site)
20% Least Impaired Visibility Days**

2000-2004 Baseline Average Estimate*

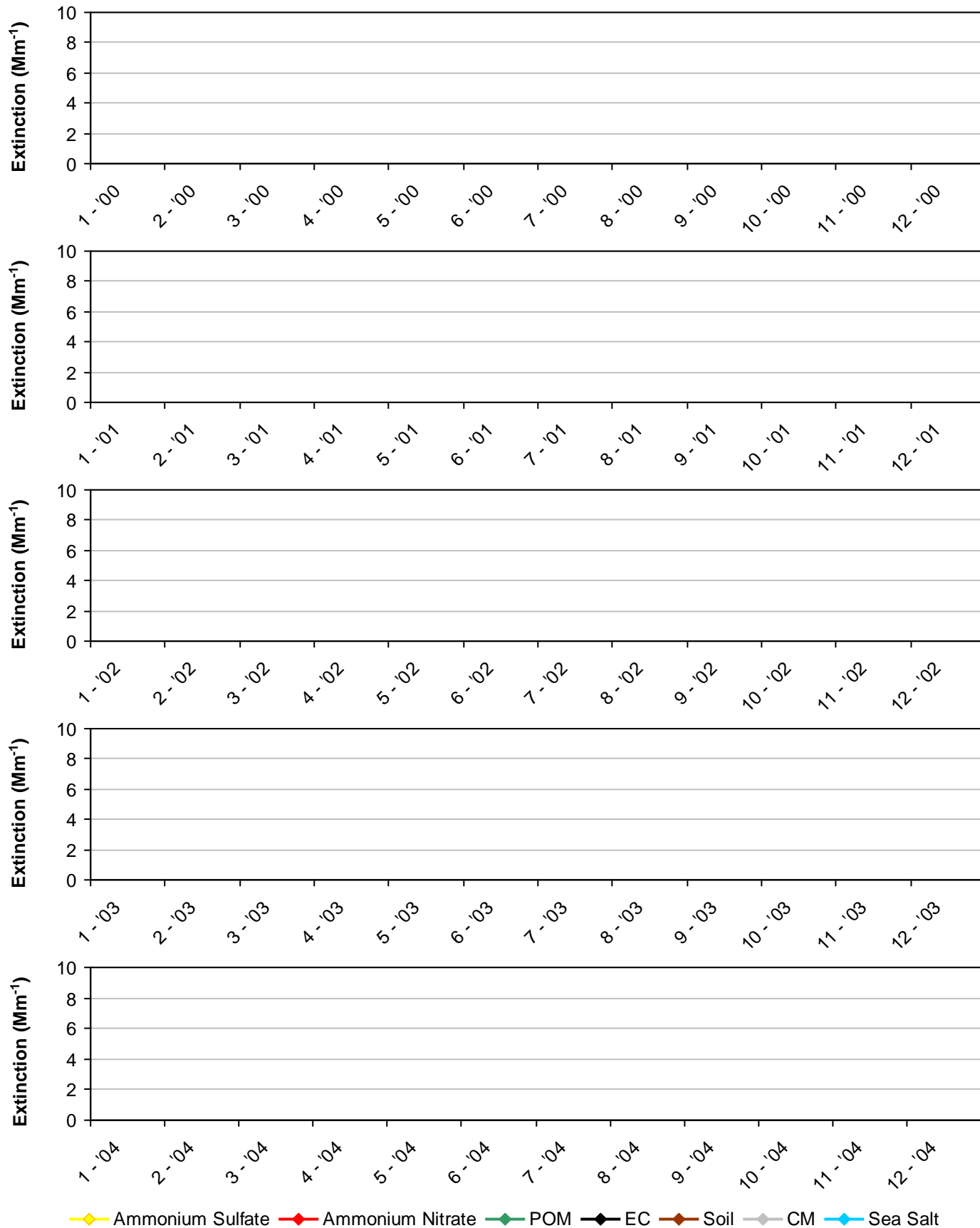


2005-2009 Progress Period Average



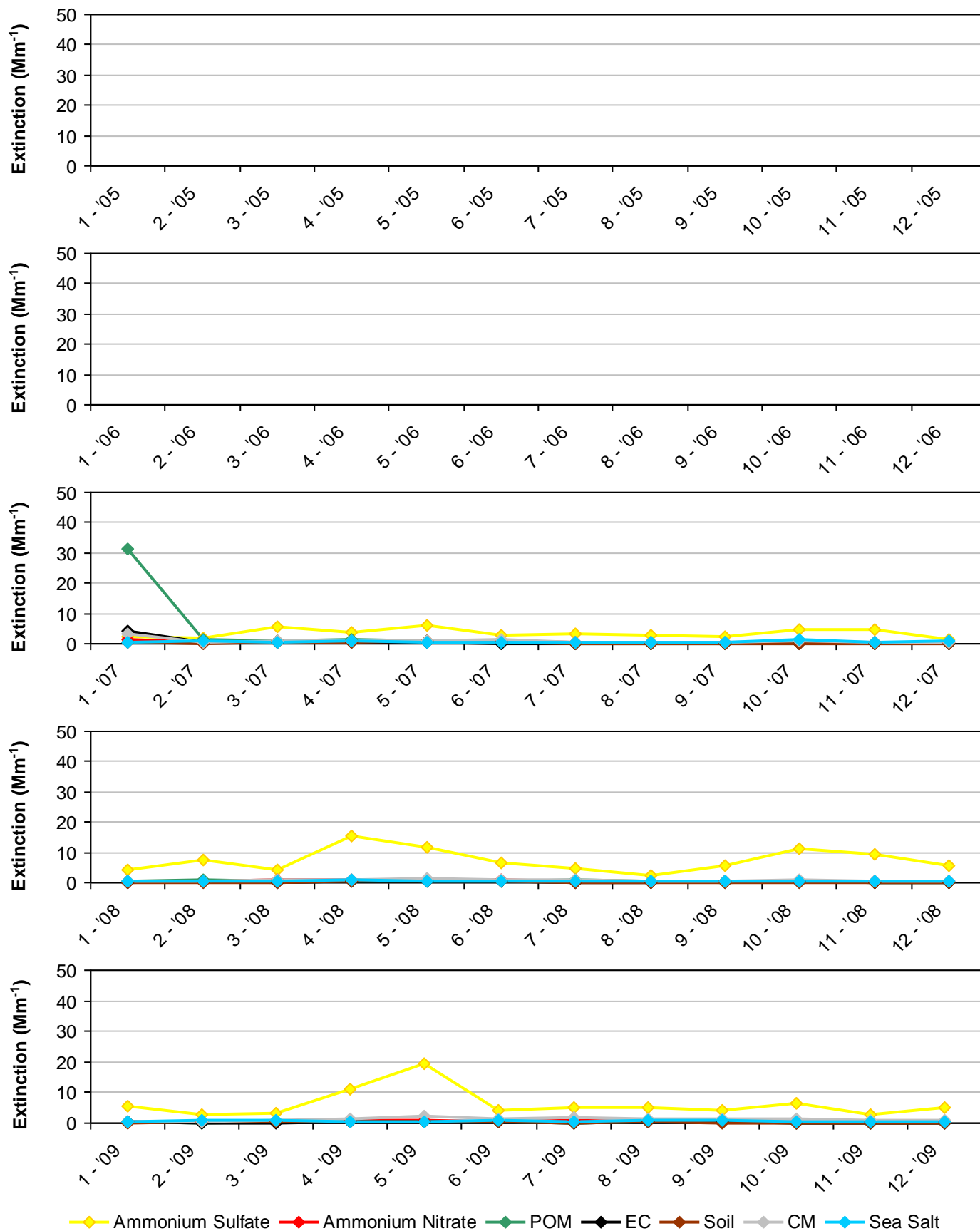
*Baseline years did not meet RHR data completeness criteria. The 5-year baseline average represents an approximation based on methods described in text.

**Figure E.1-5
Haleakala NP, HI (HACR1 Site)
2000-2004 Monthly Average Aerosol Extinction, All Monitored Days**



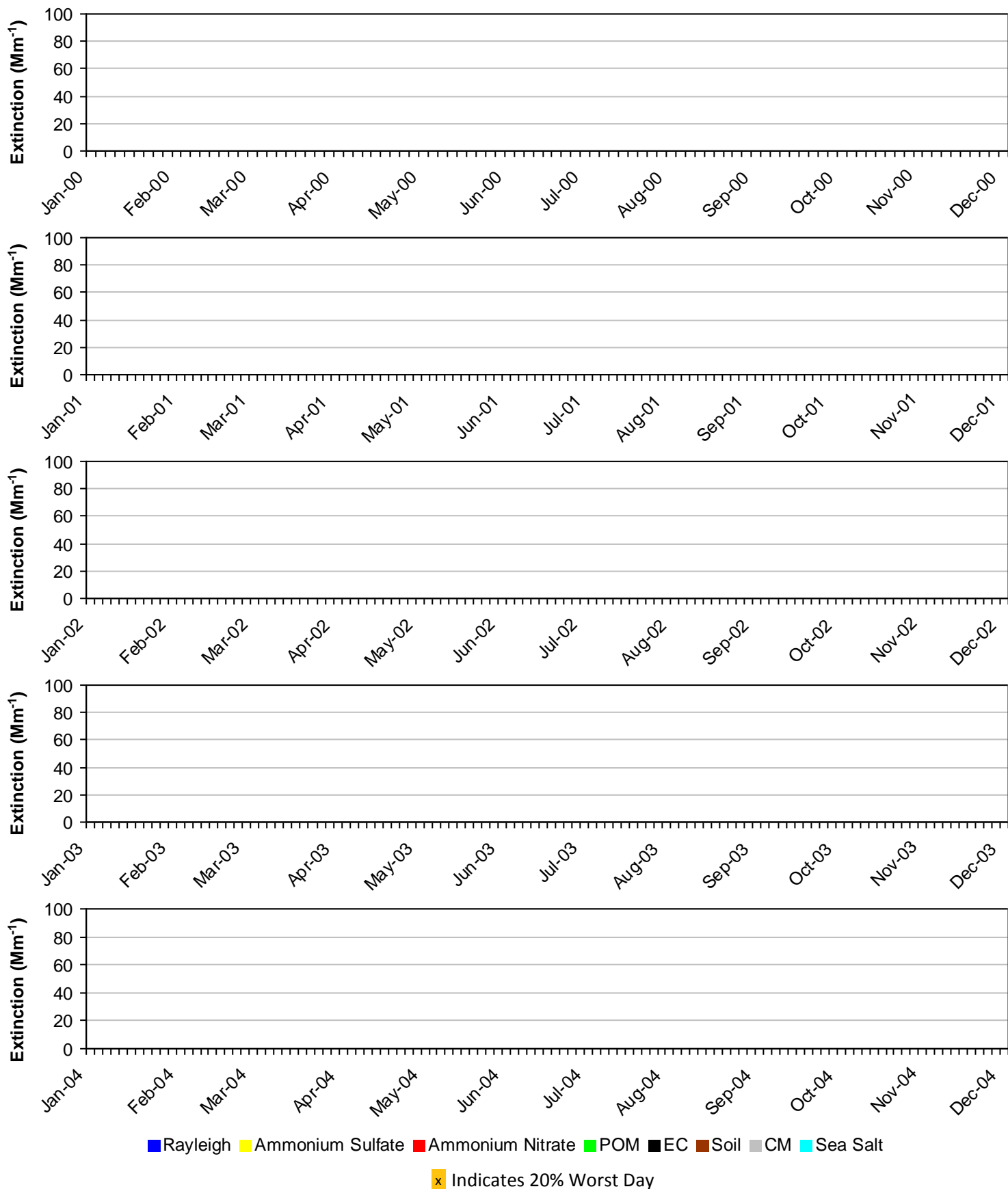
*Note that monthly averages for the years 2000, 2001, 2002, 2003 and 2004 are shown here, but these years did not meet RHR data completeness crite

Figure E.1-6
Haleakala NP, HI (HACR1 Site)
2005-2009 Monthly Average Aerosol Extinction, All Monitored Days



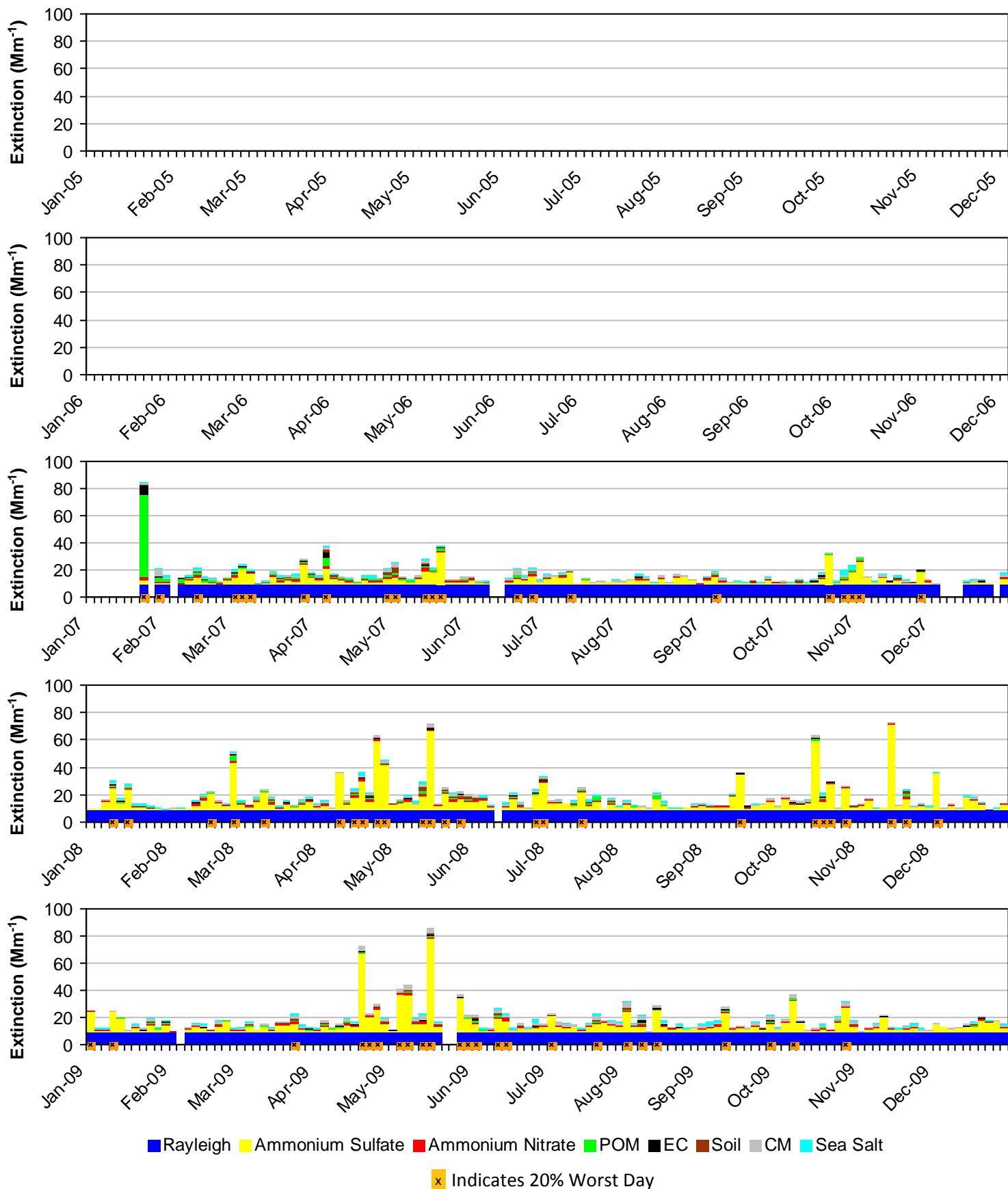
*Note that monthly averages for the years 2005 and 2006 are shown here, but these years did not meet RHR data completeness criteria.

**Figure E.1-7
Haleakala NP, HI (HACR1 Site)
2000-2004 Progress Period Extinction, All Sampled Days**



*Note that daily averages for the years 2000, 2001, 2002, 2003 and 2004 are shown here, but these years did not meet RHR data completeness criteria.

Figure E.1-8
Haleakala NP, HI (HACR1 Site)
2005-2009 Progress Period Extinction, All Sampled Days



*Note that daily averages for the years 2005 and 2006 are shown here, but these years did not meet RHR data completeness criteria.

E.2. HALEAKALA NP (HALE1)

The following tables and figures are presented in this section for the Haleakala NP represented by the HALE1 IMPROVE Monitor:

- **Table E.2-1: Annual Averages, 5-Year Period Averages, and Trends:** Table of averages and other metrics for the 20% least impaired days, the 20% most impaired days, and all sampled days is presented.
- **Figure E.2-1: Annual and 5-Year Period Averages for the 20% Most Impaired Visibility Days:** Line graphs depicting annual and period averages by component are presented.
- **Figure E.2-2: Annual and 5-Year Period Averages for the 20% Least Impaired Visibility Days:** Line graphs depicting annual and period averages by component are presented.
- **Figure E.2-3: 20% Most Impaired Visibility Days:** Pie charts depicting period averages and stacked bar charts depicting annual averages by component for the 20% most impaired days are presented.
- **Figure E.2-4: 20% Least Impaired Visibility Days:** Pie charts depicting period averages and stacked bar charts depicting annual averages by component are presented.
- **Figure E.2-5: 2000-2004 Monthly Average Aerosol Extinction, All Monitored Days:** Line graphs depicting monthly averages by year and component for the baseline period are presented.
- **Figure E.2-6: 2005-2009 Monthly Average Aerosol Extinction, All Monitored Days:** Line graphs depicting monthly averages by year and component for the progress period are presented.
- **Figure E.2-7: 2000-2004 Progress Period Extinction, All Sampled Days:** Stacked bar charts depicting daily averages by year and component for the baseline period are presented.
- **Figure E.2-8: 2000-2004 Progress Period Extinction, All Sampled Days:** Stacked bar charts depicting daily averages by year and component for the progress period are presented.

Table E.2-1
Haleakala NP, HI (HALE1 Site)
Annual Averages, 5-Year Period Averages and Trends

Group	Baseline Period					Progress Period					2010	2000-2009 Trend Statistics*		Period Averages**			
	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009		Slope (change/yr.)	p-value	Baseline (B)	Progress (P)	Difference (P-B)	Percent Change
Deciview (dv)																	
Best 20% Days	---	4.6	4.8	4.3	4.5	3.7	4.5	4.6	4.6	4.6	4.2	0.0	0.5	4.5	4.4	-0.1	-2%
Worst 20% Days	---	13.1	12.6	14.8	12.8	13.5	13.7	13.3	17.9	15.4	14.8	0.3	0.0	13.3	14.8	1.5	11%
All Days	---	8.5	8.7	9.1	8.6	8.5	8.8	8.5	9.9	9.3	8.6	0.1	0.2	8.7	9.0	0.3	3%
Total Extinction (Mm-1)																	
Best 20% Days	---	15.9	16.2	15.5	15.8	14.6	15.8	15.9	15.8	16.0	15.2	0.0	0.5	15.8	15.6	-0.2	-1%
Worst 20% Days	---	37.7	36.1	45.1	36.1	39.0	39.9	38.9	63.2	50.2	46.5	1.0	0.0	38.7	46.2	7.5	19%
All Days	---	24.7	25.0	26.9	24.6	24.9	25.6	24.8	30.9	28.1	26.0	0.3	0.1	25.3	26.8	1.5	6%
Ammonium Sulfate Extinction (Mm-1)																	
Best 20% Days	---	2.3	2.4	2.1	2.0	1.7	2.3	2.2	2.2	2.1	1.8	0.0	0.3	2.2	2.1	-0.1	-5%
Worst 20% Days	---	16.2	15.2	23.5	15.3	18.8	19.4	18.6	45.3	30.3	26.8	1.2	0.0	17.5	26.5	9.0	51%
All Days	---	7.0	7.2	8.7	6.9	7.6	8.1	7.1	14.0	10.8	9.3	0.4	0.1	7.4	9.5	2.1	28%
Ammonium Nitrate Extinction (Mm-1)																	
Best 20% Days	---	0.5	0.7	0.5	0.5	0.3	0.4	0.5	0.4	0.5	0.4	0.0	0.1	0.6	0.4	-0.2	-33%
Worst 20% Days	---	3.1	2.8	2.4	2.4	2.3	2.4	2.4	1.7	1.8	1.7	-0.1	0.0	2.7	2.1	-0.6	-22%
All Days	---	1.7	1.8	1.6	1.5	1.4	1.6	1.5	1.4	1.3	1.1	-0.1	0.0	1.6	1.4	-0.2	-13%
Particulate Organic Mass Extinction (Mm-1)																	
Best 20% Days	---	0.4	0.7	0.7	0.9	0.6	0.4	0.6	0.5	0.5	0.4	0.0	0.3	0.7	0.5	-0.2	-29%
Worst 20% Days	---	2.2	3.0	3.6	2.8	2.3	2.0	2.0	1.7	3.0	2.5	-0.1	0.2	2.9	2.2	-0.7	-24%
All Days	---	1.4	1.8	2.0	1.9	1.4	1.4	1.3	1.2	1.4	1.2	0.0	0.0	1.8	1.3	-0.5	-28%
Elemental Carbon Extinction (Mm-1)																	
Best 20% Days	---	0.2	0.2	0.2	0.2	0.2	0.2	0.1	0.1	0.2	0.2	0.0	0.0	0.2	0.2	0.0	0%
Worst 20% Days	---	1.2	1.3	1.7	1.3	1.3	1.0	1.0	1.1	1.3	1.0	0.0	0.3	1.4	1.2	-0.2	-14%
All Days	---	0.7	0.8	0.9	0.8	0.6	0.7	0.6	0.6	0.6	0.5	0.0	0.1	0.8	0.6	-0.2	-25%
Soil Extinction (Mm-1)																	
Best 20% Days	---	0.1	0.1	0.1	0.1	0.0	0.1	0.1	0.1	0.1	0.1	0.0	0.4	0.1	0.1	0.0	0%
Worst 20% Days	---	0.4	0.4	0.3	0.3	0.3	0.3	0.4	0.4	0.4	0.3	0.0	0.1	0.3	0.4	0.1	33%
All Days	---	0.3	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.0	0.5	0.2	0.2	0.0	0%
Coarse Mass Extinction (Mm-1)																	
Best 20% Days	---	1.2	1.1	1.0	0.9	0.8	0.8	0.9	0.9	1.0	0.9	0.0	0.1	1.0	0.9	-0.1	-10%
Worst 20% Days	---	3.2	2.7	2.4	2.2	1.9	2.3	2.0	1.6	1.9	1.9	-0.2	0.0	2.6	1.9	-0.7	-27%
All Days	---	2.2	2.0	1.9	1.6	1.5	1.6	1.6	1.5	1.6	1.5	-0.1	0.0	1.9	1.6	-0.3	-16%
Sea Salt Extinction (Mm-1)																	
Best 20% Days	---	1.1	1.0	0.9	1.3	1.1	1.4	1.6	1.7	1.7	1.5	0.1	0.0	1.1	1.5	0.4	36%
Worst 20% Days	---	1.4	0.7	1.3	1.7	2.1	2.5	2.5	1.3	1.5	2.4	0.1	0.1	1.3	2.0	0.7	54%
All Days	---	1.4	1.1	1.6	1.7	2.3	2.1	2.5	1.9	2.1	2.2	0.1	0.0	1.4	2.2	0.8	57%

*Values highlighted in blue (red) indicate statistically significant decreasing (increasing) annual trend. Significance is measured at the 85% confidence level (p-value ≤0.15).

**Values highlighted in blue indicate a decrease in the 5-year average, values highlighted in red indicate an increase.

---" Indicates a missing year that did not meet RHR data completeness criteria.

Figure E.2-1
Haleakala NP, HI (HALE1 Site)
Annual and 5-Year Period Averages
20% Most Impaired Visibility Days

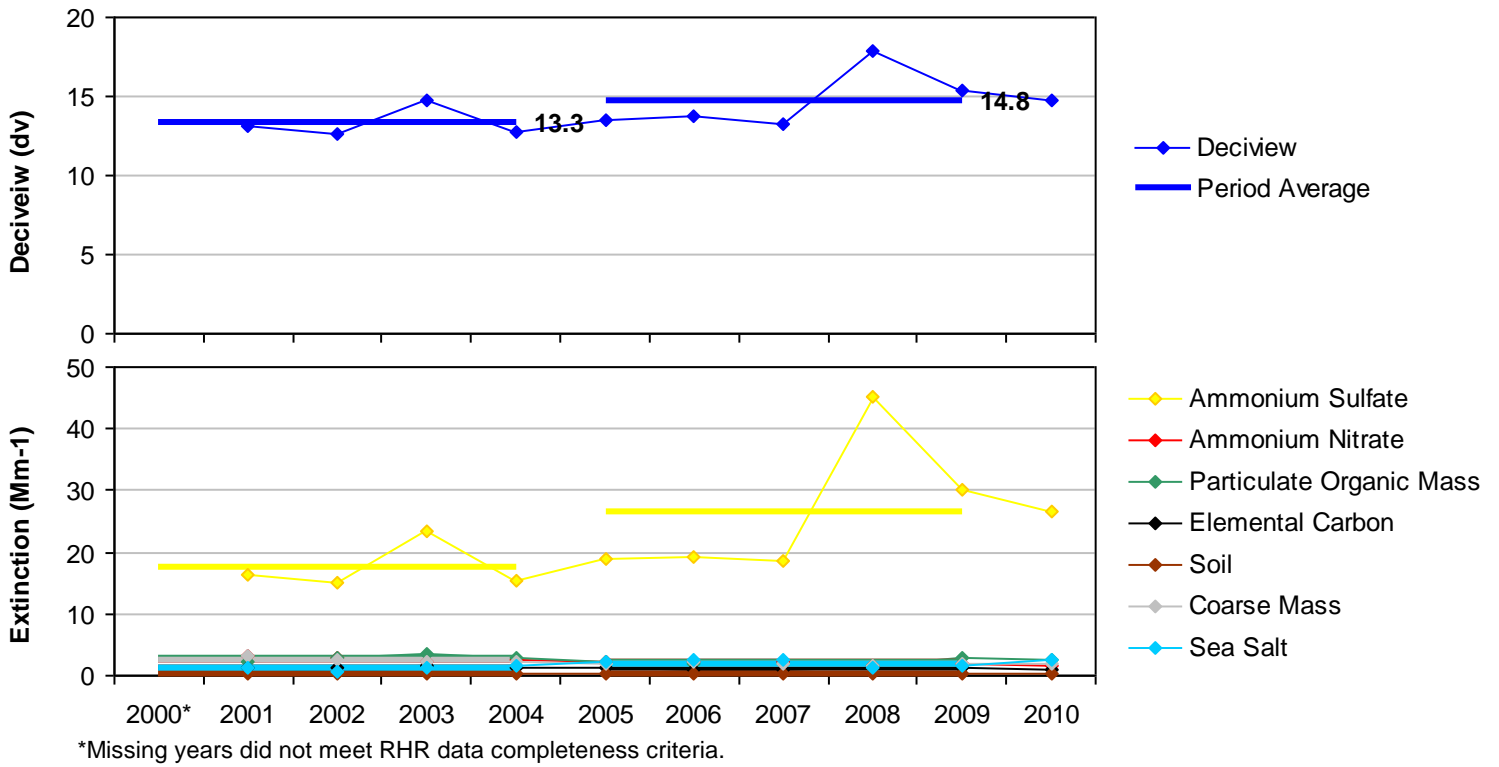


Figure E.2-2
Haleakala NP, HI (HALE1 Site)
Annual and 5-Year Period Averages
20% Least Impaired Visibility Days

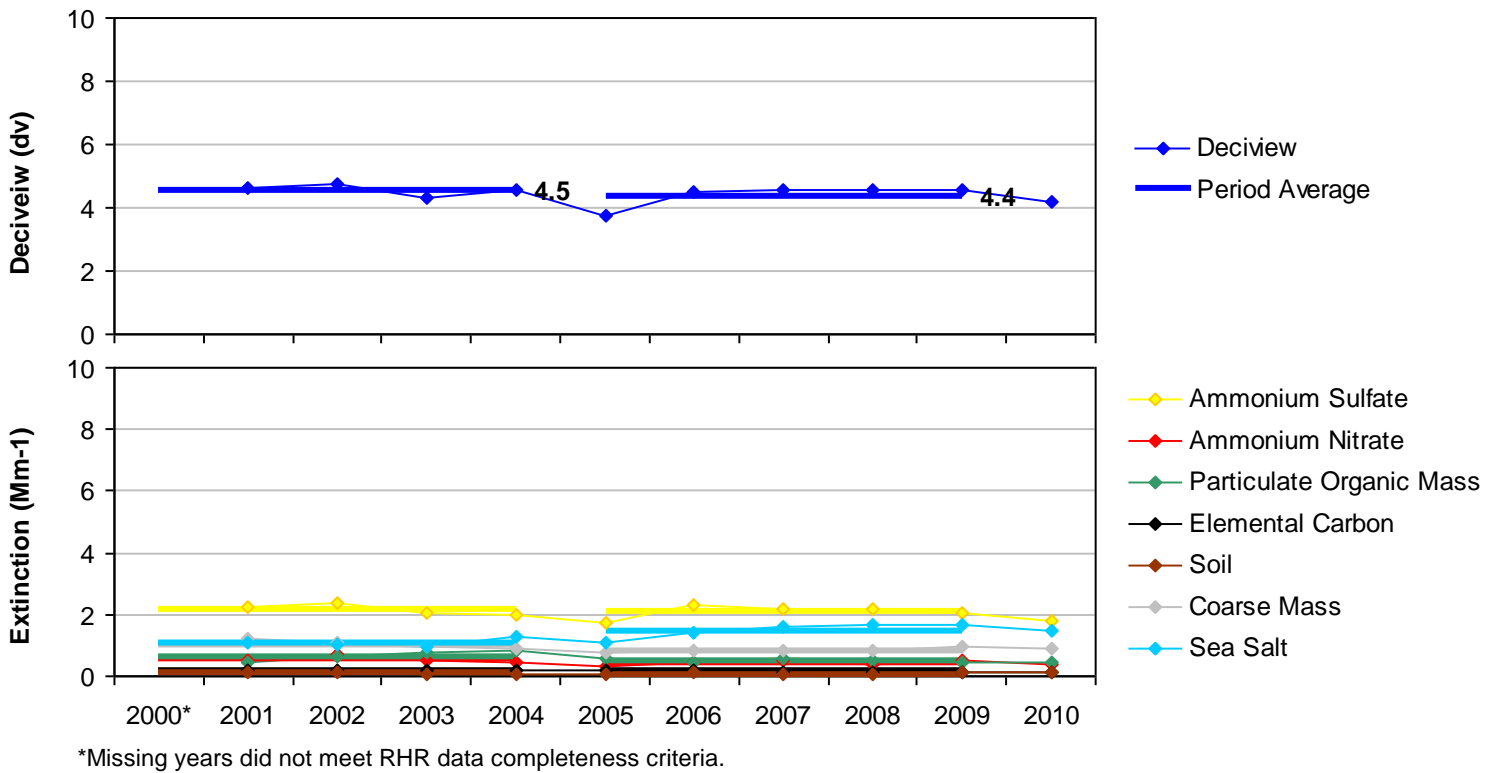
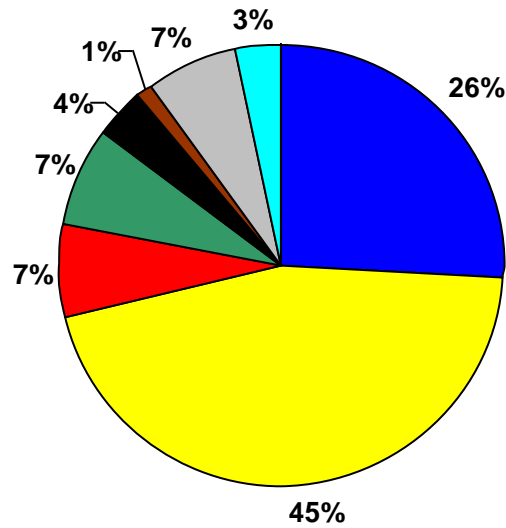
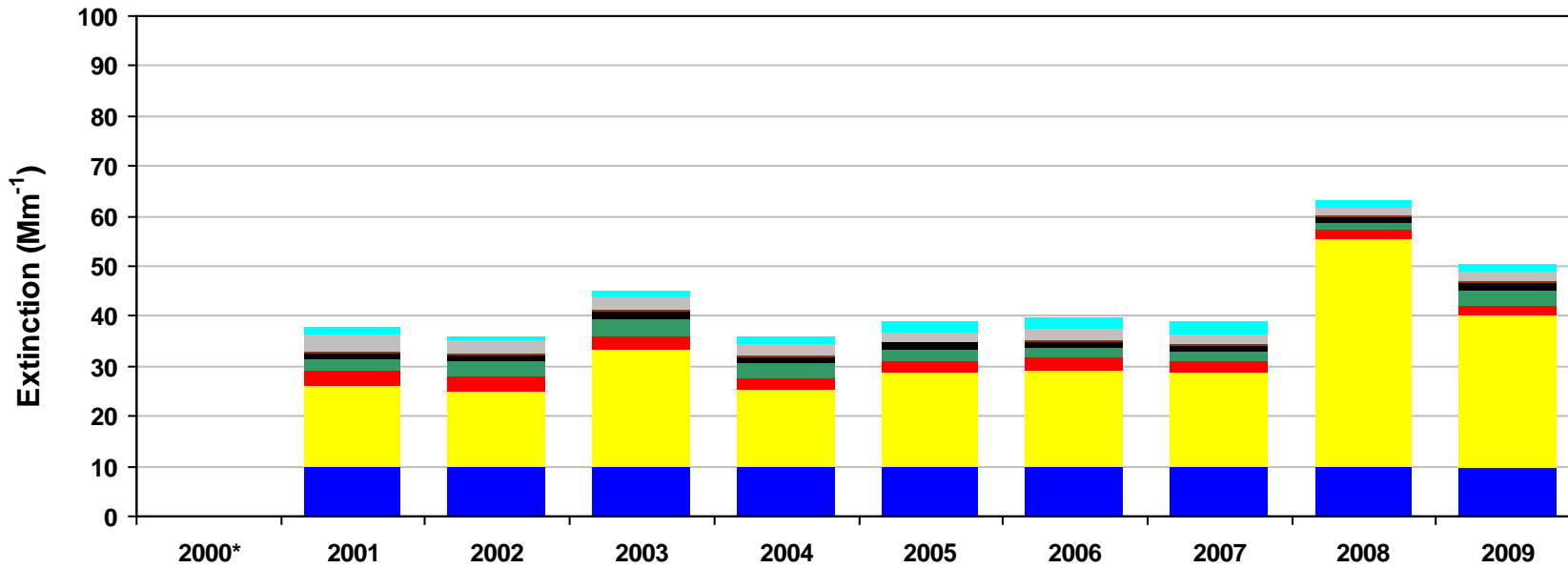
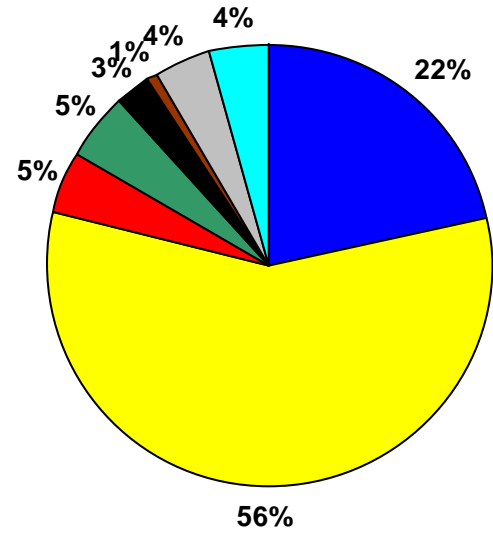
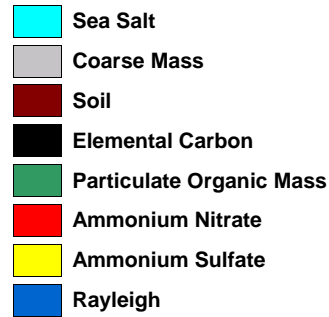


Figure E.2-3
Haleakala NP, HI (HALE1 Site)
20% Most Impaired Visibility Days

2000-2004 Baseline Average
 13.3 dv (12.6 - 14.8 dv)



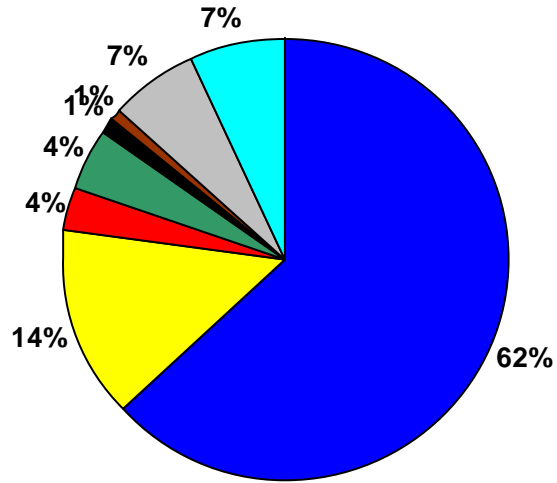
2005-2009 Progress Period Average
 14.8 dv (13.3 - 17.9 dv)



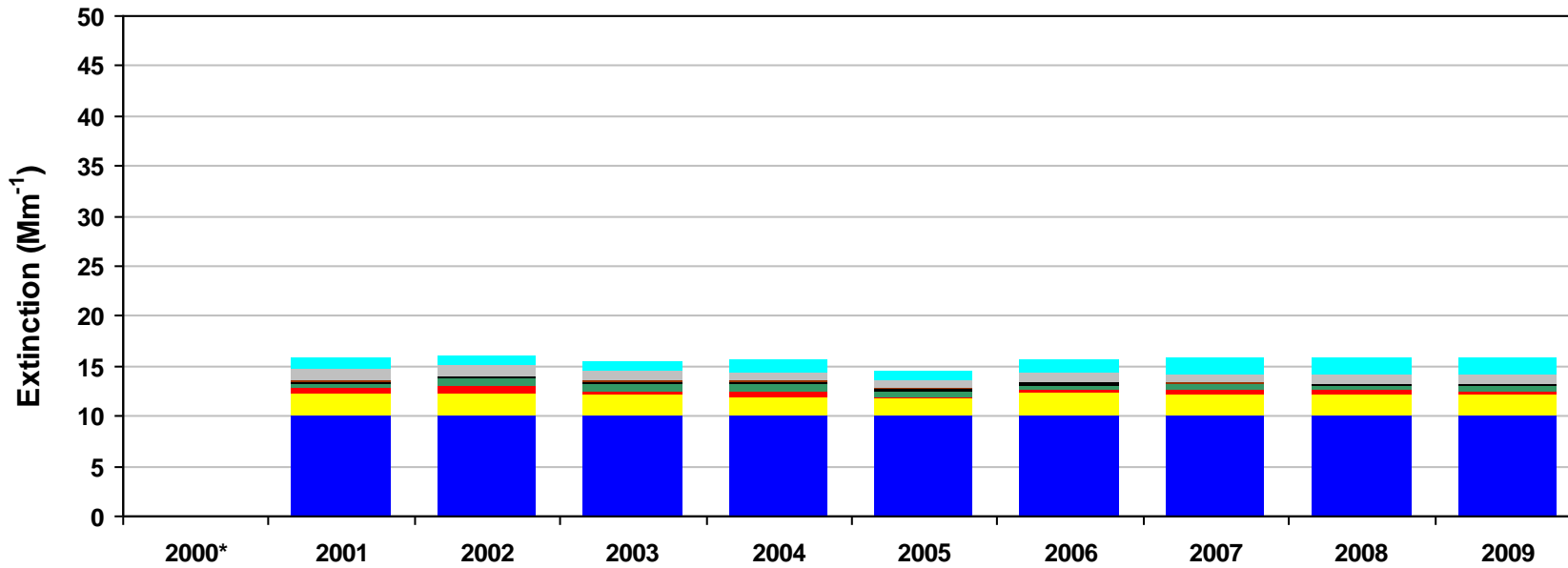
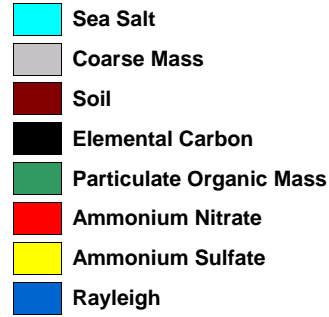
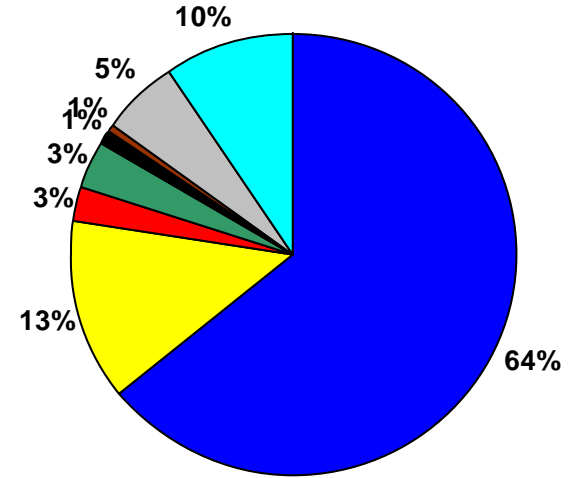
*Missing years did not meet RHR data completeness criteria. Only complete years are included in 5-year average pie charts.

Figure E.2-4
Haleakala NP, HI (HALE1 Site)
20% Least Impaired Visibility Days

2000-2004 Baseline Average
 4.5 dv (4.3 - 4.8 dv)

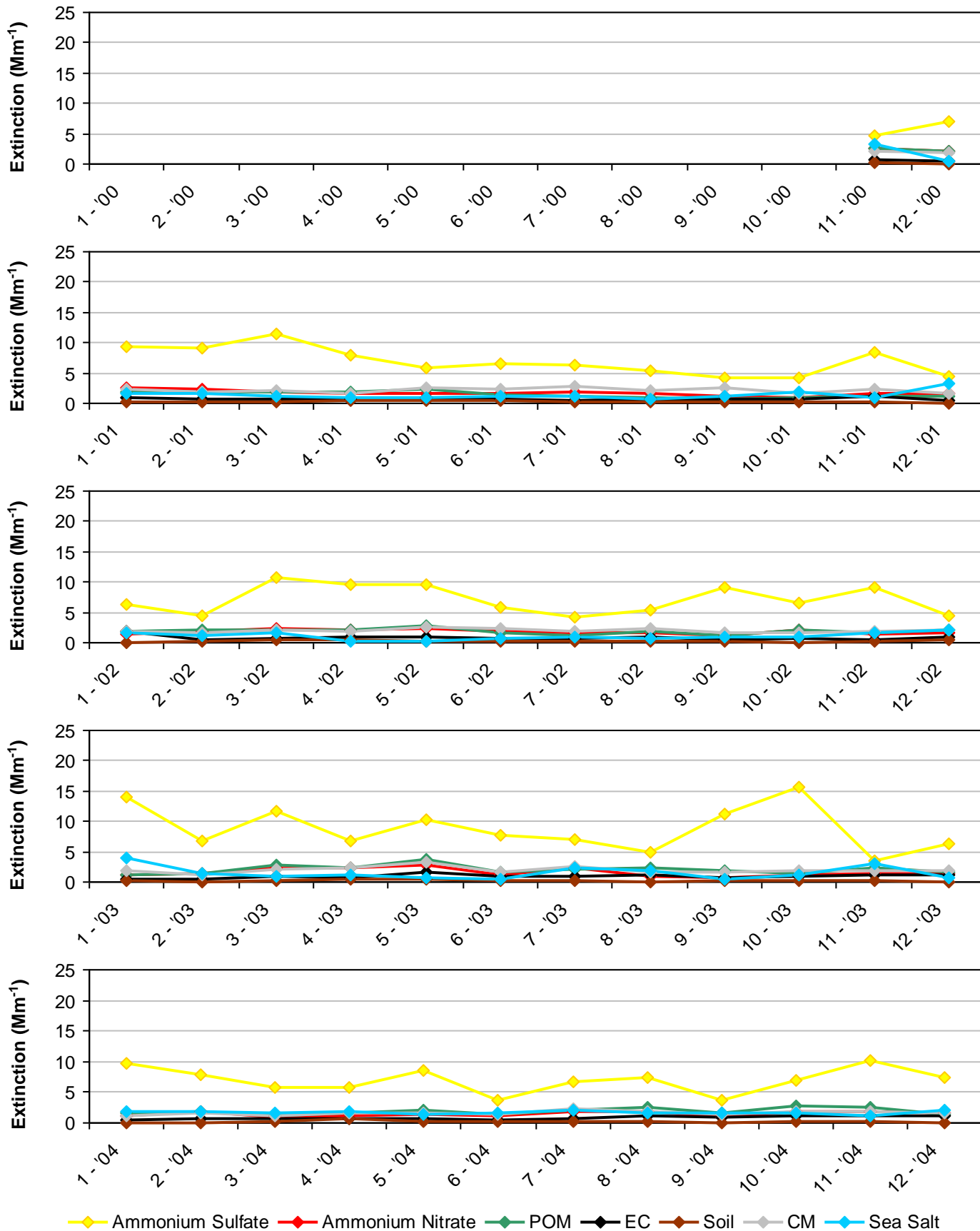


2005-2009 Progress Period Average
 4.4 dv (3.7 - 4.6 dv)



*Missing years did not meet RHR data completeness criteria. Only complete years are included in 5-year average pie charts.

Figure E.2-5
Haleakala NP, HI (HALE1 Site)
2000-2004 Monthly Average Aerosol Extinction, All Monitored Days



*Note that monthly averages for the year 2000 are shown here, but this year did not meet RHR data completeness criteria.

Figure E.2-6
Haleakala NP, HI (HALE1 Site)
2005-2009 Monthly Average Aerosol Extinction, All Monitored Days

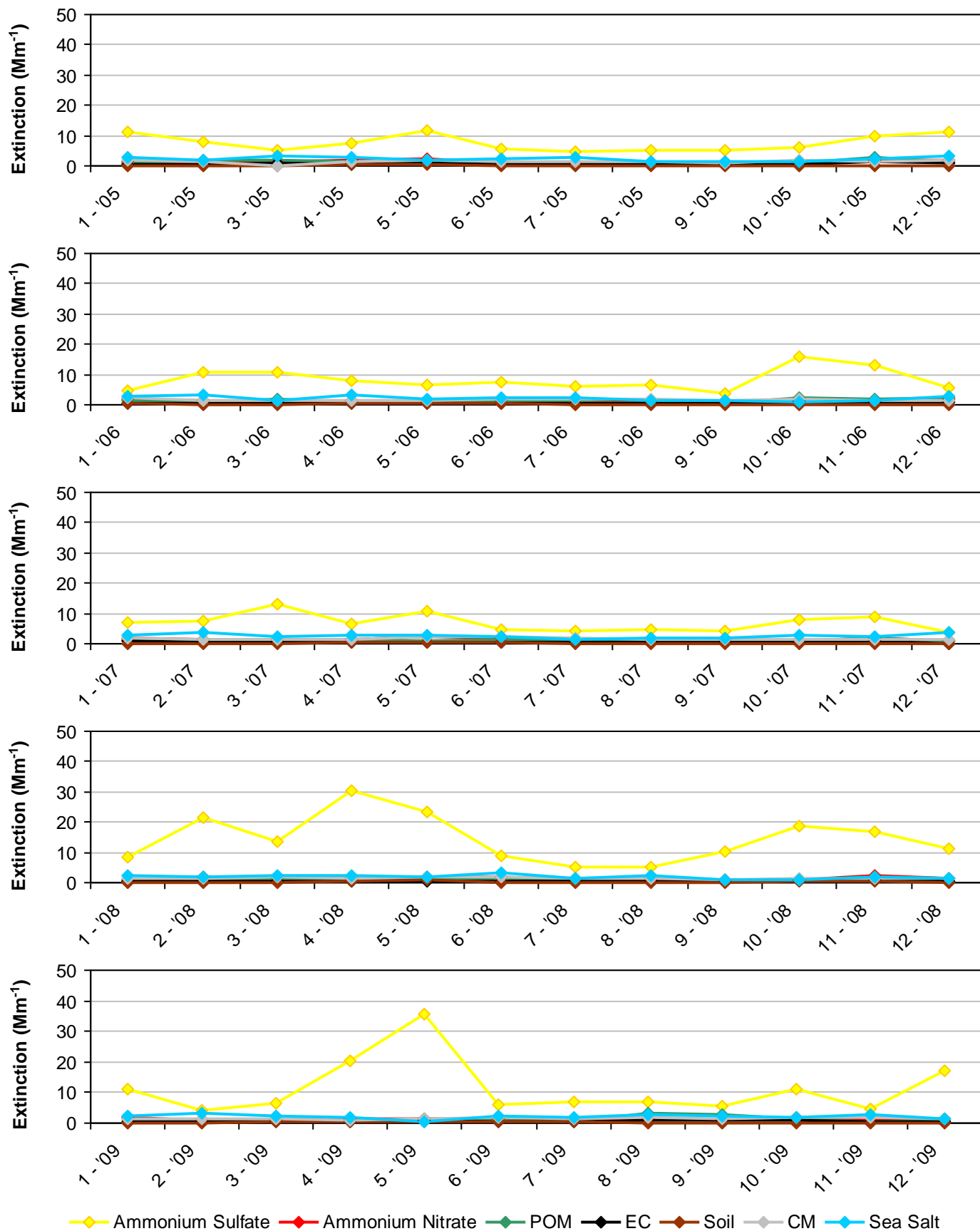
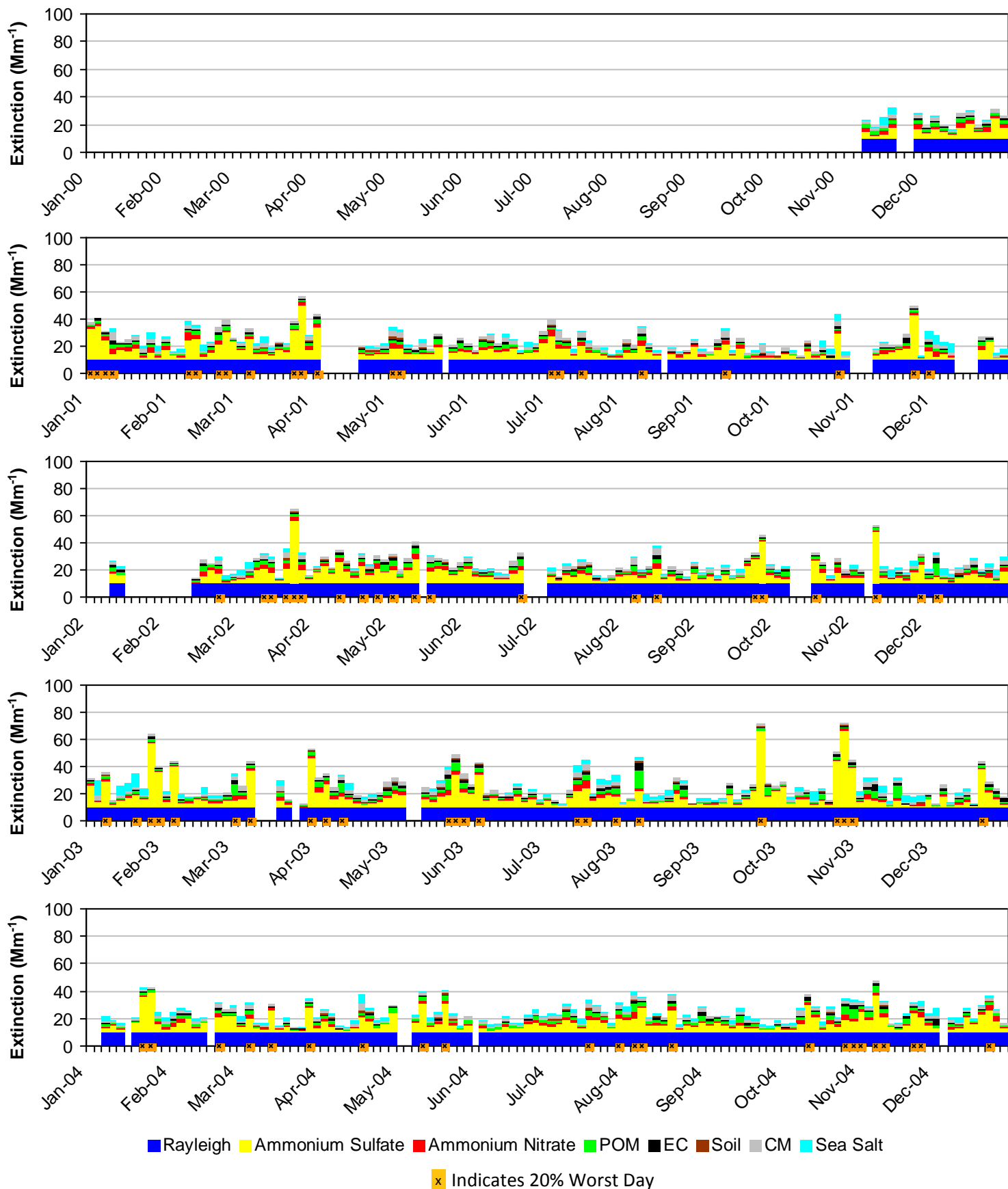
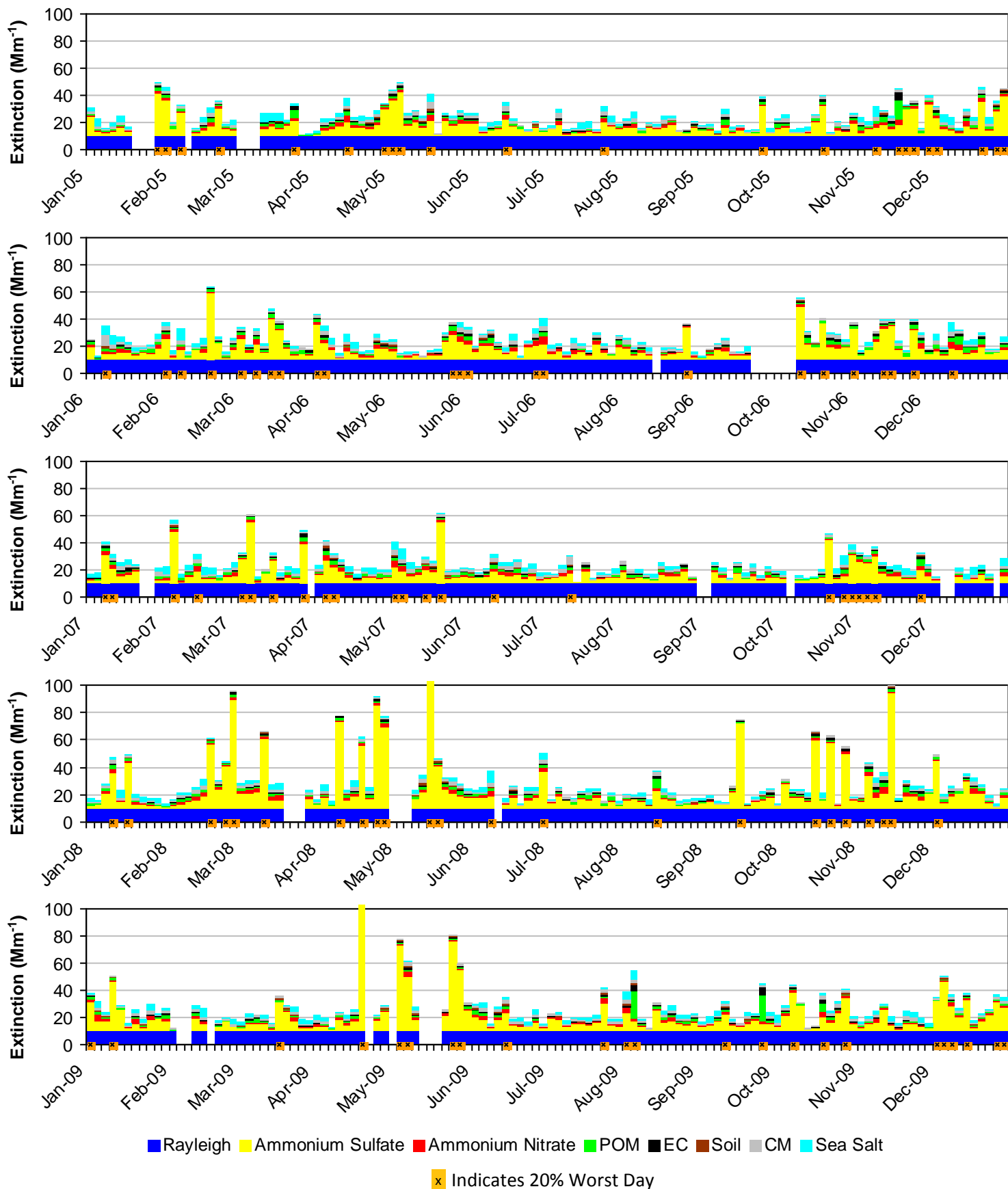


Figure E.2-7
Haleakala NP, HI (HALE1 Site)
2000-2004 Progress Period Extinction, All Sampled Days



*Note that daily averages for the year 2000 are shown here, but this year did not meet RHR data completeness criteria.

Figure E.2-8
Haleakala NP, HI (HALE1 Site)
2005-2009 Progress Period Extinction, All Sampled Days



E.3. HAWAII VOLCANOES NP (HAVO1)

The following tables and figures are presented in this section for the Hawaii Volcanoes NP represented by the HAVO1 IMPROVE Monitor:

- **Table E.3-1: Annual Averages, 5-Year Period Averages, and Trends:** Table of averages and other metrics for the 20% least impaired days, the 20% most impaired days, and all sampled days is presented.
- **Figure E.3-1: Annual and 5-Year Period Averages for the 20% Most Impaired Visibility Days:** Line graphs depicting annual and period averages by component are presented.
- **Figure E.3-2: Annual and 5-Year Period Averages for the 20% Least Impaired Visibility Days:** Line graphs depicting annual and period averages by component are presented.
- **Figure E.3-3: 20% Most Impaired Visibility Days:** Pie charts depicting period averages and stacked bar charts depicting annual averages by component for the 20% most impaired days are presented.
- **Figure E.3-4: 20% Least Impaired Visibility Days:** Pie charts depicting period averages and stacked bar charts depicting annual averages by component are presented.
- **Figure E.3-5: 2000-2004 Monthly Average Aerosol Extinction, All Monitored Days:** Line graphs depicting monthly averages by year and component for the baseline period are presented.
- **Figure E.3-6: 2005-2009 Monthly Average Aerosol Extinction, All Monitored Days:** Line graphs depicting monthly averages by year and component for the progress period are presented.
- **Figure E.3-7: 2000-2004 Progress Period Extinction, All Sampled Days:** Stacked bar charts depicting daily averages by year and component for the baseline period are presented.
- **Figure E.3-8: 2000-2004 Progress Period Extinction, All Sampled Days:** Stacked bar charts depicting daily averages by year and component for the progress period are presented.

Table E.3-1
Hawaii Volcanoes NP, HI (HAVO1 Site)
Annual Averages, 5-Year Period Averages and Trends

Group	Baseline Period					Progress Period					2010	2000-2009 Trend Statistics*		Period Averages**			
	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009		Slope (change/yr.)	p-value	Baseline (B)	Progress (P)	Difference (P-B)	Percent Change
Deciview (dv)																	
Best 20% Days	---	4.1	3.9	4.2	4.0	3.5	3.2	4.0	4.1	3.9	3.5	0.0	0.2	4.1	3.8	-0.3	-7%
Worst 20% Days	---	16.4	18.0	22.0	19.0	22.1	20.6	23.8	27.5	30.5	24.4	1.6	0.0	18.9	24.9	6.0	32%
All Days	---	8.8	9.2	10.6	9.7	10.2	10.0	10.3	11.5	13.2	10.5	0.4	0.0	9.6	11.1	1.5	16%
Total Extinction (Mm-1)																	
Best 20% Days	---	15.2	14.9	15.3	15.0	14.3	13.9	15.1	15.1	14.9	14.2	0.0	0.3	15.1	14.6	-0.5	-3%
Worst 20% Days	---	60.9	69.7	103.7	71.6	100.8	83.5	124.1	197.5	232.9	145.3	19.1	0.0	76.5	147.7	71.2	93%
All Days	---	28.6	30.5	39.3	31.8	37.7	34.5	41.4	57.4	69.4	46.4	3.9	0.0	32.5	48.1	15.6	48%
Ammonium Sulfate Extinction (Mm-1)																	
Best 20% Days	---	1.9	1.7	2.9	2.1	2.1	1.8	2.2	2.3	2.7	2.0	0.1	0.1	2.2	2.2	0.0	0%
Worst 20% Days	---	41.4	53.0	89.3	56.2	85.2	69.2	108.6	179.5	218.1	131.2	18.9	0.0	60.0	132.1	72.1	>100%
All Days	---	12.0	14.6	24.3	15.8	22.6	20.0	26.1	41.8	55.1	31.8	3.9	0.0	16.7	33.1	16.4	98%
Ammonium Nitrate Extinction (Mm-1)																	
Best 20% Days	---	0.3	0.2	0.4	0.3	0.2	0.2	0.4	0.3	0.3	0.3	0.0	0.4	0.3	0.3	0.0	0%
Worst 20% Days	---	1.1	1.0	0.8	0.6	0.6	0.3	0.7	0.7	0.5	0.4	-0.1	0.0	0.9	0.6	-0.3	-33%
All Days	---	0.9	0.9	0.8	0.8	0.7	0.6	0.8	0.7	0.5	0.6	0.0	0.0	0.8	0.7	-0.1	-13%
Particulate Organic Mass Extinction (Mm-1)																	
Best 20% Days	---	1.7	1.9	0.3	0.5	0.1	0.1	0.2	0.1	0.1	0.0	-0.1	0.0	1.1	0.1	-1.0	-91%
Worst 20% Days	---	3.6	3.9	1.3	1.2	1.4	1.0	1.5	1.7	0.9	0.8	-0.1	0.1	2.5	1.3	-1.2	-48%
All Days	---	2.4	2.7	0.8	0.9	0.6	0.5	0.7	0.6	0.4	0.3	-0.1	0.0	1.7	0.6	-1.1	-65%
Elemental Carbon Extinction (Mm-1)																	
Best 20% Days	---	0.2	0.2	0.1	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.1	0.2	0.1	-0.1	-50%
Worst 20% Days	---	0.9	0.9	1.2	1.0	0.9	0.8	0.9	0.9	0.6	0.6	0.0	0.1	1.0	0.8	-0.2	-20%
All Days	---	0.4	0.4	0.5	0.5	0.3	0.3	0.3	0.3	0.3	0.2	0.0	0.0	0.4	0.3	-0.1	-25%
Soil Extinction (Mm-1)																	
Best 20% Days	---	0.1	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5	0.1	0.0	-0.1	-100%
Worst 20% Days	---	0.2	0.2	0.4	0.3	0.3	0.2	0.3	0.7	1.2	0.8	0.1	0.0	0.3	0.5	0.2	67%
All Days	---	0.2	0.1	0.2	0.2	0.2	0.1	0.1	0.2	0.4	0.3	0.0	0.2	0.2	0.2	0.0	0%
Coarse Mass Extinction (Mm-1)																	
Best 20% Days	---	0.4	0.2	0.5	0.5	0.4	0.3	0.5	0.4	0.3	0.5	0.0	0.5	0.4	0.4	0.0	0%
Worst 20% Days	---	1.1	0.4	0.7	0.9	1.0	0.4	0.8	2.5	0.8	0.7	0.0	0.3	0.8	1.1	0.3	38%
All Days	---	0.8	0.6	1.1	0.9	0.9	0.6	0.9	1.3	0.7	0.9	0.0	0.5	0.9	0.9	0.0	0%
Sea Salt Extinction (Mm-1)																	
Best 20% Days	---	0.7	0.7	1.0	1.3	1.4	1.4	1.7	1.8	1.4	1.3	0.1	0.0	0.9	1.6	0.7	78%
Worst 20% Days	---	2.7	0.4	0.1	1.4	1.5	1.5	1.2	1.5	0.8	0.8	0.0	0.4	1.2	1.3	0.1	8%
All Days	---	1.9	1.2	1.6	2.7	2.4	2.3	2.5	2.4	2.0	2.3	0.1	0.2	1.8	2.3	0.5	28%

*Values highlighted in blue (red) indicate statistically significant decreasing (increasing) annual trend. Significance is measured at the 85% confidence level (p-value ≤0.15).

**Values highlighted in blue indicate a decrease in the 5-year average, values highlighted in red indicate an increase.

---" Indicates a missing year that did not meet RHR data completeness criteria.

Figure E.3-1
Hawaii Volcanoes NP, HI (HAVO1 Site)
Annual and 5-Year Period Averages
20% Most Impaired Visibility Days

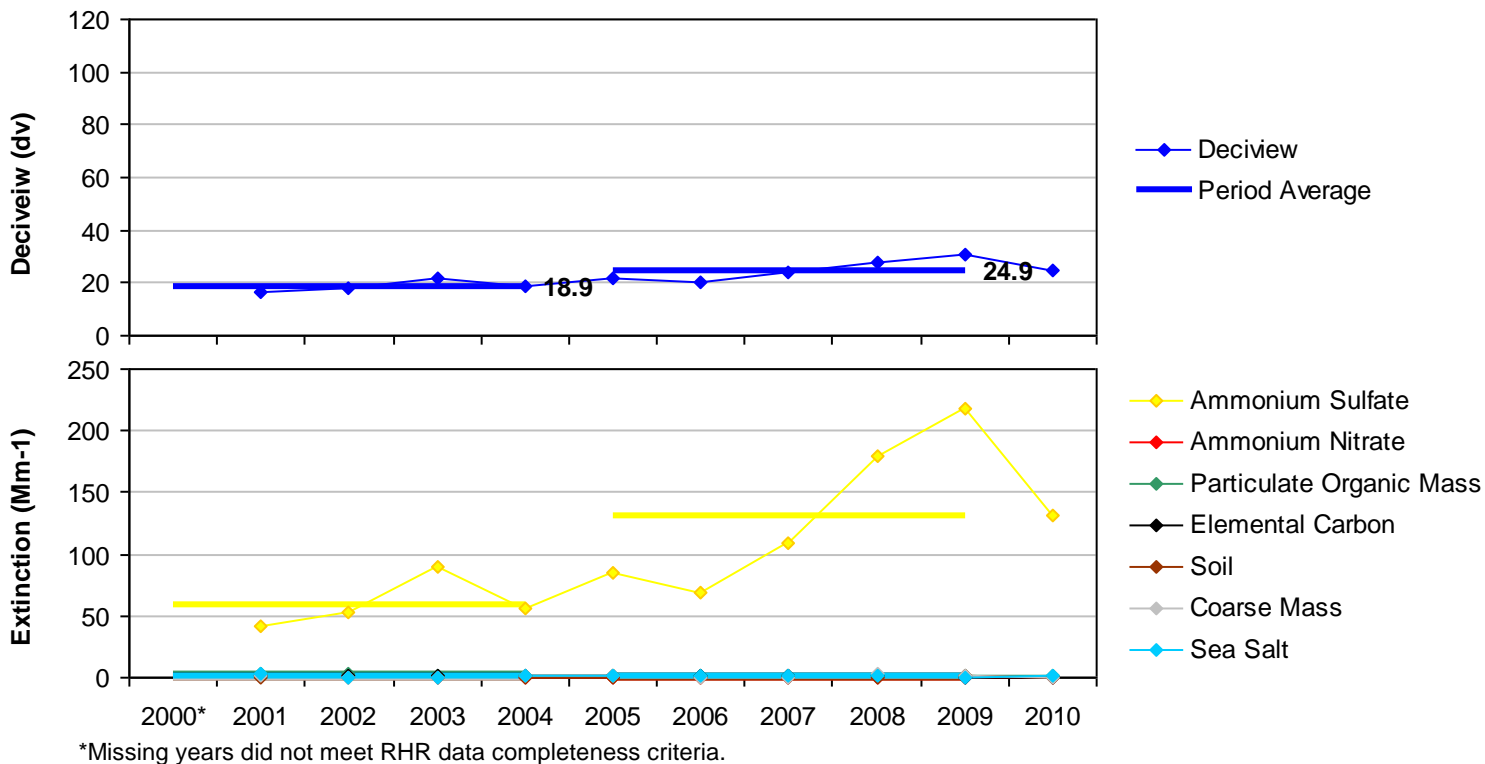


Figure E.3-2
Hawaii Volcanoes NP, HI (HAVO1 Site)
Annual and 5-Year Period Averages
20% Least Impaired Visibility Days

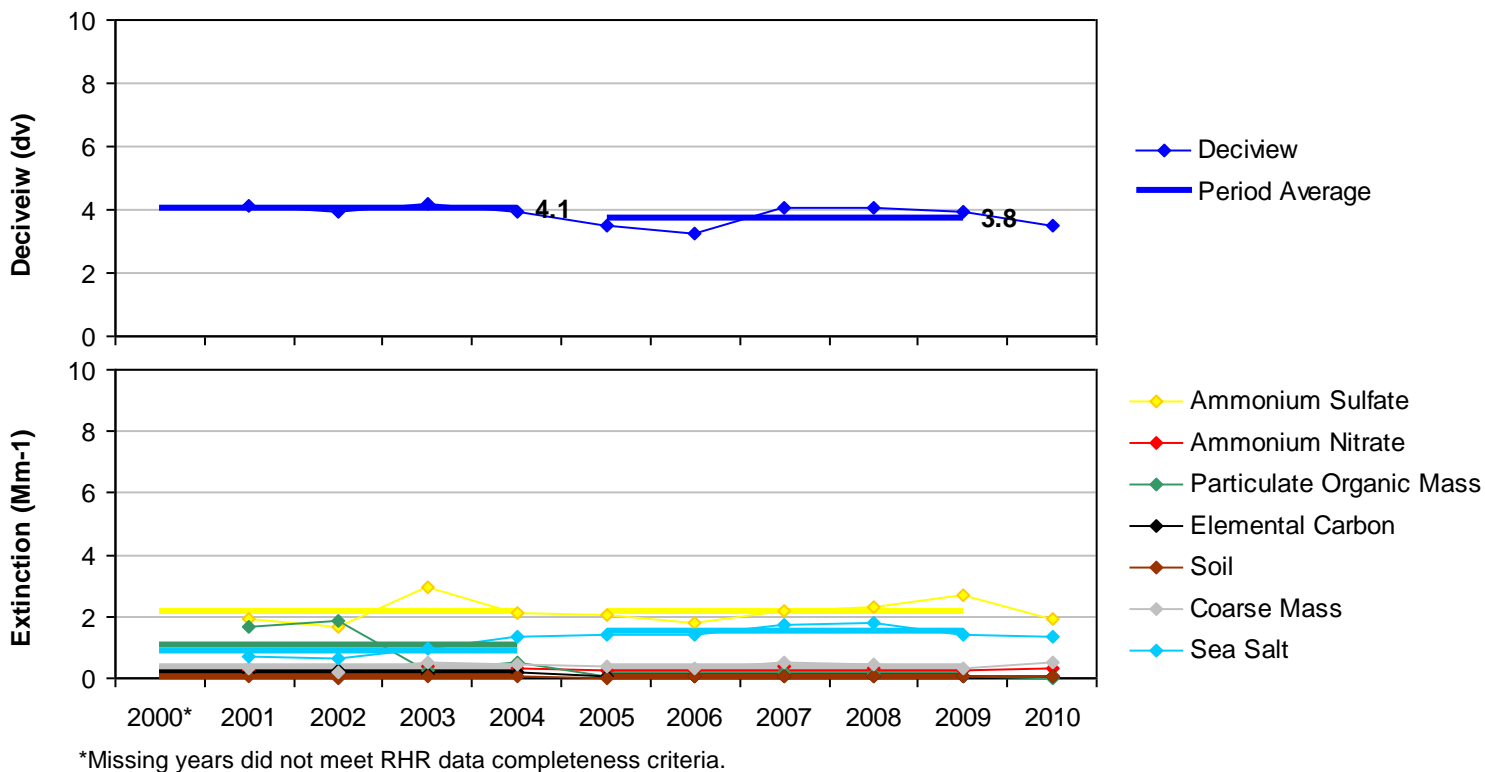
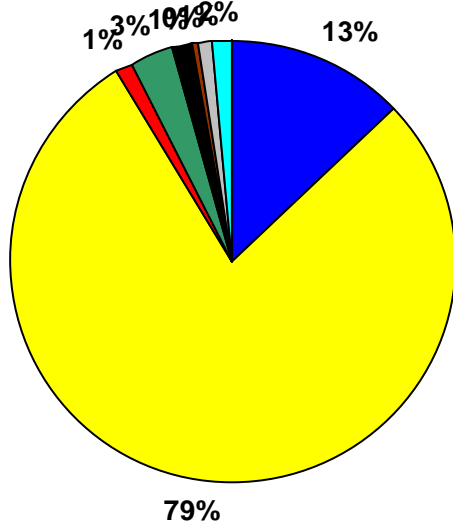
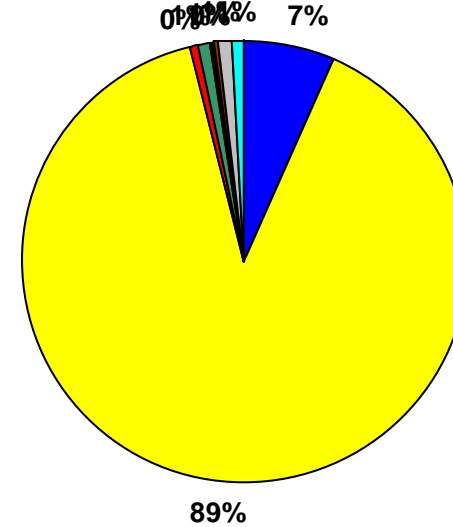


Figure E.3-3
Hawaii Volcanoes NP, HI (HAVO1 Site)
20% Most Impaired Visibility Days

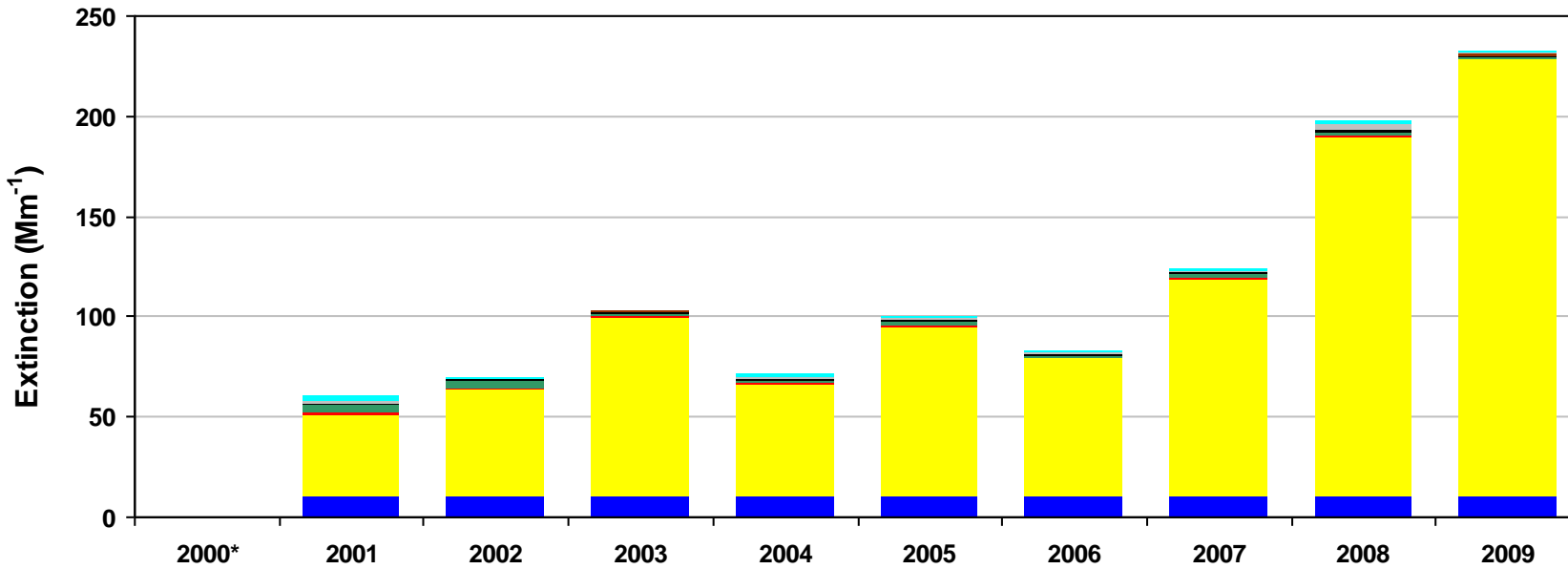
2000-2004 Baseline Average
 18.9 dv (16.4 - 22 dv)



2005-2009 Progress Period Average
 24.9 dv (20.6 - 30.5 dv)

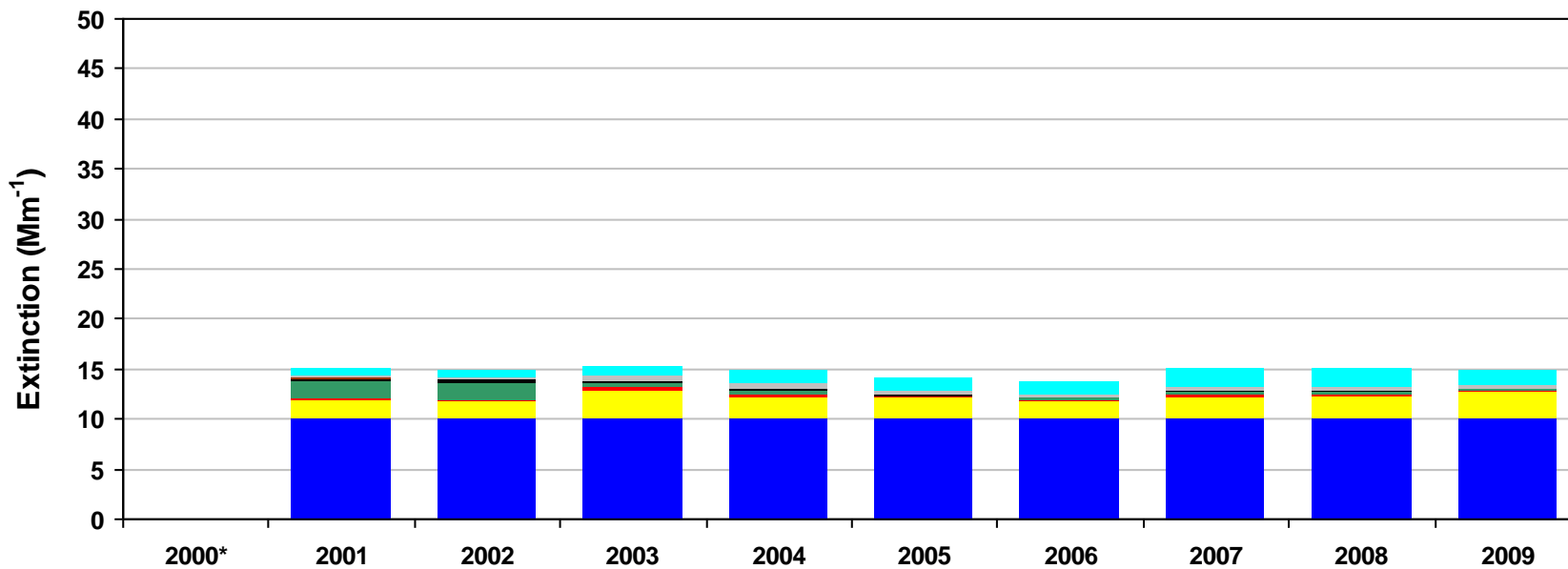
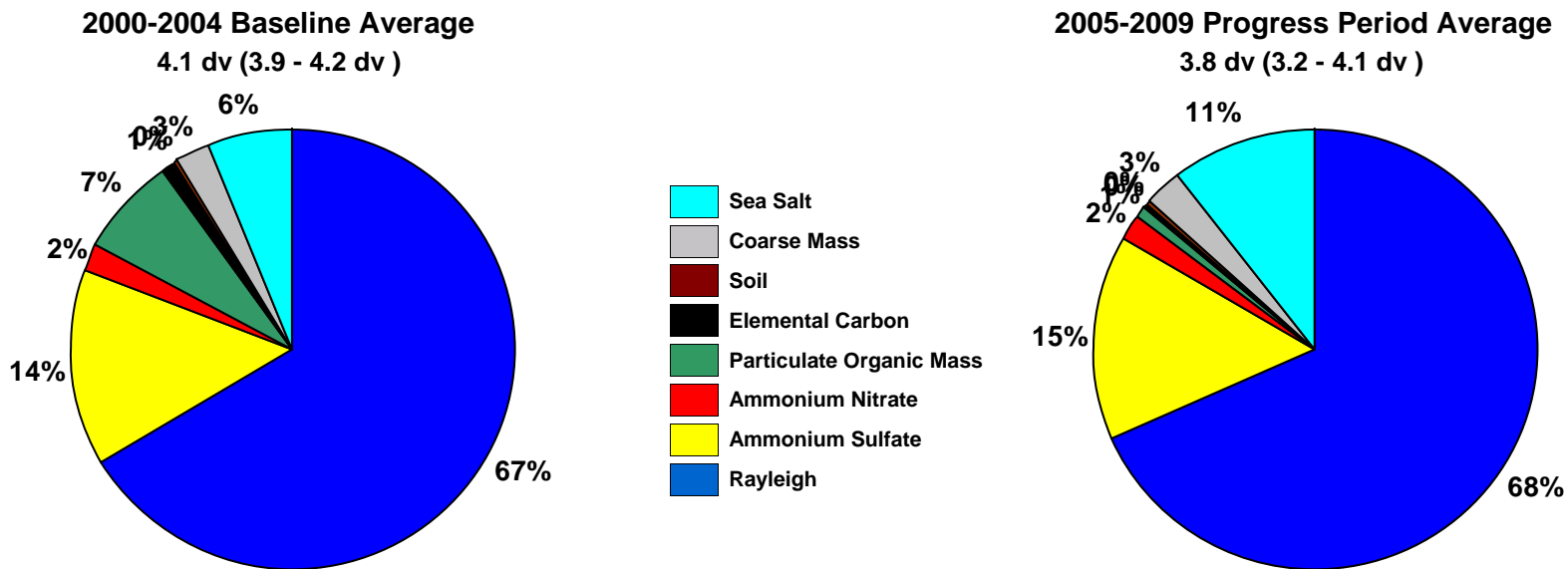


- Sea Salt
- Coarse Mass
- Soil
- Elemental Carbon
- Particulate Organic Mass
- Ammonium Nitrate
- Ammonium Sulfate
- Rayleigh



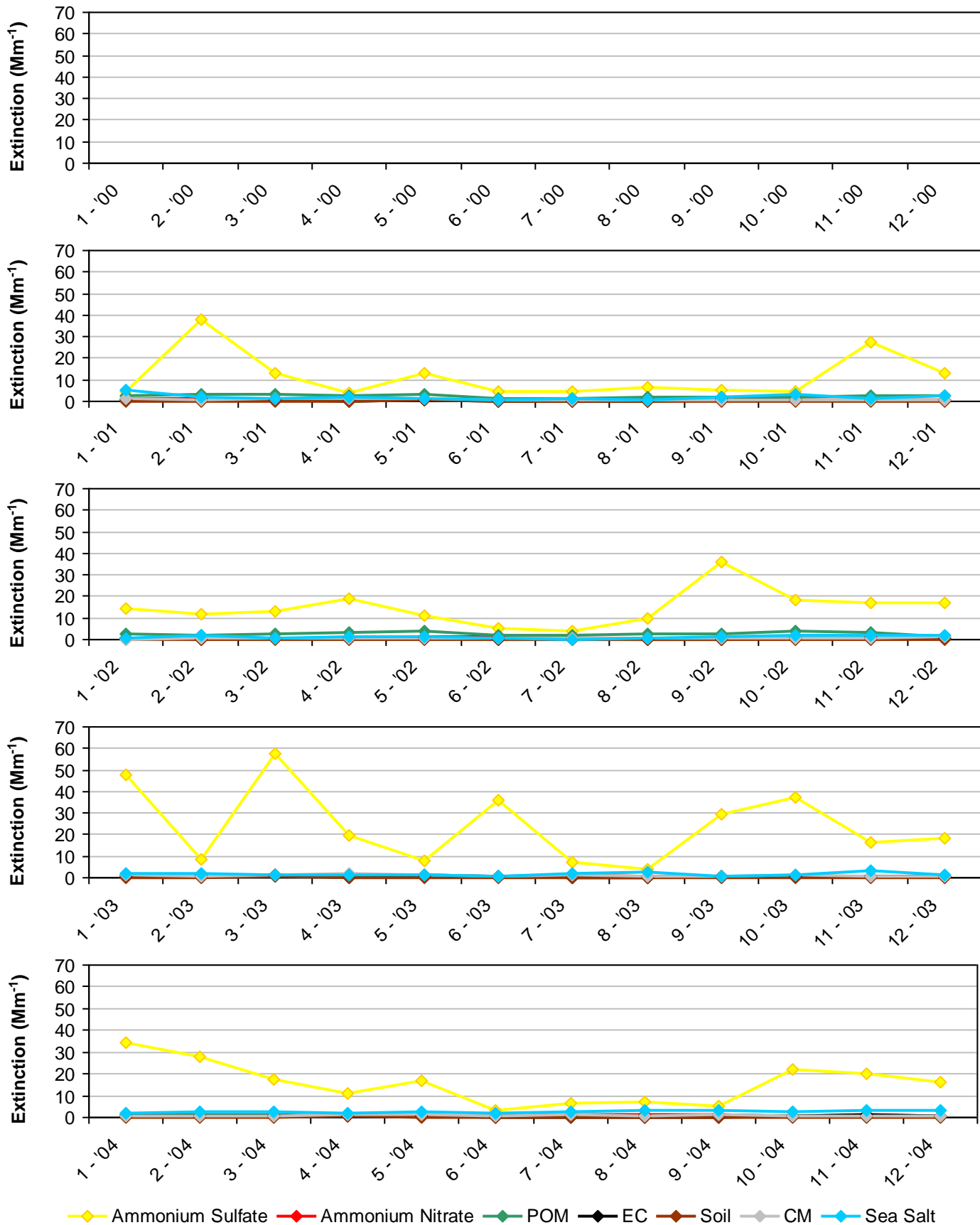
*Missing years did not meet RHR data completeness criteria. Only complete years are included in 5-year average pie charts.

Figure E.3-4
Hawaii Volcanoes NP, HI (HAVO1 Site)
20% Least Impaired Visibility Days



*Missing years did not meet RHR data completeness criteria. Only complete years are included in 5-year average pie charts.

Figure E.3-5
Hawaii Volcanoes NP, HI (HAVO1 Site)
2000-2004 Monthly Average Aerosol Extinction, All Monitored Days



*Note that monthly averages for the year 2000 are shown here, but this year did not meet RHR data completeness criteria.

Figure E.3-6
Hawaii Volcanoes NP, HI (HAVO1 Site)
2005-2009 Monthly Average Aerosol Extinction, All Monitored Days

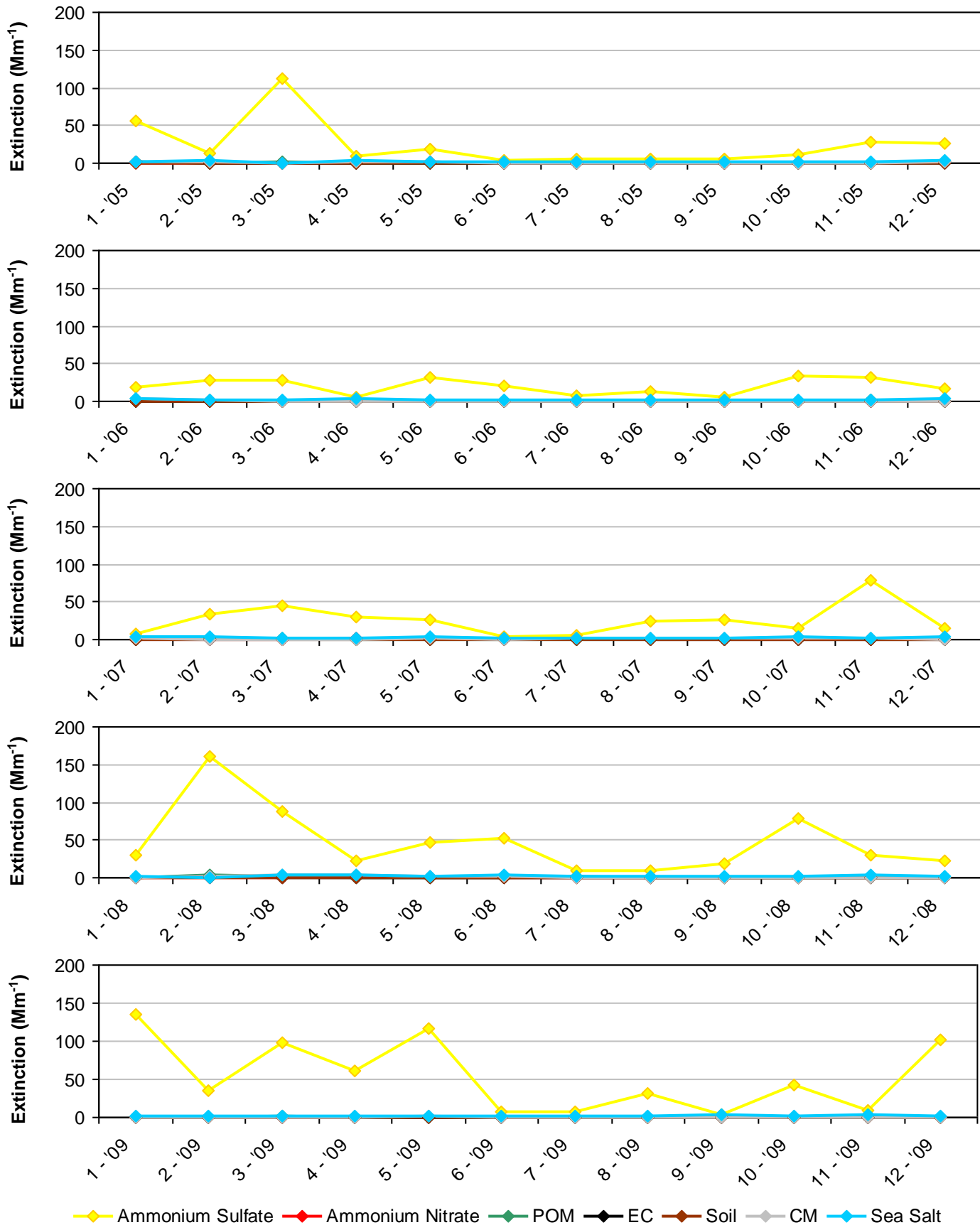
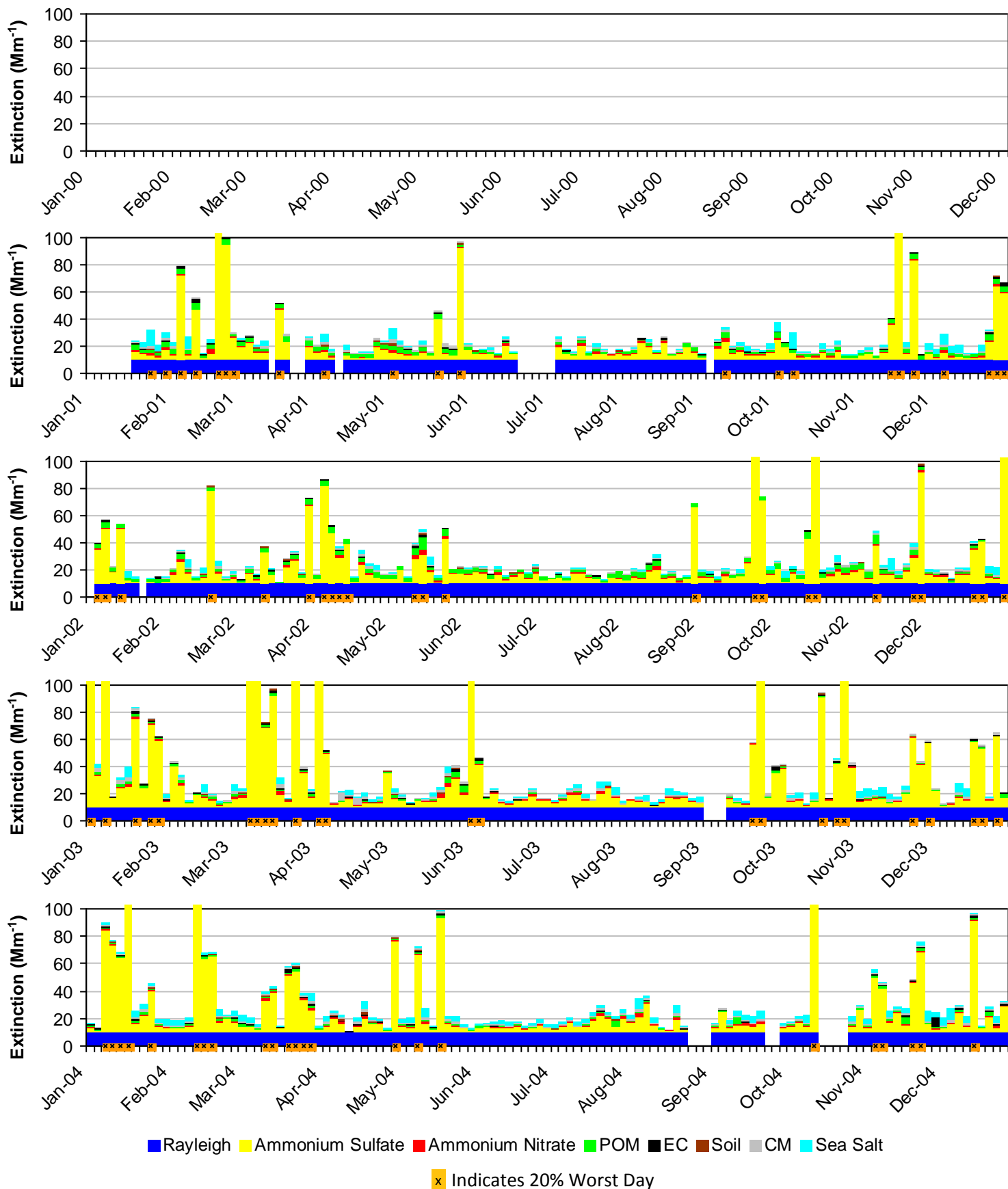


Figure E.3-7
Hawaii Volcanoes NP, HI (HAVO1 Site)
2000-2004 Progress Period Extinction, All Sampled Days



*Note that daily averages for the year 2000 are shown here, but this year did not meet RHR data completeness criteria.

Figure E.3-8
Hawaii Volcanoes NP, HI (HAVO1 Site)
2005-2009 Progress Period Extinction, All Sampled Days

