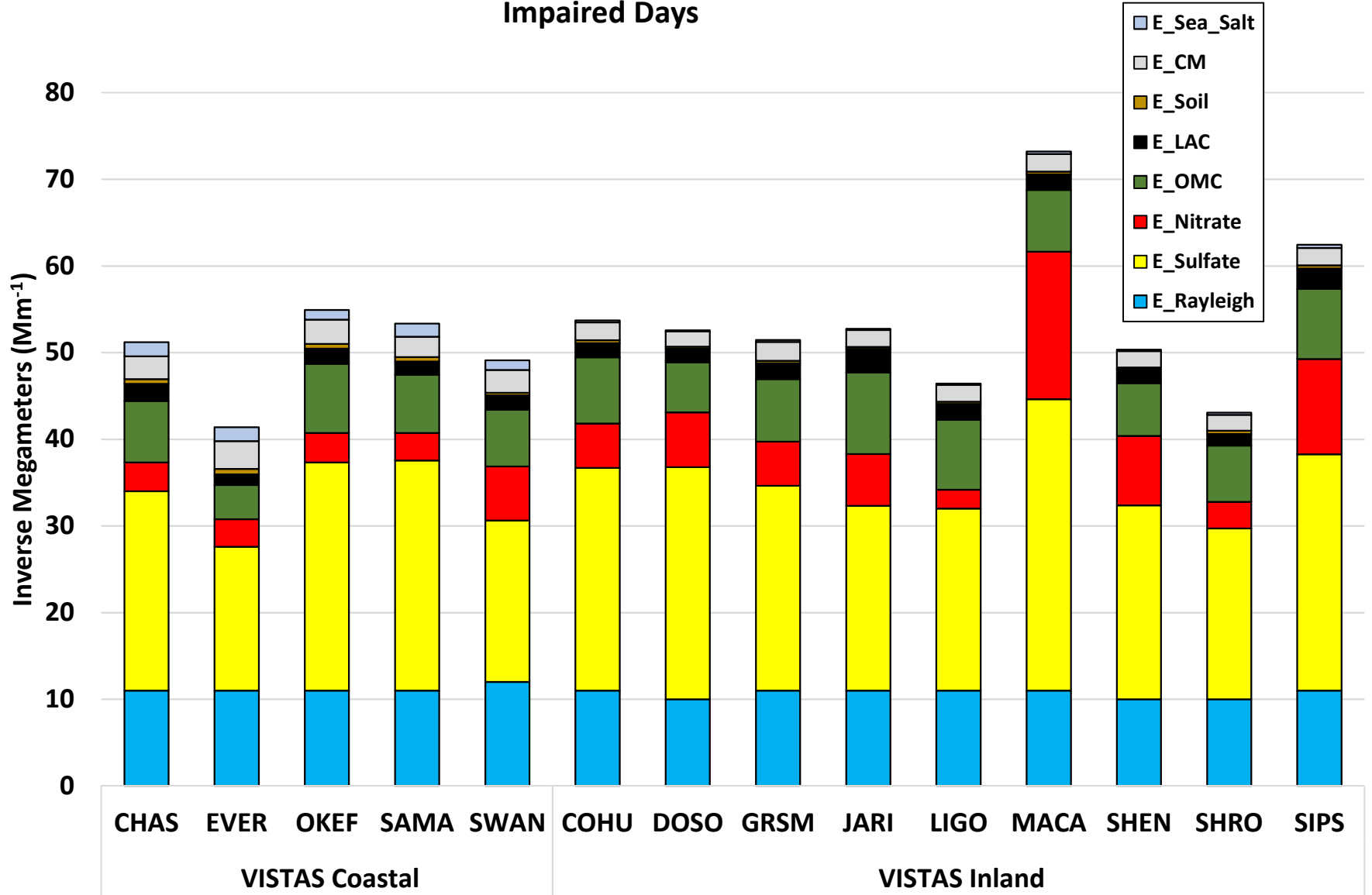


## **Appendix E-8**

### **USEPA 2028 Model Projections of Visibility Impairing Species at VISTAS Class I Areas for 20% Most Impaired Days**

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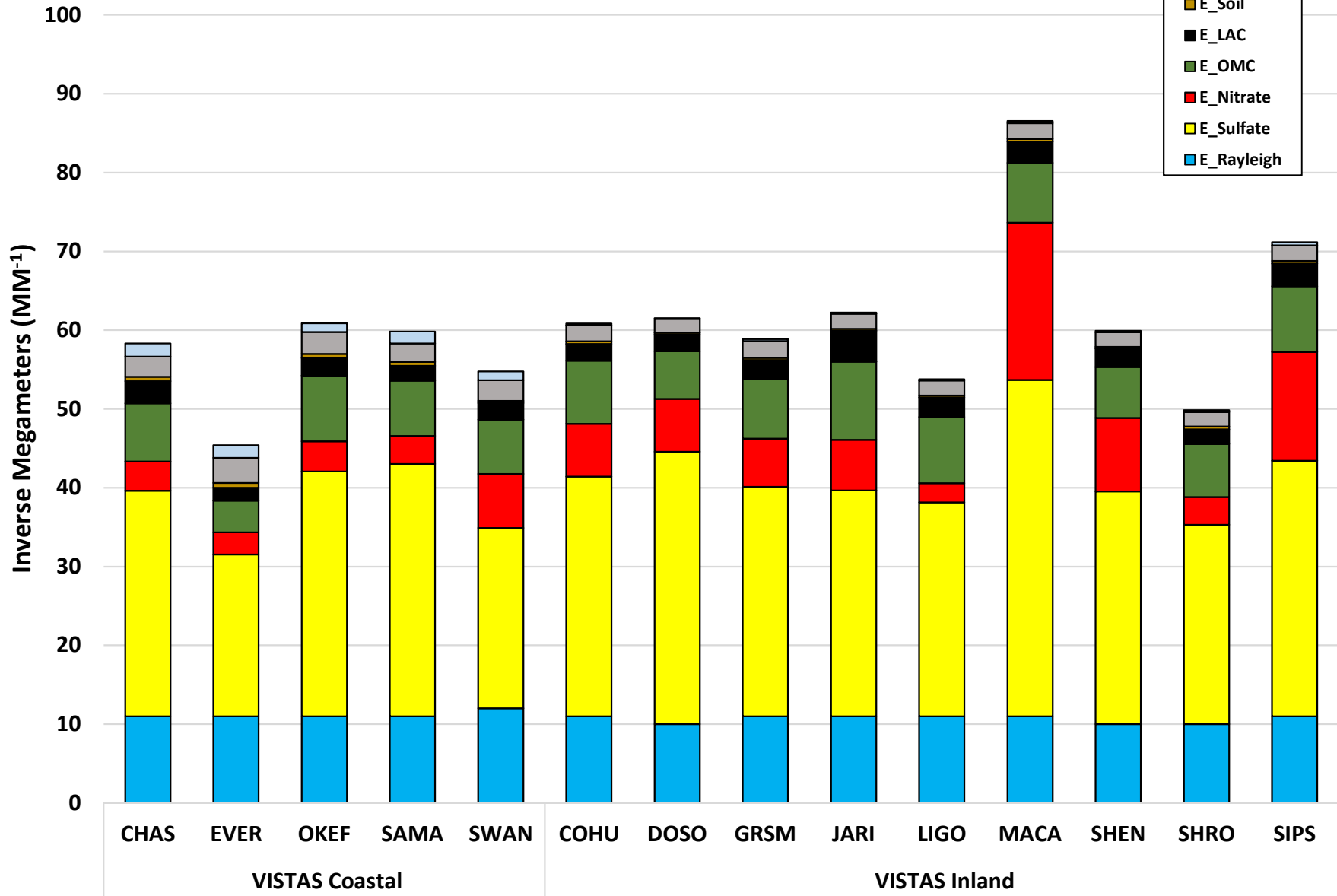
## EPA 2019 Modeling Results: 2028 Projected Visibility Impairment on 20% Most Impaired Days



| Row Labels            | E_Rayleigh | E_Sulfate | E_Nitrate | E_OMC | E_LAC | E_Soil | E_CM | E_Sea_Salt |
|-----------------------|------------|-----------|-----------|-------|-------|--------|------|------------|
| <b>VISTAS Coastal</b> |            |           |           |       |       |        |      |            |
| CHAS                  | 11         | 23.00     | 3.32      | 7.09  | 2.00  | 0.55   | 2.61 | 1.65       |
| EVER                  | 11         | 16.60     | 3.17      | 3.96  | 1.23  | 0.62   | 3.21 | 1.59       |
| OKEF                  | 11         | 26.34     | 3.40      | 7.99  | 1.75  | 0.53   | 2.81 | 1.12       |
| SAMA                  | 11         | 26.55     | 3.18      | 6.71  | 1.54  | 0.50   | 2.35 | 1.51       |
| SWAN                  | 12         | 18.64     | 6.24      | 6.55  | 1.65  | 0.29   | 2.65 | 1.12       |
| <b>VISTAS Inland</b>  |            |           |           |       |       |        |      |            |
| COHU                  | 11         | 25.69     | 5.13      | 7.64  | 1.62  | 0.35   | 2.07 | 0.21       |
| DOSO                  | 10         | 26.78     | 6.33      | 5.77  | 1.57  | 0.25   | 1.77 | 0.12       |
| GRSM                  | 11         | 23.64     | 5.08      | 7.22  | 1.81  | 0.29   | 2.18 | 0.23       |
| JARI                  | 11         | 21.33     | 5.98      | 9.40  | 2.71  | 0.25   | 1.94 | 0.14       |
| LIGO                  | 11         | 21.00     | 2.19      | 8.06  | 1.83  | 0.25   | 1.96 | 0.15       |
| MACA                  | 11         | 33.63     | 17.01     | 7.11  | 1.81  | 0.32   | 2.03 | 0.29       |
| SHEN                  | 10         | 22.38     | 8.00      | 6.10  | 1.59  | 0.22   | 1.87 | 0.19       |
| SHRO                  | 10         | 19.72     | 3.07      | 6.47  | 1.37  | 0.36   | 1.84 | 0.24       |
| SIPS                  | 11         | 27.26     | 10.99     | 8.11  | 2.34  | 0.36   | 2.01 | 0.37       |

**EPA 2019 Modeling Results: Base Year (2014-2017) Projected Visibility Impairment on 20% Most Impaired Days**

- E\_Sea\_Salt
- E\_CM
- E\_Soil
- E\_LAC
- E\_OMC
- E\_Nitrate
- E\_Sulfate
- E\_Rayleigh



| Row Labels            | E_Rayleigh | E_Sulfate | E_Nitrate | E_OMC | E_LAC | E_Soil | E_CM | E_Sea_Salt |
|-----------------------|------------|-----------|-----------|-------|-------|--------|------|------------|
| <b>VISTAS Coastal</b> |            |           |           |       |       |        |      |            |
| CHAS                  | 11         | 28.63     | 3.69      | 7.39  | 2.83  | 0.54   | 2.59 | 1.65       |
| EVER                  | 11         | 20.54     | 2.80      | 4.01  | 1.66  | 0.59   | 3.20 | 1.59       |
| OKEF                  | 11         | 31.06     | 3.85      | 8.34  | 2.22  | 0.52   | 2.78 | 1.12       |
| SAMA                  | 11         | 32.04     | 3.54      | 7.00  | 1.91  | 0.49   | 2.33 | 1.51       |
| SWAN                  | 12         | 22.91     | 6.84      | 6.89  | 2.10  | 0.28   | 2.63 | 1.12       |
| <b>VISTAS Inland</b>  |            |           |           |       |       |        |      |            |
| COHU                  | 11         | 30.41     | 6.71      | 8.02  | 2.11  | 0.34   | 2.06 | 0.21       |
| DOSO                  | 10         | 34.58     | 6.70      | 6.04  | 2.12  | 0.25   | 1.73 | 0.12       |
| GRSM                  | 11         | 29.12     | 6.13      | 7.56  | 2.40  | 0.28   | 2.14 | 0.23       |
| JARI                  | 11         | 28.65     | 6.43      | 9.93  | 3.92  | 0.24   | 1.92 | 0.14       |
| LIGO                  | 11         | 27.15     | 2.43      | 8.40  | 2.46  | 0.24   | 1.93 | 0.15       |
| MACA                  | 11         | 42.69     | 19.94     | 7.59  | 2.70  | 0.33   | 2.01 | 0.29       |
| SHEN                  | 10         | 29.53     | 9.33      | 6.45  | 2.35  | 0.21   | 1.84 | 0.19       |
| SHRO                  | 10         | 25.31     | 3.52      | 6.74  | 1.85  | 0.36   | 1.82 | 0.24       |
| SIPS                  | 11         | 32.43     | 13.79     | 8.35  | 2.87  | 0.35   | 1.98 | 0.37       |

| site_id | ss_Rayleigh | E_amm_so4_g90_b | E_amm_no3_g90_b | E_omc_g90_b | E_ec_g90_b | E_crustal_g90_b | E_cm_g90_b | E_sea_salt_g90_b | tbext_g90_b | E_amm_so4_g90_f | E_amm_no3_g90_f | E_omc_g90_f | E_ec_g90_f | E_crustal_g90_f | E_cm_g90_f | E_sea_salt_g90_f | tbext_g90_f |
|---------|-------------|-----------------|-----------------|-------------|------------|-----------------|------------|------------------|-------------|-----------------|-----------------|-------------|------------|-----------------|------------|------------------|-------------|
| ACAD    | 12          | 16.72           | 5.13            | 6.45        | 1.81       | 0.18            | 1.99       | 1.42             | 45.69       | 13.57           | 5.22            | 5.97        | 1.34       | 0.18            | 2.03       | 1.42             | 41.73       |
| AGTI    | 11          | 13.44           | 11.06           | 6.10        | 2.09       | 0.61            | 6.30       | 1.42             | 52.02       | 12.72           | 7.76            | 5.91        | 1.76       | 0.64            | 6.49       | 1.42             | 47.70       |
| ALLA    | 11          | 9.12            | 7.45            | 6.06        | 1.75       | 0.19            | 1.09       | 0.38             | 37.05       | 8.87            | 5.94            | 5.87        | 1.37       | 0.20            | 1.11       | 0.38             | 34.75       |
| ANAC    | 10          | 4.28            | 0.72            | 4.53        | 0.95       | 0.43            | 1.47       | 0.03             | 22.41       | 4.19            | 0.68            | 4.46        | 0.86       | 0.43            | 1.49       | 0.03             | 22.15       |
| ANAD    | 9           | 6.81            | 4.17            | 5.98        | 1.20       | 0.79            | 3.04       | 0.21             | 31.20       | 6.68            | 3.23            | 5.85        | 1.10       | 0.79            | 3.06       | 0.21             | 29.93       |
| ARCH    | 9           | 3.90            | 2.31            | 2.16        | 0.73       | 0.40            | 1.43       | 0.06             | 19.98       | 3.70            | 2.21            | 2.09        | 0.59       | 0.40            | 1.44       | 0.06             | 19.48       |
| BADL    | 11          | 10.90           | 5.59            | 3.49        | 1.06       | 0.49            | 1.89       | 0.06             | 34.48       | 9.89            | 5.35            | 3.37        | 0.82       | 0.50            | 1.91       | 0.06             | 32.90       |
| BALD    | 9           | 5.47            | 0.61            | 3.09        | 0.78       | 0.45            | 1.53       | 0.04             | 20.97       | 4.86            | 0.62            | 3.08        | 0.70       | 0.46            | 1.54       | 0.04             | 20.30       |
| BAND    | 9           | 5.79            | 1.85            | 3.48        | 0.96       | 0.47            | 1.87       | 0.03             | 23.46       | 5.55            | 1.67            | 3.39        | 0.71       | 0.48            | 1.88       | 0.03             | 22.72       |
| BIBE    | 10          | 20.57           | 1.10            | 4.63        | 1.46       | 0.90            | 3.68       | 0.10             | 42.45       | 19.58           | 1.14            | 4.71        | 1.42       | 0.93            | 3.74       | 0.10             | 41.63       |
| BLCA    | 9           | 4.04            | 0.56            | 3.30        | 0.91       | 0.43            | 1.37       | 0.02             | 19.64       | 3.84            | 0.53            | 3.26        | 0.80       | 0.44            | 1.37       | 0.02             | 19.28       |
| BOAP    | 10          | 5.90            | 2.45            | 4.74        | 1.53       | 0.63            | 3.19       | 0.14             | 28.57       | 5.82            | 2.09            | 4.70        | 1.36       | 0.64            | 3.20       | 0.14             | 27.95       |
| BOMA    | 10          | 3.67            | 0.69            | 8.61        | 1.60       | 0.38            | 1.24       | 0.02             | 26.22       | 3.57            | 0.63            | 8.47        | 1.48       | 0.39            | 1.25       | 0.02             | 25.81       |
| BOWA    | 11          | 12.72           | 13.16           | 4.07        | 1.36       | 0.20            | 1.54       | 0.16             | 44.21       | 11.59           | 10.67           | 3.83        | 1.13       | 0.20            | 1.55       | 0.16             | 40.13       |
| BRET2   | 11          | 38.90           | 5.80            | 6.38        | 3.09       | 0.60            | 3.25       | 1.21             | 70.23       | 34.08           | 5.47            | 6.21        | 2.08       | 0.62            | 3.29       | 1.21             | 63.95       |
| BRID    | 9           | 3.88            | 0.85            | 3.32        | 0.63       | 0.50            | 1.37       | 0.03             | 19.57       | 3.70            | 0.81            | 3.29        | 0.56       | 0.50            | 1.38       | 0.03             | 19.27       |
| BRIG    | 12          | 26.00           | 20.73           | 9.76        | 3.95       | 0.29            | 5.18       | 1.17             | 79.08       | 19.79           | 18.42           | 9.13        | 2.61       | 0.30            | 5.26       | 1.17             | 68.67       |
| CABI    | 10          | 4.44            | 1.13            | 8.20        | 1.50       | 0.43            | 1.37       | 0.06             | 27.12       | 4.33            | 1.05            | 8.09        | 1.43       | 0.44            | 1.38       | 0.06             | 26.78       |
| CACR    | 11          | 31.23           | 8.94            | 8.36        | 2.23       | 0.55            | 2.88       | 0.47             | 65.66       | 23.53           | 7.56            | 8.10        | 1.80       | 0.59            | 2.92       | 0.47             | 55.96       |
| CANY    | 9           | 3.90            | 2.31            | 2.16        | 0.73       | 0.40            | 1.43       | 0.06             | 19.98       | 3.70            | 2.21            | 2.09        | 0.59       | 0.40            | 1.44       | 0.06             | 19.48       |
| CAPI    | 9           | 4.22            | 1.90            | 2.30        | 0.76       | 0.49            | 1.74       | 0.06             | 20.46       | 4.02            | 1.84            | 2.26        | 0.66       | 0.49            | 1.75       | 0.06             | 20.06       |
| CARI    | 10          | 5.62            | 1.59            | 6.33        | 1.37       | 0.55            | 2.22       | 0.11             | 27.79       | 5.49            | 1.31            | 6.20        | 1.23       | 0.56            | 2.23       | 0.11             | 27.13       |
| CAVE    | 9           | 14.87           | 1.59            | 3.57        | 1.01       | 1.53            | 4.38       | 0.09             | 36.03       | 14.33           | 1.56            | 3.58        | 0.91       | 1.56            | 4.42       | 0.09             | 35.46       |
| CHAS    | 11          | 28.63           | 3.69            | 7.39        | 2.83       | 0.54            | 2.59       | 1.65             | 58.30       | 23.00           | 3.32            | 7.09        | 2.00       | 0.55            | 2.61       | 1.65             | 51.21       |
| CHIR    | 10          | 7.69            | 0.81            | 2.59        | 0.81       | 0.65            | 3.26       | 0.05             | 25.86       | 6.55            | 0.80            | 2.60        | 0.73       | 0.67            | 3.29       | 0.05             | 24.69       |
| CHIW    | 10          | 7.69            | 0.81            | 2.59        | 0.81       | 0.65            | 3.26       | 0.05             | 25.86       | 6.55            | 0.80            | 2.60        | 0.73       | 0.67            | 3.29       | 0.05             | 24.69       |
| COHU    | 11          | 30.41           | 6.71            | 8.02        | 2.11       | 0.34            | 2.06       | 0.21             | 60.84       | 25.69           | 5.13            | 7.64        | 1.62       | 0.35            | 2.07       | 0.21             | 53.71       |
| CRLA    | 9           | 6.40            | 1.18            | 4.01        | 1.23       | 0.48            | 1.00       | 0.16             | 23.47       | 6.31            | 1.09            | 3.94        | 1.13       | 0.48            | 1.01       | 0.16             | 23.12       |
| CRMO    | 10          | 3.70            | 6.00            | 2.28        | 0.65       | 0.31            | 1.14       | 0.23             | 24.31       | 3.64            | 5.20            | 2.22        | 0.55       | 0.31            | 1.15       | 0.23             | 23.30       |
| CUCA    | 9           | 7.85            | 11.50           | 4.72        | 1.38       | 0.58            | 3.77       | 0.61             | 39.41       | 7.74            | 8.09            | 4.66        | 1.10       | 0.58            | 3.81       | 0.61             | 35.59       |
| DESO    | 9           | 4.86            | 1.14            | 6.78        | 1.36       | 0.57            | 2.02       | 0.07             | 25.80       | 4.76            | 0.97            | 6.61        | 1.26       | 0.57            | 2.03       | 0.07             | 25.28       |
| DIPE    | 9           | 6.40            | 1.18            | 4.01        | 1.23       | 0.48            | 1.00       | 0.16             | 23.47       | 6.31            | 1.09            | 3.94        | 1.13       | 0.48            | 1.01       | 0.16             | 23.12       |
| DOME    | 10          | 9.37            | 8.46            | 7.81        | 1.66       | 0.97            | 7.83       | 0.22             | 46.31       | 9.23            | 5.83            | 7.72        | 1.57       | 0.98            | 7.87       | 0.22             | 43.41       |

| site_id | ss_Rayleigh | E_amm_so4_g90_b | E_amm_no3_g90_b | E_omc_g90_b | E_ec_g90_b | E_crustal_g90_b | E_cm_g90_b | E_sea_salt_g90_b | tbext_g90_b | E_amm_so4_g90_f | E_amm_no3_g90_f | E_omc_g90_f | E_ec_g90_f | E_crustal_g90_f | E_cm_g90_f | E_sea_salt_g90_f | tbext_g90_f |
|---------|-------------|-----------------|-----------------|-------------|------------|-----------------|------------|------------------|-------------|-----------------|-----------------|-------------|------------|-----------------|------------|------------------|-------------|
| DOSO    | 10          | 34.58           | 6.70            | 6.04        | 2.12       | 0.25            | 1.73       | 0.12             | 61.54       | 26.78           | 6.33            | 5.77        | 1.57       | 0.25            | 1.77       | 0.12             | 52.59       |
| EACA    | 10          | 6.35            | 8.66            | 4.73        | 1.28       | 0.30            | 1.17       | 0.15             | 32.64       | 6.20            | 7.47            | 4.61        | 1.12       | 0.30            | 1.18       | 0.15             | 31.03       |
| EANE    | 8           | 3.54            | 0.87            | 1.88        | 0.63       | 0.59            | 1.00       | 0.05             | 16.57       | 3.35            | 0.86            | 1.86        | 0.55       | 0.60            | 1.01       | 0.05             | 16.27       |
| EMIG    | 10          | 7.10            | 2.53            | 7.45        | 1.37       | 0.64            | 3.24       | 0.16             | 32.48       | 6.96            | 2.28            | 7.32        | 1.29       | 0.64            | 3.26       | 0.16             | 31.90       |
| EVER    | 11          | 20.54           | 2.80            | 4.01        | 1.66       | 0.59            | 3.20       | 1.59             | 45.39       | 16.60           | 3.17            | 3.96        | 1.23       | 0.62            | 3.21       | 1.59             | 41.39       |
| FITZ    | 9           | 3.88            | 0.85            | 3.32        | 0.63       | 0.50            | 1.37       | 0.03             | 19.57       | 3.70            | 0.81            | 3.29        | 0.56       | 0.50            | 1.38       | 0.03             | 19.27       |
| FLTO    | 8           | 3.54            | 0.87            | 1.88        | 0.63       | 0.59            | 1.00       | 0.05             | 16.57       | 3.35            | 0.86            | 1.86        | 0.55       | 0.60            | 1.01       | 0.05             | 16.27       |
| GALI    | 10          | 7.69            | 0.81            | 2.59        | 0.81       | 0.65            | 3.26       | 0.05             | 25.86       | 6.55            | 0.80            | 2.60        | 0.73       | 0.67            | 3.29       | 0.05             | 24.69       |
| GAMO    | 9           | 3.93            | 1.07            | 4.65        | 0.87       | 0.43            | 1.18       | 0.03             | 21.15       | 3.83            | 1.14            | 4.59        | 0.78       | 0.44            | 1.19       | 0.03             | 20.99       |
| GEMO    | 9           | 6.40            | 1.18            | 4.01        | 1.23       | 0.48            | 1.00       | 0.16             | 23.47       | 6.31            | 1.09            | 3.94        | 1.13       | 0.48            | 1.01       | 0.16             | 23.12       |
| GICL    | 9           | 5.69            | 0.53            | 3.50        | 0.80       | 0.43            | 1.54       | 0.03             | 21.53       | 5.13            | 0.53            | 3.47        | 0.71       | 0.44            | 1.55       | 0.03             | 20.86       |
| GLAC    | 11          | 5.62            | 6.17            | 12.29       | 3.21       | 0.31            | 1.59       | 0.14             | 40.32       | 5.39            | 5.96            | 12.03       | 2.87       | 0.31            | 1.60       | 0.14             | 39.30       |
| GLPE    | 11          | 8.99            | 1.91            | 3.74        | 0.85       | 0.24            | 1.24       | 0.38             | 28.36       | 8.83            | 1.63            | 3.63        | 0.69       | 0.25            | 1.26       | 0.38             | 27.68       |
| GORO    | 10          | 6.86            | 1.43            | 2.61        | 0.65       | 0.28            | 0.93       | 0.24             | 23.00       | 6.73            | 1.24            | 2.56        | 0.59       | 0.29            | 0.93       | 0.24             | 22.58       |
| GRCA    | 9           | 4.71            | 0.97            | 2.42        | 0.69       | 0.73            | 1.39       | 0.07             | 19.98       | 4.28            | 0.94            | 2.40        | 0.65       | 0.72            | 1.39       | 0.07             | 19.45       |
| GRGU    | 11          | 17.27           | 2.61            | 5.29        | 1.59       | 0.17            | 1.54       | 0.19             | 39.66       | 14.01           | 2.61            | 4.88        | 1.19       | 0.18            | 1.58       | 0.19             | 35.63       |
| GRSA    | 9           | 4.27            | 1.14            | 4.62        | 1.22       | 0.54            | 1.56       | 0.02             | 22.37       | 4.04            | 1.12            | 4.56        | 1.06       | 0.55            | 1.57       | 0.02             | 21.91       |
| GRSM    | 11          | 29.12           | 6.13            | 7.56        | 2.40       | 0.28            | 2.14       | 0.23             | 58.87       | 23.64           | 5.08            | 7.22        | 1.81       | 0.29            | 2.18       | 0.23             | 51.47       |
| GRTE    | 9           | 3.51            | 0.98            | 5.18        | 0.99       | 0.42            | 1.37       | 0.07             | 21.52       | 3.41            | 0.92            | 5.12        | 0.91       | 0.43            | 1.38       | 0.07             | 21.24       |
| GUMO    | 9           | 14.87           | 1.59            | 3.57        | 1.01       | 1.53            | 4.38       | 0.09             | 36.03       | 14.33           | 1.56            | 3.58        | 0.91       | 1.56            | 4.42       | 0.09             | 35.46       |
| HECA    | 11          | 5.02            | 14.31           | 6.15        | 1.52       | 0.28            | 1.23       | 0.22             | 39.73       | 4.92            | 12.15           | 6.02        | 1.33       | 0.28            | 1.24       | 0.22             | 37.17       |
| HEGL    | 11          | 26.50           | 16.05           | 8.07        | 2.60       | 0.38            | 2.84       | 0.30             | 67.75       | 21.37           | 13.36           | 7.73        | 2.17       | 0.38            | 2.86       | 0.30             | 59.18       |
| HOOV    | 9           | 4.44            | 1.17            | 4.48        | 0.86       | 0.75            | 1.67       | 0.07             | 22.44       | 4.34            | 1.05            | 4.44        | 0.79       | 0.75            | 1.68       | 0.07             | 22.12       |
| ISLE    | 12          | 16.49           | 16.50           | 4.54        | 1.67       | 0.18            | 1.84       | 0.21             | 53.43       | 14.73           | 13.99           | 4.27        | 1.33       | 0.19            | 1.85       | 0.21             | 48.56       |
| JARB    | 10          | 3.98            | 0.67            | 3.56        | 0.69       | 1.02            | 2.51       | 0.03             | 22.47       | 3.91            | 0.64            | 3.53        | 0.62       | 1.02            | 2.52       | 0.03             | 22.27       |
| JARI    | 11          | 28.65           | 6.43            | 9.93        | 3.92       | 0.24            | 1.92       | 0.14             | 62.22       | 21.33           | 5.98            | 9.40        | 2.71       | 0.25            | 1.94       | 0.14             | 52.75       |
| JOMU    | 9           | 6.81            | 4.17            | 5.98        | 1.20       | 0.79            | 3.04       | 0.21             | 31.20       | 6.68            | 3.23            | 5.85        | 1.10       | 0.79            | 3.06       | 0.21             | 29.93       |
| JOSH    | 10          | 7.65            | 7.24            | 4.37        | 1.34       | 0.90            | 5.21       | 0.41             | 37.14       | 7.43            | 5.92            | 4.32        | 1.18       | 0.93            | 5.32       | 0.41             | 35.50       |
| JOYC    | 11          | 29.12           | 6.13            | 7.56        | 2.40       | 0.28            | 2.14       | 0.23             | 58.87       | 23.64           | 5.08            | 7.22        | 1.81       | 0.29            | 2.18       | 0.23             | 51.47       |
| KAIS    | 9           | 6.81            | 4.17            | 5.98        | 1.20       | 0.79            | 3.04       | 0.21             | 31.20       | 6.68            | 3.23            | 5.85        | 1.10       | 0.79            | 3.06       | 0.21             | 29.93       |
| KALM    | 12          | 7.12            | 1.86            | 7.58        | 1.39       | 0.25            | 1.54       | 1.71             | 33.46       | 6.91            | 1.75            | 7.41        | 1.26       | 0.25            | 1.54       | 1.71             | 32.83       |
| KICA    | 11          | 12.91           | 21.27           | 13.51       | 2.53       | 0.69            | 5.30       | 0.39             | 67.59       | 12.74           | 12.39           | 13.21       | 2.21       | 0.69            | 5.34       | 0.39             | 57.97       |
| LABE    | 10          | 5.60            | 1.73            | 6.41        | 1.19       | 0.52            | 1.76       | 0.09             | 27.30       | 5.47            | 1.50            | 6.30        | 1.10       | 0.52            | 1.76       | 0.09             | 26.75       |



| site_id | ss_Rayleigh | E_amm_so4_g90_b | E_amm_no3_g90_b | E_omc_g90_b | E_ec_g90_b | E_crustal_g90_b | E_cm_g90_b | E_sea_salt_g90_b | tbext_g90_b | E_amm_so4_g90_f | E_amm_no3_g90_f | E_omc_g90_f | E_ec_g90_f | E_crustal_g90_f | E_cm_g90_f | E_sea_salt_g90_f | tbext_g90_f |
|---------|-------------|-----------------|-----------------|-------------|------------|-----------------|------------|------------------|-------------|-----------------|-----------------|-------------|------------|-----------------|------------|------------------|-------------|
| LAGA    | 9           | 4.04            | 0.56            | 3.30        | 0.91       | 0.43            | 1.37       | 0.02             | 19.64       | 3.84            | 0.53            | 3.26        | 0.80       | 0.44            | 1.37       | 0.02             | 19.28       |
| LAVO    | 10          | 5.62            | 1.59            | 6.33        | 1.37       | 0.55            | 2.22       | 0.11             | 27.79       | 5.49            | 1.31            | 6.20        | 1.23       | 0.56            | 2.23       | 0.11             | 27.13       |
| LIGO    | 11          | 27.15           | 2.43            | 8.40        | 2.46       | 0.24            | 1.93       | 0.15             | 53.77       | 21.00           | 2.19            | 8.06        | 1.83       | 0.25            | 1.96       | 0.15             | 46.43       |
| LOST    | 11          | 14.07           | 17.62           | 2.97        | 1.84       | 0.24            | 1.67       | 0.23             | 49.63       | 12.65           | 17.65           | 2.87        | 1.31       | 0.25            | 1.65       | 0.23             | 47.61       |
| LYBR2   | 11          | 16.55           | 9.82            | 4.83        | 1.85       | 0.19            | 1.44       | 0.28             | 45.96       | 13.68           | 9.60            | 4.40        | 1.38       | 0.20            | 1.48       | 0.28             | 42.03       |
| MABE    | 8           | 3.54            | 0.87            | 1.88        | 0.63       | 0.59            | 1.00       | 0.05             | 16.57       | 3.35            | 0.86            | 1.86        | 0.55       | 0.60            | 1.01       | 0.05             | 16.27       |
| MACA    | 11          | 42.69           | 19.94           | 7.59        | 2.70       | 0.33            | 2.01       | 0.29             | 86.56       | 33.63           | 17.01           | 7.11        | 1.81       | 0.32            | 2.03       | 0.29             | 73.20       |
| MAZA    | 10          | 5.65            | 1.94            | 3.29        | 1.05       | 0.73            | 2.94       | 0.15             | 25.75       | 5.06            | 1.90            | 3.24        | 0.86       | 0.74            | 2.97       | 0.15             | 24.91       |
| MELA    | 11          | 13.29           | 14.93           | 2.62        | 1.33       | 0.29            | 2.00       | 0.11             | 45.57       | 13.24           | 13.87           | 2.57        | 1.01       | 0.30            | 2.01       | 0.11             | 44.12       |
| MEVE    | 9           | 4.72            | 1.05            | 2.35        | 0.61       | 0.41            | 1.32       | 0.02             | 19.47       | 4.45            | 1.00            | 2.29        | 0.50       | 0.42            | 1.33       | 0.02             | 19.01       |
| MIMO    | 10          | 3.67            | 0.69            | 8.61        | 1.60       | 0.38            | 1.24       | 0.02             | 26.22       | 3.57            | 0.63            | 8.47        | 1.48       | 0.39            | 1.25       | 0.02             | 25.81       |
| MING    | 12          | 30.95           | 19.26           | 9.01        | 3.14       | 0.42            | 3.15       | 0.31             | 78.24       | 25.43           | 16.48           | 8.52        | 2.45       | 0.41            | 3.15       | 0.31             | 68.76       |
| MOHO    | 10          | 7.05            | 2.54            | 3.34        | 0.86       | 0.33            | 1.27       | 0.44             | 25.84       | 6.81            | 2.11            | 3.29        | 0.80       | 0.33            | 1.28       | 0.44             | 25.05       |
| MOJE    | 11          | 8.35            | 1.45            | 6.60        | 1.34       | 0.46            | 2.55       | 0.18             | 31.93       | 8.15            | 1.28            | 6.50        | 1.27       | 0.47            | 2.57       | 0.18             | 31.41       |
| MOKE    | 9           | 4.86            | 1.14            | 6.78        | 1.36       | 0.57            | 2.02       | 0.07             | 25.80       | 4.76            | 0.97            | 6.61        | 1.26       | 0.57            | 2.03       | 0.07             | 25.28       |
| MOLA    | 9           | 6.40            | 1.18            | 4.01        | 1.23       | 0.48            | 1.00       | 0.16             | 23.47       | 6.31            | 1.09            | 3.94        | 1.13       | 0.48            | 1.01       | 0.16             | 23.12       |
| MOOS    | 12          | 15.10           | 3.38            | 4.97        | 1.46       | 0.16            | 1.33       | 0.95             | 39.34       | 13.31           | 3.48            | 4.55        | 1.12       | 0.16            | 1.38       | 0.95             | 36.95       |
| MORA    | 11          | 10.65           | 2.34            | 7.43        | 2.16       | 0.23            | 1.81       | 0.28             | 35.91       | 10.18           | 1.95            | 7.19        | 1.71       | 0.23            | 1.85       | 0.28             | 34.40       |
| MOWA    | 11          | 8.35            | 1.45            | 6.60        | 1.34       | 0.46            | 2.55       | 0.18             | 31.93       | 8.15            | 1.28            | 6.50        | 1.27       | 0.47            | 2.57       | 0.18             | 31.41       |
| MOZI    | 8           | 4.01            | 1.14            | 2.15        | 0.55       | 0.47            | 1.04       | 0.02             | 17.37       | 3.82            | 1.09            | 2.11        | 0.46       | 0.49            | 1.04       | 0.02             | 17.04       |
| NOAB    | 9           | 3.90            | 0.90            | 3.99        | 0.71       | 0.48            | 1.42       | 0.01             | 20.42       | 3.76            | 0.87            | 3.94        | 0.63       | 0.49            | 1.43       | 0.01             | 20.14       |
| NOCA    | 11          | 8.99            | 1.91            | 3.74        | 0.85       | 0.24            | 1.24       | 0.38             | 28.36       | 8.83            | 1.63            | 3.63        | 0.69       | 0.25            | 1.26       | 0.38             | 27.68       |
| OKEF    | 11          | 31.06           | 3.85            | 8.34        | 2.22       | 0.52            | 2.78       | 1.12             | 60.89       | 26.34           | 3.40            | 7.99        | 1.75       | 0.53            | 2.81       | 1.12             | 54.93       |
| OLYM    | 11          | 10.48           | 4.29            | 4.34        | 1.08       | 0.17            | 1.27       | 0.81             | 33.44       | 10.38           | 3.59            | 4.30        | 0.91       | 0.17            | 1.31       | 0.81             | 32.48       |
| OTCR    | 10          | 34.58           | 6.70            | 6.04        | 2.12       | 0.25            | 1.73       | 0.12             | 61.54       | 26.78           | 6.33            | 5.77        | 1.57       | 0.25            | 1.77       | 0.12             | 52.59       |
| PASA    | 10          | 6.00            | 2.16            | 4.99        | 1.02       | 0.41            | 1.39       | 0.10             | 26.06       | 5.84            | 1.89            | 4.89        | 0.90       | 0.42            | 1.40       | 0.10             | 25.44       |
| PEFO    | 9           | 5.03            | 1.07            | 3.19        | 1.41       | 0.69            | 2.65       | 0.05             | 23.10       | 4.67            | 1.00            | 3.13        | 1.18       | 0.70            | 2.68       | 0.05             | 22.41       |
| PIMO    | 10          | 5.65            | 1.94            | 3.29        | 1.05       | 0.73            | 2.94       | 0.15             | 25.75       | 5.06            | 1.90            | 3.24        | 0.86       | 0.74            | 2.97       | 0.15             | 24.91       |
| PINN    | 11          | 8.67            | 8.05            | 7.00        | 2.10       | 0.42            | 3.98       | 1.11             | 42.33       | 8.51            | 5.45            | 6.88        | 1.81       | 0.43            | 4.01       | 1.11             | 39.20       |
| PRRA    | 11          | 17.27           | 2.61            | 5.29        | 1.59       | 0.17            | 1.54       | 0.19             | 39.66       | 14.01           | 2.61            | 4.88        | 1.19       | 0.18            | 1.58       | 0.19             | 35.63       |
| RAFA    | 10          | 10.95           | 6.99            | 5.17        | 1.01       | 0.61            | 5.63       | 1.18             | 41.53       | 10.82           | 4.65            | 5.08        | 0.93       | 0.61            | 5.67       | 1.18             | 38.94       |
| RAWA    | 8           | 4.01            | 1.14            | 2.15        | 0.55       | 0.47            | 1.04       | 0.02             | 17.37       | 3.82            | 1.09            | 2.11        | 0.46       | 0.49            | 1.04       | 0.02             | 17.04       |
| REDR    | 9           | 3.51            | 0.98            | 5.18        | 0.99       | 0.42            | 1.37       | 0.07             | 21.52       | 3.41            | 0.92            | 5.12        | 0.91       | 0.43            | 1.38       | 0.07             | 21.24       |

| site_id | ss_Rayleigh | E_amm_so4_g90_b | E_amm_no3_g90_b | E_omc_g90_b | E_ec_g90_b | E_crustal_g90_b | E_cm_g90_b | E_sea_salt_g90_b | tbext_g90_b | E_amm_so4_g90_f | E_amm_no3_g90_f | E_omc_g90_f | E_ec_g90_f | E_crustal_g90_f | E_cm_g90_f | E_sea_salt_g90_f | tbext_g90_f |
|---------|-------------|-----------------|-----------------|-------------|------------|-----------------|------------|------------------|-------------|-----------------|-----------------|-------------|------------|-----------------|------------|------------------|-------------|
| REDW    | 11          | 11.14           | 2.63            | 2.83        | 0.43       | 0.11            | 2.23       | 6.65             | 37.02       | 10.88           | 2.26            | 2.80        | 0.38       | 0.12            | 2.24       | 6.65             | 36.32       |
| ROCA    | 12          | 15.10           | 3.38            | 4.97        | 1.46       | 0.16            | 1.33       | 0.95             | 39.34       | 13.31           | 3.48            | 4.55        | 1.12       | 0.16            | 1.38       | 0.95             | 36.95       |
| ROMA    | 12          | 29.33           | 3.87            | 8.56        | 2.34       | 0.50            | 3.44       | 1.28             | 61.33       | 24.38           | 3.69            | 8.30        | 1.75       | 0.52            | 3.50       | 1.28             | 55.42       |
| ROMO    | 9           | 4.60            | 3.48            | 3.88        | 1.07       | 0.50            | 1.51       | 0.04             | 24.08       | 4.23            | 3.08            | 3.78        | 0.82       | 0.50            | 1.53       | 0.04             | 22.98       |
| SACR    | 10          | 14.25           | 7.96            | 4.79        | 1.83       | 1.03            | 6.24       | 0.30             | 46.39       | 13.23           | 6.87            | 4.74        | 1.36       | 1.05            | 6.27       | 0.30             | 43.81       |
| SAGA    | 9           | 7.85            | 11.50           | 4.72        | 1.38       | 0.58            | 3.77       | 0.61             | 39.41       | 7.74            | 8.09            | 4.66        | 1.10       | 0.58            | 3.81       | 0.61             | 35.59       |
| SAGO    | 10          | 6.40            | 15.53           | 5.32        | 1.75       | 0.65            | 3.69       | 0.52             | 43.86       | 6.33            | 10.25           | 5.26        | 1.45       | 0.66            | 3.74       | 0.52             | 38.20       |
| SAGU    | 10          | 6.93            | 1.97            | 3.47        | 1.41       | 1.25            | 4.68       | 0.18             | 29.90       | 5.98            | 1.82            | 3.38        | 1.06       | 1.26            | 4.70       | 0.18             | 28.38       |
| SAJA    | 10          | 6.40            | 15.53           | 5.32        | 1.75       | 0.65            | 3.69       | 0.52             | 43.86       | 6.33            | 10.25           | 5.26        | 1.45       | 0.66            | 3.74       | 0.52             | 38.20       |
| SAMA    | 11          | 32.04           | 3.54            | 7.00        | 1.91       | 0.49            | 2.33       | 1.51             | 59.82       | 26.55           | 3.18            | 6.71        | 1.54       | 0.50            | 2.35       | 1.51             | 53.35       |
| SAPE    | 8           | 5.04            | 0.98            | 2.84        | 0.68       | 0.55            | 1.42       | 0.03             | 19.55       | 4.73            | 1.00            | 2.79        | 0.57       | 0.57            | 1.44       | 0.03             | 19.13       |
| SAWT    | 10          | 3.01            | 0.44            | 7.32        | 1.24       | 0.49            | 1.10       | 0.02             | 23.61       | 2.93            | 0.41            | 7.22        | 1.10       | 0.49            | 1.11       | 0.02             | 23.29       |
| SCAP    | 10          | 3.67            | 0.69            | 8.61        | 1.60       | 0.38            | 1.24       | 0.02             | 26.22       | 3.57            | 0.63            | 8.47        | 1.48       | 0.39            | 1.25       | 0.02             | 25.81       |
| SELW    | 10          | 4.28            | 0.72            | 4.53        | 0.95       | 0.43            | 1.47       | 0.03             | 22.41       | 4.19            | 0.68            | 4.46        | 0.86       | 0.43            | 1.49       | 0.03             | 22.15       |
| SENE    | 12          | 20.11           | 22.08           | 5.68        | 2.26       | 0.19            | 1.45       | 0.23             | 64.00       | 17.69           | 19.23           | 5.29        | 1.76       | 0.20            | 1.46       | 0.23             | 57.86       |
| SEQU    | 11          | 12.91           | 21.27           | 13.51       | 2.53       | 0.69            | 5.30       | 0.39             | 67.59       | 12.74           | 12.39           | 13.21       | 2.21       | 0.69            | 5.34       | 0.39             | 57.97       |
| SHEN    | 10          | 29.53           | 9.33            | 6.45        | 2.35       | 0.21            | 1.84       | 0.19             | 59.92       | 22.38           | 8.00            | 6.10        | 1.59       | 0.22            | 1.87       | 0.19             | 50.36       |
| SHRO    | 10          | 25.31           | 3.52            | 6.74        | 1.85       | 0.36            | 1.82       | 0.24             | 49.84       | 19.72           | 3.07            | 6.47        | 1.37       | 0.36            | 1.84       | 0.24             | 43.07       |
| SIPS    | 11          | 32.43           | 13.79           | 8.35        | 2.87       | 0.35            | 1.98       | 0.37             | 71.15       | 27.26           | 10.99           | 8.11        | 2.34       | 0.36            | 2.01       | 0.37             | 62.45       |
| SOWA    | 10          | 5.60            | 1.73            | 6.41        | 1.19       | 0.52            | 1.76       | 0.09             | 27.30       | 5.47            | 1.50            | 6.30        | 1.10       | 0.52            | 1.76       | 0.09             | 26.75       |
| STMO    | 10          | 6.35            | 8.66            | 4.73        | 1.28       | 0.30            | 1.17       | 0.15             | 32.64       | 6.20            | 7.47            | 4.61        | 1.12       | 0.30            | 1.18       | 0.15             | 31.03       |
| SUPE    | 10          | 6.97            | 1.39            | 3.76        | 1.17       | 1.02            | 4.10       | 0.16             | 28.57       | 6.11            | 1.34            | 3.68        | 0.91       | 1.03            | 4.14       | 0.16             | 27.38       |
| SWAN    | 12          | 22.91           | 6.84            | 6.89        | 2.10       | 0.28            | 2.63       | 1.12             | 54.77       | 18.64           | 6.24            | 6.55        | 1.65       | 0.29            | 2.65       | 1.12             | 49.13       |
| SYCA2   | 9           | 4.32            | 0.91            | 6.17        | 2.40       | 3.49            | 7.13       | 0.11             | 33.52       | 4.04            | 0.89            | 6.08        | 2.16       | 3.51            | 7.17       | 0.11             | 32.96       |
| TETO    | 9           | 3.51            | 0.98            | 5.18        | 0.99       | 0.42            | 1.37       | 0.07             | 21.52       | 3.41            | 0.92            | 5.12        | 0.91       | 0.43            | 1.38       | 0.07             | 21.24       |
| THIS    | 11          | 8.35            | 1.45            | 6.60        | 1.34       | 0.46            | 2.55       | 0.18             | 31.93       | 8.15            | 1.28            | 6.50        | 1.27       | 0.47            | 2.57       | 0.18             | 31.41       |
| THLA    | 10          | 5.62            | 1.59            | 6.33        | 1.37       | 0.55            | 2.22       | 0.11             | 27.79       | 5.49            | 1.31            | 6.20        | 1.23       | 0.56            | 2.23       | 0.11             | 27.13       |
| THRO    | 11          | 11.91           | 9.88            | 2.47        | 1.13       | 0.28            | 2.24       | 0.14             | 39.04       | 11.29           | 8.75            | 2.38        | 0.83       | 0.28            | 2.26       | 0.14             | 36.93       |
| ULBE    | 11          | 9.18            | 6.13            | 2.94        | 0.83       | 0.23            | 1.06       | 0.11             | 31.49       | 8.77            | 7.45            | 2.91        | 0.65       | 0.24            | 1.11       | 0.11             | 32.24       |
| UPBU    | 11          | 27.14           | 11.95           | 8.08        | 2.22       | 0.53            | 2.36       | 0.39             | 63.68       | 21.61           | 10.32           | 7.83        | 1.89       | 0.55            | 2.38       | 0.39             | 55.97       |
| VENT    | 11          | 8.67            | 8.05            | 7.00        | 2.10       | 0.42            | 3.98       | 1.11             | 42.33       | 8.51            | 5.45            | 6.88        | 1.81       | 0.43            | 4.01       | 1.11             | 39.20       |
| VOYA    | 12          | 12.52           | 12.50           | 3.80        | 1.38       | 0.20            | 1.51       | 0.25             | 44.17       | 10.77           | 10.83           | 3.57        | 1.10       | 0.21            | 1.53       | 0.25             | 40.26       |
| WASH    | 9           | 3.90            | 0.90            | 3.99        | 0.71       | 0.48            | 1.42       | 0.01             | 20.42       | 3.76            | 0.87            | 3.94        | 0.63       | 0.49            | 1.43       | 0.01             | 20.14       |

| site_id | ss_Rayleigh | E_amm_so4_g90_b | E_amm_no3_g90_b | E_omc_g90_b | E_ec_g90_b | E_crustal_g90_b | E_cm_g90_b | E_sea_salt_g90_b | tbext_g90_b | E_amm_so4_g90_f | E_amm_no3_g90_f | E_omc_g90_f | E_ec_g90_f | E_crustal_g90_f | E_cm_g90_f | E_sea_salt_g90_f | tbext_g90_f |
|---------|-------------|-----------------|-----------------|-------------|------------|-----------------|------------|------------------|-------------|-----------------|-----------------|-------------|------------|-----------------|------------|------------------|-------------|
| WEEL    | 8           | 3.54            | 0.87            | 1.88        | 0.63       | 0.59            | 1.00       | 0.05             | 16.57       | 3.35            | 0.86            | 1.86        | 0.55       | 0.60            | 1.01       | 0.05             | 16.27       |
| WEMI    | 9           | 4.04            | 0.56            | 3.30        | 0.91       | 0.43            | 1.37       | 0.02             | 19.64       | 3.84            | 0.53            | 3.26        | 0.80       | 0.44            | 1.37       | 0.02             | 19.28       |
| WHIT    | 9           | 8.44            | 2.07            | 3.70        | 0.98       | 0.76            | 3.03       | 0.14             | 28.12       | 8.14            | 1.95            | 3.68        | 0.81       | 0.78            | 3.05       | 0.14             | 27.56       |
| WHPA    | 10          | 6.86            | 1.43            | 2.61        | 0.65       | 0.28            | 0.93       | 0.24             | 23.00       | 6.73            | 1.24            | 2.56        | 0.59       | 0.29            | 0.93       | 0.24             | 22.58       |
| WICA    | 10          | 7.57            | 5.06            | 3.33        | 1.04       | 0.40            | 1.54       | 0.07             | 29.02       | 6.87            | 4.56            | 3.27        | 0.91       | 0.42            | 1.56       | 0.07             | 27.66       |
| WIMO    | 11          | 22.85           | 14.95           | 6.93        | 2.40       | 0.58            | 4.21       | 0.33             | 63.26       | 18.41           | 12.88           | 6.79        | 1.81       | 0.60            | 4.24       | 0.33             | 56.07       |
| WOLF    | 11          | 31.06           | 3.85            | 8.34        | 2.22       | 0.52            | 2.78       | 1.12             | 60.89       | 26.34           | 3.40            | 7.99        | 1.75       | 0.53            | 2.81       | 1.12             | 54.93       |
| YELL    | 9           | 3.51            | 0.98            | 5.18        | 0.99       | 0.42            | 1.37       | 0.07             | 21.52       | 3.41            | 0.92            | 5.12        | 0.91       | 0.43            | 1.38       | 0.07             | 21.24       |
| YOSE    | 10          | 7.10            | 2.53            | 7.45        | 1.37       | 0.64            | 3.24       | 0.16             | 32.48       | 6.96            | 2.28            | 7.32        | 1.29       | 0.64            | 3.26       | 0.16             | 31.90       |
| ZION2   | 10          | 4.43            | 1.32            | 2.62        | 0.87       | 0.86            | 3.40       | 0.09             | 23.58       | 4.20            | 1.27            | 2.58        | 0.71       | 0.87            | 3.43       | 0.09             | 23.14       |

| Column | Column Header    | Column Description   |
|--------|------------------|--|
| A      | site_id          | Class I Area ID  |
| B      | type             | unused   |
| C      | date             | Base model year  |
| D      | monitor_gridcell | CAMx grid cell location of monitor   |
| E      | gridcell_lat     | Latitude of grid cell centroid   |
| F      | gridcell_long    | Longitude of grid cell centroid  |
| G      | monitor_lat      | Latitude of IMPROVE monitor  |
| H      | monitor_long     | Longitude of IMPROVE monitor   |
| I      | dv_best_b        | 2014-2017 IMPROVE deciviews 20% clearest days  |
| J      | dv_best_f        | 2028 projected deciviews 20% clearest days   |
| K      | dv_worst_b       | 2014-2017 IMPROVE deciviews 20% most impaired days   |
| L      | dv_worst_f       | 2028 projected deciviews 20% most impaired days  |
| M      | amm_so4_g10_b    | 2014-2017 observed total ammonium sulfate concentration- 20% clearest days (ug/m3)           |
| N      | s_amm_so4_g10_b  | 2014-2017 observed "small" ammonium sulfate concentration- 20% clearest days (ug/m3)         |
| O      | l_amm_so4_g10_b  | 2014-2017 observed "large" ammonium sulfate concentration- 20% clearest days (ug/m3)         |
| P      | amm_no3_g10_b    | 2014-2017 observed total ammonium nitrate concentration- 20% clearest days (ug/m3)           |
| Q      | s_amm_no3_g10_b  | 2014-2017 observed "small" ammonium nitrate concentration- 20% clearest days (ug/m3)         |
| R      | l_amm_no3_g10_b  | 2014-2017 observed "large" ammonium nitrate concentration- 20% clearest days (ug/m3)         |
| S      | omc_g10_b        | 2014-2017 observed total organic carbon mass concentration- 20% clearest days (ug/m3)        |
| T      | s_omc_g10_b      | 2014-2017 observed "small" organic carbon mass concentration- 20% clearest days (ug/m3)      |
| U      | l_omc_g10_b      | 2014-2017 observed "large" organic carbon mass concentration- 20% clearest days (ug/m3)      |
| V      | ec_g10_b         | 2014-2017 observed elemental carbon concentration- 20% clearest days (ug/m3)                 |
| W      | crystal_g10_b    | 2014-2017 observed fine crustal mass concentration- 20% clearest days (ug/m3)                |
| X      | cm_g10_b         | 2014-2017 observed coarse mass concentration- 20% clearest days (ug/m3)                      |
| Y      | sea_salt_g10_b   | 2014-2017 observed sea salt concentration- 20% clearest days (ug/m3)                         |
| Z      | amm_so4_g90_b    | 2014-2017 observed total ammonium sulfate concentration- 20% most impaired days (ug/m3)      |
| AA     | s_amm_so4_g90_b  | 2014-2017 observed "small" ammonium sulfate concentration- 20% most impaired days (ug/m3)    |
| AB     | l_amm_so4_g90_b  | 2014-2017 observed "large" ammonium sulfate concentration- 20% most impaired days (ug/m3)    |
| AC     | amm_no3_g90_b    | 2014-2017 observed total ammonium nitrate concentration- 20% most impaired days (ug/m3)      |
| AD     | s_amm_no3_g90_b  | 2014-2017 observed "small" ammonium nitrate concentration- 20% most impaired days (ug/m3)    |
| AE     | l_amm_no3_g90_b  | 2014-2017 observed "large" ammonium nitrate concentration- 20% most impaired days (ug/m3)    |
| AF     | omc_g90_b        | 2014-2017 observed total organic carbon mass concentration- 20% most impaired days (ug/m3)   |
| AG     | s_omc_g90_b      | 2014-2017 observed "small" organic carbon mass concentration- 20% most impaired days (ug/m3) |
| AH     | l_omc_g90_b      | 2014-2017 observed "large" organic carbon mass concentration- 20% most impaired days (ug/m3) |
| AI     | ec_g90_b         | 2014-2017 observed elemental carbon concentration- 20% most impaired days (ug/m3)            |

| Column | Column Header    | Column Description   |
|--------|------------------|--|
| AJ     | crustal_g90_b    | 2014-2017 observed fine crustal mass concentration- 20% most impaired days (ug/m3)                 |
| AK     | cm_g90_b         | 2014-2017 observed coarse mass concentration- 20% most impaired days (ug/m3)                       |
| AL     | sea_salt_g90_b   | 2014-2017 observed sea salt concentration- 20% most impaired days (ug/m3)                          |
| AM     | ss_Rayleigh      | Site specific Rayleigh scattering (Mm-1)   |
| AN     | E_amm_so4_g10_b  | 2014-2017 observed beta extinction (Mm-1) ammonium sulfate 20% clearest days                       |
| AO     | E_amm_no3_g10_b  | 2014-2017 observed beta extinction (Mm-1) ammonium nitrate 20% clearest days                       |
| AP     | E_omc_g10_b      | 2014-2017 observed beta extinction (Mm-1) organic carbon mass 20% clearest days                    |
| AQ     | E_ec_g10_b       | 2014-2017 observed beta extinction (Mm-1) elemental carbon 20% clearest days                       |
| AR     | E_crustal_g10_b  | 2014-2017 observed beta extinction (Mm-1) fine crustal 20% clearest days                           |
| AS     | E_cm_g10_b       | 2014-2017 observed beta extinction (Mm-1) coarse mass 20% clearest days                            |
| AT     | E_sea_salt_g10_b | 2014-2017 observed beta extinction (Mm-1) sea salt 20% clearest days (observed IMPROVE data)       |
| AU     | tbext_g10_b      | Total beta extinction (Mm-1) on the 20% clearest days (including Rayleigh)                         |
| AV     | E_amm_so4_g90_b  | 2014-2017 observed beta extinction (Mm-1) ammonium sulfate 20% most impaired days                  |
| AW     | E_amm_no3_g90_b  | 2014-2017 observed beta extinction (Mm-1) ammonium nitrate 20% most impaired days                  |
| AX     | E_omc_g90_b      | 2014-2017 observed beta extinction (Mm-1) organic carbon mass 20% most impaired days               |
| AY     | E_ec_g90_b       | 2014-2017 observed beta extinction (Mm-1) elemental carbon 20% most impaired days                  |
| AZ     | E_crustal_g90_b  | 2014-2017 observed beta extinction (Mm-1) fine crustal 20% most impaired days                      |
| BA     | E_cm_g90_b       | 2014-2017 observed beta extinction (Mm-1) coarse mass 20% most impaired days                       |
| BB     | E_sea_salt_g90_b | 2014-2017 observed beta extinction (Mm-1) sea salt 20% most impaired days                          |
| BC     | tbext_g90_b      | 2014-2017 observed total beta extinction (Mm-1) on the 20% most impaired days (including Rayleigh) |
| BC     | amm_so4_g10_f    | 2028 total ammonium sulfate concentration- 20% clearest days (ug/m3)                               |
| BE     | s_amm_so4_g10_f  | 2028 "small" ammonium sulfate concentration- 20% clearest days (ug/m3)                             |
| BF     | l_amm_so4_g10_f  | 2028 "large" ammonium sulfate concentration- 20% clearest days (ug/m3)                             |
| BG     | amm_no3_g10_f    | 2028 total ammonium nitrate concentration- 20% clearest days (ug/m3)                               |
| BH     | s_amm_no3_g10_f  | 2028 "small" ammonium nitrate concentration- 20% clearest days (ug/m3)                             |
| BI     | l_amm_no3_g10_f  | 2028 "large" ammonium nitrate concentration- 20% clearest days (ug/m3)                             |
| BJ     | omc_g10_f        | 2028 total organic carbon mass concentration- 20% clearest days (ug/m3)                            |
| BK     | s_omc_g10_f      | 2028 "small" organic carbon mass concentration- 20% clearest days (ug/m3)                          |
| BL     | l_omc_g10_f      | 2028 "large" organic carbon mass concentration- 20% clearest days (ug/m3)                          |
| BM     | ec_g10_f         | 2028 elemental carbon concentration- 20% clearest days (ug/m3)                                     |

| Column | Column Header                               | Column Description   |
|--------|---|--|
| BN     | crustal_g10_f                               | 2028 fine crustal mass concentration- 20% clearest days (ug/m3)                          |
| BO     | cm_g10_f                                    | 2028 coarse mass concentration- 20% clearest days (ug/m3)                                |
| BP     | sea_salt_g10_f (from observed IMPROVE data) | 2028 sea salt concentration- 20% clearest days (ug/m3) (from observed IMPROVE data)      |
| BQ     | amm_so4_g90_f                               | 2028 total ammonium sulfate concentration- 20% most impaired days (ug/m3)                |
| BR     | s_amm_so4_g90_f                             | 2028 "small" ammonium sulfate concentration- 20% most impaired days (ug/m3)              |
| BS     | l_amm_so4_g90_f                             | 2028 "large" ammonium sulfate concentration- 20% most impaired days (ug/m3)              |
| BT     | amm_no3_g90_f                               | 2028 total ammonium nitrate concentration- 20% most impaired days (ug/m3)                |
| BU     | s_amm_no3_g90_f                             | 2028 "small" ammonium nitrate concentration- 20% most impaired days (ug/m3)              |
| BV     | l_amm_no3_g90_f                             | 2028 "large" ammonium nitrate concentration- 20% most impaired days (ug/m3)              |
| BW     | omc_g90_f                                   | 2028 total organic carbon mass concentration- 20% most impaired days (ug/m3)             |
| BX     | s_omc_g90_f                                 | 2028 "small" organic carbon mass concentration- 20% most impaired days (ug/m3)           |
| BY     | l_omc_g90_f                                 | 2028 "large" organic carbon mass concentration- 20% most impaired days (ug/m3)           |
| BZ     | ec_g90_f                                    | 2028 elemental carbon concentration- 20% most impaired days (ug/m3)                      |
| CA     | crustal_g90_f                               | 2028 fine crustal mass concentration- 20% most impaired days (ug/m3)                     |
| CB     | cm_g90_f                                    | 2028 coarse mass concentration- 20% most impaired days (ug/m3)                           |
| CC     | sea_salt_g90_f                              | 2028 sea salt concentration- 20% most impaired days (ug/m3) (from observed IMPROVE data) |
| CD     | E_amm_so4_g10_f                             | 2028 beta extinction (Mm-1) ammonium sulfate 20% clearest days                           |
| CE     | E_amm_no3_g10_f                             | 2028 beta extinction (Mm-1) ammonium nitrate 20% clearest days                           |
| CF     | E_omc_g10_f                                 | 2028 beta extinction (Mm-1) organic carbon mass 20% clearest days                        |
| CG     | E_ec_g10_f                                  | 2028 beta extinction (Mm-1) elemental carbon 20% clearest days                           |
| CH     | E_crustal_g10_f                             | 2028 beta extinction (Mm-1) fine crustal 20% clearest days                               |
| CI     | E_cm_g10_f                                  | 2028 beta extinction (Mm-1) coarse mass 20% clearest days                                |
| CJ     | E_sea_salt_g10_f                            | 2028 beta extinction (Mm-1) sea salt 20% clearest days (observed IMPROVE data)           |
| CK     | tbext_g10_f                                 | 2028 Total beta extinction (Mm-1) on the 20% clearest days (including Rayleigh)          |
| CL     | E_amm_so4_g90_f                             | 2028 beta extinction (Mm-1) ammonium sulfate 20% most impaired days                      |
| CM     | E_amm_no3_g90_f                             | 2028 beta extinction (Mm-1) ammonium nitrate 20% most impaired days                      |
| CN     | E_omc_g90_f                                 | 2028 beta extinction (Mm-1) organic carbon mass 20% most impaired days                   |
| CO     | E_ec_g90_f                                  | 2028 beta extinction (Mm-1) elemental carbon 20% most impaired days                      |
| CP     | E_crustal_g90_f                             | 2028 beta extinction (Mm-1) fine crustal 20% most impaired days                          |
| CQ     | E_cm_g90_f                                  | 2028 beta extinction (Mm-1) coarse mass 20% most impaired days                           |
| CR     | E_sea_salt_g90_f                            | 2028 beta extinction (Mm-1) sea salt 20% most impaired days (from observed IMPROVE data) |
| CS     | tbext_g90_f                                 | 2028 Total beta extinction (Mm-1) on the 20% most impaired days (including Rayleigh)     |
| CT     | rrf_g10_crustal                             | Modeled (2028/2016) fine crustal relative response factor (RRF) on 20% clearest days     |
| CU     | rrf_g10_no3                                 | Modeled (2028/2016) nitrate relative response factor (RRF) on 20% clearest days          |

| Column | Column Header   | Column Description  |
|--------|-----------------|---|
| CV     | rrf_g10_oc      | Modeled (2028/2016) organic carbon relative response factor (RRF) on 20% clearest days        |
| CW     | rrf_g10_ec      | Modeled (2028/2016) elemental carbon relative response factor (RRF) on 20% clearest days      |
| CX     | rrf_g10_cm      | Modeled (2028/2016) coarse mass relative response factor (RRF) on 20% clearest days           |
| CY     | rrf_g10_so4     | Modeled (2028/2016) sulfate relative response factor (RRF) on 20% clearest days               |
| CZ     | rrf_g90_crustal | Modeled (2028/2016) fine crustal relative response factor (RRF) on 20% most impaired days     |
| DA     | rrf_g90_no3     | Modeled (2028/2016) nitrate relative response factor (RRF) on 20% most impaired days          |
| DB     | rrf_g90_oc      | Modeled (2028/2016) organic carbon relative response factor (RRF) on 20% most impaired days   |
| DC     | rrf_g90_ec      | Modeled (2028/2016) elemental carbon relative response factor (RRF) on 20% most impaired days |
| DD     | rrf_g90_cm      | Modeled (2028/2016) coarse mass relative response factor (RRF) on 20% most impaired days      |
| DE     | rrf_g90_so4     | Modeled (2028/2016) sulfate relative response factor (RRF) on 20% most impaired days          |