Supplementary Material 6

Table SM6. Variable, description, and unit of CMAQ outputs.

Variable	Description	Unit
TFLAG	Time flag indicator for model outputs	<YYYYDDD,HHMMSS>
NO2	Nitrogen dioxide (NO2)	ppmV
NO	Nitric oxide (NO)	ppmV
O	Atomic oxygen (O)	ppmV
O3	Ozone (O3)	ppmV
NO3	Nitrate radical (NO3)	ppmV
O1D	Excited state oxygen (O1D)	ppmV
OH	Hydroxyl radical (OH)	ppmV
HO2	Hydroperoxyl radical (HO2)	ppmV
H2O2	Hydrogen peroxide (H2O2)	ppmV
N2O5	Dinitrogen pentoxide (N2O5)	ppmV
HNO3	Nitric acid (HNO3)	ppmV
HONO	Nitrous acid (HONO)	ppmV
PNA	Polynuclear aromatic hydrocarbons (PNA)	ppmV
SO2	Sulfur dioxide (SO2)	ppmV
SULF	Sulfate aerosols	ppmV
C2O3	Ketoalcoxy radicals (C2O3)	ppmV
MEO2	Methoxy radicals (MEO2)	ppmV
RO2	Alkylperoxy radicals (RO2)	ppmV
PAN	Peroxyacetyl nitrates (PAN)	ppmV
PACD	Peroxy carboxylic acids (PACD)	ppmV
AACD	Peroxy acyl aldehydes (AACD)	ppmV
CXO3	Ketoalkylperoxy radicals (CXO3)	ppmV
ALD2	Acetaldehyde (ALD2)	ppmV
XO2H	Alkylperoxy hydroperoxides (XO2H)	ppmV
PANX	Alkyl peroxy nitrates (PANX)	ppmV
FORM	Formaldehyde (FORM)	ppmV
MEPX	Methoxyperoxy radicals (MEPX)	ppmV
MEOH	Methanol (MEOH)	ppmV
ROOH	Alkyl hydroperoxides (ROOH)	ppmV
XO2	Alkylperoxy radicals (XO2)	ppmV
XO2N	Alkylperoxy nitrate radicals (XO2N)	ppmV
XPAR	Alkylperoxy alkyl radicals (XPAR)	ppmV
XPRP	Alkylperoxy propionyl radicals (XPRP)	ppmV
NTR1	Organic nitrogen oxides (NTR1)	ppmV
NTR2	Organic nitrogen oxides (NTR2)	ppmV

FACD	Acetylperoxy radical (FACD)	ppmV
CO	Carbon monoxide (CO)	ppmV
HCO3	Bicarbonate ion (HCO3)	ppmV
ALDX	Aldehydes (ALDX)	ppmV
GLYD	Glycolaldehyde (GLYD)	ppmV
GLY	Glycol (GLY)	ppmV
MGLY	Methylglyoxal (MGLY)	ppmV
ETHA	Ethane (ETHA)	ppmV
ETOH	Ethanol (ETOH)	ppmV
KET	Ketones (KET)	ppmV
PAR	Hydrocarbons	ppmV
ACET	Acetaldehyde	ppmV
PRPA	Propane	ppmV
ROR	ROR	ppmV
ETHY	Ethylene	ppmV
ETH	Ethane	ppmV
OLE	Olefins	ppmV
IOLE	Iso-olefins	ppmV
ISOP	Isoprene	ppmV
ISO2	ISO2	ppmV
ISPD	Isoprene-derived peroxy radicals	ppmV
INTR	Intramolecular H-shifted peroxy radicals	ppmV
ISPX	Isoprene-derived peroxycarbonyl radicals	ppmV
HPLD	Hydroperoxyl radicals	ppmV
OPO3	Oxygenated organic peroxy radicals	ppmV
EPOX	Epoxides	ppmV
IEPOXP	IEPOXP	ppmV
EPX2	EPX2	ppmV
TERP	Terpenes	ppmV
APIN	Alpha-pinene	ppmV
TERPNRO2	Total terpene-derived organic nitrates	ppmV
MTNO3	Methyl nitrates	ppmV
BENZENE	Benzene	ppmV
CRES	Cresols	ppmV
BZO2	Benzoate peroxy radicals	ppmV
OPEN	Other peroxy radicals	ppmV
BENZRO2	Benzyl peroxy radicals	ppmV
TOL	Toluene	ppmV
TO2	Toluene peroxy radicals	ppmV
TOLRO2	Toluene-derived peroxy radicals	ppmV
XOPN	Other peroxy alkyl nitrates	ppmV

XYLMN	Xylene-derived peroxy alkyl nitrates	ppmV
XLO2	Other peroxy alkoxy radicals	ppmV
XYLRO2	Xylene-derived peroxy alkoxy radicals	ppmV
NAPH	Naphthalene	ppmV
PAHRO2	PAH peroxy radicals	ppmV
CRO	CRO	ppmV
CAT1	CAT1	ppmV
CRON	CRON	ppmV
OPAN	Organic peroxyacyl nitrates	ppmV
ECH4	Ethane and methane	ppmV
CL2	Chlorine gas	ppmV
CL	Atomic chlorine	ppmV
HOCL	Hypochlorous acid	ppmV
CLO	Chlorine monoxide	ppmV
FMCL	Free molecular chlorine	ppmV
HCL	Hydrogen chloride	ppmV
CLNO2	Chlorine nitrate	ppmV
CLNO3	Chlorine nitrate	ppmV
SESQ	SESQ	ppmV
SOAALK	Secondary organic aerosol from anthropogenic precursors	ppmV
H2NO3PIJ	HNO3(H2O) and HNO4 primary inorganic aerosols	ppmV
H2NO3PK	HNO3(H2O) and HNO4 primary inorganic aerosols	ppmV
VLVPO1	Very low-volatility primary organic aerosol mode 1	ppmV
VSVPO1	Very semi-volatile primary organic aerosol mode 1	ppmV
VSVPO2	Very semi-volatile primary organic aerosol mode 2	ppmV
VSVPO3	Very semi-volatile primary organic aerosol mode 3	ppmV
VIVPO1	Very insoluble primary organic aerosol mode 1	ppmV
VLVOO1	Very low-volatility oxygenated organic aerosol mode 1	ppmV
VLVOO2	Very low-volatility oxygenated organic aerosol mode 2	ppmV
VSVOO1	Very semi-volatile oxygenated organic aerosol mode 1	ppmV
VSVOO2	Very semi-volatile oxygenated organic aerosol mode 2	ppmV
VSVOO3	Very semi-volatile oxygenated organic aerosol mode 3	ppmV
PCVOC	Primary carbonaceous volatile organic compounds	ppmV
FORM_PRIMARY	Primary formaldehyde	ppmV
ALD2_PRIMARY	Primary acetaldehyde	ppmV
BUTADIENE13	1	ppmV
ACROLEIN	Acrolein	ppmV
ACRO_PRIMARY	Primary acrolein	ppmV
TOLU	Toluene	ppmV

HG	Mercury	ppmV
HGIIGAS	Mercury gas phase	ppmV
SVAVB1	Sem	ppmV
SVAVB2	Secondary organic aerosol from biogenic precursors (mode 2)	ppmV
SVAVB3	Secondary organic aerosol from biogenic precursors (mode 3)	ppmV
SVAVB4	Secondary organic aerosol from biogenic precursors (mode 4)	ppmV
ASO4J	Ammonium sulfate (j mode)	ug m-3
ASO4I	Ammonium sulfate (i mode)	ug m-3
ANH4J	Ammonium nitrate (j mode)	ug m-3
ANH4I	Ammonium nitrate (i mode)	ug m-3
ANO3J	Nitrate aerosol (j mode)	ug m-3
ANO3I	Nitrate aerosol (i mode)	ug m-3
AISO1J	Isoprene secondary organic aerosol (j mode)	ug m-3
AISO2J	Isoprene secondary organic aerosol (j mode)	ug m-3
ASQTJ	SQT	ug m-3
AORGCJ	Primary organic carbon aerosol (j mode)	ug m-3
AECJ	Elemental carbon aerosol (j mode)	ug m-3
AECI	Elemental carbon aerosol (i mode)	ug m-3
AOTHRJ	Other organic aerosol (j mode)	ug m-3
AOTHRI	Other organic aerosol (i mode)	ug m-3
AFEJ	Fine soil aerosol emissions (j mode)	ug m-3
AALJ	Aluminum aerosol (j mode)	ug m-3
ASIJ	Silicon aerosol (j mode)	ug m-3
ATIJ	Titanium aerosol (j mode)	ug m-3
ACAJ	Cadmium aerosol (j mode)	ug m-3
AMGJ	Magnesium aerosol (j mode)	ug m-3
AKJ	Potassium aerosol (j mode)	ug m-3
AMNJ	Manganese aerosol (j mode)	ug m-3
ACORS	Copper aerosol (surface)	ug m-3
ASOIL	Soil aerosol (surface)	ug m-3
NUMATKN	Number concentration of aerosol ammonium sulfate	m-3
NUMACC	Number concentration of aerosol ammonium chloride	m-3
NUMCOR	Number concentration of aerosol coarse mode	m-3
SRFATKN	Surface area concentration of aerosol ammonium sulfate	m2 m-3
SRFACC	Surface area concentration of aerosol ammonium chloride	m2 m-3
SRFCOR	Surface area concentration of aerosol coarse mode	m2 m-3
AORGH2OJ	Primary organic carbon aerosol in ambient air (j mode)	ug m-3
AH2OJ	Water in primary organic carbon aerosol (j mode)	ug m-3
AH2OI	Water in primary organic carbon aerosol (i mode)	ug m-3
AH3OPJ	Hydrogen in organic peroxide aerosol (j mode)	ug m-3
AH3OPI	Hydrogen in organic peroxide aerosol (i mode)	ug m-3

ANAJ	Ammonium aerosol (j mode)	ug m-3
ANAI	Ammonium aerosol (i mode)	ug m-3
ACLJ	Chloride aerosol (j mode)	ug m-3
ACLI	Chloride aerosol (i mode)	ug m-3
ASEACAT	Sea salt aerosol inactivation by clouds	ug m-3
ACLK	Chloride aerosol inactivation by clouds	ug m-3
ASO4K	Ammonium sulfate aerosol inactivation by clouds	ug m-3
ANH4K	Ammonium nitrate aerosol inactivation by clouds	ug m-3
ANO3K	Nitrate aerosol inactivation by clouds	ug m-3
AH2OK	Water in organic aerosol (k mode)	ug m-3
AH3OPK	Hydrogen in organic peroxide aerosol (k mode)	ug m-3
AISO3J	Isoprene-derived secondary organic aerosol (j mode)	ug m-3
AOLGAJ	Primary organic aerosol from light-duty gasoline vehicles (j mode)	ug m-3
AOLGBJ	Primary organic aerosol from light-duty gasoline vehicles (j mode)	ug m-3
AGLYJ	Glyoxal aerosol (j mode)	ug m-3
AMTNO3J	Methyl nitrate aerosol (j mode)	ug m-3
AMTHYDJ	Methylglyoxal aerosol (j mode)	ug m-3
APOCI	Primary organic carbon aerosol from isoprene	ug m-3
APOCJ	Primary organic carbon aerosol (j mode)	ug m-3
APNCOMI	Primary organic carbon aerosol from anthropogenic non-methane organic compounds	ug m-3
APNCOMJ	Primary organic carbon aerosol (j mode)	ug m-3
APCSOJ	Primary organic carbon aerosol from cooking and bioparticles (j mode)	ug m-3
ALVPO1I	Very low-volatility primary organic aerosol mode 1 (i mode)	ug m-3
ASVPO1I	Very semi-volatile primary organic aerosol mode 1 (i mode)	ug m-3
ASVPO2I	Very semi-volatile primary organic aerosol mode 2 (i mode)	ug m-3
ALVPO1J	Very low-volatility primary organic aerosol mode 1 (j mode)	ug m-3
ASVPO1J	Very semi-volatile primary organic aerosol mode 1 (j mode)	ug m-3
ASVPO2J	Very semi-volatile primary organic aerosol mode 2 (j mode)	ug m-3
ASVPO3J	Very semi-volatile primary organic aerosol mode 3 (j mode)	ug m-3
AIVPO1J	Very insoluble primary organic aerosol mode 1 (j mode)	ug m-3
ALVOO1I	Very low-volatility oxygenated organic aerosol mode 1 (i mode)	ug m-3
ALVOO2I	Very low-volatility oxygenated organic aerosol mode 2 (i mode)	ug m-3
ASVOO1I	Very semi-volatile oxygenated organic aerosol mode 1 (i mode)	ug m-3
ASVOO2I	Very semi-volatile oxygenated organic aerosol mode 2 (i mode)	ug m-3
ALVOO1J	Very low-volatility oxygenated organic aerosol mode 1 (j mode)	ug m-3
ALVOO2J	Very low-volatility oxygenated organic aerosol mode 2 (j mode)	ug m-3
ASVOO1J	Very semi-volatile oxygenated organic aerosol mode 1 (j mode)	ug m-3
ASVOO2J	Very semi-volatile oxygenated organic aerosol mode 2 (j mode)	ug m-3
ASVOO3J	Very semi-volatile oxygenated organic aerosol mode 3 (j mode)	ug m-3
AAVB1J	Alkylbenzenes from light-duty gasoline vehicles (j mode)	ug m-3

AAVB2J	Alkylbenzenes from light-duty gasoline vehicles (j mode)	ug m-3
AAVB3J	Alkylbenzenes from light-duty gasoline vehicles (j mode)	ug m-3
AAVB4J	Alkylbenzenes from light-duty gasoline vehicles (j mode)	ug m-3
AMT1J	Monoterpenes (j mode)	ug m-3
AMT2J	Monoterpenes (j mode)	ug m-3
AMT3J	Monoterpenes (j mode)	ug m-3
AMT4J	Monoterpenes (j mode)	ug m-3
AMT5J	Monoterpenes (j mode)	ug m-3
AMT6J	Monoterpenes (j mode)	ug m-3
NH3	Ammonia	ppmV
SVISO1	ISOPOOH-derived secondary organic aerosol	ppmV
SVISO2	ISOPOOH-derived secondary organic aerosol	ppmV
SVSQT	SQT-derived secondary organic aerosol	ppmV
LVPCSOG	Large-scale primary carbonaceous soluble organic gases	ppmV
SVMT1	Methane-derived secondary organic aerosol	ppmV
SVMT2	Methane-derived secondary organic aerosol	ppmV
SVMT3	Methane-derived secondary organic aerosol	ppmV
SVMT4	Methane-derived secondary organic aerosol	ppmV
SVMT5	Methane-derived secondary organic aerosol	ppmV
SVMT6	Methane-derived secondary organic aerosol	ppmV
RH	Relative humidity	1
TA	Ambient temperature	K
PRES	Pressure	Pa