## **Sampling Site and Measurement Program Summary**

# Global Monitoring Division NOAA Earth System Research Laboratory Boulder, Colorado



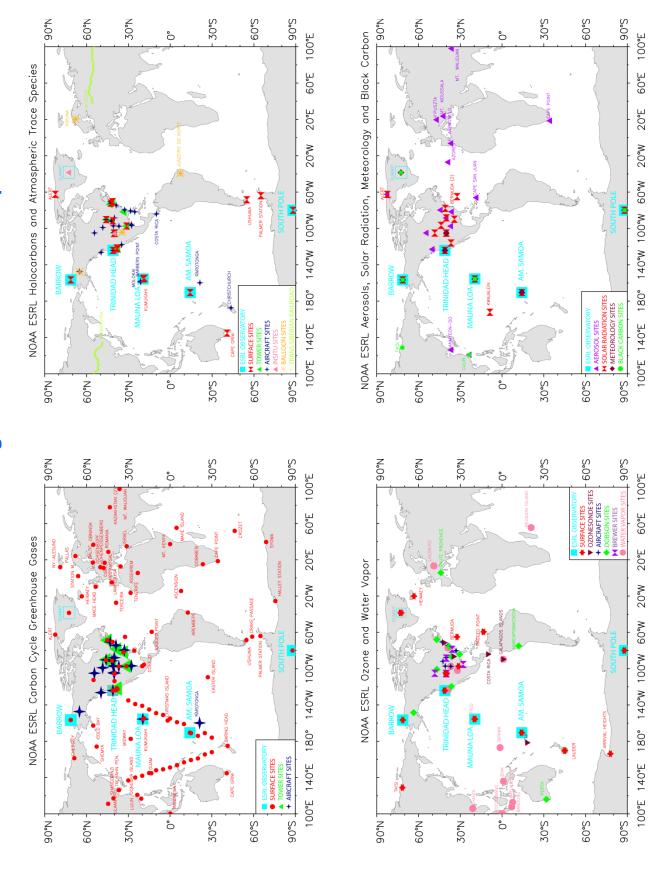
Atmospheric Research Observatory - South Pole, Antarctica

Photo by: Patrick Cullis

### September, 2011

Contacts:
Russell Schnell - 303-497-6733 - Russell.C.Schnell@noaa.gov
Brian Vasel - 303-497-6655 - Brian.Vasel@noaa.gov

# NOAA ESRL Global Monitoring Division Network Site Maps



	Measurement Programs Global Monitoring Division, ESRL, Boul	September, 2011 der, Colorado
Measurement	United States and Territories	International
Aerosols	Surface, Continuous Measurements	Surface, Continuous Measurements
Absorption, scattering,	Barrow, Alaska	Alert, Canada
particle number, and	Bondville, Illinois	Anmyeon-do, Korea
chemical composition at	Boone, North Carolina	Azores, Portugal
most sites.	Cape San Juan, Puerto Rico	Black Forest, Germany (Campaign)
	Lamont, Oklahoma	Cape Point, South Africa
	Mauna Loa, Hawaii	East Trout Lake, Canada
	Point Reyes, California (Closed)	Egbert, Canada
	Steamboat Springs, Colorado Trinidad Head, California	El Arenosillo, Spain Gosan, South Korea (Campaign)
	Tutuila, American Samoa	K'puszta, Hungary
	Tatana, 7 tilonoan Gamba	Kashidhoo, Maldives (Campaign)
		Lulin, Taiwan
		Moussala, Bulgaria
		Mt. Waliguan, China
		Niamey, Niger (Campaign)
		Sable Island, Canada (Campaign)
		Shouxian, China (Campaign)
		South Pole, Antarctica
		Summit, Greenland (black carbon)
Aerosol Lidar	Daily Profiles	Whistler, Canada  Daily Profiles
Aerosol light scattering	Boulder, Colorado (stratosphere)	South Pole, Antarctica (troposphere)
verses altitude.	Mauna Loa, Hawaii (stratosphere)	Summit, Greenland (stratosphere & troposphere)
	Trinidad Head, California (troposphere)	[,
	Tutuila, American Samoa (stratosphere)	
Carbon Cycle Gases	Surface, Continuous	Surface, Continuous
(Species listed)	Barrow, Alaska (CO <sub>2</sub> , CH <sub>4</sub> , CO)	
	Mauna Loa, Hawaii (CO <sub>2</sub> , CH <sub>4</sub> , CO)	
	Tutuila, American Samoa (CO <sub>2</sub> )	
	South Pole, Antarctica (CO <sub>2</sub> )	
Carbon Cycle Gases	Tall Tower, Continuous	Tall Tower, Continuous
(Species listed)	Argyle, Maine (CO <sub>2</sub> , CO)	
(openie inital)	Beech Island, South Carolina (CO <sub>2</sub> , CO)	
	Erie, Colorado (CO <sub>2</sub> , CO),	
	·	
	Marthas Vineyard, Massachusetts (CO <sub>2</sub> )	
	Moody, Texas (CO <sub>2</sub> , CO)	
	Park Falls, Wisconsin (CO <sub>2</sub> , CH <sub>4</sub> , CO)	
	Shenandoah, Virgina (CO <sub>2</sub> , CO)	
	Walnut Grove, Califoirnia (CO <sub>2</sub> , CH <sub>4</sub> , CO)	
	West Branch, Iowa (CO <sub>2</sub> , CO)	
Carbon Cycle Gases	Airborne, Light Aircraft (Bi-weekly)	Airborne, Light Aircraft (Bi-weekly)
(Flask Samples)	Beaver Crossing, Nebraska	East Trout Lake, Saskatchewan, Canada
Species Measured	Bondville, Illinois (on funding hold)	Estevan Point, British Columbia, Canada
In Carbon Cycle Flasks:	Bradgate, Iowa (on funding hold)	Raratonga, Cook Islands
CO <sub>2</sub> , CH <sub>4</sub> , CO, H <sub>2</sub> , SF <sub>6</sub>	Briggsdale, Colorado	
<sup>13</sup> C in CO <sub>2</sub> , 18O in CO <sub>2</sub> ,	Cape May, New Jersey	
N <sub>2</sub> O, <sup>13</sup> C in CH <sub>4</sub> , CH <sub>3</sub> D	Charleston, South Carolina	
·	Dahlen, North Dakota	
	Fairchild, Wisconsin (on funding hold)	
	Harvard Forest, Massachusetts (closed)	
	Homer, Illinois	
	Isles of Shoals, New Hampshire	
	Kodiak USCG, Alaska Oahu, Hawaii (on funding hold)	
	Oglesby, Illinois (on funding hold)	
	Park Falls. Wisconsin	
	Poker Flat. Alaska	
	Ponca City, Oklahoma	
	Rowley, Iowa (closed)	
	Sinton, Texas	
	Trinidad Head, California	
	West Branch, Iowa	
	West Lafayette, Indiana (INFLUX campaign)	

Measurement	United States and Territories	International
arbon Cycle Gases	Ship Sampling, Carbon Cycle Flasks	Ship Sampling, Carbon Cycle Flasks
lask Samples)	<u> </u>	Antarctic Ocean, Chinese Ship (annual)
pecies Measured		Drake Passage Transect (every 6 weeks)
n Carbon Cycle Flasks:		Eastern Pacific Transect (monthly)
CO <sub>2</sub> , CH <sub>4</sub> , CO, H <sub>2</sub> , SF <sub>6,</sub>		North Atlantic, Norway (Ship M), weekly
C in CO <sub>2</sub> , 18O in CO <sub>2</sub> ,		Western Pacific Transect (monthly)
<sub>2</sub> O, <sup>13</sup> C in CH <sub>4</sub> CH <sub>3</sub> D		Trotom admo mandos (monumy)
arbon Cycle Gases	Surface, Weekly Flasks	Surface, Weekly Flasks
pecies Measured	Argyle, Maine	Alert. Canada
Carbon Cycle Flasks:	Barrow, Alaska	Amsterdam Island, France (closed)
O <sub>2</sub> , CH <sub>4</sub> , CO, H <sub>2</sub> , SF <sub>6</sub> .	Beech Island, South Carolina	Arembepe, Brazil
C in CO <sub>2</sub> , 18O in CO <sub>2</sub> ,	Cape Kumukahi, Hawaii	Ascension Island, United Kingdon
	·	
<sub>2</sub> O, <sup>13</sup> C in CH <sub>4,</sub> CH <sub>3</sub> D plus	Cold Bay, Alaska	Assekrem, Algeria
olatile Organic Compounds:	Erie, Colorado	Baltic Sea, Poland
hane, n-hexane,	Key Biscayne, Florida	Baring Head, New Zealand
opane, propene	Lamont, Oklahoma	Bird Island, United Kingdom (closed)
ethyl-chloride, ethene,	Mauna Loa, Hawaii	Black Sea, Romania
pentane, n-pentane	Martha's Vinyard, Massachusetts	Bukit Kototabang, Indonesia
outane, n-butane	Midway Island, Pacific	Cape Grim, Australia
a subset of flasks.	Moody, Texas (daily flasks)	Cape Meares, Oregon (closed)
	Mt. Wilson Observatory, California	Cape Point, South Africa
	Niwot Ridge, Colorado (daily flasks)	Christmas Island, Kiribati
	Park Falls, Wisconsin (daily and weekly)	Cofre de Perote, Mexico
	Point Arena, California	Conejo, Mexico
	Shemya Island, Alaska	Crozet Island, Indian Ocean
	Sutro, California	Dongsha Island, Taiwan
	Trinidad Head, California	Dwejra Point, Gozo (closed)
	Tutuila, American Samoa	Easter Island, Chile
	Walnut Grove, California	Gobabeb, Namibia
	Wendover, Utah	Grifton, North Carolina (closed)
	West Branch, Iowa	Guam, Marianas Islands
		Halley Station, Antarctica
		Hegyhatsal, Hungary
		Heimaey, Iceland
		Hohenpeissenberg, Germany
		Kaashidhoo, Maldives (closed)
		Lac La Biche, Canada
		Lampedusa, Italy
		Lulin, Taiwan
		Mace Head, Ireland
		Mahe Island, Seychelles
		Maxaranguape, Brazil
		McMurdo Station, Antarctica (closed)
		Mould Bay, Canada (closed)
		Mount Kenya, Kenya
		Mt. Waliguan, China
		Ny-Alesund, Svalbard
		Obninsk, Russia
		Ocean Station C, United States (closed)
		Ocean Station M, Norway (closed)
		Ochsenkopf, Germany
		Olympic Pennisula, Washington (closed)
		Palmer Station, Antarctica
		Plateau Assy, Kazakhstan (closed)
		Ragged Point, Barbados
		Sammaltunturi, Finland
		Sary Takum, Kazakhstan (closed)
		Sede Boker, Israel
		Shangdianzi, China
		South China Sea, China (closed)
		South Pole, Antarctica
		St. Croix, Virgin Islands (closed)
		St. David's Head, Bermuda (closed)
		Summit, Greenland
		Syowa, Antarctica (Japan)
		Tae-ahn Peninsula, South Korea
		Tenerife, Canary Islands
		Terceira, Azores
		Tierra Del Fuego, Argentina
		Tudor Hill, Bermuda
		Ulaan Uul, Mongolia
		Valladolid, Spain

GMD Sampling Sites and Measurement Programs		
Measurement	United States and Territories	International
Halocarbon Network	Surface, Weekly High Pressure Flasks	Surface, Weekly High Pressure Flasks
Species Measured	Barrow, Alaska	Alert, Canada (weekly)
In Halocarbon Flasks	Cape Kumukahi, Hawaii	Cape Grim, Australia (weekly)
CFC-11 & -12, HCFC-142b	Erie, Colorado	Palmer, Antarctica (bi-weekly)
CH <sub>2</sub> Br <sub>2</sub> , N <sub>2</sub> O, CS <sub>2</sub> , CHBr <sub>3</sub>	Harvard Forest, Massachusetts	South Pole, Antarctica (bi-weekly)
CFC-113, HCFC-22, C <sub>6</sub> H <sub>6</sub>	Marthas Vineyard, Massachusetts	Summit, Greenland (bi-weekly)
HCFC-141b, CS <sub>2</sub>	Mauna Loa, Hawaii	Trans-Siberian Railway, Russia (periodic)
HFC-134a, HFC-152a,	Moody, Texas (tall tower in CCGG flasks)	Ushuaia, Argentina (weekly)
CH <sub>3</sub> Br, CH <sub>3</sub> Cl, CH <sub>3</sub> I, SF <sub>6</sub> ,	Niwot Ridge, Colorado (in CCGG flasks)	
CH <sub>3</sub> CCl <sub>3</sub> , CCl <sub>4</sub> , CH <sub>2</sub> Cl <sub>2</sub> ,	Niwot Ridge, Colorado (steel flasks)	
CHCl <sub>3</sub> , C <sub>2</sub> Cl <sub>4</sub> , C <sub>2</sub> HCl,	Park Falls, Wisconsin (in CCGG flasks)	
Halon 1211,-1301,-2402.	Park Falls, Wisconsin (steel flasks)	
	Trinidad Head, California	
	Tutuila, American Samoa	
	Sutro, California	
	Walnut Grove, California	
Halasanhan Onsailea	West Branch, Iowa	Ourfees Outliness Message
Halocarbon Species	Surface, Continuous Measurements	Surface, Continuous Measurements
N <sub>2</sub> O, SF <sub>6</sub> , CFC-11, CFC-12	Barrow, Alaska	South Pole, Antarctica
CFC-113, halon-1211, CHCl <sub>3</sub> ,	Mauna Loa, Hawaii	Summit, Greenland
CH <sub>3</sub> CCl <sub>3</sub> , CCl <sub>4</sub> ,	Niwot Ridge, Colorado	
(all but Summit: HCFC-22,	Tutuila, American Samoa	
HCFC-142b, COS, CH <sub>3</sub> CI		
(Summit: CO, H <sub>2,</sub> CH <sub>4</sub> )		
Halocarbon Species	Surface, Tower Flasks	Surface, Tower Flasks
Measured In Carbon	Argyle, Maine Beech Island, South Carolina	East Trout Lake, Saskatchewan, Canada
Cycle Flasks CFC-11 & -12, HCFC-142b,	Erie, Colorado	
CFC-113, HCFC-22,	Marthas Vineyard, Massachusetts	
HCFC-141b,	Moody, Texas (tall tower in CCGG flasks)	
HFC-134a, HFC-152a,	Mt. Wilson Observatory, California	
CH <sub>3</sub> Br, CH <sub>3</sub> Cl, CH <sub>3</sub> I,	Park Falls, Wisconsin	
CH <sub>3</sub> CCl <sub>3</sub> , CCl <sub>4</sub> , CH <sub>2</sub> Cl <sub>2</sub> ,	Sutro, California	
CHCl <sub>3</sub> , C <sub>2</sub> Cl <sub>4</sub> ,	West Branch, Iowa	
halon 1211,-1301,-2402,	Walnut Grove, California	
CH <sub>2</sub> Br <sub>2</sub> , C <sub>6</sub> H <sub>6</sub> , COS,	West Lafayette, Indiana (INFLUX campaign)	
CHBr <sub>3</sub> , CS <sub>2</sub> .		
Halocarbon Species	Airborne, Light Aircraft, Bi-weekly	Airborne, Light Aircraft, Bi-weekly
Measured In Carbon	Beaver Crossing, Nebraska	East Trout Lake, Saskatchewan, Canada
Cycle Flasks	Bondville, Illinois (on funding hold)	Estevan Point, British Columbia, Canada
CFC-11 & -12, HCFC-142b,	Bradgate, lowa (on funding hold)	Raratonga, Cook Islands
CFC-113, HCFC-22,	Briggsdale, Colorado	
HCFC-141b,	Cape May, New Jersey	
HFC-134a, HFC-152a,	Charleston, South Carolina	
CH <sub>3</sub> Br, CH <sub>3</sub> CI, CH <sub>3</sub> I,	Dahlen, North Dakota	
CH <sub>3</sub> CCl <sub>3</sub> , CCl <sub>4</sub> , CH <sub>2</sub> Cl <sub>2</sub> ,	Fairchild, Wisconsin (on funding hold)	
CHCl <sub>3</sub> , C <sub>2</sub> Cl <sub>4</sub> ,	Harvard Forest, Massachusetts (funds hold)	
halon 1211,-1301,-2402,	Homer, Illinois	
CH <sub>2</sub> Br <sub>2</sub> , C <sub>6</sub> H <sub>6</sub> , COS,	Kodiak USCG, Alaska	
CHBr <sub>3</sub> , CS <sub>2</sub> .	Molokai, Hawaii (on funding hold)	
-	Park Falls, Wisconsin	
	Poker Flat, Alaska	
	Rowley, Iowa (on funding hold)	
	Sinton, Texas	
	Southern Great Plains, Oklahoma	
	Trinidad Head, California Worchester, Massachusetts	
Halocarbon Missions	Airborne, Large Balloons and Aircraft	Airborne, Large Balloons and Aircraft
Balloon Measurements:	Barbers Point, Hawaii (aircraft, periodic)	Christchurch, NZ (aircraft, periodic)
CH <sub>4</sub> , H <sub>2</sub> , CO, N <sub>2</sub> 0, SF <sub>6</sub> ,	Edwards, California (aircraft, periodic)	COBRA (aircraft, Canada and U.S.)
CH <sub>3</sub> CCl <sub>3</sub> , CCl <sub>4</sub> , halon-1211,	Fairbanks, AK (aircraft/balloons, periodic)	HIPPO (NSF aircraft, Global)
		Kiruna, Sweden (balloon, periodic)
CHCl <sub>3</sub> , CFC-11,-12,-113.	IFt. Sumner, New Mexico (balloon, periodic)	
CHCl <sub>3</sub> , CFC-11,-12,-113.  Aircraft: Above list plus	Ft. Sumner, New Mexico (balloon, periodic) Houston, Texas (aircraft, periodic)	
Aircraft: Above list plus	Houston, Texas (aircraft, periodic)	San Jose, Costa Rica (aircraft)
-	, , , , , , , , , , , , , , , , , , , ,	

Measurement	United States and Territories	International
Halocarbon Species	Unmanned Aircraft Systems (UAS)	Unmanned Aircraft Systems (UAS)
CH <sub>4</sub> , H <sub>2</sub> CO, N <sub>2</sub> 0, SF <sub>6</sub> ,	Alaska Mission	GloPac (aircraft, Arctic & Pacific)
CHCl <sub>3</sub> , CFC-11,-12,, RH	California Mission	ATTREX (aircraft, Pacific and Indian Oceans)
ialon-1211, O <sub>3</sub> , H <sub>2</sub> O, T	Gray Butte, California (Altair, test phase)	ATTICEX (alicials, Facilic and indian oceans)
Iaion-1211, O <sub>3</sub> , 11 <sub>2</sub> O, 1	Western U.S.( Altair, wildfires, periodic)	
Ozone	Surface, In Situ, Continuous	Surface, In Situ, Continuous
J2011e	Barrow, Alaska	Arrival Heights, Antarctica
	BAO, Erie, Colorado	Lauder, New Zealand
	Mauna Loa, Hawaii	Ragged Point, Barbados
	Moody, Texas (WKT Tower)	South Pole, Antarctica
	Niwot Ridge, Colorado	Summit, Greenland
	Trinidad Head, California	Tudor Hill, Bermuda
	Tutuila, American Samoa	Westman Island, Iceland
Ozone	Total Column Ozone	Total Column Ozone  Lauder, New Zealand** (Dobson)
	Barrow, Alaska (Dobson) Bismarck, North Dakota (Dobson)	Maracompoche, Peru (Dobson)
	Bondville, Illionos (Brewer) ***	OHP, France** (Dobson)
		· · · · · · · · · · · · · · · · · · ·
	Boulder, Colorado (Dobson)** Caribou, Maine (Dobson)	Perth, Australia** (Dobson) South Pole, Antarctica (Dobson)
	Fairbanks, Alaska (Dobson)**	Sodili Fole, Altarellea (Dobson)
	Fort Peck, Montana (Brewer)***	
	Hanford, California (Dobson)	** Also conduct Umkehr profiles that give
	Houston, Texas (Brewer)	ozone concentrations in 8 successive
	Mauna Loa, Hawaii (Dobson)**	layers within the sounding twice per day.
	Nashville, Tennessee (Dobson)	
	Niwot Ridge (Brewer)***	***Also conduct Umkehr profile measurements
	Raleigh, North Carolina (Brewer)***	that yield ozone concentrations in 10
	Table Mountain, Colorado (Brewer)***	successive layers at sunrise and sunset
	Tallahassee, Florida (Dobson) Tutuila, American Samoa (Dobson)	
	Wallops Island, Virginia (Dobson)	
Ozone Profiles	Balloonborne Ozonesondes, Weekly	Balloonborne Ozonesondes, Weekly
	Boulder, Colorado	Galapagos Islands, Ecuador
	Hunstville, Alabama	Ragged Point, Barbados
	Mauna Loa, Hawaii	San Jose, Costa Rica
	Narragansett, Rhode Island	South Pole, Antarctica
	Trinidad Head, California	Summit, Greenland
D D (1	Tutuila, American Samoa	Suva, Fiji
Ozone Profiles	Light Aircraft, Weekly Profiles	Light Aircraft, Weekly Profiles
	Beaver Crossing, Nebraska Worcester, Massachusetts	
	Briggsdale, Colorado	
	Cape May, New Jersey	
	Homer, Illinois	
	Lamont, Oklahoma	
	Rowley, Iowa	
	Summerville, South Carolina	
	Trinidad Head, California	
Vater Vapor Profiles	Balloonborne Water Vapor Profiles	Balloonborne Water Vapor Profiles
	Beltsville, Maryland (Campaign)	Bandung, Indonesia (Campaign)
	Boulder, Colorado	Biak, Indonesia (Campaign) Galapagos Island, Ecuador (Campaign)
	Hilo, Hawaii Lamont, Oklahoma (Campaign)	Hanoi, Vietnam (Campaign)
	Midland, Texas (Campaign)	Kototabang, Indonesia (Campaign)
	Table Mountain, California (Campaign)	La Reunion Island, Indian Ocean (Campaign)
	rable Mountain, Gamornia (Gampaign)	Lauder, New Zealand
		Lindberg, Germany (Campaign)
		Summit, Greenland (Campaign)
		Tarawa, Kiribati (Campaign)
		Watukosek, Indonesia (Campaign)
urface Radiation Budget	SURFRAD Continuous Measurements	SURFRAD Continuous Measurements
lownwelling short wave	Bondville, Illinois	
nd long wave radiation,	Desert Rock, Nevada	
lbedo, aerosol optical	Fort Peck, Montana	
lepth, direct beam and liffuse radiation. UV and UVB	Goodwin Creek, Mississippi Penn State, Pennsylvania	
illiuse raulation. UV allu UVB		
adiation photosynthetically		
	Sioux Falls, South Dakota Table Mountain, Colorado	
adiation, photosynthetically active radiation, and T, RH, WS, WD, P.	Table Mountain, Colorado	

GMD Sampling Sites	and Measurement Programs	
Measurement	United States and Territories	International
	BSRN Continuous Measurements	
Surface Radiation Budget  Downwelling short wave	Alert, Canada	BSRN Continuous Measurements  Kwajalein, Marshall Islands*
and long wave radiation,	Barrow, Alaska	Prospect Hill, Bermuda*
albedo, aerosol optical	Boulder, Colorado	South Pole, Antarctica*
depth, direct beam and	Erie, Colorado	* GMD Operated
diffuse radiation	Mauna Loa, Hawaii	Alert, Canada
and UV radiation, and	Trinidad Head, California	Alice Springs, Australia
T, RH, WS, WD, P.	Tutuila, American Samoa	Cabauw, Netherlands
1,141, 110, 110, 11	Tatalia, 7 merican Garrioa	Cambourne, United Kingdom
		Carpentras, France
		Cocos Island, Australia
		DeAar, South Africa (Closed)
		Dome Concordia, Antarctica (with ISAC, Italy)
		Eureka, Canada
		Florianoplis, Brazil
		Fukuoka, Japan
		Ilorin, Nigeria
		Ishigakijima, Japan
		Izana, Spain
		Lerwick, United Kingdom
		Lindenberg, Germany
		Mt. Waliquan, China (GAW)
		Neumayer, Antarctica
		Ny Alesund, Svalbard
		Palaiseauu, France
		Payerne, Switzerland Regina, Canada
		9 7
		Sede Boker, Israel
		Sumatrak, Indonesia (GAW)
		Summit, Greenland
		Syowa, Antarctica
		Tamanrasset, Algeria
		Tateno, Japan
		Tiksi, Russia
		Toravere, Estonia
Surface UV Radiation	UN/ Oti	Xianghe, China
Surface OV Radiation	UV Continuous  Bondville, Illinois	UV Continuous  McMurdo, Antarctica
	· ·	
	Boulder, Colorado	South Pole, Antarctica
	Fort Peck, Montana	Palmer, Antarctica
	Houston, Texas	
	Mauna Loa, Hawaii	
	Niwot Ridge, Colorado	
	Raleigh, North Carolina	
Dadieties K	Table Mountain, Colorado	N-1-1 At
Radiation Ke	ey: (BSRN = Baseline Surface Radiation Network; GAW = G SURFRAD = US National Surface Radiation Network)	olobal Atmosphere watch;
Meteorology	Surface, Continuous Measurements	Surface, Continuous Measurements
Wind	Barrow, Alaska (10 m)	Alert, Canada (SEARH Project)
Propeller	Boulder, Colorado (10 m)	South Pole, Antarctica (2, 10, and 30 m)
Anemometer	Mauna Loa, Hawaii (10 and 38 m)	Summit, Greenland (12 m)
	Trinidad Head, California (10 m)	
	Tutuila. American Samoa (19 m)	
Meteorology	Surface, Continuous Measurements	Surface, Continuous Measurements
Barometric Pressure	Barrow, Alaska	Alert, Canada (SEARH Project)
Pressure transducer	Boulder, Colorado	South Pole, Antarctica
	Mauna Loa, Hawaii	Summit, Greenland
	Trinidad Head, California	
	Tutuila. American Samoa	
Meteorology	Surface, Continuous Measurements	Surface, Continuous Measurements
Ambeint Temperature	Barrow, Alaska (3 and 16 m)	Alert, Canada (SEARH Project)
Aspirated platinum	Boulder, Colorado (2 and 10 m)	South Pole, Antarctica (2, 10, and 30 m)
resistance probes	Mauna Loa, Hawaii (2, 9, and 37 m)	Summit, Greenland (2 and 8 m)
1	Trinidad Head, California (2 and10 m)	
	Tutuila. American Samoa (2 and 19 m)	
Meteorology	Surface, Continuous Measurements	Surface, Continuous Measurements
Dewpoint	Barrow, Alaska (3 m)	Alert, Canada (SEARH Project)
Temperature	Boulder, Colorado (2 m)	South Pole, Antarctica (2 m)
Hygrothermometers and	Mauna Loa, Hawaii (2 m)	Summit, Greenland (2 m)
relative humidty probes	Trinidad Head, California (2 m)	,
Process	Tutuila. American Samoa (2 m)	
Meteorology	Surface, Continuous Measurements	Surface, Continuous Measurements
Precipitation	Boulder, Colorado	
Tipping bucket	Mauna Loa, Hawaii	
	Tutuila. American Samoa	
	a. / monoan camed	

Accord Chemisty Measurement Program Measurement Me			
Source   Sou	Cooperative Programs	co-located at Baseline Observatorie	S
Source   Sou	,		
Source   Sou	Measurement Program	Home Institution	American Samoa
Scripps Institution of Oceanography FCF-L1, CFC-L1, CQL, CLI, CQL CFC-L1, CQL, CQL CFC-L1, CQL, CQL CFC-L1, CQL, CQL CFC-L1, CQL, CQL CFC-L1, CQL CFC-L1, CQL, CQL CFC-L1, C	<u> </u>		
TECH 1, CFC-12, CH2, CH2, CH3, ASA/AGAGE CH1, NQ, CHCI3, CH2, CH3, ASA/AGAGE CH1, NQ, CHCI3, CH2, CH3, ASA/AGAGE CH2, NQ, CHCI3, CH3, ASA/AGAGE CH3, NQ, CH3, CH3, CH3, ASA/AGAGAGE CH3, CH3, CH3, CH3, CH3, CH3, CH3, CH3,			
CPC-113, CQL, CH, CQL, CML, NQC, CH, CQL, CML, NQC, CH, CML, NQC, NQC, NQC, NQC, NQC, NQC, NQC, NQC			http://agage.eas.gatech.edu/
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University of California, Irvine Ophy Princeton University of Usine Measurement Program USOA Snow Survey University of Warn Measurement Program USOA Snow Survey University of Usine USOA Snow Survey University of Usine USOA Snow Survey University of California, Irvine USOA Snow Survey University of Valor University UNIVERS Satellite quink UNIVERS Satellite UNIV			
Princeton University of Mania Measurement Program Horizon Bushittution H			
Measurement Program   Home Institution   Sarrow, Alaska	O <sub>2</sub> /N <sub>2</sub>		
USDA/ Snow Survey	Aerosol Chemisty	University of Miami	
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Mineral Dust & Radionuclides  Black Carbon University of Hawaii, Manoa Halides, Black Carbon, Surface O <sub>3</sub> , and SO <sub>2</sub> EPA/NERL EPA/NERL CO Isotopes Volcano Activity Hawaii Volcano Observatory Wideo Surveillance UV NOAA and NIWA Stratospheric O <sub>3</sub> & Temp Profiles Aerosol Profile NOAA and NIWA NOAA and NIWA BrO Column O <sub>3</sub> New Mexico State University Hawaii, Manoa Http://www.epa.gov/nerl/ http:	AERONET Photometers  Measurement Program  CO <sub>2</sub> , <sup>13</sup> C, N <sub>2</sub> O  O <sub>2</sub> /N <sub>2</sub> UV  13°C/12°C and <sup>18</sup> O/16°O in CO <sub>2</sub> Radon  Climate Reference Network (CRN)  Persistent Organic Pollutants  Sulfate, Nitrate Aerosols  Hg <sup>0</sup> , Hg <sup>12</sup> , Hg <sup>0</sup> Particulate 2.5-10um  GPS Derived Water Vapor  Seismometer,  GPS Testbed  AERONET Photometers  Corrosion Project  Organic & Elemental Carbon	NASA/Goddard Space Flight Center  Home Institution  Scripps Institution of Oceanography Scripps Institution of Oceanography Colorado State University CSIRO ANSTO NOAA/NESDIS Environment Canada University of Hawaii EPA EPA UNAVCO USGS FAA/Stanford University NASA/Goddard Space Flight Center University of Hawaii, Manoa University of Hawaii, Manoa	http://mplnet.gsfc.nasa.gov/  Mauna Loa, Hawaii  http://www.csiro.au/ http://www.ansto.gov.au/  http://www.msc-smc.ec.gc.ca/gaps/  http://www.suominet.ucar.edu/support/
Black Carbon  University of Hawaii, Manoa  Aerosol Chemistry Halides, Black Carbon,  EPA/NERL  EPA/NERL  CO Isotopes  Volcano Activity  Video Surveillance  UV  Stratospheric O <sub>3</sub> & Temp Profiles  Aerosol Profile  NO2  NOAA and NIWA  BrO  NOAA and NIWA  MSC Canada  University of Hawaii, Manoa  http://www.epa.gov/nerl/  http://www	AERONET Photometers  Measurement Program  CO <sub>2</sub> , <sup>13</sup> C, N <sub>2</sub> O  O <sub>2</sub> /N <sub>2</sub> UV  13°C/12°C and <sup>18</sup> O/16°O in CO <sub>2</sub> Radon Climate Reference Network (CRN) Persistent Organic Pollutants Sulfate, Nitrate Aerosols Hg <sup>0</sup> , Hg <sup>2</sup> , Hg <sup>0</sup> Particulate 2.5-10um GPS Derived Water Vapor Seismometer, GPS Testbed AERONET Photometers Corrosion Project Organic & Elemental Carbon Variable Young Star Survey	NASA/Goddard Space Flight Center  Home Institution  Scripps Institution of Oceanography Scripps Institution of Oceanography Colorado State University CSIRO ANSTO NOANNESDIS Environment Canada University of Hawaii EPA EPA UNAVCO USGS FAA/Stanford University NASA/Goddard Space Flight Center University of Hawaii, Manoa University of Hawaii, Manoa University of Hawaii, Manoa University of Hawaii, Manoa	http://mplnet.gsfc.nasa.gov/  Mauna Loa, Hawaii  http://www.csiro.au/ http://www.ansto.gov.au/  http://www.msc-smc.ec.gc.ca/gaps/  http://www.suominet.ucar.edu/support/
Aerosol Chemistry Aerosol Chemistry Alaildes, Black Carbon, EPA/NERL CD Isotopes State University New York Volcano Activity Hawaii Volcano Observatory MOAA and NIWA Stratospheric O <sub>3</sub> & Temp Profiles Aerosol Profile NO2 NOAA and NIWA Bro Column O <sub>3</sub> MSC Canada  http://www.epa.gov/nerl/ http://ww	AERONET Photometers  Measurement Program  CO2, <sup>13</sup> C, N <sub>2</sub> O  O <sub>2</sub> /N <sub>2</sub> UV <sup>13</sup> C/ <sup>12</sup> C and <sup>18</sup> O/ <sup>16</sup> O in CO <sub>2</sub> Radon  Climate Reference Network (CRN)  Persistent Organic Pollutants  Sulfate, Nitrate Aerosols  Hg <sup>0</sup> , Hg <sup>2</sup> , Hg <sup>9</sup> Particulate 2.5-10um  GPS Derived Water Vapor  Seismometer,  GPS Testbed  AERONET Photometers  Corrosion Project  Organic & Elemental Carbon  Variable Young Star Survey  Filter Radiometer/PMOD	NASA/Goddard Space Flight Center  Home Institution  Scripps Institution of Oceanography Scripps Institution of Oceanography Colorado State University CSIRO ANSTO NOANNESDIS Environment Canada University of Hawaii EPA EPA UNAVCO USGS FAA/Stanford University NASA/Goddard Space Flight Center University of Hawaii, Manoa University of Hawaii, Manoa University of Hawaii, Institute for Astronomy World Radiation Center	http://mplnet.gsfc.nasa.gov/  Mauna Loa, Hawaii  http://www.csiro.au/ http://www.ansto.gov.au/  http://www.msc-smc.ec.gc.ca/gaps/  http://www.suominet.ucar.edu/support/
Halides, Black Carbon, Surface O <sub>3</sub> , and SO <sub>2</sub> EPA/NERL Surface O <sub>3</sub> , and SO <sub>2</sub> EPA/NERL CO Isotopes State University New York Volcano Activity Hawaii Volcano Observatory Volcano Surveillance UV NOAA and NIWA Stratospheric O <sub>3</sub> & Temp Profiles Aerosol Profile JPL NOA and NIWA NO <sub>2</sub> NOAA and NIWA BRO NOAA and NIWA MSC Canada  http://www.epa.gov/nerl/ http://hvo.wr.usgs.gov/maunaloa/ http://hvo.wr.usgs.gov/maunaloa/ http://www.niwa.co.nz/ http://www.niwa.co.nz/	AERONET Photometers  Measurement Program  CO2, <sup>13</sup> C, N <sub>2</sub> O  O <sub>2</sub> /N <sub>2</sub> UV <sup>13</sup> C/ <sup>12</sup> C and <sup>18</sup> O/ <sup>16</sup> O in CO <sub>2</sub> Radon  Climate Reference Network (CRN)  Persistent Organic Pollutants  Sulfate, Nitrate Aerosols  Hg <sup>0</sup> , Hg <sup>-2</sup> , Hg <sup>0</sup> Particulate 2.5-10um  GPS Derived Water Vapor  Seismometer,  GPS Testbed  AERONET Photometers  Corrosion Project  Organic & Elemental Carbon  Variable Young Star Survey  Filter Radiometer/PMCD  Mineral Dust & Radionuclides	NASA/Goddard Space Flight Center  Home Institution  Scripps Institution of Oceanography Scripps Institution of Oceanography Colorado State University CSIRO ANSTO NOAA/NESDIS Environment Canada University of Hawaii EPA EPA UNAVCO USGS FAA/Stanford University NASA/Goddard Space Flight Center University of Hawaii, Manoa University of Hawaii, Manoa University of Hawaii, Manoa University of Hawaii, Institute for Astronomy World Radi Hawaii-Institute for Astronomy	http://mplnet.gsfc.nasa.gov/  Mauna Loa, Hawaii  http://www.csiro.au/ http://www.ansto.gov.au/  http://www.msc-smc.ec.gc.ca/gaps/  http://www.suominet.ucar.edu/support/
Surface O <sub>3</sub> , and SO <sub>2</sub> CO Isotopes  State University New York  Volcano Activity  Video Surveillance  JV  NOAA and NIWA  Stratospheric O <sub>3</sub> & Temp Profiles  Aerosol Profile  NOAA and NIWA  NO2  NOAA and NIWA  BrO  NOAA and NIWA  MSC Canada  http://www.epa.gov/nerl/  http://hvo.wr.usgs.gov/maunaloa/  http://hvo.wr.usgs.gov/maunaloa/  http://www.niwa.co.nz/  http://www.niwa.co.nz/  http://www.niwa.co.nz/	AERONET Photometers  Measurement Program  CO <sub>2</sub> , <sup>13</sup> C, N <sub>2</sub> O O <sub>2</sub> /N <sub>2</sub> UV  13°C/12°C and <sup>18</sup> O/16°O in CO <sub>2</sub> Radon Climate Reference Network (CRN) Persistent Organic Pollutants Sulfate, Nitrate Aerosols Hg <sup>9</sup> , Hg <sup>12</sup> , Hg <sup>9</sup> Particulate 2.5-10um GPS Derived Water Vapor Seismometer, GPS Testbed AERONET Photometers Corrosion Project Organic & Elemental Carbon Variable Young Star Survey Filter Radiometer/PMOD Mineral Dust & Radionuclides Black Carbon	NASA/Goddard Space Flight Center  Home Institution Scripps Institution of Oceanography Scripps Institution of Oceanography Colorado State University CSIRO ANSTO NOAA/NESDIS Environment Canada University of Hawaii EPA EPA UNAVCO USGS FAA/Stanford University NASA/Goddard Space Flight Center University of Hawaii, Manoa University of Hawaii, Manoa University of Hawaii-Institute for Astronomy World Radiation Center New Mexico State University University of Hawaii, Manoa	http://mplnet.gsfc.nasa.gov/  Mauna Loa, Hawaii  http://www.csiro.au/ http://www.ansto.gov.au/  http://www.msc-smc.ec.gc.ca/gaps/  http://www.suominet.ucar.edu/support/
CO Isotopes  State University New York  Volcano Activity  Hawaii Volcano Observatory  Video Surveillance  DV  NOAA and NIWA  Stratospheric O <sub>3</sub> & Temp Profiles  Aerosol Profile  NO2  NOAA and NIWA  BrO  NOAA and NIWA  http://www.niwa.co.nz/  http://www.niwa.co.nz/  MSC Canada	AERONET Photometers  Measurement Program  CO <sub>2</sub> , <sup>13</sup> C, N <sub>2</sub> O  O <sub>2</sub> /N <sub>2</sub> UV  13°C/12°C and <sup>18</sup> O/16°O in CO <sub>2</sub> Radon Climate Reference Network (CRN) Persistent Organic Pollutants Sulfate, Nitrate Aerosols Hg <sup>0</sup> , Hg <sup>12</sup> , Hg <sup>0</sup> Particulate 2.5-10um GPS Derived Water Vapor Seismometer, GPS Testbed AERONET Photometers Corrosion Project Organic & Elemental Carbon Variable Young Star Survey Filter Radiometer/PMOD Mineral Dust & Radionuclides Black Carbon Aerosol Chemistry	NASA/Goddard Space Flight Center  Home Institution  Scripps Institution of Oceanography Scripps Institution of Oceanography Colorado State University CSIRO ANSTO NOANNESDIS Environment Canada University of Hawaii EPA EPA UNAVCO USGS FAA/Stanford University NASA/Goddard Space Flight Center University of Hawaii, Manoa University of Hawaii, Manoa University of Hawaii, Institute for Astronomy World Radiation Center New Mexico State University University of Hawaii, Manoa	http://mplnet.gsfc.nasa.gov/  Mauna Loa, Hawaii  http://www.csiro.au/ http://www.ansto.gov.au/ http://www.msc-smc.ec.gc.ca/gaps/  http://www.suominet.ucar.edu/support/ http://aeronet.gsfc.nasa.gov/
Volcano Activity  Hawaii Volcano Observatory  PMRF  NOAA and NIWA  Stratospheric O <sub>3</sub> & Temp Profiles  Aerosol Profile  VO <sub>2</sub> NOAA and NIWA  BrO  NOAA and NIWA  NOAA and NIWA  http://www.niwa.co.nz/  http://www.niwa.co.nz/  MSC Canada	AERONET Photometers  Measurement Program  CO2, <sup>13</sup> C, N <sub>2</sub> O  O <sub>2</sub> /N <sub>2</sub> UV <sup>13</sup> C/ <sup>12</sup> C and <sup>18</sup> O/ <sup>16</sup> O in CO <sub>2</sub> Radon  Climate Reference Network (CRN)  Persistent Organic Pollutants  Sulfate, Nitrate Aerosols  Hg <sup>0</sup> , Hg <sup>2</sup> , Hg <sup>0</sup> Particulate 2.5-10um  GPS Derived Water Vapor  Seismometer,  GPS Testbed  AERONET Photometers  Corrosion Project  Organic & Elemental Carbon  Variable Young Star Survey  Filter Radiometer/PMOD  Mineral Dust & Radionuclides  Black Carbon  Aerosol Chemistry  Halides, Black Carbon,	NASA/Goddard Space Flight Center Home Institution Scripps Institution of Oceanography Scripps Institution of Oceanography Colorado State University CSIRO ANSTO NOANNESDIS Environment Canada University of Hawaii EPA EPA UNAVCO USGS FAA/Stanford University NASA/Goddard Space Flight Center University of Hawaii, Manoa University of Hawaii, Manoa University of Hawaii, Institute for Astronomy World Radiation Center New Mexico State University University of California, Davis EPA/NERL	http://mplnet.gsfc.nasa.gov/  Mauna Loa, Hawaii  http://www.csiro.au/ http://www.ansto.gov.au/ http://www.msc-smc.ec.gc.ca/gaps/  http://www.suominet.ucar.edu/support/ http://aeronet.gsfc.nasa.gov/
Video Surveillance         PMRF           UV         NOAA and NIWA           Stratospheric O <sub>3</sub> & Temp Profiles         JPL           Aerosol Profile         JPL           NO <sub>2</sub> NOAA and NIWA           BrO         NOAA and NIWA           Column O <sub>3</sub> MSC Canada	AERONET Photometers  Measurement Program  CO2, <sup>13</sup> C, N <sub>2</sub> O  O <sub>2</sub> /N <sub>2</sub> UV  13°C/12°C and <sup>18</sup> O/16°O in CO <sub>2</sub> Radon  Climate Reference Network (CRN)  Persistent Organic Pollutants  Sulfate, Nitrate Aerosols  Hg <sup>0</sup> , Hg <sup>12</sup> , Hg <sup>0</sup> Particulate 2.5-10um  GPS Derived Water Vapor  Seismometer,  GPS Testbed  AERONET Photometers  Corrosion Project  Organic & Elemental Carbon  Variable Young Star Survey  Filter Radiometer/PMCD  Mineral Dust & Radionuclides  Black Carbon  Aerosol Chemistry  Halides, Black Carbon,  Surface O <sub>3</sub> , and SO <sub>2</sub>	NASA/Goddard Space Flight Center  Home Institution  Scripps Institution of Oceanography Scripps Institution of Oceanography Colorado State University CSIRO ANSTO NOAA/NESDIS Environment Canada University of Hawaii EPA EPA UNAVCO USGS FAA/Stanford University NASA/Goddard Space Flight Center University of Hawaii, Manoa University of Hawaii, Manoa University of Hawaii, Manoa University of Hawaii, Institute for Astronomy World Radiation Center New Mexico State University University of California, Davis EPA/NERL EPA/NERL	http://mplnet.gsfc.nasa.gov/  Mauna Loa, Hawaii  http://www.csiro.au/ http://www.ansto.gov.au/ http://www.msc-smc.ec.gc.ca/gaps/  http://www.suominet.ucar.edu/support/ http://aeronet.gsfc.nasa.gov/
NOAA and NIWA Stratospheric O <sub>3</sub> & Temp Profiles JPL Aerosol Profile NO <sub>2</sub> NOAA and NIWA BrO NOAA and NIWA NOAA and NIWA NOAA and NIWA MSC Canada  NOAA and NIWA MSC Canada	AERONET Photometers  Measurement Program  CO <sub>2</sub> , <sup>13</sup> C, N <sub>2</sub> O O <sub>2</sub> /N <sub>2</sub> UV  13°C/12°C and <sup>18</sup> O/16°O in CO <sub>2</sub> Radon Climate Reference Network (CRN) Persistent Organic Pollutants Sulfate, Nitrate Aerosols Hq <sup>9</sup> , Hq <sup>2</sup> , Hq <sup>9</sup> Particulate 2.5-10um GPS Derived Water Vapor Seismometer, GPS Testbed AERONET Photometers Corrosion Project Organic & Elemental Carbon Variable Young Star Survey Filter Radiometer/PMOD Mineral Dust & Radionuclides Black Carbon Aerosol Chemistry Halides, Black Carbon, Surface O <sub>3</sub> , and SO <sub>2</sub> CO Isotopes	NASA/Goddard Space Flight Center  Home Institution  Scripps Institution of Oceanography Scripps Institution of Oceanography Colorado State University CSIRO ANSTO NOANNESDIS Environment Canada University of Hawaii EPA EPA UNAVCO USGS FAA/Stanford University NASA/Goddard Space Flight Center University of Hawaii, Manoa University of Hawaii, Manoa University of Hawaii, Institute for Astronomy World Radiation Center New Mexico State University University of Hawaii, Manoa University of Hawaii, Manoa University of California, Davis EPA/NERL EPA/NERL State University New York	http://mplnet.gsfc.nasa.gov/  Mauna Loa, Hawaii  http://www.csiro.au/ http://www.ansto.gov.au/  http://www.msc-smc.ec.gc.ca/gaps/  http://www.suominet.ucar.edu/support/  http://aeronet.gsfc.nasa.gov/
Stratospheric O <sub>3</sub> & Temp Profiles  Aerosol Profile  NO <sub>2</sub> NOAA and NIWA  BrO  NOAA and NIWA  NOAA and NIWA  MSC Canada   http://www.niwa.co.nz/  http://www.niwa.co.nz/	AERONET Photometers  Measurement Program  CO <sub>2</sub> , <sup>13</sup> C, N <sub>2</sub> O  O <sub>2</sub> /N <sub>2</sub> UV  13°C/12°C and <sup>18</sup> O/16°O in CO <sub>2</sub> Radon Climate Reference Network (CRN) Persistent Organic Pollutants Sulfate, Nitrate Aerosols Hg <sup>0</sup> , Hg <sup>1</sup> , Hg <sup>0</sup> Particulate 2.5-10um  GPS Derived Water Vapor Seismometer, GPS Testbed AERONET Photometers Corrosion Project Organic & Elemental Carbon Variable Young Star Survey Filter Radiometer/PMOD Mineral Dust & Radionuclides Black Carbon Aerosol Chemistry Halides, Black Carbon, Surface O <sub>3</sub> , and SO <sub>2</sub> CO Isotopes Volcano Activity	NASA/Goddard Space Flight Center Home Institution Scripps Institution of Oceanography Scripps Institution of Oceanography Colorado State University CSIRO ANSTO NOANNESDIS Environment Canada University of Hawaii EPA EPA UNAVCO USGS FAA/Stanford University NASA/Goddard Space Flight Center University of Hawaii, Manoa University of Hawaii, Manoa University of Hawaii, Institute for Astronomy World Radiation Center New Mexico State University University of Hawaii, Manoa University of Hawaii, Manoa University of Hawaii, Manoa University of Hawaii, Manoa University of California, Davis EPA/NERL EPA/NERL EPA/NERL State University New York Hawaii Volcano Observatory	http://mplnet.gsfc.nasa.gov/  Mauna Loa, Hawaii  http://www.csiro.au/ http://www.ansto.gov.au/  http://www.msc-smc.ec.gc.ca/gaps/  http://www.suominet.ucar.edu/support/  http://aeronet.gsfc.nasa.gov/
Aerosol Profile         JPL           NO2         NOAA and NIWA           BrO         NOAA and NIWA           Column O3         MSC Canada	AERONET Photometers  Measurement Program  CO <sub>2</sub> , <sup>13</sup> C, N <sub>2</sub> O  O <sub>2</sub> /N <sub>2</sub> UV  1 <sup>3</sup> C/1 <sup>2</sup> C and <sup>18</sup> O/1 <sup>6</sup> O in CO <sub>2</sub> Radon  Climate Reference Network (CRN)  Persistent Organic Pollutants  Sulfate, Nitrate Aerosols  Hg <sup>9</sup> , Hg <sup>2</sup> , Hg <sup>9</sup> Particulate 2.5-10um  GPS Derived Water Vapor  Seismometer,  GPS Testbed  AERONET Photometers  Corrosion Project  Organic & Elemental Carbon  Variable Young Star Survey  Filter Radiometer/PMOD  Mineral Dust & Radionuclides  Black Carbon  Aerosol Chemistry  Halides, Black Carbon,  Surface O <sub>3</sub> , and SO <sub>2</sub> CO Isotopes	NASA/Goddard Space Flight Center Home Institution Scripps Institution of Oceanography Scripps Institution of Oceanography Colorado State University CSIRO ANSTO NOANNESDIS Environment Canada University of Hawaii EPA EPA UNAVCO USGS FAA/Stanford University NASA/Goddard Space Flight Center University of Hawaii, Manoa University of Hawaii, Manoa University of Hawaii, Institute for Astronomy World Radiation Center New Mexico State University University of Hawaii, Manoa University of Hawaii, Manoa University of Hawaii, Manoa University of Hawaii, Davis EPA/NERL EPA/NERL State University New York Hawaii Volcano Observatory PMRF	http://mplnet.gsfc.nasa.gov/  Mauna Loa, Hawaii  http://www.csiro.au/ http://www.ansto.gov.au/  http://www.msc-smc.ec.gc.ca/gaps/  http://www.suominet.ucar.edu/support/  http://aeronet.gsfc.nasa.gov/
NO2         NOAA and NIWA         http://www.niwa.co.nz/           BrO         NOAA and NIWA         http://www.niwa.co.nz/           Column O3         MSC Canada	AERONET Photometers  Measurement Program  CO <sub>2</sub> , <sup>13</sup> C, N <sub>2</sub> O  O <sub>2</sub> /N <sub>2</sub> UV  13°C/12°C and <sup>18</sup> O/16°O in CO <sub>2</sub> Radon Climate Reference Network (CRN) Persistent Organic Pollutants Sulfate, Nitrate Aerosols Hg <sup>0</sup> , Hg <sup>-2</sup> , Hg <sup>0</sup> Particulate 2.5-10um GPS Derived Water Vapor Seismometer, GPS Testbed AERONET Photometers Corrosion Project Organic & Elemental Carbon Variable Young Star Survey Filter Radiometer/PMOD Mineral Dust & Radionuclides Black Carbon Aerosol Chemistry Halides, Black Carbon, Surface O <sub>3</sub> , and SO <sub>2</sub> CO Isotopes Volcano Activity Video Surveillance UV	NASA/Goddard Space Flight Center  Home Institution Scripps Institution of Oceanography Scripps Institution of Oceanography Colorado State University CSIRO ANSTO NOAA/NESDIS Environment Canada University of Hawaii EPA EPA UNAVCO USGS FAA/Stanford University NASA/Goddard Space Flight Center University of Hawaii, Manoa University of Hawaii, Manoa University of Hawaii, Institute for Astronomy World Radiation Center New Mexico State University University of Hawaii, Manoa University of Hawaii, Manoa University of Hawaii, Manoa University of California, Davis EPA/NERL EPA/NERL State University New York Hawaii Volcano Observatory PMRF NOAA and NIWA	http://mplnet.gsfc.nasa.gov/  Mauna Loa, Hawaii  http://www.csiro.au/ http://www.ansto.gov.au/  http://www.msc-smc.ec.gc.ca/gaps/  http://www.suominet.ucar.edu/support/  http://aeronet.gsfc.nasa.gov/
BrO NOAA and NIWA http://www.niwa.co.nz/ Column O <sub>3</sub> MSC Canada	AERONET Photometers  Measurement Program  CO2, <sup>13</sup> C, N <sub>2</sub> O  O <sub>2</sub> /N <sub>2</sub> UV  13°C/12°C and <sup>18</sup> O/16°O in CO <sub>2</sub> Radon Climate Reference Network (CRN) Persistent Organic Pollutants Sulfate, Nitrate Aerosols Hg <sup>0</sup> , Hg <sup>-2</sup> , Hg <sup>0</sup> Particulate 2.5-10um GPS Derived Water Vapor Seismometer, GPS Testbed AERONET Photometers Corrosion Project Organic & Elemental Carbon Variable Young Star Survey Filter Radiometer/PMOD Mineral Dust & Radionuclides Black Carbon Aerosol Chemistry Halides, Black Carbon, Surface O <sub>3</sub> , and SO <sub>2</sub> CO Isotopes Volcano Activity Video Surveillance UV Stratospheric O <sub>3</sub> & Temp Profiles	NASA/Goddard Space Flight Center  Home Institution  Scripps Institution of Oceanography Scripps Institution of Oceanography Colorado State University CSIRO ANSTO NOANNESDIS Environment Canada University of Hawaii EPA EPA UNAVCO USGS FAA/Stanford University NASA/Goddard Space Flight Center University of Hawaii, Manoa University of Hawaii, Manoa University of Hawaii, Institute for Astronomy World Radiation Center New Mexico State University University of Hawaii, Manoa University of Hawaii, Manoa University of Hawaii, Manoa University of Hawaii, Manoa University of California, Davis EPA/NERL EPA/NERL State University New York Hawaii Volcano Observatory PMRF NOAA and NIWA JPL	http://mplnet.gsfc.nasa.gov/  Mauna Loa, Hawaii  http://www.csiro.au/ http://www.ansto.gov.au/  http://www.msc-smc.ec.gc.ca/gaps/  http://www.suominet.ucar.edu/support/  http://aeronet.gsfc.nasa.gov/
Column O₃ MSC Canada	AERONET Photometers  Measurement Program  CO <sub>2</sub> , <sup>13</sup> C, N <sub>2</sub> O O <sub>2</sub> /N <sub>2</sub> UV  13°C/12°C and <sup>18</sup> O/16°O in CO <sub>2</sub> Radon Climate Reference Network (CRN) Persistent Organic Pollutants Sulfate, Nitrate Aerosols Hg <sup>9</sup> , Hg <sup>12</sup> , Hg <sup>9</sup> Particulate 2.5-10um GPS Derived Water Vapor Seismometer, GPS Testbed AERONET Photometers Corrosion Project Organic & Elemental Carbon Variable Young Star Survey Filter Radiometer/PMOD Mineral Dust & Radionuclides Black Carbon Aerosol Chemistry Hallides, Black Carbon, Surface O <sub>3</sub> , and SO <sub>2</sub> CO Isotopes Volcano Activity Video Surveillance UV	NASA/Goddard Space Flight Center  Home Institution  Scripps Institution of Oceanography Scripps Institution of Oceanography Colorado State University CSIRO ANSTO NOANNESDIS Environment Canada University of Hawaii EPA EPA UNAVCO USGS FAA/Stanford University NASA/Goddard Space Flight Center University of Hawaii, Manoa University of Hawaii, Manoa University of Hawaii, Institute for Astronomy World Radiation Center New Mexico State University University of Hawaii, Manoa University of Hawaii, Manoa University of Hawaii, Manoa University of Hawaii, Manoa University of California, Davis EPA/NERL EPA/NERL ESTA/NERL State University New York Hawaii Volcano Observatory PMRF NOAA and NIWA JPL JPL	http://mplnet.gsfc.nasa.gov/  Mauna Loa, Hawaii  http://www.csiro.au/ http://www.ansto.gov.au/ http://www.msc-smc.ec.gc.ca/gaps/  http://www.suominet.ucar.edu/support/ http://aeronet.gsfc.nasa.gov/  http://www.epa.gov/nerl/ http://www.epa.gov/nerl/ http://hvo.wr.usgs.gov/maunaloa/
	AERONET Photometers  Measurement Program  CO2, <sup>13</sup> C, N <sub>2</sub> O  Q <sub>2</sub> /N <sub>2</sub> UV  13 C <sub>1</sub> <sup>12</sup> C and <sup>18</sup> O/ <sup>16</sup> O in CO <sub>2</sub> Radon  Climate Reference Network (CRN)  Persistent Organic Pollutants  Sulfate, Nitrate Aerosols  Hg <sup>0</sup> , Hg <sup>1*</sup> , Hg <sup>0</sup> Particulate 2.5-10um  GPS Derived Water Vapor  Seismometer,  GPS Testbed  AERONET Photometers  Corrosion Project  Organic & Elemental Carbon  Variable Young Star Survey  Filter Radiometer/PMOD  Mineral Dust & Radionuclides  Black Carbon  Aerosol Chemistry  Halides, Black Carbon,  Surface O <sub>3</sub> , and SO <sub>2</sub> CO Isotopes  Volcano Activity  Video Surveillance  UV  Stratospheric O <sub>3</sub> & Temp Profiles  Aerosol Profile	NASA/Goddard Space Flight Center Home Institution Scripps Institution of Oceanography Scripps Institution of Oceanography Colorado State University CSIRO ANSTO NOANNESDIS Environment Canada University of Hawaii EPA EPA UNAVCO USGS FAA/Stanford University NASA/Goddard Space Flight Center University of Hawaii, Manoa University of Hawaii, Manoa University of Hawaii, Institute for Astronomy World Radiation Center New Mexico State University University of Hawaii, Manoa University of Hawaii, Manoa University of Hawaii, Davis EPA/NERL State University Of California, Davis EPA/NERL State University New York Hawaii Volcano Observatory PMRF NOAA and NIWA JPL JPL NOAA and NIWA	http://mplnet.gsfc.nasa.gov/  Mauna Loa, Hawaii  http://www.csiro.au/ http://www.ansto.gov.au/  http://www.msc-smc.ec.gc.ca/gaps/  http://www.suominet.ucar.edu/support/  http://aeronet.gsfc.nasa.gov/  http://www.epa.gov/nerl/ http://www.epa.gov/nerl/ http://www.epa.gov/nerl/ http://hvo.wr.usgs.gov/maunaloa/
	AERONET Photometers  Measurement Program  CO2, <sup>13</sup> C, N <sub>2</sub> O  O <sub>2</sub> /N <sub>2</sub> UV  13°C/12°C and <sup>18</sup> O/16°O in CO <sub>2</sub> Radon  Climate Reference Network (CRN)  Persistent Organic Pollutants  Sulfate, Nitrate Aerosols  Hg°, Hg²*, Hg°  Particulate 2.5-10um  GPS Derived Water Vapor  Seismometer,  GPS Testbed  AERONET Photometers  Corrosion Project  Organic & Elemental Carbon  Variable Young Star Survey  Filter Radiometer/PMOD  Mineral Dust & Radionuclides  Black Carbon  Aerosol Chemistry  Halides, Black Carbon,  Surface O <sub>3</sub> , and SO <sub>2</sub> CO Isotopes  Volcano Activity  Video Surveillance  UV  Stratospheric O <sub>3</sub> & Temp Profiles  Aerosol Profile  NO <sub>2</sub>	NASA/Goddard Space Flight Center Home Institution Scripps Institution of Oceanography Scripps Institution of Oceanography Colorado State University CSIRO ANSTO NOAA/NESDIS Environment Canada University of Hawaii EPA EPA UNAVCO USGS FAA/Stanford University NASA/Goddard Space Flight Center University of Hawaii, Manoa University of Hawaii, Imanoa University of Hawaii, Imanoa University of Hawaii, Imanoa University of Hawaii, Institute for Astronomy World Radiation Center New Mexico State University University of Hawaii, Manoa University of California, Davis EPA/NERL EPA/NERL State University New York Hawaii Volcano Observatory PMRF NOAA and NIWA NOAA and NIWA NOAA and NIWA	http://mplnet.gsfc.nasa.gov/ Mauna Loa, Hawaii  http://www.csiro.au/ http://www.ansto.gov.au/ http://www.msc-smc.ec.gc.ca/gaps/  http://www.suominet.ucar.edu/support/ http://aeronet.gsfc.nasa.gov/  http://www.epa.gov/nerl/ http://www.epa.gov/nerl/ http://hvo.wr.usgs.gov/maunaloa/

### **GMD Sampling Sites Summary** State and Territory (34) Country and Ocean Summary (70) Country and Ocean Summary (70) Algeria (2) Antarctic Circumpolar (Chinese) (24) (continuation of column to the left) Alabama (1) Alaska (9) Kenya (1) Kiribati (2) American Samoa (2) Antarctica (7) California (8) Argentina (3) Korea (South) (2) Colorado (7) Ascension Island (1) La Reunion Island, Indian Ocean (1) Maldives (1) Marshall Islands (1) Florida (3) Australia (5) Azores (1) Barbados (3) Georgia (1) Hawaii (6) Mexico (2) Illinois (4) Bermuda (3) Midway Island (1) lowa (2) Brazil (2) Mongolia (2) Maine (2) Canada (7) Namibia (1) Maryland (1) Canary Islands (1) Chile (1) Netherlands (1) New Zealand (3) Massachusetts (1) Midway Island (1) China (5) Niger (1) Mississippi (1) Cook Islands (1) Nigeria (1) Montana (2) Costa Rica (2) Norway (1) Crozet Island, Indian Ocean (1) Drake Passage Ships (6) Eastern Pacific Ships (15) Pacific Ocean Aircraft (2) Nebraska (2) Nevada (1) New Hampshire (2) Peru (1) Poland (1) New Jersey (1) Ecuador (Galapagos Islands) (2) Puerto Rico (2) New Mexico (2) Estonia (1) Romania (1) Fiji (1) Finland (2) North Carolina (1) Russia (5) North Dakota (3) Oklahoma (3) Pennsylvania (1) Saipan (1) Saudi Arabia (1) France (4) Germany (2) Greenland (1) Seychelles (1) Rhode Island (1) Ship M, North Atlantic (1) South Carolina (2) Guam (2) South Africa (1) Hungary (1) Iceland (1) Spain (2) Svalbard (1) South Dakota (2) Tennessee (2) Sweden (1) Switzerland (1) Texas (4) Indian Ocean Aircraft (1) Utah (2) Indonesia (5) Virginia (3) Ireland (2) Taiwan (1) Washington (1) Israel (2) United Kingdom (2) Italy (1) Japan (3) Vietnam (1) Western Pacific Ships (13) Wisconsin (2) Kazakhstan (2) (continued, column right, top) SITE TOTALS Number of U.S. states operating in = 34 Total Number of all U.S. state locations = 90 Number of foreign countries operating in = 70 Total Number of all foreign locations = 184 TOTAL NUMBER OF ALL GLOBAL SITES (U.S. + Foreign) IN OPERATION = 274

Global Monitoring Division, ESRL, Boulder, Colorado		
B	D-I-	Barrell.
James Butler	Role  Management group	WMO Commission for Atmospheric Sciences
James Buller	Management group  Management group	GCOS/WCRP Atmospheric Observation Panel for C
	Management group	GEO-Carbon Steering Committee
	Management group	GEO Carbon Community of Practice
	Chair	WMO/GAW Scientific Advisory Group - Greenhouse
Brad Hall	Member	WMO/GAW Scientific Advisory Group - Greenhouse
John Ogren	Chair	WMO/GAW Scientific Advisory Group - Aerosols
	Member	Advisory Panel, European Supersites for Atmospher
		Aerosol Research
Numerous	Member	WMO/IAEA (International Atomic Energy Agency) M
1		of Experts on Carbon Dioxide, Other Greenhouse G
		and Related Tracer Measurement Techniques
Numerous	Member	WMO/IAEA (International Atomic Energy Agency) M
		of Experts on Carbon Dioxide, Other Greenhouse Ga and Related Tracer Measurement Techniques
Numerous	Member	WMO/IAEA (International Atomic Energy Agency) M
Humerous	Wiember	of Experts on Carbon Dioxide, Other Greenhouse G
		and Related Tracer Measurement Techniques
Numerous	Member	WMO/IAEA (International Atomic Energy Agency) M
Tumbrous .	monibol	of Experts on Carbon Dioxide, Other Greenhouse G
		and Related Tracer Measurement Techniques
Numerous	Member	WMO/IAEA (International Atomic Energy Agency) M
Numerous	Wellbei	of Experts on Carbon Dioxide, Other Greenhouse G
		and Related Tracer Measurement Techniques
Ells Dutton	Chair	WMO/GAW Baseline Surface Radiation Network (BS
		,
Brian Vasel	United States country contact	WMO/GAW
Brad Hall	Member	Commerce Standards Committee