

**APPENDIX E.  
AIR MONITORING NETWORKS FOR CLIMATE FORCING, TRANSPORT,  
VERTICAL PROFILE INFORMATION, AND STRATOSPHERIC OZONE**

Network	Lead Federal Agency	Number of Sites	Initiated	Measurement Parameters	Location of Information and/or Data
<b>Global Monitoring Division Baseline Observatories</b>					
Mauna Loa	NOAA	1	1957	CO <sub>2</sub> , CO, CH <sub>4</sub> , SO <sub>2</sub> , O <sub>3</sub> , SF <sub>6</sub> , N <sub>2</sub> O, H <sub>2</sub> , CFCs, HCFCs, HFC's, Aerosols, Solar Radiation, Surface Meteorology	<a href="http://www.cmdl.noaa.gov/obop/ml">http://www.cmdl.noaa.gov/obop/ml</a>
Point Barrow	NOAA	1	1973	CO <sub>2</sub> , CO, CH <sub>4</sub> , SO <sub>2</sub> , O <sub>3</sub> , SF <sub>6</sub> , N <sub>2</sub> O, H <sub>2</sub> , CFCs, HCFCs, HFC's, Aerosols, Solar Radiation, Surface Meteorology	<a href="http://www.cmdl.noaa.gov/obop/br">http://www.cmdl.noaa.gov/obop/br</a>
Samoa	NOAA	1	1974	CO <sub>2</sub> , CO, CH <sub>4</sub> , SO <sub>2</sub> , O <sub>3</sub> , SF <sub>6</sub> , N <sub>2</sub> O, H <sub>2</sub> , CFCs, HCFCs, HFC's, Aerosols, Solar Radiation, Surface Meteorology	<a href="http://www.cmdl.noaa.gov/obop/s">http://www.cmdl.noaa.gov/obop/s</a>
South Pole	NOAA	1	1957	CO <sub>2</sub> , CO, CH <sub>4</sub> , SO <sub>2</sub> , O <sub>3</sub> , SF <sub>6</sub> , N <sub>2</sub> O, H <sub>2</sub> , CFCs, HCFCs, HFC's, Aerosols, Solar Radiation, Surface Meteorology	<a href="http://www.cmdl.noaa.gov/obop/sp">http://www.cmdl.noaa.gov/obop/sp</a>
Trinidad Head	NOAA	1	2002	CO <sub>2</sub> , CO, CH <sub>4</sub> , SO <sub>2</sub> , O <sub>3</sub> , SF <sub>6</sub> , N <sub>2</sub> O, H <sub>2</sub> , CFCs, HCFCs, HFC's, Aerosols, Solar Radiation, Surface Meteorology	<a href="http://www.cmdl.noaa.gov/obop/th">http://www.cmdl.noaa.gov/obop/th</a>
<b>Global Monitoring Division -- Carbon Cycle Greenhouse Gases Group (CCGG)</b>					
Observatory Measurements	NOAA	4	1957	See above baseline observatories	<a href="http://www.cmdl.noaa.gov/ccgg/ins">http://www.cmdl.noaa.gov/ccgg/ins</a>
Cooperative fixed sites	NOAA	62	1967	CO <sub>2</sub> , CH <sub>4</sub> , CO, H <sub>2</sub> , N <sub>2</sub> O, and SF <sub>6</sub> , stable isotopes of CO <sub>2</sub> and CH <sub>4</sub>	<a href="http://www.cmdl.noaa.gov/ccgg/fla">http://www.cmdl.noaa.gov/ccgg/fla</a>
Commercial Ships	?????	?????	?????		
<b>University of Washington</b>					
Cheeka Peak Observatory	None	1	1997	O <sub>3</sub> , CO, Aerosols, Solar Radiation, Surface Meteorology	<a href="http://www.washington.edu/research/field/">http://www.washington.edu/research/field/</a>
Mt. Bachelor Observatory	None	1	2004	O <sub>3</sub> , CO, NO/NO <sub>2</sub> , Aerosols, Hg, Surface Meteorology	<a href="http://research.uwb.edu/jaffegroup/modules/mbo_plot/">http://research.uwb.edu/jaffegroup/modules/mbo_plot/</a>
<b>Vertical Profile and Other Measurement Networks</b>					
ALE / GAGE / AGAGE Network	NASA	5 Current 2 Discontinued	1978	CO, CH <sub>4</sub> , SF <sub>6</sub> , N <sub>2</sub> O, H <sub>2</sub> , CFCs, HCFCs, HFC's, methyl chloroform, carbon tetrachloride, chloroform, perchloroethylene, halons & others	<a href="http://cdiac.ornl.gov/ndps/alegagage.html">http://cdiac.ornl.gov/ndps/alegagage.html</a>
Tall Tower Measurements	NOAA	8	1992	CO <sub>2</sub> , CO, CH <sub>4</sub> , H <sub>2</sub> , CFCs, methyl chloroform, carbon tetrachloride, chloroform, sulfur hexafluoride, perchloroethylene	<a href="http://www.esrl.noaa.gov/gmd/ccgg/towers/index.html">http://www.esrl.noaa.gov/gmd/ccgg/towers/index.html</a> <a href="http://www.nacarbon.org/cgi-nacp/web/investigations/inv_pgp.pl?pgid=171">http://www.nacarbon.org/cgi-nacp/web/investigations/inv_pgp.pl?pgid=171</a>
Research Wind Profiler Network	NOAA	variable	???	Vertical wind and temperature profiles, surface meteorology	<a href="http://www.etl.noaa.gov/et7/data/">http://www.etl.noaa.gov/et7/data/</a>
REALM – Regional East Atmospheric Lidar Mesonet	NOAA	13	2004	Lidar measurements for mixing height and vertical profiling of aerosols, ozone and water vapor	<a href="http://alg.umbc.edu/REALM/">http://alg.umbc.edu/REALM/</a>
Ozonesonde Network	NOAA	3 (9?)	???	Weekly Upper Air measurements of ozone, temperature, and humidity information from surface to approximately 32 km	<a href="http://www.cmdl.noaa.gov/ozwv/ozsondes/">http://www.cmdl.noaa.gov/ozwv/ozsondes/</a>
SHADOZ Network (Southern Hemisphere Additional Ozonesondes)	NASA	12	1998	Upper air measurements of ozone, temperature, and humidity	<a href="http://croc.gsfc.nasa.gov/shadoz/">http://croc.gsfc.nasa.gov/shadoz/</a>

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Aircraft Measurements	NOAA	16 airport sites	1992	CO <sub>2</sub> , CH <sub>4</sub> , N <sub>2</sub> O, CO, H <sub>2</sub> , SF <sub>6</sub>	<a href="http://www.cmdl.noaa.gov/ccgg/aircraft.html">http://www.cmdl.noaa.gov/ccgg/aircraft.html</a> <a href="http://www.nacarbon.org/cgi-nacp/web/investigations/inv_pgp.pl?pgid=171">http://www.nacarbon.org/cgi-nacp/web/investigations/inv_pgp.pl?pgid=171</a>
Networks for Halogenated Gases and Ozone	NOAA	Multiple platforms	1986	nitrous oxide (N <sub>2</sub> O), CFCs, HCFCs, HFCs, CH <sub>3</sub> Br, CH <sub>3</sub> Cl, CH <sub>3</sub> I, halons	<a href="http://www.cmdl.noaa.gov/hats/">http://www.cmdl.noaa.gov/hats/</a>
Network for Aerosols	NOAA	Multiple platforms	mid-1970s	light absorption, total scattering and backscattering	<a href="http://www.cmdl.noaa.gov/aero/">http://www.cmdl.noaa.gov/aero/</a>
Ameriflux CO <sub>2</sub> exchange network	DOE, NOAA, USDA, NASA	~50 Micrometrological towers	1996	CO <sub>2</sub> , meteorological variables	<a href="http://public.ornl.gov/ameriflux/index.html">http://public.ornl.gov/ameriflux/index.html</a>
FluxNet CO <sub>2</sub> exchange network	International	~150 Micrometrological towers	1996	CO <sub>2</sub> , meteorological variables	<a href="http://www.fluxnet.ornl.gov/fluxnet/index.cfm">http://www.fluxnet.ornl.gov/fluxnet/index.cfm</a>
North American Carbon Program Atmospheric Observing System	Multiple participants	Multiple platforms	2001	CO, CO <sub>2</sub> , CH <sub>4</sub>	<a href="http://www.nacarbon.org/nacp/">http://www.nacarbon.org/nacp/</a>
AERONET -- AErosol RObotic NETwork	NASA co-located networks	22 + other participants	1998	Aerosol spectral optical depths, aerosol size distributions, and precipitable water	<a href="http://aeronet.gsfc.nasa.gov/index.html">http://aeronet.gsfc.nasa.gov/index.html</a>
MPLNET – Micro-pulse Lidar Network		8	2000	Aerosols and cloud layer heights	<a href="http://mplnet.gsfc.nasa.gov/">http://mplnet.gsfc.nasa.gov/</a>
<b>International Aircraft Measurements</b>					
MOZAIC (Measurement of ozone, water vapour, carbon monoxide and nitrogen oxides aboard Airbus in-service aircraft)	None	2500 Airbus international flights/year	1994	O <sub>3</sub> , H <sub>2</sub> O, CO, NO <sub>x</sub>	<a href="http://www.fz-juelich.de/icg/icg-ii/mozaic/home">http://www.fz-juelich.de/icg/icg-ii/mozaic/home</a>
NOXAR (Measurements of Nitrogen Oxides and Ozone Along Air Routes)	None	500 Swiss Air flights to U.S. and far east	1995 - 1996	O <sub>3</sub> , NO, NO <sub>2</sub>	<a href="http://www.iac.ethz.ch/en/research/chemie/tpeter/Noxar.html">http://www.iac.ethz.ch/en/research/chemie/tpeter/Noxar.html</a>
CARIBIC (Civil Aircraft for the Regular Investigation of the atmosphere Based on an Instrument Container)	None	~100 Lufthansa flights	1997	CO, O <sub>3</sub> , CO, CH <sub>4</sub> , CO <sub>2</sub> , N <sub>2</sub> O, SF <sub>6</sub> , NMHC, Position & Meteorology and Cloud cover.	<a href="http://www.caribic-atmospheric.com/">http://www.caribic-atmospheric.com/</a>
AMATRAS (Atmospheric Measurement by Airliners for Trace Species)	None	262 flights between Japan and Australia	1993	CO <sub>2</sub> , CH <sub>4</sub> , CO and SF <sub>6</sub>	<a href="http://www.jal.com/en/press/0000336/img/AMATRAS.pdf">http://www.jal.com/en/press/0000336/img/AMATRAS.pdf</a>
<b>NOAA Research Observing Systems</b> (Systems typically incorporated in intensive field campaigns)					
R/V Ronald H. Brown, Lockheed WP-3D Twin Otter	NOAA	ship aircraft aircraft	???	O <sub>3</sub> , NO, NO <sub>2</sub> , NO <sub>y</sub> , VOCs, CO <sub>2</sub> , CO, SO <sub>2</sub> , HNO <sub>3</sub> , NH <sub>3</sub> , other reactive pollutants, aerosols, meteorological parameters & upper air, altitude	<a href="http://esrl.noaa.gov/csd/2006/p3science.html">http://esrl.noaa.gov/csd/2006/p3science.html</a>