

ANNUAL REPORT

National Research Support Project 3, National Atmospheric Deposition Program January 1 to December 31, 1999

Title: The National Atmospheric Deposition Program-A Long-term Monitoring Program in Support of Research on Effects of Atmospheric Chemical Deposition
Supported by the Regional Research Fund, Hatch Act, as amended August 11, 1985, and voluntary contributions from many other federal, state, and private research organizations

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National Atmospheric Deposition Program - NRSP-3
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National Research Support Project - 3, National Atmospheric Deposition Program Progress of Work and Principal Accomplishments - 1999

The National Atmospheric Deposition Program (NADP) seeks to characterize geographic patterns and temporal trends in biologically important chemical deposition using data from three precipitation chemistry networks: the National Trends Network (NTN), the Atmospheric Integrated Research Monitoring Network (AIRMoN), and the Mercury Deposition Network (MDN). At the end of 1999, 220 NTN stations (Appendix 1) were collecting one-week precipitation samples for analysis of inorganic acids, nutrients, and base cations. This is an increase of 20 sites since 1998 and is due largely to the addition of 15 sites formerly within the Environmental Protection Agency's Clean Air Status and Trends Network. The NTN now operates sites in 47 states, as well as in Puerto Rico, the Virgin Islands, and Quebec Province, Canada. These routine operations yield a long-term data set on atmospheric chemical deposition to the nation's agricultural crops, forests, rangelands, streams, lakes, and other natural and cultural resources. Complementing the NTN are the 9-site AIRMoN (Appendix 2) and the 39-site MDN (Appendix 3). Data from the daily precipitation samples collected at AIRMoN sites support efforts by NADP researchers to identify source-receptor relationships and the effects of changing emissions on atmospheric deposition. The high temporal resolution afforded by AIRMoN data supports the development of computer models that simulate the transport and removal of pollutants on a storm-by-storm basis. The MDN offers the only measurements of mercury in North American precipitation on a regional scale. These data are being used to quantify mercury deposition to certain water bodies in which fish and other wildlife are contaminated with this toxic compound.

Attendees at the 1999 NADP Technical Committee meeting in Sacramento, California, included 77 scientists and other Technical Committee members. Between meetings of the Executive Committee (Appendix 4) and of the three subcommittees, 47 papers were presented at four platform sessions and a poster session. These papers (Appendix 5) covered topics such as the impacts of emissions reductions following the Clean Air Act Amendments of 1990, atmospheric deposition monitoring and assessment in the East and West, and spatial and temporal trends in mercury deposition. During the annual business meeting, the Technical Committee endorsed several actions passed during the year by the Executive Committee. Particularly noteworthy is the commitment to move ahead with the modernization of NADP equipment by developing a prototype precipitation collector and continuing a raingage testing program. The Technical Committee also accepted a set of guidelines prescribing membership in the Technical Committee and delineating the overall NADP structure. This new document (Appendix 6) describes the composition, operation, and responsibilities of the NADP committees and subcommittees, as well as the roles and election of committee and subcommittee officers. A change in the voting membership of the Executive Committee to include the co-Chair of the Budget Advisory Committee was also endorsed at this meeting. By reducing the reliance on "institutional memory", the Guidelines will help stabilize the NADP for future generations of scientists and policy-makers interested in atmospheric deposition and its effects.

Below are highlights of 1999 research activities in which Technical Committee scientists used NADP data to learn about the spatial distributions or temporal trends in atmospheric wet deposition (objective 1):

Objective 1. Characterize geographic patterns and temporal trends in biologically important chemical deposition.

- In an effort to calculate contemporary and pre-industrial global reactive nitrogen budgets, scientists from the United States and Europe found excellent agreement between NTN nitrate and ammonium deposition data and their computer-modeled nitrogen deposition amounts. Their model shows as much as 16 times more nitrogen deposition in some Northern Hemisphere temperate ecosystems today than before industrialization.
- Kentucky's Environmental Quality Commission used NTN data in its biennial assessment of air quality and found that over the past 12 years the average pH of Kentucky rainfall has become less acidic.
- A University of Central Florida investigator reported statistically significant nitrate increases in central Florida rainfall over the last 15-20 years.
- Several MDN scientists reported that 11% to 19% of the annual mercury deposition was deposited in a single storm that may have picked up mercury as it tracked over major urban and industrial sources in New Jersey, New York, and Massachusetts before depositing mercury at MDN sites in Maine, New Brunswick, and Nova Scotia.
- Reviewing the potential air quality impact of hydrochloric acid emitted at electric utility plants, the Maryland Power Plant Research Program used NTN data to contrast chloride deposition, which is strongly influenced by sea salts, and sulfate deposition, which is strongly influenced by coal combustion.

- A University of Illinois scientist found that the spatial patterns of ammonia emissions from livestock waste, the largest source of airborne ammonia in the United States, are generally consistent with the average ammonium concentrations in precipitation in the Midwest and East.
- After examining sulfate and nitrogen (nitrate-N plus ammonium-N) concentrations from 17 years (1981-1997) of NTN data, a U.S. Geological Survey researcher reported significant increases in the proportion of nitrogen relative to sulfur in precipitation in the East (increases from ~0.7 to ~1.1) and in the Midwest and West (increases from ~1.1 to ~2.0).
- While testing for trends in ion concentrations at NTN sites in western North Carolina and parts of Tennessee, the North Carolina Division of Air Quality found statistically significant decreases in sulfate concentrations except at Mount Mitchell, North Carolina, where the results were inconclusive.
- Examining more than a decade of NTN data, researchers at Penn State University, the Illinois State Water Survey, and the Northeast States for Coordinated Air Use Management program report decreases in eastern U.S. sulfate deposition that are consistent with SO₂ emissions reductions at coal-fired utilities in the East.

Below is a list of 1999 research activities in which NADP data supported investigations of the effects of atmospheric deposition (objective 2):

Objective 2. Support research activities related to: (a) the productivity of managed and natural ecosystems; (b) the chemistry of surface and ground waters including estuaries; (c) the health of domestic animals, wildlife, and fish; (d) human health; (e) the effects of atmospheric deposition on visibility and materials; and (f) discerning source-receptor relationships.

- USDA-Forest Service scientists are using NTN data along with measurements of dry deposition, visibility, meteorological variables, surface water chemistry, and soils to study the effects of atmospheric deposition and climate change on the alpine and subalpine terrestrial and aquatic ecosystems in the Glacier Lakes Ecosystem Experiments Site in the Medicine Bow National Forest in Wyoming.
- Scientists studying Biscuit Brook, a headwater stream in the Catskill Mountains of New York, found that nitrogen from atmospheric deposition enters the soil nitrogen cycle, where it may remain for years before it is released to streams, a finding consistent with recent stable isotope studies.
- Investigators documenting soil calcium decreases over the past 40 to 50 years in the eastern United States have related these decreases to leaching by acidic deposition and to downward trends in the wet deposition of calcium. Low soil calcium has been related to reduced stress tolerance in red spruce and sugar maple trees.
- Some U.S. Geological Survey researchers tracking the trends (1984-1996) in precipitation and stream-water sulfate in the northeastern United States report that stream-water sulfate concentrations in five benchmark watersheds are decreasing in response to regional decreases in sulfate deposition, but these sulfate decreases have not been accompanied by increases in stream-water alkalinities. They speculate that stream-water alkalinities will not increase until acidic deposition is lower than cation resupply from weathering and atmospheric deposition.
- In a publication from the Maine Agricultural and Forest Experiment Station, scientists used precipitation chemistry data, dry deposition estimates, and chemical weathering and road salt application rates to isolate the effect of road salt (elevated calcium, potassium, magnesium, and sodium concentrations) on the stream water chemistry in a first-order Maine watershed.
- A University of Nebraska scientist used the ¹⁸O and ²H analyses of groundwater and archived NTN samples to demonstrate that a significant fraction of the total recharge of Nebraska aquifers results from summertime precipitation, which contradicts the previous thinking that recharge only occurs in the winter.
- University of California-Davis scientists evaluated the addition of calcium acetate as an alternative to calcium carbonate (lime) for ameliorating soil acidification.

Usefulness of Findings

The NADP database, with 21 years of NTN data, 7 years of AIRMoN data, and 3 years of MDN data, is an invaluable resource supporting research of atmospheric deposition and its effects on managed and unmanaged ecosystems, i.e., NRS-3 objectives 1 and 2. On-line requests for NADP data continue to increase. In 1999, the NADP Internet site received over 34,000 unique visitors. Nearly one in five visitors returned to the site, which offers individual sample records, seasonal and annual averages, maps, reports, and other information. Most frequently accessed data products were color contour maps of

pollutant concentrations and depositions. Site users viewed nearly 70,000 maps, almost three times the 1998 figure, and retrieved more than 17,000 data files. Almost two-thirds of the electronic data requests served the needs of university researchers, and the balance served educators from elementary schools, secondary schools, and colleges. User statistics show that researchers most often use NADP data to study atmospheric deposition and watershed processes, as well as environmental phenomena such as the effects of deposition on aquatic and terrestrial ecosystems and on cultural resources.

Scientists and policy-makers are using NADP data to address contemporary environmental issues. One issue is the recurrent zone of hypoxic waters that forms in the Gulf of Mexico during June to August. Sediments in the Mississippi River delta suggest that hypoxia is associated with increased nutrient fluxes to the Gulf. In May 1999, the federal Committee on Environment and Natural Resources released its scientific assessment of the causes and consequences of this zone and strategies for reducing nutrients in the Mississippi River. The Committee made extensive use of NTN data in preparing its estimate of atmospheric nitrogen inputs to the Mississippi-Atchafalaya River basin. A similar issue is eutrophic estuarine waters in the Chesapeake Bay. In its October 1999 report, *State of the Chesapeake Bay*, scientists relied on NTN and AIRMoN data to estimate that 21% of the nitrogen entering the Bay and its watershed comes from atmospheric sources. Principal sources of inorganic nitrogen in precipitation are the combustion of fossil fuels in mobile and stationary sources. Acidic deposition is an ongoing issue. In a briefing before U.S. Congressional staffers, organized by the Ecological Society of America, scientists used NTN data to discuss atmospheric deposition effects on western ecological systems. Finally, the Conference of New England Governors and Eastern Canadian Premiers' Committee on the Environment is using NTN and MDN data to formulate guidelines and recommendations for reductions in sulfur and nitrogen oxide emissions to reduce the impacts of acidic deposition and reductions in mercury emissions to decrease the incidence of this toxic compound in fish and wildlife tissues.

Work Planned for Next Year

In 2000, the NADP will continue to provide uninterrupted high-quality measurements of inorganic acids, nutrients, base cations, and mercury in precipitation. Continued growth of on-line data requests attests to the utility and value of the NADP data archive. A multi-year effort to make Geographic Information System (GIS) coverages available on the NADP Internet site will continue. Those GIS coverages under preparation are maps of topography, land use, roads, population, and point and area emissions in the vicinity of each NADP site. A system that enables users to view these coverages selectively is planned. NADP data can now be selected by watersheds. Future plans include estimates of annual and seasonal mean deposition fluxes and total loadings for entire watersheds, along with the uncertainties in these estimates.

In keeping with the Executive Committee's goal to upgrade NADP field site equipment, the NADP Program Office will issue a request in 2000 for the design and prototype of a new wet deposition collector that can be used at NTN, AIRMoN, or MDN sites.

Publications

Appendix 7 lists nearly 170 publications, including 24 journal articles, written by NADP scientists. This list does not include publications by other scientists using NADP data but not reporting these publications to the NADP Program Office. Seven papers stemming from the 1998 NADP meeting in St. Petersburg, Florida, and submitted to *Atmospheric Environment* this year were all successfully reviewed, modified, and accepted for publication as a Special Section under the NADP banner. Four reports were published in 1999, the Technical Committee meeting proceedings (Appendix 5), the 1996/97 Central Analytical Laboratory QA report (Appendix 8), the 1998 map summary (Appendix 9), and a new NTN Site Operation Manual (Appendix 10). The popular brochure, *Inside Rain* (Appendix 11), was revised and reprinted in 1999. Finally, the *2000 CALendar* (Appendix 12), featuring pictures and information about 19 sites was published and distributed to site supervisors, operators, and Technical Committee meeting attendees.

APPROVED:

Dennis Lamb

Past Chair

NRSP-3 Technical Committee

Date

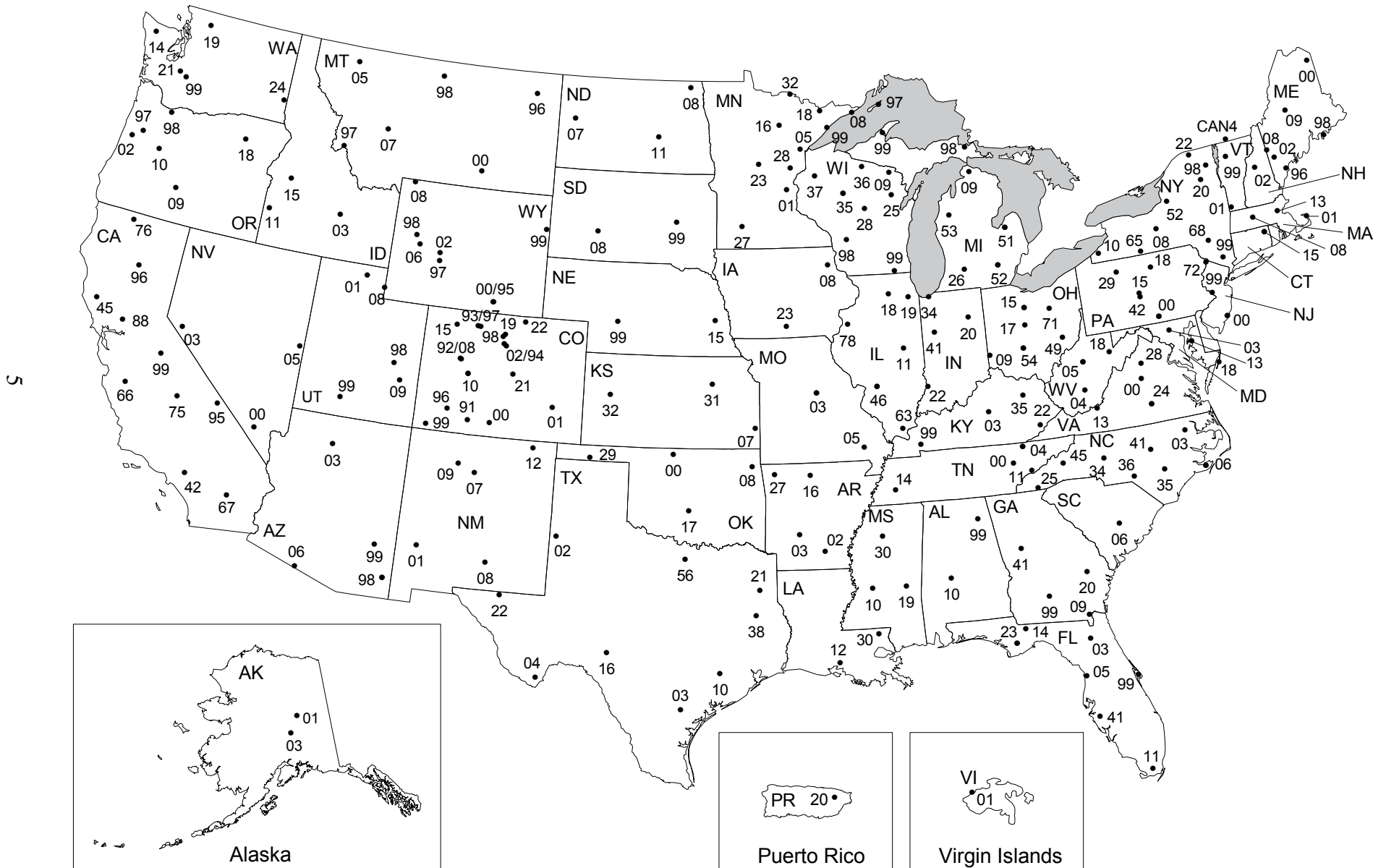
Wayne Banwart

Administrative Advisor

NRSP-3

Date

National Atmospheric Deposition Program National Trends Network



**National Atmospheric Deposition Program/National Trends Network Sites
December 31, 1999**

State	Site Code	Site Name	County	Sponsoring Agency	Start Date
Alabama					
	AL10	Black Belt Ag Substation	Dallas	US Geological Survey	08/83
	AL99	Sand Mountain Ag Experiment Station	DeKalb	Tennessee Valley Authority	10/84
Alaska					
	AK01	Caribou - Poker Creek	Fairbanks	USDA Forest Service	12/92
	AK03	Denali NP - Mount McKinley	Denali	National Park Service - Air Resources Div	06/80
Arizona					
	AZ03	Grand Canyon NP - Hopi Point	Coconino	National Park Service - Air Resources Div	08/81
	AZ06	Organ Pipe Cactus NM	Pima	National Park Service - Air Resources Div	04/80
	AZ98	Chiricahua	Cochise	US Environmental Protection Agency-CAMD	02/99
	AZ99	Oliver Knoll	Graham	US Geological Survey	08/81
Arkansas					
	AR02	Warren 2WSW	Bradley	US Geological Survey	05/82
	AR03	Caddo Valley	Clark	US Geological Survey	12/83
	AR16	Buffalo NR - Buffalo Point	Marion	National Park Service - Air Resources Div	07/82
	AR27	Fayetteville	Washington	US Geological Survey	04/80
California					
	CA42	Tanbark Flat	Los Angeles	USDA Forest Service	01/82
	CA45	Hopland	Mendocino	US Geological Survey	10/79
	CA66	Pinnacles NM - Bear Valley	San Benito	National Park Service - Air Resources Div	11/99
	CA75	Sequoia NP - Giant Forest	Tular	National Park Service - Air Resources Div	07/80
	CA76	Montague	Siskiyou	US Geological Survey	06/85
	CA88	Davis	Yolo	US Geological Survey	09/78
	CA99	Yosemite NP - Hodgdon Meadow	Tuolumne	National Park Service - Air Resources Div	12/81
Colorado					
	CO00	Alamosa - Weather Service Office	Alamosa	US Geological Survey	04/80
	CO01	Las Animas Fish Hatchery	Bent	US Geological Survey	10/83
	CO02	Niwot Saddle	Boulder	NSF/INSTAAR-University of Colorado	06/84
	*CO08	Four Mile Park	Garfield	US Environmental Protection Agency-CAMD	12/87
	CO10	Gothic	Gunnison	US Environmental Protection Agency-CAMD	02/99
	CO15	Sand Spring	Moffat	Bureau of Land Management	03/79
	CO19	Rocky Mtn NP - Beaver Meadows	Larimer	National Park Service - Air Resources Div	05/80
	CO21	Manitou	Teller	USDA Forest Service	10/78
	CO22	Pawnee	Weld	SAES-Colorado State University	05/79
	CO91	Wolf Creek Pass	Mineral	USDA Forest Service	05/92
	CO92	Sunlight Peak	Garfield	US Environmental Protection Agency-CAMD	01/88
	CO93	Buffalo Pass - Dry Lake	Routt	USDA Forest Service	10/86
	CO94	Sugarloaf	Boulder	US Environmental Protection Agency-CAMD	11/86
	CO96	Molas Pass	San Juan	USDA Forest Service	07/86
	CO97	Buffalo Pass - Summit Lake	Routt	USDA Forest Service	02/84
	CO98	Rocky Mtn NP - Loch Vale	Larimer	USGS/Colorado State University	08/83
	CO99	Mesa Verde NP - Chapin Mesa	Montezuma	US Geological Survey	04/81
Connecticut					
	CT15	Abington	Windham	US Environmental Protection Agency-CAMD	01/99
Florida					
	FL03	Bradford Forest	Bradford	St. John's River Water Management District	10/78
	FL05	Chassahowitzka NWR	Citrus	US Fish & Wildlife Serv - Air Quality Branch	08/96
	FL11	Everglades NP - Research Center	Dade	National Park Service - Air Resources Div	06/80
	FL14	Quincy	Gadsden	US Geological Survey	03/84
	FL23	Sumatra	Liberty	US Environmental Protection Agency-CAMD	01/99
	FL41	Verna Well Field	Sarasota	US Geological Survey	08/83
	FL99	Kennedy Space Center	Brevard	NASA/Dynamac Corp.	08/83
Georgia					
	GA09	Okefenokee NWR	Charlton	US Fish & Wildlife Serv - Air Quality Branch	06/97
	GA20	Bellville	Bellville	US Environmental Protection Agency-CAMD	04/83
	GA41	Georgia Station	Pike	SAES-University of Georgia	10/78
	GA99	Chula	Tift	US Geological Survey	02/94

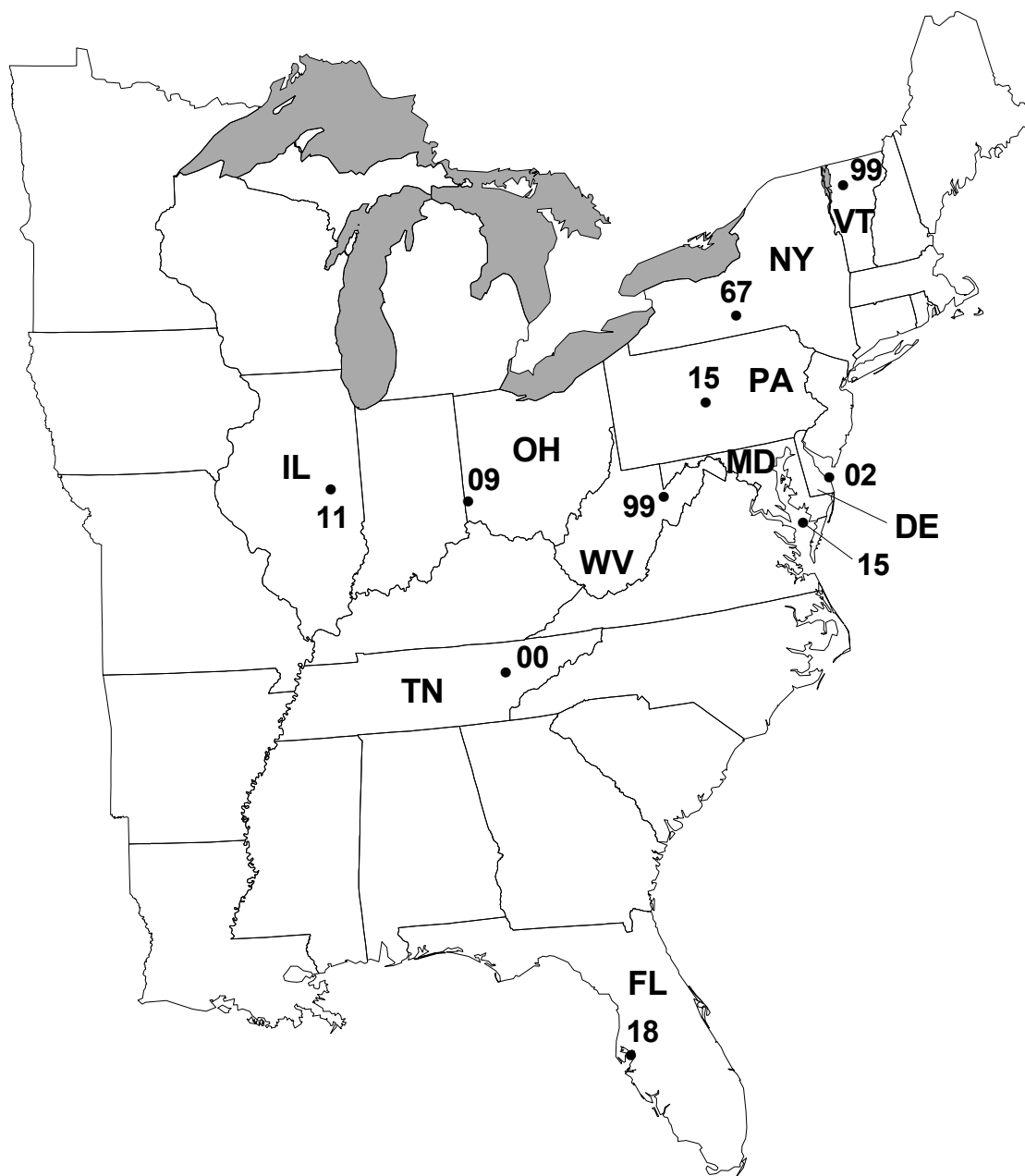
State					Start
Site Code	Site Name	County	Sponsoring Agency		Date
Idaho					
ID03	Craters of the Moon NM	Butte	National Park Service - Air Resources Div		08/80
ID11	Reynolds Creek	Owyhee	US Geological Survey		11/83
ID15	Smiths Ferry	Valley	US Geological Survey		10/84
Illinois					
IL11	Bondville	Champaign	SAES-University of Illinois		02/79
IL18	Shabbona	DeKalb	SAES-University of Illinois		05/81
IL19	Argonne	DuPage	DOE-Argonne National Laboratory		03/80
IL46	Alhambra	Madison	US Environmental Protection Agency-CAMD		01/99
IL63	Dixon Springs Ag Center	Pope	SAES-University of Illinois		01/79
IL78	Monmouth	Warren	US Geological Survey		01/85
Indiana					
IN20	Huntington Reservoir	Huntington	US Geological Survey		08/83
IN22	Southwest Purdue Ag Center	Knox	US Geological Survey		09/84
IN34	Indiana Dunes NL	Porter	National Park Service - Air Resources Div		07/80
IN41	Purdue University Ag Farm	Tippecanoe	SAES-Purdue University		07/82
Iowa					
IA08	Big Springs Fish Hatchery	Clayton	US Geological Survey		08/84
IA23	McNay Memorial Research Center	Lucas	US Geological Survey		09/84
Kansas					
KS07	Farlington Fish Hatchery	Crawford	US Geological Survey		03/84
KS31	Konza Prairie	Riley	SAES-Kansas State University		08/82
KS32	Lake Scott State Park	Scott	US Geological Survey		03/84
Kentucky					
KY03	Mackville	Washington	US Geological Survey		11/83
KY22	Lilley Cornett Woods	Letcher	NOAA-Air Resources Lab		09/83
KY35	Clark State Fish Hatchery	Rowan	US Geological Survey		08/83
KY99	Mulberry Flats	Trigg	TVA/Murray State University		12/94
Louisiana					
LA12	Iberia Research Station	Iberia	US Geological Survey		11/82
LA30	Southeast Research Station	Washington	US Geological Survey		01/83
Maine					
ME00	Caribou	Aroostook	NOAA-Air Resources Lab		04/80
ME02	Bridgton	Cumberland	Maine Dept of Environmental Protection		09/80
ME08	Gilead	Oxford	US Geological Survey		09/99
ME09	Greenville Station	Piscataquis	SAES-University of Maine		11/79
ME96	Casco Bay - Wolfe's Neck Farm	Cumberland	EPA/University of Southern Maine		01/98
ME98	Acadia NP - McFarland Hill	Hancock	National Park Service - Air Resources Div		11/81
Maryland					
MD03	White Rock Substation	Carroll	Baltimore Gas & Electric Co.		10/84
MD13	Wye	Queen Anne	SAES-University of Maryland		03/83
Massachusetts					
MA01	North Atlantic Coastal Lab	Barnstable	National Park Service - Air Resources Div		12/81
MA08	Quabbin Reservoir	Franklin	NESCAUM		03/82
MA13	East	Middlesex	NESCAUM		02/82
Michigan					
MI09	Douglas Lake- Univ Michigan Biological Station	Cheboygan	SAES-Michigan State University		07/79
MI26	Kellogg Biological Station	Kalamazoo	SAES-Michigan State University		06/79
MI51	Unionville	Tuscola	US Environmental Protection Agency-CAMD		01/99
MI52	Ann Arbor	Washtenaw	US Environmental Protection Agency-CAMD		01/99
MI53	Wellston	Wexford	USDA Forest Service		10/78
MI97	Isle Royale NP - Wallace Lake	Keneenaw	National Park Service - Air Resources Div		05/85
MI98	Raco	Chippewa	US Environmental Protection Agency-CAMD		05/84
MI99	Chassell	Houghton	National Park Service - Air Resources Div		02/83
Minnesota					
MN01	Cedar Creek	Anoka	Minnesota Pollution Control Agency		12/96
MN05	Fond du Lac	Carlton	EPA/Fond du Lac Reservation		11/96
MN08	Hovland	Cook	Minnesota Pollution Control Agency		12/96
MN16	Marcell Experimental Forest	Itasca	USDA Forest Service		07/78
MN18	Fernberg	Lake	US Environmental Protection Agency-CAMD		11/80
MN23	Camp Ripley	Morrison	US Geological Survey		10/83
MN27	Lamberton	Redwood	Minnesota Pollution Control Agency		01/79
MN28	Grindstone Lake	Pine	Minnesota Pollution Control Agency		12/96
MN99	Wolf Ridge	Lake	Minnesota Pollution Control Agency		12/96

State	Site Code	Site Name	County	Sponsoring Agency	Start Date
Mississippi					
	MS10	Clinton	Hinds	US Geological Survey	07/84
	MS19	Newton	Newton	NOAA-Air Resources Lab	11/86
	MS30	Coffeetown	Yalobusha	Tennessee Valley Authority	07/84
Missouri					
	MO03	Ashland Wildlife Area	Boone	US Geological Survey	10/81
	MO05	University Forest	Butler	US Geological Survey	10/81
Montana					
	MT00	Little Big Horn Battlefield	Big Horn	US Geological Survey	07/84
	MT05	Glacier NP - Fire Weather Station	Flathead	National Park Service - Air Resources Div	06/80
	MT07	Clancy	Jefferson	US Geological Survey	01/84
	MT97	Lost Trail Pass	Ravalli	USDA Forest Service	09/90
	MT98	Havre	Hill	US Geological Survey	07/85
Nebraska					
	NE15	Mead	Saunders	SAES-University of Nebraska	07/78
	NE99	North Platte Ag Station	Lincoln	US Geological Survey	09/85
Nevada					
	NV00	Red Rock Canyon	Clark	Bureau of Land Management	01/85
	NV03	Smith Valley	Smith	US Geological Survey	08/85
	NV05	Great Basin NP - Lehman Caves	White Pine	National Park Service - Air Resources Div	01/85
New Hampshire					
	*NH02	Hubbard Brook	Grafton	USDA Forest Service	07/78
New Jersey					
	NJ00	Edwin B. Forsythe NWR	Atlantic	US Fish & Wildlife Serv - Air Quality Branch	10/98
	NJ99	Washington Crossing	Mercer	US Environmental Protection Agency-CAMD	08/81
New Mexico					
	NM01	Gila Cliff Dwellings NM	Catron	EPA/New Mexico Environment Dept.	07/85
	NM07	Bandelier NM	Los Alamos	DOE-Los Alamos National Lab	06/82
	NM08	Mayhill	Otero	US Geological Survey	01/84
	NM09	Cuba	Sandoval	Bureau of Land Management	02/82
	NM12	Capulin Volcano NM	Union	EPA/New Mexico Environment Dept.	11/84
New York					
	NY08	Aurora Research Farm	Cayuga	SAES-Cornell University	04/79
	NY10	Chautauqua	Chautauqua	US Geological Survey	06/80
	NY20	Huntington Wildlife	Essex	EPA/State Univ of New York-Syracuse	10/78
	NY22	St. Regis Mohawk - Fort Covington	Franklin	US Environmental Protection Agency-CAMD	08/99
	NY52	Bennett Bridge	Oswego	EPA/State Univ of New York-Oswego	06/80
	NY65	Jasper	Steuben	US Geological Survey	02/80
	NY68	Biscuit Brook	Ulster	US Geological Survey	10/83
	NY98	Whiteface Mountain	Essex	US Geological Survey	07/84
	NY99	Black Rock Forest	Orange	US Geological Survey	09/83
North Carolina					
	NC03	Lewiston	Bertie	North Carolina State University	10/78
	NC06	Beaufort	Carteret	US Environmental Protection Agency-CAMD	01/99
	NC25	Coweeta	Macon	USDA Forest Service	07/78
	NC34	Piedmont Research Station	Rowan	North Carolina State University	10/78
	NC35	Clinton Crops Research Station	Sampson	North Carolina State University	10/78
	NC36	Jordan Creek	Scotland	US Geological Survey	10/83
	NC41	Finley Farms	Wake	North Carolina State University	10/78
	NC45	Mount Mitchell	Yancey	North Carolina State University	11/85
North Dakota					
	ND07	Theo Roosevelt NP - North Unit Headquarters	McKenzie	National Park Service - Air Resources Div	05/81
	ND08	Icelandic State Park	Pembina	US Geological Survey	10/83
	ND11	Woodworth	Stutsman	US Geological Survey	11/83
Ohio					
	OH09	Oxford	Butler	US Geological Survey	08/84
	OH15	Lykens	Crawford	US Environmental Protection Agency-CAMD	01/99
	OH17	Delaware	Delaware	USDA Forest Service	10/78
	OH49	Caldwell	Noble	US Geological Survey	09/78
	OH54	Deer Creek State Park	Pickaway	US Environmental Protection Agency-CAMD	01/99
	OH71	Wooster	Wayne	US Geological Survey	09/78

State				Start
Site Code	Site Name	County	Sponsoring Agency	Date
Oklahoma				
OK00	Salt Plains NWR	Alfalfa	US Geological Survey	12/83
OK17	Great Plains Apiaries	McClain	NOAA-Air Resources Lab	03/83
OK29	Goodwell Research Station	Texas	US Geological Survey	01/85
Oregon				
OR02	Alsea Guard Ranger Station	Benton	US Environmental Protection Agency-CAMD	12/79
OR09	Silver Lake Ranger Station	Lake	US Geological Survey	08/83
OR10	H J Andrews Experimental Forest	Lane	USDA Forest Service	05/80
OR18	Starkey Experimental Forest	Union	US Geological Survey	03/84
OR97	Hyslop Farm	Benton	US Environmental Protection Agency-CAMD	04/83
OR98	Bull Run	Clackamas	USGS-City of Portland	07/82
Pennsylvania				
PA00	Arendtsville	Adams	US Environmental Protection Agency-CAMD	01/99
PA15	Penn State	Centre	NOAA-Air Resources Lab	06/83
PA18	Young Woman's Creek	Clinton	US Geological Survey	04/99
PA29	Kane Experimental Forest	Elk	USDA Forest Service	07/78
PA42	Leading Ridge	Huntingdon	SAES-Pennsylvania State University	04/79
PA72	Milford	Pike	USDA Forest Service	12/83
Puerto Rico				
PR20	El Verde	Rio Grande	USDA Forest Service	02/85
South Carolina				
SC06	Santee NWR	Clarendon	US Geological Survey	07/84
South Dakota				
SD08	Cottonwood	Jackson	NOAA-Air Resources Lab	10/83
SD99	Huron Well Field	Huron	US Geological Survey	11/83
Tennessee				
TN00	Walker Branch Watershed	Anderson	DOE/Oak Ridge Natl Lab/Lockheed-Martin	03/80
TN04	Speedwell	Claiborne	US Environmental Protection Agency-CAMD	01/99
TN11	Great Smoky Mountain NP - Elkmont	Sevier	National Park Service - Air Resources Div	08/80
TN14	Hatchie NWR	Haywood	Tennessee Valley Authority	10/84
Texas				
TX02	Muleshoe NWR	Bailey	US Geological Survey	06/85
TX03	Beeville	Bee	NOAA-Air Resources Lab	02/84
TX04	Big Bend NP - K-Bar	Brewster	National Park Service - Air Resources Div	04/80
TX10	Attwater Prairie Chicken NWR	Colorado	US Geological Survey	07/84
TX16	Sonora	Edwards	US Geological Survey	06/84
TX21	Longview	Gregg	Texas Natural Resource Conservation Comm	06/82
TX22	Guadalupe Mountains NP-Frijole Ranger Station	Culberson	US Geological Survey	06/84
TX38	Forest Seed Center	Nacogdoches	Texas Natural Resource Conservation Comm	08/81
TX56	LBJ National Grasslands	Wise	US Geological Survey	09/83
Utah				
UT01	Logan	Cache	US Geological Survey	12/83
UT08	Murphy Ridge	Rich	BP Amoco	03/86
UT09	Canyonlands NP	San Juan	National Park Service - Air Resources Div	11/97
UT98	Green River	Emery	US Geological Survey	04/85
UT99	Bryce Canyon NP - Repeater Hill	Garfield	National Park Service - Air Resources Div	01/85
Vermont				
VT01	Bennington	Bennington	US Geological Survey	04/81
VT99	Underhill	Chittenden	US Geological Survey	06/84
Virgin Islands				
VI01	Virgin Islands NP - Lind Point	St. John	National Park Service - Air Resources Div	04/98
Virginia				
VA00	Charlottesville	Albemarle	US Geological Survey	10/84
VA13	Horton's Station	Giles	Tennessee Valley Authority	07/78
VA24	Prince Edward	Prince Edward	US Environmental Protection Agency-CAMD	01/99
VA28	Shenandoah NP - Big Meadows	Madison	National Park Service - Air Resources Div	05/81
Washington				
WA14	Olympic NP - Hoh Ranger Station	Jefferson	National Park Service - Air Resources Div	05/80
WA19	North Cascades NP-Marblemount Ranger Station	Skagit	US Geological Survey	02/84
WA21	La Grande	Pierce	US Environmental Protection Agency-CAMD	04/84
WA24	Palouse Conservation Farm	Whitman	US Geological Survey	08/85
WA99	Mount Rainier NP - Tahoma Woods	Pierce	National Park Service - Air Resources Div	10/99

State					Start
Site Code	Site Name	County	Sponsoring Agency		Date
West Virginia					
WV04	Babcock State Park	Fayette	US Geological Survey		09/83
WV05	Cedar Creek State Park	Gilmer	US Environmental Protection Agency-CAMD		01/99
WV18	Parsons	Tucker	USDA Forest Service		07/78
Wisconsin					
WI09	Popple River	Florence	Wisconsin Department of Natural Resources		12/86
WI25	Suring	Oconto	Wisconsin Department of Natural Resources		01/85
WI28	Lake Dubay	Portage	Wisconsin Department of Natural Resources		06/82
WI35	Perkinstown	Taylor	US Environmental Protection Agency-CAMD		01/99
WI36	Trout Lake	Vilas	Wisconsin Department of Natural Resources		01/80
WI37	Spooner	Washburn	Wisconsin Department of Natural Resources		06/80
WI98	Wildcat Mountain	Vernon	Wisconsin Department of Natural Resources		08/89
WI99	Lake Geneva	Walworth	Wisconsin Department of Natural Resources		06/84
Wyoming					
WY00	Snowy Range - West Glacier Lake	Albany	USDA Forest Service		04/86
WY02	Sinks Canyon	Fremont	Bureau of Land Management		08/84
WY06	Pinedale	Sublette	Bureau of Land Management		01/82
WY08	Yellowstone NP - Tower	Park	National Park Service - Air Resources Div		06/80
WY95	Brooklyn Lake	Albany	USDA Forest Service		09/92
WY97	South Pass City	Fremont	SF Phosphates Ltd		04/85
WY98	Gypsum Creek	Sublette	Exxon Co.		12/84
WY99	Newcastle	Weston	Bureau of Land Management		08/81
Canada					
CAN4	Sutton	Brome	US Geological Survey		09/86
*Intercomparison sites					

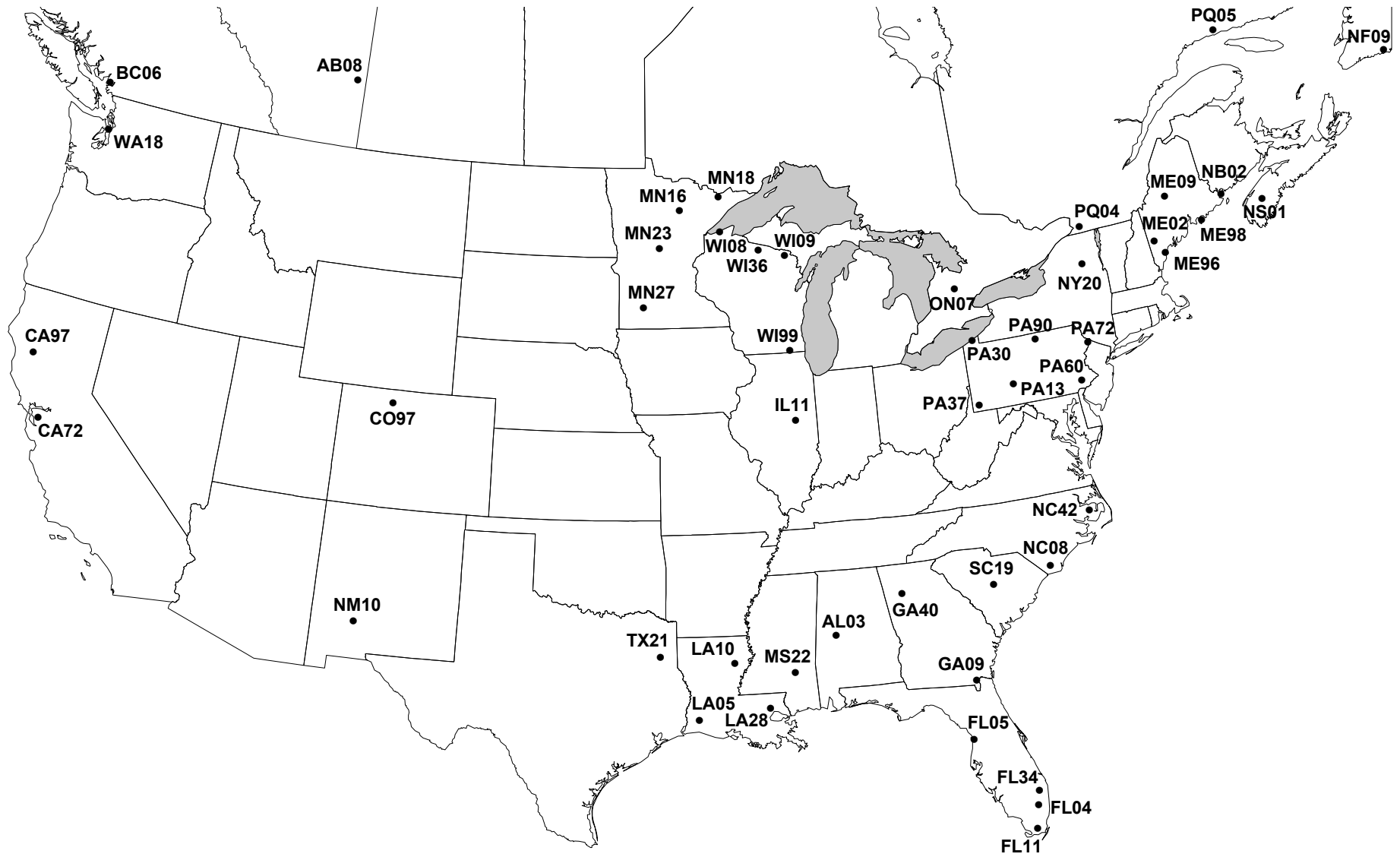
National Atmospheric Deposition Program Atmospheric Integrated Research Monitoring Network



**NADP/Atmospheric Integrated Research Monitoring Network Sites
December 31, 1999**

State Site Code	Site Name	County	Sponsoring Agency	Start Date
Delaware DE02	Lewes	Sussex	NOAA-Air Resources Laboratory	09/92
Florida FL18	Tampa Bay	Hillsborough	EPA/Tampa Bay Regional Planning Council	08/96
Illinois IL11	Bondville	Champaign	NOAA-Air Resources Laboratory	10/92
Maryland MD15	Smith Island	Somerset	NOAA-Air Resources Laboratory	11/95
New York NY67	Cornell University	Thompkins	NOAA-Air Resources Laboratory	09/92
Ohio OH09	Oxford	Butler	NOAA-Air Resources Laboratory	10/92
Pennsylvania PA15	Penn State	Centre	NOAA-Air Resources Laboratory	10/92
Tennessee TN00	Oak Ridge National Lab	Anderson	NOAA-Air Resources Laboratory	09/92
Vermont VT99	Underhill	Chittenden	NOAA-Air Resources Laboratory	01/93

National Atmospheric Deposition Program Mercury Deposition Network



**National Atmospheric Deposition Program/Mercury Deposition Network Sites
December 31, 1999**

State/Province Site Code	Site Name	County	Sponsoring Agency	Start Date
California CA97	Covelo	Mendocino	Electric Power Research Institute	12/97
Colorado CO97	Buffalo Pass - Summit Lake	Routt	USDA Forest Service-Rocky Mtn Forest & Range Exp Station	10/98
Florida FL04	Andytown	Broward	South Florida Water Management District	01/98
FL05	Chassahowitzka NWR	Citrus	US Fish and Wildlife Service - Air Quality Branch	07/97
FL11	Everglades NP - Research Center	Dade	South Florida Water Management District	10/95
FL34	ENRP	Palm Beach	South Florida Water Management District	07/97
Georgia GA09	Okefenokee NWR	Charlton	US Fish and Wildlife Service - Air Quality Branch	07/97
Illinois IL11	Bondville	Champaign	Illinois State Water Survey	01/99
Louisiana LA05	Lake Charles	Calcasieu	Louisiana Dept of Environmental Quality	10/98
LA10	Chase	Franklin	Louisiana Dept of Environmental Quality	10/98
LA28	Hammond	Tangipahoa	Louisiana Dept of Environmental Quality	10/98
Maine ME02	Bridgton	Cumberland	EPA/University of Southern Maine	06/97
ME09	Greenville Station	Piscataquis	Maine Dept. of Environmental Protection	09/96
ME96	Casco Bay - Wolfe's Neck Farm	Cumberland	EPA/University of Southern Maine	01/98
ME98	Acadia NP - McFarland Hill	Hancock	NPS/Acadia NP & ME Dept of Environmental Protection	09/95
Minnesota MN16	Marcell Experimental Forest	Itasca	USDA Forest Service-North Central Forest Experiment Station	02/95
MN18	Fernberg	Lake	USDA Forest Service & MN Pollution Control Agency	03/95
MN23	Camp Riley	Morrison	Minnesota Pollution Control Agency	07/96
MN27	Lamberton	Redwood	Minnesota Pollution Control Agency	07/96
New Hampshire NH00	Laconia	Belknap	New Hampshire Air Resources Agency	01/98
New Mexico NM10	Caballo	Sierra	Bureau of Reclamation/New Mexico State University	05/97
North Carolina NC08	Waccamaw State Park	Columbus	North Carolina Dept of Environment & Natural Resources	05/95
NC42	Pettigrew State Park	Washington	North Carolina Dept of Environment & Natural Resources	05/95
New York NY20	Huntington Wildlife	Essex	EPA/Syracuse Univ & New York State ERDA	12/99
Pennsylvania PA13	Allegheny Portage Railroad NHS	Cambria	Pennsylvania Dept of Environmental Protection/PA State Univ	01/97
PA37	Holbrooke	Greene	US Dept of Energy/Federal Energy Technology Center	05/99
PA60	Valley Forge	Montgomery	Pennsylvania Dept of Environmental Protection/PA State Univ	12/99
PA90	Hills Creek State Park	Tioga	Pennsylvania Dept of Environmental Protection/PA State Univ	01/97
South Carolina SC19	Congaree Swamp State Park	Richland	South Carolina Dept of Health & Environmental Quality	03/95
Texas TX21	Longview	Gregg	Texas Natural Resource Conservation Commission	11/95

State/Province Site Code	Site Name	County	Sponsoring Agency	Start Date
Washington				
*WA18	Seattle - NOAA	King	Frontier Geosciences, Inc	03/96
Wisconsin				
WI08	Brule River	Douglas	Wisconsin Department of Natural Resources	03/95
WI09	Popple River	Florence	Wisconsin Department of Natural Resources	06/95
WI36	Trout Lake	Vilas	Wisconsin Department of Natural Resources	05/95
WI99	Lake Geneva	Walworth	Wisconsin Department of Natural Resources	01/97
CANADA				
New Brunswick				
NB02	St. Andrews	Charlotte	Environment Canada, Atmospheric Environment Branch	07/96
Nova Scotia				
NS01	Kejimikujik NP	Queens	Environment Canada, Atmospheric Environment Branch	07/96
Quebec				
PQ04	St. Anicet		Environment Canada, Atmospheric Environment Branch	04/98
PQ05	Mingan		Environment Canada, Atmospheric Environment Branch	04/98

*Intercomparison Site

**NATIONAL ATMOSPHERIC DEPOSITION PROGRAM (NRSP-3)
EXECUTIVE COMMITTEE - 1999-00**

EXECUTIVE COMMITTEE

Chair	James A. Lynch	Penn State University 311 Forest Research Lab University Park, PA 16802
Vice Chair	Richard S. Artz	NOAA-Air Resources Lab R/E/AR, SSMC3, Room 3151 1315 East West Highway Silver Spring, MD 20910
Secretary	Kathy A. Tonnessen	NPS/RM-CESU School of Forestry University of Montana Missoula, MT 59812
Past Chair	Dennis Lamb	Penn State University 503 Walker Building University Park, PA 16802

Committee & Subcommittee Chairs:

Budget Advisory Committee Co-Chair	Mark Nilles	U.S. Geological Survey
Network Operations Subcommittee	Jane Rothert	Illinois State Water Survey
Data Management & Analysis Subcommittee	Bob Brunette	Frontier Geosciences
Environmental Effects Subcommittee Co-Chair	Ellen Porter	U.S. Fish & Wildlife Service
Environmental Effects Subcommittee Co-Chair	John Sherwell	MD Dept. of Natural Resources

PROGRAM REPRESENTATIVES

SAES Administrative Advisors

North Central Region	Wayne Banwart	University of Illinois ACES Admin. 104 Mumford Hall, MC-710 1301 West Gregory Urbana, IL 61801
Northeastern Region	Bruce Wiersma	Dean College of Natural Sciences, Forestry and Agriculture University of Maine Orono, Maine 04469-0163
Western Region	Lee E. Sommers	Director Agricultural Experiment Station Colorado State University 16 Administration Building Fort Collins, CO 80523
Southern Region	William H. Brown	Louisiana State University P. O. Box 25055 Baton Rouge, LA 70894-5055

Other Advisors

USDA/CSREES	Daniel D. Jones	USDA CSREES Room 843, Aerospace Building 1400 Independence Avenue SW Washington, DC 20250-2220
NAPAP	Michael Uhart	NAPAP/NOAA/PDC 1315 East West Highway Room 11419 Silver Spring, MD 20910
NTN (USGS)	Mark Nilles	U.S. Geological Survey Box 25046, MS 401 Denver, CO 80225
MDN (WI DNR)	Bruce Rodger	Wisconsin Dept of Natural Resources Bureau of Air Management 101 South Webster Street Madison, Wisconsin 53707
AIRMoN (NOAA)	Richard S. Artz	NOAA-Air Resources Lab R/E/AR, SSMC3, Room 3151 1315 East West Highway Silver Spring, MD 20910

OTHER AGENCY REPRESENTATIVES

BLM	Scott F. Archer	NARSC (RS-140) Denver Federal Center, Building 50 P.O. Box 25047 Denver, CO 80225-0047
CASTNeT	Gary Lear	U.S. Environmental Protection Agency Mail Code 6204J 401 M Street SW Washington, DC 20460
EPA	Rona Birnbaum	U.S. Environmental Protection Agency Mail Code 6204J 401 M Street SW Washington, DC 20462

FWS	Ellen Porter	U.S. Fish & Wildlife Service NPS - AIR P. O. Box 25287 Denver, CO 80225-0287
NPS	Kristi Heuer	National Park Service-AIR P. O. Box 25287 Denver, CO 80239
TVA	William J. Parkhurst	Tennessee Valley Authority P.O. Box 1010, CEB 2A Muscle Shoals, AL 35660-1010
USDA/FS	Richard G. Cline	Department of Agriculture Forest Service, WFWAR 201 14 th St. SW P. O. Box 96090 Washington, DC 20090-6090

Other Representatives

NADP Coordinator	Van C. Bowersox	Illinois State Water Survey 2204 Griffith Drive Champaign, IL 61820
Associate NADP Coordinator for Toxics	Clyde W. Sweet	Illinois State Water Survey 2204 Griffith Drive Champaign, IL 61820
Assistant NADP Coordinator & CAL Director	Karen Harlin	Illinois State Water Survey 2204 Griffith Drive Champaign, IL 61820
HAL - Lab Director	Eric M. Prestbo	Frontier Geosciences 414 Pontius North Seattle, WA 98109
NADP Recorder	Kathy Douglas	Illinois State Water Survey 2204 Griffith Drive Champaign, IL 61820

SUBCOMMITTEE OFFICERS

Network Operations Subcommittee

Chair	Jane Rothert	Illinois State Water Survey 2204 Griffith Drive Champaign, IL 61820
Vice Chair	Susan Johnson	Minnesota Pollution Control Agency 320 West 2 nd Street, Room 704 Duluth, MN 55802
Secretary	John Shimshock	Advanced Technology Systems 639 Alpha Drive RIDC Park Pittsburgh, PA 15238

Data Management and Analysis Subcommittee

Chair	Bob Brunette	Frontier Geosciences 414 Pontius North Seattle, WA 98109
Vice Chair	Gary Lear	U.S. Environmental Protection Agency Mail Code 6204J 401 M Street SW Washington, DC 20460
Secretary	Bob Larson	Illinois State Water Survey 2204 Griffith Drive Champaign, IL 61820

Environmental Effects Subcommittee

Co-Chair:	Ellen Porter	U.S. Fish & Wildlife Service NPS-AIR P.O. Box 25287 Denver, CO 80225-0287
Co-Chair:	John Sherwell	Maryland Department of Natural Resources Tawes Building B-3 Annapolis, MD 21401

NADP TECHNICAL COMMITTEE MEETING PROCEEDINGS

Sacramento, California
October 25-28, 1999

NATIONAL ATMOSPHERIC DEPOSITION PROGRAM

A Cooperative Research Support Program of the
State Agricultural Experiment Stations (NRSP-3)
Federal and State Agencies
and Private Research Organizations



Guidelines Governing The National Atmospheric Deposition Program

Section 1. HISTORY AND STRUCTURE

The **National Atmospheric Deposition Program (NADP)** was established in 1977 by the State Agricultural Experiment Stations (SAES) of the United States Department of Agriculture (USDA) to address problems of atmospheric deposition and its effects on agricultural crops, forests, rangelands, surface waters, and other natural and cultural resources of the nation. The NADP was organized initially as SAES North Central Regional Project NC-141 and involved the operation of 22 sites that commenced precipitation sampling on a weekly basis in 1978. In 1982, the NADP, which then became designated as SAES Interregional Project IR-7, combined its resources with those of the National Acid Precipitation Assessment Program (NAPAP), resulting in a single network of precipitation chemistry monitoring stations that became known as the National Trends Network (NTN). In 1992, the SAES IR-7 Project became reclassified as the SAES National Research Support Project NRSP-3. That same year, the Atmospheric Integrated Research Monitoring Network (AIRMoN) joined the NADP with the objective of collecting samples on each day that precipitation occurs. The Mercury Deposition Network (MDN), which samples precipitation weekly, joined the NADP in 1996. The NADP now serves as the parent organization overseeing the operations of these various complementary monitoring and research networks.

The NADP operates, as it has since its inception, as a public, nonprofit, unincorporated, interstate association of interested parties to investigate atmospheric deposition and its effects on the environment. The NADP is structured as a cooperative program that represents many interested individuals and numerous federal, state, academic, and private organizations that coordinate efforts to operate monitoring sites, report data, and oversee research activities related to atmospheric deposition.

All members of the NADP constitute the “Technical Committee”. The governing body of the NADP Technical Committee is the “Executive Committee”, a subset of the Technical Committee that is composed of elected officers and various institutional representatives. Management and various support activities of the NADP are carried out by the Program Office under guidance from the Executive Committee. The Budget Advisory Committee and several standing subcommittees advise the Executive Committee on various financial, technical, and scientific matters.

Section 2. MEMBERSHIP

Membership in the NADP is open to individuals and institutions interested in any aspect of atmospheric deposition monitoring or research stemming from NADP data. The collective body of members constitutes the NADP Technical Committee. Permanent members include the SAES regional representatives, representatives from the various offices and laboratories contracted to perform NADP support functions, as well as representatives from any organization that sponsors or operates one or more NADP monitoring sites. For other persons and organizations, attendance at any official meeting of the NADP shall initiate a three-year period of active membership.

Privileges of active membership include notification of and the right to attend all meetings of the Technical Committee or any of its standing subcommittees, voting rights in the Technical Committee and its subcommittees, as well as receipt of NADP products and publications, and other benefits or privileges designated by the Technical Committee.

Termination of membership occurs once a nonpermanent member fails to attend or be represented at any NADP meeting within a three-year period. However, a nonpermanent member may request provisional membership on an annual basis by notifying the NADP Program Office of his or her continued interest in NADP activities. Provisional members shall have all the privileges of active membership except the right to vote. Provisional members shall become active members by attending an NADP-sponsored meeting. Membership may also end whenever an individual voluntarily notifies the Program Office of this intent.

Section 3. TECHNICAL COMMITTEE

A. General Description

The NADP Technical Committee operates as a “committee of the whole” to set policy and make decisions concerning the technical and scientific aspects of the program. Decisions of the Technical Committee are determined by a simple majority vote of members attending the annual business meeting.

B. Officers

The elected officers of the NADP Technical Committee shall consist of the Chair, the Past Chair, the Vice Chair, and the Secretary. The Secretary shall hold office for one year and then shall automatically assume the office of Vice Chair. The Vice Chair shall hold office for one year and then shall automatically assume the office of Chair for one year, and then the office of Past Chair for one additional year.

If, for any reason, the Chair is unable to carry out the duties of that office, the Vice Chair shall act in that capacity until the Chair can resume duties or until the term of office is completed. If neither the Chair nor the Vice Chair is able to complete the term of the Chair, then the Past Chair shall assume the duties of the Chair until the Executive Committee chooses a Chair to complete the term.

C. Duties of NADP Officers

The duties of NADP officers are the same as those of officers in similar organizations, unless prescribed otherwise by these Guidelines or assigned by the Technical Committee. NADP officers serve without honoraria.

Chair: The Chair shall preside at all meetings of the Technical Committee and of the Executive Committee. The Chair also serves as the co-chair of the Budget Advisory Committee. The Chair shall appoint chairs and members of all *ad hoc* committees under the Technical and Executive Committees, unless otherwise specified by these Guidelines or by the order creating the same. The Chair, in consultation with the Executive Committee, may delegate certain duties and perform such duties as usually pertain to this office. The Chair is responsible for planning and organizing the interim meeting of the Executive Committee and the annual meeting of the Budget Advisory Committee.

Vice Chair: The Vice Chair is responsible for planning and organizing the program of the annual Technical Committee meeting. The Vice Chair shall perform other duties as delegated by the Chair. In the event the Chair is unable to perform his or her duties, the Vice Chair shall assume the duties of the Chair.

Secretary: The Secretary shall assist the Vice Chair in planning and organizing the annual Technical Committee meeting. The Secretary shall become fully knowledgeable about NADP policies and functions, review the status of available NADP products, and help formulate a strategy for disseminating any new products. The Secretary shall perform other duties as delegated by the Chair.

Past Chair: The Past Chair is responsible for compiling all necessary information from NADP members to generate an annual report of the NADP. The Past Chair shall also assist in long-range planning for the continued health of the NADP, as well as assist the Chair as mutually agreed. In the event that neither the Chair nor the Vice Chair is able to perform the duties of the Chair, the Past Chair shall assume the duties of the Chair.

D. Election of Officers

A nominating committee, appointed by the outgoing Chair, shall submit nominations for Secretary to the Executive Committee for its approval prior to the closing business meeting of the annual Technical Committee meeting. Approved nominations shall be forwarded to the Technical Committee by the Chair, who will preside over the election at the closing business meeting and also accept, if seconded, additional nominations from the floor by any qualified member. All nominated persons must be members of the Technical Committee at the time of nomination. The Technical Committee elects the incoming Secretary by a simple majority of members in attendance at the closing business meeting. The terms of new officers shall commence at the adjournment of the annual Technical Committee meeting or as soon as possible thereafter.

E. Technical Committee Meetings

There shall be at least one meeting of the Technical Committee each year, typically in the autumn. This annual meeting shall include the NADP annual business meeting, and it shall also provide opportunities for a program of presentations and other activities relating to atmospheric deposition. The Vice Chair may call additional Technical Committee meetings as deemed necessary in consultation with the Executive Committee. The time and place of each NADP Technical Committee meeting shall be coordinated by the Vice Chair in consultation with the Executive Committee and with help from the Program Office. The NADP Program Office shall notify all NADP members at least 90 days prior to each Technical Committee meeting. The Program Office shall also provide a recorder at all business meetings, who shall collate, disseminate, and archive a written record of all actions.

F. Annual Business Meeting

At least one NADP business meeting shall be held in conjunction with the annual Technical Committee meeting and announced explicitly in the program for that meeting. For voting purposes, a quorum shall consist of the number of eligible members present at the business meeting. Reports of activities and motions of the Executive Committee and of all standing subcommittees and other groups appointed by the Executive Committee shall be presented by the respective chairs and approved by vote of the Technical Committee. Additionally, any member may introduce motions recommending changes in NADP operations or bring up other matters for discussion at the business meeting. All motions must be seconded by a member of the Technical Committee, and all votes at the business meeting shall be by simple majority. The Program Office shall provide a recorder at all business meetings, who shall collate, disseminate, and archive a written record of all actions.

Section 4. EXECUTIVE COMMITTEE

A. Structure and Responsibilities

The Executive Committee is the governing body of the NADP that is responsible for executing the decisions and actions of the Technical Committee, making budgetary recommendations, and generally developing the vision required to ensure continuity, stability, and balance for the NADP. In general, the Executive Committee conducts NADP business between Technical Committee meetings and performs other tasks assigned by the Technical Committee. The voting members of the Executive Committee shall be empowered to set policy and make decisions concerning the technical and scientific aspects of the program on behalf of the Technical Committee membership. The Executive Committee also makes recommendations to the Technical Committee concerning administrative and budgetary aspects of the program.

The voting membership of the Executive Committee consists of the four elected officers of the Technical Committee (Chair, Vice Chair, Secretary, and Past Chair), as well as the Chair of each standing subcommittee (currently designated Data Management and Analysis, Network Operations, and Environmental Effects) and the elected Co-chair of the Budget Advisory Committee. Nonvoting members of the Executive Committee are the regional administrative advisors representing the State Agricultural Experiment Stations (SAES), a representative of the Cooperative State Research Education and Extension Service (CSREES), representatives from each NADP network (currently the National Trends Network or NTN, the Atmospheric Integrated Research Monitoring Network or AIRMoN, and the Mercury Deposition Network or MDN), representatives of the analytical laboratories, the director of the National Acid Precipitation Assessment Program (NAPAP), and the Program Coordinator. Representatives of the various funding organizations are nonvoting, ex-officio members of the Executive Committee.

B. Executive Committee Meetings

The Executive Committee shall meet at least two times each year. One of these meetings must take place in person at the annual Technical Committee meeting. The interim meeting is typically held in conjunction with the Budget Advisory Committee meeting. When meeting in person is not possible for the interim meeting or for other meetings of the Executive Committee, a conference telephone call may be substituted. Additional discussions and voting may take place by U.S. or by electronic mail. Actions of the Executive Committee require approval by a simple majority of the voting members physically present at a meeting or of those responding electronically, by telephone, or by mail. The Program Office shall provide a recorder at all business meetings, who shall collate, disseminate, and archive a written record of all actions. The record of all meetings and discussions conducted by the Executive Committee will be made accessible to all Executive Committee members.

C. Budget Advisory Committee

The Budget Advisory Committee has overall responsibility for the financial planning of the NADP. The Budget Advisory Committee shall meet, upon request of the Technical Committee Chair, at least once each year to review the NADP income and expenditures, and to plan for future funding. Actions of the Budget Advisory Committee require approval by a simple majority of the voting members physically present at a meeting, or by responding to voting conducted by telephone, by mail, or by electronic means. The Budget Advisory Committee makes recommendations concerning the annual budget to the Executive Committee.

The Budget Advisory Committee is comprised of the Chair, Vice Chair, and Past Chair of the Technical Committee, the chair of the SAES regional administrative advisors, and representatives of the funding organizations for the NADP networks. The Budget Advisory Committee is co-chaired by the Chair of the NADP Technical Committee and one other member elected by the Budget Advisory Committee. At all meetings, the co-chairs of the Budget Advisory Committee designate a recorder, who shall provide a written record of all nonconfidential actions to the Program Office for dissemination to all members of the Budget Advisory Committee, the Executive Committee, and the archives.

Section 5. SUBCOMMITTEES

A. Structure

Subcommittees provide much of the technical guidance necessary to conduct the NADP mission. In general, subcommittees may be either permanent (“standing”) or temporary (“*ad hoc*”). Whereas *ad hoc* subcommittees may be formed by either the Executive Committee or the Technical Committee to accomplish specific tasks over restricted time periods, standing subcommittees shall exist indefinitely for the purpose of providing routine input to the Executive and Technical Committees.

Three standing committees currently coordinate the monitoring and research activities of the NADP networks. Specific matters considered by the standing subcommittees relate to (a) network operations, including siting criteria, site operations, methods development, and quality assurance (*Network Operations Subcommittee* or NOS); (b) data management, including data coding, analysis, and reporting (*Data Management and Analysis Subcommittee* or DMAS); and (c) interfacing the network monitoring program with environmental effects (*Environmental Effects Subcommittee* or EES). Each subcommittee may consider other matters as determined by assignment from the Executive Committee and/or by suggestions from its members.

Standing subcommittees convene at least once each year at the annual Technical Committee meeting and at additional times as needed. Membership and voting rights in the standing subcommittees are open to all Technical Committee members. Decisions in all subcommittees are made by a simple majority of the voting members present at an in-person meeting, or by responding to voting conducted by mail, by telephone, or by electronic means. Each subcommittee shall designate a recorder who shall prepare a written record of all actions and provide this record in a timely manner to the Program Coordinator for dissemination and archiving. Standing subcommittees shall provide input to the Technical Committee and the Executive Committee through reports and recommendations (as motions brought to the Technical Committee for approval).

B. Subcommittee Officers

Officers of each subcommittee shall be determined by the members of that subcommittee and shall serve without honoraria. Typically, officers consist of a Chair, Vice Chair, and Secretary who rotate through the various positions on an annual basis. However, the arrangement and terms of subcommittee officers may differ from this model if agreed upon by the members of that subcommittee. The duties of NADP subcommittee officers are the same as those of officers in similar organizations, unless prescribed otherwise by these Guidelines or assigned by the Technical Committee.

C. Charges of the Standing Subcommittees

The *Subcommittee on Network Operations* (NOS) is charged with the following:

- Evaluating siting criteria, instrumentation, procedures, methods, and technologies proposed for use by each of the various NADP networks.
- Reviewing and evaluating field-measurement procedures to ensure that the proper protocols are routinely followed, making recommendations for change as appropriate.
- Periodically reviewing/auditing the analytical laboratories and the external quality assurance program to ensure that the proper procedures are being used and that appropriate quality control (QC) and quality assurance (QA) protocols are being followed.
- Evaluating and determining the acceptability of changes proposed for the analytical laboratories concerning analytical methods, laboratory procedures, and QC and QA protocols.
- Assuring that the analytical data generated for the networks meet program needs and are accompanied by complete QA documentation. When program needs change, this subcommittee reviews and recommends changes in the QA Plan on matters of network operations.
- Reviewing, evaluating, and approving the instruction manuals for site operations and proposing changes in these manuals as deemed necessary.
- Recommending and reviewing procedures for recording measurements and observations reported by field site operators, the analytical laboratories, the Program Office, and by external auditing agencies. This charge includes the review and approval of the design of the Field Observer Report Form and the precipitation gage records.
- Providing reports to the Technical Committee and the Executive Committee as appropriate. Copies of these reports are sent to the network QA manager and to the agency representatives of the external-audit and QA programs.

The *Subcommittee on Data Management and Analysis* (DMAS) is charged with the following:

- Reviewing and recommending proposed changes in data management procedures to improve accuracy or efficiency in current practices and to meet new or modified objectives.
- Reviewing and approving all standard operating procedures (SOPs) relating to data management and reporting, including all proposed changes to these documents. This charge includes all data screening and coding procedures used by sites, the analytical laboratories, the Program Office, and all criteria for data reporting.
- Reviewing and approving the format of data reports and summaries from the Program Office and recommending changes consistent with reporting objectives, including evaluating and approving the criteria for use of site data in these reports and summaries.
- Ensuring that appropriate data management procedures are being used and that appropriate QA and QC protocols are being followed by participating in the technical reviews and audits of the analytical laboratories and Program Office data management operations.
- Ensuring that the network data meet program needs and are accompanied by complete QA documentation and reviewing and recommending changes in the QA Plan on matters of data-management operations when the needs of the program change.

- Providing reports to the Technical Committee and to the Executive Committee as appropriate and sending copies of these reports to the network QA manager and the agency representatives of the external audit programs.

The *Subcommittee on Environmental Effects* (EES) is charged with the following:

- Advising the NADP on the needs for atmospheric deposition data by effects researchers.
- Reviewing scientific approaches and content in all interpretive publications of NADP.
- Making recommendations to the Executive Committee on priorities for research funding.
- Promoting communication and cooperation among effects researchers.

Section 6. PROGRAM OFFICE

The Program Office is responsible for administering the activities of the NADP on a daily basis under the guidance of the Executive Committee. Primary responsibilities of the Program Office include, but are not limited to data management and dissemination; fiscal management; assistance to site operators, including hardware replacement; coordination of QA activities; the production of annual summaries and other reports; site documentation; contracting for analytical services; coordinating with cooperating agencies and other supporting programs; and performing other activities that enable the networks to function smoothly.

Program Coordinator: The Program Coordinator shall have the administrative responsibility for all Program Office activities. Specifically, the Program Coordinator shall be responsible for implementing the various policies, programs and activities approved by the Technical Committee and the Executive Committee. The Program Coordinator, appointed and employed by the institution at which the Program Office resides, shall be a voting member of the Technical Committee and a nonvoting member of the Executive Committee. The Program Coordinator shall oversee and archive the records of the NADP; distribute and archive the minutes of the various meetings of the Technical Committee, the Executive Committee, and the standing subcommittees; and prepare meeting announcements as advised by the Executive Committee for distribution to appropriate members in a timely manner. The Program Coordinator shall have on hand at all times these NADP Guidelines and the parliamentary rules of order, and shall perform other duties as may be delegated by the Technical Committee.

Staffing: The Program Office shall be staffed with appropriate professional specialists, under the direction of the Program Coordinator, to carry out the contractual and other responsibilities of the Program Office, including, but not limited to, providing suitable analytical services and support for NADP meetings.

Section 7. AMENDMENTS AND PARLIAMENTARY AUTHORITY

These Guidelines may be amended as appropriate by a simple majority of voting members at any Technical Committee meeting.

A version of the parliamentary writings of General Henry M. Roberts approved by the Technical Committee shall govern the NADP in all instances not covered by these Guidelines.

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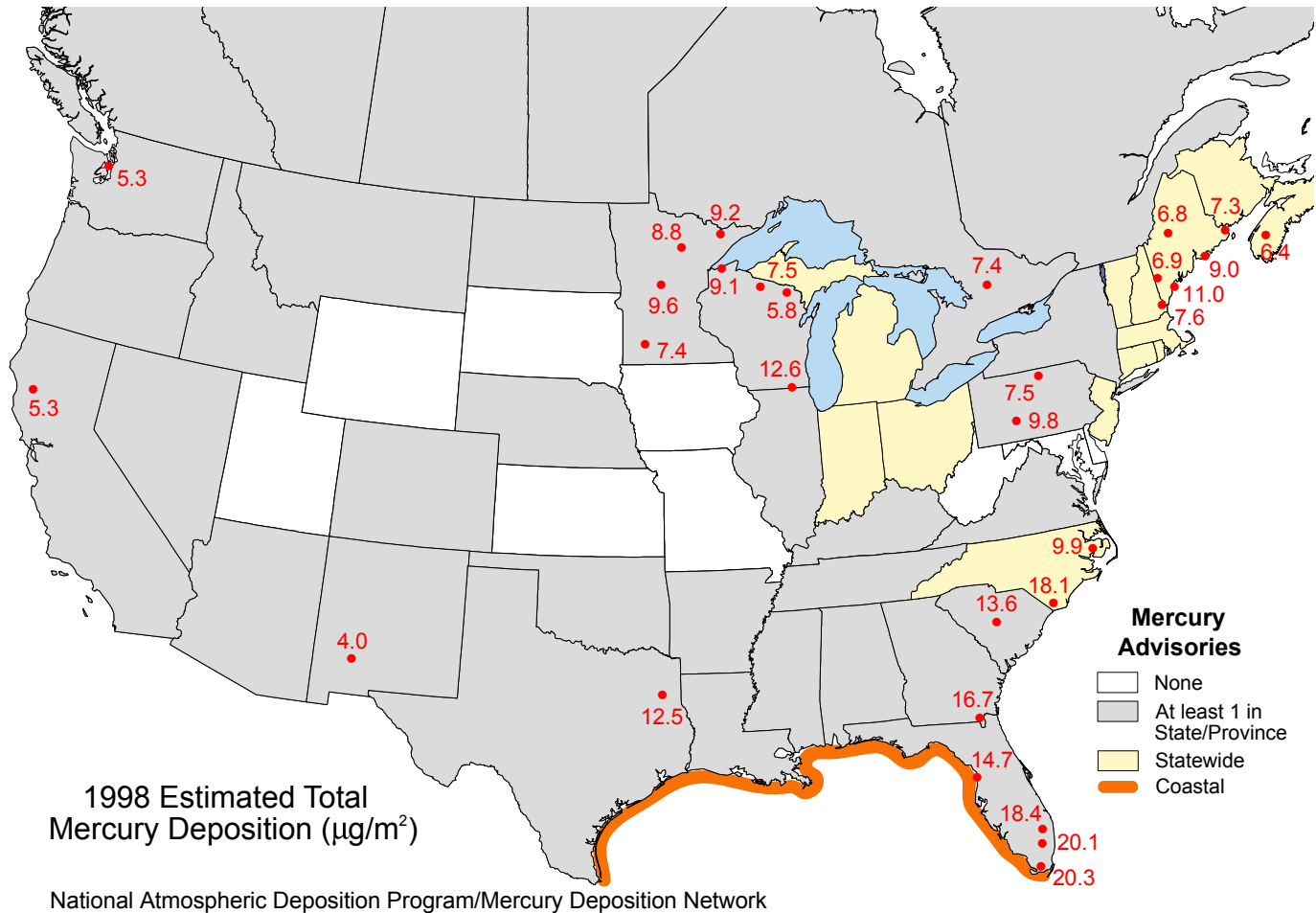
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Inside Rain

A Look at the National Atmospheric Deposition Program



NATIONAL ATMOSPHERIC DEPOSITION PROGRAM

2000 CALENDAR



NV03

NV03 is located in Smith Valley, Nevada. Spectacular views of five mountain ranges can be seen from the high desert site (Elev. 4,840 ft.). The site began sampling on August 7, 1985, and was relocated to nearby private property in June of 1995.

The site is operated by the U.S. Geological Survey (USGS) and sponsored by the USGS Water Resources Division (USGS-WRD). Kerry Garcia and Laurie Bonner (above), both of the USGS-WRD, supervise and operate the site, respectively.

Rain can be scarce in the high desert and weeks or months can go by without precipitation. The desert will quite often celebrate an unexpected rain shower with a myriad of flowers (at left).

Photos by Laurie Bonner

