

USDA Forest Service

Air Resource Monitoring System Existing Data Set Listing (May 1997)



Air Resource Monitoring System (ARMS)

Data Set Listing

May 1997

Contact

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AIR RESOURCE MONITORING SYSTEM DATA SET LISTING

Introduction

The Analysis Stage of the Air Resource Monitoring System (ARMS) was initiated in February 1996 with the intent of understanding and documenting the “user requirements” of the Air Program as they relate to the collection, storage and analysis of resource monitoring data. The interests of the Air Program are truly unique in the Forest Service. They span a wide range of functional interests including lakes and streams, vegetation, wet and dry deposition, soil, geology, snowpack, air quality (including visibility), aquatic fauna, cultural resources and many others. These user requirements were collected during a series of interview sessions conducted in Lakewood, CO; Atlanta, GA; Sacramento, CA; and Portland, OR in the Spring of 1996. These sessions were attended by approximately 40 people, spanning the range from Regional Program Managers, to district biologists and interagency counterparts (see Appendix).

The identification of existing data sets was an important part of the process. Interview participants were asked to bring copies of the data sets they were currently interested in, including field data forms and monitoring protocols, where possible.

Since this initial collection could have been overwhelming, the project core team, consisting of Bruce Bayle (R8), Susan Sater (R6), Ann Mebane (R4), and Steve Boutcher (WO/R6), developed criteria to help reduce the potential listing of data sets of interest to the Air Program to a manageable number. In order for a data set to be included within the scope of this project, it must pass three screens.

- (1) The data set must have been collected, at least partially on Forest Service lands, or by the Forest Service on adjacent lands.
- (2) The data set must have a written protocol, detailed enough that a data user in the shared Forest Service information environment would have a good indication of the data set’s quality and reliability.
- (3) The data should not currently be accessible to all interested Forest Service employees.

What was excluded were data sets of interest to the Forest Service Air Program, though collected on non-Forest Service lands (e.g. National Weather Service Upper Air Transport Data), as well as data sets that had no identifiable meta-data (who, when, and how the data was collected) and those already residing in Forest Service applications on the corporate hardware (e.g. Weather Information Management System).

A total of 104 distinct data sets made it through this screening process. These data sets varied greatly in both spatial and temporal extent, ranging in geographic size from a single lake to the entire United States, and in time from a single sampling event to a 50-year monitoring effort.

Data Set Descriptions

What follows is a set-by-set description of the data sets identified during the Analysis Stage of the ARMS Project.

Data sets are organized first by those which are national or multi-regional, and then followed by regional data sets. The data set descriptions forms include:

- * **Data Set Name:** A name attached by the project team to this data set. Though an attempt was made for this name to be consistent with the title used locally, some discrepancies may exist.
- * **Who Collected Data:** The person or organization responsible for the physical collection of the data, not the funding.
- * **Data Contact Name and Phone Number:** The official steward of the data, and the person who should be contacted by someone wanting to receive a copy of the raw data.
- * **Forest Service ARM Contact:** The person in the FS ARM Program most knowledgeable about this data set.
- * **Data Set Description:** A brief description of the data set objectives and contents.
- * **Data Collection Protocol:** The specific methods used to collect the data, typically listed as the document containing the protocol.
- * **Geographic Extent:** The spatial range of the data set.
- * **Location Description:** An indication of how geographic information is imbedded in the data set, which is of particular interest if this data set will link to GIS.
- * **Time Period:** The temporal range of the data set.
- * **Available Data Set Format:** The current format(s) the data currently exists in.

More detailed data set descriptions and copies of protocol documentation are available for many of these data sets. Those interested should contact Steve Boutcher at (503) 808-2960.

ARMS Existing Data Set Form

Data Set Name: EPA's Eastern Lakes Survey

Who Collected Data: Interagency (led by EPA)

Data Contact Name: Dickson Landers (EPA-Corvallis)

Phone Number: (541) 754-4427

Forest Service ARM Contact: Jerome Thomas

Data Set Description: Part of Phase I of EPA's National Surface Water Survey (NSWS). The Eastern Lakes Survey (ELS) sampled 1,592 lakes > 4 hectares, representing an estimated population of 17,593 lakes in the Northeast, the Upper Midwest, the Southern Blue Ridge Region, and Florida. Phase II of the lake survey was conducted in 1986 to evaluate seasonal chemical variability in Northeast lakes.

Data Collection Protocol:

Linthurst, R.A. et. al. 1986. Characteristics of Lakes in the Eastern United States. Volume I: Population Descriptions and Physico-Chemical Relationships. EPA/600/4-86/007b, U.S. Environmental Protection Agency, Washington, D.C.

Geographic Extent: Northeast, the Upper Midwest, the Southern Blue Ridge Region, and Florida.

Location Description: Latitude / longitude

Time Period: 1984 & 1986

Available Data Set Format: Oracle database.

Comments:

ARMS Existing Data Set Form

Data Set Name: EPA's National Stream Survey

Who Collected Data: Interagency (led by EPA)

Data Contact Name: Alan Herlihy (EPA-Corvallis)

Phone Number: 541-754-4442

Forest Service ARM Contact: Dave Wergowske

Data Set Description: Part of Phase I of EPA's National Surface Water Survey (NSWS). The National Stream Survey (NSS) sampled 500 streams representing an estimated population of 56,000 stream reaches throughout much of the Mid-Atlantic Coastal Plain, Mid-Appalachian, Poconos/Catskills, Interior Southeast, and Florida regions.

Data Collection Protocol:

Chemical Characteristics of Streams in the Mid-Atlantic and Southeastern United States (National Stream Survey - Phase I). Volume I: Population Descriptions and Physico-Chemical Relationships. EPA/600/3-88/021a.

Geographic Extent: The Mid-Atlantic Coastal Plain, Mid-Appalachian, Poconos/Catskills, Interior Southeast, and Florida regions.

Location Description: Latitude / longitude.

Time Period: 1986

Available Data Set Format: Oracle database.

Comments:

ARMS Existing Data Set Form

Data Set Name: EPA Western Lakes Survey

Who Collected Data: Interagency (led by EPA)

Data Contact Name: Dickson Landers (EPA-Corvallis)

Phone Number: (541) 754-4427

Forest Service ARM Contact: Mark Story, Tamara Blett

Data Set Description: The first phase of the National Surface Water Survey was designed to determine the present chemical status of surface waters in regions of the United States that contain the majority of lakes considered to be at risk as a result of acidic deposition. The Western Lakes Survey (WLS) sampled 719 lakes > 1 hectare, representing an estimated population of 10,393 lakes.

Data Collection Protocol:

Western Lake Survey Phase I. Characteristics of Lakes in the Western United States: Volume 1. Population Descriptions and Physico-Chemical Relationships. EPA/600/3-86/054a. January 1987.

Geographic Extent: Western United States (Montana, Idaho, Wyoming, Utah, Colorado, New Mexico, Nevada, Washington, Oregon, California)

Location Description: Latitude / longitude

Time Period: 1985 (Fall)

Available Data Set Format: Oracle Database (files available in ASCII format)

Comments: Data is available in three formats: (1) the validated data set; (2) the final data set; and (3) the PC data set.

ARMS Existing Data Set Form

Data Set Name: Forest Health Monitoring (FHM) Lichen Monitoring

Who Collected Data: Interagency

Data Contact Name: Bryan Cordova

Phone Number: (702) 731-4182

Forest Service ARM Contact: Linda Geiser

Data Set Description: The lichen community indicator is implemented in two phases: (1) construction of a gradient model of lichen communities to isolate and describe an air quality gradient and (2) application of the model to calculate air pollution impact scores for on-frame plots. Field work includes collecting lichen specimens on plot for later identification by a lichenologist, in addition to an estimate of species abundance. Tissue elemental analysis was initially conducted, but was discontinued due to unsatisfactory results.

Data Collection Protocol:

Tallent-Halsell, N.G. (editor). 1994. Forest Health Monitoring 1994 Field Methods Guide. EPA/620/R-94/027. U.S. Environmental Protection Agency, Washington D.C.

Geographic Extent: Southeastern United States, New England, Colorado, California, Oregon and Washington.

Location Description: Latitude / longitude

Time Period: 1990 - present

Available Data Set Format: Oracle database, FTP, SAS, Excel spreadsheet

Comments:

ARMS Existing Data Set Form

Data Set Name: Forest Health Monitoring (FHM) Ozone Bioindicator Plant Data Set

Who Collected Data: Interagency

Data Contact Name: Barbara O'Connell

Phone Number: (610) 975-4037

Forest Service ARM Contact: Bill Jackson

Data Set Description: Ozone injury surveys were conducted close to FHM detection monitoring plots. The foliage of sensitive plants are examined for the presence or absence of ozone injury, and the amount and severity of injury are recorded.

Data Collection Protocol: EMAP FHM, Ozone Bioindicator Plants, Rev. No. 0, April 1995

Geographic Extent: Midwest and East coast

Location Description: Latitude / longitude

Time Period: 1990 - present

Available Data Set Format: FTP, SAS, Excel spreadsheet

Comments:

ARMS Existing Data Set Form

Data Set Name: IMPROVE Aerosol Monitoring Data Set

Who Collected Data: Interagency

Data Contact Name: Scott Copeland

Phone Number: (970) 491-3315

Forest Service ARM Contact: Scott Copeland

Data Set Description: National network to determine existing air quality in federal Class I areas, identify sources of existing manmade impairment, and document long-term trends to track progress towards the long-term goal of no manmade impairment of protected areas. Aerosol monitoring conducted using up to four modules that measure the composition and concentration of the fine particles that produce extinction and the tracers that identify emission sources.

Data Collection Protocol:

IMPROVE Aerosol Sampler Operations Manual. Technical Instruction 176D. University of California at Davis.

Geographic Extent: Nationwide (71 sites)

Location Description: Latitude / longitude

Time Period: 1988-present

Available Data Set Format: Electronic flat file, hard-copy data summary

Comments:

ARMS Existing Data Set Form

Data Set Name: IMPROVE Nephelometer Data Set

Who Collected Data: Interagency

Data Contact Name: Scott Copeland

Phone Number: (970) 491-3315

Forest Service ARM Contact: Scott Copeland

Data Set Description: : National network to determine existing air quality in federal Class I areas, identify sources of existing manmade impairment, and document long-term trends to track progress towards the long-term goal of no manmade impairment of protected areas. Visibility data collected, as part of the IMPROVE network, through use of a nephelometer which measures light scattering.

Data Collection Protocol: Standard Operating Procedures and Technical Instructions: Nephelometer, Air Resource Specialists

Geographic Extent: Nationwide (approx. 25 sites)

Location Description: Latitude / longitude

Time Period: 1988-present

Available Data Set Format: Electronic flat file

Comments:

ARMS Existing Data Set Form

Data Set Name: IMPROVE Transmissometer Data Set

Who Collected Data: Interagency

Data Contact Name: Scott Copeland

Phone Number: (970) 491-3315

Forest Service ARM Contact: Scott Copeland

Data Set Description: National network to determine existing air quality in federal Class I areas, identify sources of existing manmade impairment, and document long-term trends to track progress towards the long-term goal of no manmade impairment of protected areas. Visibility data collected, as part of the IMPROVE network through use of transmissometer to measure light extinction.

Data Collection Protocol: Standard Operating Procedures and Technical Instructions: Transmissometer, Air Resource Specialists

Geographic Extent: Nationwide (approx. 25 sites)

Location Description: Latitude / longitude

Time Period: 1988-present

Available Data Set Format: Electronic flat file

Comments:

ARMS Existing Data Set Form

Data Set Name: National Atmospheric Deposition Program/ National Trends Network Data Set

Who Collected Data: Interagency (led by NADP)

Data Contact Name: Cathy Copeland

Phone Number: (970) 491-3608

Forest Service ARM Contact: Ann Mebane

Data Set Description: Deposition data from over 200 rural sites across the country. The objectives are to

determine the spatial patterns and temporal trends in chemical deposition in support of effects research. Information will help in assessing impacts on aquatic and terrestrial ecosystems. Both wet and dry deposition are collected, but only wet deposition data are available to date.

Data Collection Protocol: NADP site operator handbook

Geographic Extent: Approximately 200 sites across the country.

Location Description: Latitude / longitude

Time Period: 1978 - present

Available Data Set Format: Electronic flat file.

Comments:

ARMS Existing Data Set Form

Data Set Name: National Dry Deposition Network Data Set

Who Collected Data: Interagency (led by EPA)

Data Contact Name: Ralph Baumgardner (EPA, RTP)
Barry Martin

Phone Number: (919) 541-4625
(919) 541-4386

Forest Service ARM Contact: Ann Mebane, Nick O'Prandy

Data Set Description: Dry deposition variables tracked are: sulfur dioxide, particular sulfate, particulate nitrate, and nitric acid. They also track meteorological data (wind speed, direction, temperature, RH, solar radiation) and ozone. Many are co-located with NADP sites.

Data Collection Protocol:

CASTNET: National Dry Deposition Network, 1990 - 1992, Status Report, EPA-600-R-95-086.

Geographic Extent: Entire United States

Location Description: Latitude/longitude

Time Period: 1987 - present

Available Data Set Format: Electronic flat files

Comments:

ARMS Existing Data Set Form

Data Set Name: "Other" Nephelometer Data

Who Collected Data: Forest Service

Data Contact Name: Bob Bachman

Phone Number: (503) 326-5427

Forest Service ARM Contact: Bob Bachman

Data Set Description: This data set contains all optical measurements taken with nephelometers, other than those which are a part of the IMPROVE Program.

Data Collection Protocol: Varies by data collection effort.

Geographic Extent: Varies.

Location Description: Varies.

Time Period: Varies.

Available Data Set Format: Typically raw data stored on data logger. May involve some processing by a contractor.

Comments: At the present time, this only consists of data collected with the Radiance Research nephelometer in Region 6, but this data set may grow more diverse over time.

ARMS Existing Data Set Form

Data Set Name: Stacked Filter Unit (SFU) Network Data

Who Collected Data: University of California at Davis (funded by National Park Service)

Data Contact Name: Scott Copeland

Phone Number: (970) 491-3315

Forest Service ARM Contact: Scott Copeland

Data Set Description: An aerosol monitoring data set, the same data effectively as IMPROVE Module A

The network was funded by the National Park Service, and was conducted by University of California at Davis. Same data structure as IMPROVE Module A.

Data Collection Protocol:

Geographic Extent: Approximately 50 sites across the country.

Location Description: Latitude / longitude

Time Period: 1979 - 1993

Available Data Set Format: Electronic flat file.

Comments:

ARMS Existing Data Set Form

Data Set Name: USFS Camera Qualitative Monitoring Data

Who Collected Data: Forest Service

Data Contact Name: Kristi Savig

Phone Number: (970) 484-7941

Forest Service ARM Contact: Kristi Savig

Data Set Description: This data set contains information about slides taken as part of camera visibility monitoring programs. It includes IMPROVE qualitative camera slides.

Data Collection Protocol: Air Resource Specialists Standard Operating Procedures and Technical Instructions for Camera

Geographic Extent: Nationwide

Location Description: Latitude / longitude

Time Period:

Available Data Set Format: Electronic flat file

Comments:

ARMS Existing Data Set Form

Data Set Name: USFS Quantitative Camera Monitoring Network

Who Collected Data: Interagency

Data Contact Name: Kristi Savig (Contractor)

Phone Number: (970) 484-7941

Forest Service ARM Contact: Scott Copeland

Data Set Description: A national network of manual and automatic cameras used to measure standard visual range and to describe qualitative visibility conditions.

Data Collection Protocol: Air Resource Specialists Standard Operating Procedures and Technical Instructions for Camera

Geographic Extent: Nationwide

Location Description: Latitude / longitude

Time Period: 1983-present

Available Data Set Format: Electronic flat files; database

Comments:

ARMS Existing Data Set Form

Data Set Name: Anaconda-Pintlar Wilderness Lichen Biomonitoring Data Set

Who Collected Data: Dr. Larry St. Clair, Brigham Young University (under contract with FS)

Data Contact Name: Dr. Larry St. Clair

Phone Number: (801) 378-4879

Forest Service ARM Contact: Ann Acheson

Data Set Description: Larry St. Clair has collected basic lichen data, and conducted tissue analysis, at various Forest Service sites across the country. The typical monitoring effort includes: establishment of reference sites in and near the Wilderness of interest; a description of the reference sites characterization (plant communities, landforms, etc.); a list of lichen species for each reference site, including relative abundance, growth form, substrate and pollution sensitivity (if known); a list of pollution-sensitive lichen species for each reference site; and mean baseline concentrations of 20 potential pollutant elements in the tissues of sensitive indicator species. In most cases, lichens were collected and are stored in the herbarium at BYU.

Data Collection Protocol:

St. Clair, Larry L.: XXXX; Final Report Regarding the Establishment of a Lichen Biomonitoring Program and Baseline in the Anaconda-Pintlar Wilderness.

Geographic Extent: Anaconda-Pintlar Wilderness

Location Description: Latitude / longitude

Time Period: 1991 - present

Available Data Set Format: Electronic flat files, hard copy reports

Comments:

ARMS Existing Data Set Form

Data Set Name: Bitterroot Valley Particulate Monitoring Data Set

Who Collected Data: Forest Service

Data Contact Name: Bob Jeffrey (MT Air Quality Division) Phone Number: (406) 444-1499

Forest Service ARM Contact: Bob Hammer

Data Set Description: For assessing, predicting and mitigating air quality impacts of wildland fire in the Bitterroot Valley. Monitoring includes two hi-vol particulate samplers, a TEOM particulate sampler, and a camera. Monitoring is conducted year-round.

Data Collection Protocol: "Bitterroot Valley Particulate Monitoring Progress Report"

Geographic Extent: Bitterroot Valley, Montana

Location Description: Latitude / longitude (mapped locations)

Time Period: 1994 - present.

Available Data Set Format: ASCII files; EPA-AIRS database; hard-copy summary reports.

Comments:

ARMS Existing Data Set Form

Data Set Name: Bob Marshall Wilderness Water Quality Study

Who Collected Data: University of Montana (Bonnie Ellis, Jack Stanford, Dale Chess)

Data Contact Name: Bonnie Ellis

Phone Number: (406) 982-3301

Forest Service ARM Contact: Mark Story

Data Set Description: A benchmark water quality study of two lakes in the Bob Marshall Wilderness with emphasis on sensitivity to acid precipitation.

Data Collection Protocol: Limnology of Two Subalpine Lakes in the Bob Marshall Wilderness, Montana

Geographic Extent: Two lakes in the Bob Marshall wilderness.

Location Description: Latitude / longitude

Time Period: 1989 -1993

Available Data Set Format: Hardcopy report, data files unknown

Comments:

ARMS Existing Data Set Form

Data Set Name: Cabinet Mountains Wilderness Lichen Biomonitoring Data Set

Who Collected Data: Dr. Larry St. Clair, Brigham Young University (under contract with FS)

Data Contact Name: Dr. Larry St. Clair

Phone Number: (801) 378-4879

Forest Service ARM Contact: Ann Acheson

Data Set Description: Larry St. Clair has collected basic lichen data, and conducted tissue analysis, at various Forest Service sites across the country. The typical monitoring effort includes: establishment of reference sites in and near the Wilderness of interest; a description of the reference sites characterization (plant communities, landforms, etc.); a list of lichen species for each reference site, including relative abundance, growth form, substrate and pollution sensitivity (if known); a list of pollution-sensitive lichen species for each reference site; and mean baseline concentrations of 20 potential pollutant elements in the tissues of sensitive indicator species. In most cases, lichens were collected and are stored in the herbarium at BYU.

Data Collection Protocol:

St. Clair, Larry L.: XXXX; Final Report Regarding the Establishment of a Lichen Biomonitoring Program and Baseline in the Cabinet Mountains Wilderness.

Geographic Extent: Cabinet Mountains Wilderness

Location Description: Latitude / longitude

Time Period: 1991 - present

Available Data Set Format: Electronic flat files, hard copy reports

Comments:

ARMS Existing Data Set Form

Data Set Name: Region 1 Lake Chemistry Data Set

Who Collected Data: Forest Service

Data Contact Name: Mark Story (Gallatin NF)

Phone Number: (406) 587-6713

Forest Service ARM Contact: Mark Story

Data Set Description: A region-wide characterization of the chemical composition of lakes in Region 1 Wildernesses, leading up to more intensive monitoring of the most sensitive lakes.

Phase 1 - A synoptic survey - do as many lakes as possible in a given wilderness (30-60) - measure basic parameters such as pH and conductivity

Phase 2 - Approximately 40-50% of the lakes are resampled - more parameters are measured. Has been done in the Selway-Bitterroot, Cabinet Mountains, Anaconda-Pintler, Mission Mountains, Gates of the Mountains, and the Bob Marshall Wildernesses.

Phase 3 - Long-term monitoring of the most sensitive lakes is initiated. Only lakes in the Selway-Bitterroot, Cabinet Mountains, and Absaroka-Beartooth Wildernesses have been included in Phase 3. Due to expense, only includes 2 lakes per Wilderness.

Data Collection Protocol: Field collection protocols are documented in multiple documents, aimed at particular groupings of Wildernesses, as well as by Phase. Example:

Story, Mark. 1995. Cabinet Mountains and Selway Bitterroot Wilderness Phase 3, Chemistry Sampling Procedures, 1995.

Geographic Extent: Region 1

Location Description: Public Land Survey System; USGS Quad.

Time Period: Selway-Bitterroot, Cabinet Mountains, Anaconda-Pintler, and Gates of the Mountains Wildernesses (1992 - present); Mission Mountains Wilderness (1995); Absaroka-Beartooth Wilderness (1995 - present).

Available Data Set Format: Spreadsheet (Quattro Pro); hard-copy data summary.

Comments:

ARMS Existing Data Set Form

Data Set Name: Selway-Bitterroot Wilderness Lichen Biomonitoring Data Set

Who Collected Data: Contractor (Larry St. Clair)

Data Contact Name: Larry St. Clair

Phone Number: (801) 378-4879

Forest Service ARM Contact: Ann Acheson

Data Set Description: Approximately 15 "reference sites" have been established in/around the Selway-Bitterroot Wilderness. Activities have included: collection, curation and identification of lichen species; identification of pollution sensitive lichen species at each reference site and collection of tissue for elemental analysis; and a determination of baseline thallus concentrations of 20 potential pollutant elements.

Data Collection Protocol: "Establishment of a Lichen Biomonitoring Program and Air Quality Baseline in the Selway-Bitterroot Wilderness Area, Moose Creek District, Idaho," St. Clair, 1995

Geographic Extent: Selway-Bitterroot Wilderness (15 reference sites)

Location Description: Latitude / longitude

Time Period: 1992 - 1994.

Available Data Set Format: Spreadsheet, hard copy reports

Comments:

ARMS Existing Data Set Form

Data Set Name: Colorado Wilderness Lake Survey

Who Collected Data: U.S. Geological Survey

Data Contact Name: Don Campbell

Phone Number: (307) 236-4882 x 298

Forest Service ARM Contact: Tamara Blett

Data Set Description: USGS's Long-Term Monitoring (LTM) Project was established to detect and measure trends in the chemistry of low acid neutralizing capability (ANC) surface waters over gradients of H^+ and SO_4^{2-} deposition in different geographic areas.

Data Collection Protocol:

Data User's Guide to the United States Environmental Protection Agency's Long-Term Monitoring Project: Quality Assurance Plan and Data Dictionary. Morrison, Marilyn. 1991. U.S. EPA #600/3-91/072.

Geographic Extent: Mt. Zirkel Wilderness (Lake Elbert, Seven Lakes, Summit Lake, Long Lake Reservoir), Weminuche Wilderness (Big Eldorado, Little Eldorado, White Dome, Upper Sunlight, Lower Sunlight, Upper Grizzly), Flat Tops Wilderness (Ned Wilson Lake, pond above N.W. Lake, spring near N.W. Lake)

Location Description: Latitude / longitude

Time Period: 1984 - present

Available Data Set Format: Flat files, spreadsheet.

Comments:

ARMS Existing Data Set Form

Data Set Name: Flat Tops Wilderness Lichen Monitoring Data Set (Hale 1982)

Who Collected Data: Smithsonian, Mason Hale

Data Contact Name: Tom Nash

Phone Number:

Forest Service ARM Contact: Tamara Blett

Data Set Description: A baseline survey of the lichens in the Flat Tops Wilderness Area was completed in

July-August 1982. Twenty-one collecting sites were surveyed and inventoried and about 1,000 lichen collections made. Twelve permanent plots were established at five major sites. Twenty-six mass samples of important indicator species were collected for elemental analysis.

Data Collection Protocol:

Lichens as Bioindicators and Monitors of Air Pollution in the Flat Tops Wilderness Area, Colorado. Hale, Mason E. Jr. 1982. Final Report Forest Service Contract No. OM RFP R2-81-SP35.

Geographic Extent: Flat Tops Wilderness

Location Description: Map locations (USGS Quads)

Time Period: 1982

Available Data Set Format:

Comments:

ARMS Existing Data Set Form

Data Set Name: Flat Tops Wilderness Lichen Monitoring Data Set (Nash 1992)

Who Collected Data: Contractor (Lichens Unlimited)

Data Contact Name: Tom Nash

Phone Number: (602) 965-7735

Forest Service ARM Contact: Tamara Blett

Data Set Description: Mason Hale's inventory was re-surveyed in 1992 by Lichens Unlimited. All permanent plots were re-photographed, floristic inventory sites revisited, and lichen tissue collected for chemical analysis. The data was then compared to the baseline work of 1992.

Data Collection Protocol:

Lichens Unlimited. 1993. Floristic Surveys of the Lichens of the Flat Tops Wilderness Area, Colorado, USA, 1992.

Geographic Extent: Flat Tops Wilderness

Location Description: Map locations (USGS quads)

Time Period: 1992

Available Data Set Format: Web site: <http://lichen.la.asu.edu>, spreadsheet

Comments:

ARMS Existing Data Set Form

Data Set Name: GLEES (Glacier Lakes Ecosystem Experiment Study) Lakes and Water Chemistry Data

Who Collected Data: Forest Service Research (Rocky Mtn. Forest and Range Experiment Station)

Data Contact Name: Bob Musselman

Phone Number: 970-498-1239

Forest Service ARM Contact: Tamara Blett

Data Set Description: Extensive lake chemistry and watershed information for 3 alpine lakes and several streams and ponds.

Data Collection Protocol: GLEES Monitoring Protocols Manual

Geographic Extent: 575 hectares at 3200-3500 meters elevation in the Snowy Range on the Medicine Bow NF.

Location Description: PLSS and latitude / longitude

Time Period: Lakes data since 1987; collected monthly until 1994, then 2 X per year.

Available Data Set Format: Quattro Pro spreadsheet and Paradox database

Comments: Linda Joyce (RMS Project Leader) will need to approve release of any specific data sets.

ARMS Existing Data Set Form

Data Set Name: Lizard Head Wilderness Lichen Biomonitoring Data Set

Who Collected Data: Dr. Larry St. Clair, Brigham Young University (under contract with FS)

Data Contact Name: Dr. Larry St. Clair

Phone Number: (801) 378-4879

Forest Service ARM Contact: Tamara Blett

Data Set Description: Larry St. Clair has collected basic lichen data, and conducted tissue analysis, at various Forest Service sites across the country. The typical monitoring effort includes: establishment of reference sites in and near the Wilderness of interest; a description of the reference sites characterization (plant communities, landforms, etc.); a list of lichen species for each reference site, including relative abundance, growth form, substrate and pollution sensitivity (if known); a list of pollution-sensitive lichen species for each reference site; and mean baseline concentrations of 20 potential pollutant elements in the tissues of sensitive indicator species. In most cases, lichens were collected and are stored in the herbarium at BYU.

Data Collection Protocol:

St. Clair, Larry L.: XXXX; Final Report Regarding the Establishment of a Lichen Biomonitoring Program and Baseline in the Lizard Head Wilderness.

Geographic Extent: Lizard Head Wilderness

Location Description: Latitude / longitude

Time Period: 1993 - present

Available Data Set Format: Electronic flat files, hard copy reports

Comments:

ARMS Existing Data Set Form

Data Set Name: Mt. Zirkel Lichen/Mosses Data Set

Who Collected Data: Interagency (Forest Service, USGS, Arizona State University)

Data Contact Name: Larry Jackson (USGS)

Phone Number: (303) 236-2473

Forest Service ARM Contact: Tamara Blett

Data Set Description: Focused on chemical concentrations of lichen tissues downwind of two coal-fire power plants. Also includes physiological analysis.__

Data Collection Protocol:

Jackson, Larry L. et. al. 1996. Biogeochemistry of Lichens and Mosses in and near Mt.Zirkel Wilderness, Routt NF, Colorado: Influences of Coal-fire Power Plant Emissions. Draft Project Report.

Geographic Extent: Colorado/Wyoming Rocky Mountains

Location Description: Latitude / longitude; USGS Quad.

Time Period: 1994

Available Data Set Format: Excel spreadsheet; WordPerfect tables

Comments:__

ARMS Existing Data Set Form

Data Set Name: Region 2 Lake Monitoring Data Set

Who Collected Data: Forest Service

Data Contact Name: Tamara Blett

Phone Number: (303) 275-5744

Forest Service ARM Contact: Tamara Blett

Data Set Description: Synoptic and long-term lake chemistry monitoring. Collects samples for lab analysis, plus supporting data. Also includes background data, including photographs, assessments of vegetation and geology. This data set description incorporates the additional attributes collected in support of the Arapaho-Roosevelt NF Lake Monitoring Data Set.

Data Collection Protocol:

Region 2 Lake Sampling Protocols for Initial Inventories (1993) and Region 2 Lake Sampling Protocols for Long-Term Monitoring (1993).

Geographic Extent: Region 2 Wildernesses (Class I and II)

Location Description: Public Land Survey System; lake name.

Time Period: 1989-present.

Available Data Set Format: Lab data = spreadsheet (Quattro Pro); hardcopy field collection forms.

Comments:

ARMS Existing Data Set Form

Data Set Name: Shoshone NF Wilderness Lake Survey Data Set

Who Collected Data: Forest Service

Data Contact Name: Ann Mebane, Scott Maki

Phone Number: (307) 367-4326

Forest Service ARM Contact: Ann Mebane

Data Set Description: Data set includes measurements of water chemistry, macroinvertebrates and zooplankton. Emphasis was on synoptic survey to identify lakes most susceptible to acidic deposition.

Data Collection Protocol: Shoshone Wilderness Lake protocol, Langstaff, 1985

Geographic Extent: Wind River Mountains - east of Continental Divide, Fitzpatrick and Popo Agie wildernesses, Wind River Indian Reservation

Location Description: PLSS

Time Period: 1983-1985

Available Data Set Format: hard copy

Comments:

ARMS Existing Data Set Form

Data Set Name: South San Juan Wilderness Lichen Biomonitoring Data Set

Who Collected Data: Dr. Larry St. Clair, Brigham Young University (under contract with FS)

Data Contact Name: Dr. Larry St. Clair

Phone Number: (801) 378-4879

Forest Service ARM Contact: Tamara Blett

Data Set Description: Larry St. Clair has collected basic lichen data, and conducted tissue analysis, at various Forest Service sites across the country. The typical monitoring effort includes: establishment of reference sites in and near the Wilderness of interest; a description of the reference sites characterization (plant communities, landforms, etc.); a list of lichen species for each reference site, including relative abundance, growth form, substrate and pollution sensitivity (if known); a list of pollution-sensitive lichen species for each reference site; and mean baseline concentrations of 20 potential pollutant elements in the tissues of sensitive indicator species. In most cases, lichens were collected and are stored in the herbarium at BYU.

Data Collection Protocol:

St. Clair, Larry L.: 1994; Final Report Regarding the Establishment of a Lichen Biomonitoring Program and Air Quality Baseline in the San Juan National Forest.

Geographic Extent: South San Juan Wilderness

Location Description: Latitude / longitude

Time Period: 1993 - present

Available Data Set Format: Electronic flat files, hard copy reports

Comments:

ARMS Existing Data Set Form

Data Set Name: USGS's Dividewide Snowpack Chemistry Study

Who Collected Data: U.S. Geological Survey

Data Contact Name: George Ingersoll

Phone Number: (303) 236-4882 x292

Forest Service ARM Contact: Tamara Blett

Data Set Description: Eighty samples, collected at 60 sites, were gathered. Snow collected from these pits were analyzed for major chemical constituents and relative amounts of the stable-sulfur isotope ratio.

Data Collection Protocol:

Ingersoll, George P. 1994. Maximum-Accumulation Snowpack Chemistry at Selected Sites in Northwestern Colorado During Spring 1994. U.S. Geological Survey - Open File Report 95-139.

Geographic Extent: Along the Continental Divide in Montana, Wyoming, Colorado and New Mexico

Location Description: Latitude / longitude

Time Period: 1993 - present

Available Data Set Format: ASCII flat files; spreadsheet.

Comments:

ARMS Existing Data Set Form

Data Set Name: Weminuche Wilderness Lichen Biomonitoring Data Set

Who Collected Data: Dr. Larry St. Clair, Brigham Young University (under contract with FS)

Data Contact Name: Dr. Larry St. Clair

Phone Number: (801) 378-4879

Forest Service ARM Contact: Tamara Blett

Data Set Description: Larry St. Clair has collected basic lichen data, and conducted tissue analysis, at various Forest Service sites across the country. The typical monitoring effort includes: establishment of reference sites in and near the Wilderness of interest; a description of the reference sites characterization (plant communities, landforms, etc.); a list of lichen species for each reference site, including relative abundance, growth form, substrate and pollution sensitivity (if known); a list of pollution-sensitive lichen species for each reference site; and mean baseline concentrations of 20 potential pollutant elements in the tissues of sensitive indicator species. In most cases, lichens were collected and are stored in the herbarium at BYU.

Data Collection Protocol:

St. Clair, Larry L.: 1994; Final Report Regarding the Establishment of a Lichen Biomonitoring Program and Air Quality Baseline in the San Juan National Forest.

Geographic Extent: Weminuche Wilderness

Location Description: Latitude / longitude

Time Period: 1993 - present

Available Data Set Format: Electronic flat files, hard copy reports

Comments:

ARMS Existing Data Set Form

Data Set Name: Chiricahua Wilderness Lichen Biomonitoring Data Set

Who Collected Data: Dr. Larry St. Clair, Brigham Young University (under contract with FS)

Data Contact Name: Dr. Larry St. Clair

Phone Number: (801) 378-4879

Forest Service ARM Contact: Debby Potter

Data Set Description: Larry St. Clair has collected basic lichen data, and conducted tissue analysis, at various Forest Service sites across the country. The typical monitoring effort includes: establishment of reference sites in and near the Wilderness of interest; a description of the reference sites characterization (plant communities, landforms, etc.); a list of lichen species for each reference site, including relative abundance, growth form, substrate and pollution sensitivity (if known); a list of pollution-sensitive lichen species for each reference site; and mean baseline concentrations of 20 potential pollutant elements in the tissues of sensitive indicator species. In most cases, lichens were collected and are stored in the herbarium at BYU.

Data Collection Protocol:

St. Clair, Larry L.: XXXX; Final Report Regarding the Establishment of a Lichen Biomonitoring Program and Baseline in the Chiricahua Wilderness.

Geographic Extent: Chiricahua Wilderness

Location Description: Latitude / longitude

Time Period: 1990 - 1992

Available Data Set Format: Electronic flat files, hard-copy reports

Comments:

ARMS Existing Data Set Form

Data Set Name: Galiuro Wilderness Lichen Biomonitoring Data Set

Who Collected Data: Dr. Larry St. Clair, Brigham Young University (under contract with FS)

Data Contact Name: Dr. Larry St. Clair

Phone Number: (801) 378-4879

Forest Service ARM Contact: Debby Potter

Data Set Description: Larry St. Clair has collected basic lichen data, and conducted tissue analysis, at various Forest Service sites across the country. The typical monitoring effort includes: establishment of reference sites in and near the Wilderness of interest; a description of the reference sites characterization (plant communities, landforms, etc.); a list of lichen species for each reference site, including relative abundance, growth form, substrate and pollution sensitivity (if known); a list of pollution-sensitive lichen species for each reference site; and mean baseline concentrations of 20 potential pollutant elements in the tissues of sensitive indicator species. In most cases, lichens were collected and are stored in the herbarium at BYU.

Data Collection Protocol:

St. Clair, Larry L.: XXXX; Final Report Regarding the Establishment of a Lichen Biomonitoring Program and Baseline in the Galiuro Wilderness.

Geographic Extent: Galiuro Wilderness

Location Description: Latitude / longitude

Time Period: 1990 - 1992

Available Data Set Format: Electronic flat files, hard copy reports

Comments:

ARMS Existing Data Set Form

Data Set Name: Gila Wilderness Lichen Biomonitoring Data Set

Who Collected Data: Dr. Larry St. Clair, Brigham Young University (under contract with FS)

Data Contact Name: Dr. Larry St. Clair

Phone Number: (801) 378-4879

Forest Service ARM Contact: Pete Stewart (Gila National Forest)

Data Set Description: Larry St. Clair has collected basic lichen data, and conducted tissue analysis, at various Forest Service sites across the country. The typical monitoring effort includes: establishment of reference sites in and near the Wilderness of interest; a description of the reference sites characterization (plant communities, landforms, etc.); a list of lichen species for each reference site, including relative abundance, growth form, substrate and pollution sensitivity (if known); a list of pollution-sensitive lichen species for each reference site; and mean baseline concentrations of 20 potential pollutant elements in the tissues of sensitive indicator species. In most cases, lichens were collected and are stored in the herbarium at BYU.

Data Collection Protocol:

St. Clair, Larry L.: 1995; Establishment of a Lichen Biomonitoring Program and Air Quality Baseline at Selected Sites in the Gila Wilderness Area.

Geographic Extent: Seven sites within the Gila Wilderness

Location Description: Latitude / longitude

Time Period: 1996

Available Data Set Format: Electronic flat files, hard copy reports

Comments:

ARMS Existing Data Set Form

Data Set Name: Mazatzal Wilderness Lichen Biomonitoring Data Set

Who Collected Data: Dr. Larry St. Clair, Brigham Young University (under contract with FS)

Data Contact Name: Dr. Larry St. Clair

Phone Number: (801) 378-4879

Forest Service ARM Contact: Pete Lahm

Data Set Description: Larry St. Clair has collected basic lichen data, and conducted tissue analysis, at various Forest Service sites across the country. The typical monitoring effort includes: establishment of reference sites in and near the Wilderness of interest; a description of the reference sites characterization (plant communities, landforms, etc.); a list of lichen species for each reference site, including relative abundance, growth form, substrate and pollution sensitivity (if known); a list of pollution-sensitive lichen species for each reference site; and mean baseline concentrations of 20 potential pollutant elements in the tissues of sensitive indicator species. In most cases, lichens were collected and are stored in the herbarium at BYU.

Data Collection Protocol:

St. Clair, Larry L.: XXXX; Final Report Regarding the Establishment of a Lichen Biomonitoring Program and Baseline in the Mazatzal Wilderness.

Geographic Extent: Mazatzal Wilderness

Location Description: Latitude / longitude

Time Period: 1990 - 1992

Available Data Set Format: Electronic flat files, hard copy reports

Comments:

ARMS Existing Data Set Form

Data Set Name: Pine Mountain Wilderness Lichen Biomonitoring Data Set

Who Collected Data: Dr. Larry St. Clair, Brigham Young University (under contract with FS)

Data Contact Name: Dr. Larry St. Clair

Phone Number: (801) 378-4879

Forest Service ARM Contact: Pete Lahm

Data Set Description: Larry St. Clair has collected basic lichen data, and conducted tissue analysis, at various Forest Service sites across the country. The typical monitoring effort includes: establishment of reference sites in and near the Wilderness of interest; a description of the reference sites characterization (plant communities, landforms, etc.); a list of lichen species for each reference site, including relative abundance, growth form, substrate and pollution sensitivity (if known); a list of pollution-sensitive lichen species for each reference site; and mean baseline concentrations of 20 potential pollutant elements in the tissues of sensitive indicator species. In most cases, lichens were collected and are stored in the herbarium at BYU.

Data Collection Protocol:

St. Clair, Larry L.: XXXX; Final Report Regarding the Establishment of a Lichen Biomonitoring Program and Baseline in the Pine Mountain Wilderness.

Geographic Extent: Pine Mountain Wilderness

Location Description: Latitude / longitude

Time Period: 1990 - 1992

Available Data Set Format: Electronic flat files, hard copy reports

Comments:

ARMS Existing Data Set Form

Data Set Name: Sierra Ancha Wilderness Lichen Biomonitoring Data Set

Who Collected Data: Dr. Larry St. Clair, Brigham Young University (under contract with FS)

Data Contact Name: Dr. Larry St. Clair

Phone Number: (801) 378-4879

Forest Service ARM Contact: Pete Lahm

Data Set Description: Larry St. Clair has collected basic lichen data, and conducted tissue analysis, at various Forest Service sites across the country. The typical monitoring effort includes: establishment of reference sites in and near the Wilderness of interest; a description of the reference sites characterization (plant communities, landforms, etc.); a list of lichen species for each reference site, including relative abundance, growth form, substrate and pollution sensitivity (if known); a list of pollution-sensitive lichen species for each reference site; and mean baseline concentrations of 20 potential pollutant elements in the tissues of sensitive indicator species. In most cases, lichens were collected and are stored in the herbarium at BYU.

Data Collection Protocol:

St. Clair, Larry L.: XXXX; Final Report Regarding the Establishment of a Lichen Biomonitoring Program and Baseline in the Sierra Ancha Wilderness.

Geographic Extent: Sierra Ancha Wilderness

Location Description: Latitude / longitude

Time Period: 1990 - 1992

Available Data Set Format: Electronic flat files, hard copy reports

Comments:

ARMS Existing Data Set Form

Data Set Name: Superstition Wilderness Lichen Biomonitoring Data Set

Who Collected Data: Dr. Larry St. Clair, Brigham Young University (under contract with FS)

Data Contact Name: Dr. Larry St. Clair

Phone Number: (801) 378-4879

Forest Service ARM Contact: Pete Lahm

Data Set Description: Larry St. Clair has collected basic lichen data, and conducted tissue analysis, at various Forest Service sites across the country. The typical monitoring effort includes: establishment of reference sites in and near the Wilderness of interest; a description of the reference sites characterization (plant communities, landforms, etc.); a list of lichen species for each reference site, including relative abundance, growth form, substrate and pollution sensitivity (if known); a list of pollution-sensitive lichen species for each reference site; and mean baseline concentrations of 20 potential pollutant elements in the tissues of sensitive indicator species. In most cases, lichens were collected and are stored in the herbarium at BYU.

Data Collection Protocol:

St. Clair, Larry L.: XXXX; Final Report Regarding the Establishment of a Lichen Biomonitoring Program and Baseline in the Superstition Wilderness.

Geographic Extent: Superstition Wilderness

Location Description: Latitude / longitude

Time Period: 1990 - 1992

Available Data Set Format: Electronic flat files, hard copy reports

Comments:

ARMS Existing Data Set Form

Data Set Name: Sycamore Canyon Wilderness Lichen Biomonitoring Data Set

Who Collected Data: Dr. Larry St. Clair, Brigham Young University (under contract with FS)

Data Contact Name: Dr. Larry St. Clair

Phone Number: (801) 378-4879

Forest Service ARM Contact: Pete Lahm

Data Set Description: Larry St. Clair has collected basic lichen data, and conducted tissue analysis, at various Forest Service sites across the country. The typical monitoring effort includes: establishment of reference sites in and near the Wilderness of interest; a description of the reference sites characterization (plant communities, landforms, etc.); a list of lichen species for each reference site, including relative abundance, growth form, substrate and pollution sensitivity (if known); a list of pollution-sensitive lichen species for each reference site; and mean baseline concentrations of 20 potential pollutant elements in the tissues of sensitive indicator species. In most cases, lichens were collected and are stored in the herbarium at BYU.

Data Collection Protocol:

St. Clair, Larry L.: XXXX; Final Report Regarding the Establishment of a Lichen Biomonitoring Program and Baseline in the Sycamore Canyon Wilderness.

Geographic Extent: Sycamore Canyon Wilderness

Location Description: Latitude / longitude

Time Period: 1990 - 1992

Available Data Set Format: Electronic flat files, hard copy reports

Comments:

ARMS Existing Data Set Form

Data Set Name: Bridger Wilderness Lichen Biomonitoring Program and Air Quality Baseline

Who Collected Data: FS contracts with Brigham Young University, Dr. Larry St. Clair, original baseline collected by Smithsonian Institution - Mason Hale

Data Contact Name: Larry St. Clair

Phone Number: (801) 378-4879

Forest Service ARM Contact: Ann Mebane

Data Set Description: Includes a floristic inventory (with relative abundance) and the elemental analysis of

tissues from pollution sensitive lichen species. Original survey was conducted by Mason Hale of the Smithsonian in 1983. Resurvey conducted in 1992 by Dr. Larry St. Clair of Brigham Young University

Data Collection Protocol:

St. Clair and Newberry. 1993. Lichen Monitoring Program and Air Quality Baseline in Selected Sites of the Bridger Wilderness Area, Bridger-Teton National Forest, Final Report

Geographic Extent: Six references sites, established in two general areas of the Bridger Wilderness.

Location Description: Latitude / longitude

Time Period: 1983 (M.Hale) and 1992 (L.St.Clair)

Available Data Set Format: hard copy reports - spreadsheets

Comments:

ARMS Existing Data Set Form

Data Set Name: Frank Church-River of No Return Wilderness Lichen Monitoring Data Set

Who Collected Data: Contractor (Larry St. Clair)

Data Contact Name: Larry St. Clair

Phone Number: (801) 378-4879

Forest Service ARM Contact: Gary Jackson (Salmon National Forest)

Data Set Description: The project objectives were:

- (1) Identify reference sites across the Salmon NF including the eastern portion of the Frank Church-River of No Return Wilderness area, Idaho.
- (2) Collect, curate, and identify lichen species from various habitats and substrates at each reference site.
- (3) Identify 3-5 pollution-sensitive lichen species at each reference site and collect enough tissue of one sensitive indicator species at each site for elemental analyses.
- (4) Determine baseline thallus concentrations of 20 potential pollutant elements.

Data Collection Protocol:

St. Clair and Newberry. 1994. Establishment of a Lichen Biomonitoring Program and Baseline in the Salmon National Forest including the Eastern Portion of the Frank Church-River of No Return Wilderness Area Idaho and Montana

Geographic Extent: In and near the Frank Church-River of No Return Wilderness.

Location Description: Latitude / longitude

Time Period: 1988

Available Data Set Format: Hard-copy report, spreadsheets

Comments:

ARMS Existing Data Set Form

Data Set Name: High Uintas Wilderness Lichen Biomonitoring Data Set

Who Collected Data: Dr. Larry St. Clair, Brigham Young University (under contract with FS)

Data Contact Name: Dr. Larry St. Clair

Phone Number: (801) 378-4879

Forest Service ARM Contact: Clif Benoit

Data Set Description: Larry St. Clair has collected basic lichen data, and conducted tissue analysis, at various Forest Service sites across the country. The typical monitoring effort includes: establishment of reference sites in and near the Wilderness of interest; a description of the reference sites characterization (plant communities, landforms, etc.); a list of lichen species for each reference site, including relative abundance, growth form, substrate and pollution sensitivity (if known); a list of pollution-sensitive lichen species for each reference site; and mean baseline concentrations of 20 potential pollutant elements in the tissues of sensitive indicator species. In most cases, lichens were collected and are stored in the herbarium at BYU.

Data Collection Protocol:

St. Clair, Larry L.: XXXX; Final Report Regarding the Establishment of a Lichen Biomonitoring Program and Baseline in the High Uintas Wilderness.

Geographic Extent: High Uintas Wilderness

Location Description: Latitude / longitude

Time Period: 1983 - present

Available Data Set Format: Electronic flat files, hard copy reports

Comments:

ARMS Existing Data Set Form

Data Set Name: High Uintas Wilderness Water Chemistry Data

Who Collected Data: Forest Service

Data Contact Name: Nick O'Prandy

Phone Number: (801) 722-5018

Forest Service ARM Contact: Ann Mebane

Data Set Description: Lake monitoring program, following up on work initiated as part of the Western Lakes Survey Program.

Data Collection Protocol: Following EPA's Western Lakes Survey protocol

Geographic Extent: High Uintas Wilderness

Location Description: Stored as lake name (with latitude / longitude)

Time Period: 1985 - present

Available Data Set Format: Stored hard-copy in file cabinet.

Comments: Data may not all be comparable. Water analysis lab was changed a couple of years back and may change again.

ARMS Existing Data Set Form

Data Set Name: Jarbridge Wilderness Lichen Biomonitoring Data Set

Who Collected Data: Dr. Larry St. Clair, Brigham Young University (under contract with FS)

Data Contact Name: Dr. Larry St. Clair

Phone Number: (801) 378-4879

Forest Service ARM Contact: Clif Benoit

Data Set Description: Larry St. Clair has collected basic lichen data, and conducted tissue analysis, at various Forest Service sites across the country. The typical monitoring effort includes: establishment of reference sites in and near the Wilderness of interest; a description of the reference sites characterization (plant communities, landforms, etc.); a list of lichen species for each reference site, including relative abundance, growth form, substrate and pollution sensitivity (if known); a list of pollution-sensitive lichen species for each reference site; and mean baseline concentrations of 20 potential pollutant elements in the tissues of sensitive indicator species. In most cases, lichens were collected and are stored in the herbarium at BYU.

Data Collection Protocol:

St. Clair, Larry L.: XXXX; Final Report Regarding the Establishment of a Lichen Biomonitoring Program and Baseline in the Jarbridge Wilderness.

Geographic Extent: Jarbridge Wilderness

Location Description: Latitude / longitude

Time Period: 1986 - 1989

Available Data Set Format: Electronic flat files, hard copy reports

Comments:

ARMS Existing Data Set Form

Data Set Name: Manti-Lasal National Forest Lichen Biomonitoring Data Set

Who Collected Data: Dr. Larry St. Clair, Brigham Young University (under contract with FS)

Data Contact Name: Dr. Larry St. Clair

Phone Number: (801) 378-4879

Forest Service ARM Contact: Clif Benoit

Data Set Description: Larry St. Clair has collected basic lichen data, and conducted tissue analysis, at various Forest Service sites across the country. The typical monitoring effort includes: establishment of reference sites in and near the Wilderness of interest; a description of the reference sites characterization (plant communities, landforms, etc.); a list of lichen species for each reference site, including relative abundance, growth form, substrate and pollution sensitivity (if known); a list of pollution-sensitive lichen species for each reference site; and mean baseline concentrations of 20 potential pollutant elements in the tissues of sensitive indicator species. In most cases, lichens were collected and are stored in the herbarium at BYU.

Data Collection Protocol:

St. Clair, Larry L.: XXXX; Final Report Regarding the Establishment of a Lichen Biomonitoring Program and Baseline in the Manti-Lasal National Forest.

Geographic Extent: Manti-Lasal National Forest

Location Description: Latitude / longitude

Time Period: 1993 - present

Available Data Set Format: Electronic flat files, hard copy reports

Comments:

ARMS Existing Data Set Form

Data Set Name: Salmon & Challis National Forests Ozone Monitoring Data

Who Collected Data: Forest Service

Data Contact Name: Gary Jackson

Phone Number: (208) 756-5110

Forest Service ARM Contact: Clif Benoit

Data Set Description: The Salmon & Challis National Forests installed a U.V. Photometric Ambient Ozone

Instrument capable of measuring the ambient level of ozone concentrations on a continuous, real-time basis. The U.V. photometer determines the ozone concentration by measuring the intensity of light due to ozone in the absorption cells.

Data Collection Protocol: Ozone monitoring protocol written by Ted Hehn (FS-RMS).

Geographic Extent: One site, located on North Baldy Mtn. at an elevation of 9,000 feet, adjacent to an IMPROVE Module A sampler.

Location Description: Latitude / longitude

Time Period: August 1996 - present

Available Data Set Format: ASCII file from data logger.

Comments:

ARMS Existing Data Set Form

Data Set Name: Sawtooth National Recreation Area Lichen Biomonitoring Data Set

Who Collected Data: Dr. Larry St. Clair, Brigham Young University (under contract with FS)

Data Contact Name: Dr. Larry St. Clair

Phone Number: (801) 378-4879

Forest Service ARM Contact: Clif Benoit

Data Set Description: Larry St. Clair has collected basic lichen data, and conducted tissue analysis, at various Forest Service sites across the country. The typical monitoring effort includes: establishment of reference sites in and near the Wilderness of interest; a description of the reference sites characterization (plant communities, landforms, etc.); a list of lichen species for each reference site, including relative abundance, growth form, substrate and pollution sensitivity (if known); a list of pollution-sensitive lichen species for each reference site; and mean baseline concentrations of 20 potential pollutant elements in the tissues of sensitive indicator species. In most cases, lichens were collected and are stored in the herbarium at BYU.

Data Collection Protocol:

St. Clair, Larry L.: XXXX; Final Report Regarding the Establishment of a Lichen Biomonitoring Program and Baseline in the Sawtooth National Recreation Area.

Geographic Extent: Sawtooth NRA

Location Description: Latitude / longitude

Time Period: 1986 - 1989; 1993 - present

Available Data Set Format: Electronic flat files, hard copy reports

Comments:

ARMS Existing Data Set Form

Data Set Name: Uinta Wilderness Lichen Biomonitoring Data Set

Who Collected Data: Dr. Larry St. Clair, Brigham Young University (under contract with FS)

Data Contact Name: Dr. Larry St. Clair

Phone Number: (801) 378-4879

Forest Service ARM Contact: Clif Benoit

Data Set Description: Larry St. Clair has collected basic lichen data, and conducted tissue analysis, at various Forest Service sites across the country. The typical monitoring effort includes: establishment of reference sites in and near the Wilderness of interest; a description of the reference sites characterization (plant communities, landforms, etc.); a list of lichen species for each reference site, including relative abundance, growth form, substrate and pollution sensitivity (if known); a list of pollution-sensitive lichen species for each reference site; and mean baseline concentrations of 20 potential pollutant elements in the tissues of sensitive indicator species. In most cases, lichens were collected and are stored in the herbarium at BYU.

Data Collection Protocol:

St. Clair, Larry L.: XXXX; Final Report Regarding the Establishment of a Lichen Biomonitoring Program and Baseline in the Uinta National Forest.

Geographic Extent: Uinta National Forest

Location Description: Latitude / longitude

Time Period: 1995

Available Data Set Format: Electronic flat files, hard copy reports

Comments:

ARMS Existing Data Set Form

Data Set Name: Wind River Bulk Deposition Data Set

Who Collected Data: Forest Service

Data Contact Name: Ann Mebane

Phone Number: (307) 367-4326

Forest Service ARM Contact: Ann Mebane

Data Set Description: Bulk deposition chemical data and associated field notes. Hubbard-Brook collectors are used during rainfall season (July-September) and bulk snow collectors used rest of winter. Samples are currently collected every other week in summer and once a month in winter. Samples are handled like NADP samples and have been sent to CAL for analysis. Samples from 1995 on are sent to Rocky Mt Experiment Station. Until 1992 there were 4 wilderness locations and 3 samplers co-located with NADP sites. Currently are 2 wilderness locations only.

Data Collection Protocol: Wind River Field Manual

Geographic Extent: Wind River Mountains, Bridger-Teton and Shoshone National Forests

Location Description: UTM, latitude/longitude

Time Period: 1984 - present

Available Data Set Format: MS Access database, Excel spreadsheets, hard copy

Comments:

ARMS Existing Data Set Form

Data Set Name: Wind River Mountains Long-Term Lake Monitoring Data Set

Who Collected Data: Forest Service

Data Contact Name: Ann Mebane

Phone Number: (307)367-4326

Forest Service ARM Contact: Ann Mebane

Data Set Description: Five lakes are sampled three times each summer for lake chemistry. Samples are taken at the lake inlet, outlet, hypolimnion and epilimnion. Zooplankton and macroinvertebrate samples are collected once each summer.

Data Collection Protocol: Wind River Field Manual

Geographic Extent: Wind River Mountains - Bridger-Teton and Shoshone NF

Location Description: UTM's; latitude / longitude

Time Period: 1983 - present

Available Data Set Format: MS Access data base, Excel spreadsheets, hard copy

Comments:

ARMS Existing Data Set Form

Data Set Name: California Wilderness Lichen Study

Who Collected Data: Contractors (Bruce Ryan, Thomas Nash -- ASU, Tucson, AZ)

Data Contact Name: Corinna Gries

Phone Number: (602) 965-7735 (Nash)

Forest Service ARM Contact: Jim Frazier_

Data Set Description: Baseline study evaluating elemental constituents found in lichen tissues. Includes sample #, weight, and numerous elemental constituents. (May also be floristic inventory - need to look into this).

Data Collection Protocol:

"Lichens and Air Quality in Wilderness Areas in California: A Series of Baseline Studies" (Ryan and Nash, December 1990), Region 5 Lichen Monitoring Protocol , 1988

Geographic Extent: Five California Wilderness Areas (Desolation, Emigrant, Marble Mountain, San Gabriel, and Agua Tibia)

Location Description: Latitude / longitude

Time Period: 1989

Available Data Set Format: Spreadsheet, download flat files from <http://lichen.la.asu.edu>

Comments:

ARMS Existing Data Set Form

Data Set Name: Desolation Wilderness Lake Monitoring Data Set

Who Collected Data: Forest Service

Data Contact Name: Trent Procter

Phone Number: (209) 784-1500 (ext. 114)

Forest Service ARM Contact: Andrea Holland- Sears

Data Set Description : A basic screening of lakes, initiated by a map review of high elevation lakes at the top of watershed, with little anthropogenic activity. Thirteen lakes have been monitored for basic water quality parameters (lab analysis). One lake, Lost Lake, has been more intensively monitored.

Data Collection Protocol: The field collection protocols changed over time, and eventually resulted in a documented protocol: "Wilderness Lake Monitoring Plan, USDA Forest Service, Lake Tahoe Basin Management Unit." The lab analysis protocols are those issued by the UC Santa Barbara lab.

Geographic Extent: Desolation Wilderness (10 lakes); Mokelumne Wilderness (3 lakes)

Location Description: Narrative

Time Period: 1984 - 1990

Available Data Set Format: Hard copy field collection forms; summary reports from lab analysis.

Comments: Data storage in folders at Lake Tahoe Basin office. Includes field forms and data summary (by lake). Zooplankton data was collected, though Andrea did not see the results before she left. She recommended we contact Jim Sickman @ UC Santa Barbara (209-561-3448) to get the results.

ARMS Existing Data Set Form

Data Set Name: Desolation Wilderness Lichen Data Set

Who Collected Data: Forest Service

Data Contact Name: Trent Procter

Phone Number: 209-784-1500 (ext. 1114)

Forest Service ARM Contact: Andrea Holland-Sears

Data Set Description: Data set consists of three components: (1) lichen inventory and community analysis; (2) tissue elemental analysis; and (3) an herbarium.

Data Collection Protocol: Initial data collection was without formalized protocol, but followed techniques taught by Charis Bratt. Later years followed the procedures outlined in the draft Lichen Monitoring Protocols, USDA Forest Service, Region 5.

Geographic Extent: Desolation Wilderness, California

Location Description: Public Land Survey System, USGS Quads; points on maps; and photos.

Time Period: 1986 & 1988

Available Data Set Format: Hard-copy field data collection forms; elemental analysis results on hardcopy reports; and a listing of species in the herbarium.

Comments: The field data collection forms are stored on file at the Lake Tahoe Basin, along with the results of the issue analysis. A listing of species in the herbarium is on file at the Basin, and the physical specimens are included in the Lake Tahoe herbarium.

Andria also mentioned a baseline lichen inventory conducted in the San Gabriel Mountains in the 1920's -- Maile Neel (San Bernadino NF) has the original data - Trent Procter would be a good contact.

ARMS Existing Data Set Form

Data Set Name: Emigrant Wilderness pH Study Data Set

Who Collected Data: Forest Service

Data Contact Name: Jim Frazier
05

Phone Number: (209) 532-3671, ext.

Forest Service ARM Contact: Jim Frazier

Data Set Description: Water chemistry study of lakes in the Emigrant Wilderness.

Data Collection Protocol:

Dow, Del. 1988. Emigrant Wilderness pH Study.

Geographic Extent: Emigrant Wilderness

Location Description: Public Land Survey System

Time Period: 1975 - 1982

Available Data Set Format: Hard-copy data summary

Comments:

ARMS Existing Data Set Form

Data Set Name: Emigrant Wilderness Water Quality Data Set

Who Collected Data: Forest Service

Data Contact Name: Jim Frazier
05)

Phone Number: (209) 532-3671(ext.

Forest Service ARM Contact: Jim Frazier

Data Set Description: Water chemistry study of lakes in the Emigrant Wilderness.

Data Collection Protocol:

Frazier, Jim. 1996. Emigrant Wilderness Water Quality Monitoring Protocols

Geographic Extent: Emigrant Wilderness

Location Description: Public Land Survey System

Time Period: 1975-1982

Available Data Set Format: Hard-copy data summary

Comments:

ARMS Existing Data Set Form

Data Set Name: Inyo National Forest Lichen Bioindicator Air Quality Study

Who Collected Data: Forest Service

Data Contact Name: Luci McKee

Phone Number: (619) 873-2464

Forest Service ARM Contact: Luci McKee

Data Set Description: Initial lichen inventory, including locations, species, substrate. Uses fixed plots. No tissue analysis conducted to date.

Data Collection Protocol: "Lichen Monitoring Report, Inyo National Forest, December, 1996"

Geographic Extent: John Muir, Hoover, and Ansel Adams Wildernesses

Location Description: Mapped locations, photos, narrative

Time Period: 1990-1991 (revisiting plots 1996)

Available Data Set Format: Oracle database (DG)

Comments:

ARMS Existing Data Set Form

Data Set Name: Inyo National Forest Stream Data Set

Who Collected Data: Forest Service

Data Contact Name: Luci McKee

Phone Number: (619) 873-2464

Forest Service ARM Contact: Luci McKee

Data Set Description: Periodic water monitoring also of interest to Air Program. Data attributes include date, discharge, pH, conductivity, turbidity, dissolved oxygen.

Data Collection Protocol: Followed procedures outlined in "USGS National Handbook For Recommended Methods For Water Data Acquisition "

Geographic Extent: Inyo National Forest , approximately 50,000 acres - all non-wilderness.

Location Description: Latitude/longitude data from GPS.

Time Period: 1989- present

Available Data Set Format: Lotus spreadsheet

Comments:

ARMS Existing Data Set Form

Data Set Name: Lassen National Forest Lichen Data Set

Who Collected Data: Forest Service

Data Contact Name: Beth Corbin (Lassen NF)

Phone Number: (916) 257-2151

Forest Service ARM Contact: Bob Faust (Mendocino NF)

Data Set Description: Transect monitoring recording lichen species and substrates

Data Collection Protocol:

Lichen Monitoring Protocol, USDA Forest Service, Region 5 (Draft -- October 17, 1988).

Geographic Extent: Lassen National Forest

Location Description: PLSS, Descriptive

Time Period: 1990 - present

Available Data Set Format: hard copy, DG summary

Comments:

ARMS Existing Data Set Form

Data Set Name: Project FOREST Ozone Bioindicator Data Set

Who Collected Data: Interagency (Forest Service, National Park Service, California Air Resources Board)

Data Contact Name: Susan Schilling (USFS-PSW)

Phone Number: (909) 276-6680

Forest Service ARM Contact: Trent Procter, Chris Sanders (Stanislaus NF)

Data Set Description: Forest Ozone Response Study: primary objective to evaluate the relationship between ozone injury and exposure. Uses Western Pine Plot Method to evaluate ozone injury to Ponderosa and Jeffrey Pines, and correlates with nearby ozone monitors. Uses same protocols as Forest Health Monitoring Program. Includes ozone injury plot data, which includes plot, tree, and whorl level data. This data set does not include the ozone monitoring data (collected by CARB).

Data Collection Protocol:

Procter, Trent et. al. 1995. Forest Ozone Response Study - Project Plan

Geographic Extent: Total of 12 sites, scattered along the range of the Sierra's, from Lassen National Park in the north, to Sequoia National Forest in the south.

Location Description: Latitude / longitude (GPS).

Time Period: 1991-1994, 1996

Available Data Set Format: Existing database (type unknown)

Comments: In relational database - good attention to quality control procedures.

ARMS Existing Data Set Form

Data Set Name: Project FOREST Ozone Monitoring

Who Collected Data: California Air Resources Board

Data Contact Name: Brent Takemoto

Phone Number: (916) 324-2981

Forest Service ARM Contact: Trent Procter

Data Set Description: An aerometric monitoring project was conducted to measure concentrations of ozone and meteorological parameters at six sites on the western slope of the Sierra Nevada Mountains in California. This data is collected to support the ozone injury assessments to Ponderosa Pine at nearby plots.

Data Collection Protocol: "Forest Ozone Response Study – Project Plan", USFS, 1994

Geographic Extent: Six sites along the western slope of the Sierra Nevada Mountains, ranging from the Tahoe National Forest in the north, to the Sequoia National Forest in the south.

Location Description: Latitude / longitude

Time Period: 1991 - 1994 and 1996

Available Data Set Format: Data base files

Comments:

ARMS Existing Data Set Form

Data Set Name: San Gabriel Wilderness Lichen Inventory

Who Collected Data: Forest Service (Maile Neel)

Data Contact Name: Maile Neel

Phone Number: (909) 383-5588

Forest Service ARM Contact: Trent Procter

Data Set Description: The purpose of this project was to assess the effect of air pollution on the air quality related value of vegetation in the San Gabriel Wilderness by gathering baseline data on the current condition of the lichen flora of the wilderness and establishing a means of monitoring future changes. This was accomplished by collecting specimens, analyzing heavy metal content of selected specimens and establishing permanent plots and transects.

Data Collection Protocol:

Neel, Maile. Lichens and Air Pollution in the San Gabriel Wilderness, Angeles National Forest, California. USDA Forest Service, Region 5, Monograph 13.

Geographic Extent: San Gabriel Wilderness

Location Description: Public Land Survey System

Time Period: 1987

Available Data Set Format: Stored in a database (dBASE III) and spreadsheet (Lotus 1-2-3)

Comments:

ARMS Existing Data Set Form

Data Set Name: San Joaquin Air Quality Data Set

Who Collected Data: California Air Resources Board

Data Contact Name: Andrew Ranzieri (CARB)

Phone Number: (916) 324-4069

Forest Service ARM Contact: Trent Procter

Data Set Description: Describes key elements of a conceptual model that describes the sources, dispersion within, and fate of ozone and ozone precursors in the San Joaquin Valley.

Data Collection Protocol:

“Meteorological Analysis of the San Joaquin Valley Air Quality Study Atmospheric Utilities Signatures, Predictions and Experiments Program (SJVAQS/AUSPEX)”, Lehrman, et. Al, 1994.

Geographic Extent: San Joaquin Valley and adjacent Sierra Mountains

Location Description: Latitude / longitude

Time Period: 1989 - present

Available Data Set Format: Electronic database (dbase)

Comments:

ARMS Existing Data Set Form

Data Set Name: Sequoia National Forest Macroinvertebrate Analysis Data Set

Who Collected Data: Fred Mangum (National Aquatic Monitoring Center)

Data Contact Name: Fred Mangum

Phone Number: 801-378-4928

Forest Service ARM Contact: Trent Procter

Data Set Description: Community analysis of macroinvertebrates in two streams in the Domeland Wilderness Area of the Sequoia NF.

Data Collection Protocol: Sampling was per "Guidelines for Measuring the Physical, Chemical, and Biological Condition of Wilderness Ecosystems" (Fox et al).

Geographic Extent: Five aquatic macroinvertebrate samples from two stations on two streams in the Domeland Wilderness Area.

Location Description: Unknown

Time Period: 1989

Available Data Set Format: Hard-copy data summary & spreadsheet printout.

Comments:

ARMS Existing Data Set Form

Data Set Name: Sierra Nevada Acid Lakes Survey

Who Collected Data: University of California at Santa Barbara

Data Contact Name: John Melack, UC Santa Barbara

Phone Number: (619) 873-2464

Forest Service ARM Contact: Luci McKee

Data Set Description: Seventy-three lakes were sampled throughout the Sierra Nevada Mountains to determine relative sensitivity to acid precipitation. The study also determined the pH and chemical composition of precipitation (rain and snow). Zooplankton was also collected for analysis.

Data Collection Protocol:

Melack, J.M. 1983. Assessment of Acidity of Lakes and Precipitation in the Sierra Nevada.

Geographic Extent: The entire Sierra Nevada Mountain range, including both east-side and west-side sampling.

Location Description: Latitude / longitude

Time Period: 1981 - 1982

Available Data Set Format: Hardcopy reports, spreadsheet?

Comments:

ARMS Existing Data Set Form

Data Set Name: Sierra Nevada Aquatic Amphibian Survey

Who Collected Data: California Air Resources Board

Data Contact Name: David Bradord (EPA, Environmental Monitoring Systems Lab) P.O. Box 93478,
Las Vegas, NV 89193-3478 Phone Number: Unknown

Forest Service ARM Contact: Trent Procter

Data Set Description: The goals of the study were: (1) to provide a basis for evaluating the potential future effects of acidic deposition on aquatic-breeding amphibians in the Sierra Nevada at high elevation, and (2) to evaluate evidence that acidic deposition may have been a factor in causing recent population declines of amphibians throughout the Sierra Nevada.

Data Collection Protocol:

Aquatic Amphibians in the Sierra Nevada: Current Status and Potential Effects of Acidic Deposition on Populations. 1992. Bradford, David F; and Gordon, Malcolm S. Final Report Prepared for California Air Resources Board under Contract No. A932-139.

Geographic Extent: Seven watersheds throughout the Sierra Nevada Mountains.

Location Description: Longitude / longitude

Time Period: 1990-1991

Available Data Set Format: Lotus spreadsheets

Comments:

ARMS Existing Data Set Form

Data Set Name: Yolla Bolly - Middle Eel Wilderness Acid Lakes Study

Who Collected Data: Forest Service

Data Contact Name: Bob Faust

Phone Number: (309) 532-3671

Forest Service ARM Contact: Bob Faust

Data Set Description: Lake water acidity and amphibian sightings. Five bodies of water ranging from .2 to 3 acres, and 1 to 20 feet deep.

Data Collection Protocol: Notes on results report, Faust, Oct. 21, 1994

Geographic Extent: Yolla Bolly - Middle Eel Wilderness

Location Description: Narrative description.

Time Period: 1990-present

Available Data Set Format: DG CEO documents; field data collection forms.

Comments:

ARMS Existing Data Set Form

Data Set Name: Alpine Lakes Wilderness Lake Reconnaissance Data Set

Who Collected Data: US Geologic Survey

Data Contact Name: Janice Peterson

Phone Number: (206) 744-3425

Forest Service ARM Contact: Janice Peterson

Data Set Description: Data set includes: lake name; location; drainage basin; physical data (drainage area, altitude, lake surface, lake volume, mean depth, maximum depth, shoreline length, shoreline configuration); basin geology; inflow; outflow; water quality (nutrients, specific conductance, water temperature, secchi disc visibility, dissolved oxygen, hardness/alkalinity, emersed plants); remarks; bathymetric maps; temperature and dissolved oxygen profiles.

Data Collection Protocol:

USGS Open File Report 79-1465, "Reconnaissance Data on Lakes in the Alpine Lakes Wilderness Area, Washington ", Dethier, Heller, and Safioles, 1979.

Geographic Extent: 60 lakes in the Alpine Lake Wilderness

Location Description: Latitude / longitude

Time Period: 1974 and 1978

Available Data Set Format: Electronic flat file

Comments: Currently stored on microfiche (in Janice Peterson's possession)

ARMS Existing Data Set Form

Data Set Name: Glacier Peak Wilderness and Summit Lake Lichen Biomonitoring Data Set

Who Collected Data: Bruce Ryan (Arizona State University, Tempe, AZ)

Data Contact Name: Bruce Ryan

Phone Number: (602) 965-3414

Forest Service ARM Contact: Janice Peterson

Data Set Description: This study was conducted for the purposes of providing baseline data on the diversity and relative abundance of lichens in the Green Mountain area of Washington State, primarily with respect to monitoring ozone and heavy metals expected to be produced by the Tenaska Generating Plant. Included both floristic surveys and elemental analysis.

Data Collection Protocol:

“Glacier Peak Wilderness Area Lichen Biomonitoring Study”, Ryan, 1995

Geographic Extent: 6 permanent plots in/near the Glacier Peak Wilderness; supported by additional collecting sites; and 2 sites near Summit Lake (Clearwater Wilderness)

Location Description: Latitude / longitude

Time Period: 1993 - 1994

Available Data Set Format: Hard copy summary, electronic database for voucher specimens

Comments:

ARMS Existing Data Set Form

Data Set Name: : Glacier / Lyman Oxidant Monitoring Project

Who Collected Data: Tony Basabe (Western Washington University)

Data Contact Name: Janice Peterson

Phone Number: (206) 744-3425

Forest Service ARM Contact: Janice Peterson

Data Set Description: Study includes four electronic ozone monitoring sites (co-located with passive ozone monitors) and four passive ozone monitors in the Glacier Peak Wilderness.

Data Collection Protocol: Yearly report for Glacier/Lyman Oxidant Monitoring Project, 1994

Geographic Extent: Glacier Peak Wilderness in Whatcom and Skagit Counties

Location Description: Mapped locations.

Time Period: 1993 - 1996

Available Data Set Format: Unknown

Comments:

ARMS Existing Data Set Form

Data Set Name: Oregon / Washington Lichen Monitoring Data Set

Who Collected Data: Forest Service

Data Contact Name: Linda Geiser

Phone Number: (541) 750-7058

Forest Service ARM Contact: Linda Geiser

Data Set Description: Community and tissue elemental analysis.

Data Collection Protocol: "Monitoring Air Quality Using Lichens, Methods and Strategy," Geiser, 1995.

Geographic Extent: Willamette, Deschutes, Mt. Hood, Siuslaw, Gifford Pinchot National Forests & Columbia River Gorge National Scenic Area.

Location Description: Latitude / longitude

Time Period: 1994 - present

Available Data Set Format: Electronic database and Excel spreadsheet

Comments:

ARMS Existing Data Set Form

Data Set Name: Mt. Baker-Snoqualmie NF Lichen Monitoring Data Set

Who Collected Data: Jan Henderson, Robin Leshner

Data Contact Name: Jan Henderson

Phone Number: (206) 744-3462

Forest Service ARM Contact: Janice Peterson

Data Set Description: Implemented 4 or 5 elevational transects on forests, and are conducting both elemental analysis and floristic inventory (a number of plots at 5,000').

Data Collection Protocol: Uses protocols documented in "Forested Plant Associations of the Olympic National Forest" (Henderson et. al.)

Geographic Extent: Mt. Baker-Snoqualmie NF (from Canadian border south)

Location Description: Public Land Survey System

Time Period: 1993 - present

Available Data Set Format: Electronic database

Comments:

ARMS Existing Data Set Form

Data Set Name: Packwood Lake Ozone Monitoring Data Set

Who Collected Data: Washington Department of Ecology

Data Contact Name: George Benson

Phone Number: (360) 407-6834

Forest Service ARM Contact: Bob Bachman

Data Set Description: Hourly averages of ozone concentration values and supporting meteorological data.

Data Collection Protocol: Washington State Department of Ecology, QA/QC Plan

Geographic Extent: Single site, Gifford Pinchot National Forest

Location Description: Unknown.

Time Period: 1995 - present

Available Data Set Format: Electronic flat file

Comments:

ARMS Existing Data Set Form

Data Set Name: Region 6 Lake Monitoring Data Set

Who Collected Data: Forest Service

Data Contact Name: Mike Lohrey

Phone Number: (503) 326-5927

Forest Service ARM Contact: Steve Boutcher

Data Set Description: Part of a long-term, 3-phase program. Level 1 involves an office reconnaissance of

all available information. Level 2 involves a field reconnaissance of the physical, chemical and biological characteristics of the lake. The goal of Level 2 is to characterize every lake in the Region, and then return on a 10-year cycle to see if the characterization has changed. The results of Level 2 monitoring may point to certain lakes worthy of Level 3 monitoring. Level 3 is objective driven, depending on the results of Level 2. It typically would involve more intensive monitoring of certain parameters of concern.

Data Collection Protocol: Region 6 Lake Inventory Handbook -- Level I & II (1993) [Version 1.2]

Geographic Extent: All lakes on National Forest lands in Oregon and Washington (Wilderness and Non-Wilderness)

Location Description: : By Watershed Code, USGS Quad, and Public Land Survey System

Time Period: 1992 - present

Available Data Set Format: Data currently on hardcopy field data collection forms.

Comments: Hardcopy forms are at each of the Forests where data was collected. No effort for centralized collection at this point. Forests have been encouraged to enter water chemistry parameters into Water Quality Database Entry System (DG/Oracle) but uncertain how many Forests have actually done this.

ARMS Existing Data Set Form

Data Set Name: Summit Lake (Washington) Water Monitoring Data Set

Who Collected Data: Joe Eilers (E&S Environmental Chemistry, Inc.)

Data Contact Name: Joe Eilers

Phone Number: (503) 758-5777

Forest Service ARM Contact: Janice Peterson

Data Set Description: Basic water chemistry analysis (pH, ANC, Conductivity, Base Cations, Acid Anions) on lake and snow samples, as well as sediment cores and phytoplankton and zooplankton samples

Data Collection Protocol:

Lake and Snow Chemistry of Summit, Lake, Washington, A Report to the Mt. Baker-Snoqualmie National Forest, Eilers and Bernert, 1994

Geographic Extent: Summit Lake (Clearwater Wilderness - Class II)

Location Description: Latitude/longitude

Time Period: 1985 and 1993

Available Data Set Format: Electronic data base

Comments:

ARMS Existing Data Set Form

Data Set Name: Arkansas Ambient Ozone Monitoring Data Set

Who Collected Data: State of Arkansas

Data Contact Name: Virginia Ambrose

Phone Number: (919) 541-5454

Forest Service ARM Contact: Cliff Hunt

Data Set Description: The Forest Service helps to maintain two cooperative ozone monitoring stations in the State of Arkansas. The site at Oden, AR (Ouachita NF) was installed in 1990, and the site at Deer, AR (Ozark NF) was installed in 1991. In both instances, the Forest Service bought the monitoring equipment, provides the physical site, and is responsible for equipment maintenance. The state is responsible for the day to day operation of the site, including equipment calibration, data collection and reporting. The ozone data collected from these sites are fed into EPA's Aerometric Information Retrieval System. Data summary reports are also available upon request from the state air agency.

Data Collection Protocol: EPA

Geographic Extent: Two sites in Arkansas (Oden and Deer, AR)

Location Description: Unknown.

Time Period: Oden (1990-present); Deer (1991-present)

Available Data Set Format: ASCII files

Comments:

ARMS Existing Data Set Form

Data Set Name: Caney Creek Wilderness Water Chemistry Data

Who Collected Data: Forest Service

Data Contact Name: Alan Clingenpeel

Phone Number: (501) 321-5246

Forest Service ARM Contact: Cliff Hunt

Data Set Description: Baseline water chemistry survey of streams within the Caney Creek Wilderness. Parameters measured include major anions/cations, acidity, alkalinity, aluminum, lead, and turbidity.

Data Collection Protocol: "Baseline Sampling Protocol", Clingenpeel, 1996

Geographic Extent: Caney Creek Wilderness

Location Description: Latitude / longitude

Time Period: 1988 - present

Available Data Set Format: Excel spreadsheet

Comments:

ARMS Existing Data Set Form

Data Set Name: Cohutta Wilderness and Sipsey Wilderness Water Chemistry Data Set

Who Collected Data: Forest Service

Data Contact Name: Dave Wergowske

Phone Number: (334) 241-8137

Forest Service ARM Contact: Dave Wergowske

Data Set Description: Stream water chemistry data, including: water temperature; conductivity; pH (field and lab); alkalinity; dissolved organics; sulfate; chloride; fluoride; phosphorus; NO₃ + NO₂; ammonia; calcium; magnesium; sodium; potassium; iron; manganese; aluminum; zinc; copper; cadmium; chromium; and silica.

Data Collection Protocol:

Stream-water Sampling & Preservation Techniques for Analyses Related to Acid Neutralizing Capacity at Sipsey and Cohutta Wilderness Areas (USFS).

Geographic Extent: Cohutta and Sipsey Wildernesses - approx. 40 sites/Wilderness basic field parameters; 6 sites/Wilderness lab analysis.

Location Description: Narrative and point on map (latitude / longitude not determined yet)

Time Period: 1991-1994

Available Data Set Format: Word document on DG; hard-copy reports.

Comments:

ARMS Existing Data Set Form

Data Set Name: Daniel Boone, George Washington, Jefferson National Forest FHM Ozone Injury Data

Who Collected Data: FHM Program (Asheville)

Data Contact Name: Cindy Huber, Barbara O'Connell

Phone Number: (540) 265-5156
(610) 975-4037

Forest Service ARM Contact: Cindy Huber

Data Set Description: Three-year survey ranking ozone damage to various bioindicator species. Ozone injury was assessed visually, including interveinal stippling and mottling. A severity rating was developed by amount of injury (modified Horsfall-Barrett rating system).

Data Collection Protocol:

1994 Field Manual for Identifying Ozone Injury on Sensitive Plant Species (Brantley, 1994)

Geographic Extent: Daniel Boone, George Washington, Jefferson National Forests (forestwide)

Location Description: General narrative; maps of each plot (on file at the George Washington and Jefferson NF's)

Time Period: 1993-1995

Available Data Set Format: Excel spreadsheet, SAS.

Comments:

ARMS Existing Data Set Form

Data Set Name: FS Wildernesses in Alabama, Arkansas and Texas FHM Ozone Bioindicator Data Set

Who Collected Data: FHM Program (Alexandria, LA)

Data Contact Name: Dale Starkeym Barbara O'Connell

Phone Number: (318) 473-7293
(610) 975-4037

Forest Service ARM Contact: : Dave Wergowske, Cliff Hunt

Data Set Description: Five-year data collection effort focusing on ozone injury to various species of plants.

A relative severity rating was established. Parameters included: percentage of foliage with visible ozone injury and average severity rating based on ability to see injury.

Data Collection Protocol:

Anderson and Knighten. 1990. Modification of survey procedures for assessing ozone injury on bioindicator plants in Region 8 Class I Wilderness areas. Rpt. 91-1-02. Asheville, NC: USDA Forest Service, Southern Region. Forest Pest Management.

Geographic Extent: Little Lake Creek (Class II), Caney Creek, Upper Buffalo, and Sipsy Wildernesses

Location Description: Fixed location on map (latitude / longitude has not been determined yet)

Time Period: 1991-1995

Available Data Set Format: Hard-copy data summary, SAS, Excel spreadsheet

Comments: ARM Staff probably only interested in data summaries. Both data summaries and raw field data can be received from Alexandria Office.

ARMS Existing Data Set Form

Data Set Name: George Washington National Forest Rapid Bioassessment Data Set

Who Collected Data: Forest Service & Partnerships

Data Contact Name: Mark Hudy

Phone Number: (540) 564-8348

Forest Service ARM Contact: Cindy Huber

Data Set Description: Macroinvertebrate and water chemistry information collected to use in developing a model linking acid rain to family level aquatic insect communities.

Data Collection Protocol:

Macroinvertebrates = Rapid Bioassessment Protocols for Use in Streams and Rivers: Benthic Macroinvertebrates and Fish. U.S. EPA EPA/444/4-89-001 (May 1989)

Water Chemistry = Standard Methods for the Examination of Water and Waster Water. American Public Health Association. ISBN 0-87553-161-X (1989)

Geographic Extent: George Washington NF

Location Description: UTM's

Time Period: 1987 - 1995

Available Data Set Format: Database (DG-Oracle V6.0)

Comments:

ARMS Existing Data Set Form

Data Set Name: James River Face Wilderness Lichen Inventory

Who Collected Data: Contractor (Larry St. Clair)

Data Contact Name: Larry St. Clair

Phone Number: (801) 378-4879

Forest Service ARM Contact: Cindy Huber

Data Set Description: In 1987, Larry St. Clair conducted a lichen inventory, though he did not establish fixed plots. He developed a listing of lichen species, by substrates -- including the identification of 6 pollution sensitive species.

Data Collection Protocol:

The Establishment of an Air Quality Biomonitoring Program Using Various Lichen Parameters in the James River Face Wilderness Area, Jefferson National Forest, Virginia, St, Clair, 1987.

Geographic Extent: James River Face Wilderness

Location Description: Latitude / longitude

Time Period: : 1988 & 1993

Available Data Set Format: Spreadsheet, hard-copy reports.

Comments:

ARMS Existing Data Set Form

Data Set Name: James River Face Wilderness and Mt. Rogers NRA Lichen Inventory

Who Collected Data: Contractor (Jonathan Dey, Illinois-Wesleyan Univ.)

Data Contact Name: Jonathan Dey

Phone Number: (309) 556-3057

(309) 556-3060

James Lawrey

(703) 993-1059

Forest Service ARM Contact: Cindy Huber

Data Set Description: Includes a resurvey of St. Clair's 1987 James River Face inventory, and an initial survey of the Mt. Rogers NRA. Includes a listing of species (and subspecies) occurrences (across plots),

Data Collection Protocol:

Report on the Identifications of the Corticolous Macrolichen Species Collected in the James River Face Wilderness Area and in the Mount Rogers National Recreation Area of Jefferson National Forest, Virginia, Dey, 1995

Lichen Biomonitoring Program in the George Washington and Jefferson National Forests, A Survey of Lichen Floristics and Elemental Status, Lawrey, 1996.

Geographic Extent: James River Face Wilderness, Mt. Rogers NRA

Location Description: Latitude / longitude

Time Period: 1994

Available Data Set Format: Unkown

Comments:

ARMS Existing Data Set Form

Data Set Name: Virginia Acid Precipitation Network Data Set

Who Collected Data: Virginia Department of Environmental Quality

Data Contact Name: Dan Salkowitz

Phone Number: (804) 698-4404

Forest Service ARM Contact: Cindy Huber

Data Set Description: Nine acid deposition sites using same protocol as NADP. Actually includes 3 NADP sites.

Data Collection Protocol: "Virginia Acid Precipitation Network, 1989 Rainwater Analyses," Buikema et.al.

Geographic Extent: Virginia

Location Description: UTM's

Time Period: Network 1982- present, FS participation 1992 - present

Available Data Set Format: Excel spreadsheet

Comments:

ARMS Existing Data Set Form

Data Set Name: Virginia Trout Stream Sensitivity Study Water Data Set

Who Collected Data: Forest Service

Data Contact Name: Cindy Huber

Phone Number: (540) 265-5156

Forest Service ARM Contact: Cindy Huber

Data Set Description: Objectives: (1) to provide a framework for assessment of acid base status based on

a classification of the study streams and watersheds by physiographic and geochemical characteristics; and (2) to examine and interpret trends in stream water composition that are detectable based on a six year record of sampling and analysis.

Data Collection Protocol:

The Acid-Base Status of Native Brook Trout Streams in the Mountains of Virginia: A Regional Assessment Based on the Virginia Trout Stream Sensitivity Study, Webb, et. Al., 1994.

Geographic Extent: Throughout mountains of Virginia (many sites on George Washington and Jefferson National Forests and Shenandoah National Park)

Location Description: UTM's

Time Period: 1987 - 1993

Available Data Set Format: Oracle (IBM-AIX) database

Comments: Interfaces with GIS database.

ARMS Existing Data Set Form

Data Set Name: Bearden Knob Bulk Precipitation and Ambient Air Data Set

Who Collected Data: Forest Service Experiment Station

Data Contact Name: Frederic Wood
128

Phone Number: (304) 478-2000 ext

Forest Service ARM Contact: Cindy Huber

Data Set Description: A number of different variables are measured, including bulk precipitation chemistry, ozone and meteorological data. The ambient air monitoring equipment is co-located with an IMPROVE visibility site. SO₂ and NO_x are also monitored at the site, but do not adhere to any QA/QC program, and therefore are dropped from this project.

Data Collection Protocol:

Ozone - follows NDDN protocols, though not a part of the network

Bulk precipitation - follows NADP protocols, though not a part of the network

Geographic Extent: Single site (between Dolly Sods and Otter Creek Wildernesses)

Location Description: Latitude / longitude

Time Period: 1992 - present

Available Data Set Format: ASCII text file format; some data duplicated in MS-Access

Comments:

ARMS Existing Data Set Form

Data Set Name: Boundary Waters Canoe Area Lichen Elemental Analysis Data Set

Who Collected Data: Contractor (Clifford Wetmore, Univ. of Minnesota)

Data Contact Name: Clifford Wetmore

Phone Number: (612) 625-6292

Forest Service ARM Contact: Jerome Thomas

Data Set Description: Under a grant from the Forest Service, a lichen study was to be performed in the Boundary Waters Canoe Area of the Superior National Forest. This study was to survey the lichens of the wilderness area, produce a lichen flora, collect and analyze lichens for their chemical contents and evaluate the lichen flora with reference to the air quality.

Data Collection Protocol:

Wetmore, Clifford M. 1987. Lichens and Air Quality in the Boundary Waters Canoe Area of the Superior National Forest - Final Report. FS Contract 43-63A9-5-867. Botany Department, University of Minnesota.

Geographic Extent: Boundary Waters Canoe Area Wildernesses.

Location Description: Latitude/longitude

Time Period: 1986

Available Data Set Format: Hard-copy data summary, electronic database of voucher specimens

Comments:

ARMS Existing Data Set Form

Data Set Name: Dolly Sods / Otter Creek Wilderness Amphibian Monitoring Data Set

Who Collected Data: Marshall University

Data Contact Name: Tom Pauley (USFS-NE Lab, Parsons, WV)
5413

Phone Number: (304) 696-

Forest Service ARM Contact: Cindy Huber

Data Set Description: Amphibian species and life-stage assessments with supporting environmental condition data, such water chemistry, temperatures, UV-B radiation.

Data Collection Protocol:

Preliminary Report on the Status of Amphibians at the Dolly Sods and Otter Creek Wilderness Areas, Pauley, 1996.

Geographic Extent: Dolly Sods and Otter Creek Wildernesses

Location Description: Mapped locations

Time Period: 1995 - present

Available Data Set Format: dbase IV

Comments:

ARMS Existing Data Set Form

Data Set Name: Dolly Sods, Otter Creek Lichen Data Set (1987)

Who Collected Data: Contractors (James Lawrey, George Mason Univ.; and Mason Hale, Smithsonian)

Data Contact Name: James Lawrey

Phone Number: (703) 993-1059

Forest Service ARM Contact: Cindy Huber

Data Set Description: Initial survey resulting in species listing and elemental analysis of lichens, and a listing of the pollution sensitive species.

Data Collection Protocol:

Lichens as Indicators of Atmospheric Quality in the Dolly Sods and Otter Creek Wildernesses of the Monongahela National Forest, West Virginia, Lawrey and Hale, 1988

Geographic Extent: Dolly Sods and Otter Creek Wildernesses

Location Description: Mapped locations

Time Period: 1987

Available Data Set Format: Hard-copy data summary

Comments:

ARMS Existing Data Set Form

Data Set Name: Dolly Sods, Otter Creek Lichen Data Set (1993)

Who Collected Data: Contractor (James Lawrey, George Mason Univ.)

Data Contact Name: James Lawrey

Phone Number: (703) 993-1059

Forest Service ARM Contact: Cindy Huber

Data Set Description: Species listing and elemental analysis of lichens, and a listing of the pollution sensitive species. Resurvey of data collected in 1987.

Data Collection Protocol:

Lichen Biomonitoring Program in the Dolly Sods and Otter Creek Wildernesses of the Monongahela National Forest: A Resurvey of Lichen Floristics and Elemental Status, Lawrey, 1993.

Geographic Extent: Dolly Sods and Otter Creek Wildernesses

Location Description: Mapped locations

Time Period: 1992

Available Data Set Format: Hard-copy data summary

Comments:

ARMS Existing Data Set Form

Data Set Name: Dolly Sods and Otter Creek Ozone Bioindicator Data Set

Who Collected Data: : FHM Program

Data Contact Name: Martin McKenzie

Phone Number: (304) 285-1550

Forest Service ARM Contact: Cindy Huber

Data Set Description: Evaluation of the current distribution and intensity of apparent ozone damage.

Data Collection Protocol:

An Ozone Symptom Survey at the Otter Creek and Dolly Sods Wildernesses, Monongahela National Forest, 1990, Jackson and Iskra, 1990.

Geographic Extent: Dolly Sods and Otter Creek Wildernesses

Location Description: Mapped locations

Time Period: 1990

Available Data Set Format:

Comments:

ARMS Existing Data Set Form

Data Set Name: Dolly Sods / Otter Creek Surface Water Synoptic Sampling Data Set

Who Collected Data: Forest Service, University of Virginia, volunteers

Data Contact Name: Rick Webb

Phone Number: Ph - 540-943-4208 (H)

Ph - 540-924-7817 (W)

Forest Service ARM Contact: Jerome Thomas

Data Set Description: Basin-wide sampling of sensitive aquatic indicators in the Otter Creek and Dolly Sods Wilderness Areas. Parameters measured are chemical composition of streams, ponds and vernal pools.

Data Collection Protocol:

Webb, Rick et. al. 1994. Synoptic Surveys of Surface-Water Chemical Composition in Dolly Sods and Otter Creek Wilderness Areas. University of Virginia.

Geographic Extent: Otter Creek and Dolly Sods Wilderness

Location Description: UTM Coordinates (GPS)

Time Period: 1994 (may be repeated in 1999)

Available Data Set Format: Database (at University of Virginia)

Comments:

ARMS Existing Data Set Form

Data Set Name: Hercules Glades Wilderness Lichen Data Set

Who Collected Data: Contractor (Clifford Wetmore, Univ. of Minnesota)

Data Contact Name: Clifford Wetmore

Phone Number: (612) 625-6292

Forest Service ARM Contact: Jerome Thomas

Data Set Description: Four objectives: (1) prepare a lichen species list; (2) conduct elemental analysis of those species; (3) study the health of species most sensitive to air pollution; and (4) assess the effects of air quality on lichens.

Data Collection Protocol:

Lichens and Air Quality in Hercules Glades Wilderness of Mark Twain National Forest, Wetmore, 1992.

Geographic Extent: Hercules Glades Wilderness

Location Description: PLSS, narrative description

Time Period: 1991

Available Data Set Format: Electronic data base, hard copy report

Comments:

ARMS Existing Data Set Form

Data Set Name: Lye Brook Wilderness Biological / Chemical Survey of Surface Waters Data Set

Who Collected Data: Vermont Monitoring Cooperative

Data Contact Name: James Kellogg (VT AEC)

Phone Number: (802) 747-6742

Forest Service ARM Contact: Nancy Burt (Green Mountain NF)

Data Set Description: Inventorying and monitoring of hydrogeochemical and biological characteristics of lakes and streams within, and adjacent to, Lye Brook Wilderness. Includes water chemistry, sediments, stream and lake macroinvertebrates, and fish.

Data Collection Protocol:

A Biological and Chemical Survey of Selected Surface Waters in the Lye Brook Wilderness Area, Vermont, Kellogg, Fiske, and Langdon, 1994

Geographic Extent: Lye Brook Wilderness

Location Description: Latitude/longitude

Time Period: 1993

Available Data Set Format: Database (Paradox), ASCII.

Comments:

ARMS Existing Data Set Form

Data Set Name: Lye Brook Wilderness Lichen Data Set

Who Collected Data: Contractor (Clifford Wetmore, Univ. of Minnesota)

Data Contact Name: Clifford Wetmore

Phone Number: : (612) 625-6292

Forest Service ARM Contact: Nancy Burt (Green Mountain NF)

Data Set Description: Four objectives: (1) prepare a lichen species list; (2) conduct elemental analysis of those species; (3) study the health of species most sensitive to air pollution; and (4) assess the effects of air quality on lichens.

Data Collection Protocol:

Lichens and Air Quality in Lye Brook Wilderness of the Green Mountain National Forest, Final Report, Wetmore, 1995.

Geographic Extent: Lye Brook Wilderness

Location Description: Latitude / longitude

Time Period: 1993

Available Data Set Format: Hard-copy data summary, electronic database of voucher specimens.

Comments:

ARMS Existing Data Set Form

Data Set Name: Lye Brook Wilderness Ozone Bioindicator Data Set

Who Collected Data: Cooperator (James O'Brien, Forest Health Protection, Durham, NH)

Data Contact Name: James O'Brien

Phone Number: (603) 868-7713

Forest Service ARM Contact: Nancy Burt (Green Mountain NF)

Data Set Description: The objectives of the evaluation were: (1) to determine if symptoms of ozone injury were present in ozone sensitive species on Lye Brook Wilderness, and if so, to quantify the extent and intensity of the injury; and (2) to relate the occurrence of symptoms found in the Wilderness to ozone concentrations recorded nearby. The species examined for injury were white ash, black cherry, and blackberry.

Data Collection Protocol:

O'Brien, James T. 1994. Evaluation of Ozone Damage to Vegetation on the Lye Brook Wilderness in 1993. USDA Forest Service, Forest Health Protection, Durham Field Office.

Geographic Extent: Lye Brook Wilderness

Location Description: Point on a map.

Time Period: 1988 - 1994

Available Data Set Format: Hard-copy data reports

Comments:

ARMS Existing Data Set Form

Data Set Name: Minnesota (MPCA) Ambient Air Concentrations Data Set

Who Collected Data: Minnesota (MPCA)

Data Contact Name: Rick Strassman

Phone Number: (612) 296-7754

Forest Service ARM Contact: Bob Berrisford

Data Set Description: Ambient air concentrations including: sulfur dioxide, various particulate elements. Other data sets available include lake chemistry, and sediment coring with mercury concentrations.

Data Collection Protocol: EPA Criteria monitoring

Geographic Extent: Minnesota

Location Description: Coordinates

Time Period: early 1980's through present

Available Data Set Format: AIRS, Oracle database

Comments:

ARMS Existing Data Set Form

Data Set Name: Monongahela National Forest Aquatic Benthic Macroinvertebrate Inventory Data Set

Who Collected Data: Interagency

Data Contact Name: Mark Vinson

Phone Number: 801-750-2038

Forest Service ARM Contact: Jerome Thomas

Data Set Description: A general assessment of the aquatic ecosystem based on the aquatic macroinvertebrate community. Includes macro species and associated metrics. Summary includes interpretation of the health and integrity of the aquatic ecosystem.

Data Collection Protocol: "Aquatic Benthic Macroinvertebrate Monitoring Report", Vinson, 1994

Geographic Extent: Monongahela National Forest

Location Description: Latitude / longitude

Time Period: 1993

Available Data Set Format: Hard-copy data summary; spreadsheet

Comments:

ARMS Existing Data Set Form

Data Set Name: Ontario Ministry of Environment Ozone Monitoring Data

Who Collected Data: Ontario Ministry of Environment and Energy

Data Contact Name: Philip Kiley

Phone Number: (416) 235-5780

Forest Service ARM Contact: Bob Berrisford

Data Set Description: Hourly ozone monitoring values

Data Collection Protocol: Unknown

Geographic Extent: Large geographic coverage in Ontario, with one site in Ely, MN

Location Description: Latitude/longitude

Time Period: 4/16/91 - 1/30/96

Available Data Set Format: Database -- Air Quality Information System (AQUIS)

Comments:

ARMS Existing Data Set Form

Data Set Name: Rainbow Lake Wilderness Water Chemistry Data Set

Who Collected Data: Forest Service

Data Contact Name: Dale Higgins (Chequamegon NF)

Phone Number: (715) 762-5181

Forest Service ARM Contact: Jerome Thomas

Data Set Description: A monitoring effort undertaken to provide baseline data for use in establishing limits of acceptable change for pH, alkalinity, and other water quality characteristics. Ion balances (cations and anions) for seven lakes in the Rainbow Lake Wilderness - includes lab analysis data.

Data Collection Protocol: 1990 AQRV Inventory Plan for Water : Rainbow Lake Wilderness Class I Air Quality Area

Geographic Extent: Rainbow Lake Wilderness

Location Description: Latitude / longitude

Time Period: 1984-present

Available Data Set Format: EPA Storet database

Comments:

ARMS Existing Data Set Form

Data Set Name: White Mountain National Forest Lichen Elemental Analysis Data Set

Who Collected Data: Contractor (Clifford Wetmore, Univ. of Minnesota)

Data Contact Name: Clifford Wetmore

Phone Number: (612) 625-6292

Forest Service ARM Contact: Nancy Burt (Green Mountain NF)

Data Set Description: Strictly elemental analysis - comparing data collected to a 1988 data collection effort (using same methods) - which Wetmore also conducted.

Data Collection Protocol:

1993 Elemental Analysis of Lichens of the White Mountain National Forest Wilderness Areas, Wetmore, 1995.

Geographic Extent: Great Gulf and Presidential/Dry River Wildernesses.

Location Description: Latitude / longitude

Time Period: 1993

Available Data Set Format: Hard-copy data summary, electronic database for voucher specimens

Comments:

ARMS Existing Data Set Form

Data Set Name: White Mountain National Forest Ozone Bioindicator Data Set

Who Collected Data: Contractors (Gretchen Smith, William Manning, Univ. of Massachusetts)

Data Contact Name: Barbara O'Connell

Phone Number: (413) 545-1680

Forest Service ARM Contact: Nancy Burt

Data Set Description: Objectives: (1) evaluate frequency of occurrence and distribution of photo toxic ozone concentrations in Class I Areas; (2) identify and describe amount and severity of foliar injury.

Data Collection Protocol:

An Ozone Effects Monitoring Program for the Class I Wilderness Areas in the White Mountain National Forest of New Hampshire, Smith, 1990.

USFS General Technical Report RM-146

Geographic Extent: Great Gulf and Presidential/Dry River Wildernesses

Location Description: Narrative description

Time Period: 1988 - 1989

Available Data Set Format: SAS, Excel spreadsheet

Comments:

ARMS Existing Data Set Form

Data Set Name: Southeast Alaska Lichen Biomonitoring

Who Collected Data: Forest Service

Data Contact Name: Chiska Derr

Phone Number: (360) 750-3900

Forest Service ARM Contact: Linda Geiser

Data Set Description: 50 permanent plots were established in Pinus contorta peatlands across the Tongass National Forest between 1990 and 1992. Lichen community analysis and tissue elemental analysis were conducted.

Data Collection Protocol:

Lichen Biomonitoring in Southeast Alaska and Western Oregon, Derr, Chiska C. 1994. A Thesis submitted to Oregon State University

Geographic Extent: Tongass National Forest

Location Description: Latitude/longitude

Time Period: 1989 -1992

Available Data Set Format: Electronic flat files

Comments:

ARMS Existing Data Set Form

Data Set Name: Tongass National Forest Lichen Data Set

Who Collected Data: Forest Service

Data Contact Name: Linda Geiser

Phone Number: (541) 750-7058

Forest Service ARM Contact: Linda Geiser

Data Set Description: Baseline conditions were described through: (1) elemental analysis of 366 samples of four lichens common to the forests and muskegs of the Tongass National Forest; (2) forest-wide inventory of the macro-lichens and their habitat characteristics at 176 temporary and permanent standardized sites evenly distributed in clusters over the Tongass and more than 45 additional collecting sites; and (3) quantitative analysis of branch lichens abundance in two common old growth forested habitats: shorepine and western hemlock.

Data Collection Protocol:

Geiser, Linda H. et. al. 1994. Air Quality Monitoring on the Tongass National Forest: Methods and Baselines Using Lichens. R10-TB-46. USDA Forest Service, Tongass National Forest, Stikine Area.

Geographic Extent: Tongass National Forest

Location Description: Latitude / longitude.

Time Period: 1989-1992

Available Data Set Format: Hard-copy reports and PC database.

Comments:

Appendix -- Interview Session Participants

<u>Name</u>	<u>Organization</u>	<u>Office</u>	<u>Job Title</u>
Ann Acheson	USDA Forest Service	R1, Regional Office	Regional ARM Program Manager
Scott Archer	USDA Bureau of Land Management	Denver Federal Center	Air Resources Specialist
Bob Bachman	USDA Forest Service	R6 Regional Office	Regional ARM Specialist
Tamara Blett	USDA Forest Service	R2 Regional Office	Regional ARM Specialist
Dan Brown	USDA Forest Service	R8, Regional Office	
Nancy Burt	USDA Forest Service	R9, Green Mountain National Forest	
Barry Callenberger	USDA Forest Service	R5, Regional Office, Mather Center	Prescribed Fire Specialist
Bill Carothers	USDA Forest Service	R8, Regional Office	
Scott Copeland	USDA Forest Service	CIRA/CSU Campus	Visibility Data Analyst
Diane Ewell	USDI National Park Service	Sequoia/Kings Canyon National Park	Air Resources Specialist
Bob Faust	USDA Forest Service	R5, Mendocino National Forest	Forest Hydrologist
Rich Fisher	USDA Forest Service	WO/Rocky Mtn. Station	Assistant National ARM Program Manager
Jim Frazier	USDA Forest Service	R5, Stanislaus National Forest	Forest Hydrologist
Jerry Gause	USDA Forest Service	R5, Regional Office	Regional ARM Program Manager
Linda Geiser	USDA Forest Service	R6, Siuslaw National Forest	Zone ARM Program Manager
Christi Gordon	USDA Forest Service	R2, Pike & San Isabel National Forests	Resource Assistant
Jack Holcomb	USDA Forest Service	R8, Regional Office	
Andrea Holland- Sears	USDA Forest Service	R2, White River National Forest	Hydrologist
Cindy Huber	USDA Forest Service	R8, Jefferson National Forest	Zone ARM Specialist
Laura Hudnell	USDA Forest Service	R2, Arapaho-Roosevelt National Forests	Forest Soil Scientist
Bill Jackson	USDA Forest Service	R8, National Forests in North Carolina	Zone ARM Specialist
Gary Jackson	USDA Forest Service	R4, Salmon National Forest	
Jim Keys	USDA Forest Service	R8, Regional Office	
Donna Lamb	USDA Forest Service	Washington Office	National ARM Program Manager
Gia Martynn	USDA Forest Service	R5, Sequoia National Forest, Tule River Ranger District	District Wildlife/Range Programs
Luci McKee	USDA Forest Service	R5, Inyo National Forest	Forest Hydrologist
Ann Mebane	USDA Forest Service	R4, Bridger-Teton National Forest, Pinedale Ranger District	Zone ARM Specialist
Garry Oye	USDA Forest Service	R5, Regional Office	Regional Wilderness Program Manager
Janice Peterson	USDA Forest Service	R6, Mt. Baker-Snoqualmie National Forest	Zone ARM Specialist
Trent Procter	USDA Forest Service	R5, Sequoia National Forest	Zone ARM Specialist
Marc Rounsaville	USDA Forest Service	R8, Regional Office	
Chris Sanders	USDA Forest Service	R5, Sequoia National Forest	ARM Specialist
Jon Skeels	USDA Forest Service	R2, Regional Office	Branch Chief, S&PF Info.Systems
Ken Snell	USDA Forest Service	R6, Regional Office	Regional ARM Program Manager
Pete Stewart	USDA Forest Service	R3, Gila National Forest	Forest Hydrologist
Mark Story	USDA Forest Service	R1, Gallatin National Forest	Forest Hydrologist
Jerome Thomas	USDA Forest Service	R9, Regional Office	Regional ARM Program Manager
Kathy Tonnessen	USDI National Park Service	Air Resources Division	Ecologist
Kathy Van Zuuk	USDA Forest Service	R5, Tahoe National Forest	Forest Botanist
Dave Wergowske	USDA Forest Service	R8, National Forests in Alabama	Zone ARM Specialist