National Atmospheric Deposition Program (IR-7)
1985 Technical Committee Meeting
Minutes
Fort Collins, Colorado

First Session
Tuesday, October 8, 1985, 8:15 a..m.

The opening session of the 1985 NADP (IR-7) Technical Committee meeting convened in Fort Collins, Colorado, with Dave Shriner, Chairman, presiding. A list of attendees is attached. Dave introduced Robert Heil, Director of the Colorado State University Experiment Station and Administrative Advisor to IR-7 from the Western Region. Bob welcomed the group to Fort Collins. Jim Davidson, newly appointed Administrative Advisor from the Southern Region, was introduced.

Jerry Walker reported on the activities of Subcommittee No. 1, Network Site Criteria and Standards.

1. The site description booklet will be printed in late spring or early summer. It will consist of two volumes, approximately 850 pages, listing 193 sites.

2. The Subcommittee recommends issuing certificates for site operators who have been through the training program and who have been operators for five years. Hopefully, this question will be resolved at the meeting

3. The raingage questionnaire has been mailed. Results will be compiled when replies are received.

The report for Subcommittee No. 2 Methods Development and Quality Assurance, was presented by the Vice Chairman, Jerry Aubertin, in the absence of the Chairman, Don Bogen. The subcommittee met in St. Louis in July and discussed the following items:

1. New electrodes have been sent to all sites. CAL recommends that they be stored in a dry condition and that sites use the pH 4.30 check solution as a check for conductance.

2. Some sites are not doing field measurements or participating in the site intercomparison study. The subcommittee recommends that data from these sites not be included in the quarterly reports. Protocol for accomplishing this will be developed by the QA Steering Committee.

3. CAL has switched from the Technicon Auto Analyzer to the ion chromatograph for the anions.

4. With regard to filters and aliquots, the filters are being disposed of after notification to the sites. The subcommittee recommends that wording be changed in the contract with CAL to allow wet aliquots to be disposed of after five years.

5. The bucket gasket problem has been resolved. A minor problem with the dishwasher at CAL has now been corrected.

In September, a group met in Denver for evaluation of the USGS external QA program. A report of this evaluation is currently being prepared.

Steve Lindberg, Chairman of Subcommittee No. 3 Data Management and Analysis, commented on the following items:

1. The 1982 Annual Data Summary is out, and there have been several responses, mostly favorable, to the request for comments. During the meeting, the subcommittee will discuss these responses and make a decision regarding the format for the ‘83 report.

2. The 1983 quarterly reports are currently being published and mailed. These reports contain the field pH data. A QA check or validation procedure will be developed during the meeting for inclusion in the ‘84 quarterly data reports.

3. The final item for consideration will be the flagging procedures and recommended changes.

Two significant activities on the part of Subcommittee No. 4, Effects Research, were reported by Jim Perry.

1. The subcommittee has provided input into the development of priorities for the CSRS Competitive Grants program.

2. The subcommittee has looked at the way NADP is viewed among peer scientists and discussed how a broader range of atmospheric pollutants can be included. A prioritized list has been developed which will be further defined during the meeting. A draft statement of “pollutants of interest” will be drawn.

Gary Stensland reported on the activities of the CAL for the past year.

1. There were 169 active sites at the beginning of the year; there are now 193 active sites in the network. Gary illustrated the rate of growth for the network and commented that such rapid growth is now expected in the future.

2. Two training courses, with about 45 people participating, have been held.

3. The CAL data management people moved into new quarters in August, and the analytical people are expected to move next month.

4. Regarding the refrigerated aliquots, 96 samples were selected out of storage and retested. Gary showed a series of transparencies depicting scatter blocks of the original and new values. All new values showed slightly higher than the original values, with samples becoming slightly more acid over time.

Warren Knapp, Chairman of the Quality Assurance Steering Committee commented briefly on the committee's structure and reported on its activities. -

1. There has been a concentrated effort to gather together all the QA material within the network and to publish a QA document.

2. The site visitation program is now being carried out by Research Triangle Institute personnel.

3. Bernie Malo of USGS called a meeting in July. The most significant recommendation was that an attempt. should be made to identify a permanent membership for the QA Steering Committee. It was suggested that it consist of a Chairman appointed by the Executive Committee, the chairmen of each of the four NADP subcommittees, the Quality Assurance Manager, the Director of the CAL, and representatives from each of the Federal agencies involved in QA, (USGS, EPA).

4. Another important activity with which the committee is now involved is the sample coding structure. One of the recommendations of the team which performed an external audit of the data management and handling was that a two-level coding structure be developed. The first level would be a simplified structure for data users, and the second, a detailed set of codes to be used internally by CAL and the Coordinator's Office.

5. Dave Bigelow, Van Bowersox, Steve Lindberg and Warren Knapp met on Sunday, October 6. They are suggesting that a qua1ity level be identified for each of three categories: 1) Precipitation data quality; 2) Chemical data quality; and 3) Site quality. The third category would include such things as does the site have the standard equipment, are they operating the equipment correctly, do they meet general site criteria. Subcommittee No. 1 has been asked to come up with a set of recommendations to evaluate site quality on these three levels,

Jim Gibson reported on activities of the Coordinator's Office. He displayed an overhead of the network as it currently stands. He then commented on the structure of the Coordinator's office and noted that staffing is still deficient in the site activities area. Other items mentioned were:

1. Data is now available on tape through February of 1985.

2. The 1983 quarterly reports are nearly finished and out. Based on a mandate of the Executive Committee annual reports will have the higher priority, and the 1983 and 1984 annual summaries will be published before the '84 quarterly reports.

3. There are 193 sites currently active, and Jim expects that the network will probably plateau at approximately 200. He showed slides depicting a breakdown of funding, operating and ownership of sites, as well as percentages of overall total.

Jim referenced the NAPAP Review held in Boulder, Colorado, in September. He mentioned two items.

1. Dry deposition (which has now become an NTN program).

2. Elevation. Little is presently known about elevation gradient concentrations. Also, at high elevations, there is no ability to sample snow. A Rocky Mountain Alpine/Subalpine Study is now being funded by the U.S. Forest Service, and Jim, along with a group of people primarily from Colorado and Wyoming, hope to be the successful bidders on this project.

Jack Pickering, Chairman of NAPAP Task Group D, Deposition Monitoring, commented that the wet deposition monitoring network has been fully implemented. There are now plans for implementing a dry deposition network. Thirty sites will be added to the five which have been operating as the pilot program. These sites will be located primarily in the northeastern U.S. He elaborated on the purpose and function of the network. Plans are to implement the network during this fiscal year.

Keith Huston, who has resumed serving as Chairman of the Administrative Advisors, commented briefly on the history of the NADP monitoring effort, which is a network organized in a voluntary way due to initial lack of resources. He remarked on the NADP brochure and reminded the group that the State Ag Experiment Station components must agree to a five-year renewal of IR-7

in 1987. This decision is up to each member state, and it is the individual scientists who must sell their administrators on renewal. The renewal of NADP as an Interregional project will be decided on a regional basis, and three out of the four regions must vote for renewal. It will then pass to the Committee of Nine for their approval in order that resources continue to be put into the program. Each state may

participate if they wish, using state or federal funds. Dave Shriner commented that the next few months will be the critical time for developing the IR-7 renewal proposal .

Jack Barnes, who has been officially designated as USDA-CSRS liaison with NAPAP, interacting with other Task Groups as well as Task Group D, was introduced. Jack complimented NADP on the brochure. He described the processes currently being used in the Competitive Grants Program for awarding funds to acid precipitation research. At the present time, acid precipitation research is separated from other stress research. There is a desire to have the acid precipitation program placed under the biological stress/plant stress management area. Olga Owens has asked NADP to make recommendations regarding this proposed plan. She also requested that her office receive annual reports and other pertinent items from scientists who were awarded a grant during '84 and '85. At this point in time, renewal or continuation grants are not encouraged in this program. Therefore, a case needs to be made for continuation of existing grants.

With regard to funding for data interpretation and assessment, one of the key factors was timing and the ability to come up with a large amount of money. At the present time, a small amount of money has been set aside to fund a project for this purpose. CSRS received a proposal , and they are now in the final stages of establishing cooperative agreements with Cornell as lead institution, four other institutions, and CAL for data evaluation.

Appreciation was expressed to Ellis Cowling for the excellent job done on the brochure. Ellis provided the group with the background of the development of the brochure and asked each participant to give thought as to how it can be used within their organization. He suggested giving copies to site operators, leaders within each agency, the public at large, members of Congress and staff personnel advisory to them, state legislative people, private industry, etc. Ellis expressed hope that one person could be identified within each state and each organization who would be key to the furtherance of the program.

Dave Shriner referenced the interpretive data summary project that is beginning under funding from USDA. Warren Knapp elaborated on the project. He commented that chemical deposition data has been collected for the past seven years and has been widely used by scientists, but no one has attempted to deal with characterization for data, from all sites in the network. Until this is done and information relevant to effects studies extracted and presented in a useful form, the true potential of NADP isn't being realized or utilized.

The project is titled "Analysis of Interregional Project IR-7 Deposition Chemistry Data." NADP scientists involved are Boris Chevone, Jim Lynch, Sagar Krupa, Van Bowersox, Bill McFee and Warren Knapp. The major objectives are to:

1. Statistically summarize precipitation chemistry data from all NADP network sites for seasonal and annual periods, and identify spatial patterns and temporal trends in wet deposition chemistry over the U.S.

2. Relate regional rreteorological and climatological regimes to observed patterns of chemical deposition.

3. Identify features of chemical deposition patterns and trends which are relevant to the study of effects of chemical deposition on the nation's crops, soils, forests, and surface waters.

The first phase will be one of analyzing and presenting information in the most useful manner. He solicited advice or comments regarding at what, in particular, they should be looking.

Jay Jacobson expressed his feeling that one aspect which is extremely important is the need for information on the duration and frequency, as well as the chemistry, of wet deposition events, thus allowing more relevant experiments. There was discussion of this research aspect.

Jim Gibson commented that there will be some 30 sites in the Northeast which will collect event data and which will be collocated with existing NADP sites. Keith Huston urged that there be as many approaches as possible, as early as possible, within the network. Interpretation made within a few years of the collection of the data is probably much more useful than interpretations made later. He sees no conflict in having people from all disciplines making interpretations of the data to provide different perspectives.

The meeting was adjourned. Following break, the Technical Committee reconvened for an invited paper by Volker Mohnen of SUNY, "Air and Precipitation Quality in the Eastern United States and West Germany."

Second Session
Tuesday, October 8, 1985, 1 p.m.

The afternoon session convened for presentation of an invited paper, "Reconstruction of Lake Acidification Based on Diatoms: A Regional Comparison," by Donald F. Charles of Indiana University. Following this presentation, participants adjourned to attend subcommittee meetings.

A one-day poster session began Tuesday evening at 8 p.m. A listing of posters and authors is attached.

Third Session
Wednesday, October 9, 1985, 8 a.m.

The third session of the NADP (IR-7) Technical Committee meeting convened with an invited paper, "Regional Surface Water Chemical Characteristics Based on the Eastern Lake Survey," presented by David F. Brakke of Western Washington University.

Contributed Paper Session I, consisting of papers in the areas of quality assurance, sampling methodology and data analysis, began at. 9 a.m. A listing of papers and authors is attached.

Fourth Session
Wednesday, October 9, 1985, 1 p.m.

The fourth session convened with continuation of contributed papers in quality assurance, sampling methodology and data analysis (see attached list)

Following break, Contributed Paper Session II commenced with papers on the topics of input analysis and effects research. (see attached list)

Subcommittee meetings were convened at 8 p.m.

Fifth Session
Thursday, October 10, 1985, 8 a.m.

Chairman Dave Shriner called the final business session to order and made a few announcements. John Robertson requested that all those having comments suggestions, etc. regarding improvement of meeting format, please communicate with him. The spring Executive Meeting will be held in Syracuse, New York, during mid May. A date has not yet been set.

The first item of business was selection of a location for the 1986 Technical Committee meeting. It. was suggested that the group consider choosing a location for 1987 as well. Invitations from the floor were requested. Jim Perry extended an invitation to Minneapolis for the fall of either 1986 or 1987. There are several options available which include large hotels in the city, a large conference center in a rural setting, and a conference facility on the campus (requires an 18-month lead time). Jerry Walker suggested holding the meeting in Atlanta or Savannah. CAL invited for future years, perhaps 1988. It was agreed that planning more than one year ahead would be a good idea. John Robertson moved that Georgia be accepted for 1986, Minnesota for 1987, and Illinois for 1988. The motion was seconded and carried.

Question was then raised regarding a choice between Atlanta or Savannah. It was moved and seconded that the meeting be held in Savannah. Savannah offers the possibility of field trips to the Okefenokee Swamp or the Savannah River Laboratory, but will probably be more expensive, both to reach and for accommodations. Following discussion, the motion was withdrawn. It was agreed that the host will make the decision, based on logistical considerations. Mid to late October will be the target date.
(NOTE: Has been scheduled for the week of October 27)

Dave Shriner commented on the activities of the budget committee. They reviewed the 1987 coordination budget proposal which has been approved by the Executive Committee. Final action on the proposed budget will be taken at a meeting in Washington on December 10. The budget places priority on catching up with publications and hiring a site activities manager.

Jerry Walker reported for the nominating committee, which consisted of Craig Weidensaul as Chairman, Jerry Walker, Alan VanArsdale, Denis DuBay, and Keith Huston. The committee placed the name of Steve Lindberg in nomination for the position of Secretary. Dave Shriner invited further nominations from the floor. None were received. It was moved and seconded that the recommendation of the nominating committee be accepted and that Steve Lindberg be elected Secretary by acclamation. Motion carried. Following the previously established protocol of rotation of officers, Dudley Raynal became Chairman for 1985-86, and John Robertson assumed the responsibilities of Vice Chairman.

Reports from the subcommittees were the next item of business.

Subcommittee No. 1 presented the following resolutions:

1. Whereas the NADP/NTN program has established 193 operating sites without the issuance of site certification documents, and
   Whereas, the data and other information obtained from these sites are no less valid than if certificate's had been issued, and
   Whereas, the Site Criteria and Standards Committee has not resolved the question of Site Certification,
   Therefore, be it resolved that the issue of site certification shall be considered irrelevant and dead.

2. The subcommittee agreed that the problems regarding sites and protocol which have been reported by RTI, CAL and the Coordinator's Office should be resolved. They strongly recommend that the Site Activities Manager position, proposed in the Coordination Budget, be funded.

3. Following discussion of the proposed, simplified coding scheme, the subcommittee recommends that the present coding

system be left in place. The subcommittee consensus was that the individual researcher should shoulder responsibility for interpretation, but that any coding redundancies should be modified by CAL/CSU.

4. Certain replacement parts, such as the motor drive, for the Aerochem Metrics collector should be stockpiled. Jim Gibson and Dick Semonin will meet with Wallace Weber of Aerochern regarding establishing a parts supply at CAL.

5. CAL has recently distributed a "Wet/Dry Collector Maintenance Manual." This manual will be reviewed by subcommittee members, and they will, perhaps, publish a revision of this and other manuals (Belfort, pH meter) under the auspices of NADP/NTN.

6. Cary Eaton of RTI reported to the subcommittee on the findings of site audits conducted to date.

7. Officers for 1985-86 are:

   Chairman - Dick Semonin
   Vice Chairman - Jerry Walker

It was moved, seconded and carried that the report be accepted.

Subcommittee No. 2 invited guest speaker, Dr. Ronald Wingender, from the Chemical Technology Division of Argonne National Laboratory, for a presentation on organics in precipitation and the ambient atmosphere. The committee considered the following items of old business:

1. With regard to non-participation by sites in the field pH and conductivity intercomparisons, LeRoy Schroder of the USGS QA program reported that, since the inception of the intercomparison in 1983, thirty sites have not participated. This number excludes sites who had known reasons for not submitting intercomparisons. Approximately half of the thirty sites are chronic offenders, but no one site has failed to participate in all intercomparisons. After much discussion of possible corrective actions, the following suggestions were made:

   A. All data from delinquent sites should be placed in the "non-standard" section of the quarterly reports,

   B. Publish a list of offenders for distribution,

   C. Enclose a letter with intercomparison samples warning that failure to participate in intercomparisons would result in punitive action, and

   D. A delinquent site (supervisor, manager and operator) would be contacted by the Coordinator's Office for an explanation of their non-compliance.

2. Jackie Lockard of the CAL reported that. since the July meeting, further investigation of possible contamination by "O" rings in lids was made. Following a number of tests; it was concluded that no significant contamination occurs with the current "O" ring, in either deionized water or dilute nitric acid, for periods up to one week. Actual data from the study is available upon request.

3. The turnaround time for pH electrode replacement has been lessened as CAL now has an ample supply on hand.

4. Sample filtration protocol was discussed. The subcommittee agreed that, since there has never been any evidence of contamination by filters, a change in protocol would not be appropriate and condones the practice of filtration.

The subcommittee then moved to new business and considered the items below.

1. The Subcommittee, and other selected individuals, will conduct a second audit of CAL in the next month or so. They will also review data handling procedures at the Coordinator's office.

2. The Subcommittee recommend the following procedures and objectives for the IR-7 renewal proposal:

   A. Include all protocols for collection, shipping, handling, analyses, etc.

   B. Dry deposition monitoring implemented as soon as acceptable techniques become available.

   C. Investigation of stabilities of pH, $P0_4$, NO_3, and NH_4 be carried out and procedures implemented.

   D. There be a faster turnaround of data.

   E. Development of a full quality assurance plan.

   F. Inclusion cf past accomplishments (e.g. pH 4.30 check samples, pH electrode replacement, field operator training,

CAL provision of buffers and troubleshooting, site visitation program, quarterly QA blinds for field measurements of pH and conductivity, etc.).

G. Reinstatement of NADP/CAPMoN co-location sampling

H. All publications and reports related to Subcommittee No. 2 activities be appended (material should be mailed To Bill McFee).

3. Recommend to the budget committee that some provision for travel funds for invited speakers be included in the coordination budget.

4. On the topic of QA of field measurements, the following recommendations were made by the subcommittee.

   A. Generate pH and conductivity frequency diagrams to be included in the quarterly reports.

   B. Generate percentile rankings for each site, to be reported with individual site data.

   C. Sites that do not participate in intercomparison will be noted.

   D. pH 4.30 check values be reported in the quarterly reports.

   The subcommittee considers the pH 4.30 check to be quality control and the intercomparisons, quality assurance. They feel quarterly intercomparisons are sufficient and, therefore, recommend that the current practice be maintained. They further recommend that the QA manager assess whether a site is "delinquent" by evaluating the reason for the non-reporting of intercomparison data. The QA Manager should develop criteria for assessment of "delinquent" sites in the overall QA plan. This criteria to be approved by Subcommittee No. 2.

5. It is recommended that comparisons of the CAL analysis and the USGS analysis of the QA blind samples be made in an effort to explain the small biases which have been found. Responsibility for this comparison will be negotiated between USGS and CAL.

6. A question as to the representativeness of QA blind samples, submitted by the sites when no precipitation occurs, was addressed earlier in the year by an ad hoc committee composed of the USGS audit team, LeRoy Schroder and Gary Stensland. This committee made the following recommendations, which were accepted by Subcommittee No. 2.

   A. The USGS will provide QA blind samples to site operators.

   B. Each QA blind sample will be accompanied by specific instructions as to when and how the blind sample is to be sent to CAL.

   C. On the designated date, the site operator will place an appropriate volume of the QA blind sample in a CLEAN bucket, run standard field measurements on the volume, and record the results on the site's weekly form. The blind sample will be sent to CAL as the site's weekly rain sample.

   D. The site's normal rain sample will be sent to CAL, under a dummy number, after the field operator has performed the usual field measurements.

   E. The site operator will return the unused portion of the blind sample to the USGS for analysis.

   F. The Coordinator's Office will contact each site by phone just prior to the date the QA blind sample is to be submitted by that site.

   C. CAL will know that the dummy sample is a true rain sample, but will not know from which site it is being received.

   H. Two blind samples should reach CAL each week.

   I. Each site will be asked to submit a QA blind sample, in their turn, about once every two years.

7. The Executive Committee has accepted responsibility for development of a strawman regarding who within NADP will carry the "Big stick."

8. The following individuals were elected as Subcommittee officers for 1985-86:

   Chairman- G. M. "Jerry" Aubertin
   Vice Chairman- Douglas L. Sisterson

Secretary Walter Chan (Note: Has subsequently resigned due to change in responsibilities.)

The subcommittee participated in a joint meeting with Subcommittee No. 3 to discuss handling the field pH measurements. It was subsequently agreed that field pH measurements should be included in the quarterly reports, along with a caveat that informs the user with regard to quality assurance of the data.

Subcommittee No. 3 considered the items listed below during their meetings.

1. IR-7 Renewal Proposal - Feel the major thrust for the renewal proposal should be in the area of data interpretation.

2. Field pH data - validation (Joint meeting with Subcommittee No. 2) -

   A. In Quarterly Reports
   The 1984 quarterly data reports should include field pH and check sample data.
   Beginning with the 1985 quarterly reports, field pH, check sample and USGS audit results data for the current and previous three quarters should be published.

   B. In Annual Summary Reports
   Starting with the 1983 report, they should include field pH data, with a statement concerning levels of uncertainty in field pH, and should also include a summary of USGS intersite audit results.

3. Annual Summary Reports - The subcommittee considered all the written reviews which were received and discussed several suggested revisions for inclusion in the 1983 report. No undue delay in completing the next summary report is anticipated. The expected schedule at the Coordinator's Office is to complete the 1983 and 1984 summaries during the coming year.

4. Rainfall amount data for 1980, which is currently on tape - correction of errors in missing rainfall data should be made by the Coordinator's Office, as soon as possible, and future problems should be corrected as they arise.

5. Field Observer Report Form- The Coordinator's Office should send a letter to each site stating that the new policy on field forms is as follows:

   Each site must return a completed field form to CAL for every week of the year.

6. Annual report distribution list - The subcommittee recommends that this list be expanded to include interested parties outside the U.S. They suggest using the North Carolina State University publication, *International Directory of Acid Deposition Researchers,* as a reference.

7. Primary unfinished business - No resolution has yet been reached regarding reorganization of the CAL/CSU data flagging and screening codes (on tapes) to reduce ambiguity in interpretation of data quality for users. The subcommittee will devote time over the next year to revise these codes, making them more acceptable.

8. Elections -

   Chairman - Jim Lynch
   Vice Chairman - Van Bowersox

   The subcommittee stressed that they do not feel the election of Van Bowersox poses a potential for conflict of interest between his position at CAL and holding this office. They further feel that his position on the subcommittee is important for maintaining continuity in the preparation of annual summary reports.

Steve Lindberg also reported that a resolution had been passed by the Executive Committee to the effect that reports would be published in the following order - 1st quarter, 2nd quarter, 3rd quarter, 4th quarter, annual, for any given year.

It was moved and seconded that Subcommittee No. 3's report be accepted as presented. Motion carried.

Subcommittee No. 4 discussed several items. Most of their recommendations are being prepared in writing for submission to Dr. Owens of the CSRS Competitive Grants Program. They are suggesting that the priority during 1987 be given to crops research but that essential projects in forest research not be ruled out. Priority is being placed here as this is basically the only money available for crops research. NADP scientists have been a major source in providing suggestions for funding priorities for the past several years, originally to the Special Grants Program and now to the Competitive Grants Program.

With regard to the IR-7 renewal proposal, suggestions from the committee have been presented to the proposal writing committee.

The committee elected the following individuals for the coming year:

Chairman - Wayne Banwart

Vice Chairman - Gary Lovett

Working Group officers are:

Aquatics:

Chairman - Alan VanArsdale

Field and Horticultural Crops:

Chairman - Denis DuBay

Forestry:

Chairman- Ann Bartuska

Vice Chairman - Ivan Fernandez

Materials:

Chairman. Ray Herrmann

It was moved, seconded and carried that the report be accepted.

Discussion then returned to the report from Subcommittee No. 2, specifically to the modification of their original recommendation concerning the question of nonconformity by sites and the handling of data for these sites. The subcommittee's modified recommendation is that the Quality Assurance Steering Committee develop a statement of compliance expectations for network sites, and that the Coordinator's Office be charged with carrying out the recommendation of the Steering Committee.

It was moved and seconded that the report from Subcommittee No. 2 be accepted as revised. Motion carried.

Warren Knapp reported for the Quality Assurance Steering Committee.

1. This committee has been charged to come up with a set of' criteria to correct abuse of protocol by site operators.

2. The committee will participate in an audit of the data management functions of CAL and the Coordinator's Office in early January. This will be basically the same group of people who conducted the original audit. The committee will consider including the ADS system as part of the audit.

Jim Davidson mentioned that Keith Huston will continue, for the time being, as Chairman of the Administrative Advisors. The IR-.7 project renewal is the major thing which needs to be undertaken.-

Dave Shriner commented regarding the IR-7 proposal. The next six months will be the most critical time. The renewal proposal will be distributed to the Technical Committee for review and comment. This will most probably be done through the Subcommittees. He asked for participation and cooperation from all involved, as it is critical that comments are received from as large a group as possible.

Thanks were expressed to the outgoing subcommittee chairmen and to Dave Shriner. Thanks were also expressed to the Coordinator's Office staff and to Dudley Raynal for their efforts in planning the meeting. Dave Shriner then turned the chair over to Dudley Raynal, Technical Committee Chairman, for 1986.

The morning session ended with an invited presentation by Dr. Tom C. Hutchinson of the University of Toronto, "Effects of Atmospheric Pollution on Forest Ecosystems in Eastern North America."

Sixth Session
Thursday, October 10, 1085, 1:30 p.m.

The final session of the 1885 NADP (IR-7) Technical Committee Meeting convened for presentation of contributed papers on Input Analysis and Effects Research. (see attached listing)

The meeting was officially adjourned.

The field trips scheduled for Friday, October 11, were cancelled due to inclement weather.

Participant List

Name	Affiliation
Ray Albright	Southern Illinois University
William Alsop	Massachusetts Dept of Environmental Quality
John Anderson	New Mexico State University
Richard Artz	NOAA/Air Resources Laboratory
G. M. Aubertin	Southern Illinois University
Linda Bandhauer	NADP/NTN Coordinator's Office
Wayne Banwart	University of Illinois
John Barnes	U.S. Department of Agriculture
Jill Baron	National Park Service
Ann Bartuska	North Carolina State University
Berne Bennett	U. S. Environmental Protection Agency
Gail Bingham	Utah State University
Van Bowersox	Illinois State Water Survey
Gordon Bradford	University of California
David Brakke	Western Washington University
Patricia Brewer	Tennessee Valley Authority
Steven Bromberg	U. S. Environmental Protection Agency
Myron Brooks	U.S. Geological Survey
Darrell Bushman	Exxon Company
Gerald Byers	NADP/NTN Coordinator's Office
Ann Carey	USDA Forest Service
Walter Chan	Ontario Ministry of the Environment
Donald Charles	Indiana University
Boris Chevone	VPI and State University
Edward Corbett	USDA Forest Service
Ellis Cowling	North Carolina State University
Terry Dana	Battelle-Northwest
James Davidson	University of Florida
Rosa de Pena	Penn State University
David Dewalle	Penn State University
Scotty Dossett	Illinois State Water Survey
Thomas Dreschel	The Bionetics Corporation
Denis DuBay	North Carolina State University
Cary Eaton	Research Triangle Institute
Ivan Fernandez	University of Maine
Joel Frisch	U.S. Geological Survey
Eric Fujita	California Air Resources Board
Phil Galvin	New York Department of Environmental Conservation
Alan Gertler	Desert Research Institute
James Gibson	NADP/NTN Coordinator
Richard Graham	U.S. Military Academy
Charles Hakkarinen	Electric Power Research Institute
Robert Heil	Colorado State University
Bruce Hicks	NOAA/Air Resources Laboratory
James Hornig	Dartmouth College
Robert Houghton	U.S. Geological Survey
Keith Huston	North Central Assoc of Ag Exp Stn Directors
T.C. Hutchinson	Institute of Environmental Studies
Jay Jacobson	Boyce Thompson Institute
Paul Kapinos	U.S. Geological Survey
J. M. Kelly	Tennessee Valley Authority
Edward Klappenbach	U. S. Environmental Protection Agency
Warren Knapp	Cornell University
Safar Krupa	University of Minnesota
Timothy Lewis	Lockheed-EMSCO
Chin-I Lin	Pacific Gas and Electric Company
Steven Lindberg	Oak Ridge National Laboratory
Harry Lins	U.S. Geological Survey
Michael Litaor	University of Colorado, INSTAAR
Jacqueline Lockard	Illinois State Water Survey
Mark Losleben	University of Colorado
Gary Lovett	Institute of Ecosystem Studies
James Lynch	Penn State University
Bernard Malo	U.S. Geological Survey

C. Wayne Martin	USDA Forest Service
Detleff Matt	NOAA/Air Resources Laboratory
Volker Mohnen	SUNY, Albany
Andy Morton	Wisconsin Department of Natural Resources
Thomas Murphy	DePaul University
Dale Nichols	USDA Forest Service
Patrick O'Connell	New York Department of Environmental Conservation
Anthony Olsen	Battelle-Norwest
Mark Peden	Illinois State Water Survey
James Perry	University of Minnesota
Jack Pickering	U.S. Geological Survey
John Pinkerton	Natl Council/Paper Industry/Air & Stream Improvement
David Radloff	USDA Forest Service
Danny Rambo	Corvallis Environmental Research Laboratory
Dudley Raynal	SUNY, Syracuse
Michael Reddy	U.S. Geological Survey
David Rengert	Niagara Mohawk
John Reuss	Colorado State University
Benedicte Reynaud	Colorado State University-INSTAAR
John Reynolds	University of Tennessee
Al Riebau	Bureau of Land Management
Hans Riekerk	University of Florida
John Robertson	U.S. Military Academy
Bruce Rodger	Wisconsin Department of Natural Resources
Jane Rothert	Battelle Pacific Northwest Laboratory
V.K. Saxena	North Carolina State University
Perry Samson	NCAR/University of Michigan
Jackie Sauer	Illinois State Water Survey
Terry Schertz	U.S. Geological Survey
LeRoy Schroder	U.S. Geological Survey
Gwen Scott	NADP/NTN Coordinator's Office
Matthew Scott	Maine Department of Environmental Protection
John Seiler	VPI and State University
Richard Semonin	Illinois State Water Survey
William Sharpe	Penn State University
David Shriner	Oak Ridge National Laboratory
J.E. Sickles, II	Research Triangle Institute
David Silsbee	National Park Service
Michael Simini	Purdue University
Douglas Sisterson	Argonne National Laboratory
Loretta Skowron	Illinois State Water Survey
Antoinette Slavich	Battelle-Northwest
Skip Snow	Theodore Roosevelt National Park
Randy Stahlhut	Illinois State Water Survey
Hans Spors	Southern Illinois University
Joachim Staack	Southern Illinois University
Kenneth Steel	University of Arkansas
Gary Stensland	Illinois State Water Survey
Malcolm Still	Atmospheric Environment Service
Robert Stottlemeyer	Michigan Tech University
M. Ali Tabatabai	Iowa State University
Alan Telk	Colorado State University
Patricia Thasan	University of Arkansas
Leo Topol	Environmental Monitoring & Services, Inc.
Alan VanArsdale	Massachusetts Dept of Environmental Quality Engineering
Anne Veigel	USDA-ARS/University of Idaho
Shashi Verma	University of Nebraska
Elon Verry	USDA Forest Service
Jerry Walker	University of Georgia
Craig Weidensaul	Ohio State University
Lois West	Louisiana State University
Alice Westerinen	California Air Resources Board
James Womack	NOAA/Air Resources Laboratory