IMPROVE Steering Committee Meeting Summary
July 26 & 27, 2005
Schoodic Education and Research Center; Acadia National Park, ME

Overview

The Steering Committee met at the Schoodic Education and Research Center in Acadia National Park, ME, on July 26 and 27, 2005. A copy of the agenda and meeting participants is attached.

Major discussion topics included:

- Carbon analyzer changes
- Aerosol data quality control/quality assurance
- Independent field audit program
- Quality Assurance Project Plan review
- Instrument evaluation
- Aerosol extinction algorithm assessment
- Various special studies
- Network assessment plans
- Data tools on IMPROVE and VIEWS Web sites

The following summarizes the meeting discussions in greater detail as shown in the agenda.

Field Site Tour

Before the meeting began, the group traveled to the IMPROVE and RAIN monitoring site for a tour of the site with commentary by the site operators (Bill Gawley, Emily Seger, and Kit Sheehan).

Welcome and Introductions

David Manski, Chief of Resource Management at the park, welcomed the group and spoke about the history of Acadia NP and its air resource program. Jim McKenna, Schoodic Education and Research Center (SERC) Coordinator, also spoke of the history of the current SERC facility. Denny O'Brien, Executive Director of Acadia Partners for Science and Learning, also spoke about the organization's mission.

Attendees introduced themselves and most acknowledged this is their first time visiting Acadia NP. Presentations from the meeting will be posted on the IMPROVE Web site.

Network Operations Updates

Optical. There are currently 15 remote and 7 urban location transmissometers, and 34 remote and 9 urban location nephelometers operating throughout the country. All SOPs for optical and scene monitoring have been updated and delivered to CIRA.

ARS has reexamined the SUVA calibration gas multiplier for nephelometers. The first testing in 1992-1993 resulted in a multiplier of 7.1. Various studies indicated this is too low a multiplier value and a retest occurred Fall 2004. The retest used a newly manufactured NGN-2 nephelometer and multiple span gases. The new multiplier is 7.25, which results in a 2%-3% increase in reported b_{sp}. Approximately 700,000 reprocessed data values were delivered to CIRA in July 2005 and a report on the testing is available on the IMPROVE Web site. Test results show that 99.95% of the data are within 2.5% of previously reported b_{sp}. Only the December 1998 Shenandoah data lie outside of that range and it is unknown why.

Nephelometer data are reported 90 days after the end of each quarter and transmissometer data are reported 1 year later. Nephelometer data through March 31, 2005 have been delivered to CIRA. Transmissometer data through December 2004 are expected to be delivered by August 2005.

The Virgin Islands monitoring shelter is deteriorating rapidly due to sea salt and numerous hurricanes. The next hurricane may destroy it so we need a new shelter soon. The shelter houses a meteorological tower, nephelometer, and the IMPROVE aerosol sampler. All but the IMPROVE sampler are to be removed due to network reconfiguration.

➔ UC Davis will build a new outdoor shelter for the sampler on their next site visit, later in 2005.

There are approximately 58 digital Web cameras in the U.S. designed to document visibility. The IMPROVE Protocol program has two 35mm cameras remaining in the network; ARS hopes to switch them to digital cameras this year.

Aerosol. The 2004 annual sample recovery for Channel A is 96%, with each quarter being 95%, 95%, 96%, and 96%. The 2004 sample recovery for all four modules is 94%, with each quarter being 93%, 94%, 94%, and 95%. Six percent (6%) of all samples were lost due generally to equipment problems, power outages, and operator no-shows. The Regional Haze Rule requirements state that to be valid, sites must have >75% data recovery annually, >50% data recovery for each quarter, and <11 consecutive missed samples. Five sites failed these criteria in 2004: 1) Breton, LA (hurricane); 2) North Cascades, WA (landslide); 3) Indian Gardens, AZ (ongoing power problems); 4) Bliss, CA (equipment and poor winter access); and 5) Addison Pinnacle, NY (equipment problems). Sites that may still fail are: Chassahowitzka, FL; Mingo, MO; and Swanquarter, NC; due to inlet blockage that removes particles while allowing normal airflow rates.

During Summer 2005, 172 sites operated in the IMPROVE and IMPROVE Protocol networks. Three sites are being decommissioned: Walker River Paiute, NV (tribal funding was cut); Spokane, WA (tribal funding was cut); and Hillside, AZ. Also, the urban sites of Houston, Chicago, Rubidoux will end monitoring by December 2005. A new site will be installed at Egbert, Ontario in August 2005, where it will be collocated with Canadian PM speciation monitoring systems to help assess the comparability of

such data from both sides of the border; sampling at this site will be conducted on the Canadian schedule from 0800 to 0800 (not the IMPROVE schedule of 2400-2400). Other urban sites may change modules. The Lake Sugema, IA site was relocated in November 2004.

UC Davis is developing a new database which will be more compatible with CIRA's database. CIRA currently has August 2004 aerosol data. The Fall 2004 data (Sept-Oct-Nov 2004) will be delivered by August 10 and December 2004 data will be delivered by August 31, 2005. Laser absorption data (not used in the Regional Haze Rule metric) are delayed due to a laser failure.

Data since 2000 that require corrections will be resubmitted by September 30, 2005. Among the changes are new flow validation flags, which will be more quantitatively specified. Also, prior to January 2004, flows were incorrectly calculated using the temperature at calibration rather than standard temperature (20 degrees C), resulting in a flow bias usually less than 2%. Flows will be recalculated using the correct absolute temperature and will be resubmitted in September.

Carbon Analysis Changes. Last January the Steering Committee approved a change recommended by DRI that allows the use of a newer version of the carbon analyzer. A corresponding change in analyzer protocols (referred to as IMPROVE-A protocol) was developed to mimic the temperature cycle used in the old system. In the course of developing the new protocol, DRI discovered that the optically-determined pyrolytic organic fraction, OP, used to adjust the split of carbon into EC and OC that was always assumed to be a positive number, can in fact be a negative value. The practice applied to all IMPROVE data has been to set OP to zero when the analysis results produced a negative value. Using a negative value instead of zero will have the effect of reducing the EC and increasing the OC. Negative OP values are relatively rare, but DRI has not yet assessed the magnitude of changes to the data that would result from adjusting past data for this discrepancy, nor have they estimated the effort required to make the corrections to past data.

The Steering Committee was concerned about the effects of any changes in the OC-EC split for the Regional Haze Rule five-year baseline period (i.e., 2000 to 2004). States need access to the IMPROVE data set as soon as possible so they can prepare State Implementation Plans for haze.

➔ Judy Chow will estimate the magnitude of the changes to the OC-EC split and the amount of effort required to correct it in the data for the regional haze baseline period by September, so that the Steering Committee can make a decision about whether the adjustments are needed quickly or not.

Data generated using the new DRI Model 2001 sampler begin January 2005. Changes to the SOPs with the new sampler include changes to the minimum detection limits, changes to daily multipoint injection calibration, and conducting a trace oxygen check to ensure oxygen in the pure helium atmosphere is less than 25ppm.

The IMPROVE OC/EC split is not affected by oxygen in the helium. The OC and EC fractions are not affected by oxygen <40ppm. Five DRI Model 2001 samplers are being used for IMPROVE analysis; 10% are random samples for replication and 5% of the samples will also run on the DRI/OGC analyzer for comparison. The current laboratory configuration is an estimated 500-750 samples per week. The transition plan is to complete instrument calibrations, and then reprocess historical data that had negative OP data set to zero (2000-2004 data). The target transition date is August 2005. Semiannual instrument audits will be performed for post-transition evaluation.

Aerosol Data Quality Control – Quality Assurance

Data checks, flags, collocated data. CIRA and UC Davis performed an assessment of the current IMPROVE quality assurance system. The data management system at UC Davis needs a major overhaul to better address quality assurance (QA) issues. The new database will allow for ready access to data, include a robust archival system, promote data reproducibility, and include features for tracking changes to data.

UC Davis is also reviewing and updating its QA documentation (QAPP, SOPs), data validation methods, and quality control (QC) data. Changes to the quality assurance project plan (QAPP) will include revisions to measurement and data quality objectives (MQOs/DQOs). The current version of the standard operating procedures (SOPs) are dated 1996-1997 and need updating to include SOPs for the copper anode XRF system. The QAPP and SOP revisions should be final by December 2006.

Site metadata history has been delivered to CIRA for upload to the IMPROVE Web site; 9800 site records have been added for the years 1988-2004. Metadata will be updated and delivered to CIRA on a semiannual basis.

CIRA implemented new data integrity checks to address data reporting issues (consistency between flags and data values, data record completeness, etc.). CIRA performed a historical review of the 1988-2003 data; a summary of the findings will be included in the next IMPROVE report. CIRA began performing secondary data validation beginning with 2004 data; the quarterly reports will be posted on the IMPROVE Web site. Key validation issues identified include significant variations in flow rate and thus cut-points, titanium contamination with PIXE, aluminum detection problems, and other data quality issues at specific sites. Examples of flow rates and cut-point time-series plots for a typical and a problem site were presented. An example of aluminum detection problems with both PIXE and copper anode XRF was presented. Several months of Swanquarter data were removed from the CIRA database when the reason for a downward trend in concentration was discovered to be the result of insect nest materials that blocked particles passing through some of the sampler inlets.

IMPROVE is developing and documenting objective data validation criteria to promote consistency over time and make the validation process more efficient. UC Davis is developing objective data quality standards for the raw data (flow rates, duplicate lab analyses, field blanks, etc.). The new data management system is required before many of these objective checks can be implemented. UC Davis also plans to inspect data on longer time scales (currently on a 3-month basis) and apply the NARSTO flagging

scheme (3 levels of flags). Discussion ensued regarding the filter clogging issue due to forest fires; leave the data in or take it out? Chemical analysis-level range checks and site-specific range checks (flow rate, etc.) are also “objective data quality standards.” The flow rate validation criteria will change and all data from 2000-2004 will be reevaluated. Nicole Hyslop of UC Davis will spend next year working on the data management and validation system. Lindsey DeBell of CIRA will prepare the IMPROVE report next year.

There are currently 24 collocated modules operating in the network. These data have been the basis for identifying a few unexpected issues; details of cassette design can significantly impact flow rates and “swapped” filters are not easy to identify. The observed differences in the collocated concentration data were compared to the differences estimated by the uncertainties reported with each concentration value. The uncertainty estimates for NO_3, SO_4, and several of the elements associated with particles smaller than 2.5 microns, accurately reflected the observed differences. The uncertainty estimates for the soil-related elements were consistently underestimated, likely due to cut-point differences in the routine and collocated samplers. Zinc concentrations may be contaminated by residue from the filter labels. UC Davis is using the collocated data to evaluate the uncertainty estimates.

Independent field audit program. Flow audits performed by EPA’s Radiation and Indoor Environments National Laboratory in Las Vegas as part of the EPA sponsored independent site audit program use BGI Trical flow monitors. The site audits are being performed by EPA staff, including those from regional offices, who have been trained and certified to conduct audits of IMPROVE particle monitoring sites. Sampler verifications include clock checks via cell-phone or GPS. The TSA Form is used during audits for both the IMPROVE and Speciation Trends Networks. The audit form is being updated and audit SOPs will be completed by December 31, 2005. Operators show good field reporting, but there is some need for sample handling technique training and health and safety awareness.

Ten site audits have been audited to date. Flow rates at all sites are acceptable, but approximately 50% of all audited clocks are not accurate (>5 minutes) and approximately 50% of all audited temperature checks fail $\pm$ 2°C). One safety hazard is apparent; Isle Royale has an unsafe platform that is scheduled to be replaced later this year. A potential future problem at some sites is shrub/tree growth. Recommendations are: 1) samplers need a calibration date sticker, 2) operators need training with filter handling, 3) inaccurately set clocks need correcting 4) inaccurate temperature sensors needs correcting, 5) need a corrective action program for safety concerns, and 6) operators need to be more aware of siting criteria (more observant of shrub/tree growth, etc). There was a discussion about incorporating the flash card flow rate data during the audit in order to assess their ability to accurately monitor flow rates continually at all sites during sampling.

There will be 7-10 audits in Regions 1 and 10 this year, and additional auditor training is scheduled. The EPA would like a 25% audit rate. To help accomplish this, auditor training will include representatives from EPA regions 5, 6, 7, and 8 in August in the

EPA Denver Regional Office. UC Davis performs annual site visits at each site; they need to share the information obtained during these annual visits with the EPA auditors. To increase the annual number of audits, skilled regional EPA auditors are needed, as well as state auditors, if they have an interest and resources to participate in the auditing program. An annual QA summary report will be drafted in early 2006.

The National Air and Radiation Environmental Lab (NAREL)'s $PM_{2.5}$ Air Program Support performs on-site laboratory audits and annual performance evaluations at UC Davis, DRI, and RTI. Weighing room conditions (temperature and humidity) at UC Davis are not as closely controlled as the weighing chamber at NAREL. However, comparisons show that there is virtually no difference in the $PM_{2.5}$ mass measured by UC Davis and NAREL. Further studies include: XRF performance evaluation, filter mass equilibration, and gravimetric chamber humidity criteria.

QAPP review. According to the current Quality Assurance Project Plan (QAPP), the primary data quality objective (DQO) is to measure a 5% change in b_{ext} in 5 years for each component – sulfur, organic carbon, soil. [Section 4, page 30 of QAPP]. This formulation carries no implications for measurement quality, because it fails to specify the accuracy with which the change is to be measured or the reliability with which it is to be detected. The natural variability of the atmosphere yields a 4% statistical uncertainty in the 5-year hazy day mean for sulfate in the eastern U.S. all by itself, independent of any measurement uncertainty. Statistical analyses show that detection and measurement of concentration change is much more sensitive to slowly changing errors than to random noise. The QAPP specifies measurement quality objectives in terms of precision and accuracy. Precision is operationally definable as the agreement between collocated samplers. Accuracy is defined as the agreement between measured and true values, but true atmospheric concentrations are unknown. A pair of samplers is all we need to determine overall precision of our measurement system, but we have no way to determine overall bias or accuracy; collocated measurements by the same method cannot reveal analytical or method biases. The QAPP needs to reflect our need to narrow measurement tolerances relative to NIST-traceable reference standards to ensure that measurements at different sites and times are comparable. We also need to utilize flags to identify and annotate observations taken outside of established tolerances.

Methods evaluation. The OC/EC decrease and sulfur/sulfate increase are indicators of inlet blocking. Mud dauber wasps have built nests that block particle flow through the inlets at three sites. The inlets should be cleaned more often, but they are difficult to disassemble. New inlets, which are more easily cleaned and assembled, are now being used and replaced at sites with older inlets. Flow rates are not affected by the blocks and the new inlets provide comparable concentrations. Operators need to check the inlets on a monthly basis. The new inlets have been standard on new URG samplers purchased since 2002.

UC Davis is running out of original filter cassettes and they cannot be obtained anymore. There are masked and unmasked cassettes; the masked ones (with metal stripping around the edges) clog more readily than the unmasked cassettes. A new

cassette design is now being tested at UC Davis. Fine mass appears to be comparable and XRF is yet to be performed. Durability testing will also be performed of the perforated 1/4 hard steel used to support the filters in the cassettes.

During routine pump testing UC Davis discovered that the needle valve as installed is not operating as a critical orifice over an extended back-pressure range. This is only an issue for samplers with failing pumps. However, critical flow is maintained over a larger range of back pressure when the valve is turned around (i.e., installed so flow is reverse of the nominal direction), apparently due to less abrupt gas expansion around the needle pin. UC Davis is reversing the valves on all samplers during this summer's maintenance visits.

A new vacuum XRF system is in place at UC Davis and is being tested. Each slide with filter material enters the vacuum chamber of the XRF. The vacuum rids the chamber of argon; the minimum detection limits will be better due to purged argon. The new system also does not require a helium supply and is expected to have better detector reliability.

UC Davis has a new field test shelter on its rooftop test site in Davis. The IMPROVE network currently is configured with about half the network samplers mounted inside a shelter and the rest of the network samplers mounted outdoors on racks. UC Davis will test the mounting configuration differences and other issues at the rooftop test site.

Data Derivatives

Visual air quality metrics. ARS is developing techniques to calibrate digital cameras. Over 50 Web-cameras operate now. Image processing includes: 1) digital camera characterization (taking photographs of a 96-color color chart) and determining repeatability of the red/green/blue values, 2) image registration, and 3) clear/uniform sky identification. To identify a clear sky, five scans are performed across the sky portion of the images. Red values should increase is clouds are detected. This registration process correctly identifies cloud-free images 95% of the time. Then you can calculate metrics (contrast). Standard, automatic monthly reports are printed on-site every month at Web-camera sites. Semiautomatic quarterly reports include cumulative frequency statistics and a correlation plot with transmissometer or nephelometer data. Various image difference metrics are available. This is currently operational at Grand Canyon NP, Great Smoky Mountains, NP, and at Phoenix, AZ. Ongoing work includes testing of various camera models and the development of additional data products.

Aerosol extinction algorithm assessment. EPA uses the IMPROVE algorithm in the Regional Haze Rule. The IMPROVE Steering Committee hasn't revised the algorithm since its adoption nearly 20 year ago. Because of the consequences of its use in regulations, the IMPROVE Steering Committee has be asked to assess the algorithm in light of the more current scientific literature and where needed to revise it to make it more defensible.

Bill Malm and Jenny Hand presented an abbreviated version of the presentations they made at the Denver RPO technical meeting in June on their work to review the technical basis and performance of the aerosol extinction algorithm. The complete Denver

presentations are available at the gray literature section of the IMPROVE Web site at http://vista.cira.colostate.edu/improve/Publications/GrayLit/016_IMPROVEeqReview/IMPROVEeqReview.htm.

While there are a number of things that could improve the performance of the algorithm to estimate extinction, the assessment and revisions will be limited to use of existing IMPROVE data. The issues that a new algorithm is likely to address include: revisions to the factor used to calculate organic mass from the measured organic carbon (the ratio of 1.4 will probably be replaced with 1.8); the addition of a term for sea salt light scattering; revised dry extinction efficiencies for inorganic (e.g., sulfate and nitrate) and organic constituent that may vary depending on the measured concentrations; and new relative humidity adjustment functions (f(RH)), to be technically consistent with the newly selected dry efficiency terms for the hygroscopic components.

There are a number of possible approaches to making these revisions. Since the goal over the next decade is for the new algorithm to perform as well as the old one did, we want the new algorithm to be as technically credible as possible. Visibility stakeholders including states, RPOs, and utility companies, have a keen interest in applying the most credible technical approach to address the Regional Haze Rule. Regulatory timelines are imposing pressure to expediently develop a new algorithm. As there are a number of options that have been proposed by the Malm-Hand team as well as several by the EPRI on behalf of the utility industry, there was no single proposal for the Steering Committee to consider at the meeting. The Steering Committee indicated their desire prior to voting on a change, to have one specific proposed algorithm and results of its performance at Class I area sites, compared with the results using the original algorithm. To facilitate this, Naresh Kumar from EPRI offered to work with Bill Malm and Jenny Hand to develop a consensus proposal if possible.

With the acceptance of a new aerosol extinction algorithm, IMPROVE will need to calculate and post on its Web site the regional haze metrics for each monitoring site using both the new aerosol extinction algorithm and the original algorithm. This is because IMPROVE's adoption of a new algorithm does not automatically change EPA guidance, which refers to the original algorithm. Changes to EPA's guidance documents would likely take the better part of a year or more to accomplish. However, states don't have to follow the EPA guidance, though doing so requires no additional technical justification of the method chosen. The feeling was expressed that EPA would likely approve for use in the Regional Haze Rule, a revised algorithm adopted by IMPROVE. If so, the ability of states to use either algorithm (or in fact other methods, if states choose to do so) could lead to some confusion if states in a region use different visibility metrics for the same Class I area. The Regional Planning Organizations may be able to help in this regard.

➔ Bill Malm, Jenny Hand, Naresh Kumar, Warren White, and Marc Pitchford volunteered to work on as a group to develop a consensus proposal for the revised algorithm, with a goal of having a documented proposal for the Steering Committee by September 30, 2005, so that they can discuss and vote on its acceptance in October.

FAST-CAT update. Fast Aerosol Sensing Tools for Natural Event Tracking (FASTNET) and Combined Aerosol Trading Tool (CATT) are both data tools available on the Internet at http://datafed.net. They include catalogs of data including IMPROVE data. Various graphic packages are available and the user can select various time series, symbols, variables, export data, etc.

Special Studies

CSU denuder study. Denuders were tested in the field in 2003 with all configurations (including new, used, and uncoated denuders) giving comparable concentrations. New and used denuders were subsequently sent to CSU for laboratory tests. Results show comparable efficiencies for new and used denuders (85%-95% collection), but some variability was observed from one denuder to the next. Results of both the field and laboratory tests suggest that denuder capacity is sufficient to last for a year in the field.

Great Smoky NP ammonia study. The study was held during Summer 2004 for approximately 1 month. Its objective was to determine how accurately ammonium can be quantified on a nylon filter and to assess the effects of any contamination during sample handling. Study results found that IMPROVE filters were biased approximately 15% low but no contamination was found along the way. Ammonium is measured routinely at only a small number of sites in the IMPROVE network.

Nylon filter tests. UC Davis has conducted side-by-side comparison tests of several different nylon filters to assess any differences in their collection efficiencies for nitrate. These tests were performed at the test facility on the Davis campus. A new manufacturing lot of nylon filters is introduced into the network about once a year and the filter manufacturer was changed at the beginning of 2004, so the tests were designed to verify that these changes would not subject the nitrate data to any bias. The tests included filters from several lots and from three different manufacturers, including one manufacturer that has not been used in IMPROVE, as an independent check. The tests revealed no significant differences in nitrate collection efficiencies among the various filters.

Carbon 14. Sampling for $PM_{2.5}$ carbon-14 was conducted at five sites during the Summer of 2004 and Winter of 2004-2005. The results have shown that the majority of carbonaceous material at the rural sites is composed of modern carbon, as compared to fossil carbon. Results from the one urban site in the study, Seattle, indicate that the urban aerosol is evenly split between modern and biogenic carbon. Measurements are continuing at six different sites during 2005-2006.

PM_{10} speciation. A PM_{10} speciation special study was conducted during 2004. PM_{10} samples on Teflon, nylon, and quartz filters were collected at nine sites on the routine 1-in-3 day schedule and were subjected to all of the standard IMPROVE analyses. Data analysis is currently underway.

UC Davis mobile lab. A new mobile laboratory will be delivered to CSU in September, designed for use in IMPROVE special studies. The lab is housed in a 20-foot box on an

International truck frame. The vehicle is equipped with International's "Green Diesel" technology to minimize any effects of vehicle emissions on samples. The lab will house continuous analyzers for OC/EC and ions, a MOUDI, various gas samplers, a wet chemistry lab, and it will have an IMPROVE aerosol sampler mounted on the outside. It is scheduled to be used on the 2006 Front Range Study.

RAIN. Rural Aerosol Intensive Network. The northeastern regional planning organization (MANE-VU) is sponsoring long-term real-time carbon and sulfate measurements at three rural sites with high elevation: Frostburg, MD; Mohawk Mountain, CT; and Acadia NP, ME; in a southwest to northeast line. Measured scattering and reconstructed scattering at Acadia show an r^2 of 0.94, using reconstructed organic carbon and sulfate, and measured nephelometer data. A new format is available for the hazecam network. High-resolution cameras in JPEG 2000 and wide-angle format are being used in Boston and at Blue Hill (Boston). The format will also be implemented at Burlington, VT and at Acadia NP, ME. Wide angle (100°-130°) is useful because it shows the range of haze events and if they are local or regional events. The wide angle cameras capture images in 16 megapixels while regular digital cameras use 2-3 megapixels. The current Acadia McFarland camera may move to the top of Cadillac Mountain for a better view.

IMPROVE – STN comparison. Beginning in 2001, three urban/rural pairs of sites operated collocated samplers from the IMPROVE and Speciation Trends Network (STN) networks. Two years of data were obtained and most data from the two types of samplers agreed well. Exceptions included typically high values of organic carbon from the STN sampler (due to artifact corrections in IMPROVE but not in STN), high IMPROVE soil values at some sites (due apparently to flow rate and cut-point differences), and variability in agreement among trace elements measure near or below their detection limits.

Other Topics

IMPROVE network assessment plans. EPA is expected to assess program priorities and effectiveness, including their support of IMPROVE, in the next fiscal year. To aid in their review, the IMPROVE Steering Committee should assess the adequacy of the IMPROVE network for meeting the monitoring requirements of the Regional Haze Rule. The ultimate product of such an assessment is a characterization of sites with respect to their value for meeting the needs of the regional haze program. Though the primary concern of the Steering Committee is the 110 IMPROVE sites that represent the mandatory federal Class I areas with visibility protection, many of the IMPROVE Protocol sites also contribute information that is useful for the implementation of the Regional Haze Rule. Factors such as data similarity among neighboring sites, identification of spatial gaps in the network, data capture, likely changes to spatial gradients from possible future emissions changes, degree to which sites adhere to the siting criteria, and budget consequences of network changes should be included in this assessment. It was suggested that the current IMPROVE team (CIRA, UC Davis, etc.) be used to perform the assessment. Related assessment activities include the upcoming preparation of the next IMPROVE report being planned by CIRA, and a

regional haze monitoring strategy document being prepared by the RPOs. Feedback on this approach was requested.

➔ Chuck McDade (UC Davis), Bret Schichtel (CIRA), and Marc Pitchford (EPA) will devise a management approach as a team.

2000-2004 Regional Haze Certification. A complete and consistent version of the 2000-2004 data labeled as appropriate for use for the Regional Haze Rule baseline assessment will be posted on the IMPROVE Web site this fall. This posted data needs to have consistently applied data flags and include recommendations concerning the advisability of using flagged data.

➔ UC Davis will prepare a site-by-site assessment of old data flags vs. new flags, etc. in the next month, and distribute to IMPROVE personnel.

Budget review. UC Davis obtained a new contract in August 2004. The 7/1/05 – 6/30/06 budget is approximately $6 million. For the year 7/1/04 – 6/30/05, the budget breakdown is: 17% CSU/CIRA ($1,032,900); 15% carbon analysis ($880,800); 6% ion analysis ($363,300); 60% elemental analysis/particle coordination $3,567,200); 1% IMPROVE Newsletter and meeting ($45,000), and 1% miscellaneous/studies ($65,000). Estimated cost per site is $31,900. There are 179 full-year sites.

IMPROVE & VIEWS Web sites. The IMPROVE Web site reaches 1400-2400 visitors each month. Next year the QA documents will be added, continued maintenance will be performed on it, and the education section will be completed. This year CIRA has added more data, documents, and analyses, with quarterly data submittals. Nephelometer data were reprocessed from 1993 - Winter 2005. Transmissometer data are available from 1987-2003. Also on the Web site are BRAVO Study data and the Yosemite Aerosol Characterization Study data will be available soon. Regional Haze Rule metrics have also been added. The site also includes meeting presentations, updated ARS SOPs, meeting minutes, IMPROVE calendars, the BRAVO final report, a paper on the revised SUVA span gas calibration for the nephelometer systems. The gray literature section is growing and the query wizard has been upgraded on the VIEWS Web site. Users can now save the query, create various plots, etc.

Quarterly newsletter. Approximate costs are $2,000 to mail and print the newsletter each year. The next issue will be delivered in mid to late August. It is delivered to approximately 500 persons and 180 site operators, as well as being electronically available on the IMPROVE Web site. Articles are solicited from the Steering Committee and other related parties each quarter.

➔ Gloria Mercer will add to the November newsletter, a item that instructs readers to notify her if they still want to receive the newsletter, and if so, in what format (hardcopy or pdf).

➔ Gloria Mercer will send the newsletter mailing list to Marc Pitchford and others for review and update.

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IMPROVE Steering Committee Meeting Agenda
July 26 & 27, 2005
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Time	Topic	Discussion Leader
	Tuesday, July 26	
8:00am	Assemble at training center for carpool to IMPROVE & RAIN site visit (lunch in Bar Harbor)	
2:45pm	Welcome & Introductions	Marc Pitchford
	Network Operations Updates:	
3:00pm	1. Optical (data recovery, field and data processing QC, SOP updates)	Molenar
3:20pm	2. Aerosol (sample recovery, data delivery, flow, analytical & data processing QC)	McDade, Ashbaugh
4:00pm	3. Carbon analysis changes	Chow
	Aerosol Data Quality Control – Quality Assurance:	
4:30pm	1. Data checks, flags, collocated data	Hyslop, DeBell
5:15pm	-- Adjourn for the day –	
	Wednesday 7/27/05	
8:00am	2. Independent field audit program	Lantz
8:30am	3. QAPP review (data quality objectives, data validation, etc.)	White
9:15am	4. Methods evaluation (inlet clogging, cassette redesign, critical flow, etc.)	Dillner, McDade
10:00am	-- Break --	
	Data Derivatives	
10:15am	Visual air quality metrics from digital data	Molenar
10:30am	Aerosol extinction algorithm assessment	Malm
12:00pm	-- Lunch (catered) --	
1:00pm	FAST-CAT update	Poirot
	Special Studies (~15 minutes each)	
1:20pm	CSU denuder study	McDade
	Great Smoky NP ammonia study	Dillner
	Nylon filter tests	Dillner
	Carbon 14	Malm
	PM_{10} speciation	Malm
	UC Davis mobile lab	McDade
	RAIN	Allen
	IMPROVE – STN comparison	McDade
3:30pm	-- Break --	
	Other Topics	
4:00pm	IMPROVE network assessment plans	Pitchford
4:15pm	Budget review	Maxwell
4:30pm	IMPROVE & VIEWS Web sites	Schichtel
4:45pm	Quarterly newsletter	Mercer
5:00pm	-- meeting adjourned --	

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