IMPROVE STEERING COMMITTEE
2013 ANNUAL MEETING

Date: Tuesday, October 8, 2013
Location: Park City, Utah
The Prospector, 2175 Sidewinder Drive, Grub Steak Meeting Room
Time: 8:00am – 5:30pm

IMPROVE Steering Committee members present:

Scott Copeland (Chair)	CIRA/USFS	307-335-2154	scott.copeland@colostate.edu
Bob Lebens	WESTAR	503-478-4956	blebens@westar.org
Rich Poirot	VTDEC/NESCAUM	802-241-3807	rich.poirot@state.vt.us
Charles Turner	VDEQ/MARAMA	804-527-5178	charles.turner@deq.virginia.gov

IMPROVE Steering Committee members not present:

Neil Frank	USEPA	919-541-5560	frank.neil@epa.gov
Dave Maxwell	BLM	303-236-0489	dmaxwell@blm.gov
Rick Saylor	NOAA	865-576-0116	rick.saylor@noaa.gov
Bret Schichtel	NPS ARD	970-491-8581	bret.schichtel@colostate.edu
Sandra Silva	USFWS	303-914-3801	sandra_v_silva@fws.gov

Additional IMPROVE stakeholders present:

Cassie Archuleta	ARS	970-484-7941	carchuleta@air-resource.com
Scott Cismoski	ARS	970-484-7941	scismoski@air-resource.com
Ann Dillner	UC-Davis	530-752-0509	amdillner@ucdavis.edu
Jenny Hand	CSU/CIRA	970-491-3699	jlhand@colostate.edu
David Hardison	RTI	919-541-5922	davidh@rti.org
Eva Hardison	RTI	919-541-5926	eva@rti.org
Nicole Hyslop	UC-Davis	530-754-8979	nmhyslop@ucdavis.edu
Keith Jones	Environment Canada		keith.jones@ec.gc.ca
Donna Kenski	LADCO	847-720-7883	kenski@ladco.org
William Malm	CSU/CIRA	970-491-3679	wcmalm@colostate.edu
Chuck McDade	UC-Davis	530-752-7119	cemcdade@ucdavis.edu
John Molenar	ARS	970-484-7941	jmolenar@air-resource.com
Marc Pitchford	DRI	775-674-7127	marcp@dri.edu
Mark Tigges	ARS	970-484-7941	mtigges@air-resource.com
John Watson	DRI	775-674-7046	john.watson@dri.edu
Tony Wexler	UC-Davis	530-754-6558	aswexler@ucdavis.edu
Warren White	UC-Davis	530-752-1213	whwhite@ucdavis.edu

WELCOME AND AGENDA REVIEW

Scott Copeland opened with welcoming comments, a review of a revised agenda, and introductions. Summary points are as follows:

- Of important note was the fact that government representatives (e.g., EPA, NPS, BLM, NOAA, and USFWS steering committee members) were not able to attend due to a partial federal government shutdown which began on October 1, 2013 and was still in effect as of the Steering Committee Meeting.
- This meeting was the first joint effort with the NADP Fall Conference. The IMPROVE business meeting was followed by a joint conference session with the NADP on October 9 at the Marriot.

NETWORK REVIEW

John Molenar presented an update regarding optical, scene, and night sky network status. A copy of his PowerPoint presentation accompanies these minutes. Summary points are as follows:

- Eighty-seven (87) optical and webcam network sites are currently in operation.
- Eleven (11) remote, and six (6) urban nephelometers are in operation. All nephelometers in the network have been converted to LED light sources
- Bridger WA has the only remaining transmissometer in the IMPROVE network (3 urban remain).
- A new night sky camera was recently installed at Bryce Canyon. John noted that a number of parks have night sky programs, and the enhanced imaging capabilities (e.g. 360° view, night sky calibration, etc.) could potentially support these programs.

Quality Assurance – Field Audits

Chuck McDade presented updates regarding field audits. A copy of his PowerPoint presentation accompanies these minutes. Summary points are as follows:

- Thirty (30) independent field audits were performed in 2012.
- Five (5) sites had issues with flow rate measurements.
- Three (3) sites had issues with nominal flow differences.
- In cases where follow-up tests confirm audit results, modules were recalibrated.
- In cases where follow-up checks indicated normal operation, no remedial action was deemed necessary.

➢ *Mark Pitchford asked if there were other ways to determine instrument performance besides internal (UC-Davis) and external (EPA) checks.*

➢ *Chuck replied that independent checks also occur during the data validation process.*

Action Item: Scott Copeland offered to look at periods affected by audit discrepancies in the IMPROVE data set (e.g., comparisons of S and SO_4).

Aerosol Monitoring Network Status

Chuck McDade presented an overview of network status. A copy of his PowerPoint presentation accompanies these minutes. Summary points are as follows:

- Three (3) sites discontinued monitoring due to budget cuts
- One (1) site was added in South Korea, and one (1) site was added in Bishop, CA (collocated with an NCORE site)
- Data are currently submitted through February 2013. UC-Davis is currently working towards a goal of a six (6) month data submittal timeline.
- Average sample recovery was 91% in 2012. Most data collection issues were due to equipment problems, operator no-shows, and power outages.
- Six (6) sites (GAMO1, BRET1, HACR1, LOST1, NOAB1, CORI1) did not meet RHR data completeness requirements in 2012.
- Equipment is currently being tested for lightning strike protection.

Nicole Hyslop followed up additional details regarding network status. A copy of her PowerPoint presentation accompanies these minutes. Summary points are as follows:

- Due to budget cuts, on-site maintenance is expected to be cut from 1-year cycles, to 2-year cycles. Nicole noted that there were concerns about not being able to discover chronic or severe sampler issues in a timely manner.
- A 30-minute training video is in development. A sample of the video was shown. Currently, the video is only available by request, but it will be made available on the UC-Davis and IMPROVE websites when finished.
- Quarterly site status reports are currently sent to 47 recipients highlighting data collection issues for concerned parties.
- As of Fall, 2012, sites run on local standard time (as opposed to making adjustments for daylight time).
- To address lighting strike damage issues, sophisticated mitigation equipment has been installed at the SHRO1 site, using a North Carolina based consulting company. Estimates were that repairs following lighting strikes cost ~$2,000 in parts. Mitigation equipment at SHRO1 was ~$6,000. There are plans to move forward with additional sites next year.
- Sampler & controller electronics are currently being redesigned. Advantages include less noise in signals, the ability to collect more diagnostic information, and the ability to diagnose issues and calibrate remotely. New controller systems will also require only replacement of a controller card, as opposed to the entire controller. Additionally, future plans include moving towards more intuitive GUI displays for operators. Field testing is expected to commence in 2014, with replacement occurring through 2015 & 2016.

- Long-term re-analysis of data was discussed, including the effects of temperature (T) and relative humidity (RH) on gravimetric mass measurements.
- New sampler design may use fixed critical orifices to allow for more precise flow calculations.

➢ *Mark Pitchford noted that lightning strike data are monitored and available, and looking at the frequency of strikes in an area may allow the network to preemptively address areas of lightning strike concern.*

➢ *Bill Malm suggested that measured RH effects on mass be compared with theory. He also asked how water uptake changes as the result of changes in composition, e.g., neutralization of species.*

LABORATORY REVIEW & METHODS DEVELOPMENT

Carbon Analysis

John Watson presented of the status of carbon analysis. A copy of his PowerPoint presentation accompanies these minutes. Summary points are as follows:

- John noted that the DRI 2001 TOR analyzer is becoming obsolete, and they are moving towards new instrumentation that moves from single wavelength measurements to multiple wavelengths.
- New instruments will retain the optics and heating components of previous instruments to make methods more comparable.
- The new method is expected to provide more information about the nature of the sample (e.g., diesel vs. biomass burning).
- Comparisons between methods are expected in the near future, and results will be distributed to the IMPROVE community.

Action Item: John Watson indicated that after comparisons results from instrument tests are distributed, DRI will schedule a conference call with the larger group to determine how to implement the analyzer retro-fits for future analysis.

Ion Analysis

Eva Hardison presented of the status of ion analysis from RTI. A copy of the PowerPoint presentation accompanies these minutes. Summary points are as follows:

- Electronic deionized H_2O pipettes have been replaced with an auto-handler, which allows for labor and cost savings through unattended operation, and reduces human error for greater precision in dispensing H_2O.
- RTI has recently conducted research for the State of Alaska looking at levoglucosan levels in high PM samples. Results indicated that levoglucosan levels measured on quartz filters were similar to levels measured on nylon filters. They are also

investigating measurements of S which are not associated with SO_4, and noted that levels of organosulfur compounds were not identified.

- *Marc Pitchford noted that measurements of carbon based compounds on nylon filters may have implications for the IMPROVE Network.*

- *Jenny Hand noted that oceanic sources of DMS may contribute to the measured sulfur.*

Method Development

Chuck McDade presented an update regarding the Broadband Integrating Transmittance/ Reflectance Spectrometer (BITS) system. A copy of his PowerPoint presentation accompanies these minutes. Summary points are as follows:

- The lab is moving from the current single wavelength HIPS system to BITS.
- New system is a complete rebuild of current HIPS setup using fiber optic cable bundles to transmit and collect the light signals.
- Upcoming development work will include some fine tuning and include comparisons of HIPs and BITs measurements before the instrument is brought online for IMPROVE network analysis.

Ann Dillner presented a summary of an EPA-funded project to generate reference standards for lead (Pb) analysis. A copy of her full PowerPoint presentation accompanies these minutes. Summary points are as follows:

- The uses of the new reference standards in include laboratory audits, FEM references and XRF calibration reference standards for the IMPROVE Network.
- Reference materials mimic ambient conditions (e.g., particle deposits on the same filter material measured using a PM sampler).

Data Quality

Nicole Hyslop presented long term trends in re-analysis data. A copy of her PowerPoint presentation accompanies these minutes. Summary points are as follows:

- Determining trends in the IMPROVE network can be complicated by the fact that methodology changes have occurred in analysis methods over time. UC-Davis re-analyzed fifteen (15) years of archived filters at three sites to determine trends for re-analysis vs. the original reported data.
- Reanalyses showed good agreement for elements which are routinely well above MDL. Differences between original and reanalysis trends were not consistent across sites.

Warren White presented a summary of recent results from the Hybrid Integration Plate Sphere (HIPS) system. A copy of his PowerPoint presentation accompanies these minutes. Summary points are as follows:

- All archived filter data were re-analyzed for several sites using 2010 HIPS analytical methods, and noted that HIPS response has been quite stable since 2003.
- Results show that mineral dust can be an important contributor to absorption.
- Future plans include the repossessing of historical raw data with revised calibrations, and submittal of revised absorption coefficients.

➢ *Bill Malm asked for speculation as to the absorption efficiency of coarse mass.*

➢ *Mark Pitchford suggested that HIPS analysis could be applied to PM_{10} to help determine the coarse component of absorption.*

Action Item: Warren White indicated that he would get back to the group with a recommendation on whether it might be important to further investigate the absorption coefficient of coarse mass for total extinction calculations. That response is posted with the presentations.

DATA PROCESSING, DISTRIBUTION, AND QUALITY

FED

Scott Copeland presented a PowerPoint regarding the FEDs database prepared by Bret Schichtel, who could not attend due to the government shutdown. A copy of his PowerPoint presentation accompanies these minutes. Summary points are as follows:

- RHR data are currently posted through 2011, with 2012 expected soon.
- The website has a number of place holder links, but the Database Query Wizard tool is fairly stable and contains the latest data.

➢ *Bill Malm commented that philosophically, the site was designed to be simple and transparent, allowing presentation of major points down to more in depth information.*

WESTAR RHR Core Issues

Bob Lebens presented regarding RHR core issues. A copy of his PowerPoint presentation accompanies these minutes. Summary points are as follows:

- State representatives have recently participated in discussion session with the EPA and other RHR stakeholders to prepare recommended improvements to the RHR process. Discussion topics included what works well in the RHR, what doesn't work, and what improvements might be made.
- Federal stakeholders participated, but recommendations came from states.

- Important considerations include timelines for SIP and progress report submittals, refining natural conditions, better defining reasonable progress, and determining effective long-term strategies after BART.
- The EPA will take recommendations, and are expected to have a sense of what will/will not be changed in six (6) months to a year.

NC3, MAX Data Set

Scott Copeland led a discussion regarding natural conditions development, and deferred discussion of the MAX Data Set to later in the day.

- *Scott noted that every time a 10-year step is taken in the RHR SIPs, NC estimates become more important. He suggested that the IMPROVE Steering Committee should be in the loop for any projects looking at revisions to natural conditions.*

- *Bob Lebens noted that Tom Moore now works for WESTAR, but it still the WRAP Air Quality Program Manager. Cassie Archuleta commented that she and Tom Moore recently prepared a short summary document on behalf of the WRAP, which summarizes the current status of NC, and is intended to serve as a starting point to talk about possible NC refinements for the next round of State SIPS. The document link is http://www.wrapair2.org/RHRNC.aspx.*

Action Item: Scott Copeland indicated that there would be more discussion regarding how to involve the Steering Committee in any upcoming Natural Conditions work.

DATA ANALYSIS

Joint Fire Sciences AQI Work

Bill Malm presented recent work he did for the Join Fire Science Executive Board. He was tasked with determining a relationship between visual range (VR) and mass (PM) to be used as a preliminary indicator of potential health effects, as determined against the EPA's Air Quality Index (AQI). A copy of his PowerPoint presentation accompanies these minutes. Summary points are as follows:

- The relationship between VR and PM was investigated for a number of scenarios, including west, east, wet, and dry.
- Assessment methods would involve picking a landscape feature that had not disappeared, and making a mass estimate based on the distance of the feature. The biggest uncertainty is this estimation method is likely to be the location of the landscape target, as it is not likely to be at the prescribed VR.
- Due to uncertainty, using only two AQI levels was proposed, as opposed to the five or six that are routinely used for AQI now.

OTHER TOPICS

Newsletter and Calendar

Cassie Archuleta, who recently became the editor of the quarterly IMPROVE newsletter when Gloria Mercer left ARS in December 2012, presented a status summary for both the newsletter and calendar. A copy of her PowerPoint presentation accompanies these minutes. Summary points are as follows:

- Due to recent budget cuts, the newsletter and calendar have been discontinued. One final newsletter was released in 2013, and no calendar will be available in 2014.
- The last newsletter indicated that important news items would likely be relayed by e-mail, and simple scheduling tool may be available to replace the calendar in 2014.

- *Scott Copeland noted that the budget committee did not directly recommend cutting the calendar along with the newsletter. Bill Malm responded that IMPROVE funding did not completely cover the calendar effort, and the NPS decided to no longer fund it.*

- *Mark Pitchford noted that the newsletter and calendar were originally in response to feedback that network success would in part be dependent on keeping site operators engaged and invested. The operator profiles and broader network perspectives provided in both the newsletter and calendar were intended in part to keep operators informed and appreciated. It was noted that new ARD staff were likely not aware of the history of the inception of the newsletter and calendar.*

Action Item: Mark Pitchford indicated that the Steering Committee should prepare a statement offering historical perspective on the value of the newsletter and calendar, and that this statement should be circulated to all of the FLMs.

IMPROVE Steering Committee Business

Scott Copeland led a discussion regarding IMPROVE business updates. He noted that no motions could be made, as a quorum was not available due to absences caused by the government shutdown. Scott noted that although there could not be a request for a motion at the meeting, he would be willing to serve as chair again next year.

Action Item: Scott Copeland indicated that, as no quorum was available, he would contact the Steering Committee via email regarding his appointment as chair.

- *Mark Pitchford suggested that future IMPROVE meetings not be scheduled during the first weeks of October.*

- *Warren White asked if conservation groups like NPCA should be invited to future IMPROVE meetings to help gain their support. Bob Lebens noted that such groups are often litigants in RHR rulings.*

- *Chuck McDade asked if the next meeting should be conducted at RTP, so that it could be more accessible to some of the EPA administrators. Mark Pitchford noted that he prefers neutral accommodations such as a hotel conference room, but that he would like some of the higher level EPA officials to participate.*

- *Nycole Hyslop asked if more effort could be made to include local stakeholders, such as participants from the state where the meeting is held.*

Action Item: Bob Lebens indicated that he would be willing to extend invitations to local representatives, such as state air monitoring groups and site operators, prior to the next meeting.

BUDGET

Budget Analysis & Discussion

Scott Copeland led a discussion regarding the IMPROVE budget. He indicated that the best guess for future funding indicated that there would be flat funding next fiscal year, so an estimated 3-5% cost reduction exercise may be necessary again to offset rising costs.

- *Mark Pitchford noted that, with the government shutdown, there would be some budget savings due to loss of samples. He suggested that they could revisit the scheduled loss of holiday samples this year.*

- *Scott Copeland noted that the cuts in maintenance visits were predicated on the deployment of new controllers. He indicated that, given current estimates of a 2-3 year phase in time for new controllers, the maintenance schedule changes might need to be revisited.*

After some budget discussion, Scott Copeland showed a short presentation including some analysis of potential cost savings scenarios, including options such as eliminating D module samples and eliminating sample days.

- *Mark Pitchford suggested that implementation of a 1 in 6 day sampling schedule might be the easiest sample frequency change to implement, and it would have the advantage of keeping consistent with other federal sampling programs.*

- *Bill Malm indicated that cutting sites should be considered more seriously. He expressed a concern that cuts short of eliminating a site conveys the impression that the same amount of information can be attained for less money. He noted that cuts which eliminate sites are more severely felt, and may help prompt fiscal responses that restore funding.*

Action Item: Scott Copeland proposed that the budget review committee re-convene if cost-savings are required.

Due to remaining time in the day, Scott Copeland showed a presentation and led a discussion regarding a MAX data set. A copy of his PowerPoint presentation accompanies these minutes. Summary points:

- Missing data can affect interpretation of metrics calculated for the RHR. As an example, Scott showed an anomalously high ammonium sulfate year (2005 at UPBU1) that was discounted in RHR metrics because the year did not meet RHR data completeness criteria, resulting in apparently lower average ammonium sulfate than other nearby sites.
- Methodology has previously been applied separately by RPOs to estimate missing data, beyond the already prescribed, and somewhat restrictive, RHR data "patching" methods.
- Scott suggested that a more automated and consistent secondary data substitution method might assist in data interpretation for the RHR.

➢ *Warren White indicated that any "patched" or "substituted" data should be appropriately distinguished from actual measured data. Rich Poirot suggested that data flags could be used to distinguish datasets.*

Action Item: Scott Copeland proposed that a data committee be convened to discuss proposed methods for implementing additional data substitution methods for use in RHR datasets. Nycole Hyslop indicated that she would be interested in serving on the committee.

Review Agenda and Wrap Up

The IMPROVE business meeting was adjourned at 5:20pm. The business meeting was followed by a joint NADP/IMPROVE conference session on October 9, 2013. Information regarding the joint conference is available on the NADP website (http://nadp.sws.uiuc.edu/nadp2013/).