

Workshop on IMPROVE Research Agenda

8:30 am – 4:40 pm, Wednesday, 13 July 2005
Room 310C, Atmospheric Sciences Building, University of Washington
Seattle, Washington

8:30 Welcome, Tribute to Peter Hobbs, and Overview of IMPROVE
(Mark Stoelinga)

Session 1. Identification of precipitation processes and mechanisms (Session Chair: Cliff Mass)

- 9:00 What we've learned about orographic precipitation 'mechanisms' from MAP and IMPROVE-2: Observations. Bob Houze, Socorro Medina, and Ellen Sukovich, UW.
- 9:20 What we've learned about orographic precipitation 'mechanisms' from MAP and IMPROVE-2: Modeling. Socorro Medina, Bob Houze, and Brad Smull, UW; and Matthias Steiner, Princeton U.
- 9:40 Evidence and impacts of mountain wave structures within a major orographic precipitation event. Part 1: Evaluation of modeled flow kinematics via comprehensive airborne Doppler radar observations. Brad Smull, Matt Garvert, and Cliff Mass, UW.
- 10:00 Evidence and impacts of mountain wave structures within a major orographic precipitation event. Part 2: Comparison of observed vs. modeled precipitation fields. Matt Garvert, Brad Smull, and Cliff Mass, UW.
- 10:20-10:40 Break
- 10:40 Ice particle habits observed at the ground during the passages of synoptic-scale weather systems over the Cascades. Mark Stoelinga, John Locatelli, Chris Woods, and Peter Hobbs, UW.

Session 2. Modeling of precipitation (Session Chair: Brad Smull)

- 11:00 Improving the representation of snow particles in a bulk scheme. Chris Woods, Mark Stoelinga, John Locatelli, and Peter Hobbs, UW.
- 11:20 Analysis of two heavy precipitation events (28 November and 13 December) during IMPROVE-2. Kyoko Ikeda, Greg Thompson, and Roy Rasmussen NCAR.
- 11:40 Modeling of two heavy precipitation events (28 November and 13 December) during IMPROVE-2. Greg Thompson, Kyoko Ikeda, and Roy Rasmussen NCAR.
- 12:00-1:20 Lunch at a local restaurant

Session 2 (continued)

- 1:20 The 4-5 December event during IMPROVE-2: Comparison of observations and model simulations. Brian Colle, SUNY/Stony Brook (presented by Mark Stoelinga, UW).
- 1:40 Three-dimensional modeling with spectral ("bin") microphysical parameterization. Barry Lynn, Columbia University/Hebrew University of Jerusalem.

Session 3. Discussion (Moderator: Mark Stoelinga)

- 2:20 a. Observational/Phenomenological Issues
- Case study overview: Which IMPROVE cases have been, are now, or should be the subject of intensive study?
 - Who has been doing, or is planning to do, more comprehensive studies that examine aspects of precipitation (observed and/or modeled) over ALL the IMPROVE cases? Do we need more effort in this regard?
 - What phenomenological questions/hypotheses have our studies to date raised? What measurements or observational strategies might we need in the future to answer these questions or test these hypotheses?
- 3:20-3:40 Break
- 3:40 b. Modeling Issues
- Are we converging toward some key answers for IMPROVEMENT of model-based QPF in orographic/non-deep-convective environments? Are there demonstrable and correctable problems with:
 - snow microphysics in bulk schemes?
 - mountain wave representation?
 - representation of turbulent cellularity over orography?
 - other physical processes?
 - At what point are we ready to make use of a real-time test-bed (i.e., the UW real-time MM5/WRF forecast system) to test improvements to the model?
 - The future of bulk microphysical parameterizations
 - What is their future in research? In operations?
 - What key processes require multi-moment schemes? Multi-habit schemes? Bin schemes?
 - Is the validation of bulk schemes via more sophisticated schemes a viable complementary approach to observational validation?
- 4:40 Adjourn