



International Cooperative on Aerosol Prediction (ICAP) Workshop on Aerosol Emission and Removal Processes

Frascati, Italy
14-16 May 2012

Acknowledgments: thanks to ESA/ESRIN for hosting ICAP and especially to Bojan Bojkov and Lia Fonseca. Many thanks also to all speakers.



What is ICAP?

- An international collaboration based on common interest in all *global* aerosol forecasting aspects. This includes model development, data assimilation, satellite products, and verification.
- Operational focus, but scientific approach
- “Grassroots” movement: no funding or budget. Participants (and speakers) attend meetings at their own cost for their own benefit.
- Members: ECMWF/MACC, JMA, NASA, NRL, NOAA NCEP



Format of the ICAP meetings

- ICAP meetings focus on status updates/ discussions between operational centres and data providers.
- Each meeting has a theme where invited subject matter experts review the current state of the science and provide recommendations for operational development and transitions.
- Previous meetings topics include: aerosol observability, predictability, and verification.
- This year's meeting focus on aerosol emissions, including discussions on current emission inventories, dust and marine aerosol emissions, pollution and secondary production, biomass burning emissions, and estimates of emissions through inversion modelling.

Overarching Goals and Outcomes of current meeting:

- Overview state-of-the-art in aerosol emission and removal processes modelling.
- Identify areas in which rapid improvements can be made in forecasting systems.
- Discuss the role of observations (in situ/satellite) in helping the development of parameterizations and the description of the emission sources.
- Examine current capabilities and uncertainties in inverse modelling through assimilation.
- Discuss longer term goals and objectives in aerosol science from the point of view of the operational centres and the multi-model ensemble developments.



Key topics for discussion and debate

- a) How are emission inventories created and to what degree are they suitable for aerosol forecasting?
- b) How can high-resolution local inventories be incorporated into global inventories?
- c) How should we treat secondary aerosol production?
- d) What are the state-of-the-art parameterizations for emission, secondary production and removal processes?
- e) Are the state-of-the-art parameterizations computationally feasible in a global forecasting framework?
- f) Where does the sink term fit in to our conception of sources?
- g) What is the role of data assimilation and inverse modeling in estimating emissions and removal parameters?
- h) What are the observations still needed for parameterization “closure?”
- i) Should ICAP adopt an emissions baseline?

Agenda – Monday May 14

- 09:00 -09:30 Registration **Bojan & Angela**
- 09:30-09:45 Preliminaries and welcome **Bojan, Angela, Pete & Jeff**
- 09:45 -10:30 An Update on the GEOS-5 Aerosol Forecasting System **Peter Colarco, NASA GFSC**
Taichu Tanaka, JMA
- 10:30-11:15 JMA updates
- 11:15-11:35 Break
- 11:35-12:20 UKMO updates **Jane Mulcahy , UKMO**
- 12:20-13:05 NRL Monterey updates **Jeffrey Reid, NRL**
- 13:05-14:35 Lunch
- 14:35-15:20 ECMWF updates **Jean-Jacques Morcrette, ECMWF**
- 15:20-15:40 Dust modelling and forecasting in the BSC: Activities and developements **Sarah Basart, BSC**
Sunhee Lee, CSRO
- 15:40-16:00 The Australian Air Quality Forecasting System (AAQFS)
- 16:00-16:30 Break
- 16:30-17:30 Aerosol Particles: The big picture **Bill Collins, NCAR**
- 17:30-18:00 End of Day Discussions:Centers
- 18:00 **Icebreaker**

Agenda – Tuesday May 15

- 09:00-10:00 Parameterization of aerosol sinks in chemical transport models
• **Peter Colarco, NASA**
- 10:00-10:50 Anthropogenic and Volcanic Emission Inventories: Methodologies and Error
• Estimates, Using AeroCom as an Example **Thomas Diehl, NASA**
- 10:50-11:10 Break
- 11:10-12:00 MACC emissions **Claire Granier, LATMOS**
- 12:00-13:00 Emissions modeling - advances and challenges **Greg Carmichael, U Iowa**
- 13:00-14:30 Lunch
- 14:30-15:20 MACC Biomass Burning Emissions and Plumes **Johannes Kaiser, ECMWF**
- 15:20-16:10 Biomass burning **Edward Hyer, NRL**

- 16:10-16:40 Break
- 16:40-17:30 Putting Secondary Organic Aerosols into Global Models: Issues and Approaches **Dean Hegg, U Washington**
- 17:30-18:00 End of Day Discussion

Agenda – Wednesday May 16

- 09:00-09:50 Mineral dust emission processes and their modeling: recent progresses and remaining challenges **Béatrice Marticorena, LISA**
- 9:50-10:40 Meteorological controls on dust emission and implications for modeling **Peter Knippertz, Uni Leeds**
- 10:40 -11:00 Break
- 11:00-11:50 The Coarse Mode Marine Aerosol Environment **Jeffrey Reid, NRL**
- 11:50-12:40 Fine mode and organic marine environment **Colin O'Dowd, U Galway**
- 12:40 -13:30 Aerosol removal in AeroCom modeling exercises **Stefan Kinne, MPI**
- 13:30-14:30 Lunch
- 14:30 -15:20 Estimating aerosol emissions by assimilating aerosol optical depth in a global aerosol model **Nicolas Huneus, LMD**
- 15:20-16:10 Inverse estimation of the emission of radioactive materials from Fukushima **Taichu Tanaka, JMA**
- 16:10-16:30 Break
- 16:30-17:00 Discussion and questions
- 17:00-17:30 ICAP Product Lines **Walter Sessions, NRL**
- 17:30-18:00 Final ICAP discussions
- 20:00 **Conference dinner**



Recommendations