

**Summary of
The Second Meeting of Working Group I
for Joint Research on Dust and Sand Storms
Tokyo, September 8-9, 2009**

1. The Working Group I (WG I) for Joint Research on Dust and Sand Storms (DSS) under the Tripartite Environment Ministers Meeting (TEMM) was held in Tokyo, Japan during 8th to 9th of September, 2009. Representatives from China, Korea, Japan as well as Mongolia participated as an observer in this meeting.
Mr. KINO Nobuhiro, on behalf of the Ministry of the Environment, Japan, delivered the opening remarks.
2. In Session One, Dr. NISHIKAWA Masataka of National Institute of Environmental Studies, Japan, as the chairperson, initiated the session by reiterating the agenda and purpose of the Second Meeting of WG I. Dr. CHUN Youngsin of National Institute of Meteorological Research, Korea, reviewed the discussion points and results of the Shenyang Workshop held in June 2009 in China.
3. In Session Two, based on the past agreements of the WG I meetings, progress on the cooperative data sharing for the nominated DSS case was discussed among the four countries. Ms. KIM Youngmi of National Institute of Meteorological Research, Korea, taking in charge of data sharing, reported on the current situation of data submitted from each country and introduced the website that was launched for the data sharing.

[Provision of Data Set]

Period of DSS Case: March 25th to April 5th 2007 (12 days)

Country Data:

- ◇ Mongolia: Vegetation map data (Vegetation, precipitation, pasture plants)
- ◇ China: Daily average PM10 data (10 sites)
- ◇ Korea: Hourly average PM10 (36 sites)
- ◇ Japan: Hourly average of SPM (21 sites),
Lidar network (Lidar extinction coefficient, 9 sites)

Dr. DULAM Jugder of Institute of Meteorology and Hydrology, Mongolia, gave a presentation on “Dust/Sand Storm Data in Mongolia”.

4. Participants exchanged their views and opinions on the result of cooperative data sharing. In terms of maximizing the outcomes of joint research on the DSS regional monitoring, it was emphasized that the objectives and significance of data sharing should be clarified.

Korea and Japan recommended that the participation of China Meteorological Administration (CMA) is required, based on the fact that CMA has been exchanging data with Korea Meteorological Administration (KMA), for accelerating the activities of joint research and will report this matter to the higher authority, i.e. the Tripartite Director General Meeting.

5. Participants confirmed the scope and the extent of the data use among the four countries. It was agreed that the utilization would be limited to the joint research, only for the members' related activities such as model forecasting, regional DSS monitoring and fabricated DSS information service.
6. In Session Three, based on the past agreements of the WG I meetings, the outputs of the nominated DSS case derived from the forecast models of Korea and Japan were discussed. Dr. MIKAMI Masao of Meteorological Research Institute, Japan, as the chairperson of the session, introduced the experience of Dust Model Intercomparison Project (DMIP). It was emphasized that model comparison experiments are conducted by various parties and if WG I were to do such comparison, it should have particular objectives to promote the TEMM objective. Presentations on the results of ADAM by Dr. KIM Seungbum of National Institute of Meteorological Research, Korea, MASINGER by Dr. MIKAMI Masao, and CFORS by Dr. UNO Itsushi of Kyushu University, Japan, followed. Referring to the aforementioned objective of the ongoing joint research of WG I (analyzing the improved level of forecasting accuracy by utilizing the shared data among the four countries), participants exchanged their views and opinions on the future orientation of WG I activities. It was also emphasized that model experiment is useful for clarifying the availability and importance of shared data among the four countries.

7. Participants shared the perception that visibility and Lidar data are useful set of data for improving the forecast accuracy through the presentation by Dr. SUGIMOTO Nobuo of the National Institute of Environmental Studies, Japan. Based on this common recognition, current situation of acquired data in each country was reviewed and reached to the mutual understanding that, among the four countries, sharing the set of data would be beneficial, as described in Annex 1.
8. It was expressed that the prediction of DSS in the source area using the forecasting model should be another purpose for data sharing and model comparison activities of WG I, taking into account the importance of the early warning system for mitigation impact of DSS. Such idea was shared that the output of DSS model experiment and monitoring would be beneficial and may contribute to the WG II activity.
9. In Session Four, Dr. CHANG LimSeok of the National Institute of Environmental Research, Korea, gave a presentation on the “Aging of Asian Dust from a Week Event Study (2008.05.21-22)” as WG I related research issues.
10. In Session Five, future prospects, objectives, and specific activities were discussed. During the remaining months of 2009, as described in Annex 1, it was agreed that joint research output of WG I could be posted to international journals, such as Scientific Online Letters on the Atmosphere (SOLA) and Asian Journal of Atmospheric Environment (AJAE). It was also noted that tentative titles and authors should be informed to the Japanese secretariat by the end of 2009. In addition, it was agreed that the second DSS case be nominated, i.e. DSS case during 24th May to 4th June 2008. It was confirmed that data accumulation of DSS cases would be effective for improving the model accuracy.
11. It was agreed that data sharing of the second nominated 2008 case should be completed two months prior to the third WG I meeting in 2010. In addition, participants agreed to start preparations for the comparison of forecasting results with or without the inputs of shared data using the models of each country. In 2010, it was agreed that such set of model forecasting for the nominated 2007 case be completed by Korean and Japanese models.

12. In Session Six, Japan suggested other countries to also prepare proposals for future plans of WG I beyond 2010, based on the proposed future plans as shown in Annex 2. All parties agreed to consider future activities and submit them to Japan before the third WG I meeting. In addition, it was confirmed that Dr. KIM Seungbum will continue to collect the data for the nominated 2008 DSS case from the four countries and process it.
13. Participants also suggested that Mongolia could be invited to become an official member of the joint research to the Tripartite Director General Meeting. The idea was also shared that data sharing with other countries would be beneficial for the joint research on DSS.
14. Before closing, it was informed that the third meeting of WG I will be held in China based on the decision of the TOR of the WG I. The date and venue of the third meeting will be confirmed after the second meeting of WG I.

DATA SET (Nominated DSS cases)

1. PM10/SPM

Mongolia:

China: daily average PM10 data (10 sites)

Korea: hourly average PM10 (36 sites)

Japan: hourly average of SPM (21 sites), PM10 (12 sites)

2. Lidar data

Mongolia:

China:

Korea:

Japan: Toyama, Matsue, Nagasaki, Tsukuba, Sapporo, Sendai,
Fukue, Hedomisaki (total 8 sites)

3. Visibility

Mongolia:

China:

Korea:

Japan:

4. Source information

Mongolia: Specific meteorological data and vegetation data
(selected representative points on ground)

China:

5. Others

- The results of joint research will be posted to SOLA and/or AJAE by the end of 2009 and circulated among the WG I members.
- Tentative titles and authors should be informed to the Japanese secretariat by the end of 2009.

DATA SET (Future)

1. PM10/SPM

Mongolia: PM10

China: daily average PM10 data (10 sites), more sites and hourly data are recommended

Korea: hourly average PM10 (36 sites), PM2.5 (2 sites)

Japan: hourly average of SPM (21 sites) and PM10 (12 sites)
PM2.5 (2 sites)

2. Lidar data

Mongolia: Ulaanbaatar, Sainshand, Zamiin-Uud

China: One site recommended Hohhot

Korea: TBD

Japan: Toyama, Matsue, Niigata, Chiba, Tokyo, Osaka, Nagasaki,
Tsukuba, Sapporo, Sendai, Fukue, Hedomisaki
(total 12 sites)

3. Visibility (instrumental/airport)

Mongolia: TBD

China: TBD

Korea: TBD

Japan: TBD

4. Source information

Mongolia: Vegetation data only at the end of August (station TBD), snow cover (TBD)

5. Other

- Nominated Case:

Data to be shared during 24th May to 4th June 2008

Future Plans of WG I (proposed)

A Draft Items of Activities in the remaining months of 2009

1. Data sharing
 - review and identify the points discussed during Session II
2. Model comparison
 - review and identify the points discussed during Session III
3. Other Follow-up issues (if any)
 - discuss issues which require follow-up research and analysis

B Draft Items of Activities in 2010

The proposed theme of activity:

Analysis on the improvement of forecast accuracy of each model in case of data sharing (towards upgrading monitoring network for early warning)

1. Objectives

If monitoring data of the nominated DSS was shared among the four countries, to analyze its characteristics and transported dynamics, to confirm the level of improvement in forecast accuracy by comparison of modeling results between with and without such data.

2. Data shared

(i) Types of Data

Observation Data : PM (PM₁₀>SPM), Lidar, Visibility

Geographical Data : geographical data and land information (size and distribution of particles) on DSS source area, land use/vegetation coverage ratio change, soil moisture (including snow cover) .

(ii) Observation site (number, identification of the locations), time resolution (hourly > daily)

(iii) Accuracy (need confirmation of QA/QC)

3. Methods for comparison/analysis

- (i) Target of the comparison
Forecast result without shared data
- (ii) Methods for comparison
Index, analytical techniques, etc.

4. Output

- (i) Schedule/Measures
By Autumn 2010
 - Posting of articles to academic journals, workshops in academic societies, etc.

C Draft Items of Activities after 2010

1. QA/QC of DSS Monitoring (PM/Lidar/Visibility)

- (i) Required level of QA/QC (of shared data) necessary for model forecasting
- (ii) Need for cooperation for QA/QC among the four countries
- (iii) Content, financial arrangements, period, etc. for cooperation

2. Expansion of DSS case subject to data sharing/comparative validation

- (i) Increase the number of DSS cases (approximately 5 to 10) in future.

3. Collaboration between WG I and WG II

- (i) Feedback on model experiment and monitoring result to the WG II would be beneficial.
- (ii) Other means of collaboration (inputs from WG I, request for WG II) besides the above

4. Other Issues