Agenda for the WMO ET meeting in Geneva 26-28 june 2017

location: WMO Building,
7bis, avenue de la Paix,
CH- 1211 Geneva 2
Room « Jura 6 » on the 6th floor
(Turn right when you exit the elevator, at the end of the floor)

9h00 Welcome

Welcome from WMO (Deon Terblanche): background to the report and the UAE support

Presentations from the ET (20min each + 10 min discussion)

- ✓ Roelof Bruintjes: " Summary and state of the last assessment reports"
- ✓ Roelof Bruintjes: "Work currently done in UAE and expectations from review"
- ✓ Andrea Flossmann: presentation of the proposal for a strategy of the review

10h30 Coffee/tea

11h00 Winter orographic seeding:

- ✓ Masataka Murakami: "Evaluation of Snow Enhancement by Cloud Seeding for Drought Mitigation"
- ✓ Mike Manton: 'The evaluation of cold-cloud seeding activities in Australia'
- ✓ Mike Manton: "winter oragraphic snowpack enhancement campaigns in general »

12h30 Lunch break

14h Summer convective clouds:

- ✓ Ali M. Abshaev : "Experience on artificial regulation of precipitation by methods of influence on clouds"
- ✓ Thara Prabhakaran: "Cloud Aerosol Interaction and Precipitation Enhancement Experiment (CAIPEEX) and related research in India"
- ✓ Thara Prabhakaran: "hygroscopic seeding of convective clouds »

15h30 Coffee/tea

16h00 continuation

- ✓ Zhanyu Yao: "seeding activities in China"

- ✓ Ilan Koren : « Israeli 3 or 4 (line seeding)"
- ✓ Warawut KHANTIYANAN : "seeding activites in Thailand"

Other :

- ✓ Ali M. Abshaev « Methods using electricity or ionisation for seeding »

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17h30 end of 1st day session

19h30 joint dinner (location to be determined)

27 june

9h discussion of the points of the draft content table (see below):

- ✓ past and present reviews and campaigns (lead: Roelof, Mike, …)

10h30 coffee/tea

11h continuation:

- ✓ modelling of seeding (lead: Masataka, Thara…)

12h30 lunch break

14h00 continuation:

- ✓ seeding materials and applications (lead: Ali, Mike…)

15h30 coffee/tea

16h00 continuation:

- ✓ seeding strategies and scores for success (lead: Roelof, Mike, Zhanyu …)

17h30 end of 2nd day session

19h30 joint dinner (location to be determined)

28 june

9h: discussion and agreement on report outline and chapters

10h30 tea/coffee

11h attribution of writing tasks + wrap-up

end: 12h00

Peer review of efforts for precipitation enhancement

Overall philosophy:
Cloud seeding : adding artificial aerosol particles competing with the natural particles
Trying to create a signal that overrides natural cloud development

Draft Table of content:

1. Introduction:
- ✓ short summary of previous reports and state of the art of the recommendations
- ✓ introduction of the overall philosophy

2. Documentation of the variability of natural clouds :
- ✓ Dynamics (dominating air flow, vertical, horizontal extension, formation mechanism, time evolution)
- ✓ Microphysics (liquid drops, ice particles, natural precipitation development)
- ✓ Aerosol particles (origin, size distribution, chemical composition, number and mass concentration)
- ✓ Information mandatory for a seeding experiment
- ✓ historical analysis of probability of detection

3. The seeding material (hygroscopic and glaciogenic)

- ✓ chemical composition, size distribution, number and mass concentration
- ✓ ways of seeding : ground based, aircraft, rockets, ..
- ✓ location and time of release of material
- ✓ transport, diffusion and dilution
- ✓ persistence of seeding effect (in time and space)
- ✓ use of ions, electricity?...
- ✓ properties and usefulness of tracer releases
- ✓ Information mandatory for a seeding experiment

4. seeding strategy and documentation of success
- ✓ decision on time and mode of seeding (ground, air,..)
- ✓ selection of reference conditions (second area?, alternate time?,..)
- ✓ following the evolution of seeded cloud (static or dynamic seeding ?)
- ✓ documentation of success/failure (radar, statistics)

- ✓ Information mandatory for a seeding experiment
- ✓ Recommendations for scores and benchmarks

5. modelling of seeding

- ✓ model configurations
- ✓ model applications
- ✓ modelling prior/during/after the campaign

6. Campaigns since 2003 and Critical assessment (wrt points 2-5)

- ✓ Summertime convective clouds
- ✓ Winter frontal and orographic clouds
- ✓ any other campaigns regarding precipitation modification

Campaigns to be considered:

- Wyoming program (winter ororgraphic snow)
- Snowie Australia (winter orographic snow)
- Idaho program (winter orographic snow)
- CAIPEEX (summer convective clouds and more focused on hygroscopic seeding)
- Israeli 3 or 4 (line seeding)
- China (may be Zhao can give input here)
- Russia (mostly glaciogenic seeding)
- Saudi Arabia and UAE (more aerosol work to evaluate previous seeding experiments)
- …..

7. Conclusions and recommendations for future campaigns and research