WORLD METEOROLOGICAL ORGANIZATION

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COMMISSION FOR INSTRUMENTS AND METHODS OF OBSERVATION

ITEM: 3

INTERNATIONAL ORGANIZING COMMITTEE (IOC) FOR THE WMO SOLID PRECIPITATION INTERCOMPARISON EXPERIMENT (SPICE)
Fourth Session

Davos, Switzerland
17 – 21 June 2013

Original: ENGLISH

SITE REPORT FOR CARIBOU CREEK (CANADA)

(Submitted by Daqing Yang)

Summary and purpose of document

This document provides site report of Caribou (Canada) for the 2012/2013 winter.

ACTION PROPOSED

The Meeting is invited to take this information into consideration when deciding on necessary modifications and clarifications on the overall set-up of the experiment and procedures to be followed to ensure best quality observations are collected on all sites and appropriate coordination and data transfer mechanisms are implemented.

Site Report v.1.1
IOC-SPICE-4

Site: Caribou Creek, Canada

Date: June 6, 2013

1. Site layout

See Addendum 1

2. Configuration of references:

Covering: gauge used, heating (hardware, algorithm), sampling strategy, physical configuration (height, shields, etc):

Reference type	Gauge	heating	shield	Data sampling interval	Sampling strategy	Output interval	Height of the rim
R0	Geonor	USCRN	Alter	20 sec	Frequency	1min	2m
R0	Pluvio2	USCRN	Alter	20 sec	Default	1min	2m
R2	Geonor	USCRN	Alter	20 sec	Frequency	1 min	3m
R3	Geonor	USCRN	none	20 sec	Frequency	1 min	2m
R3	Geonor	none	none	20 sec	Frequency	1 min	2m

3. Changes made during the season 12/13, if any.

Gauges were set up in Feb 2013. Data were collected during Feb to May 2013. Heating was turned on February 21st. A field calibration of approximately 500ml is planned for June 10th.

4. Issues: heating, data quality, vibrations, capping;

1) Gauges are showing some noise which may be related to a grounding issue that needs to be explored further. Alter shield on R2 installed with fins hanging the wrong direction.
2) Alter shield on the R3 did not get installed (location C4). One heater on R3 pair not installed (location C4).
3) Wind speed sensor located near the bush shielded (R0G) gauge remains in the original location where it was installed before the site was reconfigured for SPICE. This site is more exposed that the actual gauge and therefore is somewhat unrepresentative of the wind speed near the gauge. This will be relocated prior to the 2013/2014 season.

4) Sample frequency: Because of the reluctance to move away from frequency sampling of 1500 cycles, a 6 second sampling rate was not possible due to program time-out issues. For this reason, the 2012/2013 season was sampled every 20 seconds with output of the average occurring once per minute. A solution to this is being examined for the 2013/2014 season. Data are being stored onsite using a PC. A satellite internet connection is planned.
5) Mast Vibration: Geonor gauges on site have the wind shields installed on the pedestal. This isn't a windy site, so it is unknown if the increased noise is related to wind.
6) Instrumentation not installed: We plan to set up a web camera. This is not done yet due to lack of internet connection at the site. We will have the internet in the fall and install the web camera before the 2013/2014 winter season. Other supplementary instruments, such as an optical disdrometer will also be set up. Further instrumentation will include more snow depth sensors and wind speed monitors.
7) Evaporation: We used lighter weight motor oil to prevent evaporation at this site, so far we did not see major problems.

5. Heating report:

i. Summary of configurations throughout the winter of 12/13:
    a. Hardware:
        i. The heated R0, R2 and R3 Geonor references on site utilized the USCRN heating algorithm, adjusted for SPICE, using the USCRN style heater. The R0 Pluvio reference used the default heater settings. This heater was not tested in February so it's effectiveness is unknown
        ii. Each heater was powered with its own 12V power supply connected to an AC power source.
        iii. Heater on Shielded R3 (pedestal C4) not installed due to missing cable.
    b. Software (Heated Geonors):
        i. upper limit temperature: +2 deg C (Ta and Rim)
        ii. lower limit temperature: -5 deg C
        iii. heating interval: 20 sec
        iv. other factors considered: Rim temperature was logged at 1 minute resolution. Heating "switch control" was also logged at this resolution showing 1 when the heater was turned on at any time during the 1 minute period.
    c. Software (Heated Pluvio): factory default
ii. Summary of changes made during the season: none after installation on Feb 21, 2013
iii. Effects noted: none
iv. Changes needed for the future: make modifications and test Pluvio2 heater
v. Provide pictures: web cam will go online before the 2013/2014 season

vi. Any other topic of challenge with impact on data, specific to your experience: none

6. *What has worked well;*

Setting up the site in mid winter is tough, but we got it up. Overall, the site worked well for the later part of the winter with some snowfall vents, although data are showing more noise than ideal. Data analysis has begun and will continue over the summer. We also need to work out plans for the next season.

7. *What has not worked that well: lessons learned;*

Some supplementary instrumentation, such as the optical disdrometer and the web camera, did not get installed last winter. Also, this is a site unmanned , we may detect issues in data when we work on them. Due to an early, cold, snowy winter, the site was very late coming online. Site access was difficult during winter months.

8. *Data available:*

Data have been collected since Feb 21, 2013 and will be uploaded to the NCAR data site after some QA/QC.

i. # of days of data collected for each sensor on site: Since Feb 21, 2013— Heated R0 (Pluvio and Geonor), Heated R2, R3 pair, Geonor 1500mm, Temp, RH, 2m and 3m Wind Speed, Surface Pressure, DRD11A precip detector, Geonor Rim temperatures, Heater On/Off.
ii. Data transmitted to NCAR: none
iii. Data QC'd: in progress
iv. Issues in data: raw data have spurious characters that need to be removed. This is likely related to a needed OS update on the CR3000 logger.

9. *Instruments under test: list, issues*

- Geonor 1500mm gauge under test not heated and appears noisier than the others
- Have all instruments allocated to your site from Instrument Providers, been installed?
    - Parsivel 2 from OTT never provided
- Has the data been shared with the Instrument Providers?
    - Instrument providers have been notified of availability of data but none have expressed interest to date in receiving the data.
- Have any of them visited the site?
    - No

10. Information on the Precipitation Detector(s) used;

DRD11A installed on the site between C7 and the C1/C2 pedestals. No analysis has been completed on this sensor so no issues can be reported at this time.

11. Commissioning:

- Date: June 17, 2013
- configuration at commissioning: nearly complete installation, missing some supplementary instrumentation and heaters on the gauges. This will be remedied before the 2013/2014 season.
- Availability of report: completion prior to meeting in Davos.

12. Results to date:

Working on the data analysis and hoping to get some preliminary results before the SPICE meeting.

13. Interaction Site manager and the IOC and Project team

As site managers for the Caribou Creek site, both Daqing Yang and Craig Smith have been participating in most teleconferences and attended the last SPICE workshop in Boulder (June, 2012). Both are also members of the DAT.

14. Small things, big impacts?

No web camera at the site for last winter. The web camera will be extremely useful in identifying capping/icing/clinging events as well as potentially qualifying drifting and blowing snow events.

Addendum 1

Caribou Creek Site Layout

Distances not exact and need to be verified