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**Table 1: Gauge visits during the autumn 2012. Comments: DD=gauge data download, MN=general gauge maintenance (cleaning, bounce sheet, re-level), CV= clear vegetation, CA = calibration with two nozzles, SN=snow survey, and LS=ML1 data logger swap.**

Date	Gauges Visited	Technicians	Comments
30 Sep 2012	100, 100T, 104, 105	Thomas, Ashley	DD, MN, CV
28 Sep 2012	2, 5, 8, 106	Nick, Thomas	DD, MN, CV
29 Sep 2012	4, 10	Doug M, Candice	DD, MN, CV
6 Oct 2012	101, 102, 103, 110	Megan, Kurt	DD, MN, CV
7 Oct 2012	1, 3	Kurt, Doug M	DD, MN, CV
9 Oct 2012	1	Doug M, Lisa M	DD, MN, CV
13 Oct 2012	107, 109, 111, 112	Thomas, Candice	DD, MN, CV
14 Oct 2012	304, 307	Kurt, Robert	DD, MN, CV
19 Oct 2012	108	Doug M , ATMS 111 class	DD, MN, CV
20 Oct 2012	305, 309, 310	Doug H, Ashley	DD, MN, CV
21 Oct 2012	300, 308	Nick, Robert	DD, MN, CV
27 Oct 2012	303, 306, 311	Doug H, Doug M	DD, MN, CV
3 Nov 2012	301, 302	Kurt, Robert	SN
17 Nov 2012	301, 302, 300	Doug H, Robert	DD, MN, CV
1 Dec 2012	300, 311	Robert, Doug M	LS

Gauge visitation in support of the Great Smoky Mountain Rain Gauge Network (GSMRGN) during the autumn 2012 occurred over 15 days spanning a period of over ten weeks in the September – December 2012 period. The primary purpose of the visits was [1] to complete maintenance tasks, [2] to download gauge observations that were made since the previous gauge visits in the summer 2012, and [3] clear vegetation. Eleven technicians and volunteers (listed on the front page) made the visits and performed the required work. It is important to note that the volunteers were NOT directly involved in any of the gauge visit tasks, but were volunteering to assist with personal safety should someone get injured during a particular series of gauge visits.

The general tasks completed at **every** gauge visit consisted of (1) gauge data download from the data loggers [DD in Table 1], (2) general gauge maintenance [MN in Table 1], and (3) clearing of vegetation from the gauge site [CV in Table 1]. Specialized tasks were to conduct snow surveys after the passage of Sandy, swap the rain gauge at Mt. Cammerer with a smaller capacity tipping bucket gauge, and swap out ML1 data loggers that showed a serious problem with keeping accurate time. Task (1) merely required a serial port link between the field study laptop and the gauge data logger and consisted of pulling the data (often in files having two different formats) onto a desktop folder on the laptop, checking for completeness of the data, and comparing the data logger time to the actual time, making corrections to the data logger clock if necessary. The standard that has been chosen for this study is to maintain the clocks on Eastern Daylight Time, since most of the “warm” precipitation will be occurring during the season when EDT is in effect. Because of concerns regarding accuracy of the time on the ML1 data loggers, a standard was followed whereby the time from the Garmin GPS locators was used as guidance for accurate time since the GPS time (and each GPS satellite) is synched with the atomic clock of the U.S. Naval Observatory. Two ML1 loggers (gauges #300 and 311) were found to have a time drift between the logger and the actual time exceeding 30 minutes since the summertime visits and so these were swapped out with loaner ML1 loggers from Hydrological Services so they could analyse the source of the time-keeping problem. Task (2) required the cleaning of debris from the funnel filter, cleaning the tipping buckets of debris (if necessary), cleaning the gauge drain ports, removal of the old “Bounce” fabric softener sheet inside the case of the gauge, and re-leveling the gauge if it has come unlevelled. Task (3) is

required to insure that none of the surrounding vegetation overgrew the funnel top during the growing season, thereby reducing the catchment of the gauge. In addition, the larger rain gauge at Mt Cammerer (g#303) was removed and replaced with a smaller capacity tipping bucket gauge. A snow survey was undertaken along the Appalachian Trail (in proximity of gauge #302) to measure snow depth in the wake of the tropical/extratropical storm Sandy. This was a first attempt at measuring snow depth and snow water equivalent during the cold season as part of this project. Much was learned so that future snow surveys will provide the greatest possible accuracy for field measurements.

The challenges encountered during some of the gauge visits in the autumn 2012 were related primarily to dealing with very deep snow, locked access gates, and rapidly diminishing daylight hours. It was hoped that gauges #301 and 302 could be accessed on the snow survey trip. Unfortunately, the snow was two to three feet deep and made hiking slow and some portions of the trail impassible. A return trip had to be made to Camp Daniel Boone since an access gate was unexpectedly locked on 7 October 2012, blocking access to gauge #1. Repeat visits to gauges #300 and 311 were necessary when the severe time drift of the ML1 loggers was noted. A new laptop was utilized for the gauge visits in the autumn 2012 and some difficulty was initially encountered in using the HOBO software when T/RH sensors were unable to “talk” with the software loaded on the laptop. Two gauges in the Great Smoky Mountain National Park (gauges# 301 and 303) were found to have posts that have come slightly loose in the soil and are in need of shoring up with ground stakes and cables during visits in the spring 2013.

Details of every gauge visit along with each gauge precipitation and calibration data record can be found at [http://blizzard.atms.unca.edu/dmiller/fall2012\\_visits.zip](http://blizzard.atms.unca.edu/dmiller/fall2012_visits.zip) which contains sub-folders for each gauge that consist of the individual data files (often having at least two different formats), pictures taken at the gauge site during the visit, screenshots of the GPS (laptop) and ML1 logger time comparison, and a MS Word document that mirrors the notes made in the field journal during each gauge visit.

Plans for the spring months of 2013

**Table 2: Planned gauge visits during the autumn 2012. Comments: DD=gauge data download, MN=general gauge maintenance (cleaning, bounce sheet, re-level), and CV= clear vegetation.**

Date	Gauges Visited	Technicians	Comments
31 Mar 2013	-EASTER-	-EASTER-	-EASTER-
5 Apr 2013	2, 5, 8, 106	TBD	DD, MN, CV
6 Apr 2013	1, 3	TBD	DD, MN, CV
7 Apr 2013	Make-up day	TBD	DD, MN, CV
13 Apr 2013	4, 10	TBD	DD, MN, CV
14 Apr 2013	100, 100T, 104, 105	TBD	DD, MN, CV
20 Apr 2013	101, 102, 103, 110	TBD	DD, MN, CV
21 Apr 2013	107, 108, 109, 111, 112	TBD	DD, MN, CV
27 Apr 2013	305, 309, 310	TBD	DD, MN, CV
28 Apr 2013	303, 306, 311	TBD	DD, MN, CV
4 May 2013	300, 308	TBD	DD, MN, CV
5 May 2013	301, 302	TBD	DD, MN, CV
6-10 May 2013	Make-up days	TBD	DD, MN, CV
11 May 2013	-commencement-	-commencement-	-commencement-
12 May 2013	304, 307	TBD	DD, MN, CV

Gauge visitation in support of the GSMRGN during the spring 2013 will occur over at least 11 days spanning a period of nearly six weeks in April and May 2013. The primary purpose of the visits will be to prepare for the upcoming HMT-SEPS field project by performing maintenance, downloading precipitation observations that were made since the previous gauge visits in September-December 2012, and checking if the time adjustment (“TA”) command has fixed the tendency of many data logger time stamps to gradually drift between visits. A primary maintenance issue will be to clear each gauge funnel of typical winter and spring season debris (needles/leaves, bird poop, blossom debris), to keep the “field-of-view” of the gauges clear of vegetation overgrowth, and to replace the HOBO 3V (2032) batteries. The higher elevation gauges during the April and May period will be visited last as the trees open their buds last in the vicinity of these gauges and some of the access roads remain closed until mid-spring.

The general tasks completed at every gauge visit will consist of (1) gauge data download from the data loggers [DD in Table 2], (2) general gauge maintenance [MN in Table 2], and (3) clearing of vegetation from the gauge site [CV in Table 2].

Details of every gauge visit along with each gauge precipitation data record will be updated at <http://blizzard.atms.unca.edu/dmiller/> which will contain sub-folders for each gauge that consist of the individual data files (often having at least two different formats), pictures taken at the gauge site during the visit, screenshots of the GPS (laptop) and ML1 logger time comparison, and a MS Word document that mirrors the notes made in the field journal during each gauge visit.

Earlier visits to the gauges# 107 and 110 will be made over the winter 2012, 2013 to replace their funnel shell with those having firmly fixed tops. Each of these gauges has at one point had the flared funnel collar come off of the primary gauge funnel shell.

Candice Boling and Nick Stone are new undergraduate research students at UNC Asheville who have been added to the technician team to help replace students who graduated in May 2012. We will be losing Megan Cutting and Robert David to graduation in December 2012. It is hoped that new undergraduate research students will be added to the team during the spring 2013 academic semester to replace Megan and Robert.