Great Smoky Mountain Rain Gauge Network Field Report 24 November 2010

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Status

Table 1: Gauge visits during the fall 2010. Comments: DD=gauge data download, MN=general gauge maintenance (cleaning, bounce sheet, re-level), CV= clear vegetation, VG = vegetation growth, and AI = animal interaction.

Date	Gauges Visited	Technicians	Comments
20 Nov 2010	4, 10	D. Martin, D. Miller	DD, MN, CV, AI, VG
13 Nov 2010	1, 3	W. Groetsema, A. Felts	DD, MN, CV, AI, VG
12 Nov 2010	2, 5, 8, 106	M. Talley, D. Martin	DD, MN, CV
6 Nov 2010	4, 10, 104	M. Talley, D. Martin, A. Woodward	DD, MN, CV
7 Nov 2010	111, 112	M. Talley, A. Felts	DD, MN, CV
31 Oct 2010	101, 102, 103, 108, 110	M. Talley, D. Martin	DD, MN, CV, AI
24 Oct 2010	305, 309, 310	D. Martin, A. Felts	DD, MN, CV, VG
30 Oct 2010	100, 105, 107, 109	A. Woodward, D. Martin, M. Goldsbury	DD, MN, CV
17 Oct 2010	303, 306, 311	A. Felts, D. Miller	DD, MN, CV
16 Oct 2010	300, 301, 302, 308	W. Groetsema, D. Martin	DD, MN, CV, VG
23 Oct 2010	304, 307	W. Groetsema, A. Woodward	DD, MN, CV

Gauge visitation in support of the Great Smoky Mountain Rain Gauge Network (GSMRGN) during the fall 2010 occurred over 11 days spanning a period of nearly five weeks in October and November 2010. The primary purpose of the visits was to perform maintenance after a rather warm and humid summer season and to download gauge observations that were made since the previous gauge visits in May and June 2010. Eight 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]. 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. Task (2) required the cleaning of debris from the funnel filter, cleaning the tipping buckets of debris (if necessary), cleaning the gauge drain ports, fixing a fresh "Bounce" fabric softener sheet inside the case of the gauge (throwing out the old sheet), and re-leveling the gauge if it has come unleveled. A final MN task during the fall 2010 visits consisted of installing a software patch for the MiniLog ML1 data loggers (MiniLog ML1 Firmware Rev 1.16). This was done for **all** 32 data loggers of the GSMRGN. Task (3) is required to insure that none of the surrounding vegetation overgrows the funnel top during the growing season, thereby reducing the catchment of the gauge.

The specialized tasks completed during some of the gauge visits in the fall 2010 consisted of dealing with vegetation growth issues [VG in Table 1], animal interaction with some of the gauges [AI in Table 1], and an early season snowfall that disrupted some of the scheduled gauge visits. It was discovered during the fall 2010 gauge visits that several gauges (Gauges# 1, 4, 302, 305, and 309) had enhanced briar-patch growing seasons over the summer 2010, perhaps due to the warmer- and more-humid-than-normal weather that may have resulted in under-catch since the spring 2010 visits. It should be noted that Gauge# 309 was visited by Doug Miller on 6 June 2010 and showed no vegetation overgrowth. These gauges will need to be visited more frequently during warm and humid growing seasons to insure a clear sky view.

Several gauges (Gauges# 3, 10, and 110) had shown evidence of tampering by humans or by animals. Gauge# 3 (High Top, Camp Daniel Boone) had a puncture in the side (near the top) of the gauge cover but there was no obvious damage to the internal components of the gauge, other than the Hobo data logger lying on top of the tipping buckets. Daytime hikers had called Doug Miller in early October 2010 indicating that the gauge on High Top "looked to be in good shape." Hence, the hole to the gauge cover was inflicted between early October and the day of the gauge visit (13 November 2010). Gauge# 10 (Beatty Spring Knob) was leaning as if there had been a collision with an animal. The gauge is located next to a popular deer hunting area, so a collision with a deer is possible. The gauge was re-leveled and new support cables were attached to nearby boulders. The gauge funnel collar of Gauge# 110 (Hawkins Property, Cataloochee Divide) had been removed and was found lying nearby the gauge. The collar was re-installed into the top of the gauge funnel.

Other complications encountered during the fall 2010 gauge visits were related to road closures. An early season snowfall prevented the original planned visit to Gauges# 4 and 10 on 6 November 2010 due to the closure of roads having icy surface conditions. These gauges were successfully revisited on 20 November 2010. The road at Camp Daniel Boone to the High Top gauge (#3) is now nearly entirely blocked due to fallen trees lying across it. Future visits may require an all-day visit to Camp Daniel Boone if the scouts continue to let the road become overgrown with vegetation and fallen trees and a longer hike then becomes necessary to reach Gauge# 3.

Details of every gauge visit along with each gauge precipitation data record can be found in folder "GAUGE-DATA-PMM" which contains sub-folders for each gauge that consists of the individual data files (often having at least two different formats) and a "history" MS Word document that mirrors exactly the notes made in the field journal during each gauge visit. The "history" files for each gauge were last updated by Doug Miller in November 2010.

Plans for the spring and summer months of 2011

Table 2: Planned gauge visits during the spring and summer 2011. Comments: DD=gauge data download, MN=general gauge maintenance (cleaning, bounce sheet, re-level), and CV= clear vegetation.

Date	Gauges Visited	Technicians/volunteers	Comments
26 Mar 2011	1, 3	TBD	DD, MN, CV
25 Mar 2011	2, 5, 8, 106	TBD	DD, MN, CV
2 Apr 2011	4, 10, 104	TBD	DD, MN, CV
3 Apr 2011	111, 112	TBD	DD, MN, CV
9 Apr 2011	101, 102, 103, 108, 110	TBD	DD, MN, CV
10 Apr 2011	305, 309, 310	TBD	DD, MN, CV
16 Apr 2011	100, 105, 107, 109	TBD	DD, MN, CV
17 Apr 2011	303, 306, 311	TBD	DD, MN, CV
23 Apr 2011	300, 301, 302, 308	TBD	DD, MN, CV
24 Apr 2011	304, 307	TBD	DD, MN, CV

Date	Gauges Visited	Technicians/volunteers	Comments
25 Jun 2011	1, 3	TBD	DD, MN, CV
24 Jun 2011	2, 5, 8, 106	TBD	DD, MN, CV
2 Jul 2011	4, 10, 104	TBD	DD, MN, CV
3 Jul 2011	111, 112	TBD	DD, MN, CV
9 Jul 2011	101, 102, 103, 108, 110	TBD	DD, MN, CV
10 Jul 2011	305, 309, 310	TBD	DD, MN, CV
16 Jul 2011	100, 105, 107, 109	TBD	DD, MN, CV
17 Jul 2011	303, 306, 311	TBD	DD, MN, CV
23 Jul 2011	300, 301, 302, 308	TBD	DD, MN, CV
24 Jul 2011	304, 307	TBD	DD, MN, CV

Gauge visitation in support of the GSMRGN during the spring and summer 2011 will occur over at least 10 days spanning a period of nearly six weeks in March/April and June/July 2011. The primary purpose of the visits will be to perform maintenance during another potentially warm and humid growing season and to download precipitation observations that were made since the previous gauge visits in October and November 2010. A primary maintenance issue will be to clear each gauge funnel of typical spring debris (pollen pods) and to keep the "field-of-view" of the gauges clear of vegetation overgrowth, particularly for Gauges# 1, 4, 302, 305, and 309. The higher elevation gauges during the March/April period will be visited last as the leaves on high elevation trees come out later in the spring season. The gauge visits in June/July 2011 will serve to prepare the gauges for a potential Intensive Observation Period field campaign at the National Park Service Purchase Knob research facility in late July / early August 2011.

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 in folder “GAUGE-DATA-PMM” which contains sub-folders for each gauge that consists of the individual data files (often having at least two different formats) and a “history” MS Word document that mirrors exactly the notes made in the field journal during each gauge visit.

It is anticipated that a new undergraduate research student at UNC Asheville will be added to the technician team in time for the spring 2011 gauge visits to eventually help replace senior students Wesley Groetsema, Melissa Talley, and Aaron Woodward. Ashley Felts, a sophomore at UNCA, joined the GSMRGN technician team in the fall 2010 and was involved in four different days of gauge visits. She was fortunate to spot a bear on the first day of her gauge visits and is still looking forward to the next opportunity!