

Interim Report for Phase 1 GIS Mapping of Cultural, Paleoclimatic and Paleoenvironmental
Landscapes in Rocky Mountain National Park
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During the past several months, progress was made on assembling a GIS database for the project's landscapes mapping component. In November, 2011, a paper on preliminary results of the mapping and archaeological/paleoclimate reconstruction was delivered at the 2011 Chacmool Conference in Calgary, Canada. A conference proceedings paper was produced for publication and the final edited version was completed and sent to the proceedings editor on October 2nd.

On August 8th, 2012, a UNC team obtained a sediment core from an alpine-subalpine ecotone fen wetland on a north-facing Mt. Ida Ridge mountainside bench, overlooking upper Forest Canyon. The 1.3m sediment core was extracted using a square-rod piston sampler (2.5 cm diameter, 1 m sampler). The core, recovered in segments, were wrapped in plastic film and aluminum foil and transported to the Paleoecology Laboratory at the University of Northern Colorado. In the laboratory, the core was examined and sediment samples were collected for radiocarbon dating, sediment analysis (loss on ignition, bulk density, and magnetic susceptibility). Bulk samples of sediment were submitted for accelerator mass spectrometry (AMS) radiocarbon dating. Loss on ignition (LOI) and bulk density (BD) measurements are on-going to using techniques modified from those described by Dean (1974). Bulk density is calculated on oven-dried samples; organic carbon content is determined using loss on ignition at 550°C for two hours. Magnetic susceptibility (MS) measurements were made on 1-cm intervals using standard techniques (Thompson and Oldfield 1986). Magnetic susceptibility analysis is complete.

Sediments in the Forest Canyon Bench core (FC 12-1) were composed of peat, soft gyttja (a fine-grained organic-rich lake mud), and coarse sands and gravel. The sediment core analyzed was 1.3m in length. The upper 55 cm of the core is peat. Between 55 and 75 cm the core was composed of gyttja. The sediment below 75 cm was a mix of coarse sand and gravel which was not retained in the barrel of the corer upon retraction. There was no evidence of a depositional hiatus in the core.

Three accelerator mass spectrometry (AMS) radiocarbon ages were subsequently obtained on organic materials in the core at 30 cm, 75 cm, and 95 cm (Table 1). The upper date was derived from bulk peat sample and yielded a date of 2990 ± 30 ¹⁴C yr BP (3170 cal yrs). The sample at 75 cm was obtained from a discrete wood fragment and dated to 8220 ± 40 ¹⁴C yr BP (9165 cal yrs). The lowermost age was obtained from a bulk sample of organic-rich sediment at a depth of 95 cm and its age was 8850 ± 40 ¹⁴C yr BP (9950 cal yrs). Final results of the sediment analysis should be completed by December, 2012.

Further GIS mapping of archaeological sites, RMNP ice patch localities, and paleoclimate data from RMNP coring sites, as well as data from UNC paleoclimate study sites in North Park, is in progress and will be integrated into the final GIS mapping project report during 2013.

TABLE 1. Uncalibrated and calibrated AMS ^{14}C Ages for Forest Canyon Bench wetland.

Depth (cm)	Material dated	Laboratory no.	Dating method ^a	Uncalibrated ^{14}C age (^{14}C yr BP)	Calibrated age ^b (cal yr BP)	2 sigma age range (cal yrs BP) ^b
30	Peat	Beta 328515	AMS	2990 ± 30	3170	(3075 to 3265)
75	Wood	Beta 328516	AMS	8220 ± 40	9165	(9030 to 9300)
95	Plant Material	Beta 328517	AMS	8850 ± 40	9950	(9740 to 10160)

^a Accelerator mass spectrometry method.

^b Calendar age used in the age-depth model. Ages are derived from CALIB 6.0.1 calibration curves (Stuiver et al., 1998) with the 2 sigma calibrated results given in parentheses.