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HOLOCENE FLOOD FREQUENCY IN NEW ENGLAND: LARGE, EPISODIC EVENTS IN THE SEDIMENT RECORD

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Holocene flooding of steep basins in the hilly terrain of New England, specifically VT, NH, and ME, leaves clear sedimentologic signatures in post-glacial ponds and lakes (~ 0.3-2.2 km2). 11 sediment cores (4.5-6 m in length) were taken from seven of these lakes near the base of stream delta foreslopes. All of the cores have been analyzed (cm-by-cm) for organic content (% loss-on-ignition) and magnetic mineral content (Magnetic Susceptibility), and so far, the South Pond (SU) (Stark, NH) core and the Ogontz Lake (OG) (Lisbon, NH) core have been analyzed (cm-by-cm) for siliclastic grain size. These analyses are paired with 9 14C dates from the SU core and 6 14C dates from the OG core to reconstruct a Holocene chronology of hydrologic events. Increases in the median grain size and the coarsest fraction (d90) of the cores are used to indicate changes in the energy of sediment deposition by the streams feeding these deltas. Floods (initiated by rainstorms, but also rain on snow) cause increased deposition of coarse, clastic sediment into the lake.

Medium silt (15-31 mm) is the predominant grain size for the clastic material in gytta dominated sections of the SU core, comprising ~75% of the 275 samples, whereas fine silt (7-15 mm) is the predominant grain size for the clastic material in gytta dominated sections of the OG core, comprising ~85% of the 488 samples. However, where clastic sediments punctuate gytta, indicating depositional events, median grain sizes of clastic sediments in the SU core coarsen to fine and very fine sands (~60-170 mm), and median grain sizes of clastic sediments in the OG core coarsen to medium silt (~15-22 mm). Increases in the coarsest fraction (d90) correlate moderately well with increases in median grain size (R2=0.61 (SU), R2=0.67 (OG)). The coarsest fraction of the clastic sediments in the SU core contain medium and coarse sand (~250-826 mm), and the coarsest fraction of the clastic sediments in the OG core contain very fine sand (~65-80 mm).

These coarse, clastic sediments are characterized by lower organic content and higher magnetic mineral content, as defined by LOI and MS, respectively. In both cores, there is an increase in depositional events from 1,500 to 2,500 cal yr. BP, similar to a period of storminess in New England defined by Brown et al, 2000 and Noren et al, in review.

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