In 2007 Koster, *et al* used a soil core from the mouth of the Abbagadasset River to reconstruct the environmental history of the Kennebec estuary. After chemical analyses they found the expected increases in heavy metal concentrations resulting from industrial pollution in the river, but they also found a spike that could not be linked to anthropogenic pollution. A large peak in the concentration of iron (Fe) and sulfur (S) occurred at an approximate depth of 45-60cm. This region of the core was radio carbon dated to approximately 1200 A.D (Figure 1). Given the time period this peak is likely to be from a climatic and not anthropogenic source. The primary source of sulfur in sediments results from the reduction of sulfate (SO₄) to sulfide (H₂S) by sulfate reducing bacteria in anoxic conditions. The byproduct sulfide is then available to oxidize with iron (Fe) to form pyrite (FeS₂). Pyrite is not soluble in water and precipitates, settling on the floor (Canfield & Thamdrup 1996). Concentrations of sulfate are much greater in marine systems than freshwater systems and the percentage of sulfur in sedimentary rocks can be used in determining whether or not the rock was formed under freshwater or marine conditions (Mazumdar, *et al* 2007). The peak of sulfur at 45-60cm could be indicative of an influx of marine water into a portion of the river that is typically fresh. If the region experienced a severe drought, the inland source of water would be reduced and the brackish portion of the estuary would have extended farther upriver than seen today. This would lead to an increase in available sulfate and the formation of pyrite in the sediment.

Looking to expand upon the knowledge gained from the Koster, *et al* core, this summer we took a 2 meter core at the mouth of the Abbagadasset River. We divided the core into 5 mm sections and prepared them for chemical analysis. This core is twice the length of the one described in Koster, *et al* and we hope to gain greater resolution of fluctuations by using 5 mm sections. In the future we will obtain a second core from farther upriver to use as a comparison. If our assumption is correct, the core from the upriver site should have a less significant or a nonexistent peak of iron and sulfur.

Excluding data gained from instrumental weather observations, the majority of information pertaining to drought records in North America is based on tree-ring reconstructions. Due to the ecology and the land use history of different regions in North America, tree ring data is more heavily favored in some regions over others. Stahle, *et al* were able to reconstruct a drought record North America, but tree age limited the record to the past 700 years. Out of 929 trees sampled, 97 were able to be dated to A.D 1300 and out of these 97 only 9 were found on the east coast. Reconstructing drought records through sediment cores can provide a much longer record than available with tree rings and they could be used to fill in the gaps in the drought record along the east coast.

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