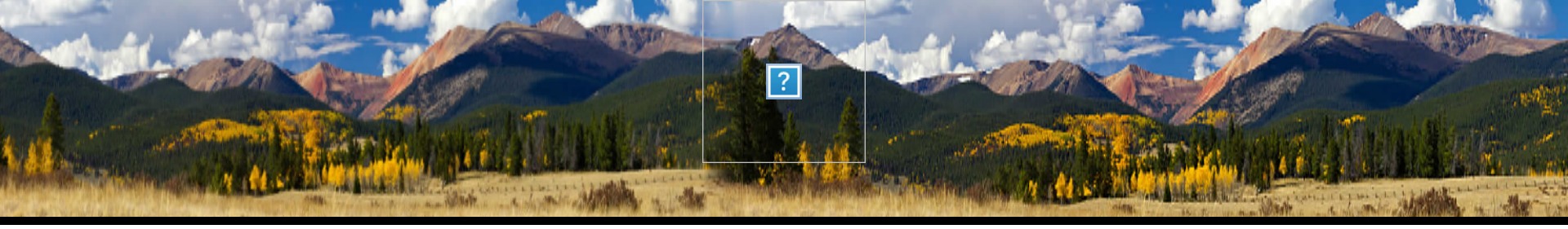

Booth No. 20 INVESTIGATING THE CAUSES OF EUTROPHICATION IN HIGH ANDEAN LAKES (JUNÍN REGION, PERU) THROUGH NITROGEN ISOTOPE ANALYSIS OF SEDIMENT CORES

Sunday, March 18, 2018
01:30 PM - 05:30 PM
DoubleTree by Hilton - Lake Champlain Exhibition Hall

Anthropogenic emissions of nitrogen through the burning of fossil fuels, the Haber-Bosch process, and other agricultural techniques can have adverse effects on ecosystems. Although adverse effects of N additions are often focused in areas of high agricultural productivity due to its use in fertilizers, recent studies suggest that atmospheric deposition of N from the burning of fossil fuels occurs in remote areas far from agricultural activity. This study focuses on investigating the cause of eutrophication in five remote high Andean lakes in Peru (provinces of Junín and Pasco). In order to determine the origin of excess N in these lakes, we have analyzed N isotopic signatures in surface cores collected at the lakes. Due to the fact that there is little agriculture in the region, our preliminary hypothesis is that excess N is present as a result of either atmospheric deposition or animal waste from grazers. Based on previous work using N isotopes, we expect that atmospheric deposition will yield decreasing $\delta^{15}N$ values through the 19th and 20th century intervals in the cores, while inputs of animal waste would yield higher $\delta^{15}N$ values. Our initial analyses have shown varying results amongst the five lakes. $\delta^{15}N$ values of the two southernmost lakes decrease with time, by 3.28‰ and 0.7‰ respectively. The three northern lakes have less clear trends. Two of the lakes differed in that one showed an ultimate decrease in $\delta^{15}N$ values, while the other showed an ultimate increase, however neither showed a consistent overall trend throughout the core, possibly due to changing N inputs over time. The fifth lake displayed a trend of consistently increasing $\delta^{15}N$ values over time, increasing by 1.32‰. The one lake with consistently increasing values has the highest $\delta^{15}N$ values, with a range of 5-9‰, whereas the next highest value among the lakes is less than 4‰. Wind direction and geography surrounding the lakes could affect the amount of atmospheric N deposition occurring in a location. Also, lateral inputs of N from soil erosion could also affect N signatures in the cores. We will continue to analyze these data to interpret the sources of N in these high Andean lakes. Overall, determining the source of excess N in these lakes will provide us with a better idea of how anthropogenic N emissions affect ecosystems removed from agriculturally productive areas.

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