Effects of Laboratory Combustion on Impacted and Native Plant Biomass from a Subtropical Calcareous Wetland.

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The frequency of using prescribed burning as a tool for ecosystem management and restoration has increased tremendously in the last few decades within the Everglades National Park. The combustion of plant biomass that occurs during this process leads to both the loss and accumulation of both macronutrients and their forms in the ash and char material. While biogeochemical cycles of these nutrients have been studied extensively in this ecosystem, the concentrations and forms remaining after plant biomass combustion has not. Plant biomass, live, dead and litter, was collected within the Everglades National Park of both impacted and native plants and combusted in both a muffle furnace at differing temperatures and by flame ignition at a range of intensities. We hypothesized that initial plant biomass nutrient concentrations would determine the amount of macronutrients remaining after combustion, and that as temperature and intensities increased so would available forms of P while C and N would be lost due to volatilization. The results from muffle furnace combustion of the two plant biomass materials found that the rate of volatilization of both C and N, between 300 and 400°C varied significantly. Above 450°C, however, little difference was measured in nutrient forms or concentrations. The major nutrient left over in both materials after combustion was P, most as labile P_i. The results from flame ignition combustion found that no significant differences existed between the nutrients or their forms, after combustion of the native and impacted plant biomass.