



Stocks and sources of carbon buried in the salt marshes and seagrass beds of Patos Lagoon Estuary, Southern Brazil

Elizabeth Patterson (1), Beverly Johnson (1), Philip Dostie (1), and Margareth Copertino (2)

(1) Department of Geology, Bates College, Lewiston, ME, United States (pattersonewp@gmail.com), (2) Instituto de Oceanografia, Universidade Federal do Rio Grande - FURG, Rio Grande, RS, Brazil (marga.copertino@gmail.com)

This project investigates carbon stocks in salt marshes and seagrass beds in the Patos Lagoon estuary, the largest choked lagoon in the world, located in Southern Brazil. The study was conducted in the mesohaline region, at three shallow shoals. At each shoal, three sediment cores (50 cm deep) and plant biomass samples (above and belowground) were collected along a transect line, spanning from the marsh to seagrass beds (total = 9 sediment cores). The 50cm cores were subsampled and analyzed for organic carbon (C) and nitrogen (N) content, C/N ratios, and the isotope ratios of $^{13}\text{C}/^{12}\text{C}$, and $^{15}\text{N}/^{14}\text{N}$. The organic carbon content of these sediments ranged between 10% (in surface sediments) and 1% (deeper in the core), suggesting that both the salt marshes and seagrass beds in this region are sequestering carbon. Early results indicate that cores taken in marsh dominated by C3 plants (*Scirpus maritimus*) tended to be the most depleted in ^{13}C with $\delta^{13}\text{C}$ values around -25‰ . Cores taken in marsh dominated by C4 plants (*Spartina alterniflora*, *Spartina densiflora*), seagrass beds (*Ruppia maritima*), and non vegetated areas were generally isotopically heavier with $\delta^{13}\text{C}$ values ranging -20‰ to -15‰ indicating a mix of organic sources in the sediments. The $\delta^{15}\text{N}$ values and C/N ratios both varied with most values falling in a range of 2-8‰ and 7-20 respectively. Analysis of the $\delta^{34}\text{S}$ isotope composition of the sediments is currently underway and may provide better information on the relative contributions of macro and micro algae in the sediments. The present data will reveal the carbon stock size, as well as the types and history of organic matter deposition in Patos Lagoon estuary.