

## Dynamics of Soil Carbon and Nitrogen Contents and Stocks along a Salinity Gradient

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**Abstract :** To investigate the effects of salinity on dynamics of soil carbon and nitrogen contents and stocks, soil samples were collected at a depth of 30 cm at four sampling sites (Sites B, T, S and P) along a salinity gradient in a drained coastal wetland, the Yellow River Delta, China. The salinity of these four sites ranked in the order: B ( $8.68 \pm 4.25$  ms/cm) > T ( $5.89 \pm 3.17$  ms/cm) > S ( $3.19 \pm 1.01$  ms/cm) > P ( $2.26 \pm 0.39$  ms/cm). Soil total carbon (TC), soil organic carbon (SOC), soil microbial biomass carbon (MBC), soil total nitrogen (TN) and soil microbial biomass carbon (MBC) were measured. Based on these data, soil organic carbon density (SOC<sub>D</sub>), soil microbial biomass carbon density (MBC<sub>D</sub>), soil nitrogen density (TN<sub>D</sub>) and soil microbial biomass nitrogen density (MBC<sub>N</sub><sub>D</sub>) were calculated at four sites. The results showed that the mean concentrations of TC, SOC, MBC, TN and MBN showed a general decreasing tendency with increasing salinities in the top 30 cm of soils. The values of SOC<sub>D</sub>, MBC<sub>D</sub>, TN<sub>D</sub> and MBN<sub>D</sub> exhibited similar tendency along the salinity gradient. As for profile distribution pattern, The C/N ratios ranged from 8.28 to 56.51. Higher C/N ratios were found in samples with high salinity. Correlation analysis showed that the concentrations of TC, SOC and MBC at four sampling sites were significantly negatively correlated with salinity ( $P < 0.01$  or  $P < 0.05$ ), indicating that salinity could inhibit soil carbon accumulation. However, no significant relationship was observed between TN, MBN and salinity ( $P > 0.05$ ).

**Keywords :** carbon content and stock, nitrogen content and stock, salinity, coastal wetland

**Conference Title :** ICEBESE 2016 : International Conference on Environmental, Biological, Ecological Sciences and Engineering

**Conference Location :** Los Angeles, United States

**Conference Dates :** April 05-06, 2016