# Appendix 5-6: Spatial Distribution of Soil Characteristics in STA-2, Cells 2 and 3

Manuel Zamorano and Delia Ivanoff

## BACKGROUND

Soil monitoring is an important aspect of environmental condition assessment in the stormwater treatment areas (STAs). Soil biogeochemistry has a major role in controlling phosphorus concentration on the overlying water. The amount and stability of phosphorus stored in the soil influences the flux rate and release into the overlying water column. Also, unconsolidated floc can re-suspend into the water column during wind events and high flow events and cause an increase in phosphorus concentration in the water column. Floc resuspension also affects water column clarity and therefore affects the sustainability of submerged aquatic vegetation.

The goal is to take an inventory of the phosphorus storage in the soil layer of each cell in each STA through soil sampling. The routine soil sampling program in the STAs involves collection of intact cores that are then sectioned into the floc and upper 10-centimeter (cm) soil layer (**Figure 1**). Baseline sediment cores (0–10 cm) are taken upon completion of construction of new STA cells, and then follow-up sampling is conducted at approximately three-year intervals. Sampling stations are selected following a 1,333-foot by 1,333-foot sampling grid design. Samples are then analyzed for total floc depth (**Figure 2**), bulk density (**Figure 3**), total ash-free dry weight (**Figure 4**), total phosphorus (**Figure 5**), total nitrogen (**Figure 6**), total carbon (**Figure 7**), and total calcium (**Figure 8**).

Results of previous sampling events have been published in past South Florida Environmental Reports and other reports. The following analyses were conducted using 2009 soil sampling results to determine the differences and similarities in soil characteristics between Cell 2 and Cell 3 of Stormwater Treatment Area 2 (STA-2).

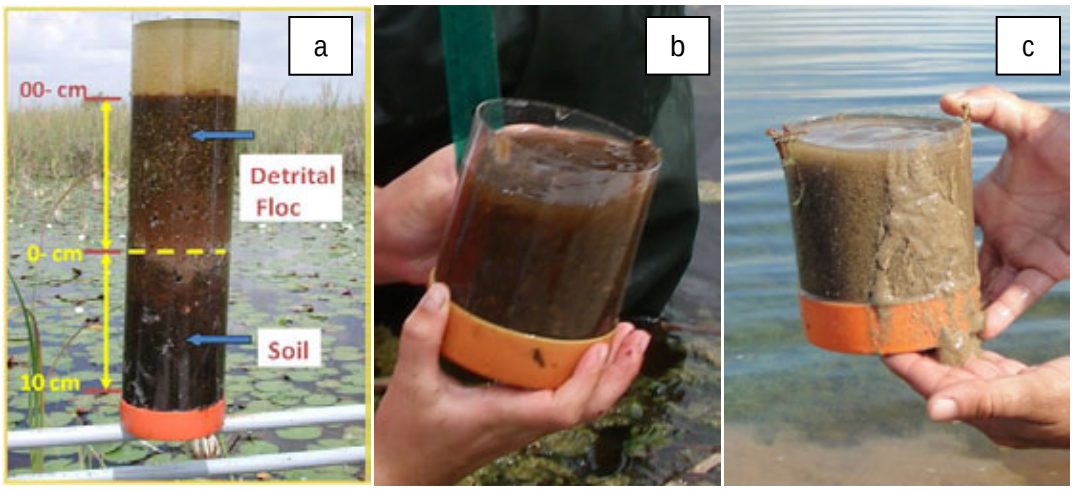


**Figure 1.** An illustration of core sampling in the STAs, which involves collection of intact cores and sectioning the cores into the floc layer and soil layer (0-10 cm) (photo a). Photo b is floc material from an emergent aquatic vegetation (EAV) cell. Photo c is floc material from a submerged aquatic vegetation (SAV) cell.

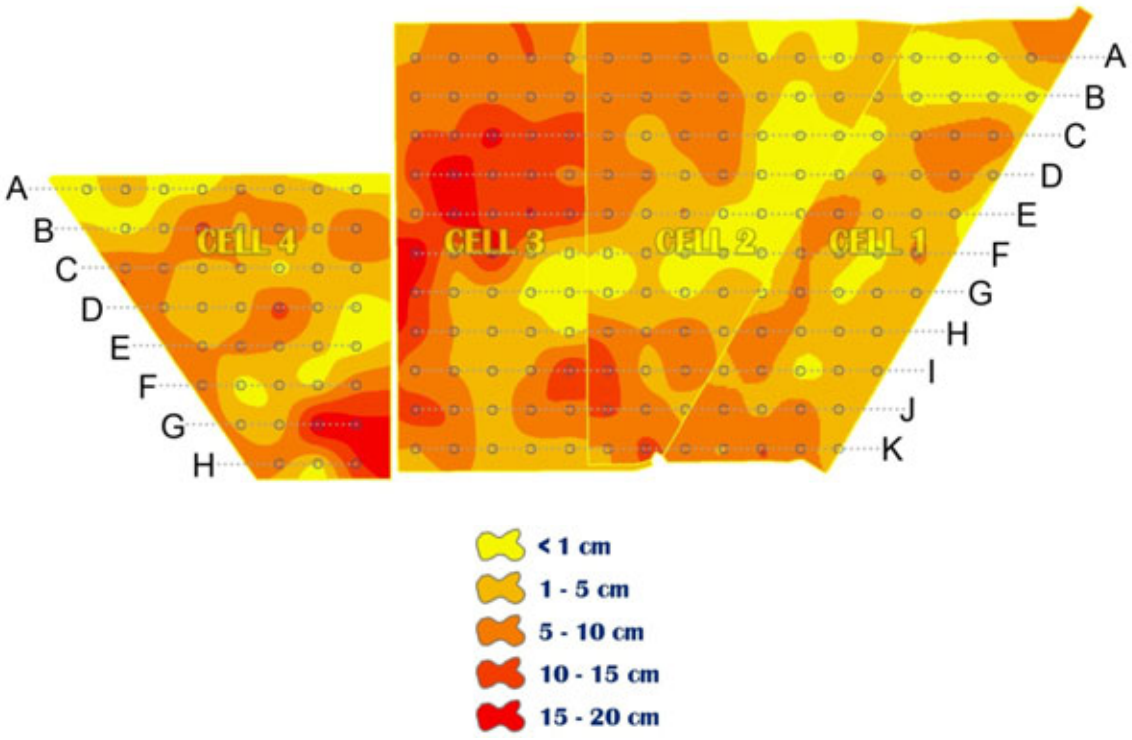


**Figure 2.** Spatial distribution of total floc depth in STA-2, Cells 1–4.

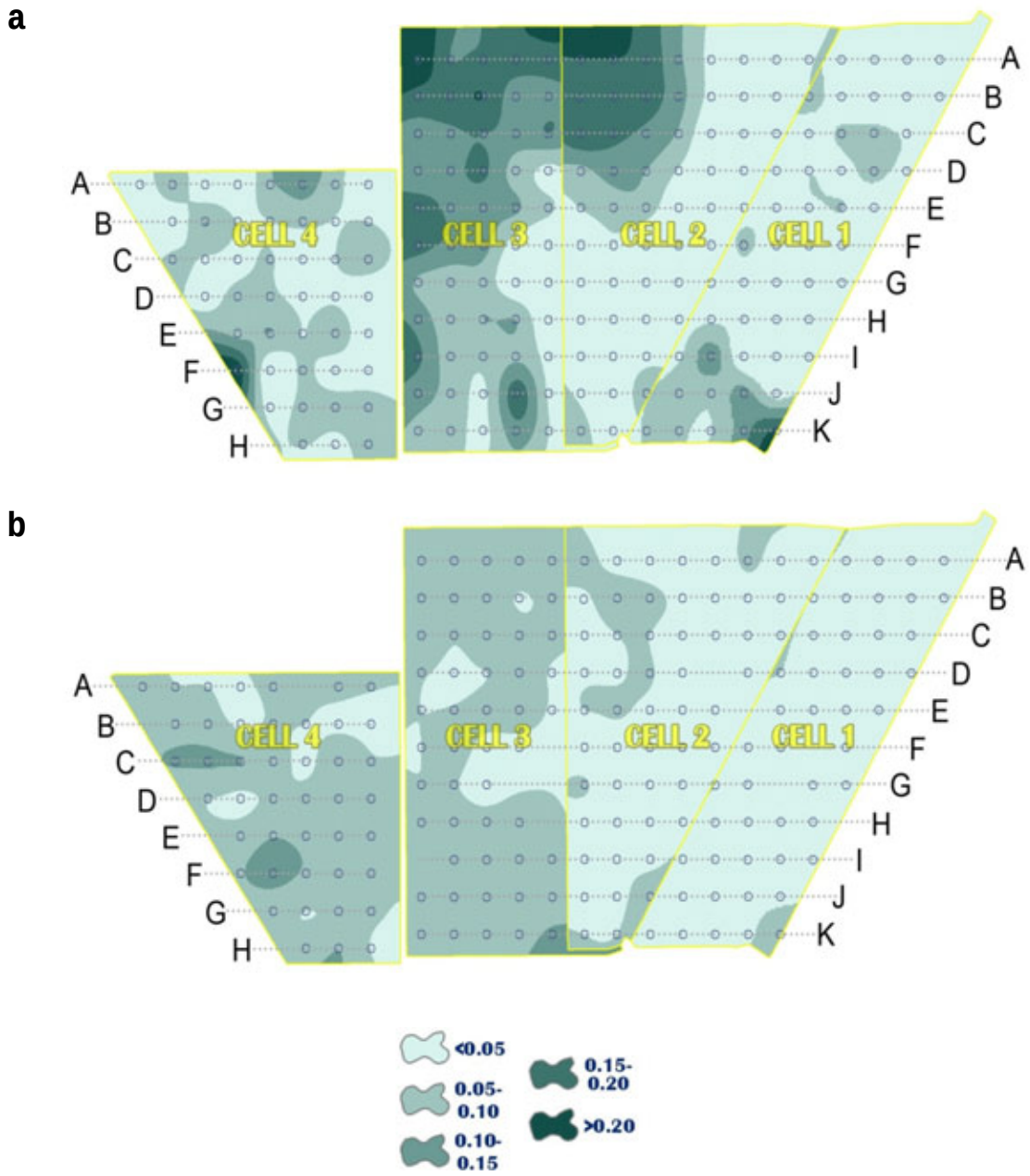


**Figure 3.** Spatial distribution of bulk density in the (a) floc layer and (b) soil layer (0–10 cm) in STA-2, Cells 1–4.

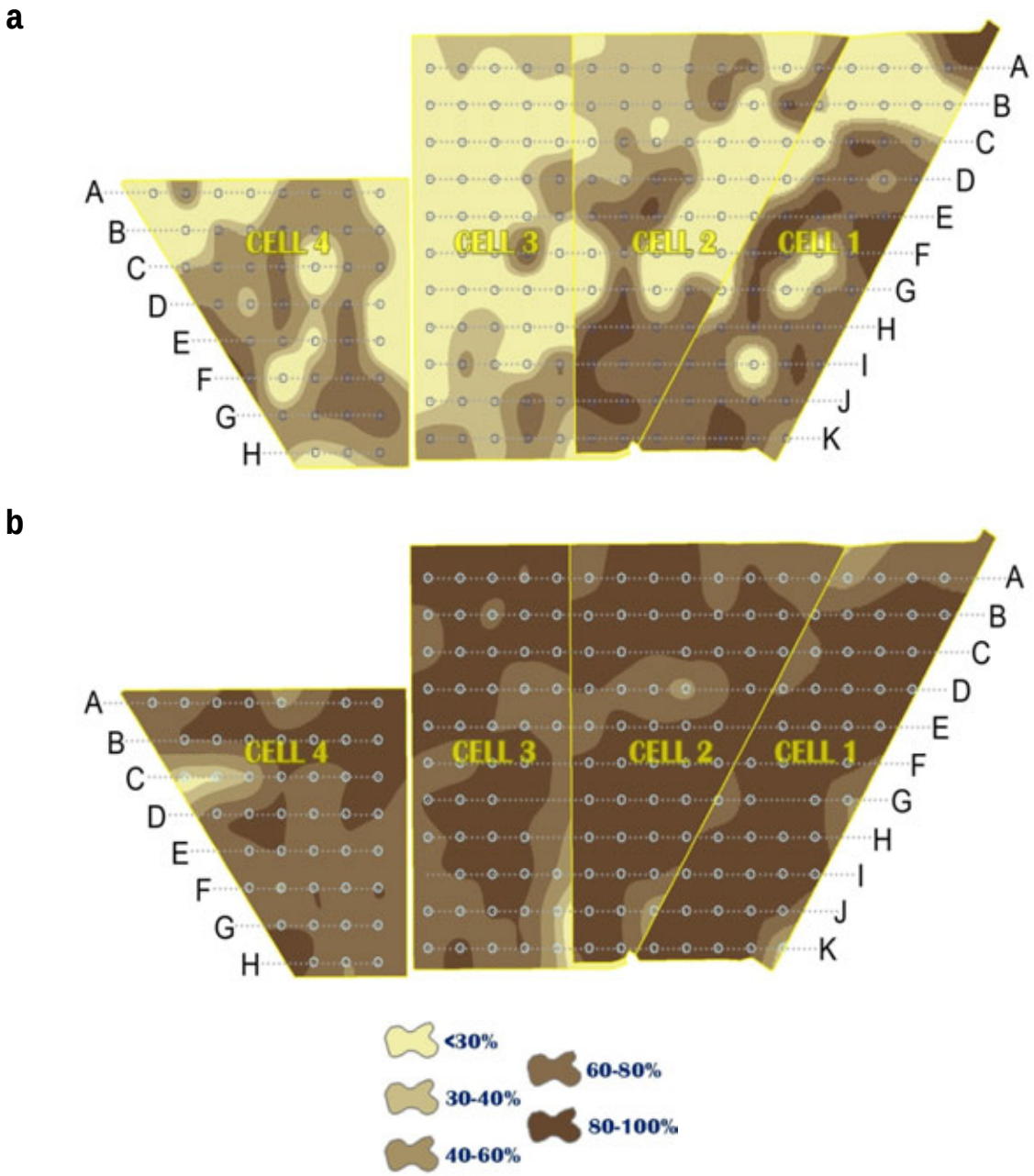


**Figure 4.** Spatial distribution of ash-free dry weight in the (a) floc layer and (b) soil layer (0–10 cm) in STA-2, Cells 1–4.

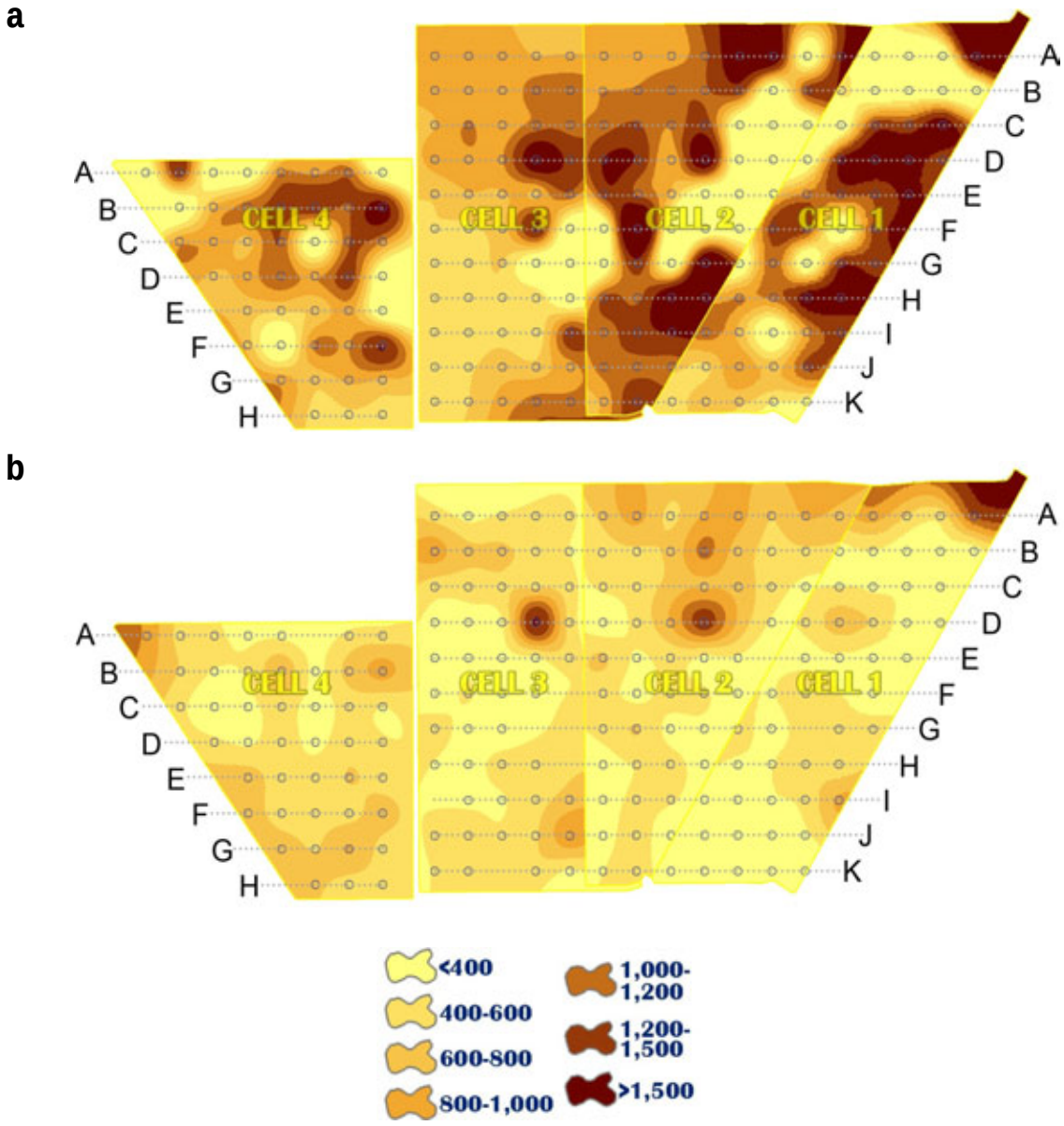


**Figure 5.** Spatial distribution of total phosphorus concentration in the (a) floc layer and (b) soil layer (0–10 cm) in STA-2, Cells 1–4.

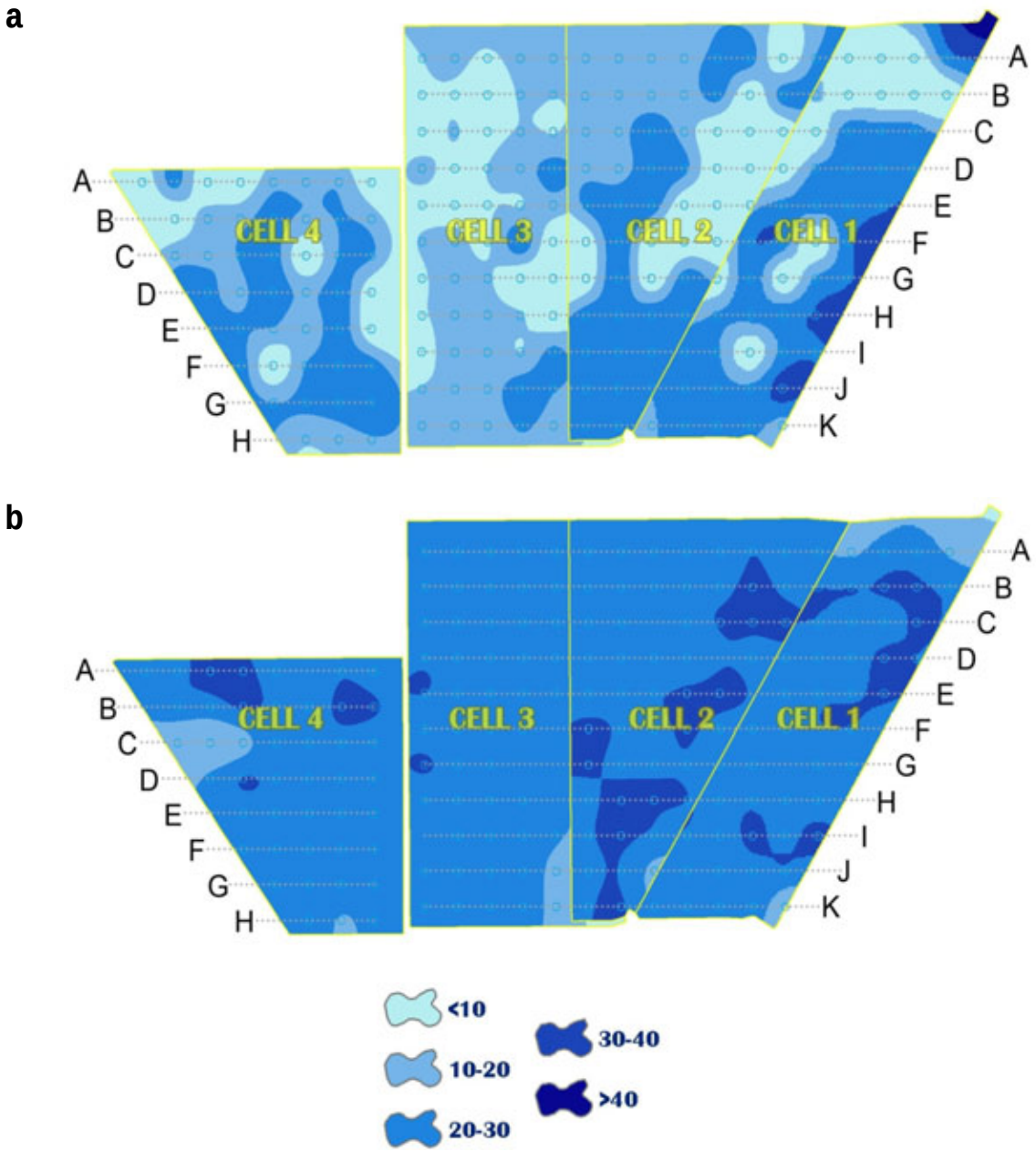


**Figure 6.** Spatial distribution of total nitrogen concentration in the (a) floc layer and (b) soil layer (0–10 cm) in STA-2, Cells 1–4.

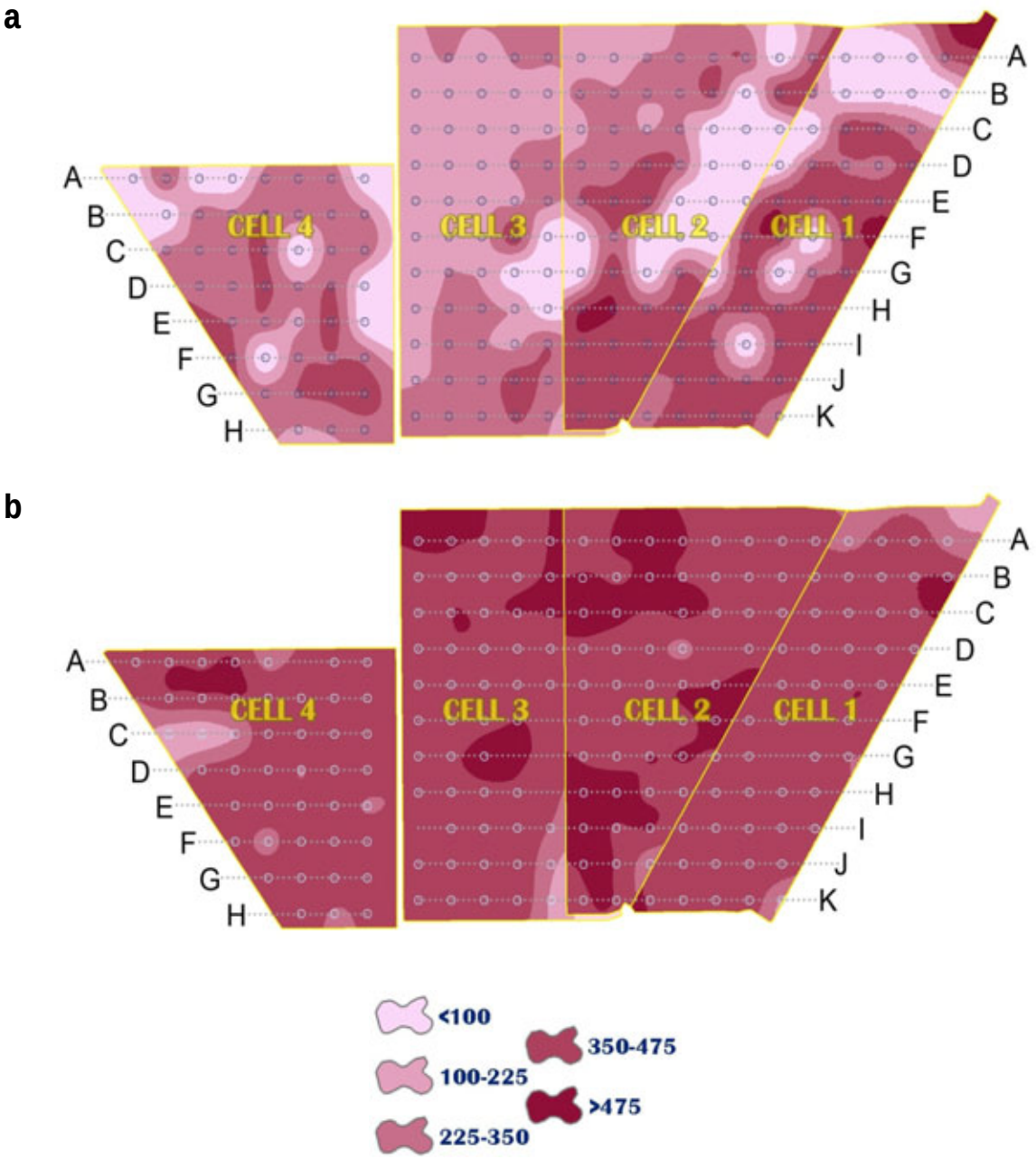


**Figure 7.** Spatial distribution of total carbon concentration in the (a) floc layer and (b) soil layer (0–10 cm) in STA-2, Cells 1–4.

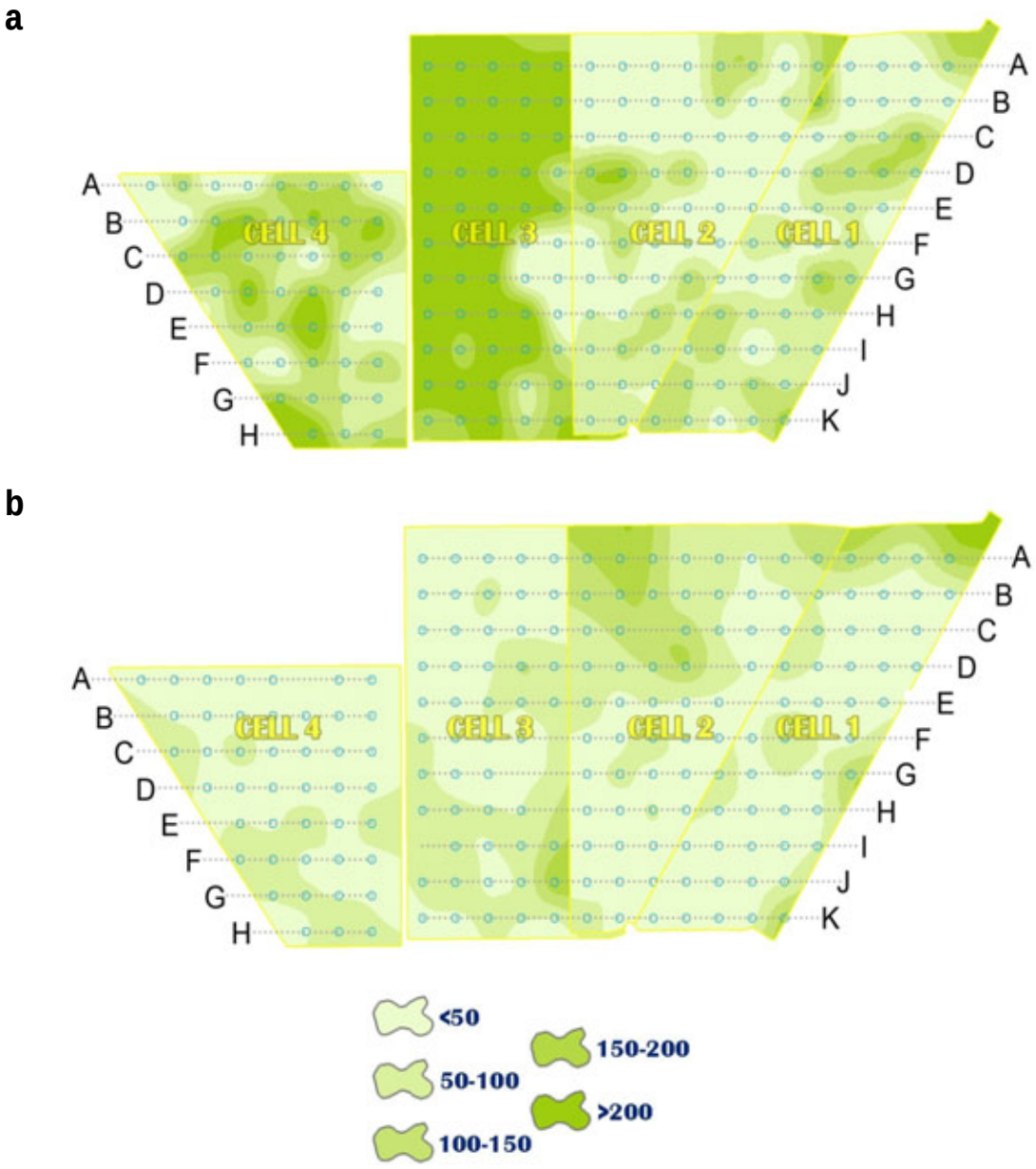


**Figure 8.** Spatial distribution of total calcium concentration in the (a) floc layer and (b) soil layer (0–10 cm) in STA-2, Cells 1–4.