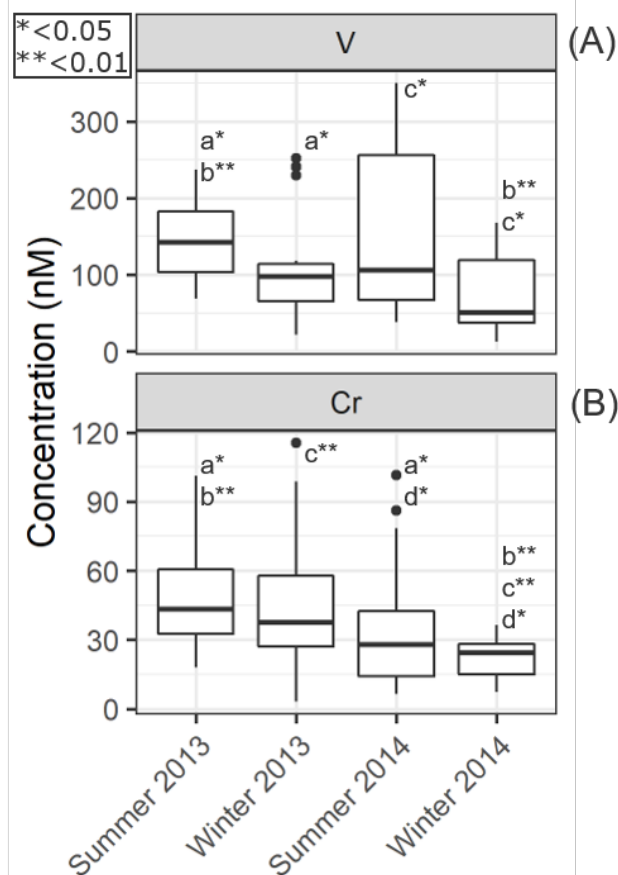


SI-1. (A) The study site is located on the western side of the Gloucester Point peninsula on the York River estuary (Virginia, USA). (B) Upgradient of the sampling site is a marsh, and granite breakwaters (part of a larger York River shoreline restoration project) line the shore. (C) Permanent sampling wells were installed at the points shown (specific depths found in Supplementary Information). Depth profiles were located at the spring high tide (HT), mid tide (MT), and just below low tide (LT) water levels. Several intermediate points between HT and MT were collected to delineate chemical distributions. Median salinities during the sampling period are shown in contour. The locations of the shallow (“a”) and deep (“b”) freshwater endmembers are noted.



SI-2. Boxplots showing concentrations of (A) V and (B) Cr at MT between 100 and 140 cm. Within this depth range, DOC, Fe, and Mn also reached maximum concentrations (O'Connor et al., 2018). The horizontal lines indicate the median concentration. The top and bottom edges of the boxes indicate the first and third quartiles. The whiskers extend to the farthest point 1.5 times the interquartile range of the box. The text notation indicates which seasons are significantly different from one another at the given p value. The p values were determined using paired t tests, with the alpha level corrected for multiple comparisons using the Bonferroni adjustment. Due to missing data, samples at 130 cm depth were excluded from the paired t test.