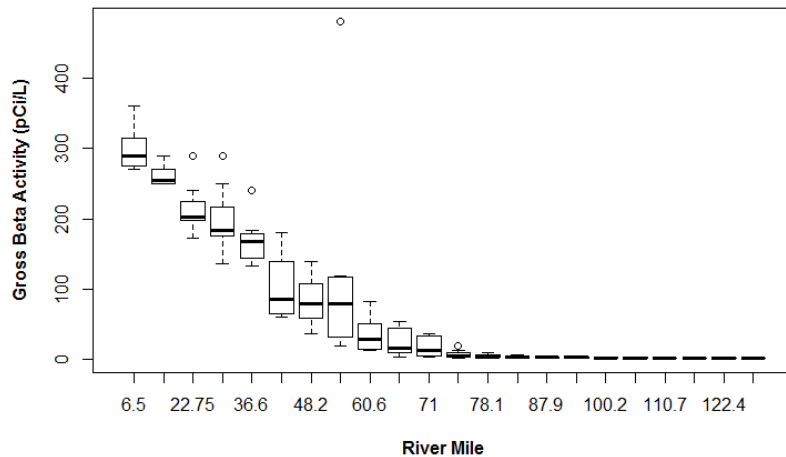


# Boat Run Radiochemistry: Tritium, Gross Alpha, and Gross Beta

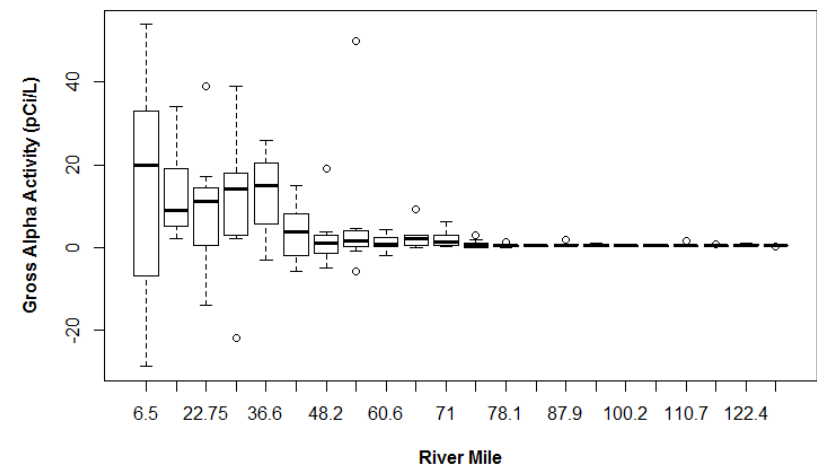
- \* Delaware Estuary Boat Run Water Quality Monitoring (Delaware DNREC contracted for this work);
  - \* Sampled 22 locations starting at River Mile 6.5 (South Brown Shoal) and ending at River Mile 131.04 (Biles Island Channel) from April-October 2016;
    - Once per month, gross alpha and gross beta samples were collected at all locations. Tritium samples were collected at 5 locations spanning from River Mile 44.0 to River Mile 66.0 due to reports of high tritium levels near the PSEG Hope Creek Generating Station;
    - NJDOH reports radiochemistry results as both the activity concentration  $\pm$  uncertainty and sample-specific minimum detectable concentration (MDC).

# Boat Run Radiochemistry: Tritium, Gross Alpha, and Gross Beta

Gross Beta Activity - Delaware River Mainstem

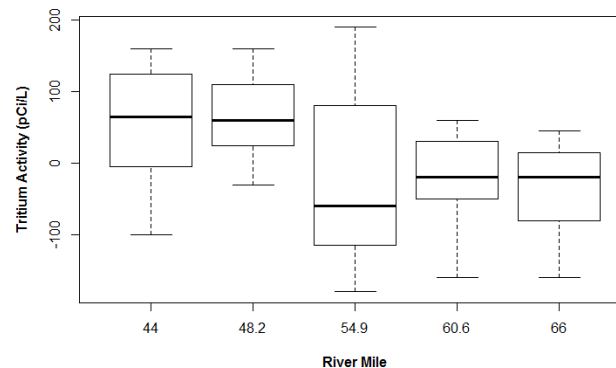


Gross Alpha Activity - Delaware River Mainstem



EPA Maximum Contaminant Level for Tritium is 20,000 pCi/L. Exceedances occurred (estimated 10 million pCi/L) at PSEG Nuclear's Salem/Hope Creek reactor complex in early 2015. NJDEP requested that DRBC sample between River Mile 66 and 44 in October 2015 and starting April 2016 .

Tritium Activity - Delaware River Mainstem



DRBC Stream Quality Objectives for Radioactivity in Zones 2-6:

- Alpha emitters not to exceed 3 pCi/L
- Beta emitters not to exceed 1,000 pCi/L

# Boat Run Radiochemistry: Tritium, Gross Alpha, and Gross Beta

- \* After noting exceedances of Gross Alpha activity, DRBC met with some of NJDEP's Radiochemistry experts (Karen Tuccilo and Jay Vouglitois) in January;
  - \* Although exceedances occurred, all occurred in the bay;
    - This may be due to the solubility of radium (a gross alpha particle), which increases as salinity increases;
    - Radium is bound to particle surfaces, thus may be present in similar concentrations in areas with lower salinity, but are just bound to the sediment (sediment samples from lower salinity areas may indicate these similar concentrations).

