

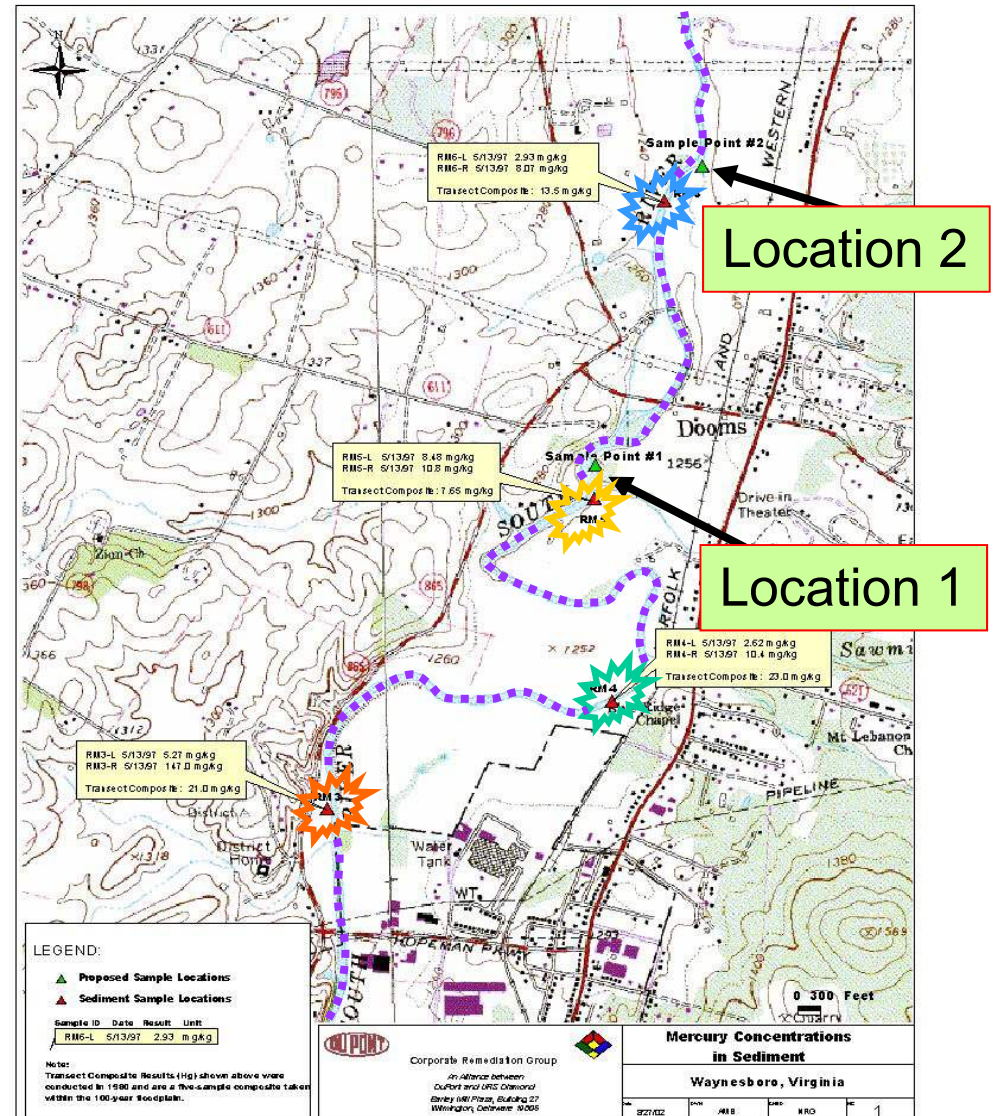
South River Sediment Coring Project Update

**E. E. Mack,
October 22, 2003**

Sediment Sampling Plan

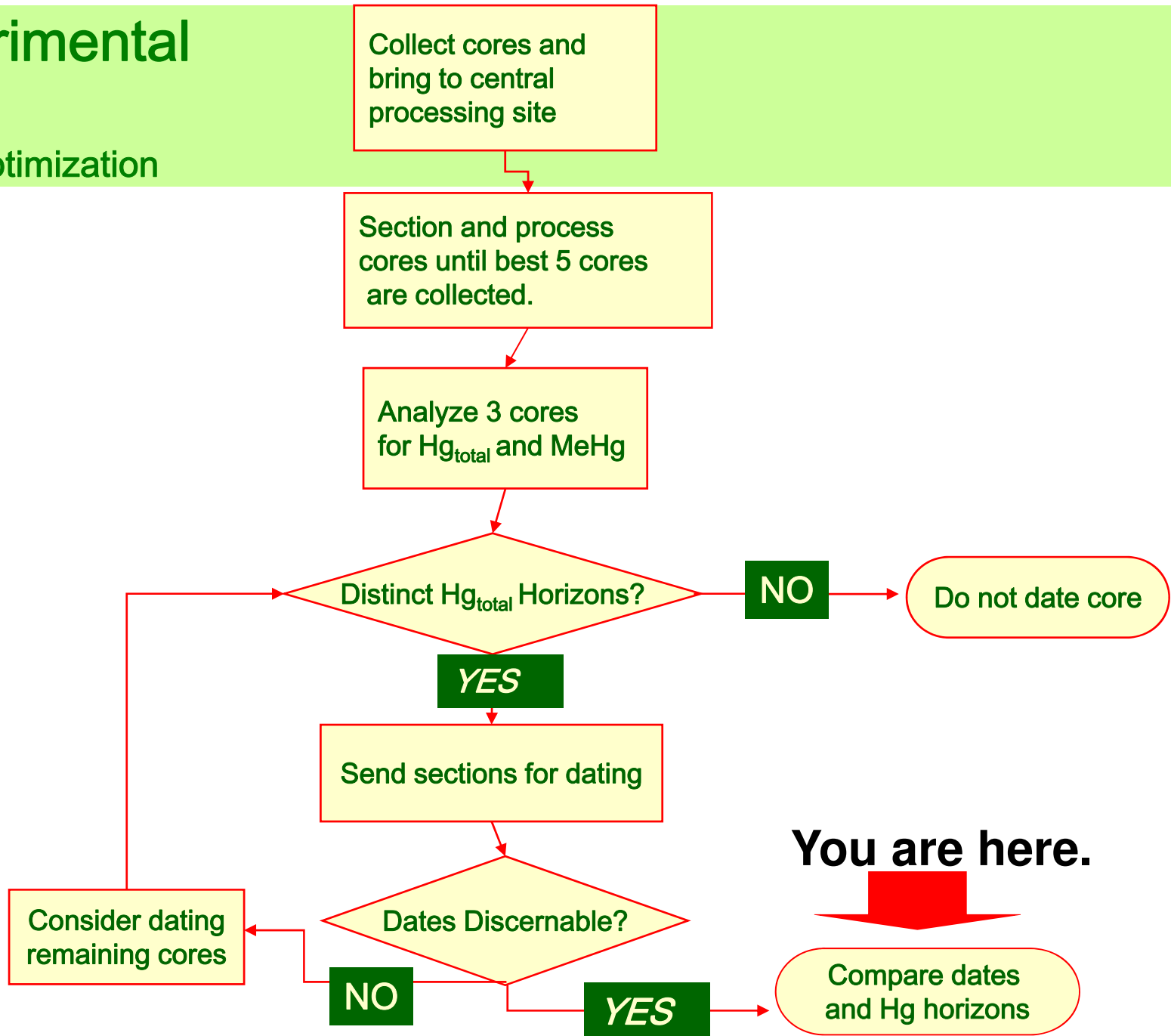
- rationale, goals & sites

- Rationale:
 - Stable sediments will provide a historic record of mercury inputs into the S. River.
- Specific Goals
 - Characterize sediment Hg_t and MeHg in selected depositional area of the riverbed.
 - Compare Hg profiles from main river channel and a tributary that cuts through the flood plain.
 - Compare collected data with historical grab sample data when possible.



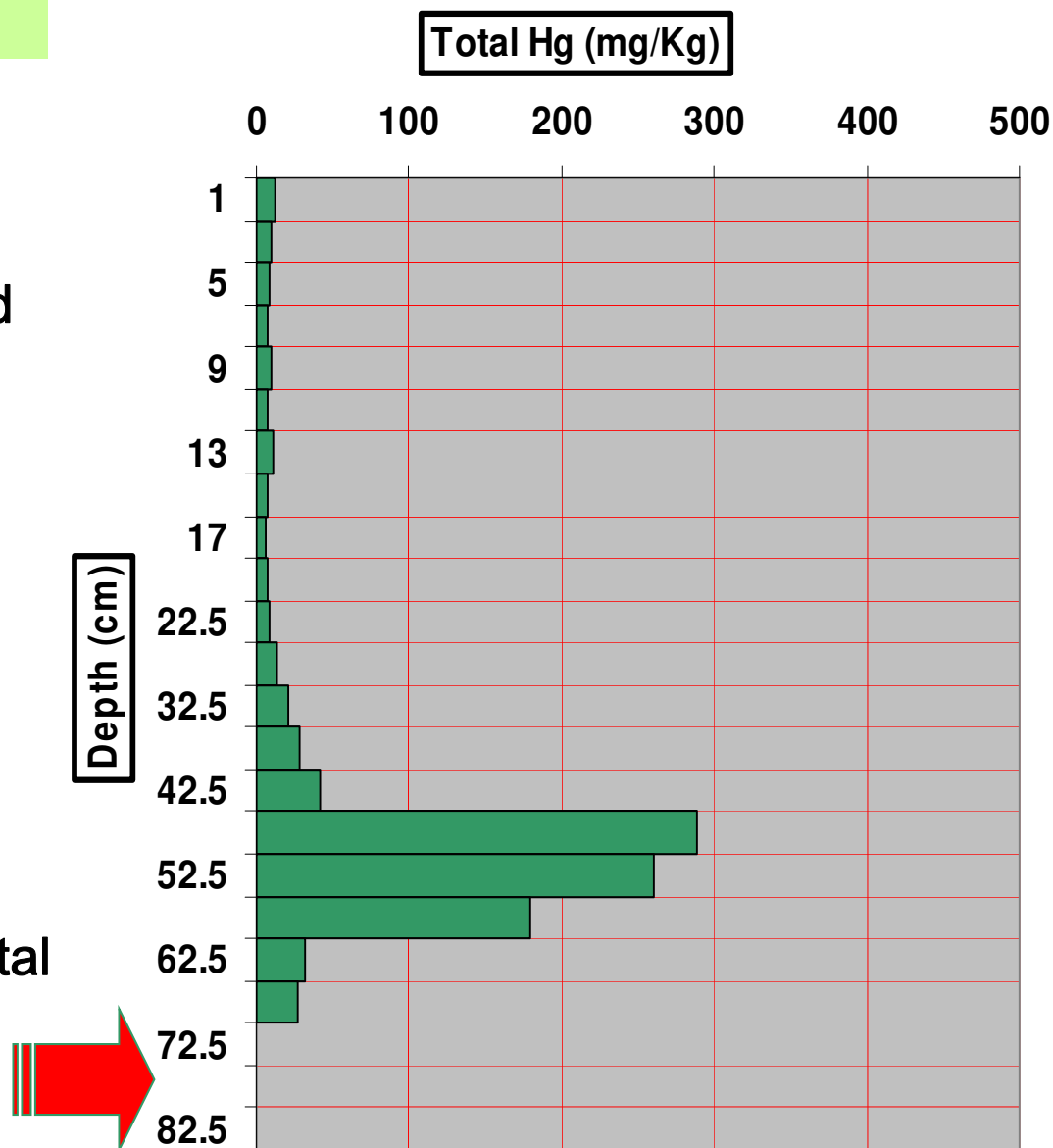
Experimental Logic

-Cost Optimization



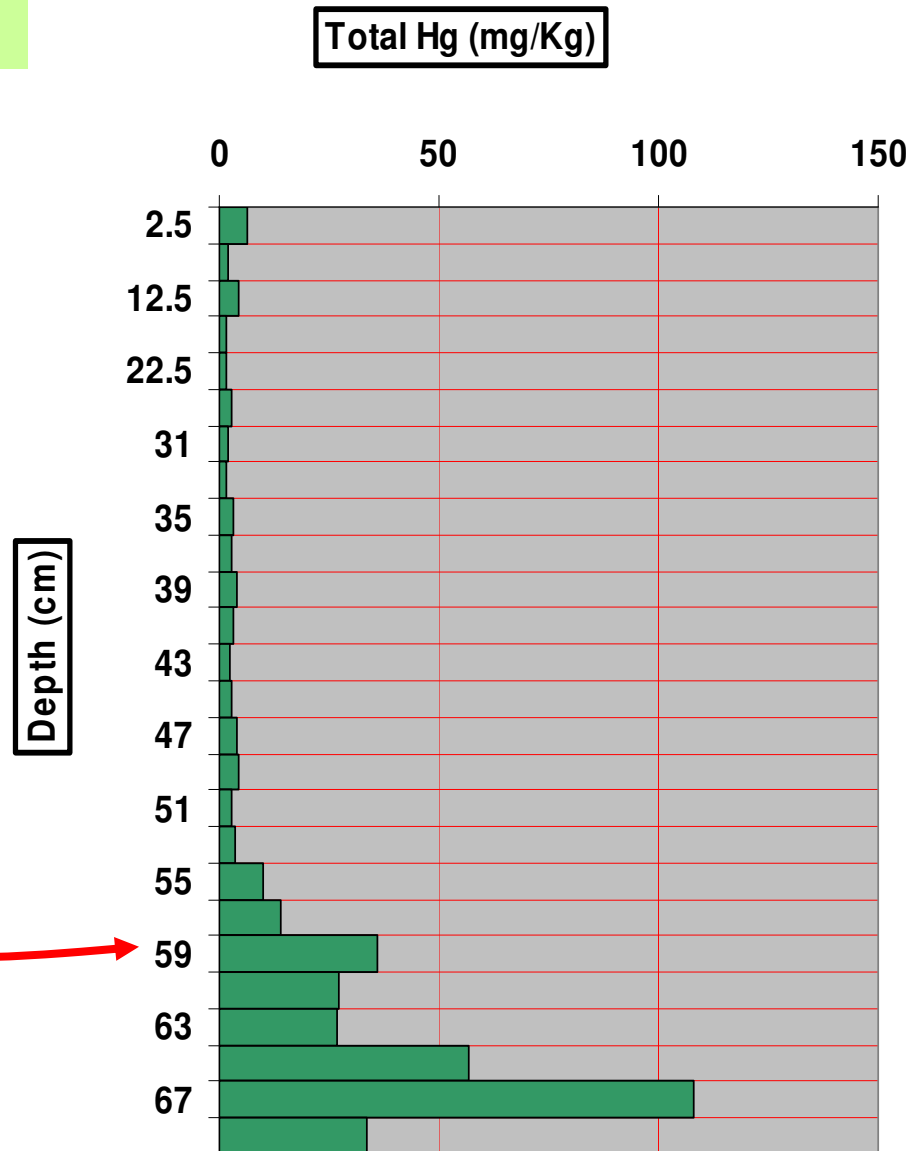
Site 1 (Dooms' Dam) – Core 4

- Distinct horizon of elevated total Hg at 32 to 65 cm.
- Below 65 cm Hg total decreases significantly.
- Between 70 and 85 cm Total Hg = 0.23 – 1.2 ppm

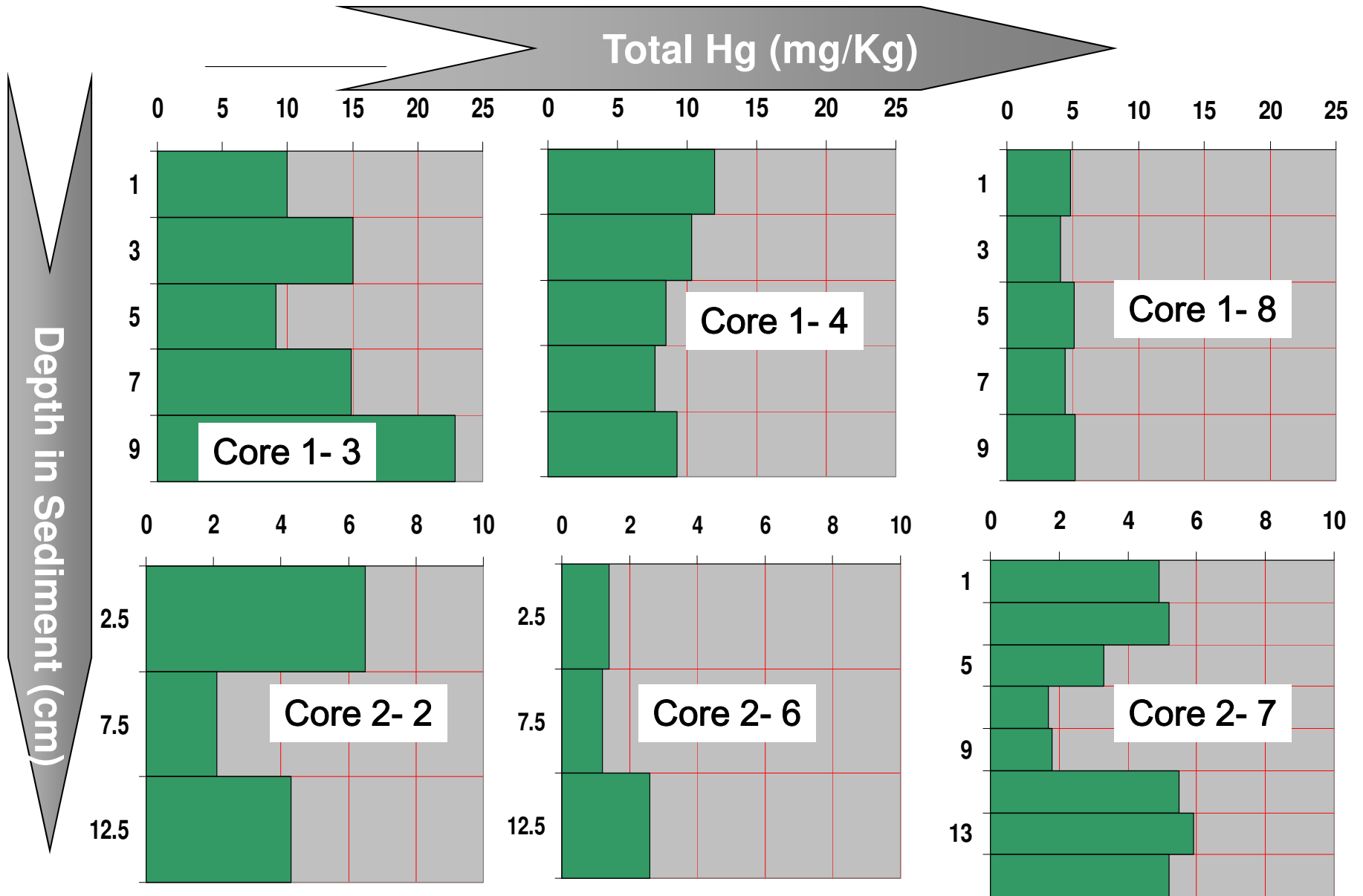


Site 2 (Tributary) – Core 2

- Uppermost site on tributary
- Surface soils are dry and covered with vegetation
- Core collected by driving with mallet
- Note significant decrease in Hg total above ~ 59 cm

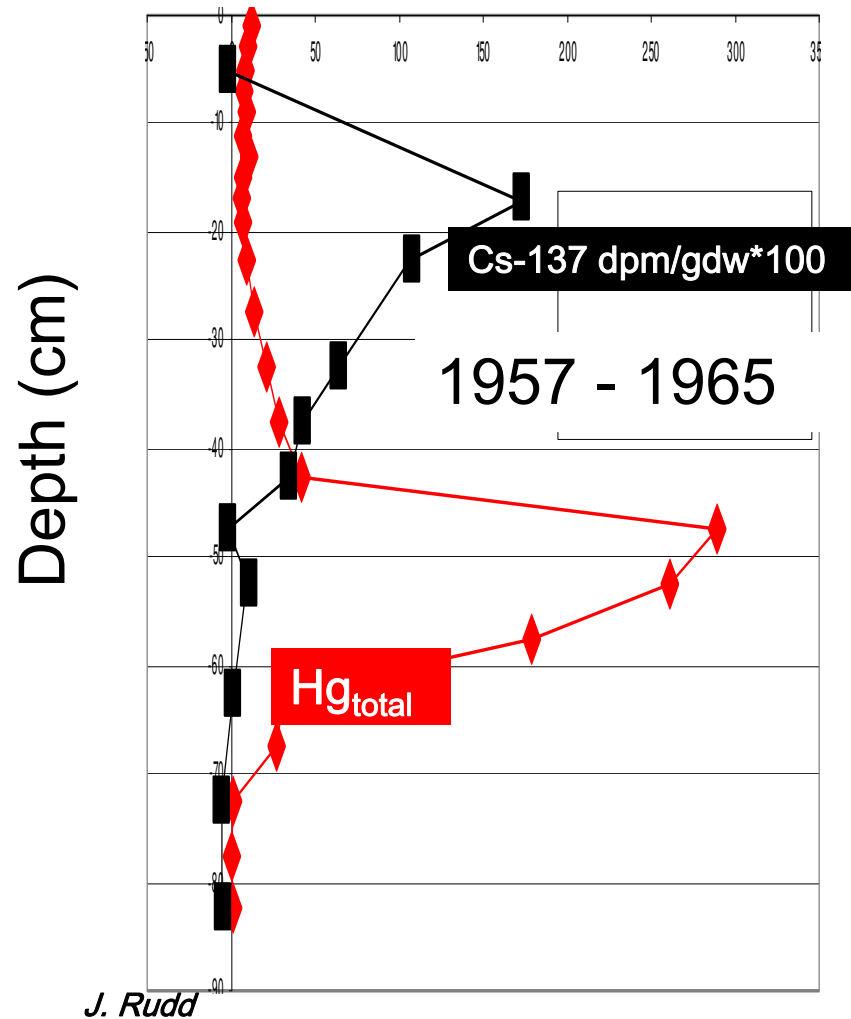


Hg Total in Surficial Sediments

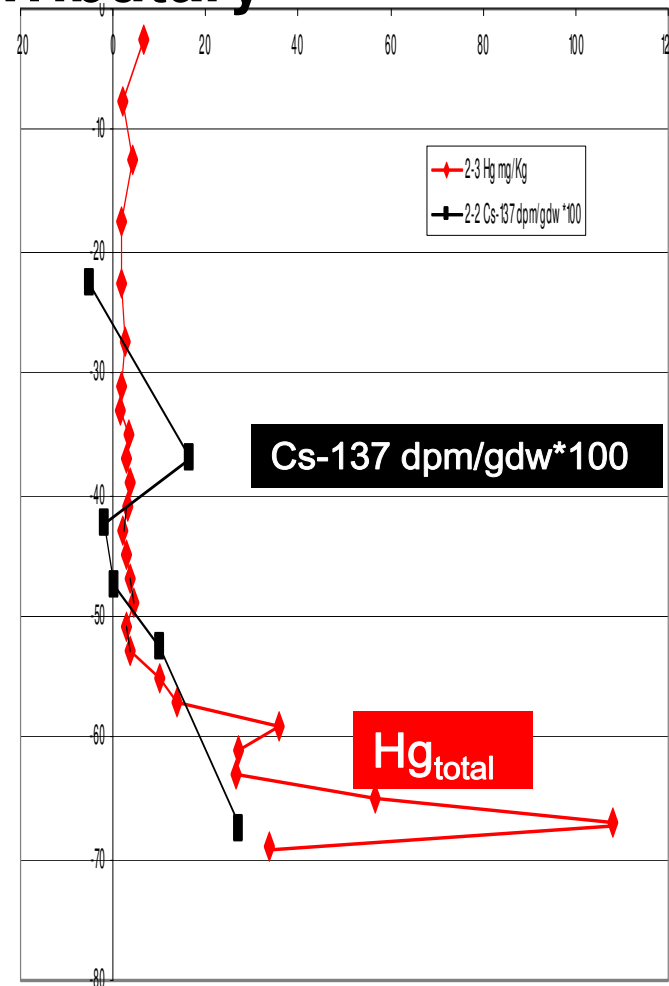


Cs and Hg_{total} Data: Core 1-4 and 2-3/2-2

Site 1 - Dooms Dam

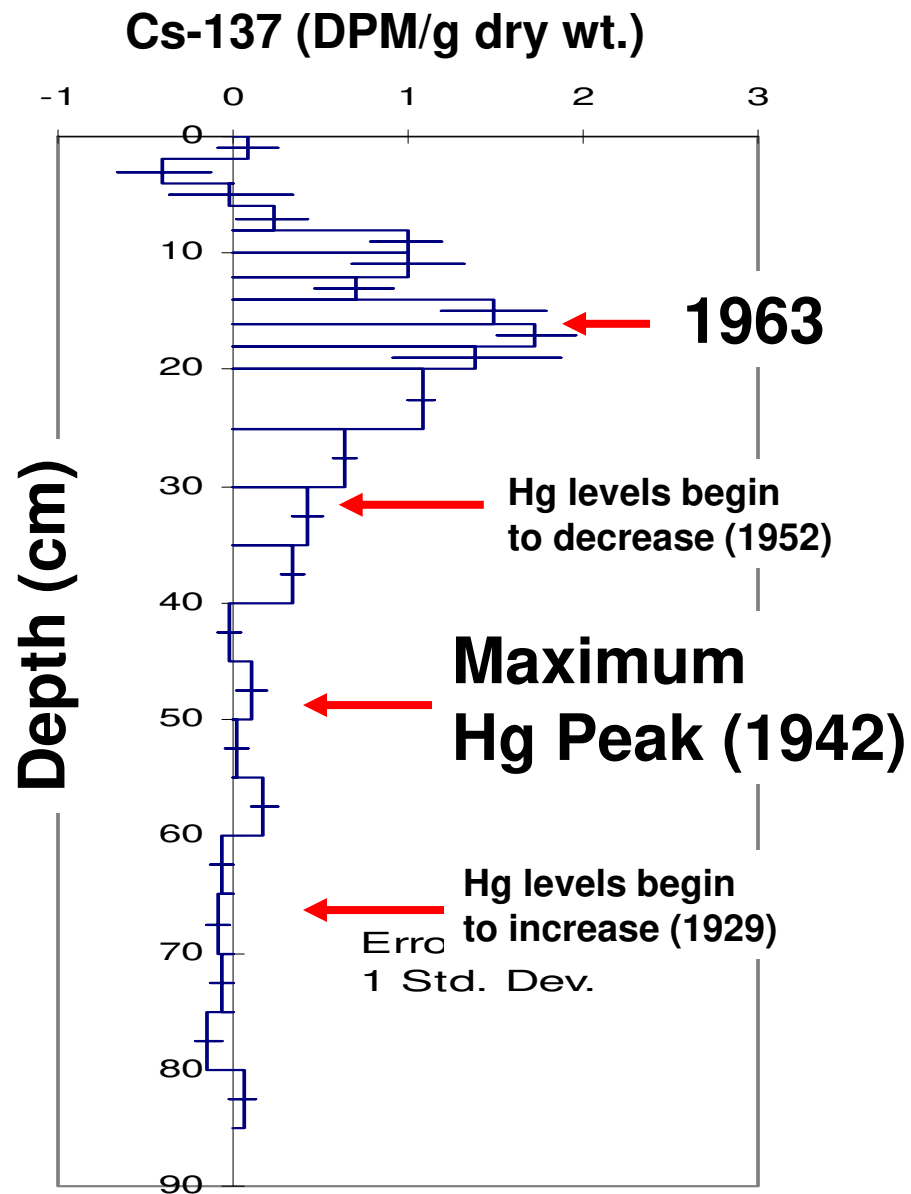
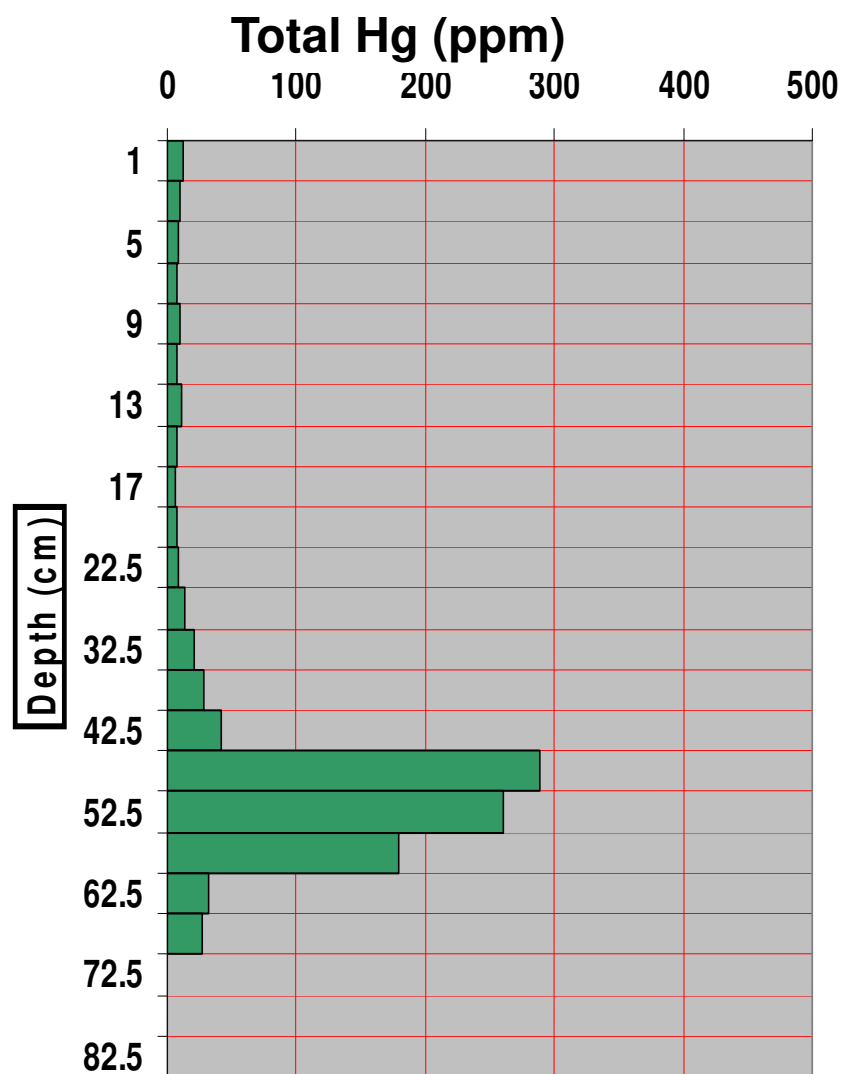


Site 2 - Flood Plain Tributary



Dooms' Dam (Site 1, core 4)

- Hg, Cs-137 and Pb Chronology



Observations

- Evidence of historic releases of Hg, followed by deposition of cleaner sediments.
- In the selected depositional environments sampled in the October 2002 coring project surficial sediment Hg levels were elevated above background.
 - Isotope data suggests that cores do not represent deposition between 1963 and 2002
 - Surficial sediments in all but one core were 5-10 ppm Hg
 - Water column data is consistent with 5-10 ppm Hg in surficial sediments
- Estimated sedimentation rates range from 0.4 to 1.5 cm/yr
- Combined isotope data is consistent with known history that Hg releases were pre-1960's.

Path Forward

- Storm sampling of plant site (*completed*), river, and tributaries (*planned*) to look for evidence of particle associated transport of Hg from floodplains.
- Examine extant data for Flood-plain and water column mercury levels.