Beaverlodge lake excercise 2
SCK•CEN assessment

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Global issues

- ERICA basic assumptions
  - Daughters included in calculation DDC if half-life<10d
    - For Pb-210→Bi-214
    - For Ra-226→Rn-222, Po-218, Pb-214, Bi-214 Po-214
  - RBE: 1-3-10
- No separation in dose rates between internal sediment/water or external sediment/water possible with ERICA and hence not given
- U-234 and Th-234 included
- U-235 series not considered
- Deterministic calculations since ERICA tool

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Organisms

- Created new organisms based on dimensions given
- OF

GEOMETRY, MASS, & OCCUPANCY FACTORS

	Geometry (cm)	Mass (g ww)	Occupancy	
	Length x height x width		% water / %sediment	
Pelagic (e.g. Northern pike & Lake Trout)	50 x 15 x 10	1200	75/25	on sediment
Benthic Fish - Large (White sucker & Lake whitefish)	45 x 15 x 10	1191	30/70	on sediment
Benthic Fish - Small (Lake chub)	6.8 x 1.5 x 1	4.5	80/20	on sediment
Benthic Invertebrates (Chironomus riparius)	0.34 x 0.17 x 0.15	0.12	50/50	25 in sediment, 25 on sedi
Benthic Invertebrates (*Pisidium sp.*)	2.5 x 1.5 x 1	1.6	50/50	on sediment
Benthic Invertebrates (Caddisfly, *Nemotaulius sp.*)	3.5x1.46x1.46	1.75	50/50	on sediment

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Media concentrations and Kds

- If there were missing data for water or sed concentrations
  - Generally, I took concentration of nearest mother or daughter
- If there was a need to calculate a Kd (e.g. to calculate water concentrations, to calculate CR)
  - I took the Kd for the same RN in that area (if there was just one value), or the average Kd for that area. (red)
  - If no Kd for that RN available from another site in that area, I took the average of all Kd for that RN for all areas (yellow)

CR –always required by ERICA even if you have biota concentrations!

- If biota concentrations were available, they were always input in ERICA
- Pelagic fish
  - CR for given RN for another location in that area or if more CR data for a given RN in that area, the average CR for that area. (red)
  - If no CR for that RN available from another location in that area, I took the average of all CR for that RN for all areas (yellow) (in some cases CR water could have been calculated from CRsed through the Kd but the differences with the earlier approach were not important).
- Benthic fish
  - CR for given RN for another site in that area or if more CR data for a given RN in that area, the average CR for that area. (red)
  - If only CRsed, I calculated CRwater from CRwater=CRsed*Kd; sometimes this seems not required as biota conc. were available, but these CRs were then used also for the CR values for small benthic fish (blue) and anyway ERICA requires inputs for all CRs
  - For Po and Th there were generally no CR water data: then these data were derived from the same data for pelagic fish. (green)

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CR-continued

- CR for small bentic fish
  - CR for given RN for another site in that area or if more CR data for a given RN in that area, the average CR for that area. (red)
  - If no data= same CR as large benthic fish (green)
- CR for pisidium
  - ERICA CR for bivalves
- CR for caddisfly and chironomous riparius
  - ERICA CR for insect larvae (which are data for crustaceans)
  - CR Pb-210: Hosseini, 2008, JER; value for insect larvae, derived from crustacean

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