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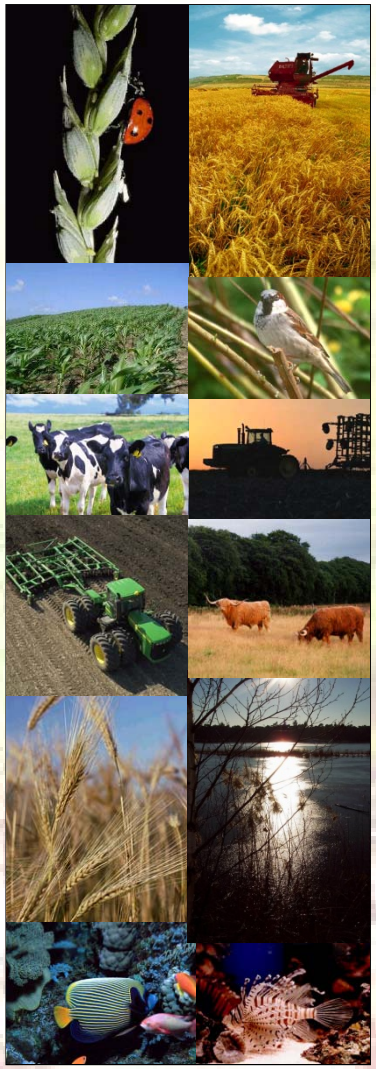
STUDIECENTRUM VOOR KERNENERGIE
CENTRE D'ÉTUDE DE L'ÉNERGIE NUCLÉAIRE



IAEA EMRAS II
Biota Modelling Group (WG 4)

Beaverlodge lake
Prediction of biota concentrations

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Biosphere Impact Studies, SCK•CEN

Vienna, January 26, 2010

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Assumptions

- Starting from mean water concentrations as input to **ERICA tool**
- One case with missing water concentrations
  - For calculation of the Ace Creek Watershed - Dubyna lake (shallow) I used the Kds of the Ace Creek Watershed - Dubyna lake (deep)
- I did not use 'blindly' CFs provided by ERICA tool
  - Small literature check (Hosseini et al., 2008; IAEA-1616; IAEA-422; IAEA-SS19; Poston and Klopfer, 1986; Baylock, 1982)
- Most data from Hosseini (largely cfr ERICA)

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CFs and their origin

	CR value used (fresh weight)		CR value used (fresh weight)	
	Lake White Fish	White Sucker	Chironomus sp.	Pisidium sp.
	Pelagic fish	Benthic fish	Insect larvae	Bivalve
Pb210	370	370	7500	1400
Po210	240	240	9900	38000
Ra226	80	80	1500	1500
Th230	110	110	100	510
U-238	30	30	500	32
	SD value used		SD value used	
	Lake White Fish	White Sucker	Chironomus sp.	Pisidium sp.
Pb210	3	3	21000	7400
Po210	200	200	1400	49000
Ra226	120	120	1300	1600
Th230	110	110		290
U-238	60	60	700	30

Most CR data from Hosseini et al., JER, 2008, 99, 1408-1429, Annex B2 on freshwater CFs

Except

370	IAEA 2009 TECDOC 1616
240	same as pelagic fish
7500	Hosseini Marine
	IAEA safety series 19 for crustaceans
	same as crustacean
	Hosseini values are same as ERICA except those with red rectangles

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SD – min/max

mean	**meanCR*meanWC**	**WC= water concentration**
SD	**(meanCR*meanWC)*(SD'CR/meanCR+SD'WC/meanWC)**	
min	**minWC*meanCR**	
max	**maxWC*meanCR**	

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Part of output

Area	Site	Date		Predicted White sucker wholebody activity concentration (Bq/kg FW)				
				Pb210	**Po210**	**Ra226**	**Th230**	**U-238**
Fulton creek watershed	Fulton Lake	2004	mean	7.40E+00	1.80E+00	5.20E-01	7.15E+00	4.58E-01
			std		2.35E+00	9.50E-01	1.57E+01	9.93E-01
			min	7.40E+00	1.20E+00	4.00E-01	1.10E+00	4.03E-01
			max	7.40E+00	2.40E+00	6.40E-01	1.32E+01	5.13E-01
Fulton creek watershed	Greer Lake	2004	mean	4.63E+01	1.20E+01	1.72E+02	3.85E+00	1.81E+02
			std	2.99E+00	1.34E+01	2.64E+02	4.63E+00	3.65E+02
			min	4.44E+01	9.60E+00	1.68E+02	3.30E+00	1.79E+02
			max	4.81E+01	1.44E+01	1.76E+02	4.40E+00	1.83E+02
Ace creek watershed	Verna Lake	2001	mean	7.77E+01		8.00E+00		1.66E+02
			std					
			min	7.77E+01		8.00E+00		1.66E+02
			max	7.77E+01		8.00E+00		1.66E+02
Athabasca Lake	Elliott Bay	2006	mean			5.60E-01		7.33E-02
			std					
			min			5.60E-01		7.33E-02
			max			5.60E-01		7.33E-02