

## **SKB TR-10-07**

### **Element-specific and constant parameters used for dose calculations in SR-Site**

In the earlier distributed report, there are errors that have now been corrected. The corrected pages 69, 70, 108, 109, 112 and 120 are enclosed. The changed text is marked with a vertical line in the page margin. An updated pdf version of the report, dated 2011-10, can be found at [www.skb.se/publications](http://www.skb.se/publications).

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Table 7-2. Type of information used in the selection of BE values of CRs for different types of natural terrestrial biota. "L" indicates that only literature data were used, "S" that only site data were used, "S+L" that both site and literature data were used, "S(pp)" that site data for primary producers were used and "M" that the values were derived with the kinetic-allometric model described in Section 2.4.

Element	Primary producers	Mushrooms	Herbivores
Am	L	L	M
Cl	S	S (pp)	S
Cs	S+L	S+L	S
I	S	S	M
Nb	S	S (pp)	S
Ni	S+L	S	S
Np	L	L	M
Pd	L	L	M
Pu	L	L	M
Ra	S+L	L	M
Se	L	L	M
Sn	S	S (pp)	S
Tc	L	L	M
Th	L	S	S
U	S+L	S	S
Zr	S	S(pp)	S

Table 7-3. Type of information used in the selection of BE values of CRs for different types freshwater biota. "L" indicates that only literature data were used, "S" that only site data were used, "S+L" that both site and literature data were used and "S(macroph)" that site data for macrophytes were used.

Element	Phytoplankton	Microphytobenthos	Macrophytes	Crustacean	Fish
Am	L	L	L	L	L
Cl	S(macroph)	S(macroph)	S+L	S+L	S+L
Cs	S(macroph)	S(macroph)	S+L	S+L	S+L
I	S(macroph)	S(macroph)	S+L	S+L	S+L
Nb	S(macroph)	S(macroph)	S	S+L	S+L
Ni	S(macroph)	S(macroph)	S+L	S+L	L
Np	L	L	L	L	L
Pd	L	L	L	L	L
Pu	L	L	L	L	L
Ra	S(macroph)	S(macroph)	S+L	S+L	S+L
Se	S(macroph)	S(macroph)	S+L	S+L	S+L
Sn	L	L	L	S+L	L
Tc	L	L	L	L	L
Th	S(macroph)	S(macroph)	S+L	S+L	L
U	S(macroph)	S(macroph)	S+L	S+L	S+L
Zr	S(macroph)	S(macroph)	S	S+L	S+L

Table 7-4. Type of information used in the selection of BE values of CRs for different types marine biota. "L" indicates that only literature data were used, "S" that only site data were used, "S+L" that both site and literature data were used and "S(macroph)" that site data for macrophytes were used.

Element	Phytoplankton	Microphytobenthos	Macrophytes	Fish
Am	L	L	L	L
Cl	S	S	S+L	S+L
Cs	S+L	S	S+L	S+L
I	S	S	S+L	S
Nb	S(macroph)	S(macroph)	S+L	S+L
Ni	S	S	S+L	S+L
Np	L	L	L	L
Pd	L	L	L	L
Pu	L	L	L	L
Ra	L	L	L	L
Se	S+L	S	S+L	S+L
Sn	S(macroph)	S(macroph)	S+L	S+L
Tc	L	L	L	L
Th	S+L	S	S+L	S+L
U	S(macroph)	S(macroph)	S+L	S+L
Zr	S+L	S	S+L	S+L

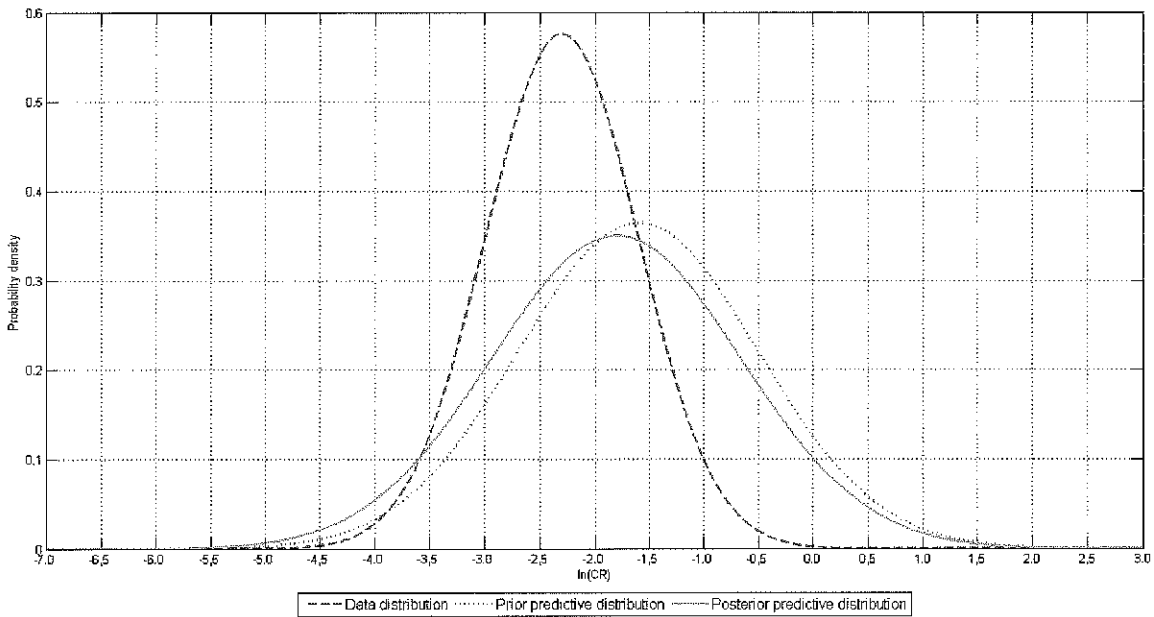
and the value of 0.48 given in Table C-1 is directly used in Equations C-15 and C-16. Applying Equation C-17 for generating several  $\sigma^2$  values would result in several estimates of  $\mu_n$  and  $\tau_n^2$ . The parameter values in Table C-2 are then used in the final step of the direct updating procedure to obtain predictive posterior distributions of the CR. The results are presented in Table C-3 and illustrated in Figure C-2 and Figure C-3.

**Table C-2. Parameter values of the posterior distributions obtained for two cases where different priors are used, derived from data for the same sub-population and population, respectively.**

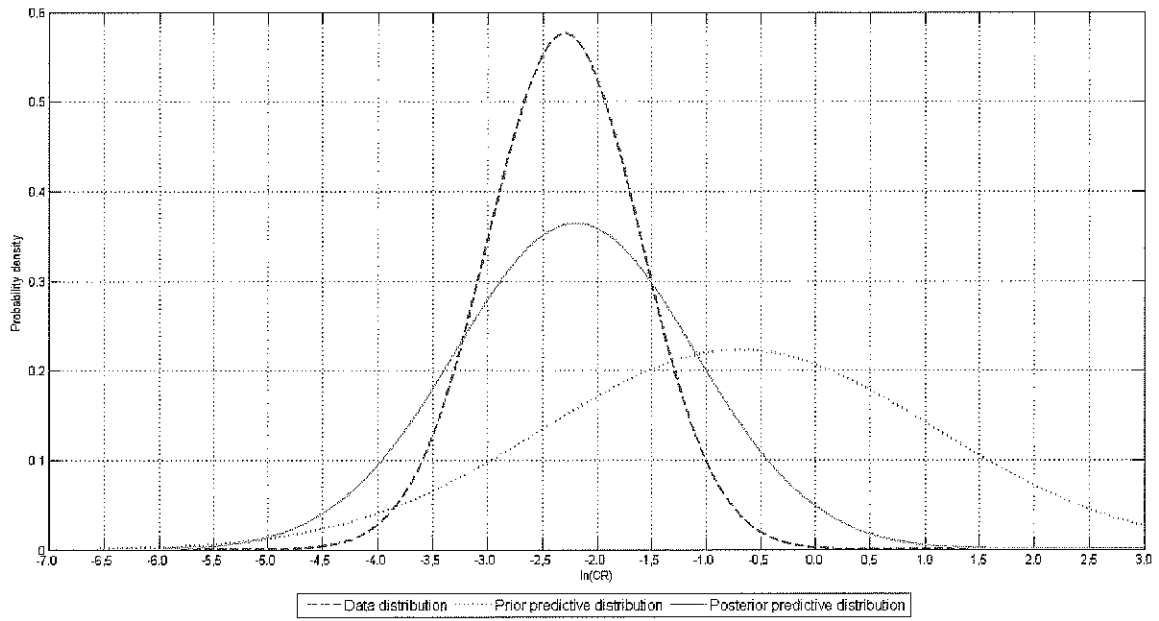
Prior based on	$n_n$	$\mu_n$	$\sigma_n^2$
Data for species from the same sub-population	15	-1.8	1.0
Data for species from the same population	5	-2.3	0.093

**Table C-3. Parameter values of the predictive posterior distributions obtained for two cases where different priors are used, derived from data for the same sub-population and population, respectively.**

Prior based on	$n_n$	GM	GSD	$\mu$	$\sigma^2$
Prior data for species from the same sub-population	15	0.16	3.1	-1.8	1.3
Prior data for species from the same population	5	0.11	3.0	-2.2	1.2



**Figure C-2. Predictive posterior distribution of the CR (shown on logarithmic scale) for the reference species obtained by direct Bayesian updating using prior data from the same sub-population.**



**Figure C-3.** Predictive posterior distribution of the CR (shown on logarithmic scale) for the reference species obtained by direct Bayesian updating using prior data from the same population.

Table D-2.  $K_d$  values for organic soil ("Ter\_regoUp", "Ter\_regoMid", "Lake\_regoUp", "Lake\_regoMid", "Sea\_regoUp" and "Sea\_regoMid"),  $m^3/kg$  dw resulting from the Bayesian updating.

Element	Site-specific data			Prior (Literature data)			Results						
	N	GM		N	GM		POSTERIOR_Subp		POSTERIOR_Pop		Selected values		
		GSD	GM		GSD	GM	GSD	GM	GSD	GM	BE	GM	GSD
Ag	11	6.2E+01	3.0	9	3.8E-01	7	6.1E+00	24.3	5.2E+01	3.5	6.2E+01	5.2E+01	3.5
Am	-	-	-	-	-	-	-	-	-	-	-	-	-
Ca	26	3.1E-02	5.9	34	8.0E-03	3	1.5E-02	5.0	2.8E-02	6.6	3.1E-02	1.5E-02	5.0
Cd	29	4.3E+00	21.1	13	6.5E-01	6	2.4E+00	18.6	3.7E+00	24.5	4.3E+00	2.4E+00	19
Cl	20	1.3E-02	3.2	22	3.0E-04	3	1.8E-03	9.9	1.1E-02	3.5	1.3E-02	1.1E-02	3.5
Cm	-	-	-	-	-	-	-	-	-	-	-	-	-
Cs	23	2.7E+01	2.1	108	2.7E-01	7	6.0E-01	12.5	2.6E+01	2.2	2.6E+01	2.6E+01	2.2
Eu	24	8.6E+00	5.4	10	1.0E+00	4.6	-	-	7.7E+00	6.1	8.6E+00	8.6E+00	5.4
Ho	23	1.2E+01	3.3	4	9.3E-01	3	8.2E+00	4.7	1.0E+01	3.6	1.2E+01	8.2E+00	4.7
I	20	7.1E-01	3.8	11	3.2E-02	3	2.4E-01	7.6	5.6E-01	4.3	7.1E-01	2.4E-01	7.6
Mo	27	1.1E+00	5.2	9	4.0E-02	3	4.8E-01	8.8	8.3E-01	5.8	1.1E+00	4.8E-01	8.8
Nb	20	4.6E+01	3.5	11	1.5E+00	4	1.4E+01	8.9	4.0E+01	3.8	4.0E+01	4.0E+01	3.8
Ni	27	3.0E+00	5.0	20	9.8E-01	2	1.9E+00	4.3	2.5E+00	5.5	3.0E+00	1.9E+00	4.3
Np	-	-	-	-	-	-	-	-	-	-	-	-	-
Pa	-	-	-	-	-	-	-	-	-	-	-	-	-
Pb	28	4.3E+01	4.1	5	2.5E+00	3	2.8E+01	5.8	3.6E+01	4.4	4.3E+01	2.8E+01	5.8
Pd	-	-	-	-	-	-	-	-	-	-	-	-	-
Po	-	-	-	-	-	-	-	-	-	-	-	-	-
Pu	-	-	-	-	-	-	-	-	-	-	-	-	-
Ra	-	-	-	-	-	-	-	-	-	-	-	-	-
Se	27	5.3E-01	9.2	172	2.0E-01	3	2.3E-01	3.8	4.6E-01	10.4	5.3E-01	2.3E-01	3.8
Sm	28	1.1E+01	4.1	4	9.3E-01	3	7.8E+00	5.3	9.3E+00	4.4	1.1E+01	7.8E+00	5.3
Sn	16	8.5E+00	3.2	12	1.6E+00	6	4.1E+00	5.8	8.0E+00	3.6	8.0E+00	8.0E+00	3.6
Sr	25	1.2E-01	2.5	176	7.0E-02	6	7.5E-02	5.7	1.2E-01	2.7	1.2E-01	1.2E-01	2.7
Tc	-	-	-	-	-	-	-	-	-	-	-	-	-
Th	25	4.2E+01	3.4	5	7.3E-01	44	2.1E+01	12.8	4.2E+01	3.7	4.2E+01	4.2E+01	3.7
U	25	6.5E+00	3.2	9	1.2E+00	6	4.2E+00	5.0	6.3E+00	3.4	6.5E+00	6.3E+00	3.4
Zr	26	6.1E+00	13.8	11	4.1E-01	21	2.7E+00	22.2	5.6E+00	16.4	5.6E+00	5.6E+00	16.4

Table D-10. CR values for marine phytoplankton ("Sea\_cr\_pp\_plank") m<sup>3</sup>/kgC, resulting from the Bayesian updating.

Element	Site-specific data			Prior (Literature)			Results						
	N	GM	GSD	N	GM	GSD	POSTERIOR_Subp		POSTERIOR_Pop		Selected values		
							GM	GSD	GM	GSD	BE	GM	GSD
Ag	-	-	-	-	-	-	-	-	-	-	-	-	-
Am	-	-	-	-	-	-	-	-	-	-	-	-	-
Ca	3	2.5E-01	1.1	-	-	-	-	-	-	-	-	-	-
Cd	3	6.6E+01	1.3	56	1.5E+01	2.5	1.6E+01	2.7	5.8E+01	2.7	1.6E+01	1.6E+01	2.7
Cl	2	1.3E-01	1.0	-	-	-	-	-	-	-	-	-	-
Cm	-	-	-	-	-	-	-	-	-	-	-	-	-
Cs	3	7.3E+01	1.3	21	1.1E+00	4.9	1.8E+00	8.9	6.4E+01	3.5	1.8E+00	7.3E+01	1.3
Eu	-	-	-	-	-	-	-	-	-	-	-	-	-
Ho	-	-	-	-	-	-	-	-	-	-	-	-	-
I	2	6.2E+00	1.6	-	-	-	-	-	-	-	-	-	-
Mo	3	-	-	-	-	-	-	-	-	-	-	-	-
Nb	-	-	-	-	-	-	-	-	-	-	-	-	-
Ni	3	3.5E+01	1.3	-	-	-	-	-	-	-	-	-	-
Np	-	-	-	-	-	-	-	-	-	-	-	-	-
Pa	-	-	-	-	-	-	-	-	-	-	-	-	-
Pb	3	1.7E+02	7.3	35	6.7E+03	3.4	5.0E+03	5.3	-	-	5.0E+03	5.0E+03	5.3
Pd	-	-	-	-	-	-	-	-	-	-	-	-	-
Po	-	-	-	-	-	-	-	-	-	-	-	-	-
Pu	-	-	-	-	-	-	-	-	-	-	-	-	-
Ra	-	-	-	-	-	-	-	-	-	-	-	-	-
Se	3	4.1E+01	1.6	94	2.8E+01	5.1	2.8E+01	5.1	4.0E+01	4.2	2.8E+01	2.8E+01	5.1
Sm	-	-	-	-	-	-	-	-	-	-	-	-	-
Sn	-	-	-	-	-	-	-	-	-	-	-	-	-
Sr	-	-	-	-	-	-	-	-	-	-	-	-	-
Tc	-	-	-	-	-	-	-	-	-	-	-	-	-
Th	3	2.7E+03	1.2	25	1.5E+04	2.4	1.2E+04	2.8	2.9E+03	1.9	1.2E+04	1.2E+04	2.8
U	-	-	-	-	-	-	-	-	-	-	-	-	-
Zr	3	1.4E+03	1.1	4	7.5E+02	2.0	9.9E+02	2.2	1.4E+03	1.4	9.9E+02	9.9E+02	2.2