CRESP
Consortium for Risk Evaluation with Stakeholder Participation

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CRESP Amchitka Radionuclide Data Set

Note on: WET TO DRY WEIGHT CONVERSIONS FOR BIOTA FROM AMCHITKA AND KISKA

At present there is no widely accepted agreement on whether radionuclides, or other contaminants, should be analyzed or reported in dry versus wet weights. Each has advantages. Using dry weights ensures consistency across studies and species, while wet weights are more useful for health risk considerations since animals, including people, eat organisms in their natural state. Further, since all biota collected as part of the Amchitka Science Plan were frozen immediately and were maintained frozen until processed and analyzed, no moisture loss was expected.

CRESP chose to present all data in wet weight because one of our primary objectives was to be able to evaluate the safety of subsistence foods and commercial fisheries. The following two tables provide information to allow the reader to convert the CRESP concentrations reported on a wet weight basis to a dry weight basis. Additional information on wet/dry weight conversions can be found in the Idaho Engineering Laboratory QA/QC report. The two main reports (Powers et al. 2005, 2006), and the biomonitoring report (Burger et al. 2006) are available on the CRESP website.

We computed the percent moisture for a wide range of organisms collected at Amchitka and Kiska in 2004. The data in the CRESP reports is wet weight (Powers et al. 2005, 2006, Burger et al. 2006). To convert from (Bq/kg, wet weight) to (Bq/kg, dry weight), multiply by the number in the conversion column in Table 1 below. For general values from the literature, as well as references, see Table 2.

In general, the conversion factor for birds is 3.5, fish is around 5, and kelp ranges from 5 to 8.

Table 1. Moisture content and conversion for selected species collected at Amchitka and Kiska. To convert (Bq/kg, wet weight) to (Bq/kg, dry weight), multiply by the value in the Conversion Factor column.

SPECIES	DRY WEIGHT AS PERCENT OF TOTAL	CONVERSION FACTOR [from (Bq/kg, wet weight) to (Bq/kg, dry weight)]
ALGAE		
Fucus	19.9	5.0
Alaria nana	12.5	8.0
Alaria fistulosa	13.8	7.2
INVERTEBRATES		
Sea Urchin	20.2	5.0
Blue Mussel		
Rock Jingle	17.2	5.8
BIRDS		
Pigeon Guillemot	27.0	3.7
Glaucous-winged Gull	28.9	3.5
Tufted Puffin	27.4	3.6
Eider eggs	31.8	3.1
FISH		
Atka Mackerel	22.6	4.4
Rock Greenling	18.3	5.5
Irish Lord	20.4	4.9
Ocean Perch	21.6	4.6
Walleye Pollock	17.7	5.6
Black Rockfish	19.9	5.0
Pacific Cod	18.3	5.5
Halibut	23.4	4.3

Table 2. Moisture content and conversion factors for selected species for Marine Specimens from the literature. To convert (Bq/kg, wet weight) to (Bq/kg, dry weight), multiply by the value in the Conversion Factor column.

	% Dry Weight	Conversion Factor	Reference
Algae			
Fucus	19	5.3	Ryan TP, McMahon CA, Dowdal A, Fegan M, Sequeira S, Murray M, MCKittrick L, Hayden E, Wong J, Colgan PA. 2003. Radioactivity monitoring of the Irish marine environment 2000 and 2001. The Radiological Protection Institute of Ireland. RPII-03/3.
	18	5.6	McMahon CA, Long S, Ryan TP, Fegan M, Sequeira S, Dowdall A, McKittrick L, Wong J, Hayden E, Murray M, Colgan PA, Pollard D. 2005. Radioactivity Monitoring of the Irish Marine Environment 2002. Radiological
Alaria nana	12.5	8	Kosson D. Personal Communication. 2005.
Alaria fistulosa	18.1	5.5	Isaakson JS, Seymour AH. 1968. Amchitka Bioenvironmental Program: Annual Progress Report, July 1, 1967-June 30, 1968. Radiometric and elemental analyses on marine organisms from Amchitka, Alaska. Columbus, Ohio:Battelle Memorial Institute.
Laminaria	19.8	5.1	Isaakson JS, Seymour AH. 1968. Amchitka Bioenvironmental Program: Annual Progress Report, July 1, 1967-June 30, 1968. Radiometric and elemental analyses on marine organisms from Amchitka, Alaska. Columbus, Ohio: Battelle Memorial Institute.
Molluscs			
Bivalves	18.2	5.5	Dahlgaard H, Eriksson M, Elus E, Ryan T, McMahon CA, Nielsen SP. Plutonium in the marine environment at Thule, NW-Greenland after a nuclear weapons accident. 2001. In:Plutonium in the Environment, A Kudo (Editor), Elsevier Science Ltd. Amsterdam. P 15-29.
Crustacean	18	5.6	Dahlgaard H, Eriksson M, Elus E, Ryan T, McMahon CA, Nielsen SP. Plutonium in the marine environment at Thule, NW-Greenland after a nuclear weapons accident. 2001. In: Plutonium in the Environment. A Kodo (Editor). Elsevier Science.

Note: fish data are generally presented in wet-weight units, so they are not included in this table. Ratios will vary to some extent by sample location, species, season, and water temperature.