

Supplemental Material

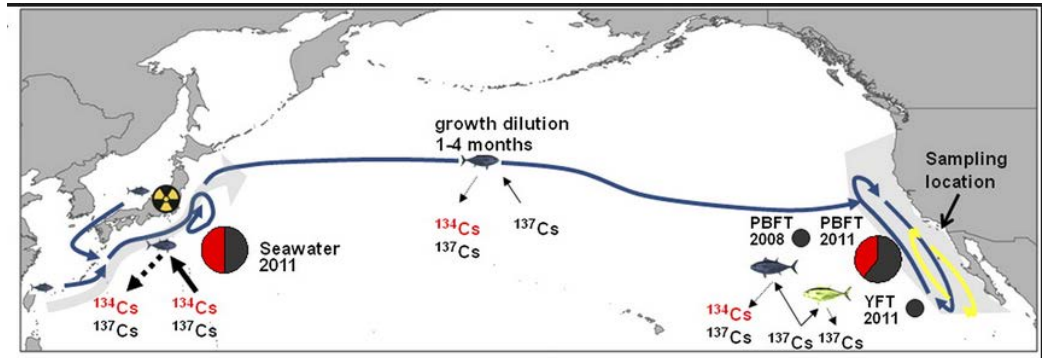
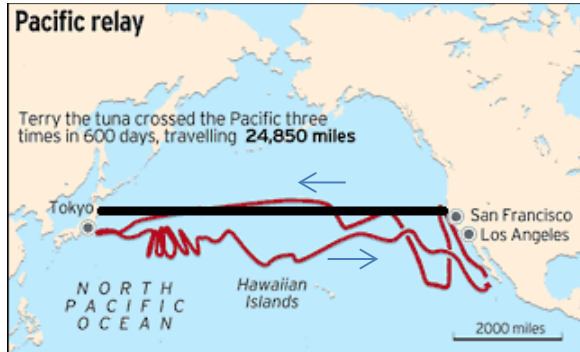
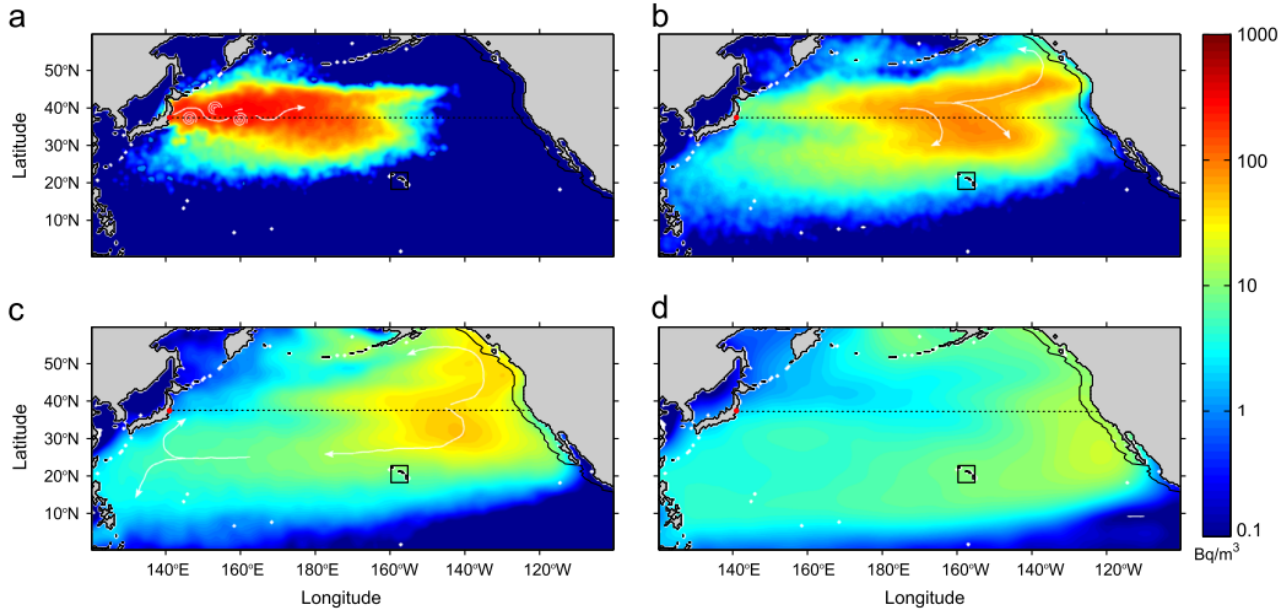
February 18, 2014

Fukushima

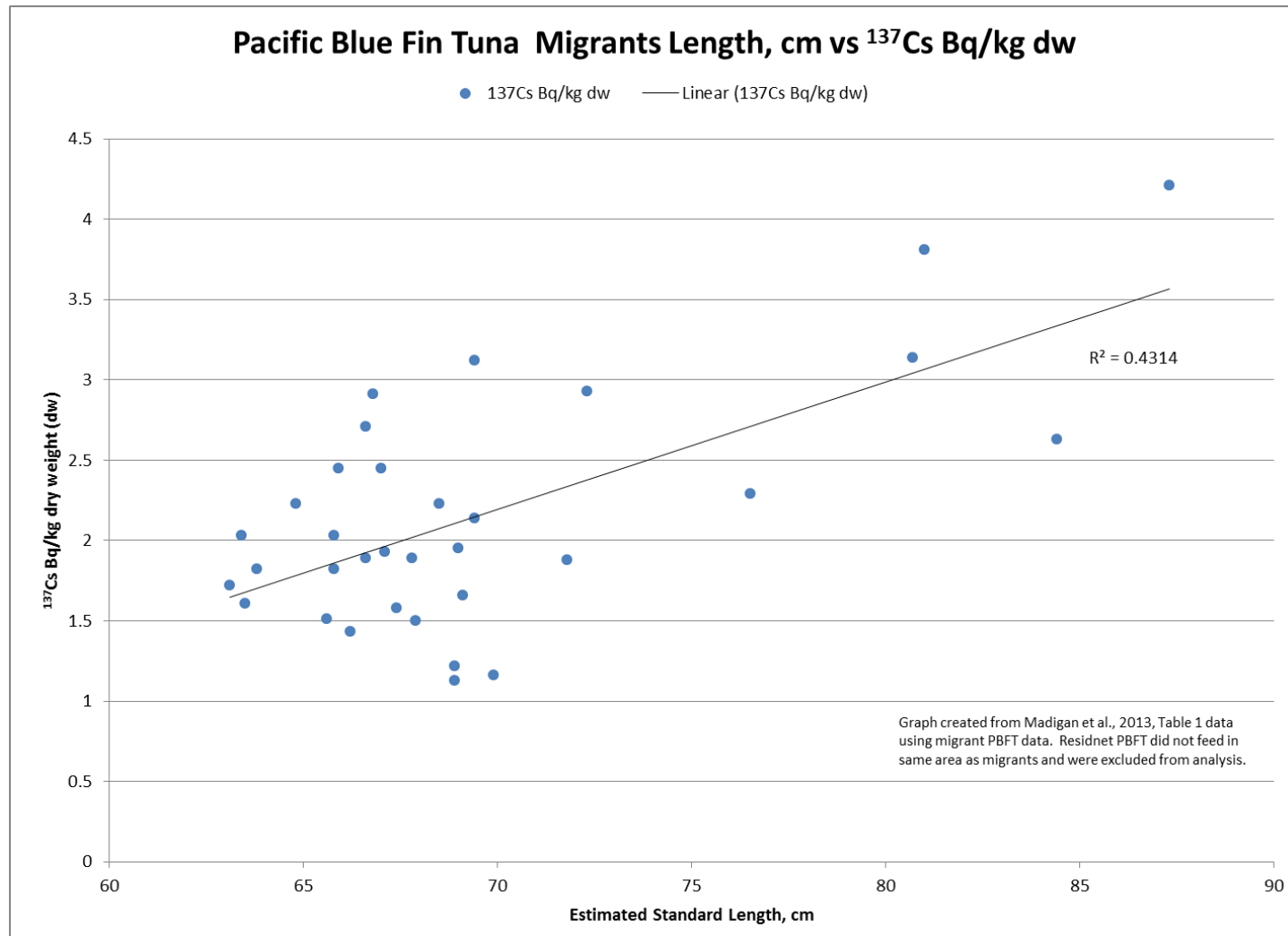
One Health Group Meeting Presentation

Doug Dasher

Can Alaska Depend on CA, OR and WA and PBFT to predict Alaska Fukushima Radionuclide Levels?



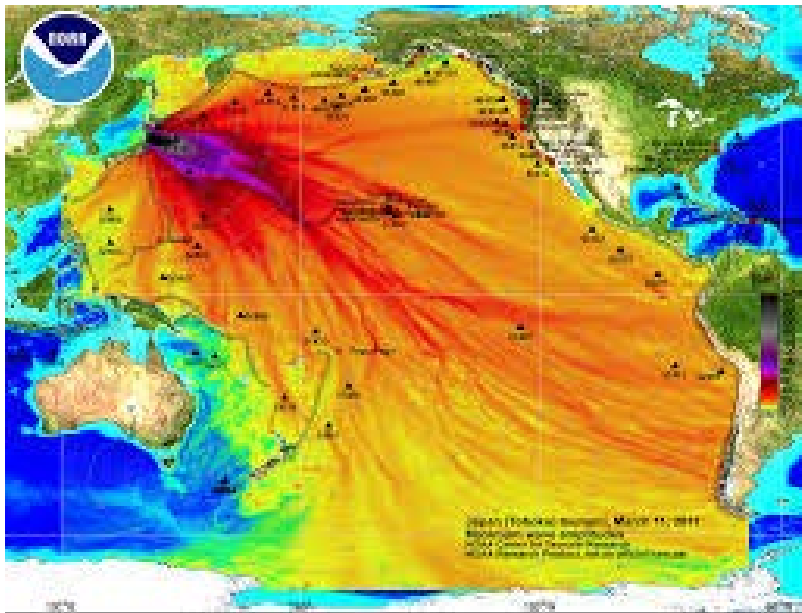
PBFT ^{137}Cs Increases with Fish Length



Alaska Lessons Learned??

- Initial Response
 - Lack of transparency
 - NNSA Atmospheric Release
 - Public instead treated to other models
 - State tracking of plume?
 - How were decisions made on where to place monitoring stations?
 - Understanding of Alaska vulnerability to fallout
 - Caribou, Musk Ox, Ptarmigan, Mushrooms
 - Freshwater fish
 - Drinking water supplies

NOAA Tsunami Model Miss-used



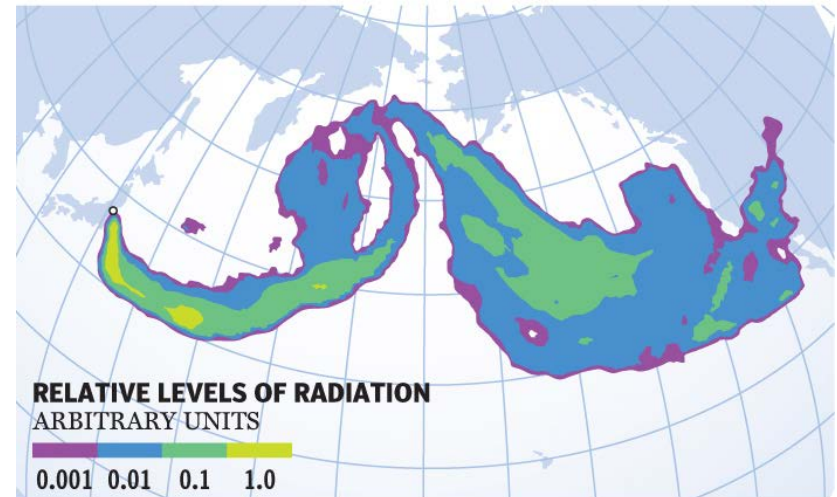
CNTBTO

RADIATION CROSSES PACIFIC

The Comprehensive Nuclear Test Ban Treaty Organization forecasts how radiation might disperse from Fukushima.

FORECAST OF RADIATION PLUME'S PATH

AS OF MARCH 18 2011, 2:00 A.M.



NOTE: Forecast does not show actual levels of radiation.

SOURCE: NEW YORK TIMES

JONATHON RIVAIT / NATIONAL POST

WHERE WAS U.S. NATIONAL ADVISORY RELEASE CAPABILITIES CENTER MAPPING IN 2011?

HySplit and NARACC

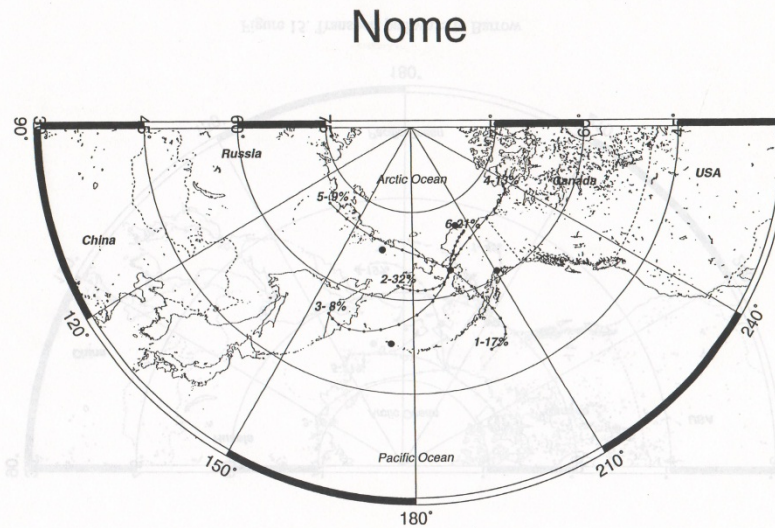


Figure 14. Transport pathways to Nome

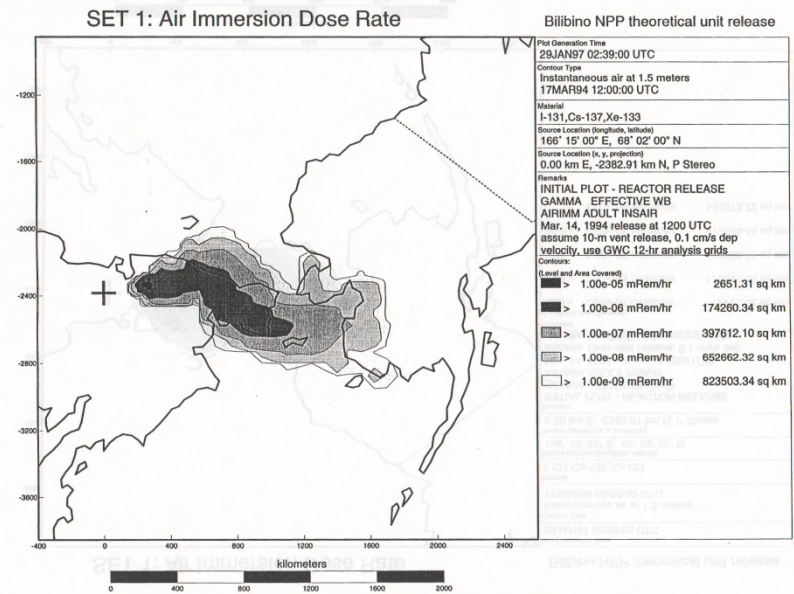
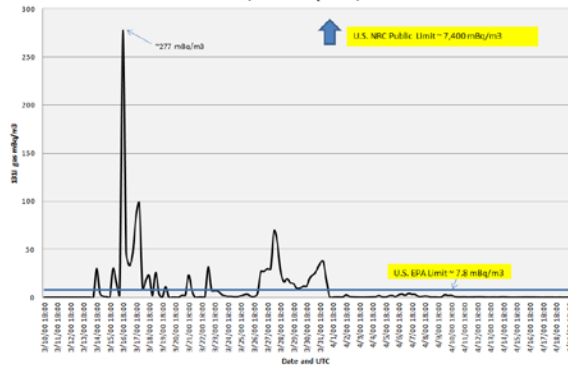


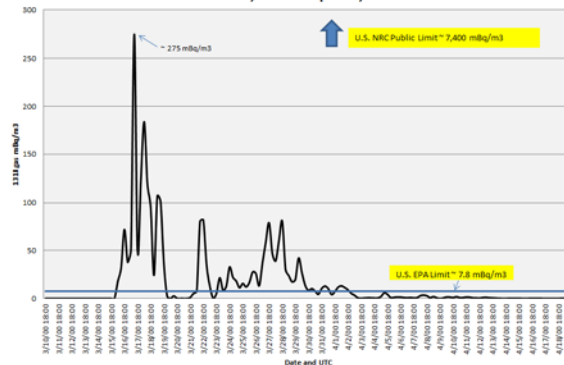
Figure 19. Air immersion dose rate for 17 March, 1994, 12 UTC

NOAA HYSPLIT Model – Fukushima Plume Historic Plume Forecast¹

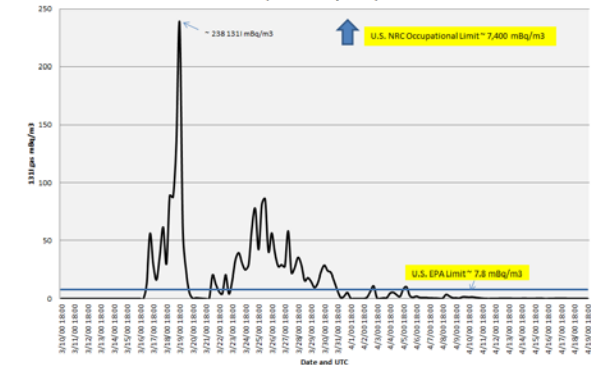
Modeled Air Concentrations of ¹³¹I gas mBq/m³ at Adak, Alaska
March 10, 2014 to April 19, 2011



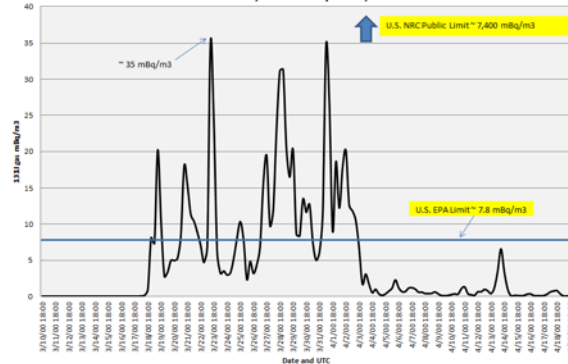
Modeled Air Concentrations of ¹³¹I gas at Unalaska, Alaska
March 10, 2014 to April 19, 2011



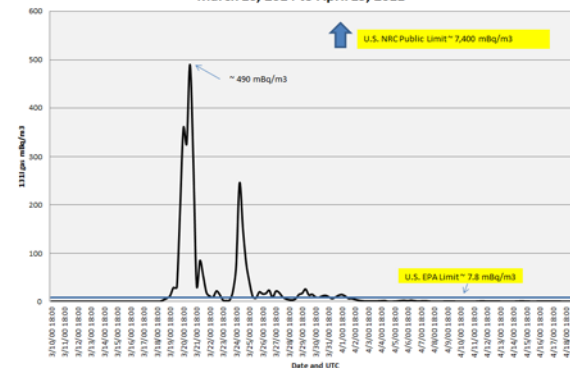
Modeled Air Concentrations of ¹³¹I gas mBq/m³ at Adak, Alaska
March 10, 2014 to April 19, 2011



Modeled Air Concentrations of ¹³¹I gas mBq/m³ at Anchorage, Alaska
March 10, 2014 to April 19, 2011



Modeled Air Concentrations of ¹³¹I gas mBq/m³ at McGrath, Alaska
March 10, 2014 to April 19, 2011



http://ready.arl.noaa.gov/READY_fdnpp.php
Source term 4 used (JAEA-Terada-3h)

FDA Derived Intervention Levels

Average +SF and Other Diets

food fraction (f) contaminated = 0.3						food fraction (f) contaminated = 1					
Radionuclide	DIL Bq/kg ww	PAG mSv	f	FI kg	DC (mSv/Bq)	Radionuclide	DIL Bq/kg ww	PAG mSv	f	FI kg	DC (mSv/Bq)
¹³⁷ Cs	1360	5	0.3	943	1.30E-05	¹³⁷ Cs	408	5	1	943	1.30E-05
¹³⁴ Cs	930	5	0.3	943	1.90E-05	¹³⁴ Cs	279	5	1	943	1.90E-05
Avg. ¹³⁷ Cs+ ¹³⁴ Cs	1145					Avg. ¹³⁷ Cs+ ¹³⁴ Cs	343				

FDA DIL is based on 1 year intake ~ 943 kg based on total dose from ¹³⁷Cs + ¹³⁴Cs in all components of the diet. Average DILs assume 30% radionuclide contamination of the diet for sub-populations dependent on specific food supplies.

Can only 30% of a subsistence diet be considered an adequate safety factor?

Table 16. Average Daily Intake Rates and Distributions of Seafood

Seafood item	Atka Diet		Nikolski Diet		Unalaska Diet		St. Paul Diet		Composite Diet	
	Avg. intake rate (g/day)	% of total intake rate	Avg. intake rate (g/day)	% of total intake rate	Avg. intake rate (g/day)	% of total intake rate	Avg. intake rate (g/day)	% of total intake rate	Avg. intake rate (g/day)	% of total intake rate
Fish, total	100	63	520	89	140	77	10	43	100	76
Halibut	19	12	160	28	30	17	5.2	22	27	20
Dolly Varden	1.0	0.61	19	3.3	1.2	0.67	— ^a	—	1.9	1.4
Cod	10	6.3	11	1.9	4.6	2.6	0.080	0.34	3.9	2.8
Salmon	55	33	330	56	98	55	4.9	21	67	49
Others	18	11	1.4	0.23	2.0	1.1	—	—	3.3	2.4
Mollusk and crustacean, total	7.0	4.3	14	2.4	12	6.7	1.5	6.6	6.8	5.0
Octopus	3.9	2.4	1.9	0.32	1.1	0.63	0.19	0.81	1.1	0.84
Sea urchin	1.7	1.0	0.93	0.16	1.1	0.62	0.32	1.4	0.82	0.60
Mussels	—	—	5.4	0.93	0.090	0.051	0.012	0.051	0.43	0.31
Bidarkis	1.5	0.91	5.4	0.93	0.21	0.12	—	—	0.67	0.49
Shrimp	—	—	0.12	0.021	1.2	0.70	—	—	0.44	0.32
Crabs	—	—	0.53	0.091	6.7	3.8	1.0	4.3	2.8	2.0
Clams	—	—	—	—	1.4	0.79	—	—	0.48	0.35
Seabird eggs	0.60	0.37	2.9	0.50	0.30	0.17	1.0	4.3	0.84	0.62
Seaweed/kelp	0.10	0.061	—	—	—	—	—	—	0.014	0.010
Seals	15	9.1	9.8	1.7	5.1	2.9	8.9	38	8.5	6.2
Sea lions	32	20	5.9	1.0	2.8	1.6	1.6	7.0	6.6	4.9
Sea birds	5.2	3.2	31	5.3	21	12	0.29	1.2	10	7.5
Total (g/day)	160		580		180		24		140	

^a — = Not available

Terrestrial mammals, berries, freshwater fish, drinking water, ect., are components not included here are likely to come from the local environment.

With Fukushima radionuclides present in the terrestrial and marine environment will the entire intake of food exceed the DILs?

Alaska Radioecology and Environmental Radioactivity Project (ARERP)

- Alaskans are concerned about Fukushima and they want to know that monitoring is taking place in Alaska.
 - Very low confidence in samples being take elsewhere
 - Statements that food is safe, but no data presented.
- UAF Institute of Marine Science is working with different parties to try and develop a assessment and monitoring effort.
 - How can State/Federal agencies and others support this effort?