Foraging Destinations of Short-tailed Albatrosses (*Phoebastria albatrus*) in the Northwest Pacific Ocean, Gulf of Alaska, and Bering Sea





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Photo by Dr. Hiroshi Hasegawa

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Historic Breeding Colonies



Tickell 2000

Torishima









Birds Captured in Japan & Alaska





PTT Deployments 2002 & 2003



				Satellite	Tacking	# Days	# Locations	
Animal ID	Age (yrs)	Sex	Deploy Loc	Begin	End	Tracked	(unfiltered)	Duty cycle
1076	5	F	Japan	8-May-02	23-Sep-02	138	417	6h on & 18h off
1181	4	Μ	"	"	2-Aug-02	86	323	8h on & 24h off
1281	3	Μ	"	"	28-Jul-02	81	412	6h on & 18h off
1291	3	-	"	"	5-Sep-02	120	480	8h on & 24h off
837	9	-	"	7-May-03	16-Aug-03	101	730	6h on & 18 h off
1034	6	-	"	"	28-Aug-03	113	754	8h on & 24h off
899	-	-	"	"	30-Jun-03	54	488	H
1311	4	-	"	10-May-03	30-Jun-03	51	131	H
900	-	-	"	"	5-Aug-03	87	610	H
963	-	-	"	"	22-Aug-03	104	726	H
962	18	-	"	11-May-03	24-Jul-03	74	480	6h on & 18h off
2428	< 1	Μ	Alaska	12-Aug-03	30-Nov-03	110	620	8h on & 24h off
2493	< 1	Μ	н	"	22-Nov-03	102	996	н
7040	2	Μ	"	18-Aug-03	7-Nov-03	81	618	"
				-		Tota	7785	_

Filtering Location Data



McConnell et al. 1992. Ant. Sci., Keating. 1994. J. Wildl. Mgmt., Austin et al. 2003. Mar. Mamm. Sci.

Retained 6709 locations (86%)

*SAS Filtering algorithm courtesy of David Douglas, USGS, Alaska Science Center

Location Accuracy

("Bench Test" after filtering)

Loc Class	n	Mean Error (km)	Std Dev
0	4	0.80	0.72
1	15	1.21	0.66
2	37	0.47	0.43
3	55	0.22	0.17
Α	63	0.50	0.62
В	58	7.14	15.31
Z	2	3.20	4.11

At-Sea Distribution





Long-term Avg. Wind Speeds (1999-2004)



Monthly Wind Speeds



SST & STAL Locations May





SST & STAL Locations June





SST & STAL Locations July





SST & STAL Locations August



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Johnson et al. (1992) Diffusion in a Fractal Landscape..... Ecology 84:282-288













FPT Results

Radii: 10 to 450 km by 10 km increments





Location of Maximum FPT for Each Bird



FPT Median Depth



All Max FPT Locations

Median Depth = 960 m SE = 315 Range = 340 – 2400 m

Median Depth of all locations = 2030 m

FPT Median Bathymetric Gradient



All Max FPT Locations

X = 6.1 % SE = 1.6 Range = 2.3 – 10.2

Bering Sea SST Fronts

Long-term persistent thermal fronts May – Nov, 1985-1996 9 km resolution



Data courtesy of Igor Belkin, University of Rhode Island Belkin et al. 2003. Proc. Amer. Meteor. Soc.

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Conclusions

Individuals ranged along the Pacific Rim above 30° N, primarily remaining over continental shelf break and slope regions.

High use areas in W Pacific basin included productive waters of the Kuroshio and Oyashio current regions off Japan and Kuril Islands, Russia.

In the Aleutian Islands, STAL often occurred within straits, particularly along western part of chain (e.g., Near Strait, Buldir and Seguam Passes).

In the Bering Sea, STAL occupied waters along N continental shelf break and Kamchatka Current region and showed some association with thermal fronts.

Conclusions (continued)

FPT analysis appears to successfully identify regions of Area Restricted Search patterns, which are important in assessing how specific marine habitats are being used.

Overall short-tailed albatrosses concentrate their activities in oceanic areas characterized by specific bathymetric and hydrographic features. Field Crew: KAYASHIMA Haruhiko MAEYAMA Ryo MURAKAMI Hayao WATANABE Yuki SUGIMURA Naomi KISHIMOTO Nobuhiko TAKAHASHI Hiroyuki KUNIKAZU Momose SUGIMURA Motoki YOSHIDA Seihaku

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