Supplementary material for: Merkel B., Aars J. & Liston G.E. 2020. Modelling polar bear maternity den habitat in east Svalbard. *Polar Research 39.*
https://doi.org/10.33265/polar.v38.3447

Correspondence: Benjamin Merkel, Norwegian Polar Institute, Fram Centre, P.O. Box 6606 Langnes, NO-9296 Tromsø, Norway. E-mail: merkel.benjamin@gmail.com.

Supplementary Table S1. Model coefficient estimates for the top selected snowdrift model at 100-m uncertainty.

	Insufficient snow	Sufficient snow
Kongsøya	-3.2	6.1
Svenskøya	-3.3	6.0
Hopen	-5.1	4.2

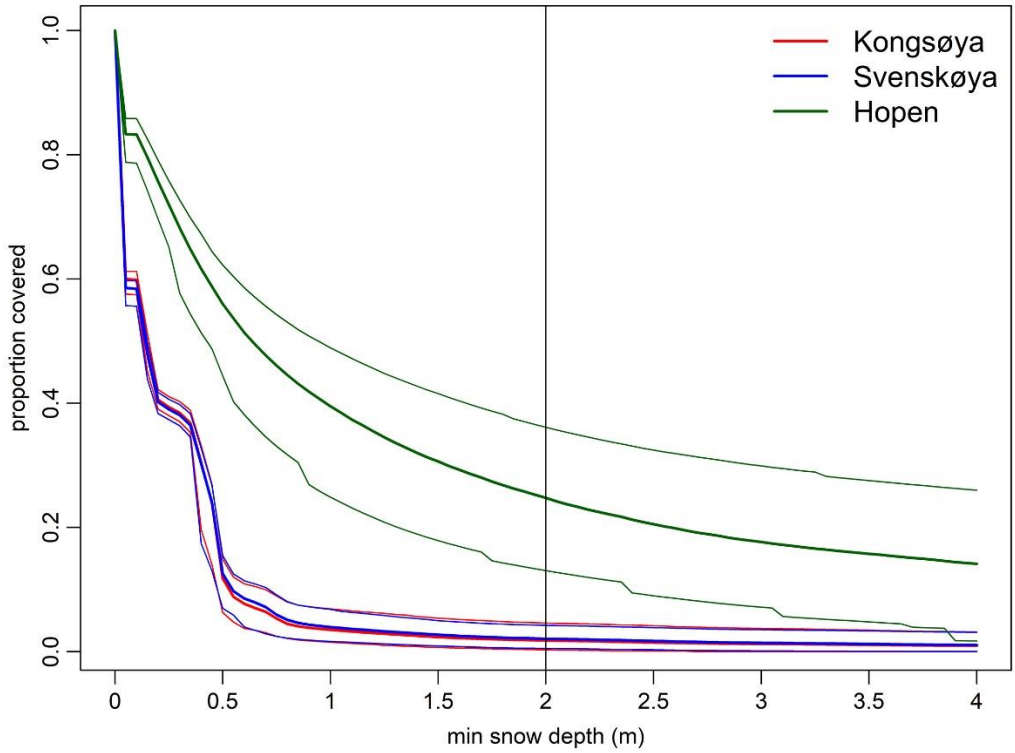
Supplementary Table S2. Model coefficient estimates for the top selected terrain model at 100-m uncertainty.

	Intercept	Slope	Slope^2	Altitude	Altitude^2
Kongsøya	-5.4	1.73	1.3932	1.422	1.399938
Svenskøya	-5.4	1.73	1.3932	1.422	1.399938
Hopen	-6.8	0.33	-0.0068	0.022	0.000062

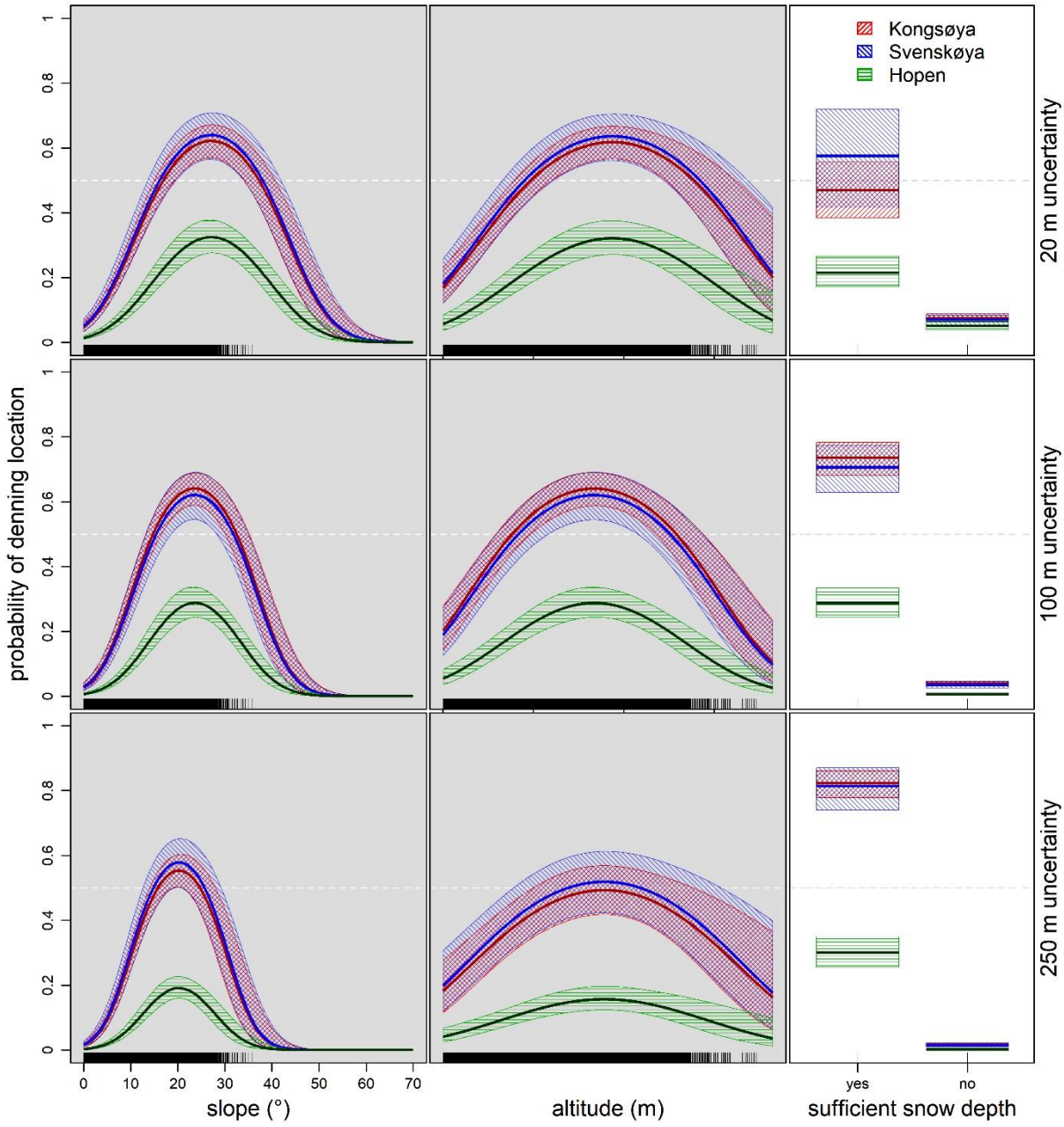
Supplementary Table S3. The four best models for the candidate model set (i.e., using SnowDens-3D, in white) as well as the alternative model set (i.e., using only a terrain model, in boldface) at 20-m and 250-m uncertainty levels according to BIC and BIC weights. ΔBIC was centred on the "snow+lo" model for each level. Dashes indicates that the given variable was unavailable for the given model set.

Un-certainty level	model variables														
	rvr[a]	*snow*[b]	*alt*[c]	*alt*^{2}	*slp*[d]	*slp*^{2}	*lo*[e]	*df*	BIC	ΔBIC	BIC weight	AUC	R^{2f}	cv[g]	sd cv[h]
20	–	–	+	+	+	+	+	**7**	**2473**	**-576.9**	**1.00**	**0.86**	**0.32**	**0.91**	**0.001**
	–	–	+		+	+	+	**6**	**2508**	**-541.9**	**0.00**	**0.86**	**0.31**	**0.91**	**<0.001**
	–	–		+	+	+	+	**6**	**2533**	**-517.3**	**0.00**	**0.85**	**0.30**	**0.91**	**<0.001**
	–	–	+	+	+	+		**5**	**2545**	**-505.3**	**0.00**	**0.85**	**0.29**	**0.91**	**<0.001**
		+	–	–	–	–	+	4	3050	0.0	0.00	0.64	0.10	0.91	<0.001
	+	+	–	–	–	–		7	3055	5.0	0.00	0.67	0.10	0.91	<0.001
	+	+	–	–	–	–	+	5	3055	5.0	0.00	0.68	0.11	0.91	<0.001
		+	–	–	–	–		2	3067	17.0	0.00	0.62	0.08	0.91	<0.001
250		+	–	–	–	–	+	4	1449	0.0	1.00	0.94	0.64	0.96	<0.001
	+	+	–	–	–	–	+	7	1463	14.0	0.00	0.94	0.64	0.96	<0.001
	+	+	–	–	–	–		5	1656	207.0	0.00	0.92	0.58	0.93	0.003
		+	–	–	–	–		2	1670	221.0	0.00	0.91	0.57	0.93	<0.001
	–	–	+	+	+	+	+	**7**	**2407**	**957.9**	**0.00**	**0.87**	**0.35**	**0.91**	**0.001**
	–	–	+		+	+	+	**6**	**2420**	**970.5**	**0.00**	**0.87**	**0.34**	**0.91**	**0.001**
	–	–			+	+	+	**5**	**2427**	**978.4**	**0.00**	**0.87**	**0.33**	**0.91**	**0.001**
	–	–		+	+	+	+	**6**	**2429**	**979.7**	**0.00**	**0.87**	**0.34**	**0.91**	**0.001**

[a] Categorical, distance to the nearest stream. [b] Presence or absence of sufficient snow depth.
[c] Altitude (m). [d] Slope (°). [e] Island factor (Kongsøya, Svenskøya, Hopen). [f] Nagelkerke's R^2.
[g] Cross-validation. [h] Standard deviation of cross-validation.



Supplementary Fig. S1. Proportion of each island covered by sufficient snow depending on various minimum snow depths considered. Thick lines denote median proportion covered during study period with minimum and maximum shown by thin lines for each island. The chosen minimum snow depth of 2 m is indicated as vertical line. Note that data for Svenskøya and Kongsøya overlap to a large extent.



Supplementary Fig. S2. Marginal plots for the best fitted terrain model (grey background) as well as snowdrift model (white background) for each uncertainty level (i.e., 20, 100 and 250 m). The effect of each variable on the predicted probability of presence of a polar bear maternity den is shown by varying one predictor variable and keeping the other constant. The 95% confidence intervals are shown as shaded areas. The distribution of the predictor variables is shown in the bottom of each panel. Note that results for Svenskøya and Kongsøya overlap to a large extent.