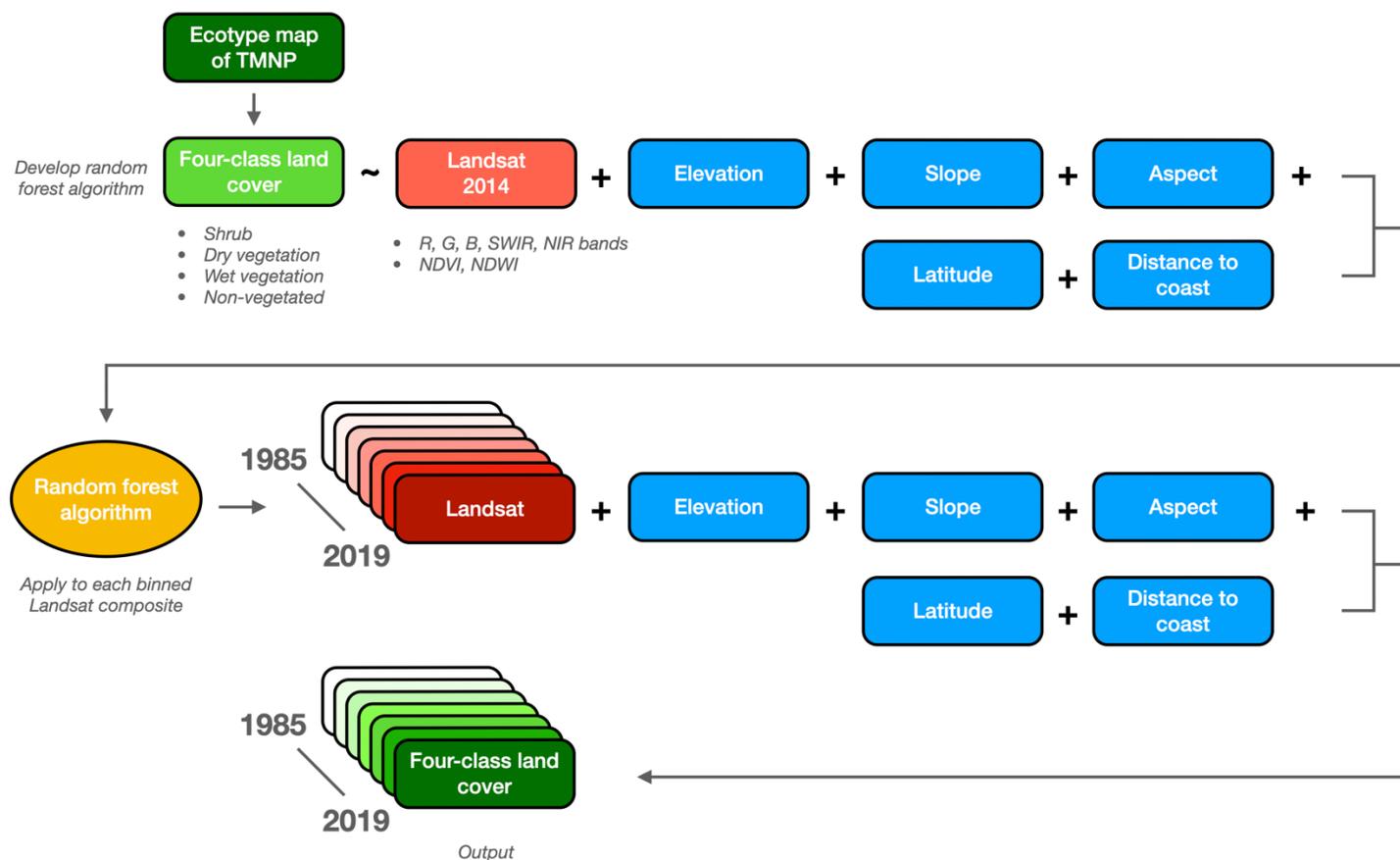
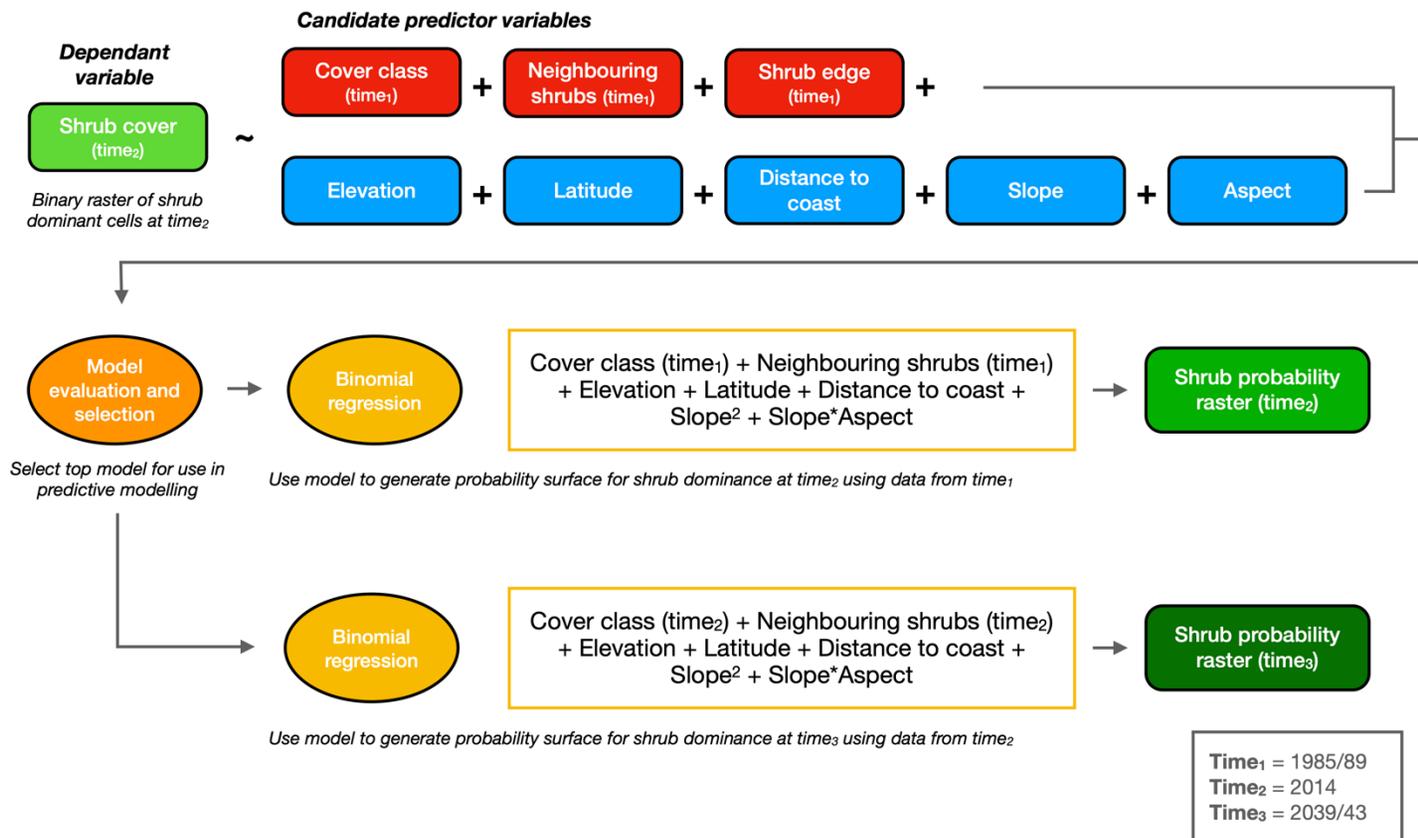


# Reconstructing transitions in vegetation cover using random forest modelling

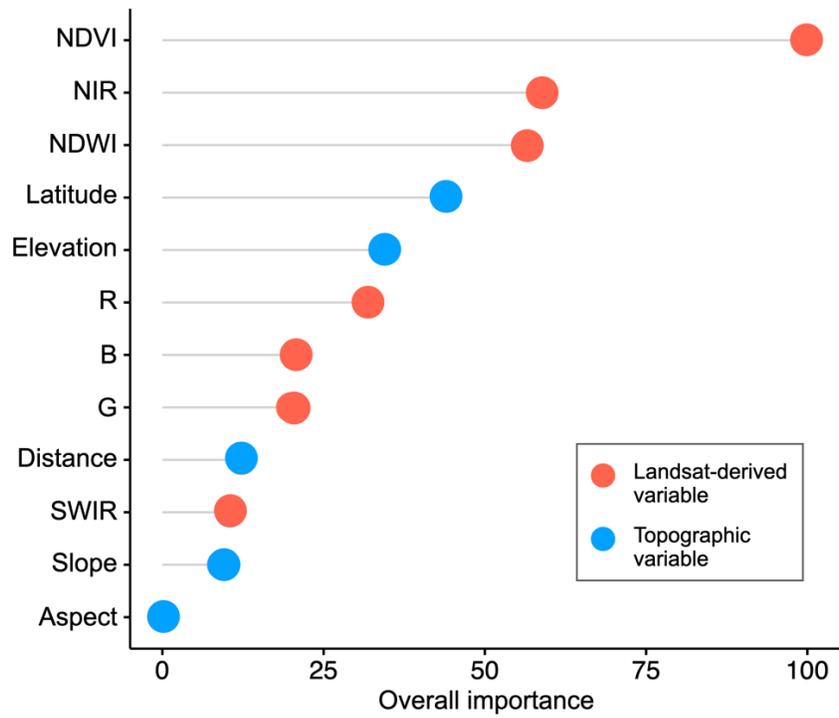


**Supporting Figure 1** Depiction of workflow used to generate four-class land cover rasters (1985/89 to 2015/19) from Landsat composites and topographic data for TMNP.

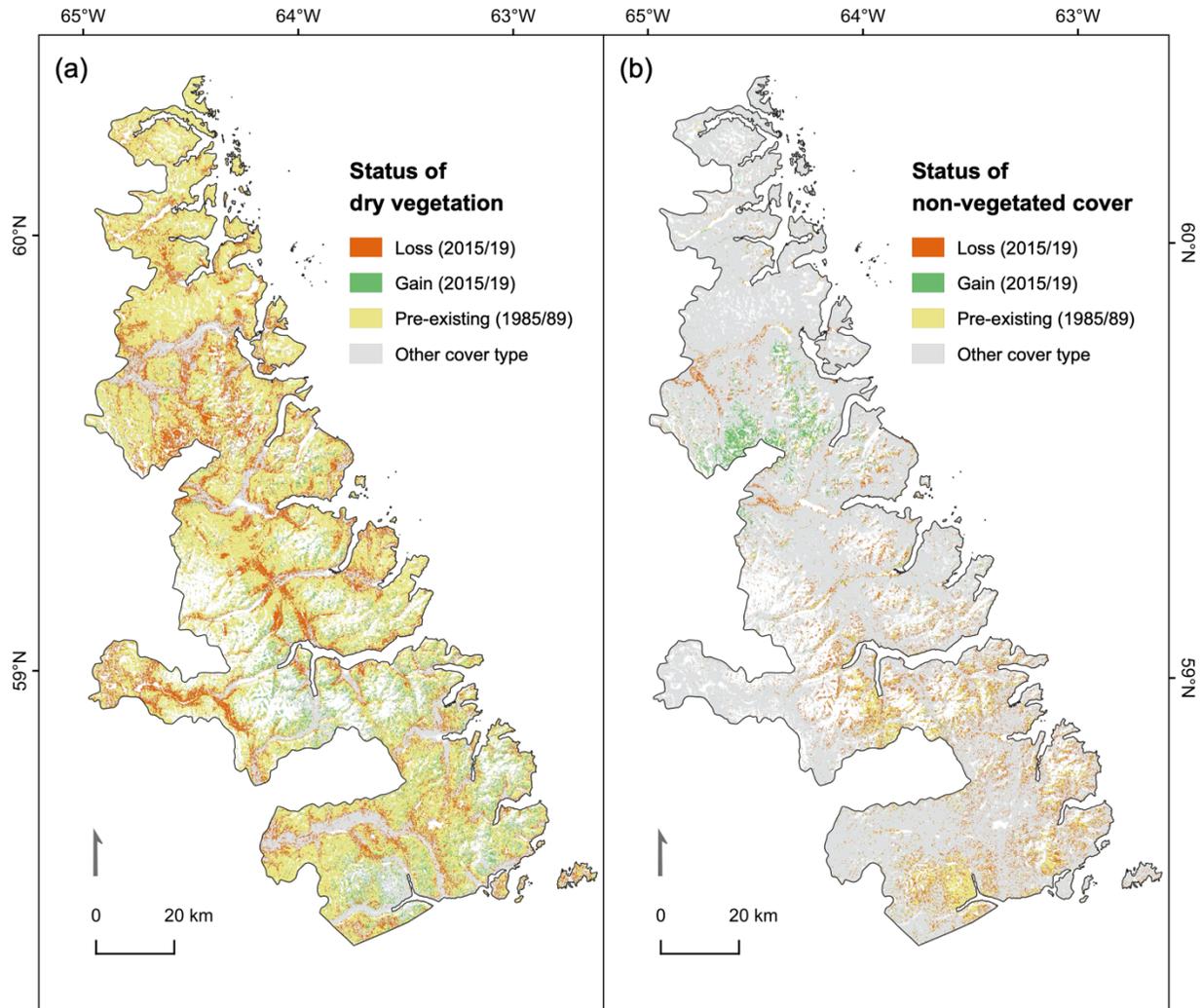
# Predicting future transitions to shrub dominance using binomial regression



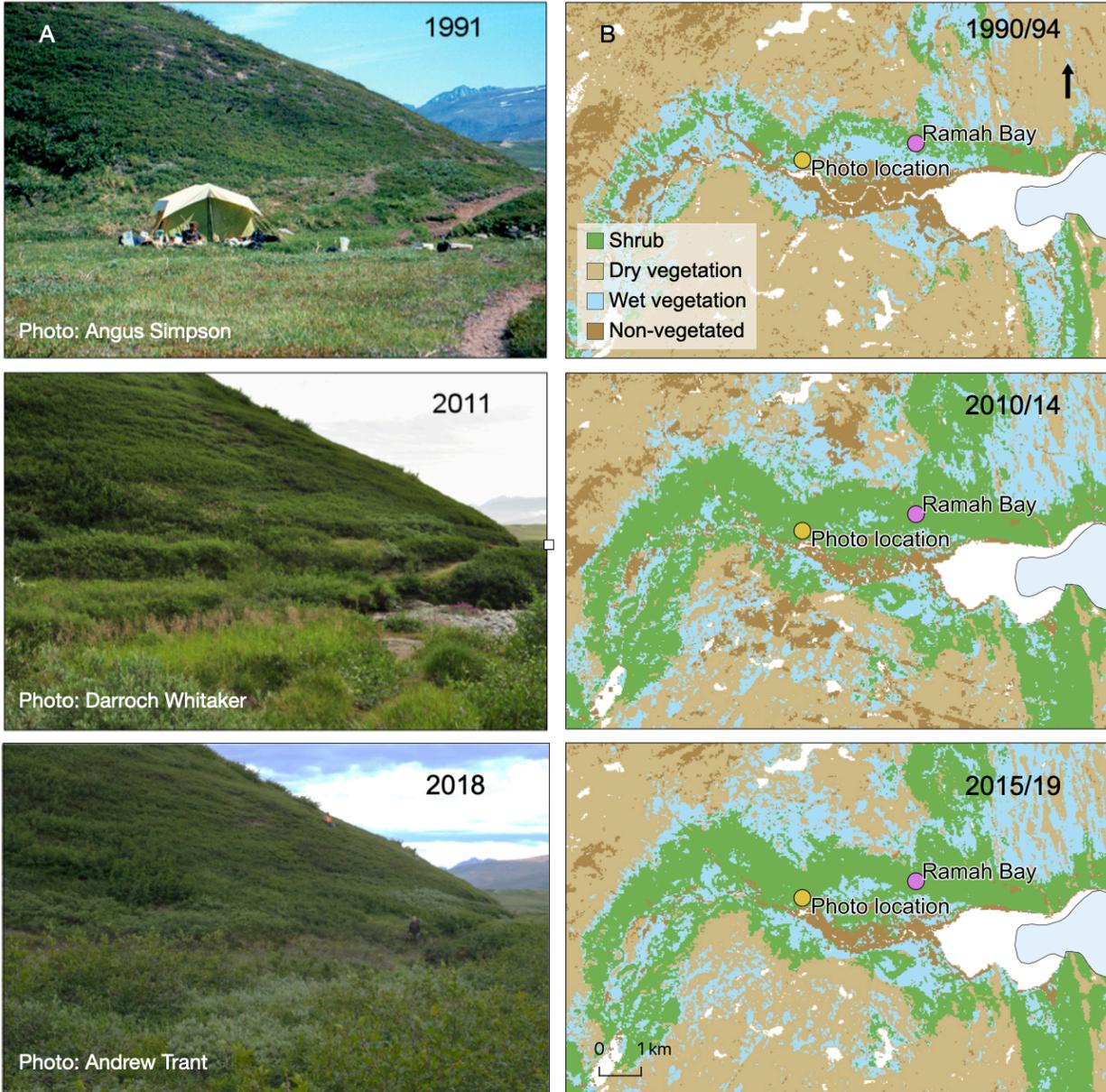
**Supporting Figure 2** Depiction of the workflow used to predict transitions to shrub dominance from biotic and topographic variables using a binomial regression framework.



**Supporting Figure 3** Relative variable importance plot of the random forest algorithm. Predictors with higher/lower overall importance values contribute more/less to the accuracy of the classification algorithm.



**Supporting Figure 4** Maps showing changes in dry vegetation (left) and non-vegetated cover (right) from 1985/89 to 2015/19 in Torngat Mountains National Park.



**Supporting Figure 5** Shrub change near Ramah Bay shown through (A) repeat photography and (B) predicted land cover maps of the park during a similar time period. The yellow dot in (B) is the approximate location of the photographs in (A).

**Supporting Table 1** Variables included in the 24 candidate binomial regression models used in an information theoretic approach to select the most suitable model for predicting shrub cover change.

Model	Class	Edge	Neighbour	DEM	Slope + Aspect + Slope <sup>2</sup> + Slope*Aspect	Latitude + Distance to coast
1	x	-	-	-	-	-
2	x	x	-	-	-	-
3	x	-	x	-	-	-
4	x	-	-	x	-	-
5	x	-	-	-	x	-
6	x	-	-	-	-	x
7	x	x	-	x	-	-
8	x	x	-	-	x	-
9	x	x	-	-	-	x
10	x	-	x	x	-	-
11	x	-	x	-	x	-
12	x	-	x	-	-	x
13	x	-	-	x	x	-
14	x	-	-	x	-	x
15	x	-	-	-	x	x
16	x	x	-	x	x	-
17	x	x	-	x	-	x
18	x	x	-	-	x	x
19	x	-	x	x	x	-
20	x	-	x	x	-	x
21	x	-	x	-	x	x
22	x	-	-	x	x	x
23	x	x	-	x	x	x
24	x	-	x	x	x	x

**Supporting Table 2** Summary statistics of the comparison between 24 candidate binomial regression models of shrub change between 1985/89 and 2014, in order of rank (Model - name of model corresponding to Table 1; df - model degrees of freedom; logLik - model log-likelihood; AIC - Akaike's Information Criterion;  $\Delta$ AIC - change in AIC between ranked models; Model weight - Akaike weight).

Model	df	logLik	AIC	$\Delta$ AIC	Model weight
24	11	-505673.62	1011369.25	0.00	1
23	11	-508159.10	1016340.20	4970.95	0
20	7	-509659.57	1019333.14	7963.89	0
17	7	-512745.96	1025505.91	14136.66	0
22	10	-529072.06	1058164.12	46794.87	0
14	6	-537171.46	1074354.91	62985.66	0
19	9	-577073.94	1154165.87	142796.62	0
10	5	-578292.92	1156595.84	145226.59	0
16	9	-585561.95	1171141.90	159772.65	0
7	5	-587249.21	1174508.43	163139.18	0
21	10	-600034.89	1200089.78	188720.53	0
12	6	-601341.39	1202694.78	191325.53	0
18	10	-610030.03	1220080.05	208710.80	0
11	8	-610962.44	1221940.88	210571.63	0
9	6	-611208.77	1222429.54	211060.29	0
3	4	-611657.09	1223322.17	211952.92	0
8	8	-622897.84	1245811.68	234442.43	0
2	4	-623448.29	1246904.57	235535.32	0
13	8	-638924.81	1277865.62	266496.37	0
4	4	-644919.48	1289846.97	278477.72	0
15	9	-667775.00	1335568.00	324198.75	0
6	5	-668352.34	1336714.68	325345.43	0
5	7	-694374.42	1388762.84	377393.59	0
1	3	-695031.49	1390068.99	378699.74	0

**Supporting Table 3** Locations of existing ground and air temperature monitoring sites in Torngat Mountains National Park.

Site name	Distance to coast (m)	Lat. (°)	Lon. (°)	Elev. (m a.s.l.)	Folded aspect (rads)	Slope (rads)
1. Kangalaksiorvik Lake	8439.76	59.41	-64.24	39.39	1.53	0.05
2. Komaktorvik Falls	15645.28	59.20	-64.10	96.90	0.49	0.10
3. Ivitak Cove	690.65	59.00	-63.75	35.86	0.19	0.08
4. Cirque Mtn Camp	9521.92	58.94	-63.60	471.49	2.21	0.03
5. Upper Ivitak Valley	10683.12	58.92	-63.67	602.21	0.46	0.06
6. Ramah Bay	1950.00	58.88	-63.36	65.28	2.14	0.11
7. Nakvak Brook	12098.04	58.64	-63.34	506.41	1.71	0.21