

Projected loss of active blanket bogs in Ireland

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Supplement 1. Covariate selection evaluated for inclusion in the 7 bioclimatic envelope models (GLM: generalised linear models, GAM: generalised additive models, ANN: artificial neural network, RF: random forest, GBM: generalised boosting method, CTA: classification tree analysis, FDA: flexible discriminant analysis), baseline climate and climate change (AIB scenario) data range used for the modelling, and bioclimatic envelope model results: predictions maps for each of the individual models implemented in the BIOMOD algorithm compared to the observed distribution of Active Blanket Bog

Table S1. Range of candidate predictor variables screened

Name	Definition	Unit
Climate		
ATR	Annual temperature range (maximum temperature of the warmest month to minimum temperature of the coldest month)	°C
MAT	Mean annual temperature	°C
MST	Mean summer temperature	°C
MTW	Mean temperature of warmest month	°C
MWT	Mean winter temperature	°C
NAP	Net annual precipitation	mm
MSP	Mean summer precipitation (Jun–Aug)	mm
MWP	Mean winter precipitation (Dec–Feb)	mm
Topography		
Min	Minimum elevation	m
Max	Maximum elevation	m
Mean	Mean elevation	m
Range	Elevation range	m

Table S2. Baseline climate (1961 to 1990) and climate change (2031 to 2060) data range used in the current study

Variables (units)	Baseline climate			Climate change data		
	Max	Min	Mean	Max	Min	Mean
Annual temperature range	18.77	14.11	16.99	24.38	15.48	19.89
Mean annual temperature (°C)	10.44	6.12	8.92	11.76	7.64	10.49
Mean summer temperature (June–Aug) (°C)	15.00	11.44	13.81	17.07	12.39	16.04
Mean temperature - warmest month (July) (°C)	19.63	15.77	18.36	18.36	12.90	17.20
Mean winter temperature (Dec–Feb) (°C)	6.74	1.45	4.62	7.88	3.07	6.15
Net annual precipitation (mm)	2114.1	691.93	1254.1	2047.9	528.21	1182.8
Mean summer precipitation (Jun–Aug) (mm)	127.90	49.64	83.84	123.88	26.11	61.10
Mean winter precipitation (Dec–Feb) (mm)	224.99	63.82	124.10	244.34	62.34	137.67

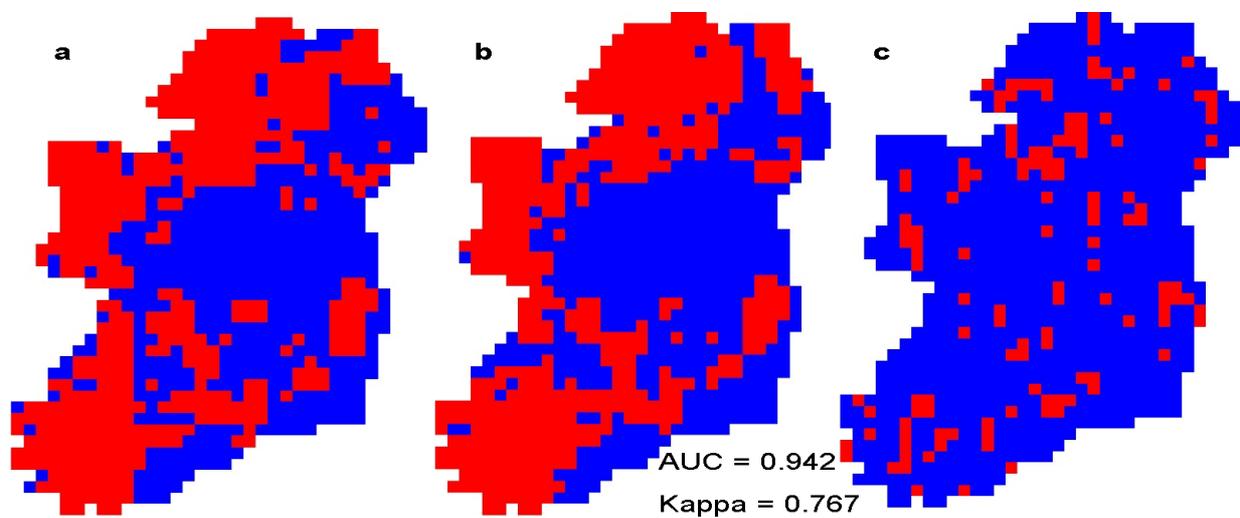


Fig. S1. (a) Observed distribution of active blanket bog based on National Parks and Wildlife Service data (Ireland) and Joint Nature Conservancy Council data (Northern Ireland). (b) BIOMOD-specified GLM predicted distribution for the baseline period; AUC = area under the curve, Kappa = Cohen's Kappa statistic. (c) Change in bioclimatic space for active blanket bog according to the A1B climate scenario for 2031 to 2060, predicted with the GLM distribution model for the 10×10 km grid. Observed and predicted occurrence (red grid cells) and absence (blue) are shown throughout

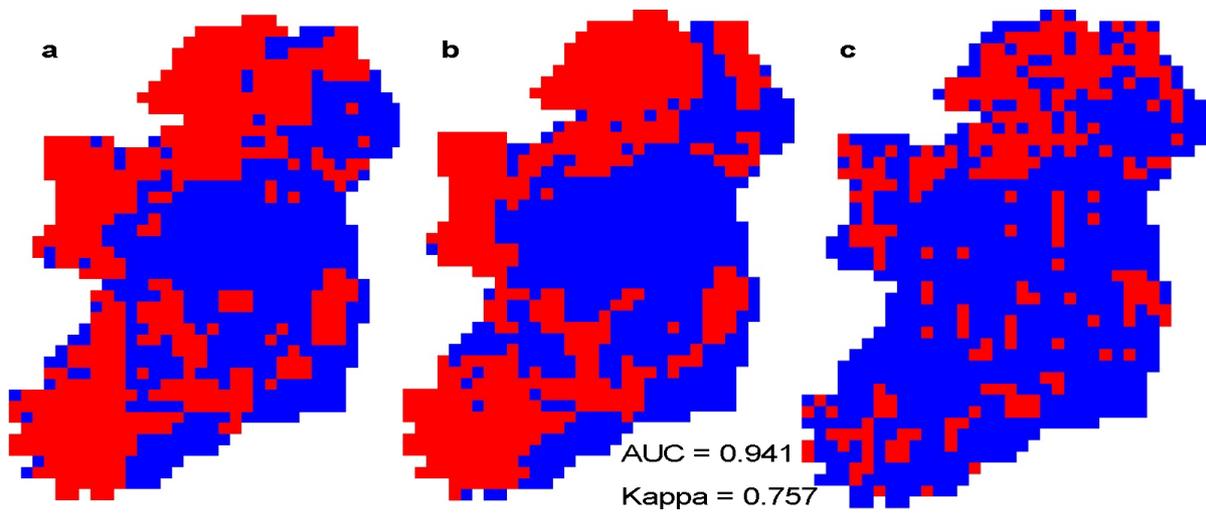


Fig. S2. Same as in Fig. S1, but for (b) BIOMOD-specified GAM predicted distribution for the baseline period and (c) change in bioclimatic space projected by the GAM model. GAM: generalised additive model

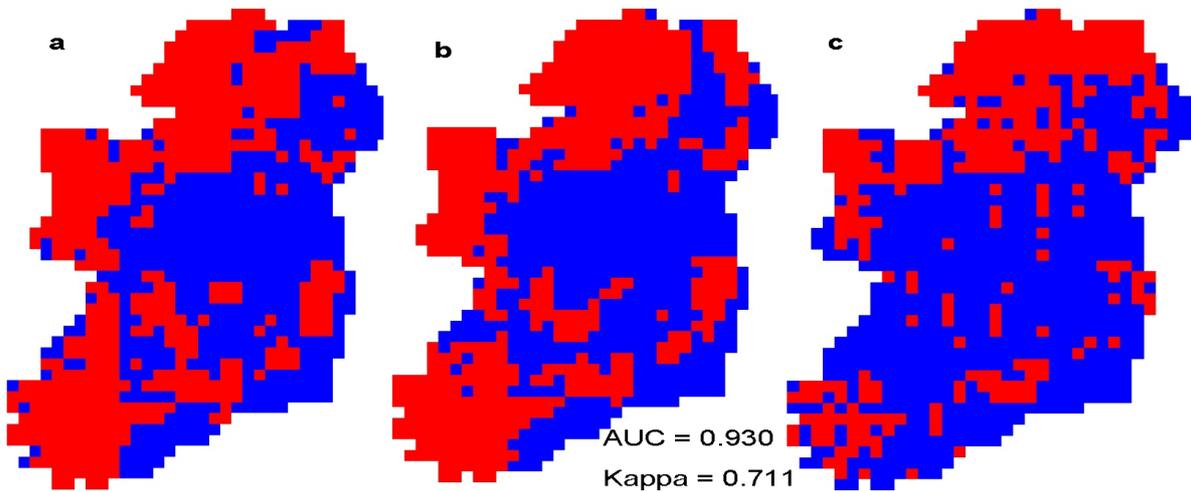


Figure S3: (a) Observed distribution of active blanket bog based on National Parks and Wildlife Service data (Ireland) and Joint Nature Conservancy Council data (Northern Ireland). (b) The BIOMOD specified ANN predicted distribution for the baseline period; AUC = the area under the curve, Kappa = Cohen's Kappa statistic. (c) Change in bioclimatic space for active blanket bog according to the A1B climate scenario for 2031–2060, predicted with the ANN distribution model for the 10×10 km grid. The observed and predicted occurrence of active blanket bog is shown with red grid cells, the observed and predicted absence is shown with dark blue grid cells throughout.

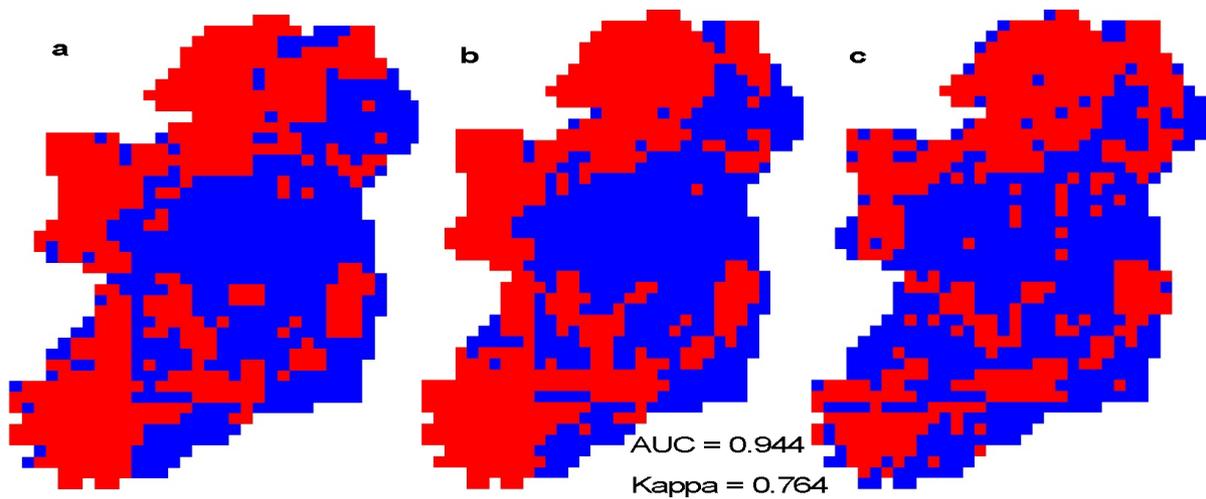


Figure S4: (a) Observed distribution of active blanket bog based on National Parks and Wildlife Service data (Ireland) and Joint Nature Conservancy Council data (Northern Ireland). (b) The BIOMOD specified GBM predicted distribution for the baseline period; AUC = the area under the curve, Kappa = Cohen’s Kappa statistic. (c) Change in bioclimatic space for active blanket bog according to the A1B climate scenario for 2031–2060, predicted with the GBM distribution model for the 10×10 km grid. The observed and predicted occurrence of active blanket bog is shown with red grid cells, the observed and predicted absence is shown with dark blue grid cells throughout.

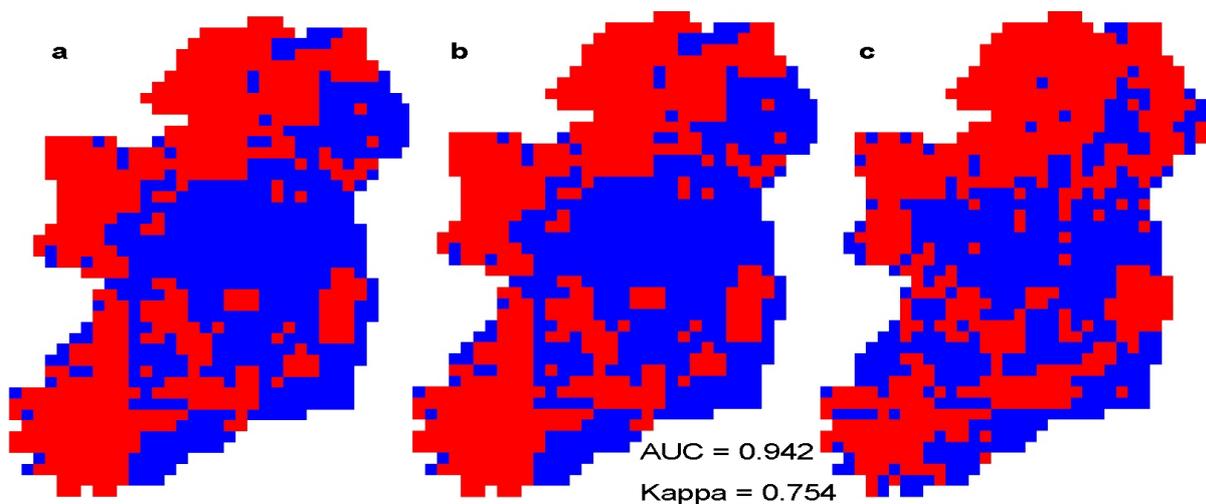


Figure S5: (a) Observed distribution of active blanket bog based on National Parks and Wildlife Service data (Ireland) and Joint Nature Conservancy Council data (Northern Ireland). (b) The BIOMOD specified RF predicted distribution for the baseline period; AUC = the area under the curve, Kappa = Cohen’s Kappa statistic. (c) Change in bioclimatic space for active blanket bog according to the A1B climate scenario for 2031–2060, predicted with the RF distribution model for the 10×10 km grid. The observed and predicted occurrence of active blanket bog is shown with red grid cells, the observed and predicted absence is shown with dark blue grid cells throughout.

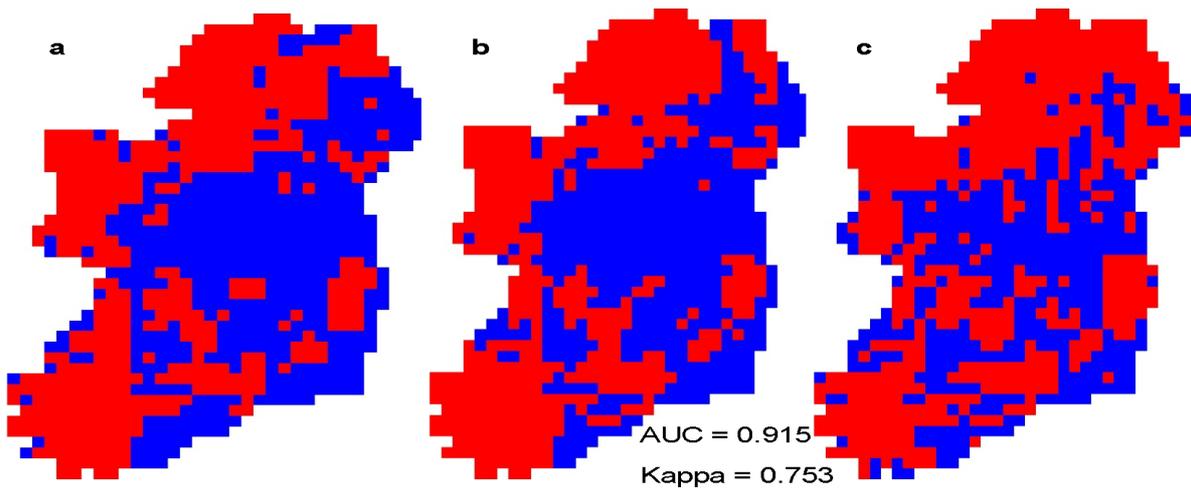


Figure S6: (a) Observed distribution of active blanket bog based on National Parks and Wildlife Service data (Ireland) and Joint Nature Conservancy Council data (Northern Ireland). (b) The BIOMOD specified CTA predicted distribution for the baseline period; AUC = the area under the curve, Kappa = Cohen's Kappa statistic. (c) Change in bioclimatic space for active blanket bog according to the A1B climate scenario for 2031–2060, predicted with the CTA distribution model for the 10×10 km grid. The observed and predicted occurrence of active blanket bog is shown with red grid cells, the observed and predicted absence is shown with dark blue grid cells throughout.

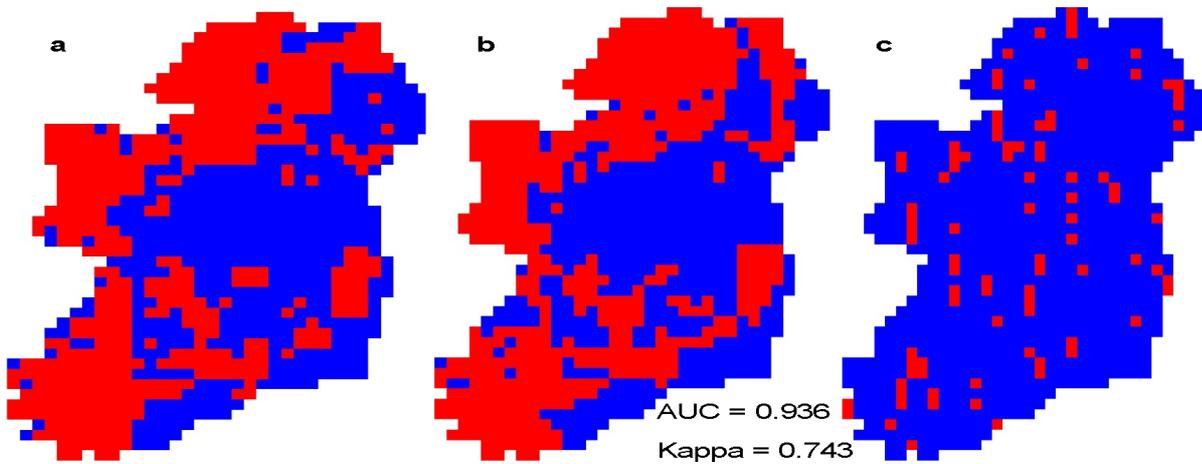


Figure S7: Same as in Fig. S1, but for (b) BIOMOD-specified FDA predicted distribution for the baseline period and (c) change in bioclimatic space projected by the FDA model. FDA: flexible discriminant analysis