

## Supporting Information

Automated acoustic monitoring captures timing and intensity of bird migration  
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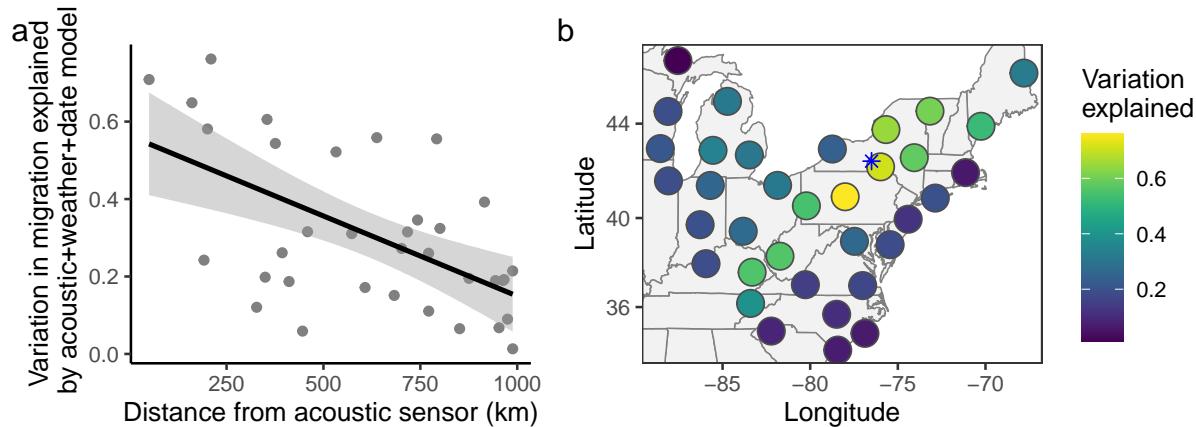


Figure S1: **Acoustic and weather information content degrades with distance.** (a) shows the performance of a model containing acoustic and weather information when predicting migration passage at radar stations at varying distances from the acoustic sensor. Line is a loess smoother. (b) shows the same information in map form. The blue asterisk is the location of the acoustic sensor.

Table S1: Species included in the *BirdVoxDetect* classifier..

Family	Common Name	Scientific Name
Passerellidae	American Tree Sparrow	<i>Spizelloides arborea</i>
Passerellidae	Chipping Sparrow	<i>Spizella passerina</i>
Passerellidae	Savannah Sparrow	<i>Passerculus sandwichensis</i>
Passerellidae	White-throated Sparrow	<i>Zonotrichia albicollis</i>
Cardinalidae	Rose-breasted Grosbeak	<i>Pheucticus ludovicianus</i>
Turdidae	Gray-cheeked Thrush	<i>Catharus minimus</i>
Turdidae	Swainson's Thrush	<i>Catharus ustulatus</i>
Parulidae	American Redstart	<i>Setophaga ruticilla</i>
Parulidae	Bay-breasted Warbler	<i>Setophaga castanea</i>
Parulidae	Black-throated Blue Warbler	<i>Setophaga caerulescens</i>
Parulidae	Canada Warbler	<i>Cardellina canadensis</i>
Parulidae	Common Yellowthroat	<i>Geothlypis trichas</i>
Parulidae	Mourning Warbler	<i>Geothlypis philadelphica</i>
Parulidae	Ovenbird	<i>Seiurus aurocapilla</i>

Table S2: **Model selection for prediction of radar-derived bird densities using acoustic and weather data.** Shown is the 95% confidence set of models (cumulative AICc weight sums to 0.95). All models include nightly calling activity and time of season. Note that the “Date (cubic)” variable represents a cubic polynomial term, not a single term with an exponent. Columns are as follows: “Rsq” is  $R^2$ , the proportion of variance explained by the model; “df” is the number of model parameters; “logLik” is the model log-likelihood; “AICc” is the corrected Akaike Information Criterion; “delta” is the difference in AICc from the best (first-listed) model; “weight” is the AICc weight; “cumulative weight” is the cumulative AICc weight.

terms	Rsq	df	logLik	AICc	delta	weight	cumulative weight
Date (cubic) + Calling activity + E/W wind + N/S wind	0.802	8	-474.779	966.957	0.000	0.249	0.249
Date (cubic) + Calling activity + E/W wind + Visibility + N/S wind	0.804	9	-474.027	967.818	0.862	0.162	0.411
Date (cubic) + Cloud cover + Calling activity + E/W wind + N/S wind	0.802	9	-474.659	969.082	2.126	0.086	0.497
Date (cubic) + Cloud cover + Calling activity + E/W wind + Visibility + N/S wind	0.806	10	-473.488	969.154	2.197	0.083	0.580
Air temp. + Date (cubic) + Calling activity + E/W wind + N/S wind	0.802	9	-474.747	969.259	2.302	0.079	0.658
Date (cubic) + Calling activity + E/W wind + Visibility + N/S wind + Calling activity $\times$ Visibility	0.806	10	-473.681	969.539	2.583	0.068	0.727
Air temp. + Date (cubic) + Calling activity + E/W wind + Visibility + N/S wind	0.805	10	-473.868	969.915	2.958	0.057	0.783
Date (cubic) + Cloud cover + Calling activity + E/W wind + Visibility + N/S wind + Calling activity $\times$ Visibility	0.808	11	-472.862	970.363	3.406	0.045	0.829
Date (cubic) + Cloud cover + Calling activity + E/W wind + N/S wind + Cloud cover $\times$ Calling activity	0.802	10	-474.644	971.466	4.509	0.026	0.855
Air temp. + Date (cubic) + Cloud cover + Calling activity + E/W wind + N/S wind	0.802	10	-474.654	971.487	4.530	0.026	0.881
Air temp. + Date (cubic) + Calling activity + E/W wind + Visibility + N/S wind + Calling activity $\times$ Visibility	0.806	11	-473.447	971.535	4.578	0.025	0.906
Air temp. + Date (cubic) + Cloud cover + Calling activity + E/W wind + Visibility + N/S wind	0.806	11	-473.486	971.613	4.656	0.024	0.930
Date (cubic) + Cloud cover + Calling activity + E/W wind + Visibility + N/S wind + Cloud cover $\times$ Calling activity	0.806	11	-473.487	971.615	4.658	0.024	0.954