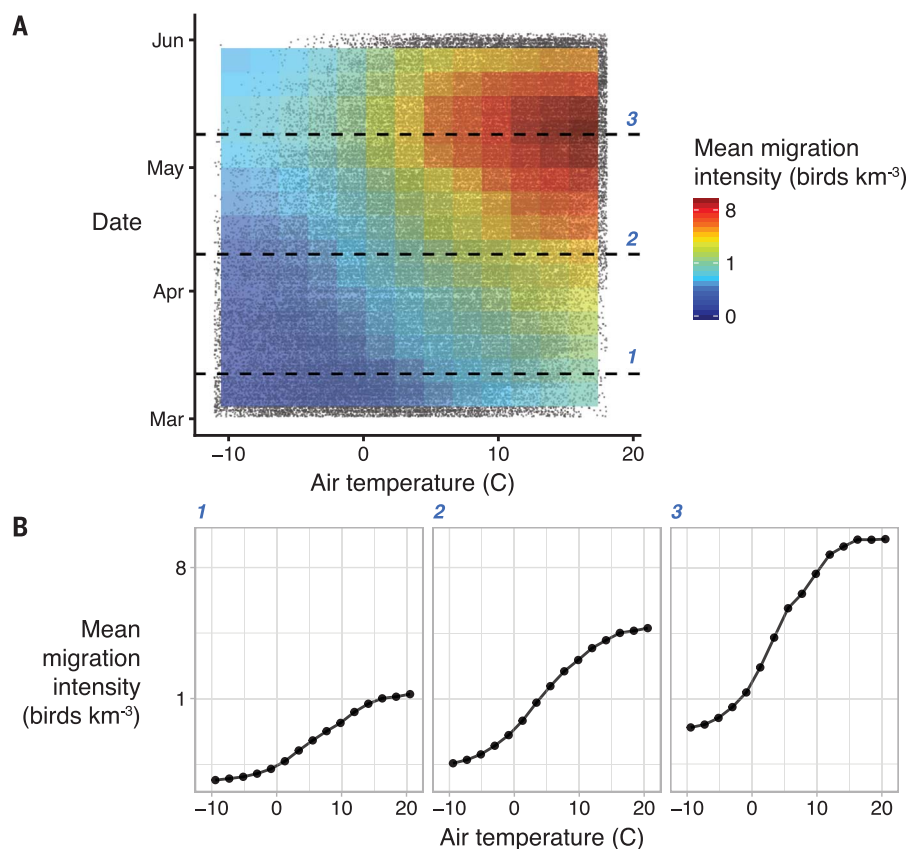


**Fig. 4. Migration intensity predictions by air temperature and date.** (A) Heat map colors show migration intensity predictions for dates and air temperature values. Each data point on the scatterplot behind the heat map represents data for one night from one radar. Only well-supported predictions and corresponding data points are shown (the outer 10% of temperature and date values are excluded). Temperature values correspond to air temperatures at altitudes up to 3000 m. (B) Cross sections of model predictions for three spring dates. For a given date, the model predicts migration intensity to vary closely with temperature. Fewer observations correspond to cold temperatures later in the season.



decreases the risk of taking unneeded mitigation action. More accurately predicting the largest migration events may require explicit modeling of migrant flow across the continent, including responses to topographical features (20).

Migration forecasts will further ecological research while aiding monitoring and mortality mitigation efforts. Accurate predictions can inform decisions to temporarily shut down lights and wind turbines, halt gas flares, choose airplane flight paths, and take other actions to prevent human and avian mortality (10, 21). Global health workers monitoring avian-borne diseases can use migration forecasts to anticipate bird movements. Further integration of large citizen science datasets with radar observations will provide the means to study species-specific patterns of behavior at a large scale (22), and studying local variation in migratory behavior will lead to more accurate models of atmospheric bird distributions (23). Migration forecast systems have great potential to aid environmental monitoring and conservation efforts; fully realizing this potential will require the cooperation not just of scientists but also of governments and agencies that produce and disseminate radar products (21).

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## SUPPLEMENTARY MATERIALS

[www.sciencemag.org/content/361/6407/1115/suppl/DC1](http://www.sciencemag.org/content/361/6407/1115/suppl/DC1)  
Materials and Methods  
Figs. S1 to S10  
References (25–37)

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