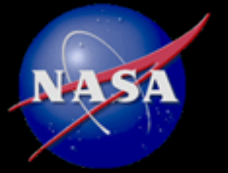


Continental Patterns of Bird Migration Linked to Climate Variability



Every spring, migratory birds arrive in the continental United States to breed. But precisely when they arrive each spring varies annually. Goddard scientist Amin Dezfuli led a study published in the Bulletin of the American Meteorological Society which linked this variability to large-scale climate patterns originating thousands of miles away.

Using 23 years of bird migration data collected via NOAA's Next Generation Radar system (NEXRAD)—a network of 143 radar stations across the continental U.S. — the scientists realized the U.S. could be divided into two regions, east and west, each with a distinct pattern of variability in bird arrival times.

They found that variability in the west region was strongly linked to regional air and sea surface temperature in the adjacent (Pacific) Ocean. The variability in the east region, however, was more strongly linked to large-scale atmospheric disturbances called Rossby waves.

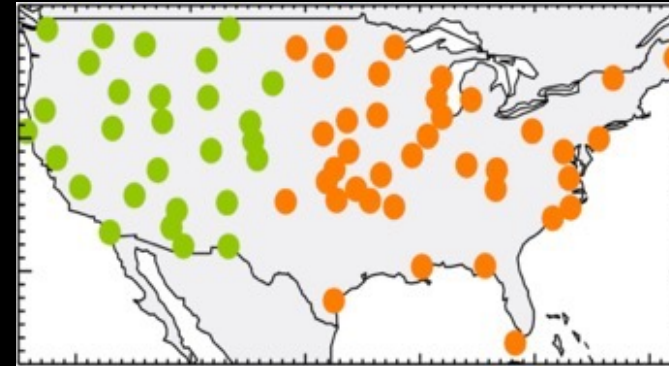


Figure A: Two regions based on interannual variability of peak bird migration date in spring. Circles show the location of NOAA's NEXRAD stations.

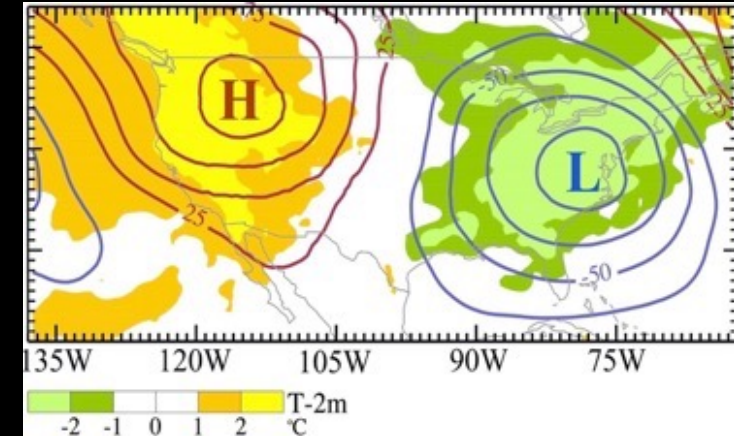


Figure B: Difference of near-surface temperature between spring 2005 and 2010 (contour lines)—years with notably east-west contrast in arrival dates of migratory birds: the western region shows an earlier date in 2005 and a later date in 2010. The opposite happened for the eastern region.

Dezfuli, A., Horton, K.G., Zuckerberg, B., Schubert, S.D. and Bosilovich, M.G., 2022:

Continental patterns of bird migration linked to climate variability.

Bulletin of the American Meteorological Society, 103(2), pp. E536-E547. doi.org/10.1175/BAMS-D-21-0220.1

<https://www.nasa.gov/feature/esnt/2022/nasa-study-climate-patterns-thousands-of-miles-away-affect-us-bird-migration>