

Challenge**LESSON 1*****Migration Patterns***

The ruby-throated hummingbird spends winters in Mexico or Central America and migrates to North America for summers. The locations of the first birds spotted in the spring of 1999 and spring of 2009 are listed in the table below.

Spring 1999			Spring 2009
Month	First-Bird Reports	Month	First-Bird Reports
February	southern tip of TX; southern borders of LA, MS	February	southern borders of TX, southeast TX, LA, MS, AL; coast of west-central FL
March	central TX; northeast TX; southeast OK; southeast AR; mid-central MS; northwest AL; northern GA; western NC; northeast NC	March	north-central TX; northeast OK; central MO; southern IL; central IN; southern VA; southeast PA
April	west-central TX; western OK; north-central OK; southeast KS; northern MO; southeast IA; northern IL; southeast WI; central-western MI; southeast MI; northeast OH; east-central KY; central MA; southeast ME	April	southwest KS; north-central and northeast KY; southeast NE; north-central and northeast IA; north-central MN; northern WI; north-central Upper Peninsula eastern MI; western NY; NY/Canadian border
May	ND (1 bird); central KS; central NE; western ME; MN, WI, MI, NY, VT, NH, ME at the Canadian border	May	north-central/northeast MT and into central Canadian provinces; northern ND, WI, MI, NY, VT, NH, ME, into the central parts of the Canadian provinces (Alberta, Saskatchewan, Manitoba, Ontario, Quebec)

Map Migration Patterns

1. Obtain two maps or outlines of North America. On each map, plot the locations of the first birds spotted from February to May of each year for which data is listed in the table (1999 and 2009).
2. Fill in the areas on each map representing the locations of the birds for each month with a different color.
3. Analyze the maps. Describe the differences between the 1999 and the 2009 maps with respect to the following: (a) the arrival at the first locations, (b) the distances traveled by the birds, and (c) the range of their summer locations.
4. Hypothesize about the Earth system interactions that are influencing the behavior of the ruby-throated hummingbird.