

Bird wintering ranges

Over a 48-year period, California bird species have collectively shifted their winter range northward.



California birds are found farther north today during the winter compared to almost 50 years ago. Many bird species regularly migrate — mostly north and south between breeding and wintering grounds — to take advantage of available resources and favorable conditions at each location. During the fall, birds migrate south in response to shorter day length, lower temperatures, and changes in food supplies.

The geographical area in which a species is distributed is called its “range.” Climate is an important factor that defines plant and animal ranges. Scientists have associated the collective shift in bird wintering ranges with warming winter temperatures. Although exceptions exist, animals in the Northern Hemisphere have generally shifted their ranges in recent decades toward more northern latitudes and higher elevations in response to warming temperatures. When bird wintering ranges shift, human and ecological communities lose not just the birds themselves, but also the valuable functions and benefits they provide.

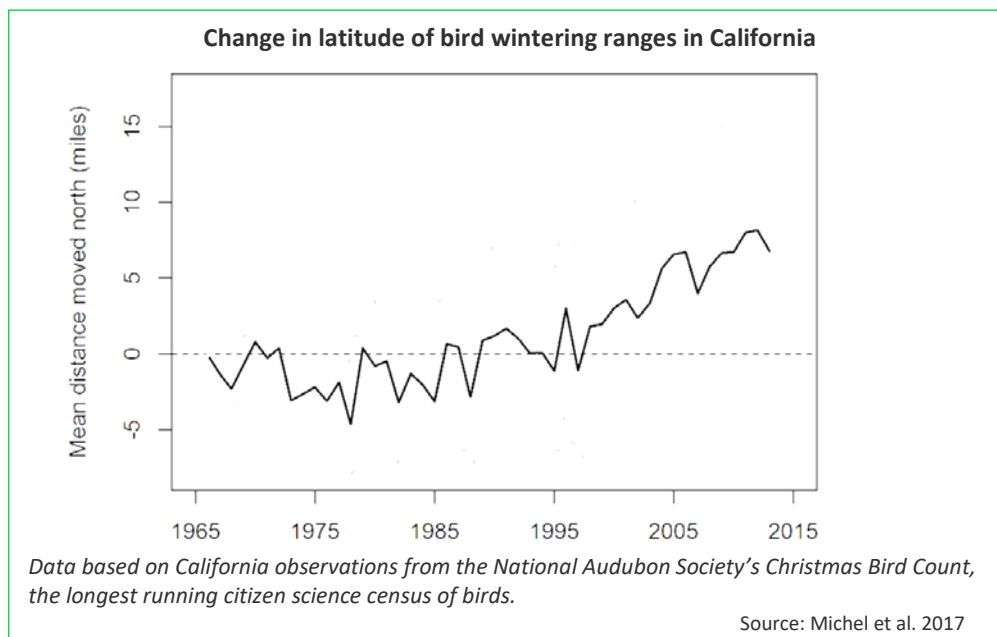


Snow geese in flight

Photo: Steve Emmons
US Fish and Wildlife Service

What does the indicator show?

The graph below shows changes between 1966 and 2013 in the collective wintertime average “center of abundance” of 234 migratory and resident bird species, relative to the winter of 1965-1966. The center of abundance is the midpoint latitude of the species’ geographic distribution from north to south. In other words, half of the birds are found to the north of this latitude, and the other half to the south. An overall northward movement of about seven miles was observed between 1966 and 2013, as birds moved a farther distance north than south.





Not all birds moved in the same direction: 87 species (37 percent) moved northward, 74 species (32 percent) moved southward, and 73 species (31 percent) showed no significant change. At 326 miles, the snow goose showed the greatest northward shift, while the Ross's goose showed the greatest southward shift, at 242 miles. These differences in range shifts are not surprising. Species have been found to respond to environmental change in a highly variable and idiosyncratic fashion, reflecting the complex interplay between land cover, climate, species interactions, and other factors. For bird species shifting northward, their wintering ranges were closely associated with warmer minimum temperatures in December.

The California findings were similar to those from a larger analysis of 305 bird species across North America. This analysis found that the average wintertime center of abundance moved northward by more than 40 miles over the same 48-year period. This northward shift was also associated with increasing winter temperatures.

Why is this indicator important?

Climate change is one of many factors threatening bird populations. Monitoring changes in the geographic distribution of birds provides scientists with a way to track which birds may be responding to a changing climate. A better understanding of these responses will help inform conservation strategies. As the climate continues to change, its pace may exceed many bird species' capacities to migrate to more favorable habitats. The predicted increase in extreme weather events, such as severe storms, might also impact the ability of birds to make these range shifts.

Range shifts can impact the areas birds formerly occupied and the new areas they inhabit. Valuable services provided by birds are lost or diminished when they move away. For example, western bluebirds eat insects that damage crops, nectar-eating birds like hummingbirds pollinate flowers, and birds like woodpeckers build roosting cavities in trees that other bird and mammal species use. The movement of a species to places where it was not previously present, or where it was present in lower numbers, may disrupt complex ecosystem interactions. For example, a newcomer species may compete for food or other resources with species that already inhabit the area.



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<https://oehha.ca.gov/climate-change/report/2018-report-indicators-climate-change-california>