

Tracking the Spectacle of Migration

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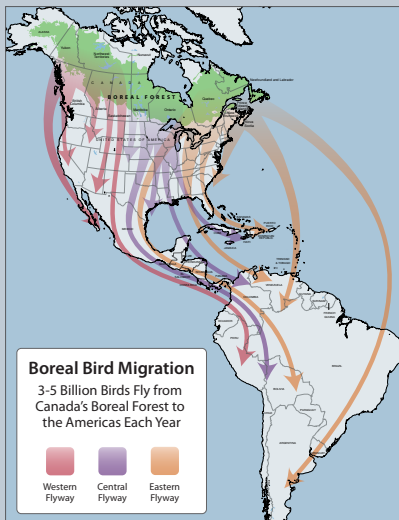
Weather Radar Reveals the Nocturnal Flight of Billions of Birds from the Boreal Forest

From now to October, billions of birds are flying from Canada's Boreal Forest, the "Bird Nursery of the North" to their southern wintering grounds.

From Labrador to Yukon, the Boreal Forest of Canada is the vital breeding grounds for billions of North America's birds. Each fall 3-5 billion birds migrate south from the Boreal Forest to their wintering grounds in the U.S. and Central and South America. They include warblers, thrushes, sparrows, flycatchers, hawks, ducks and shorebirds.

Almost all of these species make tremendous migratory movements under the cover of darkness undetected by most people. On some nights of heavy migration, tens of thousands of birds may pass over a single location – a migratory spectacle of global proportions – without notice from the human population living below.

Three hundred and twenty-five bird species occur in Canada's Boreal Forest – almost half of all the bird species in North America. For nearly 100 of these species the Boreal Forest supports more than 50% of their global population. Canada's Boreal Forest region is one of the largest unspoiled forest ecosystems remaining on earth, and its role as a vital spring nesting ground has earned it the nickname "Bird Nursery of the North."



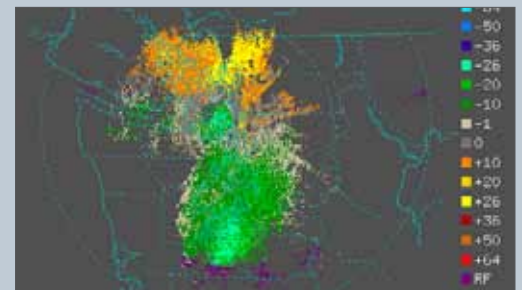
Boreal Bird Migration

Weather Radar is a Great Tool for Tracking Bird Migration

"Radar ornithology" is the practice of using Doppler radar to track nocturnally migrating birds. The radar shows where birds are moving, in what direction, and how many are aloft. If you combine those features from the radar with the weather forecast you can make reasonable predictions about whether large flocks of birds might be passing overhead or stopping near your area for the day, both of which make for good bird-watching. Birds will often land when nearing a storm, which also makes for easier predictions.

On a typical evening during spring and fall migration, birds begin departing 30 minutes after sunset, with the largest number of migrants in the air about two hours after sunset. It is believed that birds migrate at night because the atmosphere is calmer, there are fewer active predators, and the cooler temperatures help in reducing water loss. This nighttime departure is visible on radar. As birds leave their daytime stopover sites and climb to typical migration altitudes (500m/1500ft to 5,000m/15,000ft), they enter the radar beam and begin reflecting energy. Such departures appear as rapidly expanding circular (or nearly circular) patterns in a base reflectivity image as more birds climb into the radar beam.

Meteorologists are often taught to ignore radar echoes that are not related to weather, but in doing so they may not realize that so-called "noise" or "artifacts" are actually images from thousands of nocturnally migrating birds. A wonderful new dimension to weather forecasts can be added by letting people know when a major migratory movement is underway and encouraging them to step outside and listen for the high-pitched calls raining down from the night sky. People can also be encouraged to view the moon with binoculars or telescopes on heavy migration nights as individual migrating birds can be seen passing in front of the moon.



In this Doppler velocity image from April 2009, greens indicate incoming (from the south) and yellows are outgoing (to the north), showing that birds are moving north (as expected during spring migration).



In this September 2009 Doppler image, the blue and green circles are migrant birds in clear skies, except in Florida and south Texas where you can see some showers that appear as typical ragged-edged images.

Birds Play a Key Role in the Health of Forests

Birds – not just bees – are important pollinators. Nectar-eaters like hummingbirds and some warblers act as vital pollinators for many wildflowers. For instance, it is believed that as many as 19 species of plant have coevolved with the migratory Ruby-throated Hummingbird, which can be found scattered across southern Canada. Boreal-dependent breeding warblers like the Cape May Warbler and the Tennessee Warbler feed extensively on pollen in their Caribbean and Central American wintering grounds and likely serve a crucial role in maintaining the diversity of the tropical forest ecosystems in which they winter.

In addition, some birds play a vital role in pest control. Insects like spruce budworm and pine beetle often experience years of relatively low population followed by an outbreak, which is often correlated with the weather and climate. Birds that eat these bugs play a vital role in mitigating population outbreaks, and can even open holes in trees that expose larvae to outside factors that further reduce dramatic outbreaks. For example, the Pileated Woodpecker has been found to eat Mountain Pine Beetles, which have posed a significant threat to forests in Western Canada. In total, the services that birds provide have been valued at as much \$5,000 per year per square mile of forest, translating to billions of dollars worth of environmental services.



74% of the Common Loon's North American population breeds in the Boreal



94% of the Lesser Yellowlegs' North American population breeds in the Boreal



83% of the Cape May Warbler's North American population breeds in the Boreal



88% of the Boreal Chickadee's North American population breeds in the Boreal

Additional Information

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Boreal bird B-roll available upon request

More on Dr. Wells

Watch a Maine Public TV segment with Dr. Jeff Wells tracking Boreal bird migration using audio recording devices and weather radar:

www.mpbnet.net/Television/LocalTelevisionPrograms/MaineWatch/tabid/477/ctl/ViewItem/mid/3470/ItemId/1030/Default.aspx

More on Boreal Birds

Visit: www.borealbirds.org

Data Sources

Clemson Radar Ornithology Lab:
virtual.clemson.edu/groups/birdrad/comment.htm

The Feather and the Flower:
www.featherflower.blogspot.com

April Doppler Map:
cliffmass.blogspot.com/2009/04/theres-bird-in-my-radar.html

Current U.S. Doppler Radar Map:
www.weather.gov/radar_tab.php