

The background of the slide is a light brown color with several large, stylized autumn leaves in shades of orange and yellow scattered across it. The leaves have prominent veins and are arranged in a way that they appear to be floating or falling. The overall aesthetic is warm and seasonal.

The Mystery of Bird Migration

Michael Obilade and Javier Burgos

Definition of Migration

- Migration is the predictable movement of an animal from one location and climate to another location and climate
- Typically these movements are linked to resource availability, seasonal changes and reproduction
- <http://www.njaudubon.org/Education/Oases/Migration.html>

Canada Goose

- Migrates in the fall & winter
- As far south as California
- Weighs 8-10lbs
- Migrates primarily through sight
- Found throughout the US
- Migrates in "V-Pattern" for energy conservation



Image courtesy of U.S. Fish and Wildlife Service.

Canada Goose

- Migrates in V-shaped formations
 - Conserves energy by reducing drag
 - Up to 70% more distance associated with updrafts created by lead bird
- Excellent eyesight for navigating and seeing other geese
 - Can see 270 degrees around head
- Migrating speeds: 30-60 mph.

Herring Gull

- Have good memories
- Navigate along coastlines
- Social birds
- State bird of Utah



Image courtesy of Adrian Pingstone.

The Red-Tailed Hawk

- Quite common
- 2-3 pounds (mg)
- Migrate from Aug to October
- Migrate "South"
- Not over water
- Fond of Mexico



Image courtesy of the U.S. Geological Survey.

Black-Capped Chickadee

- Small: 12-14 cm.
- Distributed throughout the northern states and most of Canada
- Year-round residents
- Eat insects, berries
- An active little bird



Image courtesy of [Wikipedia.com](https://www.wikipedia.com)

Baltimore Oriole

- Winter residence: Mexico, upper South American countries
- Summer residence: Eastern North America (up to Ontario and Nova Scotia)
- Main diet: insects (caterpillars, ants beetles) and fruits (berries)
 - Insects during the spring and fall; more fruit before and during migration

Oriole Migration Patterns

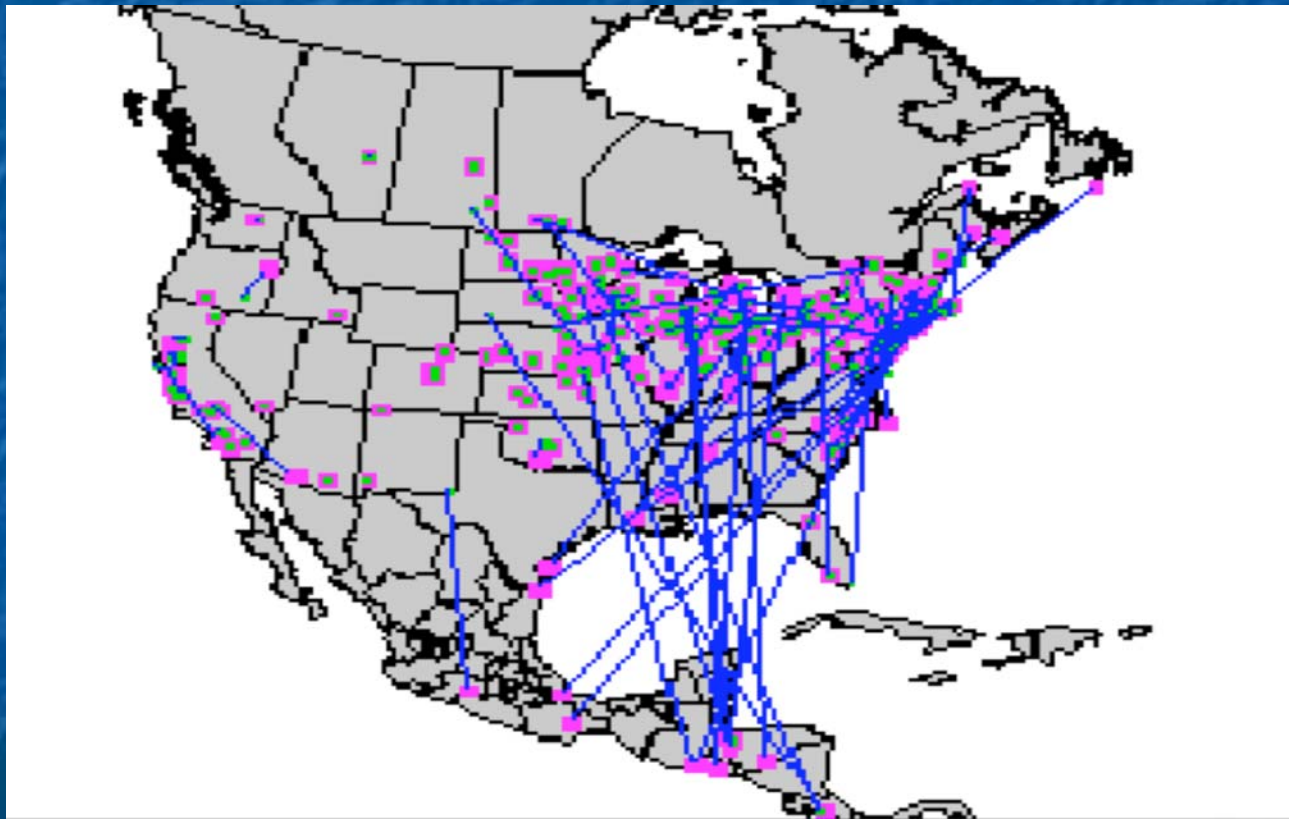


Image courtesy of U.S. Fish and Wildlife Service.

Wood Ducks

- Winter Residence: Southern US
- Summer Residence: Southern Canada
- Migrate in Pairs or small groups
- Rely heavily on sources of water: swamps, and woodland rivers and ponds; flooded fields during migration as well
- Migrate during the day and eat aquatic plants and seeds

Connecticut Warbler Migration

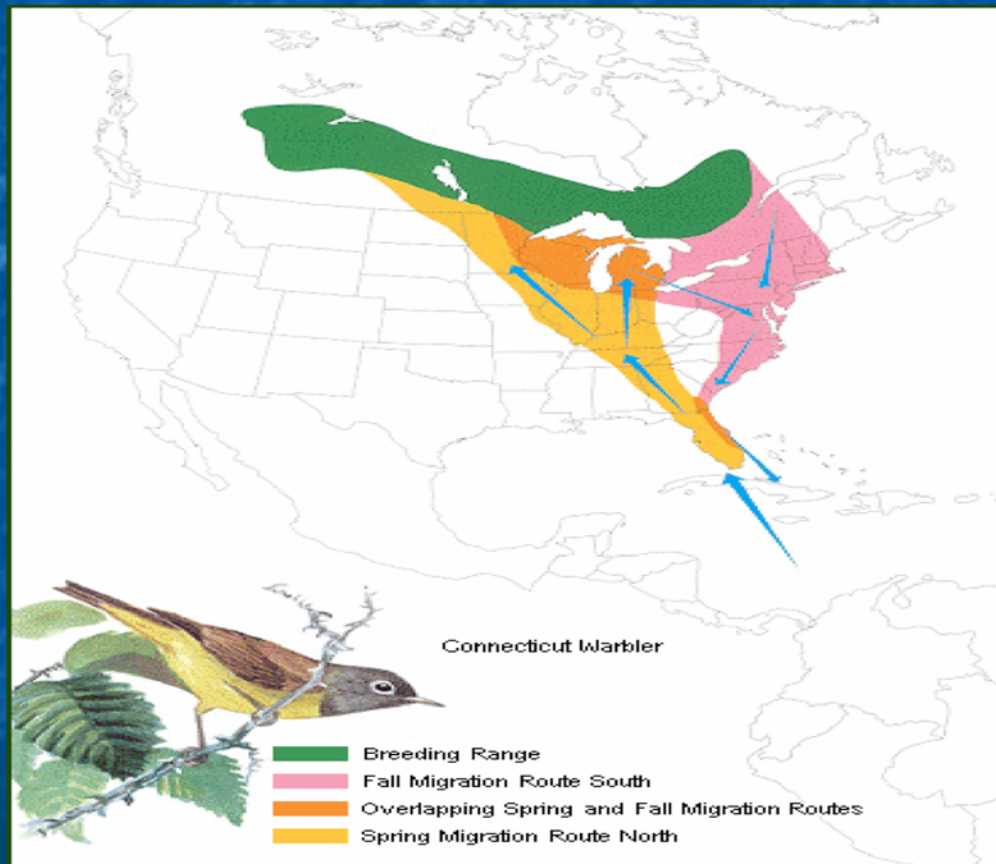


Image courtesy of the U.S. Geological Survey.

North American Flyways

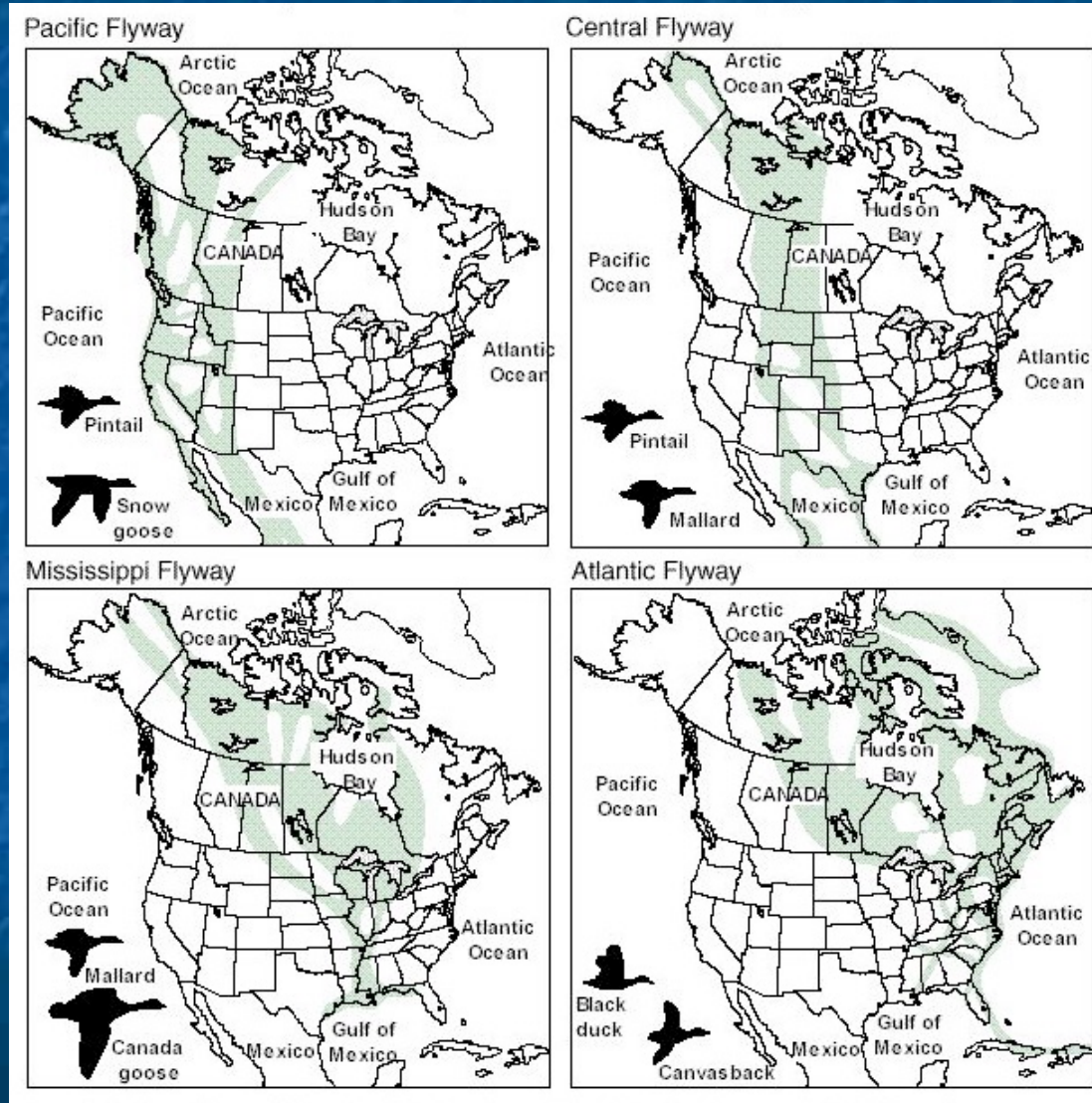


Image courtesy of U.S. Geological Survey.

Methods of Navigation

- Navigate by the Sun and the Stars
 - Even nocturnal birds
- Magnetic Field of the Earth
 - Chemical processes/magnetite
 - Act as nerves giving birds a 'sixth' sense
- Landmarks
 - Natural (rivers) & Man-made (highways)

Factors in Migration

- Winds
 - Birds follow tailwinds to facilitate migration and conserve energy
- Fuel
 - Birds revert to a diet of fruit for more fat
- Landmarks/Waterways
 - Land birds (plains, shrubs) and Waterfowl (coasts, islands)
 - Cold fronts/hot fronts affecting climate

Characteristics of Migration

- Most songbirds migrate at night
 - Must catch food during the day
- Miles/night: 300-600 miles depending on factors like wind and rest.
- So in terms of time, a 3000 mile journey will last about 3-4 weeks.
- <http://www.ornithology.com/lectures/MigrandNavig.html>

The End...

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