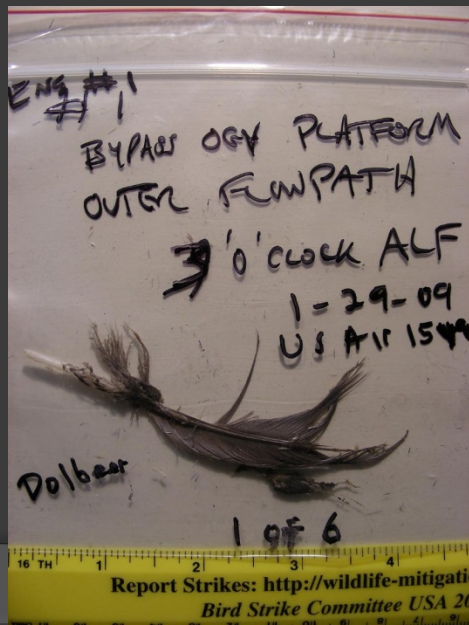


Continental U.S. Commercial Airport Bird Strike Incidents 1990-2010

Why did I choose this topic?

- I have taken a few single-engine flight lessons from Beverly Airport.
- My father used to work at GE Aircraft Engines in Lynn where they would test engines against birdstrikes.
- I wanted to find out how the January 15, 2009 ditching of US Airways Flight 1549 into the Hudson River was possible by a Canadian Geese birdstrike and if there was any geographic relation to where birdstrikes occurred.



Continental U.S. Commercial Airport Bird Strike Incidents 1990-2010

- A bird strike (sometimes birdstrike, avian ingestion (only if in an engine), bird hit, or BASH - Bird Aircraft Strike Hazard) is a collision between an airborne animal (usually a bird or bat) and a man-made vehicle, especially aircraft.
- Human deaths as a result of birdstrikes are very low with an estimate of 1 death per every 1,000,000,000 flying hours.
- Most bird strikes (65%) cause little damage to the aircraft; however, the collision is usually fatal to the bird.
- Physical damage from birdstrikes to the aircraft themselves is costly. They cause annual damages around \$400 million within the U.S. and up to \$1.2 billion to commercial aircraft around the world.
- According to the International Civil Aviation Organization, 90% of birdstrikes occur close to airports at either take-off or landing.



FAA National Wildlife Strike Database (with USAF/BASH at Joint Use Airports)

Database Categories:

Operator (Airline); Aircraft type; Incident date; Airport Code; Airport Name; State; Runway; Phase of flight; Damage; Weather; Species; Number of birds sighted; Remarks

Beverly Airport Birdstrike Incident Example:

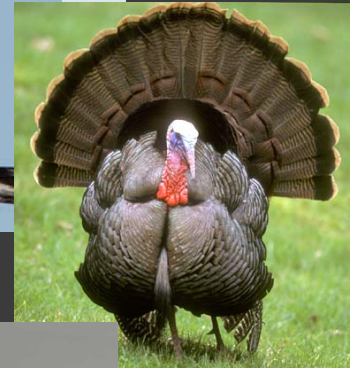
EXECUTIVE JET AVIATION; CITATION X; 4/28/2010; BVY; BEVERLY MUNI ARPT; MA; 16; Landing Roll; Overcast; Gulls; 2-10; BIRDS NOT VISIBLE FROM TOWER. BIRDS SITTING ON WHITE T/D ZONE MARKINGS. REMAINS COLLECTED BY ARPT MGMT.



Number of Incidents at Our Local Airport, Beverly Municipal Airport (BVY)

There were 15 incidents at Beverly Airport from 1990-2010:

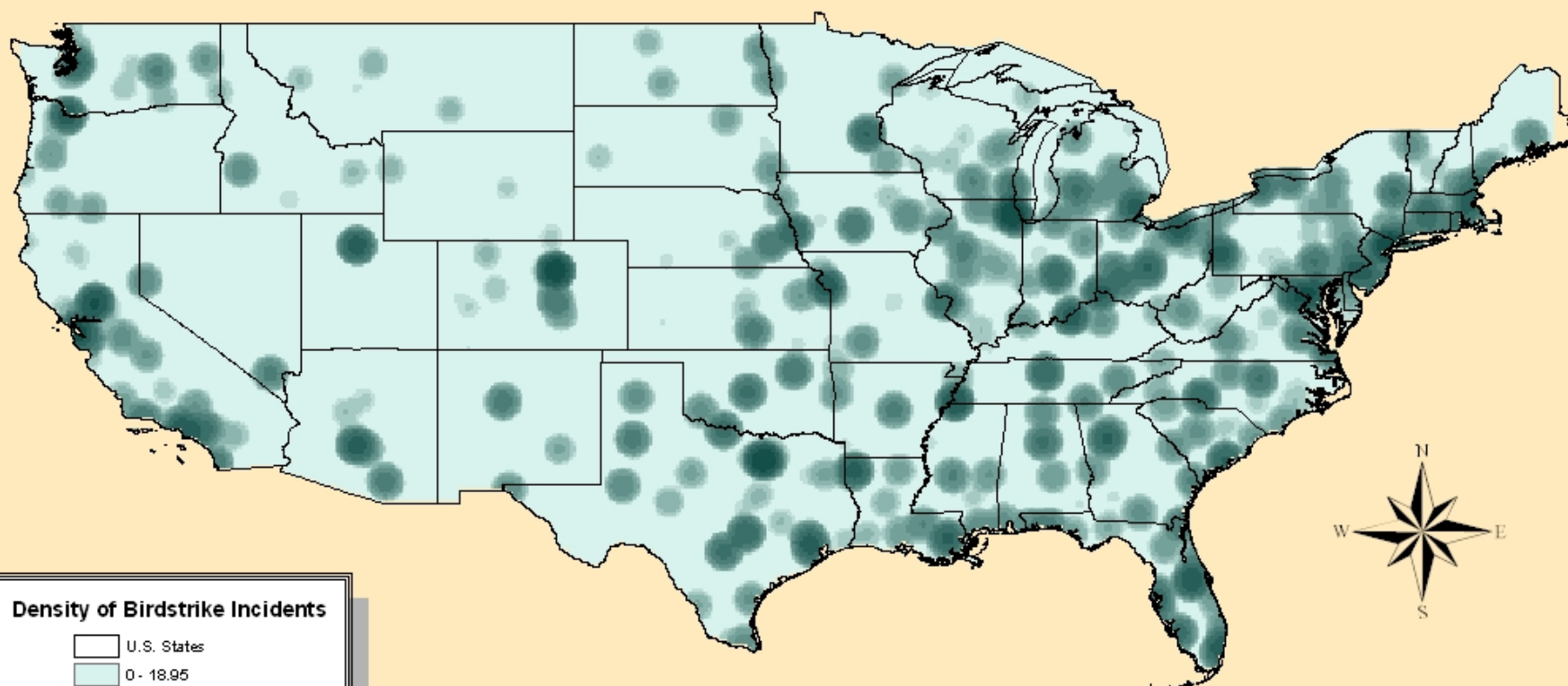
- 5 were caused by gulls.
- 5 were caused by White Tailed Deer.
- 2 were caused by Canadian Geese.
- 1 was caused by a wild turkey.
- 1 was caused by a European Starling.
- 1 was caused by an unknown species.



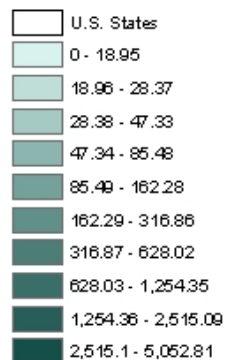
Process for Creating My Maps

- 1.) Downloaded a States shape file
- 2.) Downloaded a U.S.-Airports shape file
- 3.) Obtained FAA Bird Strike Reports from website.
- 4.) Combined Strike Report 1990-Current into one Excel worksheet. (Over 100,000 separate incidents)
- 5.) Deleted all information from reports except the “airport code” column.
- 6.) Saved the bird strike airports column as a CSV file.
- 7.) Opened States and U.S.-Airports layers in ArcMap and selected only the lower 48 states. Imported the new birdstrike table listing only airport codes.
- 8.) Summarized the number of airport codes and got the number of incidents at each airport as a result.
- 9.) Performed an Attribute Join with the summarized airport codes with US-Airports layer. This matched the number of incidents to the airport layer.
- 10.) Selected by attributes, only Cnt_Airpor greater than 0, to show only airports where a bird strike incident occurred.
- 11.) Performed a spatial analysis with density, also created a map with graduated symbols normalized by passenger enplanements, and finally overlayed a bird migration map onto the graduated symbols map to see any correlation.

Density of Continental U.S. Commercial Airport Birdstrike Incidents from 1990-2010 (Geometrical Interval)



Density of Birdstrike Incidents



0 255 510 1,020 1,530 2,040 Miles

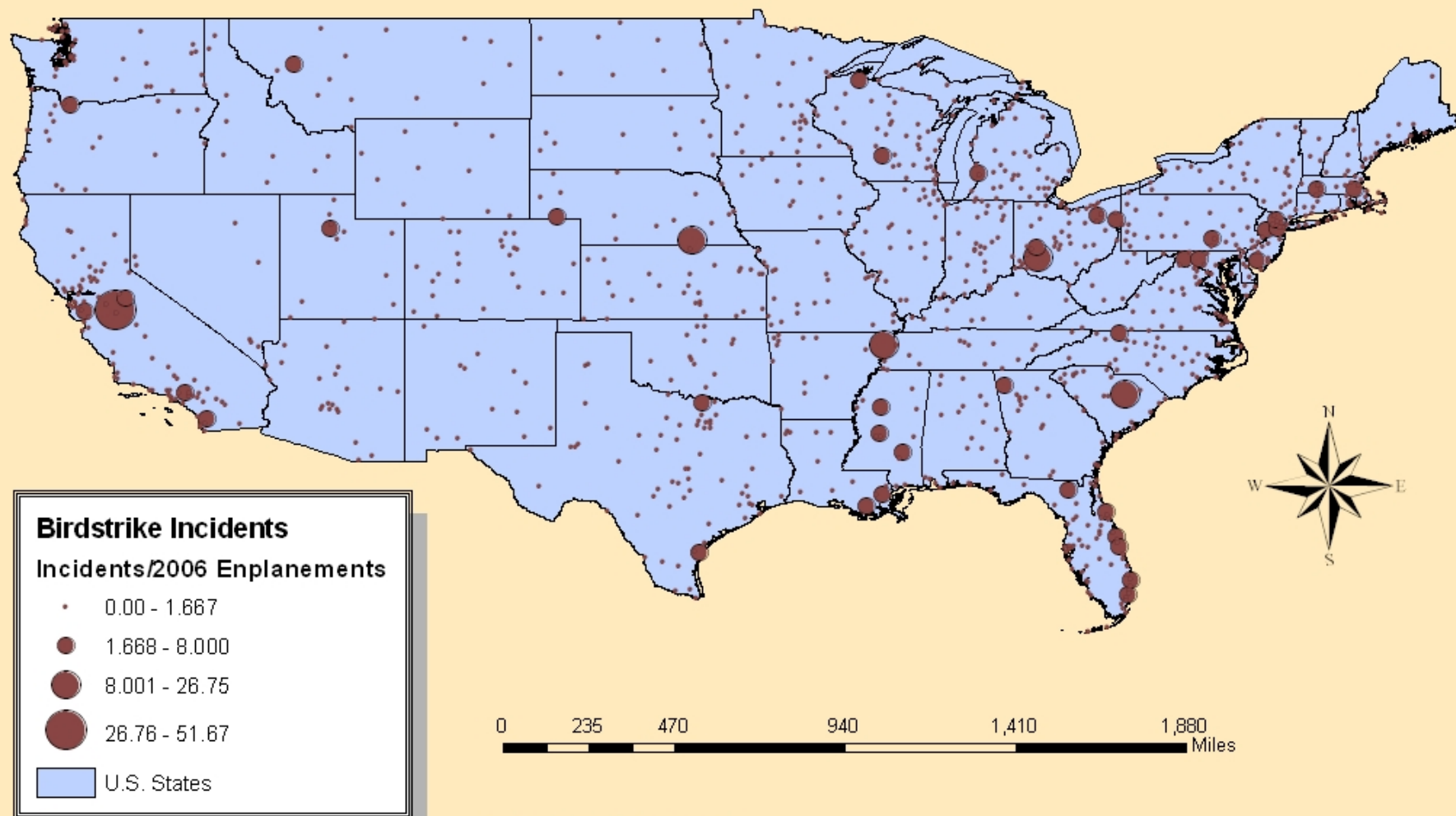
Projection: GCS_WGS_1984

Datum: D_GCS_WGS_1984

Data: FAANational Wildlife Strike Database, Statemaster.com, GeoCommunity.com, Koordinates.com

Created by: Sean McDermott, 2010

Number of Continental U.S. Commercial Airport Birdstrike Incidents from 1990-2010 Normalized by 2006 Passenger Enplanements



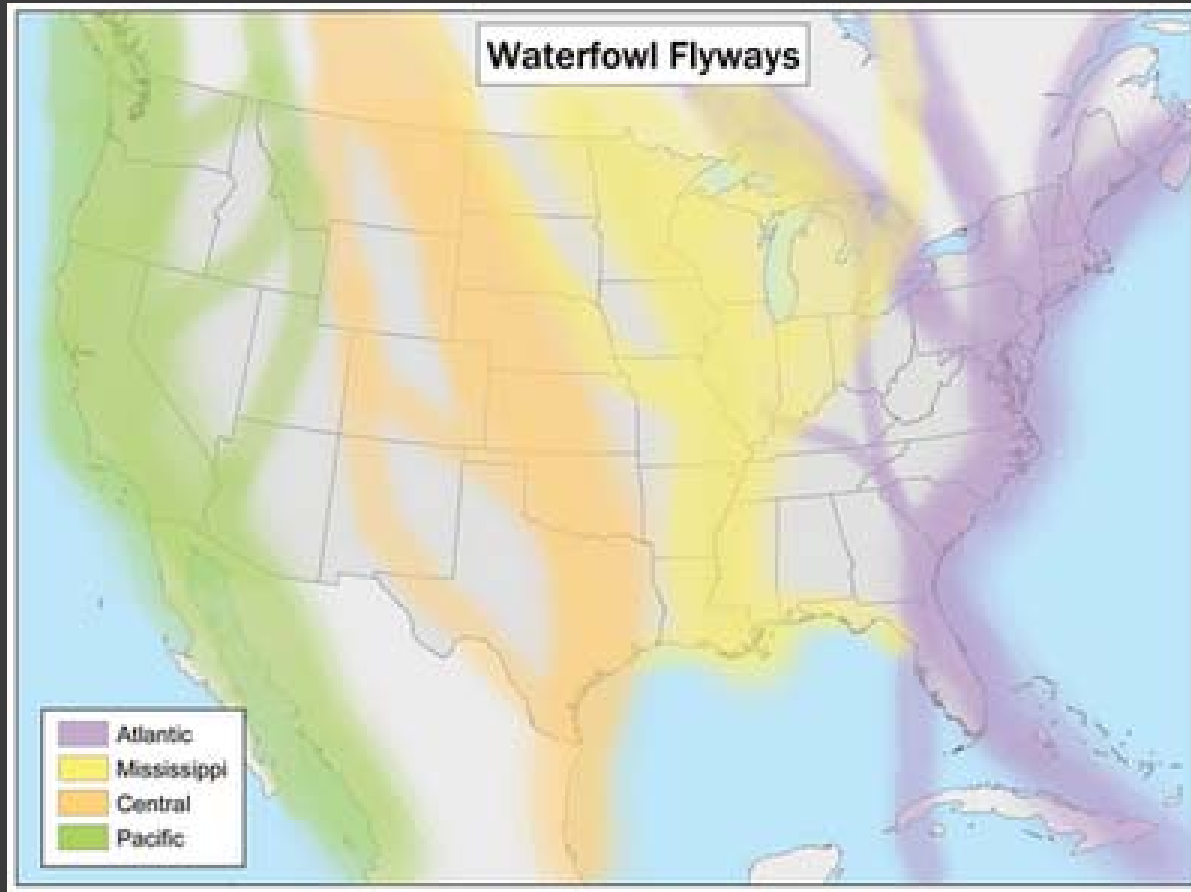
Projection: GCS_WGS_1984

Datum: D_GCS_WGS_1984

Data: FAANational Wildlife Strike Database, Statemaster.com, GeoCommunity.com, Koordinates.com

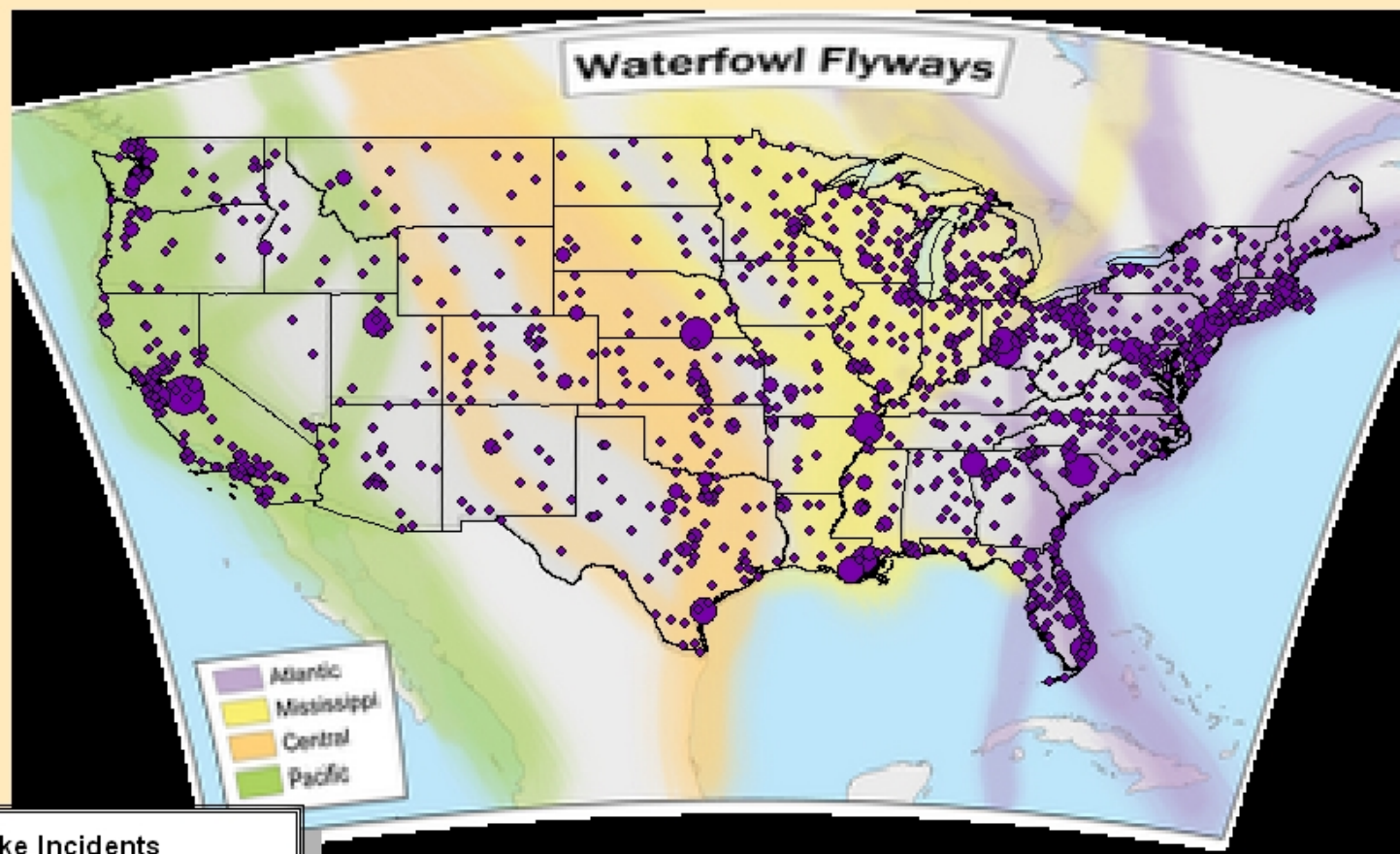
Created by: Sean McDermott, 2010

Location of Waterfowl Flyway Migration Routes in the United States



Statemaster: Bird Flyways Map. <http://www.statemaster.com/encyclopedia/Atlantic-Flyway>

Location of Continental U.S. Birdstrikes in Relation to Major Waterfowl Flyway Migration Routes 1990-2010



Birdstrike Incidents

Incidents/2006 Enplanements

- 0.000009215 - 0.7692
- 0.7693 - 3.333
- 3.334 - 8.000
- 8.001 - 26.75
- 26.76 - 51.67

U.S. States

0 265 530 1,060 1,590 2,120 Miles

Projection: GCS_WGS_1984

Datum: D_GCS_WGS_1984

Data: FAANational Wildlife Strike Database, Statemaster.com, GeoCommunity.com, Koordinates.com

Created by: Sean McDermott, 2010



Conclusion: Factors of Higher Water Fowl Birdstrike Incidents at Commercial Airports:

1. Airport is located within one of the four major bird migration flyways in the lower U.S. states.
2. Airports located closer to oceans and large bodies of water will encounter greater number of gulls.



Factors for future research:

Location of ground fowl (wild turkeys) and large mammal (white tailed deer) populations in relation to number of “birdstrike” incidents.



Works Cited

Statemaster: Bird Flyways Map.

<http://www.statemaster.com/encyclopedia/Atlantic-Flyway>

FAA National Wildlife Strike Database (with USAF/BASH at Joint Use Airports). Sept 24, 2010. Bird Strike Reports = <http://wildlife-mitigation.tc.faa.gov/wildlife/default.aspx>

Geo Community, Administrative/Political, United States.

<http://data.geocomm.com/catalog/US/group21.html>

Koordinates, US Airports, Bureau of Transportation Statistics. 27 Apr 2009. <http://koordinates.com/#/layer/748-us-airports/>