



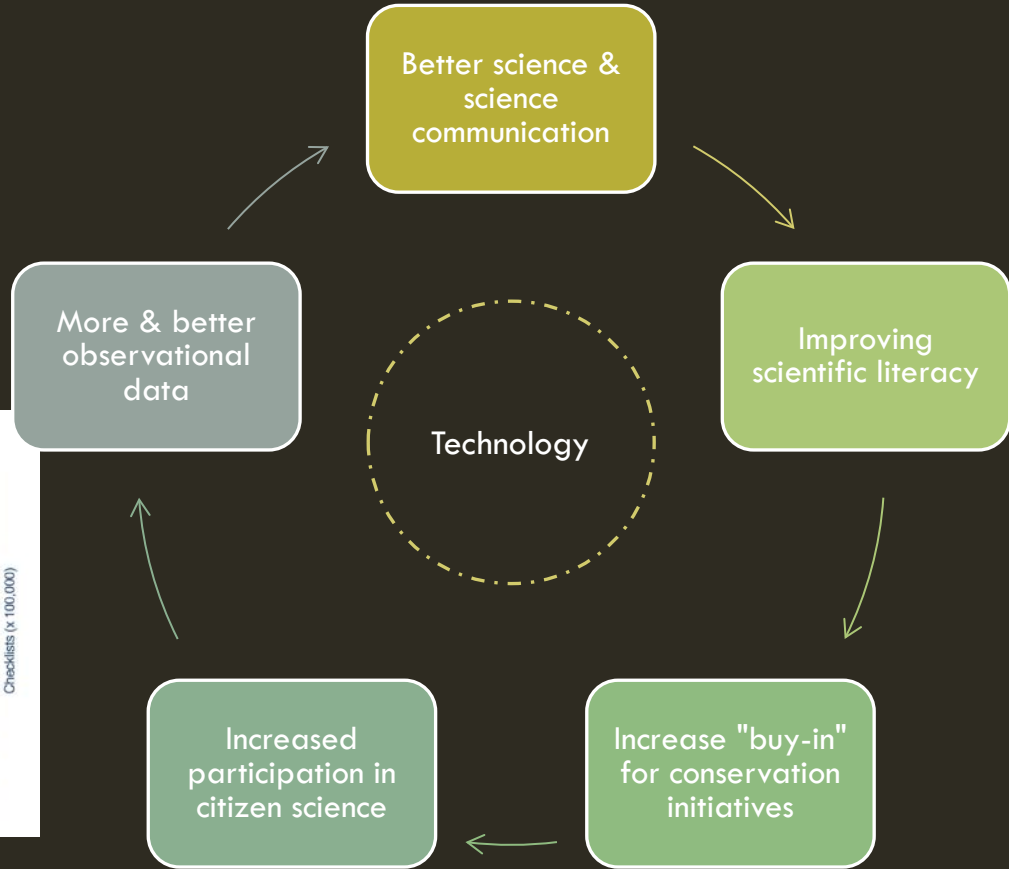
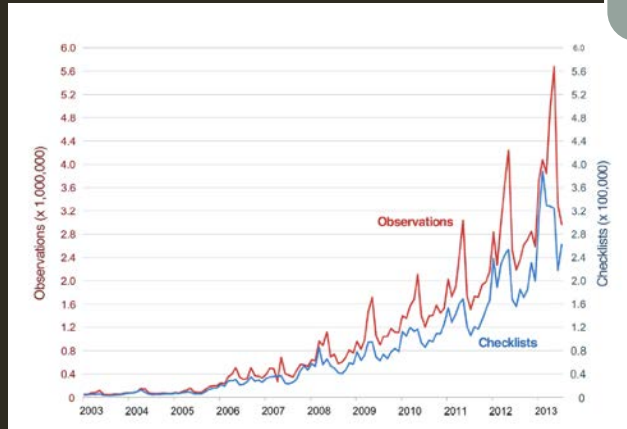
# Transforming Citizen Science Into Informative Range Maps

Laura Gast  
MGIS Candidate  
Pennsylvania State University

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Washington, DC

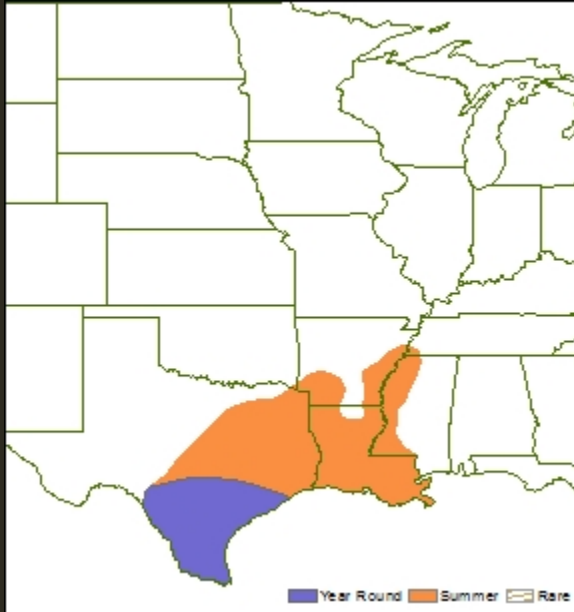


# Background

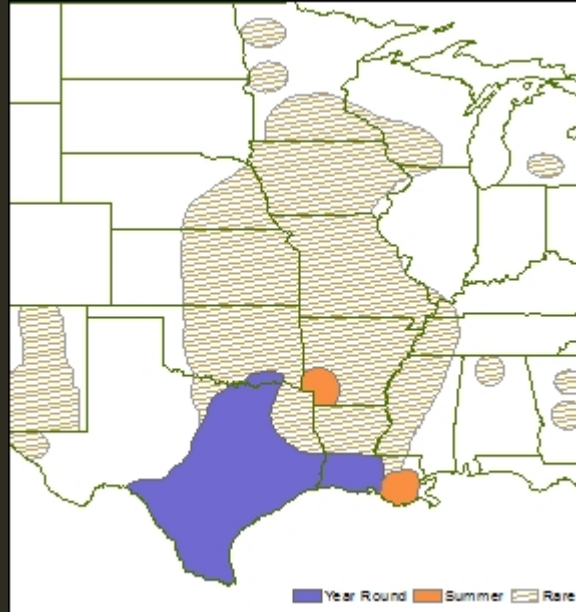


# Problem: Guide Book Ranges

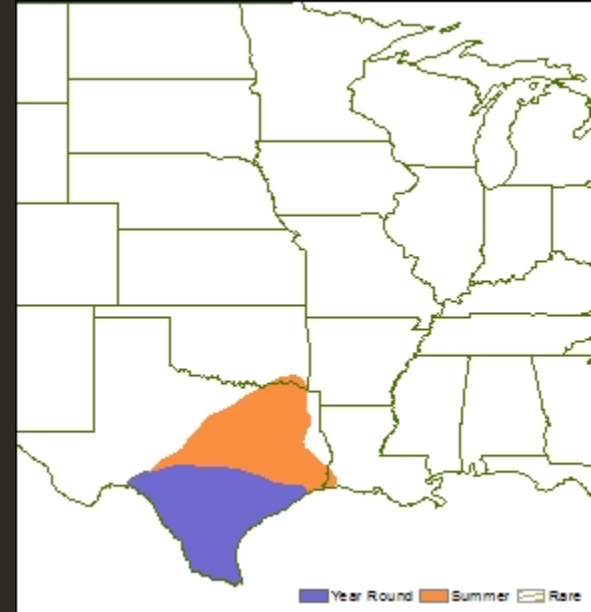
Cornell Lab Online



Sibley Guide (iPhone App)



Audubon Guide (iPhone App)

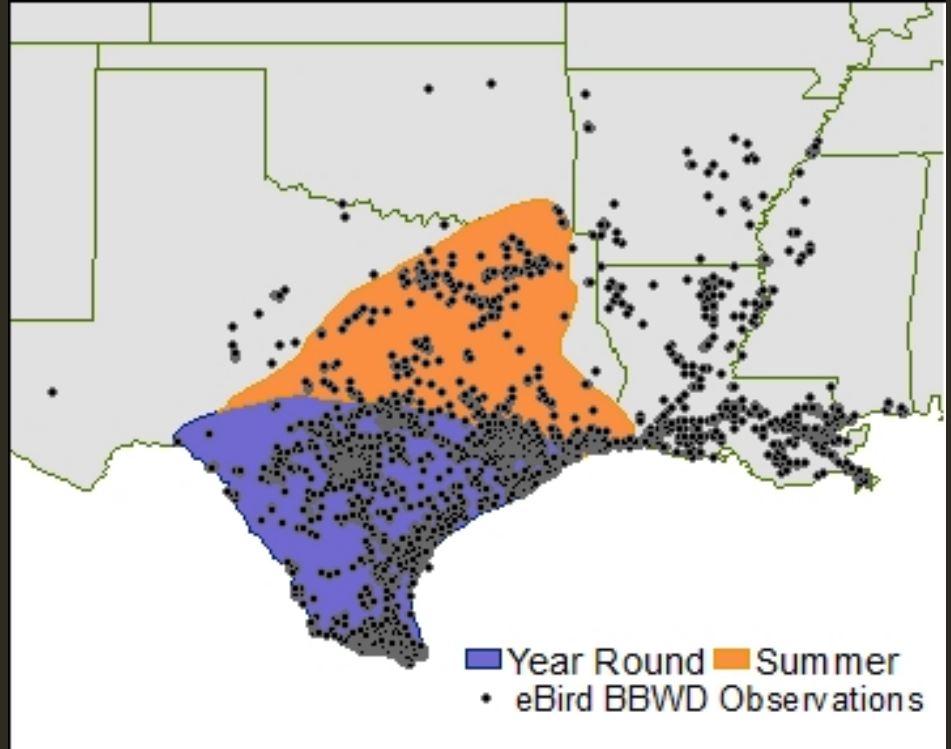


# Problem: Guide Book Ranges

Little public detail on how maps are delineated

- “expert knowledge”
- “niche modeling”

What observers are seeing in the field is not the same as what is shown in popular guide books.



Case Study:

# Black-bellied Whistling Duck In The Central USA

Citizen Science Observational data as compared with published range maps

## Data

- eBird dataset for all BBWD observations in 6 states in central USA
- Christmas Bird Count Data for all BBWD observations
- Georeferenced images of published range maps
  - Sibley (iPhone App)
  - Cornell (online)
  - Audubon (online)

## Software

- Data manipulation in R
- Mapping in ArcGIS



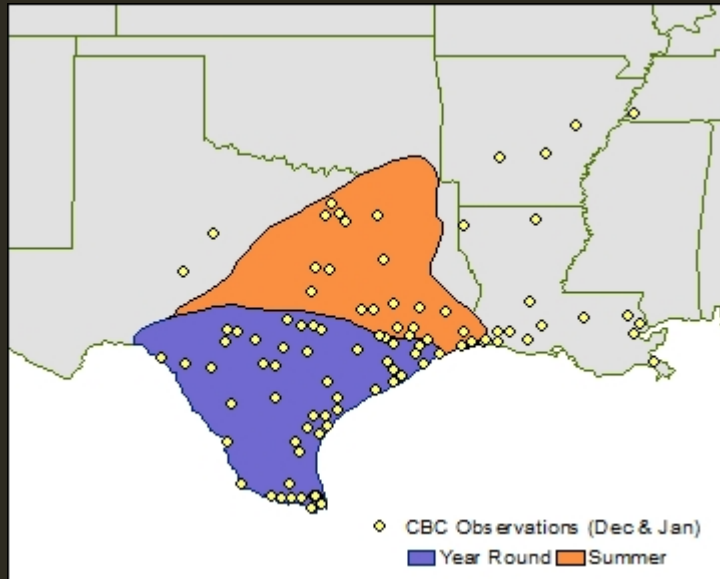
# Why are there Discrepancies?

<b>Model Choices</b>	Data	Niche Modeling? Constrained to study-based observations or Does it include citizen science observations?
	Time	
<b>Cartographic Choices</b>	'Edges'	

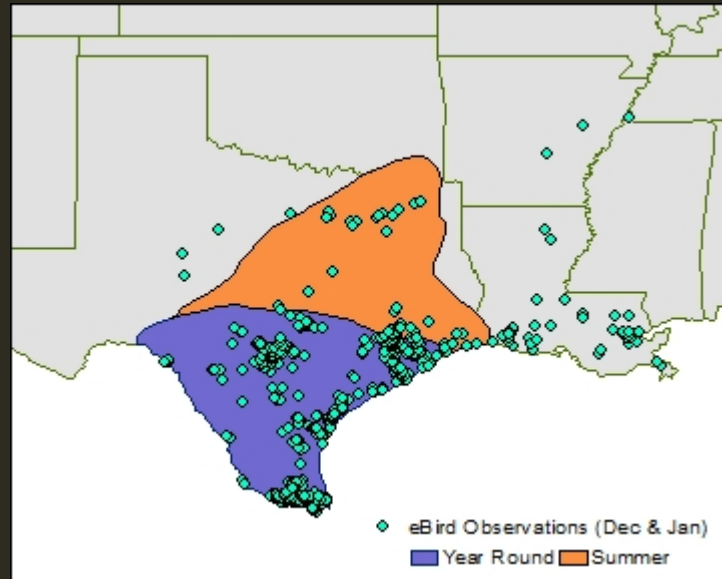
Discrepancies:

# Data Differences

Christmas Bird Count Observations



eBird Observations – Dec & Jan



# Why are there Discrepancies?

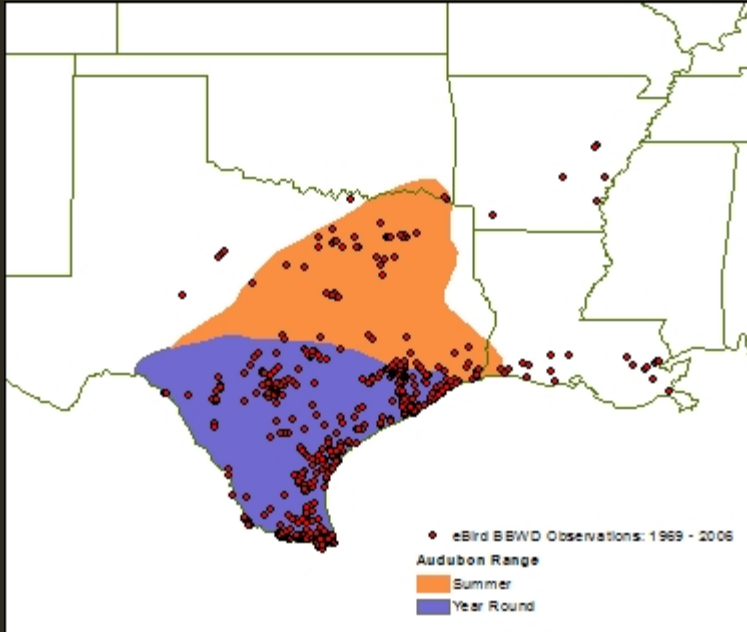
<b>Model Choices</b>	Data	Niche Modeling? Constrained to study-based observations or Does it include citizen science observations?
	Time	How often are maps updated? Print maps versus digital maps
<b>Cartographic Choices</b>	'Edges'	



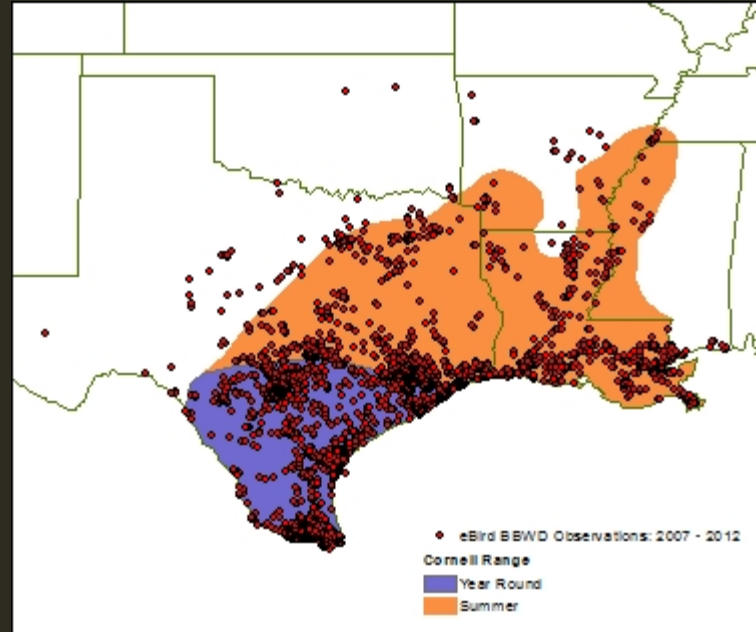
Discrepancies:

# Time Differences

1969 – 2006 & Audubon Range



2007 – 2012 & Cornell Range

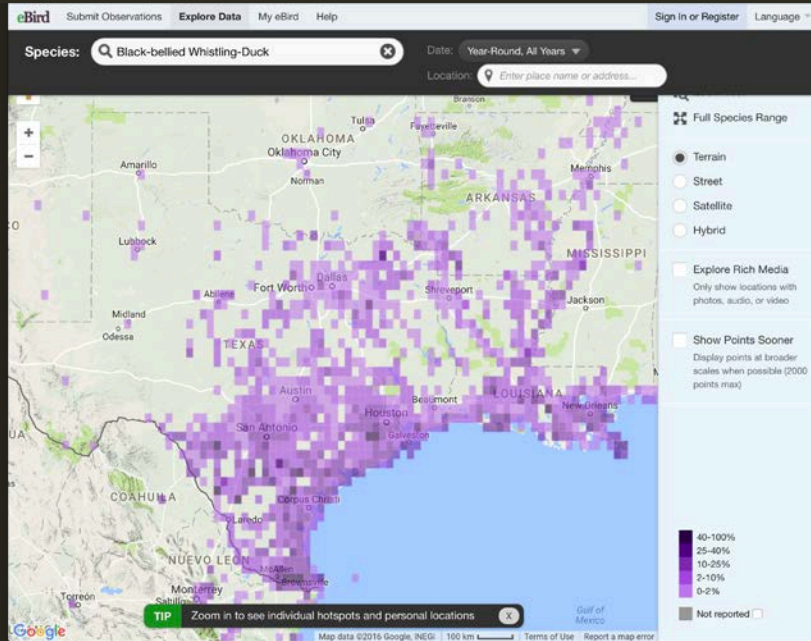


# Why are there Discrepancies?

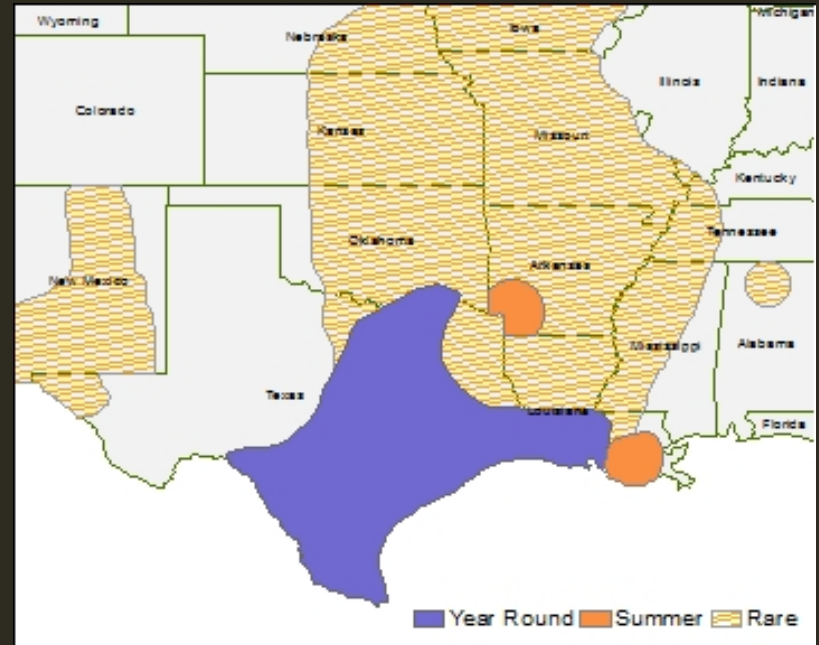
<b>Model Choices</b>	Data	Niche Modeling? Constrained to study-based observations or Does it include citizen science observations?
	Time	How often are maps updated? Print maps versus digital maps
<b>Cartographic Choices</b>	'Edges'	How are maps showing edges of range or possible expansions / 'rare' observation areas?

# Discrepancies: “Edges”

eBird Raster - Probabilities



Sibley Guide - “Rare” category



# Discussion & Suggestions

Model Choices	Data	Take advantage of eBird & citizen science data <b>**rapidly increasing**</b> submissions – quality & quantity are increasing as well
	Time	Take advantage of digital world Update maps more regularly Automation!
Cartographic Choices	'Edges'	“Rare” category

Science communication is critical to both good/effective policy, and community buy-in for conservation projects



# References

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Pennsylvania State University

[lauragast@gmail.com](mailto:lauragast@gmail.com)

