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Coo-Coo for CoCoRaHS: Participation in a Nationwide Meteorology Citizen Science Program

Adam M. Rainear

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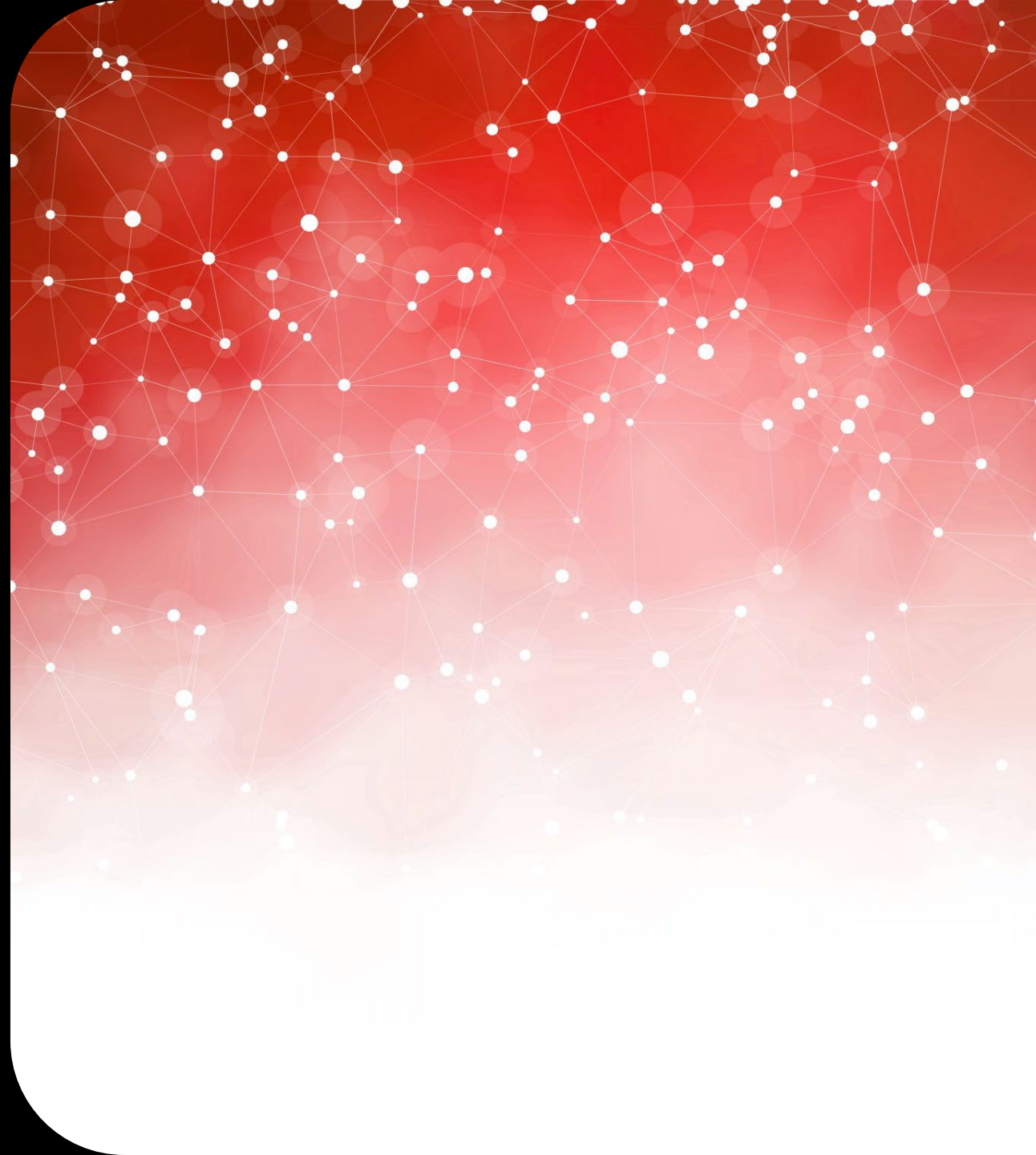


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**Coo-Coo for
CoCoRaHS**

**Participation in a
Nationwide
Meteorology Citizen
Science Program**

Adam M. Rainear
Department of Communication and Media



About Me

Assistant Professor of Media and Culture

B.S. in Meteorology

B.A. in Journalism

M.A. & Ph.D. in Communication

From Southern NJ

My “**first**” weather event: Hurricane **Floyd**

My **impactful** weather event: **Sandy**

My favorite: **tropical** systems and **blizzards**



Agenda

- Overview of Citizen Science
+ Why do we need it?
- Learning through science participation
- What is CoCoRaHS?
- My planned study



Citizen Science

6 ways to be a Citizen Scientist

WATCH FOR WHALES



Share your whale sightings so scientists can track their population trends.

GEOCACHE FOR A GOOD CAUSE



Gather field notes, photos, and GPS data at bench marks for location and height data.

TRACK THE TIDES

Report local water levels and flood impacts to help NOAA better understand and communicate about future floods.



FIGHT HARMFUL ALGAL BLOOMS



Collect water quality data that helps NOAA respond to harmful algal blooms.

BE A SANCTUARY STEWARD

Pitch in at a local marine sanctuary or estuarine research reserve.



MONITOR MARINE DEBRIS



Record the type and amount of debris on your beach to help scientists tackle the challenge of marine debris.



Citizen Science

“A method of mobilizing and democratizing the scientific process akin to how individuals are mobilized in democratic processes”

- Irwin, Citizen Science: A study of People, Expertise, and Sustainable Development



Akin to the democratic process

Citizen science to the field of (a given) science

=

Public engagement to the field of politics/political science

*It's our path to engagement, understanding, and literacy around a topic
(and it may be a better one than relying on news media/social media)*

Scientists - Why citizen science?

- Scientists NEED large amounts of data
 - + Often hard to collect
 - + Or deep in the weeds and muddy
 - + Or not enough collection sites
 - + Disrupts “normality”
- And engagement space with the public (and not one on TikTok!)
- Often asked to *act as both* researcher and advocate



Public – Why citizen science?

- The public often wants to *feel* involved on things
 - + Become engaged in meaningful collection, projects, processes
 - + More interest in exploration, knowledge, learning
 - + Help to increase literacy
 - + Upholds “normality”
- And engagement space with scientists (and not in a press conference, through the media, etc.)



Learning from Citizen Science



Might be the most important factor



Participants learn best methods for “helping” the environment



Internet/smart phones afford us new opportunities (low barrier to entry, cheap)



Often can be done individually, but comes together collaboratively



Communicative component/forming a network

Participant Motivations

- What makes someone WANT to participate in a (volunteer) science project?
 - + Former space (me in weather)
 - + Teaching others (kids, students, etc.)
 - + Boredom (hobby, something to do, something drawing you outdoors)
 - + Helping the environment (cleaning, learning more, tracking, being sustainable, etc.)
 - + Socialization!
 - + Recognition
 - + Democracy/upholding true scientific method

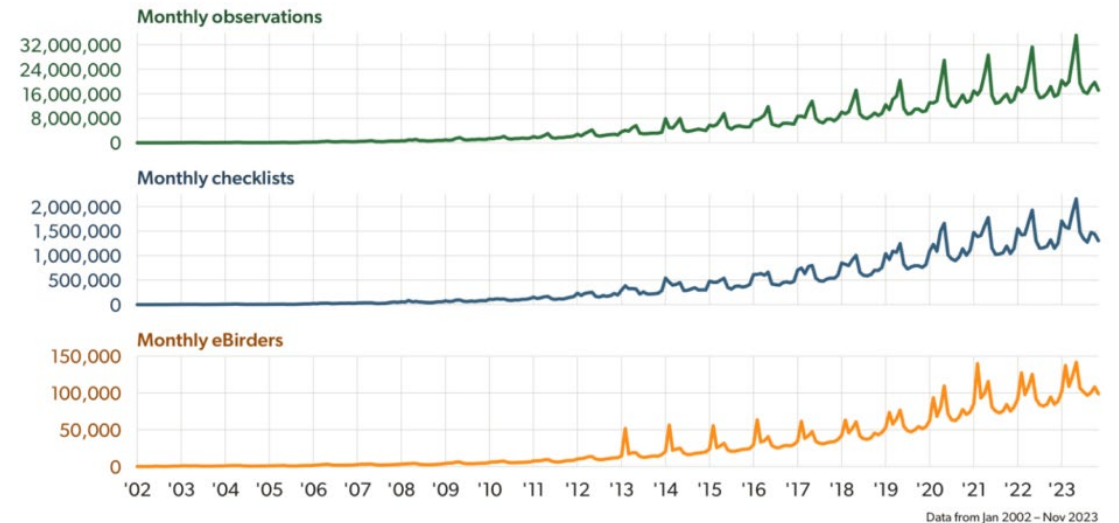
What makes a strong program?

- Level of participation aligns with participants daily activities
- Data collection should align with strengths in population
- Attracting participants through strong goal development (alignment)
- Social factor
- Reasonably frequency, duration
- Recognition

Merlin Example

- In 2023...eBird recognized these achievements
 - + Advancing understanding of bird populations (150+ journal articles; almost 1000 total all time)
 - + Able to model abundance and range maps for 2400+ species and trends for almost 900

eBird Growth



My eBird Download (csv)

World Life List

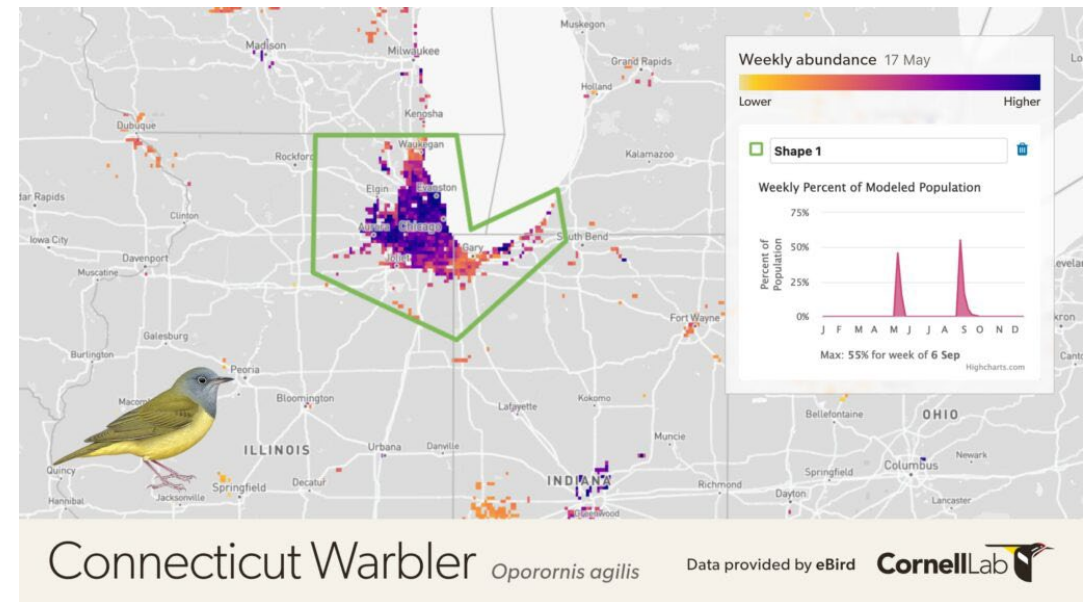
492 Species observed [Detailed stats](#)

INCLUDED IN TOTAL NOT INCLUDED IN TOTAL

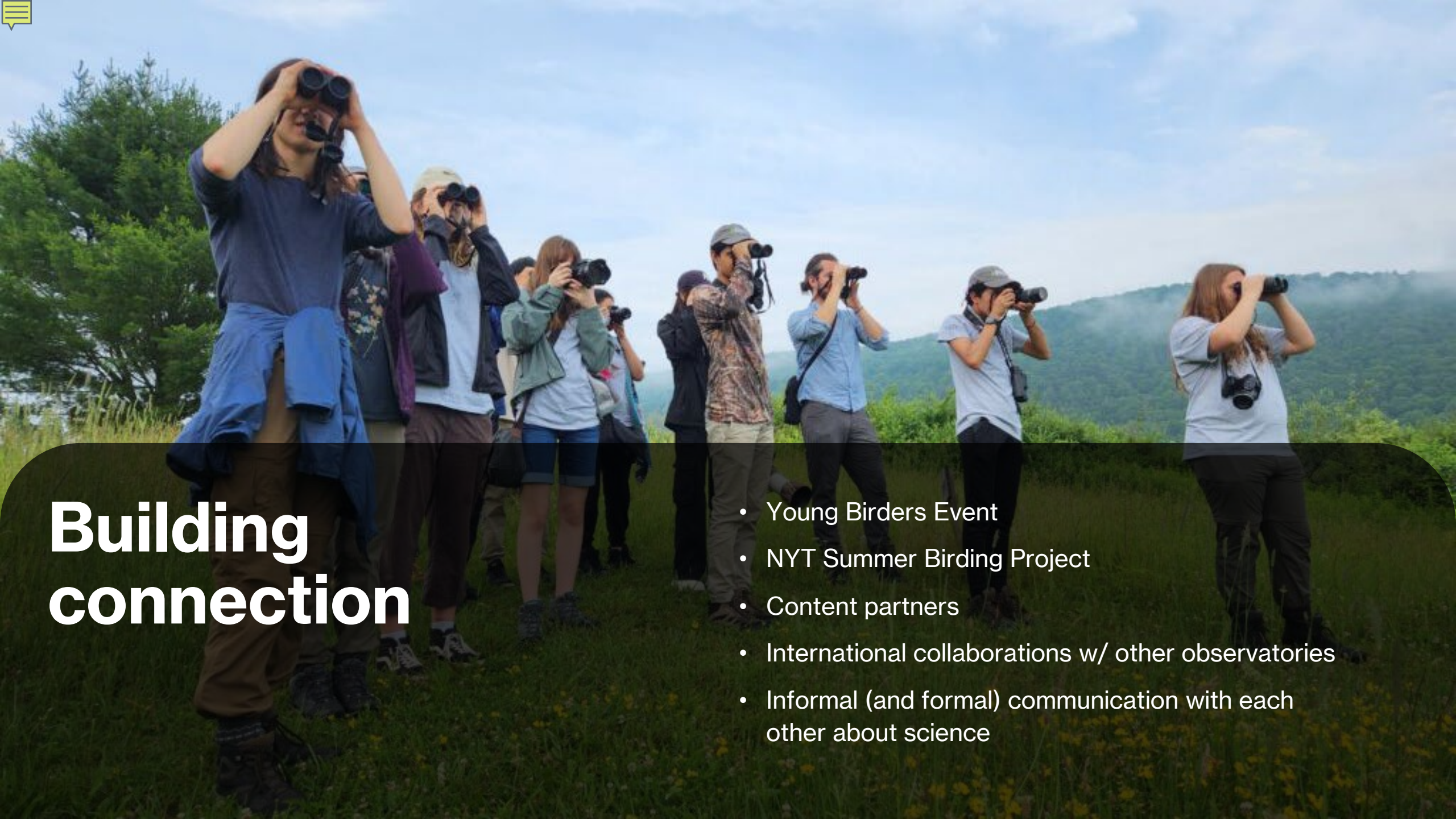
492 Total	491 Native or naturalized	1 Provisional	4 Escapee	1 Undescribed species	4 Hybrids	45 Additional taxa
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First seen **Last seen** Updated 10 sec ago. Date: Newest First

	DATE	LOCATION
NATIVE, NATURALIZED, OR PROVISIONAL		
492. Monk Parakeet <i>Myiopsitta monachus</i> *	26 Nov 2022	Wakodahatchee Wetlands US-FL View all
491. Bewick's Wren <i>Thryomanes bewickii</i>	08 Nov 2022	Lake Fayetteville US-AR View all
490. Egyptian Goose <i>Alopochen aegyptiaca</i> *	01 Sep 2021	Walker Park US-AR View all
489. Black-billed Thrush <i>Turdus ignobilis</i>	08 Feb 2021	#72-12 Circular 4, Medellín, Antioquia, CO (6.246, View all



Also forces technology development



Building connection

- Young Birders Event
- NYT Summer Birding Project
- Content partners
- International collaborations w/ other observatories
- Informal (and formal) communication with each other about science

About CoCoRaHS

- Community Collaborative Rain, Hail, and Snow Network
- Non-profit run through Colorado Climate Center (@ CSU)
- Began in 1998
- Volunteers in all 50 states, Canada, PR, Virgin Islands, and Bahamas
- Over 10,000 daily weather observations

Reports received today 3/27/2024 as of 8:25 AM EDT					
Daily	Multi-day	SigWx	Hail	Condition	ET
4,588	53	0	0	11	3

Reports received today 3/27/2024 as of 10:55 AM EDT					
Daily	Multi-day	SigWx	Hail	Condition	ET
9,369	125	0	0	21	10

About CoCoRaHS


- Community Collaborative Rain, Hail, and Snow Network
- Local level organization is often run through a state's climate office
 - + In NJ: run through Rutgers and the NJSCO
 - + They handle local communication, clarifying errors, data issues, local presentations, recognition, minor trainings, etc.
- Data is used to inform current AND future weather information
- Local participants (“observers”) report their information and it is often used by NWS

A Home Setup



11:30 📶 🔋 📶 📶 📶 📶 82%

☰ CoCoRaHS Observer

 Precipitation Report
NJ-CN-39 (english)
Cherry Hill Twp 1.6 WNW

Observation Date

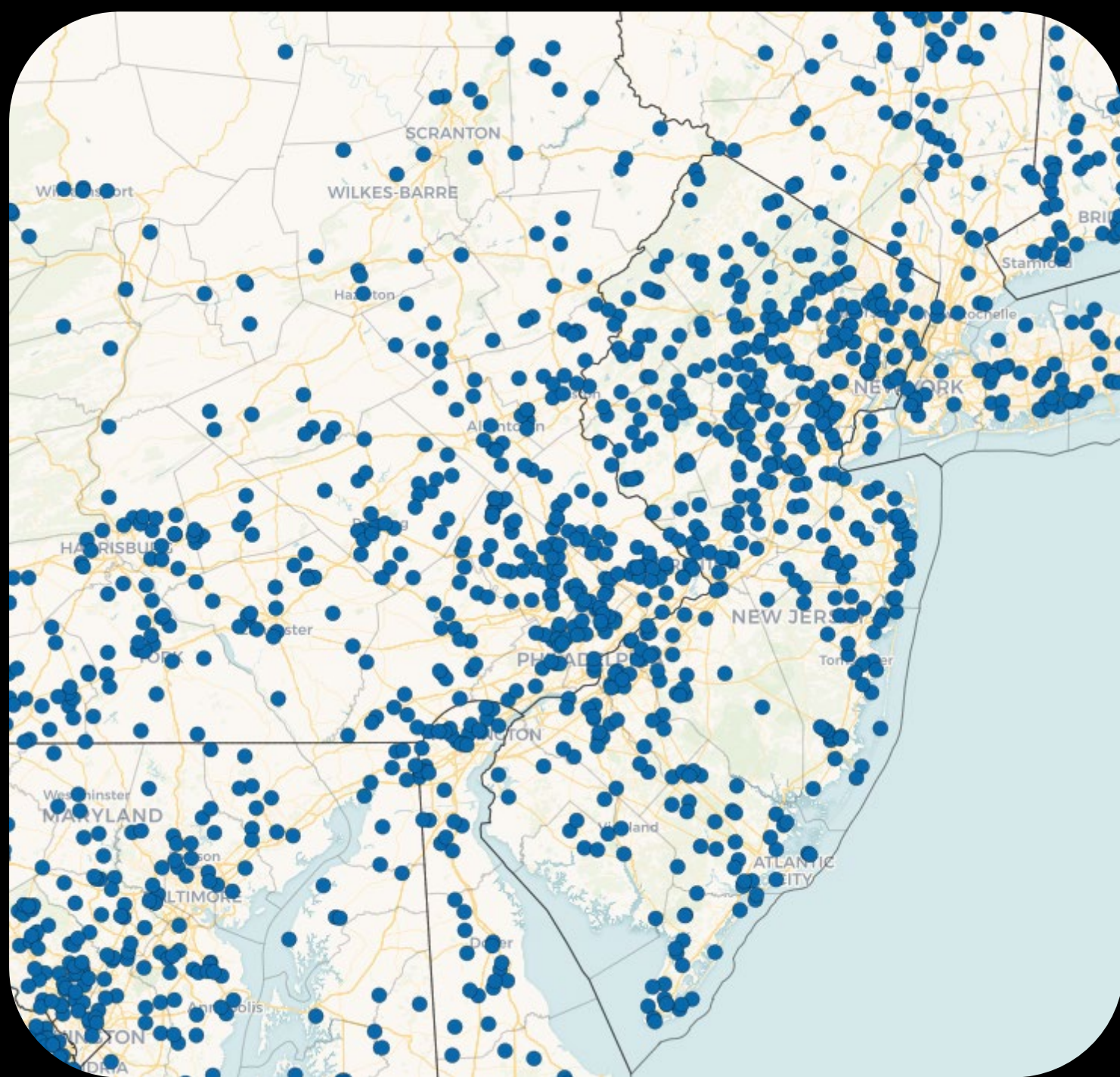
Observation Time

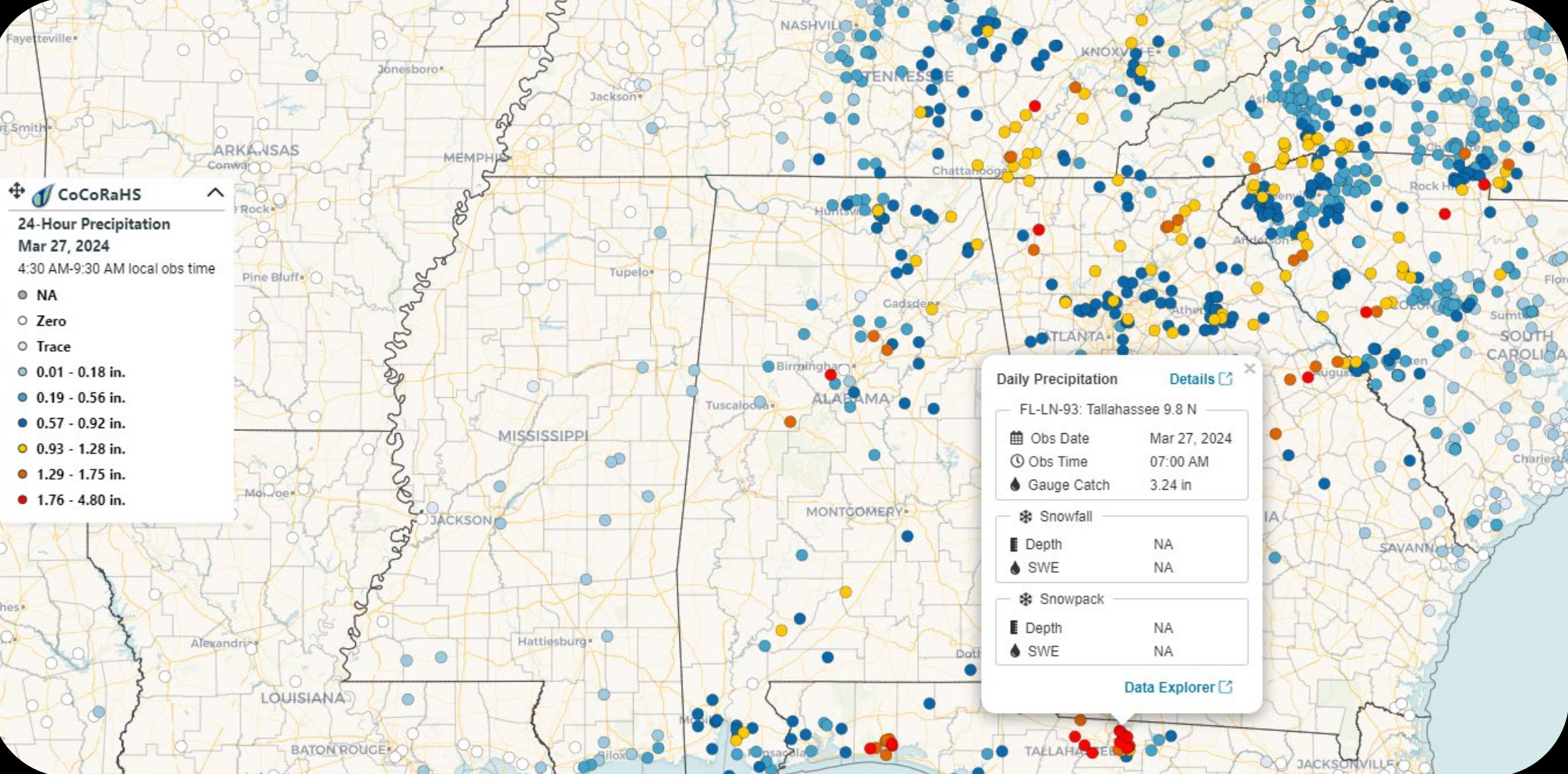
Rain/Melted Snow (in)

Trace NA

[Click To Specify Snow & Flooding Info](#)

Finding info as general public





CoCoRaHS

24-Hour Precipitation
Mar 27, 2024
4:30 AM-9:30 AM local obs time

- NA
- Zero
- Trace
- 0.01 - 0.18 in.
- 0.19 - 0.56 in.
- 0.57 - 0.92 in.
- 0.93 - 1.28 in.
- 1.29 - 1.75 in.
- 1.76 - 4.80 in.

Daily Precipitation [Details](#)

FL-LN-93: Tallahassee 9.8 N

📅 Obs Date	Mar 27, 2024
🕒 Obs Time	07:00 AM
💧 Gauge Catch	3.24 in

❄️ Snowfall

📏 Depth	NA
💧 SWE	NA

❄️ Snowpack

📏 Depth	NA
💧 SWE	NA

[Data Explorer](#)

	Station N... ↑	Station Name	Creation Date	First Obs Date	Last Obs Date	Days of Activity	% of Days Covered by Precip Obs	Daily Obs Count	Multiday Obs Count	Days Covered by Multiday Obs
+	NJ-CN-1	Merchantville 0.5 ESE	1/25/2008	3/4/2008	3/25/2017	2,878	86	2,500	60	378
+	NJ-CN-2	Mount Ephraim 0.3 W	3/13/2008			0				
+	NJ-CN-3	Audubon 0.5 W	5/25/2008	4/27/2008	10/9/2008	157	94	157		
+	NJ-CN-4	Gloucester Twp 2.6 SSW	9/10/2008			0				
+	NJ-CN-5	Winslow Twp 3.5 W	10/13/2008	10/14/2008	3/27/2024	5,636	99	5,462	53	174
+	NJ-CN-6	Berlin Twp 0.8 SE	12/7/2008			0				
+	NJ-CN-7	Camden 2.8 SSE	3/1/2009			0				
+	NJ-CN-8	Camden 0.5 SSW	3/1/2009	3/1/2009	6/29/2010	71	15	69	1	2
+	NJ-CN-9	Haddonfield 1.1 W	9/2/2009			0				
+	NJ-CN-10	Berlin Twp 0.8 W	10/17/2009			0				
+	NJ-CN-11	Berlin Twp 0.6 WNW	10/20/2009	10/21/2009	1/20/2019	3,220	95	2,965	54	255
+	NJ-CN-12	Camden 0.8 SSW	3/4/2010			0				
+	NJ-CN-13	Waterford Twp 3.8 NW	9/28/2010			0				

Camden Co - NJ

Observer level

Viewing Station: NJ-CN-39 : Cherry Hill Twp 1.6 WNW



May 1, 2023 - Mar 27, 2024

285 Total Observations

[Station Overview](#) [Climatology](#) [Precip Summary](#) [Year-Over-Year](#) [Precip Calendar](#) [Precip Distribution](#) [Obs Calendar](#) [Obs Tables](#)

Station Overview

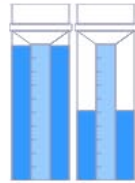


Recent Precip Accumulations [Go to Precip Summary](#)

Today: 0.00"

Month-To-Date: 7.78"
26 of 27 days covered by obs

Year-To-Date: 15.66"
77 of 87 days covered by obs



Station Activity

Period of Record

May 1, 2023 - Mar 27, 2024

Duration of Record

10 months 26 days

Pct of Days covered by Precip
Obs

89%

Observation Counts

Daily Precip
281

Multi-day Precip
4

Condition Monitori...
0

Significant Weather
0

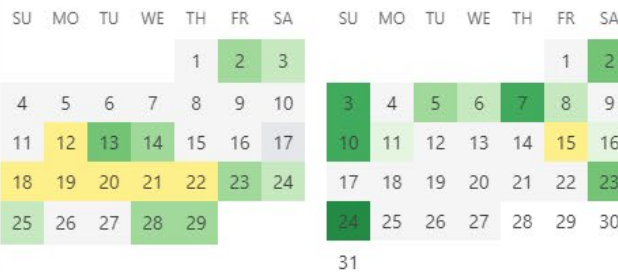
Hail
0

Total Obs
285

Recent Precip [Go to Precip Calendar](#)

February 2024 - March 2024

< TODAY >



Legend

Gauge Catch



Station Map



Station Information



Station Number	NJ-CN-39
Station Name	Cherry Hill Twp 1.6 WNW
Creation Date	May 1, 2023
Country	USA
State	New Jersey
County	Camden
Longitude	75.0214255

What do I want to know?

- Do observers/participants **learn** from participating in CoCoRaHS?
- Do they have higher levels of **science literacy/knowledge** than general public?
- What are the **primary motivations** for participating?
- Are there **communicative/social desires** in participating?
- Do people **care** about where and **how the data is used**?



Motivation for Volunteering

- **Motivation for Volunteering** (Adapted from Alender 2016)
 - Please indicate your level of agreement with the following set of statements (7-pt Likert - Strongly Disagree to Strongly Agree):
 - I want to help enhance the environment.*
 - I want to help the community.*
 - I want to get outside or connect with nature.*
 - I want to contribute to scientific knowledge.*
 - I want to learn more about water quality.*
 - I want to do something physically active.*
 - I want to learn new skills or knowledge.*
 - I want to have fun.*
 - I want to help this organization do more for less money.*
 - I want to engage with other people.*
 - I want to enhance my reputation in my community.*
 - I want to advance my career through gained experience and networking.*

Social Motives

- **Social/Communication Motivations** (Adapted from Alender 2016)
 - Please indicate your level of agreement with the following set of statements (7-pt Likert ranging from Strongly Disagree to Strongly Agree):
 - I like learning from others with more experience than me.*
 - I like sharing my experience, knowledge, and expertise with others.*
 - I want to interact with like-minded people.*
 - I want to spend time with family or friends.*
 - I want to meet new people.*



Thank you!

Questions?

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Adam Rainear

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