How Citizen Scientists are Contributing to Science

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github/birderboone
Mablab.org
The rise of Citizen Science (CS)

“Collection of data by members of the general public in collaboration with professional scientists”
- monitoring
- surveys
- incidental reports, etc…
The rise of Citizen Science (CS)

Global Biodiversity Information Facility (GBIF)
- 1.3 billion observations
- At least 700 million from Citizen Science data sources
10 million birders

X

365 days
- Began in 2002 between Cornell University and the National Audubon Society
- Currently over 500 million sightings.
- Largest CS project in the world.
- Publicly available data
- Two data sets: Research one and Raw data.
Users input checklists with details on their trips:
- Distance, time, observers, type of survey, etc..

<table>
<thead>
<tr>
<th>Species observed</th>
<th>Quantity</th>
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<tbody>
<tr>
<td>Ruddy Duck</td>
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<tr>
<td>Pied-billed Grebe</td>
<td>1</td>
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<tr>
<td>White-winged Dove</td>
<td>1</td>
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<tr>
<td>Ruby-throated Hummingbird</td>
<td>3</td>
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<tr>
<td>Common Gallinule</td>
<td>20</td>
</tr>
<tr>
<td>American Coot</td>
<td>1</td>
</tr>
<tr>
<td>Gray-headed Swamphen</td>
<td>3</td>
</tr>
<tr>
<td>Killdeer</td>
<td>3</td>
</tr>
<tr>
<td>Anhinga</td>
<td>5</td>
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<tr>
<td>Double-crested Cormorant</td>
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<tr>
<td>Great Blue Heron</td>
<td>1</td>
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<tr>
<td>Great Egret</td>
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<tr>
<td>Green Heron</td>
<td>1</td>
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<tr>
<td>White Ibis</td>
<td>5</td>
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<tr>
<td>Black Vulture</td>
<td>1</td>
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<tr>
<td>Turkey Vulture</td>
<td>5</td>
</tr>
<tr>
<td>Osprey</td>
<td>1</td>
</tr>
<tr>
<td>Northern Harrier</td>
<td>3</td>
</tr>
<tr>
<td>Red-bellied Woodpecker</td>
<td>2</td>
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<tr>
<td>American Kestrel</td>
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</tbody>
</table>
Mobile Apps – eBird Mobile

eBird by Cornell Lab
Cornell Lab of Ornithology

Uninstall

Open

What's new
Last updated Nov 12, 2019
Performance enhancements and bug fixes

Rate this app
Tell others what you think

eBird mobile app interface showing list of species with counts and names.

- Black-necked Stilt
- Marbled Godwit
- Greater Yellowlegs
- Willet
- Laughing Gull
- Royal Tern
- Black Skimmer
- Wood Stork
- Anhinga
Mobile Apps – Merlin Bird ID

Merlin Bird ID by Cornell Lab of Ornithology
Cornell Lab of Ornithology

What’s new
Last updated Sep 2, 2019
Fixes an issue with Bird Packs where some device version.

Rate this app
Tell others what you think

Can’t find your bird?
You can try adjusting your answers:

Black-bellied Whistling-Duck
Fulvous Whistling-Duck

Bahamas, BS
August 11
# eBird Incentives for Birding

- Maintain running totals, top 100, county records, etc.

## Your Stats

<table>
<thead>
<tr>
<th></th>
<th>Life</th>
<th>Year</th>
<th>Month</th>
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<tr>
<td>Total Species</td>
<td>737</td>
<td>304</td>
<td>106</td>
</tr>
<tr>
<td>Total Checklists</td>
<td>1881</td>
<td>108</td>
<td>14</td>
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<tr>
<td>ABA Area Total Ticks</td>
<td>4159</td>
<td>480</td>
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## Your Lists

<table>
<thead>
<tr>
<th>Major Regions</th>
<th>Country</th>
<th>State/Province</th>
<th>County</th>
<th>Total County Ticks</th>
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<td>Texas</td>
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<td>Oregon</td>
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<td>Florida</td>
<td>269</td>
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<td>225</td>
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<td>California</td>
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<td>New Jersey</td>
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<td>Nevada</td>
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<td>241</td>
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<td>Alabama</td>
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<td>North Carolina</td>
<td>107</td>
<td>21</td>
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<td>Nova Scotia</td>
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<td>0</td>
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<td>Tennessee</td>
<td>100</td>
<td>0</td>
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<td>133</td>
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</tbody>
</table>
- Review process of over 500 volunteer reviewers
- Process is about DATA QUALITY not what you did or not see.
“Reviewers can only decide whether the evidence to support the record is strong enough to withstand objective scrutiny 100 years from now, when all of our personal experience will long since be forgotten!” - eBird Team
- Over 500 million observations
- Nearly complete and continuous coverage in the United States, Europe, and India.
Canada Warbler Abundance

![Canada Warbler Image](https://ebird.org/science)

(CC) William H. Majoros

**Relative Abundance**

<table>
<thead>
<tr>
<th>Season</th>
<th>Range</th>
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<tr>
<td>Breeding season</td>
<td>Jun 14 - Jul 20</td>
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<tr>
<td>Non-breeding season</td>
<td>Nov 2 - Mar 15</td>
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<tr>
<td>Pre-breeding migratory season</td>
<td>Mar 22 - Jun 7</td>
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<tr>
<td>Post-breeding migratory season</td>
<td>Jul 27 - Oct 26</td>
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</tbody>
</table>

Reliability: 7.99

Note: Seasonal ranges overlap and are stacked in the order above; view full range in season maps.

**Seasons Timeline**

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[Visit eBird](https://ebird.org/science)

(CC) William H. Majoros
<table>
<thead>
<tr>
<th>Species</th>
<th>Jan</th>
<th>Feb</th>
<th>Mar</th>
<th>Apr</th>
<th>May</th>
<th>Jun</th>
<th>Jul</th>
<th>Aug</th>
<th>Sep</th>
<th>Oct</th>
<th>Nov</th>
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<tr>
<td>Blackburnian Warbler</td>
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<td>Yellow Warbler</td>
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<td>Bay-breasted/Blackpoll Warbler</td>
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<td>Black-throated Gray Warbler</td>
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<td>Black-throated Green Warbler</td>
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<td>Setophaga sp.</td>
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</table>
Background

- Began in 2008 as joint Masters Project at UC Berkley by Nathan Agrin, Jessica Kline, and Ken-ichi Ueada

- Currently funded by California Academy of Science and National Geographic Society.

- Nearly 30 million observations
Community Driven
- Everyone takes part in IDing observations
Community Driven
- Learning is part of the process

- birderboone suggested an ID
- Watersnakes
  Genus Nerodia

- bobbyfingers suggested an ID
- Watersnakes
  Genus Nerodia

- bobbyfingers commented
  Looks to potentially be a hybrid N. c. compressicauda X N. f. pictiventris. @floridensis @petekleinhenz • thoughts?

- petekleinhenz commented
  Definitely not your standard floridensis. What a neat looking snake!

- birderboone commented
  For what it helps this is a park surrounded by mangroves, so it's fairly salty.
Mobile Apps – iNaturalist
- Core interface for submitting observations
- Great how to guides at inaturalist.org/pages/help
Mobile Apps – Seek (new)
- More accessible
- Showcases their new image recognition engine.

What's new
Last updated Nov 11, 2019
- Performance updates, bug fixes
- Rebranded iNaturalist assets
- Observations from camera roll work offline

Rate this app
Tell others what you think

White-cheeked Pintail
It's been added to your observations. Learn more about this species here.
BioBlitzes
- Great way to have citizens contribute to Biodiversity knowledge
New, rare, and novel sightings
Data
- Explore Tab → Filters → Download
Background

- Started in 2011 by Maxim Larrivee and Jeremy Jerr during their PhD at the University of Ottawa
- Scientific experts validate reports.
- Over 230,000 observations and 5500 users (2017)
Submitting checklists
- www.e-butterfly.org
Integration with iNaturalist

Stats

Totals

902274
Observations »

2884
Species »

92762
People »

Most Observations

juanCarlosGarciamorales1
6978 observations

francisco3_tutor
6917 observations

immaes
5264 observations

treichard
4524 observations

robberfly
4279 observations

Most Species

stevendaniel
568 species

juanCarlosGarciamorales1
497 species

rogersnitt
489 species

mcandrews
460 species

robberfly
453 species

Most Observed Species

Monarch
76948 observations

Painted Lady
26143 observations

Common Buckeye
22755 observations

Eastern Tiger Swallowtail
22444 observations

Gulf Fritillary
21643 observations
Explore Data
- e-butterfly.org - > Explore Data
Benefits of Citizen Science
- Soroye et al. 2018

- Earliest date recorded was 34 days earlier
- 80% of species had novel range expansions from CS data
- Combining CS and expert data sets increased knowledge substantially

Butterflies are capable of rapidly reacting to temperatures changes to change their distribution.

This change has already begun in altering species diversity across Canada.

These factors effect yearly Monarch populations and distribution as well.


- Christmas Bird count began in 1900 by Frank Chapman
- 15 mile radius
- December 14 – Jan 5
- All skill levels
CBC circles
- Last year over 2585 circles
- www.audubon.org/conservation/join-christmas-bird-count
By the Numbers

Highest US Count ever 250:
Mad Island Marsh, Matagorda County, TX

In 2018
- 2673 species recorded
- 79 count circles in Florida
- Highest participants in Florida:
  Sanibel Island (150)

Highest counts in Florida:
Tampa Bay – 171
St. Petersburg – 161
Gainesville – 157
Sarasota – 157
St. Marks – 155
“Nearly half of birds will lose half of their range”

3 Billion birds already lost, 1/3 of the entire bird population since 1970

Mab Lab current work
- Understanding value of CS to biodiversity research

Common Florida birds reported

Bird submissions to GBIF in Florida

CS data can be studied through time

...and can effectively mitigate decline in Museum Collections across the world.
A black Incisitermes from east Texas that looks like a new record. Furthest north record of the Genus Gnathamitermes, near Amarillo, TX. New TX record attached. Previously, K approximatus known from FL, GA, SC, NC, MS, and LA. - Dr. Rudy Scheffrahn
Mab Lab current work
-CS in hard to ID species (Termites)
Thank You!