CHICAGO PARK DISTRICT

SCIENCE IN THE PARKS: 2022 ANNUAL REPORT

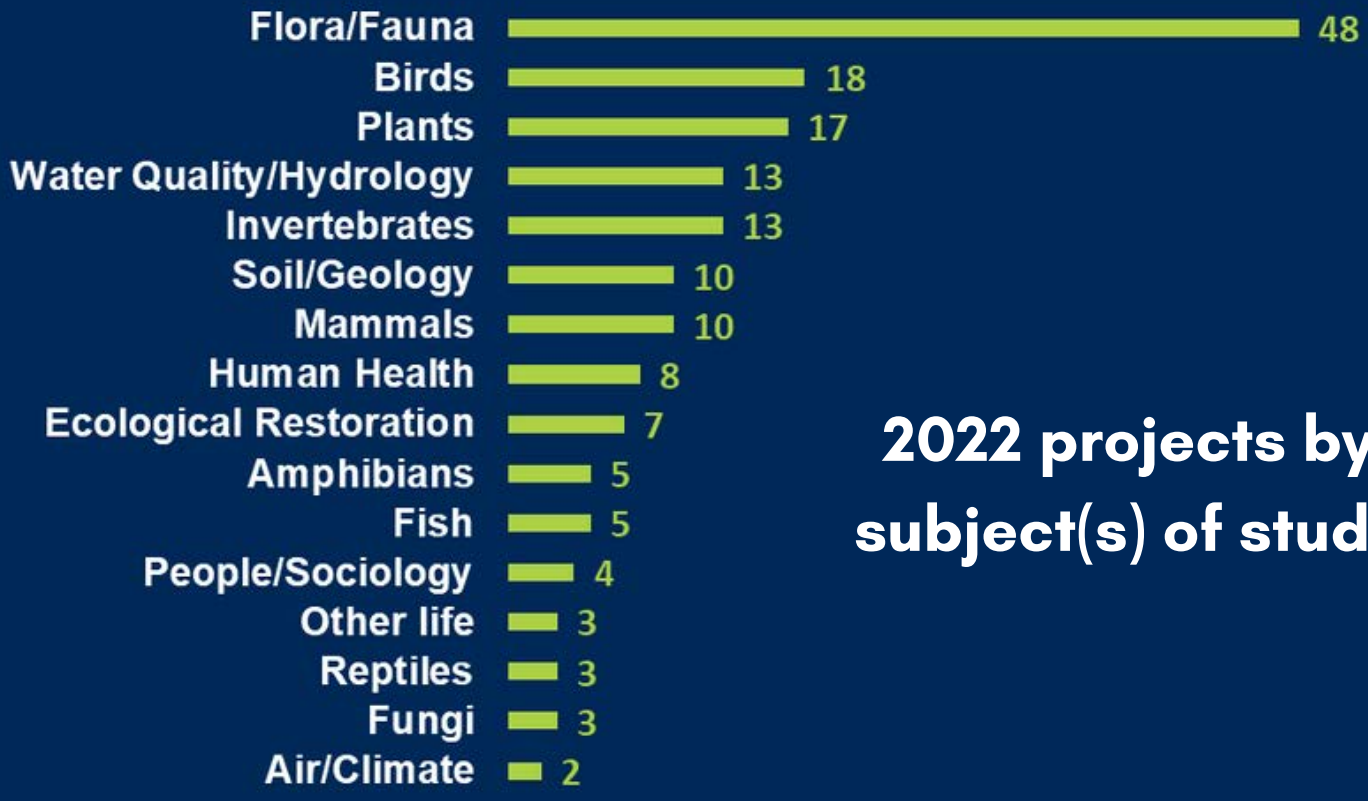
Pale purple coneflower (*Echinacea pallida*) at Northerly Island Natural Area

Research & Monitoring in 2022

65
projects

50+
organizations

Ohio goldenrod (*Solidago ohiensis*) at Montrose Beach Dunes in Lincoln Park)



2022 projects by subject(s) of study

Researchers obtain permission to conduct research and monitoring in the parks through the Chicago Park District's Research Permit program. Apply at www.chicagoparkdistrict.com

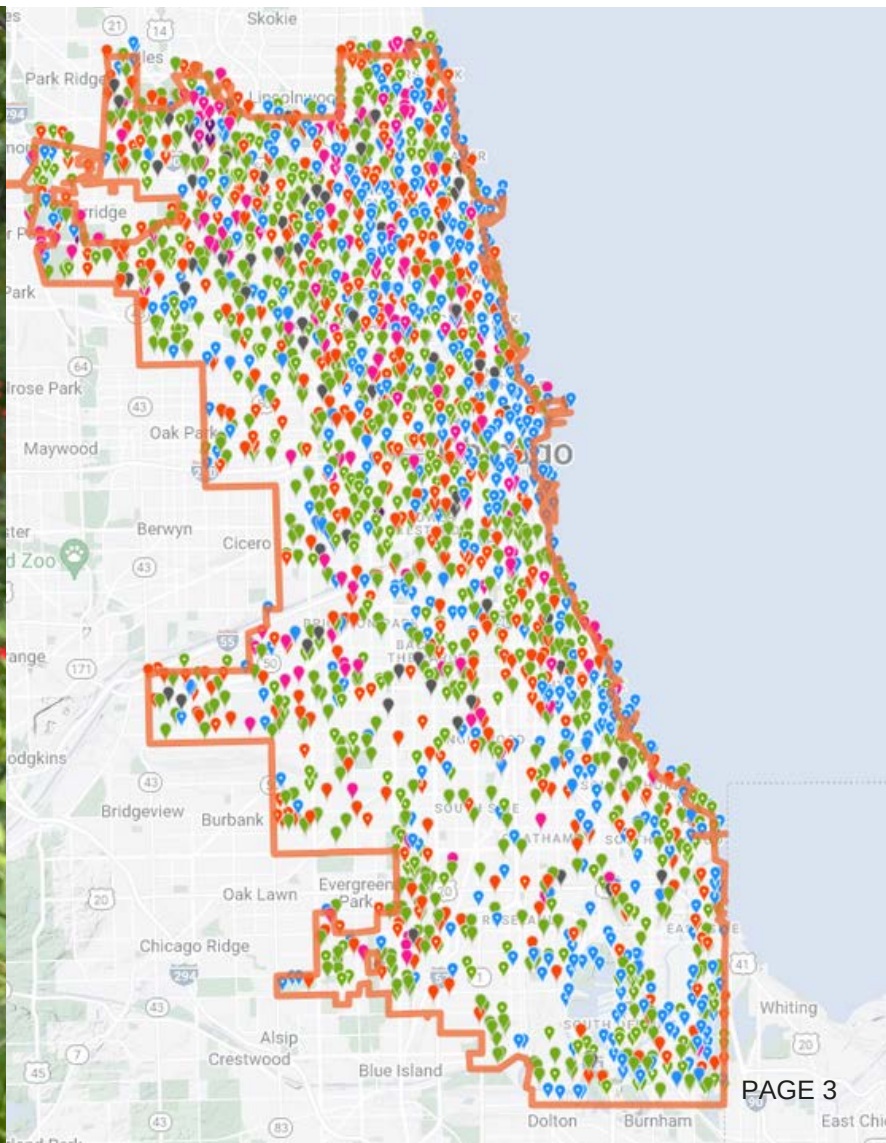
2022 on iNaturalist in the parks

2,210 community scientists

36,890 observations

1,480 species (community-identified/"Research Grade")

Left: Cardinal flower (*Lobelia cardinalis*) at Marian R. Byrnes Park
Right: Observations shared to iNaturalist throughout Chicago



The **City Nature Challenge** is an annual event where city residents and visitors document local nature and to help all of us better understand urban biodiversity. From April 29th–May 2nd, 2022, hundreds of cities worldwide participated to see who could make the most observations, find the most species, and get the most people participating. Check out what we found in the Chicago area at https://bit.ly/cnc2022.

CITY NATURE CHALLENGE IS ORGANIZED BY

California Academy of Sciences · Natural History Museum Los Angeles County · Chicago Park District · Chicago Wilderness · budburst, A project of the Chicago Botanic Garden · Shedd Aquarium · Lincoln Park Zoo, For Wildlife. For All. · Chicago Ornithological Society · Illinois Native Plant Society, Northeast Chapter · ISC Illinois Science Council

The 2023 City Nature Challenge takes place April 28th–May 1st

Learn more at https://bit.ly/cncchi2023

During September 2022, ten wildlife cameras were deployed for a "novel object" study by research intern Andrea Flores and other Lincoln Park Zoo Urban Wildlife Institute (UWI) staff. The five sites selected for the study span an "urban gradient" from Chicago into the suburbs about 30 miles, a gradient used for several other UWI projects. Three of the sites for this study were Chicago parks.

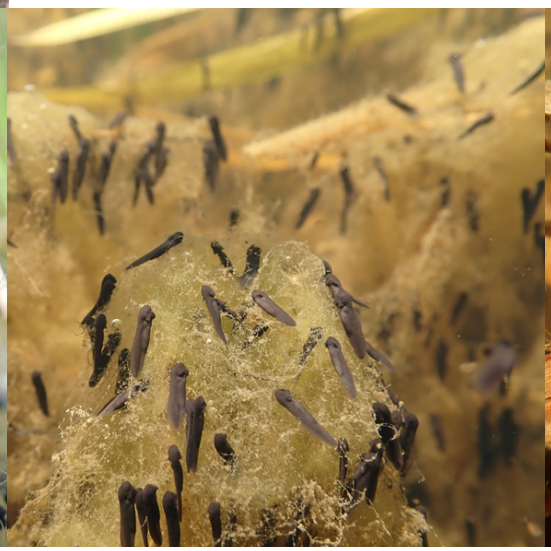
Novel object studies are used to assess an animal's boldness or avoidance of novel aspects to their environment, and it is thought that urban animals tend to be more bold than their rural counterparts. At each site, researchers placed a plastic bin in the view of a motion-triggered camera that was set to record a short video to examine how raccoons react to and spend time near the object.

UWI staff are still reviewing the videos, but will compare raccoon behavior across the gradient of sites to determine how much time raccoons spend in exploration or vigilance based on their proximity to urbanization.

Top right: Camera trap photo of a raccoon; Above: "Novel object", a plastic blue bin, deployed at three Chicago parks (photos courtesy Lincoln Park Zoo)

Above: Raccoons investigate the novel object at a Chicago Park District Natural Area (photo courtesy Lincoln Park Zoo)

Melissa Youngquist (Shedd Aquarium) is conducting surveys of amphibian and aquatic invertebrate communities at Hegewisch Marsh Park. In 2022, she documented four species of frogs breeding on site, including the American toad (*Anaxyrus americanus*) pictured here. Invertebrate samples are still being processed, with over 200 individuals among 23 different taxa recorded so far. Among those are fingernail clams, crayfish, amphipods, several types of beetles, flies, true bugs, caddisflies, and snails, as well as fairy shrimp, which are indicative of vernal pools. A vernal pool is a shallow depression filled by snow and rain during the spring ("vernal" is from the Latin word for "spring"). Some species live only in this uncommon habitat where they can avoid predators such as fish that cannot survive once the pool dries out in the summer.



Top left: American toad (*Anaxyrus americanus*, photo by Melissa Youngquist)
Middle, left to right: American toad eggs, recently hatched tadpoles, and month-old tadpoles (photos by Melissa Youngquist)

Below: Community Steward Carol Johnson and Keith Kelley take photos of recently planted native plants at Garfield Park

Erin Snyder (right, in pink) is a graduate student at Northwestern University / Chicago Botanic Garden studying if and how certain native plants can survive or thrive in urban, degraded ecosystems containing slag-based soils.

Slag is a stone-like byproduct of the steel-making process that was dumped decades ago in many areas of the Calumet region, including where several Chicago parks are today. Some soil conditions such as pH can be similar to those found in native dolomite or gravelly prairies.

Initial results of greenhouse studies comparing traditional topsoil and slag have shown that some rare plants grow remarkably well in the slag-based soil.

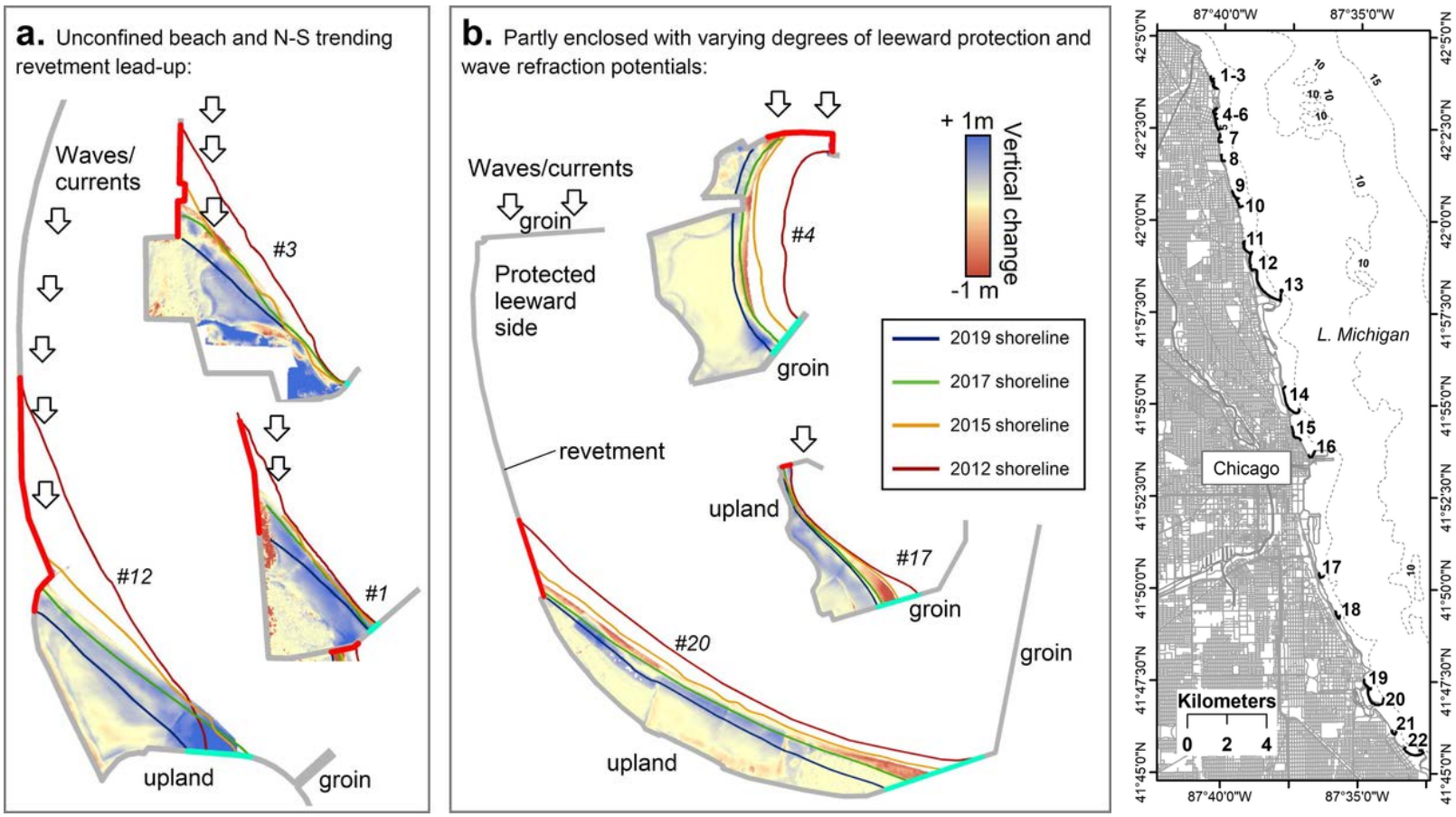

Erin Snyder


Lauren Umek

Above: Park district staff, contractors, and graduate student Erin Snyder planting native wildflowers in slag soils

Researchers at the Illinois State Geological Survey (ISGS) are using GIS, LiDAR, sonar, and other tools to study how the lakefront changes over time. Lake Michigan water level, wind shore-ice, and weather events naturally change the size and shape of Chicago beaches, but human-created infrastructure plays an important role as well.

In a research paper published in 2022, Robin Mattheus (ISGS), Katherine Braun (ISGS), and Ethan Theuerkauf (Michigan State University) found that the size and orientation of the beach, as well as the characteristics of the surrounding infrastructure (e.g. groins and jetties), affected the location and amount of sand deposition at Chicago beaches in different ways.



Top right: Rainbow Beach Dunes

Bottom: Conceptual distinction depicting elevation changes at (a) northwardly unconfined beaches and (b) partly enclosed beaches (Mattheus et al. 2022, "Great lakes urban pocket-beach dynamics: A GIS-based analysis of infrastructure-design influences on geomorphic development" in Journal of Great Lakes Research)

Researchers from the Field Museum are studying purple martins that use these nesting towers in Chicago parks. They are banding and sampling the birds to determine their genetic parentage and the extent to which they may be affected by avian malaria.

In 2022, they found that an adult female with five hatchlings at South Shore Cultural Center had been banded as a fledgling the previous year at Montrose Harbor in Lincoln Park!

Photos: Field Museum sampling days at purple martin towers; photos by Lucy Gomez-Feliciano

Did you know that dedicated teams of volunteers have helped attract and maintain artificial bird nesting structures for purple martins in the parks for over 20 years?

Habitat destruction and the introduction of invasive starlings and house sparrows following European colonization in the Americas had a devastating impact on native purple martin populations. In eastern North America, the purple martin has a near total reliance on human-created structures for nesting—people play an important role in the conservation of these populations.

Below: The Chicago Park District is participating in a Forests in Cities study coordinated by the Natural Areas Conservancy. In 2022, temperature sensors were placed on trees at three different parks throughout the city to help answer the question: are ecologically healthier places cooler than those that are degraded? The results of this study will help inform climate resiliency strategies by uncovering how natural areas contribute to cooling cities.

Above: Measuring vegetation height and density with a Robel pole at a snake nesting location (Alison Sacerdote-Velat, Peggy Notebaert Nature Museum in background) with cassi saari (CPD)

Below: Chicago Park District staff are monitoring invasive common reed (*Phragmites australis*) populations as part of the international Phragmites Adaptive Management Framework program

2022 Research Organizations in Chicago Parks

Argonne National Laboratory
Audubon Great Lakes
Bird Conservation Network
Chicago Audubon Society
Chicago Botanic Garden
Chicago Ornithological Society
Chicago State University
ChronoLog
Concordia University
CrowdHydrology
DePaul University
Duke University
eBird - Cornell University
Field Museum
Friends of the Chicago River
Geographic Society of Chicago
Illinois Department of Natural Resources
Illinois Institute of Technology
Illinois Natural History Survey
Illinois Ornithological Society
iNaturalist
Lincoln Park Zoo - Urban Wildlife Institute
Loyola University
Michigan State University
Morton Arboretum
Natural Areas Conservancy
North Park University
Northeastern Illinois University
Northwestern University
Peggy Notebaert Nature Museum
Purple Martin Conservation Association
Shedd Aquarium
The Nature Conservancy
The Wetlands Initiative
University of Chicago
University of Illinois - Chicago
University of Illinois - Urbana-Champaign
University of Michigan-Flint
University of Wisconsin-Madison
U.S. Fish and Wildlife Service
U.S. Geological Survey
USDA-APHIS Wildlife Services

+ thousands of Chicago residents and visitors who contribute to community science projects and platforms

Below: Blue vervain (*Verbena hastata*) at Hegewisch Marsh Natural Area
All photos by cassi saari (Chicago Park District) unless otherwise indicated.