



Cowling Arboretum

Community Learning in the Arboretum

This fall members of the Carleton community participated in an interdisciplinary class, aided by Carleton’s Public Works Initiative, called Natural History of Prairies and Potholes. The class combined arts, humanities, and natural sciences and utilized the Arboretum as a natural learning space. The class was created to help faculty, staff, and Northfield community members become more familiar with the Arboretum, its natural history, and the ways that the natural world can be incorporated into various disciplines. The experience was modelled after Minnesota Master Naturalists, a state-sponsored program that has been offered previously through the Arboretum.



Visiting Assistant Professor Eleanor Jensen '01, who helped teach the course said “A highlight for me was fostering a community around learning about our natural surroundings. There were diverse skill-sets and perspectives, and that deepened the collective experience.” Participants contributed to the class by teaching in their areas of expertise, which included science, fine arts, videography and writing. English Professor Susan Jaret McKinstry emphasized how “the experience of seeing and hearing about the Arboretum from unfamiliar perspectives was magical.”

Cowling Arboretum Mission

Provide opportunities for education and research.

Preserve and restore native plant and animal communities on College natural lands.

Provide opportunities for outdoor recreation and nature appreciation.



Special Funding

In addition to operating support provided by Carleton College, the Arboretum’s programs are supported by grants and funds that have been established through generous gifts (listed alphabetically):

Arboretum Endowed Fund

Arboretum Restoration Fund

The Cole Family Memorial Arboretum Fund

George W. Megeath Fund for the Cowling Arboretum

The Nunatak Fund (honoring Jason Mulvihill-Kuntz '01)

The Puzak Family

U.S. Department of Agriculture (Conservation Reserve Program)

The Louise '51 and Frank '50 Wright Endowed Arboretum Fund

We wish to thank the Arboretum’s many benefactors who help make our work possible.

Arboretum Academics

A survey of faculty this year demonstrated the breadth Arboretum use for academic purposes. Faculty reported 39 courses or programs from 24 disciplines that utilized the Arboretum in the past five years. Listed here are the departments followed by the number of classes.

Academic Departments

American Studies: 2

Archeology: 2

Art & Art History: 14

Asian Studies: 2

Biology: 12

Cinema and Media Studies: 9

Classics: 1

English: 15

Environmental Studies: 3

European Studies: 1

Gender, Women’s & Sexuality Studies: 1

Geology: 9

German: 2

Greek: 1

History: 3

Literary and Cultural Studies: 1

Music: 3

Physical Education: 3

Political Science: 7

German: 2

Religion: 6

Sociology and Anthropology: 6

Statistics: 1

Theater and Dance: 3

Other Programs

FOCUS Colloquium

Carleton Summer Science Institute

Minnesota Master Naturalist Programs

Experimental Archeology

This fall, the Experimental Archeology class, led by Austin Mason, Lecturer in History, worked with materials from the Arboretum to create a warp-weighted loom, replicating what would have been used in early medieval England to create a woman's outfit. According to Mason, the course "offers an experiential approach to crafts, technologies, and material practices in premodern societies." This project involved wood harvested from the Arboretum, wool spun at a local farm, ceramic weights created in the Carleton ceramics workshop, and brooches made in the metalworking classroom.

Mason mentioned that the Arboretum was especially useful to his class this year as an outdoor classroom in the midst of the COVID-19 pandemic, since it allows for students to practice social distancing more easily and work without masks. This project shows the many diverse advantages that the Arboretum offers to academic courses at Carleton.

Recent Publications & Research

Hammer, T.J., De Clerck-Floate, R., Tooker, J.F. et al. 2021. Are bacterial symbionts associated with gall induction in insects? *Arthropod-Plant Interactions* 15:1-12

Libbey, K., and D. L. Hernández. 2021. Depth profile of soil carbon and nitrogen accumulation over two decades in a prairie restoration experiment. *Ecosystems*. 24(6): 1348-1360.

McKone, M.J., E.W. Williams, and J.J. Beck. 2021. Evidence for local-scale community assembly processes from long-term observations of biodiversity in a grassland chronosequence. *Journal of Vegetation Science*. 32: e13065

McKone, M.J. and D.L. Hernández. 2021. Community-level assisted migration for climate-appropriate prairie restoration. *Restoration Ecology*. 29 (7): e13416.

Ponce, G.E., Fuse, M., Chan, A. et al. The localization of phytohormones within the gall-inducing insect *Eurosta solidaginis* (Diptera: Tephritidae). 2021. *Arthropod-Plant Interactions* 15:375-385.

Interview with Summer Research Assistant: Mathew Zappa

After working as a research assistant his sophomore year, biology major Mathew Zappa '22 returned this summer to get more experience studying plants in the Arboretum. Over the course of the summer, Mathew assisted with plant propagation research projects, and scoured the floodplain for rare sedges, including state-listed *Carex davisii*, *C. conjuncta*, and *C. greyii*. The last time these sedges were surveyed was 2015, so the data Mathew collected is important to understanding the status of these rare plants.

Mathew also helped monitor the control efforts of wild parsnip and birds-foot trefoil, two of the worst invasive plants in the Arboretum. After a day's work in the field, Mathew could also be found mounting specimens for the Arboretum's herbarium.



Knowing what rare species are in the Arboretum and where they are helps us do a better job managing them. Sedges contribute to a healthy floodplain, which plays an important role in reducing the severity of floods and maintaining water quality. Even if they don't realize it, everyone in the Northfield community benefits from Mathew's work!

Cole Student Naturalist Program



Student Naturalist Featured Seniors

Sydney Marie Jones '22 was born and raised in Decatur, Georgia. She grew up backpacking and kayaking along the rhododendron-lined rivers of north Georgia, where she first fell in love with bluets, thunderstorms, and wild places. A family trip to an island off the Georgia coast kickstarted a passion for birds, which continues to inspire many early mornings walks. Working in wildlife rehabilitation and shorebird management solidified her interest in wildlife ecology. As a student naturalist, she loves exploring the beauty of the Arboretum and sharing her love of the outdoors with others.



Klara Gabriela Heuchert '22 is an environmental studies major and has worked in the Arb all four years. Carleton wouldn't feel like home to her without the Arboretum that she gets to spend so much time in, and it has shaped her dream of being a conservationist. Work in the Arboretum honed her skills that have helped her land internships and jobs. More importantly, the Arboretum has filled her with wonder and joy, giving her space to appreciate beautiful Minnesota landscapes and share that appreciation with others, too. She's also very grateful for her staff mentors Matt Elbert and Nancy Braker, with whom she has so often learned, grown, and laughed!

Environmental Education and Community Outreach

Volunteers continue to be critical to getting our work done. With vaccinations in place and other precautions we were able to host more of our events, including bringing incoming students to the Arboretum to plant trees, and welcoming volunteers back to help with our prescribed burn program and participate in other projects. Retired Geology Professor, Mary Savina '72 participates every year in the tree planting event, helping us bring a little organization to the chaos of 450+ students planting trees. Mary observes that "It is beyond wonderful to see these students make connections to one of Carleton's biggest assets."

Number of Volunteers	58
Events hosted	19
Hours provided	655

Other volunteers, like Northfielder Connie Rew, work on their own, enjoying being in nature and helping us with our restoration projects. Connie says "I'm forever grateful for all that Arb staff and other volunteers have taught me. Giving a few hours of caretaking is not only my way of thanking the Arb for all I have learned and the many hours I have spent on its trails for recreation, but also makes me hope my small efforts help keep it a special place for others now and in years to come."

Rare Plants in the Arboretum

2021 was an exciting year for rare plants in the Arboretum! The state endangered *Iodanthus pinnatifidus*, or Purple Rocket, was first found here in 2020. This summer our staff conducted follow-up surveys to expand our knowledge of the plant. In addition to the known plants, we located hundreds more in three additional areas. We also stumbled across *Carex davisii*, a state threatened sedge that grows in the same floodplain habitat and has been found in only about a dozen locations in the state.

The discoveries didn't end there—sharp-eyed research assistant Mathew Zappa '22 also noticed state special concern species *Asplenium platyneuron*, Ebony Splenwort, in the Arboretum. By developing a "search image" for the plant in the same way that birds and bees do to help them find resources, Mathew carefully counted every plant he could find of these rare species. These discoveries indicate that the Arboretum is truly a unique environment for a remarkable diversity of species and suggest incredible possibilities for the future.

Kestrels in the Arboretum

Kestrels are our smallest falcon, and until recently, none had been known to nest in the Arboretum. It's unknown exactly why, but since dead trees often get cut down for safety reasons, they and other cavity nesters may have trouble finding suitable spots. However, you could still occasionally see them perched on utility wires or hunting in the prairie by hovering over the grass and looking for grasshoppers, mice, or frogs.

In order to encourage the local population of kestrels, four nest boxes were installed in 2019. This approach has proven successful in restoring populations of other cavity nesters, such as bluebirds, in other areas. Nest boxes were placed near prairie habitat, and in spots easily visible to visitors. They were up for several years before the kestrels found them, but this past summer, a pair of kestrels used a nest box to fledge three chicks. Hopefully, these and other kestrels will continue to use these boxes and become permanent members of our Arboretum community.



Carex greyii. By Minnesota Wildflowers



Students planting a tree on Earth Day. By Bryn Battani '23



American Kestrel. By Dan Tallman

CANOE (Carleton Association of Nature and Outdoor Enthusiasts)

In a typical year about 100 students travel to Book Across the Bay (BATB), a 10-kilometer dash (on skis, snowshoes, or foot) across frozen Lake Superior starting in northwestern Wisconsin. Though the event was cancelled in 2021, that didn't stop Raven Dawson '22 from getting students involved in some winter wandering in Carleton's own backyard.

Taking advantage of the off-trail accessibility offered by leafless winters, Dawson planned a route through the Arboretum that veered from the groomed paths, stomping down the path with snowshoes. Along the way, participants could stop at series of rest tables featuring hot chocolate and other snacks for a chance to warm up and socialize. Participants came from all class years and majors—and even species, since one hedgehog was reported to have joined in!

The entire route took about an hour to complete, with no need for a 4-hour drive to Wisconsin. "BATB is great, but for many students, making that trip on a busy weekend just isn't feasible," Dawson said. "The Arb is so easy to access, so almost anyone who was interested was able to join." With so much success, CANOE Club hopes to keep the tradition alive in years to come.

Student Naturalists Show Off the Arb

The Cole Student Naturalist Program is funded through an endowment created in memory of Richard S. Cole '69 and trains students in natural history and nature interpretation. The Naturalists meet every week to learn from Arboretum staff and join them on educational walks; then it's their turn to organize in-person programs and events for both the Campus and Northfield community.

This year these events took the shape of a number of guided tours. A few highlights include walks centered around bird-watching, wildflower identification, nighttime animal calls, identifying invasive species using the iNaturalist app, and a scavenger hunt for students on campus over spring break. The Naturalists guided walks for prospective students and parents, guests interviewing for jobs on campus, and members of the Carleton Board of Trustees. Especially in a year when indoor gathering was difficult, we thank the Naturalists for providing accessible opportunities for outdoor engagement, as well as their dedication to spreading their knowledge and enthusiasm for the Arboretum.

New Research by Assistant Professor of Geology Dan Maxbauer

Enhanced silicate weathering (ESW) is an emerging carbon dioxide removal technology that removes CO₂ from the atmosphere through mineral dissolution. ESW has remained largely untested in practice, and the available data is not particularly useful for encouraging agricultural partners to adopt ESW as a common practice. Assistant Professor of Geology Dan Maxbauer is seeking to change this through field trials on agricultural land in the Arboretum.

Maxbauer has involved a number of students in this project, including students in his ENTS 225 Carbon and Climate course during fall 2020, as well as research students who sampled and analyzed soils for baseline field data. Maxbauer anticipates that students will work on this research each summer for the next several years. The work of Maxbauer and these students has excellent potential to contribute to Carleton's goals of becoming carbon neutral by 2050.

Arboretum Aperture



Anna Schumacher '21



Helen Hu '23



Walt Li '23



Ava Raine '23

For additional information, contact the Arboretum director or visit our website, Facebook, or Instagram page:

www.carleton.edu/campus/arb

www.facebook.com/carletonarboretum

[carletonarboretum on Instagram](https://www.instagram.com/carletonarboretum)

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