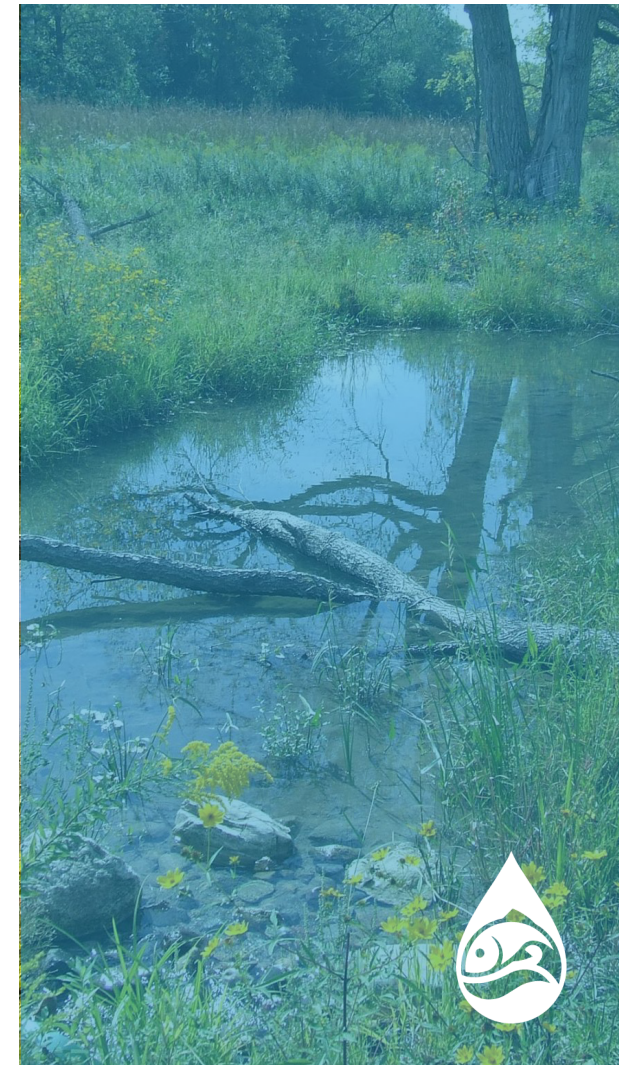


# Urbana Park District CARES Plan

## Climate Action, Resilience, Education and Sustainability

Acceptance date: April 13, 2021



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## Executive Summary

I am thrilled to present our community with the Urbana Park District Climate Action, Resilience, Education & Sustainability (**CARES**) Plan 2021. On behalf of the Board of Commissioners, staff, Urbana Park District Advisory Committee and Urbana Parks Foundation, we look forward to serving as community leaders and role models for climate action and environmental sustainability.

Commissioners, staff, stakeholders, and community members helped us create the **CARES** Plan to include a five-year projection for making local impact on climate change a reality. We acknowledge that the topic of climate change can be overwhelming—this plan strives to be the opposite. **CARES** is about breaking down information barriers and creating a healthier, safer and more resilient community for all humans, plants, and animals that call Urbana home. The plan identifies three planning pillars to simplify our path into the future:

- Communicating Climate Action
- Protecting & Strengthening Our Natural Environment
- Conserving Resources

As a parent and grandparent I want to be sure that we address climate change now to ensure a healthier planet for today and for tomorrow. We only have one Earth and we are all in this together—the Urbana Park District **CARES** Plan efforts will be magnified tremendously as our residents and climate action partners work together for a better Urbana.



Timothy Bartlett  
Executive Director

## Thank you!

### Urbana Park District Board of Commissioners:

Michael Walker  
Nancy Delcomyn  
Meredith Blumthal  
Lashaunda Cunningham  
Roger Digges

### CARES Steering Committee:

#### Co-chairs:

**Kara Dudek**, Park Planner, Climate for Health Ambassador  
**Savannah Donovan**, Environmental Public Program Coordinator, Climate Reality Leader

#### Members:

**Ashley Dennis**, Outreach and Wellness Coordinator  
**Caty Roland**, Superintendent of Business Services  
**Chelsea Prah**, Environmental Education Coordinator  
**Derek Liebert**, Superintendent of Planning and Operations  
**Ellen Kirsanoff**, Development Manager (former)  
**Joseph Schmitt**, Aquatics Maintenance Supervisor  
**Mark Schultz**, Public Information and Marketing Manager  
**Matt Balk**, Natural Areas Coordinator  
**Matt Lewis**, Public Program Assistant  
**Niki Hoesman**, Community Program Coordinator  
**Rich McMahon**, Grounds Maintenance Supervisor  
**Shane Newell**, Facilities Maintenance Supervisor  
**Tim Bartlett**, Executive Director

### Urbana Park District staff members

### Urbana Park District Advisory Committee (resident volunteers)

### Community members who provided feedback through meetings and surveys

## More Thank You!

The following advisor interviews were conducted at the beginning of the planning process:

**Andy Robinson**, Smart Energy Design Assistance Center, University of Illinois at Urbana-Champaign

**April Janssen Mahajan**, Sustainability Specialist, Illinois Sustainable Technology Center, University of Illinois at Urbana-Champaign

**Joy Scrogum**, Assistant Scientist, Sustainability; Illinois Sustainable Technology Center; Prairie Research Institute, University of Illinois at Urbana-Champaign

**Meredith Moore**, Sustainability Programs Coordinator, Institute for Sustainability, Energy, and Environment, University of Illinois at Urbana-Champaign

**Morgan White**, Facilities & Services Associate Director for Sustainability, at the University of Illinois Urbana-Champaign

**Scott R. Tess**, Sustainability & Resilience Officer, City of Urbana, IL

**Shantanu Pai**, Assistant Sustainability Researcher, Illinois Sustainable Technology Center, University of Illinois at Urbana-Champaign

**Stacey Clementz**, Education Program Specialist, Champaign County Forest Preserve District

**Stacy Gloss**, Research Specialist for the Indoor Climate Research and Training group at the University of Illinois at Urbana-Champaign; Urbana Sustainability Advisory Commission

**Warren Lavey**, adjunct professor, University of Illinois at Urbana-Champaign

## Table of Contents

1. Introduction.....	3
2. Equity, Inclusion & Justice.....	4
3. Vision & Values.....	5
4. Plan Pillars.....	6
5. Goals and Objectives.....	7
6. Plan Implementation.....	18
7. Glossary of Terms.....	19
8. Climate Change Concepts.....	21
9. Climate Change Impacts.....	24
10. Sources.....	27

### Appendices

- A. Survey #1 results
- B. Survey #2 results
- C. NRPA Climate Statement
- D. Initial Indicators of Resilience



The Hickman Wildflower Walk at Meadowbrook Park is home to a wide variety of plant, animal, and insect species.

## Chapter 1: Introduction

### CARES Plan Purpose

The Urbana Park District is committed to addressing climate change at the local level. The CARES (Climate Action, Resilience, Education & Sustainability) Plan takes advantage of common sense approaches that will improve water and air quality, mitigate risks to people and property, preserve the local landscape, reduce energy use and waste, lead to greater public awareness, and in many other ways benefit Urbana residents and surrounding communities for years to come.

Components of equity and inclusion are interwoven throughout the plan. By creating a clear course of action in which everyone has a role in creating and achieving sustainability and climate-related goals, the CARES Plan coordinates and drives local efforts toward a reduction in our carbon footprint. The Plan also addresses Urbana's vulnerability to hazards related to climate change. It outlines strategies to increase community-wide resilience by reducing climate impacts on public health and infrastructure, as well as increasing social and economic resilience. (See Appendix D for more indicators of resilience.) This plan also supports the park district in working with other local climate partners to combine knowledge, resources, and funding and achieve shared goals.



Students participate in the 2019 BioBlitz. CARES Plan goals strive to create awareness of environmental benefits.

While the Urbana Park District has already begun to reduce greenhouse gas emissions and climate-related risks, this plan is a vital component of a comprehensive, deliberate approach to join the global community in its efforts to address climate change at this critical time.

### Plan Process & Timeline

The CARES Plan process included extensive research and participation. Firstly, an environmental law class at the University of Illinois reviewed relevant plans and quantified topics frequently included in climate planning. Park district staff reviewed the plans of other park districts around Illinois and those of local entities. Following the initial research, a steering committee comprised of park district staff across all three departments was formed to lead the process. Staff conducted ten advisor interviews with professionals in various fields related to sustainability, energy efficiency, waste reduction, resiliency, and more. Introductory presentations were given to a wide range of groups listed below, and Survey #1 (Appendix A) helped guide the goal-setting process. These draft goals were presented at two public input meetings as well as seven presentations to the groups again listed below. Survey #2 (Appendix B) brought to light any missing goals or objectives, as well as helped to prioritize goals. After multiple renditions of the final plan document, it was presented to the Urbana Park District Board of Commissioners for acceptance in April of 2021.

Component of Plan Process	Timeframe
Background Research	February- August 2020
Steering Committee Kickoff Meeting	September 2020
Advisor Interviews	October 2020
<b>Plan Introduction Presentations to:</b> UPD Board of Commissioners UPD Advisory Committee Natural Areas Committee Champaign County Climate Coalition	October- November 2020
Survey #1	December 2020
Review of Survey Results & Goal Creation	December 2020-January 2021
Virtual Community Input Meetings	February 2021
<b>Draft Plan Presentations to:</b> UPD Advisory Committee UPD Board of Commissioners UPD Staff Departments Champaign County Climate Coalition Urbana Sustainability Advisory Committee	February- March 2021
Survey #2	February- March 2021
Implementation of Survey & Meeting Input	March 2021
Creation and Formatting of Final Plan	March-April 2021
CARES Plan Accepted by Board of Commissioners	April 2021

## Chapter 2: Equity, Inclusion & Justice

Climate change poses significant challenges in equity, inclusion and justice. How people contribute to climate change, experience its impacts, and adapt to these impacts is determined largely by variables such as gender, ethnicity, socio-economic status, age, physical ability, and geographic location. Environmental conditions and the availability of resources contribute to the ability to cope with climate-related events and disasters. Low-income communities, people of color, people with disabilities, aging populations, and other marginalized people are disproportionately impacted by climate change. They may lack necessary infrastructure and support systems and gain fewer benefits from sustainable practices.

### Populations of Concern

Vulnerability to climate change varies across time and location, across communities, and among individuals within communities. Addressing equity in the CARES Plans starts with identifying vulnerable groups of people. The Environmental Protection Agency’s *Environmental Justice Screening and Mapping Tool* identifies the following populations of concern in Urbana:

- People of color: 25%
- Low income population: 30%
- Population under 5 years of age: 6%
- Population over 64 years of age: 16%<sup>1</sup>

Efforts will be made to connect with people in these populations to determine their unique needs and barriers and to facilitate environmental resources and services, such as focusing tree plantings in historically underserved neighborhoods or providing opportunities that both save money and reduce environmental impact at the same time.

### You Belong Here

Furthermore, the Urbana Park District upholds our *You Belong Here* initiatives. *You Belong Here* promotes the creation of welcoming and supportive park and recreation experiences for everyone, while encouraging an inclusive and responsive staff culture. We celebrate inclusion regardless of age, ethnicity, culture, income, ability, lifestyle, interests—everyone and anyone belongs here! *You Belong Here* is a pillar of the district’s Strategic Plan 2020, as well as the basis for the *You Belong Here Inclusion Strategy* to welcome all. The *Inclusion Strategy* also provides insight into Urbana’s population and needs. For example:

- 26.7% of community members speak a language other than English at home.
- 20.2% of the population is foreign born.
- Only 78% of households have a broadband internet subscription.

The *You Belong Here* initiatives highlight how diverse Urbana’s needs are, as the first step in meeting those needs for everyone the Urbana Park District serves.



Children under five years of age are one of the groups more vulnerable to climate change impacts. Photo credit: Tyson Kruse

## Chapter 3: Vision & Values

The CARES Plan supports and is reflective of the Climate Statement for the National Recreation and Park Association (NRPA).<sup>2</sup> It states, “Park and recreation professionals plan, manage, program and maintain 11 million acres of public parks and green spaces across the country, and are poised to bring community-driven climate solutions that build a healthy, more resilient and more equitable future for generations to come. They are catalysts for positive change in service of equity, climate-readiness, and overall health and well-being.” (See Appendix C.)

### It is the mission of the Urbana Park District to:

- Improve the quality of life of its community members through a responsive, efficient, and creative park and recreation system;
- Pursue excellence in a variety of programs, parks and special facilities that contribute to the attractiveness of neighborhoods, conservation of the environment and overall health of the community.

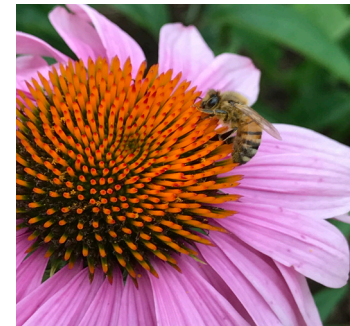
**CARES Vision:** Together, as a park district working for and with our community, we can create a more positive future for everyone by choosing clean energy, using resources efficiently, and preparing for climate risks.

We are compelled to act because carbon pollution is warming our planet. It is impacting communities across America and the world through increasing droughts, floods, wildfires, extreme weather and more. Human activity contributes to these threats, and humans can solve this challenge.

All people have the right to a healthy and viable environment. We have a moral obligation to take action today on climate change and build a sustainable future for children in our community and worldwide.<sup>3</sup>

**Values:** Together, we can create solutions rooted in shared values that effectively address climate risks. The CARES plan is essential to demonstrating these values each day and long into the future:

- We value **health, wellness**, and individual **quality of life**.
- We value **parks and natural areas**, as they provide benefits that support health and wellness.
- We value **biodiversity**—having a wide variety of living organisms and natural habitats.
- We value **equitable improvement** of neighborhoods, urban nature and the environment.
- We value **resiliency and flexibility** to change along with the times.
- We value **community-wide education, engagement, and equitable opportunities**.
- We value **individuals, partnerships**, and the ability to achieve more by **working together**.
- We value **taking action** and providing opportunities for others to take action.
- We value **creativity, efficiency and fiscal responsibility**.
- We value being a **community leader** by modeling best practices of environmentally-responsible behaviors.
- We value a healthy **economic and environmental present and future** of Urbana and all of its diverse residents.



Native plants like purple coneflower support biodiversity.

### Chapter 4: Plan Pillars

The CARES plan is comprised of three interconnected planning pillars which represent overarching themes to guide the park district forward.



**Communicating Climate Action** underscores the Urbana Park District’s commitment to serve as a community leader and role model for climate action—through internal practices, public outreach & programs, and collaborative partnerships.



**Protecting & Strengthening Our Natural Environment** reinforces the Urbana Park District’s responsibility to care for the health of humans, plants, animals, ecosystems & the climate—by reducing our carbon footprint, stewarding biodiversity & natural areas, and improving air & water quality.



**Conserving Resources** highlights the Urbana Park District’s dedication to the sustainability of natural resources—through conserving energy & water, using clean energy, reducing waste, and increasing recycling & reuse.

The first pillar, **Communicating Climate Action**, emphasizes the importance of facilitating discussion around the future of the environment, resiliency, and climate change. The topic can be very intimidating for some, but the more we discuss it, the more comfortable community members will feel, and the bigger impact we all can have on the future of our planet. One unique goal under this pillar employs art, sculpture, and interpretation as a means for engaging with people.

**Protecting and Strengthening Our Natural Environment**, the second pillar, is what many people may associate the Urbana Park District with—open park space and natural areas such as prairies and woodlands. The goals under this pillar focus on creating a healthier environment for both humans and the earth. Increased biodiversity, the variety and diversity of life on Earth, is promoted through tree plantings, natural areas expansion, green infrastructure practices, and improved air and water quality.

The third pillar, **Conserving Resources**, contains common climate plan topics such as using less energy and water or reducing waste. Notable goals here include expanding the use of renewable energy such as solar, transitioning to electric-powered vehicles and equipment, and reducing plastic reliance.



Supporting children in their exploration and appreciation of the environment promotes all three planning pillars.



# Chapter 5: Goals & Objectives

Priority Level Rankings  
see Chapter 6 for full description



= higher priority, shorter term



= mid-priority, mid-term



= lower priority, longer term








## Planning Pillar: Communicating Climate Action

### Goal 1: Communicate the importance of climate action through internal practices.


Objective	Priority Level	Strategy	Performance Measure	Responsible Staff Groups
A. Develop a district-wide green purchasing program for office supplies, cleaning products, and other routine purchasing.		1. Research existing green purchasing programs, resources, and reuse opportunities.	Create and share document by 2022.	Administration, Green Team, CORE Team
		2. Lead purchasing staff will bid or quote green products and alternatives to single-use plastics.	Generate new quotes and bid sheets for greener alternatives by 2022.	Administration, Green Team
B. Expand staff’s understanding of climate change, and cultivate an environmentally-responsible staff culture.		1. Create materials for new part-time and full-time staff during onboarding.	Develop two short training videos and additional digital resources.	Green Team
		2. Discuss how to implement environmentally-responsible practices in the workplace during all-staff meetings.	Present to all staff, part-time and full-time, at least once each year.	Green Team
			Deliver 5-minute presentations during at least four departmental staff meetings each year.	Green Team
3. Encourage employees to “go green” at home as well.	Offer optional staff development presentations at least once per year.	Green Team		

### Goal 2: Provide outreach and programming opportunities to best communicate climate action to diverse audiences.




Objective	Priority Level	Strategy	Performance Measure	Responsible Staff Groups
A. Increase kids’ knowledge and experience with reducing waste during district <b>summer camps</b> .		1. Teach kids how to compost food scraps from meals during summer camp, by using reminders such as signs.	Campers will produce usable compost each summer and decide how to use it.	Camp Coordinators
		2. Encourage recycling and waste-free lunches.	Provide information in summer camp manual for adults and children describing how to pack waste-free or low-waste lunches.	Camp Coordinators, Marketing



B. Provide relevant climate change education and related events for local <b>school children</b> .		1. Offer climate change education during SPLASH and other afterschool programs.	Integrate climate change lessons, activities and resources into at least five already-existing afterschool programs per year.	Program Coordinators
		2. Offer climate change educational programming and resources for K-12 students through standards-based (Next Generation Science Standards) curriculum.	Infuse climate change curriculum in at least two existing standards-based environmental education programs.	Environmental Education Coordinator
			Offer a free 30-minute “introduction to climate change” program and discussion for local educators.	Environmental Education Coordinator
C. Integrate the “You Belong Here” initiatives by finding ways to connect with historically <b>underserved audiences</b> .		1. Improve local conditions while increasing awareness of climate change (and how to mitigate it) in historically underserved neighborhoods and parks.	Collaborate with underrepresented neighborhoods to organize nearby park landscape improvements (such as tree plantings) by 2022.	Outreach & Wellness, Planning & Operations
			In collaboration with the Urbana Parks Foundation, establish a “UPD Tree Fund” to provide trees in underrepresented parks.	Administration, Green Team, Outreach & Wellness
		2. Support the efforts of CU Solidarity Gardens.	Utilize Urvana, website, social media, and other opportunities to promote CU Solidarity Gardens at least ten times in 2021.	Environmental, Outreach & Wellness, Marketing
		3. Identify barriers to green practices.	Collaborate with neighborhood champions such as the members of COAST (Community Outreach & Support Team) at least once per year.	Environmental, Outreach & Wellness
D. Increase <b>youth and teen</b> understanding of local climate action.		1. Offer programs and service-learning opportunities for youth and teen participants.	Facilitate at least two climate action programs for teens each year.	Program Coordinators
E. Engage <b>adults and age-friendly</b> (50 and better) audiences.		1. Increase public knowledge of cooking using low-waste, local and organic ingredients.	Host one cooking class in 2022 that demonstrates “green” cooking.	Community Programs
		2. Increase public knowledge about conserving resources at home to save money.	Host at least one program about homemade/ eco-friendly household products by 2022.	Program Coordinators
F. Engage with the community during <b>free public events</b> .		1. Green Team or Environmental Department staff will offer activities at Urvana (mobile recreation unit) events.	Offer activities at three or more Urvana events each year.	Green Team, Outreach & Wellness

**Goal 3: Provide leadership and public information to advocate for environmental sustainability and climate action.**

Objective	Priority Level	Strategy	Performance Measure	Responsible Staff Groups
A. Report and promote annual CARES Plan accomplishments to increase public awareness about climate action.		1. Seek out new avenues for public information and contact.	Staff a booth at community events, at least one new location outside of the district each year.	Program staff, Green Team, UPDAC
		2. Highlight seasonal actions that have been initiated or completed and provide infographics to inform the public on progress made by the UPD.	Publish progress updates on urbanaparks.org and in Program Guide at least twice each year.	Green Team, Marketing

**Goal 4: Communicate environmental topics, and opportunities for climate action, through art, sculpture, and interpretation.**



Objective	Priority Level	Strategy	Performance Measure	Responsible Staff Groups
A. Promote youth artistic creativity in addressing climate change.		1. During Arts Camp, create artworks (mini-sculptures, comic strips) to be displayed at the Phillips Recreation Center.	Public display or celebration of at least one piece of art related to climate change.	Program Coordinators
		2. Nature Day Camp participants will create a temporary exhibit on the topic of offsetting negative impacts of climate change.	Public display of at least three exhibits at the Nature Center and promotion on social media.	Environmental
B. Promote art and sculpture as a means to communicate environmental concerns.		1. Work with local artists to display temporary art exhibits that raise awareness of environmental issues (such as plastic waste).	At least one new piece displayed in an Urbana park each year. Create a short video about each piece.	Arts & Culture Matrix Team, Planning & Operations, Marketing
		2. Celebrate the 25 <sup>th</sup> Anniversary of the Wandell Sculpture Garden while integrating themes of natural areas and climate change.	In 2022-2023, organize a community special event.	Recreation, Planning & Operations
C. Utilize interpretive exhibits to convey climate change information.		1. Highlight the values and benefits of natural areas and restoration through interpretive exhibits in parks.	Incorporate climate change-related content into three or more new interpretive exhibits.	Environmental, Planning & Operations



Goal 5: Collaborate with partners to reach new audiences, and expand climate change impacts in the community.				
Objective	Priority Level	Strategy	Performance Measure	Responsible Staff Groups
A. Collaborate with Champaign County Climate Coalition (C4) to expand climate action community-wide.		1. Attend C4 meetings on a regular basis and participate in C4 collaborative opportunities.	UPD staff attend at least 75% of C4 meetings.	Environmental, Green Team
		2. Support C4 community-wide initiatives.	UPD staff will support and promote at least one C4 initiative each year.	
B. Work with other local groups or entities to share resources and facilitate programs and events.		1. Build and maintain ties with groups including: neighborhood groups, Youth Climate Justice Forum, Faith in Place, City of Urbana Sustainability & Resilience (including U-Cycle staff), Urbana Sustainability Advisory Committee, UIUC, and the UPD Community Outreach & Support Team (COAST).	Invite members of such groups to attend relevant district planning meetings (or district staff attend collaboration opportunities), at least three times each year.	All Staff
















Planning Pillar: Protecting & Strengthening Our Natural Environment

Goal 1: Reduce the district’s carbon footprint.				
Objective	Priority Level	Strategy	Performance Measure	Responsible Staff Groups
A. Reduce and offset overall carbon emissions.		1. Increase number of trees in UPD inventory to improve carbon sequestration and air quality, and reduce urban heat island effect.	Ensure more trees have been planted than removed each year.	Grounds Maintenance
			Identify and focus on two sites currently lacking in tree canopy.	
		2. Implement no idling best practices for district vehicles and equipment.	Educate staff on best practices at least once per year at staff trainings.	Green Team, Planning & Operations
			Request start-stop (auto-vehicle shutoff) technology in all vehicle bids.	
B. Reduce vehicle trips and total miles traveled.		1. Increase active transportation opportunities such as biking and walking.	Expand total trail mileage by 15%.	Planning & Operations
			Install at least new 5 bike racks annually.	
			Create a program to offer incentives for using active transportation to programs, events, and work.	Recreation, Administration
			2. Decrease in the amount of materials brought to Landscape Recycling Center (LRC).	Reuse wood chip material on site for at least 5 arbor projects annually.
	Use of chip in natural areas locations where soil amending is needed, e.g. fill areas, trails, or habitat.			
	3. Evaluate and create efficient vehicular routes, deliveries.	Evaluate and map routine district vehicle routes to reduce mileage, for example: trash collection or mowing.		Operations
		Develop process for bulk ordering supplies for reduced pickup/deliveries.		District-wide
	C. Determine ways of measuring carbon output and offsets (footprint).		1. Research tools for measuring carbon footprint.	Reach out to at least three other park districts and environmental groups for recommendations; determine which tool(s) apply to UPD.

Goal 2: Improve outdoor air quality.				
Objective	Priority Level	Strategy	Performance Measure	Responsible Staff Groups
A. Reduce UPD contributions to fine particulate matter that negatively impact health.		1. Improve and maintain dust free paving.	Pave and convert any non-compliant dust contributing hardscapes to be compliant by 2023.	Planning & Operations
		2. Increase frequency of street sweeping in district lots and roadways to reduce dust accumulation.	Partner with the City or contracted services to sweep district paved lots and roads at least once per summer.	Operations
B. Reduce contributions of harmful air pollutants (black carbon, nitrogen oxides, toxins, and greenhouse gases).		1. Research available technologies and maintenance protocols to reduce UPD air pollution contributions.	Implement at least three new approaches to reduce air pollution contributions.	Green Team, Operations, Planning

Goal 3: Steward biodiversity through responsible care and expansion of natural areas.				
Objective	Priority Level	Strategy	Performance Measure	Responsible Staff Groups
A. Increase the amount of quality naturalized areas.		1. Create a network of corridors through naturalized areas in each park, pollinator pockets, butterfly gardens, no mow zones, invasive species removal, and increased biodiversity.	Increase this network by 5000 square feet over next five years.	Natural Areas, Grounds Maintenance
		2. Emphasize tree species that support native insects and wildlife.	Create planting list of trees that provide higher wildlife value.	
B. Employ best practices in sustainable maintenance of parks and natural areas.		1. Annually evaluate maintenance methods to uncover possible efficiencies in time and resources.	Annual review meeting each winter with Ops staff to review innovation in equipment and methods.	Operations
		2. Implement best practices in herbicide to use glyphosate only when needed, and alternative approaches such as use of mechanical controls, and evaluating organic herbicides.	Train all Grounds and Natural Areas Staff annually (including part-time) on Integrated Pest Management (IPM) and alternative weed management approaches.	Grounds Maintenance, Natural Areas

C. Develop native, local ecotype, plant propagation program.		1. Design passive greenhouse (with water collection system) for Hickory St. Storage Site.	Preliminary design and cost estimate by end of 2022.	Planning & Operations	
		2. Seek partners or grants for funding Research appropriate grants or foundations.	Identify potential partners and funding sources by end of 2024.		
		3. Install operational greenhouse and water collection system.	Installation complete and plant production beginning by end of 2026.		
D. Enhance community-wide biodiversity.	  	1. Connect public with sources for, and information about, native plants.	Develop a “beginner native plant guide” for community members.	Marketing, Natural Areas	
			Create series of four videos on seasonal natural areas stewardship.	Natural Areas, Environmental	
			Offer one workshop per year on native landscaping.		
		2. Expand invasive species removal and planting of natives in parks and natural areas.	3. Enhance existing wildlife corridors under UPD ownership.	Add at least two new sites to be actively stewarded under a higher level of care. For example: Chief Shemauger, Judge Webber, Binkerd.	Natural Areas
				Begin invasive species removals and native plantings along 500 linear feet of corridors such as the Saline Branch.	Natural Areas
				Map existing corridors and note gaps in quality biodiversity.	Natural Areas, Planning





Goal 4: Enhance aquatic and public health through water quality improvements.				
Objective	Priority Level	Strategy	Performance Measure	Responsible Staff Groups
A. Increase the success and environmental impact of green infrastructure practices (rain gardens, bioswales, permeable pavement, engineered wetlands).	 	1. Increase the amount of bioswales and raingardens in the district by identifying overland flow locations and create a planting plan to help water infiltration.	Convert at least two mowed areas with existing overland flow into bioswales or raingardens.	Grounds Maintenance, Natural Areas, Planning
		2. Go beyond just installing green infrastructure to ensure proper maintenance and functioning.	Create maintenance checklists for natural areas management plans and each associated green infrastructure practices.	
B. Improve quality of water runoff during winter months.	  	1. Research efficient salt deicing techniques to reduce the effect of salt on waterways and aquatic life.	Provide Land Conservation Saltsmart training to staff and invite area agencies to join by winter of 2022-23.	Planning & Operations
		2. Pilot alternative deicing products (for example, corn based products) and non-chemical techniques.	Trial use of two alternative deicing products or equipment and ongoing use of any that are suitable.	Operations
C. Identify locations of point source impacts on park lands.	  	1. Partner with City to identify all storm sewers in parks, including sources and outlets.	Completed and updated GIS storm system inventory.	Planning









Planning Pillar: Conserving Resources

Goal 1: Reduce consumption of energy and water.				
Objective	Priority Level	Strategy	Performance Measure	Responsible Staff Groups
A. Reduce energy consumption.		1. Empower staff to save electricity through simple techniques such as turning off lights, monitors, etc.	Reduce total kW hours used by 2% per year from 2021 baseline.	Green Team
			Verify each facility's thermostats are programmed for vacant hours.	
		2. Catalog all light fixtures in the district for future efficiency upgrades.	Create a comprehensive list of fixtures on a facility by facility basis.	Operations
		3. Create a plan for replacing or retrofitting all lighting with LED bulbs or fixtures.	Create a phased plan and budget for upgrading all lighting in district, ensuring use of available Ameren incentive programs.	Planning & Operations
		4. Install variable frequency drives (VFDs) on equipment to reduce energy use.	Install at least 3 VFD either through retrofit or equipment replacement.	Planning & Operations
B. Reduce potable water used for watering landscaping or fields.		1. Implement rainwater harvesting to reduce water consumption and improve efficiency of landscape and tree watering operations.	Install at least one rainwater cistern collection device in next five years.	Planning & Operations
C. Target water conservation at both pools.		1. Detect underground leaks.	Annually employ pressure and dye testing to identify water leaks.	Aquatics Maintenance
		2. Address issue of showers being left on by patrons after use.	Implement process for staff to catch these issues earlier; for example, hourly staff checks for running showers.	Aquatics
			Long term, swap fixtures for water conserving or timed models.	Operations
		3. Keep pulse on aquatics industry and new technologies.	Aquatics and Aquatics Maintenance staff will attend at least one training or conference per year.	Aquatics Maintenance, Aquatics



Goal 2: Utilize cleaner energy and reduce reliance on fossil fuels.				
Objective	Priority Level	Strategy	Performance Measure	Responsible Staff Groups
A. Use more renewable energy sources.		1. Expand the use of solar arrays for generating clean energy on-site.	Grow the size of UPD’s solar arrays from 6 kW to 50 kW.	Planning & Operations
		2. Determine possible locations for implementing solar-powered lighting.	Implement solar-powered lighting in at least two sites.	Facilities Maintenance, Planning
B. Prepare district facilities for electric vehicle charging.		1. Research requirements to support electric vehicles, both for district fleet and public visitors.	Contact at least three other districts or manufacturers to better understand requirements.	Planning & Operations
			Draft specifications by end of 2022.	
		2. Create a plan to finance electric charging requirements and infrastructure.	Develop preliminary cost estimate and include in Capital Improvement Projects list.	Planning & Operations, Administration
			Seek options for grant funding including Ameren, Clean Energy Foundation, SEDAC, etc.	Planning & Operations
3. Installation of charging stations.	Install charging stations at one facility by 2026.	Planning & Operations		
C. Initiate transition towards electric powered vehicles and equipment.		1. Research electric and hybrid vehicle options.	For each vehicle replacement bid, request an alternate of electric or hybrid option.	Planning & Operations
			As part of vehicle replacement schedule, replace at least two vehicles with electric or hybrid models.	
		2. Research and test electric equipment (chainsaws, string trimmers, mowers, etc.) for future purchase.	Transition at least 10 pieces of gas-powered grounds and natural areas equipment to electric-powered.	Operations
D. Employ renewable energy and energy conservation in all new construction and substantial upgrades.		1. Explore technologies such as high efficiency HVAC systems, high R-value insulation, LED and motion sensor lighting, solar panels, geothermal heating, ENERGY STAR certified products, etc.	Planning staff will ensure energy conserving equipment is discussed at the initial stages of all construction projects, and at least one technology is implemented.	Green Team, Planning & Operations

Goal 3: Reduce waste generated through UPD programs, facilities, and processes.				
Objective	Priority Level	Strategy	Performance Measure	Responsible Staff Groups
A. Reduce waste at programs and events of more than 50 people.		1. Increase use of recyclable or compostable material.	Create a list of at least ten potential products or diversion strategies to choose from based on event.	Green Team
		2. Provide opportunities for public to recycle or compost materials at events.	Employ volunteers to stand by trash receptacles to assist in sorting at two events per year.	Operations, Recreation
		3. Adjust general philosophy of “swag” offerings to include some natural materials or items which can be used up.	Identify at least three new “swag” items that fall into these parameters, such as prairie seeds, saplings, reusable or edible items by summer of 2022.	Operations, Recreation, Marketing
B. Compost food waste created by staff at facilities.		1. Create a pilot program for composting at a staff level.	Creation and implementation of district-wide composting process through education, infrastructure (compost bins), and process.	Green Team, Grounds, Facilities Maintenance
C. Reduce paper usage district-wide.		1. Demonstrate to employees how to save documents, files, budgets, notes and other paperwork electronically.	In year one, reduce paper purchasing budget by 5%. In five years, reduce paper purchasing budget by 25%.	Green Team, Office Managers
		2. Train and transition majority of staff to a paperless time system (ex: Humanity, Microsoft Excel).	100% of full and part time staff will use a paperless timesheet system by 2026.	Administration, Technology Team
		3. Work to reduce the amount of paper generated through marketing or customer service initiatives.	Identify one new process for reducing paper used on materials For example: email lists instead of flyers, or electronic recipients.	Green Team, Marketing

Goal 4: Increase recycling and reuse to divert waste from landfills.				
Objective	Priority Level	Strategy	Performance Measure	Responsible Staff Groups
A. Increase recycling bins district-wide.		1. Identify locations, and budget for installation of additional recycling bins.	Inventory recycling bins in facilities and parks, and identify opportunities for new bins.	Facilities Maintenance
			Installation of identified bins by 2023.	
B. Reduce UPD use of plastic.		1. Provide and promote more opportunities for the public to refill reusable water bottles.	Promote the use of, and provide, reusable water bottles at five public events or programs each year.	Recreation
			Install two, new water bottle fillers in facilities or parks.	Operations
		2. Reduce or eliminate single use plastics (cutlery, cups, plates, bowls) at all staff-meals and meetings.	Request no extra single use plastics from meal provider during ordering.	All-staff
			Acquire enough reusable tableware for each staff member. Replace plastic with paper when single use products necessary.	
C. Eliminate all Styrofoam waste generated by staff.		1. Recycle all Styrofoam that comes into the district by individual staff use (food containers, small packaging).	Create a Styrofoam recycling area at Planning and Operations.	Green Team, Facilities Maintenance
		2. Reduce Styrofoam generated in purchasing of materials.	Create a reference document of frequent vendors who do not use Styrofoam.	Operations, Office Managers

## Chapter 6: Plan Implementation

The importance of an implementation strategy for the five-year life of the CARES Plan cannot be emphasized enough. Many wonderful plans have gathered dust on a shelf after completion due to a lack of forethought on implementation.

First, each strategy and performance measure has been assigned a responsible staff group or groups. This ensures each project or initiative already has staff in charge of moving it forward. These responsible groups can be one of the three main departments (Administration, Planning & Operations, and Recreation), or a subgroup of these (such as Accounting, Outreach & Wellness, or Grounds Maintenance). There are also some groups comprised of staff from across departments, such as the Green Team or Technology Team.

Progress will be reviewed by staff each winter, and an annual progress report will be submitted to the Board of Commissioners each spring. This follows the same process as the *Urbana Park District Strategic Plan 2020*. Reviewing each plan during the period of creating annual goals allows for integration of both short-term and long-term initiatives into the fiscal year ahead.



The Urbana Park District Strategic Plan 2020 and the CARES Plan follow the same implementation process and complement each other.

Lastly, each objective lists a priority level ranging from 3 to 1 leaves in importance. This is based on a combination of the following: community input from the CARES Survey #2 (Appendix B), ease of implementation, and cost.

In addition to these three, other drivers that influenced the prioritization include climate impact, capital improvement schedule, strategic initiatives, grants, partnerships and other opportunities.

It is important to note that the prioritization level is not all-encompassing, but it strives to set priorities and create a road map for implementation over the next five years. For example, preparing district facilities for electric vehicle charging may be a high priority, but it will also take significant time and funding to implement. It is ranked at one leaf because it is anticipated to take at least four years until implementation and cost greater than \$100,000.

See below for the detailed breakdown of each prioritization level.

- Three leaves denotes:**
- Prioritized highly by community (top 1-2 priority in survey)
  - Shorter-term implementation (< 2 years)
  - Lower cost (< \$10,000)

- Two leaves denotes:**
- Neither high or low priority of community
  - Mid-term implementation (2-4 years)
  - Mid-range cost (\$10,000- \$100,000)

- One leaf denotes:**
- Prioritized at a lower level by community (bottom 1-2 priority in survey)
  - Longer term implementation (>4 years)
  - Higher cost (>\$100,000)

## Chapter 7: Glossary of Key Terms

**Biodiversity** - The variety and diversity of life on Earth. Biodiversity can be measured at the levels of genetics, species, and ecosystems. Biodiversity boosts ecosystem productivity where each species, no matter how small, has an important role to play.

**Bioswale** - This green infrastructure practice uses dense vegetation along with layers of soil and aggregate to treat, store and infiltrate stormwater runoff. They are similar to rain gardens in many ways.

**Black Carbon or Soot** - Fine particulate air pollution that contributes to climate change and negatively impacts environmental and human health.

**Carbon Dioxide (CO<sub>2</sub>)** - The primary greenhouse gas and driver of climate change. It is an integral part of life cycles on earth, produced through animal respiration (including human respiration) and absorbed by plants to fuel their growth, to name just two ways. Human activities are drastically altering the carbon cycle in many ways. Two of the most impactful are: one, by burning fossil fuels and adding more carbon dioxide into the atmosphere; and two, by affecting the ability of natural sinks (like forests) to remove carbon dioxide from the atmosphere.<sup>4</sup>

**Carbon Footprint** - The total greenhouse gas emissions generated by the actions of an individual, event, organization, service, or product (expressed as carbon dioxide equivalent). The average carbon footprint for a person in the United States is 16 tons, one of the highest rates in the world.<sup>5</sup>

**Carbon Offset** - A reduction in emissions of carbon dioxide or other greenhouse gases made in order to compensate for greenhouse gas emissions made elsewhere. Offsets are measured in tons of carbon dioxide equivalent (CO<sub>2</sub>e). One ton of carbon offsets represents the reduction of one ton of carbon dioxide or its equivalent in other greenhouse gases. More than just trees removes carbon dioxide from

the atmosphere; greenscapes such as parks, prairies, forests and wetlands are all carbon sinks which offer offsets to emissions.

**Climate Action** - Increased efforts to reduce greenhouse gas emissions and strengthen resilience and adaptive capacity to climate-induced impacts. This often includes integrating climate change measures into policies, strategies and planning. Increasing education, awareness and human and institutional capacity for climate change mitigation and resilience are also important components of climate action.

**Climate Change** - Global or regional changes in average temperature and rainfall—particularly apparent from the 1950s onwards—because of increased levels of carbon dioxide in the atmosphere from the burning of fossil fuels like oil and coal. Other human activities, like agriculture and deforestation, also contribute to the excess of greenhouse gases that cause climate change.

**Decarbonizing** - The reduction of carbon. Typically refers to the conversion to an economic system that sustainably reduces and compensates for carbon dioxide emissions. The long-term goal is to create a carbon dioxide-free global economy.

**Emissions** - Greenhouse gases released into the air that are produced by activities such as burning fossil fuels, industrial agriculture, and melting permafrost, to name a few. These gases cause heat to be trapped in the atmosphere, slowly increasing the Earth's temperature over time.<sup>4</sup>

**Fossil Fuels** - Sources of non-renewable energy, formed from the remains of living organisms that were buried millions of years ago. Burning fossil fuels like coal and oil to produce energy is where the majority of greenhouse gases originate. As the world has developed and demand for energy has grown, we have burned more fossil fuels, causing more greenhouse gases to be trapped in the atmosphere and air temperatures to rise.<sup>4</sup>

**Green Purchasing** - Also known as “environmentally preferable purchasing” or EPP, green purchasing refers to utilizing products and services that have fewer negative impacts on human health and the environment when compared with competing products or services.

**Greenhouse Gas (GHG)** - A chemical compound found in the Earth’s atmosphere, such as carbon dioxide, methane, water vapor, and other human-made gases. These gases allow much of the sun’s radiation to enter the atmosphere. This solar energy strikes the Earth and warms the surface. Some of this energy is reflected back towards space as infrared radiation. Some of this outgoing radiation bounces off the greenhouse gases, trapping the radiation in the atmosphere in the form of heat. The more greenhouse gas molecules there are in the atmosphere, the more heat is trapped, and the warmer on average the Earth will become.<sup>4</sup>

**Invasive Species** - Species of insects, plants, and animals that can be either native or introduced and have detrimental impacts on the diversity and ecological processes of the environment in which they are present. Other terms can include nuisance species, pest species, weedy species, or harmful non-native species.

**Methane (CH<sub>4</sub>)** - A chemical compound that is the main component of natural gas, a common fossil fuel. Just like carbon dioxide (CO<sub>2</sub>), methane is a greenhouse gas that traps heat in the atmosphere. Methane accounts for about 10% of all U.S. greenhouse gas emissions, second only to carbon dioxide. While methane doesn’t stay in the atmosphere as long as carbon dioxide, it absorbs 84 times more heat, making it very harmful to the climate.<sup>4</sup>

**Mitigation** - This refers to an action that will reduce or prevent greenhouse gas emissions, such as planting trees in order to absorb more carbon dioxide. It can also include developing and deploying new technologies, using renewable energies like wind and solar, or making older equipment more energy efficient.<sup>4</sup>

**Nitrogen Oxides NO<sub>x</sub> (NO and NO<sub>2</sub>)** - Nitrogen oxides are produced from the reaction of nitrogen and oxygen gases in the air during combustion, especially at high temperatures. The combustion of gasoline in automobiles and emissions from coal-fired power plants emit nitrogen oxides into the atmosphere. Nitrogen oxides react to form smog and acid rain. They react with ammonia, moisture and other compounds to form nitric acid vapor and related particles. The impacts on human health include damage to the lung tissue and other respiratory problems.

**Particulate Matter (PM)** - Also referred to as “particle pollution,” particulate matter is of different sizes and can be released by human and natural sources. The primary sources include automobile emissions, dust and smoke. Small particles can penetrate into the lungs, which can lead to serious health effects.

**Renewable Energy** - Energy that comes from naturally replenished resources, such as sunlight, wind, waves, and geothermal heat. By the end of 2014, renewables were estimated to make up almost 28% of the world’s power generating capacity, enough to supply almost 23% of global electricity. Because renewables do not produce the greenhouse gases driving climate change, shifting away from fossil fuels to renewables to power our lives will put us on the path to a safe, sustainable planet for future generations.<sup>4</sup>

**Resilience** - The ability to anticipate, prepare for, and respond to hazardous events, trends, or disturbances related to climate. Improving climate resilience involves assessing how climate change will create or alter climate-related risks, and taking steps to better cope with these risks. See Appendix D for Indicators of Resilience as defined by the Champaign County Climate Resilience Task Force.

**Sustainability** - Meeting our own needs without compromising the ability of future generations to meet their needs. In addition to natural resources, humans also need social and economic resources.

## Chapter 8: Climate Change Concepts

### Weather vs. Climate

Weather refers to atmospheric conditions in the short term, including changes in temperature, humidity, precipitation, cloudiness, brightness, wind, and visibility. While the weather is always changing, especially over the short term, climate is the average of weather patterns over a longer period of time (usually 30 or more years).<sup>4</sup>

### Global Warming vs. Climate Change

Many people use these two terms interchangeably, but there are differences. Global warming is an increase in the Earth's average surface temperature from human-caused greenhouse gas emissions. Climate change, on the other hand, refers to long-term changes in the Earth's climate (or a region on Earth) and includes more than just the average surface temperature. For example, variations in the amount of precipitation, sea levels, and sea ice can all be consequences of climate change.<sup>4</sup>

### Greenhouse Gas Effect<sup>6</sup>

Human influences have led to rampant release of carbon dioxide and other heat-trapping gases over the past century. The Earth's climate depends on the functioning of a "natural greenhouse effect." This effect is a result of heat-trapping gases in the atmosphere, also known as greenhouse gases. These include water vapor, carbon dioxide, ozone, methane and nitrous oxide. These gases absorb heat bouncing off of the Earth's surface and then redirect much of that energy back towards the Earth's surface. Without this natural greenhouse effect, the average surface temperature of the Earth would be 60 degrees F colder. However, human activities, primarily the excessive burning of fossil fuels (coal, oil, and natural gas) have been releasing additional heat-trapping gases, intensifying the natural greenhouse effect and changing the Earth's climate. Reducing greenhouse gas emissions can potentially slow the rate of climate change and decrease the overall effects.



The "greenhouse gas effect" can be more accurately compared to the discomfort of a "heat-trapping blanket."

### Global Warming Potential (GWP) of Heat-Trapping Gases

Depending on how well a gas absorbs energy and how long it stays in the atmosphere, certain greenhouse gases are more effective at warming the Earth than others. The Global Warming Potential (GWP) for a gas is a measure of the total energy that a gas absorbs over a particular period of time (usually 100 years) compared to carbon dioxide. For example, methane is 21 times more powerful than carbon dioxide and nitrous oxide is 300 times more powerful than carbon dioxide.

### Carbon Sequestration & Carbon Sinks

Carbon sequestration is the process of capturing and storing atmospheric carbon dioxide. It is one method of reducing the amount of carbon dioxide in the atmosphere with the goal of reducing global climate change. This may include land surface changes such as planting trees and other native plant species, and other types of habitat restoration or replacement.

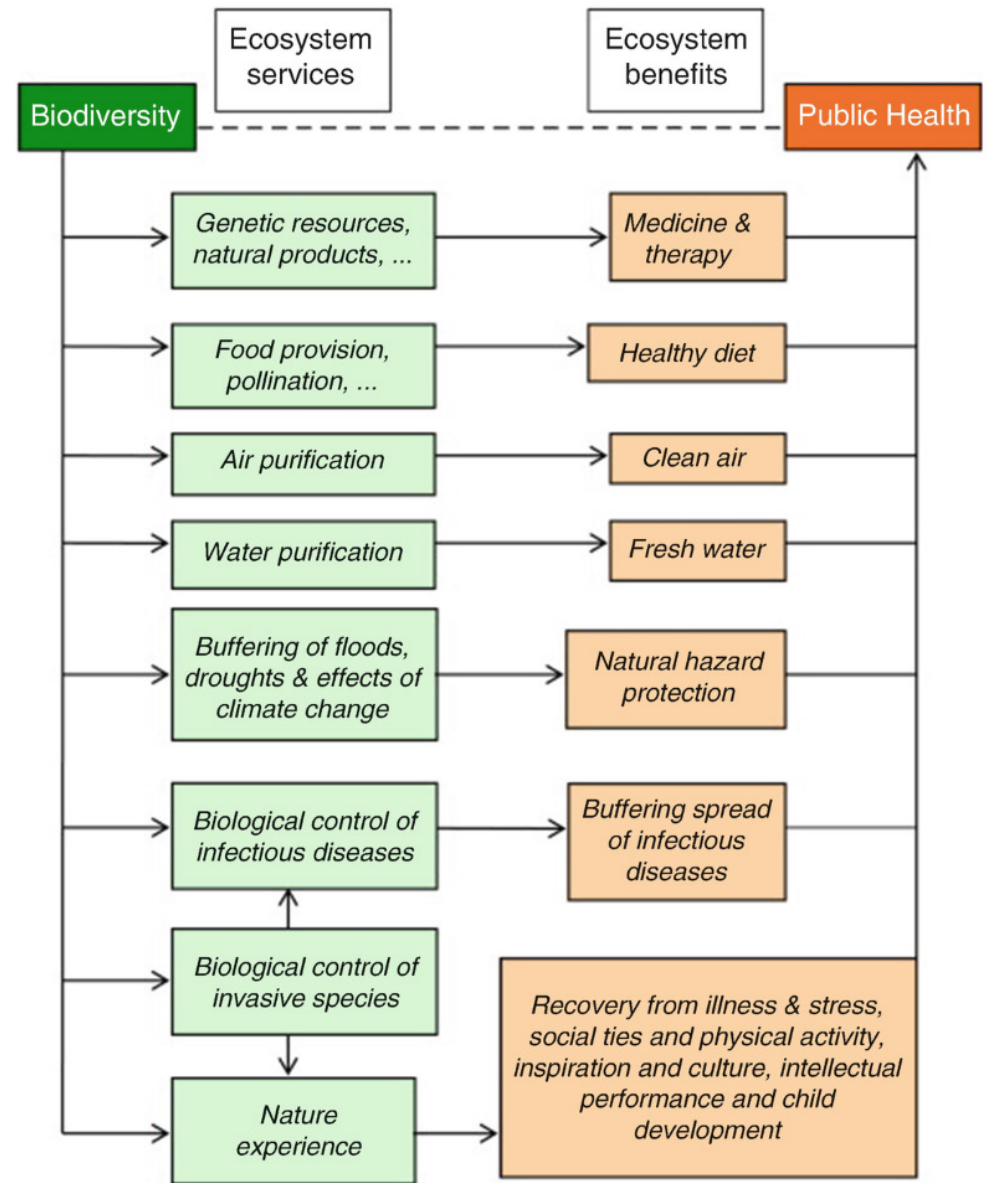
Carbon sinks extract carbon dioxide from the atmosphere by absorbing more carbon than they release. (Carbon sources, conversely, release more carbon than they absorb.) These include forests, grasslands and oceans, and cover about 30% of the Earth's land surface. As much as 45% of the carbon stored on land is tied up in these sinks. Maintaining carbon sinks, such as through stewardship of natural areas, is therefore essential to counteracting climate change.

**Ecosystem Services<sup>7</sup>**

Ecosystem services, also known as “natural capital,” are the benefits that people obtain from ecosystems. They are indispensable to the wellbeing of all people, everywhere in the world. Human interventions are decreasing the ability of ecosystems to provide goods (like fresh water, food and chemical compounds) and services (like purification of air, water and soil). Ecosystem disruption can impact public health in a variety of ways and through complex pathways.

Human health and well-being ultimately depends upon ecosystem products and services—from the availability of adequate food and water, to regulation of disease vectors, pests, and pathogens. Biodiversity underlies all ecosystem services.

A biodiverse environment promotes overall health. Healthy habitats provide ecosystem services directly, such as through flood risk mitigation and cooling, and indirectly as a resource for cultural and physical activities. “The single biggest priority for public health is to work across governments and countries to protect biodiverse natural resources and introduce measures to stem climate change.”<sup>8</sup>



Human health and environmental impacts, or ecosystem services, are directly linked.<sup>8</sup>



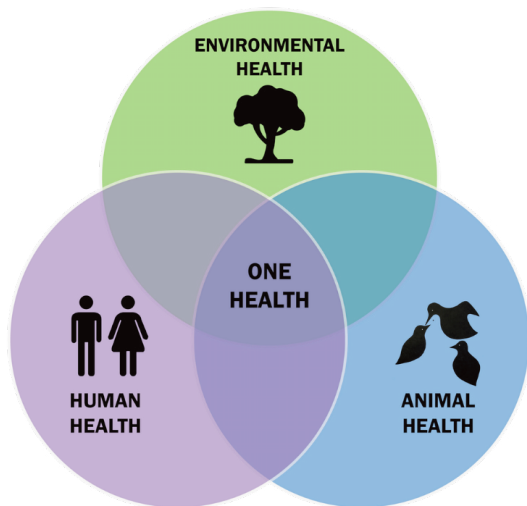
**One Health: Climate Change and Pandemics<sup>9</sup>**

One Health is the idea that the health of people is connected to the health of animals and our shared environment. When we protect one, we help protect all.<sup>10</sup>

Many of the same root causes of climate change also increase the risk of pandemics. For example, deforestation is the largest cause of habitat loss worldwide. Loss of habitat forces animals to migrate and potentially contact other animals or people and share disease.

Climate change alters how we relate to other species on Earth, and that increases the risks of infectious disease emergence. Climate change has already made conditions more favorable to the spread of Lyme disease in Illinois and the northeastern United States.

Climate solutions are also health solutions. Reducing air pollution caused by burning fossil fuels like coal, oil and natural gas also helps keep our lungs healthy, which can protect us from respiratory infections like coronaviruses. Generating electricity from renewable energy sources like wind and solar decreases harmful air pollutants such as nitrogen oxides that lead to more heart attacks and strokes.

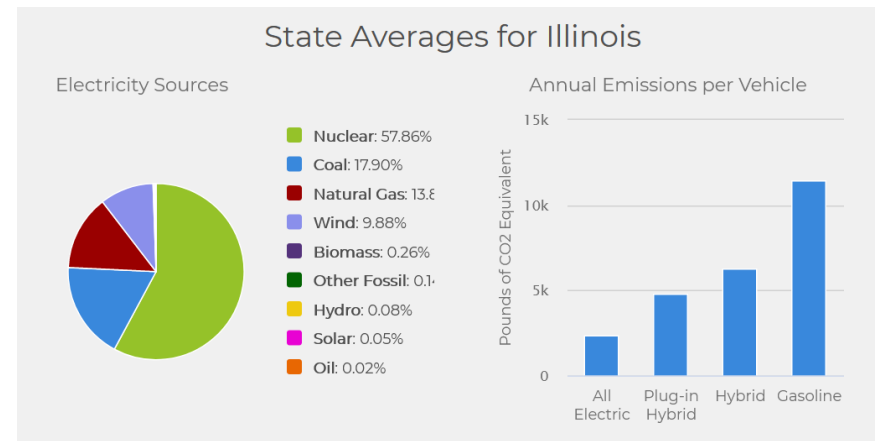


**Electric Vehicles and Equipment, Electricity Sources & Emissions<sup>11</sup>**

Since electricity is often generated from fossil fuels, how much emissions are electric vehicles responsible for?

In geographic areas that use more renewable energy sources for electricity generation, electric vehicles are responsible for lower emissions “well-to-wheel” than similar conventional vehicles running on gasoline or diesel.

“Well-to-wheel” emissions (measured in pounds of CO<sub>2</sub> equivalent) include all emissions related to fuel production, processing, distribution, and use. In the case of gasoline, emissions are produced while extracting petroleum from the earth, refining it, distributing the fuel to stations, and burning it in vehicles. In the case of electricity, most electric power plants produce emissions, and there are additional emissions associated with the extraction, processing, and distribution of the primary energy sources they use for electricity production.



In Illinois, less than 1/3 of our electricity comes from fossil fuel sources. The more renewable energy sources that become available, the fewer equivalent emissions electric vehicles are responsible for. This “greening” of energy sources improves each year, making electric vehicles and equipment increasingly cleaner as well.

## Chapter 9: Climate Change Impacts from Local to Global

Climate change is a global concern with local impacts. According to the National Oceanic and Atmospheric Administration (NOAA), impacts from climate change are happening now.<sup>12</sup> These impacts extend well beyond an increase in temperature, affecting ecosystems and communities in the United States and around the world. Things that we depend upon and value such as **water, energy, agriculture, transportation, wildlife, ecosystems, and human health** are experiencing the effects of a changing climate.

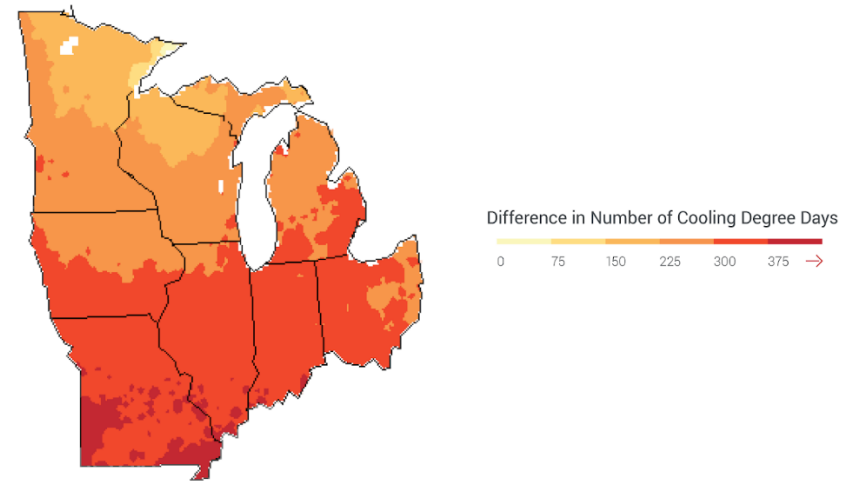
Although the United States accounts for only 4% of the world’s population, it is responsible for emitting 20% of the world’s greenhouse gases. According to Urbana’s baseline emissions inventory, the community was responsible for 548,700 metric tons of carbon dioxide equivalent units (MT CO<sub>2</sub> e) in 2007.<sup>13</sup> At current rates of increase, Urbana’s output was expected to increase 16% by 2020.

### Impacts in Urbana and East-Central Illinois

A 2014 study by the Urbana Sustainability Advisory Commission looked at the local impacts of climate change here in Central Illinois, and what the future could be if trends continue.<sup>14</sup> They isolated three major categories for impacts: increase in temperature, extreme precipitation, and a shift in plant hardiness zones.

#### 1. Increase in Temperature

- Public health issues
- More heat waves
- Increased ozone (O<sub>3</sub>) pollution
- Higher energy demand in the summer and power outages
- Shifting seasons (may affect endemic species and ecosystems)



Annual projected increases in cooling degree days, defined as the number of degrees that a day’s average temperature is above 65 F.

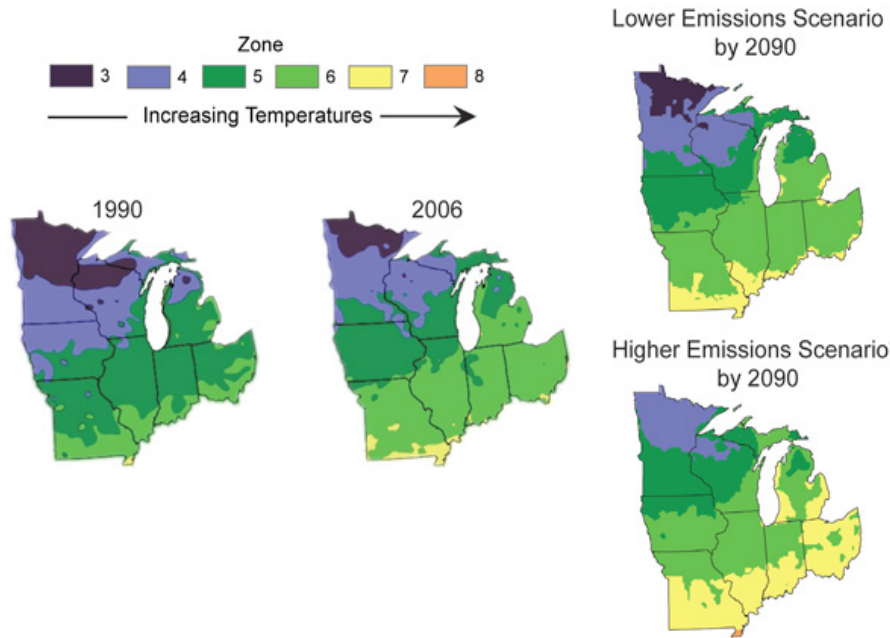
Source: NOAA NCDC/ CICS-NC<sup>15</sup>

#### 2. Extreme Precipitation

- Overall annual increase (may come in the form of more extreme events)
- Greater risk of flooding issues (including water quality issues, sewer overflows, and other pollutants)
- Higher intensity snowfall increasing risk of blackouts and falling trees or branches
- Longer periods without precipitation, resulting in droughts
- Stress on agriculture

#### 3. Plant Hardiness Zone

- Optimal tree and plant species for central Illinois may change
- Warmer, potentially drier summers may impact current tree species



Plant winter hardiness zones in the Midwest have already changed significantly, and are projected to shift one-half to one full zone every 30 years, affecting crop yields and where plant species can grow. By the end of this century, plants now associated with the Southeast are likely to become established throughout the Midwest.<sup>16</sup>

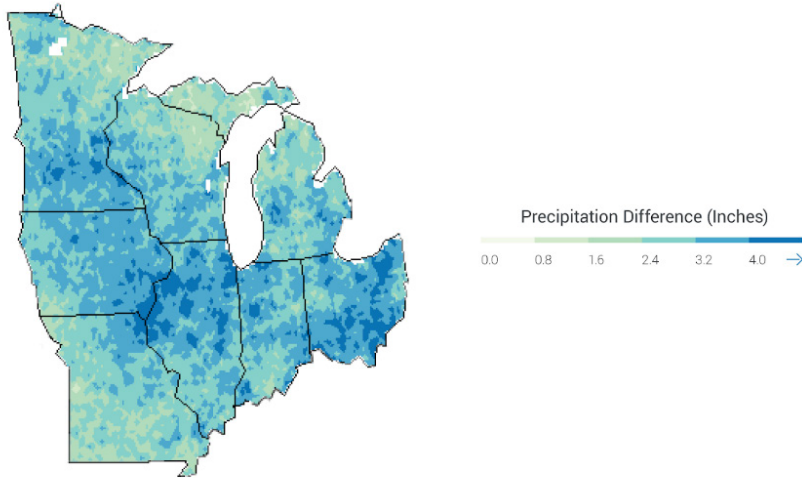
**Economic Impacts in Illinois<sup>17</sup>**

- **Agriculture:** Increased runoff and soil loss are anticipated from changes in precipitation. Potentially drier weather resulting from higher temperatures also poses a concern, as more investment in irrigation is needed to stay viable. These impacts mean higher costs on agricultural production.
- **Human Health:** Where there is no infrastructure to properly treat storm water from more frequent rainfall, waterborne diseases can spread in the water supply. Impacts of heat on vulnerable populations is especially dangerous and can result in serious illness and death.

- **Water Resources:** If additional pollutants in Illinois’ water network increased by 10%, the state will need an additional \$1.5 billion to meet federal requirements.
- **Infrastructure:** Heavy precipitation events poses a huge risk to Illinois’ infrastructure, and flooding is the most economically damaging peril in the state. According to the Illinois State Water Survey, a 10% change in precipitation produces a 20-25% change in stream flow.<sup>18</sup>

**Regional Impacts**

- During the summer, public health and the quality of life, especially in cities, are likely to be negatively affected by increasing heat waves, reduced air quality, and an increase in insect and waterborne diseases. In winter, warming will have mixed impacts.
- A significant reduction in Great Lakes water levels projected under a higher emissions scenario may lead to impacts on shipping infrastructure, beaches and ecosystems.
- A likely increase in precipitation in the winter and spring months, heavier downpours and greater evaporation in summer may lead to more frequent periods of both droughts and floods, as well as water deficits.
- A longer growing season will create the potential for increased crop yields. However, increases in heat waves, floods, droughts, insects and weeds will present major challenges to the management of crops, livestock, and forests.
- Native species will face increasing threats from rapidly changing climate conditions, pests, diseases, loss of habitat and invasive species moving from warmer regions.



Precipitation patterns affect many aspects of life, from agriculture to urban storm drains. This map shows projected changes for the middle of the current century (2041-2070) relative to the end of the last century (1971-2000) across the Midwest under continued emissions. The total amount of water from rainfall and snowfall is projected to increase. Source: NOAA NCDC/ CICS-NC<sup>15</sup>

- The destructive energy of Atlantic hurricanes has increased in recent decades, and is likely to increase in this century. In the eastern Pacific, the strongest hurricanes have become stronger since the 1980s, even while the total number of storms has decreased.
- Sea level has risen along most of the U.S. coast over the last 50 years, and will rise more in the future.
- Cold-season storm tracks are shifting northward and the strongest storms are likely to become stronger and more frequent.

**Global and National Impacts<sup>16</sup>**

- Impacts are vast, vary by location, and some people are more impacted than others.
- U.S. average temperature has risen by more than 2 degrees F over the past 50 years and is projected to rise more in the future.
- Precipitation has increased by an average of 5% over the past 50 years. Projections indicate that northern areas will become wetter, and southern areas, and particularly the west will become drier. The amount of rain falling in the heaviest downpours has increased approximately 20% on average in the past century and this trend is very likely to continue.
- Many types of extreme weather events, such as heat waves and regional droughts have become more frequent and intense during the past 40 to 50 years.

## Chapter 10: Sources

1. United States Environmental Protection Agency, 2021, March 31, "EJSCREEN: Environmental Justice Screening and Mapping Tool" <https://www.epa.gov/ejscreen>
2. National Recreation and Park Association, 2020, November 9, "Climate Statement for the National Recreation and Park Association" <https://www.nrpa.org/about-national-recreation-and-park-association/press-room/climate-statement-for-the-national-recreation-and-park-association/>
3. ecoAmerica, 2019, "A Path to Positive on Climate Change: Vision, Principles and Commitment" <https://ecoamerica.org/wp-content/uploads/2019/06/p2p-vpc-2.19.18-1.pdf>
4. The Climate Reality Project, 2015, October 27, "Key Terms You Need to Know to Understand Climate Change" <https://www.climate realityproject.org/blog/key-terms-you-need-understand-climate-change>
5. The Nature Conservancy, 2021, "Calculate Your Carbon Footprint" <https://www.nature.org/en-us/get-involved/how-to-help/carbon-footprint-calculator/>
6. National Network for Ocean and Climate Change Interpretation, Climate Interpreter, 2020, "heat\_trapping\_blanket.jpg" <https://climateinterpreter.org/file/heattrappingblanketjpg>
7. World Health Organization, "Climate change and human health: Ecosystem goods and services for health" <https://www.who.int/globalchange/ecosystems/en/>
8. Cook P.A., Howarth M., Wheeler C.P., 2019, "Biodiversity and Health in the Face of Climate Change: Implications for Public Health" In: Marselle M., Stadler J., Korn H., Irvine K., Bonn A. (eds) Biodiversity and Health in the Face of Climate Change. Springer, Cham. [https://doi.org/10.1007/978-3-030-02318-8\\_11](https://doi.org/10.1007/978-3-030-02318-8_11)
9. Harvard T.H. Chan School of Public Health, 2021, "Coronavirus, Climate Change, and the Environment: A Conversation on COVID-19 with Dr. Aaron Bernstein, Director of Harvard Chan C-CHANGE (Center for Climate, Health, and the Global Environment)" <https://www.hsph.harvard.edu/c-change/subtopics/coronavirus-and-climate-change/>
10. Centers for Disease Control and Prevention, National Center for Emerging and Zoonotic Infectious Diseases, 2021, March 23, "One Health" <https://www.cdc.gov/onehealth/>
11. U.S. Department of Energy: Energy Efficiency & Renewable Energy, Alternative Fuels Data Center, 2021, "Emissions from Hybrid and Plug-In Electric Vehicles" [https://afdc.energy.gov/vehicles/electric\\_emissions.html](https://afdc.energy.gov/vehicles/electric_emissions.html)
12. U.S. Department of Commerce: National Oceanic and Atmospheric Administration, 2021, "Climate Change Impacts" <https://www.noaa.gov/education/resource-collections/climate/climate-change-impacts>
13. City of Urbana CAP (Climate Action Plan): Phase 1, 2012, February 7, <https://urbanaininois.us/sites/default/files/attachments/city-urbana-cap-phase-i-final.pdf>
14. Woloszyn, M., 2014, February 4, "Local Climate Change Impacts for Central Illinois" for the Urbana Sustainability Advisory Commission [https://www2.city.urbana.il.us/Boards\\_-\\_Commissions/Sustainability\\_Advisory\\_Commission/2014/02-11-14/local-climate-change-impacts-central-illinois.pdf](https://www2.city.urbana.il.us/Boards_-_Commissions/Sustainability_Advisory_Commission/2014/02-11-14/local-climate-change-impacts-central-illinois.pdf)
15. U.S. Global Change Research Program, 2014, "Climate Change Impacts in the United States: The Third National Climate Assessment" <https://www.globalchange.gov/browse/reports/climate-change-impacts-united-states-third-national-climate-assessment-0>
16. U.S. Global Change Research Program: Global Climate Change Impacts in the United States, 2009, "Observed and Projected Changes in Plant Hardiness Zones" <https://nca2009.globalchange.gov/observed-and-projected-changes-plant-hardiness-zones/index.html>
17. U.S. Environmental Protection Agency, 2016, August, "What Climate Change Means for Illinois" <https://19january2017snapshot.epa.gov/sites/production/files/2016-09/documents/climate-change-il.pdf>
18. University of Maryland, Center for Integrative Environmental Research, 2008, July, "Economic Impacts of Climate Change on Illinois" <http://cier.umd.edu/climateadaptation/Illinois%20Economic%20Impacts%20of%20Climate%20Change.pdf>