

## Metropolitan Water Reclamation District of Greater Chicago

Welcome to the August Edition of the 2023 M&R Seminar Series

#### **NOTES FOR SEMINAR ATTENDEES**

- Remote attendees' audio lines have been muted to minimize background noise. For attendees in the auditorium, please silence your phones.
- A question and answer session will follow the presentation.
- For remote attendees, Please use the "<u>Chat</u>" feature to ask a question via text to "**Host**". For attendees in the auditorium, please raise your hand and wait for the microphone to ask a verbal question.
- The presentation slides will be posted on the MWRD website after the seminar.
- This seminar has been approved by the ISPE for one PDH and approved by the IEPA for one TCH. Certificates will only be issued to participants who attend the entire presentation.

#### Şevin Yildiz, Ph.D.

#### Assistant Professor of City Design College of Urban Planning and Public Affairs University of Illinois Chicago



Dr. Sevin Yıldız is an assistant professor in the Urban Planning and Policy Department at the University of Illinois, Chicago. She researches ecological planning and urban design in the context of climate change and global urbanization. She received a bachelor's degree in Architecture from Istanbul Technical University, a master's degree in Architecture from KU Leuven, Belgium, and a doctoral degree from Rutgers University - New Jersey Institute of Technology. She heads the UIC's Master of City Design (MCD) semester-long 'Great Cities Studio' that focuses on conceiving innovative design strategies and systems planning for Chicago's future urban form in the face of changing climate and working on issues of adaptability and infrastructure retrofitting. She also serves on the Chicago Department of Planning's River Ecology Task Force since 2020.

# Innovative Climate Planning for Chicago

Strategies for Adaptation and Ecological Co-Existence

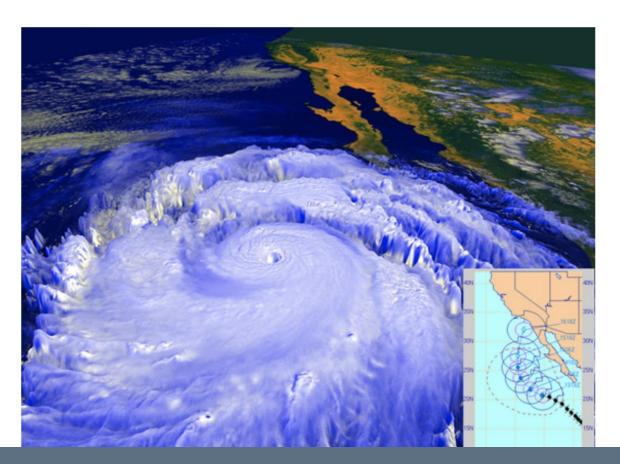
Şevin Yıldız, PhD
Assistant Professor @ Urban Planning and Policy
University of Illinois Chicago

MWRD Lecture Series August 25th, 2023

NEWS I October 16, 2012

#### Could a hurricane ever strike Southern California?

**Explore** 



"In addition, Southern Californians are flood resistant now because of those storms in 1938-39, which led to all the major rivers here being concreted.

So, we're largely immunized against these kinds of catastrophic flooding events now."

#### The arrival of the 'Unprecedented'



### The arrival of the 'Unprecedented'



#### The arrival of the 'Unprecedenteds'

Glacier Lake Outburst in Alaska, August 2023





#### **Never Seen This Before**



## Climate change is redrawing the disaster map

From tropical storms to wildfires, climate disasters aren't confined to the places we're used to seeing them.

By JUSTINE CALMA | August 22, 2023 2:42 pm



Reprints Print Share

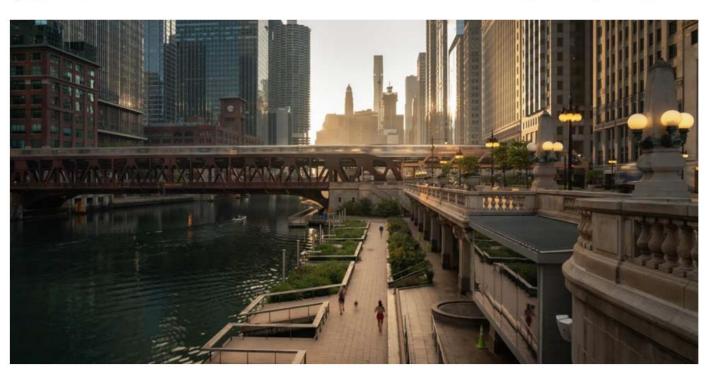
Crain's Forum on climate migrants

Newsletters

#### Climate change could make Chicago a sweet home for migrants

Once the place people sought to escape because of its weather, the metropolitan area could beckon as a safe harbor from climate change.

By Cassandra West



Credit: Getty Images

The Chicago River



From the pension crisis to gun violence, the city and state face a whole host of seemingly intractable problems. Crain's explores these issues in depth with the goal of respectfully and objectively raising the conversation, and in some cases, suggest possible solutions.

See complete Forum on climate

## Chicago could see population growth due to climate change, report claims



Chicago's location along the Great Lakes could make the city a prime candidate for growth as the effects of climate change increase, a recent TIME Magazine article claimed. Photo credit Getty Images



#### I.II LATEST

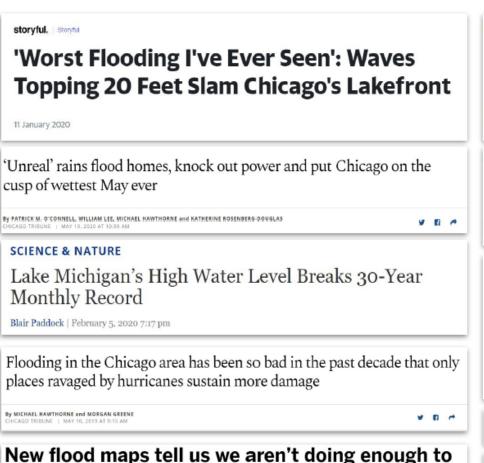


Nerve agents, poison and window falls. Over the years, Kremlin foes...



Stock market today: Global shares mixed ahead of a speech by t...

#### The Irony of the Missing Sense of Urgency



stop rising waters

By CST Editorial Board | Jul 5, 2020, 7:00am CDT

Chicago and the region need to step up fast to reduce flooding and protect inhabitants and

#### **CLIMATE FWD:**

### Chicago's Big Climate Problem

It's not heat or drought. It's the level of Lake Michigan.

#### **SCIENCE & NATURE**

New Analysis Shows Large Swaths of Chicago at High Flood Risk

Erica Gunderson | July 6, 2020 6:26 pm

#### **E&E**NEWS

ENVIRONMENT

#### Chicago Takes a Beating as Lake Levels Surge

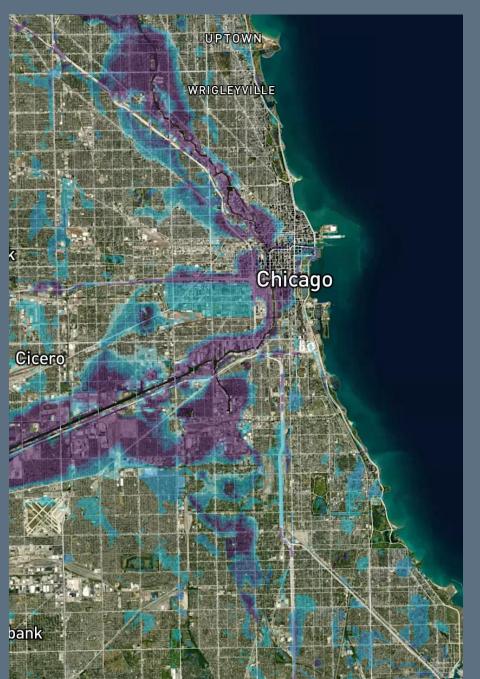
High water and 12-foot waves are eroding shorelines on Lake Michigan

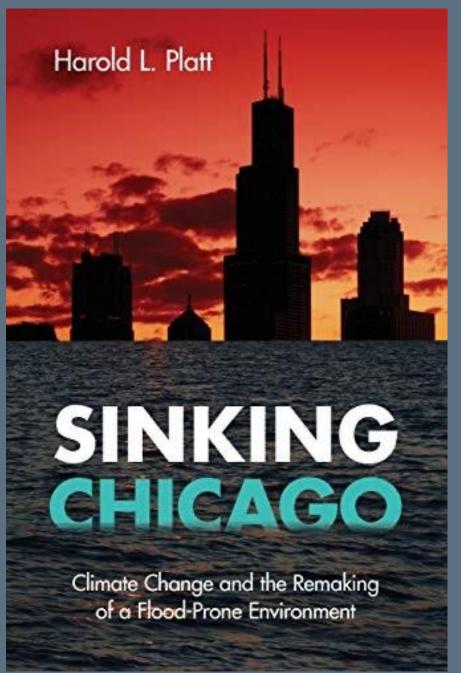
In Chicago, Flooding Overwhelmingly Strikes Communities of Color

### Chicagoans swamp city with flood complaints after spring's record rain

A Sun-Times analysis shows the city received more than 27,000 reports to 311 about flood-related problems in the past two years.

#### The Irony of the Missing Sense of Urgency

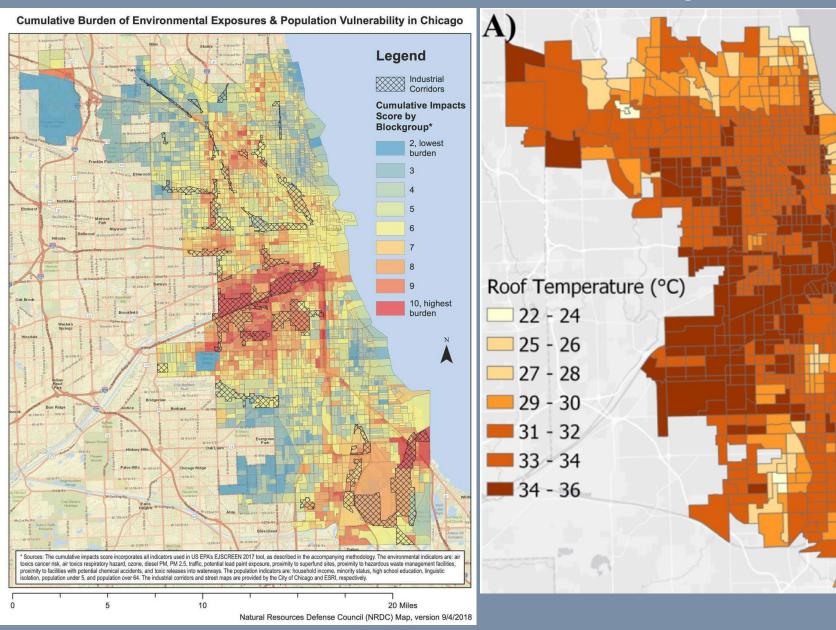




#### The 'Historic' Visits Chicago



#### **Environmental Burden in Chicago**



How did urban areas get the resiliency aspect in planning so wrong in the past two centuries?



1833 Chicago grid was laid out with exceptions for important Native American trails and villages.

"The interstate highway system, it's mostly old Indian trails"

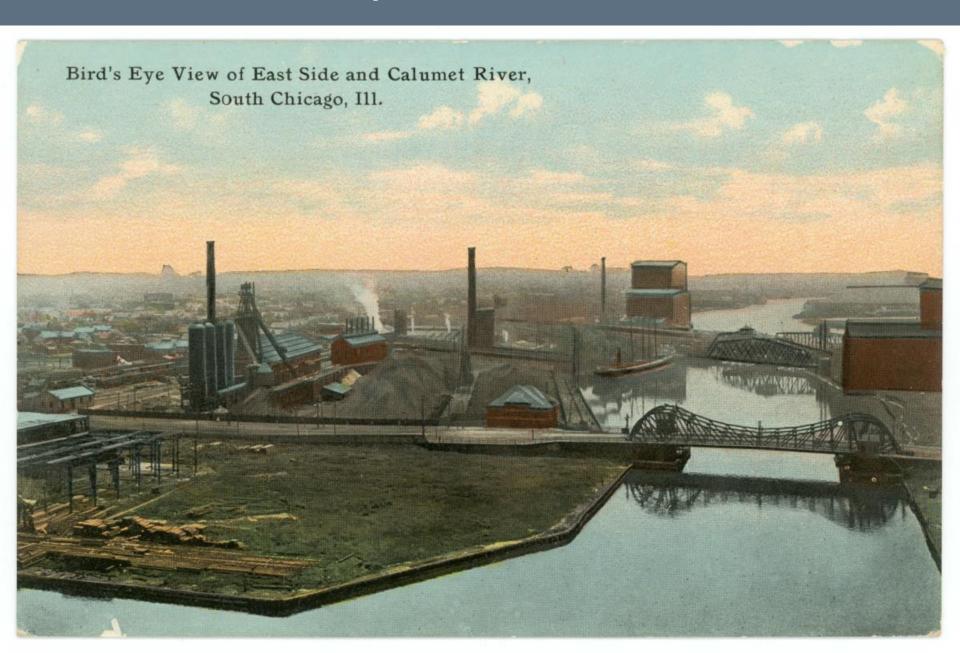
The Indians marked the way, and we just follow, with the railroads and roadways.

They created the blueprint for Chicago."

Historian Susan -Sleeper



#### Nature's Metropolis and the Industrial Natures



#### Tokyo Ochanomizu Crossing, 1910





#### Tokyo Nihonbashi Bridge Kilometer Zero Junction



#### Tokyo Nihonbashi Bridge Kilometer Zero Junction



## Nature's Unboxing Tendencies through Environmental Catastrophes

Pakistan Floods, 2022



Image: Nature

# A New Set of Conditions and Problems Old Sets of Regulations and Toolkits











**∩** PODCASTS & SHOWS

**Q** SEARCH

NATIONAL

### Groups fight for recognition of legal rights for natural entities

July 5, 2023 · 5:05 AM ET

**Heard on Morning Edition** 

By Juanpablo Ramirez-Franco



3-Minute Listen









There's a growing movement that calls for granting legal rights to natural entities such as the Mississippi River. (Story first aired on All Things Considered on July 4, 2023.)

## Rights of Nature is on the Rise

**ECONOMY FEATURED** 

## Rights of Nature, Self-Owning Land, and Other Hacks on Western Law

By David Bollier, originally published by David Bollier blog

July 10, 2023



"What we did was borrow the rights of nature language and embed it into the land easement, so that a landowner could not just restrict use of the property, but actually recognize rights for ecosystems within that conservation easement,"

Env Lawyer Thomas Linzey







**J** MUSIC

**∩** PODCASTS & SHOWS

**Q** SEARCH

CLIMATE

## Montana youth climate ruling could set precedent for future climate litigation

August 23, 2023 · 6:00 AM ET

By Nathan Rott, Seyma Bayram



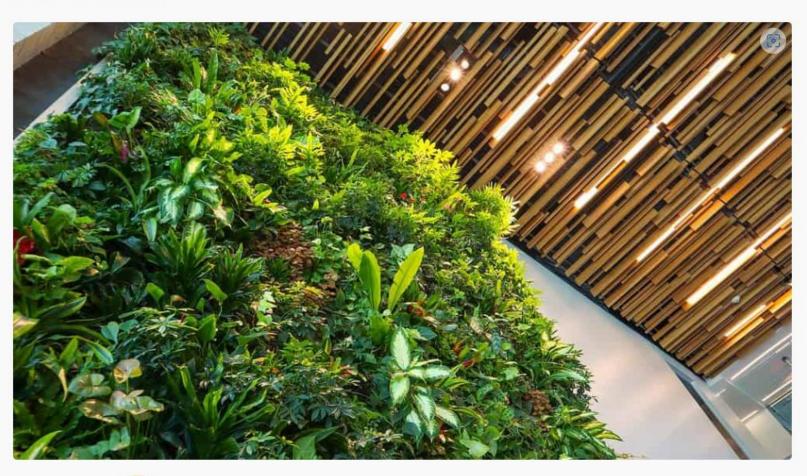
Rikki Held, 22, arrives for the United States' first youth climate-change trial at Montana's 1st Judicial District Court in Helena, Mont., on June 12. She was one of 16 young plaintiffs, ages 5 to 22, who sued the state for promoting fossil fuel energy policies that they say violate their constitutional right to a "clean and healthful environment."

William Campbell/Getty Images

#### Turning up the creativity to turn down the heat

EUROPE BATTLING THE HEAT - With climate change pushing global temperatures ever higher, innovative and sustainable solutions are needed to cool our cities.

FEATURES 14 AUGUST 2023

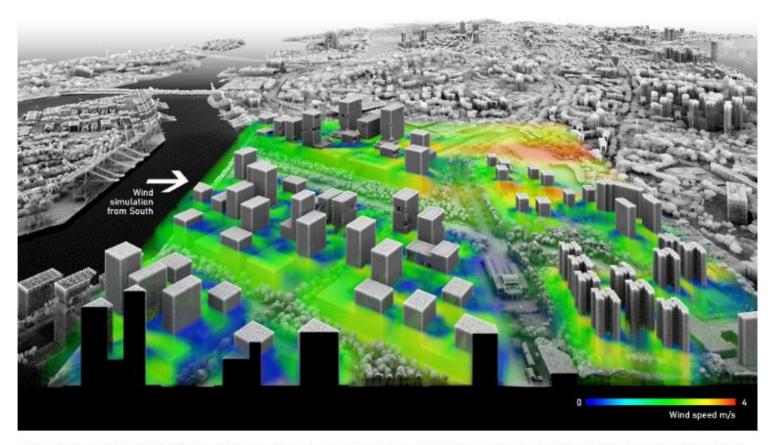


#### Wind garden designed to reduce Madrid's sizzling temperatures



## Form and Performance in Shaping Urban Landscapes

Dr. Philipp RW Urech | Chair of Prof. Christophe Girot, Landscape Architecture | Future Cities Laboratory



The existing cargo port in Tanjong Pagar will make way for a new expansion of the central business district of Singapore. The Rail Corridor with its terminus station could be integrated into the strategic use of the open spaces to dissipate the urban heat island effect. At street level, the airflow improves thermal comfort. Designs by ETH and SUTD students

# How do we Innovate and Break Down Silos?

- Flexible adaptation
- Risk/Uncertainty admission in design and spatial planning
  - Co-existence with natural systems (beyond the sustainability paradigm)
    - Possibilities of Repurposing









# 2022 \* \* \* \* \* CAP CHICAGO CLIMATE ACTION PLAN









......

#### A New Planning Tool is Introduced

Copenhagen Cloudburst Plan



## A New Paradigm: A Corridor vs. a System?

Chicago's legacy

## **Waterways**





Image courtesy: Chicago History Museum



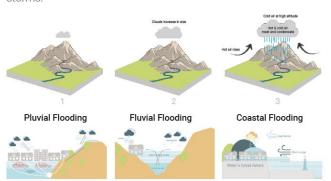


Image courtesy: Chicago History Museum

Image courtesy: University of Illinois

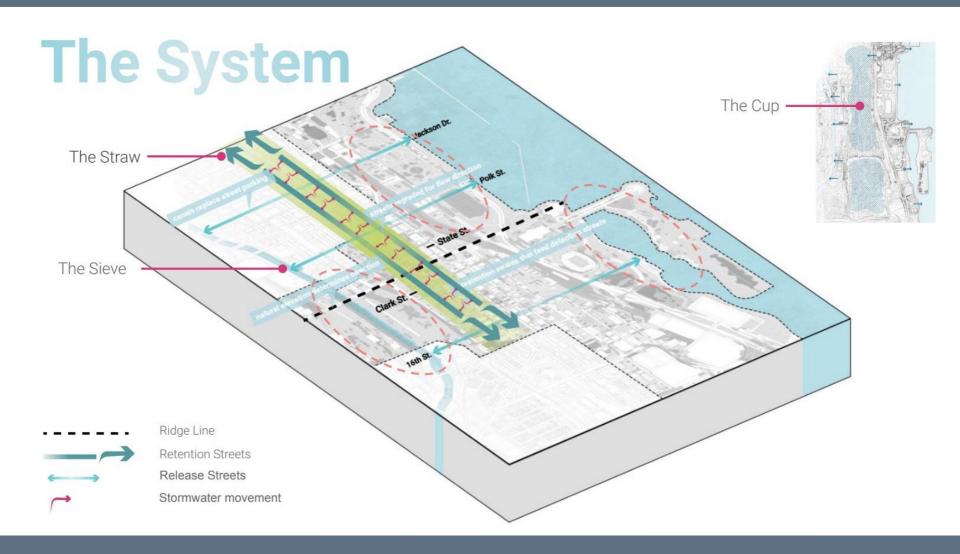
Cloudburst flooding is caused by sudden, substantial rainfall events that can overwhelm stormwater systems and lead to excess water pooling across a city.

Partially due to Chicago's unique location on the precipice of two major environmental systems - the Mississippi River watershed and the Great Lakes basin - adverse and extreme precipitation events are expected to increase in coming years. Acknowledging this now is crucial to address concerns for the years ahead. Cook County's Tunnel and Reservoir Plan (TARP) was commissioned in the 1970's at a time when climate change's impact on weather was not fully understood. Creating additional stormwater capacity through sustainable solutions is critical to contend with coming storms.

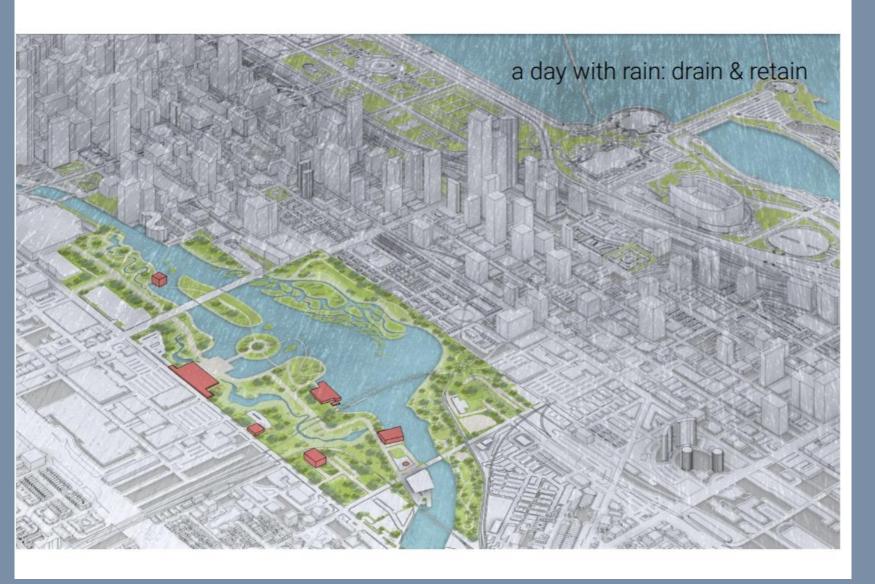


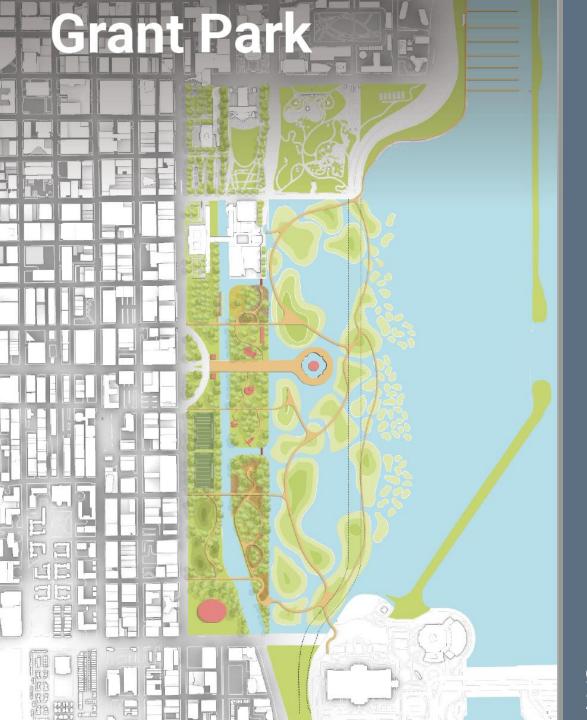


## The Cloudburst Studio of 2022



## Rail Yards & The 78



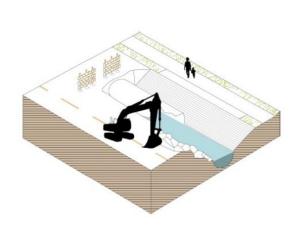


Easements and Right of Ways

## If we see it as a system, how can we re-link the pieces?

Prototype or Catalyst Design for various contingencies

## **Toolkit**



Repurposed Tunnels



Wildlife Intervention



Reimagining the River



# Our Design and Research work at UIC Urban Planning and Policy is a provocation to reconsider existing systems and to propose retrofits.



The Cloudburst studio of 2022 built a base knowledge of repurposing for flash floods, this studio defined new adaptation strategies for conditions of heat waves, low water levels in the river and the lake and conditions of regreening.

These require a regional-level planning philosophy that will trickle down to local implementations in the longterm phasing.

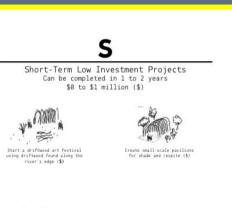
## Phasing is the Critical Tool for Adaptation

Short-Term(1-5yrs)

learning (\$)

Medium-Term (5-10yrs)

Long-Term (inter-generational)



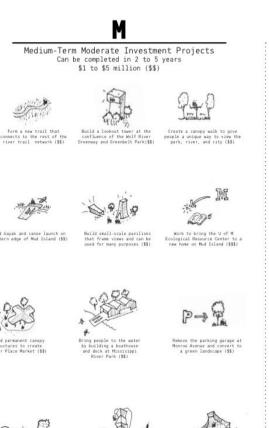


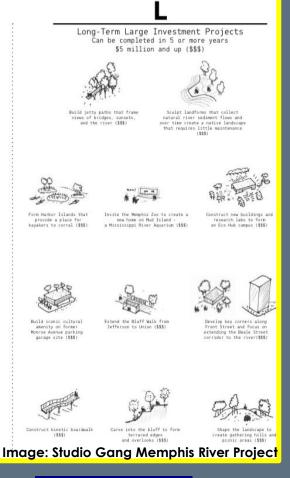
Build benche

and seatwalks (\$)









Community Consensus Public Engagement Risk planning Override Planning

Legislative Frameworks **Work Coalitions** Tailored Visions

Build pavilion at river'

Socio-ecological transformation Co-Existence paradigm





ZSL Zoological Society of London

22 September 2022

A landmark report by ZSL shows how increased urban rewilding efforts could boost wildlife and buffer city dwellers from the worst impacts of climate change.

## The Missing Link: Rewilding

"Wildlife species, throughout their interaction with the environment, are the missing link between biodiversity and climate.

This interaction means rewilding can be among the best nature-based climate solutions available to humankind."



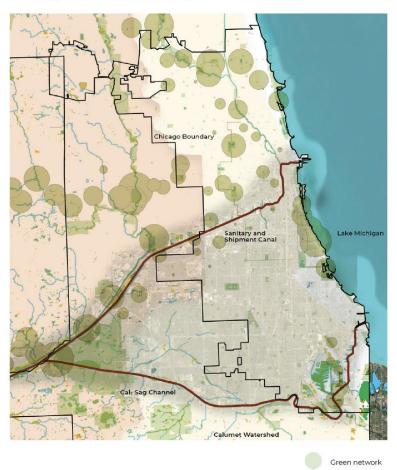
#### Studio Framework

The Spring 2023 Override Studio is a provocation to reconsider existing systems.

- Open Space Networks of Chicagoland A network of different type of reserve zones and programmed parks propose a new version of a natures Nolli map of built up areas proposing a new string of override zones and gradients. (Regional Scale)
- Green Roof Master Plan
   The studio will develop strategies for proactive green roof master planning. Repurposed structures, due to high post-covid vacancies and the typologies of the past open new avenues for rooftop catchment areas and canopy planning. (City-wide scale)
- Cloudburst Streets Building off last years cloudburst studio, students will activate cloudburst prototypes and integrate street overrides. (Downtown scale)
- Override Conjunctions
   Chicagoland is a complex system of underground and above ground. Underground tunnels that are not used, the dense high-rise blocks that stand out as islands, open park spaces and edge typologies such as vast parking garages are accumulated layers of past planning + design practices. The studio aims to map out these relationships to explore new typological arrangements for override conjunctions.
   Students will identify a series of encounter corridors. (City-wide scale)
- Catalysts These are structures that will function to reorganize overrides in conjunctions. They can take on the form of a dual-function infrastructure, a highly flexible cluster of built structures, or a time and modality-based land uses. (Special Zone scale)



### **Ecological Overlaps**



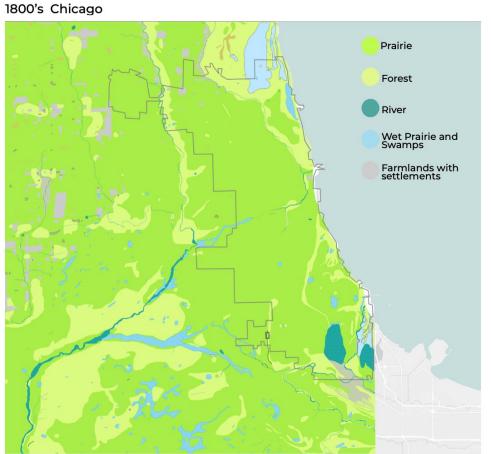
### **Geo-morphology**



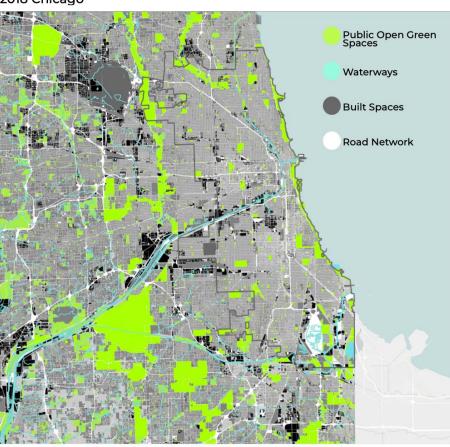
Chicago now

## **Urban sprawl**





#### 2018 Chicago



## We Defined this Area as "the C"



From our design studio work with grad students at UIC CUPPA, 2023

#### Engineered Landscapes

Where natural systems have been engineered, resulting in changed functionality.



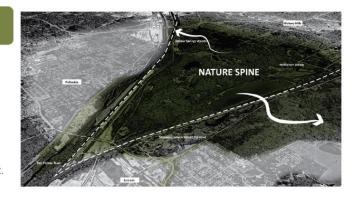


#### Grid Disruptors

Natural and built systems that disrupt the city grid.

#### Natural Spine

Protected ecological hotspots that should be retained to connect to other natural areas and integrate into the built environment.





#### Eco-Remnants

Natural areas that are cut off from their ecological point of origin but retain similar characteristics.

#### Shifting Greys

Utility and industrial corridors shaping nearby land uses.





#### Dynamoscapes

Built and natural systems in proximity to each other which influence one another and trigger a ripple effect.



New Tools, New Laws in the City

From fragmented autonomy to shared long-term goal

Property rights, progressive taxation, climate land trusts

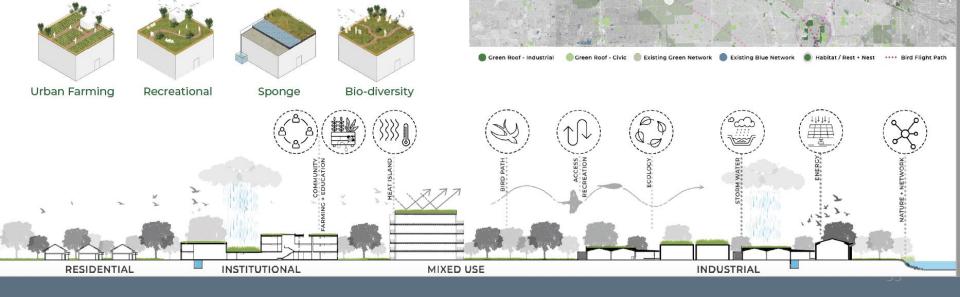


#### **Green Roof Network**

Our comprehensive ecological green roof plan prioritizes the identification of suitable areas for green roof installations, such as industrial zones, institutional buildings, and commercial buildings. To ensure maximum coverage, we set targets for the percentage of eligible roofs that should be covered by green roofs while considering their potential benefits, including reducing the urban heat island effect, improving air quality, and managing stormwater runoff.

To encourage the adoption of green roofs, we propose financial incentives for property owners, such as grants or tax incentives. In effect, the green roof plan will contribute significantly to Chicago's sustainable and resilient future.

#### **Proposed Typologies**



The Green Roof Flyway

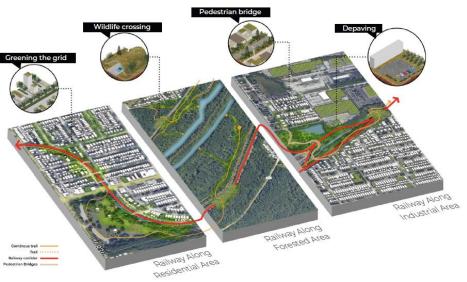
### **Green Roof Network**



## Reimagined Infrastructure Connections

A broken network of natural systems scatter the landscape across our study area. Many were manipulated and engineered to facilitate Chicago's industrial legacy. Infrastructure, particularly railways, defined the form of the urban landscape in this region, and today dissect and fragment both open space and neighborhoods. But the interlaced systems of railways and overhead power lines present an opportunity to restitch this area back together.

We propose a reimagination of underutilized space within the right of ways of both these systems, creating a 35 foot wide linear green buffer adjacent to tracks and underneath power lines, that can be rewilded to create corridors of connectivity for wildlife and humans alike.



#### **Existing Conditions**

1,805 miles of railroad

converge within the study area

755,540 people

live within a quarter mile of railway tracks

4,750 acres

of underutilized rail right of way

1,824 acres

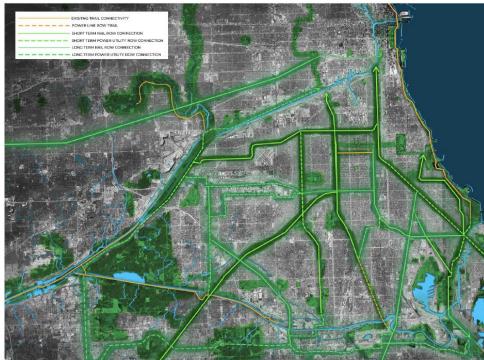
of underutilized utility corridor right of way

#### **Proposed Conditions**

8836

reutilized rail and utility corridor right of ways to create rewilded corridors for wildlife and public realm for humans

#### **Proposed Typologies**



## Reimagined Infrastructure Connections





## **Prototyping Solutions**

Due to the unique placetypes created by the intersecting and overlapping geographies of built and natural systems, the Chicago region is well positioned for innovative and resilient climate adaptation.

This adaptation aims to restitch fragmented ecosystems, create breathing room for vital habitat, and provide natural safe havens for wildlife. These solutions will reconnect isolated communities and allow for access to the vibrant nature that calls the region home.

Solutions come in the form of prototypes that can be applied based on site context, needs, challenges, and opportunities.



#### Connect

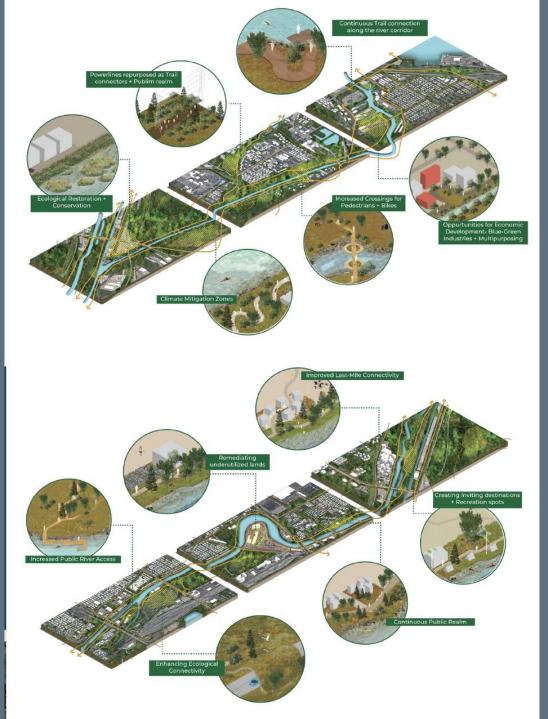


### Repurpose



### **Adapt**





## **Policy Overrides**

Short Term	Long Term	Outcomes
Add public access easements	Public buyout of land along waterways as industries phase out. Land is placed in a land bank for community ownership	Natural systems will be restored and ecosystems can flourish independently. Local communities can enjoy access to the river and deepen their understanding and appreciation of nature.
Create accessible pathways for community control over redevelopment with a focus on environmental programming like phytoremediation, pocket parks, and community gardens	Implement anti-gentrification measures in the form of property tax and demolition freezes along with community land trusts as stewards of public lands	Increased open space, improved stormwater management
Develop green roofs on civic buildings and include an ecologist to review and consult on the construction on green roofs in an effort to find best practices.	Offer tax incentives to existing industrial and private businesses who develop green roofs. Require new developments to add a green roof feature.	Reduce the heat island effect, improve air quality and enhance biodiversity
	Create accessible pathways for community control over redevelopment with a focus on environmental programming like phytoremediation, pocket parks, and community gardens  Develop green roofs on civic buildings and include an ecologist to review and consult on the construction on green roofs in an	Add public access easements  Public buyout of land along waterways as industries phase out. Land is placed in a land bank for community ownership  Create accessible pathways for community control over redevelopment with a focus on environmental programming like phytoremediation, pocket parks, and community gardens  Develop green roofs on civic buildings and include an ecologist to review and consult on the construction on green roofs in an  Public buyout of land along waterways as industries phase out. Land is placed in a land bank for community ownership  Implement anti-gentrification measures in the form of property tax and demolition freezes along with community land trusts as stewards of public lands  Offer tax incentives to existing industrial and private businesses who develop green roofs. Require new developments to add a green



1.28 million

people living in the 'C' impacted by *Chicago's New Nature*  14,000+ acres

of new green space across the Green Roof Network

A vision for a resilient &

12,500+ acres

of remediated and rewilded land

**2000** miles

of newly connected ecological corridors

vibrant Chicago region

