



ALLIANCE FOR THE GREAT LAKES

ENSURING A LIVING RESOURCE FOR ALL GENERATIONS



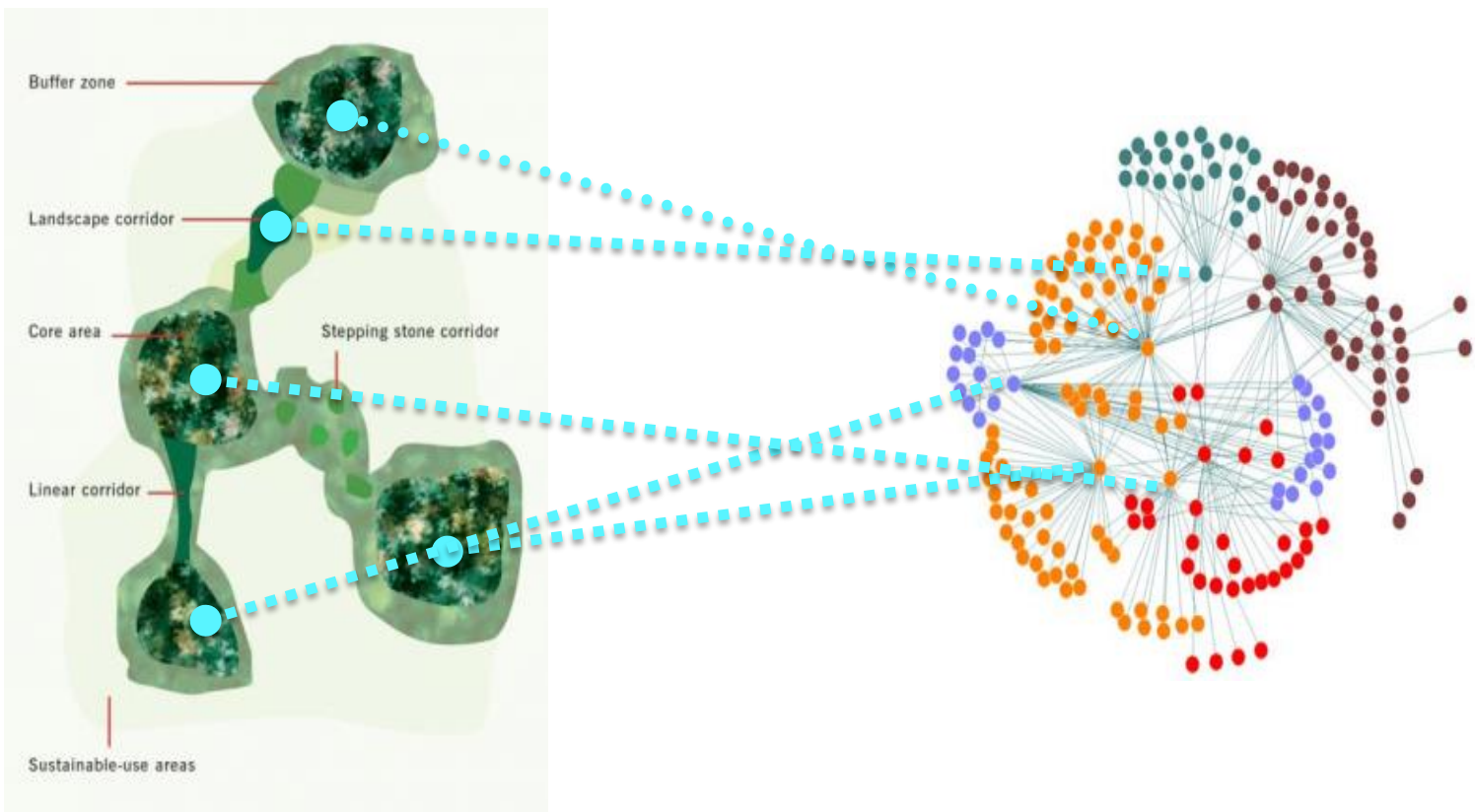
Angela Larsen

Community Resilience Manager

Community Networks

Three Community Networks that share common stressors and landscapes are linked through a planning and public engagement process and implementation of ongoing on-the-ground projects that create enduring resilience

5 Year Goal



Measures of Success

1. **Engage & Support** network stakeholders in implementation of project, policies, and practices
2. **Persuade** community leaders to support implementation
3. **Implement** project, policies and practices
4. **Measure & Evaluate** the network's capacity and the ability of our facilitation strategy to result in implementation

Community Networks





McNeil, Larry. From the photo collage "Winter in Jeneau".

Changes for Communities

Climate Stressors

Contextual...

- Increasing Extreme Weather
- Increasing Air Temperature
- Increasing Water Temperatures
- Variable Lake Levels

Climate Impacts

Contextual ...

- Resident's quality of life
- Community leaders ability to provide services

Which community do you want to live in?



"EVERYBODY LEAVES WHEN WE SHOW UP."

Key to Resilient Communities

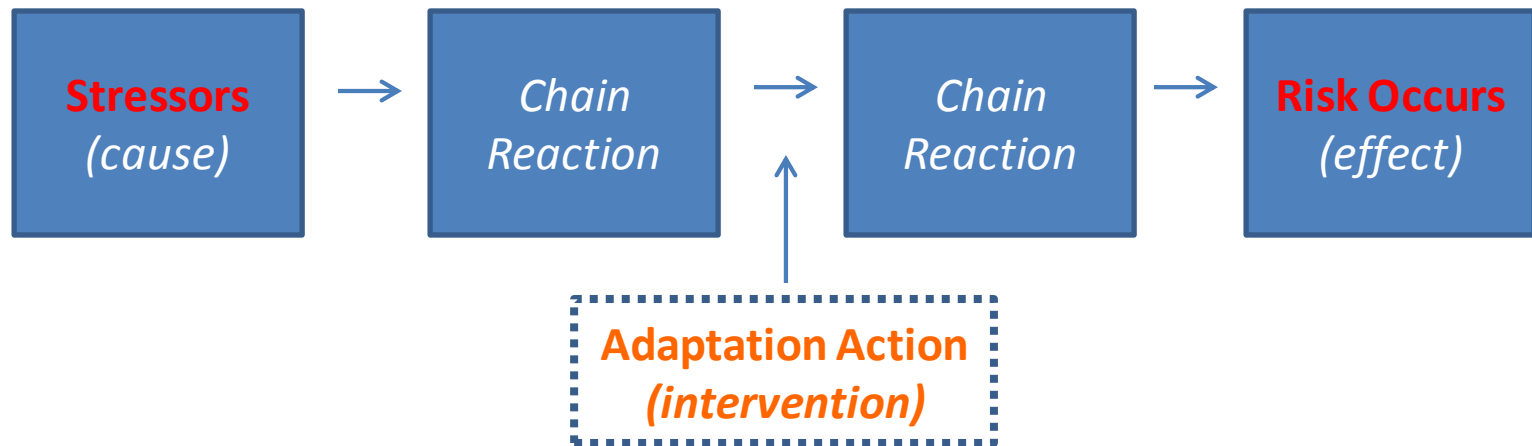
- Understand the needs of the community
- Establish shared goals
- Evaluate the impact to community leaders' ability provide needed services
- **Community leaders come together** to develop, prioritize, fund, and implement practices



Identify Adaptation Actions

Good news – we can take action!



























Which actions will be the most effective in eliminating, reducing or disrupting the risk?



Source: Climate Ready Estuaries, EPA Office of Water, Being Prepared for Climate Change, A Workbook for Developing Risk-Based Adaptation Plans, DRAFT saved: 9/19/2013

	Drought	Extreme Heat	SW flooding	Habitat	Coastal
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Strategies (examples)

River landscaping incentives			 		
Stormwater management requirements and fees			 		
Update to city codes to require green infrastructure			 		
Land easements				 	 
Private property buyout	 				 

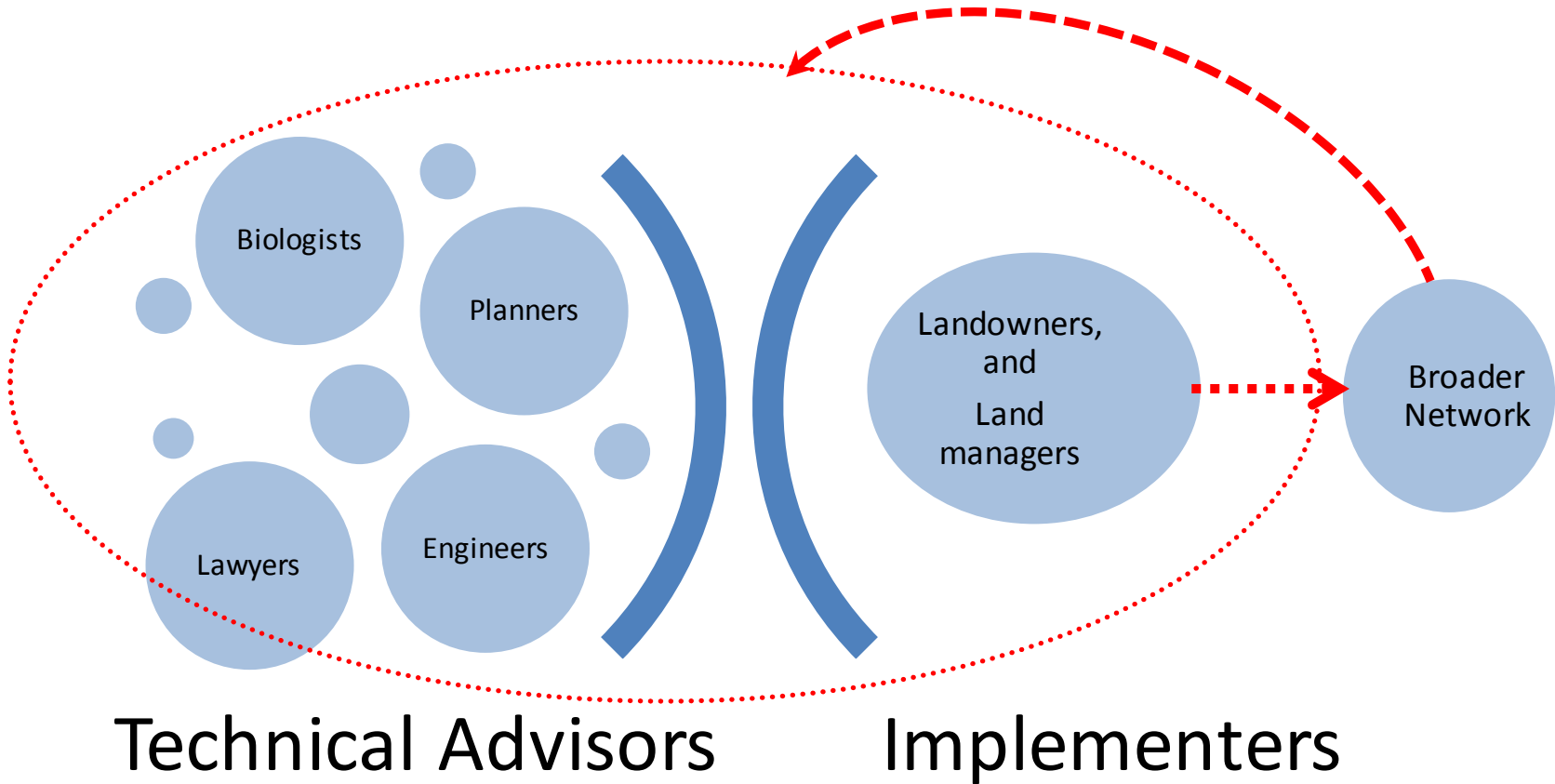
Source: Green Works for Climate Resilience, A Guide to Community Planning for Climate Change, National Wildlife Federation, Reeve and Kingston, April 2014

Design an iterative engagement strategy to achieve the goals

BEFORE WE ENGAGE...

Iterative Engagement Process

Social Network



Establish a collective goal

FIRST...

Goals

Michigan City, IN / Trail Creek watershed

- **Reduce volume of water entering the sewers**
- **Meet or exceed water quality standards**
- Protect natural resources, like Trail Creek and Lake Michigan
- Provide people with access to recreational resources
- Build Michigan City's brand as a coastal community

Goals

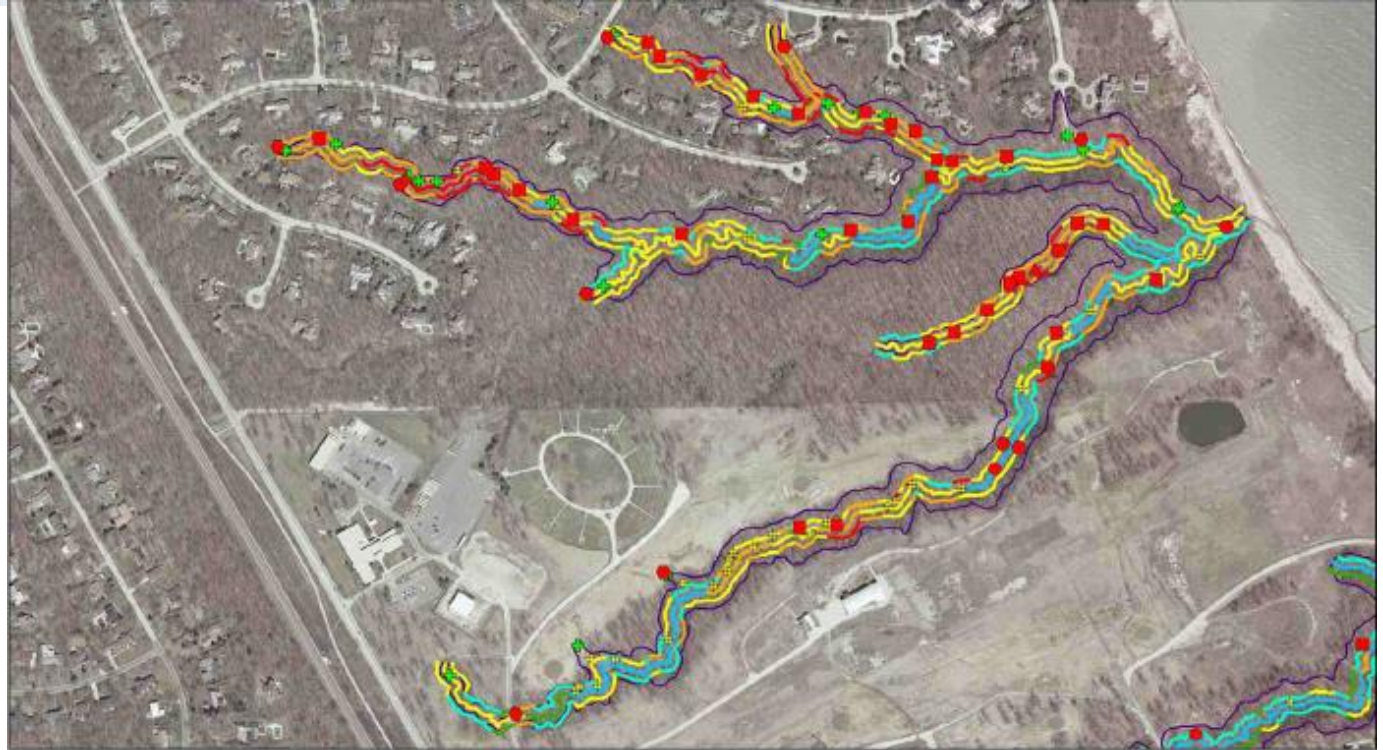
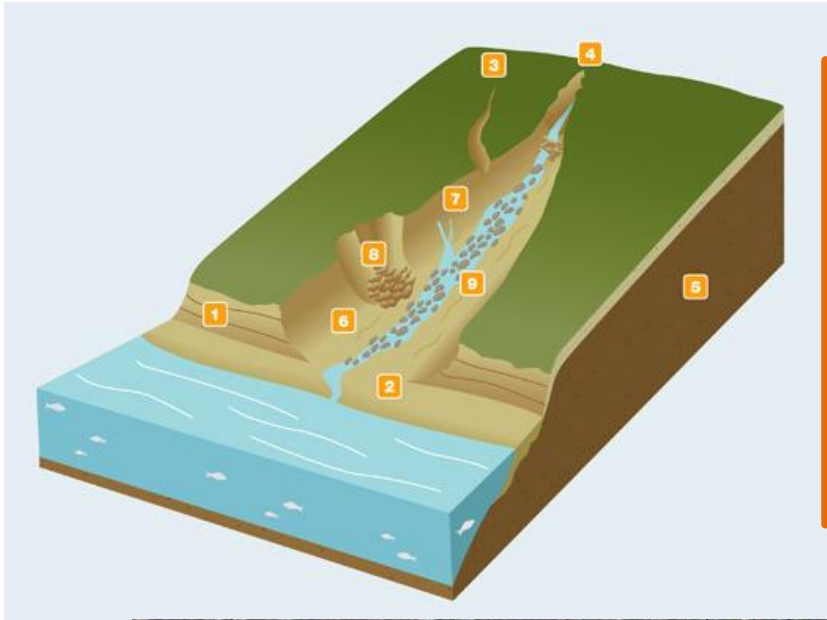
Chicago-Milwaukee, Ravine Network

- Restore ecological functions and environmental conditions that results in habitat for the unique assemblage of highly diverse floristic & faunal communities associated with coastal ravines

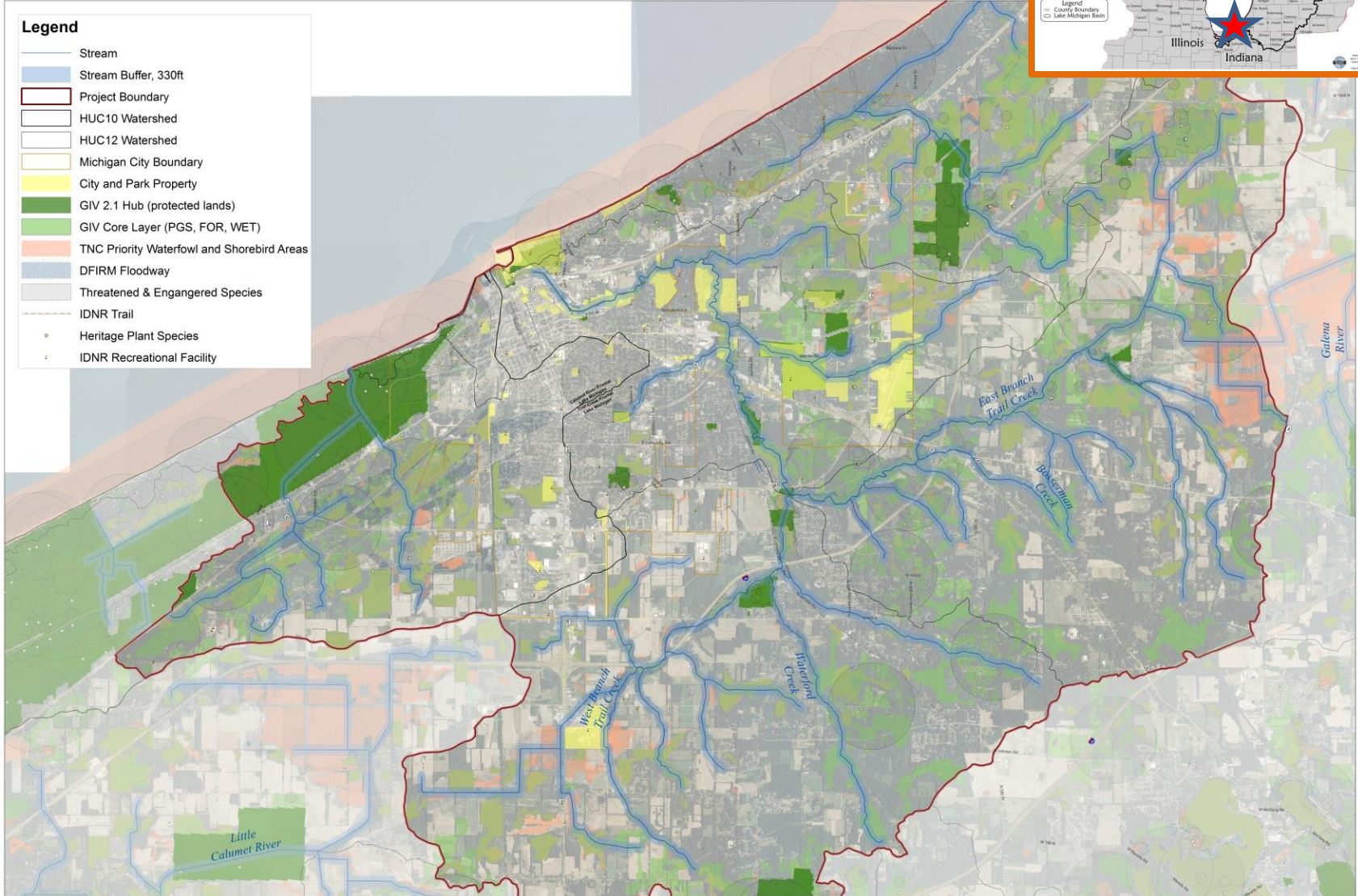
Ground the dialogue

SECOND...

Ecological Network



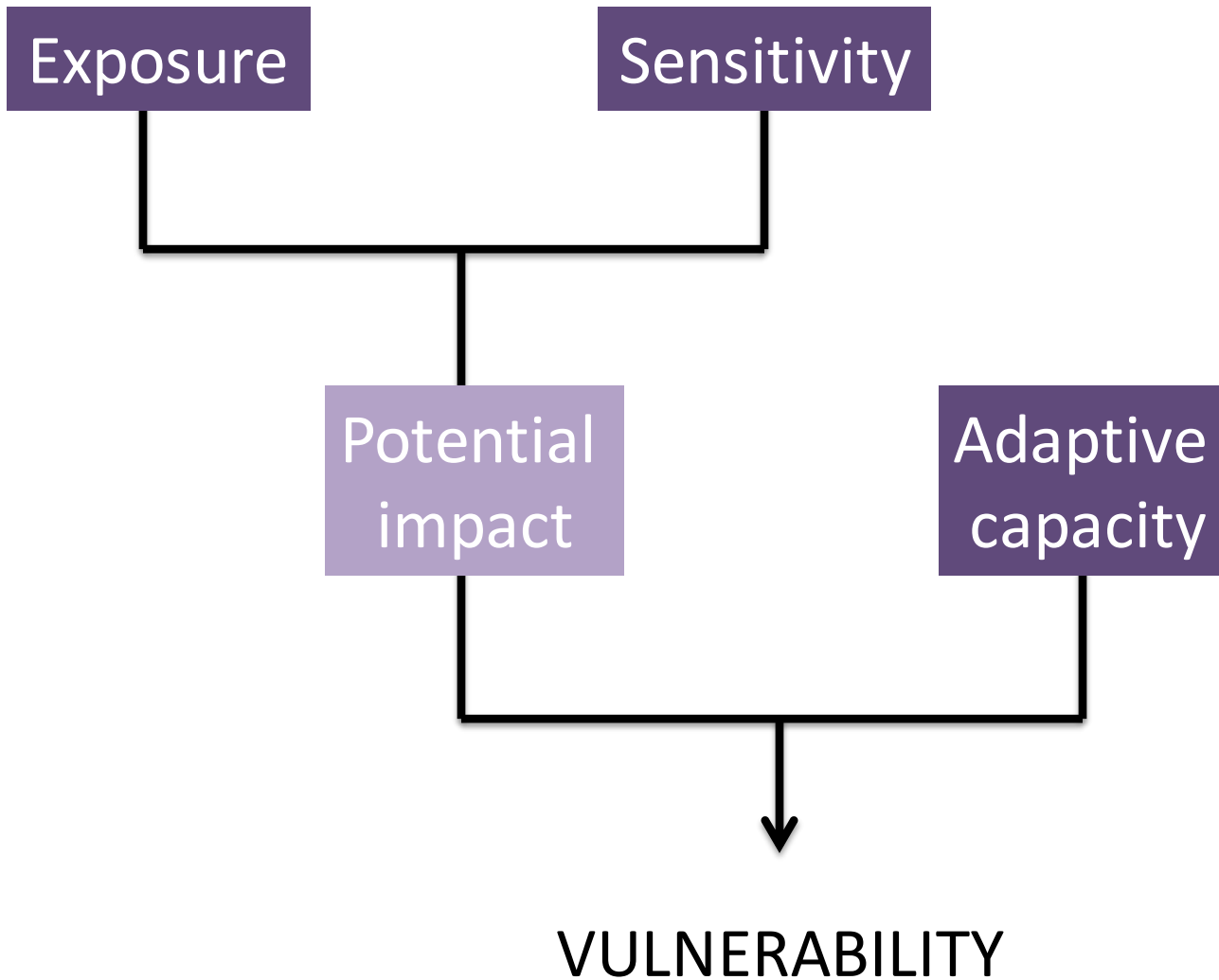
Ecological Network



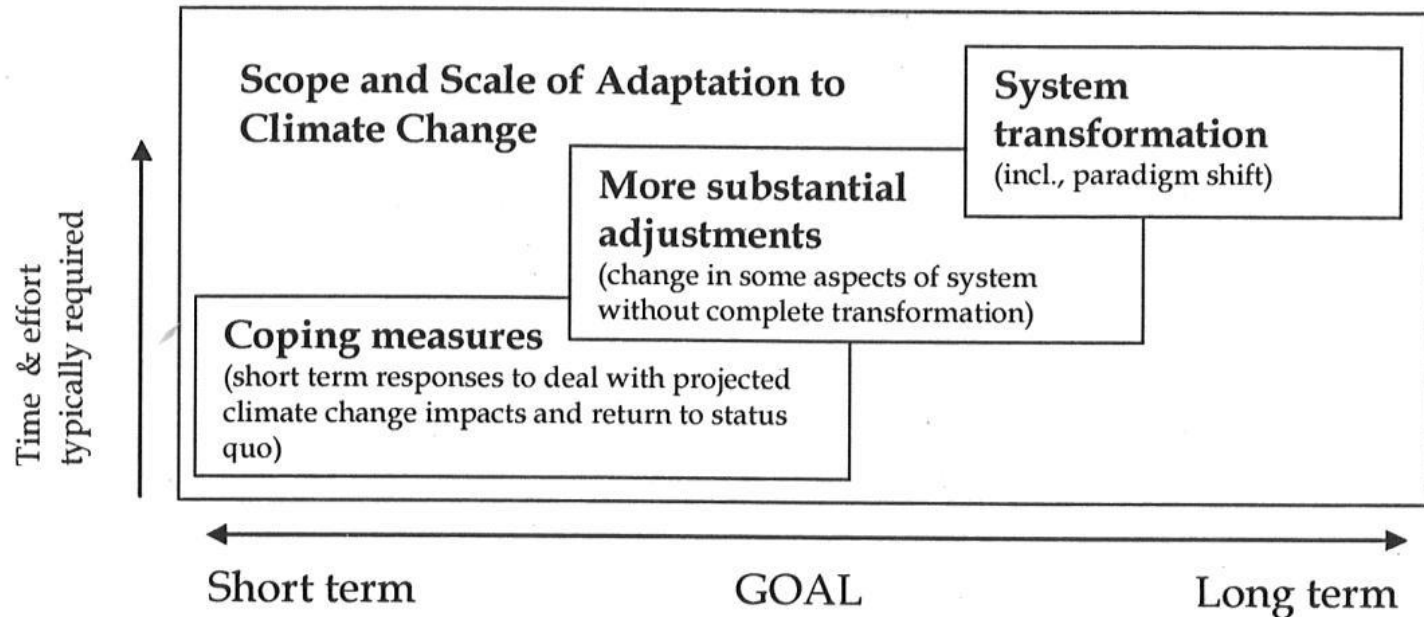
- Legend**
- Stream
 - Stream Buffer, 330ft
 - Project Boundary
 - HUC10 Watershed
 - HUC12 Watershed
 - Michigan City Boundary
 - City and Park Property
 - GIV 2.1 Hub (protected lands)
 - GIV Core Layer (PGS, FOR, WET)
 - TNC Priority Waterfowl and Shorebird Areas
 - DFIRM Floodway
 - Threatened & Engangered Species
 - IDNR Trail
 - Heritage Plant Species
 - IDNR Recreational Facility



Concepts



Concepts



Resistance - compensate for change, hold the same

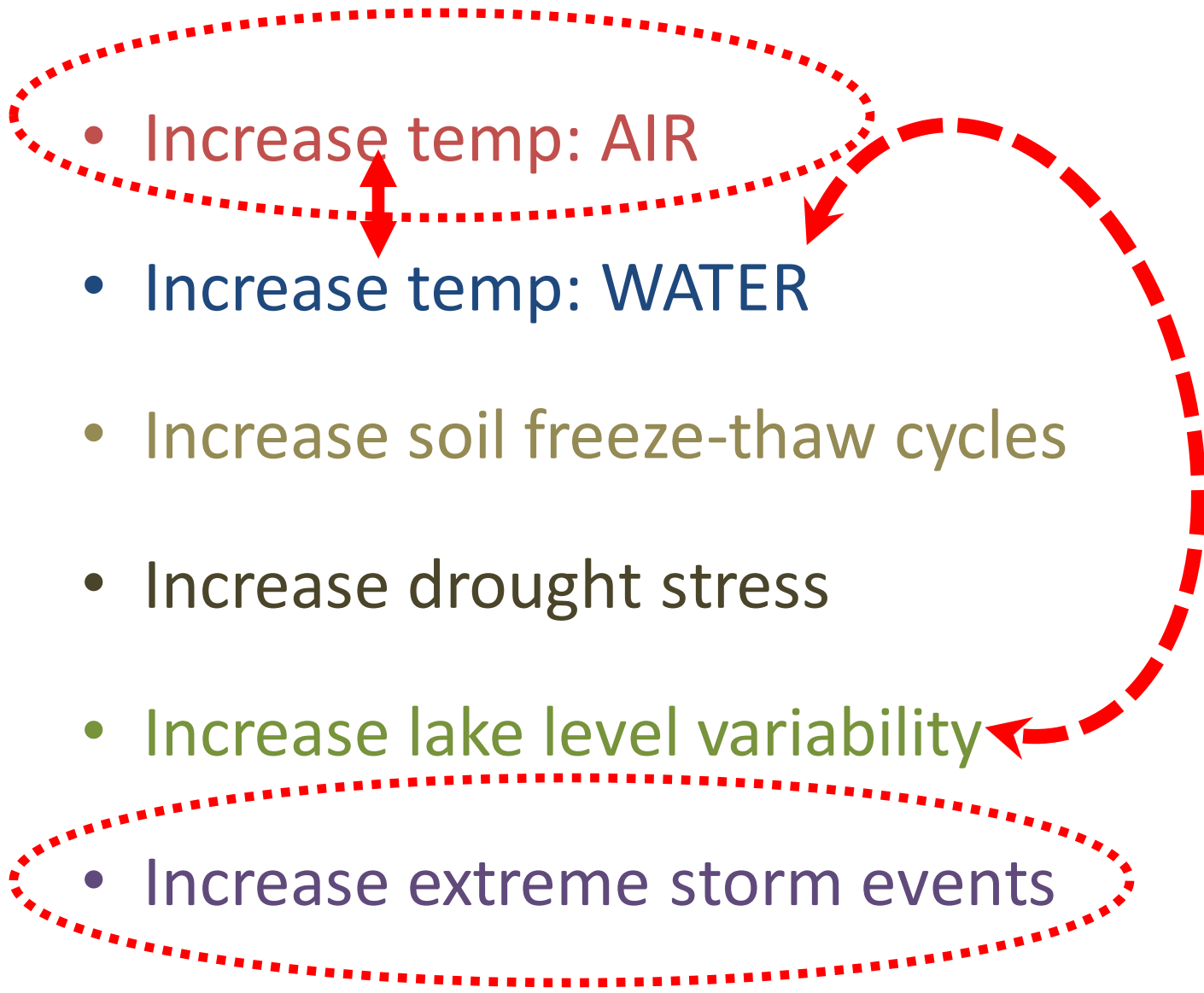
Resilience - remove constraints to response, promote shifts

Transformation - facilitate change to a new state/system

Integrate climate data

THEN...

Identify Climate Stressors



Narrative Climate Summary

1. Local narrative of existing data

- Temperature, Precipitation
- Annual, Seasonal


2. Relates local trends to larger regional trends

3. Two time frames

- Historical Observations
- Future Projections

LOCALIZED CLIMATE INFORMATION FOR IL AND WI RAVINES

Historical and projected future climate trends for the Illinois and Wisconsin Ravines located between Chicago, IL and Milwaukee, WI along Lake Michigan are summarized in this report. The Ravines area is located within the Southeast climate division in Wisconsin and the Northeast climate division in Illinois.



Map of IL/WI Ravines area (circled)


Regional and Local Climate Summary

The climate divisions in which the Ravines are contained have seen increases in annual air temperature and precipitation. These increases have not been consistent throughout the year. Temperature increases have been largely observed in winter and spring. While summer and fall temperature increases have been substantially smaller.

Precipitation has increased over both climate divisions that enclose the Ravines annually. Seasonally, precipitation has increased in both divisions the most in the winter and fall. During spring and summer increases have been less, with spring precipitation in NE Illinois decreased slightly over the period.

Table 1: Summary of observed climate change statistics for the Southeast Wisconsin and Northeast Illinois climate divisions. Changes are for the 1951-1980 to 1981-2010 time period.

	Annual	Winter	Spring	Summer	Fall
NE Illinois					
Temperature (°F)	1.13	2.27	1.32	0.55	0.59
Precipitation (%)	5.70	10.54	-0.39	2.32	15.65
SE Wisconsin					
Temperature (°F)	1.13	2.51	1.27	0.43	0.46
Precipitation (%)	7.34	14.75	5.63	3.29	11.58



GLISA
GREAT LAKES INTEGRATED SCIENCES + ASSESSMENTS

Temperatures in Lake Michigan have risen during the summertime and lake ice levels have declined during the winter, though there is significant interannual variation.^{1,2,3} Increased water temperatures and ice cover declines have the potential to alter the near-shore climate through increased evaporation and potential for increased lake effect snowfall. Though lake effect snowfall is less common on the windward side of Lake Michigan.

Future climate information for the Ravines area comes primarily from global and regional climate models (GCMs and RCMs). In the Midwest, the GCMs project a wider range of temperature and precipitation outcomes than the RCMs, so some of the values reported here are beyond what is shown in the RCM-based maps. No model perfectly simulates the physics that govern global, regional, and local climate, so several models are consulted⁴ to describe potential climate changes in the Midwest and the Ravines area.

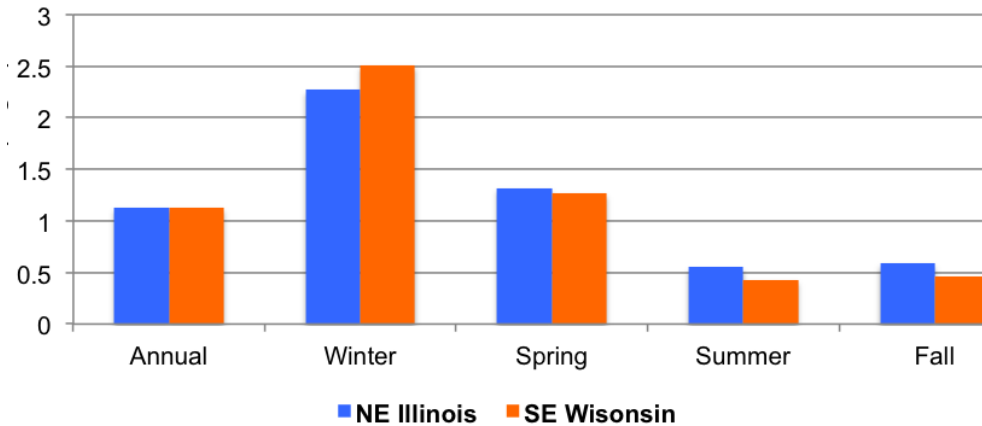
Table 2: Summary of projected climate changes for the Midwest with localized descriptions for the Ravines area

		Short Term (2021-2050)	Long Term (2041-2070)
		Annual	<p>Temperature: Midwest ranges from 1.5-4.5°F warming with an average around 3°F.</p> <p>Precipitation: Midwest ranges from -4% to +7% change.</p>
Winter	<p>Temperature: Midwest ranges from 2-5°F warming with an average around 3.5°F.</p> <p>Precipitation: Midwest ranges from -3% to +15% change.</p>	<p>Temperature: Midwest ranges from 3.5-7°F warming with an average around 5°F in the Ravines area.</p> <p>Precipitation: Midwest ranges from -3% to +17% change. Winter has the greatest projected precipitation increases for the Ravines area (+10 to 15%). More precipitation will fall as rain.</p>	

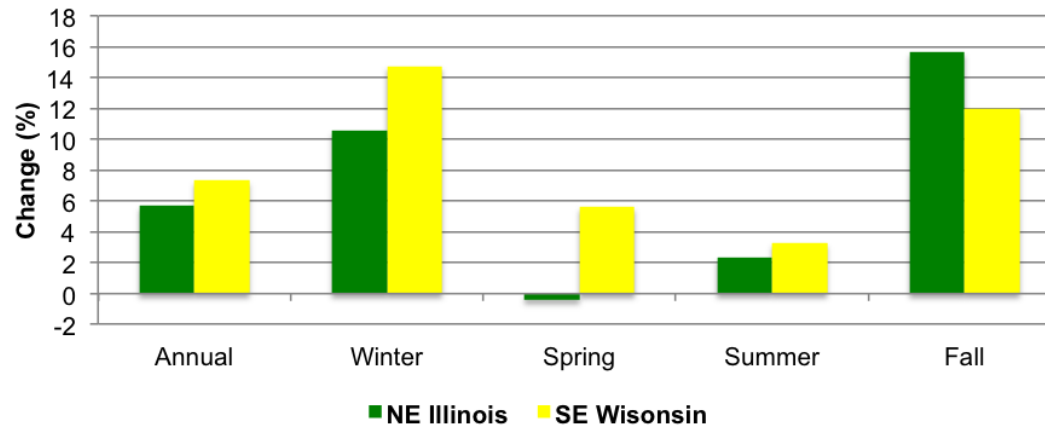
Draft Document. Do not cite. Last updated: 5/6/2014

Observed Changes

Temperature Change (1951-1980 vs. 1981-2010)



Precipitation Change (1951-1980 vs. 1981-2010)



Air temperature increases

Increases in freeze/thaw episodes

Water temperature increases

Increased summer/fall drought stress

More variable lake levels – low years

More extreme rain events

Heat stress/range shifts

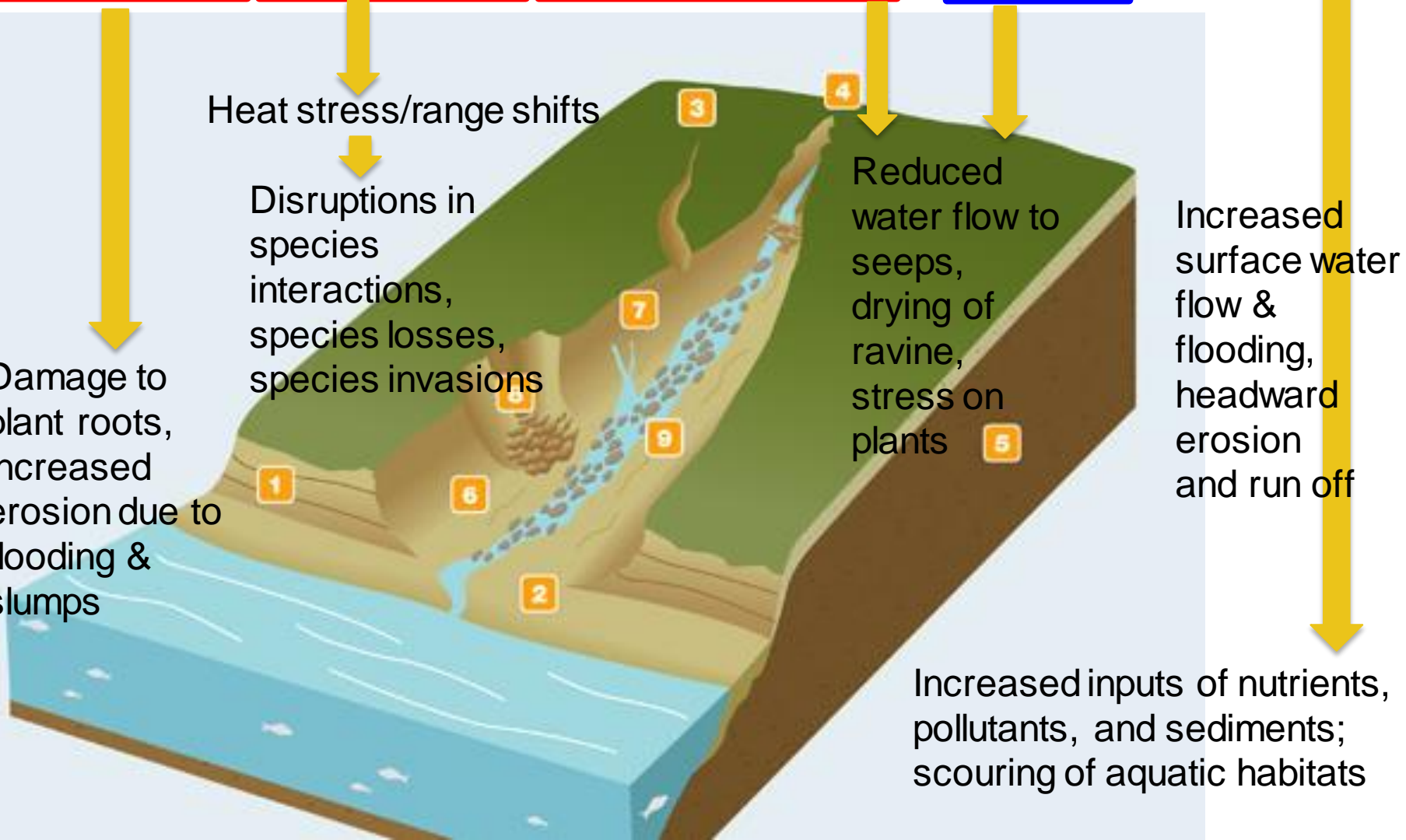
Disruptions in species interactions, species losses, species invasions

Reduced water flow to seeps, drying of ravine, stress on plants

Increased surface water flow & flooding, headward erosion and run off

Damage to plant roots, increased erosion due to flooding & slumps

Increased inputs of nutrients, pollutants, and sediments; scouring of aquatic habitats



Connect impacts to action

STRATEGIES...

Refine impacts and strategies

Climate Stressor	Possible Impacts	Possible Adaptation strategy
Increased extreme storm events	<ul style="list-style-type: none">• increased flashiness and surface flow• increased freq of channel-forming events• groundwater loading behind bluffs leading to bluff failure• changes in chemistry, nutrient load, and clarity at ravine/lake junction	<ul style="list-style-type: none">• evaluate stormwater management practices and ordinances to ID where and how to integrate ways to protect systems and divert stormwater from ravines• stabilize side tributaries and restore main channels to account for energy generated by high flows that occur during rainfalls

Select which strategies to implement

IMPLEMENT!

Policies

Michigan City

1. Low Impact Development (LID)

- Riparian buffers
- Reduce % of Impervious Surface
- Minimize total acreage disturbed

2. Land acquisition strategy for riparian buffer

- Develop criteria for priority parcel acquisition
- Land transfer
- Land management

Practices

IL /WI ravines

1. Stormwater

- Address upstream impacts by using existing maps, and new data layers to identify locations for decentralized retention basins.

2. Habitat

- Start to develop a regional seed source policy to promote interagency seed sharing, which takes into consideration:
 - existing public and non-profit growing capacity,
 - pros and cons of using private sector growing services, and
 - feasibility for volunteers to assist with seed collection

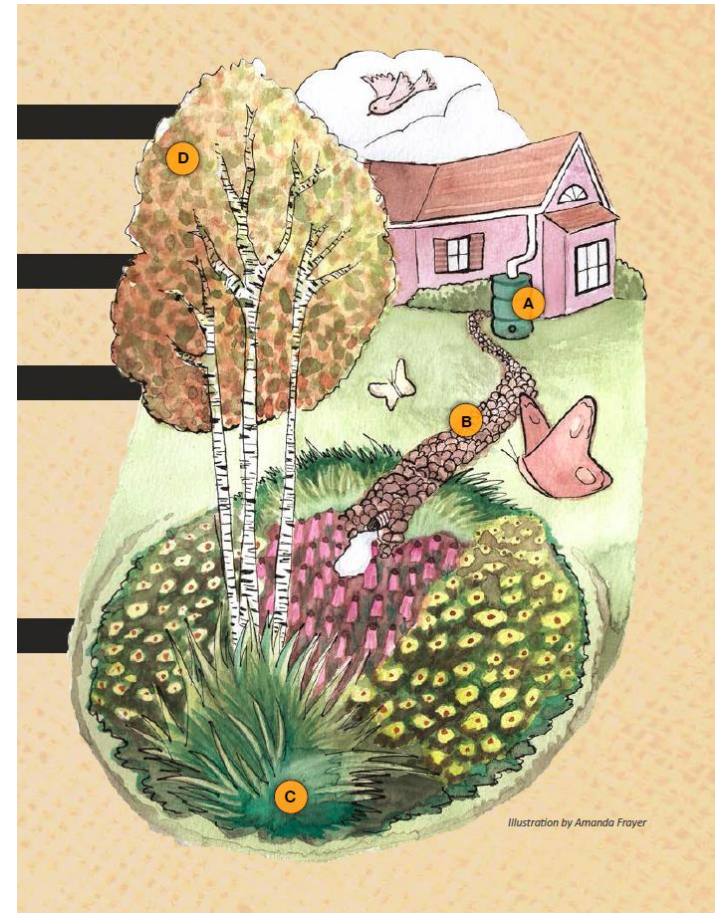
Larger-Scale Infrastructure Projects

Pass through to land managers / owners:

1. \$200,000 to restore ravine flora/faunal diversity – WI and IL
2. \$250,000 to implement green street scaping
- IN

Smaller-Scale Demonstration Projects

- **Pass through to land managers / owners:**
 - \$20,000-\$60,000 – rain gardens, native riparian buffers, invasive species removal



Source: *Green Works for Climate Resilience, A Guide to Community Planning for Climate Change*, National Wildlife Federation, Reeve and Kingston, April 2014

Further translation of climate impacts in a way that resonates locally

PERSUADE...

Persuade

Communication Goals

- Implementation by local leaders
- Building capacity of local leaders

Target Audiences

1. Decision makers

- Elected official
 - Fed (reps and senators)
 - State (reps and senators)
 - Muni (mayors)
- City council
- Commissions

Target Audiences

2. The public

- Voters
 - Residents (landowners or renters, within and outside of the basin)
- Community Leaders
- Campaign donors
- Tax base
 - Corporate

Whether facilitation and persuasive communication leads to increased implementation

MEASURE...

Measure

Survey

Measure, whether participation increases

- knowledge
- Implementation

Identify

- barriers to implementation
- which key members are connected to each other

Measure

Network Mapping

- Map the social structure
- Identify links / relationships
- Overlay the social map with the ecological map
- Identify members implementing and changing behaviors



Thank you

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Northwater
Consulting

Hey and Associates, Inc.
Engineering, Ecology and Landscape Architecture



The Field
Museum



delta institute 



openlands
conserving nature for life


CHICAGO BOTANIC GARDEN

