

# The Great Water Design Challenge

## *A Collaboration with NOAA Planet Stewards*

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# Session Goals

- ❑ Define design challenge
- ❑ Generate ideas for classroom design challenge
- ❑ Outline design challenge for your classroom

[NOAA Planet Stewards](#)  
[NESTA Article](#)

# Identify, Mitigate, Expedite

- Support innovation by solving a problem in quick & creative manner
- Engage students in 21st century skills
- NGSS
- United Nations Sustainable Development Goals

Identify Problem	<ul style="list-style-type: none"><li>• Prior to event</li><li>• Selected from general list</li></ul>
Design Solution	<ul style="list-style-type: none"><li>• Some worked prior</li><li>• Idea formed during event</li><li>• Time limitations – Work in progress</li></ul>
Solution Accomplished via Research, Discussion, Ideation, Prototyping	<ul style="list-style-type: none"><li>• Some worked prior</li><li>• Completed during event</li><li>• SME, Resources</li><li>• Prototype or Poster</li></ul>

# Outcomes

- Professional Development Teachers
- Design Poster – Model of Solution
- Poster Session – Explain Solution & Answer Question(s)
  - Define issue
  - Impact of issue
  - Explain how solution mitigates issue
  - Further investigation/action(s)
  - Answer question(s)
  - Awards
    - SME
    - People's Choice

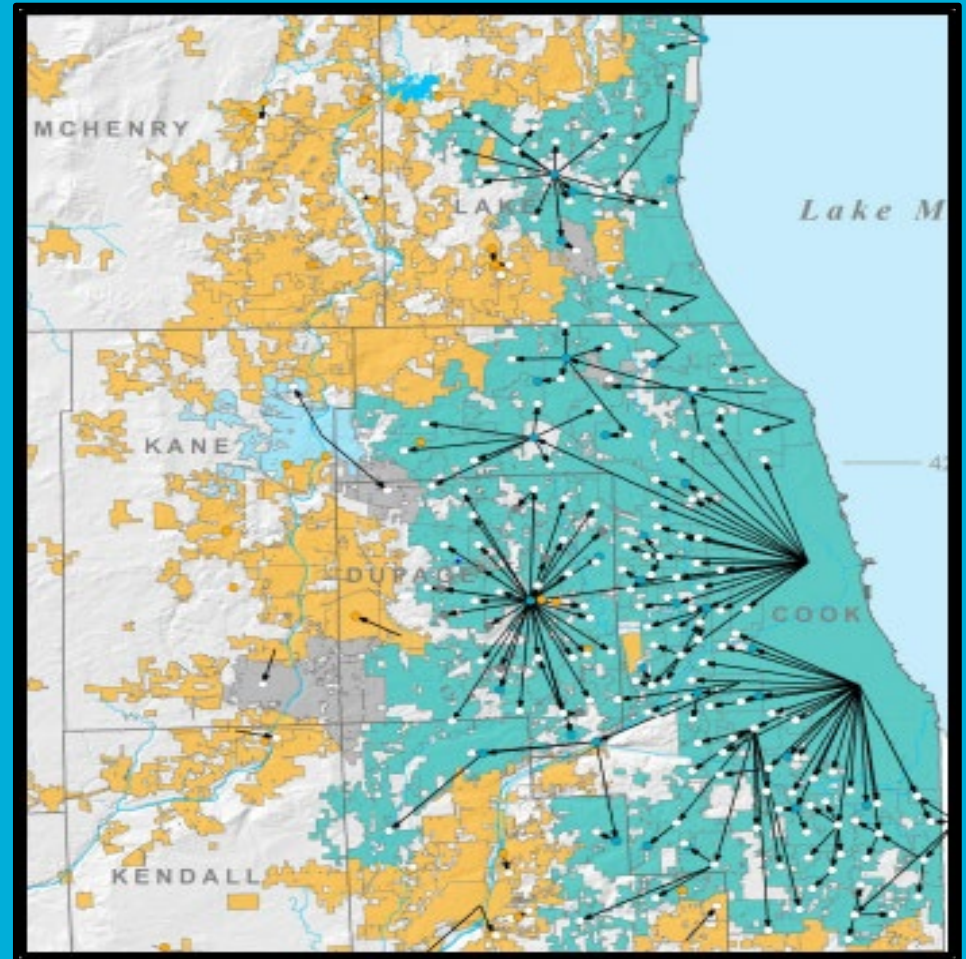
# Determine Outcome(s)

Curricular Objectives

How will groups...

- Document solution
- Share solution
- Optional – What would their next steps be in mitigation development

# Topic: Major Waterways Illinois



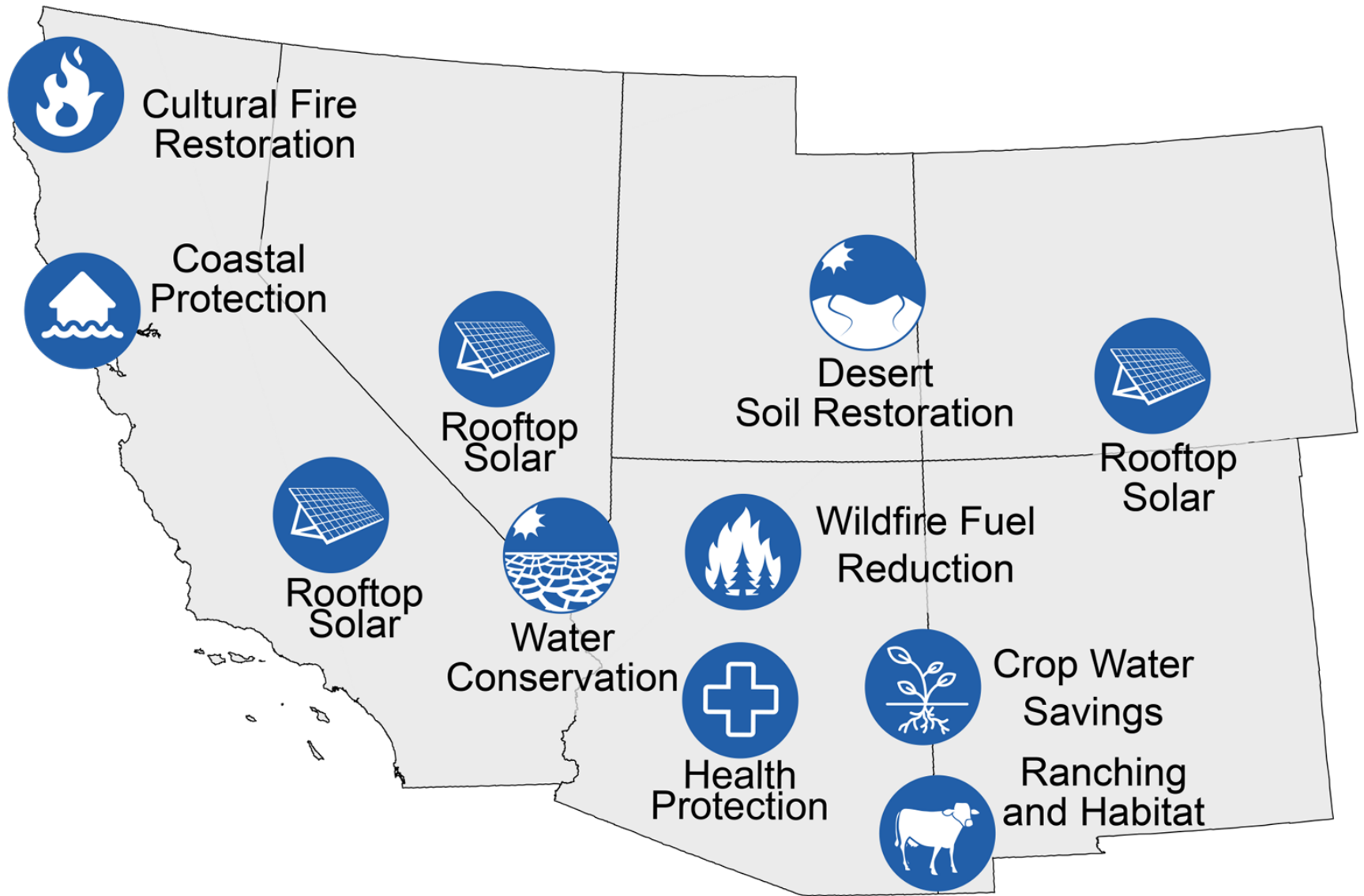


# Research Questions

- **Marine Debris, Microplastics, Plastics**
  - What are the trends in the use of microplastics and what actions can be taken to reduce what ends up in the ocean?
  - Document the presence of marine debris in the Great Lakes and what communities can do to reduce the input.
- **Human health Issues, vector-borne disease**
  - How is climate change affecting the incidence of vector-borne diseases?
  - What actions can be taken to reduce the incidences of vector-borne diseases?

*Samples on Table*

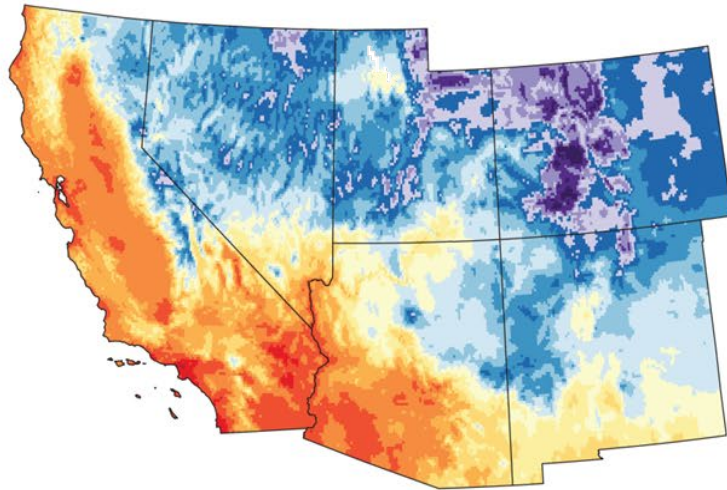




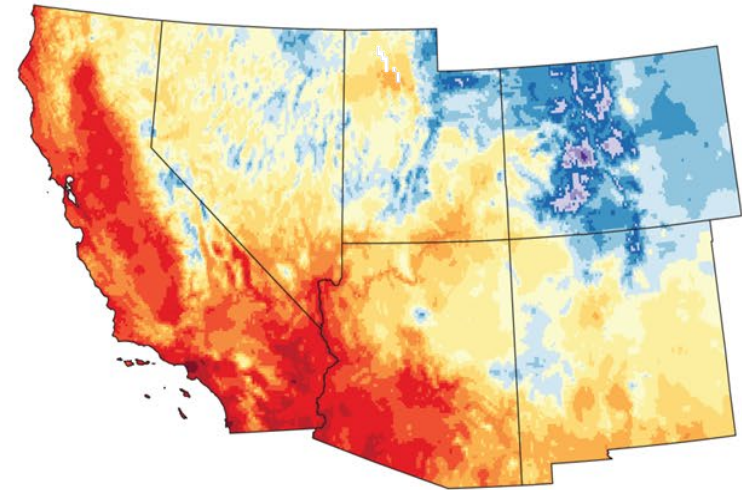
<https://nca2018.globalchange.gov/chapter/25/>

# Projected Changes: Agricultural Zones

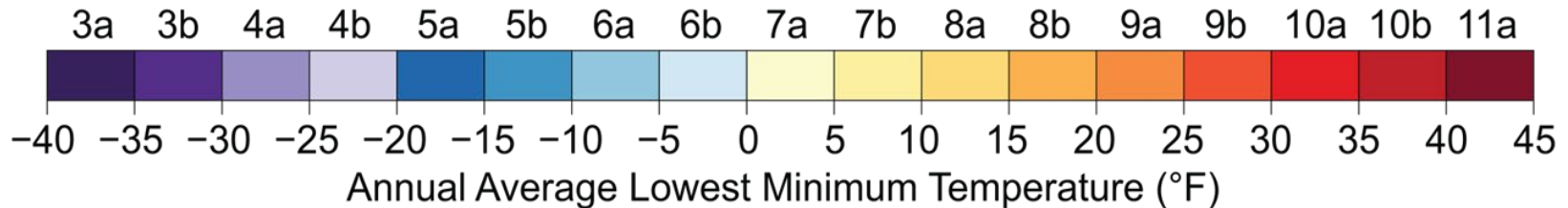
Historical (1976–2005)



Higher Scenario  
(RCP8.5; 2070–2099)



USDA Plant Hardiness Zone



# Identify Issue(s) & Research Questions

- Interest
- Geographic
- Topic – Discipline(s)
- Resources
- Subject Matter Experts (SME)
- Scope

# Subject Matter Experts

- Colleague
- Department of Natural Resources, Agriculture, Health, Meteorology
- Arboretum, Nursery, Nature Center, Water Group
- Urban Planning – Disaster
- NSTA Network

# Logistics

- Where – Classroom? Interdisciplinary? Classes/Schools?
- Time, Schedule
- SME – Local, DNR, Agencies, NSTA Connections, Civic Groups, Elected Officials
- List of Issues – Teacher Generated? Student Generated?
- Research Resources
- Materials Needed – Product Development
- Partners – Food, Funding

“I didn’t know that what we do here bothers the ocean.” *Student*

“Why aren’t there laws to stop that?”  
*Student*

“I met real scientists.” *Student*

“This is the best day of my life!” *Student*

“Students were well prepared. They asked really good questions and had great ideas.” *SME*

“They are persistent.” *SME*

“It was refreshing – their perspective.”  
*SME*



Dr. Dennis Liu  
Invasive Animal and Plant Species