The Great Water Design Challenge
A Collaboration with NOAA Planet Stewards

Liz Martinez, emartinez@imsa.edu
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 | Prior to event  
| Selected from general list |
| Design Solution | Some worked prior  
| Idea formed during event  
| Time limitations – Work in progress |
| Solution | Some worked prior  
| Completed during event  
| SME, Resources  
| Prototype or Poster |
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

![Map of Illinois showing major waterways](image-url)
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*
Projected Changes: Agricultural Zones

Historical (1976–2005)

Higher Scenario (RCP8.5; 2070–2099)

USDA Plant Hardiness Zone

Annual Average Lowest Minimum Temperature (°F)

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