



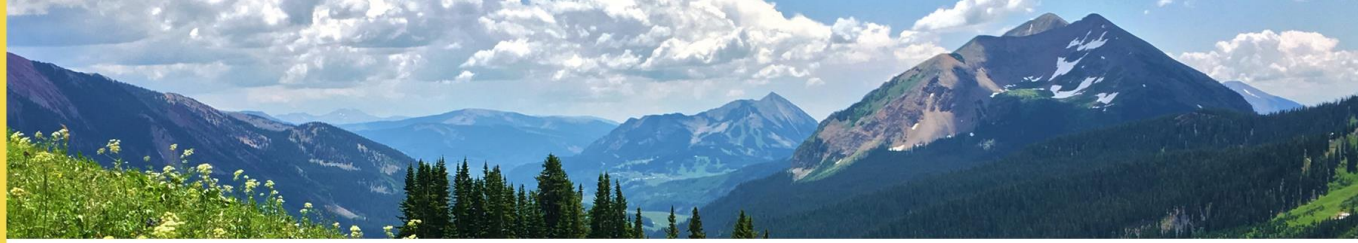
# Building resilient communities

This work is supported by the National Science Foundation under Grant Number 2314180 to the Space Science Institute. Any opinions, findings, and conclusions or recommendations expressed in this material are those of the author(s) and do not necessarily reflect the views of the National Science Foundation.





## Building Resilient Communities



**Exploring how libraries and community-based organizations can work together to mitigate environmental and health-related concerns due to climate change**

### **Project Focus**

Strengthening partnerships between public libraries and community organizations to take locally relevant climate action and address environmental change.

### **Goal**

Empower libraries and community partners to co-create resilient, thriving environments through teamwork and action.

### **Impact**

Public libraries, alongside their partners, are leading efforts to help communities prepare for changing environments, unexpected disruptions, and new challenges—ensuring they can thrive no matter what lies ahead.

# Today's presenters



**Steph Harmon**

Program Design and  
Development Manager,  
WebJunction



**Rae Ostman**

Research Professor, Arizona State  
University's School for the Future  
of Innovation in Society, Co-  
director, Center for Innovation in  
Informal STEM Learning, and  
Director, National Informal STEM  
Education Network (NISE Net)



**Vivienne Byrd**

STEAM Librarian &  
Program Lead,  
Neighborhood Science  
Initiative, Los Angeles  
Public Library



**Gabriel Varela**

Director of Resilience and  
Outreach, Climate  
Resolve



**Sarah Weatherby**

Library Specialist, East  
Flagstaff Community  
Library (AZ)



STEM **LEARNING**  
**ECOSYSTEMS**



**Center for  
Innovation  
in Informal  
STEM Learning**  
**Arizona State  
University**

# STEM Learning Ecosystems: A Climate Action Perspective

Rae Ostman

Arizona State University



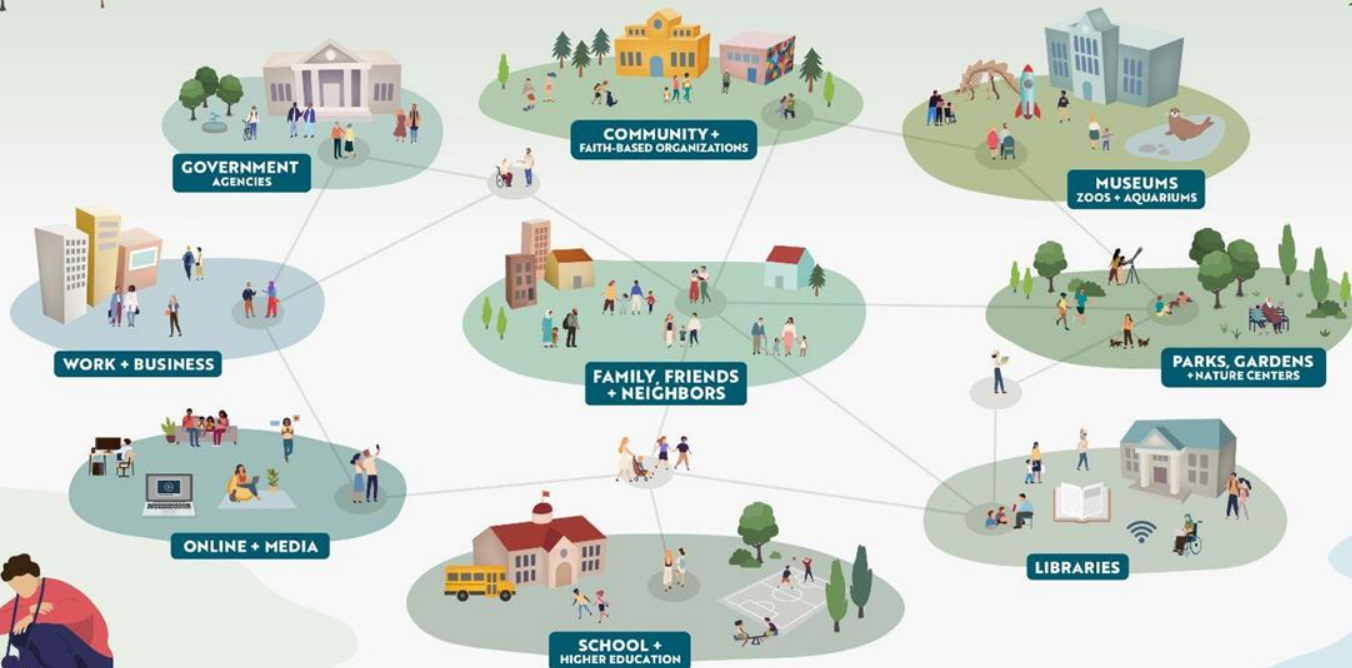
# SciAct STEM Ecosystems project

- **Collaboration** of several teams in NASA's Science Activation (SciAct) program
- **Inquiry** that included many different sources and perspectives
- **Key ideas** about community partnerships, broadening participation, and authentic STEM learning



# STEM learning ecosystems

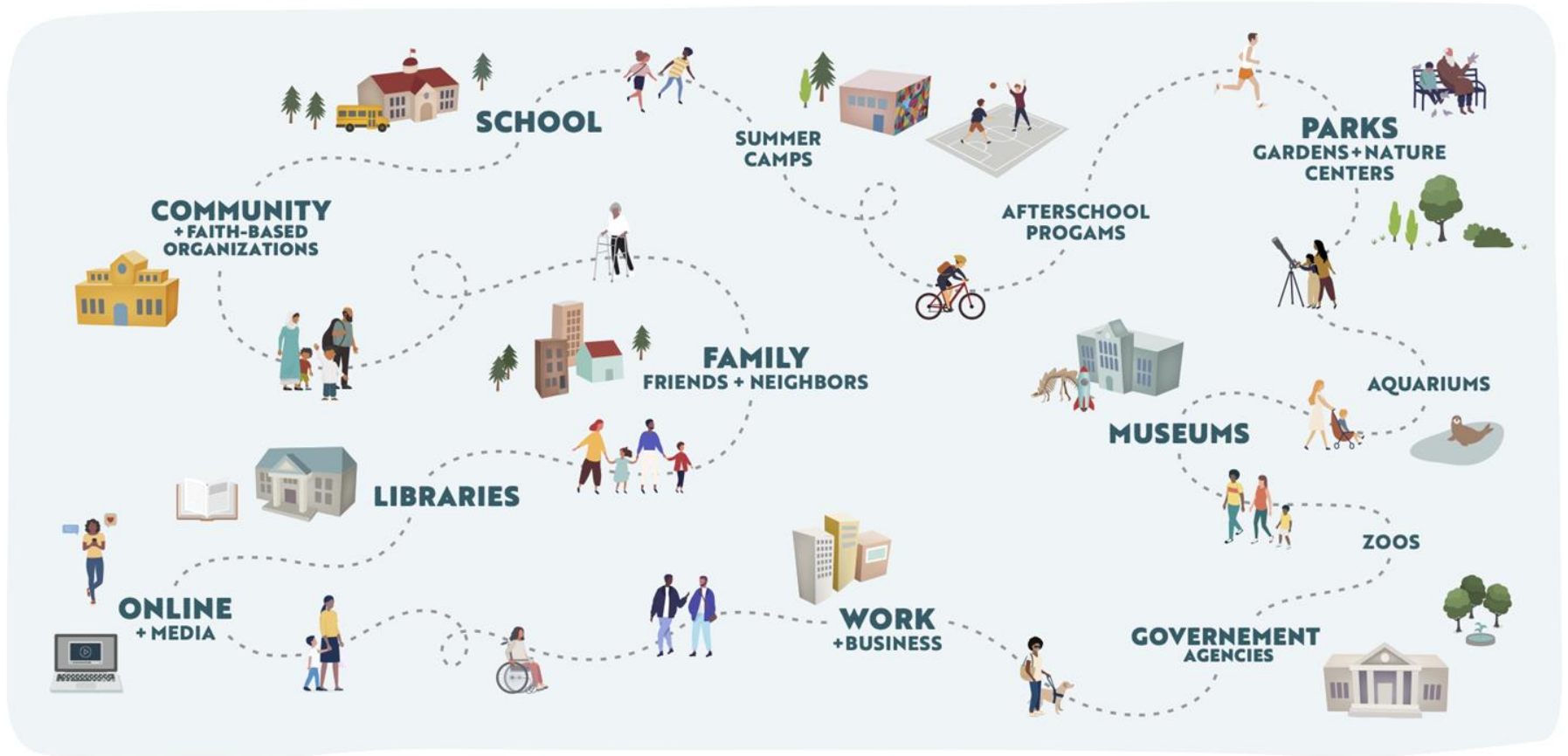
# STEM Learning Ecosystems





# STEM Learning Pathways

Varied journeys for learning across a lifetime



# STEM Learning Ecosystems

## KEY IDEAS

### Community

STEM learning ecosystems are built and sustained through intentional practices; thrive through reciprocal relationships; and are grounded in their geographic and cultural context.



# STEM Learning Ecosystems

## KEY IDEAS

### Belonging

Ecosystems can broaden participation by cultivating genuine relationships among individuals and organizations; creating a flexible and transparent culture; sharing programming and resources; and prioritizing diversity, equity, accessibility, inclusion, and belonging.



# STEM Learning Ecosystems

## KEY IDEAS

### Engagement

Authentic STEM engagement starts with understanding what is relevant to learners and communities, then creates connections to content through active learning experiences.



# Authentic STEM Engagement

## Relevance

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Connects to identity and culture, promotes a sense of belonging, and fosters inclusion



## STEM content

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Includes community observations, scientific data, assets, and a range of expert perspectives



## Experience design

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Supports active learning, encourages dialogue, and builds on community strengths



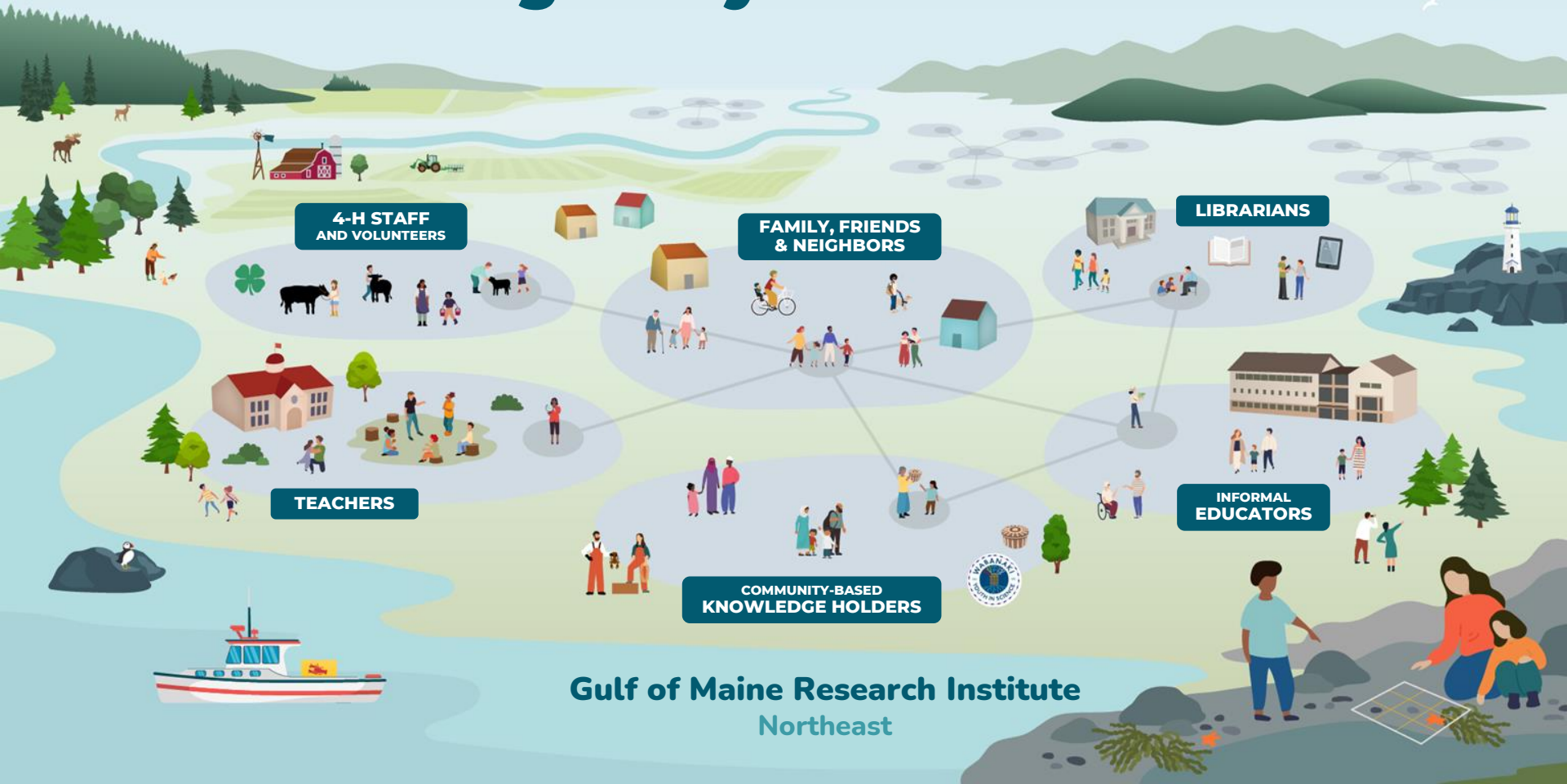
# Libraries and learning ecosystems

- **Community:** Libraries are trusted spaces that provide key community services
- **Belonging:** Libraries foster relationships and share resources across the community
- **Engagement:** Libraries offer programming and circulate learning materials



**Climate action**

# Learning Ecosystems Northeast





# Goals

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- Create local learning ecosystems to empower the next generation of climate stewards
- Support educators of all kinds in building the climate and data literacy young people will need to tackle the challenges ahead
- Connect local ecosystems through regional communities of practice



# Climate action

- Teachers, informal educators, and librarians work develop programs that:
  - are related to local impacts of climate change
  - feature NASA data
  - take meaningful stewardship action
- Together, these efforts expand learning opportunities and pathways for young people
- Examples of local climate stories:
  - Gulf of Maine warming
  - Emerald ash borer
  - Maple sugar
  - Vernal pools



# Resources

# Project resources

<https://www.nisenet.org/stem-learning-ecosystems>

## *SciAct STEM Ecosystems:*

- Overview and findings
- Videos and conversation guide
- Activities
- Graphics

## Plus other projects:

- Engagement materials
- Professional learning
- Newsletter



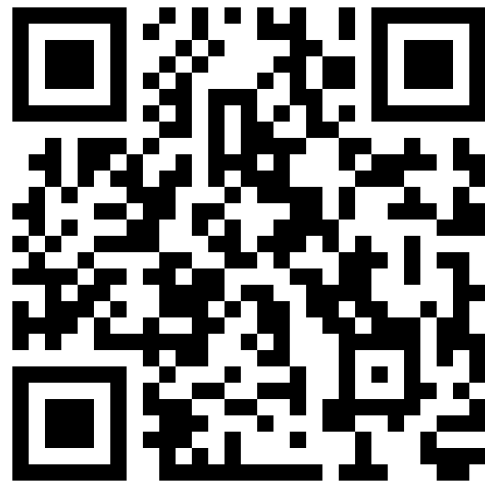
**NISE** NATIONAL INFORMAL  
STEM EDUCATION  
**NETWORK**

# Network of ecosystems

<https://stemecosystems.org/>

STEM Learning Ecosystem national network:

- Community of practice
- Convenings and online workshops
- Resources
- Newsletter





## STEM LEARNING ECOSYSTEMS



## INVESTIGATORS

Rae Ostman Arizona State University (PI)

Paul Martin Arizona State University (co-I)

Matt Cass Southwestern Community College (co-I)

Elena Sparrow University of Alaska Fairbanks (co-I)

## EVALUATORS

Liz Kollmann Museum of Science (evaluator)

Allison Anderson Museum of Science (evaluator)

Ann Atwood Museum of Science (evaluator)

## ECOSYSTEMS

Arctic and Earth SIGNs

Learning Ecosystems Northeast

Rural Activation and Innovation Network

Smoky Mountain STEM Collaborative

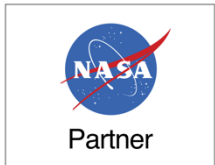
# Thank you

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**STEM LEARNING  
ECOSYSTEMS**

*Note: All images in Rae Ostman's slides used with permission, as created by Emily Maletz for Arizona State University / NISE Network.*



*This material is based upon work supported by NASA under cooperative agreement award number 80NSSC21M0007. Any opinions, findings, and conclusions or recommendations expressed in this material are those of the author(s) and do not necessarily reflect the view of the National Aeronautics and Space Administration (NASA).*

# Partnerships for Climate Action Through Neighborhood Science

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By  
Vivienne Byrd, LAPL  
Gabriel Varela, Climate Resolve



# What is Neighborhood Science (NeiSci) ?

- Public participation in **real scientific research** as **collaborators** to contribute to the advancement of scientific knowledge.
- Turning curiosity and concerns into impact.



Photo credit: Vivienne Byrd/LAPL

# NeiSci Tuesdays

Harness the power of Science for your Neighborhood



## VIRTUAL WATER JOURNEY

March 16 @ 4 PM PST on ZOOM  
Join us online.  
RSVP: [bit.ly/neiscitues](http://bit.ly/neiscitues)

\*\*For other upcoming programs in the series, go to: [lapl.org/neisci-tuesdays](http://lapl.org/neisci-tuesdays).

# NeiSci Tuesdays

Harness the power of Science for your Neighborhood



## EXTREME HEAT AWARENESS

March 9 @ 4 PM PST on ZOOM  
Join us online.  
RSVP: [bit.ly/neiscitues](http://bit.ly/neiscitues)

\*\*For other upcoming programs in the series, go to: [lapl.org/neisci-tuesdays](http://lapl.org/neisci-tuesdays).



# NeiSci Tuesdays

Harness the power of Science for your Neighborhood



## PLAY TO END ALZHEIMER'S

March 30 @ 4 PM PST  
Join us on Zoom.  
RSVP: [bit.ly/neiscitues](http://bit.ly/neiscitues)

\*\*For other upcoming programs in the series, go to: [lapl.org/neisci-tuesdays](http://lapl.org/neisci-tuesdays).



LOS ANGELES PUBLIC LIBRARY

# NeiSci Tuesdays

Harness the power of science for your neighborhood

# NeiSci Tuesdays

Harness the power of Science for your Neighborhood



## SLIME

March 23 @ 4 PM PST on ZOOM  
Join us online.  
RSVP: [bit.ly/neiscitues](http://bit.ly/neiscitues)

\*\*For other upcoming programs in the series, go to: [lapl.org/neisci-tuesdays](http://lapl.org/neisci-tuesdays).

# NeiSci Tuesdays

Harness the power of Science for your Neighborhood



## WHERE ARE THE STARS? Light Pollution In Our Ecosystems

April 6 @ 4 PM PST on ZOOM  
Join us online.  
RSVP: [bit.ly/neiscitues](http://bit.ly/neiscitues)

\*\*For other upcoming programs in the series, go to: [lapl.org/neisci-tuesdays](http://lapl.org/neisci-tuesdays).



# NeiSci Tuesdays

Harness the power of Science for your Neighborhood



## PLANTAS NATIVAS DE CALIFORNIA EN MACETAS

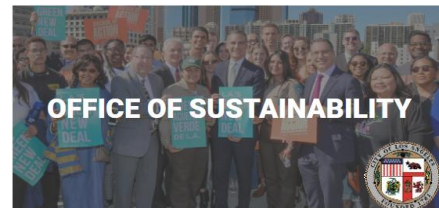
13 de abril a las 4 PM PST  
Acompáñenos en línea  
Para registrarse visite: [bit.ly/neiscitues](http://bit.ly/neiscitues)

\*\*Para ver los programas próximos de la serie, visita <http://lapl.org/neisci-tuesdays>.

# Impactful Partnerships



KOREATOWN YOUTH+ COMMUNITY CENTER



# Partnership - Successes

- More funding and/or resources
- Connect to more partners
- Connect to Scientific expertise
- Amplify program efforts
- Help recruit and sustain participants
- Ensure equity and accessibility



Photo credit: Los Angeles Public Library

# NeiSci Partnership Challenges

- Lack of recognition from scientific community
- Misconceptions of public libraries & librarians
- Lack of public awareness & engagement
- Resources Limitations (funding, time, etc.)
- Alignment of goals and expectations
- Equity and accessibility

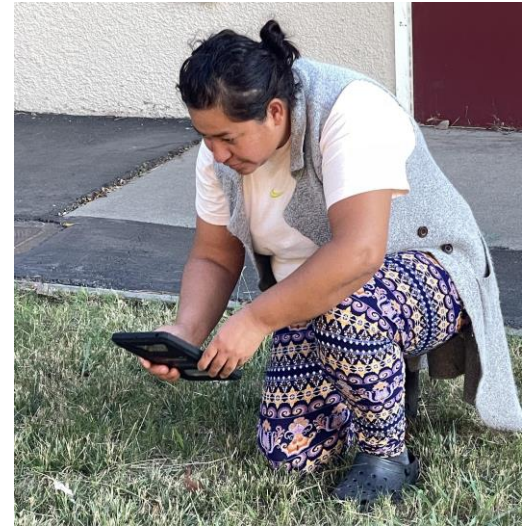
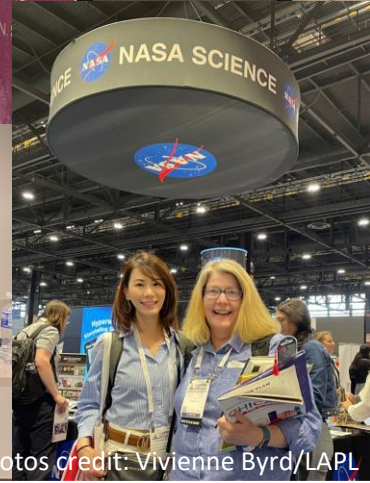
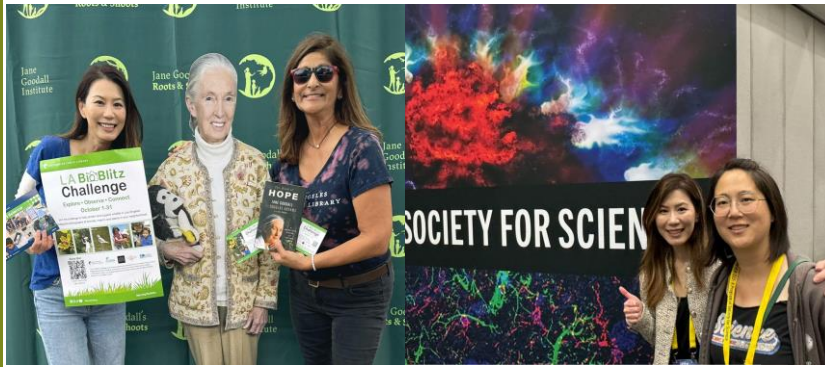


Photo credit: Los Angeles Public Library

# Overcoming Partnership Hurdles:

- Sharing success stories
- Define goals & find alignment
- Build network - Persistence is key!
- Professional development
- Active communication & coordination
- Equity & accessibility



Photos credit: Vivienne Byrd/LAPL

# Partnership with the GLOBE Program



# The GLOBE Program

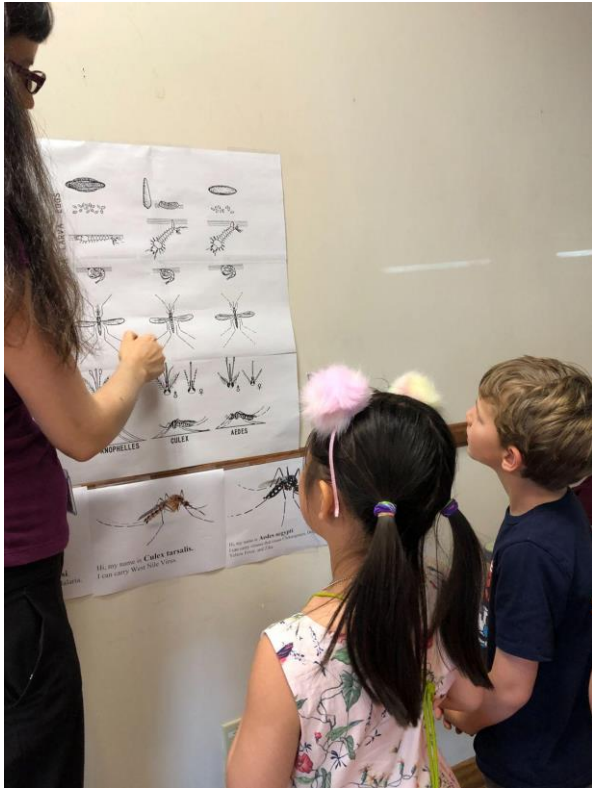


Photo credit: Vivienne Byrd/LAPL



# NASA GLOBE + Greater LA Vector Control District



Photo credit: Los Angeles Public Library



Photo credit: Vivienne Byrd/LAPL



LOS ANGELES PUBLIC LIBRARY

# Neighborhood Science

Harness the power of science for your neighborhood

X



Climate  
Resolve

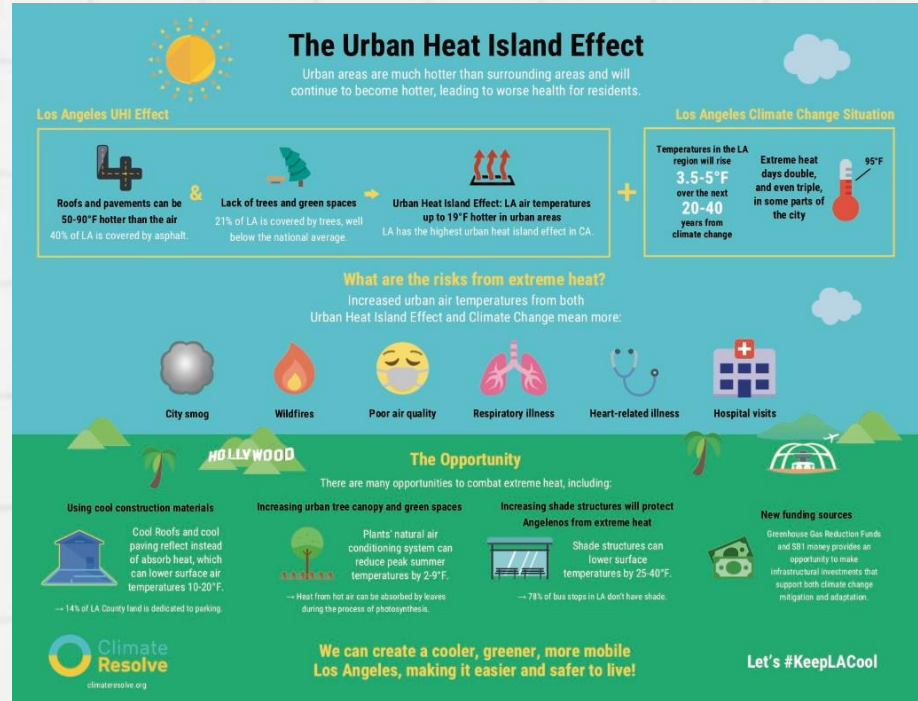


# Climate Resolve & LAPL

**Gabriel Varela**  
**Director, Resilience &**  
**Outreach**  
**Climate Resolve**

# Topics and programs

- Extreme heat
- Resilience
- Community health
- Resources





# Successes and Challenges

01.



Reaching local  
communities

02.

Education and  
Resilience

03.

How can we continue  
our partnership?



# Partnering with LAPL

- Trusted institution
- Natural community space
- Culture of learning and resilience
- Cooling/resilience center





**What would I  
like to see in  
partnership  
with LAPL**

#1

Resilience Hubs

#2

Climate mitigation  
resources

#3

Climate Programs

#4

Formalizing partnership  
and pursuing funding







## **Vivienne Byrd**

Librarian III/Program Lead,  
STEAM & Neighborhood Science Initiatives  
Los Angeles Public Library  
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IG: @STEAM.4.Earth



## **Gabriel Varela**

Director of Resilience & Outreach  
Climate Resolve  
Email: [gvarela@climateresolve.org](mailto:gvarela@climateresolve.org)

**THANK YOU!**



Photo: Graham Montgomery

# Building Effective Partnerships through Knowledge Sharing and Community Engagement



"Fall Sunflowers" provided by Sarah Weatherby, used with permission.



# Addressing Climate Change Requires...

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Interdisciplinary, Local, Regional, and Cross-Regional Efforts



Solutions Rooted in Community, Collaboration, and Partnerships



Building on Existing Resilience and Community Strengths



Improving Awareness, Social Connectedness, and Trust

# Why Focus on Resilience?

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Climate Change is Now



Resilience as a Climate Solution



Hyperlocal and Community-Led



Empowerment and Social Connectedness



# Why Libraries in Resilience Efforts?

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Libraries offer a trusted space where the community can access resources and services.



Community-Serving Facilities



Trusted Spaces



Provide Services,  
Support, and  
Resources



Increase Self-Reliance  
and Recovery Capacity



"Shoveling Chips, Making Dirt" provided by the Flagstaff Climate Resilience Project, used with permission.

# Framework

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Active Participation & Co-Learning



Building Connections & Understanding



Intergenerational Knowledge Exchange



Critical Thinking & Skill Enhancement



Collaborative Problem Solving



Reflection & Action as Tools for Change

# Climate Resilience Project

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"Many Hands" provided by the Flagstaff Climate Resilience Project, used with permission.

Promote individual and community resilience to climate change in Flagstaff through shared discussions, work supporting existing resilience initiatives, and fostering a supportive, intergenerational community environment.





"Fire Walk" provided by the Flagstaff Climate Resilience Project, used with permission.

## Inclusion

A welcoming space where people can come as they are to discover, learn, and grow.



"Horned Toad in Hand" provided by Sarah Weatherby, used with permission.

## Collaborative

A partnership between the City of Flagstaff Sustainability Office and the Flagstaff City - Coconino County Community Library.



"Collaboration" provided by Flagstaff Climate Resilience Project, used with permission.

## Focus

Community conversations to discuss feelings around climate issues and hands-on learning through workshops and volunteer efforts.



"How to Clear the Air" provided by Sarah Weatherby, used with permission.

- Assume positive intent.
- Seek to understand first, but also take risks and ask questions.
- Take space and make space; share your thoughts while also allowing for others to participate.
- If you need to challenge something, challenge the idea, not the person.
- Practice holding space for multiple perspectives. Rather than immediately deciding what is right or wrong, explore different viewpoints and possibilities.



"Wetlands Walk" provided by the Flagstaff Climate Resilience Project, used with permission.

## Agreements

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# Engaging the Community through Dialogue and Action

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Localizing & Making Climate Change Accessible



Creating Community through Dialogue & Action



Learning as a Process



Importance of Participation



"Fire Talk" provided by Sarah Weatherby, used with permission.

COMMUNITY CONVERSATION

# HOUSING & CLIMATE



CLIMATE CONVERSATION

# EMERGENCY PREPAREDNESS 101: READY, SET, GO!



CLIMATE CONVERSATIONS:

# FLAGSTAFF'S CLIMATE VULNERABILITIES & IMPACTS



CLIMATE CONVERSATION

# FOOD SOVEREIGNTY CULTIVATING COMMUNITY RESILIENCE



CLIMATE RESILIENCE PROJECT

# CULTIVATING A RESILIENT FOOD SYSTEM



CLIMATE CONVERSATIONS:

# CARBON DIOXIDE REMOVAL



CLIMATE RESILIENCE PROJECT  
**WATERSHED CLEANUP**



CLIMATE RESILIENCE PROJECT  
**INVASIVE PLANT WORKSHOP**



RESILIENCE WORK SESSION:  
**WITNESSING THE  
CHANGING CLIMATE**



RESILIENCE WORK SESSION:  
**GROWING A RESILIENT  
NEIGHBORHOOD**



CLIMATE RESILIENCE PROJECT  
**FIRE ADAPTED COMMUNITIES**



RESILIENCE WORK SESSION:  
**COMMUNITY GARDENS**



# Successes & Lessons Learned

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Meet people where they are at.



Engage diverse interests and segments of the community.



Establish clear guidelines.



Be explicit about why resilience is the focus.



Collect feedback and input to continuously improve.



You don't need to be an expert—bring yourself and your questions.



"Rio Clean-up" provided by the Flagstaff Climate Resilience Project, used with permission.



"Invasive Weeds Walk" provided by the Flagstaff Climate Resilience Project, used with permission.



"Little Garden" provided by the Flagstaff Climate Resilience Project, used with permission.

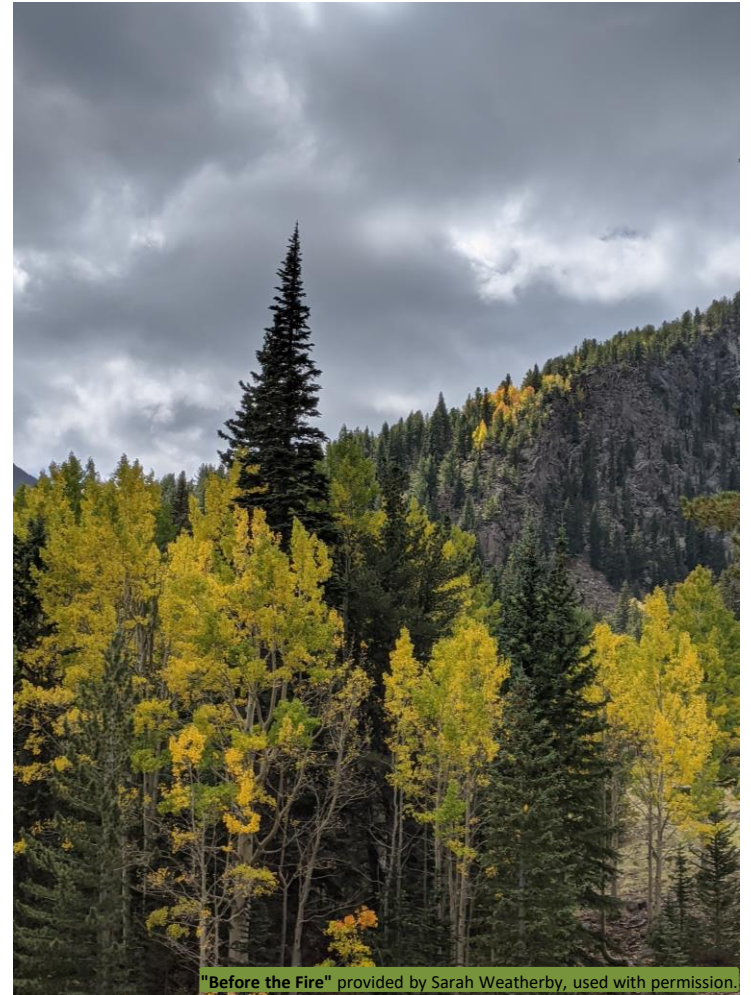
# Thank You



<https://gis.flagstaffaz.gov/portal/apps/sites/#/flagstaffclimate/pages/crp>



sweatherby@flagstaffpubliclibrary.org



# Questions?



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Library Specialist, East  
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Library (AZ)





## Building Resilient Communities



**Exploring how libraries and community-based organizations can work together to mitigate environmental and health-related concerns due to climate change**

### **Learn more about how you can take action with your community partners in these upcoming webinars**

#### **Building Community in a Changing Climate**

*November 21, 2024*

Explore how libraries and their partners are working together to empower communities to address environmental challenges.

#### **Climate Change Communication: How and Why to Do It in Libraries**

*December 5, 2024*

Gain practical strategies to effectively communicate about climate issues and inspire meaningful local action.

<https://www.webjunction.org/news/webjunction/building-resilient-communities.html>