



SOS Education Forum

Community Resilience in a World with Increasing Hazards



National Oceanic and Atmospheric Administration
U.S. Department of Commerce

December 14 , 2022





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Agenda

- Hurricane Ian panel with our Florida network members -
 - IMAG History & Science Center, Fort Myers - Christian Gould
 - Conservancy of Southwest Florida Dalton Discovery Center, Naples - Lori Heath Thorn
- Teaching potentially difficult subject matter: Bouncing forward from the Marshall Fire - HEART Force, CIRES EO - Katya Schloesser
- Using the Science on a Sphere to Connect Communities to Resiliency - Nurture Nature Center - Kate Semmens



Trauma-Informed Practices: Increasing Community **Resilience** to Natural Hazards

Katya Schloesser, CIRES Education & Outreach

Photo Credit: BFS Man



HAZARD
EDUCATION
AWARENESS &
RESILIENCE
TASK FORCE



CIRES
Education & Outreach

Colorado Fire Season 2020

Wildfires in northwest Colorado



Colorado Fire Season 2020
East Troublesome Fire in Grand Lake



Photo Credit: Haft-Van Denburg/CPR News

Colorado Fire Season 2020
East Troublesome Fire in Grand Lake



Photo Credit: Denver 7

HEART Force Program Implementation Vignette. Rebecca C., a chemistry teacher at East Grand Middle School, started off the 2020 school year engaging her students in role-play games and local wildfire data from the HEART Force curriculum. Then in October, the East Troublesome wildfire rapidly overtook the Grand Lake community, and students were evacuated from the very hazard they had been learning about in school. Suddenly it all became too real for Rebecca and her students. With a need to step away from the curriculum due to the raw emotions it brought up, she did not revisit it with her students until the spring. At first hesitant to re-engage in the topic, she charged forward and discovered that people from the local fire department were ecstatic to work with her students to create public service announcements about wildfire preparation. *“It was so wonderful to see the students get so passionate about something. The students who interviewed people who had lost their homes in the fire, their lives were completely changed as a result.”* She used to have nightmares about the fire, but as a result of taking action with her students, no longer does. She found a way to heal through the experience and thinks that the students and adults involved probably did too.



Colorado Fire Season 2020

Cameron Peak Fire



Photo Credit: Art Messal - Estes Park Trail-Gazette

Estes Park Middle School

TrailGazette Estes Park Middle School Team Takes First Place...

NEWS | COLORADO NEWS

Estes Park Middle School Team Takes First Place in Statewide Natural Hazards Competition



The EPMS Natural Hazards team (standing) and cheerleaders (sitting) at the Statewide Natural Hazards Competition in Colorado Springs, Colorado. (Photo by: Bobcat Staff, Bobcat Staff, Bobcat Staff)

By ESTES PARK SCHOOL DISTRICT |
PUBLISHED May 18, 2022 at 2:58 a.m. | UPDATED May 18, 2022 at 9:27 a.m.

On Thursday, May 12th, a team of Estes Park Middle School students were awarded 1st place in the

<https://www.eptrail.com/2022/05/18/estes-park-middle-school-team-takes-first-place-in-statewide-natural-hazards-competition/>

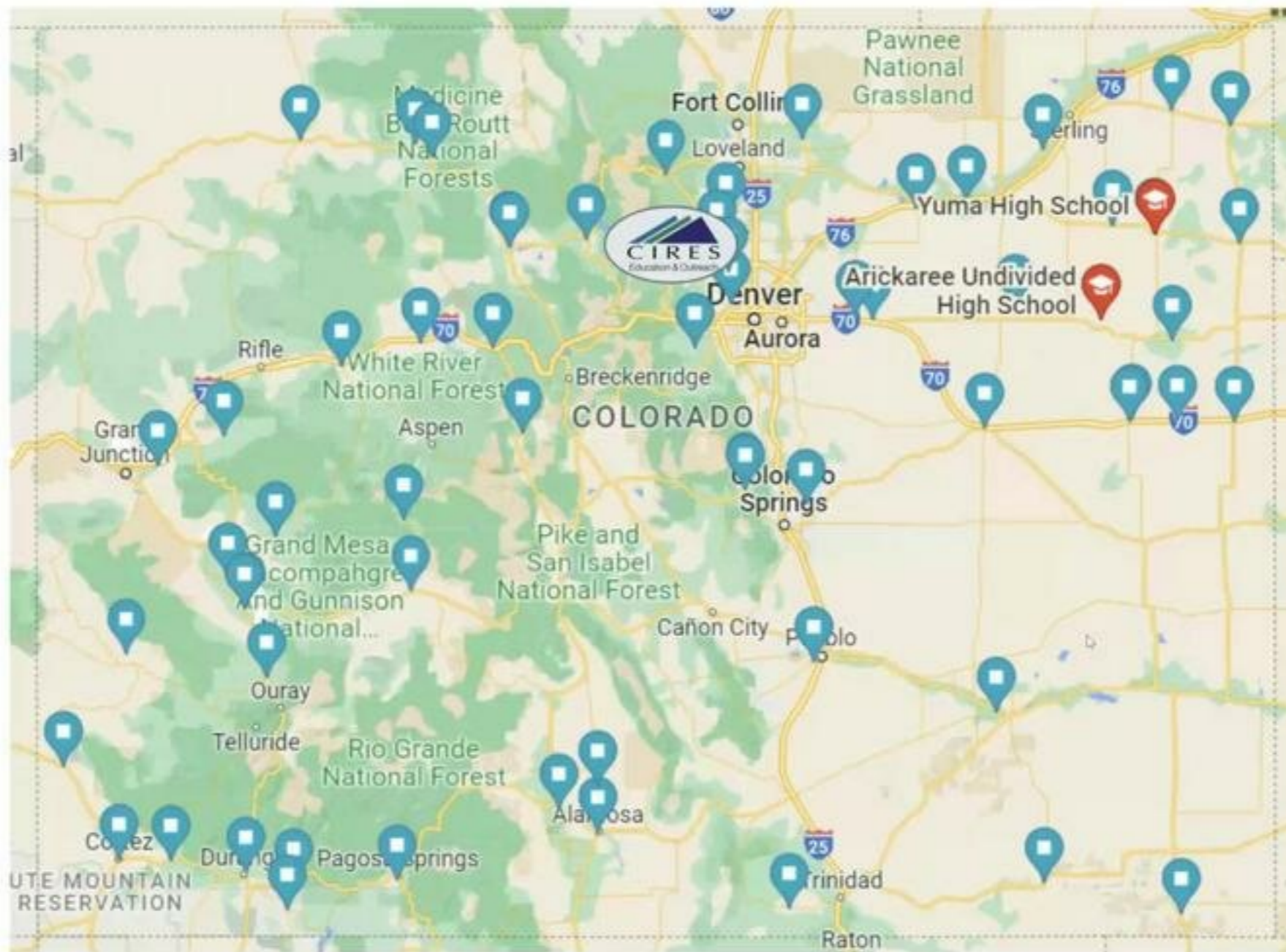
HEART Force Program Design



Curriculum

Hazard Science Lessons	1 Explore Hazards
Scenario-Based Role-Play Game	2 Assess Vulnerability & Risks
Design Challenge	3 Investigate Options
Community Resilience Expo	4 Prioritize & Plan
Project Implementation	5 Take Action

U.S. Climate Resilience Toolkit Steps to Resilience



Trained HEART Force Teachers across Colorado

Using Trauma-informed Practices to Teach Potentially Difficult Subject Matter

Courtney Welton-Mitchell, PhD

Director - Climate and Disaster Resilience certificate
Colorado School of Public Health, Anschutz Medical Campus
Research Associate, Natural Hazards Center, CU Boulder

courtney.welton-mitchell@cuanschutz.edu

Bouncing Forward from the Marshall Fire

Opportunities for Natural Hazards Resilience Professional Learning Workshop



HAZARD
EDUCATION
AWARENESS &
RESILIENCE
TASK FORCE



How to instill a sense of agency... (today and in the classroom)



- Informed consent: explain the activities
- Validate feelings at start and throughout the activities
- Allow students to make a choice about breaks and participation *before starting the task*
- Allow students to make a choice about breaks and participation *after starting the task*
- Acknowledge potential challenges
- Highlight strengths and coping skills
- Explain the relationship between anxiety, avoidance, coping, skill building (knowledge, preparedness) and confidence

How to instill a sense of agency... (today and in the classroom)

Consider setting up in advance -

- Alternative assignments or tasks
- An option to go elsewhere (e.g., study hall, bathroom)
- A non stigmatizing 'face saving' option (e.g., text the instructor)
- Fun exercises, breaks, and other forms of coping with potentially heavy subject matter
- Encourage students to try to engage with the material, noting that the focus will be on empowerment



Whether learning about the climate crisis or studying about wildfires –

- Identify goals and pathways to success (e.g., feeling confident about preparedness)
- Empower people to act – student activists, leaders, advocates
- Cultivate solidarity – encouraging peer support, peer projects and collective activism
- Make room for joy and humor
- Measure success incrementally

HOPE IS THE KEY TO ENGAGEMENT



Review

Hope, Health, and the Climate Crisis

Howard Frumkin*

Professor Emeritus, University of Washington School of Public Health, Senior Vice President, Trust for Public Land, Seattle, WA 98105

Frumkin, H. (2022). Hope, Health, and the Climate Crisis. *The Journal of Climate Change and Health*, 100115.



Potential mental health reactions to events such as a fire

Direct health effects of wildfires include mental health impacts, including depression and PTSD, especially among those experiencing property loss.

Higher rates of suicidal thoughts and increased substance use have also been reported among fire-affected communities.

Some mental health challenges can persist for years.



Potential mental health reactions to events such as a fire

Some factors may increase the potential for adverse mental health outcomes following a disaster, while other factors may be protective.

- Being **exposed to reminders of disasters** has been associated with worse psychological outcomes over time.
- **Social support** may mitigate distress among disaster victims, including those experiencing fires.
- Psychological preparedness, certain forms of coping and resilience-related approaches - including **benefit-finding** and **post-traumatic growth**, have been associated with wellbeing following exposure to disasters.



Risk and Protective factors in children after a disaster

- Exposure: type, level, duration (including fearing for one's life, injury, loss of friends/family members)
- Resulting disruptions to social systems (schooling, displacement from home, job loss within the family, family dysfunction)
- Social support from peers and caregivers (caregiver mental health and wellbeing) vs isolation and loneliness
- Preexisting mental health concerns
- Previous, ongoing/post disaster stressors
- Use of mal/adaptive coping skills and abilities



On a scale of Cat, how are you feeling today?



Lots of mood scales... some of my favorite...



30 Grounding Techniques to Quiet Distressing Thoughts

What are grounding techniques? | Physical techniques | Mental techniques | Soothing techniques | How do they work? | When to use | Bonus tips

- Breathing
- Touching objects or water
- Taking a walk
- Physical movement
- Smells
- Listen to your surroundings
- 5-4-3-2-1
(hear-see-touch-smell-taste)
- Visualization



Mindfulness in Schools

You can't separate learning and wellbeing. Wellbeing is essential for learning. With mindfulness, students are more focussed and more engaged learners.¹

<https://www.healthline.com/health/grounding-techniques>

1. Would you rather have hands for feet or feet for hands?
2. Would you rather take part in a zombie apocalypse or a pandemic?
3. Would you rather drive an ice cream truck to work or come dressed as a clown?
4. Would you rather wear bell-bottomed pants or sport a mohawk?
5. Would you rather have a dinosaur as a pet or a tiger?
6. Would you rather go on a date with the Tiger King or dress like him?
7. Would you rather color your hair neon or have a gold tooth?
8. Would you rather always sing out of tune or never be able to keep up with the beat?
9. Would you rather never use emojis again or never spell right again?
10. Would you rather eat only pickles for a week or drink only soy sauce for a week?

Ice breakers, amusing questions to set the tone

Coping Skills Sheets

Alphabet of Stress Management and Coping Skills

A

Ask for help
Aromatherapy
Art
Attend an event of interest
Athletics
Ask to talk to a friend
Allow time to think
Apologize
Add numbers
Aerobics
Act out favorite actor/c
Artistically express feelin
Act out feelings
Address the real issue

B

Bounce a stress ball
Breathe slowly
Baking
Basketball
Be attentive

F

Find a safe place
Finish house work
Fishing
Free weight
Find a book to read
Filter emotions
Find a puzzle to play

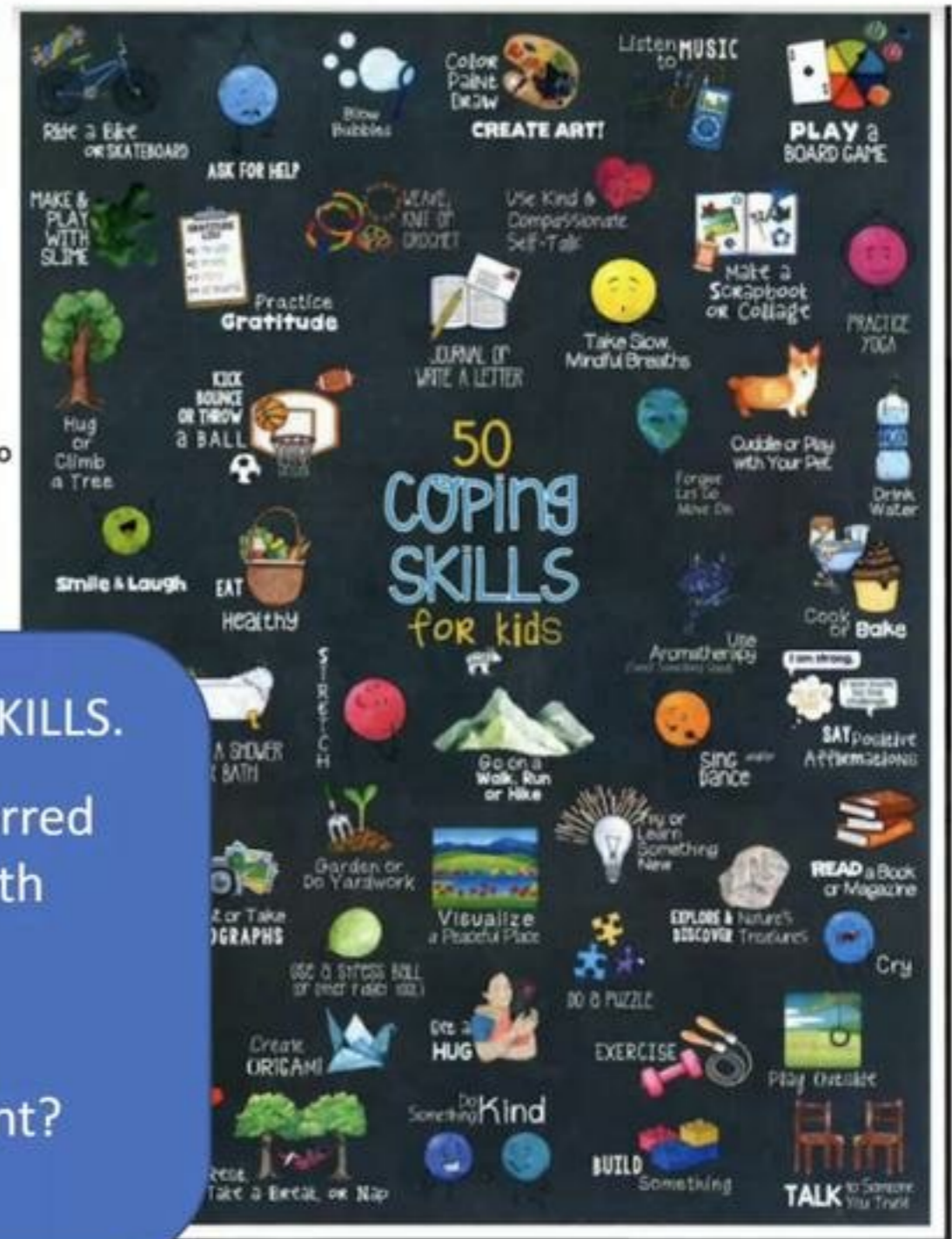
J

Jogging in place
Jot down good behavior
Jumping Jacks
Jumping rope
Journaling

Each of us has our preferred COPING SKILLS.

I encourage you to consider your preferred forms of coping and to do the same with your students.

What can you do when you are feeling anxious or overwhelmed in the moment?
Movement break, jokes...



Potential mental health reactions to events such as a fire

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CLEAN

[Climate and Energy Educational Resources](#)

[Teaching Climate and Energy](#)

[Teaching Climate](#)

[Teaching Energy](#)

[Teaching Climate \(Spanish Translation\)](#)

[Teaching Energy \(Spanish Translation\)](#)

[Guidance in Elementary Teaching About Climate and Energy](#)

[Culturally Relevant Climate Teaching](#)

[Tools for Educators](#)

[Webinars](#)

[Workshops](#)

[Create CLEAN-NGSS Units](#)

[Earth Systems Investigations](#)

[Teaching Climate Change towards Empowerment](#)

[Introduction](#)

[Self-care](#)

[Climate Justice](#)

[Listen and Validate Feelings](#)

[Encourage and Take Action](#)

Beyond Doom and Gloom: How to teach climate change towards empowerment

View related webinar:
[Beyond Doom & Gloom: How to Teach Climate Change Towards Empowerment](#)

View resources for addressing controversial aspects of climate change:
[Controversy in the Classroom: Strategies for managing climate change discourse](#)

In response to the climate crisis, many around the world, especially young people, have reported feeling overwhelmed, powerless, sad, and anxious. Overlooking emotions while learning about crushing climate data can cause anxiety, and helplessness, and impede our ability to learn and take action. **How do we support youth in stepping up rather than shutting down?**

The following pages offer a brief review of strategies and resources for processing climate change-related emotions inspiring action together and hope for the future. The goal of these pages is to facilitate the expression, processing, and validation of youths' climate emotions while also encouraging positive emotions and reducing stress. These pages are not a replacement for services from a mental health professional. Please seek professional help if any of your students or you are at risk.



Download a large (11x17") poster of the 4 Beyond climate doom and gloom strategies.



Teaching Climate Change Toward Empowerment

Click here to learn about the direct and indirect impacts of climate change on youth's mental health.

Strategies



Self-care

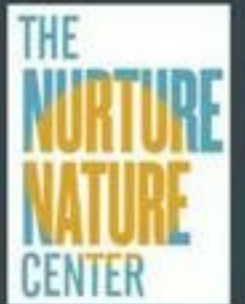
Learn about self-care strategies that can help you support youth as they navigate these impacts.

How do we create a better future? One way is through fostering resilient communities with members that are knowledgeable about their local environment and connected to each other. Science centers can serve a pivotal role in engaging their local community around resiliency through multi-disciplinary approaches and become stronger anchor institutions as a result.

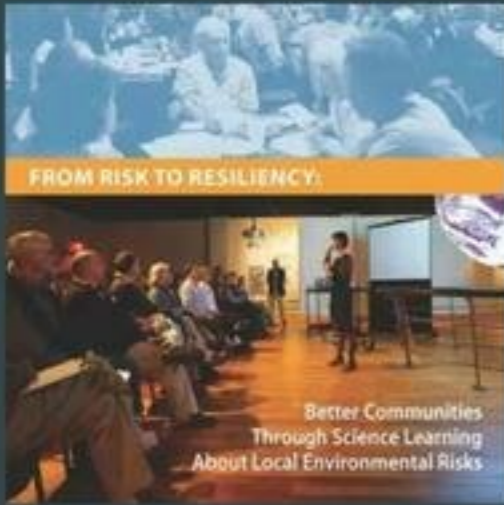
Using the Science on a Sphere to Connect Communities to Resiliency



Nurture Nature Center
SOS workshop
2022



CREATE Resilience



- Location: Easton, Bangor and Wilson Area School Districts, Lehigh Valley, PA
- Target audiences
 - 9-12th grade students
 - Adults in communities
 - Municipalities



Community meetings, educational events & surveys



Easton area residents:

Easton Area School District (see website below for Wilson and Bangor meeting dates)

What hazards do we face in our city and townships?
What mitigation steps should we take to be more resilient for the future?



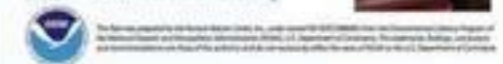
Nurture Nature Center is hosting a public meeting to learn more about the recently updated Lehigh Valley Hazard Mitigation Plan, and to announce a new community program that will help us to learn the science of hazards, identify steps we can take in our homes and community to reduce losses and develop a shared vision of resilience for our area.

Hear from Northampton County Emergency Management Agency and Lehigh Valley Planning Commission about the hazards in our area, and steps identified to mitigate them. Learn how area high school students will help develop community events with your input.

Enjoy light refreshments, and be part of the start of an ongoing community education and dialogue process that will make us stronger and more resilient to natural hazards.

Thursday, February 25, 7- 8:30 p.m.
Nurture Nature Center

55 Northampton Street
Easton, PA
610-252-8432
www.nurturenaturecenter.org



CREATE Youth Ambassadors

STORMWATER RUNOFF



The hazard...
In urban communities, as green space is replaced with asphalt and concrete, rain and meltwater can't be absorbed. The excess water, including any pollutants, is carried away to larger bodies of water, flooding homes and roads and contaminating drinking water. The accumulating volume of stormwater causes rivers to overflow and flood surrounding areas.

To help prevent localized flooding, it is important to keep storm drains and gutters clear of debris.



The impacts...
Stormwater runoff can impact the Lehigh Valley by bringing pollutants into rivers, affecting the health of the local fish population within the Delaware River as well as the people living around the area. Runoff can also cause localized flooding.



A "wash drain" or "storm drain" carries polluted stormwater underground away from roads and property. These drains often collect the untreated water that is the highly toxic and deadly.

YOUTH CLIMATE SUMMIT

OF THE LEHIGH VALLEY



THE NURTURE NATURE CENTER



CREATE Resilience: Community Resilience through Education, Art, Technology and Engagement

CREATE resilience forum and exhibit opening



Photo Credit: Lillian Robinson



Hazard Tours



Resiliency Tours

<https://storymaps.arcgis.com/stories/09c11cc6c3cb4a8d8338478d18530a08>



CREATE Resilience: Community Resiliency Tour



CREATE Resilience: Community Resiliency Tour

A virtual tour of hazard mitigation projects in the Lehigh Valley's Easton, Wilson and Bangor areas.

Nurture Nature Center, Easton PA
June 26, 2020



CREATE Resilience: Community Resilience through Education, Art, Technology and Engagement

Community Outreach

Are You Ready?

In the event of an emergency or natural hazard, do you have supplies ready to go quickly?

Nurture Nature Center is helping Bangor area residents get ready by distributing Ready Kits - free!

Our 2-gallon pails will contain starter items for your household emergency supplies, and we'll also include information about the other items you should add.

Our kits include:

- Carrying bucket with lid
- Emergency flashlight
- Flash drive for storing important documents
- Emergency blankets
- Handwarmers
- Whistles
- Shelf-stable snacks
- Flood preparedness coloring books
- Supply lists and Educational Resources

CREATE Resilience together and swing by (location) between (time) on (date) to pick up your Ready Kit!

While supplies last.

Being ready means that when an emergency comes, you can protect yourself and others in your household, and be available to help neighbors, too.

CREATE Resilience is a project of Nurture Nature Center, working with residents, municipal leaders and youth in the Easton, Bangor and School Districts to learn about hazards for resilience and mitigation. To learn more, visit nurturenaturecenter.org/create



Nurture Nature Center
518 Northampton St.
Easton, PA

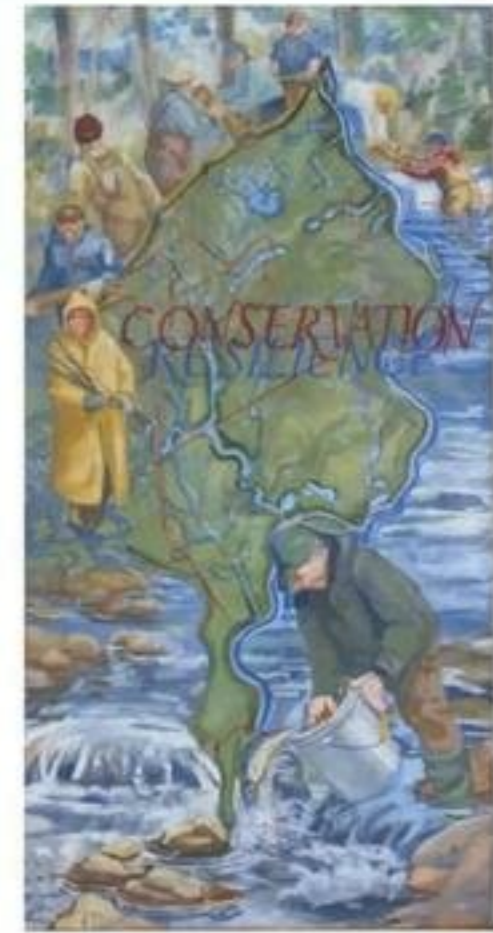


Family Go Kit

- ✓ First aid kit
- ✓ Blanket
- ✓ Food
- ✓ Water
- ✓ Radio
- ✓ Important docs
- ✓ Light
- ✓ Clean
- ✓ Whistle



CREATE Resilience Mural – Bangor area, artist James Gloria



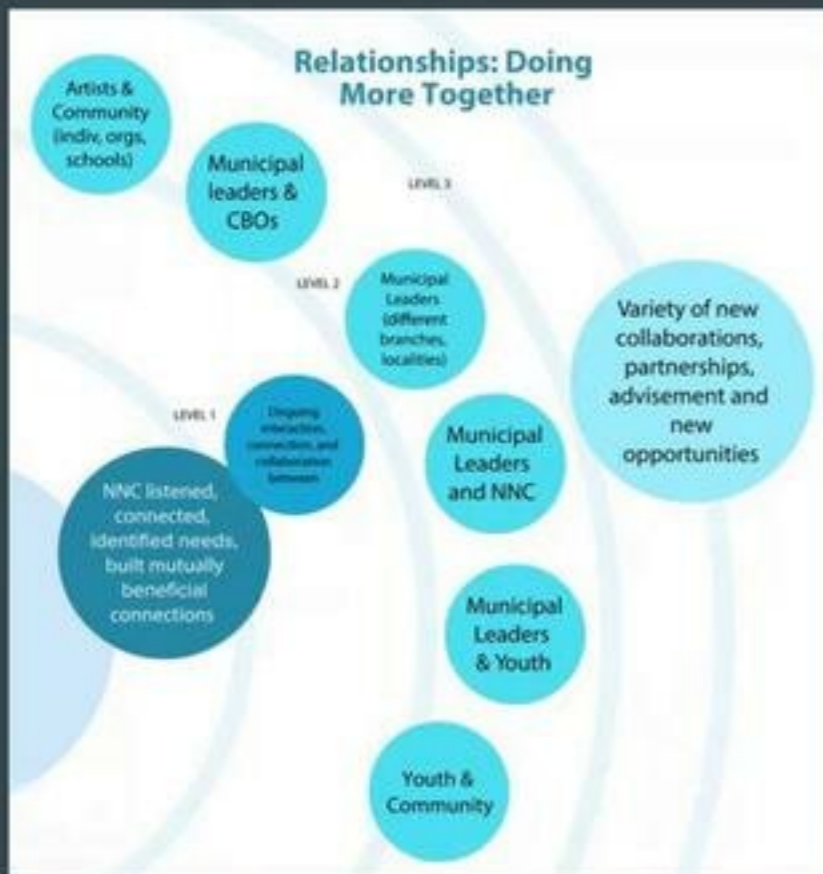
CREATE Resilience Mural – Wilson area, artist Don Wilson



CREATE Resilience Mural – Easton area, artist Jackie Lima



Ripple effect mapping



Science on a Sphere Short Film



NOAA's Community Resilience Education Theory of Change

- Provides the **philosophy/rationale** that guides the program.
- **Articulates the value of education** in community, city, state, and national efforts to **build community resilience** to extreme weather, climate change, and other environmental hazards.
- Serves as **a model for how environmental literacy contributes** to resilience that grantees and others working in the field of community resilience might use.
- Variety of uses, such as a guide for evaluation, a resource for grantees and other educators, and a tool to create logic models



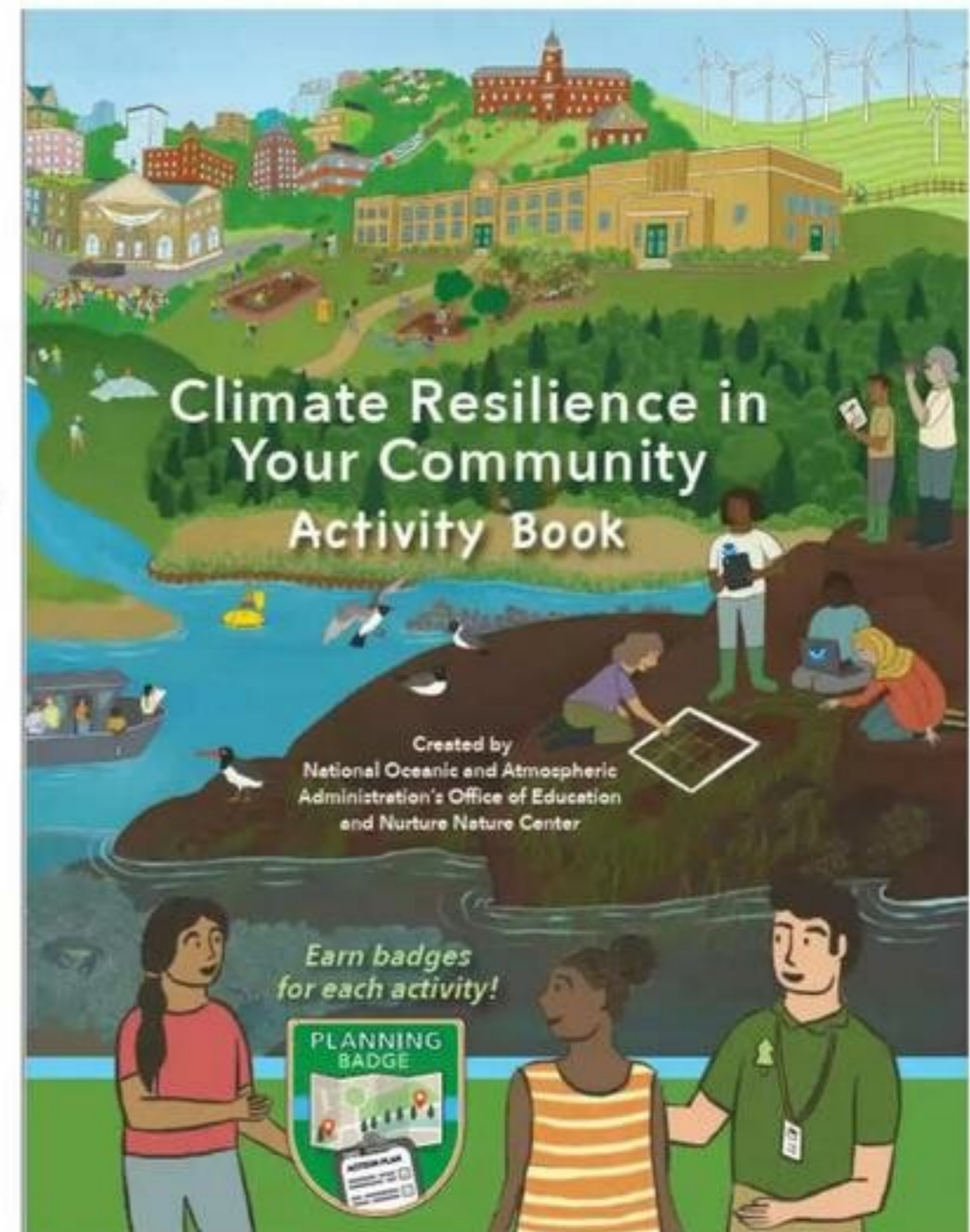
Expanding the audience of the Theory of Change

- The messages within the Theory of Change are relevant for audiences beyond NOAA, ELP grant applicants, and community resilience educators.
- ELP co-produced an activity book with The Nurture Nature Center and with consultation from other ELP grantees.
- Primary goal: Empower young people and give them some tools to act in their own communities.



Activity Book

- Activity book with six sections and additional activities plus an accompanying educators' guide
- Each section focuses on a different target area of the Theory of Change
- Target age range is grades 3-8
- All of the materials are 508 compliant
- Worked with an excellent designer from The Nurture Nature Center, Keri Maxfield
- Used art by Jessica Bartram, who created images to go along with the Theory of Change, and Tom Maxfield from The Nurture Nature Center

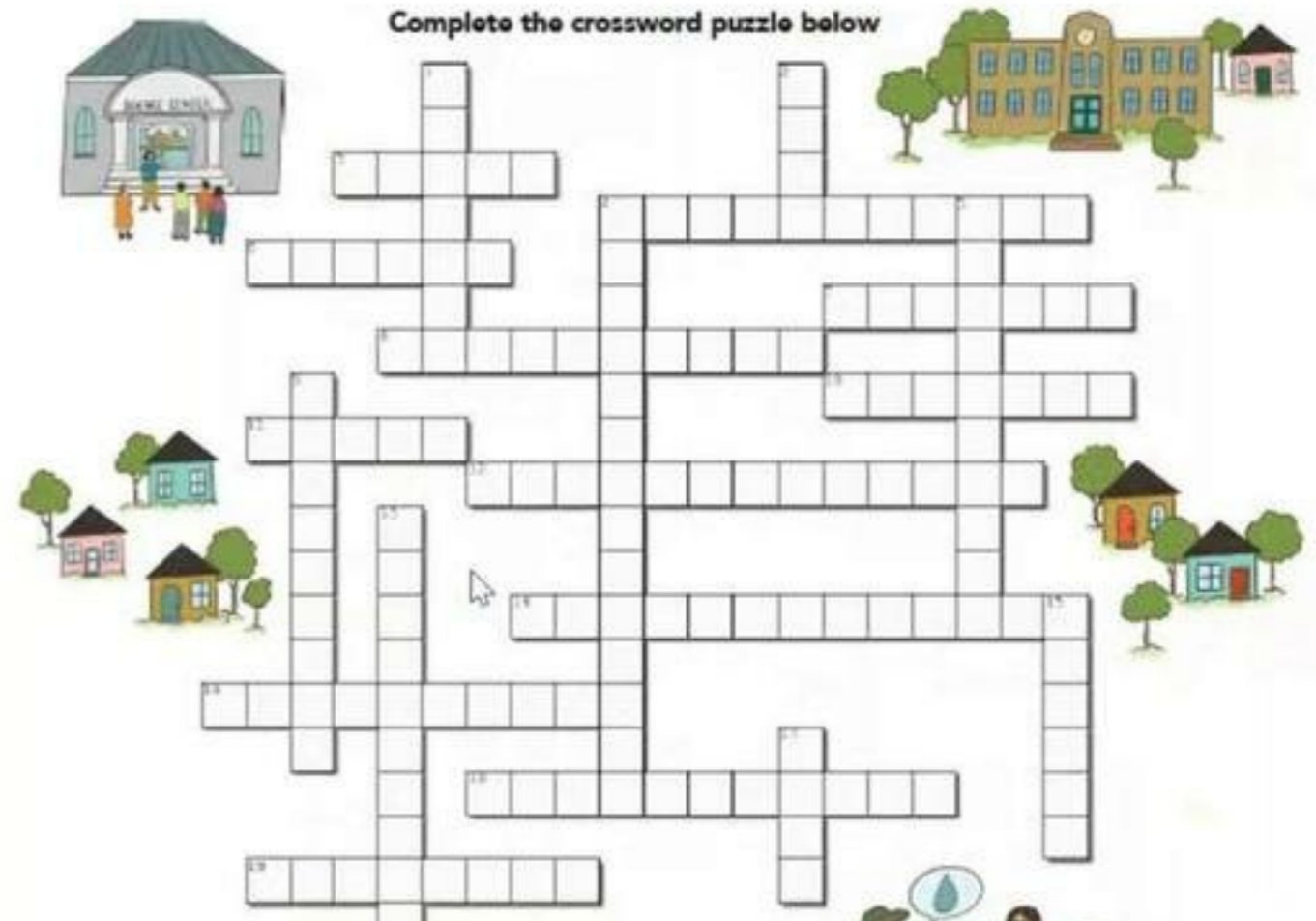


Education

Learn about key vocabulary related to community and climate resilience.

Discover innovative projects NOAA supports that work to reduce vulnerabilities and risk to climate change.

Complete the crossword puzzle below




Across

3. relating to government
4. working together to a shared goal
6. an event or condition that may cause injury, illness, or death to people or damage to property
7. effects on life and places that result from hazards
8. being able to plan for, recover from, and adapt to negative impacts

Down

1. many different perspectives
2. National Oceanic and Atmospheric Administration



Activity:
Exploring Your Community



Research important questions about your community.

Discover community assets and strengths.

Community Resources

8 Does your community have a resilience or climate action plan? See if you can find the plan and the year it was created. If your community does not have a plan, try to find one from a similar community.

10 Are there organizations working in your community to help make it better? What is the name of one of these organizations, and what are they doing to improve the community?



Traditional Ecological Knowledge

Learn about TEK and explore several examples related to seasons and activities.

Make your own table of activities.



Discover the Indigenous Peoples that live/lived in your community.

Traditional subsistence seasons

Subsistence is the act of harvesting plants and animals from the local environment for survival during specific times of the year or seasons. On the Arctic coast of Alaska, the Inupiat peoples define the seasons by the availability of resources. The table below describes traditional subsistence seasons for the Inupiat communities and changes in their environment affecting subsistence that they have observed.



Season	Month/s	Description	Observed Change
Tom-cod	January	Chop holes in ice near shore and jig for tom-cod.	Delayed sea ice development.
Winter Caribou, Crab	February, March	Caribou hunting inland. Use baited wire to catch crab through ice.	Variable weather conditions.
Whaling	April, May	In late March or early April, flocks of snowbirds are migrating and in the ice leads, bowhead and beluga.	Thin ice conditions interrupt sea ice-based hunting.
Bearded Seal, Seal Ducks, Geese	June, July	Sea ice breaks up and hunters switch to open boats to hunt bearded seal and seal species. Bird hunting.	Poor ice conditions.
Summer Caribou, Egg Gathering, Salmon, Arctic Char	August	Caribou often come down to the coast in summer and can be hunted by boat. Catch fish and trout with beach seine nets.	Temperature is too hot for drying fish and meat.
Fall Caribou, River Fish	September, October	Hunting for caribou until river freeze up, also time in fish camps, berry picking, and hunting ptarmigan and other birds.	Delayed caribou arrival.
Seal, Polar Bear	November, December	Venturing out onto the sea ice hunting seal and occasionally polar bear.	Delayed sea ice development.

Footnote: B. (1992): *The Tiagara Eskimos and Their Environment*. North Slope Borough Commission on Inupiat History, Language and Culture, Point Hope, Alaska.

Community Preparedness

Being More Sustainable

- People planting trees
- Building with green roof (roof that is covered with plants/vegetation)
- Building with green wall (walls that are covered with plants/vegetation)
- Teachers and students creating a rain garden



Discover indicators of a resilient community in a fun iSpy activity.

Think about your own community and draw places where it is resilient.



Places for Learning and Action

- Aquarium
- Planetarium
- Library
- Science Center
- City Hall (a place where youth and adults can present their ideas to officials)
- A group of students gathered outside to show support for resilience action

Activity:
Writing a Headline and Short
Article About Environmental Justice

Environmental Justice



Gridlock is just one of the negative impacts of the main highway in Highwaytown, USA

Uranium mine brings both economic opportunities and health impacts to the community

Learn about EJ.

Read news articles about EJ issues.

Research EJ issues in your community and talk to others.

Write an article.

Action

Create a story about one of the characters in the activity book.

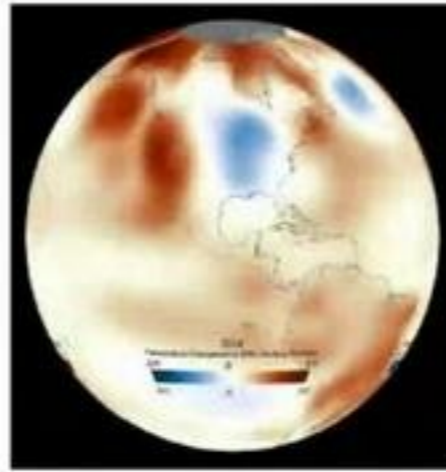


Activity:
Telling a Story and Taking Action



Think about actions you can take in your community and devise a plan.
Commit to taking action!

Activities to Continue to Learn and Explore



Citizen Science



Science on a Sphere
activity exploring
temperature change

Citizen science
opportunities



Steps to Resiliency Badges

Youth add up their points for each section.
Total number shows which badge they earn.

Badges correspond to the U.S. Climate Resilience Toolkit steps:

1. Explore Hazards
2. Assess Vulnerability and Risks
3. Investigate Options
4. Prioritize and Plan
5. Take Action

Badges highlight the importance of the process and journey.



Educators' Guide

Instructions for how the activities can be used in the classroom or other learning environments.

A table showing the alignment of the activities with the Next Generation Science Standards.

Links to additional education resources that relate to these topics that have been developed by NOAA's education grantees.

Next Generation Science Standards Performance Expectation	Activity					
	Education Activity	Community Resources Activity	Community Preparedness Activity	Environmental Justice Activity	Traditional Knowledge	Action Activity
3-ESS2-2 Climate describes a range of an area's typical weather conditions and the extent to which those conditions vary over years. [ESS.2D]						
3-ESS3-1/4-ESS3-2/ MS-ESS3-5 A variety of natural hazards result from natural processes. Humans cannot eliminate natural hazards but can take steps to reduce their impacts. [ESS3.B]						
5-ESS3-1 Human activities in agriculture, industry, and everyday life have had major effects on the land, vegetation, streams, ocean, air, and even outer space. But individuals and communities are doing things to help protect Earth's resources and environments. [ESS3.C]						
MS-ESS3-5 Human activities, such as the release of greenhouse gases from burning fossil fuels, are major factors in the current rise in Earth's mean surface temperature (global warming). Reducing the level of climate change and reducing human vulnerability to whatever climate changes do occur depend on the understanding of climate science, engineering capabilities, and other kinds of knowledge, such as understanding of human behavior and on applying that knowledge wisely in decisions and activities. [ESS3.D]						
3-5-ETS1-2 At whatever stage, communicating with peers about proposed solutions is an important part of the design process, and shared ideas can lead to improved designs. [ETS1.B]						

Distribution of the Activity Book

- You can access the activity book here:
www.noaa.gov/resilience-activity-book
- Part of the Earth Science Week 2022 Toolkit and went to COP 27
- Print versions available by request from the NOAA Outreach Center:
education@noaa.gov
- We are starting to think about future collaborations to translate the activity book and further increase its accessibility

