



Creating Authentic Opportunities for Students to Engage with their Community to Build Resilience to Environmental Hazards in Rural Colorado

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Program Description

HEART Force engages Colorado secondary students, teachers, and communities to take proactive steps in preparing for hazards that are becoming more frequent due to climate change.

- Middle and high school curriculum designed to build towards NGSS (NGSS MS-ESS3-2 and NGSS HS-ESS3-1)
- Flexible formatting: teachers can teach a 1-6 week unit using stand alone lessons or the entire lesson progression.
- Active, engaging pedagogy based in a local context

Curriculum Description

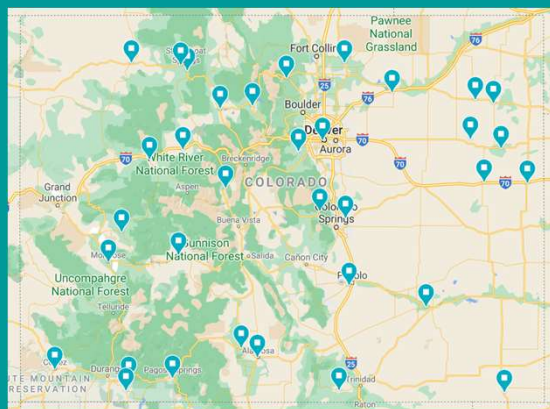


The HEART Force curriculum uses a project-based learning approach, with the driving question "How can we make our community more resilient to (wildfire, flood or drought)?" Students begin by learning more about the science of the hazard by analyzing data and using GIS to assess their communities vulnerability and risk. Next, students participate in a scenario-based role-play game to see what it's like to address the hazard as it's occurring in their community. They finish the unit by designing a resilience project to make their community more resilient to the environmental hazard they are studying.

Then, students present their ideas to their community at a Community Resilience Expo. Student incorporate feedback from community members, and can apply for implementation funding to complete their resilience project.

HEART Force Teacher Locations

CIRES Education and Outreach is partnering with several teachers across Colorado to pilot the curriculum.



Program Successes

Motivated Community Stakeholders

We've found that community experts (fire districts, floodplain managers, extension agents, water conservancy board members, etc.) are very enthusiastic about working with students and the HEART Force programs. Hazard education and awareness is within these groups' interest, but they often don't have the time or resources to engage with youth. HEART Force provides opportunities for meaningful engagement with youth and communities around planning for resilience.

Student Engagement

Real world learning opportunities have gotten students excited about science class. Teachers have told us that students that may not typically be engaged about science class have become much more interested, and are taking initiative to learn more about how hazards could affect their community.

Reaching Rural Teachers

One benefits of the COVID-19 pandemic is that we've been able to engage with teachers in rural towns across a wide geographic spread of Colorado, due to the online teacher workshop format. We suspect more teachers signed up because they didn't have to travel for the workshop. While we would like to support teachers in person when possible, the widespread adoption of video conferencing has also helped us provide deeper support by being able to meet with teachers and community stakeholders more frequently.

Statewide Collaboration

Several other groups in Colorado are offering resilience education programs, and we have coordinated our efforts to increase our reach and impact. Earth Force, a national non-profit, runs a hazards resilience program called the RISE Challenge, funded by FEMA, in the Front Range. Forces are uniting to host a virtual statewide resilience youth summit in May 2021. We've also collaborated to increase teacher professional development offerings, and make implementation funding for resilience projects more widely available.

Students at Hotchkiss High School participate in a wildfire scenario led by local fire chief Doug Fritz.



Program Challenges

Teacher & Classroom Time Constraints

Teachers are often overworked, especially this year with the uncertainty and transitions between online and in-person teaching. Rural teachers often may be the only science teacher at their school and have to teach multiple subjects (as well as drive the school bus, coach soccer, etc.). We've addressed this challenge by increasing our individual support and coordinating communications and collaboration with community experts, and helping any way we can. Additionally, a 4-6 week project may be too much time to spend on one topic. We try to recruit out-of-the-box thinking teachers who have administrative support that are willing to take risks and prioritize student-led authentic learning experiences.

Community Resilience Expo

In pilot years one and two, teachers often didn't get to the community resilience expo because they spent too much time on the first lessons and playing the game. When they did get to the resilience strategies, they run out of time to track down an expert. During our third year of the program, we have asked teachers to submit a unit plan with a list of potential experts to engage with and a community resilience expo plan. We hold a meeting with the teachers and community experts before the unit begins to get everyone on the same page and to get experts invested in the project and student success before it begins.

Working Within a Disciplinary Setting

Resilience is not a single-discipline topic - it requires science knowledge, literacy and writing skills, understanding of civic processes, and the list continues. While we have focused primarily on secondary science teachers, we would like to encourage cross-disciplinary collaboration, but have yet to be successful doing so.

Pedagogical Support

Student-led learning is a new teaching paradigm for many teachers, and requires a level of confidence and comfort with uncertainty. We've found it difficult to provide both science content professional development and pedagogical professional development in the short workshops we offer teachers. We have found that our best projects are with teachers who are already using project-based learning and/or student-led learning in their classroom.



Arickree students monitor soil moisture with CSU Extension specialists.

Learn more about HEART Force at: cires.colorado.edu/outreach/programs/heart-force