



Jan Theme of the Month: Webinar Panel

January 13th at 3:00pm ET

Addressing Climate Change in School and Community: Learning, Discussing, Doing

Panelists will explore three strategies for engaging learning and teaching about climate change.



Brian Drayton (Moderator), Gilly Puttick, Trevor Lloyd-Evans, & Leigh Peake

Watch the recording of this webinar: <https://multiplex.videohall.com/pages/january2021webinar>

Join the online discussion: <https://multiplex.videohall.com/playlists/2458#discussion>

Resources Mentioned During Webinar And Webinar Chat

Resources

CLEAN network: <https://cleanet.org/index.html>

The Climate Change Education Collective: <https://ccecollective.org/>

Climate Change Education Roundtable at the US Academy of Sciences:

https://sites.nationalacademies.org/DBASSE/BOSE/DBASSE_088839#:~:text=The%20Roundtable%20on%20Climate%20Change,secondary%20and%20post%2Dsecondary%20education

Direct links to the reports that are all available for free download:

- <https://www.nap.edu/catalog/13224/climate-change-education-goals-audiences-and-strategies-a-workshop-summary>
- <https://www.nap.edu/catalog/13435/climate-change-education-in-formal-settings-k-14-a-workshop>
- <https://www.nap.edu/catalog/18813/climate-change-education-preparing-future-and-current-business-leaders-a>
- <https://www.nap.edu/catalog/18807/climate-change-education-engaging-family-private-forest-owners-on-issues>

Commissioned papers that supported some of the reports:

- https://sites.nationalacademies.org/DBASSE/BOSE/DBASSE_080125
- https://sites.nationalacademies.org/DBASSE/BOSE/DBASSE_0890

Other Papers:

- *Advancing Community Science Literacy*
<https://www.tandfonline.com/doi/abs/10.1080/10598650.2020.1720403?journalCode=rjm e20>
- *Mind the Gap: Why Do People Act Environmentally and What Are the Barriers to Pro-Environmental Behavior?*
[https://www.researchgate.net/publication/235363126 Mind the Gap Why Do People Act Environmentally and What Are the Barriers to Pro-Environmental Behavior](https://www.researchgate.net/publication/235363126_Mind_the_Gap_Why_Do_People_Act_Environmentally_and_What_Are_the_Barriers_to_Pro-Environmental_Behavior)
<https://www.tandfonline.com/doi/abs/10.1080/13504620220145401>
- *Beyond individual behaviour change: The role of power, knowledge and strategy in tackling climate change*
[https://www.researchgate.net/publication/233032475 Beyond individual behaviour change The role of power knowledge and strategy in tackling climate change](https://www.researchgate.net/publication/233032475_Beyond_individual_behaviour_change_The_role_of_power_knowledge_and_strategy_in_tackling_climate_change)
- *Framing action in a youth climate change filmmaking program: Hope, agency, and action across scales*
<https://www.tandfonline.com/doi/abs/10.1080/13504622.2020.1821870>

NASA and NOAA websites:

- <https://www.noaa.gov/education/resource-collections/climate>
- <https://climate.nasa.gov/>

Strategy for public engagement and education at a national level

- <https://aceframework.us/>

The Climate Literacy Principles:

- <https://www.climate.gov/teaching/essential-principles-climate-literacy/essential-principles-climate-literacy>

Project websites:

- <https://wpsu.psu.edu/changingclimate/>
- <https://www.climateinteractive.org/tools/en-roads/>
- <http://www.iswooparks.com/parkslocations/acadia-national-park/>
- <https://www.sealevelsensors.org/>
- <https://climateinterpreter.org/about/projects/NNOCCI>
- <https://www.wildcenter.org/our-work/youth-climate-program/>

Tools and Games:

- Carbon Journey Game: https://youtube.com/playlist?list=PLCvqIPeInH-bnz0BQeX3_YRTHYLEa4VMI
- <https://oshermaps.org/>

Webinar Chat

Deb H: Hi, Deb Harrison here: I teach at Noble and Greenough School and one of the courses I teach is AP Environmental Science. I am also a super fan of Trevor and Manomet.

Anna-Marie F: Hi, My Name is Anna-Marie and I am a children's Librarian in Los Angeles.

Leigh Peake: Great to see everyone here!

Dean G: Hi, my name is Dean and I work at UIC and partner with community groups in Chicago. Glad to be here!

Leigh Peake: Yay for librarians, Anna-Marie!

Ysaaca A: Ysaaca Axelrod, early childhood & elementary ed literacy faculty at UMass Amherst

Dean G: Sorry: UIC is the University of Illinois at Chicago. :-)

Liana G: I teach Biology and Environmental Science at Clarkstown High School North in New City, NY

KarenJane N: Hi - Karen from Houston Texas - Keep Houston Beautiful Commissioner and NCWIT AiC coordinator

Becky T: Hello. Becky Talyn from Cal State San Bernardino. Teaching a new freshman seminar that includes an intro to sustainability and environmental science, and teach a GE upper division environmental science class.

Joni Falk: We will begin at 3:02 Can't wait :)

Tom R: Tom Rehm, The Climate Solutions Community and Climate Collaboration.

Martha M: If you live in MA and care about climate change, please contact Gov Baker's office and ask him to pass the climate change legislation that the MA state house and senate passed.

<https://actionnetwork.org/letters/lets-lock-in-the-gains-from-the-2020-session/>

Kim Descoteaux: This webinar panel is being recorded and will be available tomorrow on <https://multiplex.videohall.com>

Kristian B: Hi - my name is Kristian Berg and I'm a producer/director from WPSU Penn State - which, with the College of the Liberal Arts submitted a project to the STEM Multiplex "Finding Your Roots: The Seedlings" a middle school curriculum on genetics and genealogy. I'm involved with another project along with SCRiM - Sustainable Climate Risk Management and a documentary film we made called "Managing Risk in a Changing Climate" - an NSF funded endeavor. We want to develop teacher professional development and classroom materials helping and encouraging school projects that assess local climate risk and present

findings to the school & community (perhaps even organizing town hall meetings with decision makers). We're developing a community toolkit but hope to have materials for teachers on PBS Learning Media and to submit to the STEM Multiplex.

Kristian B: Project website is here. <https://wpsu.psu.edu/changingclimate/>

Corinne T: The graphic Gilly Puttick referenced is in this doc:
<https://www.frontiersin.org/articles/10.3389/fsufs.2019.00037/full>

Gilly Puttick: Thank you!

Kathleen L: Would planting trees be some thing kids and teens could do?

Steven B: I don't think any of us want to be "doom and gloom" but isn't there a difference between that and pushing a conversation about the realities that hasn't been happening as well as aiming people at what they will need to radically change in their own lives and communities to adapt to what's coming?

Steven B: As I work daily to train youth of color for tech jobs I wonder if that's preparing them for the climate change future of two decades from now?

Joni Falk: Kristin, I thanks for your participation in the Video Showcase, and I look forward to your 2021 presentation!

Nada M.: Ideas of sustainable schools and campuses will be a great example to promote or understaing of climate issues.

Steven B: I'm proud that in our job training we focus as much or more on "soft skills" like design thinking, communication and collaboration that I think will help our youth help their communities adapt much more than the technical stuff, or anything embedded in the dominant paradigm of competition that exists in our economy and our education system

Martin S: Since we are sharing: here few well-known older resources:

CLEAN network: <https://cleanet.org/index.html>

Climate Change Education Roundtable at the US Academy of Sciences:

https://sites.nationalacademies.org/DBASSE/BOSE/DBASSE_088839#:~:text=The%20Roundtable%20on%20Climate%20Change,secondary%20and%20post%2Dsecondary%20education

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NASA and NOAA websites:

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- <https://climate.nasa.gov/>

The Climate Literacy Principles:

- <https://www.climate.gov/teaching/essential-principles-climate-literacy/essential-principles-climate-literacy>

Steven B: Good point Gilly...

Betsy S: Nada, I agree. Could you share more on how you are approaching the term sustainability? Thanks!

Joni Falk: Wow, Martin, a lot of resources. We will clean up the chat and make it available to all participants!

KarenJane N: can you share link to your where's Waldo? - might be in above links??

Steven B: Youth of color have NO reason to put their faith in government action

Steven B: At least in the US

Steven B: LOVE it Leigh!

Joni Falk: Steven, maybe local action (as opposed to gov action) is the way to go?

Steven B: Definitely Joni!

Steven B: I just want to call in that the vulnerable communities that will be first-and-most affected are already struggling to apply local action to surviving their CURRENT dire situations, like police violence

Martin S: Just one more example of newer stuff: the Climate Change Education Collective - <https://ccecollective.org/>

Steven B: I remember New Math!

Joni Falk: I think working with vulnerable communities needs to be top of our agenda. Especially when thinking of new proposals for grants to do this work.

Steven B: SMART strategy!

Martin S: big difference between education that aims at creating independent, critical and capable minds, and communication and public engagement which has a less long-term and development perspective.

Alan P: with Joni

KarenJane N: yes remember new math - as a computer science teacher since 1985 I have lots of data and solutions- @TedE4CS

Corinne T: +1 to previous comment on prioritizing working with vulnerable communities.

Becky T: “Environmental justice is interconnected with every aspect of our fight for justice. From racial justice and economic justice, to housing justice and educational justice, we cannot disentangle the environment people live in from the lives they live,” Kamala Harris told Grist in an email. “These crises we are experiencing have exposed injustices in our nation that many of us have known and fought our entire lives.”

Martin S: Also interesting new development around community science literacy and community asset approaches, focused less on addressing the individual as actor.

Thomas F: Working on modeling climate change with students in Michigan, I’ve noticed that students are more motivated to act than they are scared of their future. They also note (in modeling) that they need to consider human behavior in the context of their (Earth) science class... not just science.

Steven B: +1 to Martin Storksdieck

Billy S: Hi Martin, good to see you here. If anyone is interested in more about “community science literacy” I co-wrote a paper on this topic:

<https://www.tandfonline.com/doi/abs/10.1080/10598650.2020.1720403?journalCode=rjme20>

Thomas F: (Importance for teaching in an interdisciplinary way)

Nada M.: @Betsy Stefany, Building sustainable schools with clean and healthy indoor air, as an environmental models for students and their communities, may play a big role.

Joan Karp: sounds like teaching challenges with evolution in some communities.

Joni Falk: Hi Billy, Good to see you. Looking forward to a 2021 video from you for the Video Showcase!

Colin D: +1 - work with vulnerable communities needs to recognize that climate change might not matter for many people if they are still marginalized, vulnerable, even if climate change is mitigated. And some forms of mitigation could further marginalize

Martin S: Strange thing: The basic issues really haven't changed in the last 25 years. Which is in some ways encouraging (stable problems might lead to stable solutions) and in some ways a sign that much of what we learn we need to relearn over time, as new generations of educators enter the "market".

Billy S: Hi Joni (and Brian)! Good to be here with you.

Billy S: For those who are interested in how we might move forward with a strategy for public engagement and education at a national level, see <https://aceframework.us/> .

Martin S: Leigh's discussion about moving the needle: useful to read Anja Kollmus & Julian Aygeman's Mind the Gap, a review of behavior change models in EE.

Leigh Peake: +1 regarding community science literacy. This would be a wonderful place for more work to be done on new projects

Steven B: I feel like we're talking about the need for a paradigm shift that dissolves the distinctions between science, education and political action.

Martin S:

https://www.researchgate.net/publication/235363126_Mind_the_Gap_Why_Do_People_Act_Environmentally_and_What_Are_the_Barriers_to_Pro-Environmental_Behavior

Martin S: or <https://www.tandfonline.com/doi/abs/10.1080/13504620220145401>

Billy S: Hi Leigh, nice to see you here! I agree that community-level literacy is really worth exploring further, especially in terms of the relationship between community needs, learning, and action.

Leigh Peake: Agreed Billy. (and hi!)

Thomas F: +1 to Steven Bean

Joni Falk: i think, especially in vulnerable communities, efforts need to be led by trusted leaders within the community.

Steven B: I think I saw someone comment on the important difference between individual behavior and social- or systems-change

Thomas F: The ENROADS simulation project with students focused on finding critical change levers

Thomas F: <https://www.climateinteractive.org/tools/en-roads/>

Steven B: I like Leigh's pointing to recycling as an example of "high-volume individual behavior" rather than real collective action

Billy S: Joni, yes, and there is so much intersectionality between climate change, health, social justice, racism — and this is so evident at the community level.

Leigh Peake: +1 Tom. ENROADS is an interesting and evolving model.

Jayma K: Sharing for those interested in our project- the Smart Sea Level Sensors Project. It places internet-enabled water level sensors across Chatham County, GA (Savannah). Strong partnerships between city & county officials, local schools, Georgia Tech researchers and partners in vulnerable communities
<https://www.sealevelsensors.org/>

Martin S: There is a boatload of research on climate change behavior and hw it is triggered and sustained:
<https://global.oup.com/academic/product/the-oxford-encyclopedia-of-climate-change-communication-9780190498986?cc=us&lang=en&>

Martin S: The Oxford Encyclopedia of Climate Change Communication

Martin S: I see much of our problem as a community in how we manage the enormous amount of knowledge from research we already can tap into.

Gilly Puttick: I'm interested in how climate change behavior can lead to SYSTEMIC change (or not)....

Liana G: This is why horizontal integration among humanities and sciences is so important.

Rachel C: At STEM Learning (UK) we are developing a Climate Change Education partnership. With the Natural Environment Research Council, Environment Agency, Royal Geographical Society, Royal Meteorological Society, Met Office, UK Research and Innovation, UK Space Agency and Department for Business, Energy and Industrial Strategy, we work to enhance educator subject understanding so learning is evidence-based and to increase students' understanding of the science and implications of climate change.

Gilly Puttick: Agreed, Liana!

Colin D: one provocation: Behavior change models are based on the idea that we know the end point - we know precisely what needs to be done. Do we need a more humble, and open-ended, approach? Given that mitigating climate change is social, not just scientific, problem?

Billy S: Leigh, thanks for the shout out to NNOCCI. For those who are interested in more info about research-based climate communication, see <https://climateinterpreter.org/about/projects/NNOCCI> (and our video on the STEM multiplex).

Alan P: Does the focus on values (which many of us hold deeply) help or hinder us in getting the engagement in the science?

Leigh Peake: +1 Colin

Corinne T: +1 Colin

Alan P: Trevor makes an important point that is similar to art appreciation - teaching students to be engaged observers

Andee R: +1 Colin. When are we “done” with climate change mitigation?

Martin S: I think we suffer from the same “bench-to-bedside” research to practice problem that so many other fields suffer from: how do practitioners on the frontline tap into what we solidly know to do, and also not to do.

Kim Descoteaux: To see all of the videos that the panelists have referenced:
<https://multiplex.videohall.com/playlists/2458>

Thomas F: Colin, Andy Pershing, now at Climate Central, notes that the RCP (concentration pathways) have become SSPs (shared socioeconomic pathways) and consider many models (ensembles)

Martin S: Locus of Control: local, yes, and then there is Greta Thunberg and the Fridays for Future movement.

Billy S: I agree Martin that the research to practice translation takes intention and effort, and that has been the focus of a lot of the work I have been involved in with NNOCCI and other projects.

Rachel C: Presenting young people with role models in the field of climate change is important. They need tangible examples of what they can work towards in terms of their careers.

Andee R: So cool, Leigh!

Kelsey T: This a nice piece on the question of individual behavior change to address climate change vs collective action
[https://www.researchgate.net/publication/233032475 Beyond individual behaviour change The role of power knowledge and strategy in tackling climate change](https://www.researchgate.net/publication/233032475_Beyond_individual_behaviour_change_The_role_of_power_knowledge_and_strategy_in_tackling_climate_change)

Corinne T: <https://oshermaps.org/>

Steven B: I’m interested in whether folks on the panel or in attendance are familiar with Jem Bendell’s recent work and what folks think of the idea of moving the narrative from prevention/aversion or mitigation to adaptation, in Prof Bendell’s nomenclature “Deep Adaptation?”

Martin S: Nice, Kelsey!

Steven B: I just learned of Prof Bendell’s work a few weeks ago

KarenJane N: yes - horizontal integration essential - same issue with @csforall scaling computer science education- how can we scale this partnership?

Becky T: @Steven, I think they have to work together. We are past the point where prevention is possible, so adaptation is required. But we still have to work on mitigation or we will get beyond the point that adaptation is possible.

Martin S: Steven: I think there are so many different avenues, tactics, strategies for various outcomes and different people (think 6 Americas) that I believe the more the merrier in terms of approaches. Let's add to our toolbox. Alas, that can confuse people...

Billy S: The concept of individual "carbon footprint" came from BP, a fossil fuel company with a vested interest in deflecting responsibility. See <https://grist.org/energy/footprint-fantasy/> for example.

Kelsey T: I also wrote about some of the tensions between individual behavior change and collective action and how it ties to hope and agency in one of my dissertation articles <https://www.tandfonline.com/doi/abs/10.1080/13504622.2020.1821870>

Josh R: NOAA has a great game called the Carbon Journey Game. I mixed it into a digital format for students and has had a great review so far. It helps students get a look at how their region has connections to the big picture.

Thomas F: +1 Brian

Martin S: I have long been concerned with the individual shaming and responsibility frame in education, at least when it comes to taking action. I would like to distinguish between creating understanding of what it is and what it means from what one should or could do. And the latter requires value clarification.

Martha M: iSWOOP gave visibility to paleoecologists' work. Jacquelyn Gill and others learn about past plant communities and expect what they find will help us manage for the future. Jacquelyn tells a funny story about her introduction to the ice age and a research expedition here. <http://www.iswoopparks.com/parkslocations/acadia-national-park/> Jacquelyn Gill is also the co-host of a podcast that focuses on climate change and humanity's role in shaping it. Through the "Warm Regards" podcast, Gill and fellow co-hosts Eric Holthaus, a meteorologist and frequent Slate contributor, and Andy Revkin, a veteran environment writer for the New York Times, bring the planet's greatest challenge closer to home.

Billy S: Well said Martin.

KarenJane N: I know student who want to scale their climate change games- are there MacArthur type grants to scale this work?

Steven B: +1 kudos to Martin

Corinne T: +1 Leigh. Same goes for agricultural industry reimagining

Martin S: NSF AISL supports lots of climate change education innovation.

Josh R: Carbon Journey Game and demonstration that I was talking about:
https://youtube.com/playlist?list=PLCvqIPeInH-bnz0BQeX3_YRTHYLEa4VMI

Leigh Peake: Yes Corinne

Willow D: Such a fabulous and nuanced discussion, thank you. An administrative request to whoever is managing the multiplex website: it would be wonderful if there were a share option from the panel page so that it could be easily spread on social media (e.g., this page where so many resources have been centralized: <https://multiplex.videohall.com/pages/january2021webinar>). Thanks!

Kim Descoteaux: Thank you for the suggestion Willow!

Colin D: +1 Leigh - imagining together, collective futuring. This is needed to get on board not only those who 'don't believe in climate change', but those who don't believe it matters.

Martin S: Agreed with Brian: "wisdom from practice" is important, but also hard to share with others. Same problem!

Nada M.: We all connect!

KarenJane N: @martin NSF grants require too much paperwork- want to give funds to those who doing proven work - any other ideas?

Martin S: And sometimes it is good that people start from scratch: it can also lead to innovation. People try new stuff.

Andee R: Mary Ann Steiner in Pittsburgh is working with a rural county in northwestern Pennsylvania around climate change by connecting with garden clubs, etc.

Joni Falk: Martin, maybe its more important if it feels innovative for participants, rather than if it is truly innovative.

Steven B: And ending the FALSE equivalency between "modernity" and "industrialization" and "technology." Soft skills are a "technology and ancient indigenous people had "technologies" most notably "wisdom" (or empiricism if you prefer)

Martin S: And the other ting that gives me hope: there are many roads that lead to Rome - many approaches empower etc. Diversity here is our friend in climate education and climate communication.

Nada M.: @Martin Storksdieck, I agree :)

Steven B: Before this zoom ends I want to express gratitude to the organizers of this webinar and to the panelists for your courage and wisdom in bringing this conversation forward.

Martin S: Yes, thank you all!

Shakti M: +1 Steven re: indigenous technologies. There are many examples of this in Gary Paul Nabhan's climate change book Growing food in a hotter, drier land including an area of cultivated/irrigated agave plants that is still alive and working after thousands of years

Steven B: Mutual support networks are an ancient wisdom

Nada M.: Thank you, Great discussion!

Corinne T: +1 Steve Bean. Also Thank you for your last comment ,Steve, elevating Indigenous practices & knowledge as part of educational community engagement.

Dean G: Yes, very inspiring!

Joni Falk: Congratulations! This is the richest chat on a webinar to date! We will clean it up, find all the resources and post it on the multiplex.

Leigh Peake: <https://www.wildcenter.org/our-work/youth-climate-program/>

Kim Descoteaux: Please use the online discussion at https://multiplex.videohall.com/month_themes/10 to continue this conversation!

Martha M: More experiments in communities like deeply subsidizing electric cars, bikes, and scooters. Just giving away scooters to essential workers in cities. I'd like to see more conversations about where residents near rising seas are going to go. Planning . We could learn from Mekong River residents who live with fluctuating water levels.

Billy S: I second Leigh's recommendation of the youth summit model, this has been well-tested and is very effective and replicable.

Steven B: I recently picked up a copy of Lo-TEK: Design by Radical Indigenism by Julia Watson

Corinne T: I ordered that book, too! but never arrived. :(

Billy S: Thanks Joni and Brian and the panelists for fostering a great discussion, great job!

Ysaaca A: As a teacher educator (in early childhood & elementary ed) I would love to know more resources for how we can better prepare future teachers to teach about climate change & climate justice.

Leigh Peake: Thank you so much for including me — so much expertise in the virtual room and so many voices that need to be heard!

Ysaaca Axelrod: Thank you for all the resources!

Kim Descoteaux: Find all of the videos, resources, online discussion and the recording of this webinar here: https://multiplex.videohall.com/month_themes/10

Betsy S: Gilly, I agree that area of developing opportunities for field work teams from the college level. I'm enjoying a virtual intern working on a site to continue our project.

Jayma K: Thank you for all of this!

Leigh Peake: Amazing attendee group!!

Gilly Puttick: Thank you for including me on the panel - I would like another three days to explore all the ideas that have collected here!

Kathleen L: have you heard of the new blue gas that is supposed to be climate clean

Leigh Peake: +1 Gilly

Steven B: Gotta go. Stay well, stay connected, stay strong everyone.

Willow D: Keep any suggestions coming on early education related to this! Reggio Emilia is very compatible with scientific inquiry rooted in community

Leigh Peake: Awesome job Joni & Brian!

Liana G: Thank you