

NSF Design & Discovery Forum: Climate Science, Children, and the Media Chat Resources

Welcome and opening session

Panelist Resources

Advancing Informal STEM Learning (AISL): <https://beta.nsf.gov/funding/opportunities/advancing-informal-stem-learning-aisl>

Other Resources

Stories of how youth are affected by and responding to climate change:

<https://yaleclimateconnections.org/topic/youth/>

Climate education resources developed by Phil Bell at the University of Washington:

<https://www.climetime.org>

Communicating to children about climate change: A cross-sectoral call to action

Panelist Resources

K-12 Climate Action: <https://www.k12climateaction.org/>,
<https://www.k12climateaction.org/blog/climate-action-plan-2021>

“For Gen Z, climate change is a clear and present danger to our planet”:

<https://www.usatoday.com/story/opinion/2020/10/07/climate-change-gen-z-urgent-threat-our-planet-column/3636669001/>

From Laura Schifter: K-12 Climate Action Plan 2021: <https://www.k12climateaction.org/blog/climate-action-plan-2021>

From Seeta Pai: Rachel Carson’s Silent Spring video:

<https://www.pbslearningmedia.org/resource/envh10.sci.life.eco.silentspring/rachel-carsons-silent-spring/>

From Nathaniel Kendall-Taylor: We have research on our website (frameworksinstitute.org) that might be helpful and then I think the Yale Program on Climate Communications is an amazingly valuable source on these issues of public thinking and framing.

Other Resources

Girl Scouts “World Thinking Day,” an event focused on climate change and impact on women:

https://www.girlscouts.org/content/dam/girlscouts-gsusa/forms-and-documents/For-Girls/think-global/DBJWorld_Thinking_Day_2022.pdf

The 2018 National Climate Assessment. A go-to resource on the state of climate science for the nation until the next one is released in 2023: <https://nca2018.globalchange.gov>

NASA resources, many geared towards children: <https://climatekids.nasa.gov>,
<https://earthobservatory.nasa.gov/blogs/eokids>

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International Day of Women and Girls in Science: <https://www.un.org/en/observances/women-and-girls-in-science-day>

NOAA videos from 2014 about the National Climate Assessment 3:
<https://vimeo.com/channels/nca/videos>

NASA Earth science resources involving the International Space Station, with many hands-on opportunities for youth: <https://www.nasa.gov/station>

Training on metaphors and messages that work best with museum audiences about climate change from National Network for Ocean and Climate Change Interpretation, which is funded by NOAA and NSF: <https://climateinterpreter.org/training>

Classroom resource for educators: Columbia Climate School - The Earth Institute - El Live K12:
<https://www.earth.columbia.edu/videos/channel/k12-education>

The MY HERO Project provides media arts training to youth so they can share their environmental hero short films, art stories. Their online media library is filled with short films made by professionals and students from around the world. <https://myhero.com/climate-change-resources>, <https://myhero.com/slater>

The United Nations 17n Goals for Sustainability and Development: <https://sdgs.un.org/goals>

NPR TED radio hour piece on the idea of “Playtivism” -
<https://www.npr.org/2022/02/11/1079873883/yana-buhrer-tavanier-can-social-activism-be-playful>

‘Young Voices for the Planet,’ where kids lead efforts to help the climate and video pieces are produced on each effort: <https://www.youngvoicesfortheplanet.com/>

The Clara Lionel Foundation, a foundation started by Rihanna, funded a group of organization who are doing work in climate justice: <https://claralionelfoundation.org/news/clf-commits-approximately-15m-to-18-grassroots-organizations-on-the-frontlines-of-climate-justice-in-partnership-with-start-small/>

A website with a climate blog and educational resources: <https://climateinterpreter.org/>

Greta Thunberg on AGU Sharing Science:
<https://blogs.agu.org/sciencecommunication/2021/08/13/antarcticlog-climate-hope-via-greta-thunberg/>

A blog post on the international young activists’ work to deal with climate change in their own backyards: <https://blogs.agu.org/sciencecommunication/2021/03/05/antarcticlog-sannas-reindeer/>

Climate change conversation tools from FrameWorks:
<https://www.frameworksinstitute.org/issues/climate-change-and-environment/>

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A Scientific American article about educators dealing with children who are falling victim to conspiratorial information: <https://www.scientificamerican.com/article/schoolkids-are-falling-victim-to-disinformation-and-conspiracy-fantasies/>

“Plausibility reappraisals and shifts in middle school students' climate change”:
conceptions https://www.sciencedirect.com/science/article/pii/S0959475213000285?casa_token=TQtJ8pH_oGsAAAAA:t6mWC4j1vruOke5GWinqzTKJQlwSR0xvfNMLQzxGtvo-89tOlGZ7mECKILrQ4mbx2QeMhfZZw

CLIMATE ALIVE!: NOAA's Ocean Today Program videos featuring NOAA Climatologist Tom DiLiberto that help kids make sense of wild weather and introduce the science of climate change: <https://oceantoday.noaa.gov/climate-alive-wild/welcome.html>

Maine climate ed bill being considered now: <https://legislature.maine.gov/bills/getPDF.asp?paper=HP1409&item=1&snum=130>

A FrameWorks report: Expanding Our Repertoire: Why and How to Get Collective Climate Solutions in the Frame: <https://www.frameworksinstitute.org/publication/expanding-our-repertoire-why-and-how-to-get-collective-climate-solutions-in-the-frame/>

Sesame Workshop in India community level campaigns with children: <https://indianexpress.com/article/parenting/events-things-to-do/sesame-workshop-india-rolls-out-mera-planet-mera-ghar-initiative-to-help-kids-voice-climate-concerns-7490655/>

“Evaluating sources of scientific evidence and claims in the post-truth era may require reappraising plausibility judgments”:
https://www.tandfonline.com/doi/full/10.1080/00461520.2020.1730181?casa_token=tA-Efbj_no4AAAAA%3A1cdeICqBjff0x3G00-T5bkOe2q5DEfMk5QGj3ytskczmfX5MDZmNguJmHYuUv0Rm-B0iW9EWjXw0A

Understanding Science: online resources about the process of science published by Berkeley: <https://undsci.berkeley.edu>

Champions of Coastal Resilience: A professional development program in Hawai'i that helps teachers engage their students in storytelling/film editing to discuss climate change related impacts to their community shorelines. Using multiple lenses - personal, family, cultural, and overlaying with NOAA data visualization tools like sea level rise viewer. Funded in part by NOAA B-WET program: <https://www.learningendeavors.org/programs>

Full Option Science System (FOSS) course for children “Observing Nature”:
<https://www.fossweb.com/module-summary?dDocName=G6130546>

Elmo’s teaching basic concept of air: <https://fb.watch/b6jYC1cyEY/>

NPR survey: Most Teachers Don’t Teach Climate Change, 4 Out of 5 Parents Wish They Would: <https://www.npr.org/2019/04/22/714262267/most-teachers-dont-teach-climate-change-4-in-5-parents-wish-they-did>

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Video about NCSE Teacher Ambassador Melissa Lau: <https://www.youtube.com/watch?v=h-mPa0LT-oQ>

Climate anxiety article in the New York Times: <https://www.nytimes.com/2022/02/06/health/climate-anxiety-therapy.html>

A survey conducted in the largest school district in the US - NYC - showed that teachers want to teach about climate change but they don't have the proper training, time, resources and support:

<https://static1.squarespace.com/static/6001a539f8f42f6c20a08362/t/61d7371b336fc71c4a409186/1641494299699/CRETf+ClimEd+Survey+2021.pdf>

National Geographic project on citizen science species counting:

<https://www.nationalgeographic.org/projects/bioblitz/>

Boston area citizen science bioblitz planned for the spring:

<https://www.zoonewengland.org/protect/here-in-new-england/boston-area-city-nature-challenge/>

A study on the children's science podcast Brains On! with recommendations for media producers about how to address challenging and scary topics with children:

<https://www.brainson.org/story/2020/10/13/brains-on-coronavirus-research>

Earthinators: a youth-led whole-of-nation movement to get every Indians on board; getting everyone motivated to help transform India into a glowing global city of sustainability.

<https://sites.google.com/view/earthinators>,
<https://www.linkedin.com/company/earthinators>, <https://twitter.com/earthinators>,
<https://www.facebook.com/earthinators>, <https://www.instagram.com/earthinators>,
<https://www.youtube.com/channel/UCAYeL82hCc775o0JW3XBruQ>

Inclusive science communication: Creating compelling stories together

Panelist Resources

From Rese Cloyd: Here are the stories that we developed for How We Respond

<https://howwerespond.aas.org/communities/>

From Rese Cloyd: I wrote a short thread that points to several of the stories and resources we developed as a part of the How We Respond program

<https://twitter.com/EngageClimate/status/1492173456301080579>

From Sunshine Menezes: Highly recommend the Doug Medin & Megan Bang paper, the culture of science communication (<https://doi.org/10.1073/pnas.1317510111>) for more thoughts on this, and especially how we represent the natural world

Other Resources

An inclusive science communication starter kit created by the Metcalf Institute and collaborators:

<https://metcalfinstitute.org/metcalf-releases-inclusive-scicomm-starter-kit/>

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A report from AAAS: “How We Respond: Communities and scientists taking action on climate change”:
<https://howwerespond.aaas.org/>

“Local Climate Experts: The Influence of Local TV Weather Information on Climate Change Perceptions”
(2016): <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4638344/>

Article from Yale Climate Connections “How to talk with kids about climate change”:
<https://yaleclimateconnections.org/2020/08/how-to-talk-with-kids-about-climate-change/>

Climate Central Media Library, an independent organization of leading scientists and journalists
researching and reporting the facts about our changing climate and its impact on the public:
<https://medialibrary.climatecentral.org>

“Weather Girls” on the Big Screen: Stereotypes, Sex Appeal, and Science” (2014):
<https://journals.ametsoc.org/view/journals/bams/95/3/bams-d-12-00079.1.xml>

A survey conducted at Sesame Workshop India with 6-10-year-olds: <https://fb.watch/b6jYC1cyEY/>

Article about kids teach parents about climate change - by learning about climate change in class,
interviewing their own families, and hosting community meetings:
<https://yaleclimateconnections.org/2018/08/kids-teach-parents-about-climate-change/>

A series of webinars on preserving and applying traditional knowledge: <http://indigenouseducation.org>

Article on indigenous knowledge by Robin Wall Kimmerer:
<https://emergencemagazine.org/feature/corn-tastes-better/>

From Kathryn Lanouette: <https://www.whitehouse.gov/wp-content/uploads/2021/11/111521-OSTP-CEQ-ITEK-Memo.pdf>

Native Skywalkers, a website about indigenous astronomy: <https://www.nativeskywatchers.com/>

Native Earth, Native Skies - NASA-funded award to Oklahoma State University to increase understanding
and interest in STEM by middle school students in the Cherokee, Choctaw and Chickasaw Nations by
developing holistic curriculum that interweaves Native American stories and language with STEM
principles: <https://education.okstate.edu/research/centers/native-earth-native-sky/>

North American Association for Environmental Learning early learning resources: <https://naaee.org/our-partners/nonprofits/children-and-nature-network>

Podcast episode on climate change and women of color: <https://t.co/tjiF7MyTn2>,
<https://twitter.com/ourbodypolitic/status/1483518470272831488?s=27>

Global Learning and Observations to Benefit the Environment (GLOBE), an earth systems measurement
partnership between NASA, NSF and NOAA: <https://www.globe.gov/>

GLOBE citizen science measurement app, including a clouds and climate challenge and a toolkit for
informal educators and activities for families: <https://observer.globe.gov>,
<https://observer.globe.gov/toolkit>, <https://observer.globe.gov/do-globe-observer/do-more/family-science>

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A multimedia library aimed at students and teachers: <https://myhero.com/explore>

Sharing the science: What do kids need to know? What do producers need to know?

Panelist Resources

From Sunshine Menezes: Related to inclusive science communication, generally, check out the resources we've collected at this link, and don't miss the "Inclusive SciComm Resources" via the blue button on that page. It leads to a crowdsourced Google doc with TONS of additional resources. <https://inclusivesciomm.org/resources/>

From Laura Schifter: Sharing a blog by a student in KY about engaging students in climate change through art: <https://www.k12climateaction.org/blog/artistic-engagement-in-schools-prepares-students-for-climate-action>

Other Resources:

A children's media program about the environment from Argentina:
<https://www.youtube.com/watch?v=SNR97-o-NOI>

A PBSKids TV show "Elinor Wonders Why" game on exploring nature sights and sounds:
<https://pbskids.org/elinor/games/elinor-nature-sights-and-sounds>

A PBSKids SciGirls citizen science themed game: <https://pbskids.org/scigirls/games/creature-features>

The Understanding Global Change Project emphasizes systems thinking in Social-Studies and History curricula: <https://ugc.berkeley.edu/>

A Super Bowl ad about the environment: <https://www.youtube.com/watch?v=t1p251KCz6k>

The 2009 USGCRP Climate Literacy: The Essential Principles of Climate Science is an interagency guide that provides a framework and essential principles for formal and informal education about climate change: <https://www.globalchange.gov/browse/educators>

A systems modeling tool to allow students to express their ideas about systems and construct a computational simulation of their ideas without needing to write code:
<https://sagemodeler.concord.org>

A National Network for Ocean and Climate Change Interpretation guide on Framing with Explanatory Metaphors:
https://climateinterpreter.org/sites/default/files/resources/framing_with_explanatory_metaphors_handout.pdf

Growing Up Boulder, a city resource for children in Boulder, CO: <https://www.growingupboulder.org/>

CLIMATE ALIVE!: a NOAA's Ocean Today Program featuring NOAA Climatologist Tom DiLiberto that help kids make sense of wild weather and introduce the science of climate change -
<https://oceanoday.noaa.gov/climate-alive-wild/welcome.html>

NASA resource for kids: <https://climatekids.nasa.gov/>

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Cornell geothermal project: <https://deepgeothermalheat.engineering.cornell.edu/>

An article on low-carbon electricity in Ithaca, NY: <https://www.washingtonpost.com/climate-solutions/2021/11/03/ithaca-new-york-decarbonize-electrify/>

An article by Anya Kamenetz on the importance of play:

<https://www.npr.org/2022/02/10/1079406041/researcher-says-rethink-prek-preschool-prekindergarten>

Science education resources from Full-Option Science System at Berkeley: Everyday Outside Challenge (K-5) <https://www.fossweb.com/delegate/ssi-wdf-ucm->

[webContent?dDocName=G6128883](https://www.fossweb.com/delegate/ssi-wdf-ucm-webContent?dDocName=G6128883), Creating a sit spot project (middle school)
<https://www.fossweb.com/delegate/ssi-wdf-ucm-webContent?dDocName=G6687565>

A standard framework on anti-bias education: <https://www.learningforjustice.org/frameworks/social-justice-standards>

National Girls Collaborative Project, a hub for STEAM resources: <https://ngcproject.org>

A podcast on food and climate: <https://soundcloud.com/user-337207863>

PBSKids Cyberchase Green It Up: <https://www.wnet.org/education/greenitup>

What works? Successful science-media collaborations

Panelist Resources

From Anya Kamenetz: Wow in the world: a podcast for 5-11 year olds:

<https://tinkercast.com/shows/wow-in-the-world/>

From Michael Levine, Noggin/Nickelodeon: FrameWorks has a slew of materials on framing successful communications work: www.frameworks.org

From Michael Levine, Noggin/Nickelodeon: NASA and Noggin have a partnership that will results in two new games later this year—one featuring a rocket scientist.

From Michael Levine, Noggin/Nickelodeon: To see an exchange between 5-7 year olds and the astronauts in the ISS see this link: https://www.nasa.gov/stem-ed-resources/lift-off-to-the-international-space-station-with-noggin.html?utm_source=stemexpress&utm_medium=email&utm_campaign=stemjune102021

From Marc Etkind: A NASA graphic novel: <https://www.nasa.gov/specials/calliefirst/>

Other Resources

NASA Science Mission directorate: <https://science.nasa.gov>

Shifted Space, a transmedia project about space junk: <https://www.shiftedspace.org/>

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Wow in the World: a science and technology podcast for children: <https://tinkercast.com/shows/wow-in-the-world/>

The Geena Davis Institute on Gender in the Media: <https://seejane.org>

An NSF funded collaboration with Latinx families, Univision, and Literacy Partners to develop a five-episode telenovela that will share activities families can use to spark children's interest in science. <https://www.edc.org/edc-use-themed-telenovela-enhance-informal-science-learning-latinx-families>

A Minecraft map about deforestation: <https://www.minecraft.net/en-us/article/free-climate-futures-map>

A National Academies program to connect scientists with media: <http://scienceandentertainmentexchange.org/>

The Arctic Climate Game Jam: <https://climategamejam.org/>

A collection, based on the PBSKids show Molly of Denali, of videos, digital games, lessons, teaching tips, and activities that educators can utilize in the classroom: <https://pbslearningmedia.org/collection/molly-of-denali/>

Learning with Media, One Adventure at a PBS KIDS program Molly of Denali teaches children about informational text. Two new studies show that it works: <https://edc.org/learning-media-one-adventure-time>

Classroom resources from PBS: <https://pbslearningmedia.org/collection/universe/home/>

An article from the Sierra Club about using the show Molly of Denali to teach children about climate change: <https://www.sierraclub.org/sierra/2021-6-winter/critic-s-notebook/children-s-programming-needs-tackle-climate-change>

Resources on climate from PBS: <https://pbslearningmedia.org/collection/universe/topic/weather-climate/>

A series of reports on child-parent engagement about Covid-19 research: <https://www.brainson.org/story/2020/10/13/brains-on-coronavirus-research>

Research tied to the CPB-PBS Ready to Learn initiative, including Elinor Wonders Why: <https://ny.pbslearningmedia.org/resource/go-and-explore-pilot-study/elinor-wonders-why-rtl-2015-2020-initiative/>

The Norman Lear Center, which conducts impact studies of media and entertainment: <https://www.mediaimpactproject.org/>

#AntarcticLog comics: <https://blogs.agu.org/sciencecommunication/2021/10/08/antarcticlog-kids-are-our-climate-future/>

NASA resources on climate: <https://climate.nasa.gov>

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The 2015-2020 CPB-PBS Ready To Learn Initiative:

<https://why.pbslearningmedia.org/collection/rtl2015/>

Taking action

Panelist Resources

From Carrie McDougall: NOAA's education resources supporting climate resilience:

<https://www.noaa.gov/office-education/elp/resilience-hub>

From Jean-Claude Brizard: "Climate Change Enters The Therapy Room":

<https://www.nytimes.com/2022/02/06/health/climate-anxiety-therapy.html?referringSource=articleShare>

From Jean-Claude Brizard: Bandura, A., & Cherry, L. (2020). Enlisting the power of youth for climate change. *American Psychologist*, 75(7), 945–951. <https://doi.org/10.1037/amp0000512>

From Jean-Claude Brizard: White House Fact Sheet: Lifting America's Game in Climate Education, Literacy, and Training:

<https://obamawhitehouse.archives.gov/sites/default/files/microsites/ostp/climateed-dec-3-2014.pdf>

From John Fraser [Knology]: These kids are taking on the "system" to eliminate plastics through policy change <http://www.cafeteriaculture.org/about.html>

From Marisa Nightingale: Check out East Los High on Hulu - innovative transmedia and storytelling that made a positive impact.

Other Resources

Digital Promise: <https://digitalpromise.org/>

Capita work on climate and early adulthood: <https://www.capita.org/climatechange>

The Tri-Agency Climate Education (TrACE) Collaboration: <https://cleanet.org/trace/index.html>

Children, clean air, and potable water in India:

https://www.instagram.com/p/CZZUFk0hrev/?utm_source=ig_web_copy_link

A Scientific American article about children and climate change:

<https://www.scientificamerican.com/article/children-change-their-parents-minds-about-climate-change/>

Community actions to combat climate change in India:

<https://timesofindia.indiatimes.com/blogs/voices/community-actions-to-combat-climate-change/>

Young Voices for the Planet: <https://www.youngvoicesfortheplanet.com/>

Climate solutions videos from the Cayuga Nature Center:

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Inventing Tomorrow, a documentary on children and climate. Includes classroom activities:

<https://www.inventingtomorrowmovie.com/>

Global Warming's Six Americas: <https://climatecommunication.yale.edu/about/projects/global-warmings-six-americas/>

Article about Sesame Workshop India work on climate:

<https://indianexpress.com/article/parenting/events-things-to-do/sesame-workshop-india-rolls-out-mera-planet-mera-ghar-initiative-to-help-kids-voice-climate-concerns-7490655/>

Smart By Nature: Schooling For Sustainability: <https://www.ecoliteracy.org/book/smart-nature-schooling-sustainability>

Helping kids understand the value of air:

https://www.instagram.com/p/CWXRXP8IUfD/?utm_source=ig_web_copy_link

The Sustainable Development Goals: <https://www.globalgoals.org/>

NCTE resources for teaching about climate: <http://bit.ly/InterdisciplinaryClimate>

Peer teaching about climate in India:

https://www.instagram.com/p/CZ1hJDHP1Wv/?utm_source=ig_web_copy_link

A NASA community of practice for educators formal and informal: <https://nasacentral.force.com/cop/s/>

A Berkeley resource for ocean literacy: <https://mare.lawrencehallofscience.org/>

A free weekly online NASA newsletter of education opportunities: <https://www.nasa.gov/stem/express>

NOAA Ocean Today video content to promote ocean literacy for middle schoolers:

<https://oceantoday.noaa.gov/>