

### NEWSLETTER OF THE CENTER FOR SCIENCE AND TECHNOLOGY POLICY RESEARCH

The CSTPR blog, Prometheus (http://ciresblogs.colorado.edu/prometheus), was revived in 2016 to feature content from CSTPR core faculty, affiliates, postdocs, and visitors to serve as a resource for science and technology decision makers. This dynamism reflects the new energies and pursuits taking place in and around CSTPR.



Heidi VanGenderen, Chief Sustainability Officer for the University of Colorado Boulder, testifies during the House Select Committee on the Climate Crisis hearing on campus. Photo: Casey A. Cass.

### The Kids Are All Right Adults Are the Climate Change Problem by Max Boykoff

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have been deeply disturbed by the "Greta bashing" going on. My disappointment has been compounded by the fact that the verbal attacks have overwhelmingly emanated from older adults. For those not following her more closely, Greta Thunberg is a 16-year old Swedish activist who began demonstrating outside Swedish parliament to raise the need for urgent action on climate change. Her commitment has sparked the Youth Climate Strikes over the past year.

On Aug. 28, the young climate activist just completed her cross-Atlantic trip by sailboat to New York City. She has arrived for the United Nations General Assembly and Climate Week, punctuated by two widely anticipated Youth Climate Strikes taking place mid- to late-September.

"Kids today" has been a common utterance laced with exasperation and disappointment that many of us have likely heard throughout our lives. Commonly disparaging comments about millennials, Generation Y and Z are that they are lazy, delicate, sensitive, fragile, narcissistic, selfish and entitled. These disparaging comments point to assumptions that adults lead the way in work ethic, resilience, altruism and morality.

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# **OGMIUS EXCHANGE**

On climate change, the opposite has been shown to be true. Evidence abounds.

In June, polling data from the Yale Program on Climate Change Communication and the George Mason University Center for Climate Change Communication showed that younger generations are more likely to view climate change as personally important while they are more willing to take action on climate change than older generations. This is consistent with Gallup polling from last year that found 70% of people ages 18-34 say they worry about climate change, contrasted with 56% of those over age 55.

Moreover, Pew Research Center polling shows that younger conservative voters are confronting climate change in much higher numbers than their conservative elders: Twice as many young Republicans (ages 23-38) than older Republicans (over age 52) say that humans contribute to climate change and effects are being felt now in the United States.

Maybe we can attribute this difference in part to the powerful intoxicant called nostalgia. This often involves a yearning for an idyllic past and romanticized times gone by. But nostalgia is troubling for many reasons. Among them, it looks backward rather than forward. Problematically, nostalgia may also emanate from feelings that "things aren't what they used to be." Well, things aren't what they used to be.

On climate change, National Oceanic and Atmospheric Administration data show that anyone born after December 1984 (currently people up to 34 years old) has not experienced a below average month of global temperatures. Decisions made in the good old days have led us to the present predicament.

I worry that we adults, who got us into this mess, are not doing enough as the kids they have introduced to climate challenges. Adult utterances about "legacies" and "intergenerational" generally ring hollow when the scale of engagement and action pales in comparison to the scale of the ongoing challenge.

With all this in mind, young people have valid reasons for feeling angry, anxious or melancholy about the state of human-environment conditions today. However, many young people are not merely accepting the state of affairs as they are. Many are now creatively expressing visions for different futures. Leaders like Thunberg have been met by other young voices, such as indigenous environmental leader and musician Xiuhtezcatl Martinez, as well as filmmaker Slater Jewell-Kemker, to meet the scale of these climate challenges with commensurate promise and resolve.



Xiuhtezcatl Martinez visits Max Boykoff's Environmental Studies course in 2018.

Through creative communications, younger generations are expressing their ambitions and concerns about climate change more than ever before. Whether by choice or by necessity, many younger people are both talking the talk and walking the walk.

The Youth Climate Strikes and youth presence at the UN and Climate Week next month and beyond may be one sign that young people are pulling on levers of change available to them: voice through creativity and protest.

U.S. comedian Stephen Colbert has joked, "I don't trust young people. They're here to replace us." In reality, though, going forward using informed, decidedly and constructively optimistic approaches are critical.

Communications approaches that empower youth to make change can be effective, as is listening to their perspectives, minimizing their burdensome worries and amplifying their voices as new knowledge brokers in a contemporary communications environment. Trust in this next generation of leaders and trust in progress in creatively communicating about climate change are vital to effectively tackling this 21st century challenge.



The kids are alright, adults must step up.

Max Boykoff boykoff@colorado.edu Director, Center for Science and Technology Policy Research

# **OGMIUS EXCHANGE**

### The Non-Partisan Environmental Group That Will Make You Feel Hopeful About Climate Change by Alison Gilchrist

f there's anything that can make you feel hopeful about the future of climate change, it might be the Citizens' Climate Lobby. Or, more precisely, the people who make up our local chapters of the Citizens' Climate Lobby.

The Citizens'Climate Lobby (CCL) is a grassroots environmental group with chapters all over the world: https://citizensclimatelobby.org. The goal of the organization is to write and support legislation that influences climate policy in specific ways. Chapters also train volunteers to interact directly with their political systems to achieve this goal.

Boulder has two chapters: Boulder CCL and a CU-specific chapter (https://orgsync.com/158400/

chapter). This month, both groups are paying close attention to the international furor created, in part, by climate activist Greta Thunberg. An international climate strike (to be held between September 20th and 27th) is kicking off this Friday, and has already mobilized a much younger crowd than many other political events.

Kelsey Grant is the leader of the CCL chapter at CU Boulder, and will be attending the strike. Her experience from past strikes galvanized her, and she's excited to be participating again.

"You finally realize you're not alone," said Grant. "You realize there are people who are equally committed to getting something done—it makes you feel hopeful."

Grant is especially supportive of the climate strikes as a way to get younger people involved in the political discussion. "If we didn't have youth doing this, we wouldn't be where we are today," she said. "A strike conveys a certain message to your lawmakers: that you want something done."

Grant also attends the strike with some CCL-specific goals in mind: reaching across the political aisle between liberals and conservatives. CCL only supports legislation with bipartisan buy-in, despite many climate-focused groups and movements catering to left-leaning citizens.

"While in theory the strikes are non-partisan, in practice they're actually not. It just naturally attracts more left-leaning individuals," says Grant. "But conservatives want a place in



Citizens' Climate Lobby members lobbying for Joe Neguse. Photo: Dan Palken.

this discussion as well; they take it seriously. They increasingly feel disenfranchised from the larger Republican party."

Grant says that the strike can be an opportunity to build bridges. "For the people going to these strikes, this is a really good opportunity to reach their hands out to conservative peers and say: this is a place for you. We're going to make a place for conservative solutions, and we want your discussion."

But the strike is not the only way that CCL members in Boulder are making themselves useful in the battle for effective climate change policy. Although supportive of the strike, Lindsay Sonderhouse, Boulder CCL chapter member, is missing it.

"I do think strikes are important; they show that there's an incredible amount of people who care about this problem," said Sonderhouse. "But in terms of what I've seen be the most effective, I think that if I went, it would be the least effective that I did this year."

Sonderhouse is a physics graduate student at CU Boulder studying optical atomic clocks. She joined CCL to feel like she was making a palpable difference in the world.

"I felt like I wasn't doing enough outside of my own lab," Sonderhouse said. "Climate change is one of the most important topics to me, and I do feel like our generation needs to solve it."

# **OGMIUS EXCHANGE CONTINUED** The Non-Partisan Environmental Group

She recruited Daniel Palken, a fellow physics graduate student studying dark matter. Palken came into the CCL fold with similar motivations, and agrees that although the strikes are important, there are multiple places where people can have an impact on climate policy.

"Right now, all of these parts of the climate movement don't have enough people in them," said Palken. "We could use more people striking, more people in the halls of congress. But one of those is even more effective—the halls of congress approach."

This, said both Sonderhouse and Palken, is where young people can really make a difference. Sonderhouse spoke to the power of lobbying.

"If you have a younger person there, then the member of congress seems to be really engaged," she said. "They're listening more, they're usually impressed by somebody who's young, who's taking the initiative at such a young age to be involved in politics."

And younger people bring a valuable and powerful perspective to the table: the perspective of those who didn't cause the problem but are trying to solve it anyway.

"Younger people have a different moral standing in the argument," said Palken. "Younger people did not create the problem of climate change. But very ironically, we're the ones who are going to have to deal with it. I think that's why you see that a) young people feel very empowered to act on it, and b) why people will listen."

Palken thinks that although the younger generation has done an excellent job of driving attention to the issue, it's currently the older generation who are left carrying the legislative torch. He urges Friday's strikers to get involved beyond the walk-outs and try to engage with the political system.

"I think if the younger generation would do for climate policy what it's done for climate awareness, we would probably have this problem solved next week," said Palken. "If you got all the young people off the streets, into their congressional offices, respectfully lobbying, in the mode that CCL has worked on developing for ten years now, with all the know-how we have in place, you would have a lot of progress very quickly."

The Citizens' Climate Lobby could be just the group for those strikers and activists who want to make this change. Open to all, deliberately non-partisan, and committed to training volunteers, it feels like an oasis from the highly confrontational political debates that are happening at the moment.

CCL is specifically trying to implement a carbon fee and dividend, a system that imposes a carbon tax on the sale of fossil fuels, and distributes the revenue equally as a regular



Citizens' Climate Lobby members, Dan Palken and Lindsay Sonderhouse, in Washington, DC. Photo: Dan Palken.

payment to individuals. This system would reduce carbon emissions without being a disproportionate burden on lowerincome populations.

Interested in the specifics? Want to lend a hand to the cause regardless? The Boulder chapters of Citizens' Climate Lobby want to meet you. As Kelsey Grant says, the time to get involved is now.

"Young people want our governments to rise to the occasion, and to respond in a way that matches the urgency and magnitude of climate change," said Grant. "I personally would love to see more people engaging within the political system because I think we can be extremely powerful there."

Plus, you know you want an "Ask Me About Carbon Fee & Dividend" t-shirt.



Alison Gilchrist alison.gilchrist@colorado.edu CSTPR Science Writing Intern

# FACULTY AFFILIATE FORUM CU Boulder Professor and 100 Women Set Sail for Antarctica

assandra Brooks has spent much of her life studying and working to preserve Antarctica.

Now, she's sharing her love and knowledge of the southernmost continent with a aroup of 100 intrepid women seeking to become global leaders in environmental sustainability.

Brooks, a University of Colorado Boulder assistant professor of environmental studies, is serving as a faculty member on a three-week Antarctic expedition organized by Homeward Bound Project, a worldwide initiative that began in 2016 to "heighten the influence and impact of women in making decisions that shape our planet," according to the organization.



Cassandra Brooks standing next to a penguin crop while on a Antarctic expedition organized by Homeward Bound Project.

"Their tagline is 'Mother Nature needs her

daughters,' with the idea being that if we actually lift women who work in (science, technology, engineering, math and medicine), we will have a better chance of sustaining the Earth and humanity," said Brooks.

So far, three cohorts of women have successfully participated in Homeward Bound Project's 12-month leadership program and traveled to Antarctica. The participants, who applied to the program from all over the world, are at various stages in their careers in science, technology, engineering, math and medicine (STEMM).

All told, Homeward Bound Project wants 1,000 women to participate in the program and visit Antarctica by 2026.

Brooks is part of the fourth cohort, which has 100 participants and 12 faculty members (Homeward Bound Project says this trip is the largest women-only expedition to Antarctica). She'll spend approximately three weeks with the group, which spent several days in Ushuaia, Argentina, before departing for Antarctica aboard a ship.

During their time at sea, the women are participating in workshops focused on leadership, visibility, strategy and science.

"How do the women become better leaders, become more visible?" said Brooks. "A lot of it will focus on women taking a deep dive and learning about who they are. It's this idea of authenticity and knowing who you are and not trying to lead in the way that someone else might lead, but really knowing your own strengths."

Weather permitting, the group is also exploring the continent

and spend time learning about topics such as Antarctic science bases and penguin colonies.

As a science faculty member on the trip, Brooks is charged with educating the women about the Antarctic environment and helping them prepare mini science presentations about themselves and their work. Other faculty members onboard the ship specialize in leadership, strategy, personal well-being and visibility in STEMM fields.

Brooks, who joined the CU Boulder environmental studies faculty in 2017, has worked on Antarctic science and conservation for the last 15 years in varying roles ranging from marine science to outreach to policy. Along with other scientists and advocates, Brooks and her husband, John Weller, a photographer and filmmaker, helped to protect 598,000 square miles of the Ross Sea off Antarctica, creating the world's largest marine preserve in 2017.

"It's been an essential part of my life for a long time, this profoundly beautiful place," Brooks said of Antarctica.

With her interdisciplinary background, Brooks was drawn to CU Boulder by its multi-faceted environmental studies program after earning her doctorate from Stanford in 2017.

"The department is fantastic, they truly value interdisciplinary work and people who have blended backgrounds and can bring that diverse perspective to the world," she said.

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# FACULTY AFFILIATE FORUM Young Womxn's Voices for Climate Contributes To Boulder's Climate Action Plan by Beth Osnes

f a dove is the symbol of peace, then a butterfly is the symbol of change," declared sixteen-year-old Finny Guy through a megaphone at the Climate Strike on the CU Boulder campus on September 20. As shown in the photo, Ting Lester stood by embodying the beauty of the butterfly, making present her commitment to transformational change needed in our policies and choices to reverse global warming. Finny and Ting are a part of Young Womxn's Voices for Climate (YWVC), a group of ten young womxn from Boulder middle and high schools along with several CU students, including Sarah Fahmy (PhD Theatre), Lianna Nixon (PhD Education), Jeneé LeBlanc (BS Environmental Studies), and Elise Collins (MBA Business). It is brought together by a partnership between Inside the Greenhouse, which resides within CSTPR and is focused on creative climate communication, and SPEAK (http://

Young Womxn's Voices for Climate at a Climate Strike on the CU Boulder campus on September 20, 2019.

speak.world/home-1), an initiative for young womxn's vocal empowerment for civic engagement. Facilitators for YWVC include CU Associate Professor of Theatre & Environmental Studies, Beth Osnes, co-founder of Inside the Greenhouse and SPEAK, and Chelsea Hackett, recent PhD graduate of New York University and co-founder of SPEAK.

These young womxn use creative communication to advocate for policies that support Boulder's efforts to mobilize our community for stabilizing our climate. They were invited to perform for a Boulder City Council meeting by Boulder's senior environmental planners on July 9 to convey their perspective on why the council should approve the request to revise our city's climate action plan. Set to the Lion King's song, "Can You Feel the Love Tonight?" they performed their own version of "Wind Turbines are Beautiful" costumed as wind turbines. YWVC is guided by the work of Project Drawdown (https:// www.drawdown.org) that researched and ordered the impact of the top one hundred climate solutions. The young womxn of YWVC meet weekly at CU to plan and rehearse their actions. On September 26th they were invited by Boulder environmental planners to perform at the Boulder City sponsored Climate Mobilization Action Plan Launch event. With over two hundred people in attendance, they performed their run down of the top five Drawdown solutions. To dramatize Drawdown solution number five, Tropical Forests, they enacted a skit and a song, featuring an old-growth tree and two costumed rolls of recycled toilet paper, to convey how reduction in use of paper products can help preserve tropical forests. Their next project will be on November 20 at Climate Change Theatre Action, at which they will perform two short plays focused on gender and climate change. They will then lead attendees in a creative process of their own expression on various climate-related issues.

Actively involving adolescents while they are still relatively young is important regarding climate-related issues, since research reveals that pessimism about addressing climate change increases with age, particularly from early to late adolescence. Our approach addresses the need to develop appropriate methods for supporting youth in maintaining their feelings of hope for sustained action. Arts-based methods are uniquely well-suited to this need since they give a context for exploring emotions and are rooted in action. In the book Pleasure Activism: The Politics of Feeling Good, author Adrienne Maree Brown introduces something she calls "pleasure activism," a politics of healing and happiness that explodes the dour myth that changing the world is just another form of work. Our approach with YWVC is certainly in line with this sentiment. By taking on this issue with humor, creativity and expression, these young womxn do not make light of the importance of the issue; they bring light to it.



\*Womxn is a term used to intentionally include transgender women and women of color.

Beth Osnes, beth.osnes@colorado.edu CU Boulder Associate Professor of Theatre and Environmental Studies 6

# **FACULTY AFFILIATE FORUM** The Endless Hurricane: Documenting Life in the Shelters, After Maria Hit Dominica by Fernando Briones

hotography has always been an important tool for social scientists. Today, the pictures' value as a data, communication tool and art is more relevant than ever: social media, digital photography and cell phones allow for almost anybody to document their environments. However, the limited use of photography essay in research and academia reminds us of the need to diversify our view about the field work and disaster studies.

In the field and for this purpose, the act of taking pictures is not about mastering a technique, it is about the interaction with the people. It requires participant observation and consensus and freedom of the people to choose what they want to share. This interaction is the most valuable part of a photo essay because it gives "a voice" to the people, transforming the photographer into an intermediary to communicate a certain part of their reality. In other hand, pictures can speak by them self, leaving the viewer the option to connect and interpret connect and interpret the images.

#### The worst disaster in history of Dominica

In September 2017 Category 5 Hurricane Maria struck Dominica before pursue its trajectory to Puerto Rico. The small island (population 74,000) in the eastern Caribbean between Guadeloupe and Martinique was sweep out for the first time by a Category 5 hurricane since records began. The devastation in Dominica was massive, with around 90 percent of houses roofs damaged or destroyed. Also, crops and infrastructure were destroyed, leaving communities isolated due the landslides that blocked roads. For almost a year, around 50 percent of the habitants lived without electricity, according with testimonies of affected people. Eclipsed by the media coverage in Puerto Rico and often confused with the Dominican Republic, the Commonwealth of Dominica its recovering slowly. Almost two years after this extreme hydro-meteorological event, the impact remains noticeable by the number of destroyed houses along the island. Less visible is life in shelters, generally improvised schools without basic services as toilets and in some of them, running water and electricity. For those who do not have the resources to rebuild their homes, to live in shelters is the only choice: the impact in their health and capacity to recovery is jeopardized. For them, the hurricane Maria still is happening now.

#### Approach

In February, 2019 in collaboration with the Office of Disaster Management of Dominica, we did a fieldwork to document with local agencies, stakeholders, local leaders, and the affected people, testimonies and interpretations of their actions to cope and survive during the emergency and the following months. Our idea was to identify some of the spontaneous actions that people developed in their communities after the hurricanes that could be taken as baseline for formal preparedness for disaster risk programs,



A woman takes a break after work by taking care of a neighbor's son, Roseau, Dominica.

based in the notion of Zero Order Responders, that reflect people's creativity for deal with immediate needs through social cohesion and resourcefulness. However, in this case, the affected people are still facing the disaster consequences. When people remains in shelters they not fully recovery, they actually are becoming permanent affected: their chances to remain in poverty are high, feeding the social vulnerability circle. The people in the shelters don't have a house to stay, for them the recovery "window" is getting closed; instead looking for coping mechanisms for recovery, they are dealing with an increase of their poverty conditions.

The purpose of this essay is simply to document and communicate through a visual tool the post disaster context of a specific affected population. Despite the limitations of this exercise, we believe it could trigger a stimulant way to document disaster risk impacts in many other places.



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Fernando Briones, fernando. brionesgamboa@colorado.edu CSTPR Research Affiliate

# **STUDENT HIGHLIGHT** If You Have No Hope, You Can't Act: Patrick Chandler on Bridging Science and Art by Alison Gilchrist

through alfway my interview with Patrick David Chandler, a current Environmental Studies araduate student based at the Center for Science and Technology Policy Research (CSTPR), I told him that it felt like his career trajectory had been a straight line-that each job he has had was a natural progression from the one before it.

"Oh no, definitely not a straight line," Chandler said, laughing. "It's been swirly."

But despite this protest, it seems that Chandler has naturally made a career out



Patrick Chandler during a performance of Inside the Greenhouse's musical, Shine, in 2019.

of caring about the natural world, wanting to educate people about these spaces, and incorporating art into his life.

Immediately after college, Chandler worked as a professional raft guide in Santa Fe, New Mexico. But he quickly became more focused on the educational aspect of the trips he was leading.

"The places where I was finding value, the trips I enjoyed most, were those where I got to engage people about the human and natural history of the area," said Chandler. "So, I transitioned to environmental education."

Chandler moved to Homer, Alaska to work for the Center for Alaskan Coastal Studies and teach intertidal ecology and marine biology. Soon after, he was offered the position of Special Programs Coordinator, which included the role of International Coastal Clean-up Coordinator for the State of Alaska. His job was to provide resources and education for communities that wanted to be involved in research and clean-up of marine debris; he also recorded all of their data in the International Coastal Cleanup database.

"That was incredibly emotionally taxing and intense work," said Chandler, about the position. He explained that Alaska has over 40,000 miles of coastline, which is more than the rest of the United States combined, and very few people. A surface current pattern moves across the Pacific from Asia and another that moves up from the continental United States, so there's a huge amount of plastic pollution and marine debris moving towards Alaska. The result of that ocean current

is striking and horrible: "There were beaches that were a quarter to a half mile long where we'd pick up 10,000 pounds of plastic every year. Clean it completely, come back the next year, clean it again."

Chandler found that he was disappointed by the impact even his best efforts were having: "We weren't really doing much as far as shifting the needle on awareness, on policy, and action. It just was an endless cycle of heartbreak."

Then he discovered Washed Ashore, a project devoted to making community-based art with washed-up debris from beaches. The art made something beautiful out of serious environmental problem, and brought new people into the conversation about marine debris.

"I watched the way that people engaged with the work. It started conversations in a way that no amount of talking and data could possibly do."

Chandler became Education Director for the Washed Ashore Project, and toured the country with some of the sculptures, engaging people from all different backgrounds on the issue. At the same time, he was also talking to educators about the effectiveness of using art to talk about marine debris.

"I kept getting the question: 'can we do this here?"," said Chandler. "No! And you shouldn't do this here, you should get scientists, artists, and educators together in a way that enables your community to give voice to an issue that matters to them."

# **STUDENT HIGHLIGHT** If You Have No Hope, You Can't Act: Patrick Chandler

In other words, marine debris was a specific topic that Washed Ashore was tackling. Chandler is deeply aware that a project that connects scientists, artists, and the community must have community buy-in. Marine debris isn't the issue that will necessarily spur community buy-in from places like Boulder or other cities, especially landlocked cities. Instead, scientists and artists should engage with their communities and ask for feedback on what issues are important to them. The process is iterative: scientists and artists can collaborate to create something that explains a scientific issue, and the community can respond with what worked for them.



Patrick Chandler giving a talk at the Center for Science and Technology Policy Research on September 25, 2019. Photo: Jeremiah Osborne-Gowey.

These ideas are the foundation of some of Chandler's current dissertation work. Chandler won a CU Engage Graduate Fellowship in Community Based Research, and is currently designing a curriculum on climate communication with a team from the Inside the Greenhouse Project, CU Natural History Museum, and Jefferson County Schools for teachers, using the principles he learned with Washed Ashore. His goal is to work with teachers, and use their feedback iteratively, improving the curriculum and piloting it at new schools over the next few years.

"We want to get to a place where teachers can pick it up and use it and it works without us," said Chandler. "If you can't do that, it's pretty pointless for mass distribution."

Chandler also won a fellowship from the Nature, Environment, Science & Technology (NEST) Studio for the Arts, along with David Oonk. Together in partnership with the Inland Ocean Coalition, they are working on a project about microplastics in Rocky Mountain streams that they hope will educate the local community in an engaging way. Chandler is trying to impress upon locals that just because you can't see the plastic pollution in places like Rocky Mountain National Park, doesn't mean it isn't there.

"These pristine places... what is pristine?" he asked. "These beautiful streams and parks in Colorado: they're still touched by our trash. We can't be in a place that's unaffected by our actions."

I asked Chandler what it feels like to work on issues (marine debris, microplastic pollution) that are so large, and that are very obvious signs of negative human influence.

"It makes you feel hopeless," admitted Chandler. "And the only way to move beyond that is to acknowledge and settle into the idea that we're more than just the facts we compile. Through our creativity, through our intuition, through our emotion, we can create. And we will re-create the world in the next one hundred years, inevitably. So, it's up to us if we're going to do that intentionally."

Chandler thinks that this is why the arts are so important.

"I'm not belittling the importance of science: we must have the wit and technology to enable some of the things that we can dream up and create. But if we lose the idea that we can create a new paradigm, that we can shift this polluted sphere we live in to be sustainable—if you don't believe that, you have no hope. And if you have no hope, you can't act."

Chandler has been guided through several jobs by the principles of art, engagement, and education. The result is an impressive series of creative and artistic projects that have brought more people into the conversation surrounding climate and pollution. He may describe his career trajectory as "swirly," but sometimes the best art is a little bit swirly.



Alison Gilchrist alison.gilchrist@colorado.edu CSTPR Science Writing Intern

# **CENTER NEWS**

#### Climate Change Already Damaging Health of World's Children, Threatens Lifelong Impact

Climate change is already damaging the health of the world's children and is set to shape the wellbeing of an entire generation unless the world meets Paris Agreement targets to limit warming to well below 2°C, according to a major new report published in The Lancet: http://www.lancetcountdown.org



"It's important to better understand

the links between climate change and public health," said CIRES fellow Max Boykoff, who contributed to the report with an investigation into media coverage of climate change and public health. "They demonstrate the immediacy of these intersecting challenges—we must approach with careful urgency to alleviate their negative impacts."

The Lancet Countdown on Health and Climate Change is a comprehensive yearly analysis tracking progress across 41 key indicators, demonstrating what action to meet Paris Agreement targets—or business as usual—means for human health. The project is a collaboration between 120 experts from 35 institutions including the World Health Organisation (WHO), World Bank, University College London, Tsinghua University, and the University of Colorado Boulder.

"This year, the accelerating impacts of climate change have become clearer than ever," says Professor Hugh Montgomery, Co-Chair of The Lancet Countdown and Director of the Institute for Human Health and Performance at University College London. "The highest recorded temperatures in Western Europe and wildfires in Siberia, Queensland, and California triggered asthma, respiratory infections and heat stroke. Sea levels are now rising at an ever concerning rate. Our children recognize this Climate Emergency and demand action to protect them. We must listen, and respond."

For the world to meet its UN climate goals and protect the health of the next generation, the energy landscape will have to change drastically, and soon, the report warns. Nothing short of a 7.4% annual cut in fossil CO2 emissions from 2019 to 2050 will limit global warming to the more ambitious goal of 1.5°C.

According to Boykoff, tracing media coverage of these issues helps to put our finger on the pulse of public discussions about their interactions and threats to human-environment wellbeing.

"We find that in newspapers across the world don't tend to report health and climate change as interconnected issues," said Olivia Pearman, a PhD student working with Boykoff and another coauthor on the report. "While coverage of these issues together has been increasing in recent years, this observation speaks to the need for continued, sustained recognition and discussion of the interactions between human health and the environment."

#### **Boulder Visit with Senator Whitehouse**

On Tuesday, October 8 a small group of University, City of Boulder, and local leaders gathered for a productive conversation with visitina Rhode Senator Sheldon Island Whitehouse. During this past Congressional recess, Senator Whitehouse traveled to Colorado and visited us here in Boulder as he was interested in learning more about what we are doing at the University of Colorado,



CSTPR Director, Max Boykoff, with Senator Sheldon Whitehouse.

in the City, and in our part of the Front Range of Colorado. Senator Whitehouse has been working tirelessly over the past several years, working first-hand with scientists, policymakers, and state officials on how to most effectively address climate change.

The Center helped facilitate the gathering with support from the University of Colorado Office of Government Affairs. Colorado was the 18th state that Senator Whitehouse has visited during short Congressional recesses. He has been motivated to pursue these opportunities as they provide him information to take back to Washington D.C. and talk with his colleagues about the threat of climate change happening today in various places.

#### Beth Osnes Named CU Assett Faculty Advisor

CU Boulder's Art and Sciences Support of Education Through Technology (ASSETT) has just announced Beth Osnes as a new faculty advisor. An Associate Professor of Theatre, Beth brings to the position a long history of innovative and unique projects involving students, technology, and



faculty from other disciplines, particularly faculty involved in environmental studies.

Beth has worked with ASSETT on projects designed to help her students express themselves through video and through educational technologies. Most recently, she has served as ASSETT Advisory Board. She is actively involved in our Innovation Incubator as a member of a team that is investigating opportunities to establish a peer-to-peer support environment for faculty and students, and she is excited to help Amanda McAndrew with ASSETT's Faculty Fellows program.

# **CENTER NEWS**

#### Public Discussions on Climate Policies with Colorado State Senators

In the fall of 2019, Colorado State Senators came to the University of Colorado to participate in the first of CSTPR's seminar series "Public Discussion: Policies on Climate and Environment" (co-Hosted with the Benson Center for the Study of Western Civilization). The discussions were recorded and can be viewed on our website: https://sciencepolicy.colorado.edu/news/webinars.

#### October 9: Colorado Senator Ray Scott (R – Grand Junction)



http://cirescolorado.adobeconnect.com/ps7vc8ftwvhu

October 16: Colorado Senator Steve Fenberg (D – Boulder)



http://cirescolorado.adobeconnect.com/pvx7pnpa63ae

November 13: Colorado Senator Kerry Donovan (D – Chaffee)



http://cirescolorado.adobeconnect.com/pvmxd814ntww

# **MULTIMEDIA HIGHLIGHT**

# A Creative Climate Change Curriculum

### **On Board Innovations video**

Patrick Chandler discusses his "Co-produced Creative Climate Change Curriculum". Created by Cal Brackin, master illustrator and founder of *On Board Innovations*.

#### Video [1:27]: https://youtu.be/vtdLu8SFfj8

To view more videos from CSTPR see: https:// sciencepolicy.colorado.edu/news/multimedia



# **CENTER PUBLICATIONS**

#### The Critical Role of Communities of Practice and Peer Learning in Scaling Hydroclimatic Information Adoption

Page, R. and L. Dilling, 2019. *Weather, Climate, and Society*, doi: 10.1175/WCAS-D-18-0130.1, Published September 24.

Abstract: Significant effort has been put into advancing the use and usability of information products to support adaptation to drought and climate variability, particularly for the water supply sector. Evidence and experience show that advancing the usability of information through processes such as coproduction is time consuming for both providers and users of information.



One challenge for boundary organizations and researchers interested in enhancing the usability of their information is how such processes might "scale" to all the potential organizations and individual managers that might possibly be able to benefit from improved climate information. This paper examines information use preferences and practices specifically among managers of small water systems in the Upper Colorado River basin, with an eye toward identifying new opportunities to effectively scale information usability and uptake among all water managers-regardless of location or capacity—in a resource-constrained world. We find that boundary organizations and other usable science efforts would benefit from capitalizing on the communities of practice that bind water managers together. Specifically, strategic engagement with larger, well-respected water systems as early adopters, supporting dissemination of successes and experiences with new information products among a broader community of water managers, and increasing well-respected water systems' capacity to engage directly with rural systems may all serve as useful strategies to promote widespread distribution, access, and adoption of information. Read more: http://sciencepolicy.colorado.edu/ admin/publication files/2019.10.pdf.

#### Now or Never: How Media Coverage of the IPCC Special Report on 1.5C Shaped Climate-Action Deadlines

**Boykoff, M.** and **O. Pearman**, 2019. *One Earth*, doi: 10.1016/j. oneear.2019.10.026, Published November 22.

Abstract: Media coverage of climate change has increased since the Intergovernmental Panel on Climate Change (IPCC) Special Report on 1.5°C, and numerous articles cite 2030 "deadlines" for action. Such messaging can galvanize public engagement, but it might also prompt complex negative responses. As 2030 targets approach, more innovative,



co-produced communication will be critical to engaging inclusive audiences. Read more: http://sciencepolicy. colorado.edu/admin/publication\_files/2019.16.pdf.

#### The 2019 Report of The Lancet Countdown on Health and Climate Change

Watts, N., M. Amann, N. Arnell, S. Ayeb-Karlsson, K. Belesova, **M. Boykoff**, **O. Pearman**, et al., 2019. *The Lancet*, doi: 10.1016/S0140-6736, Published November 13.

Executive Summary: The Lancet Countdown is an international, multidisciplinary collaboration, dedicated to monitoring the evolving health profile of climate change, and providing an independent assessment of the delivery of commitments made by governments worldwide under the Paris Agreement. The 2019 report presents an annual update of



41 indicators across five key domains: climate change impacts, exposures, and vulnerability; adaptation, planning, and resilience for health; mitigation actions and health co-benefits; economics and finance; and public and political engagement. The report represents the findings and consensus of 35 leading academic institutions and UN agencies from every continent. Each year, the methods and data that underpin the Lancet Countdown's indicators are further developed and improved, with updates described at each stage of this report. The collaboration draws on the world-class expertise of climate scientists; ecologists; mathematicians; engineers; energy, food, and transport experts; economists; social and political scientists; public health professionals; and doctors, to generate the quality and diversity of data required. The science of climate change describes a range of possible futures, which are largely dependent on the degree of action or inaction in the face of a warming world. The policies implemented will have farreaching effects in determining these eventualities, with the indicators tracked here monitoring both the present-day effects of climate change, as well as the worldwide response. Read more: http://sciencepolicy.colorado.edu/admin/publication files/2019.15.pdf.

#### Leave 'em Laughing Instead of Crying: Climate Humor Can Break Down Barriers and Find Common Ground

Boykoff, M., 2019. The Conversation, Published September 30.

Excerpt: Climate change is not inherently funny. Typically, the messengers are serious scientists describing how rising greenhouse gas emissions are harming the planet on land and at sea, or assessing what role it played in the latest wildfire or hurricane. Society may have reached a saturation point for such somber, gloomy and threatening science-centered discussions.



This possibility is what inspires my recent work with colleague Beth Osnes to get messages out about climate change through comedy and humor. Read more: https://theconversation.com/ leave-em-laughing-instead-of-crying-climate-humor-canbreak-down-barriers-and-find-common-ground-120704. 12

# **CENTER PUBLICATIONS**

#### The Politics of 'Usable' Knowledge: Examining the Development of Climate Services in Tanzania

Daly, M. and L. Dilling, 2019. *Climatic Change*, doi: 10.1007/ s10584-019-02510-w, Published October 29.

Abstract: The field of climate services has arisen rapidly out of a desire to enable climate science to meet the information needs of society to respond to climate variability and change. In order for knowledge to be "usable" for decisionmaking, in the field of climate adaptation and beyond, it must meet the criteria of credibility, salience, and legitimacy (Cash et al., PNAS 100:8086–8091, 2003).



Deliberate "co-production" of knowledge between "producers" and "users" has the potential to increase usability for decisionmaking and policy in some contexts. While co-production is increasingly advanced as an instrumental approach to facilitate the production of usable climate services, such efforts have paid scant attention to the role of power relations. In this article, we bring together literature on normative approaches to co-production—which treats co-production as an instrumental means to an end—with analytical interpretations of co-production within the field of Science and Technology Studies to examine efforts to develop usable climate services in Tanzania. We show that without reflexive processes that are explicitly attentive to power dynamics, normative coproduction within climate services development can serve to reinforce, rather than overcome, power imbalances among actors. Read more: http://sciencepolicy.colorado.edu/admin/ publication files/2019.17.pdf.

#### The Prevalence and Rationale for Presenting an Opposing Viewpoint in Climate Change Reporting: Findings From a United States National Survey of TV Weathercasters

Timm, K.M., E.W. Maibach, **M. Boykoff**, T.A. Myers, and M.A. Broeckelman-Post, 2019. *Weather, Climate, and Society*, doi: 10.1175/WCAS-D-19-0063.1, Published November 4.

Abstract: The journalistic norm of balance bas been described as the practice of giving equal weight to different sides of a story; false balance is balanced reporting when the weight of evidence strongly favors one side over others—for example, the reality of human-caused climate change. False balance is problematic because it skews public perception of



expert agreement. Through formative interviews and a survey of American weathercasters about climate change reporting, we found that objectivity and balance—topics that have frequently been studied with environmental journalists are also relevant to understanding climate change reporting among weathercasters. Questions about the practice of and reasons for presenting an opposing viewpoint when reporting on climate change were included in a 2017 census survey of weathercasters working in the United States (N=480; response rate=22%). When reporting on climate change, 35% of weathercasters present an opposing viewpoint 'always' or 'most of the time.' Their rationale for reporting opposing viewpoints included the journalistic norms of objectivity and balanced reporting (53%), their perceived uncertainty of climate science (21%), to acknowledge differences of opinion (17%), to maintain credibility (14%), and to strengthen the story (7%). These findings show that climate change reporting from weathercasters sometimes includes opposing viewpoints, and possibly a false balance, but further research is necessary. Moreover, prior research has shown that the climate reporting practices among weathercasters are evolving rapidly and so the problem of false balance reporting may already be self-correcting. Read more: https:// journals.ametsoc.org/doi/abs/10.1175/WCAS-D-19-0063.1.

#### Anthropocene Communications: Cultural Politics and Media Representations of Climate Change

McNatt, M.B., M.K. Goodman and **M.T. Boykoff**, 2019. *The Routledge Companion to Environmental Planning*, S. Davoudi, R. Cowell, I. White, H. Blanco (eds.), Routledge.

Introduction: Over the past years, the number of *Reuters* stories about climate change has declined. This trend has been consistent with trends across other media outlets globally due largely to political economic trends of shrinking newsrooms and fewer specialist reporters covering climate stories with the same frequency as before. In 2010, the *Wall Street Journal* 



and the Christian Science Monitor closed their environmental blogs. Three years later, in January 2013, the New York Times dismantled its environment desk, assigning the reporters and editors to other departments, and discontinued its 'Green blog' two months later. Yet, initially, Reuters had largely bucked those trends, continuing to employ top climate and environment reporters from around the globe, including Deborah Zabarenko (North America), Alister Doyle (Europe) and David Fogerty (Asia) who fed top media organisations with reporting comprised of a steady diet of climate and environment stories. So why this subsequent and precipitous drop in Reuters coverage of climate change? In July 2013, David Fogerty- who left Reuters in late 2012- took to The Baron blog to explain why. He recounted that, after the appointment of editor Paul Ingrassia in 2011, editorial decisions were made to deprioritise climate stories and to shift these specialists to different beats. Fogerty, for example, was moved from the climate beat to instead cover issues around shipping in the Asian region. While climate stories had been already declining upon the appointment of Ingrassia, many argued that his revamping of the Reuters reporting priorities served to accelerate this drop. Read more: http://sciencepolicy. colorado.edu/admin/publication\_files/2019.14.pdf.

# **ABOUT US**

Ogmius is the newsletter of the Center for Science and Technology Policy Research. The Center is within the Cooperative Institute for Research in Environmental Sciences (CIRES) at the University of Colorado Boulder. The mission of CIRES, which was established in 1967, is to act as a national resource for multidisciplinary research and education in the environmental sciences. CIRES is jointly sponsored by the University of Colorado Boulder and the National Oceanic and Atmospheric Administration.

Co-Editors:

Max Boykoff boykoff@colorado.edu

Ami Nacu-Schmidt ami.nacu-schmidt@colorado.edu

Jennifer Katzung jennifer.katzung@colorado.edu



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Center for Science and Technology Policy Research University of Colorado/CIRES 1333 Grandview Avenue, Campus Box 488 Boulder, CO 80309-0488 Ph: 303-735-0451 http://sciencepolicy.colorado.edu

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