

**WHAT IS SUSTAINABLE  
JOURNALISM?**

Integrating the  
Environmental, Social,  
and Economic Challenges  
of Journalism

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# Student Content Production of Climate Communications

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University-aged students are performing stand-up and sketch comedy, building sustainable cities out of Legos, trying their hand at stop-motion animation to depict animal extinction, and choreographing melting glaciers. Why? They are part of an emerging movement of user-generated content-makers communicating current issues relevant to climate change. Though these students may not self-identify as journalists, they are contributing to what could be considered as an expanded and new take on journalism—one in which student/citizens participate in content production on communicating climate change with an eye towards creating a more sustainable future.

These student efforts are encouraged through an initiative called 'Inside the Greenhouse', based at the University of Colorado. This initiative helps students build competence and confidence to re-tell stories of climate change in ways that are resonant and meaningful for target audiences. This may come in the form of translating science into a memorable, personal narrative, or using comedy to add levity and hopefully inspiration to the story of climate change. Our initiative takes shape principally through a two-part course series, along with internships, research endeavors and public events. This contribution reflects on our work so far, and explores the terrain of the student communicator of creative climate communications in the contemporary landscape of many-to-many content producers and consumers of information. In this chapter, we first situate these activities in a contemporary climate communication landscape. Then, we describe the formation and constitution of our initiative, highlight various students and follow their trajectories through Inside the Greenhouse, and ponder how Inside the Greenhouse

helps students take steps toward becoming effective climate communicators in the 21<sup>st</sup> century. Finally, we then consider how student participation in the communication of environmental issues can contribute substantively to collective efforts for sustainable journalism (complementing, contesting, circumventing traditional journalism pursuits).

## INTRODUCTION

Everyday people typically do not engage with or learn about dimensions of climate change by reading peer-reviewed literature or attending lectures. Instead, people make links between formal science and policy and their everyday lives through a range of resonant and relevant media and person-to-person communications and experiences.

Connections between information sharing through media and other communications and citizen attitudes, perspectives, intentions, and behavioral change are far from straightforward. The exposure itself does not determine knowledge or engagement; rather, it shapes their possibilities (Kahan 2014; Boykoff 2011; Carvalho and Burgess 2005). Kahan and colleagues have discussed this as a dual challenge of communicating scientific content as well as attending to associated cultural meanings (Kahan et al. 2011). The ways in which various aspects of climate change are represented—in the news, through interactive and participatory media or by way of discussions with friends—provide critical links between people's perspectives, experiences, and possible actions. These have been dynamic spaces where claims-makers in the public sphere have been changing (e.g. Baum and Groeling 2008; Fahy and Nisbet 2011), and traditional media outlets have faced newfound challenges (Boykoff and Yulsman 2013; Siles and Boczkowski 2012) while new developments in tools—such as through digital and social media—have recalibrated who has a say and how claims circulate (Graham et al. 2013; Cacciatore et al. 2012).

Broad references to communications through media platforms have generally pointed to television, films, books, flyers, newspapers, magazines, radio and internet as pathways for large-scale communication. These processes have typically involved publishers, editors, journalists, professional content producers and members of the communications industry who produce, interpret and communicate texts, images, information and imaginaries. However, over the last few decades, there has been a significant expansion from production through these more traditional ways into new dimensions. Essentially, in tandem with technological advances, there have been strong trends in communications in the public arena from longstanding models of broadcast, or 'one-to-many' (often one-way) communications to more democratized, 'many to many', user-generated, more interactive

webs of peer-to-peer communications (van Dijk 2006; O'Neill and Boykoff 2010). Amidst this shift, there have been strong signals regarding substantive changes in how people access and interact with information, who has access (discussed often as 'the digital divide'), and who are authorized definers of the various dimensions of climate issues. In these contemporary spaces, new platforms for communication often offer new opportunities for more people to become content producers, and therefore have the potential to more readily shape the public agenda.

Various actors have worked to adapt to these changing conditions, and researchers have increasingly sought to make sense of the shifts (e.g. Zhu and Dukes 2015; Horan 2013) as well as their implications (e.g. Jacobson 2012) in various cultural, political, social and environmental contexts (e.g. Adams and Gynnild 2013; Schuurman 2013). While many scholars (vigorously) research and debate the extent to which media representations and portrayals are potentially conduits to attitudinal and behavioral change, there remains a dearth of systematic analyses regarding how creative climate communications elicit varying levels of awareness and engagement. Moreover, Adam Corner from the Climate Outreach and Information Network in the UK has commented, 'There's a real kind of absence of inspiring programming or engagement to go with all this amazing science we're producing' (Sobel Fitts 2014).

As more organizations, institutions and practitioners around the world have increasingly explored creative spaces of climate communications, needs are twofold: more research must be done to examine creative and effective projects and practices on climate change, and more efforts must be made to build capacities and provide feedback to practitioners (in our case, students) and everyday citizen communities to enhance climate awareness and engagement.

When considering communications on climate change, it is critically important to reach beyond mere 'news' reporting on climate change, and also take into account how more creative approaches capably shape perspectives, attitudes, intentions, beliefs and behaviors among the public citizenry around the world.

These expanded considerations help to more comprehensively make sense of ways in which meaning and knowledge are derived from semiotic processes of encoding and decoding. While texts are often privileged as primary means of climate communication, images (Doyle 2007) and participatory and experiential activities (Osnes 2014) have been considered as a powerful way to consider resonant climate challenges (Smith and Joffe 2009). Moreover, extensions into entertainment media and interactive platforms have been increasingly recognized as important facets of making climate change meaningful (Boykoff 2011).

In this context, and to address the gaps as we see them, has sprouted and grown the 'Inside the Greenhouse' project at the University of Colorado in the United States. Below, we explain how our project works to engage in these spaces of sustainable journalism.

Our aim in writing this article is to share our experience and our lessons learned early on in this initiative. We believe that our students' participation in our initiative contributes to sustainability by giving them experience in crafting their own communications, and by helping to combat feelings of alienation when finding their place in these large and daunting issues. Through their participation students gain (1) exposure (2) experience (3) understanding (4) appreciation (5) increased critical skills for assessing and participating in sustainable journalism in the 21st century.

## GOING 'INSIDE THE GREENHOUSE'

Climate change is a massive issue that cuts across numerous disciplines within and outside of academia. Deep currents of ideologies, values, culture, and world-views coarsen through what emerge as differing views on what are priority issues within diagnoses and prognoses of the challenge (Hulme 2009). Our engagement in this arena is through creative storytelling of issues surrounding climate change through video, theatre, dance, and writing in order to help connect wider and new audiences to the deep and pressing need to address climate change. Our focus here is on undergraduate students as emergent communicators and leaders in the new millennium.

Inside the Greenhouse was co-founded and is co-directed by three professors at the University of Colorado (CU). Our transdisciplinary initiative includes Beth Osnes, Theatre, Rebecca Safran, Ecology and Evolutionary Biology, and Max Boykoff, Environmental Studies. Each of us found very different paths to our commitment to this issue and involvement in this initiative. Osnes' work in theatre veers towards applied theatre in which she is committed to using theatre as a tool for primarily women and youth to empower their voices for participation in authoring their own sustainable development especially in regard to energy and climate issues (Osnes 2014). Safran is an evolutionary biologist whose work focuses on the origin and maintenance of biodiversity. In particular, her group works on how adaptation to new climates and environmental contexts shapes patterns of diversification in one of the most widespread vertebrate animals on planet earth: the barn swallow. Boykoff has focused on the 'cultural politics of climate change'. This refers to how the attitudes, intentions, beliefs and behaviors of individuals and groups shape (and are shaped by) the perceived spectrum of possible action in the context of climate change. He has examined how climate science and policy find meaning in people's everyday lives, and how this, in turn, feeds back into science-policy decision-making.

The chosen title of our initiative acknowledges that, to varying degrees, we are all implicated in, part of, and responsible for greenhouse gas emissions into the

atmosphere. Through the development and experimentation with creative modes to communication, we treat this 'greenhouse' as a living laboratory, an intentional place for growing new ideas and evaluating possibilities to confront climate change through a range of mitigation and adaptation strategies. While some people continue to ask 'why don't people just get it?' and 'why can't people make the 'right' decision?', Inside the Greenhouse takes a different approach. Instead we ask 'what are the reasons to be hopeful?', 'how can we ignite interest in new solutions to climate change'? Through direct student engagement and a firm belief in meeting people where they are, we aim to draw upon our students' strengths to consider the complexity of climate change in new ways. Through our classes and events, we seek to provide direct links between the natural and social sciences and arts to communicate, imagine and work toward a more resilient and sustainable future, while also opening a space for students to become meaningful and sustaining content producers. In this project, students are the integral part of all of our efforts, evident in part participatory events featuring student performers.

## Courses

The first course, *Climate Change and Film*, has been taught by Rebecca Safran each fall since 2009. This course serves as an introductory course for students interested in exploring and expanding upon their personal relationship to climate change, and communicating about their views on the issue. By the end of the course, students produce twice weekly journal entries and four short films that display their knowledge of video production and their ability to converse on their perspective on the issue of climate change. They also share their videos within and outside the classroom. The term ends with a film festival that showcases the students' best work. The end-of-term film festival is juried each year by professional scientists, film-makers and journalists who award three top prizes as well as honorable mentions. Prize-winning film-makers are invited to participate in summer internships that enable these students to further expand upon their film and communication skill sets. A goal of this class is to invite each student on a personal journey that provides the opportunity for them to think critically and emotionally about pressing environmental, political, and social issues. By the end of this class, each student must leave with an opinion, one that they have thought about critically, can defend, and can express in front of several audiences, in writing and on film.

In the Film and Climate Change class Safran draws on the tools of storytelling, filmmaking, effective communication, advertising and art in various forms. Each student's personal experience is critical and is something they should learn how to incorporate into their narrative. To achieve this objective, students are asked such questions as: what is the starting point in your journey? What defines your views? What do you want to communicate with others? Who is your target

audience and why? We help define answers to these questions through in-class discussion, bringing in world-class leaders in the science of climate change, as well as in science writing and the performance arts, and one-on-one dialog through weekly journal assignments. One exceptional film featured the personal journey of a student, Clara Boland Pena (see highlight at the end of this chapter) who traveled back to a coal-mining town on the Western slope of Colorado where her father grew up to understand the deep history, connection and dependency on the coal industry. The loss and the dignity of this profession was explored, along with her own understanding of how the use of fossil fuels is impacting our climate. In the final pan of the film as she climbs a sea of coal mounds, her voice-over claims her own place within this legacy. This film took first prize in the end-of-term film festival but more importantly, was a critical inflection point for this student who went on to use film-making in the classroom during her internship with 'Teach for America' as well as shape her own long-term goals to return to this coal-mining town to call it home.

The second course in the two-course sequence is called *Creative Climate Communications*, team-taught by Max Boykoff and Beth Osnes. This course began in 2012. Throughout the semester, students also appraise and extract effective methods and techniques through roundtable co-facilitation discussions of peer reviewed research on climate communication and public engagement. Through these avenues, students delve deep into the issues surrounding climate change, how the media impact how those issues were communicated, and create three original compositions in groups. For example, one group sought to target Latino youth audiences,<sup>1</sup> and produced a 3-minute video entitled *El Verde* featuring a Latino rap artist, self-proclaimed voice for the environment. The composition was complete with original music, edgy lyrics and hilarious antics of the students themselves as his backup chorus.

Once Safran, Boykoff and Osnes joined forces in 2013 to create the initiative Inside the Greenhouse, they began to group these courses as a two-part series in which Safran's course took students through an internal journey of their own views on climate change specifically through film, and Boykoff and Osnes' course challenged students to express their views on climate outward through multi-modal<sup>2</sup> compositions which often included but were not limited to film. For instance, one student group created a sculpture installation in their front yard made of plastic water bottles painted as a large globe and documented passer-by responses and reactions.

As a CU senior Paul Henning took Safran's course and overcame much of his initial skepticism that anything could be done to make a positive difference in the face of the mounting challenges associated with climate change. His final film for the course documented his personal journey as it dramatized him talking with his girlfriend and friends about his disillusionment with humanity's ability

to make a difference. The film follows him going into nature as a replenishing retreat and culminates with him going off to work as a wind energy engineer. In that next semester, Henning took Osnes' course. Of all the students offered, he accepted the opportunity posed by Osnes to travel to Totogalpa, Nicaragua over Spring Break to document a training by Liz Johndrow with the Nicaragua Pueblo Project that uses locally sourced materials to provide hands-on training for women and youth to build affordable, environmental, strong, resilient homes. His week spent in this rural community included rejuvenating forest hikes and swimming in a naturally fed spring. His resulting promotional film *Nicaragua Pueblo Project* has helped Johndrow fund her efforts and won him second prize in our juried final class showing for best films. His friendship with Johndrow and the many local people he met was made evident through his film. About a year after his graduation, he sent along an update that he is now working as a wind turbine engineer. Though we make no claims of having been the sole inspiration for the course his life has taken, it is a remarkable example of life imitating art.

Through both of these courses, student participants worked to deepen their understanding of how issues associated with climate change are/could be communicated creatively, by analyzing previously created expressions from a variety of media and then by creating new artifacts and compositions. The experiences of our students are rich and transformative and have provided the inspiration for outside of classroom extensions to our initiative. Below, we describe the details of, but also the connections between our classes and public events and internship programs. In all, we believe that the connection between personal experience, story-telling, and the science of climate change make for powerful multi-media form of journalism focused squarely on sustainability, social and environmental justice.

## Events

To highlight the multiple ways that people engage with the issue of climate change and to shine a light on the work we are doing with our students, we have brought in a number of successful and high-profile climate communicators as well as those who might not be as well-known but whose stories have tremendous impact. We began our work together in 2013 hosting large-scale live events featuring world renown climate communicators commencing with 'The Art of Chasing Ice' with James Balog who is the subject of the award-winning documentary *Chasing Ice*. This CU event included an interview of Balog by Osnes on his experiences, views and advice around climate communication, and culminated in a spoken-word poem performed by Balog, backed by original music and a slide montage of Balog's photography. We drew from the recent success with *Chasing Ice* to showcase the photographs and the story behind Balog's work: to bring the issue of Climate Change by enabling them to *see* it. In our view, this is sustainable journalism at



its best: the audience was personally challenged to confront the reality of climate change and through their discomfort possibly re-think their attitudes and views.

An obvious connection between our student experiences and climate communication at large was to highlight the work of *New York Times* blogger Andrew Revkin. Like Balog, Revkin spoke to a large audience during which he was able to talk openly about his goals as a climate change communicator through his *New York Times* blog Dot Earth. The day of his event, we hosted an informal lunch meeting between Revkin and graduate students with the Institute of Arctic and Alpine Research at CU, which allowed students to share their work with Revkin, who took copious notes of each of their projects for possible inclusion in his upcoming blog posts.

During fall 2013 we hosted an event featuring two speakers with Climate Wise Women, Constance Okollet of Uganda and Ngozi Onuzo of Nigeria, who used the age-old art of storytelling to convey the human impact on front-line community organizers in regions already suffering the impacts of climate change. Then, in fall 2014 we hosted an event entitled 'Indigenous Women Telling a New Story of Energy' that featured renowned activist, author and economist Winona LaDuke and Nanibah Chacon an activist artist with Honor the Treatise. The audience was treated to free posters by Chacon that served as propaganda campaigns for the various efforts by Honor the Treaties. For both the Balog and the LaDuke events, local youth artists created stunning murals that were featured on the stage as the backdrops for the events. For Revkin's final song, *Liberating Carbon*, local youth performed a live shadow puppet show animating the lyrics.

In 2015 we partnered with Casey Middle School to host an event featuring William Kamkwamba, who co-authored a book called *The Boy Who Harnessed the Wind* (with Bryan Mealer). This was the true story of Malawian-born Kamkwamba and his dream of building a windmill to provide electricity and running water for his village. Before his public presentation, we filmed six middle school students interviewing Kamkwamba (available for viewing on our website). Also in 2015, we interviewed former Irish president Mary Robinson, who is the founder of the Mary Robinson Foundation-Climate Justice.

As we have gained more experience with this initiative, we have realized that our goal is for our students to be positioned front-and-center. Although a few students assisted with the planning and documentation of these large events and many attended them, these high-profile events drained a lot of our resources in terms of time, energy and funding. Our more recent events have taken a turn towards being more participatory in nature and are less about featuring already established names in climate communication. As an example of this, and as an example of the melding of coursework with events while placing student involvement at the center of project activities, in March 2016 student from the spring course assembled and held an event called *Standing Up for Climate: An Experiment*

with *Creative Climate Comedy*. This featured student-created comedy sketches, and stand-up comedy acts. The event transpired in the spirit of finding ways to connect with different audiences to make climate change more relevant and meaningful through humor. In addition to the student performances, the winners of the first ‘Inside the Greenhouse comedy and climate change short video competition’ were announced and their videos were shown, and additional ‘talent’ from across CU-Boulder took part in the event.

The event was not without its challenges. Early in the process, a number of students voiced concern that the remit of mixing climate and comedy was like mixing oil and water, where it was very difficult to make something so serious also funny. Moreover, embarking on comedy mixed with climate change, everyone involved in the production recognized the risks of trivializing a critically important issue. Everyone also carefully considered the elements of audience and context. Through the process—and products in the show—audience feedback through survey data, the general atmosphere on the night and further feedback from the students after the event all indicated that the experiment was seen to largely be a success.

Students in the course, who put together and then performed in the event, later reflected that the challenging process ultimately proved worthwhile. One student commented, ‘it helped me not only become a better climate communicator, but also built my confidence in the academic and social realms’. Another recounted, ‘Never in my whole life have I been so nervous and stressed out for a school project ... and yet, I’ve never walked away from a presentation or in a class event feeling as proud of myself as I did [that] night ...’.



Photo 6.1: Students performing at the ‘Stand up for Climate: An Experiment with Creative Climate Comedy’ event at the Black Box theater at the University of Colorado in 2016.

## Internships

A big part of the Inside the Greenhouse mission is to provide students with skill sets that can be leveraged to bring attention to incredible climate communication efforts within and beyond the CU community. Safran began offering summer internship opportunities for students of her course even before the creation of Inside the Greenhouse. Each summer since 2009, students have been partnered with climate scientists or local non-profit agencies to expand upon their creative climate communications skill set. For example, in 2009 our first-place film winner traveled to Australia to document a project working on the role of habitat fragmentation and biodiversity. In 2010, students traveled with and documented researchers working in the role of wildfires in climate change. More recently, students have worked on film projects related to habitat loss, climate change and amphibian decline. Beginning in the summer of 2015 Inside the Greenhouse offered four internships to students from the previous fall and spring classes. Sara Berkowitz and Angela Earp were students in the Film and Climate Change class in Fall 2014. Both were Ecology and Evolutionary Biology majors at the University of Colorado. They traveled to Albuquerque, New Mexico to document the work of a Native American muralist, Nanibah Chacon. (Chacon was part of the Inside the Greenhouse fall 2014 event; along with Winona LaDuke, 'Indigenous Women telling a new story about energy and climate'). Berkowitz and Earp documented the installation of a mural by Chacon's from start to finish that filled the side of an old building in Albuquerque that houses a traditional herbalist healer, Maclovia Sanchez de Zamora. Safran served as an active mentor, requiring them to prepare storyboards and shot lists before embarking on their journey in keeping with the old adage that you can only improvise if you are truly prepared. Their work led to the creation of two short films. The first film, *Neglected Beauty*, documents Chacon's vision for her work. The second film, *Tribute to a Traditional Healer: Maclovia Sanchez de Zamora* focuses on the subject of the mural itself: an herbalist and healer whose portrait was painted on the mural. They also created a short time-lapse video of the mural being created, entitled *A Tribute to Bavelas*.

The depth of impact of this internship experience can be effectively understood by reading portions of the blog posts by Berkowitz and Earp that chronicle their journey, artistic process, and their experience of climate and landscape that permeated it all.

Blogpost excerpt from Angela Earp, Monday July 27th, 2015,

On Monday morning, after much anticipation, we were finally able to meet the subjects of our two upcoming films. Nanibah (Nani) Chacon, a Navajo and Chicana artist, will be painting a mural on the side of a local drug store. The mural will be a portrait of another amazing woman, the subject of our other film, Maclovia Zamora, who has been prescribing herbal medicine inside this building since 1981.

We spend some time getting to know Nani, discussing her art, the film, the mural, etc. Around 9:45 a.m. a car pulls into the parking lot, and out comes Maclovia Zamora, her husband Eloy, and daughter Beatrice ... mulling over the narrative for our film, I knew it must capture the authenticity of a store like Maclovia's. How is it that herbalism and naturopathic medicine, which have been practiced by many ancient and indigenous people for thousands of years, have now become what some in modern society would consider 'trendy' or 'alternative' medicine, and allowed to be gradually taken over by big business instead of resting easy in the hands of local herbalists like Maclovia?

Blogpost excerpt from Sara Berkowitz Thursday July 30, 2015

Nani summed up a lot for Angela and me at dinner last night. She said, 'With Climate Change, we have two options: we can stop what's going on (which no one seems to be doing), or we can adapt.' Maclovia is a beautiful example of adaptation and resilience. She gathers her herbs wherever life has taken her. While her husband has been through two wars, she's raised six amazing children. She's moved to many places around the United States as an air force wife, and she's found beauty and health in every place she encounters. Maclovia's work is at risk of adaptation.

If drought dries up New Mexican land, it will become difficult for Maclovia to harvest her herbs. The more we alter the landscape and climate, the more we will alter Maclovia. Her business relies on the ability to grow and harvest plants in a certain environment. Taking away that privilege would take away years of knowledge that Maclovia has acquired. When it comes to climate change, there's more at stake than land and weather: people's knowledge and essence are at stake as well.

To understand even further, not only is Maclovia's livelihood at stake, but also the art of herbalism ... As Nani puts it, 'as we take away parts of nature and our landscape, we are taking away parts of humanity.' I think this applies to Maclovia's story as well as most people's stories. There are many places in this world that I would describe as part of who I am, and the nature of the landscape is important to these places. For example, my family has created countless memories spending my childhood winters in Aspen, Colorado. I can't imagine living without visiting the snow-capped mountains every year. In addition, my family has also spent our summers down the Jersey Shore. If sea level rises, who knows what could happen to the thin strips of land along the coastline. These places are threatened by climate change. While cities and communities can adapt, those that lie on the shores of the ocean may never be the same. When these places go, so will parts of my soul.

Blog post by Angela Earp Saturday August 1, 2015

Being able to meet and spend time with Maclovia and Nani has been an invaluable experience, and an opportunity I am extremely grateful for. This internship as a whole allowed me to further explore my creative side, while allowing me to gain important perspectives on understanding the real value of our landscape, and what is really at stake from losing it. I hope that the films we made about Nani and Maclovia communicate these points to a broader audience, and inspire people to ask questions about how landscape changes in their regions are affecting them, and how they can get involved in their community to protect it.



Photo 6.2: Sara Berkowitz, Maclovia Zamora and Angela Earp (left to right) in Albuquerque, New Mexico.

Another Inside the Greenhouse internship focused on the development of a live theatrical experience. In 2015 several Inside the Greenhouse students joined forces with Boulder youth, National Center for Atmospheric Research scientists, and Osnes to rehearse and perform a new musical by Osnes, then named *Sol-Her Energ-He*, now named *Shine*, that prepares youth to author original solutions for local climate, energy and resilience issues. This performance became the first touring show that is partnering with the Rockefeller Foundation's 100 Resilient Cities Initiative to engage youth voices through performance in authoring their city's plan for resilience in the face of climate challenges. Thus far it has been performed by local youth in Boulder, New York City, London, New Orleans, and Malope South Africa. CU student and Inside the Greenhouse intern Conner Callahan contributed significantly to the development of this project. Conner first traveled with a pilot version of the performance *Sol-Her Energ-He* to the Navajo Nation over Spring Break in the Spring of 2015 while a part of the Creative Climate Communication course. When the revised version of the show was being mounted at the National Center for Atmospheric Research in June of 2015, Conner became an Inside the Greenhouse intern and created a video recording of the process and the performance at NCAR and at the Conference on Communication and the Environment that occurred at CU Boulder. What is unique about Conner's process in creating a recording of this event is that he was also very much a

participant and performer in the piece, which granted him an embodied experience with the material. He also influenced the development of the piece through the collaborative process. Throughout he was a positive role model for the youth performers involved in the process. He deepened our discussion of the environmental issues that are the focus of the show and contributed his ideas and energy throughout the entire process. In Callahan's blog post he described the impact of these experiences on his life.

Blog post excerpt from Conner Callahan March 1, 2016

I told Beth that I would like to join her on the Tuba City Spring Break trip and help her with what she was doing. At Tuba City High School, word had spread around the school and everyone wanted to have their class join in our rehearsals. We had upwards of 7 classes involved in authoring the show or related activities. During the last rehearsal we asked the teachers to get involved, and once that happened their students saw expected roles being broken and were much more likely to give it their all. The oldest licensed Zumba teacher in Arizona (who also was a teacher) joined in our dance choreography and students' jaws dropped (mine too).

My role was to help with the production but also film and photograph media that was created by the youth in Tuba City. This would be used to support Beth's work to provide evidence showing how effective our method of communication was. We performed *Sol-Her Energ-He* our youth-led musical in front of the school, many family members and local community advocates ... I took many lessons away from the trip; the absolute need for more individuals to get out and see the world, use those experiences to help in your local community, and connect with others that share a similar mindset to propagate success. I learned the very important skill of looking to the future, an indispensable lesson, after playing a road-trip game on the trip to Tuba City. We explored the idea of what we would be doing 10 years in the future to the minute. I had never thought so In-depth about what I wanted it all to look like but that jumpstarted my desire to actively make decisions to be happy and help others to the best of my ability.



Photo 6.3: An Inside the Greenhouse performance on Navajo Nation in summer 2015.

The recordings Callahan created share this work beyond the live experience.



Photo 6.4: Inside the Greenhouse intern Conner Callahan performing (front, center) in the Inside the Greenhouse musical, Shine, at the Sustainability, Energy and Environment Complex at CU in October 2015.

### Individual Student Highlight

Clara Pena was a student in Safran's Film and Climate Change class in 2011. Clara enrolled in the class on a whim, with an interest in climate change and filmmaking, though she had no prior experience in videography. In her final film for the class, "Shades of Grey," Clara revisited a personal story by creating a short film on the pros and cons of coal mining in rural Western Colorado, a place where her father grew up. Her film "Shades of Grey" took first place in the class film festival and was viewed at the Paonia Film Festival in 2012. Clara's shorter version of the film, titled "The Day the Whistle Went Off" focused on the tragic deaths of five miners in a coal mine collapse, and was selected for the Aspen Shortsfest in 2012.

While a student in the class and later as Safran's teaching assistant, Clara became engaged with two of many guest lecturers Marda Kirn, Founder of EcoArts Communications and Ryan Vachon, a University of Colorado researcher and ended up working closely with each of them on creative climate communication projects. Among many collaborative projects during two internships, Clara

worked with Marda Kirn on an exhibit created by Los Angeles artist Kim Abeles. She helped Ryan Vachon co-produce several episodes of a pilot TV series on science communication.

Since graduating from the University of Colorado with honor's in Ecology and Evolutionary Biology, Clara has pursued her joint interests in filmmaking and ecology. She has created videos on varied topics, and for various groups including a video titled "A Letter to the BLM" in opposition of oil and gas development in Colorado's North Fork Valley, which was aired at the General Land Office Symposium in 2012. As a 'Teach for America' volunteer, Clara taught eighth grade science in Kirtland, New Mexico. In a classroom setting, Clara put her Film and Climate Change skills to good use. She worked with her students to prepare videos addressing alternative energy sources, which resulted in Clara's selection by the PBS Learning Media Digital Innovators Program as one of 30 PBS Lead Digital Innovators in the nation. Today, Clara says she is 'living the dream'. She resides in Paonia, the small town in Colorado that was the focus of her first film project. In Paonia, she is working to reestablish the family's apple orchard and works for an environmental consulting firm.

## CONCLUSION

Through our Inside the Greenhouse project at the University of Colorado, we are building capacities among students—going on to careers in fields often relating to the environment and sustainability—to become competent and confident communicators of current issues relevant to climate change. This initiative creates cultures of participation and productive collaboration among students, interfacing with the larger community and world in retelling the stories of climate.

Questions surrounding the ways of knowing about and engaging with climate change in the 21<sup>st</sup> century involve considerations of how various perspectives—from climate scientists to business industry interest and environmental non-governmental organization (ENGO) activists—influence what becomes public discussions on climate change. While audiences, perspectives and priorities vary significantly across this public sphere, 'actors' in this theatre are ultimately all members of a collective public citizenry.

Again, students are the integral part of all of our efforts, evident in part by participatory events featuring student performers. Our initiative has placed priorities on supporting students to empower their voices while also working with them to understand what can work, how, when and why, through what channels and focused on which audiences. In so doing, we help students to also combine their power and knowledge as they grab the means of communication production. This can, at times, complement as well as circumvent and contest traditional journalism



practices by re-shaping permissible discourses and by empowering alternative voices to have a say in (un)sustainable futures.

Critical engagement with tools to create change through *Inside the Greenhouse* has been an inspiring and resonant experience for participants, and has been gratifying for us as well. It has helped to overcome what Susanne Moser and Lisa Dilling (2011) have called the 'science-action gap' and what Anthony Leiserowitz has described as a 'hope gap' that often sits between increased awareness of the challenges and real opportunities to take action in the face of understanding, from the individual to the collective levels (Upton 2015).

Clifford Geertz defines culture as 'the ensemble of stories we tell ourselves about ourselves' (Geertz 1973: 448). Similarly, Fred Inglis suggests that identity is formed through a process whereby we observe and 'inhabit the narratives of how to live' available within a given culture (Inglis 2005: 1–2). Through *Inside the Greenhouse*, students are being led through a process of self-introspection (in Safran's class) where they find their place within their own interpretation of the story of climate. What we see among a fair number of our students is that they now inhabit narratives based on the stories they told as 'sustainable journalists.' Although these students were largely already on a trajectory towards a life committed to environmental issues, their experiences in our classes largely expanded their notions of themselves as storytellers of that commitment.

Through our initiative, we are interested in cultivating the principal of active culture that reflects the recognition that people frequently get more out of making art than seeing the fruits of other people's labors (Cohen-Cruz 2005: 99). Here the line between what constitutes artistic expression and journalism becomes unclear. Thus far, we have been satisfied to reside in this new, yet-to-be-determined classification of what we are actually leading our students in generating. Like good journalism, we tirelessly encourage our students to fact-check and critically analyze information (e.g. science) underlying their compositions, while also encouraging them to search for forms of expression that reach beyond mere reporting of those facts. The students in our project gain an allegiance with other communicators of sustainable journalism that renders them both sympathetic, but also more astute consumers. They have an embodied experience of going out into the field to investigate issues, conduct interviews, edit footage, and presenting their work at culminating events at the conclusion of the semester where experts in the field critique their work. Our initiative cultivates experiences for students in which they perceive of themselves as authors of communications on climate and issues of sustainability.

University is a time when many young scholars are forming their identities and making decisions that will likely set them on a given course for possibly their entire lives. They are preparing to enter their culture as adult change-agents, impacting the world around them through their actions and life choices. By having

gone through the process of identifying, researching and expressing a topic for communication while ‘Inside the Greenhouse’, these students become more astute consumers and analysts of media communications as well as mediated messaging.

In terms of dissemination and reach, our students’ work does not have the impact that established news media outlets command. But we are focused on process as much as product and public impact at this stage—we seek to build capacity among the students with whom we work so that they populated a range of professional activities—from businesses to government positions and environmental non-governmental organization activities—with an awareness and capability to effectively<sup>3</sup> communicate about climate and environment issues.

The students highlighted in this chapter and who have taken part in the many dimensions of the Inside the Greenhouse project over the years demonstrate the impact of student content production to shifts in their own lives and on the future of journalism. To have an informed citizenry and mobilize the kind of change necessary to avoid the worse effects of climate change, we need effective communicators of climate change and environmental issues. One result of our approach is that it broadens the base of who identifies as a climate communicator and the range of expression through which this communication finds expression. Our hope is that the work of Inside the Greenhouse can contribute towards an expanded definition of sustainable journalism and towards a sustainable future.

## NOTES

1. This example demonstrates how perceived and intended audiences drive all student compositions in the Inside the Greenhouse Project.
2. A mode is “a system of choices used to communicate meaning. What might count as a mode is an open-ended set, ranging across a number of systems, including but not limited to language, image, color, typography, music, voice, quality, dress, gesture, special resources, perfume, and cuisine” (Page 2009: 6). Therefore, multi-modal draws on many of these systems for communication.
3. We assess effectiveness by drawing on research approaches such as those of Mark Gammon and Beth Osnes studying the impact of brief comic videos to illuminate issues of sustainability and spark positive social change through her online performance site *Striking the Match* (Osnes and Gammon 2013). In so doing, we address a research-practice gap in climate communication (Han and Stenhouse 2014).

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