

## **Changing Climates @ Colorado State University: A "How To" Guide**

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Not long ago a letter appeared in one of our mailboxes at work, and it made both of us smile. It was addressed to:

Climate Change  
Colorado State University  
Fort Collins CO 80523

No name of a person. No department. This might have made sense if we worked in the Department of Atmospheric Science, or in one of the departments or research groups that focus on ecology or natural resources—our large land-grant university has plenty of those. But no, the two of us, who are married, happen to be English professors. We teach creative writing, literature, criticism, essays, stories, and poems.

How did that letter end up in our hands?

We'll begin by telling you that story. Then we'll offer you two sets of tips: first, for doing something like what we've done—building a cross-curriculum climate-change education and outreach program—but at your own college or university; and second, for speakers who are preparing to talk to the public about climate change.

### I

One afternoon in the spring of 2007, we found ourselves sitting at our kitchen table fretting about the state of the world, especially the *natural* world. SueEllen couldn't stop thinking about Elizabeth Kolbert's 2005 *New Yorker* articles and 2006 book *Field Notes from a Catastrophe*. Its well-researched vision of our planet in the grips of human-caused climate change was compelling and terrifying, a *Silent Spring* for our times. John was troubled by NPR and other media stories about the newly-released Intergovernmental Panel on Climate Change (IPCC) report, the work of thousands of scientists, which basically said the same thing as Kolbert did about Planet Earth, *aka* The Only Home We Have.

Obviously, human-caused global warming was happening and was going to get worse before it got better, so civilization and the most influential nations of the world had better come up with something to do about it. Plus the public discussion about climate change was badly misinformed, despite the steadily mounting scientific evidence. The carefully considered opinions of huge scientific organizations, like the American Geophysical Union, were being labeled a hoax. A hoax! And most of our students, if they thought about climate change at all, had no idea what to believe.

We quickly agreed that publishing on the topic in our usual scholarly, literary, and nature-writing venues no longer seemed enough. Ditto for merely assigning new readings to the students in our classes. Climate change demanded substantial action, and we wanted to reach a much larger audience. Every student, in every major, we thought, ought to move into the world with at least some climate literacy.

Within days we'd started planning what turned into an education and outreach program we called Changing Climates @ CSU.

Right away, we decided to work around the institutional edges. So we gathered friends, acquaintances, and folks we'd only heard about for a couple of brainstorming sessions—and left both with more ideas than we could possibly enact. Then we planned a semester-long lecture series, faculty speaking to faculty, sixteen speakers covering topics like how the climate system works, diseases that will spread with warmer temperatures, and potential impacts on farmers in the US and East Africa. We scheduled these talks for late Tuesday afternoons, advertised them only on campus (as “The Climate Change Problem: A Primer for Faculty & Staff”), and drew an overflow crowd for our first event. We moved to a bigger room and eventually averaged about 80 listeners per talk. The next year, we ran a revised series, advertised widely as Thursday-evening public lectures, “Climate Change: What We All Need to Know,” eight speakers on climate science, biological and ecological effects, economics, the literary imagination, effects on people, politics and policy making, and energy solutions. This time our audiences averaged about 250.

Late that first fall, we started getting forwarded emails about a national climate-change teach-in to be held in late January. After some resistance, we gave in and organized two days of talks that year and again the next, featuring some of the same speakers and topics but adding many others: visual art, national security, impacts in the Rocky Mountains, how to talk to skeptics, and so on. A few lectures since have brought our total to nearly 120 talks given by over 110 different speakers—speakers drawn from twenty-eight academic departments and all eight colleges on campus, plus numerous other entities at CSU, in town, in the region and farther away. We've counted well over six thousand heads in our audiences.

How did we pay for all this? We kept things simple, did a lot by ourselves, and manna fell from heaven: people like our dean, the vice president for research, and the university president's assistant offered us money or urged us to apply for funds we didn't know existed, then said yes immediately when we asked. Even more important, many people helped us without charge. Almost all our speakers have donated their work. We paid to have posters printed, but a colleague designed them for free. Modest refreshments and the larger rooms in the student center cost us, but smaller rooms there and even the largest classrooms didn't. The student center and the campus teaching and learning center gave us videotaping. We relied heavily on the university's public relations apparatus—and on word-of-mouth advertising. Our total expenses were so low that virtually any university or college could afford them.

We also found the leaders of a climate research center (CMMAP, the Center for Multiscale Modeling of Atmospheric Processes) that happened to be headquartered on our campus. They wanted to expand their education and outreach activities, and their excellent long-term funding from the National Science Foundation allowed them to adopt us after our first year. They have bought course-release time for each of us—covering the not inconsiderable, though not really monetary, cost of our time and energy. This was one significant bit of luck that not everyone could duplicate. Another was that our campus turned out to be full of faculty and researchers who are actively working on or interested in climate

change. We didn't know this when we began, and you might make similar happy discoveries.

We've stopped running lots of lectures now, partly because other folks on campus have taken on this job. Instead, we've been working more on two other fronts. We've built a climate-change website, 100 Views of Climate Change, with a primary audience of college teachers and their students. We want to make it easy for teachers anywhere to introduce climate-change issues to their classrooms without feeling that they have to spend months and months reading books to catch up. So our topics cross the curriculum, and we work hard to choose and create materials that are accessible and reasonably lively, with college-level content and primer-level clarity. These resources include long and short videos, annotated links to especially well-written and substantial articles and websites, notes about books, and some teaching materials—about climates past, current, and present; natural ecosystems; food and agriculture; impacts on humans; responses from ethics, art, and literature; communication; solutions through policy, energy, business, and daily life; and sources that attempt to bring the big picture into focus. And we've been helping faculty, researchers, and graduate students—especially but not only scientists—communicate more clearly to the general public on this important and difficult issue, running workshops and giving talks on this subject.

## II

Perhaps at this point you're wondering whether you, too, could do something similar—not building a website, necessarily (just use and contribute to ours!), but organizing lectures or some other ways of energizing and expanding well-informed conversations and teaching about climate change in your part of the world.

We think the answer is yes. Here, then, are some suggestions for would-be organizers of a large or small "Changing Climates @ (your school or institution)."

### *It's everybody's business.*

Embrace this unfortunate but also potentially exciting truth: we need everybody's skills and perspectives to deal with global climate change. This problem is so large, so far-reaching, that atmospheric scientists alone cannot solve it. Nor can solar engineers. Nor can chemists who are working on lithium batteries, nor policy folks, nor, God knows, politicians. No single approach, however brilliant and high-powered, is going to be enough. What this means is that many people on your campus will very likely have something to contribute.

Try this: name any department at your university or college that has nothing to say now or in the near future about climate change.

Sociology? How about the way people cope with disasters such as rising seas and more severe storms? Military Science? The U.S. military has been worrying for some time about the fact that there are now more environmental refugees, worldwide, than all other refugees combined. Where are they going to go, and with what geo-political and national security consequences? Increasingly, philosophers are discussing environmental justice: the ethics of countries with large carbon footprints contributing to the desertification or flooding of poverty-stricken countries with virtually no carbon footprint. Exercise and sports science scholars are revising guidelines for outdoor football practice, for instance, during hotter and

hotter seasons. And so on. Cast your net widely and you will pull in a wealth of local expertise and talent.

Global climate change is also the business of those who it will affect the most. On any college campus this means the students—most of your audience—who twenty years hence, forty or fifty years hence, will find themselves and their children living in a world much warmer and more ecologically chaotic than now. It's crucial, therefore, that they leave your institution with some degree of climate literacy, no matter what their major. There is more at stake here than just career choices and potential solutions to large problems. To be literate in any field of knowledge means to be able to think critically about it, to focus on its most daunting challenges as well as to step back and take in broader perspectives, so as not to be overwhelmed or fall into despair. Wallowing in what environmental writers call "eco-grief" helps nobody. It doesn't help the planet, either.

### *Gather your team.*

Find out who's doing what at your school—in teaching and research—and recruit their expertise and goodwill.

True, maybe easier said than done. Lots of us have been happily and quite productively working inside intellectual silos for years. You may know people in other departments only socially, or from the occasional university committee assignment. So how do you find out who is studying climate change, without having to scroll for hours through faculty web pages?

Check out your school's public relations or public information office, which usually maintains annotated lists of experts for the media. Even if such a list is out of date (and it often is), just a few questions to the right people can lead you to many others. The wildlife biologist who's studying pikas as their alpine habitats are pushed perilously higher may tell you about a colleague in natural resources or recreation who's studying climate change impacts on national parks, who in turn happens to know an economist working on the same project. One person's passion can lead to many others.

Or sit down briefly with the dean of each college and ask who is doing exciting climate change research or teaching. Or send out a mass email.

At the same time, work outward through people you know. When we were starting our project, a biologist friend told us about a distinguished ecologist who was lecturing on campus, and we went. The organizer invited the audience to a party at her house, and soon we were standing in her living room explaining what we had in mind—our faculty-to-faculty talks—when she put up a hand and said, "Hold it right there," then dragged in several colleagues from her kitchen. "Listen to this," she told them. We had suddenly recruited several new potential speakers, and they eventually told us about others.

Higher education is *packed* with enthusiastic and curious people, passionately involved in their work, many wanting to reach a larger, more mainstream audience than their own small world of colleagues. This is one of the happy secrets of the academic world. And when the subject matter profoundly affects the common good, even better. We asked dozens of people to speak, nearly all of them agreed, and everyone created a fresh presentation for their new, non-specialist audience. It was as though they had been waiting for years for the chance to do this.

*Set up your events.*

Maybe you want to do the sorts of things we've described above: faculty-to-faculty primers, public lecture series, teach-ins. Or maybe you'll have other ideas for brown-bag lunches, Friday afternoon conversations, something newer, more creative, more fun. Experiment! There's less to lose than to gain.

For lectures, you might want to scare up a little money to rent rooms and microphones and maybe basic refreshments. This is the sort of project money-handlers tend to like—maybe for a couple thousand bucks, maybe for a hundred or so. Apply for local grants; maybe there's one for the arts, for instance, or for conservation biology, or for agricultural economics. Ask local speakers to speak for free. Tap into departments and small grants for help with speakers from outside. Ask for volunteer help to design a poster and pin copies up around campus and town. Talk to departments with interested faculty; ask for small amounts and list the departments on the poster as sponsors. Call the local radio station and newspaper. Enlist the campus publicity folks to help spread the word. Send announcements to the campus email list; to the deans; to department chairs and heads; to everybody you've collected in your network. Ask everyone to spread the word to friends, colleagues, students, neighbors, churches, reading groups . . .

Suggest that speakers use props they are comfortable with—big blow-up globes to show how the atmosphere and oceans move energy around the planet, candy bars to divide as the world's wealth is divided among nations. Set up hands-on displays; let people touch a thin solar film or explore a carbon-footprint-calculating computer site. While you're at it, compile an image collection for slide shows, to add an element for visual learners and for memorable effect. These tactics can help break up a deluge of facts and figures.

For a single event, clump two or three speakers by topic, preferably from different departments. Collect an anthropologist, an ecologist, an economist, a land manager, and a science-education person for a session on climate change and rangelands—or wetlands, or forests. Or, on the topic of how to talk with global warming deniers and doubting relatives, find speakers from the forest service, the journalism and communications departments, atmospheric science, and psychology. Urge each of those speakers to invite their students to attend.

Even more specifically, keep introductions short, lively, and to the point. A general audience is *not* a tenure and promotion committee and does not care about every detail or nuance of somebody's CV. Consider videotaping the talks so people can find them online; tell the audience this ahead of time—you'll be asked about it, anyway.

Leave ample room for Q&A. Despite the efforts of Rush Limbaugh and the dismissive TV and radio rage crowd, most people are genuinely curious about these topics. Many sense that they have been mis- or under-informed. Give them time to ask honest questions and get clear and respectful replies, no matter how naïve their assumptions. At the same time, prepare yourself and your speakers to deal efficiently with hostile questions or inquiries based on erroneous hearsay or simple untruths.

*One thing leads to another: stay open to the possibilities.*

Maybe your sprawling composition or basic writing program can be persuaded to focus a semester's worth of writing on a single grand theme—the

changing planet, say. Or perhaps your school adopts a book for all incoming freshman to read and discuss in the first semester. Why not something like Kolbert's *Field Notes from a Catastrophe*? Consider opportunities to join forces with an already existing program with its own budget, tradition, and energy; this might include a public deliberation center in the speech department, or a science communication initiative jointly formed by the biology and journalism departments. You might be amazed by how many fascinating programs are already up and rolling at your school.

Partway through our second year of talks, all kinds of other possibilities we'd never thought about began to come our way, with invitations from the university sustainability committee, CSU's new School of Global Environmental Sustainability, the Alumni Association, the Extension energy group whose mission is to take CSU's research out into the communities of Colorado, and others. All of these were opportunities to serve the university and its greater community, and we accepted the challenges gladly.

At the same time, we learned that if we didn't keep our focus on our own highest priorities, we could easily get overwhelmed. We've learned to trust and count on various people who have had the time and skills to do a better job than we could with parts of this job.

### III

One of your jobs as organizer is to coach your speakers. If they often speak to the public, or if they teach students from outside their field, they may need relatively little guidance. But if they mostly work with graduate students or on their own research, you'll be doing your audiences a big favor by passing along some of these tips.

*Think about who's listening to you!*

This is the most important thing, always. *Who* has come to hear you? And why *you* and your topic? What are they likely to already know, and what more do they want, or need, to learn?

Sometimes you can find out some of these things ahead of time. Other times you just have to guess. It can help to imagine a couple of people you know as part of this group. If there will be many first-year college students, and you have a nephew in this category, imagine talking partly to him. If it's a group of retirees, think of your grandmother or great aunt.

*Distill your message.*

Once you've decided who you're talking to, and why, you'll be better able to figure out the core of what you want—or need—to say. That's the *core*, not the entire picture: the most important things for your listeners to hear, learn, and remember. Make sure your talk is set up to emphasize this core message. Lead with it, close with it, repeat it in the middle.

Though it may go against your professional-discourse grain, it's good to start with what's most certain. If you lead (or conclude) with uncertainty, many of your listeners will leave with uncertainty—something you may well not want.

Think melody, not complete symphony score.

*Avoid setting off defense mechanisms.*

How many of us really want to think about climate change—or, more accurately, global climate disruption? It's tough to grasp for a host of reasons, such as that you can't see carbon dioxide and that many of the effects will be gradual, in faraway places, and in the future. The topic also raises lots of psychological defenses, including denial and hopelessness, with results that are bad for everybody.

You can do some things to help get around these defenses: Tell stories and use vivid images. Make some of your examples local, so they're more concrete, easier to imagine, grasp, and care about. Offer your audiences something specific they can do right away, then something else they can do next. And make it clear that all is not lost, that actions begun now can prevent the worst climate disruptions.

*Cut to the chase.*

Communicating effectively outside one's own field is a learned skill: we're not born knowing how to convey college-level content with primer-level clarity. Most of us need at least a little coaching to speak even to academic audiences outside our area of expertise, not to mention the general public.

So here's the Golden Rule: unless we really want to communicate only with other specialists in our own subfield, we should speak (and write) as we'd want someone from clear across campus to do for us. That is, with respect for our intelligence, our own expertise, and our genuine but limited interest in their topic—but also recognizing that we haven't had the same training and don't speak the same language they do, and that we likely don't actually *want* to learn as much as they know, or even as much as they might teach an introductory class.

What nonspecialists need most, or at least first, is a broader picture featuring the most important facts and ideas. Entering a new field, they need to know what's *most important*, mixed with some compelling examples drawn from the realm of the familiar. They need the *what*, the *how* and *why*, and the *so what*. They don't need details, complications, exceptions, and nuances, not at first or maybe ever. It is important, of course, to know such complications exist—but not to get into them in detail, at least until they understand the bigger picture.

Often this means that to talk to the public, you need to return to things you learned so long ago and use so often you think everybody is born knowing them, such as how to identify the subject and predicate of a sentence, or what it means for the pH of seawater to drop by point 2 (never mind the complicated business of logarithmic scales, and the counterintuitive link of *higher* pH with *lower* acidity, something most people have to take time to think about). You'll also have to set aside some conventions of professional thinking and discourse, such as surrounding your conclusions with conditions and caveats. Similarly, academic or professional communications often consist of arguments and data, while stories and images work better for most nonspecialists. Scientists often emphasize such things as uncertainties and error bars; literary critics focus on complicating everything: both of these habits backfire with more general audiences.

*Speak English, not Specialist.*

Speak in a voice that's as direct, clear, accurate, lively, and personable as possible. Note that last item: talk like a person, not a cog in a knowledge machine—a person with interests and passions and actual life experiences. Let your audience hear and see those passions.

Among other things, this means minimizing disciplinary language, *aka* jargon.

Syntax is one culprit. Avoid long sentences laden with modifiers, even if they're elegant. Avoid the passive voice: that is, rather than saying "the hat is worn by the cat," where the action (wearing) is done to rather than by the subject of the sentence (hat), say instead, "the cat wore the hat," where the subject (cat) does the action (wearing).

Another more obvious culprit is vocabulary—which means remembering which words really *are* disciplinary. Some instances are obvious—abbreviations, acronyms, foreign or hard-to-pronounce words, words we can remember learning ourselves. But others are much harder to identify. Some words you'll think you know, but they don't mean the same thing or get used the same way in different fields, even if they share a dictionary root. *Anomaly* and *phenomenological*, for instance, mean quite different things in English and atmospheric science; the sociologist's "global south" is mostly the climatologist's subtropics and tropics, not southern hemisphere. Then there are "iceberg words"—*gender, ideology, model, inquiry, vulnerability, theory*—where most of the disciplinary meaning (and maybe the meaning you really want to convey) is hidden beneath the surface, invisible and inaudible to those not in the know. Watch out, too, for such troublesome terms as *positive feedback*: most folks think this is a good thing, the kind of feedback you want teachers to give your children, but of course when the subject is melting ice, positive is anything but good.

Scientists catch a lot of flak for their unintelligible language, and they often deserve it, but other specialists of all kinds speak jargon, too. For talks at your school, you might imagine you're speaking to college juniors on the other side of campus. Scientists: aim for students in fashion-design and construction management and history. Sociologists: imagine audiences of poets, athletes, and mechanical engineers. Think what's most important for *everybody* to understand, not what your own students need to understand. Remember you've only got a little bit of time—an hour maybe, or less, not a whole semester, not a couple of years. Make the best use of it.

Really, we're just elaborating our earlier point: Think about who's listening to you.

### *This is NOT dumbing down*

We're not saying you need to dumb things down. It's a very bad idea to assume your listeners are stupid or ignorant. Even thinking with this phrase is an implicit insult to, say, a professor in another college than yours; for all you know, she's quite a bit smarter and more productive than you are, but she lives in a very different realm and speaks a different professional language.

Remember that some awfully good scientists have found it worth their while to devote significant portions of their professional lives to communicating out of the box. For instance: Stephan J. Gould on evolutionary biology, E.O. Wilson on



ecology, Sylvia Earle on the oceans, Francis S. Collins on human genomes, and so many more.

And you might find the translating a challenge worthy of your own set of smarts. For our first university-wide talk, we asked CSU atmospheric scientist and cloud-modeler David Randall to start by laying out the scientific foundations of climate change. Randall stands at the top of his field internationally, and he was one of the lead authors of the 4<sup>th</sup> Assessment from the IPCC. Thinking ahead to his general audience, he asked us to critique a practice talk the day before his lecture, along with a couple of his graduate students and two administrative assistants who had little science training. Overnight, based on our comments, he changed or threw out *two-thirds* of his graphs and equations. He gave a great talk. There was nothing dumb about it.

What we are saying—again—is that you should translate the most important things you want to say into a message your actual listeners can understand. They don't all have to understand every bit of it, but if they're paying attention, they should walk away with your main points and a couple of memorable specifics lodged firmly in their heads.

And we're saying this again, too: follow the Golden Rule.

*If you're a scientist . . . .*

Minimize your use of equations and graphs, which can be the numerical equivalents of acronyms and jargon.

How many times have you watched a speaker rush through an image before you have a chance to figure out even half of the squiggly lines? Or seen a graph for which the speaker doesn't bother to identify the *x* or *y* axis or tell you what the small print is about? Lots of people have trouble understanding these modes of communication, at least as quickly as you might assume. Their last engaged conversation with a graph might have been decades ago, they may not remember which axis is which, or even what an axis is, and the very sight of an equation might remind them of their worst high school experiences.

If you really need an equation, try putting up the word version of it along with the symbol version. If you really need a graph, talk your listeners through it. And simplify so that small print and extraneous information don't distract your audience.

Indeed (and this isn't just for scientists), keep a sharp eye on the legibility of all your slides. Too much stuff on the screen, or font that's too small, can be seriously distracting. If you want folks to focus on reading your slide rather than listening to you, then stop talking and give them time to do so.

And if your audience includes significant numbers of people from the United States, don't talk metric. (You may fervently believe everyone should think in metric, but making this happen is a job for another occasion.) This means using feet and inches, not meters and centimeters; miles, not kilometers; pounds, not kilograms; acres, not hectares. ("God's green hectares"? Not in the U.S.) Maybe most critically, talk about degrees F, not C. U.S. listeners will pay much more attention if they hear the temperatures in their home towns are projected to rise by 10 degrees Fahrenheit, not 6 C.

Once again, however much it may go against your professional training, remember that most people respond to human beings with personalities and

passions. (Perhaps they've come to listen to you speak for just this reason, rather than reading a website or textbook?) You are in fact such a being. Don't hide it.

#### IV

Why do this sort of work? There are lots of good reasons.

For one, it's personally and professionally rewarding. Our own experience has been overwhelmingly positive; we joke about how we've found one way to make global warming fun. New friends and colleagues, new information, new ways of seeing the world, new challenges, new skills, new questions to investigate, new venues: it's sometimes tiring, sure, but we've absorbed far more energy from this work than we've lost. And we know many others feel the same.

For another, to watch good communication take place between people who know things and people who want to know them, especially on a topic of such importance—and to realize that you've had something to do with making it happen—this too is enormously rewarding. It's a way of ratcheting up from private actions like lightbulb-changing and biking to work to a larger social register, and so it helps displace despair and eco-grief. It offers the satisfaction of taking action with other people who also care deeply about the living world.

Mostly, though, this is good work because it is important. We'll say it again: our beleaguered planet is the only home we have. The human imprint on it and its creatures, including human creatures, has been immense. If we as a species are capable of causing the global changes that science is again and again confirming, surely we can use our ingenuity and wisdom to help turn things around, and sooner rather than later.

As ordinary citizens with some power to affect change, we must recognize that this is our mandate to Earth and to our children. As educators, we must act to help generations now and in the future grasp this responsibility—and opportunity—and focus their talents to the best of their abilities.

#### V

Our website (<http://changingclimates.colostate.edu>) offers an annotated selection of excellent resources on many climate-change topics, including communication. (To find "Communication," hover over "The Human Face" on the home page.) And we're more than happy to talk about any of this, any time, so please feel free to contact us via the English Department website at Colorado State University.