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Climate change: Is seeing believing?

Gary Braasch

Abstract

Images of climate change and global warming—including tens of thousands of photographs, charts, graphs, cartoons, illustrations, and moving images—have been spread across magazines, television, and films, and are scrolling down the growing array of websites devoted to some aspect of environmental news and climate change. The content of climate imagery falls into several broad categories, and not all of them have been effective in educating people about the dangers and causes of climate change or encouraging civic action and involvement. A new framing of local climate impacts and positive actions may encourage more people to take action.

Keywords

climate change, climate communication, imagery, media, photography

In early 2005, I was en route to photograph very high tides in Tuvalu, the tiny South Pacific nation under threat from sea-level rise, when an e-mail arrived from a BBC editor in London. She wanted to run a set of “‘past’ and ‘present’ photographs, sitting side by side,” to illustrate environmental change. The editor had seen glacier comparisons posted on my three-year-old global warming photography website and asked, “Are there any other images you can recommend?” Indeed there were, and, using a satellite e-mail service, I managed to send five sets of images, including a new one comparing tidal flooding with normal sea levels in Tuvalu.

The BBC ran the feature, “In pictures: How the world is changing,” on February 15 of that year (BBC News, 2005). The photo comparisons (along with a sixth set from Greenpeace) of glaciers, an eroding shoreline, a forest, and Tuvalu’s tidal inundation instantly became the most popular pages on the BBC website. They were reposted by many other sites, and links back to my website drew more than 900,000 page views for a few days. The photos are still online and have been viewed by schoolchildren, journalists, and Al Gore, who found new images for his climate slide show after seeing the BBC feature.

Time-series images that illustrate how climate change is rapidly altering some

parts of the Earth are now a common, but still powerful, tool of science communication. Since climate scientist James Hansen's dramatic testimony before a Senate committee in 1988 that "the greenhouse effect has been detected, and it is changing our climate now," the public has seen endless smokestacks, blazing suns, and polar bears; astounding time-lapse images of clouds, storms, and glaciers; thousands of people up to their waists in high tides and floods; and ranks of wind turbines and solar panels.¹

The 2006 film "An Inconvenient Truth," debate in the United States Congress, and the run-up to the 2009 Copenhagen climate talks spiked further public interest. Tens of thousands of photographs, charts, graphs, cartoons, illustrations, advertisements, and moving images have since been spread across magazines, television, and films, and are scrolling down the growing array of websites devoted to some aspect of environmental news and climate change. Are these accurate representations of global warming and its solutions? Has the increase in the range and published use of climate images made a difference for public policy? Are we better educated about the dangers and causes of climate change, and have the pictures encouraged more people to take action in response?

Curves and sticks

Hansen used simple line graphs of his computer analysis of rising temperatures to illustrate his 1988 testimony before the Senate. Graphs have been a staple of scientific communication, of course, but they also have informed the public perception of rising carbon dioxide levels and temperatures. Key graphs

include the Keeling Curve (2013), showing the steady rise of carbon dioxide levels in the atmosphere; the rising temperature record since 1880 (NASA Earth Observatory, 2013); the paleoclimate reconstruction of Northern Hemisphere temperatures during the past millennium, dubbed the "hockey stick" because of its abrupt incline in the twentieth century (Mann et al., 1999); and a graph of polar ice core measurements that shows temperature and carbon dioxide fluctuating in tandem in geological history (EPA, 2013). A 2013 study of people's reactions to various climate change images found that non-scientific viewers agreed with the description of a graph of rising temperatures as an "authoritative scientific image representing rapid and frightening change" (O'Neill et al., 2013). But most people who communicate with the general public have learned from audiences' glazed-over eyes to avoid all but the most dramatic and simple graphs, especially because the ups and downs of graphs that track complex data often raise more questions than can be answered briefly.

Polar bears and penguins

Editors of many popular publications, films, and websites have instead chosen symbolic images: the planet Earth seen from space, the sun, illustrations of the Earth on fire, skies with clouds, and satellite views of the poles and hurricanes. Equally simple and iconic are pictures of polar bears and penguins, changing landscapes (for example, calving and flowing glaciers), glacier recession over time, floodwaters, sunbaked earth, dead crops, forest fires, and bleached coral reefs. Many of these images have become clichés, to say the least,

shorthand created through decades of advertising and fast video cuts. Burning Earths, blazing suns, and calving glacier ice are frequently irrelevant in the climate context and often just plain misleading. Solar radiation is not high now and is not the reason for rapid temperature increases, and most tidewater glaciers calve while both growing and receding.

The preeminent poster animal for climate change is the polar bear, especially in images that show the Arctic predator in distress or pushed from its normal icy habitat. Clichés though they are, they keep the thawing of the Arctic on public display. However, some stock photos of the bear have been manipulated and Photoshopped. In one unfortunate example in 2010, the journal *Science* published a dramatic stock image of a polar bear on an ice floe to accompany a letter from scientists (Gleick et al., 2010a) responding to distortions by certain politicians and climate deniers. Ever-watchful skeptical bloggers quickly determined the image was a fake—a composite of separate photos of the bear, ice, and open water—and *Science* (Gleick et al., 2010b) replaced the photo with an authentic, and very similar, image taken by a *National Geographic* photographer. But as recounted by *New York Times* Dot Earth blogger Andrew C. Revkin (2011), the fake photo “ended up being the story, instead of the letter.”

Causes and solutions

The modern world’s incessant media and advertising have also created a lexicon of “cause” and “solution” icons that have been used since the beginning to illustrate concerns about air pollution

and climate change. “Cause” imagery includes smokestacks, oil and gas wells, steam and smoke from power plants, jammed-up freeways, tailpipe fumes, and sooty forest and cooking fires. On the “solution” side, generic photos and drawings of wind turbines, solar panels, and electric cars are frequent stand-ins for the complex and crucial need to shift energy production away from fossil fuels. During times of political action and international climate meetings, images used for climate stories often shift to uninformative images of UN negotiators, US presidents and politicians, and celebrities.

The global view

One over-used image still has power and relevance: the whole Earth, whether in its original 1972 portrait shot from Apollo 17 with a Hasselblad film camera or in the satellite digital photo assemblages NASA calls “The Blue Marble.” Images of the home planet and its natural features speak of global citizenship and responsibility (Szczepanski, 2005). There is a sense of the fragility of the atmosphere and of humanity’s dependence on the interactions of ocean and air. NASA is a source of thousands of detailed images of Earth that depict climate and weather events with scientifically accurate captions, such as the time series of diminishing Arctic sea ice cover. One of the latest is a night image revealing the glaring smear of lights from gas flaring and equipment lights on the fracked Bakken oil fields in North Dakota and Montana (NASA Earth Observatory, 2012).

Far too many editors and video producers continue to reach for the easy illustration that, instead of advancing a

story or presenting facts, just says “heat” or “melting” or “political controversy” to the underinformed and undecided. University of Exeter social scientist Saffron O’Neill studied 1,600 photographs used in newspaper climate articles in the United States, the United Kingdom, and Australia in 2010 (O’Neill, 2013). She found that most of the images either reinforced in readers what she described as an effect of being distant from everyday life (for example, industrial smokestacks and remote glaciers) or framed the issue as “contested” (for example, politicized or controversial images showing leaders, meetings, and protests). She concluded that these most prominent “visual frames” were influential in “shaping the cultural politics of climate change” (O’Neil, 2013: 18).

Photojournalists who focus on natural history field research, as I do, can create a more meaningful kind of climate photography that reports on specific climate impacts and documents how scientists know the Earth is changing. For example, when I visited Peru’s Cordillera Blanca in 1999 and 2000 to make my first of many photos showing glacier retreat, I carried 1930s photographs of these Andean glaciers, provided by leading glaciologists. Today, with the widespread availability of digital cameras, there are more images of weather events from more places by more photographers than ever before, not all of which are carefully captioned or informed by science. Science and technology photography remains an important professional specialty and avenue for increased public understanding and involvement. Informed photography of climate change also covers energy sources, adaptation, and methods for reducing carbon emissions.

The human element

Dramatic news photographs and video of severe changes to coral reefs, glaciers, forests, and coastal settlements are particularly compelling, and carry a more personal shock if they show vulnerable people caught in storms, flooding, fires, and drought. The 2004 fictional adventure film *The Day after Tomorrow* and the 2006 documentary *An Inconvenient Truth*, which reached enormous audiences, made extensive use of disaster images. Audience surveys noted that these films had an immediate effect on viewers of increased concern and willingness to act to reduce climate change, but that this motivation may decrease over time (Jacobsen, 2011; Leiserowitz, 2004). Recently, Hansen and others (Cook, 2013) have begun comparing the excess heat of global warming to the energy released by the Hiroshima atomic bomb, perhaps the ultimate connection to a human-created disaster. Hansen showed an image of a nuclear mushroom cloud in a TED talk in 2012, saying that the climate energy imbalance is “equivalent to exploding 400,000 Hiroshima atomic bombs per day 365 days per year” (Hansen, 2012).

Until Hurricane Katrina sent more than a million people fleeing from the Gulf Coast, US publications paid scant attention to climate refugees. Likewise, the death toll from drought and urban heat waves has received little publicity even though extreme heat kills and hospitalizes more people than hurricanes or tornadoes do (NOAA, 2013). Editors and activist groups wanting to make this point have frequently published my photo of Chicago during the heat wave of 1995 that killed at least 750 people. Because humans tend to be interested

in other humans, two of the most-published photographs in my archive show three kids sitting on a porch as extra-high tides in Tuvalu flood in, and Bangladeshis on the eroded edge of their village. Because these people are distant from Americans and Europeans, however, it is easy for viewers to get the message but feel no relevance to their lives or need to act.

Seeing changes vs. making changes

Research on the role of visuals in climate communication is still in its infancy compared with studies of the written and spoken word. The challenge of any medium is that, as Yale climate pollsters Nicholas Smith and Anthony Leiserowitz (2012: 8) wrote, “climate change seems distant and abstract to most Americans, while carbon dioxide, other greenhouse gases, and the impacts that have already been observed around the world are largely invisible and outside of most people’s direct experience.” Surveys by Leiserowitz and colleagues at the Yale Project on Climate Change Communication and the Center for Climate Change Communication at George Mason University and by the Pew Research Center for the People & the Press show that from 2006 to 2008 more than 70 percent of Americans surveyed thought climate change was real and currently happening. After Copenhagen, failed congressional action, and a sharp reduction in press coverage, this percentage dropped sharply by 2010, to 57 percent. Although it is rising again, it has not regained its previous level (Boykoff, 2013; Leiserowitz et al., 2013; Pew Research Center, 2013). Debate and denial of climate science

is a factor in public opinion shifts about climate change (Smith and Leiserowitz, 2012). Climate science denial communication does not typically use pictures, and image use by news media, although focusing more on weather disasters, decreased along with general press coverage.

A recent controlled study of climate images by O’Neill and three colleagues indicates that pictures of climate impacts on distant landscapes—such as aerial views of flooding, glaciers, and polar bears—were attention-getting and seen as evidence that the issue is important, but did not empower individuals to do anything (O’Neill et al., 2013). Participants said that they saw images of smokestacks and traffic jams as proof of climate pollution. They told researchers that pictures of solar panels, wind farms, electric cars, and home insulation provided examples of how they could personally undertake meaningful actions and energy choices. The study leaders wrote that few, if any, images could do both: create a feeling of the importance of climate change as an issue while empowering the viewer to do something about it.

An earlier study found that images that made climate change seem important and scary—starving children, a dried-up lake, industrial smokestacks, a flood in Bangladesh, a graph of temperature rise, and a flooded house—also were “likely to distance or disengage individuals from climate change, tending to render them feeling helpless and overwhelmed” (O’Neill and Nicholson-Cole, 2009: 375–376). The authors cautioned that sensational and possibly frightening images could cause “denial, apathy, avoidance, and negative associations.” Imagery that will “enable a

person to establish a sense of connection with the causes and consequences of climate change in a positive manner” tended to create more possibilities for engagement and action. Positive images in use today show climate change effects in local areas and carry visual narratives about how familiar people are coping and adapting to change.

Refusing to see

Communicating climate change with imagery is particularly challenging in the United States because of strong political polarization, peer group pressures, the profit motive, and religious value systems. Social research and polling show that people who doubt that humans are causing climate change, or are strongly against taking action to mitigate climate change, are often resistant to more scientific information (Hart and Nisbet, 2012; Kahan, forthcoming; Leiserowitz et al., 2013; Shepherd and Kay, 2012). Thus images depicting scientific findings and distant damage from climate change may not resonate with a large segment of the public. People may be more willing to respond if, as communications professor Matthew Nisbet (2012) told a National Academies of Science seminar, “we switch the frame of reference and put people in the middle of our story about climate change.” Photojournalists could focus, for example, on personal health effects such as increasing asthma, or on children and teachers who reduce emissions and save money by opening windows instead of turning on the school air conditioner (Cherry, 2011).

Until recently, some Americans were able to ignore climate change because it was not local, did not affect them, was

described as decades in the future, and the science was said to be “unsettled.” However, climate science has become more and more robust, and climate-related disasters are affecting broad regions of the United States and other affluent Western nations. The New York and New Jersey shores, the Corn Belt, and Colorado and California are the new Bangladesh, Africa, and Australia—adapting to fatal storms like Sandy, crop-killing drought, unusually severe flooding, and raging wildfires. The latest images of energy battlefields are not in Iraq or Nigeria but in the fracking fields of Pennsylvania and Colorado, the tar sands of Alberta, and the coal trains headed from Wyoming to the West Coast.

Envisioning the future

Heeding the social scientists’ warnings about the helplessness-inducing effects of negative images means that more pictures are needed of specific solutions and adaptations that will shape the world of tomorrow. The future is here. Vast wind turbine fields may still be distant to most people and not very personal, and images of them can be numbing clichés. In contrast, images of a neighborhood of homes with local wind generation, solar panels, electric cars, gardens, and attractive public transit may encourage people to work toward positive goals. Public information and images should be more inspiring and educational. Picturing a healthier and safer future can be empowering.

This is a realm where artwork, personal expressions, and collaborations among artists, architects, musicians, and film makers can also play a role.

Climate change has reached theater stages in New York and other cities, with productions of plays such as *The Great Immensity* and *This Clement World* (Zinoman, 2013). The Museum of Modern Art (MoMA) in New York City is perhaps the most prominent institution to display contemporary art informed by climate change. MoMA's "Rising Currents" exhibit of architectural proposals for coping with sea-level rise around New York Harbor was mounted in collaboration with the P.S. 1 Contemporary Art Center (MoMA, 2010). Barry Bergdoll, MoMA's chief curator of architecture and design, told architects: "Your mission is to come up with images that are so compelling they can't be forgotten and so realistic that they can't be dismissed" (Cilento, 2010). Famous artists such as Maya Lin and Mary Miss have brought climate change into the public eye through sculpture and interactions with environmental groups (Dederer, 2007; Kino, 2013). Climate change-inspired art can be controversial and challenging to institutions and public officials, as shown by the forced removal of Chris Drury's "Carbon Sink" from the University of Wyoming campus in 2012 (Studio 360, 2012). During the Copenhagen climate change conference in 2009, outdoor photo exhibitions and large sculptures filled the streets (Braasch, 2009). Associations like Marda Kirn's EcoArts, and blogs such as Chantal Bilodeau's Artists and Climate Change, showcase artistic ways of visualizing the human connection to global warming through performance, films, public exhibits, and the traditional arts (Bilodeau, 2013; Kirn, 2013).

It is the human connection, to each other and to other species, that matters

more now than the pure science and distant destruction. Climate scientists are still giving the facts, but many are also publicly expressing concern for their fellow humans. People still need to understand the physical changes caused by excess greenhouse gases, and the more they see those close to home who are harmed by climate disasters, the more they will comprehend changes around the world. With that will come inspiration from images of those whose actions are reducing the damage and creating a better future for everyone.

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Notes

1. There had been public statements by Hansen and other scientists before his testimony at the 1988 hearing, but only that testimony made major headlines, including on the front page of the *New York Times* (Weart, 2013).

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Author biography

Gary Braasch is an environmental photojournalist based in Portland, Oregon. His central project since 2000 has been “World View of Global Warming,” a photo documentation of the effects of rapid climate change around the world. In its second decade, this work now includes the solutions that will reduce greenhouse gas emissions. Braasch is the author of *Earth under Fire: How Global Warming Is Changing the World* (University of California Press, 2009). His images are currently on display at the Boston Museum of Science in the one-person exhibition “Climate Change in Our World.”