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## Why We Can (and Should!) All Teach Climate History: A Few Brief Ideas from North America

### Abstract

This article reviews some of the reasons why history teachers choose not to teach about climate change. The authors suggest that climate change can be an integral part of a history course and they offer examples of energy, cultural identities, and wildland fire as places to weave climate into traditional history classes. Teaching about climate change does not only have to be about scientific data or geophysical facts; the moral, emotional, and cultural impacts of climate change have a natural fit in history classrooms, environmental and otherwise.

### Keywords

Climate education, Environmental history, Teaching, Energy, Wildfire

*«I have always believed that climate change is an ecological issue, but I believe first and foremost that it is a spiritual issue. If we do not recognize that this is our ethical challenge in the 21<sup>st</sup> century, then I think we will fail to respect and honor the future generations that would follow us.»*

Terry Tempest Williams<sup>1</sup>

In April of 2019, the National Public Radio of the United States asked the question, «where does climate change belong in the educational curriculum?» 65 % of teachers of high school-aged students (15-18) said that this topic did not apply to the subjects they teach. Many of these teachers who do not teach it consider climate to be «science» only<sup>2</sup>. There is some truth to the idea that one needs to understand the general scientific theory and processes behind climate change: Greenhouse gas emissions, melting ice caps, rising oceans, extreme weather fluctuations, and harsher summers... etc. But the NPR article and both authors here are in agreement that teaching about climate change is not only appropriate but also essential in most academic disciplines, not least of which is history.

Climate history is not primarily about «getting all the facts» or making sure students understand the geophysical cycles that make up climate and the forces that have changed over the course of

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<sup>1</sup> <https://news.harvard.edu/gazette/story/2018/09/writer-terry-tempest-williams-reflects-on-being-at-harvard-divinity-school/>, consulted on 24.08.2020.

<sup>2</sup> National Public Radio, «8 Ways to Teach Climate Change in Almost Classroom», Available under: <https://www.npr.org/2019/04/25/716359470/eight-ways-to-teach-climate-change-in-almost-any-classroom>, consulted on 24.08.2020.

human history<sup>3</sup>. These are important, but we see the role of climate change in the history classroom as something slightly different. In our view, history education is as much about how people perceive, narrate, and make meaning out of the world around them as it is about so-called facts. With the subject of climate change, the dynamics of its occurrence are perhaps less important to teach history students than are the complex ways humans have contributed to the altering of natural systems and the ways in which humans have accepted or resisted these alterations. The meanings of the facts, rather than the facts themselves, are at the heart of the lesson. When it comes to climate, the histories of emotions, identity, dissonance, and deceit have just as much of an opportunity to teach as do the scientific studies that have historically proven the fact of climate change<sup>4</sup>. History is full of transformative examples of the analytical intersections between human activities and natural processes that have direct impacts on climate - even topics often not identified as being about «the climate» per se – that have direct connections with climate variations both local and global. Identifying, critiquing, and rethinking these intersections can humanize the weather, localize climate, and empower students to see possibilities of a different future.

Once we get over the fear of having to teach the scientific facts of climate history, the next area of resistance from historians is that only global historians can «really» teach climate change. It is, after all, a global phenomenon and all peoples, economies, and nation states contribute to it and experience its effects. While there are a few world (or global) historians qualified to take on

the whole history of the globe, most of us are not<sup>5</sup>. Thus, the authors of this article advocate keeping the global in mind but focusing on the local because local decision-making, cultural habits, and value systems contribute to the changing climate *and* are accessible for students and teachers alike. We could think about climate change as being a pebble thrown into a lake. That tiny act and object are ultimately the cause of countless ripple effects. For climate history, the local actions of people in places are the pebble and the ripples are the wider effects of the local on global climate shifts.

Hopefully, this introduction has convinced you as to why it is imperative and possible for history teachers at all levels to find a place to discuss climate variation in the history classroom. We argue that historians must set aside their urge to feel as though they must cover all of human history and the entire Earth in order to help students understand how climate is affected by even the seemingly most disconnected of «traditional» history topics. Here, we take on three of these topics. First, we show how energy development can be studied in order to consider how human decision-making about that important economic and political topic has also had long-ranging consequences for the climate. Second, we urge you to think about the ways in which cultural shifts in response to the climate normalize variations in interesting ways. From fashion in the Little Ice Age to paintings during the Renaissance, traditional lessons can be edited to include an analysis of the climate. Finally, we turn to agricultural and land management history to show how the history of forest fire policy is nothing if not radically affected by and affecting the climate. In each example, we hope that it becomes clear to students that incremental cultural and policy decisions can have exponential effects. History classrooms, more so than engineering or geology, are where students understand the role of human responsibility and agency – their own, that of their government and society, and of other generations. Feeling responsible coupled

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<sup>3</sup> If this is your goal, this is a great resource: <https://www.historical-climatology.com/>, consulted on 20.08.2020. Brian Fagan's work is accessible on this topic, especially for students. See FAGAN Brian, *The Little Ice Age: How Climate Made History, 1300–1850*, New York: Basic Books, 2000; FAGAN Brian, *The Great Warming: Climate Change and the Rise and Fall of Civilizations*, New York: Bloomsbury, 2008. A useful review is: CAREY Mark, «Climate and History: A Critical Review of Historical Climatology and Climate Change Historiography», *WIREs Clim Change*, 3, 2012, p. 233-249.

<sup>4</sup> JAQUETTE RAY Sarah, *Field Guide to Climate Anxiety*, Berkeley: University of California Press, 2020. She makes similar points. Also, see our primer, WAKILD Emily, BERRY Michelle K., *A Primer for Teaching Environmental History*, Durham, N.C.: Duke University Press, 2018.

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<sup>5</sup> See for example, MCNEILL John R., *Something New Under the Sun: An Environmental History of the Twentieth-Century World*, New York: W.W. Norton, 2001 or DAVIS Mike, *Late Victorian Holocausts: El Nino Famines and the Making of the Third World*, London, New York: Verso, 2001.

with a sense of agency can help empower students and allow them to change the present trajectory.

## Energy and Water

So, let's get real. One of the most important secrets to great teaching is to arm students with information and skills which they know they can use to understand and solve contemporary issues and problems. The climate is no different. If we set out in our classes to teach the staid story of every scientific experiment undertaken to understand the greenhouse effect, we may lose the students on experiment number 5. But if we teach them how something that matters to them in their daily lives applies to climate change and show them the history of this topic, how it has changed over time, then we have caught their interest, and interest equals learning.

One of the best topics to achieve this is energy history. Focusing on your specific area of study (the US, Europe, Mexico, Japan) can you seek out monographs about the energy grids, and the ways in which the grids were built over time and with different sources of energy? For example, in the United States, there is no more compelling story (full of discovery, subterfuge, violence, innovation, villains, and heroes) than the discovery and eventual widespread adoption of fossil fuels to power the American energy grid. Students can, literally, see history at work when they plug in their technological devices or walk into an air-conditioned building. In Michelle's classes, the topic of energy sometimes takes on the form of the people who first discovered oil in the United States in the 19<sup>th</sup> century and the subsequent public decision making that led communities to adopt the filthy liquid for their survival. Sometimes there is a combined tale of coal and oil. The greenhouse gases spewing from unregulated coal-powered factories during the US Industrial Revolution are easy to see in photographs from the period and a quick lesson on greenhouse gas emissions and carbon during an examination of the Second Industrial Revolution will not only work, it will make tremendous sense to students who hear the debates about carbon and dirty coal in 21<sup>st</sup>-century political debates.

Another approach is to think about global car manufacturing during the 1920s-1950s when corporations such as Ford and General Motors made very conscious choices to utilize gasoline (even leaded gasoline) despite its known drawbacks. American consumers accepted the decision until air pollution in the 1950s made it so that they couldn't see across the street. They then agitated for a variety of legislative changes<sup>6</sup>. Asking students to think about and discuss the tradeoffs people were willing to make in order to make the economy boom can result in rich debates and discussion, while helping students understand that the ramifications of fossilized energy were well known at the same time they were adopted. Michelle is an environmental historian, but she is also a labor historian and energy topics allow for in-depth discussions about class warfare, racialized workplace dangers, and ongoing environmental justice concerns. Also, of course, the ramifications of climate change are composed of all these things. Indeed, energy is a perfect place to have students begin to humanize the effects political and economic choices have had on the climate. Students are fascinated to learn that wind, water, and trees have powered much of human culture over the eons, and it is important that the transitions from «organic» to «inorganic» are understood by students to be uneven and halting. The continuation of hydroelectric power in the era of nuclear and fossil fueled energy, for example, can show students that no «transition» is complete or irreversibly permanent. When teaching energy history as both environmental history and climate history, this lesson in human choice is critical if the goal is to have students understand their own agency for creating change<sup>7</sup>.

Once you have laid the historical foundation that makes clear the choices historical actors made and inherited in terms of energy, it is time to ask students to begin the hard work of applying their learning to the current crisis. Learning activities that allow students to observe energy choices they

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<sup>6</sup> MCCARTHY Tom, *Auto Mania: Cars, Consumers and the Environment*, New Haven: Yale University Press, 2007.

<sup>7</sup> For an excellent overview discussion of many of these issues, see «Forum: The Environmental History of Energy Transitions», *Environmental History*, No. 3, July 2019, p. 463-534.

and their culture make daily can be very effective. «Trace the Kilowatt» is a ladder assignment that asks students to do preliminary research on the sources of energy in their local communities. Each part of the assignment adds a rung to the ladder resulting in a higher level of understanding by the end of the assignment. First, ask them to write a short essay about how an electronic device of their choice gets its power. Once they know the location of the powerplants, ask them to figure out how the powerplants get their power – are they coal-based? Wind-based? Solar-based? Maybe a combination of all three? The next part of the assignment asks students to research how natural sources are harnessed and what the history of that extraction has meant for communities and environments. How does coal arrive at the power plant? Who does the work? What are the environmental effects of the work? Have these effects changed over time? This might seem like a very basic assignment, and it is meant to be introductory to a larger project. But you will be amazed at how their understanding grows, how simple many of them want to make the process of charging their phones to begin with and how collaboratively sharing their findings engages and enthuses them for what might otherwise be a less than electrifying but exceedingly complex task.

Connect the ladder assignment to a larger project by asking students how the grid to which they are connected and upon which they depend might affect human and nonhuman communities in the specific places that supply energy sources. Here is one the best opportunities to show students how topics that are not obviously about climate change have profound climatic results – both in terms of the physical climate but also in terms of cultural climates. To help students begin to understand the intersections and entanglements of energy, environment, and climate justice, have students research any resistance movements to the energy sources that they discovered power their grid. The Dakota Access Pipeline protests in the United States and Canada 2014-present come up in Michelle's classes, as do the protests against dams in the mid-20<sup>th</sup> century in the United States. The harmful effects of uranium and coal mining on the Navajo Reservation in the intermountain United States West show how local peoples can

be profoundly harmed by the demands for certain kinds of fuels<sup>8</sup>. In South America, the multifaceted «Patagonia sin represas (Patagonia without dams)» movement successfully prevented the creation of five megadams in southern Chile in 2014 and the ongoing (now 18 year) lawsuit against Chevron-Texaco by Ecuadorian citizens both have excellent teaching films and sources available to take students to these faraway places and provide key background on how energy has long been a force for globalization<sup>9</sup>. In each example, the high likelihood of local dependence on dirty energy to unevenly harm some humans and nonhumans more than others becomes obvious. This part of the project teaches energy history services to humanize climate change by localizing the energy choices that eventually contribute to the «facts» of the greenhouse gas effect. Ultimately, this can help students to then think about the long-term effects of energy use for global climate health and equity.

## Cultural Imaginings

That the climate has changed in the past is a radical thought to most students. Many 'know' all kinds of things they have absorbed from the media about climate change – that it is urgent, that it is happening fast, that it is unprecedented, etc. But few have thought about how other peoples in other times experienced it and adapted (or not). Here are two content and place-specific examples of where cultural imaginings and representations of climate shifts can be powerful for students as a way of seeing power manifested in relations beyond states and governments. One is an example that would fit into any survey of Western Civilization; the other could be a modern counterpoint from the Global South.

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<sup>8</sup> AMUNDSON Michael A., *Yellowcake Towns: Uranium Mining Communities in the American West*, Boulder: University of Colorado Press, 2004; NEEDHAM Andrew, *Power Lines: Phoenix and the Making of the Modern Southwest*, Princeton: Princeton University Press, 2014; PEARSON Byron E., *Still the Wild River Runs: Congress, the Sierra Club, and the Fight to Save Grand Canyon*, Tucson: University of Arizona Press, 2002; COHN Julie A., *The Grid: Biography of an American Technology*, Cambridge, Massachusetts: MIT Press, 2017.

<sup>9</sup> BERLINGER Joe, *Crude*, New York: First Run Features, 2009; LILLA Brian, *Patagonia Rising*, New York: First Run Features, 2011.



*The Ambassadors*, 1533, by Hans Holbein the Younger.  
The impacts of the Little Ice Age can be observed in how people dressed in paintings.

The impacts of the Little Ice Age, especially in Europe, are relatively well-studied by historians. The dramatic but erratic cooling of the Northern Hemisphere from the 14<sup>th</sup> to 19<sup>th</sup> centuries resulted in expanding glaciers, frigid summers, and increased sea ice. These shifts have important implications for broad global phenomena – from understanding why some societies expanded (the Dutch) and others imploded (the Maya) – but also very visible, familiar objects. Take coats and hats, or fashion, for example. Art historian Lane Eagles has analyzed shifts in how people dressed in paintings and manuscripts and found that

their layers kept increasing to keep up with the cooling<sup>10</sup>. A French knight might have worn a skirt with a high slit, a hemline to the knee, and no stockings, cape, or hat in the 1120s, while by the 1550s, French ambassadors had floor-length velvet capes, fur-lined coats, high collars, thick boots, stylish hats, and visible undergarment layers. Why did fashion shift towards heavier fabrics,

<sup>10</sup> LANE Eagles, «How fashion adapted to climate change - in the Little Ice Age», 09.07.2017, <https://theconversation.com/how-fashion-adapted-to-climate-change-in-the-little-ice-age-82104>, consulted on 20.07.2020.

furs, and layers? Perhaps it was a whim of the wealthy. But more likely, it was to mitigate the harshness of the changing climate. Asking students to examine Renaissance paintings to look for evidence of how the climate changed can begin a conversation about what animals gave their lives for those fashions, and why the quest for warmth matters to understanding industrialization. They might talk about how inequalities between the rich and poor might be seen in those fashions and how they may have felt. Setting cultural literature – Charles Dickens or Mary Shelly’s *Frankenstein* in the frigid summers of the Little Ice Age also enables students to see a world unlike their own with attention to climate<sup>11</sup>.

In other times and places, the climate has had measurable effects in producing disasters. Mark Carey argues that the most devastating natural disasters in the history of Peru have been produced by melting glaciers<sup>12</sup>. «Did you say melting glaciers?» students might ask. «I thought those only affected polar bears?» No. More than 70 000 people have died in their home in the Andes mountains since the 1940s due to the impacts of glacial lake outburst floods and the subsequent mudslides that destroy towns, infrastructure, and fields in their paths. When students are able to put the face of an Andean farmer onto a melting glacier, it changes how they consider what precisely is being lost in a warming world. Part of what makes Carey’s careful history so compelling is that he outlines the expertise and investment the Peruvian government introduced to monitor and mitigate these disasters after the initial tragedies. That this state-based and publicly benefiting action has been eroded and downplayed in recent years is significant to

the conversation about resilience and adaptive capacity. It provides a clear example for students to see scientific expertise about climate in a local setting put into action – to prevent deadly flooding. General climate information, narratives, and publicity has dehumanized the melting of glaciers and diffused responsibility for its effects, but when you draw a line between carbon in the atmosphere and alpine flooding, the human costs are undeniable and past actions become possibilities.

Wearing furs, living in mountain villages, and monitoring lake levels are all examples of cultural choices made in relation to a changing climate, whether those cultures understood them to be so or not. In different times and places, humans have variously contributed and responded to a world they shaped but never fully controlled.

## A world on fire

Fire is not necessarily a climatic phenomenon. But the connection between fire and climate change, especially in the western US at this present time, is one that helps students see they have been experiencing climate change their whole lives and may not even have recognized it around them. This manifestation of climate shift is very much connected to decisions made by historical actors at specific moments in time. In the mid-20<sup>th</sup> century, for example, cattle ranchers in the dry southwestern states of America made the choice to import species of grass that were both nutritionally beneficial to their cattle as well as suited to growing in desert grasslands. Species native to the Mediterranean, Middle East, and Africa, such as buffelgrass, were chosen by the United States government and local cattle ranchers to be used as feed and, like so many invasive lifeforms, propagated themselves even where they were not intended to spread. Buffelgrass, in particular, burns hot as it evolutionarily lives in savannah landscapes where big trees are few and far between. In addition, buffelgrass is not like the bunch grasses that are native to the southwestern Sonoran, Mojave, and Chihuahuan desert regions. The desert is not as adapted to fire as other landscapes are. When these grasses create thick fuel stands around keystone species such as Saguaro

<sup>11</sup> There are many great histories of these impacts, pairing the fashion example with readings from these new works would likely work well. ZILBERSTEIN Anya, *A Temperate Empire: Making Climate Change in Early America*, New York: Oxford University Press, 2016; DEGROOT Dagomar, *A Frigid Golden Age: Climate Change, the Little Ice Age, and the Dutch Republic, 1560-1720*, New York: Cambridge University Press, 2018; DEMUTH Bathsheba, *Floating Coast: An Environmental History of the Bering Strait*, New York: WW Norton, 2019. For articles, see MIKHAIL Alan, «Ottoman Iceland: A Climate History», *Environmental History*, 20:2, 2015, p. 262-284; BLINKENBERG HASTRUP Kirsten, «A History of Climate Change: Inughuit Responses to Changing Ice Conditions in North-West Greenland», *Climatic Change*, Feb. 2012, p. 1-12.

<sup>12</sup> CAREY Mark, *In the Shadow of Melting Glaciers*, New York: Oxford University Press, 2009.



Burnt forest, Mount Graham, Safford, AZ Summer 2020. Photo by: Michelle K. Berry.

Cactus, they put the desert ecosystems at grave risk of wildfire damage. Buffelgrass in the 1930s, the 1970s, and even today lives rather happily in the southwestern deserts of the United States and has been understood by many people to be highly beneficial for both livestock and erosion control. But then there is the issue of climate change. Even the slightest shift in precipitation in regions that have on average twelve inches/year can ensure that any conflagration could be far more devastating than it otherwise might be. Dry grasses that already burn hot, coupled with

less humidity and rainfall conspire to create a desert that is literally turned to ash. The ability of native species to respond to such a catastrophe is limited, thus ensuring that the ecosystems and watersheds affected by these fires are altered permanently. And this all due to a collision between a rather innocent decision by a cattle farmer to feed cows a sweeter, more nutrient dense grass with the unanticipated arrival of climate-related long-term drought. Further human choices have meant that these grasses remain unmanaged on public lands due to cuts in government agency budgets. Left unattended, the grasses proliferate and the desert burns<sup>13</sup>.

## Conclusion

While it is worthwhile noting that climate history is difficult, it may not be as overwhelming as it seems. Climate change as a topic (both in its early form and today) is unwieldy, all-encompassing, and abstract. It is full of abrupt and slow changes, reversals, pulses, equilibriums, and, for our students, many false preconceptions. It is largely written by scientists and displayed in chart rather than narrative form. If left to geochemists and climatologists armed with their dry «facts», climate might not be connected to the political, economic, and social changes left in its wake, but it needs to be, which is why it should be at home in a history class. The lack of certainty and constant contingency of the climate makes for a muddled story of short- and long-term change and consistent variability based on decisions humans make about how they will use, interact with, and think about the uninhabited parts of the Earth. This complexity is at the core of great history. From it emerge techniques and temptations that suggest how to plan a course, how students might approach the past, and how we may move forward toward a more sustainable future.

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<sup>13</sup> Stephen J. PYNE has written 15 monographs on the history of wildfires and is the leading expert on this area of climate history. To learn more about his work on global fire and what he has termed the «pyrocene», see <http://www.stephenpyne.com/index.htm>, consulted on 24.08.2020.

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