

## **HUMN 4325**

### **Frozen! The Climate Crisis of 1816 and Its Lessons for Today**

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*FROZEN! The Climate Crisis of 1816* is an elective I teach regularly at Wentworth Institute of Technology in Boston. We do not currently offer a major in English. (Our students pursue bachelor's degrees in architecture, industrial design, applied math, six fields of engineering, construction management, and computer science.) Because of the university's orientation toward STEAM, I've designed the class so that our engagement with Romanticism emerges within an interdisciplinary context. Therefore, I believe this submission offers a valuable model for revivifying Romanticism in a non-liberal arts setting.

Our starting point for the class is the eruption of Mt. Tambora in April of 1815, which caused a three-year global weather catastrophe and ushered in the last great subsistence crisis of the West. Geographically, the syllabus moves from the British East Indies to the U.S. and Europe, with special focus, of course, on Geneva in the summer of 1816. We also move forward in time so that after many weeks examining what Coleridge called "end of the world weather," we broach climate disruption in our own day.

Throughout the semester, our engagement with literature evolves from the students' orientation in the technical fields. For example, as you'll see below, a colleague from Applied Math visits the class to explore the first known global pandemic, an outbreak of cholera in the wake of Tambora's eruption. She leads the students in using simulation software to model disease transmission; together, they also digest data offered in a scientific paper on aquatic reservoirs. Then, during the following class, I introduce materials I've pulled from the local historical society. These include notices from city and state boards of health exposing the putative connection between susceptibility and social class—and also a poem titled "Lines Composed on the Prevailing Malignant Cholera," which anticipates the arrival of the disease on the east coast of the U.S. We find that the software, scientific paper, and communiqués provide important context for understanding the artistic choices the poet has made in his work. As even this single example shows, the quantitative and qualitative effectively catalyze each other.

Moreover, it suggests the degree to which canonical Romantic texts are complemented in the syllabus by works across a broad range of literary forms. Through this approach, my students come to understand that climate is not just a set of data (as important as those data are); climate is also a discourse with a cultural history that can be illuminated through literary study. If, as Lawrence Buell has maintained, our current environmental emergency involves a crisis of the imagination, my class presents Romanticism as just such a literature of crisis.

By the end of the semester, we venture appropriate connections between that two-hundred-year-old phenomenon of global cooling and our own experience of planetary warming. Here, we engage more fully with the only text I require for purchase, Maureen McLane's 2014 volume *This Blue: Poems*. Her

work allows us to see this literary tradition freshly deployed, asking: How do we keep the fragility of climate before us? How do we weather our own times?

Other features to highlight include an emphasis on archival research; the deployment of interdisciplinary teamwork; inclusion of what we call an “external partner” on the final day of class; and the generosity of colleagues who offer guest lectures. What follows is an example of a spring semester calendar.

<b>CLASS SCHEDULE</b>	
<b>Class #</b>	<b>// Subject and/or assignments due</b>
<b>1</b>	<b>INTRODUCTION AND OVERVIEW</b>
<b>2</b>	<p><b>Assignment: Read these two articles on Blackboard and complete Response Paper 1</b></p> <ul style="list-style-type: none"> <li>• Weisburd, Stefi. “Excavating Words: A Geological Tool.” <i>Science News</i> 127.6 (9 Feb. 1985): 91–94.</li> <li>• Boers, Bernice De Jong. “Mount Tambora in 1815: A Volcanic Eruption in Indonesia and Its Aftermath.” <i>Indonesia</i> 60 (1995): 37–60.</li> </ul> <p><b><u>In-class focus:</u></b> the Little Ice Age (climatic context) and frost fairs on the Thames (cultural context) “Great Britain’s Wonder, or, London’s Admiration.” Printed by Haley and Millett, London, 1684.</p>
<b>3</b>	<p><b>Assignment: Read these two items and complete Response Paper 2</b></p> <ul style="list-style-type: none"> <li>• Raffles, Sir Thomas Stamford. “Narrative of the Effects of the Eruption from the Tomboro [<i>sic</i>] Mountain in the Island of Sumbawa.” <i>Batavian Transactions</i> 8 (1816): 1–25.</li> <li>• Wood, Gillen D’Arcy. <i>Tambora: The Eruption that Changed the World</i>. Princeton UP, 2014, pp. 27–32.</li> </ul> <p><b><u>In-class resources:</u></b></p> <ul style="list-style-type: none"> <li>• Dedication and introduction to Raffles, <i>History of Java</i></li> <li>• Visual survey: orientalism via the works of Ingres, Felton, Matisse, Assaydi</li> <li>• Maureen McLane’s poem “Ice People, Sun People”</li> </ul>
<b>4</b>	<p><b>Assignment: Each interdisciplinary team should read its assigned article and report to the class, amplifying with any outside research you feel illuminates the text—</b></p> <ul style="list-style-type: none"> <li>• Payne, Richard J. “The ‘Meteorological Imaginations and Conjectures’ of Benjamin Franklin.” <i>North West Geography</i> 10 (2010).</li> <li>• Guevara-Murua, A., et al. “Observations of a stratospheric aerosol veil from a tropical volcanic eruption in December 1808: is this the Unknown ~ 1809 eruption?” <i>Climate of the Past</i> 10.5 (2014): 1707–22.</li> <li>• Johnston, Emma. “Up from the Ashes,” <i>Popular Archaeology</i>, June 2012.</li> <li>• Sutawidjaja, Igan S. et al. “Characterization of Volcanic Deposits and Geoarchaeological Studies from the 1815 Eruption of Tambora Volcano.” <i>Jurnal Geologi Indonesia</i> 1.1 (2006): 49–57.</li> </ul>

5	<p><b>Assignment: Work on archival report continues</b>  <b>Guest Lecture</b> by Professor Greg Sirokman (Chemistry): The physics and chemistry of volcanic explosion and impact on climate</p>
6	<p><b>Assignment: Work on archival report continues</b>  <b>In-class activities:</b> preparing for your archives-based project by examining the following articles:</p> <ul style="list-style-type: none"> <li>• <i>Daily National Intelligencer</i>, Sep 30, 1816</li> <li>• <i>Niles Register</i>, August 10, 1816</li> <li>• <i>Morning Chronicle</i>, October 4, 1817</li> <li>• <i>Leeds Mercury</i>, February 1816</li> <li>• <i>Providence Patriot</i>, “The Great Storm,” Sep. 1815</li> <li>• <i>Raleigh Register</i>, May 10, 1816</li> </ul>
7	<p><b>Assignment: Archival report due</b>  <b>Goals:</b> assess how the eruption of Tambora affected New England and northern Europe by accessing databases of 19<sup>th</sup>-century newspapers; distinguish between primary and secondary sources; evaluate data that is not numerical or scientific.</p> <p>VISIT TO SCHUMANN LIBRARY AND LEARNING COMMONS to begin Team Work</p>
8	<p><b>In-class activities:</b> Volcanoes in Western cultural tradition  Central texts:</p> <ul style="list-style-type: none"> <li>• Felicia Hemans, “The Image in Lava,” 1827</li> <li>• Byron, “Darkness,” 1816</li> </ul> <p>Also considered:</p> <ul style="list-style-type: none"> <li>• Pliny the Younger’s eyewitness account of Vesuvius’s eruption 79 CE</li> <li>• Levi, Primo. “The Girl of Pompeii.”</li> </ul> <p><b>Image survey:</b> Vesuvius in works by Joseph Wright of Derby, Jacobin pamphleteers, John Martin, J. M. W. Turner, Andy Warhol, and Andrew McCollum (“The Dog of Pompeii”)</p>
9	<p><b>Assignment: Read this article and complete Response Paper 3</b></p> <ul style="list-style-type: none"> <li>• Bewell, Alan. “Jefferson’s Thermometer: Colonial Biogeographical Constructions of the Climate of America.” <i>Romantic Science: The Literary Forms of Natural History</i>. Noah Heringman, ed. Albany: SUNY P 2003. 111–38.</li> </ul> <p><b>In-class resources:</b></p> <ul style="list-style-type: none"> <li>• Giaimo, Cara. “Thomas Jefferson Built This Country on Mastodons.” <i>Atlas Obscura</i>, 2 July 2015.</li> </ul>
10	<p><b>Assignment: 2 Teams present</b></p> <p><i>Team 1: Food riots and political unrest in England</i>  Related resources:</p> <ul style="list-style-type: none"> <li>• Shelley, <i>The Masque of Anarchy</i> (excerpted)</li> </ul>

	<ul style="list-style-type: none"> <li>British Library page on the Peterloo Massacre</li> <li>Hannah More, “Half a Loaf is Better than None”</li> </ul> <p><i>Team 2: Tree rings as proxy data</i> Related resource:</p> <ul style="list-style-type: none"> <li>Bartholomaus Traubeck, “Years,” musical composition that “plays” a section of tree</li> </ul>
11	<p><b>Assignment: 2 Teams present</b></p> <p><i>Team 3: The Erie Canal</i> Related resource:</p> <ul style="list-style-type: none"> <li>Lewis Leary, “Phillip Freneau at Seventy,” <i>The Journal of the Rutgers University Library</i> 1.2 (June 1938), pp. 1–13.</li> </ul> <p><i>Team 4: Luke Howard</i> Related resources:</p> <ul style="list-style-type: none"> <li>Luke Howard, <i>The Climate of London</i> (1818)</li> <li>Luke Howard, <i>Essay on the Modification of Clouds</i> (1803), reprint 1832.</li> <li>Goethe, “In Honor of Mr. Howard”</li> </ul>
12	<p><b>Assignment: 2 Teams present</b></p> <p><i>Team 5: British exploration of North Pole and Barrow’s role</i> Related resources:</p> <ul style="list-style-type: none"> <li><i>Arctic Expeditions</i>, an 1818 poem by Eleanor Anne Porden, first wife of explorer Franklin</li> <li>Siobhan Carroll, “Crusades Against Frost: <i>Frankenstein</i>, Polar Ice, and Climate Change in 1818,” <i>European Romantic Review</i>, 24:2 (2013), pp. 211-230.</li> <li>excerpt from John Franklin’s journal of his 1819–1822 expedition to the North Pole from Elizabeth Kolbert, ed. <i>The Ends of the Earth: An Anthology of the Finest Writing on the Arctic and the Antarctic</i>, Vol. 1. Granta, 2007, pp. 9–13.</li> </ul> <p><i>Team 6: Ice cores as proxy data</i> Related resources:</p> <ul style="list-style-type: none"> <li>Escher de la Linth, “A Description of the Val de Bagnes . . . June 1818.” <i>Blackwood’s Edinburgh Magazine</i>, vol. 4, October 1818-March 1819, pp. 87–95.</li> <li>Maureen McLane’s poem “Glacial Erratic”</li> </ul>
13	<p><b>Assignment: Read these items in preparation for class discussion</b></p> <ul style="list-style-type: none"> <li>“Letters to Mrs. Saville” [opening frame of <i>Frankenstein</i>, 1818 text]</li> <li>“Expedition to the Northern Ocean,” <i>Edinburgh Monthly Magazine</i>, April 1818</li> </ul> <p><b>In-class activities:</b> The Geneva summer; comparison of Alps passages in 1818 and 1831 texts of <i>Frankenstein</i>. Topics: mutability; discourse of mastery vs. discourse of fragility</p>
14	<p><b>Assignment: Read these articles and complete Response Paper 4</b></p>

	<ul style="list-style-type: none"> <li>Webb, Patrick. "Emergency Relief during Europe's Famine of 1817 Anticipated Crisis-Response Mechanisms of Today." <i>The Journal of Nutrition</i> July 2002. 132.7: 2092S-2095S.</li> <li>Wood, Gillen D'Arcy. "Frankenstein, the Baroness, and the Climate Refugees of 1816." <i>Public Domain Review</i>, 15 June 2016.</li> </ul> <p><b>Related resource:</b></p> <ul style="list-style-type: none"> <li>Ville Saarinen and Juho Ojala, "The Flow Towards Europe," updated Feb. 2018. <a href="http://www.lucify.com/the-flow-towards-europe/">http://www.lucify.com/the-flow-towards-europe/</a></li> </ul>
15	<b>Guest Lecture</b> by Prof. Lawrence DeGeest (Economics): The economic crisis of 1819 in the United States due to fluctuations in grain markets
16	<p><b>SITE VISIT TO MUSEUM OF FINE ARTS</b></p> <p><b>Assignment:</b> Contribute to discussion board on one of works on our itinerary. Which of the four functions of art does the work fulfill in relation to climate disruption?</p>
17	<p><b>Assignment: read this article and complete Response Paper 5</b></p> <ul style="list-style-type: none"> <li>Zerefos, C. S., et al., "Atmospheric effects of volcanic eruptions as seen by famous artists and depicted in their paintings." <i>Atmospheric Chemistry and Physics</i> 7 (2007): 4027–42.</li> </ul> <p><b>In-class visual survey:</b> Sky paintings of Turner and Constable</p>
18	<p><b>Guest Lecture:</b> Prof. Mami Wentworth (Applied Math) on the cholera pandemic after Tambora</p> <p><b>In-class resource:</b></p> <ul style="list-style-type: none"> <li>Mari et al., "Modelling Cholera Epidemics: The Role of Waterways, Human Mobility, and Sanitation." <i>Journal of the Royal Society Interface</i> 9 (2012): 376–88. Royal Society Interface. 13 July 2011.</li> </ul> <p><b>In-class activities:</b> modeling of cholera pandemic using SiR simulation software. Each team will complete the mini-lab, inputting new variables and values. Did Tambora cause the first global pandemic?</p>
19	<p><b>Assignment:</b> Annotated Bibliography due</p> <p><b>In-class resources:</b></p> <ul style="list-style-type: none"> <li>Poem about cholera:</li> <li>Baily, Edward. "Lines Composed on the Prevailing Malignant Cholera." 1832. Broadside. Lansingburgh, NY. Historical Society.</li> <li>Boston Board of Health letter about approaching disease</li> <li>Suburban town's 1832 broadside about cholera and social class</li> <li>Cholera maps <a href="https://www.nlm.nih.gov/exhibition/cholera/images.html#maps">https://www.nlm.nih.gov/exhibition/cholera/images.html#maps</a></li> <li>How cholera was finally understood to be waterborne: <a href="http://www.choleraandthethames.co.uk/">http://www.choleraandthethames.co.uk/</a></li> </ul>

20	<b>Guest Lecture:</b> Professor Robert Cowherd (Architecture) on his work in Bali and Jakarta.
21	<b>In-class activity:</b> Keats, “To Autumn” Bring to class: McLane, Maureen N., <i>This Blue: Poems</i> . New York: Farrar Straus Giroux, 2014.
22 & 23	<b>13 students present work in progress (individual research)</b> Half the class will present in this “dynamic poster session”: each student will set up a laptop to scroll a visual overview of his or her research project. All students will provide feedback via backchannel, which will be projected in real time onto front screen.  <b>In-class activity:</b> Maureen McLane, <i>This Blue: Poems</i> .
24	<b>Assignment: read this article and short story and respond to prompt via Discussion Board</b> <ul style="list-style-type: none"> <li>• Ullrich, J. K. “Climate Fiction: Can Books Save the Planet?” <i>The Atlantic</i> 14 Aug. 2015. Web. 27 Dec. 2015.</li> <li>• Margaret Atwood, “Time Capsule Found on the Dead Planet”</li> </ul>
25	Last regularly-structured class: <b>SUMMARY OF THE SEMESTER</b>  <b>In-class activity:</b> Select one poem from a list of McLane works and use it as a prompt for your “concluding remarks” on the semester.  <b>Guest lecture:</b> Founder and CEO of a company crowd-sourcing data on climate change in mountainous regions used for sport.
26	<b>Individual research essay due.</b>