Event	Timescale	Temperature change	Spatial scale	Reference
Younger Dryas (onset)	20-50 yrs (1300 yrs)	cooling ($5-15\,^{\circ}$C)	global	Berger (1990); Alley et al. (1993); Carlson (2010)
End of Younger Dryas	1-40 yrs	warming ($10-18\,^{\circ}$C)	global/ Greenland*	Cuffey and Clow (1997); Alley (2000*b*); Augustin et al. (2004)
Anthropogenic climate change (1970-current)	40 yrs	warming ($0.6\,^{\circ}$C)†	global	IPCC Core Writing Team et al. (2007)
Anthropogenic climate change (projected 1970-2100)	130 yrs	warming ($1.7-4.4\,^{\circ}$C)	global	IPCC Core Writing Team et al. (2007)
8.2K event	20 yrs (150 yrs)	cooling ($3-4\,^{\circ}$C)	global	Kobashi et al. (2007)
Ice ages/Glaciations (periodicity)	100,000 yrs	cooling ($7-10\,^{\circ}$C)	global	(Shackleton, 2000; Kump et al., 2009; Abe-Ouchi et al., 2013)
Cold front	hours to days	cooling ($10-30\,^{\circ}$C)	100s-1000s of kilometers	Ahrens (2007)
Heat waves	days to weeks	warming ($5-15\,^{\circ}$C)	100s-1000s of kilometers	Robinson (2001)
Heat Burst	minutes	warming ($5-20\,^{\circ}$C)	meters to kilometers	American Meteorological Society (2013)
Jet Stream/NAO	days to weeks	warming or cooling ($2-5\,^{\circ}$C)	100s-1000s of kilometers	Hurrell et al. (2003)
Volcanoes	months to years	cooling ($0.2-1\,^{\circ}$C)	1000s of kilometers to global	Shindell et al. (2004); Gleckler et al. (2006); Emile-Geay et al. (2008)
Dansgaard-Oeschger events	30-40 years	warming ($5-8\,^{\circ}$C)	Northern Hemisphere	Alley (2000*a*)

Table S1: Supporting information for Figure 4. Note that temperature change ranges represent both uncertainty and/or variability across regions. Timescale generally refers to the length of time for climate change, but we give duration of events parenthetically when highly different and not shown on the figure. *Event was global but temperature change given is for Greenland. †Based on the moderate (A1B) emissions scenario.

Supporting information for Figure 9:

For (a) we used data from Harvard Forest (USA) and calculated first flowering day (FFD) as the day of year when the percentage of flower buds open on a tree was > 0. Further details on these data can be found in Farnsworth et al. (1995); Wolkovich et al. (2012). We thank John O'Keefe for the collection of these data. For (b) Drought data are from the half degree version of the North American Drought Atlas, a tree ring based reconstruction of the Palmer Drought Severity Index (PDSI) (Cook et al., 2010). PDSI is a normalized index of drought, with positive values indicating wetter than normal conditions (pluvials) and negative values indicating drier than normal conditions (droughts). The time series for the PDSI are averaged for the Central Plains (32N-46N, 105W-90W), and drought durations are calculated based on consecutive years with PDSI$<$0.

References

Abe-Ouchi, A., F. Saito, K. Kawamura, M. E. Raymo, J. Okuno, K. Takahashi, and H. Blatter. 2013. Insolation-driven 100,000-year glacial cycles and hysteresis of ice-sheet volume. Nature 500:190–+.

Ahrens, D. C. 2007. Meteorology Today: an introduction to weather, climate, and the environment. Thomas Learning, Inc.

Alley, R. 2000*a*. Ice-core evidence of abrupt climate changes. Proceedings of the National Academy of Sciences of the United States of America 97:1331–1334.

———. 2000*b*. The Younger Dryas cold interval as viewed from central Greenland. Quaternary Science Reviews 19:213–226.

Alley, R., D. Meese, C. Shuman, A. Gow, K. Taylor, P. Grootes, J. White, M. Ram, E. Waggington, P. Mayewski, and G. Zielinksi. 1993. Abrupt increase in greenland snow accumulation at the end of the Younger Dryas event. Nature 362:527–529.

American Meteorological Society. 2013. Glossary of meteorology.

Augustin, L., C. Barbante, P. Barnes, J. Barnola, M. Bigler, E. Castellano, O. Cattani, J. Chappellaz, D. DahlJensen, B. Delmonte, G. Dreyfus, G. Durand, S. Falourd, H. Fischer, J. Fluckiger, M. Hansson, P. Huybrechts, R. Jugie, S. Johnsen, J. Jouzel, P. Kaufmann, J. Kipfstuhl, F. Lambert, V. Lipenkov, G. Littot, A. Longinelli, R. Lorrain, V. Maggi, V. Masson-Delmotte, H. Miller, R. Mulvaney, J. Oerlemans, H. Oerter, G. Orombelli, F. Parrenin, D. Peel, J. Petit, D. Raynaud, C. Ritz, U. Ruth, J. Schwander, U. Siegenthaler, R. Souchez, B. Stauffer, J. Steffensen, B. Stenni, T. Stocker, I. Tabacco, R. Udisti, R. van de Wal, M. van den Broeke, J. Weiss, F. Wilhelms, J. Winther, E. Wolff, M. Zucchelli, and E. C. Members. 2004. Eight glacial cycles from an Antarctic ice core. Nature 429:623–628.

Berger, W. H. 1990. The Younger Dryas cold spell - a quest for causes. Global and Planetary Change 89:219–237.

Carlson, A. E. 2010. What caused the Younger Dryas cold event? Geology 38:383–384.

Cook, E. R., R. Seager, R. R. Heim, R. S. Vose, C. Herweijer, and C. Woodhouse. 2010. Megadroughts in north america: placing ipcc projections of hydroclimatic change in a long-term palaeoclimate context. Journal of Quaternary Science 25:48–61.

Cuffey, K., and G. Clow. 1997. Temperature, accumulation, and ice sheet elevation in central Greenland through the last deglacial transition. Journal of Geophysical Research-Oceans 102:26383–26396.

Emile-Geay, J., R. Seager, M. A. Cane, E. R. Cook, and G. H. Haug. 2008. Volcanoes and ENSO over the past millennium. Journal of Climate 21:3134–3148.

Farnsworth, E. J., J. NunezFarfan, S. A. Careaga, and F. A. Bazzaz. 1995. Phenology and growth of three temperate forest life forms in response to artificial soil warming. Journal of Ecology 83:967–977.

Gleckler, P., T. Wigley, B. Santer, J. Gregory, K. AchutaRao, and K. Taylor. 2006. Krakatoa's signature persists in the ocean. Nature 439:675.

Hurrell, J. W., Y. Kushnir, G. Ottersen, and V. M. 2003. The North Atlantic Oscillation: Climatic Significance and Environmental Impact, vol. 134 of *Geophysical Monograph Series*. AGU, Washington, D. C.

IPCC Core Writing Team, R. K. Pachauri, and A. Reisinger. 2007. IPCC, 2007: Climate Change 2007: Synthesis Report. Contribution of Working Groups I, II and III to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change. IPCC, Geneva, Switzerland.

Kobashi, T., J. P. Severinghaus, E. J. Brook, J.-M. Barnola, and A. M. Grachev. 2007. Precise timing and characterization of abrupt climate change 8200 years ago from air trapped in polar ice. Quaternary Science Reviews 26:1212–1222.

Kump, L. R., J. F. Kasting, and R. G. Crane. 2009. The Earth System, chap. 14: Pleistocene Glaciations, page 432. 3rd ed. Prentice Hall.

Robinson, P. 2001. On the definition of a heat wave. Journal of Applied Meteorology 40:762–775.

Shackleton, N. J. 2000. The 100,000-year ice-age cycle identified and found to lag temperature, carbon dioxide, and orbital eccentricity. Science 289:1897–1902.

Shindell, D., G. Schmidt, M. Mann, and G. Faluvegi. 2004. Dynamic winter climate response to large tropical volcanic eruptions since 1600. Journal of Geophysical Research-Atmospheres 109.

Wolkovich, E. M., B. I. Cook, J. M. Allen, T. M. Crimmins, J. L. Betancourt, S. E. Travers, S. Pau, J. Regetz, T. J. Davies, N. J. B. Kraft, T. R. Ault, K. Bolmgren, S. J. Mazer, G. J. McCabe, B. J. McGill, C. Parmesan, N. Salamin, M. D. Schwartz, and E. E. Cleland. 2012. Warming experiments underpredict plant phenological responses to climate change. Nature 485:494–497.