



Introduction to Phenology

Nature's Notebook video series

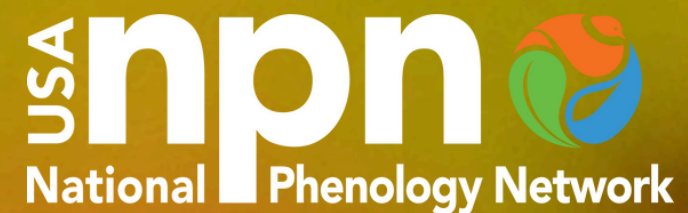




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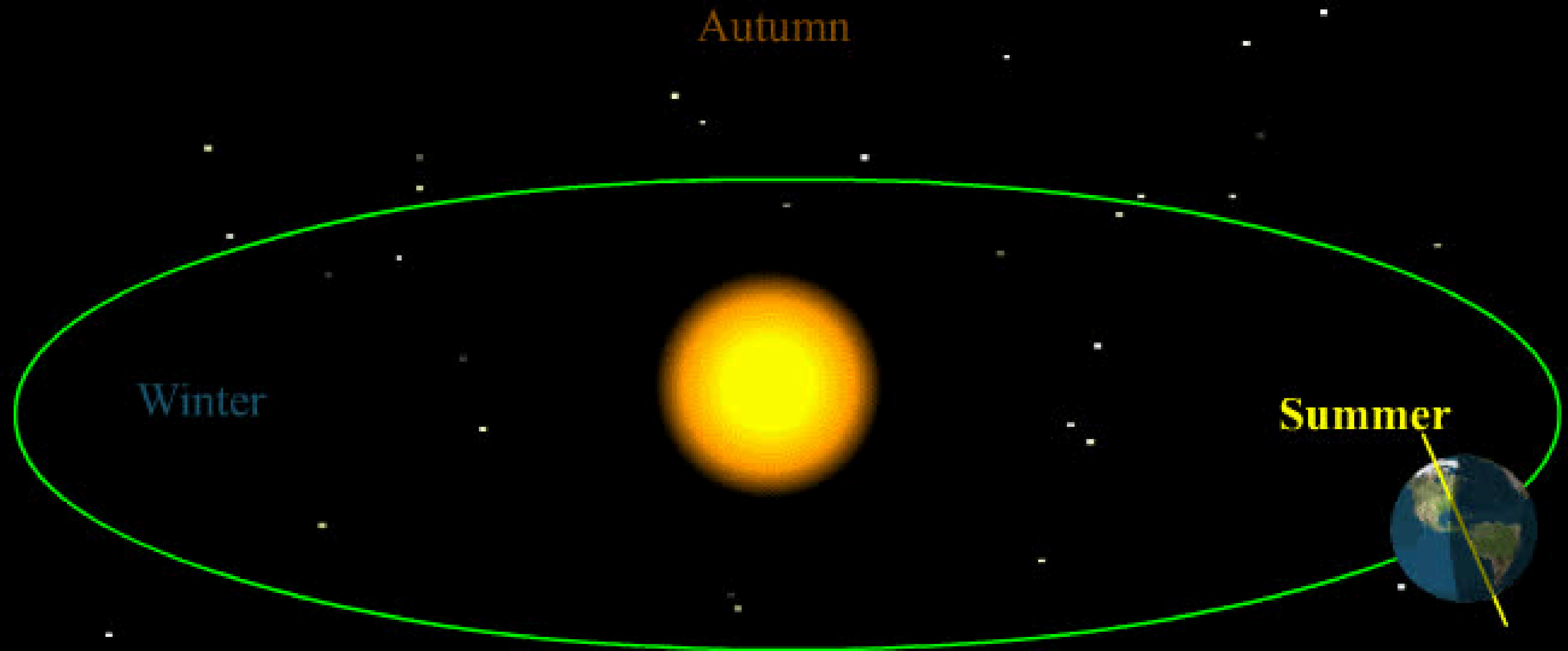


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Season designations are for Northern Hemisphere



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Spring

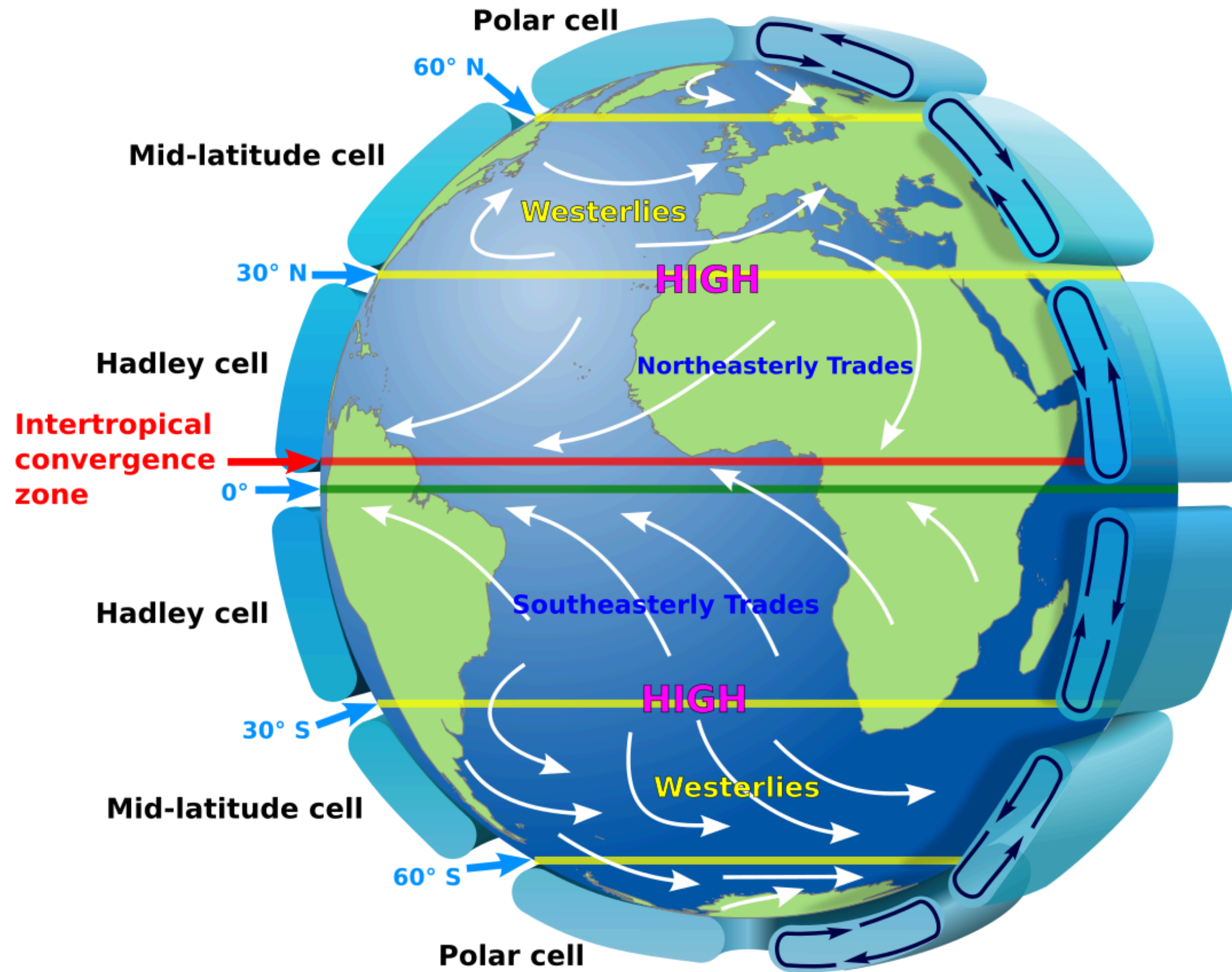




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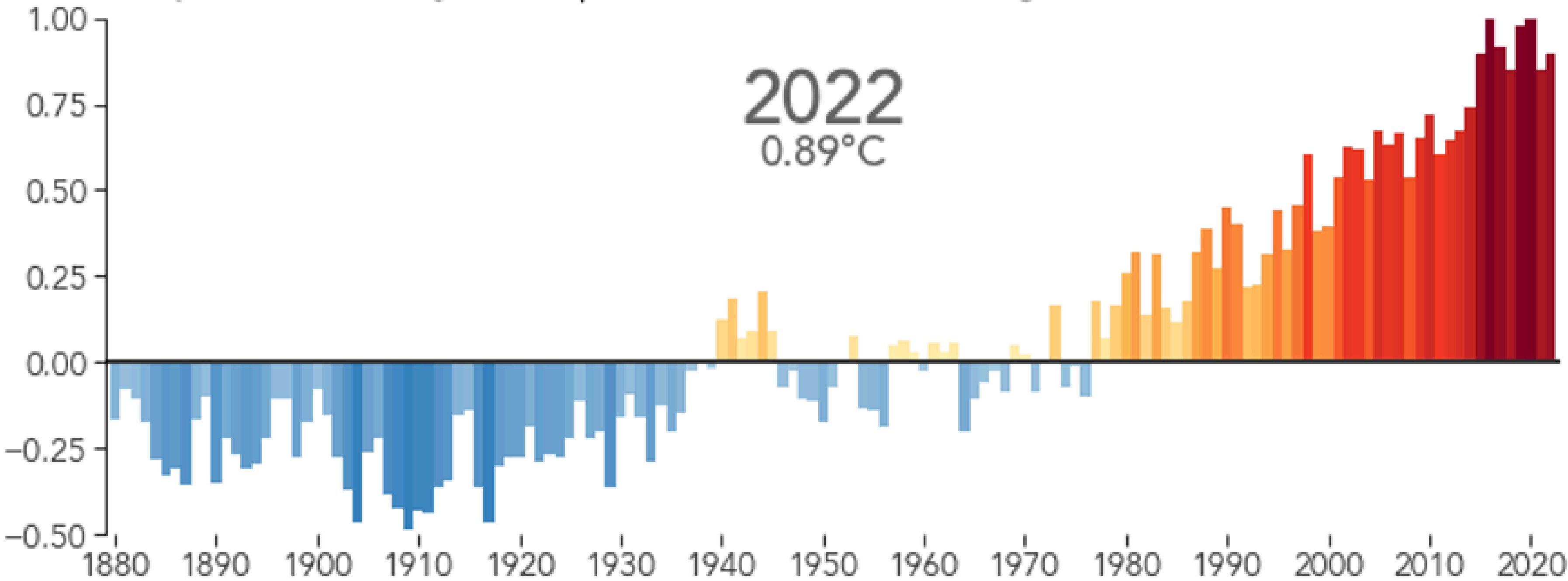
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Last 9 Years Warmest on Record

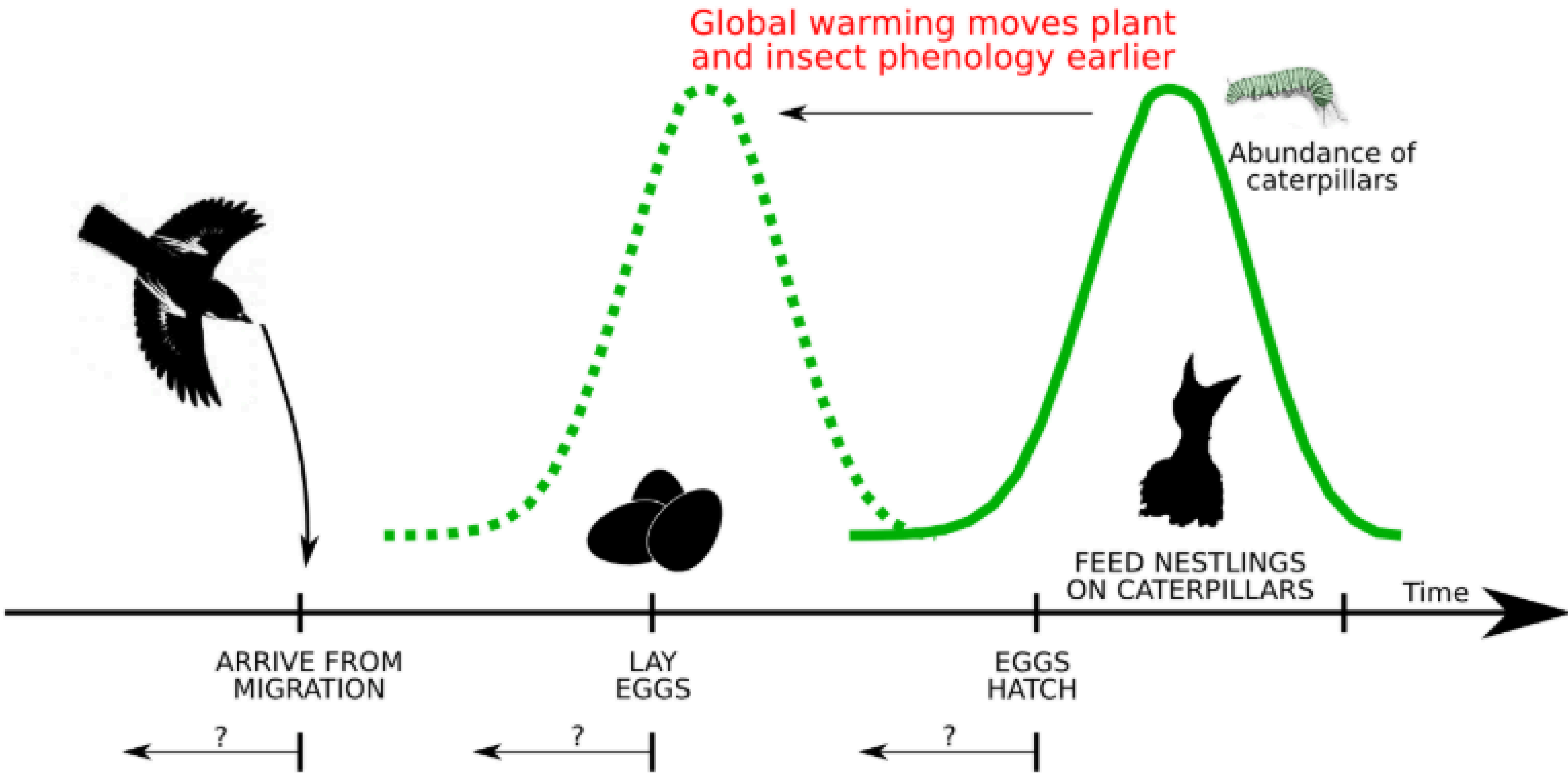
Global Temperature Anomaly (°C compared to the 1951-1980 average)



Credit: earthobservatory.nasa.gov/world-of-change/global-temperatures

Average global shift of 4 days,
across plants and animals

Source: *Phenology*, Theresa Crimmins;
Photo: Maria Cassagne via Unsplash, Public Domain



What will be the effect on migratory bird phenology?

Phenology is “perhaps the simplest process in which to track changes in the ecology of species in response to climate change”

Intergovernmental Panel on Climate Change, 2007

Photo: Brian F Powell

Henry David Thoreau

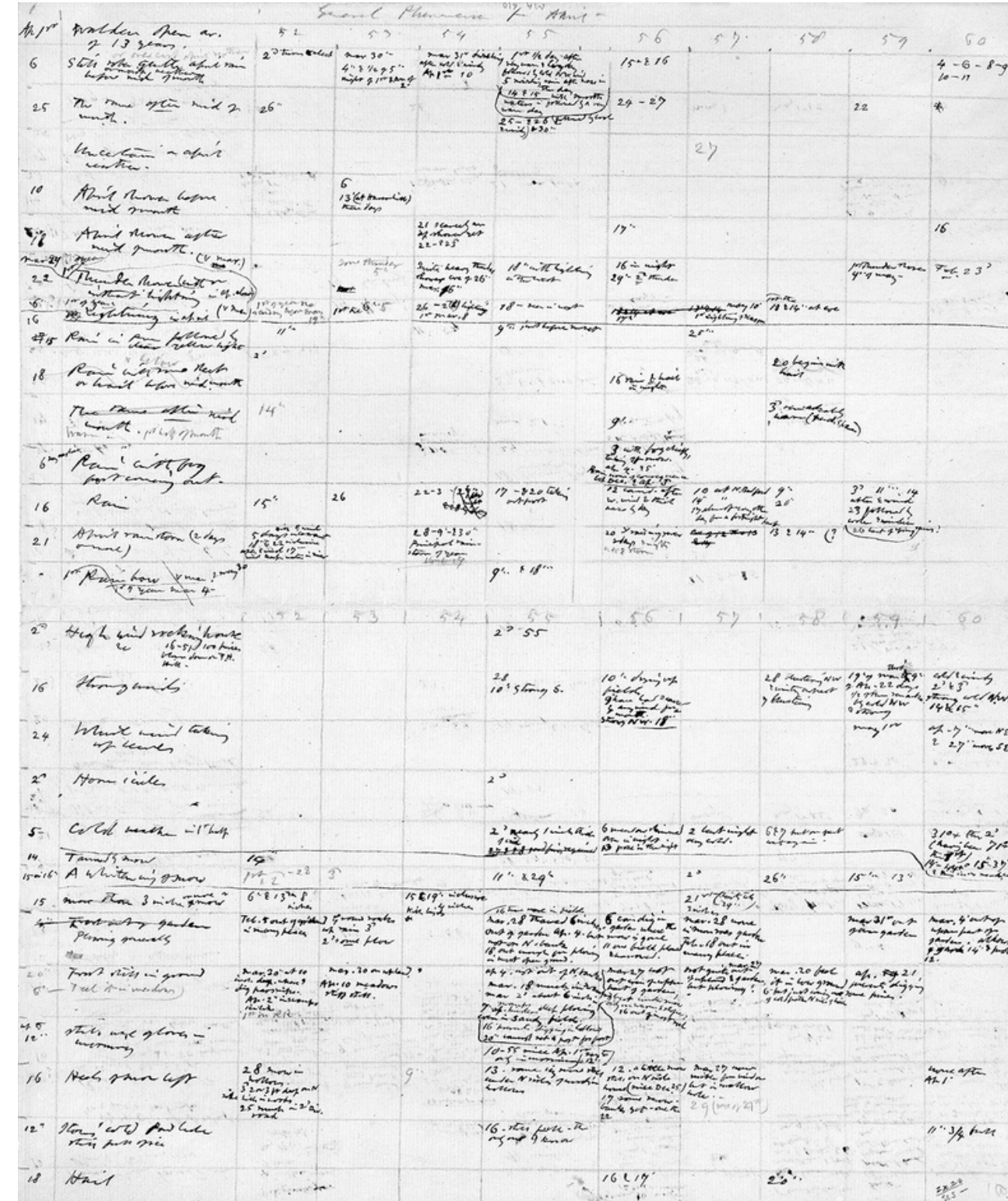


Photo (left): Benjamin D. Maxham via Wikipedia, Public Domain

Credit (right): The Pierpont Morgan Library New York

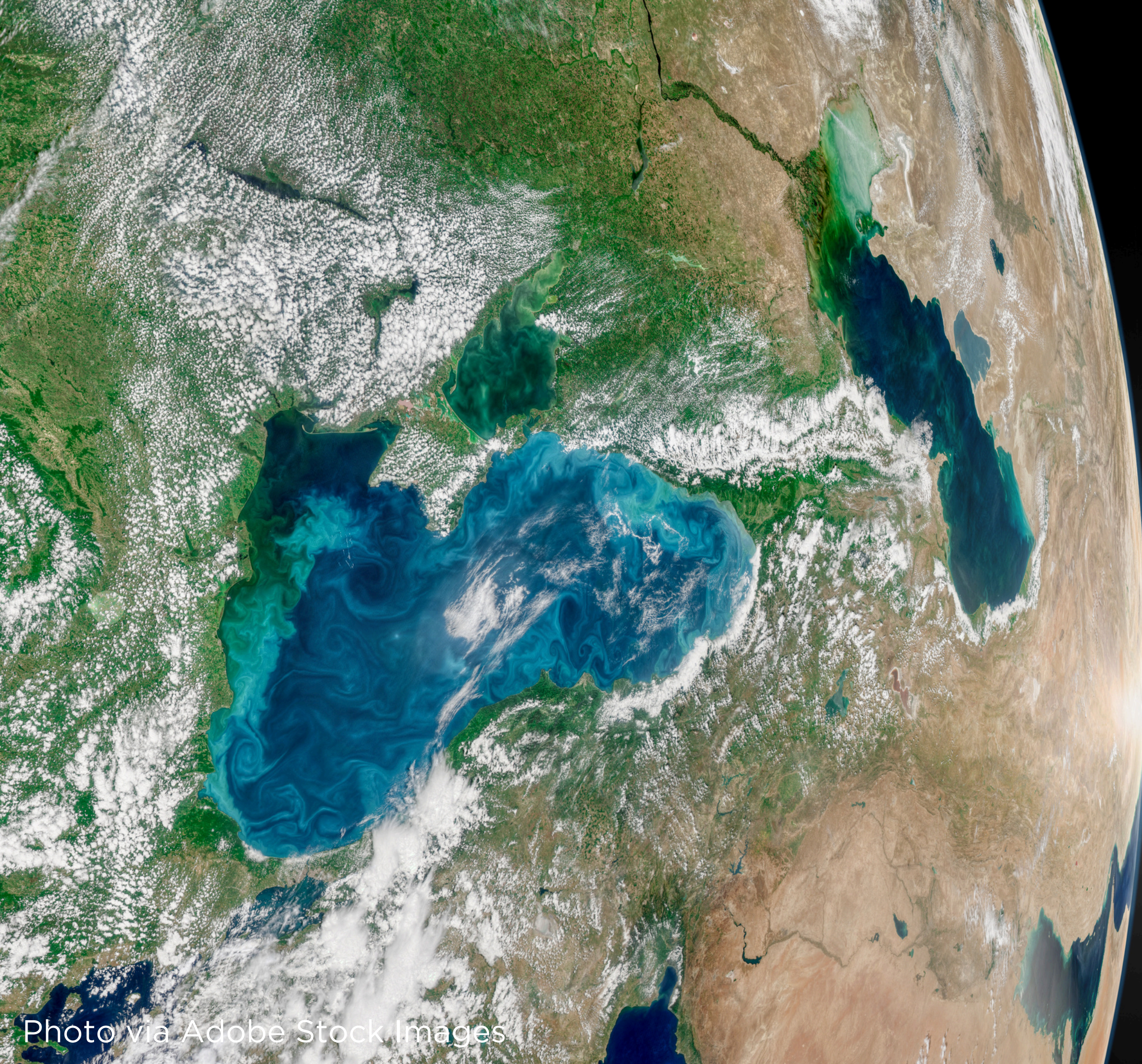


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References (in order cited)

Crimmins, Theresa M. *Phenology*. Cambridge, Massachusetts : The MIT Press, 2025.

IPCC, 2007: Climate Change 2007: Impacts, Adaptation and Vulnerability. Contribution of Working Group II to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change, M.L. Parry, O.F. Canziani, J.P. Palutikof, P.J. van der Linden and C.E. Hanson, Eds., Cambridge University Press, Cambridge, UK, 976pp.

This video was created September 2025