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Democracy Dies in Darkness

When winter ends: A guide to what happens during Monday's spring equinox

Monday's equinox is at 5:24 p.m. Eastern, heralding spring's arrival in the Northern Hemisphere

By Justin Grieser

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The weather may still be chilly, but Monday's equinox is a reminder that warmer days are on our doorstop. The vernal (or spring) equinox, which arrives March 20 at 5:24 p.m. Eastern time, signals the end of winter and first day of spring in the Northern Hemisphere.

Equinoxes happen twice a year, in March and September. They occur halfway between the winter and summer solstices and mark the precise moment in time when the sun appears directly over the Earth's equator.

What happens on the vernal equinox?

During the March equinox, the sun's direct rays cross Earth's equator into the Northern Hemisphere. It's the first day of astronomical spring in North America, Europe and Asia, while in the Southern Hemisphere, summer is transitioning to autumn.

The reason we have equinoxes and seasons is because we don't orbit the sun completely upright. Because Earth is tilted on its axis by about 23.5 degrees, the Northern and Southern hemispheres receive different amounts of sunlight throughout the year. On the spring and autumnal equinoxes, however, both hemispheres receive equal amounts of the sun's energy. As a result, day and night are nearly equal everywhere on Earth.

Equal day and night? Not quite.

Though “equinox” comes from the Latin words “aequus” (equal) and “nox” (night), the length of day and night are not exactly 12 hours.

Washington, D.C., for example, sees 12 hours 8 minutes of daylight on Monday, with sunrise at 7:11 a.m. and sunset at 7:19 p.m. The date of the “equilux” — when sunrise and sunset are closest to 12 hours apart — occurs a few days before the equinox, on March 16 or 17 for most of the Lower 48 states.

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The equilux is the date that is closest to having exactly 12 hours of daylight. For areas north of about 37°N, today is the equilux. For most areas south of 37°N, it was yesterday. [Note, these lines are different every year.]

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There are two reasons we have more than 12 hours of daylight on the equinox.

One is how we define the term “sunrise” and “sunset” to measure the length of a day. The sun appears as a disk, not a discrete point in the sky like a nighttime star. Sunrise occurs the moment the sun’s upper edge appears on the horizon, while sunset doesn’t happen until the sun’s upper edge completely dips below it. If you’ve ever watched a sunset, you’ve likely noticed that it takes a few minutes for the sun to fully disappear from the sky.

Moreover, the Earth’s atmosphere can refract, or bend, the sun’s light. This optical illusion allows us to see the sun at sunrise and sunset when it’s technically below the horizon.

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Map showing how much daylight there is on the March (Vernal) Equinox.

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Together, these two factors — atmospheric refraction and how we measure the length of daytime — add several minutes of daylight to the equinox. Near the equator, the sun is up for 12 hours 6 minutes, while Earth’s polar regions see about 12 hours 20 minutes of daylight.

Daylight increases rapidly

The days have been steadily getting longer since mid-December, but we experience the fastest increase in daylight around the spring equinox.

The rate of change depends on your latitude, or distance from the equator. D.C. gains 2 minutes 33 seconds of daylight per day, while northern cities like Boston, Chicago and Seattle gain closer to three minutes of daylight. In Anchorage, the sun spends at least 5½ additional minutes above the horizon with each passing day.

As you move closer to the equator, however, the change is less extreme: Miami and Houston, for example, gain less than two minutes of sunlight per day.

The position of sunrise and sunset change

The spring and fall equinoxes are the only times of year when the sun rises due east and sets due west no matter where you live. (The only place this doesn't hold true is near the North and South poles, where the sun is either rising or setting for the first time in six months.)

From now until the summer solstice, the position of sunrise and sunset will keep moving closer to the northern horizon as the sun takes a longer and higher path through the sky. After the summer solstice, the sun's position in the sky retreats south, and the days will get shorter again.

Spring temperature outlook

As the days continue to get longer, temperatures will inevitably march upward as we head toward summer. The National Oceanic and Atmospheric Administration recently released its spring 2023 outlook, and is forecasting above-average temperatures across the eastern and south-central United States. For the West Coast, Rockies and northern Plains, temperatures this spring may end up close to the long-term average.

While spring always has its share of temperature swings, one thing is certain: The equinox means we will see more daylight than darkness for the next six months.