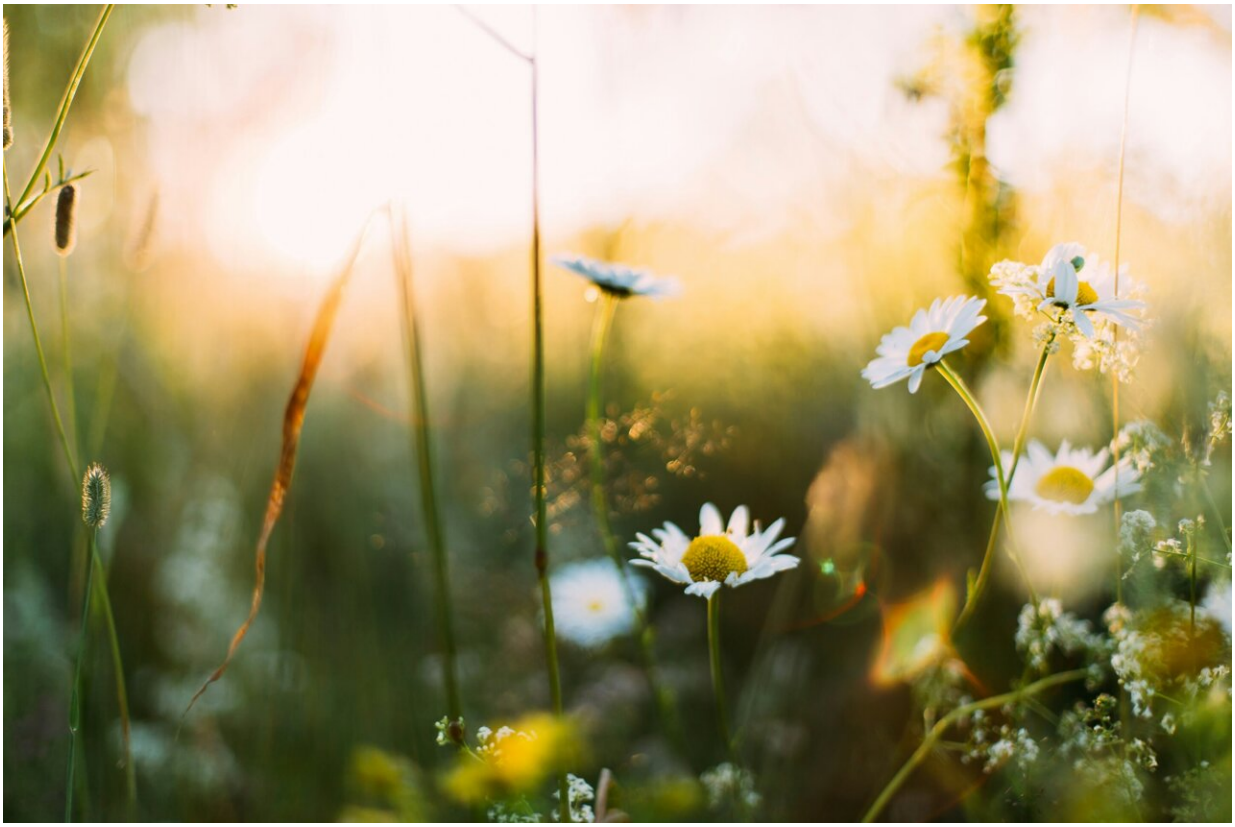
Spring is here: NOAA satellite animation captures vernal equinox

March 20 2024



Credit: Unsplash/CC0 Public Domain

Spring has officially arrived in the Northern Hemisphere, while the Southern Hemisphere is embracing autumn. The start of astronomical spring, known as the vernal equinox, occurred yesterday, March 19,

2024, at 11:06 p.m. EDT.

During equinoxes, which happen twice a year, the Earth's axis is not tilted toward or away from the sun, resulting in nearly equal periods of daylight and darkness worldwide. The term "equinox" is derived from Latin, meaning "equal night," indicating the balance between day and night during these events.

At the equator, the sun shines directly overhead at noon during equinoxes due to this alignment. The "nearly" equal hours of day and night is due to refraction of sunlight, or a bending of the light's rays, that causes the sun to appear above the horizon when the actual position of the sun is below the horizon. Additionally, the days become a little longer at higher latitudes farther from the equator, because it takes the sun longer to rise and set.

Seasonal changes are driven by the Earth's axial tilt of 23.5 degrees as it orbits the sun, exposing different hemispheres to varying sunlight angles and durations throughout the year. Equinoxes mark the moments when the sun rises due east and sets due west for most places on Earth.

This animation was created by taking one GeoColor image a day for a year from GOES East, captured at 11:50 UTC each day, and stringing them together.

In the Northern Hemisphere, meteorological spring is based on temperature cycles and runs from March 1 until May 31, while astronomical spring shifts to summer on the summer solstice, which this year will occur on June 20 at 4:50 p.m. EDT.

NOAA's GOES-16 and GOES-18 satellites, positioned above the equator, track the Earth's surface and observe the terminator—the edge between the shadows of nightfall and the sunlight of dusk and

dawn—providing insights into seasonal changes throughout the year. The slope of the terminator curve changes with the seasons. During an equinox, the terminator is a straight north-south line over the equator.

From their position 22,236 miles above the equator, the GOES satellites orbit at the same rate Earth rotates, so they can keep constant watch over the same region. The GOES East geostationary satellite, also known as GOES-16, keeps watch over most of North America, including the contiguous United States and Mexico, as well as Central and South America, the Caribbean, and the Atlantic Ocean to the west coast of Africa. The GOES West satellite, also known as GOES-18, provides geostationary satellite coverage of the Western Hemisphere, including the United States, the Pacific Ocean, Alaska and Hawaii.

Provided by NOAA Headquarters

Citation: Spring is here: NOAA satellite animation captures vernal equinox (2024, March 20) retrieved 27 April 2024 from https://phys.org/news/2024-03-noaa-satellite-animation-captures-vernal.html