

**Terminators: The Death of Solar Cycles and La Niña 2020**

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The Sun provides the energy required to sustain life on Earth and drive our planet's weather. Over the past few years a new picture to describe solar variability has developed, based on observing bands of magnetism that belong to the Sun's \*22-year\* magnetic activity cycle, and migrate from high latitudes towards the equator. The intra- and extra-hemispheric interaction, so-called "magnetic telecommunication," of these magnetic bands appear to explain the occurrence of decadal scale variability that primarily manifests itself in the sunspot cycle. One of the most important events in the progression of these bands is their death, or termination, at the solar equator that signals a global increase in magnetic activity that becomes the new solar cycle. Their death is NOT dragged out, but abrupt. Indeed, the triggering of growth in the new solar cycle is almost immediate (significantly less than 1 solar rotation). Here we show the particulate and radiative implications of these termination points, their temporal recurrence and signature, from the Sun to the Earth. We show the correlated signature of solar cycle termination events and major oceanic oscillations that extend back many decades. A combined one-two punch of reduced particulate forcing and increased radiative forcing that result from the termination of one solar cycle and rapid blossoming of another correlates strongly with a shift from El Niño to La Niña conditions in the Pacific Ocean. Should current projections of solar magnetic band migration hold, we expect the current solar cycle termination to occur in or around April 2020, and thus we expect to see La Niña conditions develop in the Pacific 2-3 months thereafter. These observations can help us to explore the capability of the Sun to dynamically drive the Earth's atmosphere.