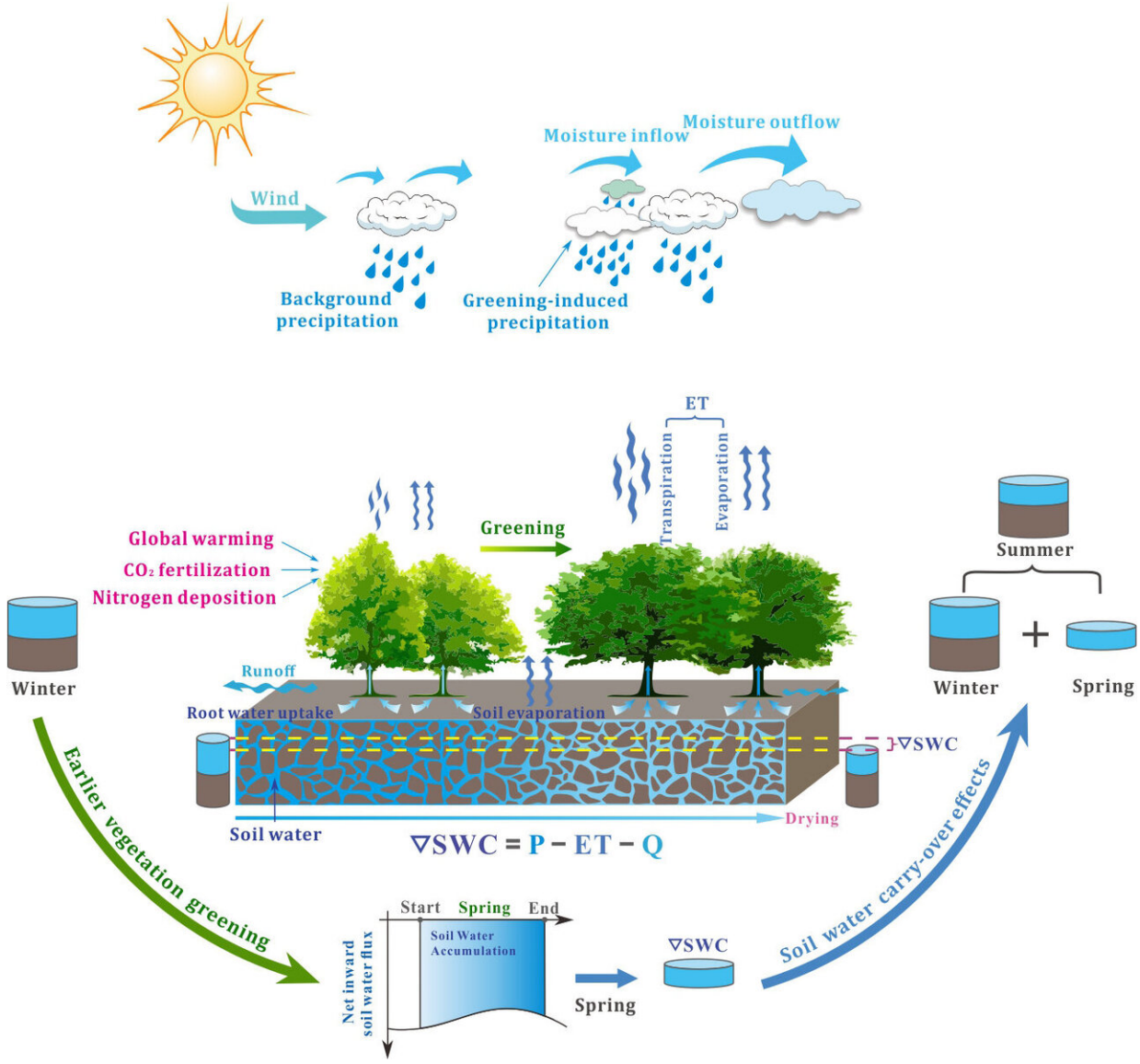
Global warming found to give rise to earlier springs contributing to drier summers

January 6 2020, by Bob Yirka



A diagram showing how earlier spring greening modulates summer soil moisture.

Credit: Xu Lian

An international team of researchers has found evidence that suggests global warming is giving rise to earlier springs in some parts of the world, which contributes to drier summers—at least in the northern hemisphere. In their paper published in the journal *Science Advances*, the group describes their study of satellite data over a 30-year period and what they learned from it.

As humans emit carbon dioxide and other greenhouse gases into the atmosphere, the planet responds by heating up. No one knows for sure what overall impact a warming planet will have on our species, but many studies have suggested it could be catastrophic. Because of that, scientists continue to look for ways to reduce carbon emissions even as they try to better understand what a warming planet will look like. In this new effort, the researchers looked at the possible impacts of an earlier spring.

Prior studies have shown that as the planet heats up, many areas experience longer warm seasons, which means an earlier spring, a longer summer and a later fall—and a shorter winter. In this new study, the researchers wondered what impact an earlier spring might have on weather conditions. To find out, they used satellite data for the northern hemisphere for the years 1982 to 2011 to build climate models.

The researchers report that they found that earlier greening led to water earlier water depletion from the soil by plants, which led to drier soil as summer came on. Noting that most of the water that is pulled by plants makes its way into the air through pores in leaves, the researchers wondered if that might contribute to more rainfall. The researchers found that it did contribute to more rainfall, but not enough to offset the

amount of water pulled from the soil by plants. They suggest that in addition to making conditions more difficult for plants, the drier soil could also lead to higher temperatures in the drier areas due to less evaporative cooling in the summer. They report also that they found drying is worse in Europe, east and west Asia and some parts of North America. One area that seemed to benefit from drying was Siberia, which grew wetter in models because of moisture-laden air arriving from Europe. The researchers plan to carry out a similar study for the southern hemisphere.

More information: Xu Lian et al. Summer soil drying exacerbated by earlier spring greening of northern vegetation, *Science Advances* (2020). DOI: 10.1126/sciadv.aax0255

Press release