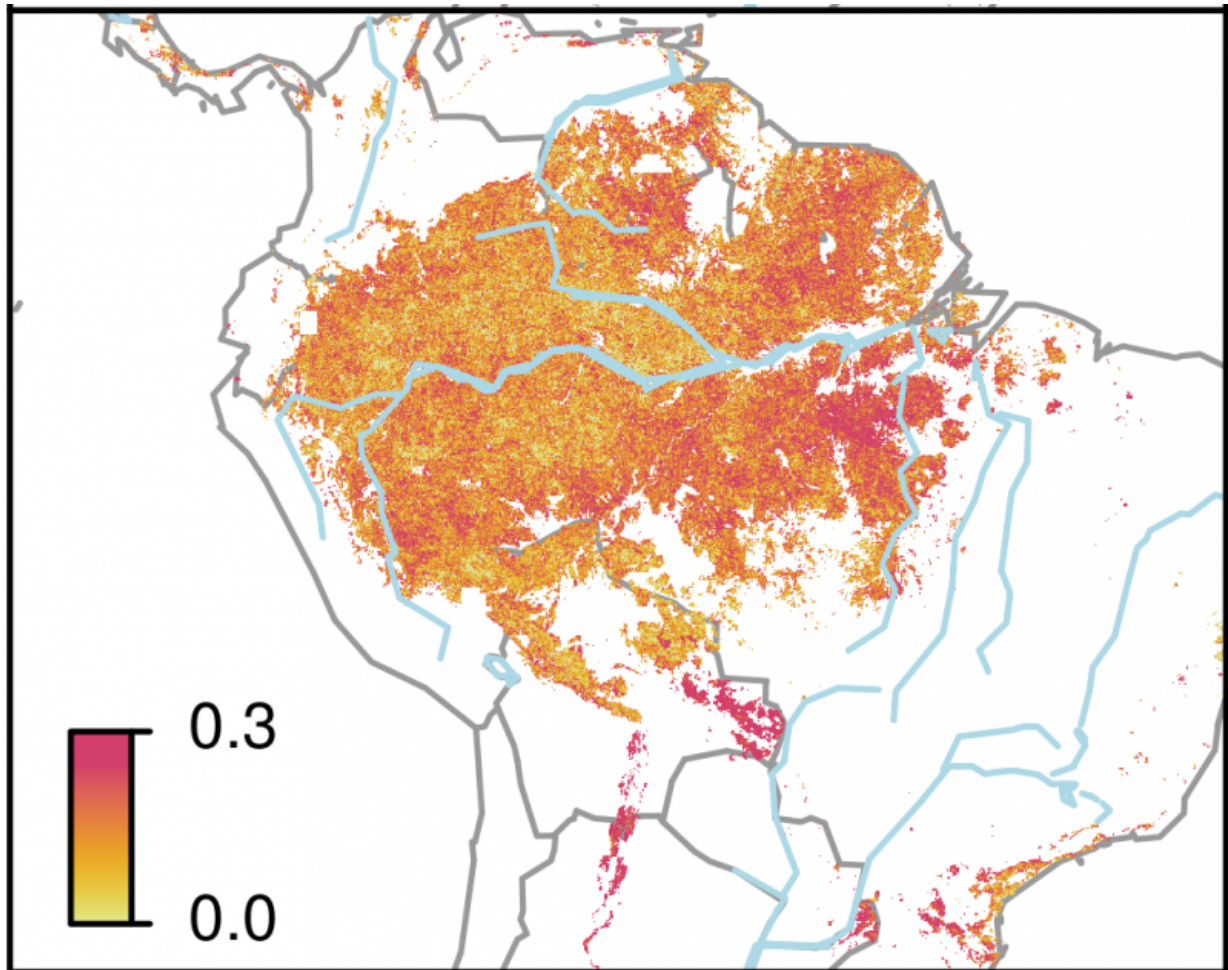


Detecting forest fragility with satellites

September 6 2016



The Amazon area with high (light colours), and low dynamics (dark), meaning low recovery rates after perturbations. The dark purple colours (0.3) reflect areas in fragile state. Credit: Wageningen University and Research Centre

In recent decades, forests in different parts of the world have suffered sudden massive tree mortality. Now an international team of scientists led by researchers from Wageningen University in the Netherlands has found a way to spot from satellite images which forests may be most likely to fall prey to such die-off events.

Tree cover is one of the most defining aspects of landscapes, says Jan Verbesselt, lead author and a specialist in remote sensing. "It is therefore remarkable how poorly we can predict where trees are most likely to succumb to drought and other stresses. However, our planet is permanently monitored by satellites in detail, and we are proposing a new way to use that information for detecting the fragility of ecosystems to environmental perturbations.

"For the first time, we were able to derive evidence for such changes from long-term satellite time series observations of [tropical forests](#). Martin Herold emphasis: "Global satellite archives are getting longer and denser every day. Together with free and open archived data, this provides a rich source of information that only now is starting to be used for tropical [forest](#) resilience analysis over large areas and increasing time spans."

Slow recovering

"The basic idea is simple" says Marten Scheffer, who leads the research program on resilience of complex systems. "As a system loses resilience it becomes slower to recover from small perturbations. This also happens as a system approaches a tipping point. Now we found that the natural fluctuation in greenness of forests, as driven by weather changes, may actually reflect such slowness. This is the first time, we are able to generate indicators that can anticipate the fragility of forests to future climate changes and disturbances."



Credit: Wageningen University and Research Centre

More information: Remotely Sensed Resilience of Tropical Forest.
Jan Verbesselt, Nikolaus Umlauf, Marina Hirota, Milena Holmgren,
Egbert H. Van Nes, Martin Herold, Achim Zeileis and Marten Scheffer,
Nature Climate Change, 5 September 2016.

Provided by Wageningen University

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