

Monitoring vegetation dynamics in the Amazon with RapidScat

van Emmerik, Tim; Steele-Dunne, Susan; Paget, Aaron; van de Giesen, Nick

Publication date
2017

Document Version
Final published version

Published in
Geophysical Research Abstracts (online)

Citation (APA)

van Emmerik, T., Steele-Dunne, S., Paget, A., & van de Giesen, N. (2017). Monitoring vegetation dynamics in the Amazon with RapidScat. *Geophysical Research Abstracts (online)*, 19, Article EGU2017-5364.

Important note

To cite this publication, please use the final published version (if applicable). Please check the document version above.

Copyright

Other than for strictly personal use, it is not permitted to download, forward or distribute the text or part of it, without the consent of the author(s) and/or copyright holder(s), unless the work is under an open content license such as Creative Commons.

Takedown policy

Please contact us and provide details if you believe this document breaches copyrights. We will remove access to the work immediately and investigate your claim.

Geophysical Research Abstracts Vol. 19, EGU2017-5364, 2017 EGU General Assembly 2017 © Author(s) 2017. CC Attribution 3.0 License.



Monitoring vegetation dynamics in the Amazon with RapidScat

Tim van Emmerik (1), Susan Steele-Dunne (1), Aaron C. Paget (2), and Nick van de Giesen (1) (1) Water Resources Section, Faculty of Civil Engineering and Geosciences, Delft University of Technology, Delft, The Netherlands, (2) Department of Marine Sciences, University of Connecticut, Groton, CT, USA

Several studies affiliated diurnal variations in radar backscatter over the Amazon [1,2] with vegetation water stress. Recent studies on tree and corn canopies [3,4] have demonstrated that during periods of low soil moisture availability, the total radar backscatter is primarily sensitive to changes in leaf water content, highlighting the potential of radar for water stress detection.

The RapidScat mission (K_u -band, 13.4GHz), mounted on the International Space Station, observes the Earth in a non-sun-synchronous orbit [5]. This unique orbit allows for reconstructing diurnal cycles of radar backscatter. We hypothesize that the state of the canopy is a significant portion of the diurnal variations observed in the radar backscatter. Recent, yet inconclusive, analyses support the theory of the impact of vegetation water content on diurnal variation in RapidScat radar backscatter over the Amazon and Congo. Linking ground measurements of canopy dynamics to radar backscatter will allow further exploration of the possibilities for monitoring vegetation dynamics.

Our presentation focuses of two parts. First, we reconstruct diurnal cycles of RapidScat backscatter over the Amazon, and study its variation over time. Second, we analyze the pre-dawn backscatter over time. The water content at this time of day is a measure of water stress, and might therefore be visible in the backscatter time series.

References

- [1] Frolking, S., et al.: "Tropical forest backscatter anomaly evident in SeaWinds scatterometer morning overpass data during 2005 drought in Amazonia", Remote Sensing of Environment, 2011.
- [2] Jaruwatanadilok, S., and B. Stiles: "Trends and variation in Ku-band backscatter of natural targets on land observed in QuikSCAT data", IEEE Transactions on Geoscience and Remote Sensing, 2014.
- [3] Steele-Dunne, S., et al.: "Using diurnal variation in backscatter to detect vegetation water stress", IEEE Transactions on Geoscience and Remote Sensing, 2012.
- [4] van Emmerik, T., et al.: "Impact of diurnal variation in vegetation water content on radar backscatter from maize during water stress", IEEE Transactions on Geoscience and Remote Sensing, 2015.
- [5] Paget, A., et al.: "RapidScat Diurnal Cycles Over Land", IEEE Transactions on Geoscience and Remote Sensing, 2016.