CURRICULUM VITAE of Sander VERAVERBEKE

PhD in Geography

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Profile

I am an environmental scientist with specific interest in studying wildfire effects from a regional to global perspective. I received my PhD in Geography in 2010 from Ghent University (Belgium) and was a postdoctoral researcher at NASA's Jet Propulsion Laboratory for three years. Now, I am a project scientist in the Randerson lab at the University of California, Irvine.

My research focuses on the spatio-temporal patterns of fire processes, and I use a combination of field, modeling and remote sensing methods. My work has primarily focused on Mediterranean-type ecosystems, and more recently the boreal forest. My goals is to better understand the complex interactions between fire, ecosystems, climate and humans in a changing world.

Besides pyrogeography, I have a broad interest in landscape ecology, carbon cycling, terrestrial ecosystems, biosphere-atmosphere interactions and global environmental change. Among others, I have contributed to projects on land cover change and permafrost mapping.

Education

2007-2010 PhD in Geography (Ghent University)
Dissertation: *Assessing fire/burn severity using spaceborne spectral indices*

2007-2010 Doctoral training program in Geography (Ghent University)

2005-2007 Master in Geography (Ghent University) with highest honors
Thesis: *Study of landscape changes and land degradation by means of remote sensing and GIS at Chios island, Greece* (in Dutch) (best master thesis award winner)

2003-2005 Bachelor in Geography (Ghent University) with high honors

Research experience

2013-now	project scientist (UC Irvine) Focus on Alaskan fire emissions
2011-2013	post-doctoral scholar (NASA Jet Propulsion Laboratory, California Institute of Technology) Focus on the interactions between fires, climate, ecosystems and humans in southern California
2010-2011	post-doctoral scholar (Ghent University) Focus on post-fire vegetation recovery trajectories in Mediterranean-type ecosystems
2007-2010	PhD student (Ghent University) Focus on the ecological impact of wildfires using spaceborne data

Project collaboration

- NASA Interdisciplinary Research in Earth Science, *Fires in Southern California: Interactions between climate change, ecosystems, and humans*, in cooperation with UCI and UCLA, funded by NASA (2011-2013)
- HeathReCover, *Remote sensing support to assist ecological restoration management after heathland fires at the Kalmthoutse Heide, Belgium,* in cooperation with INBO, ANB, VITO and KNMI, funded by Belgian Science Policy (2011-2013)
- PROBA-V Preparatory programme, *Burned area mapping and post-fire monitoring of Mediterranean ecosystems using Proba-V imagery*, in cooperation with the laboratory of forest management and remote sensing of the Aristotle Univeristy of Thessaloniki, funded by Belgian Science Policy (2010-2011)

Proposal writing experience

- Co-I on HeathReCover, *Remote sensing support to assist ecological restoration management after heathland fires at the Kalmthoutse Heide, Belgium,* in cooperation with INBO, ANB, VITO and KNMI, funded by Belgian Science Policy (2011-2013)
- Co-I on the PROBA-V Preparatory programme, *Burned area mapping and post-fire monitoring of Mediterranean ecosystems using Proba-V imagery*, in cooperation with the laboratory of forest management and remote sensing of the Aristotle University of Thessaloniki, funded by Belgian Science Policy (2010-2011)

Journal reviewer for

Remote Sensing of Environment, International Journal of Wildland Fire, ISPRS Journal of Photogrammetry and Remote Sensing, International Journal of Applied Earth Observation and Remote Sensing, Applied Vegetation Science, Natural Hazards, International Journal of Remote Sensing, Journal of Applied Remote Sensing, Photogrammetric Engineering and Remote Sensing, International Journal of Digital Earth, Remote Sensing, Geosciences, International Journal of Safety and Security Engineering, The Open Remote Sensing Journal

Panel reviewer for

NASA Research Opportunities in Space and Earth Sciences

Awards

2009	Best poster at the PhD symposium of Ghent University
2007-2011	Special Research Funds PhD scholarship (Ghent University)
2007	Best master thesis in Geography at Ghent University

Education support

Master thesis support

2011-2012	Lennert Schepers, *Burn severity assessment of the natural fire at the Kalmthoutse Heide by using hyperspectral airborne imagery* (Ghent University, in Dutch)
2010-2011	Carolien Willen, *Remote sensing for mapping lava stream chronology (Nyamulagira, Africa)* (Ghent University, in Dutch)
2009-2010	Niels Gagelmans, *Multitemporal analysis of the 'heide' heathland area (Belgium) with high resolution satellite imagery* (Ghent University, in Dutch)
2008-2009	Stephanie de Muelenaere, *Land use and cover changes in the Ethiopian highlands; Landsat data analysis using contemporaneous ground photographs for calibration* (Ghent University, in Dutch)

Master thesis jury membership

2009-2010	Niels Gagelmans, *Multitemporal analysis of the 'heide' heathland area (Belgium) with high resolution satellite imagery* (Ghent University, in Dutch)

Teaching experience

2007-2010 Lab sessions in *Remote sensing: image registration and processing* (Bachelor in Geography, Ghent University), *Remote sensing: image interpretation* (Bachelor in Geography, Ghent University), *Remote Sensing* (Master in Physical Land Resources, Ghent University)

Publications

Published peer-reviewed publications (listed in Web of Knowledge)

21. Schepers, L., Haest, B., Veraverbeke, S., Spanhove, T., Vanden Borre, J. & Goossens, R. (2014). *Burned area detection and burn severity assessment of a heathland fire in Belgium using airborne imaging spectroscopy (APEX).* Remote Sensing, in press.

20. Katagis, T., Gitas, I., Toukiloglou, P., Veraverbeke, S. & Goossens, R. (2014). *Trend analysis of medium and coarse resolution time series image data for burned area mapping and post-fire monitoring.* International Journal of Wildland Fire, in press.

19. Veraverbeke, S., Sedano, F., Hook, S., Randerson, J., Jin, Y. & Rogers, B. (2014). *Mapping fire progression of large wildfires using MODIS active fire data.* International Journal of Wildland Fire, in press.

18. de Muelenaere, S., Frankl, A., Haile, M., Poesen, J., Deckers, J., Munro, R., Veraverbeke, S. & Nyssen, J. (2014). *Historical landscape photographs for calibration of Landsat land use/cover (1972) in the Ethiopian highlands*. Land Degradation and Development, in press.

17. Hulley, G., Veraverbeke, S & Hook, S. (2014). *Thermal-based techniques for land cover change detection using a new dynamic MODIS multispectral emissivity product (MOD21)*. Remote Sensing of Environment, 140, 755-765.

16. Polychronaki, A., Gitas, I., Veraverbeke, S. & Debien, A. (2013). *Evaluation of ALOS PALSAR imagery for burned area mapping in Greece using object-based classification.* Remote Sensing, 5, 5680-5701.

15. Veraverbeke, S. & Hook, S. (2013). *Evaluating spectral indices and spectral mixture analysis for assessing fire severity, combustion completeness and carbon emissions.* International Journal of Wildland Fire, 22, 707-720.

14. Van De Kerchove, R., Lhermitte, S., Veraverbeke, S., & Goossens, R. (2013). *Assessment of the spatio-temporal variability in remotely sensed Land Surface Temperature, and its relationship with physiographic variables in the Russian Altay Mountains*. International Journal of Applied Earth Observation and Geoinformation, 20, 4-19.

13. Veraverbeke, S., Hook, S. & Harris, S. (2012). *Synergy of VSWIR (0.4-2.5 µm) and MTIR (3.5-12.5 µm) data for post-fire assessments*. Remote Sensing of Environment, 124, 771-779.

12. Veraverbeke, S., Verstraeten, W.W., Lhermitte, S., Van De Kerchove, R. & Goossens, R. (2012). *Assessment of post-fire changes in land surface temperature and surface albedo, and their relation with fire-burn severity using multitemporal MODIS imagery*. International Journal of Wildland Fire, 21, 243-256.

11. Veraverbeke, S., Hook, S. & Hulley, G. (2012). *An alternative spectral index for rapid fire severity assessments*. Remote Sensing of Environment, 123, 72-80.

10. Veraverbeke, S., Gitas, I., Katagis, T., Polychronaki, A., Somers, B. & Goossens, R. (2012). *Assessing post-fire vegetation recovery using red-near infrared vegetation indices: accounting for background and vegetation variability*. ISPRS Journal of Photogrammetry and Remote Sensing, 68, 28-39.

and Veraverbeke, S., Gitas, I., Katagis, T., Polychronaki, A. , Somers, B. & Goossens, R. (2012). *Erratum to "Assessing post-fire vegetation recovery using red-near infrared vegetation indices : accounting for background and vegetation variability" [ISPRS Journal of Photogrammetry and Remote Sensing 68 (2012) 28-39]*. ISPRS Journal of Photogrammetry and Remote Sensing, 68C, 191.

9. Veraverbeke, S., Somers, B., Gitas, I., Katagis, T., Polychronaki, A. & Goossens, R. (2012). *Spectral mixture analysis to assess post-fire vegetation regeneration using Landsat Thematic mapper imagery: accounting for soil brightness variation*. International Journal of Applied Earth Observation and Geoinformation, 14, 1-11.

8. Harris, S., Veraverbeke, S., & Hook, S. (2011). *Evaluating spectral indices for assessing fire severity in chaparral ecosystems (southern California) using MODIS/ASTER (MASTER) airborne simulator data*. Remote Sensing, 3, 2403-2419.

7. Veraverbeke, S., Harris, S. & Hook, S. (2011). *Evaluating spectral indices for burned area discrimination using MODIS/ASTER (MASTER) airborne simulator data*. Remote Sensing of Environment, 115, 2702-2709.

6. Veraverbeke, S., Lhermitte, S., Verstraeten, W.W., & Goossens, R. (2011). *Evaluation of pre/post-fire differenced spectral indices for assessing burn severity in a Mediterranean environment with Landsat Thematic Mapper*. International Journal of Remote Sensing 32, 3521-3537.

5. Veraverbeke, S., Lhermitte, S., Verstraeten, W.W., & Goossens, R., (2011). *A time-integrated MODIS burn severity assessment using the multi-temporal differenced Normalized Burn Ratio ($dNBR_{MT}$)*. International Journal of Applied Earth Observation and Geoinformation 13, 52-58.

4. Lhermitte, S., Verbesselt, J., Verstraeten, W.W., Veraverbeke, S. & Coppin, P. (2011). *Assessment of the intra-annual variation in vegetation regrowth after fire based on the pixel based regeneration index*. ISPRS Journal of Photogrammetry and Remote Sensing 66, 17-27.

3. Veraverbeke, S., Lhermitte, S., Verstraeten, W.W., & Goossens, R., (2010). *The temporal dimension of differenced Normalized Burn Ratio (dNBR) fire/burn severity studies: the case of the large 2007 Peloponnese wildfires in Greece*. Remote Sensing of Environment 114*,* 2548-2563

2. Veraverbeke, S., Verstraeten, W.W., Lhermitte, S., & Goossens, R. (2010). *Evaluating Landsat Thematic Mapper spectral indices for estimating burn severity of the 2007 Peloponnese wildfires in Greece*. International Journal of Wildland Fire 19, 558-569

1. Veraverbeke, S., Verstraeten, W.W., Lhermitte, S. & Goossens, R. (2010). *Illumination effects on the differenced Normalized Burn Ratio's optimality for assessing fire severity*. International Journal of Applied Earth Observation and Geoinformation, 12, 60-70

Book chapters

Gitas, I., Mitri, G., Veraverbeke, S. & Polychronaki, A. (2012). *Advances in remote sensing of post-fire vegetation recovery monitoring – a review.* Remote Sensing of Biomass: Principles and Applications, Lola Fatoyinbo (Ed.), ISBN: 978-953-51-0313-4, InTech, Available from: http://www.intechopen.com/books/remote-sensing-of-biomass-principles-and-applications/advances-in-remote-sensing-of-post-fire-monitoring-a-review-

Proceedings and other publications

Veraverbeke, S., Sedano, F., Hook, S., Randerson, J., Jin, Y. & Rogers, B. (2013). *Mapping the daily progression of large wildland fires using MODIS active fire data*. In Tansey, K. (Ed.) Proceedings 9th EARSeL Forest fire special interest group workshop, 6-9.

Haest, B., Schepers, L., Veraverbeke, S., Spanhove, T., Vander Borre, J., Kempeneers, P. & Goossens, R. (2013). *Burn severity assessment of a heathland fire in Belgium using APEX hyperpesctral indices*. In Tansey, K. (Ed.) Proceedings 9th EARSeL Forest fire special interest group workshop, 19-24.

Veraverbeke, S., Capps, S., Hook, S., Randerson, J., Jin, Y. & Hall, A. (2013). *Meteorological controls on biomass burning during Santa Ana events in southern California*. In Tansey, K. (Ed.) Proceedings 9th EARSeL Forest fire special interest group workshop, 94-97.

Haest, B., Vanden Borre, J., Spanhove, T. , Veraverbeke, S., Lhermitte, S., Waterinckx, M., Dufrene, M. & Paelinckx, D. (2012). *The HeathReCover project: remote sensing support to assist ecological restoration management after heathland fires*. EARSeL Newsletter, 89, 14-15.

Veraverbeke, S., Van De Kerchove, R., Verstraeten, W.W. , Lhermitte, S. & Goossens, R. (2010). *Fire-induced changes in vegetation, albedo and land surface temperature assessed with MODIS*. In Reuter, R. (Ed.) Remote sensing for science, education and natural and cultural heritage, 431-438

Veraverbeke, S., Lhermitte, S., Verstraeten, W.W. & Goossens, R. (2010). *Assessing burn severity using satellite time series*. In Perona, G. & Brebbia, C. (Eds.) Modelling, monitoring and management of forest fires II , 107-118

Veraverbeke, S., Lhermitte, S., Verstraeten, W.W., & Goossens, R., (2010). *Assessing burn severity using satellite time series*. Geophysical research abstracts, Vol. 12, EGU2010-253

Veraverbeke, S., Lhermitte, S., Verstraeten, W.W., & Goossens, R., (2010). *Assessing the temporal sensitivity of the differenced Normalized Burn Ratio (dNBR) to estimate burn severity using MODIS time series*. Geophysical research abstracts, Vol. 12, EGU2010-254

Veraverbeke, S., Verstraeten, W.W., Lhermitte, S. & Goossens, R. (2009). *Correction of topographic effects influencing the differenced Normalized Burn Ratio's optimality for estimating fire severity*. In Chuvieco, E. & Lasaponara, R. (Eds.) Proceedings 7th EARSeL workshop on advances in RS and GIS applications in forest fire management , 271-276

Veraverbeke, S., Verstraeten, W.W., Lhermitte, S. & Goossens, R. (2009). *Burn severity mapping using Landsat Thematic Mapper data, case of the 2007 Peloponnese fires (Greece)*. In Neutens, T. & De Maeyer, P. (Eds.) Proceedings of the 15th international conference InterCarto-InterGIS part II-Ghent, 259-271

Veraverbeke, S., Lhermitte, S., Verstraeten, W.W., & Goossens, R., (2009). *Assessing post-fire effects of the 2007 Peloponnese (Greece) wildfires using spaceborne data*. Doctoraatssymposium faculteit Wetenschappen, 113

Veraverbeke, S., Vanderstraete, T., & Goossens, R., (2009). *Use of ASTER-data for a soil erosion risk model application, Chios island (Greece)*. In Maktav D. (Ed.) Proceedings of the 28th Symposium of the European Association of Remote Sensing Laboratories, 117-124

Veraverbeke, S., Vanderstraete, T. & Goossens, R. (2008). *Study of landscape changes and land degradation by means of remote sensing and GIS at the Chios island, Greece* (in Dutch). De Aardrijkskunde, 3-4, 91–101