

Manuela Balzarolo

Education

Ph.D. in Forest Ecology. April 2008. University of Viterbo (Italy), Faculty of Agronomy. Thesis title: Biometrics parameters and fluxes estimation in Mediterranean mountainous grassland with remote sensing techniques.

Master degree in Environmental Science. April 2003. University of Milan (Italy), Faculty of Agronomy. Dissertation title: Estimating the productivity of a mountainous pasture by in-situ remote sensing measurements.

Research/Work experience

1 April 2016 – 30 April 2017

Post-doctoral fellowship at the University of Antwerp, Faculty of Biology, PLECO (Belgium)
Research subject: assessment of isoprene emission by hyperspectral data. Scientific project manager of HYPI project.

15 June 2013 – 31 March 2016

Post-doctoral fellowship at the University of Antwerp, Faculty of Biology, PLECO (Belgium)
Research subject: integration of remote sensing data into the productivity database developed by PLECO.

15 April 2013 – 15 June 2013

Short Terms Scientific Mission grant at the Flemish Institute of Technology-VITO (Belgium).
Funded by COST Action ES0903 Spectral Sampling Tools for Vegetation Biophysical Parameters and Flux Measurements in Europe.

1-5 October 2012

Visiting scientist at ECMWF, Physical Aspects Section/Model Division, Reading (UK) funded by Land Carbon Core Information Service (LC-CIS) of European FP7 geoland2 project.

1 November 2009 – 31 May 2013

Post-Doc researcher at the University of Viterbo, Faculty of Agronomy, Airborne Remote Sensing Laboratory, DiBAF, Italy. Funded by Land Carbon Core Information Service (LC-CIS) of European FP7 geoland2 project.

1 December 2004 – 31 October 2009

Research fellowship at the University of Viterbo, Faculty of Agronomy, Laboratory of Forest Ecology, DiSAFRi, Italy. Funded by CARBOMONT and CarboEurope-ip European projects.

1 April 2003 – 31 November 2003

Stage grant for young researcher at Carlo Gavazzi Space Spa – Milan (Italy).

Publications

Vicca S., **Balzarolo M.**, Filella I., Granier A., Herbst M., Knohl A., Longdoz B., Mund M., Nagy Z., Pintér K., Rambal S., Verbesselt J., Verger A., Zeileis A., Zhang C., Peñuelas J.

(2016). Remotely-sensed detection of effects of extreme droughts on gross primary production. *Scientific Reports*, 6, 28269, doi:10.1038/srep28269.

Vanbeveren S.P.P., Bloemen J., **Balzarolo M.**, Broeckx L. S., Sarzi-Falchi I., Verlinden M.S., Ceulemans R. (2016). A comparative study of four approaches to assess phenology of *Populus* in a short-rotation coppice culture. *iForest*, doi: 10.3832/ifer1800-009.

Balzarolo M., Vicca S., Nguy-Robertson A. L., Bonal D., Elbers J. A., Fu Y. H., Grünwald T., Horemans J. A., Papale D., Peñuelas J., Suyker A., Veroustraete F. (2016). Matching the phenology of Net Ecosystem Exchange and vegetation. *Remote Sensing of Environment*, 174, 290–300.

Porcar-Castell A., Mac Arthur A., Rossini M., Eklundh L., Pacheco-Labrador J., Anderson K., **Balzarolo M.**, Martín M. P., Jin H., Tomelleri E., Cerasoli S., Sakowska K., Hueni A., Julitta T., Nichol C. J., Vescovo, L. (2015). EUROSPEC: at the interface between remote sensing and ecosystem CO₂ flux measurements in Europe. *Biogeosciences*, 12, 6103–6124, 2015.

Wingate L., Ogee J., Cremonese E., Filippa G., Mizunuma T., Migliavacca M., Moisy C., Wilkinson M., Moureaux C., Wohlfahrt G., Hammerle A., Hoertnagl L., Gimeno C., Porcar-Castell A., Galvagno M., Nakaji T., Morison J., Kolle O., Knohl A., Kutsch W., Kolari P., Nikinmaa E., Ibrom A., Gielen B., Eugster W., **Balzarolo M.**, Papale D., Klumpp K., Koestner B., Gruenwald T., Joffre R., Ourcival J.-M., Hellstrom M., Lindroth A., Charles G., Longdoz B., Genty B., Levula J., Heinesch B., Sprintsin M., Yakir D., Manise T., Guyon D., Ahrends H., Plaza-Aguilar A., Guan J.H., and Grace J. (2015). Interpreting canopy development and physiology using the EUROPhen camera network at flux sites. *Biogeosciences*, 10, 11857–11897.

Balzarolo M., Vescovo L., Hammerle A., Gianelle D., Papale D., and Wohlfahrt G. (2015). On the relationship between ecosystem-scale hyperspectral reflectance and CO₂ exchange in European mountain grasslands. *Biogeosciences*, 10, 11857–11897.

Berninger F., Susiluoto S., Damiano G., Bahn M., Wohlfahrt G., Campbell C., Anderson M., Sutton M., Christensen T., Garcia-Pausas J., Gimeno C., Sanz M. J., Dore S., Rogiers N., Furger M., Eugster W., **Balzarolo M.**, Sebastià M.T., Tenhunen J., Staszewski T. and Cernusca A. (2015). Management and site effects on carbon balances of European mountain pastures and meadows. *Boreal Environment Research*, 20, 748–760.

Balzarolo M., Boussetta S., Balsamo G., Beljaars A., Maignan F., Calvet J.-C., Lafont S., Barbu A., Poulter B., Chevallier F., Szczypta C., Papale D. (2014). Evaluating the potential of large scale simulations to predict carbon fluxes of terrestrial ecosystems over a European Eddy Covariance network. *Biogeosciences*, 11, 2661–2678.

Boussetta S., Balsamo G., Beljaars A., Agusti-Panareda A., Calvet J-C, Jacobs Cor, van den Hurk B., Viterbo P., Lafont S., Dutra E., Jarlan L., **Balzarolo M.**, Papale D., van der Werf G.. Natural land carbon dioxide exchanges in the ECMWF integrated forecasting system: Implementation and offline validation (2013). *Journal of Geophysical Research: Atmospheres*, DOI: 10.1002/jgrd.50488.

Anderson K., Rossini M., Pacheco-Labrador J., **Balzarolo M.**, MacArthur A., Fava F., Julitta T., Vescovo L. (2013). Inter-comparison of hemispherical conical reflectance factors (HCRF) measured with four fibre-based spectrometers. *Optics Express*, 21, 605–617.

Balsamo G., Albergel C., **Balzarolo M.**, Beljaars A., Boussetta S., Calvet J. C., Dutra E., Kral T., Papale D., de Rosnay P., Sandu I. (2012). Usefulness of benchmarking for global land-surface model development. Bulletin of the American Meteorological Society, 06/2012, 93.

Balzarolo M., Anderson, K., Nichol, C., Rossini, M., Vescovo, L., Arriga, N., Wohlfahrt, G., Calvet, J.-C., Carrara, A., Cerasoli, S., Cogliati, S., Daumard, F., Eklundh, L., Elbers, J.A., Evrendilek, F., Handcock, R.N., Kaduk, J., Klimpp, K., Longdoz, B., Matteucci, G., Meroni, M., Montagnani, L., Ourcival, J.-M., Sánchez-Cañete, E.P., Pontailler, J.-Y., Juszczak, R., Scholes, B. and Martín, M.P. (2011). Ground-Based Optical Measurements at European Flux Sites: A Review of Methods, Instruments and Current Controversies. Sensors, 11, 7954–7981.

Vescovo L., Wohlfahrt G., **Balzarolo M.**, Piloni S., Sottocornola M., Rodeghiero M., Gianelle D. (2012). New spectral vegetation indices based on the near-infrared shoulder wavelengths for remote detection of grassland phytomass. International Journal of Remote Sensing, 33, 2178–2195.

Bahn M., Rodeghiero M., Anderson M., Dore S., Gimeno S., Drösler M., Williams M., Ammann C., Berninger F., Flechard C., Jones S., **Balzarolo M.**, Kumar S., Newesely C., Priwitzer T., Raschi A., Siegwolf R., Susiluoto S., Tenhunen J., Wohlfahrt G., Cernusca A. (2008). Soil respiration in European grasslands in relation to climate and assimilate supply. Ecosystems, 11, 1352–1367.

Wohlfahrt G., Anderson-Dunn M., Bahn M., **Balzarolo M.**, Berninger F., Campbell C., Carrara A., Cescatti A., Christensen T., Dore S., Eugster W., Friborg T., Furger M., Gianelle D., Gimeno C., Hargreaves K., Hari P., Haslwanter A., Johansson T., Marcolla B., Milford C., Nagy Z., Nemitz E., Rogiers N., Sanz M.J., Siegwolf R.T.W., Susiluoto S., Sutton M., Tuba Z., Ugolini F., Valentini R., Zorer R., Cernusca A. (2008). Biotic, abiotic and anthropogenic controls on the net ecosystem CO₂ exchange of European mountain grasslands. Ecosystems, 11, 1338–1351.

Gilmanov T.G., Soussana J.-F., Aires L., Allard V., Ammann C., **Balzarolo M.**, Barcza Z., Bernhofer C., Campbell C.L., Cernusca A., Cescatti A., Clifton-Brown J., Dirks B.O.M., Dore S., Eugster W., Fuhrer J., Gimeno C., Gruenwald T., Haszpra L., Hensen A., Ibrom A., Jacobs A.F.G., Jones M.B., Lanigan G., Laurila T., Lohila A., Manca G., Marcolla B., Nagy Z., Pilegaard K., Pinter K., Pio C., Raschi A., Rogiers N., Sanz M.J., Stefani P., Sutton M., Tuba Z., Valentini R., Williams M.L., Wohlfahrt G. (2007). Partitioning European grassland net ecosystem CO₂ exchange into gross primary productivity and ecosystem respiration using light response function analysis. Agriculture, Ecosystems and Environment, 121, 93–120.

Papers in conference proceedings with peer review (from author or co-author presentations)

Balsamo G., Albergel C., **Balzarolo M.**, Beljaars A., Boussetta S., Calvet J.C., Dutra E., Kral T., Papale D., de Rosnay P., Sandu I. (2012): Usefulness of Benchmarking for Global Land Surface Model Development" BAMS Conference notebook, summary from the 26th AMS Conference on Hydrology, 22-26 January, 2012, New Orleans, Louisiana, US.

Anderson K., Rossini M., **Balzarolo M.**, Vescovo L., Nichol C., Pilar-Martin, M., MacArthur A.. Spectral measurements at flux tower sites: initial findings from the Eurospec project (2011). Proceeding of RSPSoc Annual Conference - Earth Observation in a Changing World, 13-15 September 2011, Bournemouth, United Kingdom.

Calvet, J.-C., Balsamo G., **Balzarolo M.**, Barbu A., Cescatti A., Chevallier F., Delbart N., de Vries J., Gibelin A.-L., Horanyi A., Kullmann L., Lafont S., Mahfouf J.-F., Maignan F., Papale D., Seufert G., The H. (2009): Monitoring soil and vegetation fluxes of carbon and water at the global scale: the land carbon core information service of GEOLAND2, Proc. of ECMWF/GLASS workshop on Land Surface Modelling, Data Assimilation and the implications for predictability, 9-12 November 2009, Reading, United Kingdom.

Balzarolo M., Boschetti M., Bocchi S., Brivio P.A.. Estimation of alpine pasture biomass using field radiometric data: limit and application of traditional satellite data. IEEE GOLD Remote Sensing Conference Proceedings, 13-14 May 2004, Naples, Italy.

Balzarolo M., Belli C., Dore S., Valentini R.. Monitoring grassland pasture productivity using high- resolution ASPIS imagery and field remote sensing. IEEE GOLD Remote Sensing Conference Proceedings, 13-14 May 2004, Naples, Italy.

Balsamo G., Albergel C., **Balzarolo M.**, Beljaars A., Boussetta S., Calvet J.C., Dutra E., Kral T., Papale D., de Rosnay P., Sandu I. (2012): Usefulness of Benchmarking for Global Land Surface Model Development" BAMS Conference notebook, summary from the 26th AMS Conference on Hydrology, 22-26 January, 2012, New Orleans, Louisiana, US.

Anderson K., Rossini M., **Balzarolo M.**, Vescovo L., Nichol C., Pilar-Martin, M., MacArthur A.. Spectral measurements at flux tower sites: initial findings from the Eurospec project (2011). Proceeding of RSPSoc Annual Conference - Earth Observation in a Changing World, 13-15 September 2011, Bournemouth, United Kingdom.

Research monographs, chapters in collective volumes and any translations thereof

Papale D., Migliavacca M., Cremonese E., Cescatti A., Alberti G., **Balzarolo M.**, Beelli Marchesini L., Canfora E., Casa R., Duce P., Facini O., Galvagno M., Genesio, Gianelle D., Magliulo V., Matteucci G., Montagnani L., Petrella F., Pitacco A., Seufert G., Spano D., Stefani P., Vaccari F. P., and Riccardo Valentini (2014). Carbon, water and energy fluxes of terrestrial ecosystems in Italy. Chapter in: The Greenhouse Gas Balance of Italy. An Insight on Managed and Natural Terrestrial Ecosystems. ISBN 978-3-642-32423-9. Valentini, R., and Miglietta, F. (Eds.). (2014). Springer.

Calvet J.-C., Balsamo G., **Balzarolo M.**, Barbu A., Cescatti A., Chevallier F., Delbart N., de Vries J., Gibelin, A.-L., Horanyi A., Kullman L., Lafont S., Mahfouf J.-F., Maignan F., Papale D., Seufert G. (2010). Monitoring soil and vegetation fluxes of carbon and water at the global scale: the land carbon core information service of GEOLAND2. Chapter in: Proceedings of the Third Recent Advances in Quantitative Remote Sensing, Valencia. ISBN: 978-84-370-7952-3. Sobrino, J.A., Ed.; Universitat de València. de la Universitat de València: València, Spain.

Corona P.M., Monteverdi, M.C., Barbati A.M, Beritognolo I., **Balzarolo M.**, Santini M., Da Canal S., De Dato G., Fratini G., Kuzminsky E., Abbruzzese G., Sabatti M., De Angelis P. (2007). Linee di ricerca forestale a supporto della lotta alla desertificazione. In Rendiconti Accademia Naz. delle Scienze detta dei XL, Memorie di Scienze Fisiche e Naturali, 125, vol. XXXI, P.II,t. I, pp. 311-328.

Balzarolo M., S. Bocchi, M. Boschetti, P.A. Brivio (2003). Utilizzo di immagini Landsat ETM+ per lo studio della produttività del pascolo alpino. Caso di studio: la malga di Trela, Parco

Nazionale dello Stelvio. Bollettino dell'associazione Italiana di cartografia (AIC), 117-119:
455-464 (ISSN: 0044-9733).