

# CURRICULUM VITAE



## PERSONAL INFORMATION

Name **CREMONESE EDOARDO**  
Adress  
Tel  
E-mail  
  
Nationality  
Date of birth

## WORK EXPERIENCE

- Employer **Environmental Protection Agency of Aosta Valley**  
**Climate Change Unit**
- Position Researcher and Project Coordinator
- Dates 2005-ongoing
- Main duties and responsibilities
  - Climate change impacts, adaptation, and mitigation, with a specific focus on mountain regions: climate scenarios, impact modeling and indicators; impact analysis on socio-economic sectors (agriculture, winter tourism, water management and hydropower production, forest management, biodiversity and ecosystems, human health ...), analysis and assessment reports; lead author of regional climate change adaptation strategy; contributing author of regional climate neutrality roadmap; stakeholder engagement in transdisciplinary and participatory processes; science-policy interface knowledge transfer
  - Climate change and terrestrial ecosystems interactions and feedbacks; ecosystem processes and biodiversity: carbon fluxes in ecosystems; forest carbon sequestration and accounting; phenology, land-use changes in agro-ecosystems. Long Term Socio-Ecological Research; environmental monitoring and field observations; data collection, processing and analysis; integration of remote sensing, modeling, and data assimilation; climate change impacts assessment, indicators development and Essential Biodiversity Variables, and reporting
  - Climate change and the mountain cryosphere: snow hydrology, permafrost and glaciers. Integration of field observation, remote sensing imagery and model data assimilation; data analysis for water resources assessment, hydropower production optimization, climate risk analysis, indicators development, and reporting
  - Principal Investigator (PI) of ICOS (Integrated Carbon Observation System) site IT-Tor (grassland ecosystem)
  - Long Term Socio-Ecological Research. Principal Investigator (PI) of LTSER sites T19-005-T and T19-006-T
  - Scientific staff of Fluxnet site IT-Trf (forest ecosystem)
  - Public speaking and teaching on climate change, adaptation and mitigation
- Research and Cooperation Projects
  - 2020-2002 ESA EXPRO+ AlpSnow - Alps Regional Initiative - Science ALPSNOWATER. Project partner: development of advanced dataset characterizing snow parameters over the Alps with novel earth-observation based algorithms and techniques; use of novel products in operational modeling chains (hydropower production and water resources assessments)
  - 2020-2022 Grassland mapping using earth-observation data. Project coordinator: pasture structural and functional properties modeling and mapping, development of land use detection methods, stakeholder engagement (agricultural services); contribution to Regional Agricultural Policies development

2018-2022	Agrometeorological services for agriculture (viticulture, horticulture, and pasture management) in the framework of climate adaptation strategies; late frost risk indicators, crop phenology modeling, pests and diseases risk management; project coordination and stakeholder engagement (agricultural services, meteorological office, farmers, ...)
2018-2022	Climate Change impact analysis on mountain hydrology and water use. Project coordinator: climate scenario and mountain hydrology modeling; climate change impact assessment; climate risk analysis for hydropower production and water use in agriculture
2020-2022	Reservaqua (Italy-Switzerland Interreg project) Project partner: sustainable water management in mountain area, water availability, irrigation water requirement; policy definitions and stakeholder engagement
2017-2022	LIFE project PASTORALP (Pastures vulnerability and adaptation strategies to climate change impacts in the Alps - LIFE16 CCA/IT/000060) Project partner: remote sensing of alpine grassland. Mountain pastures climate adaptation strategies definition, testing, and modeling, stakeholders engagement in transdisciplinary and participatory processes (agricultural services, protected areas, NGOs, ... ); policy definitions
2017-2020	AdaptMontBlanc project (Italy-France Interreg project) Project responsible for climate scenarios assessment in Mont-Blanc area, climate change impact analysis on socio-economic sectors; definition and development of impact indicators, climate change adaptation, coordinator of science-policy interface knowledge transfer, stakeholders engagement in transdisciplinary and participatory processes (regional administrations, local municipalities, NGOs, private sector, ...) <a href="http://www.espace-mont-blanc.com/asset/rapportclimat_eng.pdf">http://www.espace-mont-blanc.com/asset/rapportclimat_eng.pdf</a>
2018-2020	Fire Risk modeling in Italy (Fondazione CIMA, National Civil Protection contract). Sub-contractor involved in the development of earth-observation based approaches for the assimilation of vegetation phenology dynamics (leaf water content) in fire risk modeling at the national scale
2016-2017	Toursience project (Italy-France Interreg project) Project Coordinator: climate change and mountain terrestrial ecosystems interactions and feedbacks. Sustainable Tourism Development. Socio-Ecological analysis and stakeholder engagement
2013-2015	e-Pheno project (Italy-France Interreg project) Project Coordinator: implementation of vegetation phenology monitoring network across NW Alps; integration of field observations and remote sensing data; climate change and mountain terrestrial ecosystems interactions and feedbacks
2010-2013	ACQWA Assessing Climate impacts on the Quantity and quality of Water. Seventh Research Framework Programme (FP7). Snow hydrology modelling through the integration of field observation and remote sensing data; glaciers response to climate change
2010-2013	PhenoALP project (Italy-France Interreg project) Project Coordinator: climate change and mountain terrestrial ecosystems interactions and feedbacks; vegetation phenology, carbon sequestration by ecosystems
2011-2013	Strada project (Italy-Switzerland Interreg project) Project Partner responsible for snow hydrology modelling through the integration of field observation and remote sensing data
2011-2012	Rischnat and Glariskalp projects (Italy-France Interreg project) Project Partner responsible for mountain cryosphere modelling and monitoring, climate change impact analysis and assessment, climate risk indicators development, and stakeholder engagement (sustainable risk management in mountain communities)
2009-2011	Permanet project (Alpine Space Interreg project) Project Partner responsible for permafrost distribution modelling, data management (European permafrost evidence database), monitoring network implementation and management, stakeholder engagement
2009-2011	Manfred project (Alpine Space Interreg project) Climate Change impacts on vegetation phenology and CO2 fluxes: observation sites, environmental monitoring, data analysis and assimilation in process models
2006-2008	PERMADataROC (Italy-France Interreg project) Project Partner responsible for mountain permafrost thermal monitoring network implementation, data analysis and indicator development

• Collaboration, Networking, Memberships

2015-2019	Co-organizer of Italian Snow Water Equivalent Intercomparison workshops
2013	Main organizer of Mountains under Watch 2013 congress (Bard-Aosta, Italy)
2016-2021	Member of Italian ICOS ( <u>Integrated Carbon Observation System</u> ) Joint Research Unit
2020-2021	Member of Italian NRC for Climate change impacts, vulnerability and adaptation

## EDUCATION AND TRAINING

• Date	1998-2003
• Education or training organisation	Environmental Sciences, Milano Bicocca University

- Principal subjects covered Environmental sciences, chemistry, GIS, remote sensing, ecology
  - Qualification awarded Master's degree 110/110 cum laudae
- Date 1993 –1998
- Education or training organisation Liceo scientifico “E. Bérard” PNI - Aosta
  - Principal subjects covered Mathematic, Physics, Biology, Geology, Italian, French, English
  - Qualification awarded Maturità scientifica votazione 48/60

## PUBLICATIONS

<https://orcid.org/0000-0002-6708-8532>

<https://scholar.google.it/citations?user=1ur3yVQAAAAJ&hl=en>

### 2021

- Oddi, L., Cremonese, E., Ascari, L., Filippa, G., Galvagno, M., Serafino, D., & Cella, U. M. D. (2021). Using UAV Imagery to Detect and Map Woody Species Encroachment in a Subalpine Grassland: Advantages and Limits. *Remote Sensing*, 13(7), 1239
- Pisek, J., Erb, A., Korhonen, L., Biermann, T., Carrara, A., Cremonese, E., ... & Vincke, C. (2021). Retrieval and validation of forest background reflectivity from daily Moderate Resolution Imaging Spectroradiometer (MODIS) bidirectional reflectance distribution function (BRDF) data across European forests. *Biogeosciences*, 18(2), 621-635.

### 2020

- Lembrechts, J. J., Aalto, J., Ashcroft, M. B., De Frenne, P., Kopecký, M., Lenoir, J., ... & Rocha, A. (2020). SoilTemp: A global database of near-surface temperature. *Global change biology*, 26(11), 6616-6629.
- Graf, A., Klosterhalfen, A., Arriga, N., Bernhofer, C., Bogen, H., Bornet, F., ... & Vereecken, H. (2020). Altered energy partitioning across terrestrial ecosystems in the European drought year 2018. *Philosophical Transactions of the Royal Society B*, 375(1810), 20190524.
- Fu, Z., Ciais, P., Bastos, A., Stoy, P. C., Yang, H., Green, J. K., ... & Koepsch, F. (2020). Sensitivity of gross primary productivity to climatic drivers during the summer drought of 2018 in Europe. *Philosophical Transactions of the Royal Society B*, 375(1810), 20190747.
- Terzago, S., Andreoli, V., Arduini, G., Balsamo, G., Campo, L., Cassardo, C., ... & Provenzale, A. (2020). Sensitivity of snow models to the accuracy of meteorological forcings in mountain environments. *Hydrology and Earth System Sciences*, 24(8), 4061-4090.
- Luo, Y., El-Madany, T., Ma, X., Nair, R., Jung, M., Weber, U., ... & Migliavacca, M. (2020). Nutrients and water availability constrain the seasonality of vegetation activity in a Mediterranean ecosystem. *Global change biology*, 26(8), 4379-4400.
- Fisher, J. B., Lee, B., Purdy, A. J., Halverson, G. H., Dohlen, M. B., Cawse-Nicholson, K., ... & Hook, S. (2020). ECOSTRESS: NASA's next generation mission to measure evapotranspiration from the International Space Station. *Water Resources Research*, 56(4), e2019WR026058.
- Pastorello, G., Trotta, C., Canfora, E., Chu, H., Christianson, D., Cheah, Y. W., ... & Li, Y. (2020). The FLUXNET2015 dataset and the ONEFlux processing pipeline for eddy covariance data. *Scientific data*, 7(1), 1-27.

### 2019

- Filippa, G., Cremonese, E., Galvagno, M., Isabellon, M., Bayle, A., Choler, P., ... & Migliavacca, M. (2019). Climatic drivers of greening trends in the Alps. *Remote Sensing*, 11(21), 2527.
- Colombo, R., Garzonio, R., Di Mauro, B., Dumont, M., Tuzet, F., Cogliati, S., ... Cremonese, E. (2019). Introducing Thermal Inertia for Monitoring Snowmelt Processes With Remote Sensing. *Geophysical Research Letters*, 46(8), 4308–4319. <https://doi.org/10.1029/2019GL082193>
- Di Mauro, B., Garzonio, R., Rossini, M., Filippa, G., Pogliotti, P., Galvagno, M., ... Cremonese, E., Colombo, R. (2019). Saharan dust events in the European Alps: Role in snowmelt and geochemical characterization. *Cryosphere*, 13(4), 1147–1165. <https://doi.org/10.5194/tc-13-1147-2019>
- Conte, A., Fares, S., Salvati, L., Savi, F., Matteucci, G., Mazzenga, F., Spano, D., Sirca, C., Marras, S., Galvagno, M., Cremonese, E., Montagnani, L. (2019). Ecophysiological Responses to Rainfall Variability in Grassland and Forests Along a Latitudinal Gradient in Italy. *Frontiers in Forests and Global Change*, 2(May), 1–12. <https://doi.org/10.3389/ffgc.2019.00016>
- Piazzini, G., Campo, L., Gabellani, S., Castelli, F., Cremonese, E., di Cella, U. M., ... & Ratto, S. M. (2019). An EnKF-based scheme for snow multivariable data assimilation at an Alpine

## 2018

- Franz D., Acosta M., Altimir N., Arriga N., Arrouays D., Aubinet M., Aurela M., Ayres E., López-Ballesteros A., Barbaste M., Berveiller D., Biraud S., Boukir H., Brown T., Brümmner C., Buchmann N., Burba G., Carrara A., Cescatti A., Ceschia E., Clement R., Cremonese E., Crill P., Darenova E., Dengel S., D'Odorico P., Gianluca F., Fleck S., Fratini G., Fuß R., Gielen B., Gogo S., Grace J., Graf A., Grelle A., Gross P., Grünwald T., Haapanala S., Hehn M., Heinesch B., Heiskanen J., Herbst M., Herschlein C., Hörtnagl L., Hufkens K., Ibrom A., Jolivet C., Joly L., Jones M., Kiese R., Klemetsson L., Kljun N., Klumpp K., Kolari P., Kolle O., Kowalski A., Kutsch W., Laurila T., De Ligne A., Linder S., Lindroth A., Lohila A., Longdoz B., Mammarella I., Manise T., Marañon-Jimenez S., Matteucci G., Mauder M., Meier P., Merbold L., Mereu S., Metzger S., Migliavacca M., Mölder M., Montagnani L., Moureaux C., Nelson D., Nemitz E., Nicolini G., Nilsson M., Op de Beeck M., Osborne B., Ottosson Löfvenius M., Pavelka M., Peichl M., Peltola O., Pihlatie M., Pitacco A., Pokorný R., Pumpanen J., Ratié C., Schrupf M., Sedlák P., Serrano Ortiz P., Siebicke L., Šigut L., Silvennoinen H., Simioni G., Skiba U., Sonnentag O., Soudani K., Soulé P., Steinbrecher R., Tallec T., Thimonier A., Tuittila E., Tuovinen J., Vestin P., Vincent G., Vincke C., Vitale D., Waldner P., Weslien P., Wingate L., Wohlfahrt G., Zahniser M., Vesala T. (2018) Towards long-term standardised carbon and greenhouse gas observations for monitoring Europe's terrestrial ecosystems: a review. *International Agrophysics* 32, 439-455.
- Hufkens, K., Filippa, G., Cremonese, E., Migliavacca, M., & Odorico, P. D. (2018). Assimilating phenology datasets automatically across ICOS ecosystem stations. *International Agrophysics*.
- Oddi, L., Celi, L., Cremonese, E., Filippa, G., Galvagno, M., Palestini, G., & Siniscalco, C. (2018). Decomposition processes interacting with microtopography maintain ecosystem heterogeneity in a subalpine grassland. *Plant and Soil*.
- Luo, Y., El-Madany, T., Filippa, G., Ma, X., Ahrens, B., Carrara, A., ... & Pacheco-Labrador, J. (2018). Using Near-Infrared-Enabled Digital Repeat Photography to Track Structural and Physiological Phenology in Mediterranean Tree-Grass Ecosystems. *Remote Sensing*, 10(8), 1293.
- NDVI derived from near-infrared-enabled digital cameras: Applicability across different plant functional types. Filippa, G., Cremonese, E., Migliavacca, M., Galvagno, M., Sonnentag, O., Humphreys, E., ... & Richardson, A. D. *Agricultural and Forest Meteorology*, 249, 275-285. 2018
- Rogora, M., Frate, L., Carranza, M. L., Freppaz, M., Stanisci, A., Bertani, I., ... Matteucci, G. (2018). Assessment of climate change effects on mountain ecosystems through a cross-site analysis in the Alps and Apennines. *Science of the Total Environment*, 624.

## 2017

- Corbari, C., Ravazzani, G., Galvagno, M., Cremonese, E., & Mancini, M. (2017). Assessing Crop Coefficients for Natural Vegetated Areas Using Satellite Data and Eddy Covariance Stations. *Sensors*, 17(11), 2664.
- Heat wave hinders green wave: The impact of climate extreme on the phenology of a mountain grassland. E. Cremonese, G. Filippa, M. Galvagno, C. Siniscalco, L. Oddi, U. Morra di Cella, M. Migliavacca: *Agricultural and Forest Meteorology* 12/2017; 247:320-330., 2017
- Contribution of advection to nighttime ecosystem respiration at a mountain grassland in complex terrain. M. Galvagno, G. Wohlfahrt, E. Cremonese, G. Filippa, M. Migliavacca, U. Morra di Cella, E. van Gorsel. *Agricultural and Forest Meteorology* 05/2017; 237-238:270-281., 2017

## 2016

- 'Hearing' alpine plants growing after snowmelt: ultrasonic snow sensors provide long-term series of alpine plant phenology. Y. Vitasse, M. Rebetez, G. Filippa, E. Cremonese, G. Klein, C. Rixen. *International Journal of Biometeorology* 08/2016;2016.
- Hummocks affect soil properties and soil-vegetation relationships in a subalpine grassland (North-Western Italian Alps). E. Pintaldi, M.E. D'Amico, C. Siniscalco, E. Cremonese, L. Celi, G. Filippa, M. Prati, M. Freppaz. *Catena* 06/2016; 145:214-226., 2016
- Phenopix: A R package for image-based vegetation phenology. G. Filippa, E. Cremonese, M. Migliavacca, M. Galvagno, M. Forkel, L. Wingate, E. Tomelleri, U. Morra di Cella and A. D. Richardson. *Agricultural and Forest Meteorology*, 220, 141-150, 2016.

## 2015

- Interpreting canopy development and physiology using a European phenology camera network at flux sites. L. Wingate, J. Ogée, E. Cremonese, G. Filippa, M. Migliavacca, M. Galvagno et al. *Biogeosciences*, 12, 5995-6015, 2015.
- Five years of phenological monitoring in a mountain grassland: inter-annual patterns and evaluation of the sampling protocol. G. Filippa, E. Cremonese, M. Galvagno, M. Migliavacca, U. Morra di Cella, M. Petey and C. Siniscalco. *International Journal of Biometeorology*, 2015.
- Warming permafrost and active layer variability at Cime Bianche, Western European Alps. P. Pogliotti, M. Guglielmin, E. Cremonese, U. Morra di Cella, G. Filippa, C. Pellet, and C. Hauck. *The Cryosphere*, 9, 647-661, 2015.
- Carbon, water and energy fluxes of terrestrial ecosystems in Italy. D. Papale, M. Migliavacca, E. Cremonese, A. Cescatti, G. Alberti, N. Arriga, M. Balzarolo, L. Beelli, E. Canfora, R. Casa, P. Duce, O. Facini, M. Galvagno, L. Genesisio, D. Gianelle, E. Magliulo, G. Matteucci, L. Montagnani, F. Petrella, A. Pitacco, G. Seufert, D. Spano, P. Stefani, F. Vaccari, R. Valentini. *The Greenhouse Gas Balance of Italy*, Edition: Environmental Science and Engineering, Chapter: 1, Publisher: Springer, Editors: Valentini R., Miglietta F.

## BEFORE 2015

- Using digital camera images to analyse snowmelt and phenology of a subalpine grassland. T. Julitta, E. Cremonese, M. Migliavacca, R. Colombo, M. Galvagno, C. Siniscalco, M. Rossini, F. Fava, S. Cogliati, U. Morra di Cella, A. Menzel. *Agricultural and Forest Meteorology*, 198-199, 116-125, 2014
- Influence of physiological phenology on the seasonal pattern of ecosystem respiration in deciduous forests.. M. Migliavacca, M. Reichstein, A.D. Richardson, M.D. Mahecha, E. Cremonese, N. Delapierre, M. Galvagno, B.E. Law, G. Wohlfahrt, T.A. Black, N. Carvalhais, G. Ceccherini, J. Chen, N. Gobron, E. Koffi, J.W. Munger, O. Perez-Priego, M. Robustelli, E. Tomelleri, A. Cescatti. *Global Change Biology*, 198-199, 116-125, 2014
- Shifting mountain snow patterns in a changing climate from remote sensing retrieval. J.P. Dedieu, A. Lessard-Fontaine, G. Ravazzani, E. Cremonese, G. Shalpykova, M. Beniston. *Science of The Total Environment*, 2014
- Remote estimation of grassland gross primary production during extreme meteorological seasons. M. Rossini, M. Migliavacca, M. Galvagno, M. Meroni, S. Cogliati, E. Cremonese, F. Fava, A. Gitelson, T. Julitta, U. Morra di Cella, C. Siniscalco, R. Colombo. *International Journal of Applied Earth Observation and Geoinformation*, 2014
- Tradeoffs between global warming and day length on the start of the carbon uptake period in seasonally cold ecosystems. G. Wohlfahrt G., E. Cremonese, A. Hammerle, L. Hörtnagl, M. Galvagno, D. Gianelle, B. Marcolla, U. Morra di Cella. *Geophysical Research Letters*, 2013
- Phenology and carbon dioxide source/sink strength of a subalpine grassland in response to an exceptionally short snow season. M. Galvagno, G. Wohlfahrt, E. Cremonese, M. Rossini, R. Colombo, G. Filippa, T. Julitta, G. Manca, C. Siniscalco, U. Morra di Cella and M. Migliavacca. *Environmental Research Letters*, 2013
- Seasonal course of photosynthetic efficiency in *Larix decidua* Mill. in response to temperature and change in pigment composition during senescence. M. Galvagno, M. Rossini, M. Migliavacca, E. Cremonese, R. Colombo, U. Morra di Cella. *International Journal of Biometeorology*, 2012
- Remote sensing-based estimation of gross primary production in a subalpine grassland. M. Rossini, S. Cogliati, M. Meroni, M. Migliavacca, M. Galvagno, L. Busetto, E. Cremonese, T. Julitta, C. Siniscalco, U. Morra di Cella, and R. Colombo. *Biogeosciences*, 2012.
- Using digital repeat photography and eddy covariance data to model grassland phenology and photosynthetic CO<sub>2</sub> uptake. M. Migliavacca, M. Galvagno, E. Cremonese, M. Rossini, M. Meroni, O. Sonnentag, S. Cogliati, G. Manca, F. Diotri, L. Busetto, A. Cescatti, R. Colombo, F. Fava, U. Morra di Cella, E. Pari, C. Siniscalco, A. D. Richardson. *Agricultural and Forest Meteorology*, 2011.
- Phenological monitoring of grassland and larch in the Alps from Terra and Aqua MODIS images. R. Colombo, L. Busetto, F. Fava, B. di Mauro, M. Migliavacca, E. Cremonese, M. Galvagno, M. Rossini, M. Meroni, S. Cogliati, C. Panigada, S. Siniscalco, U. Morra di Cella. *Italian Journal of Remote Sensing / Rivista Italiana di Telerilevamento*, 2011
- The hyperspectral irradiometer, a new instrument for long-term and unattended field spectroscopy measurements. M. Meroni, A. Barducci, S. Cogliati, F. Castagnoli, M. Rossini, L. Busetto, M. Migliavacca, E. Cremonese, M. Galvagno, R. Colombo, and U. Morra di Cella. *Rev. Sci. Instrum.*, 2011.
- Brief Communication: An inventory of permafrost evidence for the European Alps. E.

Cremonese, S. Gruber, M. Phillips, P. Pogliotti, L. Boeckli, J. Noetzli, C. Suter, X. Bodin, A. Crepaz, A. Kellerer-Pirklbauer, K. Lang, S. Letey, V. Mair, U. Morra di Cella, L. Ravel, C. Scapozza, R. Seppi, and A. Zischg. *The Cryosphere*, 2011.

- Remote sensing of larch phenological cycle and analysis of relationships with climate in the Alpine region. L. Busetto, R. Colombo, M. Migliavacca, E. Cremonese, M. Meroni, M. Galvagno, M. Rossini, C. Siniscalco, U. Morra di Cella, E. Pari. *Global Change Biology*, 2010
- On the spatial and temporal variability of Larch phenological cycle in mountainous areas. R. Colombo, L. Busetto, M. Migliavacca, E. Cremonese, M. Meroni, M. Galvagno, M. Rossini, C. Siniscalco, U. Morra di Cella. *Italian Journal of Remote Sensing / Rivista Italiana di Telerilevamento*, 2009.
- Innovative devices for the SWE estimation at the basin scale: A field study in the Western Alps. G. Bal, I. Bevilacqua, E. Cremonese, P. Dellavedova, F. Diotri, S. Ferraris, B. Frigo, A. Godio, S. Letey, U. Morra Di Cella, P. Pogliotti, M. Previati, R. Rege. *ISSW 09 - International Snow Science Workshop, Proceedings*, 2009.
- European larch phenology in the Alps: Can we grasp the role of ecological factors by combining field observations and inverse modelling? M. Migliavacca, E. Cremonese, R. Colombo, L. Busetto, M. Galvagno, L. Ganis, M. Meroni, E. Pari, M. Rossini, C. Siniscalco, U. Morra di Cella. *International Journal of Biometeorology*, 2008.

## DATASET

- Seyednasrollah, B., A.M. Young, K. Hufkens, T. Milliman, M.A. Friedl, S. Frolking, A.D. Richardson, M. Abraha, D.W. Allen, M. Apple, M.A. Arain, J. Baker, J.M. Baker, C.J. Bernacchi, J. Bhattacharjee, P. Blanken, D.D. Bosch, R. Boughton, E.H. Boughton, R.F. Brown, D.M. Browning, N. Brunzell, S.P. Burns, M. Cavagna, H. Chu, P.E. Clark, B.J. Conrad, E. Cremonese, D. Debinski, A.R. Desai, R. Diaz-Delgado, L. Duchesne, A.L. Dunn, D.M. Eissenstat, T. El-Madany, D.S.S. Ellum, S.M. Ernest, A. Esposito, L. Fenstermaker, L.B. Flanagan, B. Forsythe, J. Gallagher, D. Gianelle, T. Griffis, P. Groffman, L. Gu, J. Guillemot, M. Halpin, P.J. Hanson, D. Hemming, A.A. Hove, E.R. Humphreys, A. Jaimes-Hernandez, A.A. Jaradat, J. Johnson, E. Keel, V.R. Kelly, J.W. Kirchner, P.B. Kirchner, M. Knapp, M. Krassovski, O. Langvall, G. Lanthier, G.I. Maire, E. Magliulo, T.A. Martin, B. McNeil, G.A. Meyer, M. Migliavacca, B.P. Mohanty, C.E. Moore, R. Mudd, J.W. Munger, Z.E. Murrell, Z. Nestic, H.S. Neufeld, T.L. O'Halloran, W. Oechel, A.C. Oishi, W.W. Oswald, T.D. Perkins, M.L. Reba, B. Rundquist, B.R. Runkle, E.S. Russell, E.J. Sadler, A. Saha, N.Z. Saliendra, L. Schmalbeck, M.D. Schwartz, R.L. Scott, E.M. Smith, O. Sonnentag, P. Stoy, S. Strachan, K. Suvocarev, J.E. Thom, R.Q. Thomas, A.K. Van den berg, R. Vargas, C.S. Vogel, J.J. Walker, N. Webb, P. Wetzel, S. Weyers, A.V. Whipple, T.G. Whitham, G. Wohlfahrt, J.D. Wood, S. Wolf, J. Yang, X. Yang, G. Yenni, Y. Zhang, Q. Zhang, and D. Zona. 2019. PhenoCam Dataset v2.0: Vegetation Phenology from Digital Camera Imagery, 2000-2018. ORNL DAAC, Oak Ridge, Tennessee, USA. <https://doi.org/10.3334/ORNLDAAC/1674>
- Milliman, T., B. Seyednasrollah, A.M. Young, K. Hufkens, M.A. Friedl, S. Frolking, A.D. Richardson, M. Abraha, D.W. Allen, M. Apple, M.A. Arain, J. Baker, J.M. Baker, C.J. Bernacchi, J. Bhattacharjee, P. Blanken, D.D. Bosch, R. Boughton, E.H. Boughton, R.F. Brown, D.M. Browning, N. Brunzell, S.P. Burns, M. Cavagna, H. Chu, P.E. Clark, B.J. Conrad, E. Cremonese, D. Debinski, A.R. Desai, R. Diaz-Delgado, L. Duchesne, A.L. Dunn, D.M. Eissenstat, T. El-Madany, D.S.S. Ellum, S.M. Ernest, A. Esposito, L. Fenstermaker, L.B. Flanagan, B. Forsythe, J. Gallagher, D. Gianelle, T. Griffis, P. Groffman, L. Gu, J. Guillemot, M. Halpin, P.J. Hanson, D. Hemming, A.A. Hove, E.R. Humphreys, A. Jaimes-Hernandez, A.A. Jaradat, J. Johnson, E. Keel, V.R. Kelly, J.W. Kirchner, P.B. Kirchner, M. Knapp, M. Krassovski, O. Langvall, G. Lanthier, G.I. Maire, E. Magliulo, T.A. Martin, B. McNeil, G.A. Meyer, M. Migliavacca, B.P. Mohanty, C.E. Moore, R. Mudd, J.W. Munger, Z.E. Murrell, Z. Nestic, H.S. Neufeld, W. Oechel, A.C. Oishi, W.W. Oswald, T.D. Perkins, M.L. Reba, B. Rundquist, B.R. Runkle, E.S. Russell, E.J. Sadler, A. Saha, N.Z. Saliendra, L. Schmalbeck, M.D. Schwartz, R.L. Scott, E.M. Smith, O. Sonnentag, P. Stoy, S. Strachan, K. Suvocarev, J.E. Thom, R.Q. Thomas, A.K. Van den berg, R. Vargas, C.S. Vogel, J.J. Walker, N. Webb, P. Wetzel, S. Weyers, A.V. Whipple, T.G. Whitham, G. Wohlfahrt, J.D. Wood, J. Yang, X. Yang, G. Yenni, Y. Zhang, Q. Zhang, and D. Zona. 2019. PhenoCam Dataset v2.0: Digital Camera Imagery from the PhenoCam Network, 2000-2018. ORNL DAAC, Oak Ridge, Tennessee, USA. <https://doi.org/10.3334/ORNLDAAC/1689>

## PERSONAL SKILLS

MOTHER TONGUE

ITALIAN

OTHER LANGUAGES

### ENGLISH

- Understanding (listening and reading) C2
  - Writing C2
  - Speaking C2

### FRENCH

- Understanding (listening and reading) C2
  - Writing C2
  - Speaking C2

DIGITAL COMPETENCE

(1) Operating systems

Linux/Unix and Windows.

(2) Programming:

R (advanced), IDL (proficient user), bash/shell (basic user), SQL (basic user)

(3) GIS:

Grass, Qgis, ArcGIS (proficient user)

(4) Database and website

Joomla (basic user), PgAdmin (PostgreSQL) (basic user)

(5) others

Datalogger Programming: CRBasic (proficient user)

DRIVING LICENCE

European B

Aosta , 10/04/2021

Signature