

## PhenoCam Fair Use Data Policy:

Since its inception, the objective of the PhenoCam network has been to serve as a repository for phenologically-relevant, digital, repeat (time-lapse) imagery, and to make that imagery, and derived data products, freely available to a wide array of third-party data end-users, including researchers, educators, and the general public. Thus, imagery from the PhenoCam archive is made publicly available, without restriction, and we encourage you to download imagery and datasets for use in your own research and teaching. In return, we ask that you acknowledge the source of the data and imagery, and abide by the terms of the Creative Commons CC BY Attribution License. Specifically, we request that all publications using imagery or provisional datasets downloaded from this web page include appropriate project and site acknowledgments (see below) and cite the relevant publications that describe the image acquisition and data processing procedures (e.g. Richardson et al. 2018 or Seyednasrollah et al. 2019). If you are using curated data or imagery from either the PhenoCam Dataset version 1.0 or 2.0 (see below) we also ask that you cite those datasets.

### Project Acknowledgements:

If you use PhenoCam data in a published paper, we ask that you include this text in your Acknowledgments —

We thank our many collaborators, including site PIs and technicians, for their efforts in support of PhenoCam. The development of PhenoCam has been funded by the Northeastern States Research Cooperative, NSF's Macrosystems Biology program (awards EF-1065029 and EF-1702697), and DOE's Regional and Global Climate Modeling program (award DE-SC0016011). We acknowledge additional support from the US National Park Service Inventory and Monitoring Program and the USA National Phenology Network (grant number G10AP00129 from the United States Geological Survey), and from the USA National Phenology Network and North Central Climate Science Center (cooperative agreement number G16AC00224 from the United States Geological Survey). Additional funding, through the National Science Foundation's LTER program, has supported research at Harvard Forest (DEB-1237491) and Bartlett Experimental Forest (DEB-1114804). We also thank the USDA Forest Service Air Resource Management program and the National Park Service Air Resources program for contributing their camera imagery to the PhenoCam archive.

### Site Acknowledgments:

Many site collaborators have provided us with site-specific acknowledgments text that we ask you to include in any published paper. The text for these acknowledgments is included in the metadata file associated with each PhenoCam site. For an example of how we recommend these acknowledgments be included, please see the [electronic supplement](#) to the following paper:

Richardson, A.D., K. Hufkens, T. Milliman, and S. Frolking. 2018. [Intercomparison of transition dates derived from the PhenoCam Dataset V1.0 and MODIS satellite remote sensing](#). Scientific Reports 8, Article number: 5679.

### Distribution and Re-use Policy:



The PhenoCam Dataset version 2.0, and associated camera imagery, is made publicly available under a CC BY Attribution License. If you use these data in a published paper, please cite the Scientific Data paper by Seyednasrollah et al. 2019, and the appropriate datasets. When appropriate, we encourage you to also cite the V1 Scientific Data paper by Richardson et al. 2018.

### Citations:

Syednasrollah, B., A.M. Young, K. Hufkens, T. Milliman, M.A. Friedl, S. Frohking, and A.D. Richardson. 201x. Tracking vegetation phenology across diverse biomes using PhenoCam imagery: The PhenoCam Dataset v2.0. *Scientific Data*, 6(1):222, 2019. doi:10.1038/s41597-019-0229-9

### **Vegetation Phenology**

Syednasrollah, B., A.M. Young, K. Hufkens, T. Milliman, M.A. Friedl, S. Frohking, A.D. Richardson, M. Abraha, D.W. Allen, M. Apple, M.A. Arain, J. Baker, J.M. Baker, D. Baldocchi, 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, J. Verfaillie, C.S. Vogel, J.J. Walker, N. Webb, P. Wetzler, 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>

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### **Camera Imagery**

Milliman, T., B. Syednasrollah, A.M. Young, K. Hufkens, M.A. Friedl, S. Frohking, A.D. Richardson, M. Abraha, D.W. Allen, M. Apple, M.A. Arain, J.M. Baker, D. Baldocchi, 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, J. Verfaillie, C.S. Vogel, J.J. Walker, N. Webb, P. Wetzler, 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>

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The PhenoCam Dataset version 1.0, and associated camera imagery, is made freely available under the [CC0 Public Domain Dedication](#). [We encourage you to use and cite the newer V2 of the dataset.](#)

#### Citations:

Richardson, A.D., K. Hufkens, T. Milliman, D.M. Aubrecht, M. Chen, J.M. Gray, M.R. Johnston, T.F. Keenan, S.T. Klosterman, M. Kosmala, E.K. Melaas, M.A. Friedl, and S. Frolking. 2018. [Tracking vegetation phenology across diverse North American biomes using PhenoCam imagery](#). Scientific Data 5, Article number: 180028. doi:10.1038/sdata.2018.28

- [RIS](#)

#### Vegetation Phenology

Richardson, A.D., K. Hufkens, T. Milliman, D.M. Aubrecht, M. Chen, J.M. Gray, M.R. Johnston, T.F. Keenan, S.T. Klosterman, M. Kosmala, E.K. Melaas, M.A. Friedl, S. Frolking, M. Abraha, M. Alber, M. Apple, B.E. Law, T.A. Black, P. Blanken, D. Browning, S. Bret-Harte, N. Brunzell, S.P. Burns, E. Cremonese, A.R. Desai, A.L. Dunn, D.M. Eissenstat, E. Euskirchen, L.B. Flanagan, B. Forsythe, J. Gallagher, L. Gu, D.Y. Hollinger, J.W. Jones, J. King, O. Langvall, J.H. McCaughey, P.J. McHale, G.A. Meyer, M.J. Mitchell, M. Migliavacca, Z. Nestic, A. Noormets, K. Novick, J. O'Connell, A.C. Oishi, W.W. Oswald, T.D. Perkins, R.P. Phillips, M.D. Schwartz, R.L. Scott, O. Sonnentag, and J.E. Thom. 2017. The PhenoCam Dataset V1.0. Vegetation Phenology from Digital Camera Imagery, 2000-2015. ORNL DAAC, Oak Ridge, Tennessee, USA. <https://doi.org/10.3334/ORNLDAAC/1511>.

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#### Camera Imagery

Milliman, T., K. Hufkens, A.D. Richardson, D.M. Aubrecht, M. Chen, J.M. Gray, M.R. Johnston, T.F. Keenan, S.T. Klosterman, M. Kosmala, E.K. Melaas, M.A. Friedl, S. Frolking, M. Abraha, M. Alber, M. Apple, B.E. Law, T.A. Black, P. Blanken, D. Browning, S. Bret-Harte, N. Brunzell, S.P. Burns, E. Cremonese, A.R. Desai, A.L. Dunn, D.M. Eissenstat, S.E. Euskirchen, L.B. Flanagan, B. Forsythe, J. Gallagher, L. Gu, D.Y. Hollinger, J.W. Jones, J. King, O. Langvall, J.H. McCaughey, P.J. McHale, G.A. Meyer, M.J. Mitchell, M. Migliavacca, Z. Nestic, A. Noormets, K. Novick, J. O'Connell, A.C. Oishi, W.W. Oswald, T.D. Perkins, R.P. Phillips, M.D. Schwartz, R.L. Scott, O. Sonnentag, and J.E. Thom. 2017. Images used in generation of the PhenoCam Dataset v1.0, 2000-2015. ORNL DAAC, Oak Ridge, Tennessee, USA. <https://doi.org/10.3334/ORNLDAAC/1560>

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