

Theresa M. Crimmins

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EDUCATION

- 2005 Ph.D., School of Renewable Natural Resources, University of Arizona, Tucson, AZ
- 1999 M.A., Geography, Western Michigan University, Kalamazoo, MI
- 1997 B.S., Biological Sciences, Western Michigan University, Kalamazoo, MI

PROFESSIONAL EXPERIENCE

- 2020-present Director, USA National Phenology Network, Tucson, AZ
- 2020-present Research Professor, School of Natural Resources and the Environment, University of Arizona, Tucson, AZ
- 2006-2020 Associate Research Scientist, School of Natural Resources and the Environment, University of Arizona, Tucson, AZ
- 2019-2020 Associate Director, USA National Phenology Network, Tucson, AZ
- 2015-2019 Assistant Director, USA National Phenology Network, Tucson, AZ
- 2008-2015 Partnerships & Outreach Coordinator, USA National Phenology Network, Tucson, AZ
- 2002-2006 Quantitative Ecologist, Sonoran Desert Network Inventory & Monitoring, National Park Service, Tucson, AZ
- 2002-2004 UA/NASA Space Grant Fellow, University of Arizona, Tucson, AZ

HONORS & AWARDS

Professional and Academic Honors & Awards

- 2019-2020 **Fellow, Tucson Public Voices**, Women's Foundation of Southern Arizona
- 2018 **Alumni Achievement Award**, Department of Geography, Western Michigan University
- Globally-Engaged Pillar Award**, College of Arts and Sciences, Western Michigan University
- 2005 **On-the-Spot Award**, Sonoran Desert Network, National Park Service for outstanding job performance

- 2003-2004 **University of Arizona/NASA Space Grant Graduate Fellowship**, University of Arizona/National Aeronautical Space Administration Space Grant Program
- 1999 **Department Graduate Research and Creative Scholar**, Western Michigan University Graduate College
- 1999 **Outstanding Graduate Research Award**, College of Arts & Sciences, Western Michigan University
- 1999 **Graduate Student Outstanding Scholastic Achievement Award**, Department of Geography, Western Michigan University
- 1997 **Clifford and Ella Chapman Distinguished Senior Scholarship**, Western Michigan University
- 1996 **Frank Hinds Zoology Award**, Western Michigan University Department of Biology
- 1993-1997 **Excellence Scholarship**, Western Michigan University

Team Awards

- 2019 **Outstanding Scholarly Achievement** for the USA-NPN's Pheno Forecast maps. School of Natural Resources and the Environment, University of Arizona. Project team member and nomination author.
- 2018 **USGS Shoemaker Award for Communication Product Excellence**, Excellence for the Webpage/Website category for "Tracking the Appearance of Spring: USA National Phenology Network's Status of Spring website and maps product." Project team member and nomination co-author.
- Climate Adaptation Leadership Award for Natural Resources**. Presented to the National Coordinating Office of the USA National Phenology Network. Association of Fish and Wildlife Agencies. Project team member and lead nomination author.
- Blue Pencil & Gold Screen Award of Excellence** for the USA National Phenology Network 2016 Annual Report. J.F. Weltzin, T.M. Crimmins, and T. Moody.
nagc.com/2018-blue-pencil-gold-screen-awards
- 2017 **Renewable Natural Resource Foundation Outstanding Achievement Award** for USA-NPN's Start of Spring Maps and Access Tools. Project team member and nomination co-author.
- 2016 **USGS Environmental Achievement Award** in Climate Champion category. Project team member and lead nomination author.
- Greening the Department of Interior**, Honorable Mention.
www.doi.gov/greening/awards/2016 Project team member and lead nomination author.
- 2015 **Healthy Workplace Award**. Presented by the Arizona Chapter of the American Psychological Association. Project team member
- 2014 **USGS Shoemaker Award for Communication Product Excellence**, Internet Product category for "Connecting People with Nature to Benefit Our Changing Planet: The *Nature's Notebook* website." Project team member and lead nomination author.

GRANT SUPPORT

Professional Grant Support

- USA National Phenology Network: Supporting management, science, and education. USDA Federal Capacity Grants of Hatch, Hatch Multistate, and McIntire-Stennis (NIFA). ARZT-1361780-H12-225. Total funding, \$110,000. **PI.**
- Developing and delivering short-term forecasts of winter wheat phenology. Cooperative Agreement funded by the USDA Climate Hubs, 2020-2021. Total funding: \$29,193. **PI.**
- Quantifying Phenological Coherence and Seasonal Predictability across NEON and USA-NPN Monitoring Sites. NSF-Macrosystems, 2020-2022. Total funding: \$982,043. **Co-I** (PI: M. Schwartz)
- Ecological forecasts for risk management. USGS Risk Research and Applications, 2019. Total funding: \$56,926. **Co-I.** (PI: J. Weltzin)
- Collaborating with Resource Managers to Identify and Address Phenological Information Needs. Southwest Climate Adaptation Science Center, 2018-2020. Total funding: \$40,000. **Co-I.** (PI: J. Weltzin)
- USA National Phenology Network. USGS Ecosystems Mission Area, 2018-2022. Total funding: \$2,999,928. **PI.** (Co-PI: S. Marsh)
- Workflows to support integrated predictive science capacity: Forecasting invasive species for natural resource planning and risk assessment. USGS Community for Data Integration, 2018. Total funding: \$34,324. **Co-I.** (PI: J. Weltzin)
Advance Pheno-climatic Information System. NASA ROSES A.41, Advanced Information Systems Technology, 2017-2019. Total funding: \$1,245,931. **Co-I.** (PI: J. Morissette) NNH16ZDA001N-AIST-0124.
- Integration of Phenological Forecast Maps for Assessment of Biodiversity: An Enterprise Workflow. USGS Community for Data Integration, 2016. Total funding: \$43,064. **Co-I.** (PI: J. Weltzin)
- USA National Phenology Network. USGS Ecosystems Mission Area, 2014-2018. Total funding: \$2,849,057. **Co-I.** (PI: S. Marsh)
- Community Phenology Trail. University of Arizona, Community Connections Grant, 2012. Total funding: \$9,317. **Co-I.** (PI: S. Oliver)
- Phenology, the USA National Phenology Network and the Arizona Master Gardener and 4-H Programs. Arizona Cooperative Extension – Signature Program Initiative (SPI) Funding, 2011. Total funding: \$2,990. **Co-I.** (PI: P. Warren)
- Simple Techniques for Backyard Water Harvesting: An Online Instruction Module. University of Arizona, Technology and Research Initiative Fund (TRIF), Water Sustainability Program, 2008. Total funding: \$44,781. **PI.**
- Managing Rangelands Before, During, and After Drought. National Learning Center for Private Forest and Range Land Owners, 2007. Total funding: \$14,637. **PI.**
- Watershed Function and Water Conservation for Range Management. National Learning Center for Private Forest and Range Land Owners, 2007. Total funding: \$14,842. **PI.**
- Exotic Plant Species Early Detection: Integrating Citizen Monitoring and Predictive Modeling. Desert Southwest Cooperative Ecosystems Studies Unit, 2006. Total funding: \$25,000. **PI.**
- Development of Invasive Plant Species Identification Cards. Colorado Plateau Cooperative Ecosystems Studies Unit, 2006. Total funding: \$5,000. **PI.**
- Evaluating Management of Lehmann lovegrass (*Eragrostis lehmanniana*) at Coronado National

Memorial. National Park Service Biological Resource Management Division, 2003. Total funding: \$39,513. **PI.**

- Exotic Plant Removal at Montezuma Castle and Tuzigoot National Monuments. National Park Service, 2003. Total funding: \$40,000. **PI.**

PUBLISHED WORKS

Peer-reviewed Journal Articles, Book Chapters, Technical Reports and Datasets

- 2020 Weltzin, J.F., J.L. Betancourt, B.I. Cook, **T.M. Crimmins**, C.A.F. Enquist, M.D. Gerst, J.E. Gross, G.M. Henebry, R.A. Hufft, M.A. Kenny, J.S. Kimball, B.C. Reed, and S.W. Running. Seasonality of biological and physical systems as indicators of climate variation and change. *Climatic Change*. doi.org/10.1007/s10584-020-02894-0.
- Bradford, J.B., J.F. Weltzin, M. McCormick, J. Baron, Z. Bowen, S. Bristol, D. Carlisle, **T. Crimmins**, P. Cross, J. DeVivo, M. Dietze, M. Freeman, J. Goldberg, M. Hooten, L. Hsu, K. Jenni, J. Keisman, J. Kennen, K. Lee, D. Lesmes, K. Loftin, B. Miller, P. Murdoch, J. Newman, K. Prentice, I. Rangwala, J. Read, J. Sieracki, H. Sofaer, S. Taylor, S. Thur, G. Toevs, F. Werner, C.L. White, T. White, and M. Wiltermuth. Ecological Forecasting: 21st century science for 21st century management. U.S. Geological Survey Open-File Report 2020-1073, 54 p., doi.org/10.3133/ofr20201073.
- Asrar, G., Y. Zhou, **T.M. Crimmins**, A. Sapkota. 2020. Eyes in the sky improve pollen tracking. *Eos*. doi.org/10.1029/2020EO147021. Published online 20 Jul 2020.
- Gerst, K.L., **T.M. Crimmins**, E.E. Posthumus, A.H. Rosemartin, and M.D. Schwartz. 2020. How well do the Spring Indices predict phenological activity across plant species? *International Journal of Biometeorology* 64: 889-901. doi.org/10.1007/s00484-020-01879-z
- Crimmins, T.M.**, K.L. Gerst, D.G. Huerta, R.L. Marsh, E.E. Posthumus, A.H. Rosemartin, J. Switzer, J.F. Weltzin, L. Coop, N. Dietschler, D.A. Herms, S. Limbu, R.T. Trotter III, M. Whitmore. 2020. Short-term forecasts of insect phenology inform pest management. *Annals of the Entomological Society of America* 113(2): 139-148. doi.org/10.1093/aesa/saz026.
- Crimmins, T.M.**, L. Barnett, E.G. Denny, A.H. Rosemartin, S. Schaffer, and J.F. Weltzin. 2020. "From tiny acorns grow mighty oaks: what we've learned from nurturing *Nature's Notebook*." In: *Handbook of Citizen Science in Ecology and Conservation*. Eds. C. Lepczyk, T. Vargo, and O.D. Boyle. University of California Press.
- 2019 **Crimmins, T.M.** and M.A. Crimmins. 2019. Biologically-relevant trends in springtime temperatures across the United States. *Geophysical Research Letters* 46(21):12377-12387. doi.org/10.1029/2019GL085251.
- Elmendorf, S.C., **T.M. Crimmins**, K.L. Gerst, and J.F. Weltzin. 2019. Time to branch out? Application of hierarchical survival models in plant phenology. *Agriculture and Forest Meteorology*. 279:107694. doi.org/10.1016/j.agrformet.2019.107694.
- Prudic, K.L., J.K. Wilson, M.C. Toshack, K.L. Gerst, A.H. Rosemartin, **T.M. Crimmins**, and J.C. Oliver. 2019. Creating the urban Farmer's Almanac with citizen science data. *Insects* 10(9):

294. doi.org/10.3390/insects10090294.
- Crimmins, M.A. and **T.M. Crimmins**. 2019. Does an early spring indicate an early summer? Relationships between intraseasonal growing degree day thresholds. *Journal of Geophysical Research - Biogeosciences*. 124:1-14. doi.org/10.1029/2019JG005297
- Crimmins, M.A. and **T.M. Crimmins**. 2019. Data from: Does an early spring indicate an early summer? relationships between intra-seasonal growing degree day thresholds. Dryad Digital Repository. doi.org/10.5061/dryad.pp045j3
- Posthumus, E.E., L. Barnett, **T.M. Crimmins**, P.L. Warren, E. Stancioff, and J. Einerson. 2019. "Building local resilience to climate change through citizen science, environmental education, and decision-making." In: *Addressing Climate Change at the Community Level in the United States*. Eds. P.R. Lachapelle and D.E. Albrecht. New York: Routledge/Taylor & Francis, pp 50-64.
- Gerst, K.L., A.H. Rosemartin, E.E. Posthumus, and **T.M. Crimmins**. Successes and challenges on a spectrum of stakeholder engagement. Collaboration Now for the Future: Biodiversity and Management of the Madrean Archipelago VI meeting proceedings, Tucson, Arizona, May 14-18, 2018. In press.
- 2018 Waller, E.K., **T.M. Crimmins**, J.J. Walker, E.E. Posthumus, and J.F. Weltzin. 2018. Differential changes in the onset of spring across US National Wildlife Refuges and North American migratory bird flyways. *PLoS ONE* 13(9): e0202495. doi.org/10.1371/journal.pone.0202495
- Weltzin, J.F., **T.M. Crimmins**, E.E. Posthumus, J.J. Walker, and E.K. Waller. 2018. Spring leaf and bloom index dates (1880-2013) and migratory bird flyways: U.S. Geological Survey data release, doi.org/10.5066/P9Z4C9LE.
- Browning, D.M., **T.M. Crimmins**, D.K. James, S. Spiegel, M.R. Levi, J.P. Anderson, and D.C. Peters. 2018. Synchronous species responses reveal phenological guilds – Implications for management. *Ecosphere* 9(9):e02395. doi.org/10.1002/ecs2.2395
- Crimmins, T.M.** 2018. The USA National Phenology Network's growing degree day maps and online visualization tool support management decisions. *Journal of Extension*. 56: 3, 3TOT4. www.joe.org/joe/2018june/tt4.php
- Rosemartin, A.R., M.L. Langseth, **T.M. Crimmins**, and J.F. Weltzin. 2018. Development and release of phenological data products--A case study in compliance with federal open data policy. U.S. Geological Survey Open-File Report 2018-1007. doi.org/10.3133/ofr20181007.
- Rosemartin, A.H., E.G. Denny, K.L. Gerst, R. L. Marsh, **T.M. Crimmins**, and J.F. Weltzin. 2018. USA National Phenology Network Observational Data Documentation. U.S. Geological Survey Open-File Report 2018-1060. doi.org/10.3133/ofr20181060
- 2017 **Crimmins, T.M.**, M.A. Crimmins, K.L. Gerst, A.H. Rosemartin, and J.F. Weltzin. 2017. USA National Phenology Network's volunteer-contributed observations yield predictive models of phenological transitions. *PLoS ONE* 12(8), e0182919. doi.org/10.1371/journal.pone.0182919

- Crimmins, T.M.** and Crimmins, M.A. 2017. Plant Phenology Site Phenometrics + Accumulated Growing Degree Day Calculations for the continental United States (2009-2016): U.S. Geological Survey data release, doi.org/10.5066/F7XG9Q0X.
- Ellwood, E., **T.M. Crimmins**, and A.J. Miller-Rushing. 2017. Citizen science and conservation: Recommendations for a rapidly moving field. *Biological Conservation* 208:1-4. dx.doi.org/10.1016/j.biocon.2016.10.014
- Crimmins, T.M.**, R.L. Marsh, J. Switzer, M.A. Crimmins, K.L. Gerst, A.H. Rosemartin, and J.F. Weltzin. 2017. USA National Phenology Network gridded products documentation. U.S. Geological Survey Open-File Report 2017–1003. doi.org/10.3133/ofr20171003.
- Langseth, M.L., Hsu, L., Amberg, J., Bliss, N., Bock, A.R., Bolus, R.T., Bristol, R.S., Chase, K.J., **Crimmins, T.M.**, Earle, P.S., Erickson, R., Everette, A.L., Falgout, J., Faundeen, J.L., Fienen, M., Griffin, R., Guy, M.R., Henry, K.D., Hoebelheinrich, N.J., Hunt, R., Hutchison, V.B., Ignizio, D.A., Infante, D.M., Jarnevich, C., Jones, J.M., Kern, T., Leibowitz, S., Lightsom, F.L., Marsh, R.L., McCalla, S.G., McNiff, M., Morissette, J.T., Nelson, J.C., Norkin, T., Preston, T.M., Rosemartin, A., Sando, R., Sherba, J.T., Signell, R.P., Sleeter, B.M., Sundquist, E.T., Talbert, C.B., Viger, R.J., Weltzin, J.F., Waltman, S., Weber, M., Wieferich, D.J., Williams, B., Windham-Myers, L. 2017. Community for Data Integration 2016 annual report: U.S. Geological Survey Open-File Report 2017–1053. doi.org/10.3133/ofr20171053.
- Andrianandrasana, H.T., D. Becker, A. Berardi, R. Bodmer, M. Chandler, J.A. Cousins, **T.M. Crimmins**, F. Danielsen, A.P. Giorgi, M. Huxham, A. Leslie, J. Mistry, B. Mora, M. Nelson, M.K. Poulsen, A.K. Pratihast, L.M. See, I. Theilade, P. Constantino, T. Vakil, and J. Williams. 2017. “The value and opportunities of community- and citizen-based approaches to tropical forest biodiversity monitoring.” In: *A Sourcebook of Methods and Procedures for Monitoring Essential Biodiversity Variables in Tropical Forests with Remote Sensing*. Eds. GOFCC-GOLD & GEO BON. Report version UNCBD COP-13, GOFCC-GOLD Land Cover Project Office, Wageningen University, The Netherlands. ISSN:2542-6729.
- 2015 Wright, K.W., K.L. Vanderbilt, D.W. Inouye, C.D. Bertelsen, and **T.M. Crimmins**. 2015. Turnover and reliability of flower communities in extreme environments: Insights from long-term phenology data sets. *Journal of Arid Environments* 115:27-34.
- Fuccillo, K.K., **T.M. Crimmins**, C. DeRivera, and T.S. Elder. 2015. Assessing accuracy in citizen science-based plant phenology monitoring. *International Journal of Biometeorology* 59:917-926. DOI [10.1007/s00484-014-0892-7](https://doi.org/10.1007/s00484-014-0892-7)
- 2014 **Crimmins, T.M.** 2014. “Finding a climate change signal in unexpected places.” Review of *Walden warming: climate change comes to Thoreau’s woods*. *Ecology* 95: 3234-3235.
- Crimmins, T.M.**, J.F. Weltzin, A.H. Rosemartin, E.M. Surina, and L. Marsh, E.G. Denny. 2014. Targeted campaign increases activity among participants in *Nature’s Notebook*, a citizen science project. *Natural Sciences Education* 43:64-72.
- Crimmins, T.M.**, C.D. Bertelsen, and M.A. Crimmins. 2014. Within-season flowering interruptions are common in the water-limited Sky Islands. *International Journal of Biometeorology* 58:419-426. doi.org/10.1007/s00484-013-0745-9.

- Denny, E.G., K.L. Gerst, A.J. Miller-Rushing, G.L. Tierney, **T.M. Crimmins**, C.A.F. Enquist, P. Guertin, A.H. Rosemartin, M.D. Schwartz, K.A. Thomas, J.F. Weltzin. 2014. Standardized phenology monitoring methods to track plants and animal activity for science and resource management applications. *International Journal of Biometeorology* 58:591-601. doi.org/10.1007/s00484-014-0789-5.
- Rosemartin, A.H., **T.M. Crimmins**, C.A.F. Enquist, K.L. Gerst, J.L. Kellermann, E.E. Posthumus, J.F. Weltzin, E.G. Denny, P. Guertin, and L. Marsh. 2014. Organizing phenological data resources to inform natural resource conservation. *Biological Conservation* 173:90-97. dx.doi.org/10.1016/j.biocon.2013.07.003
- Czech, B., S. Covington, **T.M. Crimmins**, J.A. Ericson, C. Flather, M. Gale, K. Gerst, M. Higgins, M. Kaib, E. Marino, T. Moran, J. Morton, N. Niemuth, H. Peckett, D. Savignano, L. Saperstein, S. Skorupa, E. Wagener, B. Wilen, and B. Wolfe. 2014. *Planning for Climate Change on the National Wildlife Refuge System*. U.S. Fish and Wildlife Service, National Wildlife Refuge System, Washington, DC. www.fws.gov/refuges/vision/pdfs/PlanningforClimateChangeontheNWRS.pdf
- 2013 Davies, T.J., E.M. Wolkovich, N.J.B. Kraft, N. Salamin, J.M. Allen, T.R. Ault, J.L. Betancourt, K. Bolmgren, E.E. Cleland, B.I. Cook, **T.M. Crimmins**, S.J. Mazer, G.J. McCabe, S. Pau, J. Regetz, M.D. Schwartz, S. Travers. 2013. Phylogenetic conservatism in plant phenology. *Journal of Ecology* 101: 1520-1530. doi: 10.1111/1365-2745.12154.
- Crimmins, T.M.**, M.A. Crimmins, and C.D. Bertelsen. 2013. Spring and summer patterns in flowering onset, duration, and constancy across a water-limited gradient. *American Journal of Botany* 100(6):1-11.
- Posthumus, E.E., L. Barnett, **T.M. Crimmins**, G. Kish, W. Sheftall, E. Stancioff, and P. Warren. 2013. *Nature's Notebook and Extension: Engaging citizen-scientists and 4-H youth to observe a changing environment*. *Journal of Extension* 51(1): 11AW1. Online: www.joe.org/joe/2013february/iw1.php.
- Schwartz, M.D., E. Beaubien, **T.M. Crimmins**, and J.F. Weltzin. 2013. "North America." In: *Phenology: An Integrative Environmental Science*. 2nd edition. Dordrecht: Kluwer Academic Publishers. Online: www.springer.com/life+sciences/ecology/book/978-94-007-6924-3 pp 67-89.
- Crimmins, T.M.**, M.A. Crimmins, and C.D. Bertelsen. Temporal patterns in species flowering in Sky Islands of the Sonoran Desert ecoregion. 2013. Pages 33-39 in: Gottfried, Gerald J.; Ffolliott, Peter F.; Gebow, Brooke S.; and Eskew, Lane G., compilers. 2012. Merging science and management in a rapidly changing world: biodiversity and management of the Madrean Archipelago III. 2012 May 1-5, Tucson, AZ. Proceedings RMRS-P-67. Fort Collins, CO: U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station. Online: www.fs.fed.us/rm/pubs/rmrs_p067/rmrs_p067_033_039.pdf.
- 2012 Cook, B.I., E.M. Wolkovich, T.J. Davies, T.R. Ault, J.L. Betancourt, J.M. Allen, K. Bolmgren, E.E. Cleland, **T.M. Crimmins**, N.J.B. Kraft, L.T. Lancaster, S.J. Mazer, G.J. McCabe, B.J. McGill, C. Parmesan, S. Pau, J. Regetz, N. Salamin, M.D. Schwartz, S.E. Travers. 2012. Sensitivity of spring phenology to warming across temporal and spatial climate gradients in two independent databases. *Ecosystems* DOI: 10.1007/s10021-012-9584-5.

- Wolkovich, E.M., B.I. Cook, J.M. Allen, **T.M. Crimmins**, S. Travers, S. Pau, J. Regetz, T.J. Davies, J.L. Betancourt, N.J.B. Kraft, T.R. Ault, K. Bolmgren, S.J. Mazer, G.J. McCabe, B.J. McGill, C. Parmesan, N. Salamin, M.D. Schwartz, and E.E. Cleland. 2012. Warming experiments underpredict plant phenological responses to climate change. *Nature* 485: 494-497.
- Crimmins, T.M.** and M.A. Crimmins. 2012. Appreciating and archiving present-day naturalists' contributions to science. *BioScience* 62:531-532.
- Deiz, J.M., I. Ibañez, A.J. Miller-Rushing, S.J. Mazer, **T.M. Crimmins**, M.A. Crimmins, C.D. Bertelsen, D.W. Inouye. 2012. Forecasting phenology: from species variability to community patterns. *Ecology Letters* 15:545-553.
- Cleland, E.E., J.M. Allen, **T.M. Crimmins**, S. Pau, S.E. Travers, E.M. Wolkovich. 2012. Phenological tracking enables positive species responses to climate change. *Ecology* 93: 1765-1771.
- 2011 **Crimmins, T.M.**, M.A. Crimmins, and C.D. Bertelsen. 2011. Onset of summer flowering in a 'Sky Island' is driven by monsoon moisture. *New Phytologist* 191:468-479. **Featured in a Commentary in the same issue of the journal:** "Broading the study of phenology and climate change", R.B. Primack and A.J. Miller-Rushing, 191:307-309.
- Posthumus, E. and **T. Crimmins**. 2011. *Nature's Notebook: A Tool for Education and Research*. *Bulletin of the Ecological Society of America* 92:185-187. dx.doi.org/10.1890/0012-9623-92.2.185
- Luvall, J.C., W.A. Sprigg, E. Levetin, A. Huete, S. Nickovic, G.A. Pejanovic, A. Vukovic, P.K. Van de Water, O.B. Myers, A.M. Budge, A.P. Zelicoff, L. Bunderson, **T.M. Crimmins**. 2011. Use of MODIS satellite images and an atmospheric dust transport model to evaluate *Juniperus* spp. pollen phenology and dispersal. Proceedings of the 34th International Symposium on Remote Sensing of Environment. Sydney, Australia. Online: www.isprs.org/proceedings/2011/ISRSE-34/211104015Final00129.pdf.
- Schwartz, K, **T. Crimmins**, and J. D'Agostino. An Online Innovation to Enhance Instruction and Assess Learning. Learning It by Living It: A Wild Ride through the Water Cycle. Proceedings of the North American Association for Environmental Education, 37th Annual Conference. 15-18 October 2008, Wichita, Kansas. Online: www.allacademic.com/meta/p240856_index.html
- 2010 **Crimmins, T.M.**, M.A. Crimmins, and C.D. Bertelsen. 2010. Complex responses to climate drivers in onset of spring flowering across a semi-arid elevation gradient. *Journal of Ecology* 98:1042-1051.
- Crimmins, T.M.** and C.L. Rupprecht. 2010. Testing Online learning modules for an extension program – useful and utilized? *Journal of Natural Resources and Life Sciences Education* 39:102-108.
- 2009 **Crimmins, T.M.**, M.A. Crimmins, and C.D. Bertelsen. 2009. Flowering range changes across an elevation gradient in response to warming summer temperatures. *Global Change Biology* 15:1141-1152.
- 2008 **Crimmins, T.M.** and G.R. McPherson. 2008. Vegetation and seed bank response to *Eragrostis*

- lehmanniana* removal. *Weed Research* 48:542-551.
- Crimmins, M.A. and **T.M. Crimmins**. 2008. Monitoring plant phenology using digital repeat photography. *Environmental Management* 41:949-958.
- Crimmins, T.M.**, M.A. Crimmins, D. Bertelsen, and J. Balmat. 2008. Relationships between flowering diversity and climatic variables along an elevation gradient. *International Journal of Biometeorology* 52:353-366.
- Crimmins, T.**, M.S. Mauzy, and S.E. Studd. 2008. Assessing exotic plant distribution, abundance, and impact at Montezuma Castle and Tuzigoot National Monuments in Arizona, USA. *Ecological Restoration* 26:47-53.
- 2007 Crimmins, M.A., G. Zaimes, N. Haas, C.K. Jones, G. Garfin, and **T.M. Crimmins**. 2007. Changes on the range: A novel exercise to explore interactions between range management decision making and climate change. *Journal of Natural Resources and Life Sciences Education*. 36:76-86.
- Mau-Crimmins, T.** 2007. Effects of removing *Cynodon dactylon* from a recently abandoned agricultural field. *Weed Research*. 47:212-221.
- 2006 Schussman, H.R., E.L. Geiger, **T.M. Mau-Crimmins**, and J. Ward. 2006. Spread and current potential distribution of an alien grass, *Eragrostis lehmanniana* Nees, in the southwestern USA: comparing historical data and ecological niche models. *Diversity and Distributions* 12:582-592.
- Mau-Crimmins, T.**, H.R. Schussman, and E.L. Geiger. 2006. Can the invaded range of a species be predicted sufficiently using only native-range data?: Lehmann lovegrass (*Eragrostis lehmanniana*) in the southwestern United States. *Ecological Modelling* 193:736-746.
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