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Refereed Scientific Publications

Garcia, M., B. Zuckerberg, J.M. LaMontagne, and P.A. Townsend: Landsat-based detection of masting in white spruce (*Picea glauca*) forests. Submitted to *Remote Sensing of Environment* on 27 April 2020, in revision.

Régnière, J., **M. Garcia**, and R. Saint-Amant, 2019: "Modeling migratory flight in the spruce budworm: Circadian rhythm." *Forests*, 10, 877, doi: 10.3390/f10100877.

Régnière, J., J. Delisle, B.R. Sturtevant, **M. Garcia**, and R. Saint-Amant, 2019: "Modeling migratory flight in the spruce budworm: Temperature constraints." *Forests*, 10, 802, doi: 10.3390/f10090802.

Garcia, M., and P.A. Townsend, 2016: "Recent climatological trends and potential influences on forest phenology around western Lake Superior, USA." *Journal of Geophysical Research–Atmospheres*, v. 121, pp. 13,364-13,391, doi: 10.1002/2016JD025190. Code and data supplement at https://matthewgarcia.tech/WxCD.

Garcia, M., M. Ozdogan, and P.A. Townsend, 2014: "Impacts of forest harvest on cold season land surface conditions and land-atmosphere interactions in northern Great Lakes states." *Journal of Advances in Modeling Earth Systems*, v. 6, pp. 923-937, doi: 10.1002/2014MS000317.

Tian, Y., C.D. Peters-Lidard, J.B. Eylander, R.J. Joyce, G.J. Huffman, R.F. Adler, K.-L. Hsu, F.J. Turk, **M. Garcia**, and J. Zeng, 2009: "Component analysis of errors in satellite-based precipitation estimates." *Journal of Geophysical Research–Atmospheres*, v. 114, paper no. D24101, doi: 10.1029/2009JD011949.

Peters-Lidard, C.D., D.M. Mocko, **M. Garcia**, J.A. Santanello, Jr., M. Tischler, M.S. Moran, and Y. Wu, 2008: "The role of precipitation uncertainty in the estimation of hydrologic soil properties using remotely-sensed soil moisture in a semi-arid environment." *Water Resources Research*, v. 44, paper no. W05S18, doi: 10.1029/2007WR005884.

Garcia, M., C.D. Peters-Lidard, and D.C. Goodrich, 2008: "Spatial interpolation of precipitation in a dense gauge network for monsoon storm events in the southwestern U.S." *Water Resources Research*, v. 44, paper no. W05S13, doi: 10.1029/2006WR005788.

Tian, Y., C.D. Peters-Lidard, B. Choudhury, and **M. Garcia**, 2007: "Multitemporal analysis of TRMM-based satellite precipitation products for land data assimilation applications." *Journal of Hydrometeorology*, v. 8, pp. 1165-1183, doi: 10.1175/2007JHM859.1.

Santanello, J.A., Jr., C. Peters-Lidard, **M.E. Garcia**, D. Mocko, M. Tischler, M.S. Moran, and D.P. Thoma, 2007: "Using remotely-sensed estimates of soil moisture to infer soil texture and hydraulic properties across a semi-arid watershed." *Remote Sensing of Environment*, v. 110, pp. 79-97, doi: 10.1016/j.rse.2007.02.007.

Tischler, M., **M. Garcia**, C. Peters-Lidard, M.S. Moran, S. Miller, D. Thoma, S. Kumar, and J. Geiger, 2006: "A GIS framework for surface-layer soil moisture estimation combining satellite radar measurements and land surface modeling with soil physical property estimation." *Environmental Modelling and Software*, v. 22, pp. 891-898, doi: 10.1016/j.envsoft.2006.05.022.

Schubert, W.H., S.A. Hausman, **M. Garcia**, K.V. Ooyama, and H.-C. Kuo, 2002: "Potential vorticity in a moist atmosphere." *Journal of the Atmospheric Sciences*, v. 58, pp. 3148-3157, doi: 10.1175/1520-0469(2001)058<3148:PVIAMA>2.0.CO;2.

Symposia and Invited Presentations

Garcia, M., B.R. Sturtevant, J. Régnière, Y. Boulanger, R. St-Amant, B.J. Cooke, G. Achtemeier, J.J. Charney, and P.A. Townsend, 2019: "Modeling Aerial Dispersal of Eastern Spruce Budworm Moths During Summer Migration." 2019 Joint Meeting of the Canadian Society for Ecology and Evolution (CSEE), the Entomological Society of Canada (ESC), and the Acadian Entomological Society (AES), 18-21 August 2019, Fredericton, New Brunswick, Canada.

Garcia, M., B.R. Sturtevant, and P.A. Townsend, 2019: "Spatiotemporally explicit forest phenoclimatology in northeastern Minnesota, USA." Symposium on Remote Sensing of Landscape Ecology: State of the Art/Science, 2019 Annual Meeting of the U.S. Regional Association of the International Association for Landscape Ecology (IALE), 7-11 April 2019, Fort Collins, Colorado.

Garcia, M., 2019: "Individual-based modeling for the migratory phase of the spruce budworm annual life cycle in eastern Canada." Department of Entomology, University of Wisconsin–Madison, 1 March 2019, Madison, Wisconsin.

Garcia, M., P.A. Townsend, and B.R. Sturtevant, 2018: "Identifying moderate-severity disturbances in forests around western Lake Superior using a 30-year Landsat-based phenoclimatology record." Symposium on Forest Entomology, 2018 North Central Branch Meeting of the Entomological Society of America, 18-21 March 2018, Madison, Wisconsin. https://esa.confex.com/esa/2018ncb/meetingapp.cgi/Paper/128215.

First-author Conference and Workshop Oral Presentations

Garcia, M., B.R. Sturtevant, J. Régnière, Y. Boulanger, R. St-Amant, B.J. Cooke, G. Achtemeier, J.J. Charney, and P.A. Townsend, 2019: "Modeling Aerial Dispersal of Eastern Spruce Budworm Moths During Summer Migration." 2019 Annual Meeting of the Ecological Society of America (ESA), 11-16 August 2019, Louisville, Kentucky.

Garcia, M., B.R. Sturtevant, J. Régnière, Y. Boulanger, R. St-Amant, B.J. Cooke, G. Achtemeier, J.J. Charney, and P.A. Townsend, 2019: "Modeling Aerial Dispersal of Eastern Spruce Budworm Moths During Summer Migration." 2019 meeting of IUFRO Sections 7.03.06 and 7.03.07 regarding "Population Dynamics and Integrated Management of Forest Insects," 8 July 2019, Québec City, Québec, Canada.

Garcia, M., B.R. Sturtevant, and P.A. Townsend, 2019: "Spatiotemporally Explicit Modeling of Forest Phenology Using Weather and Climatology." 2019 North American Forest Ecology Workshop (NAFEW), 23-27 June 2019, Flagstaff, Arizona.

Garcia, M., B.R. Sturtevant, J. Régnière, Y. Boulanger, R. St-Amant, B.J. Cooke, G. Achtemeier, J.J. Charney, and P.A. Townsend, 2019: "Modeling Aerial Dispersal of Eastern Spruce Budworm Moths During Summer Migration." 2019 North American Forest Ecology Workshop (NAFEW), 23-27 June 2019, Flagstaff, Arizona.

Garcia, M., B.R. Sturtevant, J. Régnière, Y. Boulanger, R. St-Amant, B.J. Cooke, G. Achtemeier, J.J. Charney, and P.A. Townsend, 2018: "Using Landsat, Aerial Surveys, Weather Modeling, and Agent-based Models of Outbreak Insect Phenology and Migration to Explore the Topographic Concentration Hypothesis." ForestSAT 2018, 1-5 October 2018, University of Maryland–College Park, College Park, Maryland.

Garcia, M., and P.A. Townsend, 2018: "Landsat Image Time Series Processing using HTCondor on UW-CHTC and OSG Resources." HTCondor Week 2018, 21-24 May 2018, University of Wisconsin–Madison, Madison, Wisconsin. Slides available at https://agenda.hep.wisc.edu/event/1201/other-view.

Garcia, M., P.A. Townsend, and B.R. Sturtevant, 2018: "Identifying Defoliation-based Disturbances in Forests Around Western Lake Superior Using a 30-year Landsat-based Phenoclimatology Analysis." Symposium on State-of-the-Art Techniques for Remote Sensing of Disturbed Landscapes, 2018 Annual Meeting of the U.S. Regional Association of the International Association for Landscape Ecology (IALE), 8-12 April 2018, Chicago, Illinois. Abstract available at http://sched.co/DeMf.

Garcia, M., and P.A. Townsend, 2017: "HTCondor Workflow Development for Statistical Modeling of Satellite Image Time Series with Ancillary Data." HTCondor Week 2017, 2-5 May 2017, University of Wisconsin–Madison, Madison, Wisconsin.

Garcia, M., 2016: "Changes in Climate, Forest Phenology, and Forest Disturbances around Western Lake Superior." Wisconsin Space Conference, 11 August 2016, Superior, Wisconsin.

Garcia, M., and K.K. Hirschboeck, 2009: "Integrating a Flood Hydroclimatology Database with the Arizona Hydrologic Information System (AHIS)." *Arizona Hydrological Society* and *American Institute of Hydrology*, 2009 Annual Water Symposium on Managing Hydrologic Extremes, 30 August - 2 September 2009, Scottsdale, Arizona.

Garcia, M., K. Jacobs, G.C. Woodard, C. Gries, W.-D. Otte, R. Vazquez, and J. McGill, 2009: "Ground Water-Related Data Services for the Arizona Hydrologic Information System (AHIS)." *National Ground Water Association*, 2009 Ground Water Summit, 20-23 April 2009, Tucson, Arizona.

Garcia, M., C.D. Peters-Lidard, J.B. Eylander, C. Daly, Y. Tian, and J.L. Zeng, 2008: "Development and evaluation of climatologically-downscaled AFWA AGRMET precipitation products over the continental U.S." *American Geophysical Union*, Joint Assembly, 27-30 May 2008, Fort Lauderdale, Florida. *Eos Trans. AGU*, v. 89, no. 23, Jt. Assem. Suppl., Abstract H24A-01.

Garcia, M., C.D. Peters-Lidard, J.B. Eylander, C. Daly, Y. Tian, and J. Zeng, 2007: "Use of climatological downscaling for evaluation of satellite-based precipitation analyses over the continental U.S." 1st Workshop on the Evaluation of High-Resolution Precipitation Products, 3-5 December 2007, Geneva, Switzerland.

Garcia, M., C.D. Peters-Lidard, and D. Goodrich, 2006: "Spatial interpolation of precipitation in a dense gauge network for monsoon storm events in southeastern Arizona." *American Geophysical Union*, Joint Assembly, 23-26 May 2006, Baltimore, Maryland. *Eos Trans. AGU*, v. 87, no. 36, Jt. Assem. Suppl., Abstract H21C-04.

Garcia, M., 2005: "NOAA-NWS Quantitative Precipitation Estimation—a NASA perspective." NOAA-NWS-NSSL Next-Generation QPE (Q2) Science Workshop, 28−30 June 2005, Norman, Oklahoma.

Garcia, M., 2000: "Characteristics of convective development in simulated squall lines." *American Meteorological Society*, 24th Conference on Hurricanes and Tropical Meteorology, 29 May − 2 June 2000, Ft. Lauderdale, Florida.

First-author Conference and Workshop Poster Presentations

Garcia, M., and P.A. Townsend, 2018: "Landsat-based Upper Great Lakes Forest Phenoclimatology, 1984-2013." ForestSAT 2018, 1-5 October 2018, University of Maryland–College Park, College Park, Maryland, doi: 10.6048/m9.figshare.7172807.v1.

Garcia, M., and M. Ozdogan, 2013: "Impacts of forest harvest on cold season land surface conditions and land–atmosphere interactions in northern Great Lakes states." Center for Climate Research, University of Wisconsin–Madison, Madison, Wisconsin, doi: 10.6084/m9.figshare.900949.

Garcia, M., C.D. Peters-Lidard, J.B. Eylander, C. Daly, Y. Tian, and J.L. Zeng, 2007: "Climatological downscaling and evaluation of AGRMET precipitation analyses over the continental U.S." *American Geophysical Union*, Joint Assembly, 22-25 May 2007, Acapulco, Mexico. *Eos Trans. AGU*, v. 88, no. 23, Jt. Assem. Suppl., Abstract H53B-03, doi: 10.6084/m9.figshare.826212.

Garcia, M., S. Kumar, D. Gochis, D. Yates, J. McHenry, T. Burnet, C. Coats, and J. Condrey, 2006: "Distributed application of the Unified Noah LSM with hydrologic flow routing on an Appalachian headwater basin." *American Geophysical Union*, Joint Assembly, 23-26 May 2006, Baltimore, Maryland. *Eos Trans. AGU*, v. 87, no. 36, Jt. Assem. Suppl., Abstract H23D-20, doi: 10.6084/m9.figshare.826211.

Education and Professional Experience

January 2018 to present	Postdoctoral Research Associate Principal Investigator: Prof. Philip A. Townsend Department of Forest and Wildlife Ecology, University of Wisconsin–Madison, Madison, Wisconsin
September 2011 to January 2018	Ph.D., Forestry (concentration in Remote Sensing) College of Agriculture and Life Sciences, University of Wisconsin–Madison, Madison, Wisconsin Advisor: Prof. Philip A. Townsend Thesis: *Climatology and Forest Phenology during 1984-2013 around Western Lake Superior, USA* DOI: 10.31237/osf.io/atqxp Awards: 2015-16 Wisconsin Space Grant Consortium, Graduate & Professional Research, Graduate Fellowship Award

August 2008 to August 2010	Project Manager, Arizona Hydrologic Information System Arizona Water Institute and SAHRA Assistant Research Professor of Informatics Department of Hydrology and Water Resources, University of Arizona, Tucson, Arizona
July 2008	Expert witness in the field of Hydrology, in testimony for the defendant Case no. 01 CV 1290, State of Colorado, 4th Judicial District, Judge Kirk S. Samelson Ruled in favor of the defendant on 31 July 2008
October 2004 to July 2008	Research Associate University of Maryland–Baltimore County, Catonsville, Maryland Goddard Earth Science and Technology Center Hydrological Sciences Branch (Code 614.3) NASA Goddard Space Flight Center, Greenbelt, Maryland
May 2004 to September 2004	Research Associate Caelum Research Corporation, Rockville, Maryland NASA Hydrological Sciences Branch (Code 974) NASA Goddard Space Flight Center, Greenbelt, Maryland
January 2002 to December 2003	M.S., Civil Engineering (concentration in Hydrology and Water Resources) College of Engineering, Colorado State University, Fort Collins, Colorado Advisor: Prof. Larry A. Roesner Thesis: *Estimation of Ungauged Rainfall from Measured Streamflow for the Simulation of a Colorado Front Range Flood Event*
January 2000 to December 2001	Ph.D. Student and Candidate, Atmospheric Science College of Engineering, Colorado State University, Fort Collins, Colorado Advisor: Prof. Wayne H. Schubert
August 1996 to December 1999	M.S., Atmospheric Science (concentration in Atmospheric Dynamics) College of Engineering, Colorado State University, Fort Collins, Colorado Advisor: Prof. Wayne H. Schubert Thesis: *Simulated Tropical Convection*
August 1992 to May 1996	B.S., Physics and Geosciences (double major) College of Science and Mathematics, Montclair State University, Upper Montclair, New Jersey Awards and Honors: 1996 Outstanding Senior Physics Student