Mark James Chopping, Ph.D.

Professor, Department of Earth and Environmental Studies
Director, Doctoral Program in Environmental Science and Management
College of Science and Mathematics
Montclair State University
Montclair, NJ 07043 U.S.A.

E-mail: mark.chopping@montcair.edu Office Phone: (973) 655-7384

EDUCATION

Ph.D.	University of Nottingham (England), 1998, Remote Sensing.
M.Phil.	University of Cambridge (England), 1995, Geographic Information Systems and Remote Sensing.
B.A. (Hons.)	University of Exeter (England), 1981, Music.

PROFESSIONAL EXPERIENCE

Montclair State University

Director, Ph.D. Program in Environmental Science and Management September 2017-
Synopsis: 46 faculty, 59 students (43% in candidacy), 26 graduated since Fall 2017 (mean: ~4 yr^{-1}).

Department of Earth and Environmental Studies

Professor September 2011-
Associate Professor September 2006 - 2011
Assistant Professor September 2002 - August 2006

United States Department of Agriculture, Agricultural Research Service
Jornada Experimental Range, Las Cruces, New Mexico.

Physical Scientist GS 12 January 2001 - August 2002
Performance Ratings for 2001: Outstanding.

United States Department of Agriculture, Agricultural Research Service
Hydrology and Remote Sensing Laboratory, Animal and Natural Resources Institute, BARC-West, Beltsville, Maryland.

Physical Scientist GS 11 January 1999 - January 2001
Performance Ratings for 1999 and 2000: Outstanding.

University of Nottingham (England), School of Geography

Teaching Assistant October 1996 - September 1997

University of Cambridge (England), Department of Anthropology MacArthur Project for Environmental and Cultural Conservation in Inner Asia

Database and GIS Manager March 1992 – October 1994

HONORS AND AWARDS

- State of New Jersey Certificate of Appreciation, "For dedicated service to the New Jersey Department of Environmental Protection Science Advisory Board", May 14, 2023.
- William T. Pecora Group Award for achievement in Earth remote sensing: the Terra Team (October 2019), sponsored by NASA and USGS.
- College of Science and Mathematics Recognition of Excellence 2019: For Leadership: "Leadership for the Environmental Science and Management program and its recruiting".
- Gonfalonier (CSAM), Montclair State University, The Graduate School Commencement, 5/22/18.
- Certificate of Outstanding Contribution in Reviewing, 2016, *Remote Sensing of Environment*.
- NASA Certificate of Appreciation, 2014, "in recognition of your valuable contribution & outstanding support to the Instrument Incubator Program (IIP) and the NASA Earth Science Technology Office".
- Certificate of Excellence in Reviewing, 2013. *Remote Sensing of Environment*, "in recognition of an outstanding contribution to the quality of the journal".
- Margaret and Herman Sokol Faculty Fellow 2009 ($25,000).
- Visiting Professor (honorary), School of Geography, Inner Mongolia Normal University, Huhehaote, P.R. China, October 2005.
- USDA, ARS Certificate of Merit for Outstanding Performance, 1999, 2000, 2001.
- USDA, ARS Award for Outstanding Presentation at the American Water Resources Association Annual Conference, Albuquerque, NM, November 2001.
- USDA, ARS Certificate of Merit for Outstanding Research Employing Multilevel Remote Sensing for Arid Land Characterization and Rangeland Vegetation Assessment, 1999.
- The Remote Sensing Society (UK) Best M.Sc. Paper, 1996.
- Cambridge University Geography Dept. GIS & Remote Sensing M.Phil. Best of Year 1995.

TEACHING

EAES 101 (GEOS107) Planet Earth (Fall 2002-4/6-7/9-10/16,18-22, Spring 2005/6/8/11/13-15/17)
EAES 896 Research Project II in Environmental Management, Spg '17 (w/S. Brachfeld); Spg '18-23.
EAES 790 Colloquium in Environmental Management, Fall 2021.
EAES 611 (ENVR 655) Advanced Environmental Remote Sensing (Spring 2004/7/10/14)
EAES 311/511 (GEOS/ENVR 455/555) Fund. Remote Sensing (Sprg 2004/7, Fall 2009-16)
EUGS 270 Geographic Information Systems I: Digital Mapping (Fall 2003, Spring 2005/6)
EUGS 470 Geographic Information Systems II (Fall 2002/4/5/7)
GEOS 257 Weather & Climate (Spring 2012); EUGS 427/504 Spatial Analysis (Spring 2003)
EUGS 102 World Geography (Spring 2003) & Online Practical Exercises (Fall 2003)
Guest lectures ENVR 770 Earth Systems Science, GEOS 112 Physical Geology.

DOCTORAL DEGREE COMMITTEES (^graduated, *chair)

Darko Radakovic*	Changing shrub abundance in Arctic tundra (ABoVE)	Fall 2020-
Shane Daiek	Coastal dune morphology and the role of vegetation	Spring 2022-
Maija Wehmas*	Changing shrub abundance in Arctic tundra and fire	Fall 2019-2020
Isamar Cortés	Climate impacts on mangrove island morphology	Fall 2019-
Daniel Ciarletta^	Marine sediment transport processes	Spring 2018-19
Rocio R. Duchesne Onoro^*	Remote Sensing of Arctic Tunda	Spring 2010-15
Sagarika Chanda (neé Roy)^	Hydrologic Modeling in Semi-arid Agricultural Region: An Integrated Approach	Fall 2010-13
Faith K. Justus^*	Multiangle Remote Sensing of Savanna (Chair-2012)	Fall 2010-12
Aslan Aslan*	Remote Sensing of Tropical Forest Biomass	Fall 2009-11
Zhuosen Wang^ (Boston University)	MODIS Reflectance Anisotropy and Albedo of Dormant and Snow- Covered Canopies.	Fall 2009-10
Victor U. Onwueme^	Characterization and assessment of contaminated Sediments of the Lower Passaic River, NJ.	Spring 2004-7

EXTERNAL EXAMINING

Ph.D. External Examiner, University of Toronto: Jan Pisek	Sep 4, 2009
Ph.D. External Examiner, University of Nottingham, Haoyang Xu	Sep 16, 2009
Ph.D. External Examiner, Boston University, Zhuosen Wang	Aug 17, 2010

GRADUATE STUDENT ADVISING & COMMITTEES N.E.S.

John Kendrat (M.S. Earth and Environmental Science; committee member)	Spring 2022
Christopher Tenebruso (M.S. Earth and Environmental Science; committee member)	Fall 2019-20
Isamar Cortés (M.S. Earth and Environmental Science; committee member)	Spring 2018-19
Lindsey Shanks (M.S. Earth and Environmental Science; committee member)	Spring 2017
Renee Rehfuss (M.S. Earth and Environmental Science; committee member)	Spring 2017
Robert Teeter (graduate student)	Fall 2005-6
Neeti Neeti (graduate student)	Spring 2006

INDEPENDENT STUDY

Adriana Calderon	Forest Disturbance from Large Storm Events in Landsat Images	Spring 2018
Isamar Cortés	Remote Sensing of Mangrove Forests in Two Regions	Fall 2017
Jeffrey Baker	Lake Water Quality from Remote Sensing	Fall 2015
Lewis Windle	Advanced Topics in Geographic Information Science	Spring 2015
Michael Whalen	Pro-Seminar: Groundwater Mapping	Spring 2015
Alina Tarmu	CANAPI for Urban Tree Mapping in Jersey City	Fall 2013
Faith Justus	MISR data in mapping shrubs and tree cover over savanna	Fall 2011
Rocio O. Duchesne	Geometric Correction of Aerial Imagery	Spring 2010
Aslan Aslan	Analysis of Field, UAV, and Lidar Data on Shrub Heights	Fall 2010
Amanda Smalley	Remote Sensing of Mount Kilimanjaro's Snow and Ice	Spring 2010
Lawrence Galiano	Canopy Cover and Height from Google Earth Imagery	Summer 2009
Sagarika Roy	Canopy Evapotranspiration from the NASA MASTER	Fall 2009
Marcia Anderson	High Resolution Mapping of Urban Tree Cover	Spring 2008
Chie Fuchiyama	Land Use Change/Water Quality in the Mullica R. Watershed	Spring 2005

POST-DOCTORAL & VISITING SCIENTIST

Dr. Bao Gang, Visiting Scientist, Inner Mongolia Normal University	2015-2016
Dr. Tian Yao, Post-Doctoral Fellow, now at NASA/GSFC	2012-2013
Dr. Sawahiko Shimada, Visiting Scientist, Tokyo Agricultural University	2009-2010
Dr. Lihong Su, Post-Doctoral Fellow	2004-2007

RESEARCH LEADERSHIP

SCIENCE TEAM MEMBERSHIP

- NASA MISR Science Team, 2004-, Co-Investigator with NASA HQ appointment from 2008-.
- NASA ABoVE Science Team 2015-.
- NASA Terrestrial Ecology Science Team, 2008-.
- NASA MODIS Science Team, 2011- (currently inactive).
- NASA Vegetation Structure Working Group, 2008-2011.
- Principal Investigator, North American Carbon Program (NACP), 2006-.
- NASA Land Cover Land Use Change (LCLUC) Science Team, 2004-2008
- Principal Investigator, Jornada Core Site, ESA CHRIS/Proba mission, 2000-2009.

GRANTS & PROPOSALS

My research has been funded by NASA from 2004, with current support to May 2025. Total research funding from NASA grants to me as Principal Investigator stands at over $2 million, including grants awarded from Research Opportunities in Space and Earth Sciences competitions and subcontracts from NASA, JPL to support my work as Co-Investigator in the MISR Project.

Recently Submitted

2022: NNH21ZDA001N-FINESST, F.5 Future Investigators in NASA Earth and Space Science and Technology (FINESST), Tall Shrub Expansion as a Driver of Rapid Permafrost Loss in Thermokarst Lakes. Proposed Start Date 09/01/2022, Proposed End Date 05/31/2025. PhD student: Darko Radakovic. Principal Investigator: Mark J. Chopping. Declined (panel evaluation: VG).

2020: NASA NNH20ZDA001N-CSDA (Commercial SmallSat Data Analysis), Notice of Intent# N0-CSDA20-0164.A Hybrid CANAPI-Machine Learning Approach to Forest Mapping with Commercial SmallSat Imagery was submitted 07/01/20, proposed dates: 3/1/21 – 8/31/22. Principal Investigator: Mark J. Chopping. Impacted by the COVID-19 pandemic in summer 2020.

2020: NASA Office of STEM Engagement (OSE) Fellowship Activity 2020, Solicitation: NNH20ZHA001N: Understanding shrub-fire interactions in an increasingly fire-prone Arctic (NASA Center: GSFC-000). PhD student: Maija Wehmas. PI: Mark J. Chopping. Declined.

2016: Research and Education Program for Historically Black Colleges and Universities and Minority-Serving Institutions Equipment/Instrumentation Fiscal Year 2017, Broad Agency Announcement W911NF-16-R-0024: A Small Unmanned Aerial Vehicle Facility for STEM Education and Research at Montclair State University (SUAVSTER). PI: Mark Chopping; Co-I: Stefan Robila. Commitment: 1 month, summer 2017. Declined.

2016: NNH16ZDA001N-TE Terrestrial Ecology: An Airborne Campaign for the Arctic-Boreal Vulnerability Experiment (ABoVE), Evaluating Arctic Radiation Balance and Photosynthesis characteristics with NASA's Multi-Angle Imaging BRDF Unmanned Airborne System (MALIBU). Principal Investigator: Zhuosen Wang (ESSIC/ UMD). Co-Is: Miguel O. Román (NASA/GSFC), Crystal B. Schaaf (U. of Massachusetts Boston), Mark J. Chopping (Montclair State U.), Brendan M. Rogers (Woods Hole Research Center), John A. Gamon (U. of Nebraska–Lincoln), Maciej Stachura (Blackswift Technologies). Commitment: 1 month/year over three years. Declined.

Selected

2023: NNH22ZDA001N-FINESST, F.5 Future Investigators in NASA Earth and Space Science and Technology (FINESST), Tall Shrub Expansion as a Driver of Rapid Permafrost Loss in Thermokarst Lakes. Proposed Start Date 09/01/2023, Proposed End Date 05/31/2025. PhD student: Darko Radakovic. **Principal Investigator:** Mark J. Chopping. **$93,499.**

2016-2023: National Aeronautics and Space Administration (NASA), Jet Propulsion Laboratory/MISR Project: annual renewals of contract for forest and shrub mapping using MISR, **Principal Investigator** (Subcontract #1552327, **$252,124**).

2022: U.S. National Science Foundation. Post-Bac Research Experiences for LSAMP Students (PRELS) program, to fund Garden State Louis Stokes Alliance for Minority Participation (GS-LSAMP) graduates for 12 months of research training and professional development at Rutgers, Newark / New Brunswick, Kean, and Montclair State. **Principal Investigator**: Mark J. Chopping. Research project description "Trends in New Jersey Forested Landscapes Assessed with State and Commercial Smallsat High Resolution Imagery", plus professional development outline. Students will receive a $25,000 stipend plus $5,000 for supplies and travel. Mentors / project titles are available at https://sites.google.com/view/gslsamp-prels/home

2017: National Aeronautics and Space Administration (NASA), Circumpolar Albedo of Northern Lands from Landsat-8 and Sentinel-2 (17-LCLUC17-0031), submitted to the Science Mission Directorate's Earth Science Division, in response to NASA Research Announcement NNH17ZDA001N-LCLUC, Research Opportunities in Space and Earth Science (ROSES-2017), Program Element A.2 Land Cover/Land Use Change. NASA. Award 80NCSSC18K0479. 01/31/18 – 01/30/22. **Collaborator**.

2016: Research and Education Program for Historically Black Colleges and Universities and Minority-Serving Institutions Equipment/Instrumentation Fiscal Year 2017, Broad Agency Announcement W911NF-16-R-0024: W911NF-16-R-0024: Actionable Decision-Making for Flooding Events utilizing a small UAV Platform with LiDAR and Hyperspectral Instruments, Proposal No. 70512-RT-REP. PI: Robert Taylor, **Collaborator** on proposal; further engagement curtailed owing to appointment as Doctoral Program Director, Ph.D. program in Environmental Management, 9/17.

2015: National Aeronautics and Space Administration (NASA), Research Opportunities in Space and Earth Sciences 2014 (ROSES'14), NNH14ZDA001N-TE A.4 Terrestrial Ecology: *Changes in Shrub Abundance in Arctic Tundra from the Satellite High Resolution Record for the Arctic-Boreal Vulnerability Experiment and Impacts on Albedo*. (Award #NNX15AU08A, **Principal Investigator**, **$148,357).**

2015: National Aeronautics and Space Administration (NASA), Jet Propulsion Laboratory/MISR Project: renewal of contract for forest and shrub mapping using MISR, Jan-Dec 2015, **Principal Investigator** (Subcontract #1365499, **$29,600**).

2014: National Aeronautics and Space Administration (NASA), Research Opportunities in Space and Earth Sciences 2013 (ROSES'13), NNH13ZDA001N-CARBON A.5 Carbon Cycle Science: *A high-resolution circumpolar delineation of the forest-tundra ecotone with implications for carbon balance*, submitted July 31st, 2013, Principal Investigator: Dr. K. Jon Ranson, NASA GSFC, Biospheric Sciences Branch, Code 618. July-August 2015. Award #NNX14AL10G, **Co-Investigator ($39,086**).

2014: National Aeronautics and Space Administration (NASA), Jet Propulsion Laboratory/MISR Project: renewal of contract for forest and shrub mapping using MISR, Jan-Dec 2014, **Principal Investigator** (Subcontract #1365499, **$13,321.11**).

2013: National Aeronautics and Space Administration (NASA), Jet Propulsion Laboratory/MISR Project: renewal of contract for forest and shrub mapping using MISR, Jan-Dec 2013, **Principal Investigator** (Subcontract #1365499, **$44,315**).

2011: National Aeronautics and Space Administration (NASA), Jet Propulsion Laboratory/MISR Project: renewal of contract for forest and shrub mapping using MISR, Jan-Dec 2011, **Principal Investigator** (Subcontract #1365499, **$39,975**).

2011: National Aeronautics and Space Administration (NASA), Research Opportunities in Space and Earth Sciences 2009 (ROSES'09), NNH09ZDA001N-TERRAQUA: The Science of Terra and Aqua, *A Decade of Changes in Aboveground Live Standing Dry Biomass, Canopy Cover, Height, and Understory Density in the Southwestern United States from EOS MISR and MODIS*, Mar 2011 – Feb 2014. This grant supported a post-doctoral fellow. **Principal Investigator** (Award #NNX11AF90G, **$182,386**).

2010: National Aeronautics and Space Administration (NASA), Jet Propulsion Laboratory/MISR Project: renewal of contract for forest and shrub mapping using MISR, Jan-Dec 2010, **Principal Investigator** (Subcontract #1365499, **$40,973**).

2009: National Aeronautics and Space Administration (NASA), Research Opportunities in Space and Earth Sciences 2009 (ROSES'09), *MODIS Albedo, Nadir Reflectance, and Reflectance Anisotropy for Environmental Modeling and Monitoring*, 09-TERRAQUA09-0216, NNH09ZDA001N-TERRAQUA, Trustees of Boston University, PI: Schaaf, Crystal, Submitted 03/25/10, **Collaborator**.

2008: National Aeronautics and Space Administration (NASA), Research Opportunities in Space and Earth Sciences 2008 (ROSES'08), Terrestrial Ecology Program: *Mapping Changes in Shrub Abundance & Biomass in Arctic Tundra using NASA Earth Observing System Data: A Structural Approach,* July 1, 2009 – December 30, 2013. This grant supported a full-time student in the *Doctoral Program in Environmental Management*. **Principal Investigator**, (Award #NNX09AL03G, **$522,358**).

2009: National Aeronautics and Space Administration (NASA), Jet Propulsion Laboratory/MISR Project: *Forest and Shrub Mapping with MISR*, Mar-Dec 2009. **Principal Investigator**, (Subcontract #1365499 **$74,573**). This contract will roll into subsequent years (with different totals).

2008: National Aeronautics and Space Administration (NASA), Research Opportunities in Space and Earth Sciences 2008 (ROSES'08), Terrestrial Ecology Program: *Structure, Biomass, and Disturbance in the Southwestern United States from MISR, MODIS, and LVIS*, **Principal Investigator,** ($508,004, proposal not selected but the field/air component was funded with a campaign in September 2008).

2006: National Aeronautics and Space Administration (NASA), Research Opportunities in Space and Earth Sciences 2006 (ROSES'06), Earth Observing System submission: *A New Approach for Mapping Woody Plants in the Southwestern United States Using NASA Earth Observing System Data*, 2008-2011, **Principal Investigator,** (Award #NNX08AE71G, **$192,994**).

2003: National Aeronautics and Space Administration (NASA), Earth Observing System, Earth System Science Research using Data and Products from Terra, Aqua, and ACRIM Satellites: *Quantifying Changes in Carbon Pools with Shrub Invasion of Desert Grasslands using Multi-Angular Data from EOS Terra & Aqua* 2004–2008. **Principal Investigator** (#NNG04GK91G, **$481,380**).

2005: Montclair State University Grant Proposal Writing awards (2005). *Biosphere/Hydrosphere and Atmosphere Interactions in the Asian Arid-Semiarid Belt and Their Large-scale Climate Significance*, **Co-Investigator** with Dr. Jordan Feng (EAES). Completed (**$3,000**).

2003: Montclair State University, Grant Proposal Writing awards (2003). *Exploitation of the Directional Signal for Advanced Land Cover Mapping with Moderate Resolution Satellite Sensors* (**$4,000**).

2000: European Space Agency: *Physical structure and composition of desert grasslands and shrublands via hyperspectral multiple view angle reflectance data from the CHRIS sensor on Proba*.. Awarded June 2000 (**data grant**, 2000-2006).

PUBLICATIONS

BOOK CHAPTERS

Chopping, M. (**2015**). Remote Sensing in Environmental Management, Chapter 17 in *An Integrated Approach to Environmental Management*, D. Sarkar, R. Datta, A. Mukherjee, and R. Hannigan (eds). Hoboken, New Jersey: Wiley. October 2015. ISBN: 978-1-118-74435-2 636 pages. pp. 397-422.

Chopping, M. (**2008**), Multi-angle remote sensing and applications. In: *Advances in Land Remote Sensing: System, Modeling, Inversion and Applications*, S. Liang (editor), Springer-Verlag, 95-144.

Rango, A., Ritchie, J., Schmugge, T., Kustas, W., and Chopping, M. (**2006**), Remote Sensing and the JORNEX Project. In: *A Chihuahuan Desert Ecosystem: The Jornada Basin*, Havstad, K., Huenneke, L., and Schlesinger, W. H. (eds), Oxford University Press, 305 – 320.

Onwueme, V., H. Feng, M. Chopping, W. J. Jaslanek and E. A. Stern, (**2005**), Heavy metal contaminated sediments of lower Passaic River, New Jersey, USA. In: *Urban Dimensions of Environmental Change: Science, Exposures, Policies, and Technologies*. H. Feng, L. Yu and W. Solecki (eds). Science Press, Beijing, China, 34-43.

DATA SETS

Chopping, M., Wang, Z., Bull, M., Schaaf, C., Bull. M.A., and Duchesne, R. (**2022**). Forest Aboveground Biomass in the Southwestern U.S. from a MISR Multi-angle Index, 2000 – 2021, available at the ORNL DAAC, Oak Ridge, Tennessee, USA, https://daac.ornl.gov/cgi-bin/dsviewer.pl?ds_id=1978.

Duchesne, R.R., M.J. Chopping, and K.D. Tape (**2016**). NACP Woody Vegetation Characteristics of 1,039 Sites across North Slope, Alaska, V2. ORNL DAAC, Oak Ridge, Tennessee, USA. https://doi.org/10.3334/ORNLDAAC/1365.

REFEREED PAPERS

Cortés, I.M., Lorenzo-Trueba, J., Rovai, A.S., Twilley, R.R., Fatoyinbo, T., and Chopping, M. (**2023**). Net evaporation-induced mangrove area loss across low-lying Caribbean islands, *in review.*

Chopping, M., Wang, Z., Bull, M., Schaaf, C., Bull. M.A., and Duchesne, R. (**2022**). Forest aboveground biomass in the Southwestern U.S. from a MISR multi-angle index, 2000 – 2015. *Remote Sensing of Environment*, 275, 112964, ISSN 0034-4257, https://doi.org/10.1016/j.rse.2022.112964.

Bao, G. Jin, H., Tong, S., Chen, J. Huang, X., Bao, Y., Shao, C., Mandakh, U., Chopping, M. and Du, L. (**2021**), Autumn phenology and its covariation with climate, spring phenology and annual peak growth on the Mongolian Plateau, *Agricultural and Forest Meteorology*, Volumes 298–299, 2021, 108312, ISSN 0168-1923, https://doi.org/10.1016/j.agrformet.2020.108312.

Jin, H., Bao, G., Chen, J., Chopping, M., Jin, E., Mandakh, U., Jiang, K., Huang, X., Bao, Y., and Vandansambuu, B. (**2019**). Modifying the maximal light use efficiency for enhancing predictions of vegetation net primary productivity on the Mongolian Plateau, *Intl. J. Rem. Sens.*, 41:10, 3740-3760.

Duchesne, R.R., Chopping. M.J. Tape, K.D. Wang, Z., Schaaf, C. (**2018**). Changes in tall shrub abundance on the North Slope of Alaska, 2000 – 2010, *Remote Sensing of Environment* 219: 221–232.

Bao, G., Chen, J., Chopping, M., Tuyaa, A., Dorjsurene, A., Bayarsaikane, S., Bao, Y., Jirigalaf, B., and Qing, Z. (**2018**), Dynamics of net primary productivity on the Mongolian Plateau: Joint regulations of phenology and drought, *Int J Appl Earth Obs Geoinformation* 81: 85–97.

Duchesne, R.R., Chopping. M.J. and Tape, K.D. (**2015**). Capability of the CANAPI algorithm to derive shrub structural parameters from satellite imagery in the Alaskan Arctic. *Polar Record*, available on CJO2015. doi:10.1017/S0032247415000509.

Wang, Z., Schaaf, C.B., Strahler, A.H., Chopping, M.J., Roman, M.O., Shuai, Y., Woodcock, C.E., Hollinger, D.Y., and Fitzjarrald, D.R. (**2013**), Evaluation of MODIS albedo product (MCD43A) over grassland, agriculture and forest surface types during dormant and snow-covered periods, *Remote Sensing of Environment*, 140: 60–77.

Chopping, M., North, M., Chen, J., Schaaf, C.B., Blair, J.B., Martonchik, J.V., and Bull, M. (**2012**) Forest cover and height from MISR in a topographically complex landscape assessed with high quality reference data, *IEEE J. Sel. Topics in Applied Earth Observations and Remote Sensing* 5(1): 44-58.

Wang, Z., Schaaf, C.B., Chopping, M.J., Strahler, A.H., Wang, J., Román, M.O., Rocha, A.V., Woodcock, C.E., Shuai, Y. (**2012**). Evaluation of Moderate-resolution Imaging Spectroradiometer (MODIS) snow albedo product (MCD43A) over tundra, *Remote Sensing of Environment*, 117: 264–280.

Chopping, M., Schaaf, C.B., Zhao, F. Wang, Z., Nolin, A.W., Moisen, G.G., Martonchik, J.V., and Bull, M. (**2011**). Forest structure and aboveground biomass in the southwestern United States from MODIS and MISR, *Remote Sensing of Environment*, 115, 2943–2953.

Wang, Z., Schaaf, C.B., Lewis, P., Knyazikhin, Y., Schull, M.A., Strahler, A.H., Yao, T., Myneni, R.B., and Chopping, M. (**2011**), Retrieval of canopy vertical structure using MODIS data, *Remote Sensing of Environment*, 115(6): 1595-1601.

Chopping, M. (**2011**), CANAPI: Canopy Analysis with Panchromatic Imagery, *Remote Sensing Letters* 2(1): 21-29, published 17 June 2010 http://dx.doi.org/10.1080/01431161.2010.486805.

Su, L., Huang, Y., Chopping, M.J., and Rango, A. (**2010**), Variations in reflectance with seasonality and viewing geometry: Implications for semi-arid vegetation mapping with MISR data, *International Journal of Remote Sensing* 32(23): 8183-8193.

Chopping, M., Nolin, A.W, Moisen, G.G., Martonchik, J.V., and Bull, M. (**2009**), Forest canopy height from the Multiangle Imaging Spectro-Radiometer (MISR) assessed with high resolution discrete return lidar, *Remote Sensing of Environment*, 113: 2172-2185.

Imhoff, M., L. R. Wolfe, D. J. Diner, M. Chopping, R. Kahn, V. Salomonson, J. Gille, J. Drummond, D. Edwards, N. Loeb, B. Wielicki, M. Abrams, B. Eng, K. J. Ranson, and S.-C. Tsay (**2009**), A brief overview of Terra mission results and the carbon cycle, *Geography Compass* 1749-8198.

Su, L., Huang, Y., Chopping, M. J., Rango, A., and Martonchik, J. V. (**2009**), An empirical study on the utility of BRDF model parameters and topographic parameters for mapping vegetation in a semi-arid region with MISR imagery. *International Journal of Remote Sensing* 30(13): 3463–3483.

Chopping, M., Moisen, G. Su, L., Laliberte, A., Rango, A., Martonchik, J.V., and Peters, D.P.C. (**2008**), Large area mapping of southwestern forest crown cover, canopy height, and biomass using MISR, *Remote Sensing of Environment* 112: 2051-2063.

Chopping, M., Su, L., Rango, A., Martonchik, J.V., Peters, D.P.C., and Laliberte, A. (**2008**), Remote sensing of woody shrub cover in desert grasslands using MISR with a geometric-optical canopy reflectance model, *Remote Sensing of Environment* 112: 19-34.

Su, L., M.J. Chopping, A. Rango, J.V. Martonchik, and D.P.C. Peters (**2007**), Differentiation of semi-arid vegetation types based on multi-angular observations from MISR and MODIS. *IJRS* 28(5): 1419-1424.

Su, L., M. J. Chopping, A. Rango, J. . Martonchik, and D.P.C. Peters (**2007**), Support vector machines for recognition of semi-arid vegetation types using MISR multi-angle imagery, *Remote Sensing of Environment* 107:299-311.

Chopping, M., Su, L., Laliberte, A., Rango, A., Peters, D.P.C., and Martonchik, J.V. (**2006**), Mapping woody plant cover in desert grasslands using canopy reflectance modeling and MISR data, *Geophysical Research Letters* 33, L17402, doi:10.1029/2006GL027148.

Chopping, M., Su, L., Laliberte, A., Rango, A., Peters, D.P.C., and Kollikkathara, N. (**2006**), Mapping shrub abundance in desert grasslands using geometric-optical modeling and multiangle remote sensing with CHRIS/Proba, *Remote Sensing of Environment* 104(1): 62-73.

Rosenzweig, C., Solecki, W.D., Parshall, L., Chopping, M., Pope, G., and Goldberg, R. (**2005**), Characterizing the urban heat island in current and future climates in New Jersey, *Global Environ. Change B Environ. Hazards* 6: 51-62, doi:10.1016/j.hazards.2004.12.001.

Chopping, M.J., Su, L., Rango, A., and Maxwell, C. (**2004**). Modelling the reflectance anisotropy of Chihuahuan Desert grass-shrub transition canopy-soil complexes, *International Journal of Remote Sensing*, 25(14): 2725–2745.

Chopping M.J., Rango, A., Havstad, K.M., Schiebe, F.R., Ritchie, J.C., Schmugge, T.J., French, A., Su, L., McKee, L., and Davis, R.M. (**2003**), Canopy attributes of Chihuahuan Desert grassland and transition communities derived from multi-angular airborne imagery, *Remote Sensing of Environment* 85(3): 339-354.

Steven, M.D., Malthus, T.J., Baret, F., Xu, H., Chopping, M.J. (**2003**), Intercalibration of vegetation indices from different sensor systems, *Remote Sensing of Environment* 88: 412-422.

Chopping, M.J., Rango, A., and Ritchie, J.C. (**2002**), Improved semi-arid community type differentiation with the NOAA AVHRR via exploitation of the directional signal, *IEEE Transactions on Geoscience and Remote Sensing*, Vol. 40, No.5, 1132-1149.

Rango, A., Goslee, S., Herrick, J., Chopping, M., Havstad, K., Huenneke, L., Gibbens, R., Beck, R., and McNeely, R. (**2002**), Remote sensing documentation of historic rangeland remediation treatments in southern New Mexico, *Journal of Arid Environments* 50(4):549-572.

Chopping, M.J. (**2001**), Testing LiSK BRDF models over a semiarid grassland region with visible and near-infrared ATSR-2 and AVHRR data, *Intl. Journal of Remote Sensing* 22: 3533-3552.

Ritchie, J.C., Seyfried, M.S., Chopping, M.J., and Pachepsky, Y. (**2001**), Airborne laser technology for measuring rangeland conditions, *Journal of Range Management* 54: A8-A21, March 2001.

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Chopping, M., Duchesne, R., and North, M., (**2014**), Assessing remotely-sensed aboveground biomass estimates in the Sierra National Forest. *Proc. 2014 IEEE International Geoscience and Remote Sensing Symposium*, Quebec City, Canada, July 13-18, 2014, 1041-1044.

Chopping, M. (**2014**), Semi-automated interpretation of high resolution imagery for validation of moderate resolution vegetation remote sensing products. Invited seminar given at NASA Goddard Space Flight Center, Code 618, July 9, 2014.

Chopping, M., Duschene, R., Wang, Z., Schaaf, C., North, M. *et al*. (**2013**) Forest Biomass in the Southwestern U.S. from MISR, *2013 MISR Data Users' Science Symposium*, Pasadena, CA, December 16 - 17.

Duchesne, R., Chopping, M., and Tape, K., (**2013**). Shrub Abundance Mapping in Arctic Tundra with MISR, 2013 MISR Data Users' Science Symposium, December 16 - 17, Pasadena, CA (poster).

Duchesne, R., Chopping, M., and Tape, K., (**2013**). Improved Validation Database for Arctic Tundra Maps, 2013 MISR Data Users' Science Symposium, December 16-17, Pasadena, CA (poster).

Duchesne, R., Chopping, M., Wang, Z., Schaaf, C., and Tape, K., (**2013**). Shrub Abundance Mapping in Arctic Tundra with MISR, Abstract and poster for the Fall 2013 American Geophysical Union meeting, 9 – 13 December, San Francisco, CA.

Chopping, M., Duchesne, R., Wang, Z., Schaaf, C., Tape, K., and Yao T. (**2013**), Tall Shrub Abundance on the North Slope of Alaska from MISR, 2000-2010. *NASA Terrestrial Ecology Science Team* meeting, April 30 - May 2, La Jolla, CA.

Chopping, M.J., Duchesne, R.R., Wang, Z., Schaaf, C., and Tape, K. (**2013**) Mapping shrubs in Arctic tundra with NASA's MISR instrument, *North American Carbon Program 4th All-Investigators' Meeting*, Session: Theme 4: Ecosystem Impacts of Change, February 4-7, 2013, Albuquerque, NM (abstract/poster).

Chopping, M., *et al*. (**2012**), Forest and Shrub Mapping with MISR*, 2012 MISR Data Users' Science Symposium*, Pasadena, CA, December 13-14 (talk + co-author on two posters).

Chopping, M., (**2012**), Geometric-optical modeling with MISR over the Kola Peninsula, *2012 IEEE International Geoscience & Remote Sensing Symposium*, Munich, Germany, Jul 22-27, 2012 (poster).

Chopping, M., (**2012**), 250 m Canopy Cover and Height Maps over the Kola Peninsula via GO Model Inversion with MISR, *NASA Arctic-Boreal Vulnerability Experiment (ABoVE) Workshop*, Boulder, CO, June 12-15, 2012 (poster).

Chopping, M.J., Duchesne, R.R., Wang, Z., Schaaf, C., and Tape, K (**2012**), Progress towards mapping tall shrubs in Arctic tundra with MODIS and MISR, *MODIS Science Team Meeting*, Silver Spring, MD, May 7-9, 2012 (talk).

Chopping, M., Nolin, A.W., Bull, M., Martonchik, J.V., Rocio Duschene, and Faith Justus, et al. (**2011**). Mapping Forest and Shrub Canopies with MISR, presentation at the *2011 MISR Data Users' Science Symposium*, Pasadena, CA, December 13-14 (talk + three posters).

Chopping, M., et al. (**2011**). *NASA Carbon Cycle Science Joint Workshop* and 2011 *NASA Terrestrial Ecology Science Team Meeting* Alexandria, VA, October 3-7, 2011, abstracts and posters: Shrub Abundance in Alaskan Arctic Tundra from MODIS Reflectance Anisotropy (Mark James Chopping, Rocio Duchesne, Zhuosen Wang, Crystal Schaaf, Ken Tape); Forest Cover and Height in Topographically Complex Landscapes from MISR Assessed with High Quality Reference Data (Mark James Chopping, Malcolm North, Jiquan Chen, Crystal Schaaf, John V Martonchik, Michael Bull, Bryan Blair, Michelle Hofton).

Chopping, Mark, Rocio Duchesne, Crystal Schaaf, Zhuosen Wang, Ken Tape, Sawahiko Shimada, Anne W. Nolin, Michael Bull, John V. Martonchik, Albert Rango, Andrea Laliberte, Gretchen Moisen). (**2011**), MODIS and MISR Reflectance Anisotropy: Applications in Mapping Vegetation, *NASA MODIS Science Team Meeting*, Adelphi, MD, May 18-20, 2011 (talk).

Chopping, M., Shimada, S.,. Nolin, A.W., Bull, M., Martonchik, J.V., Rango, A., Laliberte, A., Moisen, G. et al. (**2010**). Mapping Vegetation Canopies with a MISR/GO Approach: Progress and Challenges, presentation at the *2010 MISR Data Users' Science Symposium*, Pasadena, CA, December 9-10 (talk).

Duchesne, R. Chopping, M., and Tape, K. (**2010**), Reflectance Anisotropy of Arctic Tundra Surfaces from Field Radiometry, *2010 MISR Data Users' Science Symp*., Pasadena, CA, Dec. 9-10, 2010 (poster).

Nolin, A.W., Painter, T.H., and Chopping, M.J. (**2010**), MISR-derived vegetation canopy adjustment for fractional snow-covered area from MODIS, *Remote Sensing and Hydrology Symposium 2010*, Jackson Hole, Wyoming, September 27-30, 2010 (talk).

Chopping, M.J., (**2010**), Canopy height, crown cover, and aboveground biomass maps for the southwestern United States from MISR, 2000 and 2009, presented at the *2010 IEEE International Geoscience and Remote Sensing Symposium*, Session: Forest Biomass I, Honolulu, Hawaii, July 25 – 30, 2010 (talk).

Chopping, M.J., Aslan A., Hofton, M., Blair, J.B., Laliberté, A., Rango, A. (**2010**), Precision of LVIS and MISR Canopy Height Estimates for Desert Grassland Shrub Canopies Assessed with Field and UAV Estimates in a Multi-Scale Approach, Proc. *2010 IEEE International Geoscience and Remote Sensing Symposium*, Honolulu, Hawaii, July 25 – 30, 2010 (poster).

Wang, Z., Schaaf, C., Lewis, P., Knyazikhin, Y., Schull, M., Strahler, A., Myneni, R., and Chopping, M. (**2010**), Canopy vertical structure using MODIS bidirectional reflectance data, *IEEE Whispers 2nd Workshop on Hyperspectral Image & Signal Processing: Evolution in Remote Sensing*, Reykjavik, Iceland, 14-16 June 2010 (talk).

Chopping, M.J., Yang, X., Schaaf, C., and Strahler, A. (**2010**), CANAPI: Canopy Analysis with Panchromatic Imagery for Validation of Moderate Resolution Canopy Structure Products, *2010 NASA Terrestrial Ecology Science Team Meeting*, Mar 15-17, San Diego, CA. (poster).

Chopping, M.J., Shimada. S., Bull, M., and Martonchik, J. V. (**2010**), Canopy Height, Crown Cover, and Aboveground Standing Live Biomass in the Southwestern United States from MISR, 2000 and 2009, *2010 NASA Terrestrial Ecology Science Team Meeting*, Mar 15-17, San Diego, CA (poster).

Chopping, M.J., Tape, K.., Shimada, S., Duchesne, R.R., Wang, Z., Schaaf, C. (**2010**), Estimating Shrub Cover in Arctic Tundra from Structural Metrics and Effects on Albedo, *2010 NASA Terrestrial Ecology Science Team Meeting*, Mar 15-17, San Diego, CA. (poster).

Chopping, M., Shimada, S., Bull, M., Schaaf, C., Zhao, F., Wang, Z., and Martonchik, J.V., *et al*. (**2010**), Recent developments in GO model inversion for mapping canopy height, cover, and aboveground live woody biomass from NASA multi-angle imaging, MODIS/VIIRS Science Team meeting, Washington DC, January 26 - 28, 2010 (talk).

Chopping, M., Shimada, S., Bull, M., and Martonchik, J.V. (**2009**), Canopy Height, Crown Cover, and Aboveground Biomass Mapping for the SW United States from MISR, 2000 & 2009, NASA MISR Data Users' Science Symposium 2009, December 11-12, 2009, Pasadena, CA (talk).

Chopping, M., Schaaf, C., Zhao, F., Wang, Z., Nolin, A.W., Martonchik, J.V., and Bull. M. (**2009**), Mapping Canopy Structure in the Western United States using MISR and MODIS, 4th Global Vegetation Workshop 2009, June 16-19, NTSG, U. Montana, Missoula, MT (poster).

Chopping, M.J., Schaaf, C., Zhao, F., Wang, Z. (**2009**), Mapping Forest Crown Cover, Mean Canopy Height, and Aboveground Biomass using a Geometric-Optical Model and MODIS Data, poster for the North American Carbon Program 2nd All-Investigators' Meeting, Feb 16-20, 2009, San Diego (poster).

Chopping, M., Martonchik, J.V., Bull, M., Rango, A., Schaaf, C.B., Zhao, F., and Wang, Z. (**2008**), Vegetation Canopy Structure from NASA EOS Multiangle Imaging, *Eos Trans. AGU*, 89(53), Fall Meet. Suppl., Abstract B33D-04 (oral presentation at the 2008 AGU Fall Meeting).

Chopping, M., Nolin, A.W., Martonchik, J.V., Bull, M., Moisen, G., and Rango. A. (**2008**), Mapping woody plant canopy height and crown cover using MISR and geometric-optical modeling, NASA MISR Data Users' Science Symposium 2008, December 11-12, 2008, Pasadena, CA (talk+poster).

Chopping, M., Martonchik, J.V., Bull, M., Moisen, G.G., Tymcio, R., Wilson, B., Rango, A., and Laliberte, A. (**2008**), Using MISR to Map Woody Plant Canopy Crown Cover, Height, and Biomass, NASA Carbon Cycle & Ecosystems Joint Science Workshop 2008, April 28 - May 2, 2008, Adelphi, MD (poster).

Diner, D., Kahn, R., Chopping, M., and Knyazikhin, Y. (**2008**), The Multiangle SpectroPolarimetric Imager (MSPI): A MISR successor and candidate for the Decadal Survey's Aerosol-Cloud-Ecosystem (ACE) mission, poster presented at the NASA Carbon Cycle & Ecosystems Joint Science Workshop 2008, April 28 - May 2, 2008, Adelphi, MD (poster).

Chopping, M., Chopping, M., Martonchik, J.V., Bull, M., Moisen, G.G., Tymcio, R.,Wilson, B., Rango, A., and Laliberte,A. (**2008**), Forest Height, Cover, and Biomass Mapping using Passive Multiangle Data, poster presented at the NASA Veg3D & Biomass Workshop, March 3 - 5 2008, Charlottesville, VA (poster).

Chopping, M., L. Su, A. Laliberte, A. Rango, G. Moisen, DPC Peters, and J. V. Martonchik (**2007**), Mapping Woody Plant Canopies using MISR: Assessing MISR/SGM results with Forest Inventory Analysis and LVIS data, MISR Data Users' Science Symposium 2007, Pasadena, CA, Dec. 6 - 7 (talk).

Chopping, M., L. Su, A. Laliberte, A. Rango, G. Moisen, DPC Peters, and J. V. Martonchik (**2007**) Mapping Forest Crown Cover, Canopy Height, and Biomass in the Southwestern US with MISR. Poster presented at the NASA Land Cover Land Use Change Spring Meeting, Adelphi, MD, April 4 - 6, 2007 (poster).

Chopping, M., L. Su, A. Laliberte, A. Rango, G. Moisen, DPC Peters, and J. V. Martonchik (**2007**) Mapping Carbon Pools in the Southwestern US, poster and abstract for the North American Carbon Program (NACP) Investigators Meeting, Colorado Springs, CO, January 2007.

Chopping, M., Su, L., Rango, A., Laliberte, A., Peters, D.P.C. Martonchik, J.V., and Kollikathara, N. (**2006**), Mapping Woody Vegetation with the Compact High Resolution Imaging Spectroradiometer on the Proba platform: A Monospectral, Multi-Angle Approach, CHRIS/Proba Principal Investigators' Workshop, September 19-21, 2006, European Space Research Institute (ESRIN), Frascati, Italy.

Chopping, M., L. Su, A. Laliberte, A. Rango, G. Moisen, and J. V. Martonchik (**2006**) A Multi-Angle Approach to Mapping Forest and Shrub Canopy Structure in the Southwestern US (poster), NASA Carbon Cycle & Ecosystems Joint Biodiversity, Terrestrial Ecology, and Applied Sciences Workshop, University of Maryland University College Convention Center, August 21 – 25, 2006.

Chopping, M., (**2006**) Mapping Vegetation with the NASA Earth Observing System Multiangle Imaging SpectroRadiometer, **invited plenary session presentation** representing the NASA/JPL MISR instrument on the EOS Terra satellite, at the combined meeting of the Third Biennial Global Vegetation Workshop at the University of Montana and the Committee on Earth Observing Satellites Working Group on Calibration and Validation: Long term global monitoring of vegetation variables using moderate resolution satellites, University of Montana, Missoula, Montana, August 8 – 10, 2006.

Chopping, M. (**2006**), Progress in retrieving canopy structure parameters from NASA multi-angle remote sensing, **invited presentation** in the Terra session in honor of V. Salomonson, *2006 IEEE International Geoscience and Remote Sensing Symposium and 27th Canadian Symposium on Remote Sensing*, Denver, CO, July 31 – August 4, 2006.

Chopping, M., Su, L., (**2005**), Estimating shrub abundance in desert grasslands using geometric-optical models, *American Geophysical Union 2005 Joint Assembly*, May 23-27, 2005, New Orleans, LA.

Su, L. and Chopping, M. (**2005**), Improved semi-arid vegetation type differentiation at community level using MISR multi-angular and multi-spectral observations and support vector machine algorithms, *American Geophysical Union 2005 Joint Assembly*, May 23-27 2005, New Orleans.

Chopping, M., (**2005**) Remote Sensing of Woody Shrub Cover in Desert Grasslands using Canopy Reflectance Modelling and MISR Data, **invited lecture**, October 27, 2005, Inner Mongolia Key Laboratory of Remote Sensing and Geographic Information Systems, School of Geography, Inner Mongolia Normal University, Huhehaote, P.R. China.

Chopping, M., (**2005**) NASA Earth Observing System Project: Background and GO modeling, presentation for the MSU Global Education Center to Russian environmental delegation, 04/13/05.

Chopping, M., Rango, A., Laliberte, A., Schmugge, T., Ritchie, J., Walthall, C. Kustas, W., and Su, L. (**2004**), The CHRIS/Proba Jornada Experiment: Exploitation of Data from CHRIS, *CHRIS/Proba Principal Investigator Meeting*, April 28, 2004, European Space Research Institute (ESRIN), Frascati, Italy (presented by proxy).

Cox, J., Chopping, M., Hodges, S., Parshall, L., Rosenzweig, C., and Solecki, W.D. (**2004**), Urban heat islands and the built environment: A case study of New York City, *Association of American Geographers Annual Meeting, 2004*, Philadelphia, PA, presented by L. Parshall, March 17, 2004.

Rango, A., J. Ritchie, T. Schmugge, W. Kustas, K. Havstad, M. Chopping, A. Laliberte, and C. Steele, (**2004**) Repetitive remote sensing over Southwestern US rangeland undergoing vegetation change, JORNEX 1995-2004, *American Geophysical Union 2004 Western Pacific Geophysics Meeting*, Honolulu (August 16-20, 2004).

Feng, H., Onwueme, V., Jaslanek, W.J., Stern, E.A., Chopping, M., Jones, K.W. (**2004**), using GIS to study pollutant source function in the Passaic River system, New Jersey (poster), Assoc. American Geographers Annual Meeting, 2004, Philadelphia, PA, March 17, 2004.

Chopping, M. and Bologna, P. (**2003**), Progress in terrestrial canopy reflectance modeling and potential applications to the mapping of seagrass off the New Jersey coast, *Sandy Hook Association for Research & Education (SHARE) Symposium on GIS & Remote Sensing*, Montclair State University, October 31, 2003.

Chopping, M. (**2003**) A Simplified Geometric Model of Canopy Reflectance and its Validation using Multi-Angle Observations and Radiosity Methods, Presentation at College of Science & Mathematics Meeting, April 2, 2003.

Chopping, M.J. (**2003**), The CHRIS/Proba Jornada Experiment: Exploitation of Data from the CHRIS, *CHRIS/Proba Principal Investigators' Workshop*, European Space Agency-ESTEC, Noordwijk, The Netherlands, April 4, 2003.

Harris, M., Clemchalk, M. and Chopping, M. (**2003**), *The Ramapo Fault Zone: Regional Implications of Earthquakes and Nuclear Reactor Failure at the Indian Point Nuclear Plant*, poster presented at the Sigma Xi Montclair State University Chapter meeting, April 26, 2003.

Chopping M.J. (**2002**), *Modeling canopy reflectance with the Compact High-Resolution Imaging Spectrometer (CHRIS) over SW US desert grasslands and shrublands*, Association of American Geographers Middle States Division 2002 Annual Meeting, Montclair State University, October 11-12 (Amber Waves and Other Biogeographies Session).

Chopping M. J. (**2002**), Modeling canopy reflectance with the Compact High-Resolution Imaging Spectrometer (CHRIS) over SW US desert grasslands and shrublands, *Association of American Geographers, Middle States Division Fall 2002 Meeting*, October 11-12, Montclair State University, Upper Montclair, NJ 07043.

Schmugge, T., French, A., Ritchie, J., Chopping, M., and Rango, A. (**2001**), ASTER Observations of surface emissivity, *European Geophysical Society 26th General Assembly*, 26-30 March 2001, Nice, France.

Chopping M. (**2001**), *Evaluation of Water Balances, Energy Fluxes and Ecosystem Dynamics in Chihuahuan Desert in the Rio Grande Basin of Southern New Mexico*, presented at the American Water Resources Association Annual Water Resources conference, November 12-15 2001, Albuquerque, New Mexico (USDA, ARS award).

Rango. A., Chopping M., Havstad, K., Ritchie, J., Kustas, W., and Schmugge, T. (**2001**), Evaluation of water, energy and ecosystems in southern New Mexico, American Water Resources Association *Annual Water Resources Conference*, November 12-15, 2001, Albuquerque, NM.

Chopping M. (**2000**), *Improved semi-arid community type mapping with the AVHRR*, Technical Session for the Pan-American Center for Earth and Environmental Sciences (PACES) at the University of Texas at El Paso, TX, September 27, 2000.

Chopping, M., Rango, A., and Ritchie, J. (**2000**), *The potential for semiarid community type differentiation via exploitation of the directional signal: tests with AVHRR data* (Poster, IGARSS 2000: Taking the Pulse of the Planet).

Zhan, X., Kustas, W.P., Ritchie, J.C., Prueger, J.H., Hipps, L.E., Rango, A., Schmugge, T.J., Nolen, B., and Chopping, M.J. (**2000**), A preliminary assessment of regional scale carbon stocks and fluxes of a desert using field measurements, satellite images and model simulation, *Advances in Terrestrial Ecosystem Carbon Inventory, Measurement, and Monitoring* Abstracts, U.S. Forest Service, Raleigh, N.C., 3-5 October 2000, p107.

Rango, A., Havstad, K., Huenneke, L., Ritchie, J., Schmugge, T., Kustas, W., Chopping, M., Peters, D., and Herrick, J. (**2000**), The ARS Jornada Experimental Range - where long term ecological, hydrological, and remote sensing research meet, *American Geophysical Union Fall Meeting, EOS Transactions* 81(48): F382, December 15-19, 2000, San Francisco, CA.

Schmugge, T.J., Chopping, M.J., French, A.N., Havstad, K.M., Rango, A., Ritchie, J.C., and Schieldge, J. (**2000**), ASTER observations over New Mexico test sites, *American Geophysical Union Fall Meeting, EOS Transactions* 81(48): F550, December 15-19, 2000, San Francisco CA.

Rango, A., Chopping, M., Ritchie, J., Havstad, K., Kustas, W., and Schmugge, T. (**1999**), Remote sensing of shrub-coppice dunes in the desert grasslands of southern New Mexico, *1999 American Geophysical Union Fall Meeting- Hydrology*, Dec. 13-17 1999, San Francisco, CA.

Chopping M. (**1999**), *Testing LiSK BRDF models over a semi-arid grassland with shortwave and near-infrared ATSR-2 and AVHRR data* for the USDA, Beltsville Agricultural Research Center-West Poster Day 1999, April 8 1999. (Poster).

Chopping M. (**1998**), *Mind the Steppe: new angles on monitoring big environments from space*, Dept. Research Seminar Series, Nottingham University Geography Dept., May 7, 1998.

Chopping M. (**1998**), *Uses and Abuses of the AVHRR in Vegetation Monitoring from Space: New Angles on an Old Problem*, University of Nottingham Geography Department Remote Sensing Research Group Seminar Series, March 13 1998.

PROFESSIONAL SERVICE

EDITORIAL

Editorial board, *Remote Sensing of Environment*, 2008 - 2023. 5-Year Impact Factor: 2021: 10.164, 2019: 9.085, 2017: 7.653, 2015: 7.388, 2013: 6.065, 2011: 4.573; 2010: 3.951, 2009: 3.612.

Guest editor (with Dr. Zhuosen Wang) for the Special Issue of *Remote Sensing* (ISSN 2072-4292, IF:4.509) entitled "Multi-Angular Remote Sensing", January - December 2021.

NEW JERSEY STATE SCIENCE ADVISORY BOARD

New Jersey Department of Environmental Protection (NJ DEP) Science Advisory Board Standing Committee on Climate and Atmospheric Sciences, January 2010 – March 2023.

PEER REVIEW: JOURNALS AND BOOKS

International Journal of Remote Sensing
IEEE Transactions on Geoscience & Remote Sensing
Remote Sensing of Environment
Journal of Geophysical Research-Atmospheres
Environmental Monitoring and Assessment
Agricultural and Forest Meteorology
Journal of Applied Remote Sensing
Progress in Physical Geography
International Journal of Applied Earth Observation and Geoinformation
Canadian Journal of Remote Sensing
Ecological Applications, Remote Sensing Reviews
Remote Sensing and Hydrology
Photogrammetric Engineering and Remote Sensing
Journal of Applied Meteorology
Arid Land Research and Management
Advances in Space Research *(continued overleaf...)*
Journal of Vegetation Science
Springer (book chapter)
Biogeosciences …amongst others

PEER REVIEW: SELECTION PANELS AND MAIL REVIEWS

I have served on sixteen peer review panels for NASA Earth Science programs since 2001, as well as providing mail reviews for seven other NASA competitions, including two Earth Science Technology Office (ESTO) competitions. I have also served as peer reviewer for the U.S. National Science Foundation, the U.S. National Ocean and Atmospheric Administration, the Space Research Organization of the Netherlands (Earth Observation Research Cat. 1.+2A), and the New Jersey Technology Council (Mid Atlantic Imaging Symposium).

UNIVERSITY SERVICE

- Director, PhD Program in Environmental Science and Management, Fall 2017- (program doubled in size by Fall 2023). Responsible for student recruitment, evaluation of doctoral faculty applications and renewals, advising students on course selections, approving dissertation credits, submitting program modifications, compiling annual reports, hosting doctoral dissertation defense meetings, hosting Sustainability Seminar series meetings, engagement with administrators and staff at The Graduate School, resolution of student-faculty disputes, and host and program representative for the Graduate School Open House program presentation every Fall and Spring since 2017 except Fall 2019, owing to illness.
- Presentation "Diagnosis Earth: Vital Signs of your Planet from Space", a talk for the Weston Science Scholars Program students (grades 9-11), Thursday, July 13, 2023, Sokol Room, Science Hall, Montclair State University.
- Ongoing: Locating and inviting well-qualified speakers for the MSU Sustainability Seminar Series: Jennifer Francis, Kate Marvel, Radley Horton, Alan Robock, Gernot Wagner…
- Invited participant in the Association of College and Research Libraries (ACRL) focus group for Sprague Library, with evaluators visiting campus on February 1, 2023 (selectively recruited; an ACRL review provides in-depth analysis, bench-marking, and targeted recommendations for academic libraries looking to strategically refocus and engage in continuous improvement).
- Participant in the 2023 Office for Faculty Excellence *Practical Responses to ChatGPT* Workshop, January 12, 2023.
- Participant in the 2022 Summer Institute for Teaching and Learning, co-hosted by Instructional Technology and Design Services (ITDS) and the Office for Faculty Advancement (OFA), June 8 - 9, 2022, 8:30am – 3:00pm.
- Participant in the 2022 Office for Faculty Excellence *Teaching Controversial Topics* Workshop, Tuesday, March 22, 2022.
- Ongoing: Participation in Master's Thesis Defenses (EAES unless indicated otherwise):
  - Rae Cade: Beliefs and Perceptions of Millennials Pertaining to Climate Change & Sustainability, 08/**2020**.
  - Liliana Calderón Convers: Paleoenvironment Reconstruction of the Eocene Southeastern Tethys Using Geochemistry of Sedimentary Rocks, 08/**2020**.
  - Christopher Tenebruso: Modeling the Evolution of a Coupled Barrier-Marsh-Lagoon System : Insights from the New Jersey Coastline, 08/**2020**.
  - Molly Hillenbrand (Biology): Metal Accumulation Distribution in Selected Tissues of Two Turtle Species, Malaclemys terrapin and Chelydra serpentine in New Jersey, USA, May 11, **2020.**
  - Christian Bojorquez (Biology): Testing multiple climate stressors at the cold range limit of a marine calcifier, May 5, **2020**.
  - Isamar M. Cortés: Exploring the Role of Evaporation and Precipitation Rates on Mangrove Island Morphology, 08/**2019**.

- Mathew Sandefur: The Behavior of the Baltic Sea Ice Stream during the Deglaciation of the Baltic Ice Lake, recorded in the Particle Size and Geochemistry within Bornholm Basin, IODP Site M0065, July 31, **2019**.
- Kristin Carfora (Applied Mathematics): Seasonal Switching Affects Bacterial-Fungal Dominance in an Ecological System, April 19, **2018**.
- Michael Levinson (Biology): Impacts of Drainage Basin Characteristics on Aquatic Macroinvertebrate Communities in the Upper Passaic River, 12/**2017**.
- Jason Scott Darley: Watershed Sub-Basin Scale Forest Fire Impacts on Soil Chemistry : A Case Study in Delaware State Forest, Pennsylvania, USA, 08/**2017**.
- Lindsey Shanks: Targeting SAV Restoration at Lake Mattamuskeet Using GIS and Landsat 8 Data, 05/**2017 (committee member)**.
- April Lynn Kelly: Determining Late Pleistocene to Early Holocene Deglaciation of the Baltic Ice Lake Through Sedimentological and Geochemical Analysis of IODP Site M0064, 05/**2017**.

- Volunteer: MSU School of Communication and Media Live Election Night coverage, expert opinion on climate change that was to be broadcast via Zoom (event canceled owing to health concerns). **2020**.
- Feedback: to OIT/ITSD on Zoom issues and discoveries, Fall 2020 Teaching online ("HawkSYNC") as a result of the COVID-19 crisis, via email and meetings (John O'Brien, Keith Adams), **2020**.
- Participant: Office for Faculty Advancement Coffee & Cookies workshop: Teaching Strategies in Large Classes, Drs. Tony Spanakos and Josh Galster, March 4, **2020**.
- Noel-Levitz National Survey on Institutional Priorities survey at the Provost's request, April 10, **2019**.
- CSAM / Sigma Xi Student Research Symposium 2019, EAES representative, Spring **2019**.
- Participant: Digital Commons and CSAM Publications and events, Sprague Library, January 9, **2019**.
- Invited guest: First Annual Clean and Sustainable Energy Summit, organized by the MSU Clean Energy and Sustainability Analytics Center, **2018**; see: https://youtu.be/tq3tT3lxOqw?t=184 11/26/18.
- Participant: GIS Micro Masters interest meeting, CSAM, May 11, **2018**.
- Contributor: Comments on and suggestions for the Socially Responsible Investments at Montclair State University recommendation proposal by Senate task force members: Anthony Pemberton (Chair), Pankaj Lal, Erik Jacobson, Gary Kleinman, John Specchio, and Julian Keenan, March **2018**.
- University search committee: Vice Provost for Research and Dean of the Graduate School, Fall **2017**.
- Department of Earth & Environmental Studies DPAC, Fall 2015.
- College of Science and Mathematics: Research Committee member, Spring 2015.
- College of Science and Mathematics: Search Committee member: CSAM Web Manager, Fall 2013.
- Department of Earth & Environmental Studies: Search Committee member: Director for the Institute of Sustainability Studies and departmental faculty member, Fall 2012-Spring 2013.
- College of Science and Mathematics: Research Committee member, Spring 2012.
- Department of Earth & Environmental Studies: Facilities committee member, AY 2012.
- University / Office of Information Technology: Lifecycle Replacement Committee, 2010-11.
- Department of Earth & Environmental Studies: DPAC, Fall 2010-11.
- Department of Earth & Environmental Studies: Search Committee: Earth Systems Modeling, 2011.
- Department of Earth & Environmental Studies: representative at the Center for Environment and Life Sciences (CELS) new building meeting, 07/21/10.
- Chair of the College of Science and Mathematics Science and Mathematics computer User Group (SMUG), Fall 2009-Fall 2010.
- Member of the Department of Earth & Environmental Studies DPAC, Fall 2009-Fall 2010.
- Host to Visiting Scientist: Dr. Sawahiko Shimada, Associate Professor, Laboratory of Environmental Information Studies, Department of Bioproduction and Environmental Engineering, Tokyo University of Agriculture (12 months).

- Development of the Geographic Information Science Graduate Certificate (2008) and Geographic Information Science Minor (2009), contributions.
- Department of Earth & Environmental Studies web site, 2006-2012.
- Montclair State University *Focus the Nation 2008* organizing committee and contributor: 1. talk: "Earth Observation: Can We See Global Warming from Space?" 2. Panel discussion: global warming, causes and solutions 3. FTN website (was at http://csam.montclair.edu/earth/FTN).
- Participant in the CSAM / Union of Concerned Scientists' workshop: *Climate Change in the Northeast*, January 13, 2008.
- University / OIT Lifecycle Replacement Committee, 2007.
- Departmental committees (2006-7): Geographic Information Science (chair); IT; facilities.
- Service on Search Committees: committee chair for one senior position and committee member for 4 faculty positions, one research associate position, and one professional staff position, at both College and Departmental levels.
- Earth and Environmental Studies Department Website (coding and update), 2006-.
- Chair of the search committee seeking a new Director for the EAES doctoral program (Doctor of Environmental Management. D.Env.M.), V#F28, Fall 2003 – Spring 2004.
- Chair for the EAES Research Associate search committee V#84, Spring 2003 (Dr. Lihong Su).
- Search committee member for a new faculty member in EAES in the area of Land Use/Natural Resources (VF-22), Spring 2005. Dr. Danlin Yu was appointed.
- CSAM IT Director search (chair: Dr. Carl Bredlau). Mr. Joseph Youn was appointed.
- Remote Sensing Laboratory (Earth and Environmental Studies), established in December 2003.
- CSAM Science and Math Users' Group, 2003-2008.
- CSAM / MSU Center for Scientific Computing & Visualization, 2002-2003.
- Geographic Information Science Collaborations in CSAM (proposal), July 2005.
- CSAM Curriculum Committee, 2005-6.
- EAES Facilities Committee, 2005-6.
- New Jersey Science Olympiad Organizer and Judge: Remote Sensing, January 12, 2006**.**
- Organizing committee member 2003-4, for the international conference *Urban Dimensions of Environmental Change: Science, Exposures, Policies and Technologies*, held in Shanghai, P. R. China, May 23-28, 2004, sponsored by MSU, East China Normal University and the National Science Foundation: developed online abstract submission system and edited the book of abstracts.
- Geography Undergraduate Advisor, Department of Earth and Environmental Studies, 2003-4.
- New Jersey Science Olympiad Organizer and Judge (Remote Sensing), February 12, 2005.
- MSU Earth Week Movie Night 2006, organizer (http://csam.montclair.edu/~chopping/tdat; defunct)
- MSU Earth Week Movie 2007 (AIT), organizer (http://csam.montclair.edu/~chopping/ait; defunct)
- Meetings with Dr. Ahmed Ghodieh, An-Najah National University, at the request of the MSU Global Education Center/Classics Department, February 2006.
- Member of the Doctoral Faculty in the Doctor of Environmental Management (*D.Env.M.*) program, 2004-, attracting graduate students to the program (Naushad, K.P., Neeti, N.).
- Department of Earth and Environmental Studies Open House, October 2, 2005.
- Department of Earth and Environmental Studies Open House, November 7, 2004.
- Department of Earth and Environmental Studies Career Nights, 2004 and 2005.
- Department of Earth and Environmental Studies GIS Day presentations, 2004 and 2005.

OTHER SERVICE

- Mentor (volunteer, virtual only) for Little Falls High School student Sema Koc: Using High Resolution Pan-sharpened Satellite Imagery to Assess Error in MISR and GEDI estimates of Forest Aboveground Biomass at the Kilometer Scale. August 2023.
- Mentor (volunteer) for three Ph.D. students at the 9th NASA ABoVE Science Team Meeting, San Diego, CA, 23 – 36 January, **2023**.
- Mentor (volunteer) for four graduate students and post-docs at the 2019 NASA Terrestrial Ecology Science Team Meeting, College Park, MD, September 22 – 25, **2019**.
- Chair, Session 3A: Applying Spatial Techniques, Middle States Division of the Association of American Geographers Conference, Montclair State University, Saturday, October 27, **2018**.
- Participant: Challenging Participatory Norms in the Classroom workshop, sponsored by the Department of Writing Studies and the Research Academy, with special guests Dr. Katherine DeLuca, UMass Dartmouth and Dr. Lisa Blankenship, Baruch CUNY, February 28, **2018**.
- Participant, NASA *Vulnerability and Resiliency of Arctic and Sub-Arctic Landscapes* (VuRSAL) – The Role of Interactions between Climate, Permafrost, Hydrology, and Disturbance in Driving Ecosystem Processes, Workshop Aug. 10–13, **2009**, Fairbanks, Alaska.
- Participant & poster presentation, NASA *Veg3D & Biomass* Workshop, March 3 - 5 **2008**, Charlottesville, VA.
- Chair (with Dr. Richard Houghton), *Disturbance Breakout Session*, NASA Carbon Cycle & Ecosystems Joint Biodiversity, Terrestrial Ecology, and Applied Sciences Workshop, University of Maryland University College Convention Center, April 28 – May 2, **2008**.
- Chair (with Dr. H. Peter White), *Forest Mapping with VNIR Measurements Session*, *International Geoscience and Remote Sensing Symposium 2007 "Sensing and Understanding Our Planet"*, Barcelona, Spain, July 23-27, **2007**.
- Chair (with Dr. Josef Kellndorfer), *Technology Breakout Sessions (2),* NASA Carbon Cycle & Ecosystems Joint Biodiversity, Terrestrial Ecology, and Applied Sciences Workshop, University of Maryland University College Convention Center, August 21 – 25, **2006**.
- Chair (with Dr. Shunlin Liang), Surface Radiation Breakout Session, combined meeting of the third biennial global vegetation workshop at the University of Montana and the Committee on Earth Observing Satellites Working Group on Calibration and Validation: "Long term global monitoring of vegetation variables using moderate resolution satellites: Planning for Continuity", University of Montana, Missoula, Montana, August 8 – 10, **2006**.
- Lead organizer of the NASA workshop *Ecological Modeling using Multiangle Remote Sensing*, NASA, Greenbelt, MD, September 20, **2005**.
- Member, Technical Program Committee for the *IEEE International Geoscience & Remote Sensing Symposium 2003*, Orlando, FL., Feb. 28, **2003**.
- Participant, NASA New Millennium Program Earth Science Enterprise Technology Planning Workshop (Integrated Optics and Spectral Technologies), Rosslyn, VA, January 23 – 24, **2001**.

OTHER PROFESSIONAL AFFILIATIONS

- Member, American Geophysical Union, 2003-2016 (terminated in protest at the Exxon sponsorship of the Fall Meeting); re-joined temporarily Fall 2020.
- Elected member, *Phi Kappa Phi*, Spring 2010-.
- Member, *Gamma Theta Upsilon*, Montclair State University, Department of Earth and Environmental Studies, and Iota Chapter, 2002-.
- Member, The Remote Sensing and Photogrammetry Society, 1994–2007.
- Member, IEEE Geoscience and Remote Sensing Society, 2002–2006.
- Passaic River Institute, Montclair State University, June 2004-.

FIELD CAMPAIGNS AND WORKSHOPS

- Fieldwork in Inner Mongolia Autonomous Region, China, July 2013: Grasslands, Deserts, and Changes in Urban Life, funded in part by a Sokol Faculty fellowship award.
- NASA VurSAL Workshop 2009: Forest Burn Site Field Visits, Delta Junction, AK, August 12; and tundra fieldwork, Eagle Summit, AK, August 14.
- Organizer of the Montclair State University/NASA/USDA LVIS aerial survey and field campaign (with three graduate students) at the USDA, ARS Jornada Experimental Range, Sept. 13-19, 2008.
- Student Field Trip to Atlantic County Utilities Authority (ACUA), Atlantic City, to see New Jersey's only Large Wind Turbines (plus Solar Energy, Geothermal, Biodiesel). November 3, 2007.
- EOS Project Team Meeting in Las Cruces, NM, and participation in the JORNEX field campaign at the USDA, ARS Jornada Experimental Range, October 2004.
- Mini-campaign at the USDA, ARS Jornada Experimental Range to acquire field data in support of the CHRIS/Proba mission (grass-shrub transition site) January 2004.
- Participant in the *USDA-ARS Hydrology and Remote Sensing Laboratory's JORNEX* campaigns at both the Jornada Experimental Range, NM, and at the Sevilleta National Wildlife Refuge, NM, in 05/99, 09/99, 05/00 and 09/00 and at the Jornada Experimental Range, 05/01, 09/01, and 05/02.
- Initiated and directed a new airborne remote sensing experiment series to acquire multiple view angle image data over the *JORNEX* sites, May 2000-2001.
- Participant in the joint USDA/USGS workshop *Integrating Remote Sensing and Ground-Based Measurements for Inventory, Assessment and Monitoring of Southwestern Ecosystems*, Las Cruces, NM, September 19 - 21, 2000.
- Participant in the *NASA EOS MODLAND Science Data Support Team (SDST)* meeting at Goddard Space Flight Center, March 30-31, 1999.
- Hosted the Chiba University Center for Environmental Remote Sensing's US 2000 campaign at the Jornada Experimental Range, NM, using a computer-controlled helicopter UAV system (June 2000).
- Led the 1996 Grassland Field Survey, Xilingol League, Inner Mongolia Autonomous Region, August 1996, in collaboration with Inner Mongolia Normal University.
- Soil roughness measurements for Radarsat crop monitoring research in Suffolk, UK, May 1996.
- Field ecology surveys in Xilingol and Hulunbuir Leagues, Inner Mongolia Autonomous Region, P. R. China, July - August, 1993.

TECHNICAL SKILLS

- 2023 (early) adopter of the STELLA-Q spectrometer kit package developed by NASA GSFC, used in Remote Sensing classes.
- BRDF modeling package developed for the Center for Applied Remote Sensing in Meteorology, Agriculture & the Environment (CARSAME) at New Mexico State University, Summer 2003.
- Developed BRDF model inversion algorithms with multi-sensor, multi-orbit AVHRR data, with adaptations of the SMAC & AMBRALS algorithms with custom code.
- Image Processing and GIS packages I have used: Imagine 2016/10/9.x (Windows); ERDAS Imagine 8.1/2/3/4/5/6 (Unix), Arc/INFO (Unix/VMS), PCI (EASI/PACE), Idrisi, NIH Image, ImageJ and associated macro language MultiSpec (Mac), SeaDAS.
- Computer programming: C (Unix/Linux, MacOS, DOS), Fortran (Unix), ERDAS Imagine 8.1-4, 9.1-3; 10+; SML/EML (Unix), IDL (Unix/Linux), ImageJ macro language, VBA.
- Beta-tester for the AMBRALS MODIS/MISR processing (Algorithm for MODIS Bidirectional Reflectance Anisotropy of the Earth's Surface; NASA EOS Product MOD43; found relative azimuth bug that was subsequently corrected, contributing to the quality of the software).
- Beta-tester for the Tosca digitizing system v.2.1, contributing to the quality of the software.
- NASA MISR Data Users' Course at Steamboat Springs, CO. 2002 (1-day workshop).
- NASA EOSDIS Tools Training Course at Goddard Space Flight Center, October 24, 2000.
- Tcl/Tk, HTML, PHP, Unix shell scripting.
- Developed GUI-based free-text search database for Cambridge University MacArthur Project, 1993-4.

MISCELLANEOUS

- Member, Liberty Science Center, Jersey City, New Jersey, August 2016 - 2021.
- Signatory to: William J Ripple, Christopher Wolf, Thomas M Newsome, Phoebe Barnard, William R Moomaw, World Scientists' Warning of a Climate Emergency, *BioScience*, Volume 70, Issue 1, January 2020, Pages 8–12, https://doi.org/10.1093/biosci/biz088.
- Fairweather bicycle commuter, ~6 miles to/from campus ~24/22 minutes depending on wind and traffic, 2010 - October 22, 2019 (when severe vertigo suddenly hit); July 2020- (riding actually helped with recovery from vertigo).
- Member, New Jersey Bike & Walk Coalition, a non-profit 501(c)(3) organization, 2014 - 2018.
- Member, Major Taylor Cycling Club of New Jersey, 2011-; active 2011 - 2015.
- Early adopter of 100% Electric Vehicles (EVs): (1) a low-cost 2016 VW e-Golf, charged in 2016 - 2019 with wind-generated electricity from the Atlantic County Utilities Authority wind farm, purchased via Community Energy, Inc. that closed in spring 2019; and subsequently using the West Orange, NJ township electricity supply that was 100% renewable (apparently this scheme was dropped: currently seeking alternatives, maybe rooftop solar). I ditched the gas car soon thereafter. (2) A second EV, a 2022 Kona Electric SEL, was purchased in April 2022.