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### **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  
Department of Earth and Environmental Studies

Associate Professor September 2006-

Assistant Professor September 2002 - August 2006

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

Physical Scientist GS12 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 GS11 January 1999 - January 2001  
Performance Ratings for 1999 and 2000: Outstanding.

University of Nottingham (England)  
School of Geography

Teaching Assistant October 1996 - September 1997

## **PROFESSIONAL EXPERIENCE, continued...**

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**

- Margaret and Herman Sokol Faculty Fellow 2009 (\$25,000).
- Visiting Professor (honorary position), School of Geography, Inner Mongolia Normal University, Huhehaote, P.R. China, October 2005-.
- USDA, ARS Certificate of Merit For Outstanding Performance, 1999, 2000, 2001.
- The USDA, ARS Award for Outstanding Presentation at the American Water Resources Association Annual Conference, Albuquerque, NM, November 2001.
- The 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 Best M.Sc. Paper 1996.
- Cambridge University Geography Dept. GIS & Remote Sensing M.Phil. Best of Year 1995.

## **TEACHING EXPERIENCE**

GEOS 107 Planet Earth (Earth Science; Fall 2002/3/4/6/7, Spring 2005/6/8)  
EUGS 270 Geographic Information Systems I: Digital Mapping (Fall 2003, Spring 2005/6)  
EUGS 470 Geographic Information Systems II (Fall 2002/4/5/7)  
EUGS 427/504 Spatial Analysis (Spring 2003)  
GEOS/ENVR 455 Fundamentals of Remote Sensing (Spring 2004/7)  
ENVR 655 Advanced Environmental Remote Sensing (Spring 2004/7)  
EUGS 102 World Geography (Spring 2003) & Online Practical Exercises (Fall 2003)  
ENVR 770 Earth Systems Science (lecture).  
GEOS 112 Physical Geology: Remote Sensing (lecture).

## **GRADUATE STUDENT ADVISING**

Robert Teeter (graduate student)	Fall 2005-6
N. Neeti (doctoral student)	Spring 2006

## **INDEPENDENT STUDY**

Chie Fuchiyama	Land Use Change/Water Quality in the Mullica R. Watershed	Spring 2005
Marcia Anderson	High Resolution Mapping of Urban Tree Cover	Spring 2008

## **DOCTORAL DEGREE COMMITTEES**

Victor U. Onwueme	Characterization and assessment of contaminated sediments of the Lower Passaic River, New Jersey.	Spring 2004-7
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## PUBLICATIONS

### PUBLICATIONS IN REFEREED JOURNALS

- 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*, in press.
- Chopping, M., Schaaf, C.B., Zhao, F., Wang, Z., Nolin, A.W., Moisen, G.G., Martonchik, J.V., and Bull, M. (2009), Forest structure and aboveground biomass in the southwestern United States from NASA moderate resolution remote sensing, in review.
- 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, Blackwell, DOI: 10.1111/j.1749-8198.2008.00183.x.
- 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.
- Chopping, M., (2008) Multi-angle remote sensing and applications (book chapter), in *Advances in Land Remote Sensing: System, Modeling, Inversion and Applications*, S. Liang (editor), Springer-Verlag, Springer-Verlag, XXII, 498 p., 95-144.
- Su, L., Huang, Y., Chopping, M. J., Rango, A., and Martonchik, J. V. (2008), 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*, in press.
- 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. *International Journal of Remote Sensing* 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. doi:10.1016/j.rse.2006.04.022.
- Rango, A., Ritchie, J., Schmugge, T., Kustas, W., and Chopping, M. (2005), Book Chapter: Remote Sensing and the JORNEX Project. In: *A Chihuahuan Desert Ecosystem: The Jornada Basin*, Havstad, K., Hueneke, L., and Schlesinger, W. H. (eds), Oxford University Press, 305 – 320.
- 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.
- 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.
- 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, May 2003.
- 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.
- Chopping, M.J. (2000), Testing a LiSK BRDF model with *in situ* bidirectional reflectance factor measurements over semiarid grasslands, *Remote Sensing of Environment* 74(2): 287-312.
- Chopping, M., Schmugge, T., Rango, A., Ritchie, J., Kustas, W. and Vande Castle, J.R. (2000), The impact of the structure and composition of shrub-coppice dune landscapes on MASTER reflectance anisotropy, *Remote Sensing and Hydrology 2000, International Association of Hydrological Sciences (IAHS) Publ. No. 267*, (Wallingford: IAHS),162-167.
- Chopping, M.J. (2000), Large-scale BRDF retrieval over New Mexico with a multiangular NOAA AVHRR data set, *Remote Sensing of Environment* 74(1): 163-191.
- Rango, A., Chopping, M., Ritchie, J., Havstad, K., Kustas, W., and Schmugge, T. (2000), Morphological characteristics of shrub-coppice dunes in desert grasslands of southern New Mexico derived from scanning LIDAR data, *Remote Sensing of Environment* 74(1): 26-44.
- Chopping, M.J. (1999), Comment on "A simple method to account for off-nadir-scattering in the NOAA/NASA Pathfinder AVHRR Land Data Set" by Seaquist and Olsson, *IJRS Vol.19, No.7, International Journal of Remote Sensing* 20(4): 815-821.
- Haines-Young, R.H. and Chopping, M.J. (1996), Quantifying landscape structure: a review of landscape indices and their application to forested landscapes, *Progress in Physical Geography*, 20(4): 418-445.
- Chopping, M.J., (1996) Remote Sensing and GIS for monitoring grassland environments, in: *Raster Imagery in Geographic Information Systems*, S. Morain and S.V. Lopez Baros (eds.), (Santa Fe: Onword Press), 378-386.

## PROCEEDINGS

- Chopping, M., Su, L., Kollikkathara, N., and Urena, L. (2007), Advances in mapping woody plant canopies using the NASA MISR instrument on Terra, *Proc. 2007 IEEE International Geoscience and Remote Sensing Symposium*, Barcelona, Spain, July 23 – 27, 2007.
- Qi, X. and Chopping, M. (2007), Expansion of urban area in the Yellow River zone, Inner Mongolia Autonomous Region, China, from DMSP OLS nighttime lights data, *Proc. 2007 IEEE International Geoscience and Remote Sensing Symposium*, Barcelona, Spain, July 23 – 27, 2007.
- Chopping, M. (2006), Progress in retrieving canopy structure parameters from NASA multi-angle remote sensing, **invited paper** (Terra session in honor of V. Salomonson) presented at the *2006 IEEE International Geoscience and Remote Sensing Symposium and 27<sup>th</sup> Canadian Symposium on Remote Sensing*, Denver, CO, July 31 – August 4, 2006.

- Chopping, M., J.V. Martonchik, A. Rango, D.P.C. Peters, L. Su, and A. Laliberte, (2005), Geometric-optical modeling of desert grassland canopy structure with MISR, Proceedings of *The 9th International Symposium on Physical Measurements and Signature in Remote Sensing (ISPMSRS 2005)*, Beijing, Oct. 17-19, 2005, Vol. I, International Society for Photogrammetry and Remote Sensing, Vol. I, 141-143.
- Chopping, M., Diner, D.J. (2005), Workshop on Ecological Modeling using NASA Multiangle Remote Sensing, Greenbelt, MD, September 20, 2005, *The Earth Observer*, November-December 2005 edition, EOS Project Science Office, NASA/GSFC, 32-34.
- Su, L., M. J. Chopping, A. Rango, J. V. Martonchik, and D. P. C. Peters (2005), Recognition of semi-arid vegetation types based on MISR multi-angular observations and surface anisotropy patterns inverted by bidirectional reflectance models, Proceedings of *The 9th International Symposium on Physical Measurements and Signature in Remote Sensing (ISPMSRS)*, Beijing, China Oct. 17-19, 2005, Vol I, 186-189.
- Chopping, M., Laliberte, A., and Rango, A., (2004), Exploitation of multi-angle data from CHRIS on Proba: First results from the Jornada Experimental Range, *Proceedings of the 2<sup>nd</sup> European Space Agency Workshop on CHRIS/Proba*, April 28 – 30, 2004, ESRIN, Frascati, Italy, ESA Special Publication SP-578, *Compiled by: H. Lacoste, ISBN No: 92-9092-889-1*. 109-117.
- Chopping, M., Laliberte, A., Rango, A., Snyder, C., and Maxwell, C. (2004), Differences in grass-shrub transition zone canopy composition from CHRIS/Proba multi-angle data, F17 - Multi-Angular Optical Measurements, *Proc. International Geoscience and Remote Sensing Symposium 2004 VII*: 4746-4749. Anchorage, Alaska, September 20 – 24, 2004.
- Chopping, M., Laliberte, A., and Rango, A., (2004), Multi-Angle data from CHRIS/Proba for determination of canopy structure in desert rangelands. F17 - Multi-Angular Optical Measurements, *Proc. International Geoscience and Remote Sensing Symposium 2004 VII*: 4742-4745. Anchorage, Alaska, September 20 – 24, 2004.
- Chopping, M., Su, L., Schmugge, T., and Albert R. (2003), Validation of bidirectional reflectance models using the first scene acquired by the CHRIS sensor over the Jornada Experimental Range. *Proc. International Geoscience and Remote Sensing Symposium 2003*, IEEE, VII: 4425-4427.
- Chopping, M., Su, L., Rango, A., and C. Maxwell (2003), Desert landscape scene simulation with simple geometric and radiosity models. *Proceedings of the International Geoscience and Remote Sensing Symposium 2003*, July 21-25. Piscataway: IEEE, IV: 2269-2271.
- Chopping, M.J., Rango, A., and Gomez-Landes, E. (2002), The importance of early morning local overpass times for BRDF retrieval, modeling of spectral reflectance and *f*APAR estimation, *Proc.Intl. Geoscience & Rem. Sens. Symposium 2002*, Vol. IV: 2264-2266.
- Chopping, M.J., Rango, A., Goslee, S., Schmugge, T., and Ritchie, J. (2002), Simulation of a grassland-shrubland transition zone landscape image at 650 nm using a simple BRDF model, *Proc. IGARSS 2002*.Vol. VI: 3561-3563.
- Schmugge, French, A., Jacob, F., Ogawa, K., Ritchie, J.C., Chopping, M.J., and Rango, A. (2002), ASTER Thermal infrared observations over New Mexico, *Proceedings of the SPIE 9th Intl. Symposium on Remote Sensing: Remote Sensing for Agriculture, Ecosystems, and Hydrology III Conference*, Vol. 4542, 207-213.
- Chopping, M.J., Borel, C., Su, L., Rango, A., Goslee, S., and Maxwell, C. (2002), BRDF reconstruction in Chihuahuan Desert grass-shrub transition canopy-soil complexes: Validation with an airborne multiangular data set, *The Third International Workshop on Multiangular Measurements and Models (IWMMM-3)*, Steamboat Springs, CO, June 10 - 12.
- Ritchie, J.C., Schmugge, Jacob, F., Rango, A., and Chopping, M.J. (2002), Spectral reflectance differences of northern Chihuahuan Desert vegetation, *Proceedings of the 87th Annual Meeting of the Ecological Society of America*, Tucson, Arizona, August 4 - 9, 2002.
- Schmugge, T., Jacob, F., French, A., Ritchie, J., Chopping, M., and Rango, A. (2002), ASTER thermal infrared observations over New Mexico, *Proceedings of IGARSS 2002*, Vol. I: 24-26.

- Schmugge, T., French, A., Ritchie, J., Chopping, M., and Rango, A. (2002), ASTER Observations of the spectral emissivity over New Mexico, *Proceedings of the SPIE 8<sup>th</sup> Intl. Symposium on Remote Sensing: Remote Sensing for Agriculture, Ecosystems & Hydrology III*, Vol. 4542, 207-213.
- Schmugge, T., French, A., Ritchie, J., Chopping, M., and Rango, A. (2001), ASTER observations of the spectral emissivity for arid lands, *Proceedings of the International Geoscience and Remote Sensing Symposium 2001*, Sydney, Australia, Vol. III: 715-717.
- Chopping, M.J., Rango, A., and Ritchie, J.C. (2000), The potential for semiarid community type differentiation via exploitation of the directional signal: tests with AVHRR data, *Proceedings of the International Geoscience & Remote Sensing Symposium 2000*, Honolulu, 1957-1959.
- Schmugge, T., Chopping M., French, A. Havstad, K., Rango, A. Ritchie, J. and Schieldge, J. (2000), ASTER observations over New Mexico test sites. *American Geophysical Union Transactions (EOS)* 81(48):F550, 2000
- Chopping, M.J. (1998), Evaluation of the performance of linear semi-empirical BRDF models in a semi-arid grassland biome, *Proceedings of the Remote Sensing Society Annual Conference 1998: Developing International Connections*, Greenwich, England, 9th - 11th September 1998 (Nottingham: Remote Sensing Society), pp.568-574.
- Chopping, M.J. (1998), BRDF applications in semi-arid grassland monitoring with the AVHRRs. In *Developing Space '98: Proceedings of the 1998 Remote Sensing Society Student Conference*, edited by Watts, S. K. and Bakker, B., 23rd April 1998, University of Oxford (Nottingham: Remote Sensing Society), pp.59-67.

#### **OTHER WRITTEN CONTRIBUTIONS**

- Chopping, M. et al. (2008), Year One Report, NASA Project: A New Approach for Mapping Woody Plants in the Southwestern United States Using NASA Earth Observing System Data ([http://csam.montclair.edu/~chopping/jornada/EOS/PrgRpt\\_Chopping\\_1008.pdf](http://csam.montclair.edu/~chopping/jornada/EOS/PrgRpt_Chopping_1008.pdf)).
- Chopping, M. et al. (2008), Final Report, NASA Project: Quantifying Changes in Carbon Pools with Shrub Invasion of Desert Grasslands using Multiangle Data from EOS Terra and Aqua ([http://csam.montclair.edu/~chopping/jornada/EOS/Final\\_Report\\_2008.pdf](http://csam.montclair.edu/~chopping/jornada/EOS/Final_Report_2008.pdf)).
- Chopping, M., (2007), 'NASA Earth Observing System Project Update: Serendipity Strikes!', College of Science and Mathematics Spring 2007 Newsletter.
- Chopping, M., (2006), 'NASA Earth Observing System Project Update', College of Science and Mathematics Spring 2006 Newsletter.
- Chopping, M., (2004), Member in the Spotlight: Dr. Mark Chopping, *Association of American Geographers Remote Sensing Specialty Group Newsletter*, Vol. 25, No.1: 3 – 4, February 2004.
- Chopping M. (2003), 'Satellites: the Good the Bad and the Ugly', *College of Science and Mathematics Newsletter Spring 2003*, Montclair State University.
- Solecki, W.D., Rosenzweig, C., Pope, G., Chopping, M., Clark, M., Goldberg, R., Lazar, V., Melendez, B., and Onwueme, V. (2003), Analysis of the current and future heat island effect in the Greater Camden, NJ region and potential mitigation strategies, *Final Draft Report* to the New Jersey Department of Environmental Protection, Division of Science, Research and Technology, contract # SR01-096, March 2003, 56 pp + appendices.
- Contributions to two chapters of *The Manual of Remote Sensing: Biophysical Remote Sensing of Arid and Semi-Arid Regions* and *Managed Grasslands and Pastures*. 2002.
- Comis D. (2001), Major contribution by Mark J Chopping to the article 'From a Distance: Remote Sensing of Planet Earth', *Agricultural Research* magazine, 49(8):4-8, August 2001 (USDA Agricultural Research Service).

- Chopping, M.J. (1999), *Remote Sensing for Assessment of Arid Rangeland Health over the Jornada Experimental Range*, unpublished internal literature review, USDA, ARS, Hydrology and Remote Sensing Laboratory, Beltsville, MD 20705-2350, pp40.
- Chopping, M.J. (1998), *Linear semi-empirical kernel-driven bidirectional reflectance distribution function models in monitoring semi-arid grasslands from space*, unpublished Ph.D. thesis, University of Nottingham, October 1998, 501pp.
- Haines-Young, R.H. and Chopping, M.J. (1996) *Landscape indices: implications for the analysis and design of forested landscapes*, Commissioned Consultancy Review for the UK Forestry Commission, Forestry Commission, Edinburgh, 61pp., May 1996.
- Chopping, M.J. (1995), *An Application of Remote Sensing and GIS: Monitoring the Steppe Environment of Inner Mongolia Autonomous Region*, P.R.C., unpubl. M.Phil. Thesis, Darwin College, University of Cambridge, 140pp, August 1995 (Remote Sensing Society Award 1996).
- Chopping, M.J. and Qi Xiao Hong (1993), *University of Cambridge MacArthur Project Ground-Truthing Expedition: Xilingol & Hulunbuir, Inner Mongolia Autonomous Region 1993*, unpubl. research report., Department of Social Anthropology, University of Cambridge, 219pp.
- Chopping M.J. (1992), *University of Cambridge MacArthur Project for Environmental & Cultural Conservation in Inner Asia: Pilot GIS Report 1992*, unpubl. research report., Department of Social Anthropology, University of Cambridge, 17pp.
- Chopping M.J., Humphrey, C. and Sneath, D. (1992), *University of Cambridge MacArthur Project for Environmental & Cultural Conservation in Inner Asia: 1992 Interim Report*, unpubl. research report., Department of Social Anthropology, University of Cambridge, 48pp.

## **PROFESSIONAL PRESENTATIONS, POSTERS, AND ABSTRACTS**

- 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, poster for the 4th Global Vegetation Workshop 2009, June 16-19, NTSG, U. Montana, Missoula, MT.
- 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 2<sup>nd</sup> All-Investigators' Meeting, February 16-20, 2009, San Diego, CA.
- 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.
- 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, poster presented at the NASA Carbon Cycle & Ecosystems Joint Science Workshop 2008, April 28 - May 2, 2008, Adelphi, MD.
- 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.
- 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.

- Chopping, M., L. Su, A. Laliberte, A. Rango, G. Moisen, DPC Peters, and J. V. Martonchik (2007), Assessing MISR/SGM results with Forest Inventory Analysis and LVIS data, MISR Data Users' Science Symposium 2007, Pasadena, CA, Dec. 6 - 7 2007.
- 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.
- 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 27<sup>th</sup> 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., NASA Earth Observing System Project: Background and GO modeling, presentation for the MSU Global Education Center to Russian environmental professional delegation, 04/13/05.
- Chopping, M., Rango, A., Laliberte, A., Schmutge, 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 26<sup>th</sup> 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).
- Chopping, M.J. (2001), Spatial variability in reflectance at multiple scales from high resolution panchromatic imagery, *unpublished internal research report*, 25pp.
- 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), *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.

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.

World Wide Web:

1. *BRDF Applications in Semi-Arid Grassland Monitoring with the AVHRRs*, established in March 1998, currently at <http://www.csam.montclair.edu/~chopping/>
2. PHP-, Javascript, and HTML-driven web sites at Montclair State University (online forms, surveys, questionnaires, student outcomes, tests, course and research materials, remote sessions).
3. Web site and literature review *Windblown Desert Dust: Impacts on Health and Agriculture*, completed December 1998 for the University of Nottingham School of Geography.

## RESEARCH GRANTS

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 – June 30, 2012, PI (\$522,358).

National Aeronautics and Space Administration (NASA), Jet Propulsion Laboratory/MISR Project: *Forest and Shrub Mapping with MISR*, Mar-Sept 2009. PI (\$74,573).

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*, PI (\$508,004, proposal not selected but part of the field/air component was funded).

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, PI (award# NNX08AE71G, \$192,994).

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 and Aqua* 2004–2008. PI. Award# NNG04GK91G, PI (\$481,380). Completed.

National Science Foundation (NSF): Graduate Student Research Advisor in GK-12 Fellows in the Middle: Partnerships for Inquiry and Interdisciplinary Middle School Science and Mathematics, (PI: Ken Wolff, Co-Is: Mary Lou West, Mika Munakata). Current. (\$2,825,141).

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; ongoing).

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*, with Dr. Jordan Feng (EAES). Completed (\$3,000).

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

Montclair State University/Global Education Center Travel Competition (2002): *Mapping Community Types in Inner Mongolia Semiarid Grasslands using Multi-Angular Data from EOS MISR* (\$1,800).

## PROFESSIONAL SERVICE

### EDITORIAL

Editorial board member, *Remote Sensing of Environment*, SCI Impact Factor: 3.943 (2009, from 3.013 in 2008).

### PEER REVIEW (JOURNALS)

*International Journal of Remote Sensing*  
*IEEE Transactions on Geoscience & Remote Sensing*  
*Remote Sensing of Environment*  
*Journal of Geophysical Research-Atmospheres*  
*Environmental Monitoring & Assessment*

*Canadian Journal of Remote Sensing*  
*Ecological Applications, Remote Sensing Reviews*  
*Remote Sensing and Hydrology*  
*Photogrammetric Engineering & Remote Sensing*  
*Journal of Applied Meteorology (...and others)*

### PEER REVIEW (SELECTION PANELS AND MAIL REVIEWS)

I have served on peer review panels and as mail reviewer for several NASA Earth Science programs (Earth System Science Fellowships, New Investigator Program, Land Cover Land Use Change, Terrestrial Ecology, Interdisciplinary Science, Carbon Cycle Science, and science definition teams), and as a mail reviewer. I have also served as reviewer for the U.S. National Science Foundation, the Space Research Organization of the Netherlands, and the New Jersey Technology Council.

- NASA ROSES'08 ICESat-II Science Definition Team panel reviewer, October **2008**.
- NJ Technology Council Mid Atlantic Imaging Symposium, panel reviewer, November **2008**.
- NASA ROSES'06 New Investigator Program, October **2007**.
- NASA ROSES'05 Land Cover Land Use Change selection panel, September **2005**.
- NASA ROSES'05 ICESat solicitation mail reviewer, September **2005**.
- NASA ROSES'05 LBA solicitation mail reviewer, August **2005**.
- NASA Carbon Cycle Science selection panel, Crystal City, VA, May 25–28, **2004**.
- Contribution to the NASA *Earth Science and Applications from Space Strategic Roadmap Committee—Discovery and Exploration subcommittee*, February **2005**.
- National Science Foundation, research grant proposal review for the NSF Geography & Regional Science program, Proposal# 0418051, Historical GAP Analysis of Missouri, April **2004**.
- Space Research Organization of the Netherlands (SRON) research grant mail reviewer, Earth Observation Research Cat. 1. + 2A: Proposal# GO-2003/56 Linking biochemical and biophysical variables derived from hyperspectral and multispectral remote sensing data to ecological models - an integrated approach (March **2004** and September **2004** re-review).
- National Science Foundation research grant proposal review for the Geography & Regional Science program: Proposal# 0352822 & 0352810, Content Based Image Retrieval of Geographic Objects, October **2003**.
- NASA IDS (Interdisciplinary Science - Hydrological Processes) selection panel (Land Cover Land Use Change program), June 24-26, **2003**.
- NASA REASoN – Research, Education and Applications Solutions Network CAN mail reviewer, February **2003**.
- NASA NRA Large-Scale Biosphere-Atmosphere Experiment in Amazônia (LBA-ECO): Phase II, and Opportunities in Terrestrial Ecology mail reviewer, April **2002**.
- NASA Earth System Science Fellowship selection panel, June 15, **2001**.

#### UNIVERSITY-BASED

- Development of the Geographic Information Science Graduate Certificate (2008) and Geographic Information Science Minor (2009) – contributions.
- Department of Earth & Environmental Studies web site, 2006-.
- 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 (<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.
- 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.
- New Jersey Science Olympiad Organizer and Judge (Remote Sensing), January 12, 2006.
- MSU Earth Week Movie Night 2006, organizer (<http://csam.montclair.edu/~chopping/tdat>)
- MSU Earth Week Movie 2007 (AIT), organizer (<http://csam.montclair.edu/~chopping/ait>)
- 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

- 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**.

## **PROFESSIONAL AFFILIATIONS**

- Member of the MISR Science Team, 2004- (official HQ appointment late 2008).
- Principal Investigator, North American Carbon Program (NACP), 2006-.
- Member, NASA Vegetation Structure Working Group, Spring 2008-.
- Member, NASA Land Cover Land Use Change (LCLUC) Science Team, 2004-2008
- Principal investigator, Jornada Core Site, ESA CHRIS/Proba mission, 2000-.
- Member, American Geophysical Union, 2003-.
- Member, *Gamma Theta Upsilon*, *Montclair State University, Department of Earth and Environmental Studies*, and *Iota Chapter*, 2002-.
- Member, Association of American Geographers, 2007-.
- 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-.

## **OTHER ACCOMPLISHMENTS**

### **FIELD CAMPAIGNS AND WORKSHOPS**

- Organizer, 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.
- 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 C/C helicopter 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**

- BRDF modeling package developed for the Center for Applied Remote Sensing in Meteorology, Agriculture & the Environment at New Mexico State University (commissioned Summer 2003).
- Image Processing and GIS: 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 (NIH) MultiSpec (Mac), SeaDAS. I developed processing algorithms for inversion of BRDF models with multi-sensor, multi-orbit AVHRR data, including adaptations of the SMAC and AMBRALS algorithms with custom code and scripts.
- Computer programming: C (Unix/Linux, MacOS, DOS), Fortran (Unix), ERDAS Imagine 8.1/2/3/4 SML/EML (Unix), IDL (Unix/Linux), Visual Basic, Arc/INFO AML (Unix, VMS), Pascal (DOS, MacOS). I developed proprietary windowing GUI database software for the Cambridge University MacArthur Project in 1993-4. I was a beta-tester for the AMBRALS MODIS/MISR processing (Algorithm for MODIS Bidirectional Reflectance Anisotropy of the Earth's Surface; NASA EOS Product MOD43) and the Tosca digitizing system v.2.1. I contributed concretely to the quality of the software in both cases.
- 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, shell scripting.