CURRICULUM VITAE

Marilyn O'Hara Ruiz

Mailing Address
Department of Pathobiology
2001 South Lincoln Avenue
College of Veterinary Medicine
University of Illinois
Urbana, Illinois 61802

Other contact information
217-265-5115 (office) 513-317-4056 (mobile)
moruiz@illinois.edu
URL: http://vetmed.illinois.edu/path/gissa/

Educational Background

1982	B.A. University of Illinois. Geography, College of Liberal Arts and Sciences
1985	M.A. University of Illinois. Geography, College of Liberal Arts and Sciences; Specializing in Cartography and Social Geography
1995	Ph.D. University of Florida. Geography, College of Liberal Arts and Sciences; Geographic Information Science and Medical Geography. Doctoral thesis title: A Model of Error Propagation from Digital Elevation Models to Viewsheds

Professional Employment

1985 – 1987	Owner. O'Hara Cartographic Services, Champaign, IL,
1987 – 1990	Geographic Information Systems Specialist. U.S. Army Corps of Engineers Construction Engineering Research Laboratory, Champaign, IL
1994 -1997	Assistant Professor. Department of Geography. Florida State University, Tallahassee, FL
1998 – 2001	Principal Investigator. U.S. Army Corps of Engineers Construction Engineering Research Laboratory, Champaign, IL
2001 – 2004	Clinical Assistant Professor. Veterinary Diagnostic Laboratory (50%) and Center for Zoonoses Research (50%), College of Veterinary Medicine, University of Illinois, Urbana, IL.
2004 – 2010	Clinical Assistant Professor. Department of Pathobiology. College of Veterinary Medicine, University of Illinois, Urbana, IL.
2010 - present	Clinical Associate Professor, Department of Pathobiology, College of Veterinary Medicine, University of Illinois, Urbana, IL.

Primary Focus Areas of Research and Teaching

- **Spatial and temporal risk of disease**. Models built on statistical analyses that take into account disease processes and the environmental and social differences across time and space. Vector-borne and zoonotic diseases are of particular interest.
- **Weather, water, vectors, and health.** The effects of variable temperature and precipitation on health events of people and animals with a special focus on vectors and water resources.
- **Geographic Information Science for public health.** The implementation of health informatics with a spatial component for use by local health departments and other agencies.
- **Dynamic urban environments and neighborhood health.** The complexities of interactions between people, animals and arthropod vectors that influence how neighborhoods influence the health of residents.
- **Movement patterns of people and animals.** Measuring and modeling the space-time dimensions of human and animal migration, circulation and interaction.

Honors, Recognitions, and Outstanding Achievements

1983-84	University Fellow, University of Illinois
1990	Outstanding Contributions award for work toward the development of the Geographic Resources Analysis Support System (GRASS) GIS, Army Corps of Engineers
1991-93	Grinter Fellow, University of Florida
1993	Graduate School Social Science and Humanities Fellowship, University of Florida
1997 & 1999	Service Award, Legal Environmental Assistance Foundation in Tallahassee, FL for mapping and analysis support
2007	National Center for Supercomputer Applications Faculty Fellow
2010	Promising Practice Award, National Association of County and City Health Officials, Real time advanced digital mapping to plan, identify and respond to vaccination penetration rates.
2011- 2015	University of Illinois Teachers Rated as Excellent by Their Students
2012	Fulbright-Nehru Senior Scholar Research Fellowship – India, University of Delhi, College of Medical Sciences.

Publications

See Google Scholar pages for links to papers:
https://scholar.google.com/citations?user=a2Xa2EoAAAAJ&hl=en

Articles in Journals

1. Thrall, G.I., S.E. Thrall, **M. Ruiz**, and C. Sidman, *Using GIS to Analyze and Visualize Spatial Data.* Geo Info Systems, 1993. **3**(5): p. 59-65.
2. Thrall, G., B. Bates, and **M. Ruiz**, *'A History of Implementing an Urban GIS. Part Two: Two Solutions Toward a Working GIS.* Geo Info Systems, 1994. **4**(10): p. 46-51.
3. Thrall, G. and **M. Ruiz**, *A History of Implementing an Urban GIS. Part One: Design, Tribulations, and Failure.* Geo Info Systems, 1994. **4**(7): p. 50-78.
4. **Ruiz, M**., *Health Statistics Mapping Software.* Geo Info Systems, 1996. **6**: p. 52-55.
5. **Ruiz, M.O.,** *A causal analysis of error in viewsheds from USGS digital elevation models.* Transactions in GIS, 1997. **2**(1): p. 85-94.
6. **Ruiz, M**. and D.A. Morrison, *FME 2000 Translation with Oomph!* Geospatial Solutions, 2000. **10**: p. 46-47.
7. Morrison, D. and **M. Ruiz,** *Instant Replay Red Hen's Multimedia GIS.* Geospatial Solutions, 2001. **11**: p. 45-47.
8. **Ruiz, M**. and T. McTighe, *GIS with a 360 View.* GEOSPATIAL SOLUTIONS, 2003: p. 49.
9. **Ruiz, M**. and T. McTighe, *The iPIX Mapping System GIS with a 360 degree View.* Geospatial Solutions, 2003. **13**: p. 48-49.
10. **Ruiz, M.O.** and D. Remmert, *A local department of public health and the geospatial data infrastructure.* Journal of medical systems, 2004. **28**(4): p. 385-395.
11. **Ruiz, M.O**., C. Tedesco, T.J. McTighe, C. Austin, and U. Kitron, *Environmental and social determinants of human risk during a West Nile virus outbreak in the greater Chicago area, 2002.* Int J Health Geogr, 2004. **3**(1): p. 8.
12. Reeder, A.L., **M.O. Ruiz,** A. Pessier, L.E. Brown, J.M. Levengood, C.A. Phillips, M.B. Wheeler, R.E. Warner, and V.R. Beasley, *Intersexuality and the cricket frog decline: historic and geographic trends.* Environ Health Perspect, 2005: p. 261-265.
13. **Ruiz, M.O.,** W.M. Brown, J.D. Brawn, G.L. Hamer, K.E. Kunkel, S.R. Loss, E.D. Walker, and U.D. Kitron. *Spatiotemporal patterns of precipitation and West Nile virus in Chicago, Illinois, 2002-2005 and implications for surveillance*. in *American Journal of Tropical Medicine and Hygiene*. 2006.
14. **Ruiz, M.O.**, E.D. Walker, E.S. Foster, L.D. Haramis, and U.D. Kitron, *Association of West Nile virus illness and urban landscapes in Chicago and Detroit.* Int J Health Geogr, 2007. **6**(1): p. 10.
15. Bertolotti, L., U.D. Kitron, E.D. Walker, **M.O. Ruiz**, J.D. Brawn, S.R. Loss, G.L. Hamer, and T.L.

Goldberg, *Fine-scale genetic variation and evolution of West Nile Virus in a transmission "hot spot" in suburban Chicago, USA.* Virology, 2008. **374**(2): p. 381-389.

16. Hamer, G.L., U.D. Kitron, J.D. Brawn, S.R. Loss, **M.O. Ruiz**, T.L. Goldberg, and E.D. Walker, *Culex pipiens (Diptera: Culicidae): a bridge vector of West Nile virus to humans.* J Med Entomol, 2008. **45**(1): p. 125-128.
17. Hamer, G.L., E.D. Walker, J.D. Brawn, S.R. Loss, **M.O. Ruiz,** T.L. Goldberg, A.M. Schotthoefer, W.M. Brown, E. Wheeler, and U.D. Kitron, *Rapid amplification of West Nile virus: the role of hatch-year birds.* Vector-Borne and Zoonotic Diseases, 2008. **8**(1): p. 57-68.
18. Kelly, A.C., N.E. Mateus-Pinilla, J. Diffendorfer, E. Jewell, **M.O. Ruiz,** J. Killefer, P. Shelton, T. Beissel, and J. Novakofski, *Prion sequence polymorphisms and chronic wasting disease resistance in Illinois white-tailed deer (Odocoileus virginianus).* Prion, 2008. **2**(1): p. 28-36.
19. Wrobel, L., J.K. Whittington, C. Pujol, S.-H. Oh, **M.O. Ruiz,** M.A. Pfaller, D.J. Diekema, D.R. Soll, and L.L. Hoyer, *Molecular phylogenetic analysis of a geographically and temporally matched set of Candida albicans isolates from humans and nonmigratory wildlife in central Illinois.* Eukaryotic cell, 2008. **7**(9): p. 1475-1486.
20. Hamer, G.L., U.D. Kitron, T.L. Goldberg, J.D. Brawn, S.R. Loss, **M.O. Ruiz**, D.B. Hayes, and E.D. Walker, *Host selection by Culex pipiens mosquitoes and West Nile virus amplification.* American Journal of Tropical Medicine and Hygiene, 2009. **80**(2): p. 268.
21. Loss, S.R., G.L. Hamer, T.L. Goldberg, **M.O. Ruiz,** U.D. Kitron, E.D. Walker, and J.D. Brawn, *Nestling passerines are not important hosts for amplification of West Nile virus in Chicago, Illinois.* Vector-Borne and Zoonotic Diseases, 2009. **9**(1): p. 13-18.
22. Loss, S.R., G.L. Hamer, E.D. Walker, **M.O. Ruiz,** T.L. Goldberg, U.D. Kitron, and J.D. Brawn, *Avian host community structure and prevalence of West Nile virus in Chicago, Illinois.* Oecologia, 2009. **159**(2): p. 415-424.
23. Loss, S.R., **M.O. Ruiz,** and J.D. Brawn, *Relationships between avian diversity, neighborhood age, income, and environmental characteristics of an urban landscape.* Biological Conservation, 2009. **142**(11): p. 2578-2585.
24. Amore, G., L. Bertolotti, G.L. Hamer, U.D. Kitron, E.D. Walker, **M.O. Ruiz,** J.D. Brawn, and T.L. Goldberg, *Multi-year evolutionary dynamics of West Nile virus in suburban Chicago, USA, 2005–2007.* Philosophical Transactions of the Royal Society B: Biological Sciences, 2010. **365**(1548): p. 1871-1878.
25. Kelly, A.C., N.E. Mateus‐Pinilla, M. Douglas, M. Douglas, W. Brown, **M.O. Ruiz**, J. Killefer, P. Shelton, T. Beissel, and J. Novakofski, *Utilizing disease surveillance to examine gene flow and dispersal in white‐tailed deer.* Journal of Applied Ecology, 2010. **47**(6): p. 1189-1198.
26. **Ruiz, M.O.,** L.F. Chaves, G.L. Hamer, T. Sun, W.M. Brown, E.D. Walker, L. Haramis, T.L. Goldberg, and U.D. Kitron, *Local impact of temperature and precipitation on West Nile virus infection in Culex species mosquitoes in northeast Illinois, USA.* Parasit Vectors, 2010. **3**(1): p. 19.
27. Tedesco, C., **M. Ruiz,** and S. McLafferty, *Mosquito politics: Local vector control policies and the spread of West Nile Virus in the Chicago region.* Health Place, 2010. **16**(6): p. 1188-1195.
28. Chaves, L.F., G.L. Hamer, E.D. Walker, W.M. Brown, **M.O. Ruiz**, and U.D. Kitron, *Climatic variability and landscape heterogeneity impact urban mosquito diversity and vector abundance and infection.* Ecosphere, 2011. **2**(6): p. art70.
29. Hamer, G.L., L.F. Chaves, T.K. Anderson, U.D. Kitron, J.D. Brawn, **M.O. Ruiz,** S.R. Loss, E.D. Walker, and T.L. Goldberg, *Fine-scale variation in vector host use and force of infection drive localized patterns of West Nile virus transmission.* PLoS One, 2011. **6**(8): p. e23767.
30. Messina, J.P., W. Brown, G. Amore, U.D. Kitron, and **M.O. Ruiz,** *West Nile Virus in the Greater Chicago Area: A Geographic Examination of Human Illness and Risk from 2002 to 2006.* URISA Journal-Urban and Regional Information Systems Association, 2011. **23**(1): p. 5.
31. Newman, C.M., F. Cerutti, T.K. Anderson, G.L. Hamer, E.D. Walker, U.D. Kitron, **M.O. Ruiz**, J.D. Brawn, and T.L. Goldberg, *Culex flavivirus and West Nile virus mosquito coinfection and positive ecological association in Chicago, United States.* Vector-Borne and Zoonotic Diseases, 2011. **11**(8):

p. 1099-1105.

32. Gardner, A.M., G.L. Hamer, A.M. Hines, C.M. Newman, E.D. Walker, and **M.O. Ruiz**, *Weather variability affects abundance of larval culex (Diptera: Culicidae) in storm water catch basins in suburban Chicago.* J Med Entomol, 2012. **49**(2): p. 270-276.
33. Gardner, A.M., T.K. Anderson, G.L. Hamer, D.E. Johnson, K.E. Varela, E.D. Walker, and **M.O. Ruiz,** *Terrestrial vegetation and aquatic chemistry influence larval mosquito abundance in catch basins, Chicago, USA.* Parasit Vectors, 2013. **6**(9).
34. Hamer, G.L., T.K. Anderson, G.E. Berry, A.P. Makohon-Moore, J.C. Crafton, J.D. Brawn, A.C. Dolinski, B.L. Krebs, **M.O. Ruiz,** and P.M. Muzzall, *Prevalence of filarioid nematodes and trypanosomes in American robins and house sparrows, Chicago USA.* International Journal for Parasitology: Parasites and Wildlife, 2013. **2**: p. 42-49.
35. Mateus-Pinilla, N., H.-Y. Weng, **M.O. Ruiz,** P. Shelton, and J. Novakofski, *Evaluation of a wild white-tailed deer population management program for controlling chronic wasting disease in Illinois, 2003–2008.* Preventive veterinary medicine, 2013. **110**(3): p. 541-548.
36. Moise, I.K., K.S. Brown, C. Riegel, E. Kalipeni, and **M.O. Ruiz**, *Geographic Assessment of Unattended Swimming Pools in Post-Katrina New Orleans, 2006–2008.* Annals of the Association of American Geographers, 2013. **103**(5): p. 1160-1175.
37. **Ruiz, M.O.H**., A.C. Kelly, W.M. Brown, J.E. Novakofski, and N.E. Mateus-Pinilla, *Influence of landscape factors and management decisions on spatial and temporal patterns of the transmission of chronic wasting disease in white-tailed deer.* Geospat Health, 2013. **8**(1): p. 215-227.
38. Kelly, A.C., N.E. Mateus-Pinilla, W. Brown, **M.O. Ruiz**, M.R. Douglas, M.E. Douglas, P. Shelton, T. Beissel, and J. Novakofski, *Genetic assessment of environmental features that influence deer dispersal: implications for prion-infected populations.* Population Ecology, 2014: p. 1-14.
39. Hamer, G.L, T.K. Anderson, D.J. Donovan, J.D. Brawn, B.L. Krebs, A.M. Gardner, **M.O. Ruiz**, W.M. Brown, U.D. Kitron, C.M. Newman, T.L. Goldberg and E.D. Walker. 2014 *Dispersal of adult Culex mosquitoes in an urban west nile virus hotspot: a mark-capture study incorporating stable isotope enrichment of natural larval habitats.* PLoS Negl Trop Dis, 2014. **8**(3): p. e2768.
40. Harbison, J.E.; Sinacore, J.M.; Henry, M.; Xamplas, C.; Dugas, L.R.; **Ruiz, M.O**. Identification of larvicide-resistant catch basins from three years of larvicide trials in a suburb of Chicago, il. *Environmental health insights* **2014**, *8*, 1-7.
41. Herrmann, J.A.; Dahm, N.M.; **Ruiz, M.O**.; Brown, W.M. Temporal and spatial distribution of tick-borne disease cases among humans and canines in Illinois (2000-2009). *Environmental health insights* **2014**, 15-27.
42. Johnson, Y.J.; Nadler, Y.; Field, E.; Myint, M.S.; **O'Hara-Ruiz, M.S**.; Ruman, A.; Olson, S.; Herrmann, J.A.; Briscoe, J.; Hickey, M. Flu at the zoo: Emergency management training for the nation's zoos and aquariums. *Journal of Homeland Security and Emergency Management* **2014**, *11*, 415-435.
43. Kelly, A.C.; Mateus-Pinilla, N.E.; Brown, W.; **Ruiz, M.O**.; Douglas, M.R.; Douglas, M.E.; Shelton, P.; Beissel, T.; Novakofski, J. Genetic assessment of environmental features that influence deer dispersal: Implications for prion-infected populations. *Population Ecology* **2014**, 1-14.
44. Krebs, B.L.; Anderson, T.K.; Goldberg, T.L.; Hamer, G.L.; Kitron, U.D.; Newman, C.M.; **Ruiz, M.O**.; Walker, E.D.; Brawn, J.D. Host group formation decreases exposure to vector-borne disease: A field experiment in a 'hotspot' of West Nile virus transmission. *Proceedings. Biological sciences / The Royal Society* **2014**, *281*.
45. Medeiros, M.C.; Anderson, T.K.; Higashiguchi, J.M.; Kitron, U.D.; Walker, E.D.; Brawn, J.D.; Krebs, B.L.; **Ruiz, M.O**.; Goldberg, T.L.; Ricklefs, R.E*., et al.* An inverse association between West Nile virus serostatus and avian malaria infection status. *Parasites & vectors* **2014**, *7*, 415.
46. Rivera, N. A., J. Novakofski, H. Y. Weng, A. Kelly, D. Satterthwaite-Phillips, **M. O. Ruiz** and N. Mateus-Pinilla. Metals in obex and retropharyngeal lymph nodes of Illinois white-tailed deer and their variations associated with CWD status. *Prion*: **2015** 0.

47. McKee, E. M., E. D. Walker, T. K. Anderson, U. D. Kitron, J. D. Brawn, B. L. Krebs, C. Newman, **M. O. Ruiz**, R. S. Levine, M. E. Carrington, R. G. McLean, T. L. Goldberg and G. L. Hamer (2015). "West Nile Virus Antibody Decay Rate in Free-Ranging Birds." J Wildl Dis.
48. Boothe, E., M. C. Medeiros, U. D. Kitron, J. D. Brawn, **M. O. Ruiz**, T. L. Goldberg, E. D. Walker and G. L. Hamer (2015). "Identification of Avian and Hemoparasite DNA in Blood-Engorged Abdomens of Culex pipiens (Diptera; Culicidae) From a West Nile Virus Epidemic region in Suburban Chicago, Illinois." Journal of Medical Entomology: tjv029.
49. **Ruiz, M.O**. and A. K. Sharma. (2016). "Application of GIS in public health in India: a literature based review, analysis and recommendations." Indian Journal of Public Health 60: 51-58.
50. Shand, L., W.M. Brown, L.F. Chaves, T.L. Goldberg, G. Hamer, L. Haramis, U. Kitron, E.D. Walker, **M.O. Ruiz** (2016). "Predicting West Nile virus infection risk from the synergistic effects of rainfall and temperature." Journal of Medical Entomology 53: 935-944,
51. Karki, S., G. L. Hamer, T. K. Anderson, T. L. Goldberg, U. D. Kitron, B. L. Krebs, E. D. Walker, and **M. O. Ruiz (**2016**). "**Effect of Trapping Methods, Weather, and Landscape on Estimates of the Culex Vector Mosquito Abundance". Environmental Health Insights 10: 93-103.
52. Moise, I. and Ruiz, M.O. (2016 – accepted for publication). "Spatial analysis of substance abuse disorder hospitalizations: spatial clustering and area-level predictors, pre- and post-Hurricane Katrina New Orleans". Preventing Chronic Disease.

Chapters in Books

1. **Ruiz, M.O.** Spatial Surveillance of and Response to Biological Threats. Ch 6.3 in *The Geographical Dimensions of Terrorism (*Cutter, S. L., D.B. Richardson and T.J. Wilbanks, eds): 199-203. Routledge: New York and London, 2003.
2. McDonald, T., Bullard, J. Britt, and **M. Ruiz**. Identification of geologic variables in development of an archeological predictive model for management of military lands in desert terrains. Ch 20 In : *Studies in Military Geography and Geology* (Caldwell, D.R., J. Ehlen and R.S. Harmon, eds): 259-270. Kluwer Academic Publishers: Dordrecht, 2004
3. Albihn, A., **M.O. Ruiz,** ad H. Gustafsson. 2010. Impact of climate changes on the health of wildlife, domestic animals and ecosystems. Module 4 in Ecosystem Health and Sustainable Agriculture Higher Educational Programme for Northwestern Russia, Belarus and Ukraine (20pp).

Abstracts – Selected Recent

Ruiz, M.O, D. Johnson, W. M. Brown and G. Hamer. 2010. Ecosystems and health in urban areas – an examination of mosquitoes and West Nile virus. Association of American Geographers Annual meeting. 14 – 18 April 2010, Washington, DC.

Donovan, D. J., G. L. Hamer, T.L. Goldberg, **M. O. Ruiz** & E. D. Walker. 2010. Sequential sampling schemes for predicting West Nile virus epidemics utilizing Culex mosquito infection rates. Ecological Society of America Annual Meeting, 1 – 6 August 2010, Pittsburg, PA.

Brown, W. M., A. Vaid, **M. O. Ruiz**. 2010. Being H1N1 Ready: A planned response to the H1N1 outbreak. National Association of County & City Health Officials Annual Meeting. 14- 16 July 2010.

Ruiz, M.O., B. Krebs, G. Hamer, A. Gardner, William Brown, J. Brawn, C. Small, E. Walker Vegetation characteristics and West Nile virus transmission potential in suburban neighborhoods. American Society of Tropical Medicine and Hygiene Annual Meeting. & Nov 2010, Atlanta, GA.

Gardner, A.M. G. Hamer, C. Newman, **M.O. Ruiz**. Abiotic factors affecting productivity of catch basins as Culex (Diptera: Culicidae) larval habitats in suburban Chicago, USA. NSF conference on Ecology and evolution of emerging infectious diseases.. March 2011, Madison, WI.

Hines, A, J.C. Broussard, W.M. Brown, G.L. Hamer. and **M.O. Ruiz.** Estimates of West Nile virus exposure risk in suburban Chicago, IL based on human distribution and mosquito infection rates. 2010. Poster at the Summer Research Fellowship program. August 2011. University of Illinois College of Veterinary Medicine.

Ruiz, M. O. and A. Sharma. 2012. Spatial epidemiology for public health challenges in India. Fulbright Conference, March 4-6, 2012, Kochi, India.

Moise, I. and M. O. Ruiz. 2012. The Changing geography of unattended swimming pool conditions in New Oleans, 2006-2009. Annual Meeting of the Association of American Geographers. 24-28 Feb 2012. New York, NY.

Ruiz, M.O. 2013. Fine scale mosquito abundance and West Nile virus infection measures in a suburban neighborhood near Chicago, Illinois. Annual Meeting of the Association of American Geographers. 9-13 April 2013, Los Angeles, CA.

Goel, V., J.A. Herrmann and **M.O. Ruiz.** 2013. A Spatio-temporal risk assessment of hemorrhagic disease exposure in cattle in Illinois. Annual Meeting of the Association of American Geographers. 9-13 April 2013, Los Angeles, CA.

DeBaene, K., Y. Nadler, E. Sorley, J.A. Herrmann, Y. Johnson-Walker, B.T. Martin, **M.O. Ruiz,** W.M. Brown. 2013. Efficacy of avian influenza control strategies in a zoological setting: a modeling approach. Annual Conference of Research Workers in Animal Diseases. 7-9 Dec 2013. Chicago, IL.

Johnson-Walker, Y.J., Y. Nadler, M.S. Myinet, J.A. Herrmann, E. Field, G.Y. Miller, **M.O. Ruiz**, M. Ernst, J. Briscoe, and S. Olson. 2013. Development and implementation of an internet-based avian influenza response exercise for zoological personnel. Annual Conference of Research Workers in Animal Diseases. 7-9 Dec 2013. Chicago, IL.

Ruiz, M.O., T. Anderson, J. Brawn, G. Hamer, U. Kitron, B. Krebs, C. Newman, E. Walker, and T. Goldberg. 2013. West Nile virus in suburban Chicago, Illinois: our emerging view of infection dynamics of hosts, vectors and virus. NSF Ecology and Evolution of Emerging Infectious Conference. 16-17 March 2013, Athens, GA.

Krebs, B., G, Hamer, C. Newman, T. Anderson, M. Ward, **M.O. Ruiz**, T. Goldberg, E. Walker, U. Kitron and J. Brawn. 2013. Social behavior and vector-borne disease infection in the American Robin (Tudus migratorius). NSF Ecology and Evolution of Emerging Infectious Conference. 16-17 March 2013, Athens, GA.

Deheragoda, C.K.M., M.O. Ruiz, and H.M. Prabath Jayantha. 2013. Spatio-temporal distribution of dengue fever sensitivity to changing weather conditions in Colombo district – Sri Lanka. 5th International Conference on HealthGIS – 2013. 21 – 25 August 2013. Bangkok, Thailand.

Ruiz, M.O. and A. Sharma. 2013. Trends, challenges and opportunities for health applications of Geographic Information Science in India: a review. XVth International Medical Geography Symposium, 7-12 July 2013. East Lansing, MI.

Kelling, M., R. Richman, T. Anderson, G. Hamer, E. Walker, U. Kitron, and M.O. Ruiz. 2013. The Influence of urban environmental conditions on mosquito abundance in a West Nile virus focus area in suburban Chicago, Illinois. Poster at the Summer Research Fellowship program. August 2013. University of Illinois College of Veterinary Medicine.

Goel, V. M.O. Ruiz and J.A. Herrmann. 2013. A Spatio-temporal risk assessment of hemorrhagic disease exposure in cattle in Illinois. URISA GIS in Public Health meeting June 2013. Miami, FL.

Ruiz, M.O. 2014. Patterns and processes of transmission and the spatio-temporal drivers of vector-borne disease. Association of American Geographers, Annual Meeting.

Ruiz, M.O. et al. 2015. Health Informatics to Improve Public Health Response. University of Illinois Public Engagement Conference. March 2015, Urbana, IL.

Karki, S. et al. 2015. Landscape features and mosquito abundance in a West Nile virus hotspot. Ecology of emerging infectious disease, June 2015, Athens, GA.

Pagone, F., Ruiz, M.O., S. Erdal. 2015. Use of Geospatial analysis in environmental and occupational health. AIHce 2015, May 30 – June 4, 2015, Salt Lake City, UT.

Ruiz, M.O. 2015. Water resources and mosquito-borne diseases. University of Illinois iSEE Water Congress. Sept 14-16, 2015. Urbana, IL.

Ruiz, M.O., T. Britt, W.M. Brown. 2015. Archaeological location probability modeling and long-term management strategies for Death Valley National Park, CA. 10th Death Valley History Conference. Nov 6-8, 2015, Death Valley National Park, CA.

Selected Recent Invited Lectures and Invited Conference Presentations

"Spatial Data for Preparedness: Why Geography Matters". Champaign-Urbana Public Health District 2nd Annual Champaign County Preparedness Summit, Sep 29-30, 2009. Champaign, IL

"Precipitation, temperature, and mosquitoes – the case of West Nile virus vectors in the Chicago suburbs". University of Illinois Hydrosystems Seminar. 19 March 2010, Urbana, IL.

"Landscape, processes, and the spatial epidemiology of emerging diseases". International Conference on Ecosystem Health and Sustainable Agriculture, Champaign, IL. 21 Sep 2010.

"Landscape epidemiology in action: the case of West Nile virus in Chicago". Program in Ecology, Evolution, and Conservation Biology Seminar, University of Illinois, Urbana. 6 Oct 2010.

"Mosquitoes, Infections and Weather: A Historical Perspective". Illinois Mosquito and Vector Control Association Annual Meeting. Champaign, IL. 18 Nov 2010.

"Spatial Epidemiology of West Nile – the case of West Nile virus vectors and risk in the Chicago suburbs". Fourth Biannual Colloquium on Climate and Health. National Center for Atmospheric Research & the Centers for Disease Control. Boulder, CO. July 11-15, 2011,

"Mosquitoes, Vegetation and Landscape Ecology in the Chicago Suburbs'. Illinois Mosquito and Vector Control Association Annual Meeting, Champaign, IL 17 Nov 2011.

"Improving disease surveillance and preparedness through digital mapping and spatial intelligence". Illinois Veterinary Emergency Response Team Meeting, Peoria, IL. 11 Nov 2011.

"The value and challenges of One Health spatial surveillance". Center for One Health, Illinois. Workshop, Champaign, Illinois. 25 August 2011.

"Urban ecology and spatial differences in the risk of West Nile virus in northeast Illinois". International Conference on Environmental Determinants of Vector-Borne Disease Emergence and Resurgence. Champaign, IL. 7 Sep 2011.

"Spatial Epidemiology for Public Health Challenges". Faculty of Medical Sciences, University of Jayewardenapura, Sri Lanka, March 2012.

"Geographic Information Science for the Medical Sciences". University College of Medical Sciences, New Delhi, India April 2012

"Geospatial Data at Work: Spatial Epidemiology". Committee on Institutional Cooperation Collaborative Strategies Conference, Minneapolis, MN, May 2012

"Mosquito vectors and landscape ecology in suburban Illinois". Centers for Disease Control and Prevention, GeoSWG Forum, Atlanta, GA, June 2012

"Spatial and temporal dynamics of mosquito abundance and West Nile virus Infection in a suburban neighborhood. Northern Illinois University, Department of Geography Seminar, Dekalb, IL, Sep 2012

"Spatial epidemiology for public health challenges in India". Center for South Asian and Middle Eastern Studies Seminar Series, University of Illinois. Oct 2012

"Geographic modeling and mapping for vector-borne diseases in an urban area". Dengue Workshop at the Centre for Dengue Research, Colombo, Sri Lanka. Jan 2013.

"Models of mosquito populations & the built environment: the case of West Nile virus in the Chicago suburbs. Emory University Department of Environmental Sciences, November 2012

"West Nile virus infection: the temporal and spatial dimensions of risk", College of Veterinary Medicine Research Day. March 2013.

"Mosquitoes, infections and spatial differences in risk for West Nile virus in Chicago Illinois". Keynote at 5th International Conference on HealthGIS, Bangkok. August 2013.

"Spatial dimensions of infectious diseases: a big picture view of viruses and prions". Infection Biology Working Group Seminar, Urbana, IL, Sep 2014.

"The West Nile virus mosquito infection alert model meeting: Sharing results of the project". DuPage County Health Department, Wheaton, IL, November 2014.

"Prediction of mosquito infection in real-time in DuPage County: Progress and challenges. Illinois Mosquito and Vector Control Association, Springfield, IL, Nov 2014.

"Mosquitoes, landscapes, and the risk of West Nile virus in suburban Chicago". Seminar in the Department of Natural Resources and Environmental Sciences, University of Illinois, Feb 13, 2015.

"Mosquitoes, weather, and landscapes: modeling the risk of vector-borne diseases. Indian Institute of Technology – Hyderabad, India. 26 June 2015.

"Water resources and mosquito-borne diseases". University of Illinois iSEE Water Congress. Urbana, IL. Sept 14-16, 2015.

Research Grants and Contracts

1. **M. Ruiz, PI**. Data Management Plan and User Documentation to Support the Land Management System. Army Corps of Engineers, Construction Engineering Research Laboratory. 2002. $7,000.
2. **M. Ruiz, PI**. Spatial Model and GIS Development to Support Archeological Predictive Models for Fort Irwin, CA. Army Corps of Engineers, Construction Engineering Research Laboratory. 11/2001 – 7/2003, $55,000
3. **M. Ruiz, PI.** Simulation Generic Use-case Prototype. Army Corps of Engineers, Construction Engineering Research Laboratory. $11,812
4. **M. Ruiz, PI.** Methods for regionalization and risk mapping: Orbivirus epidemiology as a model. 10/2003 – 10/2004, $28,000, USDA.
5. **M. Ruiz, PI.** Landscape Characterization and Spatial Model Development for Improved Cultural Resource Management at Fort Bragg, North Carolina. Army Corps of Engineers, Construction Engineering Research Laboratory. 9/2002 - 1/2005, $255,114
6. U. Kitron, PI. J. Brawn, T. Goldberg, **M. Ruiz** and E. Walker, Co-PI. West Nile Virus: Eco-Epidemiology of Disease Emergence in Urban Areas. NSF/NIH Ecology of Infectious Disease program, 11/1/2004 – 10/31/2007, NSF 0429124 $1,179,179
7. **M. Ruiz, PI.** K. Kunkel, M. Sivapalan, E. Walker, Co-PI. Hydrology, Catch Basin Biology, Mosquitoes and West Nile Virus in Northeast Illinois. Adaptive Infrastructure Sensing and Information Systems Initiative, University of Illinois and National Center for Supercomputer Applications. 8/15/2007-8/15/2009. $65,416.
8. N. Mateus-Pinilla, PI. **M. Ruiz,** J. Diffendorfer, and J. E. Novakofski, Co-PI. Genetics and Geography of Chronic Wasting Disease in White-tailed Deer in Illinois and Wisconsin. U.S. Geological Survey. 10/1/2007-10/1/2008. $40,000
9. Geospatial Infrastructure and Disease Surveillance at Local Health Departments in Illinois. Funded by the Illinois Department of Public Health, Phil Pittman, IDPH GIS Coordinator. 7/1/2006-5/30/2007. $27,000
10. T. Goldberg, J. Brawn, U. Kitron, **M. Ruiz,** N. Walker**,** Eco-epidemiology of Disease Emergence in Urban Areas II, Subaward from University of Wisconsin, Funding from the NSF/NIH Ecology of Infectious Disease program, 9/1/2008-8/31/2014. NSF 0840403 $2,240,000.

11. N. Mateus-Pinilla, P.I., **M. Ruiz** and J. Novakofski, Co-PI. Temporal changes in site-specific population structure and CWD prevalence in IL CWD endemic areas. U.S. Geological Survey. 10/1/2008-10/1/2009. $25,000.
12. C. Caceres, **M.O. Ruiz**. PI. Integration of Biological, Epidemiological, Mathematical and Engineering Approaches to the Management of Mosquito-Borne Disease: An interdiciplinary global challenge. Focal Point program with the University of Illinois Graduate College. 7/1/2013-6/30/2014. $15,000
13. **M.O. Ruiz,** PI. Customizing the University of Illinois Mosquito Infection model for a West Nile virus Alert System. Wheaton Mosquito Abatement District, DuPage County Health Department and the Forest Preserve District of DuPage County. 5/2014 – 12/2014. $28,210.
14. Mapping and spatial analysis to manage and reduce animal overpopulation. Funded by the American Society for the Prevention of Cruelty to Animals. 8/2011 – 12/2012. $26,160
15. J. Braden, P.I. and **M. Ruiz, Co-PI.** Estimating the Effects of Brownfields Redevelopment on Property Values and Public Health Outcomes. U.S. Environmental Protection Agency, Research and Technical Assistance Project. 4/2009 – 5/2013. $194,935.
16. Health Map Online. Funded by the Champaign-Urbana Public Health District, Awais Vaid, Epidemiologist, 2/1/2009 - 4/30/ 2010. $20,000.
17. Maps and spatial context development for "Flu at the Zoo" – exercises to prepare zoos for possible outbreaks of avian influenza. Funded by the USDA. 7/2011 – 9/2014. $10,042
18. GIS support for the Champaign-Urbana Public Health District. Funded by the CUPHD, 1/2008-6/2016. $103,120
19. GIS and Spatial Analysis for Chronic Wasting Disease. Funded by the Illinois Department of Natural Resources and subcontracted through Illinois Natural History Survey, 1/2006 – 6/2016 $152,480
20. **M.O. Ruiz** PI. A Cultural resources location probability model and long-term management tool for Death Valley National Park. National Park Service. 6/2013 – 3/2015. $21,349.
21. B. Allan, C. Caceres, A. Hansen, **M.O. Ruiz (Co-PI),** A. Schmidt, S. Wang, U. of Illinois Institute for Sustainability, Energy and Environment. Engineering the Microbial and Stormwater Environment for Mosquito Control**.** 8/2015 – 8/2017, $350,000,

Service Activities

Professional Organizations

Open GIS Consortium, Committee Chair, Spatial Decision Support Group, 2000-2001. I provided a view of the applications that would be possible with the development of open GIS standards.

Urban and Regional Information System Association, Conference planning committee leader for Health and Public Safety area, 2001-2002.

Illinois GIS Strategic Planning Committee, 2007-2008. I was nominated by other GIS professionals in the state to be a part of a state-wide committee tasked to write a strategic plan for better sharing and cooperation in the creation of spatial data in the state of Illinois.

University of Illinois ESRI Development Center Board Member, 2009.

Illinois GIS Association, Education Committee member, 2009.

University Consortium of Geographic Information Science, University of Illinois Lead Delegate, 2005-2007.

Urban and Regional Information System Association Program Co-chair and Chair of the GIS in Public Health Conference, from 2006 to 2009

Urban and Regional Information System Association Program Committee GIS in Public Health Conference, from 2006 to 2012.

Program Review Committee for the International Research Conference on Humanities and Social Sciences – IRCHS 2012, Sri Lanka

Urban and Regional Information System Association Program Committee, GIS in Public Health Conference 2014-2016.

Research Review

EPA STAR Graduate Fellowship panel, 2015
NSF Ad hoc review for Geography and Spatial Sciences Program, 2012 – 2015
NASA research program review 2010

University/Campus Service at the College of Veterinary Medicine

Pathobiology Teaching Assessment Committee, 2005-2007, 2009-2011
Pathobiology Graduate Admissions Committee, 2005-2007
CVM Information Management Committee, 2005-2007, 2014-2016
Pathobiology Seminar Committee, 2006-2017 (chair in 2007-16)
Pathobiology Graduate Advisory Committee 2013 – 2015
CVM Faculty Secretary 2013-2015
College Executive Committee 2015-2017
CVM Basic Sciences Synergies Task Force 2015-2016.

Service to Academic Journals

Guest editor for Environmental Health Insights, Supplement on Disease Vectors 2014
Editorial Board for Environmental Health Insights
Article Editor for Scholar One – Sage Open

Teaching

Current courses

PATH 560 – Spatial Epidemiology
PATH 439 – Health Applications of GIS
PATH 642 - Geographic Methods for Health
Organization of reading group seminars: Molecular Spatial Epidemiology; Spatial Statistics; One Health Epidemiology; Integration of Biological, Epidemiology, Mathematical and Engineering Approaches to Management of Mosquito-borne Diseases,

Other courses taught

Introduction to Cartography
Introduction to Geographic Information Systems
Advanced Geography Information Systems
Medical Geography
Social and World Geography (large undergraduate courses)

Supervision of Graduate and Professional Student Research

Graduate Student Advisor

1. Duclos, C., *An Examination of childhood lead poisoning surveillance in the state of Florida*, in *Geography*1997, Florida State University.
2. Messina, J., *West Nile virus in the greater Chicago area: a geographic examination of human illness and risk from 2002 - 2006*, in *Geography*2008, University of Illinois at Urbana-Champaign.
3. Gardner, A., *Influence of neighborhood structure and weather conditions on density of vectors and risk for West Nile Virus in Cook County Illinois*, in *Pathobiology* 2012, University of Illinois at Urbana-Champaign.
4. Goel, V., *A spatial risk assessment of hemorrhagic disease in cattle in Illinois from 2005 to 2011*, in *Geography and Geographic InfoSci*2013, University of Illinois at Urbana-Champaign.
5. Moise, I., *Health risk differentials: implications of neighborhood conditions on various health outcomes in New Orleans, 2004-2009*, in *Geography* 2013, University of Illinois at Urbana-Champaign.

6. Rentschler, T. M.S., Epidemiology, May 2015. *The variable contributions of larval habitats on the production of mosquitoes that transmit West Nile virus: a landscape epidemiology approach.,* University of Illinois at Urbana-Champaign.
7. Karki, S. PhD, Epidemiology - ongoing
8. Le, P. PhD, Civil Engineering. Co-advisor with P. Kumar. – ongoing
9. Scott, M. PhD, PhD, Epidemiology – ongoing.

Research Advisor – Professional Students

2004 Amy Wolf: Spatial Analysis of Equine West Nile Virus Case Rates by County in Illinois in 2002 and Comparison with Land Cover,

2005 Kate Brix-Rutherford: Spatial Clustering of 2002 Equine West Nile Virus Cases in East-Central Illinois;

2008 Kelly DeBaene: Catch Basins and Mosquitoes in suburban neighborhoods; Summer 2008 Keely Delcore: Epidemiology of Fresh Produce in Champaign County, IL.

2009 Kate Varela; Internal biological characteristics of catch basins and vector mosquito productivity. Dana Johnson: Vegetation communities, storm water sewer systems and West Nile virus in Chicago.

2010 Alicia Hines; Estimates of West Nile virus exposure risk in suburban, Chicago, IL, based on human distribution and mosquito infection rates.

2010 Dana Johnson, MPH capstone project, University of Illinois. Ecosystem characteristics, human-bat conflicts and bat rabies in Illinois.

2012 Vanessa Yaeger, New York City animal care and control policy change and its effect on feline intake and public health.

2013 Mackenzie Kelling; The Influence of urban environmental conditions on mosquito abundance in a West Nile virus focus area in suburban Chicago, Illinois

2013 Kelly DeBaene, Simulation modeling approach to an introduction of HPAI at a zoo.

2014 Claire Behnke: Differences in risk perceptions and preventative behavior related to West Nile virus in DuPage county, Illinois.

2015 Cassie J. Lothery, Risky business: factors that contribute to the presence of human cases of West Nile virus in the Chicago area.

<u>Supervisory committees at University of Illinois</u>

1. Evelin Grijalva, "A Model of Habitat Suitability for *Ixodes Scapularis* in the Eastern and Central United States". (M. S. in Veterinary Medicine completed 2004)
2. Richard Djukpen, "HIV/AIDS in Nigeria: Geographic, social and economic perspectives" (PhD in Geography. The Geography of HIV/AIDS and an Assessment of Risk Factor Perspectives in Nigeria: The case of Benin City and Makurdi. Completed degree in 2012.
3. Imelda Moise, "Application of Geospatial Analysis to Surveillance Data: a Spatial Look at HIV/AIDS Prevalence in Zambia" (M.A. in Geography, Completed Sep 2007).
4. Michelle Rowland, Integrating Spatial and Temporal Analyses into Surveillance of Shiga Toxin Producing Escherichia Coli (STEC) O157 in the State of Illinois. (MD/PhD in Community Health. Defended March 2008.
5. Amy Kelly, Landscape Genetics and Chronic Wasting Disease (PhD in Animal Science). Defended April 2010.
6. Jong-Hyung (John) Lee, Socio-cultural and Geographic Factors Affecting Infant Low Birth Weight for Korean Immigrant Women in New York City. (M.A. in Geography). Completed June 2009.
7. Lan Luo, PhD in Geography. Socio-Spatial Inequalities Late-Stage Diagnosis of Cancer in Illinois: Spatiotemporal Trends and Methodological Challenges. Completed 2011.
8. Bethany Krebs, PhD in Program in Ecology, Evolution and Conservation. Impacts of Host Biology on the Urban Eco-epidemiology of West Nile Virus. Defended Oct 2013.

9. Gardner, A. PhD. Entomology. Defense 2016.
10. Jamie Fishman, M.S. Geography. Geospatial analysis of emergency department visits for ambulatory care sensitive conditions in Chicago, Illinois. August 2015.
11. Samniqueka Halsey, PhD. Natural Resources and Environmental Sciences.
12. Lyndsay Shand, PhD. Statistics.
13. Sheena Dorak, M.S. Natural Resources and Environmental Sciences.

Recent Workshops developed and presented

Workshop in Geographic Information Systems for Public and Veterinary Health
5-day workshop. Developed materials and presented to students at these locations
--UIUC College of Veterinary Medicine, May 12-16, 2003, 12 students
--University of Buenos Aires, Dec 1-5, 2003, 12 students
--UIUC College of Veterinary Medicine, May 17-21, 2004, 11 students
--University of MN College of Veterinary Medicine, July 12-16, 2004, 21 students
--ICIPE and Ministries of Health, Nairobi, Kenya, Jun 6-10, 2005, 20 students
--FIOCRUZ, Belo Horizonte, Brazil, Sep 19-23, 2005, 20 students

Workshop on GIS for Veterinary and Public health, May 19-20, 2008. College of Veterinary Medicine, Urbana. 12 students.

Using Geographic Information Systems for Improved Public Health Preparedness. 19-20 July 2011. Adams County, Illinois. 20 students.

GIS for rural Public health. 9th Annual Rural Public Health Institute, Illinois Department of Public Health. 6 March 2013. Effingham, Illinois. 20 students

Archeological Modeling and Long-term Site Management. 10-12 Sep 2013. National Park Service, 20 students.

Preconference Workshop on Spatial Analysis Techniques for the Analysis of Maternal and Child Health Data. AMCHP Conference, 23 students, 11 Dec 2012, San Antonio, TX

Space-Time Visualization and analysis of health events. Centers for Disease Control and Prevention, 30 students, 4 June 2012, Atlanta, GA.

Archeological Modeling and Long-term Site Management, 20 students, 10-12 Sep 2013, Urbana , IL

Archeological Modeling and Site Management Workshop, National Park Service, 20 students, 17-19 December 2015, University of Arkansas.