

## Marco Millones

Department of Geography  
University of Mary Washington  
Fredericksburg, Virginia 22401  
Email: [mmillone@umw.edu](mailto:mmillone@umw.edu)  
(305) 298-8542 cellphone / (540) 654-5812 office  
<http://geoie.org/>

### MAJOR FIELDS OF INTEREST/EXPERTISE

- Geospatial Analysis (GIS, mapping and spatial statistics, remote sensing)
- Policy Applications of spatial analysis (impact evaluation, land use/cover change, environmental, public services)
- Regional expertise: Latin America (Mexico, Peru, Ecuador), North America (Southeastern and Northeastern USA)

### EDUCATION

- 2005-2011** Ph.D. (Geography) Clark University, Worcester, Massachusetts, U.S.A.  
Dissertation: "Fire, flows and forests: Anthropogenic land change, commodity networks, and multi-scale sustainability in the Mexican Yucatan."
- 2003-2005** M.A. (Geography and Regional Studies) University of Miami, Miami, Florida, U.S.A.  
Thesis: "Settlement Classification using a rural-urban continuum in Cusco, Peru."
- 1992-2000** B.A. (Geography) Catholic University of Peru- PUCP, Lima. Peru

### CERTIFICATES

- 2008** University of Texas at Dallas, School of Economic, Political and Policy Sciences. NSF-Spatial Statistics and Spatial Filtering. Richardson, Texas.
- 2007** Advanced Institute in Integrated Land Systems Modeling of the Global Land Project. Advanced Land Systems Modeling and Vulnerability course. Sapporo, Hokaido, Japan.
- 2005** Max Plank Institute for Demography. Spatial Demography Course. Rostock, Germany.

### PROFESSIONAL EXPERIENCE

- 2016-present** **Assistant Professor. Department of Geography. University of Mary Washington, Fredericksburg, VA.** Teach GIS and Spatial Analysis classes, advise graduate student research on GIS. Write research grants. Design course curriculum. Member, *Expanding the reach of Long Term Impact Evaluation* strategy for USAID's Monitoring, Evaluation, Research and Learning Innovations Program. (MERLIN)

#### Courses Taught

*MSGA510 Spatial Thinking* (graduate)

*MSGA540 Spatial Statistics and Modeling* (graduate)

*MSGA550 Remote Sensing* (graduate)

*GEOG351A/GISC351 Spatial Analysis with Geographic Information Systems/*

*Spatial Analysis, Data Models, Modeling*  
*GEOG340 Remote Sensing* (undergraduate)  
*GISc200 Introduction to GIS* (undergraduate)

**2015-2016** **Adjunct Assistant Professor. School of Economic, Political and Policy Science. University of Texas at Dallas.** Wrote NSF grant proposal and academic papers for the ‘*Space Beats Time*’ Project. Trains Instituto Mora’s staff in geospatial methods and oversees their analysis of *European Union aid program targeting in Mexico*.

**2014-2015** **Director. Center for Geospatial Analysis/Visiting Faculty. Environmental Science and Policy, College of William and Mary, Williamsburg, VA.** Planned budget, wrote grant requests, managed computer lab, and designed curriculum. Taught GIS classes, advised researchers on GIS issues, supervised staff of five people, and arranged the placement of students in internships and professional positions.

Courses Taught

*INT204: Introduction to GIS* (undergraduate) Introduction to vector and raster analysis, spatial and attribute querying, cartographic representation and data entry  
*GIS 510: Geospatial Pattern Analysis* (graduate): Statistical analysis of geographic features represented as points, areas and grids including cluster, hot and cool spot analysis, spatial regression and interpolation methods.

**2012-2014** **Mellon Research Fellow/Visiting Faculty. *Geospatial Policy Evaluation of Land Tenure Programs in Southern Ecuador*. Center for Geospatial Analysis, College of William and Mary.** Funded by the Mellon Foundation.

Coordinated and conducted meetings with USAID-Ecuador and local partners to collect geospatial information about USAID funded interventions. Geocoded, footprinted the intervention areas of USAID’s PSUR program, and reviewed Ecuador’s land tenure and environmental policy. Analyzed the effectiveness of land tenure component of PSUR on forest conservation using numerous GIS Remote Sensing datasets and quasi experimental evaluation matching method with Stuart Hamilton (University of Maryland) and Mark Buntaine (UC Santa Barbara). Presented results and provided guidelines for future directions in USAID-Washington (May 2014), USAID Quito (May 2014) and at the Global Land Project Open Science Meeting in Berlin (March 2014).

Courses Taught

*ENSP 249: Transforming Landscapes* (undergraduate): Remote Sensing, land use cover change and environmental planning.  
*GIS 501: Fundamentals of GIS* (graduate): Introduction to vector and raster analysis, spatial and attribute querying, cartographic representation and data entry

**2010-2012** **Visiting Assistant Professor. Clark University, Worcester, MA. Consultant and Researcher. *Mapping Overlaps between Extractive Industries, Water and Agriculture in Ghana and Peru*.** Funded by Oxfam America. Performed geospatial analysis of the spatial conflict between mining, gas and oil concessions and agricultural areas in Peru and Ghana with Nicholas Cuba, Anthony

Bebbington, and John Rogan (Clark University). Coordinated data collection with government agencies and extractive industries in Peru. Identified and classified concession types and agricultural suitability variables. Consulted on geospatial

Courses Taught

*GEOG190: Introduction to Geographic Information Systems*

*GEOG319: GIS Concepts and Applications in Spatial Analysis*

*ID296: Advanced Topics in Vector (graduate)*

**2008-2011**     **Graduate Research Assistant.** *Environmental Disturbance in the Greater Yucatán, Mexico.* **Clark University/George Perkins Marsh Institute.** Funded by the Gordon and Betty Moore Foundation.

Assessed the socio-ecological impact of Hurricane Dean with remotely sensed data. Produced rapid assessment maps of vegetation damage using multi-temporal MODIS satellite imagery. Designed spatial sampling scheme for field validation of maps. Conducted and consulted on socio-economic and ecological field data collection. Measured statistical accuracy of map and designed new metrics to improve such metrics. Collaborated in organization of workshop to present results to local experts and environmental managers and train them in basic geospatial operations.

**2005-2007**     **Graduate Research Assistant.** *Land Cover and Land use Change in the Southern Yucatán Peninsula Region, Mexico (LCLUC-SYPR).* **Clark University/ George Perkins Marsh Institute.** Funded by NASA.

Monitored, mapped, and modeled forest and agricultural fires in the Yucatán Peninsula using MODIS active fire satellite products. Performed spatial statistical cluster analysis and spatial autoregressive models in order to assess the usefulness of active fire products to estimate rapid deforestation rates and locations. Performed field validations to evaluate the accuracy of the active fire mapping products. Performed image classification to produce a land use cover change map and field validated the data through field sample visits with GPS units and map accuracy statistical measures.

**2006**            **Graduate Research Assistant.** *Scaling Biodiversity Prioritization and Planning from Global to Regional and Local Levels.* **Clark University Labs – the Idrisi Project.** Funded by the Gordon and Betty Moore Foundation.

Data collection and compilation for a coordinated archive of environmental image data for the tropics from MODIS imagery in order to create a multi-temporal dataset to produce new time-series methods for remote sensing imagery.

**2002-2005**     **Graduate Research Assistant.** *Geography-Based Exposure Assessment for Urban Metals, Syracuse, New York.* **Syracuse University-Maxwell School of Public Affairs and Citizenship-University of Miami.** Funded by the National Science Foundation.

Performed geocoding, scripting, database construction and management of individual address locations at various city spatial resolutions of records containing lead blood levels in children 0-5. Conducted locational error analysis of address locations, and spatial autorregression and spatial filtering modeling of the effects of those errors in the analysis of the data.

## AWARDS & GRANTS

- 2017** BELSPO. Remote Sensing for Epidemiology in African Cities ([REACT](#)). Research Programme for Earth Observation Stereo III. 882 808,50 €. 48 months (consultant) <http://react.ulb.be/>
- 2016** [ERIE](#). **Expanding the Reach of Impact Evaluations**. MERLIN Monitoring, Evaluation, Research and Learning Innovations. USAID. Co-design-government grant as part of GIE. \$17,000 for to 3 years (SubK, PI)
- 2012** Mellon Research Fellow. Environmental Science and Policy. 2 years. College of William and Mary \$106,000
- 2007** RSSG Student Honors Paper Completion. Honorary Mention. Annual Meeting of the Association of American Geographers (Prize: ESRI ArcGIS License)
- 2002** De Sardon Glass Fellow. Maxwell School of Citizenship and Public Affairs. Syracuse University. 1 year \$15,000

## JOURNAL ARTICLES AND BOOK CHAPTERS

- Hamilton, S.E, G. Castellanos, **M. Millones**, and M. Chen. 2018. Remote Sensing of Mangrove Forests: Current Techniques and Existing Databases. In C. Makowski and C.W. Finkl, (Eds.), Threats to Mangrove Forests: Hazard, Vulnerability and Management. Switzerland: Springer International Publishing.
- Daly, M.R., Mellor, J.M. and **Millones, M.**, 2018. Defining Primary Care Shortage Areas: Do GIS- based Measures Yield Different Results? *The Journal of Rural Health*. <https://doi.org/10.1111/jrh.12294>
- Daly, M.R., Mellor, J.M. and **Millones, M.**, 2018. Do avoidable hospitalization rates among older adults differ by geographic access to primary care physicians? *Health services research*, 53, pp.3245-3264
- Millones, M.**, Rogan, J., Turner, B.L., Parmentier, B., Harris, R.C. and Griffith, D.A., 2017. Fire Data as Proxy for Anthropogenic Landscape Change in the Yucatán. *Land*, 6(3), pp.1-19.
- Parmentier B, Neeti N, Nickl E, and **Milones M** (2017) Space-time decomposition of global Sea Surface Temperature variability using Multichannel Empirical Orthogonal Teleconnection analysis. *Journal of Applied Meteorology and Climatology*. <http://dx.doi.org/10.1175/JAMC-D-16-0072.1>
- Millones M.**, B. Partmentier, J. Rogan, and B. Schmook. 2016. Using food flow data to asses Sustainability: land use displacement and regional decoupling in Quintana Roo, Mexico. *Sustainability* 8 (11) DOI:10.3390/su8111145

- Hamilton, S.E., J. Lovette, M. J. Borbor-Cordova, and **M. Millones**. 2016. The Carbon Holdings of Northern Ecuador's Mangrove Forests. *Annals of the Association of American Geographers* 107 (1): 54-71. DOI:10.1080/24694452.2016.1226160
- Parmentier B., **M. Millones**, D.A. Griffith, S.E. Hamilton, Y. Chun, and S. McFall. 2016. When Space beats time: A proof of concept with Hurricane Dean. In D.A. Griffith, Y. Chun, and D.J. Dean (eds.) *Advances in Geocomputation: Geocomputation 2015–The 13th International Conference*, 207-215. New York: Springer. DOI: 10.1007/978-3-319-22786-3\_19
- Hamilton S.E., A. Angelov, V. Atanasov, and **M. Millones**. 2016. Fluid Borders: Rethinking Historical Geography and Fixed Map Boundaries in Contested Regions. *Professional Geographer* 68 (1): 115-128. DOI:10.1080/00330124.2015.1054017
- Mardero, S., B. Schmook, C. Radel, Z. Christman, D. Lawrence, **M. Millones**, E. Nick, J. Rogan, and L. Schneider. 2015. Smallholders' adaptations to droughts and climatic variability in southeastern Mexico. *Journal of Environmental Hazards* 14 (4): 271-288. DOI:10.1080/17477891.2015.1058741
- Buntaine M., S.E. Hamilton, and **M. Millones**. 2015. Titling Community Land to Prevent Deforestation: An Evaluation of Best-Case Program in Morona-Santiago, Ecuador. *Global Environmental Change* 33: 32-43.
- Cuba, N., A. Bebbington, J. Rogan, and **M. Millones**. 2014. Extractive industries, livelihoods and natural resource competition: Mapping overlapping claims in Peru and Ghana. *Applied Geography* 54: 250-261.
- Cuba N., J. Rogan, Z. Christman, C.A. Williams, L.C. Schneider, D. Lawrence, and **M. Millones**. 2013. Modeling dry season deciduousness in Mexican Yucatán forest using MODIS EVI data (2000-2011). *GIScience and Remote Sensing* 50 (1): 26-49.
- Neeti N., J. Rogan, Z. Christman, L.C. Schneider, J.R. Eastman, **M. Millones**, E. Nickl, B. Schmook, B.L. Turner II, and B. Ghimire. 2012. Seasonal changes in vegetation as a measure of land cover transition using AVHRR-NDVI time series in the Yucatán Peninsula, Mexico. *Letters in Remote Sensing* 3 (5): 433-442. DOI:10.1080/01431161.2011.616238
- Pontius, R.G. and **M. Millones**. 2011. Death to Kappa: Birth of Quantity Disagreement and Allocation Disagreement for Accuracy Assessment. *International Journal of Remote Sensing* 32 (15): 4407-4429. DOI:10.1080/01431161.2011.552923
- Rogan, J., L.C. Schneider, Z. Christman, **M. Millones**, D. Lawrence, and B. Schmook. 2011. Hurricane disturbance mapping using MODIS EVI Data in the southeastern Yucatán, Mexico. *Remote Sensing Letters* 2 (3): 259-267. DOI:10.1080/01431161.2010.520344
- Griffith, D.A., **M. Millones**, M. Vincent, D.L. Johnson, and A. Hunt. 2007. Impacts of positional error on spatial regression analysis: A case study of address locations in Syracuse, NY. *Transactions in GIS* 11 (5): 655-679. DOI:10.1111/j.1467-9671.2007.01067.x

Johnson, D.L., J. Hager, A. Hunt, D.A. Griffith, S. Blount, S. Ellsworth, J. Hintz, R. Lucci, A. Mittiga, D. Prokhorova, L. Tidd, **M. Millones**, and M. Vincent. 2005. Initial results for urban metal distributions in house dusts of Syracuse, New York, USA. *Science in China Series C: Life Sciences* 48 (1): 192-199. DOI:10.1007/BF02889806

## MANUSCRIPTS UNDER REVIEW/SUBMITTED

**Millones M.**, B. Parmentier, D.A. Griffith, Y. Chun, and S.E. Hamilton. Space Beats Time: a framework for leveraging temporal and spatial autocorrelation in prediction models for disruptive social and environmental events. *Annals of the Association of American Geographers* (reviewed as revise and resubmit and being revised)

Parmentier, B., **Millones, M.**, Griffith, D.A., Hamilton, S.E., Chun, Yongwan (forthcoming 2018). Hurricane Rita's impact on vegetation: a spatio-temporal statistical approach to characterizing abrupt change and potential disaster management for target areas. IN: Using Geospatial Information Systems for Public Organizations. Edited by D. Dean and N. Valcik. NY: Taylor and Francis.

### *Other manuscripts*

**Millones M** Fire, flows and forests: Anthropogenic land change, commodity networks, and multi-scale sustainability in the Mexican Yucatan. 2012. [Doctoral Dissertation](#). Clark University. Worcester, MA.

**Millones M** Settlement Classification using a rural-urban continuum in Cusco, Peru. 2006. [Master's Thesis](#). University of Miami. Miami. FL.

**Millones M** *Estudio sobre el uso y la capacidad de las tierras en la cuenca del río Patacancha*. 1999. A Study of land use and land capability in the Patacancha river watershed. [A project report](#) for Asociación ARARIWA and COINCICE, Cusco, Peru.

### *Reviewer for professional and academic journals:*

Annals of the Association of American Geographers; Annals of Regional Science; Applied Geography; Human Geography; International Journal of Geographic Information Science; International Journal of Remote Sensing; Geographical Analysis; Landscape and Urban planning; Photogrammetric Engineering and Remote Sensing; Region et Development.

## CONFERENCE PRESENTATIONS (selected)

**"Wild Places/Natural Spaces" Conference. 4th Annual Conference. The International Association for the Study of Environment, Space, and Place.** Fredericksburg, VA. April 27-29, 2018. "Regiones Naturales: Nature, Culture and Imaginable Futures for Peru's Geography"

**Annual Meeting of the American Association of Geographers,** New Orleans, MA. April 9-14th. 2018. When Space Beats Time. (Co-authored with Parmentier, B, Griffith, D, Chun Yongwan, Hamilton S. When Space beats Time").

**ESA Ecological Society of America Meeting**, Baltimore, MD **2015**. Geostatistical modeling of primary and secondary automobile traffic volume as an ecological disturbance proxy across the contiguous United States. (Co-authored with S. McFall, B. Parmentier, M. Leu, and H. Hamilton.)

**Geocomputation Conference**. Dallas, TX. 2015. When Space Beats Time: An interpretation framework for competing spatial and temporal components of autocorrelation based prediction after abrupt system disruptive events. (Co-authored with B. Parmentier, D.A. Griffith, S.E. Hamilton, S. L. McFall).

**Climate-Eval International Conference in Evaluating Climate Change and Development**, Washington, D.C. 2014. Titling to prevent Community land to Prevent Deforestation. No reduction in Forest Loss in Santiago Morona, Ecuador. (Co-authored with M. Buntaine and S. Hamilton).

**Global Land Project Open Science Meeting (IGBP-IHDP)** Berlin, Germany. 2014. *International aid as response and driver of land use/cover change*. (Co-authored with M. Buntaine and S. Hamilton).

**US-IALE Landscape Ecology** Newport, RI, **2012**. *Birth to Better Map Comparison Methods for Land Science. Quantity and allocation disagreement for matrix summarization to replace kappa* With Pontius RG.

**Conference of Latin American Geographers**. Merida, Mexico, 2012 Mapping Land commodity flows and land use displacement in the Mexican Yucatan.

**3rd International Congress of Fire Ecology**, San Diego, CA **2006**. *Integrated Fire Risk Using MODIS data for the Southern Yucatan Peninsula*. With Rogan J, Schneider LC and Turner BL II.

**Annual Meeting of the Association of American Geographers** multiple locations **2017 2015, 2013, 2012, 2010, 2009, 2007, 2006, 2005**).

## **WORKSHOPS**

**Sistemas de Información Geográfica para el Análisis Territorial** (GIS for territorial analysis). Instituto de Investigaciones Dr. Jose María Mora. June 4th-14th, **2018**. Mexico City, Mexico. (Course design and Instruction)

**Spatial and Temporal Analysis with R**. At the Annual Meeting of the Association of American Geographers April 8th, **2017**. New Orleans, LA (Instructor).

**Spatial and Temporal Analysis with R**. At the Annual Meeting of the Association of American Geographers April 8<sup>th</sup>, **2017**. Boston, MA. (Instructor)

## **ONLINE COURSES**

**[Diplomado en Desastres Naturales y Cambio Climático](#). **Natural Disasters and Climate Change**. Instituto de Investigaciones Dr. Jose María Mora. Geospatial Analysis Module (two week module). October/November 2018 (Course design, with Albert Decatur and Benoit Parmentier)**

## INVITED LECTURES

**University of Hawaii.** Manoa, HI. **2017** When Space Beats Time. (Presented by Daniel A. Griffith).

**Presidencia del Consejo de Ministros,** Lima, Perú **2017.** *Clasificación de centros poblados usando una escala continua.*

**Salisbury University.** Salisbury, MD. **2015.** When Space Beats Time. Two Hurricane cases to illustrate a framework.

**Conservation International** Arlington, VA, **2015.** *Geospatial Impact Evaluation. A case study of Land Titling in a best case scenario in Morona-Santiago, Ecuador.*

**USAID Ecuador Mission,** Quito, Ecuador **2014.** *Evaluación Geoespacial de Impacto del Proyecto PSUR.*

**Oxfam America,** Lima, Perú **2014.** *Geografías en conflicto: Industrias Extractivas y desarrollo rural en el Perú.*

**National Center for Ecological Analysis and Synthesis-NCEAS University of California-Santa Barbara,** CA **2013.** *Fire as proxy for land cover change: a spatial analysis.*

**Ministry of Housing of Peru,** Lima, Peru, **2012.** *Settlement Classification using a rural-urban continuum: a spatial targeting tool for public investment.*

**Connecticut College,** New London, CT **2012.** *Fire, flows and forests. Anthropogenic land change, commodity flows and multi-scale sustainability in the Mexican Yucatan.*

**El Colegio de la Frontera Sur,** Chetumal, México, **2010.** *Case studies of human-environment interaction across Latin America.*

**Universidad Nacional Mayor de San Marcos,** Lima, Perú **2010.** *Selvas, fuego y templos: el manejo comunal de tierras en la península de Yucatán.*

**Presidencia del Consejo de Ministros,** Lima, Perú **2008.** *Clasificación de centros poblados usando una escala continua.*

## GOVERNMENT AND NON-GOVERNMENT CONSULTING, ANALYSIS, PROJECT MANAGEMENT

**2014- 2015** **GIS Consultant. Instituto Mora. International Aid. Development and Public Policy Observatory** Mexico City, Mexico. Workshops: *Geospatial tools for public policy and development in Latin American context* (workshop in Spanish). Basic vector GIS training including queries by attribute and location, cartographic representation, and data entry. Review of application of geospatial tools applied to



development, public policy in developing countries, with cases studies presented and designed for academic and development professionals.

- 2000-2002**    **GIS Analyst. Ministry of Education of Peru**, Lima, Peru. Strategic Planning Bureau and Statistics Unit- PLANMED. Constructed a settlement and public school database. Managed and maintained settlement and locality *for all of Peru*. Designed and produced cartographic products for data collection. Organized training for school managers in map literacy and geocoding of missing school locations. Coordinated with government agencies, including Peruvian Census Bureau, to set standards and design methodology to complete, geocode, and establish a settlement framework of Peru. Coordinated GIS unit training in introductory spatial statistical analysis.
- 1999**        **Environmental Consultant. National Environmental Council (Consejo Nacional del Medio Ambiente-CONAM).**  
*Guidelines for an Environmental and Economic Zoning: Huatanay and Urubamba River Basins.* Cusco, Peru  
Produced data inventory, organized and conducted participative planning workshops with local authorities and experts, and wrote final proposal report.
- 1997-1999**    **Project manager and GIS Analyst. DED<sup>1</sup>-COINCIDE<sup>2</sup>**  
*Land use and land capacity assessment in the Patacancha river basin,* Cusco, Peru. Coordinated and managed project, designed methodology, field surveys, creation of spatial and tabular management of databases, performed GIS analysis and wrote final reports. Organized and conducted local community workshops to present results and receive feedback to be implemented in planning process by COINCIDE partners.
- 1997-1998**    **ARARIWA. Casa Taller de Medio Ambiente y Desarrollo (Cusco, Peru).**  
Human Geography and Cartography. Field based surveying, natural resource inventory, map Reading and thematic cartography.

## **STUDENT ADVISEES and CO Advisees**

Nathan Dawes, MSGA UMW (2017)  
Katie Keplinger, MSGA (2017)  
Jacob Snyder, MSGA UMW (2017)  
John Bentley, MSGA UMW (ongoing)  
Laura Phoebus, MSGA UMW (ongoing)  
Simon Kristensen, MSGA UMW (ongoing)  
Michael Ryan, MSGA UMW (ongoing)  
David Berry, MSGA UMW (ongoing)

## **AFILIATIONS & PROFESSIONAL MEMBERSHIPS**

[Geospatial Impact Evaluation group - GIE](http://www.geoie.org) www.geoie.org (founding member)  
Association of American Geographers  
American Association for the Advancement of Science

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<sup>1</sup> German Development Agency now GIZ

<sup>2</sup> Coordinación Intercentros de Desarrollo y Educación. Peruvian Non Profit/Government Organization.

American Society of Photogrammetry and Remote Sensing  
[Aiddata.org/ITPR](http://Aiddata.org/ITPR)

**LANGUAGES**

Spanish (Native)

English (Fluent)

German (Sprachdiplom 1&2, 1991)

French (colloquial verbal communication)