



Roberto J. Marin

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<p>Personal information</p>	<p>Nationality: Colombian. Age: 31 years. Place of birth: Medellín, Colombia. Languages: Spanish, English. Technical skills: GIS (ArcGIS) specialist, Programmer (Python, Matlab, PHP: HTML, CSS, OOP, MySQL), Scientific writer/reviewer.</p>
<p>Academic education</p>	<p>Doctorate in Environmental Engineering 2019 – 2021 University of Antioquia Medellín, Colombia. Physically-based methodologies to define rainfall thresholds for shallow landslides in tropical mountain areas</p> <p>Master of Engineering 2017 - 2018 University of Antioquia Medellín, Colombia. Una propuesta metodológica para definir umbrales de lluvia para deslizamientos superficiales (spanish). <i>A methodological proposal to define rainfall thresholds for shallow landslides.</i></p> <p>Bachelor of Engineering (Civil engineer) 2009 - 2015 University of Antioquia Medellín, Colombia. Efecto de los árboles en la ocurrencia de deslizamientos superficiales en una cuenca del Valle de Aburrá (spanish). <i>Effect of trees on shallow landslide occurrence in a basin of the Aburrá Valley.</i></p>
<p>Professional experience</p>	<p>2022 - Current University College Dublin Dublin, Ireland Researcher Scientific researcher for the project "TII268 Lot 4": Long term geotechnical monitoring and deterioration modelling of earthwork slopes.</p> <p>2020 - Current Landslide Scientific Assessment (LandScient) Medellín, Antioquia CEO, Director Responsible of leading the strategic objectives of the organization and directing research projects. It is a business initiative with participation in international landslide research projects.</p>

2022 - Current	Instituto de Estudios Ambientales IDEA National University of Colombia – Manizales (Colombia)
Researcher (working remotely) Scientific researcher for the landslide early warning system of Manizales (Colombia).	
2016 - 2022	University of Antioquia Medellín, Antioquia
Lecturer (Faculty of Engineering, University of Antioquia) Course: Numerical Methods (since August 2016 to present). Course: Soil Mechanics (laboratory) (Two semesters: 2017-II – 2018-I)	
Tutor (Civil Engineering, Environmental School, Faculty of Engineering, University of Antioquia)	
Undergraduate degree work (University of Antioquia): Title: Evaluation of the slope stability in tropical mountainous terrains applying the Scoops3D model. Students: Diego Alberto Ávila Valencia and Steven Posada Lopera.	
Undergraduate degree work (EAFIT University): Title: Definition of susceptibility by mass movements in urban land using the physical-based model Scoops3D. Student: Ricardo Jaramillo González.	
Undergraduate degree work (University of Antioquia): Topic: Rainfall thresholds for shallow landslides in Valle de Aburrá (Colombia). Student: María Fernanda Velásquez Mejía.	
Undergraduate degree work (University of Antioquia): Topic: Numerical solution of the partial differential equation of the one-dimensional consolidation of soils with water flow in the vertical direction. Student: Andrés Esteban Castrillón Salas.	
Master's degree (University of Pamplona – Pamplona): Topic: Effects of anthropogenic intervention on vegetation using the interception Liu model and discrete events. Student: Cecilia Osiris Moreno Vesga.	
Master's degree (National University of Colombia – Medellín, in progress): Topic: Hazard, vulnerability and risk assessment in Envigado (Colombia). Student: Juan Diego Cadavid Arango.	
Master's degree (National University of Colombia – Medellín, in progress): Topic: Rainfall thresholds for shallow landslides using physically-based models. Student: Ricardo Jaramillo González.	
2016 - 2017	SIATA Medellín, Antioquia
Researcher Researcher at SIATA, the Early Warning System of Medellín and the Aburrá Valley. <i>Research topic: Rainfall thresholds for landslides.</i>	

	<p>2017 - 2018 National University of Colombia Medellín, Antioquia</p> <p>Researcher Researcher in the project “Basic studies of hazard of mass movements, floods and torrential floods in the municipalities of Caldas, La Estrella, Envigado, Itagüí, Bello, Copacabana and Barbosa, for the incorporation of risk management in territorial planning”, by the National University of Colombia (UNAL) and Metropolitan Area of the Aburrá Valley (AMVA). Participation: <i>Application of TRIGRS with reliability analysis (FOSM) of shallow landslides in the urban areas of the 7 municipalities.</i> <i>Application of Scoops3D for deep-seated landslide analysis in the urban areas of the 7 municipalities.</i></p> <p>2021 - 2022 Bioexplora S.A.S. Medellín, Antioquia</p> <p>Researcher Responsible to carry out landslide hazard zonation in the municipality of Bello (Antioquia, Colombia) and Caldas (Antioquia, Colombia). <i>Application of distributed physically-based models for landslide hazard assessment/zonation.</i></p>
<p>Complementary academic training</p>	<p>II Latin American Course of Mass Movements. (II Curso Latinoamericano de Movimientos en Masa) National University of Colombia, Medellín, September 2017 – October 2017. Cons Expositor: Roy C. Sidle (University of the Sunshine Coast)</p> <p>Course risk assessment of mass movements detonated by rainfall. (Curso análisis de riesgo de movimientos en masa detonados por lluvia) University of Antioquia, Medellín, September 2014 – October 2014. Expositor: Hernán E. Martínez Carvajal (University of Brasilia)</p>
<p>Research</p>	<p style="text-align: center;">Articles</p> <p>Marín, R. J., Osorio J, P (2016). <i>Evaluación de la estabilidad de taludes cuantificando el efecto de la vegetación</i>. Proceedings of the XV Colombian Geotechnical Conference and 2nd International Specialized Conference on Soft Rocks, ISBN 978-958-98770, Cartagena, Colombia.</p> <p>Marín, R. J., & Osorio, J. P. (2017). Modelación de la contribución arbórea en análisis de susceptibilidad a deslizamientos superficiales. <i>Revista EIA</i>, 14(28), 13-28.</p> <p>Marín, R. J., & Osorio, J. P. (2017). Efectos de la vegetación en la estabilidad de laderas: una revisión. <i>Revista Politécnica</i>, 13(24), 113-126.</p> <p>Marín, R. J. (2017). Importancia de la predicción de movimientos en masa en el Valle de Aburrá. <i>Ingeniería y Sociedad</i>, (12), 26-31.</p> <p>Marín, R. J., Guzmán-Martínez, J. C., Carvajal, H. E. M., García-Aristizábal, E. F., Cadavid-Arango, J. D., & Agudelo-Vallejo, P. (2018). Evaluación del riesgo de deslizamientos superficiales para proyectos de infraestructura: caso de análisis en vereda El Cabuyal. <i>Ingeniería y Ciencia</i>, 14(27), 153-177.</p> <p>García-Aristizábal, E., Aristizábal, E., Marín, R. J. & Guzmán-Aristizábal, J. C. (2019). Implementación del modelo TRIGRS con análisis de confiabilidad para la evaluación de la amenaza a movimientos en masa superficiales detonados por lluvia. <i>TecnoLógicas</i>, 22(44), 65-82.</p>

Marin, R. J.; Mattos, Á. J. (2020). Physically-based landslide susceptibility analysis using Monte Carlo simulation in a tropical mountain basin. *Georisk: Assessment and Management of Risk for Engineered Systems and Geohazards*, 14(3), 192-205.
<https://doi.org/10.1080/17499518.2019.1633582>

Marin, R. J., Velásquez, M. F. (2020). Influence of hydraulic properties on physically modelling slope stability and the definition of rainfall thresholds for shallow landslides. *Geomorphology* 351:106976. <https://doi.org/10.1016/j.geomorph.2019.106976>

Marín R. J., García-Aristizábal E., Aristizábal E. (2019). Umbrales de lluvia para deslizamientos superficiales basados en modelos físicos: aplicación en una subcuenca del Valle de Aburrá (Colombia). *Dyna* 86:312-322. <https://doi.org/10.15446/dyna.v86n210.77166>

Marín R. J., Marín-Londoño J., Mattos A. (2020). Análisis y evaluación del riesgo de deslizamientos superficiales en un terreno montañoso tropical: implementación de modelos físicos simples. *Scientia et Technica* 25:164-171.
<http://revistas.utp.edu.co/index.php/revistaciencia/article/view/22171>

Mattos Á., Marin R. J. (2020) Reliability Analysis of Bored-pile Wall Stability Considering Parameter Uncertainties. *TecnoLógicas*. 23(49). <https://doi.org/10.22430/22565337.1433>

Marin R. J. (2020) Physically based and distributed rainfall intensity and duration thresholds for shallow landslides. *Landslides*, 17, 2907–2917. <https://doi.org/10.1007/s10346-020-01481-9>

Marín R. J., García-Aristizábal E., Aristizábal E. (2020). Effect of basin morphometric parameters on physically-based rainfall thresholds for shallow landslides. *Engineering Geology*, 278, 105855. <https://doi.org/10.1016/j.enggeo.2020.105855>

Marín R. J., García-Aristizábal E., Aristizábal E. (2021). Assessing the Effectiveness of TRIGRS for Predicting Unstable Areas in a Tropical Mountain Basin (Colombian Andes). *Geotechnical and Geological Engineering*, 39, 2329–2346. <https://doi.org/10.1007/s10706-020-01630-w>

Aristizábal E., García E., Marin R. J., et al. (2021) Implementation of two physically based models to evaluate rainfall effect on landslide hazard assessment in north-western Colombian Andes. *Revista Facultad de Ingeniería*, Universidad de Antioquia.
<https://revistas.udea.edu.co/index.php/ingenieria/article/view/343311>

Marin R. J., Velásquez M. F., Sánchez O. (2021) Applicability and performance of deterministic and probabilistic physically based landslide modeling in a data-scarce environment of the Colombian Andes. *Journal of South American Earth Sciences*, 108, 103175.
<https://doi.org/10.1016/j.jsames.2021.103175>

Marin R. J., Mattos Á. J., Marín-Londoño J. (2021) Physically-based definition of rainfall thresholds for shallow landslides in a tropical mountain watershed of the Colombian Andes. Conference paper: *XIII International Symposium on Landslides*.
<https://www.issmge.org/publications/publication/physically-based-definition-of-rainfall-thresholds-for-shallow-landslides-in-a-tropical-mountain-watershed-of-the-colombian-andes>

Marín R.J., Jaramillo R. (2021) Análisis de susceptibilidad a deslizamientos con el modelo Scoops3D en un terreno montañoso tropical. *Ingeniería y Ciencia*, 17(33), 71-96.
<https://doi.org/10.17230/ingciencia.17.33.4>

	<p>Marin R.J., Velásquez M. F., García E. F., Alvioli M., Aristizábal E. (2021) Assessing two methods of defining rainfall intensity and duration thresholds for shallow landslides in data-scarce catchments of the Colombian Andean Mountains. <i>CATENA</i>, 206, 105563. https://doi.org/10.1016/j.catena.2021.105563</p> <p>Marin, R. J., Mattos, Álvaro J., & Fernández-Escobar, C. J. (2022). Understanding the sensitivity to the soil properties and rainfall conditions of two physically-based slope stability models. <i>Boletín de Geología</i>, 44(1), 93–109. https://doi.org/10.18273/revbol.v44n1-2022004</p> <p>Velásquez, M. F., Marin, R. J. (2022) Evaluation of the influence of soil mechanical parameters on the position of rainfall thresholds for shallow landslides. <i>Arabian Journal of Geosciences</i>, 15, 1678. https://doi.org/10.1007/s12517-022-10859-z</p> <p>Future publications</p> <p>Title: LandScient_EWS, a program for real time monitoring of rainfall thresholds for landslides. Authors: Roberto J. Marin, Julián C. Marín. Submitted to: Environmental Monitoring and Assessment (Q2).</p> <p>Title: Zonificación de amenaza de movimientos en masa con modelación basada en la física para un municipio Colombia. Authors: Roberto J. Marin, Johan E. Mira. Submitted to: Cuadernos de Geografía: Revista Colombiana de Geografía</p>
<p>Research groups</p>	<p style="text-align: center;">Researcher</p> <p>GeoResearch International – GeoR (from November 2014 to December 2016). University of Antioquia.</p> <p>Infrastructure Investigation Group (GII) (from January 2017 to June 2022). University of Antioquia.</p> <p>Landslide Scientific Assessment (LandScient) (from March 2020 to present). Medellín, Colombia.</p>
<p>Scientific reviewer</p>	<p>Two manuscripts (research articles) for <i>Bulletin of Engineering Geology and the Environment</i> (Q1 in Geology and Q1 Geotechnical Engineering and Engineering Geology).</p> <p>Manuscript (research article) for <i>Geofluids</i> (Q1 in Earth and Planetary Sciences).</p> <p>Manuscript (research article) for <i>Journal of Computational Methods in Sciences and Engineering</i> (Q2 in Engineering (Miscellaneous)).</p> <p>Manuscript (book chapter) for “Comisión Nacional Asesora para la Investigación en Gestión de Riesgos de Desastres (CNAIGRD)”, “Comité Nacional para el Conocimiento del Riesgo (UNGRD)”, “Sistema Nacional de Gestión de Riesgos de Desastres (SNGRD)”. Book title (preliminary): “<i>Avances, perspectivas y casos de estudio en investigación de gestión del riesgo de desastres en Colombia</i>”.</p> <p>Manuscript (research article) for <i>2020 International Conference on Green Energy, Environment and Sustainable Development (GEESD 2020)</i>.</p> <p>Manuscript (research article) for <i>Journal of Advanced Research in Fluid Mechanics and Thermal Sciences</i> (Q3 in Fluid Flow and Transfer Processes).</p> <p>Two manuscripts (research articles) for <i>Fifth International Conference on Energy Engineering and Environmental Protection (EEEP2020)</i>.</p>

	<p>Two manuscripts (research articles) for <i>Journal of Mountain Science</i> (Q2 in Geology and Q2 in Earth-Surface Processes).</p> <p>Manuscript (research article) for <i>Geotechnical and Geological Engineering</i> (Q2 in Geology and Q1 in Architecture).</p> <p>Five manuscripts (research articles) for <i>Geomatics, Natural Hazards and Risk</i> (Q1 in Earth and Planetary Sciences).</p> <p>Manuscript (research article) for <i>Acta Geotechnica</i> (Q1 in Geotechnical Engineering and Engineering Geology; Q1 in Environmental Science).</p> <p>Master thesis for <i>Universidad de Caldas (Colombia)</i>. Program: Master of Earth Sciences.</p> <p>Manuscript (research article) for <i>Lithosphere</i> (Q1 in Geology).</p> <p>Manuscript (research article) for <i>Big Earth Data</i> (Q1 in Computers in Earth Sciences).</p> <p>Two manuscripts (research articles) for <i>Boletín de Geología</i> (Q3 in Earth and Planetary Sciences).</p> <p>Manuscript (research article) for <i>Remote Sensing</i> (Q1 in Earth and Planetary Sciences).</p> <p>Manuscript (research article) for <i>TecnoLógicas</i> (Colombian Journal).</p> <p>Manuscript (research article) for <i>Natural Hazards</i> (Q1 in Earth and Planetary Sciences).</p> <p>Manuscript (research article) for <i>Arabian Journal of Geosciences</i> (Q2 in Earth and Planetary Sciences).</p> <p>Master thesis for <i>Universidad Católica de Manizales (Colombia)</i>. Program: Master in Global Changes and Disaster Risk.</p> <p>Manuscript for <i>Universidad Tecnológica de Pereira</i>. Research Project in “Convocatoria 913 del Ministerio de Ciencia, Tecnología e Innovación (Minciencias)”.</p> <p>Manuscript (research article) for <i>Landslides</i> (Q1 in Earth and Planetary Sciences).</p>
<p>Recognitions and awards</p>	<p>Meritorious Master's Research Thesis (University of Antioquia, 2018).</p> <p>Award for student researcher (2016). By: University of Antioquia. In Classical Day, University of Antioquia, Medellín: Paraninfo UdeA, October 7, 2016.</p> <p>Award for the scientific and investigative work that leads to the development of future extraordinary minds. By: Corporation for the development of complex thinking COMPLEXUS. In Extraordinary Minds Seminar – “Tres Científicos”, Medellín: Universidad de Medellín, November 2, 2016.</p> <p>Three awards (Medellín Investiga 2020, Medellín Investiga 2021, Premio a la Investigación Estudiantil-UdeA 2022) earned by an undergraduate student directed (María Fernanda Velásquez Mejía) in her degree work, for the research articles:</p> <ol style="list-style-type: none"> 1) Marin, R. J., Velásquez, M. F. (2020). Influence of hydraulic properties on physically modelling slope stability and the definition of rainfall thresholds for shallow landslides. <i>Geomorphology</i> 351:106976. https://doi.org/10.1016/j.geomorph.2019.106976 2) Marin R.J., Velásquez M. F., García E. F., Alvioli M., Aristizábal E. (2021) Assessing two methods of defining rainfall intensity and duration thresholds for shallow landslides

- in data-scarce catchments of the Colombian Andean Mountains. *CATENA*, 206, 105563. <https://doi.org/10.1016/j.catena.2021.105563>
- 3) Velásquez, M. F., Marin, R. J. (2022) Evaluation of the influence of soil mechanical parameters on the position of rainfall thresholds for shallow landslides. *Arabian Journal of Geosciences*, 15, 1678. <https://doi.org/10.1007/s12517-022-10859-z>

Events and presentations

Evaluation of slope stability quantifying the effect of vegetation. Presentation at the XV Colombian Congress of Geotechnics and II International Conference on Soft Rocks, Cartagena: Radisson Cartagena Ocean Pavilion Hotel, October 6, 2016.

Effect of trees on the occurrence of shallow landslides in a basin of the Aburrá Valley. Poster presentation in Extraordinary Minds Seminar – “Tres Científicos”, Medellín: University of Medellín, November 2, 2016.

Scoops3D for landslide assessment. Course given in EAFIT (University). Audience: researchers from EAFIT and Alcaldía de Medellín. Training as part of the project "Convenio de asociación para la identificación del riesgo de detalle en algunas zonas del Municipio de Medellín". April 22-23, 2019. Duration: 16 hours.

Landslide hazard assessment and rainfall threshold definition using physically based models. Presentation at the 2nd Edition of Webinar on Geology & Earth Science (GeoEarth-2021). January 27-28, 2021.

Physically-based definition of rainfall thresholds for shallow landslides in a tropical mountain watershed of the Colombian Andes. Presentation at the XIII International Symposium on Landslides. Colombia. February 22-26, 2021.

Organizer of the Landslide Scientific Assessment Conference (2022): Landslide Hazard (<https://landscient.com/conference/>). It was an open, free and online event with participation of +35 international top authors (speakers) presenting their already published top research articles. October 18-20, 2022. Presentations available at: <http://youtube.com/@landscient>