



Maikel Méndez-M

Civil and Environmental Engineer (M.Sc.)

- San José, Costa Rica
- May/1975

Skills

Water Resources Management 20+ yrs.

Numerical Modelling 20+ yrs.

Remote Sensing + GIS 15+ yrs.

Data Science 10+ yrs.

Computational Fluid Dynamics 8+ yrs.

Climate Change 8+ yrs.

Wastewater Treatment 6+ yrs.

Irrigation + Drainage 3+ yrs.

Language: Spanish L1

Biography

Maikel Méndez is a Senior Lecturer and Researcher in Water Resources at the Construction Engineering School, Costa Rica Institute of Technology (TEC). Maikel's research focuses on Climate Change, Hydrological Modelling, Remote Sensing, GIS Integration, Machine Learning, Data Mining, and Computational Fluid Dynamics. Maikel is the leading author of various scientific publications that have contributed to finding solutions to complex problems and have also been incorporated into Costa Rican legislation. Maikel holds an M.Sc. in Civil and Environmental Engineering (ASU), a Postgraduate Degree in Earth Observation (U-TWENTE), and a major in Agricultural Engineering (TEC).

Experience

Professor | Researcher

Construction Engineering School
Instituto Tecnológico de Costa Rica (TEC)
<https://www.tec.ac.cr>

06/2005 - Today

Research in the areas of: Water Resources Management, Climate Change and Data Science. Lectures on: Hydraulics and Fluid Mechanics, Hydrology, Applied Statistics and Numerical Mathematics.

Operations Engineer

Operations Department
Instituto Costarricense de Acueductos y Alcantarillados
<https://www.aya.go.cr>

01/2000 - 05/2005

Design, construction and operation of Water and Wastewater Facilities.

Field Engineer

Development Department
Linda Vista / Ball Horticultural Company
<https://www.ballhort.com>

04/1998 - 11/1999

Design, construction and operation of Irrigation and Drainage Systems.

Irrigation Engineer

Irrigation Department
Amanco-Plásticos para la Construcción
<https://www.wavin.com>

11/1997 - 04/1998

Design, construction and operation of Irrigation Systems.

Internship

Department of Economic and Social Affairs (DESA)
United Nations Headquarters (NYC)
<https://www.un.org/en/desa>

05/2003 - 12/2003

Research assistant in the fields of Hydrology, Applied Statistics and Environmental Accounting.

Language: English

C2

Education

06/2009 - 07/2010

Geo-Information Science and Earth Observation (Postgraduate Degree)

Faculty of Geo-Information Science and Earth Observation (ITC). University of Twente, Enschede, The Netherlands
Geostatistics ■ R + Python Programming

Thesis: „Parameterization and sensitivity analysis of the EPA-SWMM model for an urban catchment using Remote Sensing and PEST“.

09/2001 - 06/2003

Civil and Environmental Engineering (M.Sc.)

Arizona State University (ASU), Tempe, United States of America

Numerical Modelling ■ Hydrogeology
 Thesis: „An evaluation of the membrane fouling index (MFI) and its relevance to predict clogging in porous media“.

02/1993 - 02/1998

Agricultural Engineering (B.Sc.)

Instituto Tecnológico de Costa Rica, Campus Cartago, Costa Rica

Irrigation ■ Drainage

Thesis: „Reservoir waterproofing of the Río-Lajas hydropower plant“.

IT Skills

- ▶ GIS and Remote Sensing: GRASS, IDRISI, ILWIS, SAGA, QGIS
- Water Resources: ModFLOW, HBV,
- ▶ HEC-HMS/RAS, TOPMODEL, SWAT, SWMM
- ▶ Statistics and GeoStatistics: R, Python, Matlab
- ▶ Computational Fluid Dynamics: OpenFOAM, COMSOL
- ▶ Climate Change: PRECIS, RCA, RegCM, WRF

Publications

- Mendez, M., Calvo-Valverde, L.A., Hidalgo-Madriz, J.A & Araya-Obando, J.A. (2023). A comparison of generalized extreme value, gumbel, and log-pearson distributions for the development of intensity duration frequency curves. A case study in Costa Rica". In: *edp-sciences BIO Web Conf*, 62(2023), 01002, 2022.
<https://doi.org/10.1051/bioconf/20236201002>.
- Mendez, M., Maathuis, B., Calvo-Valverde, L.A. & Alvarado-Gamboa, L.F. (2022). "Hydrological Response of Tropical Catchments to Climate Change as Modeled by the GR2M Model: A Case Study in Costa Rica". In: *Sustainability*, 14(24), 16938, 2022.
<https://doi.org/10.3390/su142416938>.
- Mendez, M., Maathuis, B., Hein-Griggs, D. & Alvarado-Gamboa, L.F. (2020). "Performance evaluation of bias correction methods for climate change monthly precipitation projections over Costa Rica". In: *Water*, 12(2), 482, 2020.
<https://doi.org/10.3390/w12020482>.
- Mendez, M. & Calvo-Valverde, L.A. (2020). "Comparison performance of machine learning and geostatistical methods for the interpolation of monthly air temperature over Costa Rica". In: *IOP Conference Series: Earth and Environmental Science (EES)*, 432, 2020.
<https://doi.org/10.1088/1755-1315/432/1/012011>.
- Arriola-Valverde, S., Villagra-Mendoza, K., & Mendez, M. (2020). "Analysis of Crop Dynamics through Close-Range UAS Photogrammetry". In: *IEEE International Symposium on Circuits and Systems (ISCAS)*, 2020.
<https://doi.org/10.1109/ISCAS45731.2020.9181285>.
- Mendez, M., Maathuis, B., Hein-Griggs, D. & Alvarado-Gamboa, L.F. (2019). "Generation of Monthly Precipitation Climatologies for Costa Rica Using Irregular Rain-Gauge Observational Networks". In: *Water*, 11(1), 70, 2019.
<https://doi.org/10.3390/w11010070>.
- Hernandez-Castro, F., Monge-Fallas, J., Mendez, M. & Segura-Solis, D. (2019). "Costa Rica: Visualization of the Movements of the Earth's Crust". In: *PONTE. International Journal of Sciences and Research*, 75, 2019.
<https://doi.org/10.21506/j.ponte.2019.4.1>.
- Mendez, M. & Calvo-Valverde, L.A. (2019). "Comparison of global and local optimization methods for the calibration and sensitivity analysis of a conceptual hydrological model". In: *Tecnología en Marcha*, 32, 24-36, 2019.
<https://doi.org/10.18845/tm.v32i3.4477>.
- Arriola-Valverde, S., Villagra-Mendoza, K., & Mendez, M. (2019). "Desarrollo y Validación de una Metodología para la Cuantificación de la Erosión Hídrica a través de Fotogrametría UAS". In: *Tecnología en Marcha*, 32, 43-52, 2019.
<https://doi.org/10.18845/tm.v32i5.4171>.
- Hernandez-Castro, F., Monge-Fallas, J., Mendez, M. & Protti-Quesada, M. (2018). "Animation: Crustal Deformation in the Nicoya Peninsula Associated with the September 5th, 2012 Earthquake". In: *Scientific Visualization*, 10(3), 2018.
<https://doi.org/10.26583/sv.10.3.09>.
- Mendez, M. & Calvo-Valverde, L.A. (2016). "Development of the HBV-TEC Hydrological Model". In: *Procedia Engineering*, 154, 1116-1123, 2016.
<https://doi.org/10.1016/j.proeng.2016.07.521>.
- Mendez, M. & Calvo-Valverde, L.A. (2016). "Assessing the performance of several rainfall interpolation methods as evaluated by a conceptual hydrological model". In: *Procedia Engineering*, 154, 1050-1057, 2016.
<https://doi.org/10.1016/j.proeng.2016.07.595>.

Contact

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scholar.google.com/maikelmendez

- Mendez, M. (2014). "Hydrologic and Hydraulic Assessment of Small Tropical Urban Catchments: A Case Study in Costa Rica". In: *Proceedings of the 13th International Conference on Urban Drainage*, 15-16, 2014.
<https://doi.org/10.1016/j.proeng.2016.07.595>.
- Mendez, M. (2014). "Diseño óptimo de un sistema de distribución de agua (SDA) aplicando el algoritmo Simulated Annealing (SA)". In: *Tecnología en Marcha*, 23-31, 2014.
<https://doi.org/10.18845/tm.v27i3.2063>.
- Mendez, M., Araya, J.A., & Sánchez, L.D. (2013). "Automated parameter optimization of a water distribution system". In: *Journal of Hydroinformatics*, 15 (1), 71-85, 2013.
<https://doi.org/10.2166/hydro.2012.028>.
- Mendez, M. (2013). "Calibración y validación del modelo hidrológico SWMM en cuencas hidrográficas de alta pendiente en Costa Rica". In: *Tecnología en Marcha*, 20-32, 2013.
<https://doi.org/10.18845/tm.v26i2.1400>.
- Mendez, M. (2013). "Predicción del impacto del cambio temporal del uso del suelo sobre cuencas hidrológicas de alta pendiente en Costa Rica". In: *Tecnología en Marcha*, 13-25, 26, 2013.
<https://doi.org/10.18845/tm.v26i3.1514>.
- Mendez, M. (2013). "Generación de Modelos de Elevación Digital (DEMs) a partir de análisis fotogramétrico haciendo uso de las imágenes CARTA-2005". In: *Tecnología en Marcha*, 26-31, 26, 2013.
<https://doi.org/10.18845/tm.v26i4.1578>.
- Mendez, M. (2008). "Modelación Asistida de Sistemas de Distribución de Agua (MASDA). Caso de estudio: Acueducto Marsella". In: *Tecnología en Marcha*, 79-91, 21, 2008.
- Mendez, M. (2007). "Modelación Asistida de Sistemas de Distribución de Agua (MASDA). Caso de estudio: campo/escuela Scout de Costa Rica". In: *Tecnología en Marcha*, 12-23, 19, 2007.

Conferences

- International Conference on Environment, Resources and Energy Engineering (EREE), Bangkok, Thailand (2023).
- International Conference on Resources and Environmental Research (ICRER), Shandong University, Qingdao, China (2019).
- 37th IAHR Water World congress. Kuala Lumpur, Malaysia. (2017).
- 12th International Conference on Hydroinformatics (HIC 2016). Incheon, Korea. (2015).
- MetOffice: Regional Climate Change Model PRECIS, Exeter, United Kingdom. (2015)
- 13th International Conference on Urban Drainage 2014 (ICUD 2014). Sarawak, Borneo, Malaysia. (2014).
- PREVDA: Programa Regional de Reducción de la Vulnerabilidad y Degradación Ambiental. Ciudad de Panamá, Panamá (2010).
- AECID, Agencia Española de Cooperación Internacional y Desarrollo. Centro de Estudios Hidrográficos-CEDEX. Cartagena de Indias. Colombia (2008).

Fellowships

- NUFFIC, Netherlands Fellowship Programmes. *(2009)*.
- IIE-United Nations Fellowship Program, NYC. *(2003)*.
- Fulbright: Academic and Professional Programs for the Americas Fulbright Graduate Fellowship Program *(2001)*.