Mario A. Soriano Jr.

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EDUCATION

Ph.D. in Hydrology and Water Resources 2022 (expected)
Yale School of the Environment • New Haven, CT

M.Sc. in Sustainability (Joint Diploma) 2016
United Nations University and University of Tokyo • Tokyo, Japan

B.Sc. in Civil Engineering (With Honors) 2012
University of the Philippines • Quezon City, Philippines

RESEARCH EXPERIENCE

Doctoral Dissertation Research 2016 – present
Yale School of the Environment
Advisor: Dr. James E. Saiers
Project: Facets of vulnerability, risk, and uncertainty in the subsurface environment: Investigating the impacts of unconventional oil and gas development on groundwater resources

Masters Thesis Research 2014 – 2016
United Nations University
Advisor: Dr. Srikantha Herath
Project: Evaluating the impacts of climate and land-use change on the hydrologic response and slope stability of the Ifugao Rice Terraces, Philippines

Research Coordinator 2012 – 2014
University of the Philippines
Supervisors: Dr. Srikantha Herath & Prof. Peter P.M. Castro
Project: Ecosystem-based climate change adaptation strategies for rice terrace farming systems in Asia

Undergraduate Thesis Research 2011 – 2012
University of the Philippines
Advisor: Prof. Peter P.M. Castro
Project: Quantifying water budget components and modeling subsurface flow in the Ifugao Rice Terraces

FUNDING AND AWARDS

2020 YSE Research Grant, Yale Institute for Biospheric Studies
2019 Conference Travel Award, Yale Graduate School of Arts and Sciences
2019 YSE Conference Travel Award

2018 Doctoral Pilot Award, Yale Institute for Biospheric Studies
2018 Conference Travel Award, Yale Graduate School of Arts and Sciences
2018 YSE Conference Travel Award
2017 YSE Research Grant, Yale Institute for Biospheric Studies
2017 Conference Travel Award, Yale Graduate School of Arts and Sciences
2017 YSE Conference Travel Award
2014 Japan Foundation for the United Nations University Scholarship
2012 Best Undergraduate Research in Water Resources Engineering
2009 University of the Philippines Presidential Scholarship

PEER-REVIEWED PUBLICATIONS

Soriano, M.A., Siegel, H.G., Gutchess, K.M., Clark, C.J., Li, Y., Xiong, B., Plata, D.L., Deziel, N.C., and Saiers, J.E. (2020) Evaluating domestic well vulnerability to contamination from unconventional oil and gas development sites. *Water Resources Research*, 56(10): e2020WR028005. doi: 10.1029/2020WR028005

Soriano, M.A., and Herath, S. (2020) Climate change and traditional upland paddy farming: a Philippine case study. *Paddy and Water Environment*, 18: 317–330. doi: 10.1007/s10333-019-00784-5

Soriano, M.A., and Herath, S. (2018) Quantifying the role of traditional rice terraces in regulating water resources: implications for management and conservation efforts. *Agroecology and Sustainable Food Systems*, 42(8): 885-910. doi: 10.1080/21683565.2018.1437497

Soriano, M. A., Diwa, J., and Herath, S. (2017) Local perceptions of climate change and adaptation needs in the Ifugao Rice Terraces (Northern Philippines). *Journal of Mountain Science*, 14(8): 1455-1472. doi: 10.1007/s11629-016-4250-6

Soriano, M.A., and Castro, P.M. (2012) Assessment of the engineering aspects of the Ifugao Rice Terraces. *Philippine Engineering Journal*, 3(1): 1-10.

PAPERS IN REVIEW OR PREPARATION

Soriano, M.A., Siegel, H.G., Johnson, N.P., Gutchess, K.M., Xiong, B., Li, Y., Clark, C.J., Plata, D.L., Deziel, N.C., and Saiers, J.E. (in review.) Assessment of groundwater well vulnerability to contamination through physics-informed machine learning.

Xiong, B., **Soriano, M.A.**, Gutchess, K.M., Hoffman, N., Clark, C.J., Siegel, H.G., De Vera, G.A., Li, Y., Brenneis, R.J., Cox, A.J., Ryan, E.C., Sumner, A.J., Deziel, N.C., Saiers, J.E. and Plata, D.L. (in review.) Groundwaters in northeastern Pennsylvania near intense hydraulic fracturing activities exhibit few organic chemical impacts.

Li, Y., Thelemaque, N.A., Siegel, H.G., Clark, C.J., Ryan, E., Gutchess, K.M., **Soriano, M.A.**, Xiong, B., Deziel, N.C., Saiers, J.E., and Plata, D.L. (in prep.) Elevated groundwater methane concentrations over the Marcellus Shale in northeastern Pennsylvania are predominantly natural.

TEACHING EXPERIENCE

Ordinary & Partial Differential Equations Teaching Fellow — Spring 2021
Yale College, Professor Mitchell Smooke
Undergraduate level course

Fluid Mechanics Teaching Fellow — Fall 2020
Yale College, Professor Mitchell Smooke
Undergraduate level course

Environmental Hydrology Teaching Fellow — Spring 2017, 2019, 2020
Yale School of the Environment, Professor James Saiers
Graduate level course

Watershed Cycles & Processes Teaching Fellow — Fall 2018
Yale School of the Environment, Professors James Saiers & Peter Raymond
Graduate level course

Strength & Deformation of Mechanical Elements Teaching Fellow — Fall 2017
Yale College, Professor Eric Brown
Undergraduate level course

McDougal Graduate Writing Fellow — 2019 – present
Poorvu Center for Teaching and Learning, Yale University
Workshops taught for graduate students & postdocs: Scientific Research and Writing Series, Writing a Prospectus in the Sciences, Writing a Review Article in the Sciences
Individual writing consultations with graduate students

Tagalog language partner — 2018 – present
Yale Center for Language Study
Directed independent language study for graduate and undergraduate students

Instructor of record — 2012 – 2014
College of Engineering, University of the Philippines
Statics of Rigid Bodies
Dynamics of Rigid Bodies
Mechanics of Deformable Bodies
Fluid Mechanics

MENTORING EXPERIENCE

Undergraduate thesis mentor — 2012 – 2014
College of Engineering, University of the Philippines
Luigi Cruz, Determination of head loss through a pipe-chamber junction using computational fluid dynamics
Bredith Bucton, Modeling the surface and groundwater flow response to climatic and land-use change on a cascade of rice paddies
Arlene Co, Hydrologic response to climatic variations of a cascade of terraces

SELECTED PRESENTATIONS

Soriano, M.A. and Saiers, J.E. "Characterizing potential impacts of shale gas development on groundwater quality using hybrid machine learning approaches." 37th Annual Yale School of the Environment Research Day. 16 April 2021, New Haven, CT. (online).

Soriano, M.A. and Siegel, H.G. "Evaluating potential impacts of unconventional oil and gas development on groundwater." YSE Confluence Research Seminar. 19 November 2020, New Haven, CT. (online).

Soriano, M.A., Gutchess, K.M., Siegel, H.G., Clark, C.J., Li, Y., Xiong, B., Plata, D.L., Deziel, N.C., and Saiers, J.E. "Capture probability and well vulnerability to contamination: A framework for evaluating potential impacts of unconventional oil & gas development on groundwater resources." (H51L-1643). 2019 American Geophysical Union Fall Meeting. 9-13 December 2019, San Francisco, CA.

Soriano, M.A., Barth-Naftilan, E., Gutchess, K.M., Deziel, N.C., and Saiers, J.E. "Modeling groundwater vulnerability to contamination from unconventional oil and gas development: Uncertainty analysis using linear-based methods." (H43D-2424). 2018 American Geophysical Union Fall Meeting. 10-14 December 2018, Washington, DC.

Soriano, M.A., Deziel, N.C., and Saiers, J.E. "Towards a quantitative framework for evaluating vulnerability of drinking water wells to contamination from unconventional oil & gas development." (H53A-1430). 2017 American Geophysical Union Fall Meeting. 11-15 December 2017, New Orleans, LA.

Soriano, M.A. and Saiers, J.E. "Can 'fracking' contaminate drinking water? Approaching from the vulnerability side." 33rd Annual Yale Forestry & Environmental Studies Research Day. 21 April 2017, New Haven, CT.

Soriano, M.A. and Herath, S. "Climate change impacts on water resources and slope stability of the Ifugao Rice Terraces." 6th International Conference on Sustainability Science. 2-3 March 2016, Stellenbosch, South Africa.

Soriano, M.A., Bucton, B., and Castro, P.P.M. "Assessment of the engineering aspects and hydrologic response to climatic variations in the Ifugao Rice Terraces." UNESCO National Commission of the Philippines Forum on Conservation of the Ifugao Cultural Landscape. 12 May 2014, Ateneo de Manila University, Quezon City, Philippines.

REPORTS AND OTHER PUBLICATIONS

Herath, S., Jiao, Y., Castro, P.P.M., Diwa, J., **Soriano, M.A.**, Liang, L., Wang, Y., and Dulawan, L. (2016) Developing ecosystem-based adaptation strategies for enhancing of rice terrace farming systems against climate change. Project Report, Asia-Pacific Network for Global Change Research, Kobe, Japan.

Herath, S., **Soriano, M.A.**, and Diwa, J. (2015) Bias-corrected daily precipitation estimates in the Ifugao Rice Terraces under climate change scenarios. Rice Terrace Farming Systems Working Paper No. 3, United Nations University, Tokyo, Japan.

Herath, S., **Soriano, M.A.**, Diwa, J., and Bucton, B. (2015) Surface and groundwater flow response to climatic change in the Ifugao Rice Terraces. Rice Terrace Farming Systems Working Paper No. 6, United Nations University, Tokyo, Japan.

PROFESSIONAL AFFILIATIONS

American Geophysical Union
Geological Society of America
National Ground Water Association
National Center for Faculty Development and Diversity

SERVICE

Peer Reviewer, 2019-present: Climatic Change • Regional Environmental Change • Environmental Science: Processes & Impacts

Student Session Co-organizer, 2016: 6th International Conference on Sustainability Science (2-3 March 2016, Stellenbosch, South Africa)

Symposium Co-organizer, 2015: International Forum on current and global challenges and their relevance to the Ifugao Rice Terrace System (28 July 2015, Lamut, Ifugao, Philippines) • Science-Policy Forum on the sustainability of Hani and Ifugao Rice Terrace Systems: Building learning alliances (30 July 2015, Manila, Philippines).

Committee Service at the University of the Philippines, College of Engineering, 2012-2014: Engineering Science course planning committee • Course coordinator for Statics of Rigid Bodies • Faculty committee on partnerships with industry and student internships

SKILLS

Languages: *Fluent* (native speaker): English, Filipino/Tagalog, Pangasinan • *Intermediate:* Thai • *Elementary:* Nihongo

Research: *Hydrological modeling:* Hydrogeosphere, MODFLOW, MT3DMS, PEST, HEC-HMS, High performance computing • *Programming:* R, C, Python, bash • *Geospatial analysis:* ArcGIS, Google Earth Engine, QGIS

Online course management: Zoom, Canvas, Piazza

Last updated: April 16, 2021