Mario A. Soriano Jr.

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EDUCATION

Ph.D. in Environmental Science (Hydrology & Water Resources) Spring 2022, expected
Yale University • 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 University
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

GRANTS AND AWARDS

2021 Graduate Student Research Grant, Geological Society of America (GSA)
2021 Hydrogeology Division Travel Grant, GSA
2021 Hydrogeology Division Student Research Award, GSA

2021 Doctoral Travel Grant, Yale School of the Environment (YSE)
2020 Student Research Grant, Yale Institute for Biospheric Studies (YIBS)
2019 Conference Travel Fellowship, Yale Graduate School of Arts and Sciences (GSAS)
2019 Doctoral Travel Grant, YSE
2018 Doctoral Pilot Award, YIBS
2018 Conference Travel Fellowship, GSAS
2018 Doctoral Travel Grant, YSE
2017 Student Research Grant, YIBS
2017 Conference Travel Fellowship, GSAS
2017 Doctoral Travel Grant, YSE
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

Clark, C.J., Xiong, B., **Soriano, M.A.**, Gutchess, K.M., Siegel, H.G., Ryan, E., Johnson, N.P., Cassell, K., Elliott, E.G., Li, Y., Cox, A.J., Bugher, N., Glist, L., Brenneis, R.J., Sorrentino, K.M., Plano, J., Ma, X., Warren, J.L., Plata, D.L., Saiers, J.E., and Deziel, N.C. (2022, accepted.) Assessing unconventional oil and gas exposure in the Appalachian Basin: Comparison of exposure surrogates and residential drinking water measurements. *Environmental Science & Technology,* doi: 10.1021/acs.est.1c05081

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. (2022, accepted.) Groundwaters in northeastern Pennsylvania near intense hydraulic fracturing activities exhibit few organic chemical impacts. *Environmental Science: Processes & Impacts,* doi: 10.1039/D1EM00124H

Li, Y., Thelemaque, N.A., Siegel, H.G., Clark, C.J., Ryan, E., Brenneis, R.J., Gutchess, K.M., **Soriano, M.A.**, Xiong, B., Deziel, N.C., Saiers, J.E., and Plata, D.L. (2021) Groundwater methane in northeastern Pennsylvania attributable to thermogenic sources and hydrogeomorphologic migration pathways. *Environmental Science & Technology,* 55(24): 16413-16422. doi: 10.1021/acs.est.1c05272

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. (2021) Assessment of groundwater well vulnerability to contamination through physics-informed machine learning. *Environmental Research Letters,* 16(8): 084013. doi: 10.1088/1748-9326/ac10e0

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.P.M. (2012) Assessment of the engineering aspects of the Ifugao Rice Terraces. *Philippine Engineering Journal*, 33(1): 1-10.

MANUSCRIPTS IN REVIEW OR PREPARATION

Soriano, M.A., Deziel, N.C., and Saiers, J.E. (in preparation.) Ensemble approach and metamodeling for regional scale assessment of shallow groundwater vulnerability to contamination from unconventional hydrocarbon extraction.

Clark, C.J., Johnson, N.P., **Soriano, M.A.**, Warren, J.L., Sorrentino, K.M., Kadan-Lottick, N., Saiers, J.E., Ma, X., and Deziel, N.C. (in preparation.) Unconventional oil and gas exposure and risk of childhood leukemia in Pennsylvania.

Siegel, H.G., **Soriano, M.A.**, Clark, C.J., Johnson, N.P., Plata, D.L., Deziel, N.C., and Saiers, J.E. (in preparation.) Contaminant source attribution in a region of recent unconventional oil and gas development in the Appalachian Basin through compositional data analysis.

TEACHING EXPERIENCE

You, Your Planet, and a Sustainable Future Co-course Developer — Summer 2021
Yale College, with Professor Aaron Dollar
Undergraduate level course to be offered Fall 2022

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

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

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

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

Language Partner — 2018 – present
Yale Center for Language Study

Directed independent language study of Tagalog for graduate and undergraduate students

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

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

Instructor of record — 2012 – 2014
College of Engineering, University of the Philippines
Undergraduate level courses taught: Statics & 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. "Characterizing groundwater vulnerability to contamination from unconventional oil and gas development." Integrated Groundwater Modeling Center, Princeton University. 28 October 2021. (online).

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. "Metamodeling of groundwater well vulnerability to contamination for elucidating potential impacts of shale gas development on water quality." (71-3). The Geological Society of America Connects 2021. 10-13 October 2021, Portland, OR.

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. (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. (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.

Soriano, M.A. (2016) Editorial: Closing the gaps in the science-policy interface. *United Nations University Peace & Progress,* 3: 1-2.

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.

Soriano, M.A. (2013) Sustainable agriculture in the midst of climate change. *Engineering Times,* 3: 3.

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* • *Resources, Conservation & Recycling*

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

Editor-in-Chief, 2015-2016: *United Nations University Peace and Progress* (UNU's student-run academic journal)

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).

Editor-in-Chief, 2013: *Engineering Times* (Newsletter published by AMH Philippines, Inc.)

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 • Secretariat/ documentation committee • Faculty committee on partnerships with industry and student internships

SKILLS

Research: *Hydrological modeling and model calibration:* Hydrogeosphere, MODFLOW, MT3DMS, SHER, HEC-HMS, PEST, UCODE, High performance computing • *Programming:* R, Python, C, bash • *Geospatial analysis:* ArcGIS, Google Earth Engine • *Stakeholder engagement:* Focus group discussions, Questionnaire surveys

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

Online course management: Zoom, Canvas, Piazza

Last updated: January 13, 2022