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Semblanza

El Dr. Misael Sebastián Gradilla Hernández Obtuvo una licenciatura en ingeniería ambiental del Instituto Tecnológico de Estudios Superiores de Occidente (ITESO), México. Obtuvo una maestría en ciencia y tecnología con especialización en ingeniería ambiental y un doctorado en innovación biotecnológica del Centro de Investigación y Asistencia en Tecnología y Diseño del Estado de Jalisco, A.C. (CIATEJ). Obtuvo un segundo doctorado en gestión de la Universidad de Guadalajara con especialidad en gestión ambiental y sostenibilidad. Fue investigador posdoctoral en el Laboratorio Nacional de Ciencias de la Sostenibilidad (LANCIS) del Instituto de Ecología de la Universidad Nacional Autónoma de México (UNAM), entre 2020 y 2022. Fue profesor e investigador del Tecnológico de Monterrey en Guadalajara desde 2011 hasta 2025 y director asociado del departamento de tecnologías sostenibles y civil de 2024 a 2025. Fue también líder del eje de investigación del plan institucional de sostenibilidad y cambio climático del Tec de Monterrey desde 2022 hasta 2025 y líder del laboratorio de sostenibilidad y cambio climático. Fue director general de Protección y Gestión Ambiental de la Secretaría de Medio Ambiente y Desarrollo Territorial del gobierno de Jalisco, México, de 2018 a 2021. Fue profesor

investigador asociado a la Universidad de Leeds en 2023 y es profesor investigador asociado en la Universidad de California Davis en el periodo proyectado de 2024-2029. El Dr. Gradilla-Hernández es miembro del Sistema Nacional de Investigadores Nivel 1 y se especializa en el monitoreo y evaluación de la salud de cuerpos de agua superficiales y en estrategias biotecnológicas para el tratamiento de aguas de procedencia agroindustrial y residuos, incluyendo digestión anaerobia y tratamiento basado por microalgas. Ha sido director/codirector de 15 estudiantes tesis de posgrado (maestría y doctorado). Es autor de más de 65 artículos de revistas y capítulos de libros indizados en revistas internacionales. Ha sido coautor de varios de los programas ambientales del Estado de Jalisco, como la estrategia para reducir la pérdida y desperdicio de alimentos en el estado de Jalisco, el programa de gestión integral de residuos "Jalisco Reduce" y el desarrollo de un sistema de apoyo a la toma de decisiones en Río Santiago. También ha participado en diferentes proyectos y artículos de innovación educativa para el desarrollo sostenible. Finalmente, el Dr. Gradilla Hernández ha desarrollado una línea de investigación para el desarrollo sostenible.

Biographical note

Dr. Misael Sebastián Gradilla Hernández has been a professor at Tecnológico de Monterrey in Guadalajara since 2011, currently as associate director of the department of sustainable and civil technologies and as a research professor, he is also the leader of the research component of the institutional plan for sustainability and climate change at Tec de Monterrey and leader of the sustainability and climate change laboratory. He was the general director of Environmental Protection and Management of the Secretariat of Environment and Territorial Development of the government of Jalisco, Mexico, from 2018 to 2021. He earned a bachelor's degree in environmental engineering from the Instituto Tecnológico de Estudios Superiores de Occidente (ITESO), Mexico. He earned a master's degree in science and technology with a specialization in environmental engineering and a doctorate in biotechnological innovation from the Center for Research and Assistance in Technology and Design of the State of Jalisco, A.C. (CIATEJ). He earned a second doctorate in management from the University of Guadalajara with a specialty in environmental management and sustainability. He was a postdoctoral researcher at the National Laboratory for Sustainability Sciences (LANCIS) of the Institute of Ecology of the National Autonomous University of Mexico (UNAM), between 2020 and 2022. He was an associate research professor at the University of Leeds in 2023 and is an associate research professor at the University of California Davis in the projected period of 2024-2029. Dr. Gradilla-Hernández is a member of the National System of Researchers Level 1 and specializes in the monitoring and evaluation of the health of surface water bodies and in biotechnological strategies for the treatment of water and waste, including anaerobic digestion and microalgae-based treatment. He has participated in numerous projects related to the quality of water bodies in Jalisco, such as circular economy projects for the treatment of liquid effluents of agro-industrial origin, such as livestock waste and tequila vinasse. He is a member of the national system of researchers. He has been the director/co-director of 15 graduate student theses (master's and doctorate). He is the author of more than 65 journal articles and book chapters indexed in international journals. He has been the co-author of several of the State of Jalisco's environmental programs, such as the strategy to reduce food loss and waste in the state of Jalisco, the integrated waste management program "Jalisco Reduce" and the development of a decision-making support system in Río Santiago. He has also participated in different projects and articles on educational innovation for sustainable development. Finally, Dr. Gradilla Hernández has developed a research line focused on sustainable development.

Employment

Instituto Tecnológico de Estudios Superiores de Monterrey

Associate director of the department of sustainable and civil technologies and Leader of the Sustainability and Climate Change Laboratory

2024 to DATE

University of California, Davis

2024 to DATE

Research Associate

University of Leeds

2024 to DATE

Research Associate and visiting research fellow

Instituto Tecnológico de Estudios Superiores de Monterrey

2011 to DATE

Research professor in the Bioengineering Department and Leader of the Sustainability and Climate Change Laboratory

Ministry of Environment and Territorial Development of the government of Jalisco, Mexico

2021 to DATE

Environmental Science Consultant

Ministry of Environment and Territorial Development of the government of Jalisco, Mexico

2018 - 2021

General Director of Environmental Protection

Other designations

National System of Researchers (SNI) of National Council for Science and Technology (CONACyT)

2020 to DATE

Member of the national system of researchers, Level 1

Science of the Total Environment

Editorial Board Member

2023 to DATE

Council of the Fund for Environmental Protection of the State of Jalisco.

2021 to DATE

Advisor

Board of Directors of the Council of Science and Technology of the State of Jalisco (COECyTJAL)

2018 - 2021

Advisor

Innovation, Science and Technology State Awards, Jalisco 2019.

2019

Jury

Call of the Jalisco Scientific Development Fund Program to address State Problems, 2019 (FODECIJAL)

2019

Technical reviewer

Installation of the State Bioethics and Research Commission of the State of Jalisco 2018-2024

2019

Participation as Permanent advisor

Guadalajara Chamber of Commerce and the Waste Management Specialized Section.

2019

Participant

Education

Postdoctoral fellowship

2020 - 2022

The National Laboratory of Sustainability Sciences (at the Institute of Ecology) in the National Autonomous University of Mexico (UNAM for its acronym in Spanish)

Project title: “Desarrollo de un modelo dinámico para la gestión sostenible del agua en la cuenca del Río Santiago-Guadalajara”

Academic tutor: Dra. Marisa Mazari Hiriart

<https://drive.google.com/file/d/1qdEYrjNp-G8wZPujM-F2IR377GQzFYCE/view>

Ph.D in Biotechnology Innovation with specialization agri-food biotechnology

Graduated with an Honorable Mention in Excellence

2020

Center for Research and Assistance in Technology and Design of the State of Jalisco (CIATEJ for its acronym in Spanish).

License number: 12777426

https://drive.google.com/file/d/1T21-1A6OcfjMEE_UgNS-_LmXWazOONc_/view?usp=sharing

Thesis title: “Aplicación de redes neuronales diferenciales para caracterizar las interacciones microbianas en un simulador ex vivo del tracto gastrointestinal”

Academic tutor: Dra. Anne Christine Gchaedler Mathis

<https://ciatej.mx/estudia-ciatej/posgrados/graduados>

Ph.D in Education Management with specialization in Sustainability

2017

Center for Administrative and Economic Sciences. University of Guadalajara (UdeG for its acronym in Spanish).

Thesis title: “Contribución de las disciplinas académicas al desarrollo de competencias para el desarrollo sostenible en los estudiantes”

Academic tutor: Dra. Carla Delfina Aceves Ávila

<https://riudg.udg.mx/handle/20.500.12104/81182>

M. Sc. in Science and Technology with specialization in Environmental Engineering

Center for Research and Assistance in Technology and Design of the State of Jalisco (CIATEJ for its acronym in spanish).

License number: 11912276 https://drive.google.com/file/d/1R9y8Q0KLEVt2o377EP_0D7F0YwjhtpAQ/view?usp=sharing

Thesis title: “Patrones de bioacumulación de Cu, Zn, Hg y Cd utilizando bagre (*ictaluires punctatus*) como biomonitor activo en el lago de Chapala”

Academic tutor: Dra. Claudia Alvarado Osuna

<https://ciatej.mx/estudia-ciatej/posgrados/graduados>

B. Sc. in Environmental Engineering

Western Institute of Technology and Higher Education (ITESO for its acronym in spanish).

License number: 6723294

Additional information

Language competencies (English)

TOEFL ITP score 673: Language proficiency

Scientific publications

Summary of scientific production

Ibarra-Esparza J , Ibarra-Esparza, F E , González-López M E , Garcia-Gonzalez A. and Gradilla-Hernández M. S. (2025) Instruments and Continuous Monitoring for the Anaerobic Digestion Process: A Systematic Review. Accepted for publication in IEEE Access

García-López, C. D., Barajas-Álvarez, P., González-López, M. E., Loge, F. J., Mahlnecht, J., Senés-Guerrero, C., & **Gradilla-Hernández, M. S. (2025)**. Evaluating sludge management strategies using wastewater treatment plant simulations and life cycle assessment. *Journal of Material Cycles and Waste Management*, 27(5), 2972-2986.

Ramos-Reyes, M. F., Radilla-Alatorre, F., Díaz-Vazquez, D., González-López, M. E., Barajas-Álvarez, P., Tuesta-Popolizio, D. A., Mussatto, S. I., **Gradilla-Hernández, M. S. (2025)**. Yeast-filamentous fungi co-culture: A circular bioeconomy approach for distillation stillage treatment and revalorization. *Sustainable Chemistry & Pharmacy*. 45:102053. <https://doi.org/10.1016/j.scp.2025.102053>

Castanier-Rivas, J. D., Larrea-Cedeño, A. S., Sukumara, S., García de Alva-Verduzco, J., González-López, M. E., **Gradilla-Hernández, M. S., (2025)**. Towards Circularity: Integrating biochar production from maize stover into the tequila industry. *Sustainable Chemistry & Pharmacy*. 45:102027. <https://doi.org/10.1016/j.scp.2025.102027>

Brown, L. E., Maavara, T., Zhang, J., Chen, X., Klaar, M., Moshe, F. O., Ben-Zur, E., Stein, S., Grayson, R., Carter, L., Levintal, E., Gal, G., Ziv, P., Tarkowski, F., Pathak, D., Khamis, K., Barquín, J., Philamore, H., **Gradilla-Hernández, M. S., Arnon, S. (2025)**. Integrating sensor data and machine learning to advance the science and management of river carbon emissions. *Critical Reviews in Environmental Science and Technology*. 55(9):600–623. <https://doi.org/10.1080/10643389.2024.2429912>

López-Sánchez, A., García-López, C. D., Lara-Topete, G. O., Castanier-Rivas, J. D., Barajas-Álvarez, P., González-López, M. E., Silva-Gálvez, A. L., Zhou, H., Lan, C. Q., Robles-Rodriguez, C. E., Meramo-Hurtado, S., **Gradilla-Hernández, M. S. (2025)**. Consequential life cycle assessment of pretreatment strategies for a microalgae-based wastewater treatment pilot unit in a circular livestock industry bioeconomy. *Algal Research*. 89:104041. <https://doi.org/10.1016/j.algal.2025.104041>

Uribe-Velázquez, T., Díaz-Vázquez, D., Barajas-Álvarez, P., González-López, M. E., **Gradilla-Hernández M. S., Garcia-Amezquita, L. E., Carrillo-Nieves, D., García-Cayuela, T. (2025)**. From waste to value: Mitigating the environmental impact of whey in Jalisco, Mexico. *Journal of Cleaner Production*. 501:145334. <https://doi.org/10.1016/j.jclepro.2025.145334>

Ramos-Reyes, M. F., González-López, M. E., Barajas-Álvarez, P., García-García C. E., Tuesta-Popolizio, D. A., Mussatto, S., **Gradilla-Hernández, M. S. (2025)**. Exploring the potential of distillery vinasses through upcycling: Pathways to a circular economy. *Environmental Technology & Innovation*. 38:104072. <https://doi.org/10.1016/j.eti.2025.104072>

Hammond, C. R., **Gradilla-Hernández, M. S., Loge, F. J. (2025)**. Microalgal-bacterial aggregates for wastewater treatment: Origins, challenges, and future directions. *Water Environ Res*. 97(2):e70018. <https://doi.org/10.1002/wer.70018>

Fernández del Castillo, A., Verduzco Garibay, M., Senes-Guerrero, C., **Gradilla-Hernández, M. S., (2025)**. Chapter 7. A revisit of constructed wetlands technology—microbial density and diversity and their relation to pollutant removal. In A. Kumar Yadav, J. Vymazal, Y. Zhao, & P. Srivastava (Eds.), *Emerging Developments in Constructed Wetlands* (pp. 195-216). Elsevier, Netherlands. <https://doi.org/10.1016/B978-0-443-14078-5.00007-6>

Hinojosa-Avila, C. R., Chedraui-Urrea, J. J. T., Estarrón-Espinoza, M., **Gradilla-Hernandez, M. S., García-Cayuela, T., (2025)**. Chemical profiling and probiotic viability assessment in Gueuze-style beer: Fermentation dynamics, metabolite and sensory characterization, and *in vitro* digestion resistance. *Food Chemistry*. 462:140916. <https://doi.org/10.1016/j.foodchem.2024.140916>

- García-Gamboa, R., Díaz-Torres, O., **Gradilla-Hernández, M. S.**, Pérez-Brocal, V., Moya, A., González-Avila, M., (2024). Gut Bacterial Composition and Nutritional Implications in Mexican and Spanish Individuals with Inflammatory Bowel Disease Compared to Healthy Controls. *International Journal of Molecular Sciences*. <https://doi.org/10.22541/essoar.171322696.69831029/v1>
- Brown, L. E., Maavara, T., Chen, X., Zhang, J., Klaar, M., Moshe, F. O., Ben-Zur, E., Stein, S., Grayson, R., Carter, L., Levintal, E., Gal, G., Ziv, P., Tarkowski, F., Pathak, D., Khamis, K., Barquín, J., Philamore, H., **Gradilla-Hernandez, M. S.**, Arnon, S., (2024). Integrating sensor data and machine learning to advance the science and management of river carbon emissions. *Critical Review in Environmental Science and Technology*. <https://doi.org/10.1080/10643389.2024.2429912>
- Dogra, K., Lalwani, D., Dogra, S., Panday, D. P., Raval, N. P., Trivedi, M., Mora, A., **Gradilla-Hernandez, M. S.**, Snyder, S. A., Mahlknecht, J., Kumar, M., (2024). Indian and global scenarios of Bisphenol A distribution and its new analogues: Prevalence & probability exceedance. *J Hazard Mater*. 135128.
<https://doi.org/10.1016/j.jhazmat.2024.135128>
- Díaz-Torres, O., Valencia-de los Cobos, E. O., Kreft, J. U., Loge F. J., Díaz-Vázquez, D., Mahlknecht, J., **Gradilla-Hernández, M. S.**, Senés-Guerrero C., (2024). A metagenomic study of antibiotic resistance genes in a hypereutrophic subtropical lake contaminated by anthropogenic sources. *Science of the Total Environment*. 927. <https://doi.org/10.1016/j.scitotenv.2024.172216>
- Mazari-Hiriart M., Fernández-Reyes A., Alvarado-Velázquez, J., **Gradilla-Hernández, M. S.**, Díaz-Vázquez D., (2024). Water quality management in a tropical karstic system influenced by land use in Chiapas, Mexico. *Environmental Challenges*. 16.
<https://doi.org/10.1016/j.envc.2024.100981>
- Lara-Topete, G. O., Castanier-Rivas, J. D., Bahena-Osorio, M. F., Krause, S., Larsen, J. R., Loge, F. J., Mahlknecht, J., **Gradilla-Hernández, M. S.**, González-López, M. E., (2024). Compounding One Problem with Another? A Look at Biodegradable Microplastics. *Science of the Total Environment*. 944.
<https://doi.org/10.1016/j.scitotenv.2024.173735>
- Fernández del Castillo, A., Verduzco Garibay, M., Díaz-Vázquez, D., Yebra-Montes, C., Brown, L.E., Johnson, A., García-González, A., **Gradilla-Hernández, M. S.**, (2024). Improving river water quality prediction with hybrid machine learning and temporal analysis. *Ecological Informatics*. <https://doi.org/10.1016/j.ecoinf.2024.102655>
- García-Gamboa R, Díaz-Torres O, Senés-Guerrero C, **Gradilla-Hernández MS**, Moya A, Pérez-Brocal V, Garcia-Gonzalez A, González-Avila M (2024). Associations between bacterial and fungal communities in the human gut microbiota and their implications for nutritional status and body weight. *Sci Rep*.14(1):5703.
<https://doi.org/10.1038/s41598-024-54782-7>
- Silva-Gálvez, A. L., López-Sánchez, A., Camargo-Valero, M. A., Prosenc, F., González-López, M. E., **Gradilla-Hernández, M. S.**, (2024). Strategies for livestock wastewater treatment and optimised nutrient recovery using microalgal-based technologies. *Journal of Environmental Management*. 354. <https://doi.org/10.1016/j.jenvman.2024.120258>
- Amador-Castro, F., González-López, M. E., Lopez-Gonzalez, G., Garcia-Gonzalez, A., Díaz-Torres, O., Carbajal-Espinosa, O., **Gradilla-Hernandez, M. S.**, (2024). Internet of Things and citizen science as alternative water quality monitoring approaches and the

importance of effective water quality communication. *Journal of Environmental Management*. 352. <https://doi.org/10.1016/j.jenvman.2023.119959>

Lara-Topete, G., Castanier-Rivas, J. D., **Gradilla-Hernández, M. S.**, González-López, M. E. (2024). Life cycle assessment of agave bagasse management strategies: PLA biocomposites versus conventional waste disposal practices. *Sustainable Chemistry and Pharmacy*. 37. <https://doi.org/10.1016/j.scp.2024.101435>

Silva-Gálvez, A.L., Palafox-Sola, M.F., González-López, M. E., López Sánchez, A., Orozco-Nunelly, D.A., Pérez-Hermosillo, J., González-Valdez, J & **Gradilla-Hernández, M.S.** (2024) Treatment of swine wastewater using microalgae. In (Eds.), *Algae mediated bioremediation: Industrial Prospectives*. Wiley, USA. [10.1002/9783527843367.ch10](https://doi.org/10.1002/9783527843367.ch10)

Díaz-Vázquez, D., Camacho Sandoval, T., Reynoso Delgadillo, J., Gómez Ayo, N. A., Macías Calleja, M. G., Martínez Barba, M. P., **Gradilla-Hernández, M. S.** (2023). Characterization and multicriteria prioritization of water scarcity in sensitive urban areas for the implementation of a rain harvesting program: A case study for water-scarcity mitigation. *Urban Climate*, 51. <https://doi.org/10.1016/j.uclim.2023.101670>

González-López, M. E., Calva-Estrada, S. J., **Gradilla-Hernández, M. S.**, Barajas-Álvarez, P. (2023). Current trends in biopolymers for food packaging: a review. *Fron. Sustain. Food Syst*. 7. <https://doi.org/10.3389/fsufs.2023.1225371>

López-Sánchez, A., Silva-Gálvez, A.L., González-López, M.E., Díaz-Vázquez, D., Orozco-Nunelly, D.A., Novoa-Leiva, I., González-Valdez, J.G., Casillas-García, L.F. & **Gradilla-Hernández, M.S.** (2023). Valorization of livestock waste through combined anaerobic digestion and microalgal-based treatment in México: a techno-economic analysis for distributed biogas generation, animal feed production, and carbon credits trading. *Environmental Technology & Innovation*, 32. <https://doi.org/10.1016/j.eti.2023.103321>

Carrizales-Sánchez, A. K., Tamez-Rivera, O., Rodríguez-Gutiérrez, N. A., Elizondo-Montemayor, L., **Gradilla-Hernández, M. S.**, García-Rivas, G., Pacheco, A., & Senés-Guerrero, C. (2023). Characterization of gut microbiota associated with metabolic syndrome and type-2 diabetes mellitus in Mexican pediatric subjects. *BMC Pediatrics*, 23(1). <https://doi.org/10.1186/s12887-023-03983-6>

Ibarra-Esparza F.E., González-López, M.E., Ibarra-Esparza, j., Senés-Guerrero, C., Lara-Topete, G.O., Cansdale, A., Forrester, S., P.J. Chong, J., & **Gradilla Hernández, M.S.** (2023). Implementation of anaerobic digestion for valorizing the organic fraction of municipal solid waste in developing countries: Technical insights from a systematic review. *Journal of Environmental Management*, 37. <https://doi.org/10.1016/j.jenvman.2023.118993>

Lara-Topete, G. O., Robles-Rodríguez, C. E., Orozco-Nunelly, D. A., Vázquez-Morillas, A., Bernache-Pérez, G., & **Gradilla-Hernández, M. S.** (2023). A mini review on the main challenges of implementing mechanical biological treatment plants for municipal solid waste in the Latin America region: Learning from the experiences of developed countries. *Waste Management & Research*. <https://doi.org/10.1177/0734242X231154143>

Palafox-Sola, M. F., Yebra-Montes, C., Orozco-Nunelly, D. A., Carrillo-Nieves, D., González-López, M. E., & **Gradilla-Hernández, M. S.** (2023). Modeling growth kinetics and community interactions in microalgal cultures for bioremediation of anaerobically digested swine wastewater. *Algal Research*, 102981.

<https://doi.org/10.1016/j.algal.2023.102981>

Ibarra-Esparza FE, Verduzco-Garibay M, Lara-Topete GO, González-López ME, Orozco-Nunnelly DA, Aguilar-Juárez O, Senés-Guerrero C and **Gradilla-Hernández M.S. (2022)**, A micro and macro-scale look at the biochemical methanogenic potential of the organic fraction of municipal solid waste generated in a large city of a developing country. *Frontiers in Environmental Science*. <https://www.frontiersin.org/articles/10.3389/fenvs.2022.1020208/abstract>

Díaz-Vázquez, D., Verduzco Garibay, M., Fernández del Castillo, A., Orozco-Nunnelly, D. A., Senés-Guerrero, C., & **Gradilla-Hernández, M. S.** Yeast community composition impacts on tequila industry waste treatment for pollution control and waste-to-product synthesis. *Frontiers in Chemical Engineering*. <https://doi.org/10.3389/fceng.2022.1013873>

Fernández del Castillo, A., Garibay, M. V., Senés-Guerrero, C., Orozco-Nunnelly, D. A., de Anda, J., & **Gradilla-Hernández, M. S. (2022)**. A review of the sustainability of anaerobic reactors combined with constructed wetlands for decentralized wastewater treatment. *Journal of Cleaner Production*. <https://doi.org/10.1016/j.jclepro.2022.133428>

García-Gamboa, R., Domínguez-Simi, M., **Gradilla-Hernández, M. S.**, Bravo, J., Moya, A., Ruiz-Álvarez, B., & González-Avila, M. (2022). Anticandidal and Antibiofilm Effect of Synbiotics including Probiotics and Inulin-Type Fructans. *Antibiotics*. <https://doi.org/10.3390/antibiotics11081135>

Guardiola-Márquez, C. E., Pacheco, A., Mora-Godínez, S., Schüßler, A., **Gradilla-Hernández, M. S.**, & Senés-Guerrero, C. (2022). Septoglomus species dominate the arbuscular mycorrhiza of five crop plants in an arid region of northern Mexico. *Symbiosis*. <https://doi.org/10.1007/s13199-022-00851-2>

Díaz-Vázquez, D., Orozco-Nunnelly, D. A., Yebra-Montes, C. Senés-Guerrero, C., & **Gradilla-Hernández, M. S. (2022)**. Using yeast cultures to valorize tequila vinasse waste: an example of a circular bioeconomy approach in the agro-industrial sector. *Biomass and Bioenergy*. <https://doi.org/10.1016/j.biombioe.2022.106471>

López-Sánchez, A., Silva-Gálvez, A. L., Zárate-Aranda, E., Yebra-Montes, C., Orozco-Nunnelly, D. A., Carrillo-Nieves, D., & **Gradilla-Hernández, M. S. (2022)**. Microalgae-mediated bioremediation of cattle, swine and poultry digestates using mono-and mixed-cultures coupled with an optimal mixture design. *Algal Research*. <https://doi.org/10.1016/j.algal.2022.102717>

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Fernández del Castillo, A., Yebra-Montes, C., Verduzco Garibay, M., de Anda, J., Garcia-Gonzalez, A., & **Gradilla-Hernández, M. S. (2022)**. Simple Prediction of an Ecosystem-Specific Water Quality Index and the Water Quality Classification of a Highly Polluted River through Supervised Machine Learning. *Water*, 14(8), 1235. <https://doi.org/10.3390/w14081235>

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Available at: <http://www.librosoa.unam.mx/handle/123456789/259>

Gradilla-Hernández, M.S., Alvarado, C., and de Anda, J. (2013). Carp and catfish as heavy metals biomonitors in Lake Chapala, Mexico. In: Conference Proceedings of the XXXIV AMIDIQ National Conference and III International Conference (Published in spanish as: Carpa y Bagre como biomonitores de metales en el lago de Chapala, México. En: Memorias del XXXIV Encuentro Nacional y III Congreso Internacional de la AMIDIQ.) Mexican Academy of Research and Teaching in Chemical Engineering (AMIDIQ). ISBN 978-607-95593-1-1.

Available at: <https://www.amidiq.com/memorias.htm>

Experience as journal reviewer

Linking multivariate statistical methods and water quality indices to evaluate the natural and anthropogenic geochemical processes controlling the water quality of a tropical watershed. *Environmental Monitoring and Assessment*.

<https://doi.org/10.1007/s10661-023-11889-0>

Revision receipt communication

2023

Hydrogenotrophs–Based Biological Biogas Upgrading Technologies. *Frontiers in Bioengineering and Biotechnology*.

<https://doi.org/10.3389/fbioe.2022.833482>

2022

Projects for the dissemination and popularization of science

Historias para Mentes Curiosas Podcast

Participant – Episode 84: Water, anatomy of a crisis

2024

Article in CONECTA: Medio ambiente: ayuda Tec Gdl a crear estrategia sostenible en Jalisco

2025

[Article Link](#)

Panel organizer: Sustainable development and the participation of youth and women for the Santiago River basin.

[Panel Santiago River](#)

2025

Article in TecScience: Rainwater Recovery and Data Science: A Strategy for the Urban Water Crisis

[Rainwater Recovery and Data Science: A Strategy for the Urban Water Crisis](#)

2025

Article in TecScience: The challenge tequila vinasses represent in agriculture

[Impacto ambiental de las vinazas tequileras | TecScience](#)

2025

Environmental Frequency Podcast

Participant. Episode 189. Topic: “Sustainable management of waste streams generated in the tequila industry”

<https://open.spotify.com/episode/4s4KMrX4u0JZxMMJvFup8G?si=sYGyFU17RViDM9Qmng3klg>

2024

Article in CONECTA: Sustainable route! Tec professors share strategies in United Kingdom

[Sustainable route! Tec professors share strategies in United Kingdom | Tecnológico de Monterrey](#)

2024

Article in CONECTA: Carbon Footprint: Tec’s Sustainability Lab invites you to a debate

[Huella de carbono: laboratorio de sostenibilidad Tec invita a debatir | Tecnológico de Monterrey](#)

2024

Article in TecScience: Bioplastics: how damaging can they be to the environment?

2024

[Microbioplásticos: ¿son riesgo para el medio ambiente? | TecScience](#)

Article at TecScience: Fungi and bacteria, allies to combat obesity.

[Bacterias y hongos combaten la obesidad | TecScience](#)

2024

Stories for Curious Minds

Participant – Episode 84: Water: Anatomy of a crisis.

https://open.spotify.com/episode/5caNkhMAHTFADEOtLOC7G?si=1OzV3kp-RQGMQp_shL6Zyw

2024

Video: Inauguration of the Laboratorio de Sostenibilidad y Cambio Climático

<https://www.facebook.com/share/v/CiP8Agea6WAicwmo/?mibextid=WC7FNe>

2024

Educator's Meeting Michoacan 2024

https://youtu.be/7D7kgi_QoWM

2024

Knowledge Exchange Workshop Water Connect with University of Leeds and University of California – Davis

[Invitation poster](#)

2024

Interview on the TV channel Meganoticias Guadalajara on the new natural reserve in Jalisco.

[Meganoticias GDL | Interview](#)

2024

Podcast TecScience Tec Sounds Radio: “The problem wastewater represents for human health and ecosystems”

[Tec Science | Tec Sounds Radio | Tecnológico de Monterrey](#)

2023

Article: “For the water! Tec Gdl and University of Leeds generate research.”

[¡En pro del agua! Tec Gdl y Universidad de Leeds generan investigación | Tecnológico de Monterrey](#)

2023

Article: “To build artificial wetlands to help clean water”

[Humedales artificiales para ayudar a limpiar el agua | TecScience](#)

2023

XV Edition of “Expo Ingenierías” of Tecnológico de Monterrey

Co-author and winning-team mentor. Topic: “Life cycle assessment of Agave fiber reinforced composites and biocomposites: The case of Jalisco.”

Guadalajara, Mexico.

2023

Environmental Frequency Podcast

Participant. Episode 161. Topic: “International Tequila Day, towards a sustainable industry”

https://open.spotify.com/episode/3XE7NuRepSIOrtkp0aStVR?si=ttAMJN4rRZiNdWenND_McA

2023

Bioengineering Congress: “The role of bioengineering in the Mexican decarbonation”

2023

Organizer.

<https://youtu.be/yM5ANiBAB1c?si=I0FeDnnpn0ebjckH->

Article: “Quality water: Team from Tec GDL created a prototype for river samples”

2023

Polea AC Podcast

Participant. Topic: “The importance of the association between science and the implementation of climate change public policy”

<https://www.youtube.com/watch?v=gR9CalKM7do>

2023

HidroHack. Hackathon 2023

Winner team mentor. Team proposal: monitoring probe that estimates, remotely and in real time, the Santiago River’s water quality index.

Guadalajara, Mexico.

2023

Environmental Frequency Podcast

Participant. Episode 143. Topic: “Jalisco and its Tequila: routes to sustainable”

<https://open.spotify.com/episode/3uC0iZsyrPkC4dC0vgA0Yo?si=V-sU4nDcQfWKGp8Aprwyg>

2023

Scientific coffee. A space for citizen’s science.

Moderator. Topic: “From the macro-problem to the micro-problem: the micro-impact of plastic residues on the environment”

2022

Mexico Carbon Forum

Leader of the Tecnológico de Monterrey Team

<https://www.youtube.com/watch?v=b7zDngx3KIU>

2022

Dialogue between academia, government, and society: Technological tools for the water quality index and the decision-making support system for the integral recovery of the Santiago River

Leader

<https://www.youtube.com/watch?v=BGowdEJM-ik>

2022

Towards the improvement in the management of vinasses and bagasse of tequila production: meeting between producers, academics, and government

Leader

https://www.youtube.com/watch?v=_MJTdkgxp9M

2022

Inauguration of the sustainability and climate change laboratory of Tecnológico de Monterrey

Leader

<https://www.youtube.com/watch?v=YqDhrV9zOuc>

2022

Towards improvement in agricultural waste management: meeting between producers, academics, and government

Leader

https://www.youtube.com/watch?v=obAeC-dY_nc

2022

Diffusion video (Tec leaders): Vinasses project.

<https://www.youtube.com/watch?v=J3evYW642ZY>

2022

Article: “A scientific mission for Santiago River”

https://www.mural.com.mx/libre/acceso/accesofb.htm?__rval=1&urlredirect=/una-mision-cientifica-por-el-rio-santiago-2022-05-22/op226979?utm_source=whatsapp&utm_medium=social&utm_campaign=promocion_suscriptor&referer=--7d616165662f3a3a793b73747670777a7a7e3b767a783a--

2022

Webinar: “World Environment Day” (CUCEA, University of Guadalajara)

https://www.facebook.com/watch/live/?v=259913381919727&ref=watch_permalink

2020

Environmental Frequency Podcast

Participant. Episode 16. Topic: “Environmental State Normative and single-use plastics”

<https://open.spotify.com/episode/5tgMZliNhXvkoSpnAXYgcK?si=l9K09y2LQ1yaaCaHk4hiNw>

2019

TV report: “Regulation of one-use plastic bags and straws: Sebastián Gradilla, SEMADET”

<https://www.youtube.com/watch?v=XwcXUU0LnDk>

2019

First Colloquium for the Dissemination, Research and Strengthening of Synthetic biology and Bioelectronics in the Occidental Region of Jalisco.

2019

Organizer. Zapopan, Jalisco, Mexico.

Article: “Sebastián Gradilla, the water watchman”

<http://www.cienciamx.com/index.php/sociedad/personajes/22456-sebastian-gradilla-centinela-agua>

2018

Authored public policy and legislation

Manual of good practices in blueberry cultivation

Coauthor

[Manual de buenas prácticas arándano VF_2024.pdf](#)

2023

“Jalisco Reduce” The waste management policy of the State of Jalisco, Mexico, 2018-2024.

2022

Coauthor

https://periodicooficial.jalisco.gob.mx/sites/periodicooficial.jalisco.gob.mx/files/08-13-22-_iii_.pdf

Development of a water quality index for the Santiago River in the Santiago-Guadalajara River Basin. Ministry of the Environment and Territorial Development. Government of the State of Jalisco.

2022

First Author

<http://riosantiago.jalisco.gob.mx/estrategia>.

Environmental criteria and technical specifications to produce plastic bags for carrying and single-use straws to be distributed and/or sold in the State of Jalisco

2019

Consultant and workshop participant

https://semadet.jalisco.gob.mx/sites/semadet.jalisco.gob.mx/files/nae_010_semadet_plasticos.pdf

Externally and internally funded research projects

Support in the development of techno-economic models for GHG mitigation potential and cost modeling of eight new measures for Mexico's NDC.

Grant financed by the GIZ for SEMARNAT

<https://drive.google.com/file/d/1fJCWZ6BRJrZrxVqYX-crO65mJzhhl/view?usp=sharing>

<https://drive.google.com/file/d/1fJCWZ6BRJrZrxVqYX-crO65mJzhhl/view?usp=sharing>

Climate Skills for young

Grant financed by the British Council for young researchers and education institution for climate change related research projects.

2025

2025

AlianzaMX: Tecnológico de Monterrey – University of California Davis

Development of a preliminary roadmap for the restoration of the Río Santiago Basin.

Coordination and delivery of five strategic workshops

2025

HE Connects: UK-Americas Partnerships for TNE and Internationalization

Collaboration grant financed by the British Council between Robert Gordon University and Tecnológico de Monterrey

Collaboration grant financed by the British Council between University of Leeds, Universidad Autónoma de Yucatán and Tecnológico de Monterrey

[Grant acceptance](#)

[Invitation Letter](#)

2023

“Development and implementation of a support system for decision making for integral restoration and management of the Santiago River basin.”

The Innovation, Science and Technology Ministry of the State of Jalisco (SICYT by its acronym in Spanish) and the Science and Technology State Council (COECyTJAL by its acronym in Spanish) through Jalisco’s Scientific Development Found (FODECIJAL by its acronym in Spanish). Project 10633-2023.

[RESULTADOS_FODECIJAL_2023.pdf](#)

2023

“Harnessing the methanogenic potential of solid wastes and agro-industrial wastes generated in the state of Jalisco.”

Research collaboration with the Center of Excellence for Anaerobic Digestion (CEAD) at the University of York.

[Invitation University of York](#)

2023

“Assessing the ecological and public health risks caused by the presence of persistent and emerging pollutants in Santiago River sediments”.

Research collaboration with the University of Leeds research group water@Leeds, the University of Birmingham and the University of Toronto Mississauga.

Invitation University of Leeds

Invitation University of Birmingham

Invitation University of Toronto

2023

Production and utilization of bioenergy-inception and planning

Energy Partnership Program between Mexico (Jalisco) and Denmark

2023

Consultant

Agreement Local Consultant

Technical Report

Piloting the impact of protected agriculture in Mexico

Eco-Business Fund S.A., SICAV-SIF (Eco-Business I Sub-Fund) Citibank Europe plc (Luxembourg Branch

2023

Consultant

Activity No. 10/2022

https://drive.google.com/file/d/10FjxGPoeRd-QC_TpmInhwESVajAlMmO/view?usp=sharing

Hackathon: Hidrohack 2023. Development of artificial intelligence based predictive models of the water quality index that contribute to the monitoring strategy for the Rio Santiago sanitation

2023

German Agency for International Cooperation (GIZ)

Consultant

Reference number: 18.2251.9-038.00

A circular bioeconomy strategy for tequila vinasses management: Analyzing the effects of soil irrigation on physicochemical parameters and microbial communities.

2022

Challenge-Based Research Funding Program 2022. Tecnológico de Monterrey.

Project ID: E026 - EIC-GI01 - A-T15 - D.

https://tec.mx/sites/default/files/inline-files/Call%20for%20proposals_2022.pdf

Assessing the ecological and public health risks caused by the presence of persistent and emerging pollutants in Santiago River sediments.

2022

Challenge-Based Research Funding Program 2022. Tecnológico de Monterrey.

Project ID: E049 - EIC-GI01 - A-T9 – D.

https://tec.mx/sites/default/files/inline-files/Call%20for%20proposals_2022.pdf

Circularity of microalgae-based wastewater treatment applied for the treatment of anaerobically digested livestock waste for climate change mitigation: a pilot scale prototype including bioflocculation, pollutants removal, and biomass harvesting

2022

Challenge-Based Research Funding Program 2022. Tecnológico de Monterrey.

Project ID: E010 - EIC-GI01 - A-T11 – E.

https://tec.mx/sites/default/files/inline-files/Call%20for%20proposals_2022.pdf

Determination of the ideal conditions for the use of tequila vinasses for irrigation.

2021-2022

The Innovation, Science and Technology Ministry of the State of Jalisco (SICYT by its acronym in Spanish) and the Science and Technology State Council (COECyTJAL by its acronym in Spanish) through Jalisco's Scientific Development Found (FODECIJAL by its acronym in Spanish). Project 9784-2021.

https://www.coecytjal.org.mx/Plataforma/app/views/2021/FODECIJAL2021/Publicaci%C3%B3n%20de%20Resultados_FODECIJAL.pdf

Development of a decision support system based on multi-criteria based on water quality monitoring to identify priority areas for attention and prioritize the actions to be carried out in the upper basin of the Santiago River.

2021-2022

The Innovation, Science and Technology Ministry of the State of Jalisco (SICYT by its acronym in Spanish) and the Science and Technology State Council (COECyTJAL by its acronym in Spanish) through Jalisco's Scientific Development Found (FODECIJAL by its acronym in Spanish). Project 9784-2021.

https://www.coecytjal.org.mx/Plataforma/app/views/2021/FODECIJAL2021/Publicaci%C3%B3n%20de%20Resultados_FODECIJAL.pdf

Diagnosis of the environmental performance of the berry supply chain in the state of Jalisco and generation of a strategy for the transition towards a sustainable model based on circular bioeconomy schemes.

2021-2022

The Innovation, Science and Technology Ministry of the State of Jalisco (SICYT by its acronym in Spanish) and the Science and Technology State Council (COECyTJAL by its acronym in Spanish) through Jalisco's Scientific Development Found (FODECIJAL by its acronym in Spanish). Project 9748-2021.

https://www.coecytjal.org.mx/Plataforma/app/views/2021/FODECIJAL2021/Publicaci%C3%B3n%20de%20Resultados_FODECIJAL.pdf

Predictive support system for the recovery and comprehensive management of the upper Santiago River basin based on machine learning tools.

2020 - 2021

The Innovation, Science and Technology Ministry of the State of Jalisco (SICYT by its acronym in Spanish) and the Science and Technology State Council (COECyTJAL by its acronym in Spanish) through Jalisco's Scientific Development Found (FODECIJAL by its acronym in Spanish). Project 8962-2020.

<http://www.coecytjal.org.mx/Plataforma/app/views/2020/FODECIJAL2020/Publicaci%C3%B3n%20ganadores%20FODECIJAL%202020.pdf>

Related publications

<https://www.mdpi.com/2073-4441/14/8/1235>

<https://www.mdpi.com/2073-4441/14/11/1687>

Valorization of agricultural and livestock waste produced in the Lerma-Santiago basin for its potential use in biogas production.

2019 - 2021

The Innovation, Science and Technology Ministry of the State of Jalisco (SICYT by its acronym in Spanish) and the Science and Technology State Council (COECyTJAL by its acronym in Spanish) through Jalisco's Scientific Development Found (FODECIJAL by its acronym in Spanish). Project 7876-2019.

<https://www.coecytjal.org.mx/Plataforma/app/views/2019/FODECIJAL/Publicaci%C3%B3n%20de%20Resultados.pdf>

Related publications

<https://www.mdpi.com/2071-1050/13/14/8029>

Tequila vinasses as substrates to produce food additives with high protein value for monogastric animals.

2019 - 2021

The Innovation, Science and Technology Ministry of the State of Jalisco (SICYT by its acronym in Spanish) and the Science and Technology State Council (COECyTJAL by its acronym in Spanish) through Jalisco's Scientific Development Found (FODECIJAL by its acronym in Spanish). Project 7947-2019

<https://www.coecytjal.org.mx/Plataforma/app/views/2019/FODECIJAL/Publicaci%C3%B3n%20de%20Resultados.pdf>

Related publications

<https://doi.org/10.3389/fceng.2022.1013873>

<https://doi.org/10.1016/j.biombioe.2022.106471>

<https://doi.org/10.3389/fenvs.2021.682093>

Diagnosis and development of a proposal for mosquito (*Culicidae*) population mitigation and control at the Guadalajara International Airport influence polygone.

2019

Tecnológico de Monterrey and the Pacific's Airport Group (GAP by its acronym in Spanish)

https://drive.google.com/file/d/1feCINz9_IBLppz_HCd3cXT6oLAS62NRw/view?usp=sharing

Diagnosis of Food Loss and Waste in Jalisco

Executive Director of Environmental Protection and Management/Coauthor

[Technical Report.pdf](#)

2019

Monitoring and assessment of the main water quality parameters in Lake Cajititlán to determine the cause of massive fish death.

2018

Tecnológico de Monterrey and the Center for Research and Assistance in Technology and Design of the State of Jalisco (CIATEJ for its acronym in spanish).

https://drive.google.com/file/d/1wvODnAEX_rJYeynUOsaQz327nTYHZ1Ri/view?usp=sharing

Graduate students

Manuel García Becerra / CVU 786209 / Doctoral Degree in Biotechnology at Tecnológico de Monterrey

Residues management and circular economy models en production lines of agave in Jalisco.

2025 (Start)

Juan Daniel Castanier Rivas / CVU 2050702 / Doctoral Degree in Biotechnology at Tecnológico de Monterrey

Inoculum optimization of anaerobic digestions through microbiome engineering for the codegradation of agroindustrial waste and emergent contaminants.

2024 (Start)

Sofía Hernández Morales / CVU / Doctoral Degree in Biotechnology at Tecnológico de Monterrey

2024 (Start)

María Fernanda Ramos Reyes / CVU 1277055 / Master's in Science with Specialization in Biotechnology at Tecnológico de Monterrey

Circular economy: Tequila vinasse treatment for upcycling and downcycling.

[Graduation Certificate.pdf](#)

2022 - 2024

Carlos Daniel García López / CVU 1191992 / Doctoral Degree in Biotechnology at Tecnológico de Monterrey

Decision-support system for energy self-sufficient wastewater treatment plants: integrating life cycle assessment to support investment allocation.

2023 (Start)

Fernanda E. Ibarra-Esparza / CVU 1151405 / Doctoral Degree in Biotechnology at Tecnológico de Monterrey

Co-digestion of relevant agro-industrial waste streams through clustered anaerobic digestion systems for distributed energy generation.

2023 (Start)

Luis Fernando Amador / CVU 1048083/ Doctoral Degree in Biotechnology at Tecnológico de Monterrey

2022 (Start)

Development of technological tools for monitoring water quality and communication of information related to Rio Santiago

Anaid López Sánchez/ CVU 1047919/ Doctoral Degree in Engineering Sciences at Tecnológico de Monterrey

2022 (Start)

A life cycle assessment towards sustainable production chains of berries in Jalisco

Gary Ossmar Lara Topete/ CVU 1045534/ Doctoral Degree in Engineering Sciences at Tecnológico de Monterrey

2022 (Start)

Life cycle sustainability Assessment of priority waste streams generated in the Metropolitan Area of Guadalajara: baseline and potential circular economy scenarios.

Diego Diaz Vazquez/ CVU 1007688/ Doctoral Degree in Biotechnology at Tecnológico de Monterrey

2021 to DATE

Development of a decision support system based on multi-criteria algorithms to identify areas of attention and prioritize actions for the restoration of the Santiago River Basin.

Alberto Fernández del Castillo Barrón/CVU 966466/ Doctoral Degree in Biotechnology at Tecnológico de Monterrey

2021 to 2024

Environmental assessment of urban rivers through a Dual Lens approach: Machine Learning based Water Quality and Metagenomic Characterization of Contamination Effects.

[Graduation certificate.pdf](#)

Marycarmen Verduzco Garibay/ CVU 966473/ Doctoral Degree in Biotechnology at Tecnológico de Monterrey

2021 to DATE

Bacteria and arbuscular mycorrhiza dynamics in soils irrigated with raw, and neutralized tequila vinasses: Effects on environmental parameters and microbial communities.

Fernanda E. Ibarra-Esparza/ CVU 1151405/ Master's in Engineering Sciences at Tecnológico de Monterrey

2021 to 2023

A micro-and macro-scale look at the biochemical methanogenic potential of the organic fraction of municipal solid waste generated in a large city of a developing country.

Best thesis awarded with the “Rómulo Garza” award 2023.

https://repositorio.tec.mx/bitstream/handle/11285/651833/IbarraEsparza_TesisMaestriaFpdfa.pdf

María Fernanda Palafox Sola/CVU 922107/ Master of Science in Biotechnological Innovation at Tecnológico de Monterrey

2019 - 2022

Modeling growth kinetics and community interactions in microalgal monocultures and co-cultures for bioremediation of anaerobically digested swine wastewater

<https://hdl.handle.net/11285/649747>

Gary Ossmar Lara Topete/ CVU 1045534/ Master's in Engineering Sciences at Tecnológico de Monterrey

2019 - 2021

Integrated environmental assessment of municipal solid waste management scenarios in the Guadalajara Metropolitan Area, Mexico

<https://repositorio.tec.mx/handle/11285/645993>

Anaid López Sánchez/ CVU Master of Science in Biotechnological Innovation at Tecnológico de Monterrey

2019 - 2021

Microalgae-based livestock wastewater treatment and resource recovery: A circular bioeconomy approach

Diego Diaz Vazquez/ CVU 1007688 Master's Degree in Biotechnology at Tecnológico de Monterrey

2019 - 2021

Development of circular bioeconomy strategies for the integrated management of Tequila Vinasses

Best thesis awarded with the “Rómulo Garza” award 2021.

<https://repositorio.tec.mx/handle/11285/647344>

Alberto Fernández del Castillo Barrón/ / CVU 966466/ Master's Degree in Biotechnology at Tecnológico de Monterrey

2019 - 2020

Mathematical Modelling of a Domestic Wastewater Treatment System Combining a Septic Tank, an Up flow Anaerobic Filter, and a Constructed Wetland

<https://repositorio.tec.mx/handle/11285/645214>

Marycarmen Verduzco Garibay/ CVU 966473/ Master´s Degree in Biotechnology at Tecnológico de Monterrey

2019 - 2020

Characterization of the spatial variations in the structure and diversity of microbial communities within and between the stages of a wastewater treatment plant based on passive methods.

<https://repositorio.tec.mx/handle/11285/639377>

Courses taught at Tecnológico de Monterrey

Advanced topics on sustainable development

2022, 2024

Leadership for sustainable development, Master class

2020, 2021, 2022

Analysis of transport phenomena

2021, 2022, 2023, 2024

Sustainable use of water, Bachelor class

2020

Bioprocess engineering, Bachelor class

2018- 2020

Thermodynamics, Bachelor class

2018-2020

Conferences

United Nations Climate Change Conferences

COP 29

Participation as an Observer, Baku, Azerbaijan.

[COP 29 Acknowledgement as Observer.pdf](#)

2024

COP 28

Participation as an Observer, Dubai, United Arab Emirates.

2023

COP 27

Participation as an Observer, Sharm el-Sheikh, Egypt.

<https://www.youtube.com/watch?app=desktop&v=n2zNJlsbLak>

2022

Workshop: Desing of the Action for a Sustainable Future

Organizer. Workshop with decision makers of state entities of environmental and water management.

2025

IEEE Global Engineering Education Conference 2025

Invited speaker with the topic:

“Circular Economy, Bioeconomy and Systems thinking in PhD Biotechnology Education.”

“Shaping plastic pollution perspectives of biotechnology students in a competence-based learning course vis systems thinking”

“A comprehensive exploration of Circular Economy and Bioeconomy principles in graduate Bioengineering Education”

London, United Kingdom.

[EDUCON 25 Summary](#)

[Certificate EDUCON 2025](#)

2025

Tec Science Summit

Invited to the panel of high impact multidisciplinary research projects with the topic: “Tecno-economic modelling of climate policies: analysis of the Mexican case.”

Monterrey, NL, Mexico.

[Diploma](#)

2025

Seminar: Understanding microbial communities: a metagenomic approach with applications for freshwater ecosystems

Invited speaker.

Baylor University, Waco, TX, US.

[Invitation Letter](#)

2025

National Biologist's Day at University of Guadalajara

Panel participante with the topic: "The impact of unsustainable practices in Jalisco's biodiversity"

[National Biologist's Day](#)

2025

International Book Fair – Guadalajara 2024

Speaker with the topics:

“Circularity for the Environmental Evaluation of waste streams generated by the Tequila industry”

“Warming is coming: Planet Earth in an endless summer”

Guadalajara, Mexico

[International Book Fair 1](#)

[International Book Fair 2](#)

2024

14th European Symposium on Biochemical Engineering Sciences

Speaker with the topic: “Maximizing energy production from agri-industrial and municipal wastes in Jalisco: analysis of feedstock effects on the biogas yield of anaerobic co-digestions.”

Denmark Technical University, Denmark.

[Programa ESBES 2024 Dinamarca.pdf](#)

2024

British Council-Tec de Monterrey Alliance visit

Organizer.

Guadalajara, Mexico

[British Council-TEC GDL.pdf](#)

2024

Civil Engineering PGR-led Conference

Speaker with the topic: “Recovery of nutrients from wastewater and safe reuse in agriculture using microalgae: A novel circular bioeconomy approach.”

University of Leeds, Leeds, United Kingdom

[UoL Civil Engineering PGR-led Conference.pdf](#)

2024

Natural Environment Research Council (NERC) Digital Gathering 2024

Poster presenter on the topic: “Development of a digital platform for water quality management and communication in Mexico”

[Email - NERC-2024.pdf](#)

2024

Agri-food International Congress of Jalisco (CIA 2024)

Organizer and Panel participant with the topic: Circular economy, sustainability and water in the Agave-Tequila and Livestock industries

Evaluator of the Agrodatathon: Exploiting the power of data for future proof agrifood systems in the age of artificial intelligence.

[CIA 2024.jpg](#)

2024

Robert Gordon University visit to Tec de Monterrey: Available master’s programs

Organizer

2024

Synergy Forum

Panel speaker and organizer

[Diploma Synergy Forum](#)

2024

Innovation in Engineering for Sustainability, University of Illinois

Conference speaker with the topic: “Circular economy in action: Case studies from the sustainability and climate change laboratory.”

Webinar

[Innovation_Engineering_Symposium.pdf](#)

2024

Seminar: The future of energy

Organizer and conference speaker.

Guadalajara, Mexico.

[Invitación Seminario Técnico GE 2024 Jalisco Preliminar.pdf](#)

2024

First Nacional Dialogue Forum about the Carbon Border Adjustment Mechanism (CBAM) of the European Union in Mexico.

Organizer and panel participant as Leader of the Sustainability and Climate Change HUB at Tecnológico de Monterrey

Guadalajara, Mexico

[Nota logística_Dialogo CBAM_GDL_Misael Gradilla ITESM \(1\).pdf](#)

2024

International Conference on Algal Biomass, Biofuels and Bioproducts (AlgalBBB 2024)

Co-author and invited as conference speaker with the topic:

“Life-cycle assessment of microalgae-based wastewater treatment pilot unit for enhancing livestock industry’s circular bioeconomy.”

Clearwater, FL., USA.

[Invitation Letter](#)

2024

IEEE Global Engineering Education Conference

Co-author and invited as conference speaker with the topic:

“Shaping Plastic Pollution Perspectives of Biotechnology Students in a Competence-Based Learning Course via Systems Thinking”

Kos, Greece.

[Presented Work](#)

2024

International Conference on Basic Sciences, Engineering and Technology

Co-author and invited as conference speaker with the topic:

“Reshaping campus perceptions: Life Cycle Assessment as a catalyst for embedding sustainability in waste management.”

Alanya, Turkey.

[Diploma and Abstract](#)

2024

8th Green and Sustainable Chemistry Conference

Co-author and invited as conference speaker with the topics:

“Technical feasibility of biochar from maize stover as a replacement of granulated activated carbon in water filters”

“Harnessing filamentous fungi and yeast through circular bioeconomy treatment of tequila vinasses”

“Distribution and ecological risk of heavy metals in Santiago River sediments”

Dresden, Germany

2024

Strategic Curricular Mapping: innovating Graduate Programs and Enhancing Mexican Educational Partnerships

Webinar Organizer

[Diploma](#)

2024

XX National Congress of Biotechnology and Bioengineering

Co-author and invited speaker with the topics:

“Biogas generation potential of anaerobic co-digestion of agro-industrial waste generated in the State of Jalisco.”

“Implementation of principal component analysis with geographic weight for spatial assessment of water quality of Santiago River.”

“Environmental impact evaluation of the protected production of blueberry through life cycle assessment: Insights from a developing country.”

“Life cycle assessment of Agave fiber reinforced composites and biocomposites: The case of Jalisco.”

“Development of software for sensors for determination of water quality in the Santiago River”

“Predictive modeling of the water quality index of the Santiago River”

“Valorization of Tequila vinasses through a treatment with yeasts and filamentous fungi.”

“Valorization of livestock residue through anaerobic digestion and microalgae treatment.”

“Tequila vinasses application *in situ* as a soil property enhancer.”

“Antibiotic resistance genes in a hypereutrophic subtropical lake in Jalisco, Mexico.”

“Bacterial characterization of a playa lake in Mexico.”

Ixtapa-Zihuatanejo, Mexico

2023

Lunch Talk at Alexander von Humboldt Institut für Internet und Gesellschaft

Invited as speaker with the topic: “AI, Predictive Modeling and Sustainability.”

Berlin, Germany.

2023

Editor’s Conclave on the Global Rise of Thirsty Cities: Challenges and opportunities

Invited as panel speaker with the topic.

Guadalajara, Mexico.

2023

Mexico Carbon Forum

Panel Participant with the Topic: “Solutions based in technology: the transition towards a cleaner economy and emission reduction permanence.”

Querétaro, Querétaro, México.

[Dia 2 | Mexico Carbon Forum](#)

2023

Bioenergy Congress: “The role of bioengineering in the Mexican decarbonation”

Speaker with the topic: “Exploitation of methanogenic potential of solid and agro-industrial waste generated in the State of Jalisco.”

<https://youtu.be/fhhXnJ8rhHc?si=IKCPmGrqVAEKiQmW>

2023

Regional forum of digital transformation

Invited as panel speaker with the topic: “Climate action and technology: a call for action.”

Mexico City, Mexico.

2023

7th Green & Sustainable Chemistry Conference 2023

2023

Invited as conference speaker with the topic: "Microalgae-based swine wastewater treatment (MbWT): a complete treatment unit for circular bioeconomy."

Dresden, Germany.

[Access to the conference recall of this research](#)

7th Green & Sustainable Chemistry Conference 2023

2023

Invited as conference speaker with the topic: "Analyzing scenarios for organic waste management in a Mexican city: context-specific solutions based on life cycle assessment."

Dresden, Germany.

[Access to the conference recall of this research](#)

7th Green & Sustainable Chemistry Conference 2023

2023

Invited as conference speaker with the topic: "Environmental impact evaluation of protected blueberry production through life cycle assessment: Insights from a developing country."

Dresden, Germany.

[Access to the conference recall of this research](#)

7th Green & Sustainable Chemistry Conference 2023

2023

Invited as conference speaker with the topic: "Life cycle assessment of the management of Agave bagasse from the tequila industry to reinforce plastic composites."

Dresden, Germany.

[Access to the conference recall of this research](#)

The International Society for Ecological Modelling Global Conference 2023

2023

Invited as a conference speaker with the topic: “Modelling community interactions and growth kinetics in microalgal mono- and co-cultures for bioremediation of swine wastewater.”

Scarborough, Canada.

CIIE International Conference on Educational Innovation

2023

Panel participant. Topic: “Closing the gap between research and practice in climate action.”

Multi-stakeholder Dialogue- Artificial intelligence and sustainability.

2023

Event organized by the Alexander von Humboldt Institute for Internet and Society (HIIG) and the Digital Transformation Center (DTC) of Mexico GIZ.

Conference speaker with the topic: “AI and Sustainability in Mexico: The case of water quality management”

Mexico City, México.

Water Week@tec

2023

Conference speaker with the topic: “Real challenges, science-based solutions: Sustainability and Climate Change Laboratory”

Guadalajara, Jalisco, México.

[Water Week@Tec](#)

9th International Conference on Educational Innovation of the Monterrey Institute of Technology and Higher Education

Conference speaker with the topic: “Closing the gap between research and practice for climate action” Monterrey, Nuevo León, Mexico.

<https://drive.google.com/file/d/1ikzH9unyjUJ6FK0VwuC9nL5bDJgVBi06/view?usp=sharing>

2023

Climate labs network reunion

2022

Participant as member of the ITESM Sustainability and Climate Change Lab. Nancy, France.

**International Congress of the FEMSA Biotechnology Center: XV Years of
Biotechnological Evolution and Innovation**

2022

Conference speaker with the topic: “Modeling growth kinetics and community interactions in microalgal cultures for bioremediation of anaerobically digested swine wastewater”. Monterrey, Nuevo León, Mexico.

Energy Congress Jalisco

2022

Panel participant. Topic: “Future fuels”. Guadalajara, Jalisco Mexico.

<https://aeej.jalisco.gob.mx/cej2022/>

Mexico Carbon Forum

2022

Panel participant. Topic: “The integral vision of Jalisco for the implementation of public policy”. Zapopan, Jalisco, Mexico.

<https://www.youtube.com/watch?v=q5bjL3-MCRk>

<https://www.mexicocarbon.com/>

Mexico Carbon Forum

2022

Panel participant. Topic: “The academy as an ally in the decision-making process regarding climate change and adaptation”. Zapopan, Jalisco, Mexico.

<https://www.youtube.com/watch?v=14M9PMgxZfM>

<https://www.mexicocarbon.com/>

National Ethanol Conference: Zeroing in on New Opportunities

2022

Attendee. New Orleans, Louisiana, USA.

Semana Nórdica

2021

Panel participant. Topic: "Resource efficiency solutions: Recycled and biologically based products". Digital event.

<https://www.sostenibilidadnordica.mx/>

Volunteer Environmental Compliance Processes Diplomat Program (at CUCEA, University of Guadalajara)

2021

Facilitator of the "Water Quality" module. Zapopan, Jalisco, Mexico.

50 Anniversary of the Mechanical and Electrical Engineers College of the State of Jalisco (CIMEJ, for its acronym in Spanish)

2020

Panel participant. Topic: "Responsible waste management". Guadalajara, Jalisco, Mexico.

Alliance for Climate Action in the AMG.

2020

Panel participant. Topic: "Residues and Covid-19 in the AMG". Digital event.

Seminar of the Advanced Studies Program in Sustainable Development and Environment (LEAD Mexico)

2019

Conference speaker with the topic: "Transverse issues and Social Development". Guadalajara, Jalisco, Mexico.

Environment and Climate Change Forum of the State of Jalisco

2019

Panel participant. Topic: "Environmental impacts of food management". Guadalajara, Jalisco, Mexico.

V Symposium of Biochemical Engineering

2019

Conference speaker with the topic: "Bioprocesses with environmental applications". Lagos de Moreno, Jalisco, Mexico.

XXV National Conference on Hydraulics

2018

Conference speaker with the topic: “Preliminary study of the water quality index in Lake Cajititlán and its massive fish death predictive potential”. Mexico City, Mexico.

Second IFAC Conference on Modelling, Identification and Control of Nonlinear Systems

2018

Conference speaker with the topic: “Differential Neural Network Identifier for Parameter Determination of a Mixed Microbial Culture Model”. Guadalajara, Jalisco, Mexico.

VI National Conference of Limnology

2014

Conference speaker with the topic: “Bioaccumulation patterns of Cd, Cu, Se and Zn in tissues of cultivated catfish (*Ictalurus punctatus*) used as active biomonitor in lake Chapala, México”. Mexico City, Mexico.

XXXI AMIDIQ National Meeting (AMIDIQ is the acronym in spanish for Mexican Academy of Research and Teaching in Chemical Engineering)

2013

Conference speaker with the topic: “Carp and catfish as heavy metals biomonitors in Lake Chapala, Mexico”. Mazatlán, Sinaloa, Mexico.

First scientific-technologic innovation forum for the sustainable fishing and aquaculture production in the State of Jalisco.

2013

Conference speaker with the topic: “Metal accumulation in catfish in Lake Chapala”. Guadalajara, Jalisco, Mexico.

Courses completed

Emerging contaminants in Water: Challenges and solutions

CADI. ITESM Guadalajara Campus.

CertificateOfCompletion.pdf

2024

Life Cycle Assessment and Use of SimaPro

CADI. ITESM Guadalajara Campus.

2214cSP01_MisaelSebastian.pdf

2022

Agroindustrial residues biodigestion

CADI. ITESM Guadalajara Campus. Anaero technology company and researchers from York University.

CertificateOfCompletion (5).pdf

2022

Use of SimaPro: Life Cycle Assessment

CADI. ITESM Monterrey Campus.

CertificateOfCompletion (7).pdf

2022

The abundance cycle: accelerating sustainable development

CADI. ITESM Guadalajara Campus.

2017

SuperPro Designer Training Course

CADI. ITESM Monterrey Campus.

2017

Sustainable frontiers: competencies for leading change through sustainable innovation

2016

CADI. ITESM Guadalajara Campus.

Sustainable frontiers in an era of global challenges: unlocking change through leadership and innovation.

2016

CADI. ITESM Guadalajara Campus.

Innovation and Sustainability Workshop.

2015

CADI. ITESM Guadalajara Campus.

Systems Thinking towards sustainable development of corporations.

2015

CADI. ITESM Guadalajara Campus.

Good laboratory practice

2015

Nao Consultores

Background in Educational Sciences

Education related publications

González-López, M. E., Barajas-Álvarez, P., **Gradilla-Hernández, M. S., (2024)**. Shaping Plastic Pollution Perspectives of Biotechnology Students in a Competence-Based Learning Course via Systems Thinking. *2024 IEEE Global Engineering Education Conference*. <https://doi.org/10.1109/EDUCON60312.2024.10578923>

Barajas-Alvarez, P., González-López, M. E., Sylveira-Leon, G., **Gradilla-Hernández, M. S.**, García-Cayuela, T., (2024). Life Cycle Assessment as a Catalyst for Embedding Sustainability in Waste Management Practices. *The Eurasia Proceedings of Science, Technology, Engineering & Mathematics*. 28, 308–316.

<http://dx.doi.org/10.55549/epstem.1521952>

Gradilla-Hernández, M. S., Senés-Guerrero C., García-Gamboa R. (2023). Developing key competencies for sustainable development in a university orchard: students perspectives. In: Conference proceedings of the 9th International Conference on Educational Innovation of the Monterrey Institute of Technology and Higher Education (Published in spanish as: Desarrollando competencias clave para el Desarrollo sostenible en un huerto universitario: perspectivas de los Estudiantes. En: Memorias del 4º Congreso Internacional de Innovación Educativa del Tecnológico de Monterrey). ITESM Monterrey Campus.
<https://drive.google.com/file/d/1Z43wLNIJqJC21TfyxbQvXh-FAE2X8nUH/view?usp=sharing>

Wood-Caballero, M. W., León-Morán, R. M., Sánchez-Ruano, D, **Gradilla-Hernández, M. S.** & Encinas-Soto, A. (2022). Sustainable vision in the Guadalajara Campus. In: The university as a co-creator of the future. (Published in Spanish as Visión sostenible en el Campus Guadalajara. En: La universidad como cocreadora del future), TIRANT HUMANIDADES, Ciudad de México, ISBN: 978-84-19376-20-6.

Aceves-Ávila, C. D. and **Gradilla-Hernández, M. S.** (2017). Education in the XXI century: multi, inter and transdisciplinary and the promotion of the capabilities for sustainable development. In: state Government of Jalisco (Eds.) State Plan for the Education and Environmental Culture of the State of Jalisco, Chapter 2 (pp. 37-39). (Published in spanish as: La educación del siglo XXI: multi, inter y transdisciplinariedad y la promoción de capacidades para el desarrollo sustentable. En: *Plan de Educación y Cultura Ambiental del Estado de Jalisco, Capítulo 2*). Jalisco, Mexico. ISBN 978-607-97786-9-9.

Gradilla-Hernández, M. S. (2017). Biotechnology in the community: creating a sustainable action plan. In: Conference proceedings of the 4th International Conference on Educational Innovation of the Monterrey Institute of Technology and Higher Education (Published in spanish as: Biotecnología en la comunidad: generando un plan de acción sustentable. En: Memorias del 4º Congreso Internacional de Innovación Educativa del Tecnológico de Monterrey). ITESM Monterrey Campus.

Gradilla-Hernández, M. S. (2017). Contribution of the academic disciplines to the development of competences for sustainable development in students: the perspective of the faculty members (Published in spanish as: Contribución de las disciplinas académicas al desarrollo de competencias para el desarrollo sostenible en los estudiantes: la perspectiva de los académicos).

Hernández-Yáñez, M.L. y **Gradilla-Hernández, M. S.** (2015). Higher education for sustainable development. In: Conference Proceedings of the XXX Latin American Sociology Conference ALAS (Published in spanish as: Educación superior para el desarrollo sustentable. En: Memorias del XXX Congreso Latinoamericano de Sociología ALAS). Latin American Sociology Association. ISBN: 978-9968-9502-4-4.

Conferences

10th IEEE International Smart Cities Conference

Speaker with the Topic: Bridging Disciplines for Sustainability: Exploring Faculty Perspectives on Key Competencies for Sustainability

[Conference-a4-IEEE Gradilla Hernández.docx](#)

2024

4° International Conference on Educational Innovation of the Monterrey Institute of Technology and Higher Education

2017

Conference speaker with the topic: “Biotechnology in the community: creating a sustainable action plan”. Monterrey, Nuevo León, México.

XXX Latin American Sociology Conference ALAS

2015

Conference speaker with the topic: “Higher education for sustainable development”. San Jose, Costa Rica.

Courses completed

Educational Skills Development Program (PDHD for its acronym in Spanish)

2013

ITESM Guadalajara Campus.

Educational Orientation Counselling Program

2013

ITESM Guadalajara Campus.

Diploma course in Current Educational Trends

2013

ITESM Guadalajara Campus.

