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## Centro de Investigaciones Hidráulicas e Hidrotécnicas Artículos Científicos

| Título                                                                                                                                                                                              | Autores                                                                                                                                                                                                                                                                                         | Revista                                      | Año  | Enlace                                                                                                                                                                      |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------|------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 7Be atmospheric concentration in Panama City: influence of climatic conditions and atmospheric recovery process                                                                                     | Bernardo Fernández, Jimena Juri Ayub, Diego Valladares, Omayra Pérez, Nathalia Tejedor-Flores & Alexander Esquivel-López                                                                                                                                                                        | Isotopes in Environmental and Health Studies | 2025 | <a href="https://doi.org/10.1080/10256016.2025.2492862">https://doi.org/10.1080/10256016.2025.2492862</a>                                                                   |
| Percepción de riesgo y conocimiento popular sobre los crocodílidos (Caiman crocodilus y Crocodylus acutus) en comunidades ribereñas de las provincias de Veraguas y Chiriquí, Panamá, Centroamérica | Venegas-Anaya, M.; Tejedor-Flores, N.; Morcillo, F.; Perdices, A.; González Jaúregui, M.                                                                                                                                                                                                        | Revista Española de Desarrollo y Cooperación | 2025 | <a href="https://dx.doi.org/10.5209/redc.99599">https://dx.doi.org/10.5209/redc.99599</a>                                                                                   |
| Forecasting 7Be Concentrations Using Time Series Analysis: A Case Study of Panama City                                                                                                              | Alexander Esquivel-López, Bernardo Fernández, Omayra Pérez, Felipe Castillo, Nathalia Tejedor-Flores, Mitzi Cubilla-Montilla                                                                                                                                                                    | Atmosphere                                   | 2025 | <a href="https://doi.org/10.3390/atmos16091104">https://doi.org/10.3390/atmos16091104</a>                                                                                   |
| Novel island species elucidate a species complex of Neotropical crocodiles                                                                                                                          | Jose Avila-Cervantes, Pierre Charruau, J. Rogelio Cedeño-Vázquez, Hoai-Nam Bui, Miryam Venegas-Anaya, Marta Vargas, Marco A. López-Luna, Héctor González-Cortés, David A. Macías-Díaz, Jonathan S. Pérez-Flores, Gabriel Barrios-Quiroz, J. Miguel Salazar, W. Owen McMillan, Hans C.E. Larsson | Molecular Phylogenetics and Evolution        | 2025 | <a href="https://www.sciencedirect.com/science/article/pii/S1055790325000582?via%3Dihub">https://www.sciencedirect.com/science/article/pii/S1055790325000582?via%3Dihub</a> |
| Análisis de la Educación Climática en el Sector Marítimo Centroamericano: Construyendo Resiliencia desde el Abordaje Docente                                                                        | Dominici Arosemena, A., Jiménez Salgado, J. U., De Gracia Claude, L. C., Medina Monroy, B. D. C., y Herrera Castillo, M. E.                                                                                                                                                                     | Luna Azul                                    | 2025 | <a href="https://revistasojs.ucaldas.edu.co/index.php/lunazul/article/view/10833">https://revistasojs.ucaldas.edu.co/index.php/lunazul/article/view/10833</a>               |
| Development of a Coastal Erosion Monitoring Plan Using In Situ Measurements and Satellite Images                                                                                                    | Castro-Quintero, V.; Lima-Delgado, M.; Guerra-Chanis, G.                                                                                                                                                                                                                                        | Journal Applied Sciences                     | 2025 | <a href="https://www.mdpi.com/3618184">https://www.mdpi.com/3618184</a>                                                                                                     |



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| Workshop with Hydrogen Cells: A Pedagogical and Motivating Experience for the Study of Unconventional Forms of Energy Generation in Pre-School Students in Panama City | Milena Linette Zambrano Hernández, Jorge Serrano, Elsa Flores, Alejandrina Batista, Reinhardt Pinzón, Marta Álvarez, Jose Rogelio Fábrega Duque.                                                        | Sustainability                         | 2025 | <a href="https://doi.org/10.3390/su17094149">https://doi.org/10.3390/su17094149</a>                                                     |
| Tracing contamination in a tropical coastal reserve: A 210Pb-based reconstruction of trace element inputs in Playa La Marinera, Panama                                 | Alejandra Isabel Montero-Solano, Gisselle Guerra-Chanis, Samuel Tejeda-Vega, Ana Carolina Ruiz-Fernández, Graciela Zarazúa-Ortega, Libia Hascibe Pérez-Bernal, Joan-Albert Sanchez-Cabeza, Kathia Broce | Catena                                 | 2025 | <a href="https://doi.org/10.1016/j.catena.2025.109475">https://doi.org/10.1016/j.catena.2025.109475</a>                                 |
| Hydrogeochemical and Isotopic Evaluation of Heavy Metal Contamination in Rural Groundwater: A Case Study from Tonosí, Panama                                           | Dina Henríquez-Rivera, Yazmin L Mack-Vergara, Miguel Salceda-Gonzalez, Kathia Broce                                                                                                                     | Water                                  | 2025 | <a href="https://doi.org/10.3390/w17202918">https://doi.org/10.3390/w17202918</a>                                                       |
| Mapping Harmful Algae Blooms: The Potential of Hyperspectral Imaging Technologies                                                                                      | Fernando Arias, Maytee Zambrano, Edson Galagarza, Kathia Broce                                                                                                                                          | Remote Sensing                         | 2025 | <a href="https://doi.org/10.3390/rs17040608">https://doi.org/10.3390/rs17040608</a>                                                     |
| The Impact of a Mobile Laboratory on Water Quality Assessment in Remote Areas of Panama                                                                                | Jorge E Olmos Guevara, Kathia Broce, Natasha A Gómez Zanetti, Dina Henríquez, Christopher Ellis, Yazmin L Mack-Vergara                                                                                  | Sustainability                         | 2025 | <a href="https://www.mdpi.com/2071-1050/17/15/7096">https://www.mdpi.com/2071-1050/17/15/7096</a>                                       |
| Developing Coastal Resilience to Climate Change in Panama Through Sustainable Concrete Applications                                                                    | Kathleen J Castillo-Martínez, Gisselle Guerra-Chanis, Yazmin L Mack-Vergara                                                                                                                             | Journal of Composites Science          | 2025 | <a href="https://doi.org/10.3390/jcs9110575">https://doi.org/10.3390/jcs9110575</a>                                                     |
| Effects of cover crops on subsurface flow, total suspended solids (TSS), and phosphorus losses: a paired watershed study in Missouri Claypan soils                     | Miguel Salceda-Gonzalez, Ranjith P Udawatta, Lalith M Rankoth, Kelly A Nelson                                                                                                                           | Sustainable Water Resources Management | 2025 | <a href="https://link.springer.com/article/10.1007/s40899-025-01223-6">https://link.springer.com/article/10.1007/s40899-025-01223-6</a> |



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| Cover crop and tillage effects on soil microbial communities in a corn cropping system                                         | SS Mendis, RP Udawatta, MP Davis, B Gurmessa, M Salceda, ME Herget                                                                                                                                                                                                                              | Agrosystems, Geosciences & Environment | 2025 | <a href="https://doi.org/10.33412/idt.v20.1.3880">https://doi.org/10.33412/idt.v20.1.3880</a>                                                                     |
| Groundwater Nitrate-Nitrite Modeling in a Grazed Hillslope with Agroforestry and Grass Buffers                                 | Salceda-Gonzalez, M.; Udawatta, R.P.; Appold, M.S.                                                                                                                                                                                                                                              | Water                                  | 2025 | <a href="https://doi.org/10.3390/w17050608">https://doi.org/10.3390/w17050608</a>                                                                                 |
| SPH modelling of wave attenuation by an array of submerged resonators and vorticity generation mechanism                       | Lucas Calvo, Diana De Padova, Miguel Onorato, Paolo Pezzutto, Michele Mossa                                                                                                                                                                                                                     | Environmental Fluid Mechanics          | 2025 | <a href="https://link.springer.com/article/10.1007/s10652-025-10034-4">https://link.springer.com/article/10.1007/s10652-025-10034-4</a>                           |
| Protocol for the isolation and characterization of porcine brain region-associated extracellular particles                     | De Avila A, Diaz M, Cisterna BA, Castillo S, Lezana JP, Molino J, et al.                                                                                                                                                                                                                        | Plos One                               | 2025 | <a href="https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0329985">https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0329985</a> |
| A DNA Barcode Dataset for the Aquatic Fauna of the Panama Canal: Novel Resources for Detecting Faunal Change in the Neotropics | Saltonstall, K.; Collin, R.; Aguilar, C.; Alda, F.; Baldrich-Mora, L.M.; Bravo, V.; Castillo, M.F.; Castro, S.; De León, L.F.; Díaz-Ferguson, E.; et al.                                                                                                                                        | Data                                   | 2025 | <a href="https://doi.org/10.3390/data10070108">https://doi.org/10.3390/data10070108</a>                                                                           |
| Novel island species elucidate a species complex of Neotropical crocodiles                                                     | Jose Avila-Cervantes, Pierre Charruau, J. Rogelio Cedeño-Vázquez, Hoai-Nam Bui, Miryam Venegas-Anaya, Marta Vargas, Marco A. López-Luna, Héctor González-Cortés, David A. Macías-Díaz, Jonathan S. Pérez-Flores, Gabriel Barrios-Quiroz, J. Miguel Salazar, W. Owen McMillan, Hans C.E. Larsson | Molecular Phylogenetics and Evolution  | 2025 | <a href="https://doi.org/10.1016/j.ympev.2025.108341">https://doi.org/10.1016/j.ympev.2025.108341</a>                                                             |
| Altered intrusive rock detection through electrical resistivity tomography: The case of the San Luis area, Central Panama      | Mojica, A.; Ruiz, A.; Castrellón, M.; Fábrega, J.; Saavedra, S.; Salceda, M.; Ho, C.                                                                                                                                                                                                            | Andean Geology                         | 2024 | <a href="http://www.andeangeology.cl/index.php/revista1/article/view/V51n3-3734">http://www.andeangeology.cl/index.php/revista1/article/view/V51n3-3734</a>       |



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| Rice Husk-Based Insulators: Manufacturing Process and Thermal Potential Assessment                                                                        | Luis Cigarruista Solís, Miguel Chen Austin, Euclides Deago, Guillermo López, Nacari Marin-Calvo                                                  | Materials               | 2024 | <a href="https://www.mdpi.com/1996-1944/17/11/2589">https://www.mdpi.com/1996-1944/17/11/2589</a>                                                         |
| Enhanced Biological Nitrate Removal from Groundwater in Humid Tropical Regions Using Corn Cob-Based Permeable Reactive Barriers: A Case Study from Panama | Graciela Cecilia Sánchez Hidalgo, Maria De Los Ángeles Ortega, Euclides Deago                                                                    | Water                   | 2024 | <a href="https://www.mdpi.com/2073-4441/16/12/1668">https://www.mdpi.com/2073-4441/16/12/1668</a>                                                         |
| Effect of Biochar on Anaerobic Co-Digestion of Untreated Sewage Sludge with Municipal Organic Waste under Mesophilic Conditions                           | Joisleen Ramírez, Euclides Deago, Arthur Mc Carty James Rivas                                                                                    | Energies                | 2024 | <a href="https://www.mdpi.com/1996-1073/17/10/2393">https://www.mdpi.com/1996-1073/17/10/2393</a>                                                         |
| Integration of Isotopic and Nuclear Techniques to Assess Water and Soil Resources Degradation. A Critical Review                                          | José L Peralta Vital, Lucas E Calvo Gobbetti, Yanna Llerena Padrón, Francisco Heriberto Martínez Luzardo, Oscar Díaz Rizo, Reinaldo Gil Castillo | Applied Sciences        | 2024 | <a href="https://www.mdpi.com/2076-3417/14/20/9189">https://www.mdpi.com/2076-3417/14/20/9189</a>                                                         |
| Estimación de captura de carbono en parques urbanos del corregimiento de Rufina Alfaro, Panamá                                                            | Isabella V García-Zuleta, Manual A García González, Nathalia Tejedor-Flores, Mitzi Cubilla-Montilla                                              | Revista I+D Tecnológico | 2024 | <a href="https://revistas.utp.ac.pa/index.php/id-tecnologico/article/view/4060">https://revistas.utp.ac.pa/index.php/id-tecnologico/article/view/4060</a> |
| Influencia de variables cinéticas en la producción de biogás evaluada con un modelo matemático simplificado.                                              | Erick A Ortiz, Yeraldin L González, Marian Ramírez, Euclides Deago                                                                               | Revista I+D Tecnológico | 2024 | <a href="https://revistas.utp.ac.pa/index.php/id-tecnologico/article/view/4056">https://revistas.utp.ac.pa/index.php/id-tecnologico/article/view/4056</a> |
| Fitorremediación y biogás: un enfoque integral para la sostenibilidad del agua                                                                            | Euclides Deago, Kairós Chung, Sara Patiño, Marian Ramirez, Arthur James                                                                          | Revista I+D Tecnológico | 2024 | <a href="https://revistas.utp.ac.pa/index.php/id-tecnologico/article/view/4057">https://revistas.utp.ac.pa/index.php/id-tecnologico/article/view/4057</a> |
| Enhanced Biological Nitrate Removal from Groundwater in Humid Tropical Regions Using Corn Cob-Based Permeable Reactive Barriers: A Case Study from Panama | Graciela Cecilia Sánchez Hidalgo, Maria De Los Ángeles Ortega, Euclides Deago                                                                    | Water                   | 2024 | <a href="https://www.mdpi.com/2073-4441/16/12/1668">https://www.mdpi.com/2073-4441/16/12/1668</a>                                                         |



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| Codigestión Anaeróbica de Lodos y Residuos Orgánicos Municipales en Clima Tropical                                                                               | Marian Michelle Ramírez González, Euclides Manuel Deago De León, Lizenith Luque, Nayelis Pitty, Judith Arias, Angelica Chen | Revista I+D Tecnológico | 2024 | <a href="https://revistas.utp.ac.pa/index.php/id-tecnologico/article/view/3902">https://revistas.utp.ac.pa/index.php/id-tecnologico/article/view/3902</a> |
| Mural interactivo: estrategia pedagógica para promover el reciclaje en estudiantes de la región de Panamá Norte                                                  | Jorge Enrique Serrano-Reyes, Maria Luisa Singh Gustavino, Marta Alvarez, Milena Zambrano, Miguel Castelló Sosa              | Prisma Tecnológico      | 2024 | <a href="https://revistas.utp.ac.pa/index.php/prisma/article/view/3799">https://revistas.utp.ac.pa/index.php/prisma/article/view/3799</a>                 |
| Impacto de la ampliación del Canal de Panamá en las confiabilidades hídrica y de calado                                                                          | Lucas Calvo Gobbetti, Kevin Ríos Córdoba                                                                                    | Revista I+D Tecnológico | 2024 | <a href="https://revistas.utp.ac.pa/index.php/id-tecnologico/article/view/3880">https://revistas.utp.ac.pa/index.php/id-tecnologico/article/view/3880</a> |
| Open growth of oak species in a corn/soybean alley cropping agroforestry for watershed protection                                                                | Ranjith P Udawatta, Sidath S Mendis, Miguel Salceda, Lalith M Rankoth, Chamara Weerasekera                                  | Agroforestry Systems    | 2024 | <a href="https://link.springer.com/article/10.1007/s10457-023-00937-w">https://link.springer.com/article/10.1007/s10457-023-00937-w</a>                   |
| Design, Development and Testing of a Monitoring System for the Study of Proton Exchange Fuel Cells and Stacks                                                    | Zambrano H, M.L.; Calderón, A.J.; Calderón, M.; González, J.F.; Pinzón, R.; Fábrega Duque, J.R.                             | Sensors                 | 2023 | <a href="https://www.mdpi.com/1424-8220/23/11/5221">https://www.mdpi.com/1424-8220/23/11/5221</a>                                                         |
| Comparing Two Methods of Leaf Area Index Estimation for Rice (Oryza sativa L.) Using In-Field Spectroradiometric Measurements and Multispectral Satellite Images | Serrano Reyes, J.; Jiménez, J.U.; Quirós-McIntire, E.I.; Sanchez-Galan, J.E.; Fábrega, J.R.                                 | AgriEngineering         | 2023 | <a href="https://www.mdpi.com/2624-7402/5/2/60">https://www.mdpi.com/2624-7402/5/2/60</a>                                                                 |
| A Machine Learning-Based Approach to Estimate Energy Flows of the Mangrove Forest: The Case of Panama Bay                                                        | Brooks, J.; Rivera, A.; Chen Austin, M.; Tejedor-Flores, N.                                                                 | Sustainability          | 2023 | <a href="https://www.mdpi.com/2071-1050/15/1/664">https://www.mdpi.com/2071-1050/15/1/664</a>                                                             |
| Application of the Compound-Specific Stable Isotopes (CSSI) Technique to                                                                                         | Vital, J.L.P.; Calvo, L.; Gil,R.; Padrón, Y.L.; Broce, K.;Franco-Ábrego, A.K.                                               | Applied Sciences        | 2023 | <a href="https://www.mdpi.com/2076-3417/13/21/11736">https://www.mdpi.com/2076-3417/13/21/11736</a>                                                       |



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|---------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------|------------------------------------------|------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|
| Evaluate the Contributions of Sediment Sources in the Panama Canal Watershed                                        |                                                                                                                                   |                                          |      |                                                                                                                                                                                             |  |
| Agroforestry buffers on nitrogen reduction in groundwater on a grazed hillslope                                     | Salceda, M.; Udawatta, R.P.; Anderson, S.H.; Mendis, S.S.; Liu, F.                                                                | Agrosystems, Geosciences and Environment | 2023 | <a href="https://access.onlinelibrary.wiley.com/doi/10.1002/agg2.20370">https://access.onlinelibrary.wiley.com/doi/10.1002/agg2.20370</a>                                                   |  |
| Factors contributing to morning rain in the upper Río Chagres Basin, Panamá                                         | Ishizaki Noriko N. , Nakaegawa Toshiyuki , Pinzón Reinhardt , Sasaki Hidetaka                                                     | Frontiers in Earth Science               | 2023 | <a href="https://www.frontiersin.org/journals/earth-science/articles/10.3389/feart.2023.1105013">https://www.frontiersin.org/journals/earth-science/articles/10.3389/feart.2023.1105013</a> |  |
| Assessment of soil respiration process in a mangrove swamp of Panama's Bay                                          | Gómez, Natasha Alejandra Rodríguez, Lilisbeth López Serrano, Francisco Ramón Pinzón, Reinhardt                                    | Heliyon                                  | 2023 | <a href="https://www.sciencedirect.com/science/article/pii/S2405844023053975?via%3Dihub">https://www.sciencedirect.com/science/article/pii/S2405844023053975?via%3Dihub</a>                 |  |
| Probing radiation resistance in simulated metallic core-shell nanoparticles                                         | D.R. Tramontina, O.R. Deluigi, R. Pinzón, J. Rojas-Nunez, F.J. Valencia, R.C. Pasianot, S.E. Baltazar, R.I. Gonzalez, E.M. Bringa | Computational Materials Science          | 2023 | <a href="https://www.sciencedirect.com/science/article/abs/pii/S0927025623002987?via%3Dihub">https://www.sciencedirect.com/science/article/abs/pii/S0927025623002987?via%3Dihub</a>         |  |
| Agroforestry on runoff nitrogen and phosphorus losses from three paired watersheds after 25 years of implementation | Miguel Salceda-Gonzalez, Ranjith P Udawatta, Stephen H Anderson                                                                   | Agroforestry Systems                     | 2023 | <a href="https://link.springer.com/article/10.1007/s10457-023-00932-1">https://link.springer.com/article/10.1007/s10457-023-00932-1</a>                                                     |  |
| Agroforestry on runoff nitrogen and phosphorus losses from three paired watersheds after 25 years of implementation | Miguel Salceda-González, Ranjith P. Udawatta, Stephen H. Anderson                                                                 | Agroforestry Systems                     | 2023 | <a href="https://link.springer.com/article/10.1007/s10457-023-00932-1">https://link.springer.com/article/10.1007/s10457-023-00932-1</a>                                                     |  |



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| Precipitation interpolation, autocorrelation, and predicting spatiotemporal variation in runoff in data sparse regions: Application to Panama                                  | Varadarajan,S. , Fábrega, J. , Leung, B.                                                                                                  | Journal of Hydrology: Regional Studies | 2022 | <a href="https://www.sciencedirect.com/science/article/pii/S2214581822002658?via%3Dihub">https://www.sciencedirect.com/science/article/pii/S2214581822002658?via%3Dihub</a> |
| Radiation resistance in simulated metallic core-shell nanoparticles                                                                                                            | D.R. Tramontina , O.R. Deluigi , R. Pinzón , J. Rojas-Nunez , F.J. Valencia , R.C. Pasianot , S.E. Baltazar , R.I. Gonzalez , E.M. Bringa | Cornel University                      | 2022 | <a href="https://arxiv.org/abs/2206.09063">https://arxiv.org/abs/2206.09063</a>                                                                                             |
| Evaluación de estrategias para reducir la huella ecológica en edificaciones residenciales en clima tropical                                                                    | Pineda-Sosa, F., Borggooff, M., Tejedor-Flores, N., Mora, D., & Chen-Austin, M.                                                           | Revista I+D Tecnológico                | 2022 | <a href="https://revistas.utp.ac.pa/index.php/id-tecnologico/article/view/3650">https://revistas.utp.ac.pa/index.php/id-tecnologico/article/view/3650</a>                   |
| Diagnóstico de acueductos rurales abastecidos de fuentes subterráneas: caso de estudio El Calabacito, Provincia de Herrera, Panamá                                             | Melgar, Y., Deago, E. and Tejedor-Flores N.                                                                                               | Revista I+D Tecnológico                | 2022 | <a href="https://revistas.utp.ac.pa/index.php/id-tecnologico/article/view/3256">https://revistas.utp.ac.pa/index.php/id-tecnologico/article/view/3256</a>                   |
| Analyzing Spanish-Language Public Sentiment in the Context of a Pandemic and Social Unrest: The Panama Case. International Journal of Environmental Research and Public Health | Arias F, Guerra-Adames A, Zambrano M, Quintero-Guerra E, Tejedor-Flores N.                                                                | Int. J. Environ. Res. Public Health    | 2022 | <a href="https://www.mdpi.com/1660-4601/19/16/10328">https://www.mdpi.com/1660-4601/19/16/10328</a>                                                                         |
| Assessment of sediment profiles applying nuclear techniques: use of a nucleonic gauge in Panama Canal watershed                                                                | Sánchez, X., Hoo, H., Brisset, P. and Pinzón, R.                                                                                          | Nuclear Engineering and Technology,    | 2022 | <a href="https://www.sciencedirect.com/science/article/pii/S1738573322003047">https://www.sciencedirect.com/science/article/pii/S1738573322003047</a>                       |
| Time-lapse electrical resistivity tomography for assessment of seasonal moisture variations in a tropical regolith                                                             | Mojica, A., Duarte, B., Vergara, F., Pinto-Núñez, M., Pinzón, R., Pérez, J., Castrellón, M., Ho. C. and Gómez, M.                         | Hydrological Research Letters          | 2022 | <a href="https://www.istage.ist.go.jp/article/hrl/16/1/16_18/article">https://www.istage.ist.go.jp/article/hrl/16/1/16_18/article</a>                                       |



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| Comparison of Environmental Impact Assessment Methods in the Assembly and Operation of Photovoltaic Power Plants: A Systematic Review in the Castilla—La Mancha Region | Zarzavilla, M., Quintero, A., Abellán M., López Serrano, F., Chen, M. and Tejedor-Flores, N.                                                         | Energies                                                    | 2022 | <a href="https://www.mdpi.com/1996-1073/15/5/1926">https://www.mdpi.com/1996-1073/15/5/1926</a>                                                                                     |
| Metodología de autoevaluación institucional de la gestión ambiental en el contexto de educación superior público de Panamá.                                            | Tejedor De León, E., Araya, R., y Tejedor-Flores, N.                                                                                                 | Revista Especializada De Ingeniería Y Ciencias De La Tierra | 2022 | <a href="https://revistas.up.ac.pa/index.php/REICIT/article/view/2608">https://revistas.up.ac.pa/index.php/REICIT/article/view/2608</a>                                             |
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