Geoinformation Conference 2025: Preface

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Geoinformation is a fundamental pillar of data science that has become relevant for its effectiveness in understanding the territory, understanding, monitoring and managing complex environmental, urban and social systems. Earth observation, photogrammetry, remote sensing, spatial data infrastructures and geospatial analysis are becoming more and more widely integrated and accepted in decision-making every day, as they support these decisions with evidence that helps disaster risk reduction, climate change adaptation, urban resilience and sustainable development. Through geospatial frameworks, interoperable data architectures or innovative analytical methods, governments are becoming increasingly accountable, as are other international organizations and research institutions, all of which require better information to face global challenges, as well as the interconnectedness of local phenomena.

In the last 40 years, geoinformation has evolved in each of its facets from data capture and acquisition, processing, modeling and analysis, as well as the visualization and dissemination of information. This progress has been significant and can be obtained from multiple sources and scales, as well as dimensions (3D or 4D), through artificial intelligence or GeoAI. In addition, this data can be historical or captured in real-time monitoring systems, whose adoption is increasingly easy to find, accessible, interoperable and reusable. Despite all these advances, the reality is that there are still great challenges for geoinformation such as the efficient integration of heterogeneous data, semantic harmonization, analytical scalability, the ethical development of artificial intelligence, equitable access and quality of spatial data, etc. These challenges are particularly important and greater for regions of rapid urbanization, and with the most vulnerable populations.

The Geoinformation Conference 2025 was conceived to address these challenges by convening an international and interdisciplinary community of researchers, practitioners, policymakers, and students. The conference was jointly organised as the 26th National SELPER Mexico Congress, the 16th International Conference on Geoinformation for Disaster Management (Gi4DM), and the SELPER International XI Central America and Caribbean Geospatial Education Workshops. Held in Mérida, Yucatán, Mexico, from 24 to 28 November 2025, the event provided a forum for exchanging state-of-the-art research, operational experiences, and emerging ideas in geoinformation science.

The scientific program of the Conference consisted of keynote lectures, round tables and specialized workshops for members of SELPER, ISPRS and the general public. The presentations were given by experts in the areas of geomatics and disaster risk management. From China, Professor Deren Li, who is a member of both the Chinese Academy of Sciences and the Chinese Academy of Engineering, masterfully presented the "Spatio-Temporal Intelligence for the SDGs", addressing the main advances in geomatics, mobile mapping and machine learning, as well as their implications for global development. On the other hand, Dr. Orhan Altan (Turkey) presented the paper "International Cooperation for Disaster Risk Reduction", showing his great experience in digital photogrammetry, spatial information systems and international risk management initiatives. Professor Alik Ismail-Zadeh pronounced "Earthquakes: Yes; Disasters – No: Rethinking the relationship between hazards, risks and society", offering a systemic perspective based on Earth sciences, seismology and global scientific cooperation. Dr. Sisi Zlatanova (UNSW Sydney) presented "3D Analysis for Disaster Management", highlighting her pioneering work in 3D modeling, BIM–GIS integration and international standardization efforts such as IndoorGML.

Las jornadas de educación de Centroamérica y el Caribe formaron parte importante del programa, con la participación de la Dra. María Antonia García quien expuso la ponencia llamada "Creciente Vocación Geoespacial: Aprendizaje y Uso de Geotecnologías desde la Primera Edad", haciendo hincapié en la importancia de la alfabetización geoespacial y el desarrollo temprano de capacidades. Por su parte, la Dra. Luz Ángela Rocha presentó "Transferencia de conocimiento como estrategia dentro del ecosistema geoespacial", reflejando su liderazgo en Sudamérica a través de SELPER Colombia, así como sus contribuciones al fortalecimiento de la educación en geomática y teledetección.

The last days of the program were dedicated to the XXVI SELPER National Congress, where the keynote speeches were given by Dr. Jean-François Mas who offered the presentation "Mapping the Mexican territory: a journey from foundational maps to collaborative platforms", addressing the advances in environmental monitoring and open-source spatial analysis. While Dr. Azucena Pérez Vega presented "Geoinformation for Water Resources Monitoring: The Case Study of the Solis Dam, Guanajuato, Mexico", highlighting the impacts of land use and changes in land cover on water availability under climate change. Another final component for the SELPER National Congress in the program were the practical workshops that offered the strengthening of the specialized technical skills of the members, through an Intermediate Geocomputing in R course, taught by Inder Tecuapetla, which emphasized the analysis and processing of geospatial data using advanced computational tools. In addition to the workshop Modeling of the Use of the Solo and Changes in the Cover of the Solo Using Dinamica EGO, led by Azucena Pérez Vega, focused on modeling land use and changes in land cover through dynamic and prospective approaches.

Through a rigorous blind-pair process, 22 complete articles comprise this volume of the Annals of Photogrammetry, Remote Sensing, and Space Information Sciences. In total, 4 countries submitted their original works, which are: Mexico (16 articles), China (1), Spain (2) and Australia (1). The review authors worked to assess scientific quality, originality, methodological soundness and relevance. In a process of strengthening the manuscripts by authors and co-authors, in response to the professional and detailed comments of the reviewers, ensuring high standards of clarity, rigor and impact. Each article that was accepted reflects the diversity and maturity of research in the area of geoinformation, encompassing methodological advances, applied case studies and integrative frameworks. These final papers, which are published, demonstrate not only the growing role of geospatial science in supporting disaster risk reduction, sustainable urban development and environmental management in diverse geographical and socio-economic contexts, but also the participation of young researchers and graduate students, underscoring the importance of sustained investment in education, mentoring and international cooperation.

The editors are grateful for the time invested by the reviewers, whose experience and constructive evaluations ensured the scientific quality of this volume, mentioning each of them as follows: Aguilar Cruz, Rogelio (Mexico); Amy, Karam (Australia); Ashenif Melese, Abraham (Ethiopia); Bodum, Lars (Denmark); Clementini, Eliseo (Italy); Carrión, Daniela (Italy); Guerra Cobián, Víctor Hugo (Mexico); Guilbert, Eric (Canada); Nguyen, Huong Thi Thanh (Vietnam); Iyyanki, Murali Krishna Venkata (India); Rendón Santillán, Jojene (Philippines); Ley García, Judith (Mexico); Li, Songnian (Canada); Liu, Chang (United States); Scaioni, Marco (Italy); Breunig, Martin (Germany); Panidi, Evgeny (Russia); Pérez Martínez, Mariana (Mexico); Pirasteh, Saied (China); Rodríguez González, Kevin David (Mexico); Stouffs, Rudi (Singapore); Kemec, Serkan (Turkey); Zlatanova, Sisi (Australia); Solórzano Villegas, Jonathan Vidal (Mexico); Vázquez Rodríguez, Dariela Amaranta (Mexico); Vega Aguilar, Aylet (Mexico); Yépez, Fabiola (Mexico).

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The editors hope that this volume of the Annals will serve as a valuable reference that inspires future research and collaborations towards a more resilient, sustainable and informed world through geoinformation science, and especially motivates more Latin American countries to join these efforts.