OPEN ACCESS Freely available online

Journal of Geology & Geophysics

Commentary

Advancements in Geological Hazard Identification through Oblique Photogrammetry Techniques

Ahmed Soliman*

Department of Geology, Mansoura University, Mansoura, Egypt

DESCRIPTION

Geological hazards pose significant threats to human life, infrastructure, and the environment. Identifying and monitoring these hazards is important for effective risk management and mitigation. In recent years, advancements in remote sensing technologies have revolutionized geological hazard identification. Among these, oblique photogrammetry has emerged as a powerful technique that offers detailed and precise three-dimensional information about geological features. This article explores the principles and applications of oblique photogrammetry in the context of geological hazard identification.

Oblique photogrammetry involves the acquisition of images from different perspectives, providing a three-dimensional view of the terrain. Unlike traditional aerial photography, which captures images solely from a vertical perspective, oblique photogrammetry integrates images taken at various angles. This technique utilizes multiple sensors or cameras to capture a scene, enabling the creation of detailed 3D models.

Principles of oblique photogrammetry in geological hazard identification

Enhanced terrain visualization: Oblique photogrammetry provides a more comprehensive visualization of the terrain compared to traditional methods. By capturing images from multiple angles, it allows for a detailed examination of geological formations, enabling geologists to identify potential hazards such as landslides, rockfalls, and slope instabilities.

Precise topographic mapping: The three-dimensional models generated through oblique photogrammetry offer precise topographic mapping. This level of accuracy is essential for understanding the topography of an area prone to geological hazards, aiding in the identification of vulnerable zones and potential triggers for hazards.

Change detection and monitoring: Oblique photogrammetry is not a one-time data collection method; it allows for continuous monitoring of geological features. By periodically capturing and analyzing images, geologists can detect changes in the landscape, such as ground movements, erosion, or the development of fissures, indicating potential geological hazards.

Applications in geological hazard identification

Landslide analysis: Oblique photogrammetry has proven to be particularly effective in landslide analysis. By capturing high-resolution images from various angles, this technique enables the identification of precursory signs of landslides, such as soil displacement and slope deformations.

Rockfall assessment: In regions prone to rockfalls, oblique photogrammetry assists in assessing the stability of rock formations. The detailed 3D models allow geologists to analyze potential fracture lines, rock mass properties, and identify areas susceptible to rockfall events.

Slope stability studies: Slope instability is a common geological hazard, especially in hilly or mountainous regions. Oblique photogrammetry aids in slope stability studies by providing accurate topographic information, allowing for the identification of factors contributing to instability, such as soil composition and structural weaknesses.

Urban planning and risk mitigation: Beyond geological research, oblique photogrammetry has practical applications in urban planning and risk mitigation. By identifying areas at risk of geological hazards, city planners can make informed decisions to minimize potential damage and ensure public safety.

Oblique photogrammetry has emerged as a valuable tool in geological hazard identification, providing detailed and accurate three-dimensional information about the terrain. The enhanced visualization, precise mapping, and continuous monitoring capabilities of this technique contribute significantly to the understanding and mitigation of geological hazards. As technology continues to advance, the integration of oblique photogrammetry into geological research and risk management practices is likely to increase, fostering a safer and more resilient approach to living in hazard-prone environments.

Correspondence to: Ahmed Soliman, Department of Geology, Mansoura University, Mansoura, Egypt, E-mail: soliman.ah78@gmail.com

Received: 24-Oct-2023, Manuscript No. JGG-23-28447; **Editor assigned:** 26-Oct-2023, PreQC. No. JGG-23-28447 (PQ); **Reviewed:** 09-Nov-2023, QC. No. JGG-23-28447; **Revised:** 16-Nov-2023, Manuscript No. JGG-23-28447 (R); **Published:** 23-Nov-2023, DOI: 10.35248/2381-8719.23.12.1157.

Citation: Soliman A (2023) Advancements in Geological Hazard Identification through Oblique Photogrammetry Techniques. J Geol Geophys. 12:1157.