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THE ROLE AND CHALLENGES OF EARTH OBSERVATION IN THE BEIRUT EXPLOSION
ASSESSMENT AND RELIEF RESPONSE

Abstract

The catastrophic Beirut explosion brought to light the critical role of Earth Observation (EO) data in disaster assessment and relief efforts, marking a pivotal moment for the technology's application in real-world crises. In the immediate aftermath, EO data and satellite imagery became indispensable tools, providing vital initial insights regarding the extent of damage, its distribution across the city, and its environmental effects. This influx of satellite information was instrumental in facilitating essential dissemination efforts to evaluate and address the damages incurred from the explosion, steering first responders, search and rescue operations, and tracking the recovery process. This episode also highlighted the urgent need for stringent regulations and effective coordination mechanisms among governments, civil society, and the private sector to harness EO technology optimally and ensure timely decision-making. The deployment of satellite imagery from platforms such as Sentinel-2, Pleiades, and KhalifaSat post-explosion exemplified how advanced technologies can significantly enhance disaster response efforts, underscoring EO data's invaluable contribution to managing such emergencies.

Further examination within this study, launched by the Space Law and Policy Project Group at the Space Generation Advisory Council (SGAC), delves into the domestic and international legislation

governing satellite usage and data sharing, pointing to an acute need for more comprehensive legislation and clear policies that align with legal and ethical standards. This review of domestic laws, international agreements, principles, and guidelines serves to inform and facilitate the use of EO in humanitarian responses, while also addressing the legal and technological hurdles that may emerge. Given the dual-use nature of EO technology and the intricate rights entangled within this domain, the conclusion drawn is a call for a more fortified legal and regulatory framework. This framework would enhance the application of EO technology in the wake of humanitarian disasters like the Beirut explosion. Recommendations include establishing explicit guidelines for international cooperation and finding an equilibrium between privacy concerns and humanitarian needs. Existing legal foundations offer a basis for developing specific legislation to advance the effective and efficient utilization of EO data in disaster management, paving the way for a more resilient and informed response to future crises.