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MANAGING SPACE AS A GLOBAL COMMONS

Abstract

To prepare for a changing space economy, stakeholders seek to establish policies to manage various resources. The question "is space a global commons?" is fundamental to these policy decisions. If space is a global commons or a domain containing common pool resources (CPRs), policies and cooperative agreements may be necessary to preserve resource use. If space is not a common resource, other models involving private rights and sovereignty may come into play, which could lead to increased competition and risk of conflict.

The landscape of outer space utilization and exploration is expanding from primarily scientific research to include economic outcomes, and private-sector space technology is experiencing exponential growth. The future of space exploration likely includes additional space stations, exploration of other planets, and in-situ resource utilization. Mismanagement of space could result in Kessler syndrome or monopolies of rare space resources. These changes in the space economy demand consideration of space as a global commons. However, perspectives on space as a global commons vary widely and have economic, legal, and political implications.

Beginning with Lloyd and Hardin, we examine commons criteria and apply them to terrestrial and extraterrestrial domains. Using a rivalry and excludability continua we show differences between three separate space domains (earth orbit, celestial bodies, and interplanetary space) and consider the present and predicted demand and capacity for these domains. We further compare space domains to common pool resources on earth including the oceans, atmosphere, and Antarctica. We evaluate space domain management using Ostrom's institutional analysis. Identifying management deficiencies, we show where additional policy is required. Considering commons management strategies already in place like the Antarctic Treaty, UNCLOS, and climate agreements, we identify possible solutions and risks. We also consider hybrid management approaches with conventional commons management, limited privatization, and novel governance concepts like the New Zealand Te Urewera Act (2014) as proposed by Tepper and Whitehead. Finally, we make the case for dynamic management strategies to accommodate a changing space economy.