



Marine Governance Trade-offs: A Functional Analysis of Global Management Approaches

Author Information

Authors: Phil James and Ben Milligan

Affiliation: UNSW Centre for Sustainable Development Reform

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Summary

The contemporary ocean faces escalating conflicts between conservation imperatives and economic development, with traditional single-sector management proving inadequate for mediating complex trade-offs among fishing, shipping, energy production, and ecosystem protection. Here we present a functional typology that deconstructs marine governance systems—including Ecosystem-Based Management, Marine Spatial Planning, and Integrated Coastal Zone Management—into their fundamental design features rather than relying on generic labels. Through comparative analysis of governance approaches across 15 national and sub-national case studies, we identify critical mismatches between governance architectures and trade-off types that explain systematic policy failures. We find that technical optimization tools succeed only when matched with appropriate institutional capacity and political legitimacy; for instance, quantitative Marine Spatial Planning in Massachusetts prevented over \$1 million in losses to incumbent sectors while generating \$10 billion in energy value, yet similar approaches failed in contexts lacking robust data infrastructure or stakeholder trust. Our analysis reveals that procedural justice and incentive alignment are stronger predictors of governance success than technical sophistication alone. These findings suggest that effective marine governance requires diagnostic frameworks that match institutional designs to specific trade-off characteristics rather than universal best-practice approaches.

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Keywords

Marine governance, trade-offs, ecosystem-based management, marine spatial planning, integrated coastal zone management, stakeholder engagement, conservation-development conflicts, procedural justice, ocean policy

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