

# A SYNTHESIS OF OPPORTUNITIES FOR APPLYING THE TELECOUPLING FRAMEWORK TO MARINE PROTECTED AREAS

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The world's oceans face unprecedented anthropogenic threats in the globalized era that originate from all over the world, including climate change, global trade and transportation, and pollution. Marine protected areas (MPAs) serve important roles in conservation of marine biodiversity and ecosystem resilience, but their success is increasingly challenged in the face of such large-scale threats. Here, we illustrate the utility of adopting the interdisciplinary telecoupling framework to better understand effects that originate from distant places and cross MPA boundaries (e.g., polluted water circulation, anthropogenic noise transport, human and animal migration). We review evidence of distal processes affecting MPAs and the cutting-edge approaches currently used to investigate these processes. We then introduce the umbrella framework of telecoupling and explain how it can help address knowledge gaps that exist due to limitations of past approaches that are centered within individual disciplines. We then synthesize five examples from the recent telecoupling literature to explore how the telecoupling framework can be used for MPA research. These examples include the spatial subsidies approach, adapted social network analysis, telecoupled qualitative analysis, telecoupled supply chain analysis, and decision support tools for telecoupling. Our work highlights the potential for the telecoupling framework to better understand and address the mounting and interconnected socioeconomic and environmental sustainability challenges faced by the growing number of MPAs around the world.

**PRESENTER BIO:** Christian J. Rivera is a PhD student studying tropical ecology, conservation, and development at the University of Florida. His research interests include analysis of coupled human and natural systems, endangered species conservation, and biocultural diversity and conservation. BA: Princeton University '14; MA: Columbia University '18.