

Title: **Cointegration: A tool for Ecosystem-Based Conservation and Management of Fisheries**

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Abstract: Species within marine ecosystems are known to be interconnected. This is a result of many factors including predation and competition for resources. Despite this, many fisheries are still managed using a single species framework. This paper uses cointegration analysis to quantify the relationship between different fish species. Cointegration is a method for examining how time series variables that are integrated (e.g.,  $I(0)$  or long memory fractional) and move together. Using data from Northern Anchovy, Pacific Sardines, and Albacore Tuna off the California coast, a vector error correction model is estimated which shows a statistically significant relationship between anchovy and tuna harvests. Results suggest financial gains from accounting for external effects between these two fisheries and provide an economic justification for ecosystem based management.