

**What four years of ecosystem modeling using historical data has told us about changes to the Northwestern Atlantic ecosystem**

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This project focused on identifying changes to the Northwestern Atlantic ecosystem over the past four centuries that may be limiting current fisheries yields. To accomplish this we have modelled abundances of key forage species and time-series of catch data. Species specific work identified how fishing-induced changes in size structure and habitat loss reduce connectivity of adjacent ecosystems. Ecosystem modeling suggests these effects have had widespread effects on commercially and ecologically important species, generally leading to lower productivity. Further, these changes have reduced deterministic dynamics, even though presence of nonlinear signatures is prevalent in species prior to heavy industrial exploitation. The overarching conclusion from this work is that human activities have reduced ecosystem connectivity, productivity and are thus having legacy effects on current fisheries yields. If ecosystem-based management is to be successful, disconnected trophic dynamics need to be addressed in fisheries management targets.

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