

# Department of Marine Ecosystems and Society Abess Center for Ecosystem Science and Policy Seminar Series

## Grandfathering with Anticipation

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**Abstract:** To overcome the tragedy of the commons, natural resources such as fisheries, forests, and groundwater are increasingly regulated with environmental markets where extraction rights are traded across users. Implementing an environmental market requires an initial allocation of rights, which are almost always "grandfathered" in proportion to historical extraction. We ask how grandfathering alters extraction incentives, welfare, and resource stocks before the market goes into place. We show that if users anticipate a future market where rights will be grandfathered, this creates a strong incentive to over-extract before the market goes into effect; this lowers both welfare and resource stocks to points that are potentially much worse than even the completely unregulated equilibrium. We then show that this same incentive can be reversed. We derive an alternative allocation rule that rewards prudence from the past; this significantly improves on unregulated outcomes, and can even replicate first-best, market-like extraction years before the market is actually implemented. We apply this theory to a structural model of a hypothetical, but plausible, property rights system regulating fishing activity of the universe of 4,039 individually-tracked industrial fishing vessels on the high seas. We estimate that compared to an unregulated setting, the expectation of future grandfathering lowers welfare by 50% and stocks by 45%, but that by implementing our proposed allocation rule, these results reverse so welfare increases by 15% and stocks increase by 18% relative to the unregulated state.

**Bio:** Dr. Costello is a professor of Environmental and Resource Economics at the Bren School of Environmental Science & Management, at UC Santa Barbara. He holds a Ph.D. in Agricultural and Resource Economics from UC Berkeley, a M.S. in Agricultural and Resource Economics from Oregon State University, and a B.S. in Environmental Economics and Policy from UC Berkeley.

His research concerns natural resource management and property rights under uncertainty, with a particular emphasis on information, its value, and its effect on management decisions. His work combines theoretical work from economics with empirical analysis, often to inform policy. Dr. Costello's topical interests include fisheries management, biological diversity, introduced species, regulation of polluting industries, and marine policy.

