

Integrating Marine Protected Areas and Spatial Catch Shares

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Seafood Summit: Paris

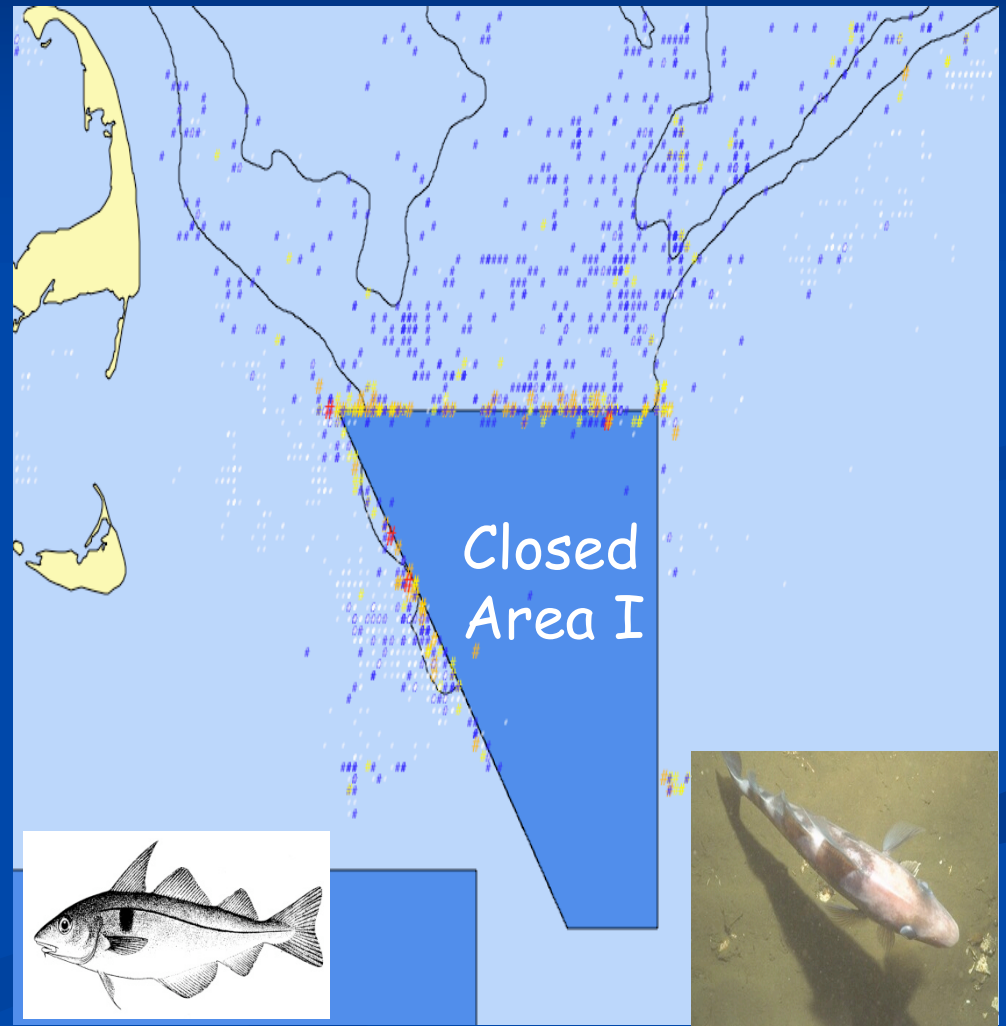
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MPAs vs. TURFs

- Fisheries as a “commons” problem
- Conservationists favor MPAs
 - Focus on sustaining populations regardless of fisheries management
 - Increase in abundance inside MPAs
 - E.g. Cuba, US, Belize, Australia, Chile, New Zealand
- Spatial catch shares (“TURFs”)
 - Managed by cooperatives or communities - exclusive access
 - Provide incentives to steward resource within TURF
 - E.g. Japan, Chile, Mexico, Australia

MPAs Can't Solve the Problem

- MPAs can solve the “fish” problem, but cannot solve the “fisheries” problem
- Closed area reduces fishing
- Fishing pressure increases outside
- Mixed results on fishery



TURFs Can't Solve the Problem

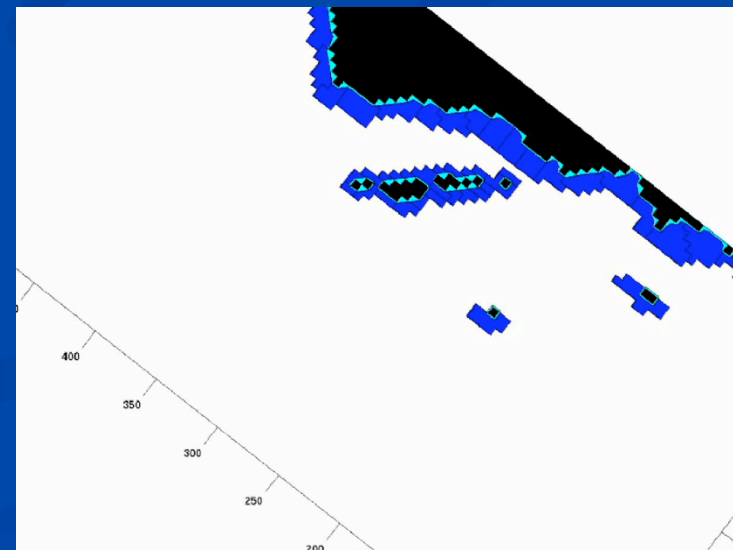
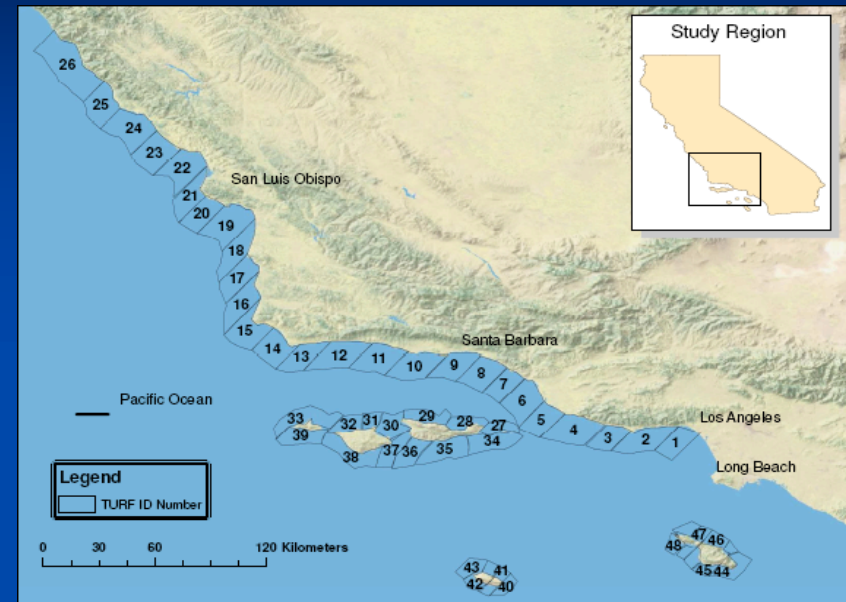
- Exclusive access to community or coop.
- Provides incentive to manage for long-run benefits
- Larval and adult connectivity creates coordination problem

Baja California, Mexico



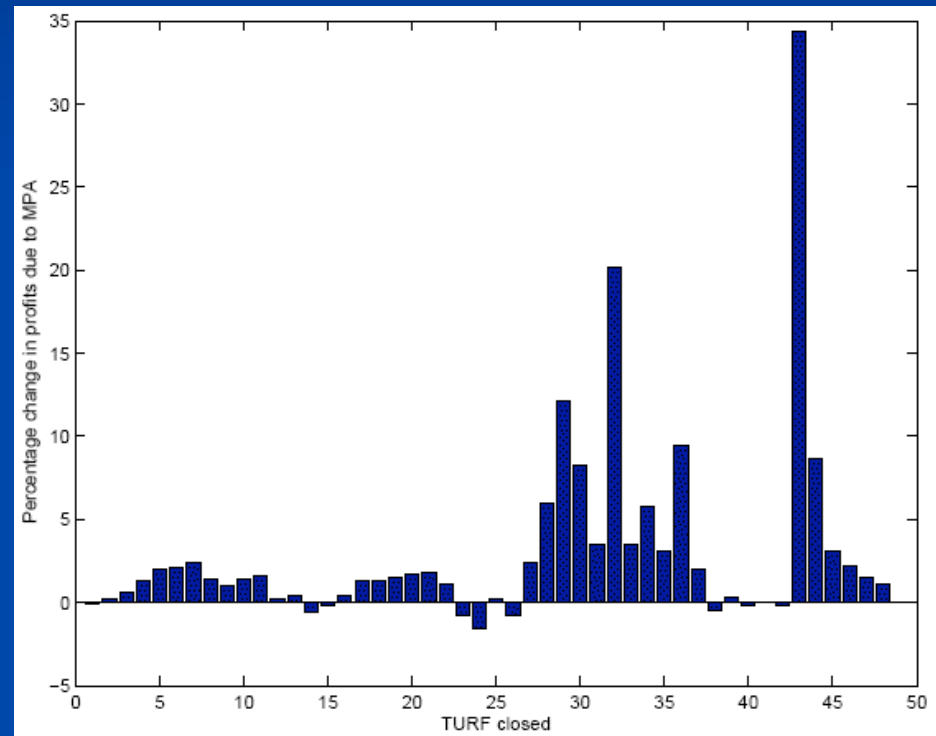
Jointly Siting MPAs & TURFs

- Modeling analysis
 - Oceanography, Ecology, Economics
 - Ocean Circulation, Metapopulation, Game Theory
- “TURFs” managed by communities
- Coordination Problem
 - Spillover creates spatial externality
 - Leads to excessive harvest



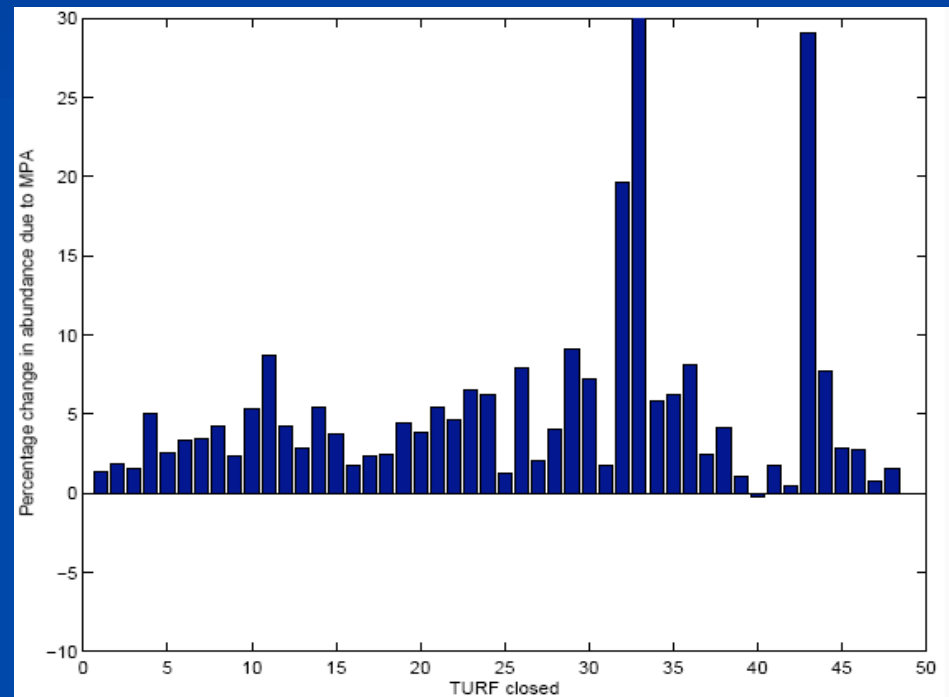
Effects on Fisheries Production

- Turn patch into an MPA
- Zero profit in closed TURF
- Spillover to “connected” TURFs...Overall effect?
- Profit increases in 85% of cases – large increases
- When decreases, losses are very small (2%)

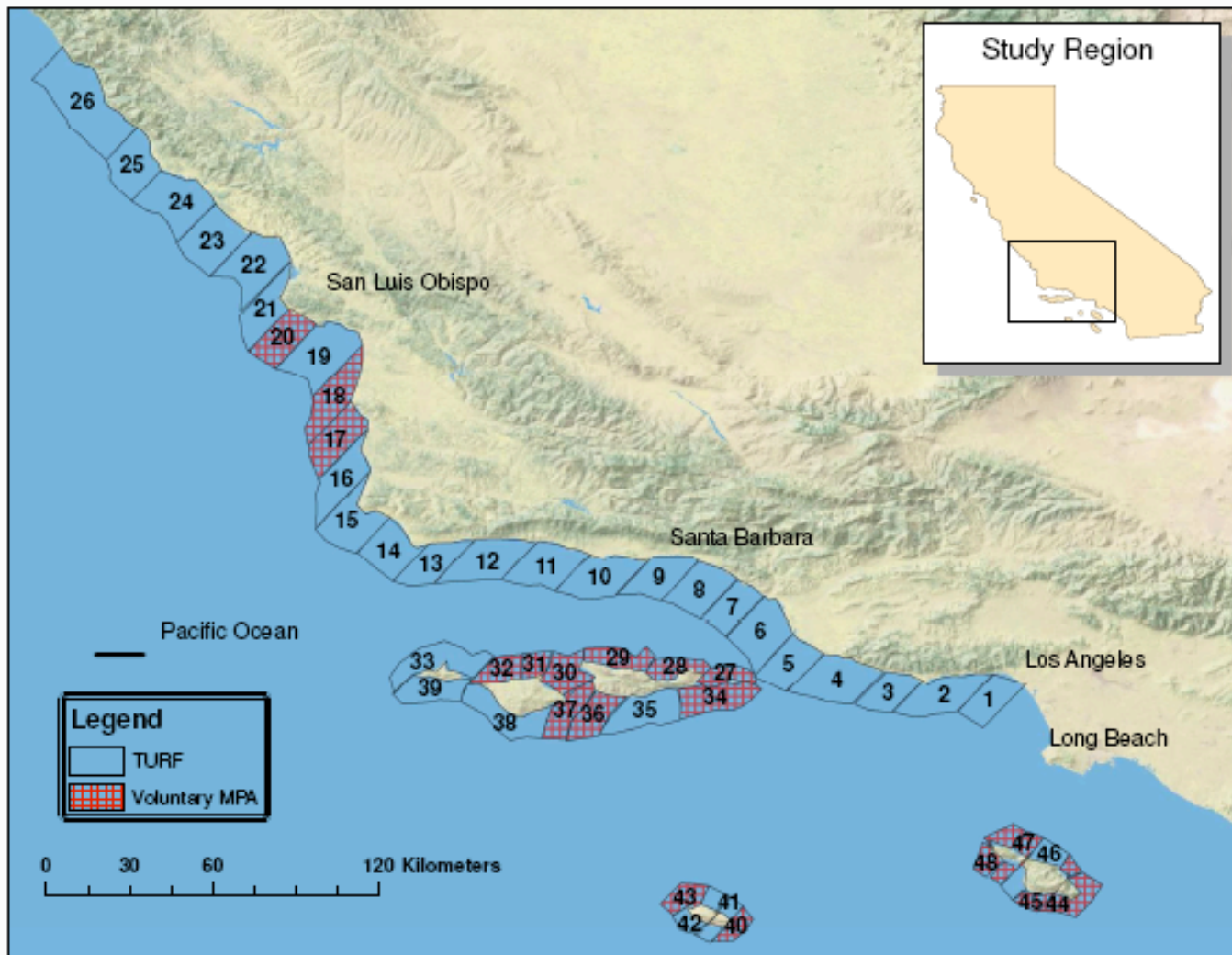


Effects on Fish Abundance

- Abundance inside MPA increases
- But fishing pressure outside MPA increases...Net Effect?
- Increased abundance in all cases
 - Typically 5%
 - Up to 30%
 - From closing a single patch

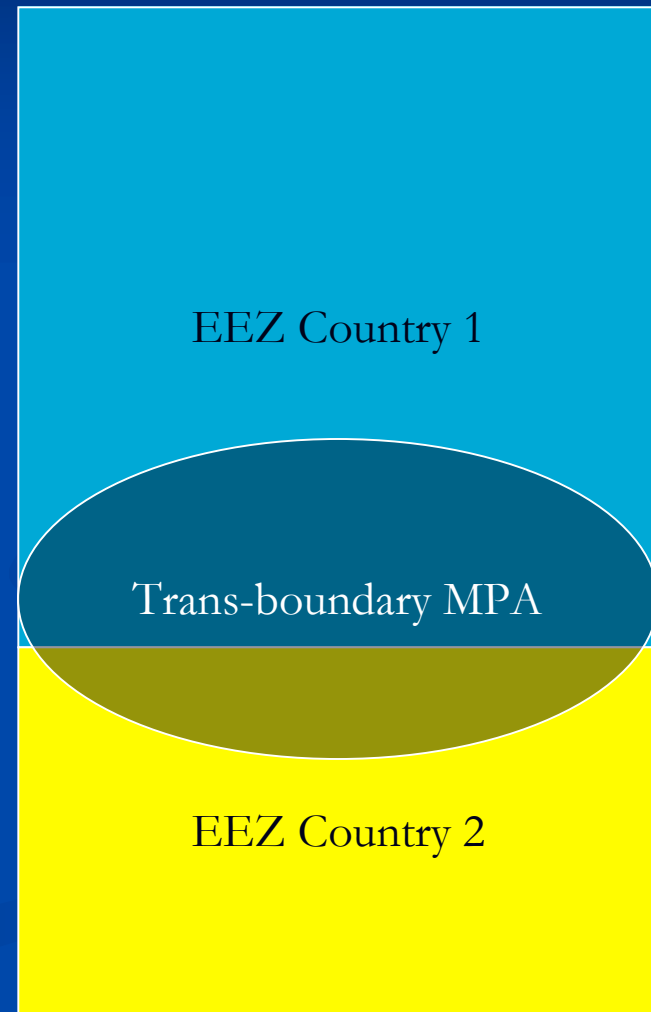


An “Optimal” MPA Network



Scaling Up: EEZs

- Shared or migratory stocks across EEZs
 - Similar problem to TURFs
 - Creates a “Fish War”
- Can MPA help solve?
- Yes! Results show can substantially increase benefits (and fish conservation) in both Countries



Conclusion

- Fisheries failures are Tragedy of the Commons
- Two possible solutions: MPAs & catch shares
 - Neither can solve problem alone
- Integrated use of MPAs and spatial catch shares
 - Increased profits to communities/cooperatives
 - Increased fish abundance
 - Can be scaled-up to trans-boundary EEZ MPAs
- Requires careful design and coordination