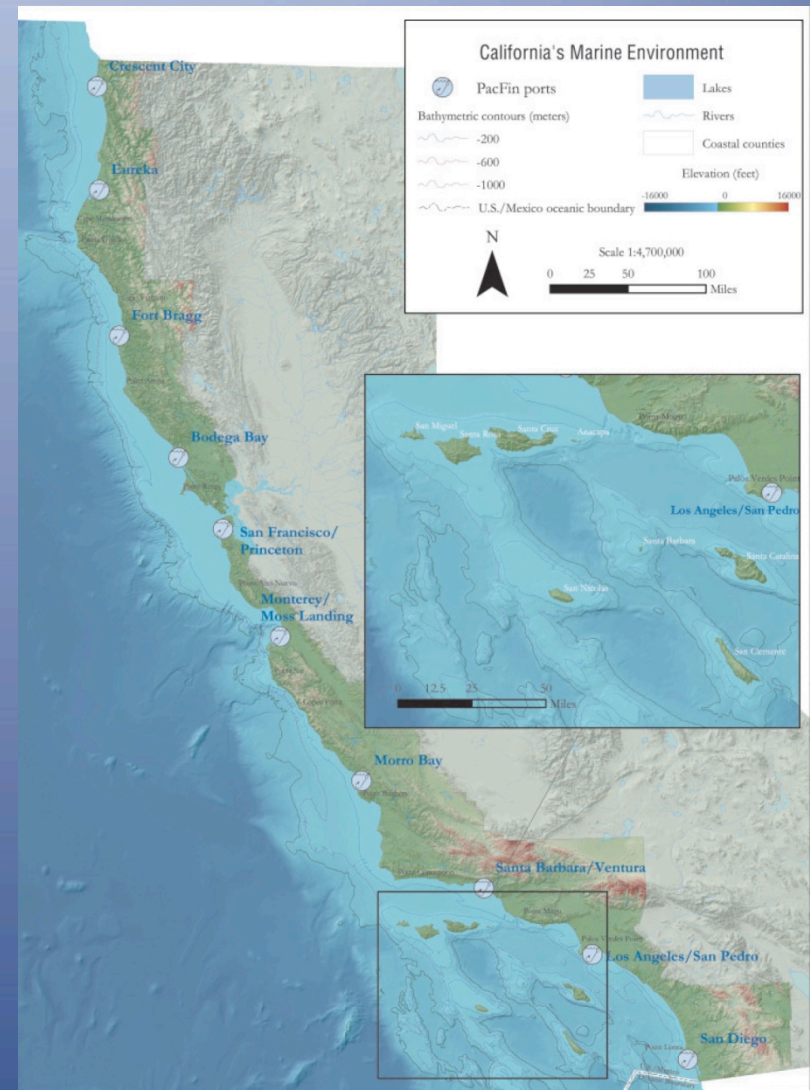


California's Marine Environment

- Highly Variable
- Narrow Continental Shelf
- Upwelling and El Nino



Fisheries Diversity

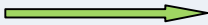
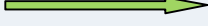
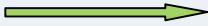


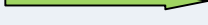
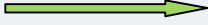
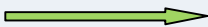
- Wetfish – small pelagics
- Tuna
- Salmon
- Groundfish
- Shellfish
- “Boutique”



Management Approaches

Biological/Ecological Approaches	
Stock Assessments	Used in setting quotas, total allowable catches (TACs), bag limits, detecting trends in populations. California example: herring
Biological Tools	Size limits, sex restrictions, seasons to protect spawning aggregations and undersized individuals, etc., population structure, using environmental variables to predict growth, recruitment, etc. California example: Dungeness crab.
Spatial Restrictions	For reference populations, protecting larger individuals, spillover effects, wilderness, protecting juveniles, protecting sensitive species. California examples: marine protected areas, depth restrictions for recreational harvest of rockfish.
Landings Trends/Indicators	CPUE, size frequencies, historical catches, ecological knowledge of biologists/managers and fishermen. California example: sea urchin.
Human Dimension Approaches	
Restricted Access	Limited entry, commercial and sportsfishing licenses. California example: squid
Allocations	Between user groups (commercial, recreational, 1 st Nations , wildlife, ecotourism) or spatial (regions, communities). California examples: striped bass, some nearshore fishes.
Dedicated Access Privileges	Individual quotas (IQ, ITQ, IFQ), community quotas, territorial use rights (TURFs) to slow “race for fish”. California example: none implemented.
Gear Restrictions	Reduce bycatch, lower mortality to undersized or non-target organisms, decrease catch rates/efficiency, reduce habitat damage. California example: nearshore gillnet restrictions.
Management Strategy Evaluation and Partnerships	Involve stakeholders in a meaningful way in harvest strategy design, co-management, research, and encourage understanding of and compliance with management plans. California example: none fully implemented.

Fish/Shellfish Ecological Variables and Their Human Dimension Analogs

Fish/Shellfish Variables		Related Human Ecology Variables
Population structure		Kinship, fishing cliques, participants' age, social linkages in community, management agency authority
Population Status		Profitability, job satisfaction, expansion possibilities, long-term sustainability of business/recreational activity
Range & Mobility		Range of vessels, vessel size, ties to homeport, knowledge, access to fishery
Habitat type & quality		Industry infrastructure, organizational strength, buyers/markets, quality/quantity of information, co-management capabilities
Food habits		Target species, diversity of prey, fishery access, allocation
Fishing/Natural mortality		Bankruptcy, risk of sinking, fishery closures
Fecundity		Access to capital, entry/exit barriers, operating costs, perceptions of future profitability/access.
Inter-annual variability		Ability to diversity, non-fishing opportunities, access to information

- Access

- Capacity



- Societal Goals

- Management Goals



Associated Press file, August 2003 Jeff Berens
 Crescent City fisherman Richard Young, right, has testified at hearings of the Pacific Fishery Management Council in favor of a quota system, which has been proposed in hopes of avoiding shutdowns like the one the council decided Thursday is necessary to protect two more species of groundfish.

AT A GLANCE

- Federal regulators, concerned about overfishing in Pacific Coast waters, have decided to close a large area there to bottom-fishing for the rest of the year.
- The closure would also apply to recreational fishing, except in certain areas where depleted species won't be affected.
- In 2001, 11,400 metric tons of groundfish generating \$16.7 million in sales, were caught off the California coast. About 1,600 commercial vessels catch and set groundfish in the zone, according to the California Department of Fish and Game.

Regulators want to cut back bottom-fishing even further

By Terence Chua
 ASSOCIATED PRESS

SAN FRANCISCO — Federal regulators have decided they should close a large swath of Pacific Coast waters to bottom-fishing for the rest of the year due to concerns about overfishing, California state officials said Thursday.

The Pacific Fishery Management Council, which sets limits on West Coast fishing, voted Wednesday to restrict catches of bottom-dwelling fish off the coasts of California, Oregon and Washington.

The council, meeting this week in Del Mar, recommended a suspension of commercial fishing in shallow coastal waters, extending from the shore to depths of up to 1,200 feet. The closure would also apply to recreational fishing, except in certain areas where the depleted species won't be affected.

The council's decision came after recent assessments found that harvest limits had been reached or exceeded for lingcod and canary rockfish, which are designated as overfished species. Council members were concerned that continued fishing near the shore would further deplete stocks of the two species.

The council will recommend the closure to the National Marine Fisheries Service, which will likely adopt the measure in mid- to late November, just before the holiday season, when demand for seafood rises and large numbers of anglers head to the ocean to fish, officials said.

► FISSE, page A4

Groundfish trawlers sit idle at the Crescent City boat basin dock earlier this fall. With the new limits on fishing in shallow coastal waters that were proposed Thursday, even more boats will be staying at the dock.

- Collaboration and Co-Management
- Human Capital
- Communication



Your Challenge

Identify applicable and feasible approaches that will work in California's marine fisheries

