

## ABSTRACTS

ductivity") at Anacapa Island (1980-1998). El Niño years were significantly correlated with reductions in numbers of BRCO and PECO at most islands. For BRCO, this correlation was greatest at islands where upwelling is typically greater. For DCCO, El Niño years were correlated with reductions in numbers at Anacapa Island and at all colonies combined only. El Niño years also were significantly correlated with reductions in productivity of DCCO and PECO at Anacapa Island. El Niño events in the 1980s and 1990s had great influence on SCB cormorant populations by leading to reduced recruitment, increased mortality, and/or colony shifting. Various anthropogenic factors (especially human disturbance) also affected cormorant populations at certain colonies.

### Climate Change and the California Current

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The role of climate-ocean variation and the consequences to marine populations is not well understood. A 50yr, spatially extensive study of the California Current has shown that there have been significant interannual and interdecadal changes in the hydrography of this system. These have had major biological effects in terms of a decrease in secondary production, species range shifts and structural changes in pelagic and benthic communities. If, as we think, the frequency of the disturbances is increasing, there is cause of great concern for the status of our coastal and oceanic ecosystems. These should be carefully monitored.

### Solutions to the Bycatch of Seabirds in Alaska Sablefish Longline Fisheries

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Seabird mortalities occur in longline fisheries as seabirds feed on sinking baits when the gear is deployed. All Alaska longline fisheries face closure or limitation due to the potential hooking mortality of short-tailed albatross, an internationally endangered species, and now operate under new regulations borrowed from other nations. In order to develop Alaska specific solutions to seabird bycatch, we compared seabird and fish catch rates among two seabird deterrent strategies and a control in the IFQ sablefish fishery in the Gulf of Alaska and Aleutian Islands in May and June of 1999. Deterrents were selected in collaboration with fishers and included lines with added weight to increase sink rates (0.23 kg of lead every 10 meters) and a surface deterrent, paired streamer lines (tori lines). Seabird abundance and behavior (bait attacks per minute) were also quantified during each set. General Linear Modeling (GLM) techniques were used to compare catch rates among treatments (ANOVA), and to explore linkages between catch rates, seabird presence and activity, and physical factors. Preliminary results indicate that compared to controls, paired streamer lines were more effective at reducing seabird bycatch (90%) than were weighted lines (35%).

### Landscape and Seascape Patterns Associated with Marbled Murrelet Offshore Abundance

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We studied the broad-scale landscape and seascape patterns associated with offshore abundance of the Marbled Murrelet in a study area that extended from Coos Bay, Oregon to Monterey Bay, California. Old-growth forest fragmentation and marine habitat variables were measured in nine subregions of the study area. Using linear regression, we determined relationships between the habitat variables and offshore murrelet population estimates. Offshore distributions of murrelets were strongly related to the amount of

old-growth forest fragmentation inland. Murrelets were most abundant offshore of large blocks of contiguous old-growth forest within a matrix of relatively abundant mature, coniferous or hardwood second-growth forests. Marine habitat associated with more murrelets had less rocky coastline. In our model, marine habitat was relatively unimportant compared to inland habitat in determining murrelet abundance offshore.

### Foraging Distances of Radio-Marked Marbled Murrelets in Southeast Alaska

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We radio marked seven female and two male Marbled Murrelets, *Brachyramphus marmoratus*, and followed their movements through the inner passages of Southeast Alaska during the breeding season in 1998. Six of the nine murrelets were detected inland in the early morning hours between 24 June and 17 July. Inland visits for each individual were consistent to a particular location, but short in duration, which precluded locating potential nest sites. We recorded 46 locations at sea up to 124 km ( $x=78 \pm 27$ km) from inland sites between 19 June to 16 July. The majority of murrelets were located at sea in western Icy Strait, a productive feeding area at the mouth of Glacier Bay. This study provides the first direct evidence that murrelets in Southeast Alaska are consistently traveling considerable distances between potential nesting and foraging areas. In addition, the consistent inland attendance patterns we observed provide the first documentation that failed or post-breeding birds attend potential nesting sites. These findings have important implications for murrelet conservation