

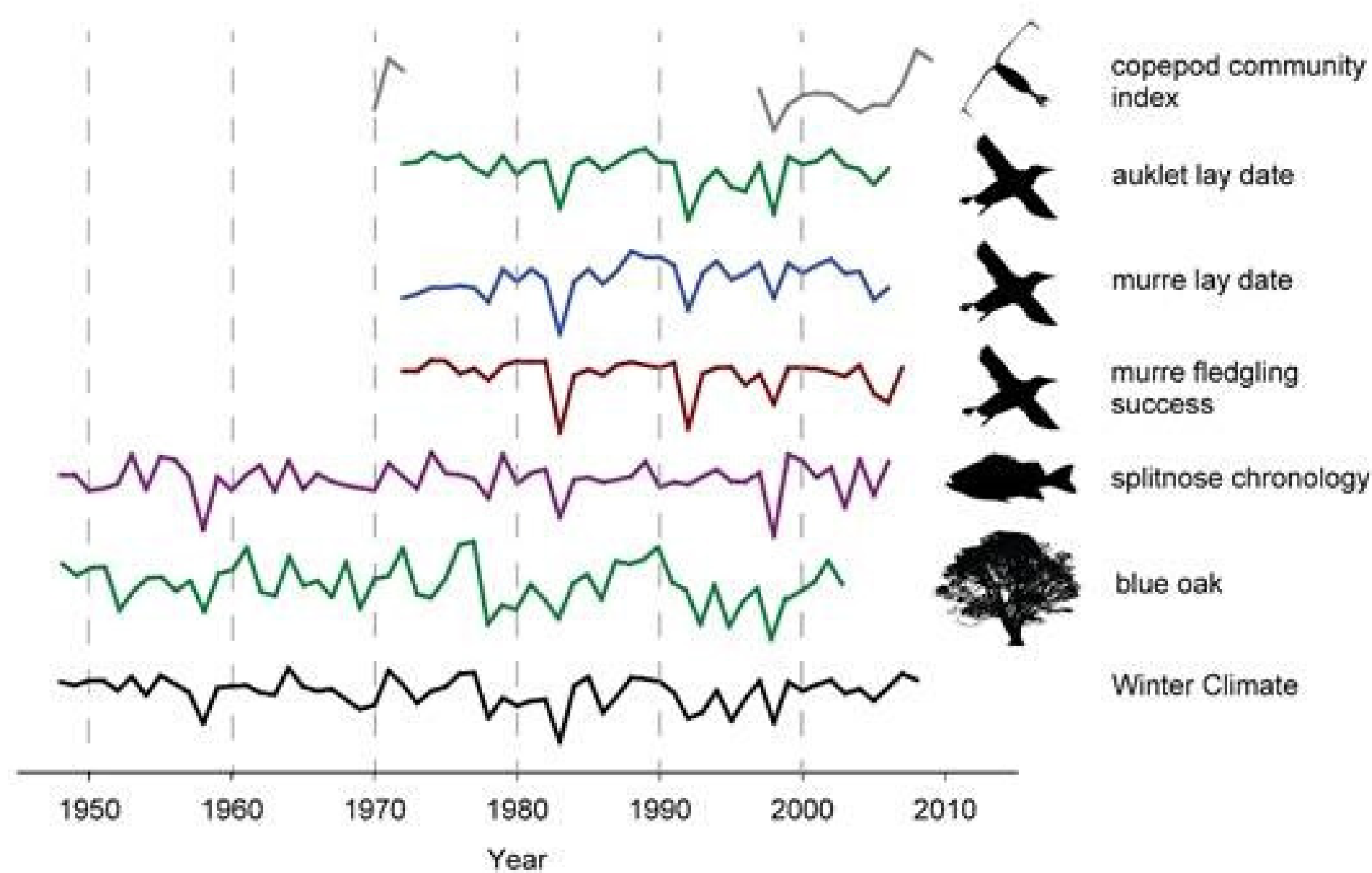
DEPARTMENT OF CHEMICAL & PHYSICAL SCIENCES COLLOQUIUM SERIES

Wednesday, March 11, 2020 @ 3:30pm in KN L1220

DR. BRYAN BLACK

Laboratory of Tree-Ring Research
University of Arizona

Forests, fisheries, and five centuries of North Pacific ecosystem variability



Along North America's West Coast, applying tree-ring (dendrochronology) techniques to growth increments in fish and clams is providing new insight on past climate variability and rates of modern change. In the California Current, a combination of fish chronologies with other marine biological records including seabird reproductive success indicate that winter climate is critical to ecosystem functioning. Moreover, these marine records strongly relate to tree-ring chronologies via the influence of winter atmospheric pressure on upwelling (productivity at sea) and precipitation (productivity on land). Growth-increment chronologies indicate that this winter climate pattern has become more variable over the past century, which has strengthened linkages across terrestrial and marine biological processes while increasing the frequency of extreme events. Farther north, tree and clam chronologies in the Gulf of Alaska reveal that temperature varies in 40-60 year cycles, but with a strong warming trend that began around 1920 and is unprecedented in at least 500 years. Thus, long-term marine and terrestrial records indicate trends in both climate mean and variance along the west coast, and that such climate extremes and “whiplash” have implications for ecosystem resilience and stability.