

Late Pleistocene and Holocene Environmental Change on the Olympic Peninsula, Washington (Ecological Studies) Hardcover – November 25, 2014

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Springer - \$117 +/-

ISBN-13: 978-3319110134 ISBN-10: 3319110136 Edition: 2015th

This study brings together decades of research on the modern natural environment of Washington's Olympic Peninsula, reviews past research on paleoenvironmental change since the Late Pleistocene, and finally presents paleoecological records of changing forest composition and fire over the last 14,000 years. The focus of this study is on the authors' studies of five pollen records from the Olympic Peninsula. Maps and other data graphics are used extensively. Paleoecology can effectively address some of these challenges we face in understanding the biotic response to climate change and other agents of change in ecosystems. First, species responses to climate change are mediated by changing disturbance regimes. Second, biotic hotspots today suggest a long-term maintenance of diversity in an area, and researchers approach the maintenance of diversity from a wide range and angles (CITE). Mountain regions may maintain biodiversity through significant climate change in 'refugia': locations where components of diversity retreat to and expand from during periods of unfavorable climate (Keppel et al., 2012). Paleoecological studies can describe the context for which biodiversity persisted through time climate refugia. Third, the paleoecological approach is especially suited for long-lived organisms. For example, a tree species that may typically reach reproductive sizes only after 50 years and remain fertile for 300 years, will experience only 30 to 200 generations since colonizing a location after Holocene warming about 11,000 years ago. Thus, by summarizing community change through multiple generations and natural disturbance events, paleoecological studies can examine the resilience of ecosystems to disturbances in the past, showing how many ecosystems recover quickly while others may not (Willis et al., 2010).