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## Inter-site variability in the season of shellfish collection on the central coast of British Columbia

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## ABSTRACT

High-resolution stable oxygen isotope analysis of the bivalve *Saxidomus gigantea* from shell midden sites was applied to identify seasonal patterns of resource procurement on the central coast of British Columbia, Canada. A total of 90 archaeological shells were examined from eight distinct sites spanning a 4500-year period. Combining micro-growth pattern analysis with high-resolution stable oxygen isotope sampling allows for a precise season of collection to be determined in estuarine bivalves recovered from archaeological sites. The results of the stable oxygen isotope analysis provide insights into seasonally structured harvest of *S. gigantea* (butter clam), which is associated with different types of sites. The results show a variety of patterns, including multi-seasonal collection, intensive seasonal harvesting and casual, supplemental use of butter clams at different locations.

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## 1. Introduction

The investigation of seasonality has been the subject of research on the Pacific Northwest Coast for over thirty years. A major goal has been to examine the timing of site occupation and to place sites within a framework of a larger seasonal-settlement system. Another aim has been to find evidence for multi-seasonal, permanent village settlements, or sedentism. Most seasonality studies have focused on the presence of an assumed 'seasonal round' (Ames, 1981), which was based on the need to procure and process food in the late summer and autumn to sustain village populations through the winter months.

This pattern of residential mobility has been heavily generalized for most of the North Pacific Coast and is influenced by observations from the early European contact era (Ford, 1989). After European

contact, during the ethnohistoric era, residential mobility was frequently noted (Barnett, 1938; Mitchell, 1983; Mitchell and Donald, 1988), and this model of the 'seasonal round' has permeated archaeological interpretations (Ford, 1989). Using ethnography to understand long-term behavioural patterns, such as settlement or shellfish gathering, does not account for change over time, nor does it permit consideration of year-to-year variation on a seasonal scale (Jochim, 1991). For example, Pomeroy (1980) coined the term 'Central-Based Seasonally Mobile' with regards to Bella Bella (Heiltsuk) settlement patterns (1978: p. 210) without the analysis of any precise seasonality indicators. Although a model of seasonal movement between site locations is widely assumed for the Northwest Coast, no archaeological studies have been of sufficient scale to document any particular model of seasonal movement in any region of the coast.

Bivalves are ideal for seasonality studies since they are sensitive geo-cultural archives that record the changes in sea surface temperature and salinity in their shells, and stable oxygen isotope analysis ( $\delta^{18}\text{O}_{\text{shell}}$ ) provides a means to interpret these seasonal changes. The application of shell oxygen isotope studies has permitted the seasonal identification of shellfish collection, and by proxy the season of site occupation in a variety of geographic contexts (i.e., Andrus and Crowe, 2000; Deith, 1986; Kennett and Voorhies, 1996; Mannino et al., 2003, 2007; Rick et al., 2006;

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