

## Ability of surface and subsurface death assemblages to track km-scale spatial and decade-scale temporal variability in living communities: Tests using the urban southern California continental shelf

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Actualistic analysis of death assemblages has always focused on quantifying, and achieving a mechanistic understanding of, the reliability of deep-time records, and is now additionally motivated to assess natural conditions before human impacts. The southern California continental shelf permits us to evaluate the ability of time-averaged death assemblages to detect known variability in urban nutrients, which increased from the early 20th Century up until the 1972 Clean Water Act. Biomonitoring since then documents strong declines in populations of pollution-and hypoxia-tolerant species, especially the chemosymbiontic lucinid bivalve Parvilucina tenuisculpta. This shelf is taphonomically challenging – median shell ages are 50-100 y, only 1% of shells survive, the mixed-zone is  $\sim$ 25 cm thick, and siliciclastic accumulation is slow, in contrast to sediment-trapping estuaries and lagoons. Nonetheless, both surficial death and buried core assemblages capture first-order urban trends, albeit with significant damping of the large, spatially localized mid-20th Century pulse in Parvilucina abundance. Paleoecologists will thus detect but under-estimate the original magnitude of even strong past excursions in community composition, an important bounding condition for both recent- and deep-time analysis.