

The Use of *Clostridium Perfringens* as a Fecal Indicator to Detect Intertidal Disposal at Backcountry Marine Campsites in Prince William Sound, Alaska

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Human waste disposal is a health concern in backcountry areas such as Prince William Sound, Alaska due to increased recreational use. Fecal contaminants are rarely monitored in the backcountry because of the difficulties in detecting low concentrations of contaminants and handling samples properly. This study measured *Clostridium perfringens* in beach sediments to detect fecal contamination resulting from intertidal disposal. Analysis in remote backcountry areas involved holding times that exceeded the recommended 8 hours before being assayed. To test the reliability of *C. perfringens* as a fecal indicator when holding times exceed 8 hours sediment samples experimentally treated with raw wastewater sewage and sediment samples from three Anchorage locations were stored and assayed repeatedly. Sediments experimentally treated with raw wastewater sewage did not decay when stored for up to 101 days, and the sediments from urban sites did not decay for up to 69 days. These results suggest that *C. perfringens* can be used to detect fecal contaminants when stored for 69 to 101 days. To determine if campers practicing intertidal disposal affected the *C. perfringens* concentration sediment samples were taken from the disposal areas used by a group of 13 campers kayaking from Whittier to Seward. The concentration of *C. perfringens* in sediment samples taken from these disposal areas were all below the method detection limit. To determine if campsite condition was associated with the *C. perfringens* concentration in beach sediments a condition class score was derived for the sampled beaches and compared with the *C. perfringens* concentration. The measured *C. perfringens* concentration at beach campsites was not associated with the condition class score, although a negative relationship was suggested. Additionally, the relationship between a site's accessibility and *C. perfringens* concentration was tested by placing beaches into one of three groups based on their boating distance from Whittier. The accessibility of a beach was not associated with the measured *C. perfringens* concentrations, although a negative relationship was suggested. Three beaches in Prince William Sound had *C. perfringens* concentrations comparable to or greater than one of the Anchorage sites, Point Woronzoff. These three beaches were in low and middle impact groups, and were located in areas furthest from Whittier. Other than these three beaches the sampled urban locations had *C. perfringens* concentrations much greater than beaches in Prince William Sound, and the sediments collected from areas where intertidal disposal was practiced. The lack of detectable fecal contamination in sediments measured during use and at heavily impacted areas suggests that intertidal disposal of wastes may be a safe method for small groups (<13) of backcountry travelers.

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