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RECONSTRUCTION OF LATE HOLOCENE PENGUIN POPULATION DENSITIES IN THE VESTFOLD HILLS, EAST ANTARCTICA

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The abundance of Adélie penguins in coastal rookeries is sensitive to sea-ice extent and is therefore closely related to climate. In the absence of long term population records, sediments of lakes adjacent to penguin rookeries can be used to recover important information about penguin population density and occupation history. Diatom-inferred nutrient concentrations and sedimentary geochemistry from a lake sediment core from the Vestfold Hills, East Antarctica, were used to reconstruct Adélie penguin population density of a neighbouring rookery in a climatically sensitive region. A diatom-nutrient transfer function was developed using an East Antarctic lake diatom-water chemistry dataset (n = 159) to permit downcore reconstruction of lake water nutrient concentrations. Along with analyses of sedimentary geochemistry of guano-related bioelements (S, P, Ca, Cu, Zn, Se, Sr, Ba and F), these data were used to construct estimates of penguin density. Possible causal factors for observed changes are discussed.