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Biofacies and faunal dynamics through the Sirius Passet Lagerstätte (lower Cambrian),

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Sirius Passet is one of the three key Cambrian Lagerstätte located in Nansen Land on the northern edge of Greenland. Field counts and identifications of thousands of in situ fossils through almost 13 m of exposed strata within the Transitional Buen Formation (lower Cambrian) at the classic locality southwest of the Sirius Pass, have precisely delimited the context and extent of the Lagerstätte horizons and charted in outline faunal dynamics through the section. To date some 45 species, including about ten new taxa have been related to substrate type, geochemical proxies and the presence of microbial mats and trace fossils. Although the succession is characterized numerically by the abundant trilobite Buenellus and the bivalved Isoxys together with a variety of sponges, multivariate analysis of abundance data, displayed as spindle diagrams, through the middle part of the succession maps out a range of biofacies characterized by varying proportions of annelids, arthropods and lobopods. There is a marked correlation between the occurrence of large soft-bodied arthropods, microbial mats together with sub and undermat miners. These analyses and observations together confirm the deep-water setting of the Sirius Passet faunas, predominantly composed of near autochthonous faunas with some allochthonous elements, transgressing an older carbonate platform.