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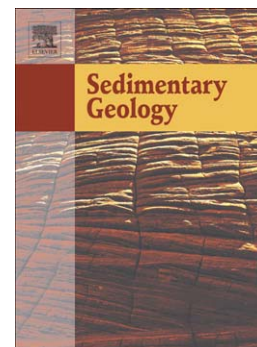
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**Morphological signatures of microbial activity across sediment and light
microenvironments of Lake Vanda, Antarctica**

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ABSTRACT

Cyanobacteria-dominated microbial mats in Lake Vanda grow with pinnacles and ridges separated by prostrate mat. Rocks protrude over microbial mats on the lake bottom to create localized, dm-scale gradients in sedimentation and irradiance. The effects of sedimentation on pinnacle and ridge growth were isolated from photosynthetic activity by contrasting growth across microenvironmental gradients. Sedimentation rate was measured as the mass of sand and mud sized sediment in mat that accumulated over 11 years, and the incident light was modeled near and under rocks by reconstructing topography using Structure from Motion techniques. Morphologically diverse pinnacles and ridges were documented in both exposed and sheltered mat microenvironments, in addition to growing downward from the underside of overhanging rocks. Mat that grew with >40% irradiance under overhangs did not have consistent differences in pinnacle

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