Mapping, Deposition and Early Diagenesis of Stromatolites: A Modern Analog from Hamelin Pool, Western Australia

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The objectives of this project include: producing detailed facies maps, digital elevation and underwater terrain models of Hamelin Pool by combining satellite imagery, aerial photography, seafloor sampling, and ground truth traverses; conducting geospatial analysis of microbialites and associated sand bodies; examining petrographic thin sections to define depositional and early diagenetic microstructures, and conducting petrophysical analyses to understand pore-scale rock-fluid interactions. This research project will deliver a comprehensive dataset capturing the lateral heterogeneity of the system, providing baseline data for improved facies modeling and reservoir prediction in a microbialite system.

Hamelin Pool is a shallow hypersaline embayment, largely barred from the rest of Shark Bay, in Western Australia, by a carbonate sand and seagrass bank. The shoreline of Hamelin Pool is 135 km and lined with stromatolites and microbial mats. The stromatolites form reefal buildups and extend from the supratidal zone to depths of 3-5 m. The extent of stromatolites in the intertidal and supratidal zones are well known but have not been mapped in detail. Recent aerial photographs show a large abundance of stromatolites in the subtidal zone and almost nothing is known about these structures. The most extensive display of modern marine stromatolites exists in Hamelin Pool, the study of which will aid in understanding microbial systems of the past.