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Coral community change on a turbid-zone reef complex: developing baseline records for the central Great Barrier Reef's nearshore coral reefs

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Understanding past coral community development and reef growth is crucial for placing contemporary ecological and environmental change within appropriate reef-building timescales. Coral reefs located within coastal inner-shelf zones are widely perceived to be most susceptible to declining water quality due to their proximity to modified river catchments. On the inner-shelf of Australia's Great Barrier Reef (GBR) the impacts and magnitude of declining water quality since European settlement (c. 1850 A.D.) still remain unclear. This relates to ongoing debates concerning the significance of increased sediment yields against the naturally high background sedimentary regimes and the paucity of long-term (>decadal) ecological datasets. To provide baseline records for interpreting coral community change within the turbid inner-shelf waters of the GBR, 21 cores were recovered from five nearshore reefs spanning an evolutionary spectrum of reef development. Discrete intervals pre- and post-dating European settlement, but deposited at equivalent water depths, were identified by radiocarbon dating, enabling the discrimination of extrinsic and intrinsic driven shifts within the coral palaeo-record. We report no discernible evidence of anthropogenically-driven disturbance on the coral community records at these sites. Instead, significant transitions in coral community assemblages relating to water depth and vertical reef accretion were observed. We suggest that these records may be used to contextualise observed contemporary ecological change within similar environments on the GBR.