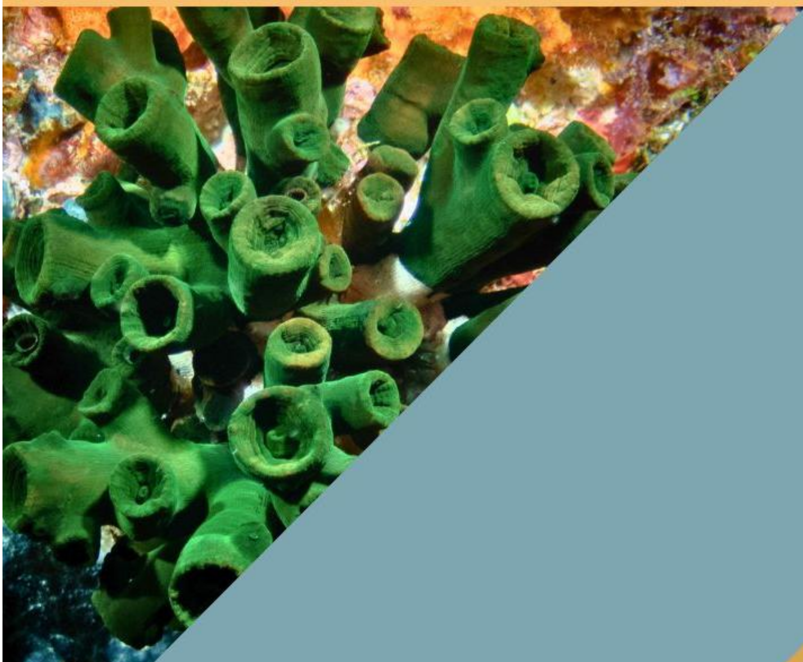
Sedimentation impacts in Moreton Bay: a priority knowledge synthesis

IMPACTS: Benthic Macrofauna

DBC David Brewer Consulting

THE MORETON BAY FOUNDATION



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This impact statement is drawn from

Sedimentation Impacts in Moreton Bay, a priority knowledge-synthesis

The report was commissioned by The Moreton Bay Foundation in 2025 to summarise key evidence on how sedimentation affects Moreton Bay's coastal and marine ecosystems, and the ecological and cultural values they support. The report brings together published and grey literature, conceptual models, and expert review to provide a clear, high-level understanding of sedimentation pressures, their impacts, and remaining knowledge gaps.

This standalone document can be found in the full report. Where references are made to other sections, these are indicated by this symbol: †. A full list of external citations, data sources, and methods used in this document is included in the complete report, available at **moretonbayfoundation.org**

David Brewer Consulting (DBC) has prepared this report for The Moreton Bay Foundation under the contract titled 'TMBF Priority Knowledge Synthesis: Sedimentation Impacts in Moreton Bay'. Information about the Moreton Bay Foundation can be found at: https://moretonbayfoundation.org/

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Benthic Macrofauna: Sedimentation Impact Statement

Seastar (Pentaceraster regulus) in Halophila spinulosa in Moreton Bay
Photo credit: C. Roelfsema

Status and trend summary

Table 1 provides a qualitative assessment of the subtidal benthic macrofaunal communities in Moreton Bay. The population status of these communities in Moreton Bay is complex and exhibits significant spatial and temporal variation, strongly influenced by habitat type and sediment characteristics. However, the Bay's highly diverse and species-rich benthic macrofaunal communities (referred to as macrofauna) have undergone significant changes, largely driven by trawling and sedimentation from the rapid growth of Greater Brisbane. In some areas, the cessation of trawling activities has led to increases in species richness and overall abundance. However, overall, the macrofaunal communities' current condition is rated as 'Poor' with 'Medium' confidence. The confidence rating is limited by a lack of monitoring and scientific knowledge.

The smothering of macrofaunal species during flood events and the subsequent resuspension of sediments are profoundly impacting large areas of their habitats, leading to lower diversity and abundance. Consequently, many of the Bay's macrofaunal communities are in decline and being replaced by more homogeneous, infaunal-dominated states, with reduced species richness. The main exceptions are the 'closed areas' of the marine park, where trawling was previously a key impacting process. These areas now show an increase in species richness and overall abundance. Many macrofaunal species in Moreton Bay are opportunistic and capable of rapid recolonisation after physical disturbances, such as dredging. However, the decreasing capacity of the Bay to effectively store fine sediment, and the relatively high frequency of recent flood events, suggest that future floods and sediment inputs will likely lead to increasingly turbid waters and persistent impacts to macrofaunal communities. Hence, the condition trend is considered 'Declining' with 'High' confidence. The contribution of sedimentation to the current condition and the condition trend is rated as 'Major'. This rating is also assigned a 'Medium' confidence for the same reason as above, namely, lack of monitoring and scientific data.

Table 1. Qualitative assessment of the overall status and trend in condition, and of the likely severity and direction of sedimentation-specific impacts, for subtidal macrofaunal communities in Moreton Bay.

Value condition assessment	Assessment	Confidence
Current condition	Poor	Medium
Contribution of sedimentation to the current condition	Major	Medium
Condition trend	Declining	High
Contribution of sedimentation to trend	Major	Medium

Overview

The benthic macrofauna of Moreton Bay generally exhibits high species diversity and richness, including a large number of singleton or rare species (Stevens and Connolly 2005; Richardson *et al*., 2015). The high diversity is due to the Bay's position as a meeting point for faunal assemblages that reflect its subtropical location, supporting both tropical and subtropical taxa (Davie and Hooper, 1998; Stevens & Connolly, 2005; Fautin *et al*., 2008). However, declines in species richness have been consistently observed in epibenthic communities across much of Moreton Bay between 2002 and 2015 (Jackson, 2015; T. Stevens, pers. comm.).

A comprehensive survey of Moreton Bay's epibenthos (species living on the surface of the seafloor) for conservation planning purposes identified 114 morphospecies and categorised four bioturbation (sediment mixing) indicators (Stevens and Connolly, 2005). While many taxa were rare, five common taxa constituted over 61% of total standardised abundance (Stevens and Connolly, 2005). Key groups and their distribution include bivalves (350 species within 155 genera and 55 families) (Healy and Potter, 2010), sea anemones (19 species) (Fautin *et al*., 2008), sessile invertebrates (e.g., cnidarians, sponges, bryozoans, tunicates) (Davie and Hooper, 1998), and infaunal and mobile epibenthic species (e.g., crustaceans, annelids, echinoderms) (Davie and Hooper, 1998).

The distribution of macrofaunal communities is strongly influenced by habitat type and sediment characteristics (Davie and Hooper, 1998; Ellis *et al*., 2017). Stevens and Connolly (2005) defined nine distinct benthic habitat types that have been classified based on their dominant faunal characteristics. 'Bioturbated mud' habitats are dominated by various bioturbators, with mostly small and (to a lesser extent) medium burrows (Stevens and Connolly, 2005). 'Bioturbated sparse' habitats are also dominated by bioturbators but distinguished by the presence of *Halophila ovalis* and high-density patches of cerianthid sand anemones (Stevens and Connolly, 2005).

'Rubble and sand' habitats feature low densities of mobile macroinvertebrates, such as echinoids, crinoids, bivalves, and occasionally sponges and soft corals, attached to rubbly substrates (Stevens and Connolly, 2005) (Figure 1). 'High-density patches of cerianthid anemones uniquely characterise diverse sandy' areas and include seagrasses and echinoderms (Stevens and Connolly, 2005).

'Seagrass-dominated' areas are characterised by species such as *H. ovalis*, *H. spinulosa*, and *Zostera capricorni* (Stevens & Connolly, 2005). Seagrass communities are described separately in this report. 'Inshore algae and sponge' habitats are very diverse, dominated by algae and sponges, with significant contributions from solitary ascidians, anemones, and seagrass (Stevens & Connolly, 2005).

'Reefal habitats' are dominated by encrusting algae, soft corals, and sponges and include deep-water algal and soft coral reefs (Stevens & Connolly, 2005). Hard coral habitats are described separately in this report.

Generally, more taxa and individuals are found at deeper depths in the northern parts of Moreton Bay, possibly due to the greater stability of the substratum or finer sediment characteristics in those areas (Richardson *et al*., 2015). The high-energy hydrodynamic conditions, including strong tidal currents and wave action, characterise northern Moreton Bay, selecting for species with adaptations for rapid locomotion and migration to deal with regular disturbance (Richardson *et al*., 2015).

Periodic flood events, storms and cyclones (large-scale), along with tidally-induced sediment movement, are key natural physical drivers of community structure (Richardson *et al*., 2015). Coastal development, reclamation, commercial fishing operations (especially trawling), and sand/gravel extraction activities are also significant human drivers of change to benthic habitats (Richardson *et al*., 2015).

However, orders of magnitude higher sediment loads have been delivered into Moreton Bay in recent decades, estimated to be approximately 100 times greater than what would have occurred from natural catchments (Lockington *et al*., 2017; Saeck *et al*., 2019a). This is due to the combination of high sediment exposure from land clearing in the catchment, in conjunction with several very large flood events in 2011, 2013, and 2022 (Grinham *et al*., 2024). The impacts of these sediment loads have changed the Bay and have substantially impacted benthic communities (Lockington *et al*., 2017; Saeck *et al*., 2019a; Grinham *et al*., 2024) as summarised below (see Population status section).

Figure 1. Images of different benthic communities in Moreton Bay. Photo credit: T. Stevens.

Population status

The population status of subtidal macrofaunal communities in Moreton Bay is complex and exhibits significant spatial and temporal variation, strongly influenced by habitat type and sediment characteristics (Dunn *et al*., 2013). The Bay's macrofaunal communities have undergone significant changes, primarily driven by anthropogenic pressures, including increasing environmental pressure with the rapid growth of Greater Brisbane (Davie and Hooper, 1998). As noted in the main report (**† Section 4**), the combination of land clearing and large flood events has greatly increased sediment loads into the bay and impacted benthic populations (Lockington *et al*., 2017; Saeck *et al*., 2019a; Grinham *et al*., 2024).

Overall, many of the Bay's wetland and benthic habitats, including those supporting macrofauna, are in decline, with human activity leading to marked decreases in their areal extent (Kovacs *et al.*, 2019).

However, the cessation of trawling activities has led to strong increases in species richness and overall abundance in some sandy substrates, indicating a positive ‘reserve effect’ (Stevens *et al.*, 2014).

Value

Ecological value

Macrofaunal communities are integral to the functioning of Moreton Bay's ecosystem. Bivalve molluscs play a key role in filtering and cleansing water by removing particulate organic and inorganic material through their gills (Healy & Potter, 2010). Macrofaunal activities, including bioturbation (e.g., burrowing), influence sediment biogeochemistry, nutrient fluxes, and the oxygenation of surface sediments, which in turn control the release of nitrogen and phosphorus to the overlying water column (Ellis *et al.*, 2004). Hence, their abundance is critical to maintaining water quality (Healy and Potter, 2010).

Macrofaunal communities serve as primary food sources for many predatory invertebrates (e.g., gastropods, octopods, crabs) and vertebrates (e.g., fish, wading birds, gulls) within the Bay system (Healy and Potter, 2010), forming an essential link in the coastal food web (Richardson *et al.*, 2015).

Clumping species such as oysters, mussels, and ark shells provide rich settlement opportunities and complex living structures for numerous smaller animals, including other molluscs, sponges, hydroids, and small fish (Healy and Potter, 2010). They also offer valuable refuge and shelter for smaller invertebrates and fish, thereby enhancing overall benthic biodiversity (Healy and Potter, 2010). Even after death, these clumped bivalves contribute to benthic biodiversity and help stabilise soft or moving sediments (Healy and Potter, 2010).

Cultural value

The macrofaunal communities in Moreton Bay possess significant cultural value, primarily articulated through the deep and enduring connection of the Quandamooka People, the Traditional Custodians of the region, who have cared for this Country for over 50,000 years (Fischer *et al.*, 2019; Adams *et al.,* 2024). This value is multi-dimensional and extends beyond mere utilitarian aspects, integrating into identity, ecological understanding, and traditional practices (Pinner *et al.*, 2019).

Macrofaunal species, especially bivalves like rock oysters (*Saccostrea glomerata*), mussels (*Trichomya hirsuta*), ark shells (*Anadara trapezia*) and pearl oysters (*Pinctada* species), have historically been, and continue to be, important elements of the diet of local Aboriginal people, a fact evidenced by the numerous shell middens found throughout the Bay islands and adjacent areas (Healy and Potter, 2010). These resources are also vital for the continuity of cultural lifestyles and Traditional Knowledge, including their use in traditional medicine (Ross *et al.*, 2019a).

For Traditional Custodians, the health and presence of macrofaunal communities, such as oyster banks, mud whelks, and cockles, are seen as integral indicators of healthy waterway conditions (Pinner *et al.*, 2019). They are perceived as part of 'nature's way to improve the water quality', demonstrating a profound understanding and value placed on their ecological function as a sign of a thriving environment (Pinner *et al.*, 2019).

Specific macrofaunal species are directly woven into the cultural identity and historical geography of Moreton Bay. For instance, Bribie Island is known as 'Yurin', meaning 'place of mud crabs', highlighting the significance and abundance of these animals in traditional place names (Pinner *et al.*, 2019).

Economic value

The macrofaunal communities in Moreton Bay hold significant economic value, serving as direct resources for commercial and recreational fisheries (Healy and Potter, 2010). Key harvested species include prawns (e.g., Tiger, Banana, Eastern School, Endeavour and Greasy back prawns), Blue swimmer crabs, Moreton Bay bugs and oysters (e.g., Sydney rock and pearl oysters) (Healy and Potter, 2010; Richardson *et al.*, 2015).

The commercial fishery in Moreton Bay accounts for approximately 10% of Queensland's total trawl catch (e.g. prawn species and Moreton Bay Bugs) and 41% of the Bay's total seafood production by weight (Jackson, 2015; Richardson *et al.*, 2015). Historically, these communities also underpinned oyster farming and other aquaculture (Fischer *et al.*, 2019; Lockington *et al.*, 2017).

Indirectly, macrofaunal communities are vital as nursery grounds for commercially important fish species (Dunn *et al.*, 2013; Kovacs *et al.*, 2019), improving water quality through filter feeding (Healy and Potter, 2010), contributing to the Bay's overall productivity and supporting broader nature-based tourism and regional primary industries (Jackson, 2015; Steven *et al.*, 2014; Lockington *et al.*, 2017).

History

Historically, intensive trawling activities since the 1960s have led to changes in benthic community structure, typically removing or damaging attached and mobile macro-epibenthic organisms, such as sponges, soft corals, and echinoderms, shifting communities towards more homogeneous, infaunal-dominated states, and reducing species richness (Stevens *et al.*, 2014).

Following the cessation of trawling in parts of Moreton Bay Marine Park in 2009, studies have observed signs of recovery (Stevens *et al.*, 2014). In muddy habitats, closed areas showed a significant increase in species richness and overall abundance, with a notable reserve effect for ascidians, sponges, burrows, and macroalgae (Stevens *et al.*, 2014). On sandy substrates, there was a recovery signal, with increases in echinoderms, burrows, and crustaceans (Stevens *et al.*, 2014). Anemone species, ascidians, and echinoderms have begun to recolonise previously impacted sandy areas, even after flood events (Stevens *et al.*, 2014).

Seafloor heterogeneity has increased in areas closed to trawling, becoming less flat and featureless compared to continuously trawled areas where net marks are still visible (Stevens *et al*., 2014). However, recovery is still considered to be in its early phases, and infauna analyses have not yet shown clear positive reserve effects (Stevens *et al*., 2014).

In areas not subject to trawling, macrofaunal communities have been impacted by increasing sedimentation from the Moreton Bay catchment (Lockington *et al*., 2017; Grinham *et al*., 2024). These impacts are described below.

Impacts of sedimentation

Fine sediment deposition has impacted over 98% of Moreton Bay's benthic zone (Grinham *et al*., 2024). Muddy bottom habitats in the Bay increased dramatically from approximately 30% in 1998 to 70% in 2011 (Saeck *et al.,* 2019a). Mud is easily resuspended, increasing turbidity and chronically reducing light availability (Lockington *et al*., 2017; Saeck *et al.,* 2019a; Grinham *et al*., 2024). This directly smothers organisms (Ellis *et al*., 2004; Lockington *et al*., 2017) and inhibits primary productivity in both pelagic and benthic microalgae, which are critical to the Bay's productivity and nutrient cycling (Saeck *et al.,* 2019b) (see conceptual model in Figure 2). The loss of large-bodied, suspension-feeding, and freely motile taxa (such as bivalves and amphipods, respectively) also significantly impacts essential ecosystem functions like bioturbation and benthic-pelagic coupling (Ellis *et al*., 2017; Richardson *et al*., 2015) and can limit benthic productivity (Lockington *et al*., 2017).

The distribution, composition, density and biomass of macrofauna are profoundly affected by the type of habitat and sediment (Dunn *et al*., 2013). Areas with increased mud content and sedimentation rates often experience lower diversity and abundance (Ellis *et al*., 2004), and a shift towards infaunal-dominated assemblages (Jackson, 2015). In Moreton Bay, areas that previously had stable sandy substrates, such as the northern and eastern regions, became entirely dominated by infaunal assemblages by 2015, suggesting a shift to mud-dominated substrates (Jackson, 2015). Communities shift to being dominated by opportunistic deposit-feeding species, such as polychaetes and oligochaetes, and an expansion of infaunal assemblages occurs, while suspension feeders, including bivalves, decline (Ellis *et al*., 2004, 2017; Jackson, 2015). Filter-feeding species, such as ascidians, sponges and cerianthid anemones, are also susceptible to increased turbidity (Stevens *et al*., 2014).

This shift from sandy to muddy habitats is exacerbated by flood events and reduced capacity of the Bay's deeper channels to store sediments, leading to a loss of vertical accommodation space (Coates-Marnane *et al*., 2016b; Saeck *et al.,* 2019a; Grinham *et al*., 2024). For example, areas that support trawl fisheries have high suspended sediment concentrations and are usually characterised by declines in species richness (Stevens *et al*., 2014). Similarly, high sedimentation rates in estuaries are associated with lower benthic macrofaunal diversity and abundance (Ellis *et al*., 2004).

While many macrofaunal species in Moreton Bay are opportunistic and capable of rapid recolonisation after physical disturbances, such as dredging (Richardson *et al.*, 2015), large-scale or catastrophic sedimentation events, particularly those caused by floods, can lead to slower recovery rates and longer-term changes in community structure (Ellis *et al.*, 2004). The decreasing capacity of the Bay to effectively store fine sediment suggests that future inputs will likely lead to increasingly turbid water columns and persistent impacts (Leigh *et al.*, 2013; Coates-Marnane *et al.*, 2016b; Saeck *et al.,* 2019a).

Recommendations

To manage the impacts of sedimentation on benthic macrofaunal communities in Moreton Bay, the primary recommendations focus on reducing the influx of fine sediments from catchments and adopting informed management practices (Coates-Marnane *et al.*, 2016; Saeck *et al.,* 2019a, b; Grinham *et al.*, 2024). They include:

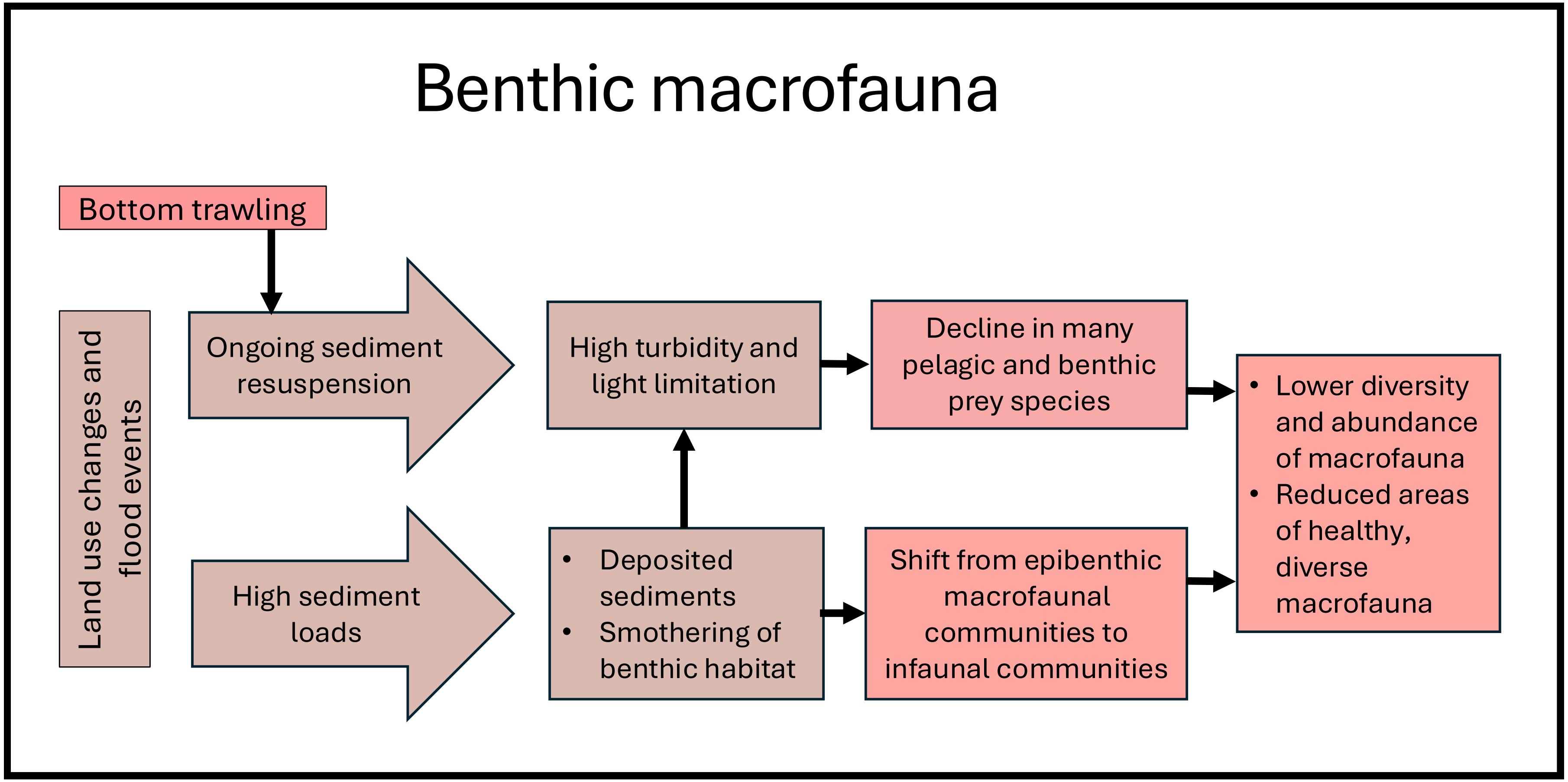
1. Reduce diffuse sediment pollution by (i) implementing targeted rehabilitation of channel networks, (ii) establishing buffers in agricultural lands, and (iii) revegetating riparian zones and catchments to decrease sediment and nutrient loads (Leigh *et al.*, 2013; Saeck *et al.,* 2019b).
2. Recognise that even moderate levels of sedimentation can reduce the positive effects of key species on ecosystem functions like productivity and denitrification, even if the species persist (Jones *et al.*, 2011).
3. Set ecologically relevant limits for sedimentation, moving beyond current sediment quality guidelines, which may not adequately protect coastal ecosystems from adverse effects (Ellis *et al.*, 2017).
4. Implement persistent monitoring and continually adapt management strategies (Jackson *et al.*, 2015; Stevens *et al.*, 2014) to understand long-term shifts in benthic assemblages and build resilience against future disturbances (Gibbs and Hewitt, 2004; Stevens *et al.*, 2014).

Expert review

Dr Timothy Stevens (Adjunct Senior Lecturer, Griffith University) kindly provided an expert review of the Benthic Macrofauna: Sedimentation Impact Statement.

Conceptual model - impacts of sedimentation on benthic macrofauna

Figure 2. Conceptual model that qualitatively describes the major impacts of sedimentation on macrobenthic communities in Moreton Bay. Brown boxes signify sedimentation-related processes; red boxes signify adverse impacts/outcomes.



References

Adams, S., Norman, K., Kemp, J., Jacobs, Z., Costelloe, M., Fairbairn, A., Robins, R., Stock, E., Moss, P., Smith, T. and Love, S. (2024) 'Early human occupation of Australia's eastern seaboard'. *Scientific reports*, *14*(1), p.2579. doi: 10.1038/s41598-024-52000-y.

Coates-Marnane, J., Olley, J., Burton, J. and Sharma, A. (2016b) 'Catchment clearing accelerates the infilling of a shallow subtropical bay in east coast Australia'. *Estuarine, Coast and Shelf Science*, 174, pp. 27-40. doi: 10.1016/j.ecss.2016.03.006

Davie, P.J.F and Hooper, J.N. (1998) 'Patterns of biodiversity in marine invertebrate and fish communities of Moreton Bay'. In Tibbetts, I.R., Hall, N.J. and Dennison, W.C. (eds.) *Moreton Bay and Catchment*. Brisbane: The University of Queensland, School of Marine Science Brisbane. pp. 331-346.

Dunn, R.J.K., Lemckert, C.J., Teasdale, P.R., and Welsh, D.T. (2013) 'Macroinfauna dynamics and sediment parameters of a subtropical estuarine lake—Coombabah Lake (Southern Moreton Bay, Australia)'. *Journal of Coastal Research*, 29(6a), 156–167.

Ellis, J., Nicholls, P., Craggs, R., Hofstra, D. and Hewitt, J. (2004) 'Effects of terrigenous sedimentation on mangrove physiology and associated macrobenthic communities', *Marine Ecology Progress Series*, 270, pp. 71–82. doi: 10.3354/meps270071.

Ellis, J., Clark, D., Atalah, J., Jiang, W., Taiapa, C., Patterson, M., Sinner, J. and Hewitt, J. (2017) 'Multiple stressor effects on marine infauna: Responses of estuarine taxa and functional traits to sedimentation, nutrient and metal loading', *Scientific Reports*, 7, Article no. 12013. doi: 10.1038/s41598-017-12323-5.

Fautin, D.G., Crowther, A.L. and Wallace, C.C. (2008) 'Sea anemones (Cnidaria: Anthozoa: Actiniaria) of Moreton Bay'. In Davie, P.J. and Phillips, J.A. (eds.) Proceedings of the Thirteenth International Marine Biological Workshop, The Marine Fauna and Flora of Moreton Bay, Queensland. *Memoirs of the Queensland Museum* — Nature 54(1): 35–64. Brisbane. ISSN 0079-8835.

Fischer, M., Burns, D., Bolzenius, J., Costello, C. and Low Choy, D. (2019) 'Quandamooka Country: The role of science and knowledge in Traditional Owner-led land and sea management'. In Tibbetts, I. R., Rothlisberg, P. C., Neil, D. T., Homburg, T. A., Brewer, D. T. and Arthington, A. H. (eds.) *Moreton Bay Quandamooka & Catchment: Past, present, and future.* Brisbane: The Moreton Bay Foundation, pp. 3-28. doi: 10.6084/m9.figshare.6713297.

Gibbs, M., and Hewitt, J. (2004) ‘Effects of sedimentation on macrofaunal communities: A synthesis of research studies for ARC’. *Auckland Regional Council Technical Publication,* No. 264. Auckland: Auckland Regional Council.

Grinham, A., Costantini, T., Deering, N., Jackson, C., Klein, C., Lovelock, C., Pandolfi, J., Eyal, G., Linde, M., Dunbabin, M., Duncan, B., Hutley, N., Byrne, I., Wilson, C. and Albert, S. (2024) ‘Nitrogen loading resulting from major floods and sediment resuspension to a large coastal embayment’, *Science of the Total Environment*, 918, p. 170646. doi: 10.1016/j.scitotenv.2024.170646.

Healy, J.M. and Potter, D.G. (2010) ‘A preliminary checklist of the marine bivalves (Mollusca: Bivalvia) of Moreton Bay, Queensland’. In Davie, P.J.F. and Phillips, J.A. (eds.), Proceedings of the Thirteenth International Marine Biological Workshop, The Marine Fauna and Flora of Moreton Bay, Queensland. *Memoirs of the Queensland Museum – Nature* 54(3): pp. 235-252. Brisbane. ISSN 0079-8835.

Jackson, R. (2015). *Changing spatial patterns of epibenthic assemblages in Moreton Bay, Australia and the factors contributing to these changes*. Bachelor of Science (Honours) thesis. Gold Coast: Griffith University, Griffith School of Environment.

Jones, H., Pilditch, C., Bruesewitz, D. and Lohrer, A. (2011) ‘Sedimentary environment influences the effect of an infaunal suspension feeding bivalve on estuarine ecosystem function’, *PLOS ONE*, 6(11), p. e27065. doi: 10.1371/journal.pone.0027065.

Kovacs, E.M., Tibbetts, H.L., Baltais, S., Lyons, M., Loder, J. and Roelfsema, C. (2019) ‘Wetland and benthic cover changes in Moreton Bay’. In Tibbetts, I. R., Rothlisberg, P. C., Neil, D. T., Homburg, T. A., Brewer, D. T. and Arthington, A. H. (eds.) *Moreton Bay Quandamooka & Catchment: Past, present, and future*. Brisbane: The Moreton Bay Foundation, pp 211-226. doi: 10.6084/m9.figshare.8072603.

Lockington, J.R., Albert, S., Fisher, P.L., Gibbes, B.R., Maxwell, P.S. and Grinham, A.R. (2017) ‘Dramatic increase in mud distribution across a large sub-tropical embayment, Moreton Bay, Australia’, *Marine Pollution Bulletin*, 116(1–2), pp. 491–497. doi: 10.1016/j.marpolbul.2016.12.029.

Pinner, B., Ross, H., Jones, N., Babidge, S., Shaw, S., Witt, K. and Rissik, D. (2019) ‘A custodial ethic: Indigenous values towards water in Moreton Bay and Catchments’. In Tibbetts, I.R., Rothlisberg, P.C., Neil, D.T., Homburg, T.A., Brewer, D.T. and Arthington, A.H. (eds.) *Moreton Bay Quandamooka & Catchment: Past, present, and future*. Brisbane: The Moreton Bay Foundation, pp. 29–44. doi: 10.6084/m9.figshare.6713312.

Richardson, D., McPhee, D., Cooper, T. and Pedersen, D. (2015) *Moreton Bay Sand Extraction Study – Phase 2: Impacts of dredging on macrobenthos*. WBM Oceanics Australia. doi: 10.13140/RG.2.1.4202.3844.

Ross, H., Jones, N., Witt, K., Pinner, B., Shaw, S., Rissik, D. and Udy, J. (2019a) 'Values towards Moreton Bay and catchments'. In Tibbetts, I. R., Rothlisberg, P. C., Neil, D. T., Homburg, T. A., Brewer, D. T. and Arthington, A. H. (eds.) *Moreton Bay Quandamooka & Catchment: Past, present, and future*. Brisbane: The Moreton Bay Foundation, pp 47-60. doi: 10.6084/m9.figshare.8072498.

Saeck E., Udy J., Maxwell P., Grinham A., Moffatt D., Senthikumar S., Udy D. and Weber, T. (2019b) 'Water quality in Moreton Bay and its major estuaries: Change over two decades (2000-2018)'. In Tibbetts I.R., Rothlisberg P.C., Neil D.T., Homburg T.A., Brewer D.T., and Arthington AH (eds.) *Moreton Bay Quandamooka & Catchment: Past, present, and future.* Brisbane: The Moreton Bay Foundation, pp 187-210. doi:10.6084/m9.figshare.8072597.

Steven, A., Revill, A., Carlin, G., McLaughlin, J., Chotikarn, P., Fry, G., Moeseneder, C. and Franklin, H., (2014). *Distribution, volume and impact of sediment deposited by 2011 and 2013 floods on marine and estuarine habitats in Moreton Bay*. Final Report for Healthy Waterways Limited, 73 pp. Brisbane: CSIRO.

Stevens, T., and Connolly, R. (2005) 'Local-scale mapping of benthic habitats to assess representation in a marine protected area'. *Marine and Freshwater Research,* 56, pp. 111-123. doi:10.1071/MF04233.

Stevens, T., Richmond, S.J., Williams, E., Rissik, D. and Suddrey, C. (2014) *Effects of cessation of trawling activities within Moreton Bay Marine Park on benthic assemblages*. Report to the Queensland Department of Science, Information Technology, Innovation and the Arts. Brisbane: Griffith University, 45 pages.

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This standalone document corresponds to **Section 5.7** of the full report. A full list of external citations, data sources, and methods used in this document is included in the complete report, available at

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