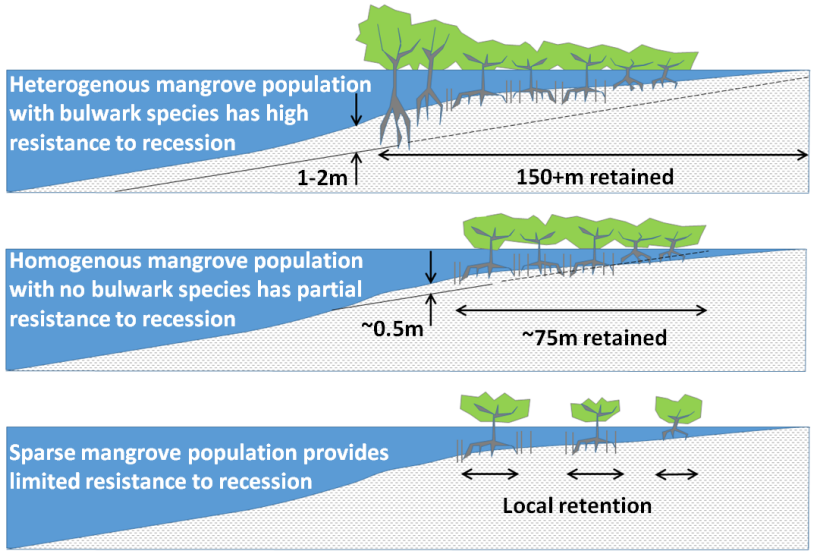
NBS Opportunities with Mangroves

Damara WA Pty Ltd

Seashore Engineering

Coastal mangroves are a useful element in nature-based solutions (NBS) for flood and erosion hazard mitigation, particularly for tropical and sub-tropical settings. Identification of NBS opportunities with mangroves requires consideration of:

- Available habitat suitable for mangroves (e.g. Winterwerp *et al*. 2013)
- Likely effectiveness for mitigation
- Disturbance-recovery cycles
- Viability of interventions for mangrove enhancement



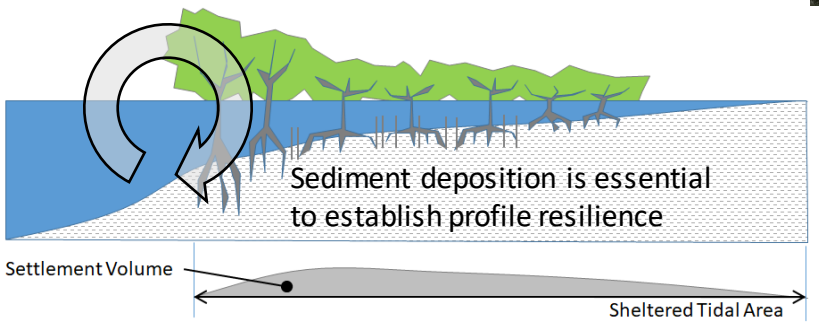
Disturbance of mangroves can be from:

(i) wind and wave damage
(ii) erosion pressure, including sediment supply cycles
(iii) environmental pressures (e.g. pollution, hydrological change)

As mangroves take some years to establish, it is necessary that growth phases match or exceed disturbance events.

Width of the riparian zone, where mangroves can grow, influences capacity for hazard mitigation. Continuous mangroves 10 to 40m wide may provide effective wave shelter, although affected by mangrove loss under severe storm conditions. Bands 100 to 1000+m wide may be required to provide flood mitigation or establish sufficient sediment trapping to offset erosion pressure.

The hydraulic resistance provided by mangroves varies substantially according to coverage and species range. Dense coverage with a heterogeneous community, including bulwark species (e.g. red mangroves) may increase effective bed friction by 7-10 times.



The influence of disturbance-recovery cycles on existing mangrove communities provides an important avenue to identify NBS opportunities. A small intervention, particularly during re-establishment, may be highly effective for mangrove enhancement.