

Table 1: Types and examples of coastal adaptation. Source: Tam 2009.

Strategy:	Mechanism:	Examples:	Advantages:	Disadvantages
Defend/hold-the-line	Coastal armouring	<ul style="list-style-type: none"> • Seawalls and levees in many locations around the world • Types include: <ul style="list-style-type: none"> ○ double dikes in the Netherlands ○ super levees in Japan, 30 times wider than tall ○ emergency levees 	<ul style="list-style-type: none"> • Familiar • Behaves predictably • Can protect existing and future development and threatened habitats 	<ul style="list-style-type: none"> • Expensive • Costly to maintain and monitor • May increase vulnerability: can increase erosion on nearby beaches • Can encourage a false sense of security and development in vulnerable areas
	Barriers	<ul style="list-style-type: none"> • Thames Barrier, UK • Maeslant Barrier, The Netherlands 	<ul style="list-style-type: none"> • Protect everyone – no equity issues • A single technological fix can protect a very large area 	<ul style="list-style-type: none"> • Expensive • May be ecologically damaging • May not be effective where riverine flooding coincides with storm surge
	Living shorelines (wetlands)	<ul style="list-style-type: none"> • Wetlands protect shorelines from erosion and floods. Examples in Australia include: <ul style="list-style-type: none"> • The Coorong and Lakes Alexandrina and Albert, SA • Moulting Lagoon, TAS • Myall Lakes, NSW • Bowling Green Bay, QLD • Coburg Peninsula, NT • Lake Gore, WA • Adaptation would involve enhancing these wetlands and constructing new areas 	<ul style="list-style-type: none"> • Provide recreational open space • Filter pollutants • Sequester carbon • Provide critical habitat for fish, wildlife and organisms at the base of food chains 	<ul style="list-style-type: none"> • Require space and time to work: <ul style="list-style-type: none"> ○ generally thicker than coastal armouring, so need more land ○ require management, monitoring and time to become established
Retreat	Managed retreat/managed realignment	<ul style="list-style-type: none"> • Pathfinder projects in UK (see Case Study UK Pathfinder Programme) • Rolling easements in Texas and South Carolina • Funding to purchase storm-threatened and coastal buffer properties in North Carolina and New Jersey, USA 	<ul style="list-style-type: none"> • Minimises human suffering by relocating to safety before a catastrophic flood • May be cheaper than coastal armouring • Can include restoration of wetlands 	<ul style="list-style-type: none"> • Very expensive where there is significant development if involves buyback • Will affect property values • Political quagmire, with tremendous legal and equity issues – not all property owners are willing sellers • May require expensive site clean-up following demolition

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Avoid	Raising the height of development or land	<ul style="list-style-type: none"> • Brisbane City Council has set minimum habitable floor level for building and development • New houses in flood-prone areas of New Orleans must be built above the base flood elevation fixed by FEMA 	<ul style="list-style-type: none"> • Allows structures to be built on an encroaching shoreline or in a vulnerable area, with low risk of flooding 	<ul style="list-style-type: none"> • Short-term strategy • Can alter the characteristics of shorelines
Accommodate	Floodable development	<ul style="list-style-type: none"> • Widespread use of temporary flood holding areas e.g.: <ul style="list-style-type: none"> ○ Rotterdam: underground car parks ○ Gold Coast: golf courses 	<ul style="list-style-type: none"> • Effective small-scale suite of tools • Still require experimentation to understand suitability for fresh vs. saltwater and urban vs. rural areas 	<ul style="list-style-type: none"> • Could be hazardous – polluted, contaminated • May require treatment prior to release to ensure quality standards
	Floating development	<ul style="list-style-type: none"> • Generally only prototypes: <ul style="list-style-type: none"> ○ Floating greenhouse, The Netherlands ○ Floating bridges, USA • Floating restaurants, Dubai 	<ul style="list-style-type: none"> • Manages the uncertainty of high tides, and the timing and nature of sea-level rise 	<ul style="list-style-type: none"> • Work only in protected areas • Does not work well in areas exposed to storms such as the open coastline