Figure 3.29 –Damaged fencing at the top of the bluff facing Casey Beach (March 16th 2010)

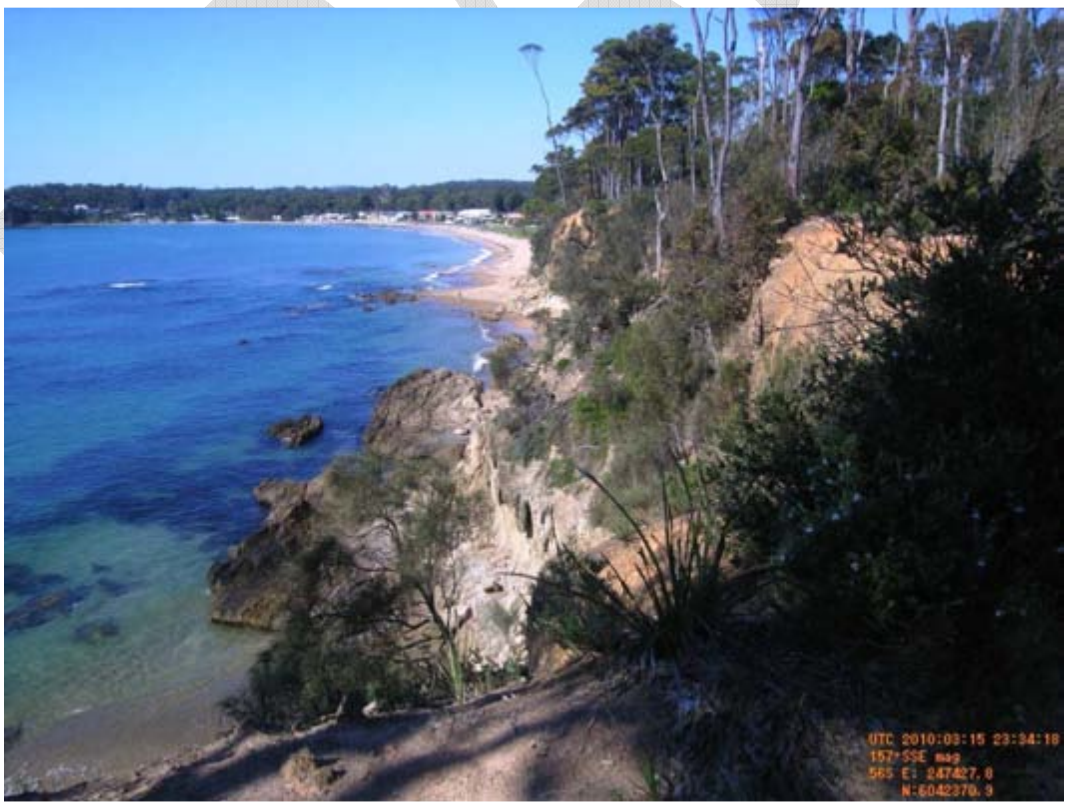

Figure 3.30 – Actively eroding bluff at the lookout facing Casey Beach (March 16th 2010)

Figure 3.31 – Casey Beach seawall overtopped at northern end (March 16th 2010)

Figure 3.32 – Bridge over Short Beach Creek (March 16th 2010)

Figure 3.33 – Undercutting of trees where no protection at Casey Beach (March 16th 2010)

Figure 3.34 – Houses at the top of the eroding bluff at the southern end of Casey Beach (March 16th 2010)

Figure 3.35 – Visible erosion in front of the car park at Sunshine Bay (March 16th 2010)

Figure 3.36 – Houses directly behind the beach at Sunshine Bay (March 16th 2010)

Figure 3.37 – Low-lying shack at the back of the beach at Sunshine Bay (March 16th 2010)

Figure 3.38 – Denhams Beach looking south (March 16th 2010)

Figure 3.39 – Good condition dune at Surf Beach (March 16th 2010)

Figure 3.40 – Seaward house access subject to slope stability issue in Mosquito Bay (March 16th 2010)

Figure 3.41 – Light beach erosion at the bottom of the slope and houses close to the edge at Garden Bay (March 16th 2010)

Figure 3.42 – Malua Beach looking north (March 16th 2010)

Figure 3.43 – Malua Beach looking south (March 16th 2010)

Figure 3.44 – Boatshed at the northern end of Rosedale Beach (March 16th 2010)

Figure 3.45 – Shacks at the southern end of Rosedale Beach (March 16th 2010)

Figure 3.46 – Healthy dune and high scarp at Barlings Beach (March 16th 2010)

Figure 3.47 – Dune arm separating the estuary and the ocean (March 16th 2010)

Figure 3.48 – High scarp at the southern end of Tomakin Beach (March 16th 2010)

Figure 3.49 – Low-lying development along the southern embankment of the Tomaga River directly upstream of the river mouth (March 16th 2010)

Figure 3.50 – North Broulee looking north (March 16th 2010)

Figure 3.51 – Informal 4-wheel drive access on the tombolo leading to Broulee Island (March 16th 2010)

Figure 3.52 – Broulee South looking south from the northern headland (March 16th 2010)

Figure 3.53 – Dune along Moruya Airport
(March 16th 2010)

Figure 3.54 – Bank erosion with falling trees along Moruya River
(March 16th 2010)

Figure 3.55 – Sand deposition upstream of Princes Highway Bridge along Moruya River (March 16th 2010)

Figure 3.56 – Large dune at Congo Beach (March 16th 2010)

Figure 3.57 – Stormwater outlet under repair at Coila Lake entrance (March 16th 2010)

Figure 3.58 – Coila Lake entrance (March 16th 2010)

Figure 3.59 – Scarp along Tuross Head coastline (March 18th 2010)

Figure 3.60 – Erosion in front of carpark at One Tree Beach south (March 18th 2010)

Figure 3.61 – Seawall in front of Tuross Beach Holiday Park (March 18th 2010)

Figure 3.62 – Recent culvert and erosion on dune facing Tuross Beach Holiday Park (March 18th 2010)

Figure 3.63 – Tuross Lake entrance
(March 18th 2010)

Figure 3.64 – Houses at the top of the cliff at Potato Point
(March 17th 2010)

Figure 3.65 – Yabbarra Beach and Duck Pond creek entrance (March 17th 2010)

Figure 3.66 – Culvert under Ocean Drive Bridge (March 17th 2010)

Figure 3.67 – Duck Pond at Dalmeny
(March 17th 2010)

Figure 3.68 – Low-lying sections of Ocean/Dalmeny Drive between Dalmeny and Kianga
(March 17th 2010)

Figure 3.69 – Narooma SLSC
(March 17th 2010)

Figure 3.70 – Low berm at Little Lake entrance
(March 17th 2010)

Figure 3.71 – Cabins close to the edge of the cliff near Narooma SLSC (March 17th 2010)

Figure 3.72 – Beach along Islandview Beach Resort looking north from the beach access (March 17th 2010)

Figure 3.73 – High cliff along Mystery Bay (March 17th 2010)

Figure 3.74 - Low-lying carpark south of Mystery Bay (March 17th 2010)

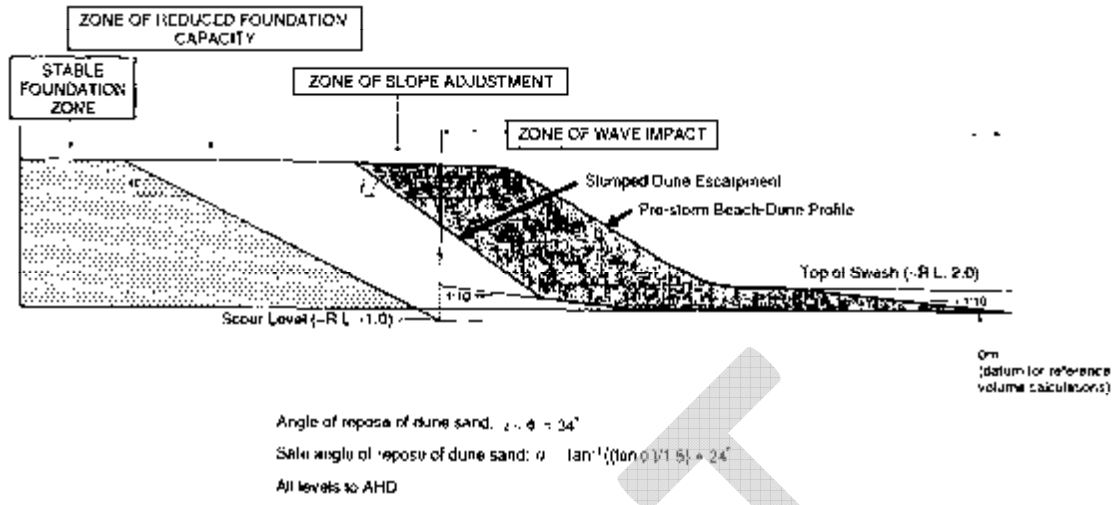

Figure 4.1 – Dune stability schema (after Nielsen et al., 1992)

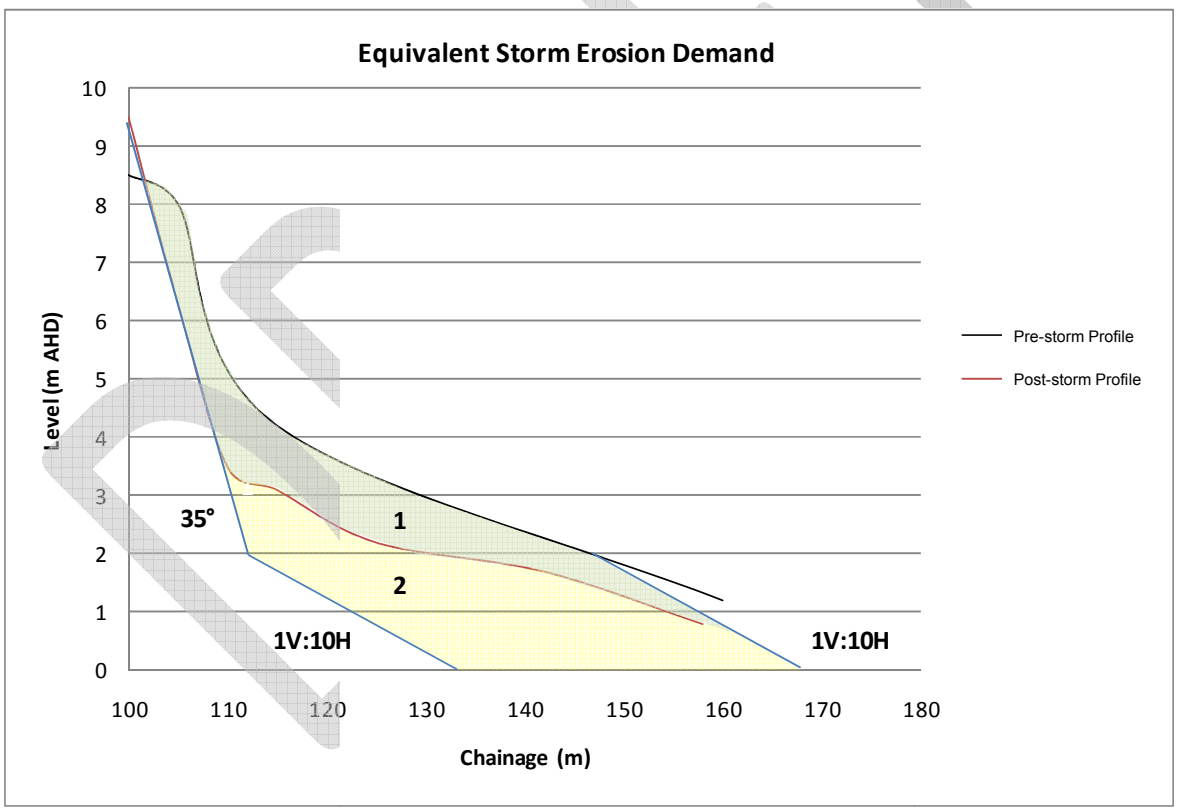

Figure 4.2 – Determination of Equivalent storm erosion, pre- and post-storm

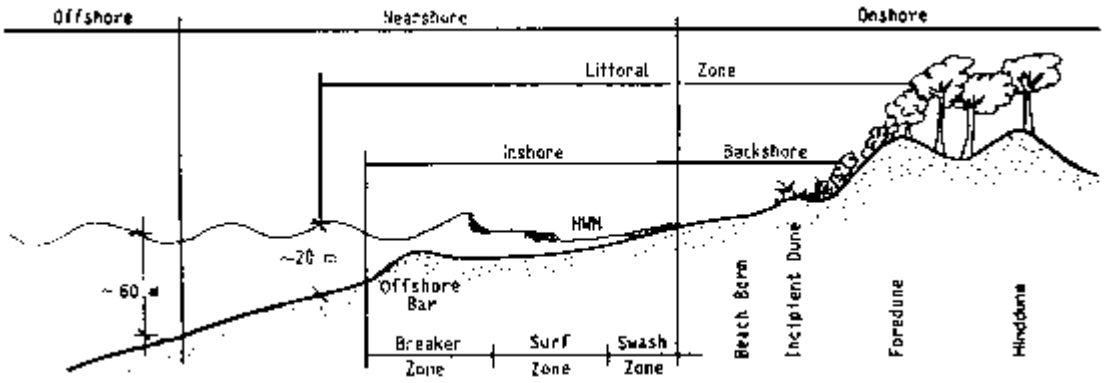

Figure 4.3 – Beach definition sketch (open coast beaches)

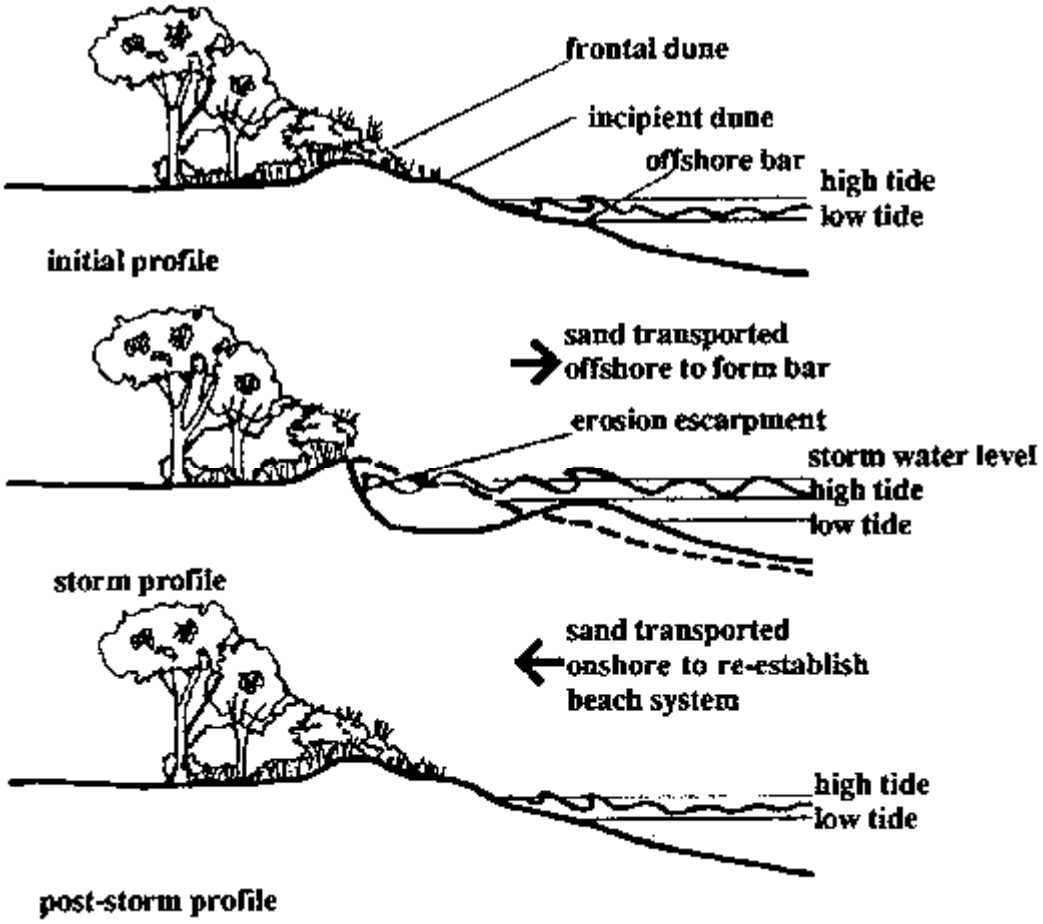

Figure 4.4 – Beach storm erosion/accretion cycle

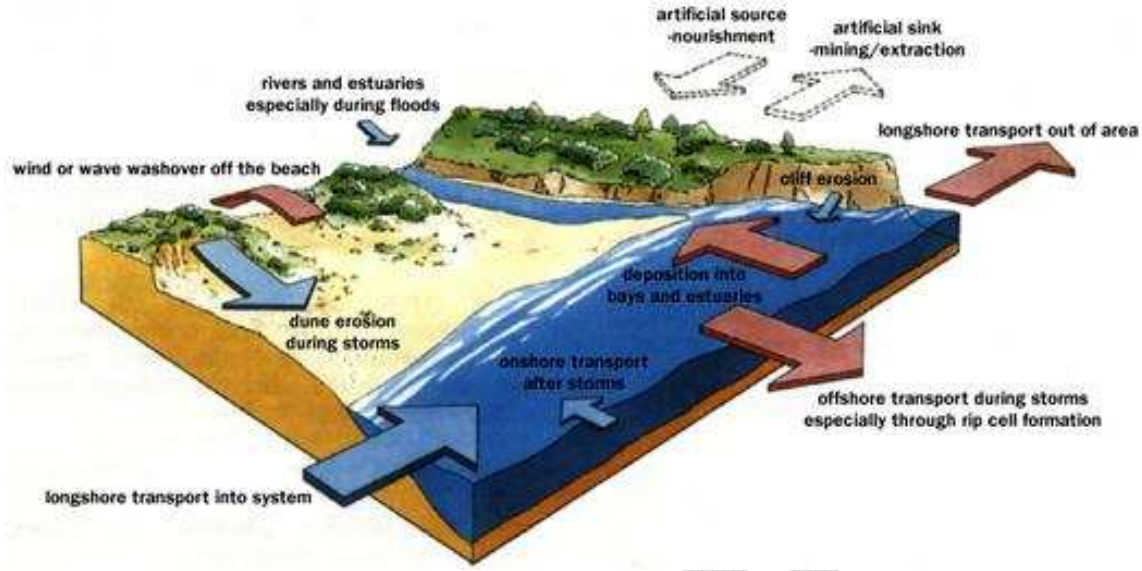

Figure 4.5 – Sediment budget schema (NSW Government, 1990)

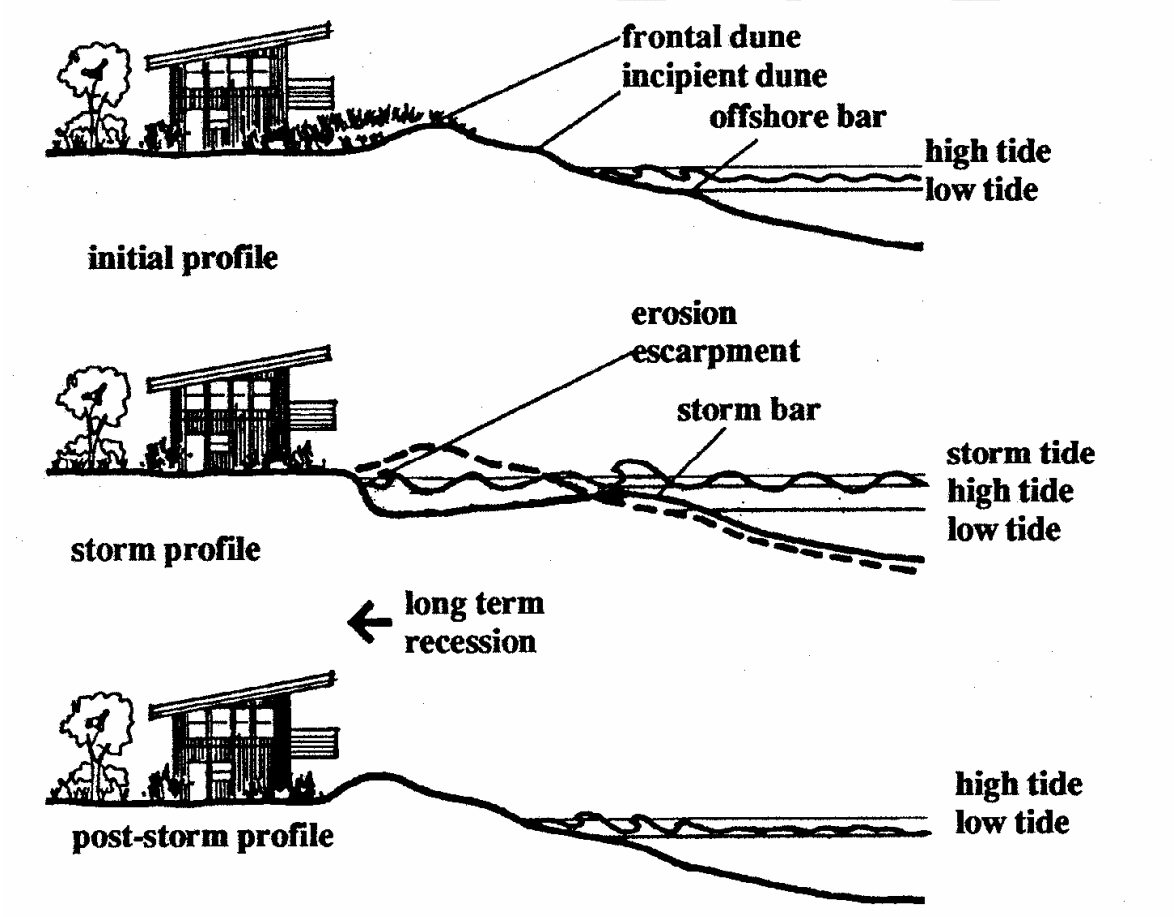

Figure 4.6 – Long term erosion schema

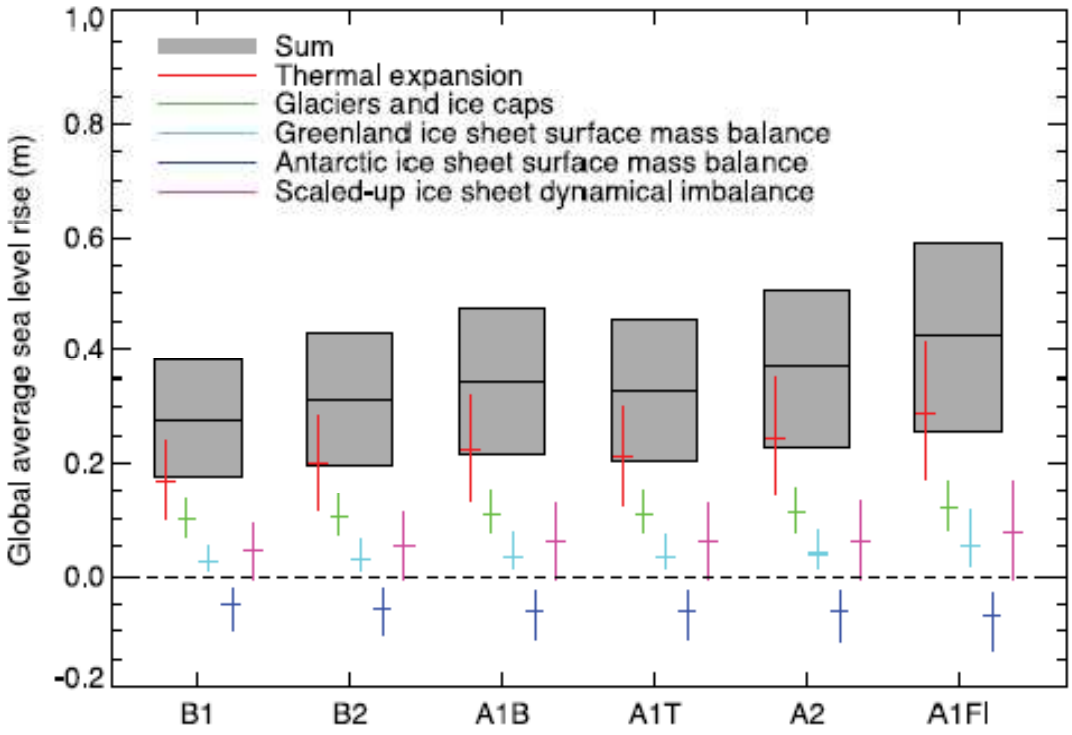

Figure 4.7 – Projected sea level rise between 2000 and 2100 (after IPCC, 2007)

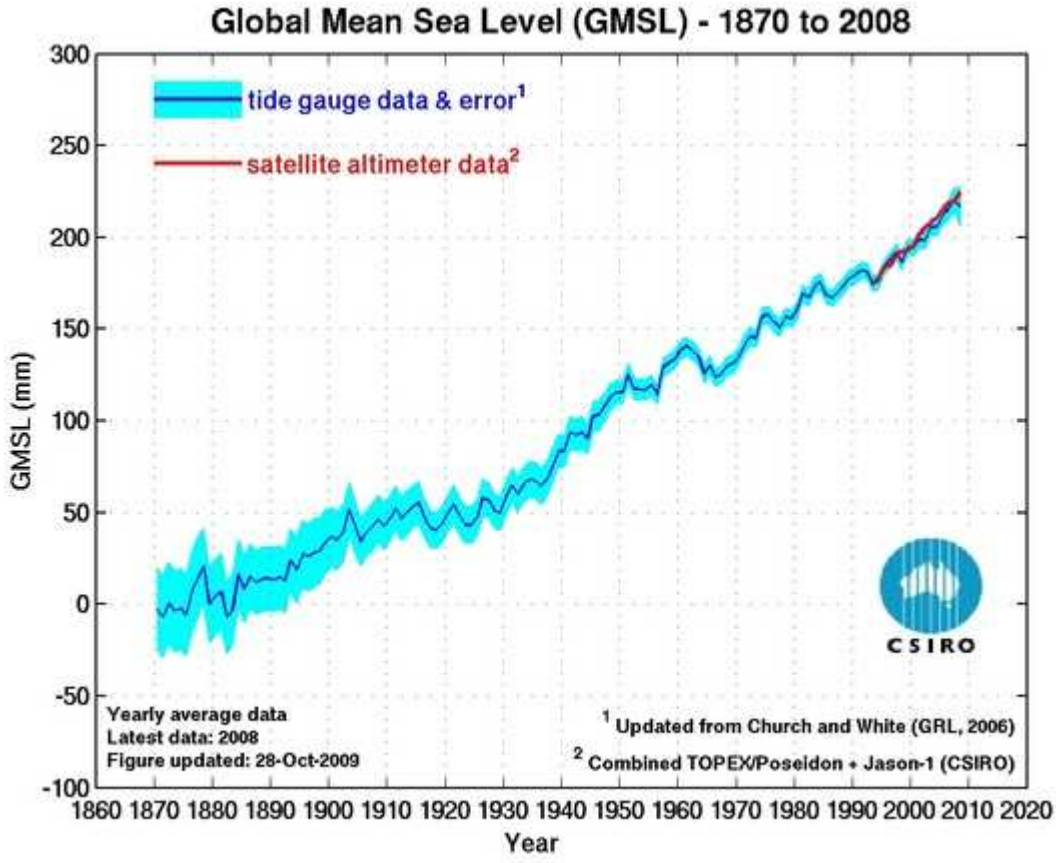

Figure 4.8 – Measured Global Sea Level Rise between 1870 and 2008
http://www.cmar.csiro.au/sealevel/

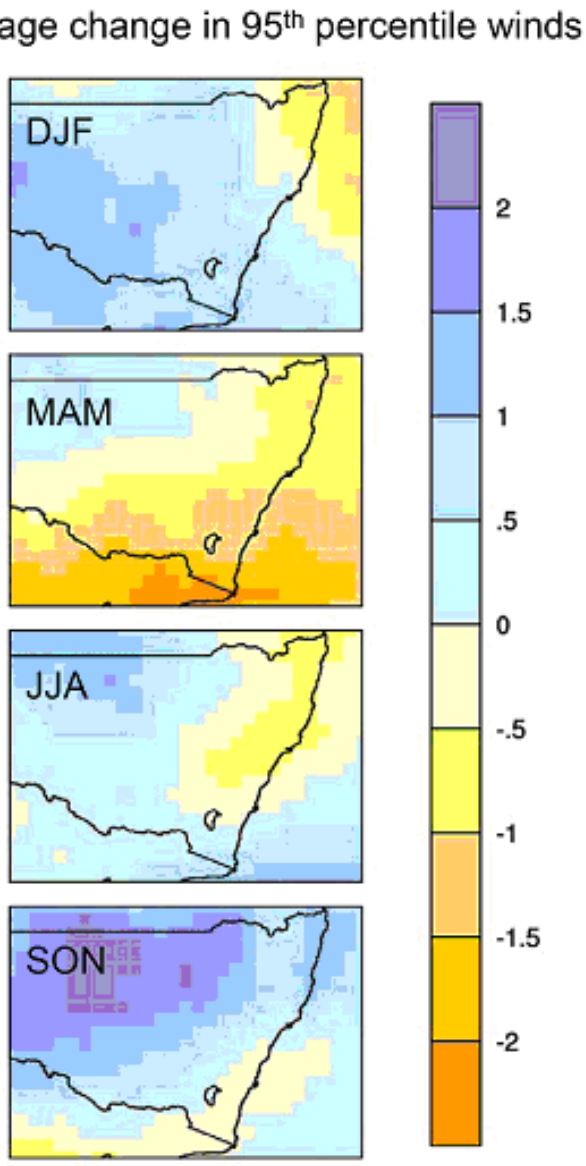

Figure S3: The change in extreme monthly wind speed derived by averaging the 12 models results. Units are % change per °C of global warming. DJF = summer, MAM = autumn, JJA = winter, SON = spring.

Figure 4.9 – Change in extreme monthly wind speeds for NSW coast (Hennessy et al 2004)

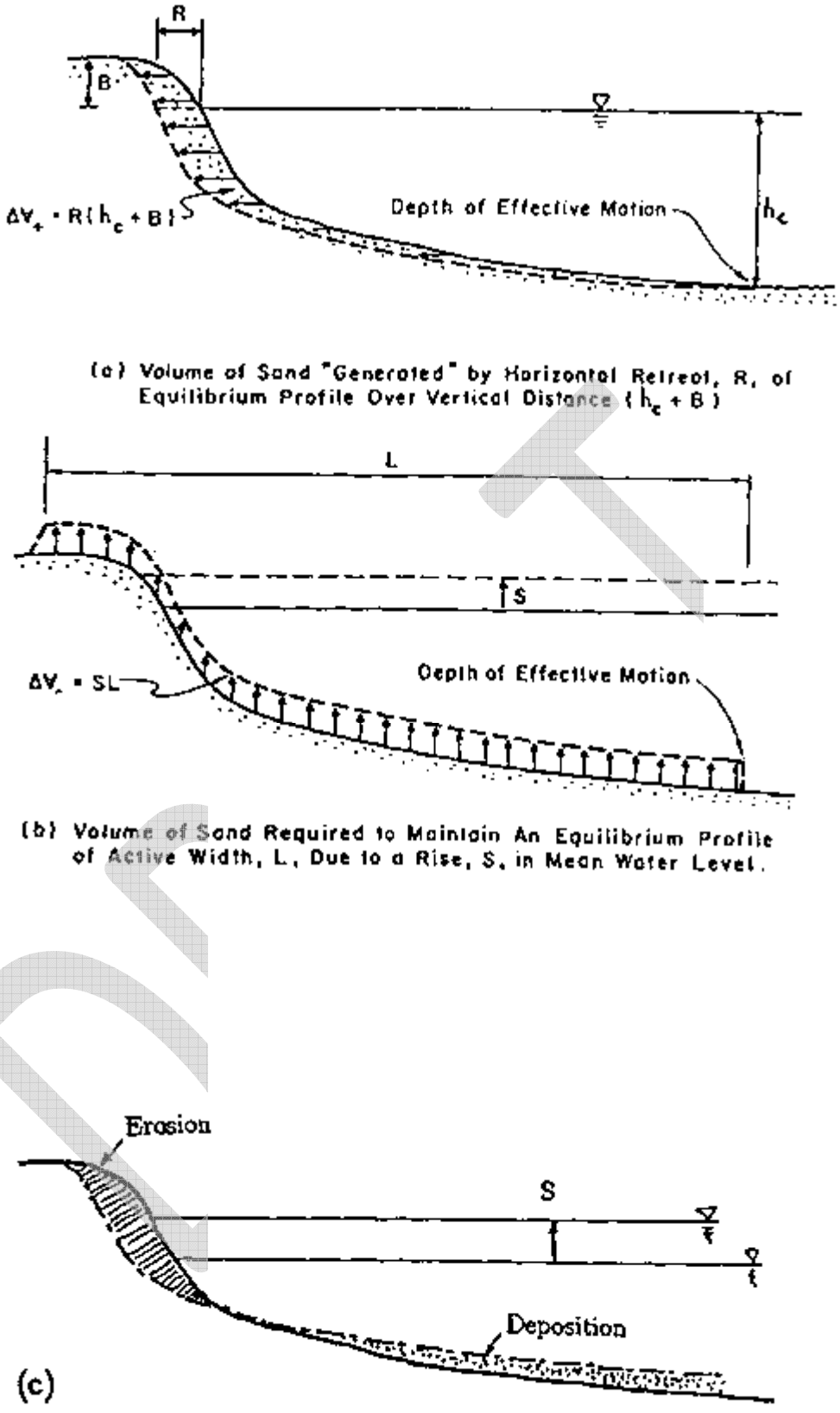

Figure 4.10 – Concept of shoreline recession due to sea level rise

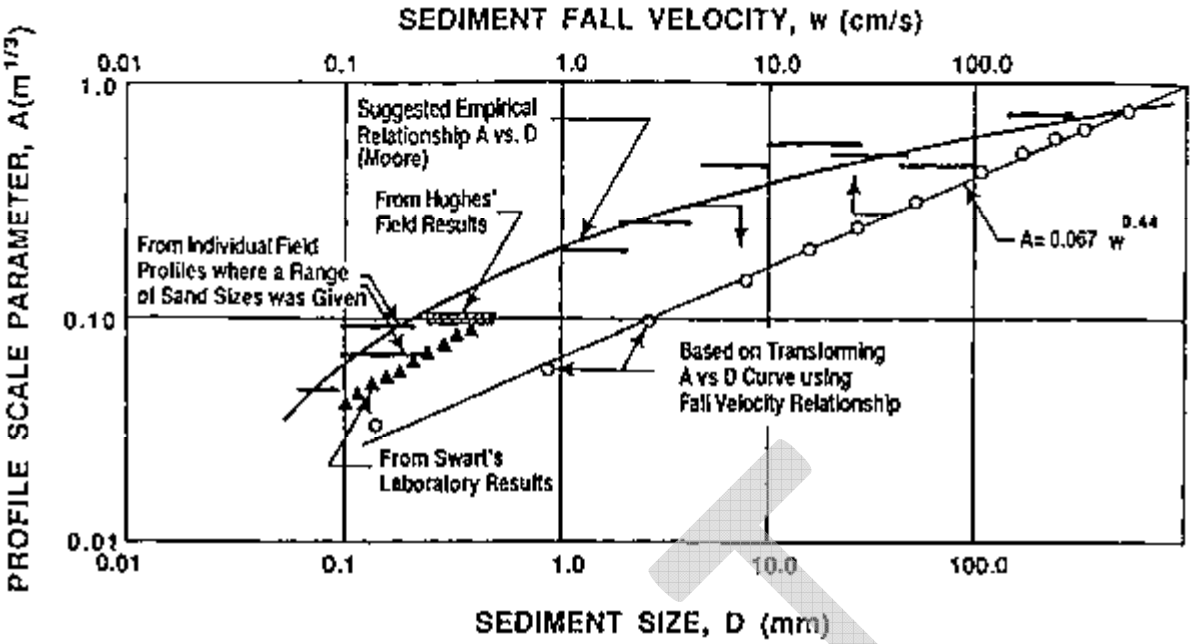

Figure 4.11 – Suggested relationship for shape factor A vs. grain size D

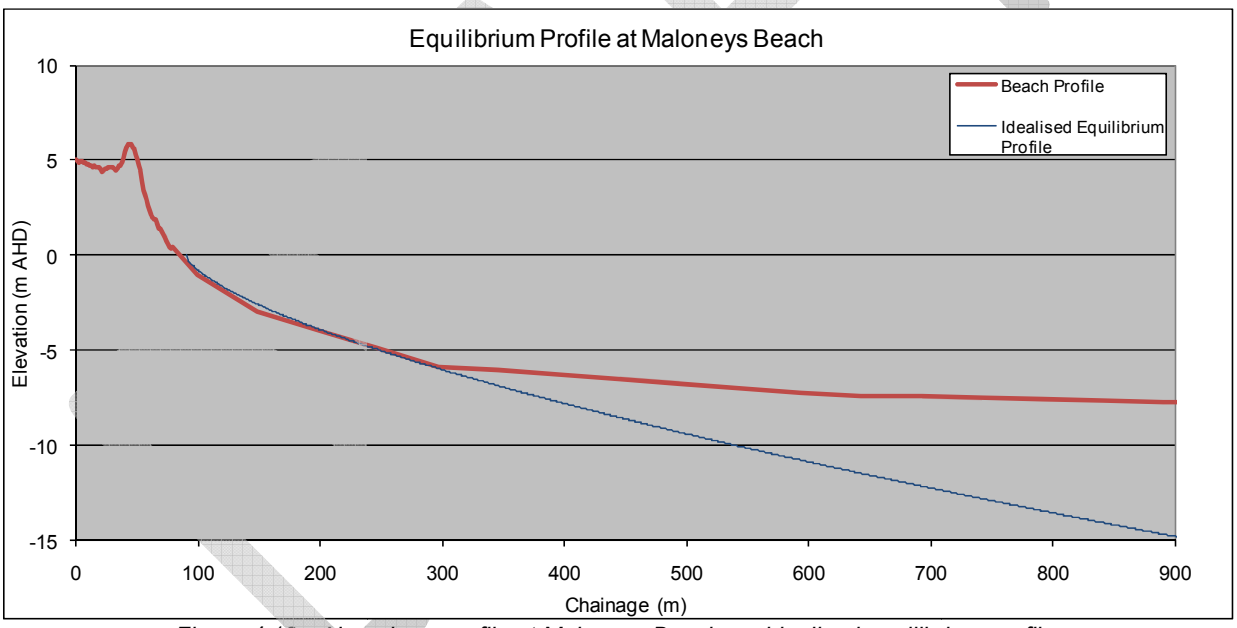

Figure 4.12 – Nearshore profile at Maloneys Beach vs. idealised equilibrium profile

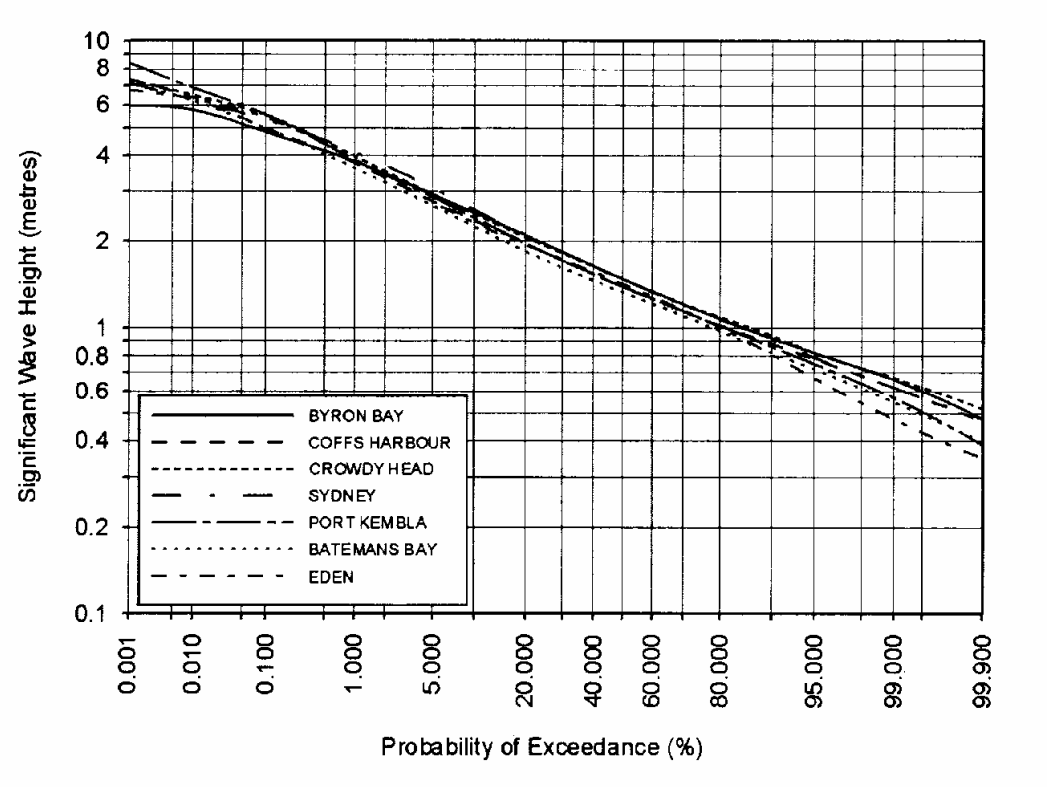

Figure 4.13 – Significant wave height exceedance for NSW coast (Lord & Kulmar, 2000)

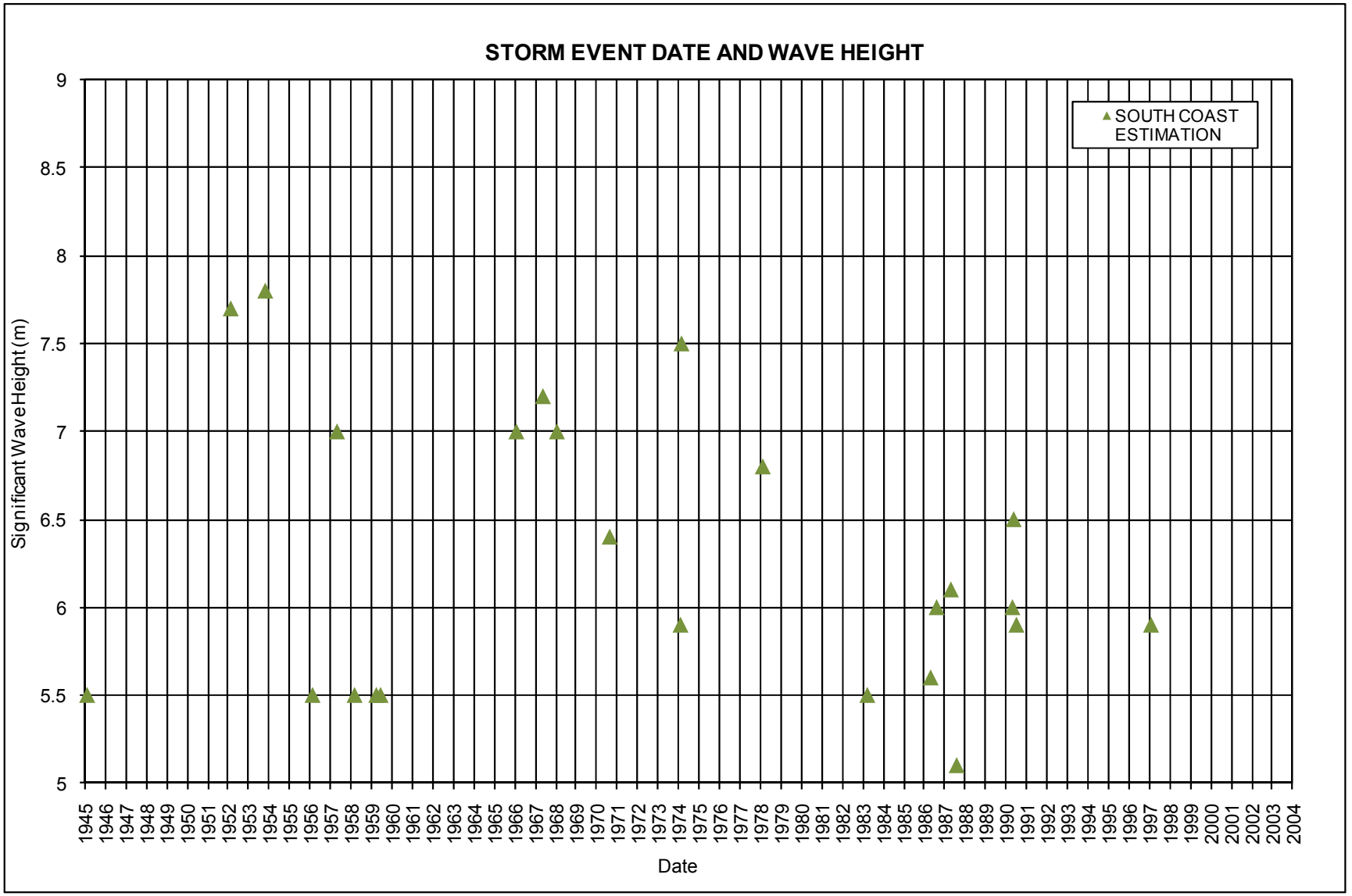

Figure 4.14 – Extreme Storm events along the South coast of NSW

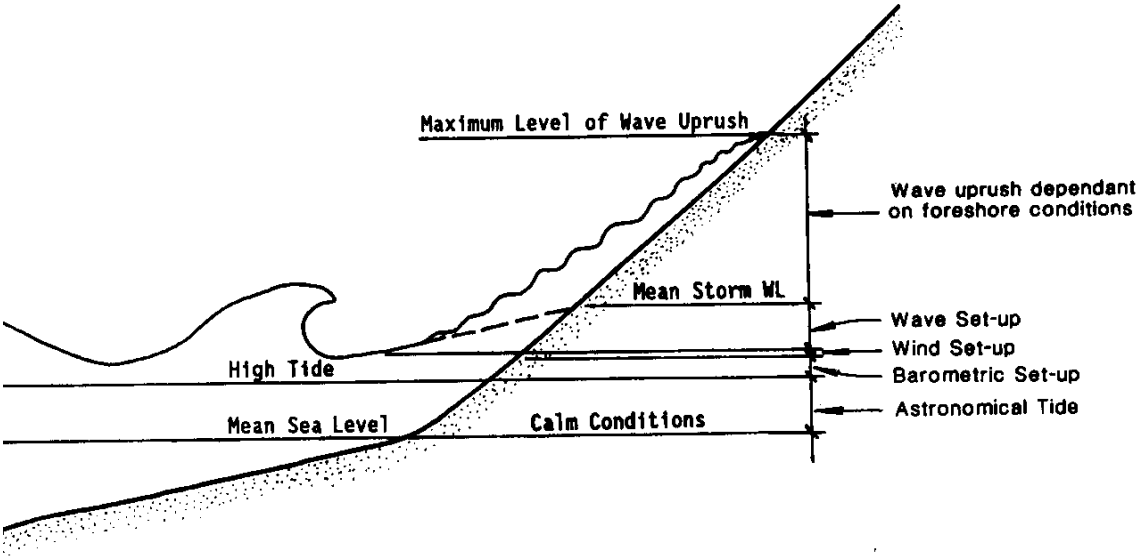

Figure 4.15 – Components of elevated water levels on the coast (NSW Government, 1990)

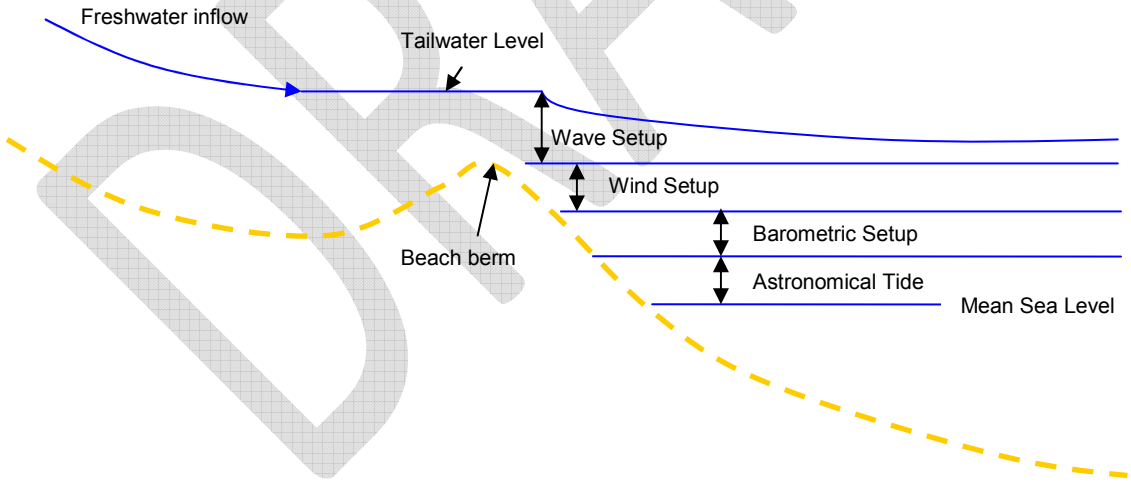

Figure 4.16 – Components of tailwater levels at an estuary entrance

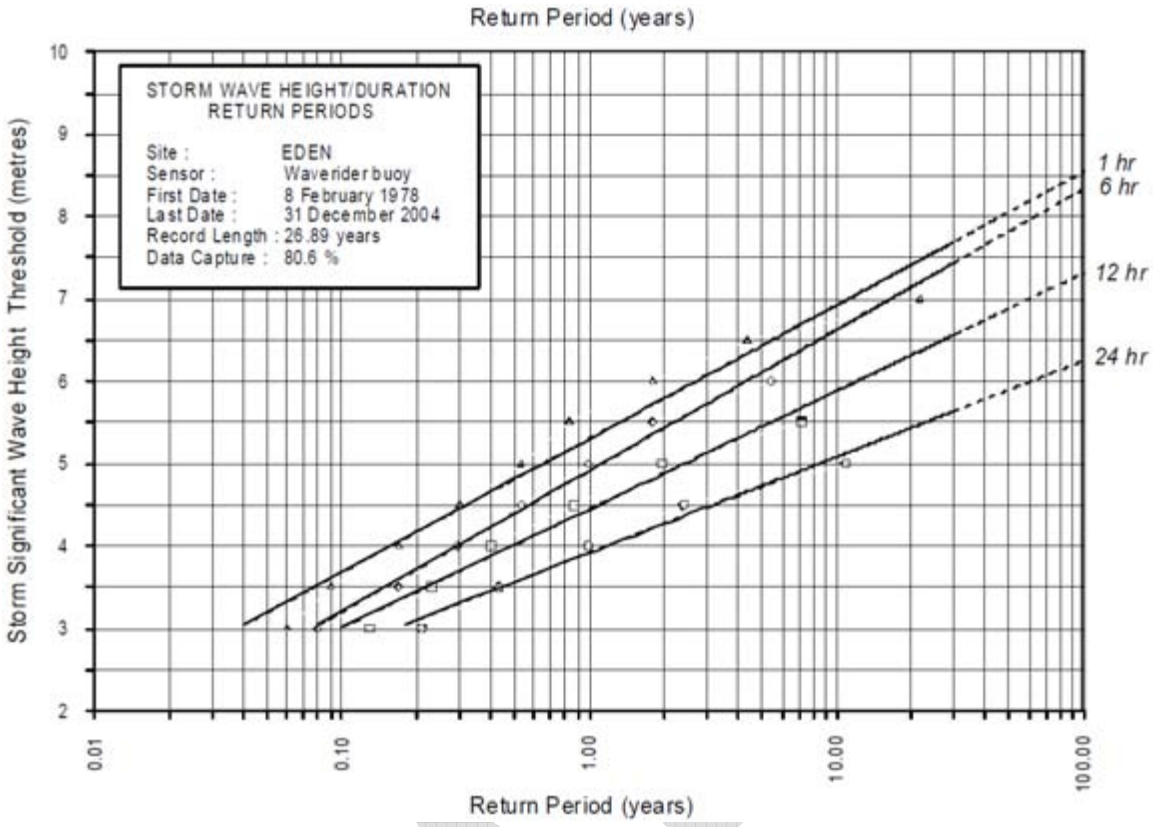

Figure 4.17 – Eden ocean wave height recurrence (Lord & Kulmar, 2005)

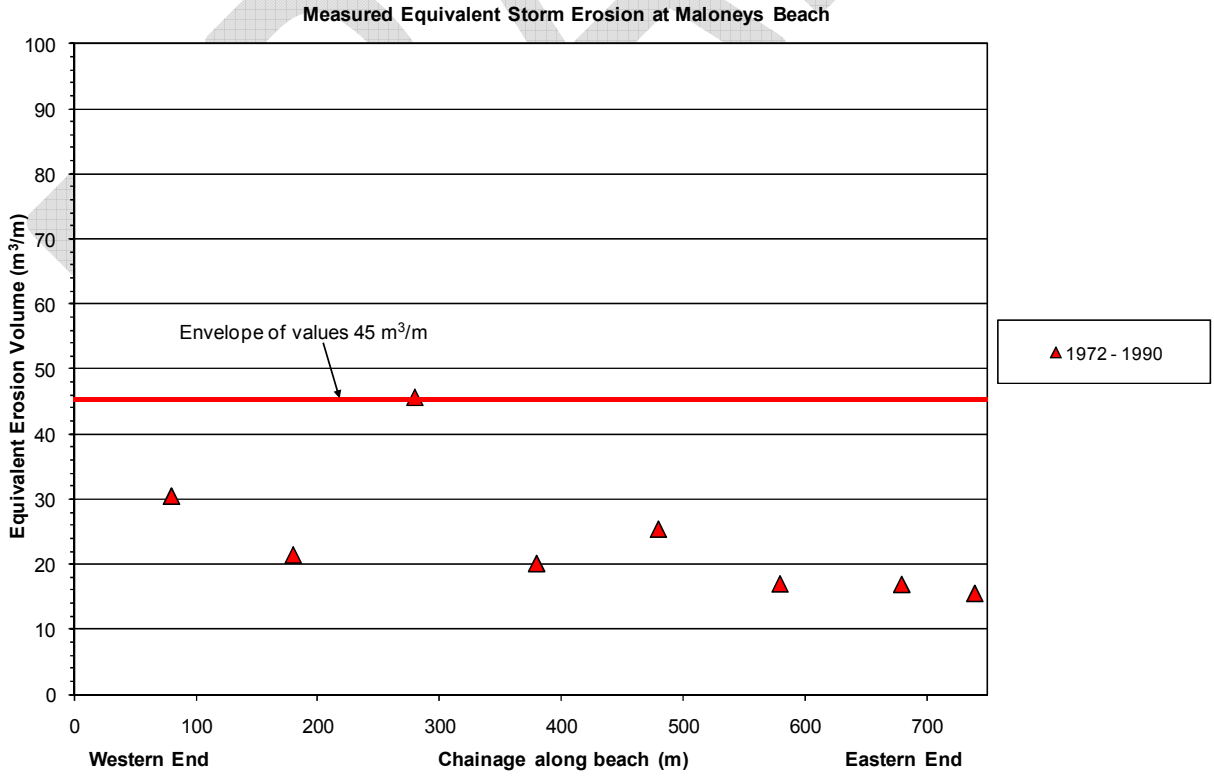

Figure 5.1 – Storm Erosion Demand for the May – June 1974 storm events at Maloneys Beach

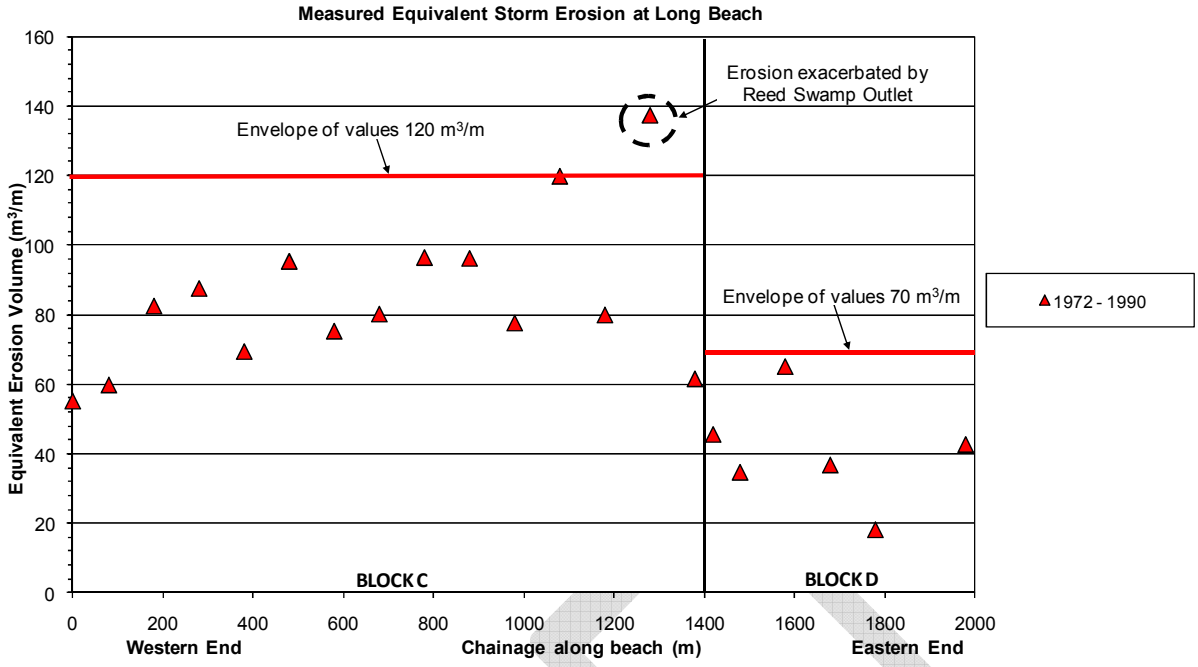

Figure 5.2 – Storm Erosion Demand for the May – June 1974 storm events at Long Beach

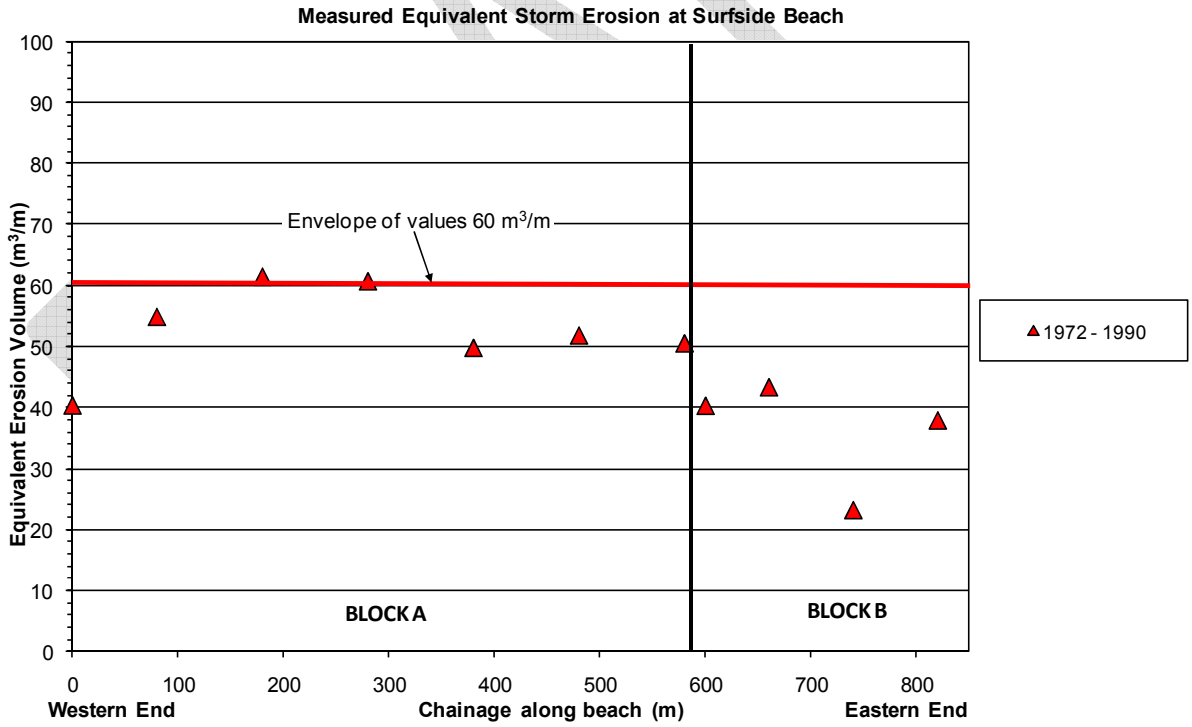

Figure 5.3 – Storm Erosion Demand for the May – June 1974 storm events at Surfside Beach

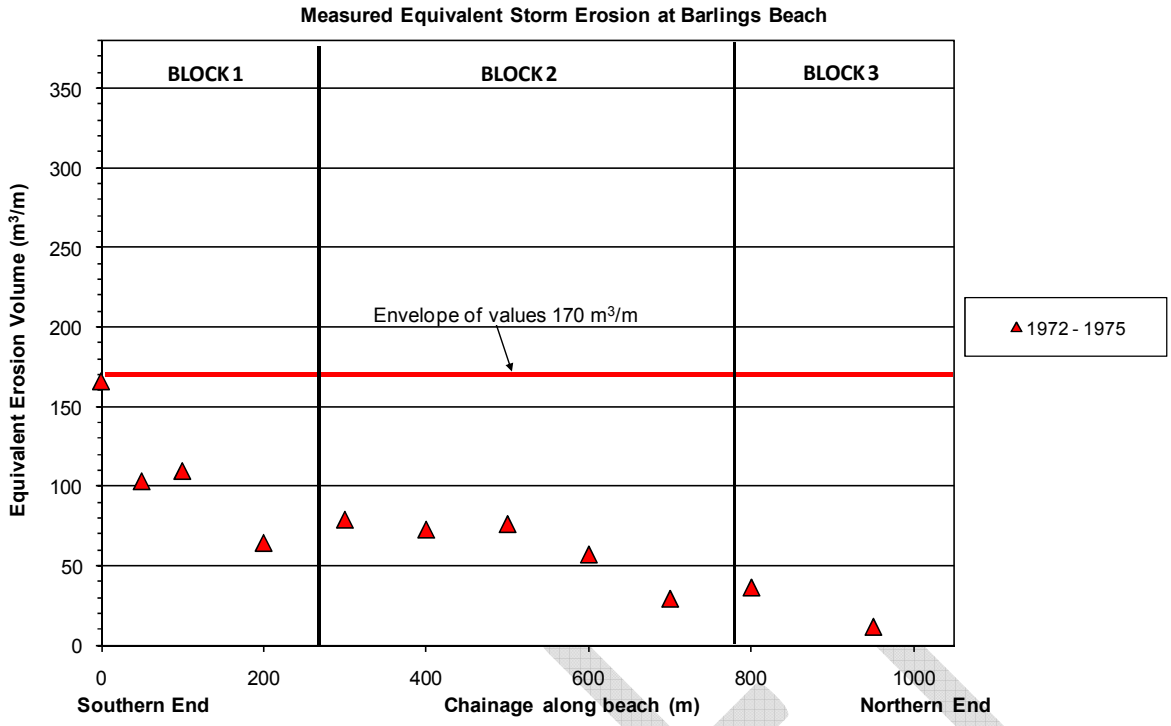

Figure 5.4 – Storm Erosion Demand for the May – June 1974 storm events at Barlings Beach

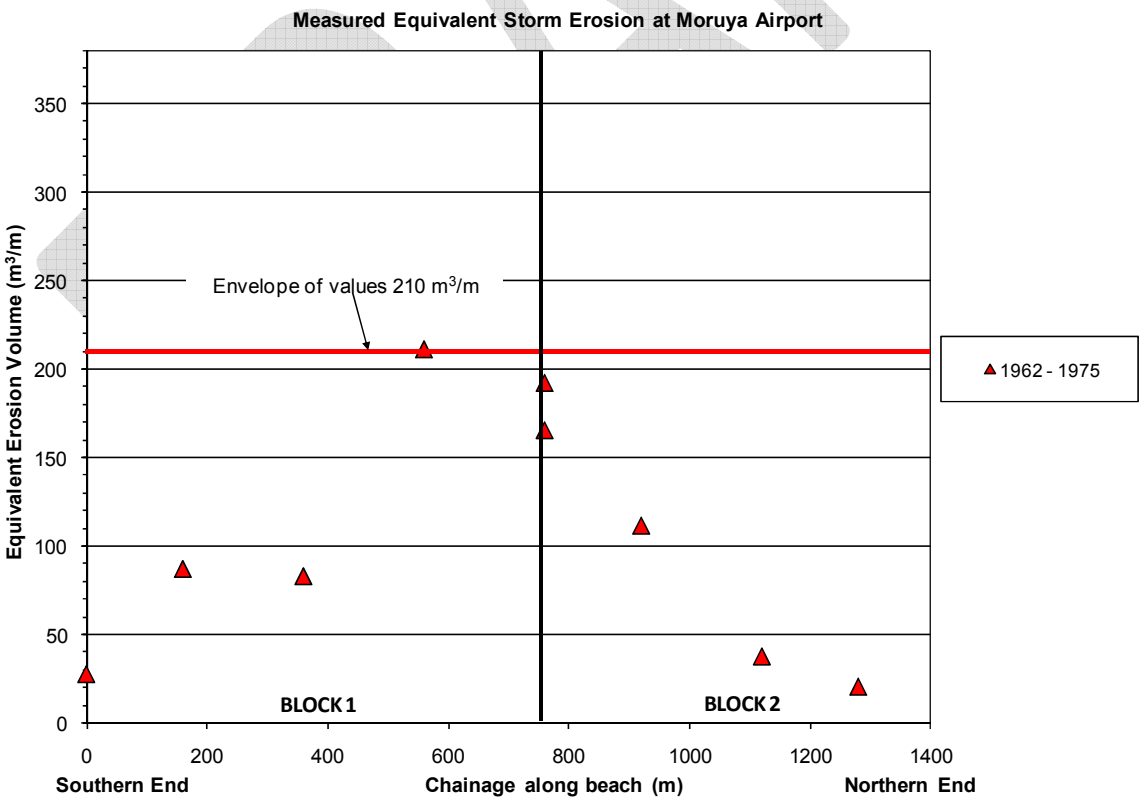

Figure 5.5 – Storm Erosion Demand for the May – June 1974 storm events at Moruya Beach

APPENDIX 1 – RISK ASSESSMENT

Table A – Table of the consequence and likelihood rating used for the risk assessment

	Consequences Rating	1	2	3	4	5
Likelihood Rating	Consequences Description / Likelihood Description	minor structures / assets impacted	<5 lots impacted	5 to 20 lots impacted	20 to 100 lots impacted	>100 lots impacted
1	100 year erosion/inundation risk or low likelihood	1	2	3	4	5
2	50 inundation risk or possible likelihood	2	4	6	8	10
3	50 year erosion risk or moderate likelihood	3	6	9	12	15
4	Immediate inundation risk or high likelyhood	4	8	12	16	20
5	Immediate erosion risk or certain/almost certain likelihood	5	10	15	20	25

Low Risk | Moderate Risk | High Risk | Extreme Risk

Table B – Risk Analysis Matrix

No	Location	Type of Hazard	Likelihood Rating	Consequence Description	Consequence Rating	Priority Score	Reports and Studies Providing Coastal Hazard Information (From Reference List Section 8 of the Main Report)	Information Needed / Study to be Undertaken	Coastal Work Protections	Comments
1	South Durras Beach	Dune stability	2	Instability of dune due to uncontrolled pathway	1	2	N/A	Dune Stabilisation Study	N/A	Fencing access would reduce spreading of pathways and allow vegetation to grow
2	South Durras Beach	Dune recession	1	Cut of the road access due to dune landward movement	2	2	N/A	Coastal Hazard Study	N/A	No risk in immediate future but possible by 2100
3	South Durras Caravan Park	Inundation	1	Inundation of cabins from the caravan park along the lake embankment	1	1	N/A	Tailwater Level Study for Durras Lake	N/A	Caravan Park is at least 3m above lake level
4	Durras Lake embankment, South Durras	Inundation	4	Tidal flooding of a couple of low-lying houses along Lakeside Drive	3	12	N/A	Tailwater Level Study for Durras Lake	N/A	Houses might be at risk in the long-term
5	Southern end of South Durras Beach	Erosion	3	Loss of boat ramp	1	3	N/A	Coastal Hazard Study	N/A	
6	Murramarang Resort	Inundation	4	Flooding of resort cabins	1	4	N/A	Coastal Hazard Study	N/A	Cabins very close to the beachfront
7	Murramarang Resort	Erosion	3	Loss of beachfront cabins Loss of beach amenity in front of the resort	1	3	N/A	Coastal Hazard Study	N/A	Some evidence of minor erosion along the beach

No	Location	Type of Hazard	Likelihood Rating	Consequence Description	Consequence Rating	Priority Score	Reports and Studies Providing Coastal Hazard Information (From Reference List Section 8 of the Main Report)	Information Needed / Study to be Undertaken	Coastal Work Protections	Comments
8	Western end of Maloneys Beach	Inundation/erosion	3	Loss of access to Maloneys Beach town	5	15	Coastal and Riverine Management Directorate (1996) WMA (2006)	Update of Coastal Hazard Study with new benchmarks from the NSW Sea Level Rise Policy (2009)	N/A	Beach recession due to sea level rise
9	Between Long and Maloneys Beaches	Cliff stability	3	Loss of houses at the edge of the cliff due to landslip Beach user safety due to falling rocks	3	9	WMA (2006)	Coastal Geotechnical Study	N/A	Rock there is very erodible (soft siltstone). Some undercutting
10	Between Long and Maloneys Beaches	Water quality	5	Water being polluted in a small bay due to septic tank leakage Loss of visual and recreational amenity Impact of poor quality water on environment and beach user health	1	5	WMA (2006)	Determination of leakage origin Water Quality Monitoring	N/A	Some malodorous black liquid currently leaking through groundwater onto a small pocket beach
11	Eastern half of Long Beach	Inundation	5	Houses located behind beach subject to inundation. Flooding of Bay Road	4	20	Willing & Partners (1991b) Coastal and Riverine Management Directorate (1996) WMA (2006)	Update of Coastal Hazard Study with new benchmarks from the NSW Sea Level Rise Policy (2009)	Seawall covered with sand of unknown length possibly all along Bay Road	Both dune and houses located behind it are very low. Beach is already very narrow at high tide
12	Eastern half of Long Beach	Erosion	4	Houses located behind beach subject to erosion. Loss of access along Bay Road	4	16	Willing & Partners (1991b) Coastal and Riverine Management Directorate (1996) WMA (2006)	Update of Coastal Hazard Study with new benchmarks from the NSW Sea Level Rise Policy (2009)	Seawall covered with of unknown length possibly all along Bay Road	Both dune and houses located behind it are very low. Beach is already very narrow at high tide
13	Western half of Long Beach	Dune recession	1	Dune recession reaching new estate	4	4	Coastal and Riverine Management Directorate (1996) WMA (2006)	Update of Coastal Hazard Study with new benchmarks from the NSW Sea Level Rise Policy (2009)	N/A	Dune in good condition and buffer is wide
14	Cullendulla Beach	Erosion	5	Loss of walking track behind the beach Beach user safety hazard due to falling trees	1	5	Coastal and Riverine Management Directorate (1996) WMA (2006)	Update of Coastal Hazard Study with new benchmarks from the NSW Sea Level Rise Policy (2009)	N/A	No development behind Cullendulla Beach. Future development are expected between Cullendulla Beach and Surfside, which could be at future risk
15	Eastern end of Surfside	Inundation	4	Inundation of houses along Myamba Parade	3	12	Coastal and Riverine Management Directorate (1996) WMA (2006)	Update of Coastal Hazard Study with new benchmarks from the NSW Sea Level Rise Policy (2009)	N/A	House are low lying and close to the dune
16	Eastern end of Surfside	Erosion	3	Erosion of beachfront houses along Myamba Parade	3	9	Coastal and Riverine Management Directorate (1996) WMA (2006)	Update of Coastal Hazard Study with new benchmarks from the NSW Sea Level Rise Policy (2009)	N/A	A stormwater outlet has already been damaged
17	Western end of Surfside	Inundation	4	Flooding of low-lying properties along Timbara Crescent	4	16	WMA (2006)	Update of Coastal Hazard Study with new benchmarks from the NSW Sea Level Rise Policy (2009)	N/A	Several low lying properties along the coast and on both sides of McLeod Road
18	Western end of Surfside	Erosion	5	Loss of sections of McLeod Road and loss of seaward houses at the intersection of Timbara Crescent and Myamba Parade	3	15	WMA (2006)	Update of Coastal Hazard Study with new benchmarks from the NSW Sea Level Rise Policy (2009)	N/A	Visible scarp along beach and road. Dwellings right on the beach. Seawall protecting road damaged.
19	Surfside Creek	Water quality	5	Pollution of creek and odour issues in the area of the creek coming out under McLeod Road Bridge Loss of visual amenity of the creek Impact of poor water quality on environment and beach user near the creek entrance	1	5	WBM (2004)	Water Quality Monitoring	Poor condition rock protection at McLeod Road bridge	Poor quality visible in the creek
20	North Batemans Bay, Wharf Road	Erosion	4	Loss of Easts Riverside Holiday Park and McLeod/Wharf Road	3	12	BMT WBM (2009) Coastal and Riverine Management Directorate (1996) Eurobodalla Shire Council (1997) WMA (2005a&b) WMA (2006) BMT WBM (2009)	Update of Coastal Hazard Study with new benchmarks from the NSW Sea Level Rise Policy (2009)	Fair condition rock seawall along the holiday park and the road	Road and holiday park protected by seawall. Visible erosion east of the road.
21	Batemans Bay CBD	Inundation	4	Flooding of the shops along Orient and Clyde Street and of Batemans Bay CBD	4	16	Willing & Partners (1984) Willing & Partners (1988)	Update of Coastal Hazard Study with new benchmarks from the NSW Sea	Good condition rock seawall and shops have elevated floor levels	Seaward shops have elevated floor level

No	Location	Type of Hazard	Likelihood Rating	Consequence Description	Consequence Rating	Priority Score	Reports and Studies Providing Coastal Hazard Information (From Reference List Section 8 of the Main Report)	Information Needed / Study to be Undertaken	Coastal Work Protections	Comments
				Loss of recreational amenities (walkway along the bay)			Coastal and Riverine Management Directorate (1996) WMA (2006)	Level Rise Policy (2009)		
22	Batemans Bay Marina	Inundation	3	Inundation of the seaward houses located within the marina	4	12	Coastal and Riverine Management Directorate (1996) WMA (2006)	Update of Coastal Hazard Study with new benchmarks from the NSW Sea Level Rise Policy (2009)	Good condition rock seawall	Some houses have mixed material seawalls and other no protection. Wave climate is very low within the marina
23	Joes Creek at Corrigans Beach	Inundation	2	Inundation of Caravan Park along the creek	2	4	Willing & Partners (1989b) WBM (2004)	Update of Tailwater Level Study with new benchmarks from the NSW Sea Level Rise Policy (2009)	N/A	Creek water level relatively high
24	Southern end of Corrigans Beach	Inundation	4	Inundation of the Caravan Park	2	8	Coastal and Riverine Management Directorate (1996) WMA (2006)	Update of Coastal Hazard Study with new benchmarks from the NSW Sea Level Rise Policy (2009)	N/A	Caravan park is very low lying and next to a creek. The very low dune in front of caravan park can be built up given the wide buffer area
25	Southern end of Corrigans Beach	Erosion	5	Loss of the seaward cabins of the Caravan Park	2	10	Coastal and Riverine Management Directorate (1996) WMA (2006)	Update of Coastal Hazard Study with new benchmarks from the NSW Sea Level Rise Policy (2009)	N/A	Very low dune in front of caravan park can be built up given the wide buffer area
26	Creek at southern end of Corrigans Beach	Water quality	5	Pollution of creek and odour issues in the caravan park surrounding the creek Loss of visual amenity due to the presence of rubbish	1	5	N/A	Water Quality Monitoring	N/A	GPT in the creek is full of rubbish and need cleaning
27	Southern end of Corrigans Beach	Cliff stability	3	Loss of 3-4 houses located at the top of the cliff Beach user safety issue due to falling rocks	2	6	N/A	Coastal Geotechnical Study	N/A	Houses are directly on the edge
28	Northern end of Casey Beach	Cliff stability	5	Section of Observation Avenue becoming unsafe Beach user safety issue due to falling rocks	2	10	N/A	Coastal Geotechnical Study	N/A	Some trees are falling along the cliff. Houses have a good buffer
29	Central section of Casey Beach	Inundation	2	Inundation of Beach Road and properties behind seawall Beach user safety as the beach is underwater at high tide	3	6	Coastal and Riverine Management Directorate (1996) WMA (2006)	Update of Coastal Hazard Study with new benchmarks from the NSW Sea Level Rise Policy (2009)	Mostly fair condition rock seawall with some part of the seawall to be fixed	No more beach at high tide in front of the seawall. Houses and road very close to seawall
30	Central section of Casey Beach	Erosion	4	Seawall failure. Loss of road and properties behind seawall	4	16	Coastal and Riverine Management Directorate (1996) WMA (2006)	Update of Coastal Hazard Study with new benchmarks from the NSW Sea Level Rise Policy (2009)	Mostly fair condition rock seawall with some part of the seawall to be fixed	Seawall is mostly in good condition where most exposed to wave climate and in front of properties
31	Short Beach Creek	Inundation	4	Inundation of Holiday Park and houses at the southern end of Casey Beach by tailwater	3	12	Willing & Partners (1989a) WBM (2004)	Update of Tailwater Level Study with new benchmarks from the NSW Sea Level Rise Policy (2009)	Fair condition rock seawall protection the creek entrance under the bridge	Existing tailwater study does not take the rainfall into account
32	South of Short Beach Creek, Casey Beach	Erosion	5	Sewage pumping station at direct risk behind eroding area located south of Short Beach Creek Entrance	2	10	Coastal and Riverine Management Directorate (1996) WMA (2006)	Update of Coastal Hazard Study with new benchmarks from the NSW Sea Level Rise Policy (2009)	Mostly fair condition rock seawall with some part of the seawall to be fixed	Visible undercutting of trees where no seawall protection. Erosion noticeable at the top of seawall
33	Southern end of Casey Beach	Cliff stability	3	Loss of houses at the top of cliff along Bronte Crescent	3	9	Coastal and Riverine Management Directorate (1996)	Coastal Geotechnical Study	N/A	Obvious erosion at the bottom of cliff
34	Sunshine Bay	Erosion	5	Loss of timber shack on the beach and carpark	1	5	N/A	Coastal Hazard Study	N/A	Visible scarp in front of carpark. Very low-lying shack directly on the duneless beach
35	Sunshine Bay	Bluff stability	3	Loss of houses located at the edge of bluff along the beach	3	9	N/A	Coastal Geotechnical Study	N/A	Properties directly on the edge of steep dune but seem founded on hard clay
36	Denhams Beach	Bluff stability	1	Loss of houses located at the edge of bluff	2	2	N/A	Coastal Geotechnical Study	N/A	Houses on the cliff have some buffer
37	Headlands north and south of Surf Beach	Bluff stability	1	Loss of houses located at the edge of bluff	3	3	N/A	Coastal Geotechnical Study	N/A	Houses on the cliff have relatively good buffer

No	Location	Type of Hazard	Likelihood Rating	Consequence Description	Consequence Rating	Priority Score	Reports and Studies Providing Coastal Hazard Information (From Reference List Section 8 of the Main Report)	Information Needed / Study to be Undertaken	Coastal Work Protections	Comments
38	Surf Beach	Erosion	3	Loss of two buildings located at the northern of the beach	2	6	N/A	Coastal Hazard Study	Fenced dune	Buildings right on the beach. Possible toilet block and sewage pumping station
39	Wimbie Beach	Inundation	1	Inundation of one houses at the back of the beach	1	1	WBM (2004)	Update of Tailwater Level Study with new benchmarks from the NSW Sea Level Rise Policy (2009)	N/A	House located near creek entrance
40	Mosquito Bay	Slope stability	5	Loss of houses located within the slope	2	10	N/A	Coastal Geotechnical Study	N/A	Seaward access to houses located along Iluka Avenue currently eroding
41	Garden Bay	Slope stability	1	Loss of houses located within the slope	2	2	N/A	Coastal Geotechnical Study	N/A	Houses seem founded on rock
42	Northern end of Malua Beach (Reedy Creek)	Inundation	1	Inundation of shops and houses by Reedy Creek	3	3	Willing & Partners (1989c) Willing & Partners (1990) Willing & Partners (1991a)	Update of Tailwater Level Study with new benchmarks from the NSW Sea Level Rise Policy (2009)	N/A	Developments are far back
43	Southern end of Malua Beach	Erosion	4	Loss of most seaward houses located at southern end of beach. Erosion of surf club and loss of public facilities. Loss of recreational amenity	3	12	N/A	Coastal Hazard Study	N/A	Developments are very low lying and but relatively far back except a couple of houses. Dune could be built up
44	Southern end of Malua Beach	Inundation	4	Inundation of houses located at southern end of beach and surf club	2	8	N/A	Coastal Hazard Study	N/A	Developments are very low lying and but relatively far back except a couple of houses. Dune could be built up
45	Northern end of Rosedale Beach	Erosion	5	Erosion of boatsheds located on the beach	1	5	N/A	Coastal Hazard Study	N/A	
46	Southern end of Rosedale Beach	Erosion	5	Erosion of shacks located on the beach	1	5	N/A	Coastal Hazard Study	N/A	
47	Guerilla Bay	Inundation	4	Inundation of a couple of houses located at the back of the Beach	2	8	N/A	Coastal Hazard Study	N/A	
48	Barlings Beach	Inundation	4	Inundation of the holiday park at the eastern end of the beach	1	4	An independent study is being undertaken for the new developments on Barlings Beach	N/A	N/A	
49	Tomaga River Entrance	Breakthrough of dune into estuary	3	Inundation of several houses along Tomaga River channel	4	12	N/A	Tailwater Level Study for Tomaga River	Dune arm is fenced at the narrowest location	Dune arm is very narrow. Visible high scarp along the dune. Whole estuarine dynamic processes and morphology could change. Many low lying houses along the river Exacerbation of risk is expected with sea level rise.
50	Tomaga River	Inundation	4	Inundation of the caravan park north of the Tomaga River entrance by tailwater	1	4	N/A	Tailwater Level Study for Tomaga River	N/A	
51	Mossy Point	Inundation	4	Inundation of several houses, boatsheds and private jetties as well as some houses along Annetts Parade near the Tomaga River entrance	4	16	N/A	Tailwater Level Study for Tomaga River	N/A	Low-lying developments at northern end of Annetts Parade along the river
52	Northern end of North Broulee	Inundation	4	Inundation of some houses around Coronation Drive bridge near Candlagan Creek entrance	3	12	N/A	Tailwater Level Study for Candlagan Creek	N/A	Couple of houses very low lying
53	Northern end of North Broulee	Slope instability	1	Loss of houses located within the slope	3	3	N/A	Coastal Geotechnical Study	N/A	Houses seem founded on rock
54	North Broulee	Dune recession	1	Cut of Coronation Drive due to dune landward movement	2	2	N/A	Coastal Hazard Study	N/A	Dune is in good condition and there is a fair buffer between the road and the beachfront
55	Broulee Island	Tombolo stability	3	Breakthrough of tombolo. Change in dynamic and morphology of the area. Loss of snorkelling areas	1	3	N/A	Tombolo Stability Study	N/A	Informal 4-wheel drive access located at the narrowest section of the tombolo should be closed

No	Location	Type of Hazard	Likelihood Rating	Consequence Description	Consequence Rating	Priority Score	Reports and Studies Providing Coastal Hazard Information (From Reference List Section 8 of the Main Report)	Information Needed / Study to be Undertaken	Coastal Work Protections	Comments
56	Broulee Southern Beach	Erosion/Inundation	5	Inundation/Loss of road and carpark along the bottom of the northern headland	1	5	N/A	Coastal Hazard Study	Road is currently protected by a low seawall	
57	Moruya Airport	Dune recession	1	Loss of northern end of the airport ground	1	1	N/A	Coastal Hazard Study	N/A	Buffer between the airport runway and the beachfront is relatively wide
58	Moruya River	Inundation	4	Flooding of access via George Bass Drive and of low-lying housing along the road	3	12	N/A	Tailwater Level Study for the Moruya River	Poor condition rock seawall along the river bank	George Bass Drive very low and wetland on both side of the road
59	Moruya River	Bank erosion	3	Loss of section of Georges Bass Drive	3	9	N/A	Tailwater Level Study for Moruya River	Poor condition rock seawall along the river bank	Some trees are falling along Moruya River
60	Moruya Beach	Erosion	3	Loss of toilet block	1	3	N/A	Coastal Hazard Study	N/A	Toilet block are relatively far back
61	Northern end of Congo	Inundation	4	Flooding of road and houses along Congo Creek	3	12	Willing & Partners (1997)	Update of Tailwater Level Study with new benchmarks from the NSW Sea Level Rise Policy (2009)	N/A	Houses along Congo Creek are low-lying
62	Congo	Inundation	2	Flooding of access to Congo on both access roads. Isolation of the town	4	8	N/A	Coastal Hazard Study	N/A	Both access roads are private and unsealed
63	Coila Lake, Tuross Head	Inundation	2	Flooding of 3-4 low-lying properties along Monash Avenue (West)	2	4	BMT WBM (2010)	Tailwater Level Study	N/A	
64	One Tree Beach south, Tuross Head	Erosion	5	Loss of carpark behind the beach	1	5	N/A	Coastal Hazard Study	N/A	Visible scarp seaward of the carpark
65	Tuross Beach Holiday Park, Tuross Head	Erosion	4	Failure of seawall. Loss of seaward cabins	1	4	N/A	Coastal Hazard Study	Caravan Park protected by relatively new seawall with geotextile	Cabins very close to beach. Erosion visible at the entrance of a creek directly south of the caravan park
66	Tuross Lake, Tuross Head	Inundation	4	Inundation of shops at the south-western tip of Tuross Head	2	8	BMT WBM (2010)	Tailwater Level Study	N/A	Shops very low-lying. 2m trigger for lake opening or 0.8m during more than 14 days due to the low-lying shops
67	Tuross Lakeside Holiday Park	Inundation	4	Inundation of the holiday park and Hector McWilliams Drive at the level of the holiday park	3	12	N/A	Tailwater Level Study	N/A	Park and section of the road very low-lying
68	Beachcomber Holiday Park between Tuross Head and Potato Point	Inundation	3	Loss of access to the caravan park and inundation of the caravan park	2	6	N/A	Coastal Hazard Study	N/A	Access to the caravan park is via Potato Point and is located directly behind the dune along the beach
69	Potato Point	Inundation	4	Inundation of section of Borang and Riverview Streets and of the access from Princes Highway	2	8	N/A	Tailwater Level Study for the creek	N/A	Some houses are possibly already certificated 149 for flooding
70	Mummuga Lake, Dalmeny	Inundation	4	Inundation of some houses and tennis court along Myuna Street and Mort Avenue along the lake	4	16	N/A	Tailwater Level Study for the Mummuga Lake	N/A	Several houses are low-lying along the two streets
71	Yabbarra Beach, Dalmeny	Inundation	3	Inundation of Ocean Drive	2	6	N/A	Coastal Hazard Study	N/A	Culvert capacity under Ocean Drive bridge is too small
72	Duck Pond, Dalmeny	Water quality	3	Pollution of Duck Pond water	1	3	N/A	Water Quality Monitoring	N/A	
73	Between Dalmeny and Kianga	Inundation/erosion	4	Inundation/loss of sections of Ocean/Dalmeny Drive	3	12	N/A	Coastal Hazard Study	N/A	Beach suffers from low sand supply and is very low. Section of road has already been washed away in the 1970s.
74	Kianga Lake	Inundation	4	Inundation of houses along Lakeside Drive by tailwater from the lake	3	12	BMT WBM (2010)	Tailwater Level Study for Kianga Lake	N/A	

No	Location	Type of Hazard	Likelihood Rating	Consequence Description	Consequence Rating	Priority Score	Reports and Studies Providing Coastal Hazard Information (From Reference List Section 8 of the Main Report)	Information Needed / Study to be Undertaken	Coastal Work Protections	Comments
75	Kianga	Inundation	3	Inundation of Williamson Drive and of cycleway along the southern end of Dalmeny Drive	2	6	N/A	Coastal Hazard Study	N/A	Cycleway and Williamson Drive are very low-lying
76	Narooma Flats	Inundation	4	Inundation of Narooma Flats, Williamson Drive and Centenary Drive	5	20	Gary Blumberg and Associates/Patterson Britton and Partners (2005)	Update of Tailwater Level Study with new benchmarks from the NSW Sea Level Rise Policy (2009)	N/A	Large very low-elevated areas
77	Narooma Beach	Inundation	4	Inundation of Surf Club	1	4	BMT WBM (2010)	Tailwater Level Study for Little Lake	N/A	SLSC relatively far back but not much dune in front of it
78	Narooma Beach	Erosion	3	Loss of Surf Club	1	3	N/A	Tailwater Level Study for Little Lake	N/A	SLSC relatively far back but not much dune in front of it
79	Islandview Beach Resort, south of Narooma	Inundation	3	Flooding of the caravan park	2	6	BMT WBM (2010)	Tailwater Level Study for Nangudga Lake	N/A	Resort is very low-lying. Access to beach is flattening dune and could be improved. Nangudga Lake entrance along the resort
80	Islandview Beach Resort, south of Narooma	Dune recession	1	Dune recession reaching the holiday park	2	2	N/A	Coastal Hazard Study	N/A	Resort is very low-lying. Fair buffer between beach and caravan park
81	Mystery Bay	Inundation	1	Inundation of sections of Mystery Bay Road near Lamont Young Drive intersection	2	2	N/A	Coastal Hazard Study	N/A	This section of road is low-lying
82	Mystery Bay	Inundation/erosion	3	Inundation/Loss of carpark and road at the southern end of Mystery Bay Road	2	6	N/A	Coastal Hazard Study	N/A	Southern end of road is on the beach
83	Mystery Bay	Cliff stability	3	Loss of section of Mystery Bay Road near Negus Drive	2	6	N/A	Coastal Geotechnical Study	N/A	Cliff is eroding and road is right on the edge
84	Akolele/Wallaga Lake	Inundation/Erosion	3	Inundation of Wallaga Lake Road at the southern end of Akolele	2	6	N/A	Tailwater Level Study for Wallaga Lake	N/A	Road is very low-lying and in relatively poor condition

No	Location	Type of hazard	Likelihood rating	Consequence description	Consequence rating
1	South Durras Beach	Dune stability	2	Unstability of dune due to uncontrolled pathway	1
2	South Durras Beach	Dune recession	1	Cut of the road access due to dune landward movement	2
3	South Durras Caravan Park	Inundation	1	Inundation of cabins from the caravan park along the lake embankment	1
4	Durras Lake embankment, South Durras	Inundation	4	Tidal flooding of a couple of low-lying houses along Lakeside Drive	3
5	Southern end of South Durras Beach	Erosion	3	Loss of boatramp	1
6	Murramarang Resort	Inundation	4	Flooding of resort cabins	1
7	Murramarang Resort	Erosion	3	Loss of beachfront cabins	1
8	Western end of Maloneys Beach	Inundation/erosion	3	Loss of access to Maloneys Beach	5
9	Between Long and Maloneys Beaches	Cliff stability	3	Loss of houses at the edge of the cliff due to landslip	3
10	Between Long and Maloneys Beaches	Water quality	5	Water being polluted in a small bay due to septic tank leakage	1
11	Eastern half of Long Beach	Inundation	4	Houses located behind beach subject to inundation. Flooding of Bay Road	4
12	Eastern half of Long Beach	Erosion	5	Houses located behind beach subject to erosion. Loss of access along Bay Road	4
13	Western half of Long Beach	Dune recession	1	Dune recession reaching new estate	4
14	Cullendulla Beach	Erosion	5	Loss of walking track behind the beach	1
15	Eastern end of Surfside	Inundation	4	Inundation of houses along Myamba Parade	3

16	Eastern end of Surfside	Erosion	3	Erosion of beachfront houses along Myamba Parade	3
17	Western end of Surfside	Inundation	4	Flooding of low-lying properties along Timbara Crescent	4
18	Western end of Surfside	Erosion	5	Loss of sections of McLeod Road and loss of seaward houses at the intersection of Timbara Crescent and Myamba Parade	3
19	Western end of Surfside	Water quality	5	Pollution of creek and odour issues in the area of the creek coming out under McLeod Road Bridge	1
20	North Batemans Bay, Wharf Road	Erosion	4	Loss of Easts Riverside Holiday Park and McLeod/Wharf Road	3
21	Batemans Bay CBD	Inundation	4	Flooding of the shops along Orient and Clyde Street and of Batemans Bay CBD	4
22	Batemans Bay Marina	Inundation	3	Inundation of the seaward houses located within the marina	4
23	Joe Creek at Corrigans Beach	Inundation	2	Inundation of Caravan Park along the creek	2
24	Southern end of Corrigans Beach	Inundation	4	Inundation of the Caravan Park	2
25	Southern end of Corrigans Beach	Erosion	5	Loss of the seaward cabins of the Caravan Park	2
26	Southern end of Corrigans Beach	Water quality	5	Pollution of creek and odour issues in the caravan park surrounding the creek	1
27	Southern end of Corrigans Beach	Cliff stability	3	Loss of 3-4 houses located at the top of the cliff	2
28	Northern end of Casey Beach	Cliff stability	5	Section of Observation Avenue becoming unsafe	2
29	Central section of Casey Beach	Inundation	2	Inundation of Beach Road and properties behind seawall	3
30	Central section of Casey Beach	Erosion	4	Seawall failure. Loss of road and properties behind seawall	4
31	Short Beach Creek	Inundation	4	Inundation of Holiday Park and houses at the southern end of Casey Beach by tailwater	3
32	South of Short Beach Creek, Casey Beach	Erosion	5	Sewage pumping station at direct risk behind eroding area located south of Short Beach Creek Entrance	2
33	Southern end of Casey Beach	Cliff stability	3	Loss of houses at the top of cliff along Bronte Crescent	3
34	Sunshine Bay	Erosion	5	Loss of timber shack on the beach and carpark	1

35	Sunshine Bay	Bluff stability	3	Loss of houses located at the edge of bluff along the beach	3
36	Denhams Beach	Bluff stability	1	Loss of houses located at the edge of bluff	2
37	Headlands north and south of Surf Beach	Bluff stability	1	Loss of houses located at the edge of bluff	3
38	Surf Beach	Erosion	3	Loss of two buildings located at the northern of the beach	1
39	Wimbie Beach	Inundation	1	Inundation of one houses at the back of the beach	1
40	Mosquito Bay	Slope instability	5	Loss of houses located within the slope	2
41	Garden Bay	Slope instability	1	Loss of houses located within the slope	2
42	Northern end of Malua Beach	Inundation	1	Inundation of shops and houses by Reedy Creek	3
43	Southern end of Malua Beach	Erosion	3	Loss of most seaward houses located at southern end of beach	3
44	Southern end of Malua Beach	Inundation	4	Inundation of houses located at southern end of beach and surf club	2
45	Northern end of Rosedale Beach	Erosion	5	Erosion of boatsheds located on the beach	1
46	Southern end of Rosedale Beach	Erosion	5	Erosion of shacks located on the beach	1
47	Guerilla Bay	Inundation	4	Inundation of a couple of houses located at the back of the Beach	2
48	Barlings Beach	Inundation	4	Inundation of the holiday park at the eastern end of the beach	1
49	Tomaga River Entrance	Breakthrough of dune into estuary	3	Inundation of several houses along Tomaga River channel	4
50	Tomaga River	Inundation	4	Inundation of the caravan park north of the Tomaga River entrance by tailwater	1
51	Mossy Point	Inundation	4	Inundation of several houses, boatsheds and private jetties as well as some houses along Annetts Parade near the Tomaga River entrance	4

52	Northern end of North Broulee	Inundation	4	Inundation of some houses around Coronation Drive bridge near Candlagan Creek entrance	3
53	Northern end of North Broulee	Slope instability	1	Loss of houses located within the slope	3
54	North Broulee	Dune recession	1	Cut of Coronation Drive due to dune landward movement	2
55	Broulee Island	Tombolo stability	3	Breakthrough of tombolo. Change in dynamic and morphology of the area. Loss of snorkelling areas	1
56	South Broulee	Erosion/Inundation	5	Inundation/Loss of road and carpark along the bottom of the northern headland	1
57	Moruya Airport	Dune recession	1	Loss of northern end of the airport ground	1
58	Moruya River	Inundation	4	Flooding of access via George Bass Drive and of low-lying housing along the road	3
59	Moruya River	Bank erosion	3	Loss of section of Georges Bass Drive	3
60	Moruya Beach	Erosion	3	Loss of toilet block	1
61	Northern end of Congo	Inundation	4	Flooding of road and houses along Congo Creek	3
62	Congo	Inundation	2	Flooding of access to Congo on both access road. Isolation of the town	4
63	Coila Lake, Tuross Head	Inundation	2	Flooding of 3-4 low-lying properties along Monash Avenue (West)	2
64	One Tree Beach south, Tuross Head	Erosion	5	Loss of carpark behind the beach	1
65	Tuross Beach Holiday Park, Tuross Head	Erosion	4	Failure of seawall. Loss of seaward cabins	1
66	Tuross Lake, Tuross Head	Inundation	4	Inundation of shops at the south-western tip of Tuross Head	2
67	Tuross Lakeside Holiday Park	Inundation	4	Inundation of the holiday park and Hector McWilliams Drive at the level of the holiday park	3
68	Beachcomber Holiday Park between Tuross Head and Potato Point	Inundation	3	Loss of access to the caravan park and inundation of the caravan park	2
69	Potato Point	Inundation	4	Inundation of section of Borang and Riverview Streets and of the access from Princes Highway	3

70	Mummuga Lake, Dalmeny	Inundation	4	Inundation of some houses and tennis court along Myuna Street and Mort Avenue along the lake	4
71	Duck Point, Dalmeny	Inundation	3	Inundation of Ocean Drive	2
72	Duck Point, Dalmeny	Water quality	3	Pollution of Duck Point water	1
73	Between Dalmeny and Kianga	Inundation/erosion	4	Inundation/loss of sections of Ocean/Dalmeny Drive	2
74	Kianga Lake	Inundation	4	Inundation of houses along Lakeside Drive by tailwater from the lake	3
75	Kianga	Inundation	3	Inundation of Williamson Drive and of cycleway along the southern end of Dalmeny Drive	2
76	Narooma Flats	Inundation	4	Inundation of Narooma Flats, Williamson Drive and Centenary Drive	5
77	Narooma Beach	Inundation	4	Inundation of Surf Club	1
78	Narooma Beach	Erosion	3	Loss of Surf Club	1
79	Islandview Beach Resort, south of Narooma	Inundation	3	Flooding of the caravan park	2
80	Islandview Beach Resort, south of Narooma	Dune recession	1	Dune recession reaching the holiday park	2
81	Mystery Bay	Inundation	1	Inundation of sections of Mystery Bay Road near Lamont Young Drive intersection	2
82	Mystery Bay	Inundation/erosion	3	Inundation/Loss of carpark and road at the southern end of Mystery Bay Road	2
83	Mystery Bay	Cliff stability	3	Loss of section of Mystery Bay Road near Negus Drive	2
84	Akolele/Wallaga Lake	Inundation/Erosion	3	Inundation of Wallaga Lake Road at the southern end of Akolele	2

Priority Score	Comments
2	Fencing access to reduced spreading of pathways
2	No risk in immediate future but possible by 2100
1	Caravan Park is at least 3m above lake level
12	Houses might be at risk in the long-term
3	
4	Cabins very close to the beachfront
3	Some evidence of minor erosion along the beach
15	Beach recession due to sea level rise
9	Rock there is very erodible (soft siltstone). Some undercutting
5	Some stinking black liquid currently leaking through groundwater onto a small pocket beach
16	Both dune and houses located behind it are very low. Beach is already very narrow at high tide
20	Both dune and houses located behind it are very low. Beach is already very narrow at high tide
4	Dune in good condition and buffer is wide
5	No development behind Cullendulla Beach. Future development are expected between Cullendulla Beach and Surfside, which could be at future risk
12	House are low lying and close to the dune

Rate	Likelihood
1	100 year erosion/inundation risk or low likelihood
2	50 inundation risk or possible likelihood
3	50 year erosion risk or moderate likelihood
4	Immediate inundation risk or high likelyhood
5	Immediate erosion risk or certain/almost certain likelihood

9	A stormwater outlet has already been damaged
16	Several low lying properties along the coast and on both sides of McLeod Road
15	Visible scarp along beach and road. Dwellings right on the beach. Seawall protecting road damaged.
5	Poor quality visible in the creek
12	Road and holiday park protected by seawall. Visible erosion east of the road.
16	Seaward shops have elevated floor level
12	Some houses have mixed material seawalls and other no protection. Wave climate is very low within the marina
4	Creek water level relatively high
8	Caravan park is very low lying and next to a creek. The very low dune in front of caravan park can be built up given the wide buffer area
10	Very low dune in front of caravan park can be built up given the wide buffer area
5	GPT in the creek is full of rubbish and need cleaning
6	Houses are directly on the edge
10	Some trees are falling along the cliff. Houses have a good buffer
6	No more beach at high tide in front of the seawall. Houses and road very close to seawall
16	Seawall is mostly in good condition where most exposed to wave climate and in front of properties
12	Tailwater does not take the rainfall into account
10	Visible undercutting of trees where no seawall protection. Erosion noticeable at the top of seawall
9	Obvious erosion at the bottom of cliff
5	Visible scarp in front of carpark. Very low-lying shack directly on the duneless beach

9	Properties directly on the edge of steep dune but seem founded on hard clay
2	Houses on the cliff have some buffer
3	Houses on the cliff have relatively good buffer
3	buildings right on the beach. Possible toilet block and sewage pumping station
1	House located near creek entrance
10	Seaward access to houses located along Iluka Avenue currently eroding
2	Houses seem founded on rock
3	Developments are far back
9	Developments are very low lying and but relatively far back except a couple of houses. Dune could be built up
8	Developments are very low lying and but relatively far back except a couple of houses. Dune could be built up
5	
5	
8	
4	
12	Dune arm is very narrow. Visible high scarp along the dune. Whole estuarine dynamic processes and morphology could change. Many low lying houses along the river Exacerbation of risk is expected with sea level rise.
4	
16	Low-lying developments at northern end of Annetts Parade along the river

12	Couples of house very low lying
3	Houses seem founded on rock
2	Dune is in good condition and there is a fair buffer between the road and the beachfront
3	Informal 4-wheel drive access located at the narrowest section of the tombolo should be closed
5	Road is currently protected by a seawall
1	Buffer between the airport runway and the beachfront is relatively wide
12	George Bass Drive very low and wetland on both side of the road
9	Some trees are falling along Moruya River
3	
12	Houses along Congo Creek are low-lying
8	Both access roads are private and unsealed
4	
5	Visible scarp seaward of the carpark
4	Caravan Park protected by relatively new seawall. Cabins very close to beach. Erosion visible at the entrance of a creek directly south of the caravan park
8	Shops very low-lying. 2m trigger for lake opening or 0.8m during more than 14 days due to the low-lying shops
12	Park and section of the road very low-lying
6	Access to the caravan park is via Potato Point and is located directly behind the dune along the beach
12	Some houses are possibly already certificated 149 for flooding

16	Several houses are low-lying along the two streets
6	Culvert capacity under Ocean Drive bridge is too small
3	
8	Beach suffer from low sand supply and is very low. Section of road has already been washed away in the 1970s.
12	
6	Cycleway and Williamson Drive are very low-lying
20	Large very low-elevated areas
4	SLSC relatively far back but not much dune in front of it
3	SLSC relatively far back but not much dune in front of it
6	Resort is very low-lying. Access to beach is flattening dune and could be improved. Nangudga Lake entrance along the resort
2	Resort is very low-lying. Fair buffer between beach and caravan park
2	This section of road is low-lying
6	Southern end of road is on the beach
6	Cliff is eroding and road is right on the edge
6	Road is very low-lying and in relatively poor condition

Consequence
minor structures/assets impacted
<5 lots impacted
5 to 20 lots impacted
20 to 100 lots impacted
>100 lots impacted

	Consequences Rating	1
Likelihood Rating	Consequences Description Likelihood Description	minor structures/assets impacted
1	100 year erosion/inundation risk or low likelihood	1
2	50 inundation risk or possible likelihood	2
3	50 year erosion risk or moderate likelihood	3
4	Immediate inundation risk or high likelyhood	4
5	Immediate erosion risk or certain/almost certain likelihood	5

2	3	4	5
<5 lots impacted	5 to 20 lots impacted	20 to 100 lots impacted	>100 lots impacted
2	3	4	5
4	6	8	10
6	9	12	15
8	12	16	20
10	15	20	25