Workshop 1 Coastal erosion – planning options

Task

- To define the hazard band thresholds
- Define the strategic planning outcome for each hazard band

Mapping the relative susceptibility of the coastal area to erosion and recession.



Understanding the mapping - Pairwise

Pairwise comparison method

- Potentially All Pairwise RanKings of all possible Alternatives (PAPRKiA)
- Qualitative assessment based on the decision makers preference
- Gives an overall rank to each feature
- Two types of pairs dominated (implicitly ranked) and un-dominated pairs
- Criteria:
 - Is one more likely to occur than the other?
 - Which has a greater area subject to an event?
 - How broad is the category, does it encompass more than one coastal erosion hazard type
 - Which presents the greater hazard to areas of existing or likely future development?"
 - Are land use controls required by State Policy

What does it tell us?

- The relative importance for intervention from land use planning
- It is a decision support tool it does not make the decisions



Understanding the mapping - Pairwise

Pairwise assessment of relative importance of row2 against column A for Land Score Rank Use Planning Controls Score Rank Acceptable hazard one (open coast soft sed. shore) - indwards of likely and possible natural recession limits 625 2 1		and the second secon	Ionger term partiellige & Suinping haard (very coarse boulder day off note) – 20m Acceptable haard zone (normal soft rocks) of Acceptable haard zone (normal soft rocks) soft rocks)	Acceptable huzard zone (all gently to moderately bogned provention) of the second shores) of Scorn bits of Scharable states and code shores to backed by moderately rising hand bedrack) Acceptable hand hour (she set, shores backed by Acceptable hand hour (she spi to diffed hard rocks) Near term hazard some (she spi to diffed hard rocks)	000 Medium-term (to 2039) potential recession hazard 2000 Done (steps to fifted hard rock) 2000 Done (steps to fifted hard rock) 2000 Acceptable hazard zone (steep to diffed hard rock) 2000 More services 2000 Done (steep to diffed hard rock) 2000 More services 2000 Done services 2000 D
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Acceptable hazard zone (sheltered soft sed. shore) - to possible natural recession limit 7234 11 1 10 1 10<	Acceptable hazard zone (sheltered soft sed. shore) - to likely natural recession limit	Acceptable hazard zone (very coarse boulder clay soft rocks)	1825	g	1 1 1000 1 1 1 100 7423
Acceptable hazard zone (sheltered soft sed. shore) - to possible natural recession limit 7,224 11 1<	Acceptable hazard zone (sheltered soft sed. shore) – to possible natural recession li	Acceptable - Resilient artificial shores	3823	10	1 1 1000 1 1 1 100 7324
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Accepable Naud and yoman (non) Recession (no 2.100 distance - Resilient artificial shores 15118 15 1 1 1 10 100 1	Longer-term potential settling & slumping hazard (very coarse boulder clay soft roc	Longer-term potential settling & slumping hazard (very coarse boulder clay soft rocks) – 20m	12220	14	1 1 1000 1 1 1 1000 12220
Marken under Unde	Acceptable hazard zone (normal soft rocks)	Recession to 2100 distance - Resilient artificial shores	15118	15	1 1 100 1 1 1 100 1825 1 1 100 1 1 1 100 1825
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Acceptable hand now block	Storm bite (S1 + S5) hazard zone (soft sed. shores backed by moderately rising hard	Recession (S3) to 2100 hazard zone (open coast soft sed. shore) – to possible natural recession limit	15316	17	1000 1000 1000 1000 1000 1000 1000 32101
Mediantisming (23) to 2100 hazard zone (sheltered soft sed. shore) - to likely natural recession limit 16612 19 1000 <t< td=""><td>Acceptable hazard zone (soft sed. shores backed by moderately rising hard bedrock Near-term hazard zone (steen to cliffed hard rocks)</td><td>Recession to 2050 distance - Resilient artificial shores</td><td>16117</td><td>18</td><td>1 1 100 1 1 1 100 1024 1000 1000 1000 1000 1000 1000 27304</td></t<>	Acceptable hazard zone (soft sed. shores backed by moderately rising hard bedrock Near-term hazard zone (steen to cliffed hard rocks)	Recession to 2050 distance - Resilient artificial shores	16117	18	1 1 100 1 1 1 100 1024 1000 1000 1000 1000 1000 1000 27304
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becession 12 200 ditance - Realient artificial shores Recession (S3) to 2100 hazard zone (open coast soft sed. shore) - to possible natural recession limit 20311 23 1 1 100 1 1 100 1 1 100 1 1 100 1 1 100 1 1 1 100 1 1 1 100 1	Acceptable hazard zone (steep to clifted hard rocks) Stormbite distance - Resilient artificial shores	Longer-term (to 2100) potential recession hazard zone (steep to cliffed hard rocks)	18313	21	1 1 1000 1000 1000 17215
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Storm bite (S1 + S5) hazard zone (sheltered soft sed. shore) – to likely natural recession limit 33100 35		Storm bite (S1 + S5) hazard zone (open coast soft sed. shore) – to likely natural recession limit	32200	34	
		Storm bite (S1 + S5) hazard zone (sheltered soft sed. shore) – to likely natural recession limit	33100	35	

Understanding the mapping - Pairwise

Tasmania Explore the possibilities



Area (Ha) susceptible to erosion and recession

LGA	Acceptable (Ha)	Acceptable (%)	Low (Ha)	Low	Medium(Ha)	Medium (%)	High(Ha)	High (%)	Total (Ha)	Total
				(%)						(%)
Circular Head Council	87,091	97%	1,091	1.2%	469	0.5%	828	0.9%	89479	1
Glamorgan-Spring Bay Council	24,066	92%	1,059	4.1%	367	1.4%	644	2.5%	26135	1
Break O'Day Council	11,080	89%	438	3.5%	337	2.7%	558	4.5%	12413	1
Dorset Council	61,658	98%	487	0.8%	202	0.3%	426	0.7%	62772	1
Flinders Council*	106,698	99%	399	0.4%	0	0.0%	423	0.4%	107520	1
Kingborough Council	8,508	85%	1,000	10.0%	181	1.8%	304	3.0%	9993	1
Clarence City Council	13,275	93%	461	3.2%	338	2.4%	271	1.9%	14344	1
Tasman Council	5,008	79%	1,032	16.3%	39	0.6%	270	4.3%	6349	1
Huon Valley Council*	21,769	93%	1,517	6.5%	9	0.0%	208	0.9%	23504	1
Sorell Council	4,901	90%	184	3.4%	148	2.7%	197	3.6%	5429	1
West Tamar Council	15,289	96%	151	0.9%	383	2.4%	96	0.6%	15919	1
Latrobe Council	14,261	97%	102	0.7%	241	1.6%	96	0.7%	14700	1
George Town Council	22,658	98%	166	0.7%	194	0.8%	85	0.4%	23102	1
Central Coast Council	1,678	88%	83	4.4%	54	2.9%	84	4.4%	1899	1
West Coast Council*	82,293	98%	786	0.9%	926	1.1%	61	0.1%	84066	1
Waratah-Wynyard Council	2,550	92%	132	4.8%	41	1.5%	51	1.8%	2774	1
Derwent Valley Council	595	83%	39	5.5%	42	5.8%	43	5.9%	719	1
King Island Council*	29,316	100%	90	0.3%	0	0.0%	39	0.1%	29445	1
Launceston City Council	5,084	95%	107	2.0%	128	2.4%	38	0.7%	5357	1
Brighton Council	967	90%	37	3.5%	39	3.7%	29	2.7%	1072	1
Devonport City Council	894	94%	35	3.7%	8	0.8%	13	1.4%	950	1
Burnie City Council	343	92%	17	4.5%	8	2.2%	7	1.7%	375	1
Glenorchy City Council	1,248	95%	31	2.3%	26	2.0%	3	0.3%	1308	1
Hobart City Council	875	96%	30	3.2%	7	0.7%	3	0.3%	914	1
Southern Midlands Council	427	100%	0	0.0%	0	0.0%	0	0.0%	427	1
								1		
Grand Total	522,532	97%	9,473	1.8%	4,186	0.8%	4,775	0.9%	540965	

Note: (*) Soft sediment data for natural recession limits storm bite buffers for West Coast, King Island, Flinders Island, Huon Valley councils is incomplete.

Public versus private tenure in the low – medium – high hazards bands



Note: (*) Soft sediment data for natural recession limits storm bite buffers for West Coast, King Island, Flinders Island, Huon Valley councils is incomplete.

Number of residential buildings susceptible to erosion and recession

		Acceptable		Low		Mediu	m	High		Total (Low - N	ledium - High)
LGA	Total number of Residences in each LGA	Count	Proportion (%)	Count	Proportion (%)	Count	Proportion (%)	Count	Proportion (%)	Count	Proportion of total residences in each LGA
Break O'Day Council	3441	1703	89%	82	4%	97	5%	30	1.6%	209	6%
West Tamar Council	8208	4620	92%	89	2%	296	6%	19	0.4%	404	5%
George Town Council	2660	2183	95%	9	0%	104	5%	11	0.5%	124	5%
Waratah-Wynyard Council	4777	2862	93%	139	5%	45	1%	16	0.5%	200	4%
Glamorgan-Spring Bay Council	3148	1003	89%	57	5%	32	3%	39	3.4%	128	4%
Clarence City Council	18906	5590	90%	420	7%	69	1%	102	1.7%	591	3%
Kingborough Council	13135	2071	84%	257	10%	126	5%	23	0.9%	406	3%
Sorell Council	7849	2071	90%	182	8%	35	2%	9	0.4%	226	3%
Latrobe Council	3592	1579	94%	37	2%	65	4%	1	0.1%	103	3%
Tasman Council	1894	465	90%	38	7%	9	2%	4	0.8%	51	3%
Central Coast Council	6135	3509	96%	130	4%	14	0%	18	0.5%	162	3%
Flinders Council*	639	314	96%		0%		0%	14	4.3%	14	2%
Circular Head Council	2177	1468	97%	36	2%	6	0%	1	0.1%	43	2%
West Coast Council*	2793	367	89%	7	2%	39	9%		0.0%	46	2%
Huon Valley Council*	6204	1362	94%	22	2%	12	1%	46	3.2%	80	1%
Brighton Council	5103	789	94%	24	3%	28	3%		0.0%	52	1%
Hobart City Council	16865	5232	98%	92	2%	7	0%	8	0.1%	107	1%
Glenorchy City Council	16245	4641	98%	34	1%	49	1%		0.0%	83	1%
Burnie City Council	7014	558	95%	25	4%	1	0%	2	0.3%	28	0%
Dorset Council	2568	815	99%	5	1%		0%		0.0%	5	0%
Devonport City Council	9627	2210	99%	17	1%	1	0%		0.0%	18	0%
Derwent Valley Council	3384	263	98%	3	1%	3	1%		0.0%	6	0%
Launceston City Council	23242	6753	100%	1	0%	15	0%		0.0%	16	0%
King Island Council*	931	330	100%		0%		0%		0.0%	0	0%
Southern Midlands Council	1214	76	100%		0%		0%		0.0%	0	0%
Grand Total	74384	52834	94%	1706	3.0%	1053	1.9%	343	0.6%	3102	4%

Note: (*) Soft sediment data for natural recession limits storm bite buffers for West Coast,

King Island, Flinders Island, Huon Valley councils is incomplete.

Southern	Guide	Strengths / weakness
Acceptable to Low	point at which risks can no longer be managed solely through non- planning measures.	
Low to Medium	point at which development controls (e.g. siting and building controls) are not adequate to mitigate risks.	
Medium to High	point at which it can be presumed that use and development should not be located in the area.	
Extra high	Locations Currently impacted by normal tide range Significant public/ private costs Protection measures unable to be used?	

Thresholds for the bands

Pairwise assessment of relative importance of row2 against column A for Landuse Planning Controls	Rank	Hazard Band	
Acceptable hazard zone (open coast soft sed. shore) – landwards of likely and possible natural recession limits	1	h	
Acceptable hazard zone (sheltered soft sed. shore) – landwards of likely and possible natural recession limits	2		
Acceptable hazard zone (steep to cliffed hard rocks)	3		_
Acceptable hazard zone (open coast soft sed. shore) – to possible natural recession limit	4		Hig
Acceptable hazard zone (soft sed. shores backed by moderately rising hard bedrock)	5		
Acceptable hazard zone (open coast soft sed. shore) – to likely natural recession limit	6		nag
Acceptable hazard zone (all gently to moderately sloping 'pure' hard rock shores)	7		ho
Acceptable hazard zone (normal soft rocks)	8		nde pod
Acceptable hazard zone (very coarse boulder clay soft rocks)	9		
Acceptable - Resilient artificial shores	10		
Acceptable hazard zone (sheltered soft sed. shore) – to possible natural recession limit	11		
Acceptable hazard zone (sheltered soft sed. shore) – to likely natural recession limit	12		
Recession (S3) to 2100 hazard zone (sheltered soft sed. shore) – to possible natural recession limit	13		
Longer-term potential settling & slumping hazard (very coarse boulder clay soft rocks) – 20m	14		
Recession to 2100 distance - Resilient artificial shores	15		
Recession (S3) to 2050 hazard zone (sheltered soft sed. shore) – to possible natural recession limit	16		
Recession (S3) to 2100 hazard zone (open coast soft sed. shore) – to possible natural recession limit	17		
Recession to 2050 distance - Resilient artificial shores	18		
Recession (S3) to 2100 hazard zone (sheltered soft sed. shore) – to likely natural recession limit	19		
Stormbite distance - Resilient artificial shores	20		
Longer-term (to 2100) potential recession hazard zone (steep to cliffed hard rocks)	21		
Recession (S3) to 2100 hazard zone (open coast soft sed. shore) – to likely natural recession limit	22		
Recession (S3) to 2050 hazard zone (open coast soft sed. shore) – to possible natural recession limit	23		
Longer-term potential recession hazard zone (normal soft rocks) – 63m to 2100	24		
Medium-term (to 2050) potential recession hazard zone (steep to cliffed hard rocks)	25		
Recession (S3) to 2050 hazard zone (sheltered soft sed. shore) – to likely natural recession limit	26		
Recession (S3) to 2050 hazard zone (open coast soft sed. shore) – to likely natural recession limit	27		
Medium-term potential recession hazard zone (normal soft rocks) – 28m to 2050	28		도 포
Storm bite (S1 + S5) hazard zone (open coast soft sed. shore) – to possible natural recession limit	29) v igh
Storm bite (S1 + S5) hazard zone (sheltered soft sed. shore) – to possible natural recession limit	30		ma
Near-term hazard zone (steep to cliffed hard rocks)	31		elił gni
Near-term potential recession hazard zone (normal soft rocks) – 14m to 2030	32		tuc
Storm bite (S1 + S5) hazard zone (soft sed. shores backed by moderately rising hard bedrock)	33		le d
Storm bite (S1 + S5) hazard zone (open coast soft sed. shore) – to likely natural recession limit	34		
Storm bite (S1 + S5) hazard zone (sheltered soft sed. shore) – to likely natural recession limit	35		

- Workshop 1 Develop the hazard matrix
- Develop Control Level
 - See example consequence statements, what is the balance between emergency management, land use planning, and building control
- Develop Strategic Planning Level
 - Should the area be avoided through settlement planning, zoning or regional strategies
- Consider Use or Development Controls
 - Direct guidance for acceptable solutions or performance criteria in a code
 - Life controls on use and developments?



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Coastal inundation planning matrix

Acceptable Band	White or clear on the hazard map.
Hazard exposure	A costal recession or erosion events are an unlikely event in 2100
Control Level	Development and use is not subject to control
Strategic Planning	No impacts on land use strategies or change to zoning required.
Guidance on Use	No hazard specific controls.
Standards	No controls are required to bring the use into an acceptable risk level.
Guidance on	No hazard specific controls.
Development Standards	No controls are required to bring the development into an acceptable
	risk level.



Low Band	Yellow on the hazard map.
Hazard exposure	This area has been modelling as identified that the area is vulnerable to a <i>coastal recession in 2100 based</i>
	on current sea level rise models and the geomorphology of the area.
Control Level	Whilst non-construction requirements are not necessary for most use and development, controls may be
	necessary to reduce the risks associated with vulnerable and hazardous uses or post –disaster and catastrophic risk-based use to ensure that risks are tolerable
	Tisk-bused use to ensure that tisks are toterable.
Strategic Planning	Where broader planning considerations support the development of the area, the low band should not inhibit
	use or development.
Guidance on Use Standards	Residential and other use and occasional or temporary use
	Existing urban areas
	Greenfield / brownfield development
	Vulnerable and hazardous uses
	Post-disaster and catastrophic risk based use
Guidance on Development	Ancillary structures
Standards	Minor extensions
	Infill/ new buildings, habitable buildings and large extensions, and minor utilities
	Major subdivision and major works
	Tasman

	Orange on the landslide hazard map.
Medium Band	
Hazard exposure	The area is exposed to a coastal recession or erosion in 2050 based on current sea level rise models and the geomorphology of the area.
Control Level	Planning controls are necessary for all use and development to ensure that risks are tolerable (as recommended by AGS 2007a). Any vulnerable or hazardous use will only be allowed in exceptional circumstances
Strategic Planning	Where there is no compelling reason to include land identified in this band for development, it should be zoned for open space, rural, or environmental purposes.
	Compelling reasons may include that it is an existing residential area, and further development will be infill. Alternatively, a risk assessment may be required to demonstrate that a proposed zoning is reasonable and avoids areas of high or very high risk.
Guidance on Use	Residential and other use and occasional or temporary use
Standards	• Existing urban areas
	Greenfield / brownfield development
	Vulnerable and hazardous uses
	Post-disaster and catastrophic risk based use
Guidance on	Ancillary structures
Development standards	Minor extensions
	Infill/ new buildings, habitable buildings and large extensions, and minor utilities
	Major subdivision and major works



High Band	Red on the hazard map.
Hazard exposure	The site is exposed to storm based erosion due to current climatic conditions and the geomorphology of the area.
Control Level	All use and development would require significant investigation and an engineered solution to mitigate the natural hazard and enable the development to achieve and maintain a tolerable level of risk, however, the mitigation measures may never achieve comprehensive levels of security and safety.
Strategic Planning	Strategies should discourage all development except vital community infrastructure that cannot be reasonably located elsewhere. Strategies must indicate appropriate zoning and overlays to provide a clear message to the public and the drafters of local government planning schemes to ensure use and development is generally prohibited except under special circumstances.
Guidance on Use Standards	Residential and other use and occasional or temporary use
	Existing urban areas
	Greenfield / brownfield development
	Vulnerable and hazardous uses
	Post-disaster and catastrophic risk based use
Guidance on Development	Ancillary structures
Standards	Minor extensions
	Infill/ new buildings, habitable buildings and large extensions, and minor utilities
	Major subdivision and major works
	Tasman Explore the possi

- Workshop 2 Develop the hazard matrix
- Review Control Level
 - See example consequence statements, what is the balance between emergency management, land use planning, and building control
- Review Strategic Planning Level
 - Should the area be avoided through settlement planning, zoning or regional strategies
- Develop Use or Development Controls
 - Direct guidance for acceptable solutions or performance criteria in a code
 - Life controls on use and developments?



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