

Supplementary Material

The effect of tidal range and mean sea-level changes on coastal flood hazards at Lakes Entrance, south-east Australia

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Table S1: Observed changes in tidal range at ANCHORS tide gauges between 1984–2001 and 2002–2019 epochs.

ANCHORS gauge	Period	1984–2001	2002–2019	Change	Percentage change
Albany	Epoch	1.408	1.388	−0.021	−1.5
Albany	Daily	0.609	0.599	−0.01	−1.7
Albany	Monthly	0.966	0.962	−0.003	−0.3
Albany	Annual	1.287	1.262	−0.024	−1.9
Ballina	Epoch	1.945	1.988	0.044	2.2
Ballina	Daily	1.184	1.192	0.008	0.7
Ballina	Monthly	1.63	1.648	0.018	1.1
Ballina	Annual	1.855	1.898	0.043	2.3
Booby Island	Epoch	4.258	4.362	0.104	2.4
Booby Island	Daily	2.503	2.533	0.03	1.2
Booby Island	Monthly	3.312	3.353	0.04	1.2
Booby Island	Annual	3.995	4.106	0.111	2.8
Brisbane	Epoch	2.685	2.686	0.001	0
Brisbane	Daily	1.771	1.785	0.014	0.8
Brisbane	Monthly	2.359	2.373	0.015	0.6
Brisbane	Annual	2.591	2.593	0.002	0.1
Broome	Epoch	10.493	10.486	−0.007	−0.1
Broome	Daily	5.881	5.862	−0.019	−0.3
Broome	Monthly	9.132	9.118	−0.014	−0.2
Broome	Annual	10.101	10.095	−0.006	−0.1
Bunbury	Epoch	1.247	1.206	−0.041	−3.3
Bunbury	Daily	0.498	0.494	−0.004	−0.7
Bunbury	Monthly	0.787	0.787	0	0
Bunbury	Annual	1.14	1.099	−0.04	−3.5
Bundaberg	Epoch	3.526	3.546	0.02	0.6
Bundaberg	Daily	2.13	2.132	0.002	0.1
Bundaberg	Monthly	3.054	3.063	0.01	0.3
Bundaberg	Annual	3.36	3.381	0.022	0.6
Burnie	Epoch	3.624	3.681	0.057	1.6
Burnie	Daily	2.563	2.575	0.013	0.5
Burnie	Monthly	3.229	3.261	0.031	1
Burnie	Annual	3.479	3.529	0.05	1.4
Cairns	Epoch	3.494	3.531	0.037	1
Cairns	Daily	1.813	1.839	0.026	1.4
Cairns	Monthly	2.895	2.932	0.037	1.3
Cairns	Annual	3.308	3.336	0.028	0.8
Carnarvon	Epoch	2.021	2.006	−0.015	−0.7
Carnarvon	Daily	1.049	1.048	−0.001	−0.1
Carnarvon	Monthly	1.52	1.522	0.002	0.1
Carnarvon	Annual	1.9	1.885	−0.015	−0.8
Darwin	Epoch	8.069	8.133	0.064	0.8
Darwin	Daily	4.8	4.8	0	0
Darwin	Monthly	7.159	7.179	0.02	0.3

ANCHORS gauge	Period	1984–2001	2002–2019	Change	Percentage change
Darwin	Annual	7.789	7.836	0.047	0.6
Eden	Epoch	2.081	2.031	−0.05	−2.4
Eden	Daily	1.256	1.224	−0.032	−2.6
Eden	Monthly	1.755	1.714	−0.042	−2.4
Eden	Annual	1.989	1.943	−0.045	−2.3
Esperance	Epoch	1.393	1.373	−0.02	−1.4
Esperance	Daily	0.638	0.643	0.005	0.8
Esperance	Monthly	0.991	1.001	0.01	1
Esperance	Annual	1.287	1.267	−0.02	−1.6
Fremantle	Epoch	1.172	1.145	−0.027	−2.3
Fremantle	Daily	0.462	0.464	0.002	0.4
Fremantle	Monthly	0.737	0.745	0.008	1.1
Fremantle	Annual	1.067	1.039	−0.028	−2.7
Geelong	Epoch	1.148	1.194	0.046	4
Geelong	Daily	0.724	0.751	0.027	3.8
Geelong	Monthly	0.937	0.971	0.034	3.6
Geelong	Annual	1.097	1.142	0.045	4.1
Geraldton	Epoch	1.241	1.202	−0.039	−3.1
Geraldton	Daily	0.507	0.507	0	−0.1
Geraldton	Monthly	0.79	0.79	0	0
Geraldton	Annual	1.13	1.093	−0.037	−3.3
Gladstone	Epoch	4.803	4.831	0.028	0.6
Gladstone	Daily	2.905	2.919	0.015	0.5
Gladstone	Monthly	4.124	4.154	0.03	0.7
Gladstone	Annual	4.561	4.587	0.025	0.6
Gold Coast	Epoch	2.032	2.106	0.074	3.6
Gold Coast	Daily	1.253	1.298	0.046	3.6
Gold Coast	Monthly	1.73	1.792	0.062	3.6
Gold Coast	Annual	1.946	2.017	0.071	3.6
Hobart	Epoch	1.703	1.723	0.02	1.2
Hobart	Daily	0.894	0.903	0.009	1
Hobart	Monthly	1.317	1.323	0.006	0.4
Hobart	Annual	1.573	1.589	0.017	1.1
Lakes Entrance	Epoch	0.904	1.162	0.257	28.4
Lakes Entrance	Daily	0.405	0.553	0.148	36.6
Lakes Entrance	Monthly	0.617	0.829	0.213	34.5
Lakes Entrance	Annual	0.841	1.086	0.245	29.1
Mackay	Epoch	6.65	6.666	0.015	0.2
Mackay	Daily	4.13	4.138	0.008	0.2
Mackay	Monthly	5.838	5.85	0.012	0.2
Mackay	Annual	6.37	6.382	0.012	0.2
Melbourne	Epoch	1.002	1.028	0.026	2.6
Melbourne	Daily	0.631	0.644	0.013	2
Melbourne	Monthly	0.812	0.829	0.017	2.1
Melbourne	Annual	0.955	0.987	0.031	3.3
Newcastle	Epoch	2.061	2.105	0.044	2.1

ANCHORS gauge	Period	1984–2001	2002–2019	Change	Percentage change
Newcastle	Daily	1.262	1.273	0.012	0.9
Newcastle	Monthly	1.766	1.784	0.019	1.1
Newcastle	Annual	1.978	2.013	0.035	1.8
Onslow	Epoch	2.977	2.986	0.009	0.3
Onslow	Daily	1.614	1.616	0.002	0.1
Onslow	Monthly	2.408	2.413	0.005	0.2
Onslow	Annual	2.839	2.843	0.004	0.1
Point Lonsdale	Epoch	1.858	1.916	0.058	3.1
Point Lonsdale	Daily	1.14	1.163	0.023	2
Point Lonsdale	Monthly	1.56	1.599	0.039	2.5
Point Lonsdale	Annual	1.77	1.823	0.053	3
Port Adelaide	Epoch	2.833	2.884	0.051	1.8
Port Adelaide	Daily	1.758	1.794	0.036	2.1
Port Adelaide	Monthly	2.419	2.467	0.048	2
Port Adelaide	Annual	2.724	2.777	0.053	1.9
Port Hedland	Epoch	7.561	7.544	-0.018	-0.2
Port Hedland	Daily	4.246	4.233	-0.013	-0.3
Port Hedland	Monthly	6.519	6.505	-0.014	-0.2
Port Hedland	Annual	7.25	7.233	-0.017	-0.2
Port Kembla	Epoch	2.059	2.081	0.022	1.1
Port Kembla	Daily	1.249	1.259	0.01	0.8
Port Kembla	Monthly	1.755	1.766	0.011	0.6
Port Kembla	Annual	1.973	1.994	0.021	1.1
Port Lincoln	Epoch	1.934	1.927	-0.007	-0.3
Port Lincoln	Daily	1.052	1.047	-0.005	-0.4
Port Lincoln	Monthly	1.525	1.52	-0.006	-0.4
Port Lincoln	Annual	1.83	1.819	-0.011	-0.6
Port Pirie	Epoch	3.454	3.528	0.074	2.2
Port Pirie	Daily	2.091	2.115	0.024	1.1
Port Pirie	Monthly	2.89	2.934	0.044	1.5
Port Pirie	Annual	3.256	3.314	0.059	1.8
Portland	Epoch	1.359	1.374	0.015	1.1
Portland	Daily	0.67	0.671	0.001	0.2
Portland	Monthly	1.021	1.026	0.005	0.5
Portland	Annual	1.252	1.266	0.014	1.1
Sydney	Epoch	2.062	2.073	0.011	0.5
Sydney	Daily	1.254	1.25	-0.003	-0.3
Sydney	Monthly	1.766	1.761	-0.006	-0.3
Sydney	Annual	1.975	1.983	0.008	0.4
Thevenard	Epoch	2.309	2.266	-0.043	-1.9
Thevenard	Daily	1.272	1.271	-0.001	0
Thevenard	Monthly	1.9	1.893	-0.007	-0.4
Thevenard	Annual	2.177	2.153	-0.024	-1.1
Townsville	Epoch	4.025	4.046	0.021	0.5
Townsville	Daily	2.161	2.173	0.013	0.6
Townsville	Monthly	3.377	3.396	0.02	0.6

ANCHORS gauge	Period	1984–2001	2002–2019	Change	Percentage change
Townsville	Annual	3.818	3.838	0.02	0.5
Victor Harbor	Epoch	1.592	1.622	0.03	1.9
Victor Harbor	Daily	0.74	0.744	0.004	0.6
Victor Harbor	Monthly	1.174	1.189	0.015	1.2
Victor Harbor	Annual	1.471	1.5	0.029	2
Weipa	Epoch	3.341	3.358	0.017	0.5
Weipa	Daily	1.578	1.576	−0.002	−0.1
Weipa	Monthly	2.278	2.276	−0.002	−0.1
Weipa	Annual	3.111	3.133	0.022	0.7
Western Port	Epoch	3.32	3.31	−0.009	−0.3
Western Port	Daily	2.227	2.203	−0.024	−1.1
Western Port	Monthly	2.92	2.893	−0.027	−0.9
Western Port	Annual	3.188	3.177	−0.011	−0.3
Wyndham	Epoch	8.706	8.704	−0.002	0
Wyndham	Daily	5.976	5.93	−0.045	−0.8
Wyndham	Monthly	7.888	7.845	−0.043	−0.5
Wyndham	Annual	8.472	8.464	−0.008	−0.1

Changes are expressed in metres and as a percentage of the 1984–2001 range. These changes are provided for several different definitions of tidal range considering different time averaging. The difference between highest and lowest astronomical tides over the entire epoch, or the average difference between daily, monthly, and annual highest and lowest astronomical tides.

Table S2: Observed trend (m year⁻¹) in tidal constituents at Australian locations in GESLA version 3 tide gauge dataset.

GESLA tide gauge	M2 trend	M2 %	S2 trend	S2 %	K1 trend	K1 %	O1 trend	O1 %
Albany	2.05E-07		-8.66E-05	-0.83	8.47E-05	0.44	-5.98E-05	-0.42
Batemans Bay Princess Jetty	-1.11E-04		9.82E-05		2.82E-05		4.97E-05	
Bermagui	3.38E-04		4.42E-05		1.69E-04		5.27E-05	
Booby Island	-4.22E-05		9.78E-05		1.95E-04		1.38E-04	
Botany Bay	2.02E-04	0.4	5.60E-05		3.03E-05		1.46E-05	
Bowen	3.70E-04	0.48	1.41E-04	0.45	3.03E-05		-1.82E-05	
Brisbane Bar	2.93E-04	0.41	1.19E-04	0.61	4.33E-05		4.84E-05	
Broome	8.21E-04	0.34	4.73E-04	0.32	1.04E-04	0.41	5.39E-05	0.34
Brunswick Heads	-9.55E-05		3.47E-05		4.94E-05		4.09E-05	
Bunbury	2.11E-05		-1.98E-05		2.37E-05		2.70E-05	
Bundaberg Burnett Heads	9.79E-05		1.17E-04	0.39	-2.11E-05		-4.95E-05	-0.43
Burnie	8.61E-04	0.74	2.07E-04	1.41	1.74E-04	1.07	1.15E-04	1
Cairns	4.80E-04	0.81	5.57E-05		9.06E-05	0.29	6.80E-05	0.44
Cape Ferguson	2.33E-04	0.33	-9.14E-05		-4.98E-05		-9.53E-06	
Cape Jervis	2.91E-04		5.14E-04		-8.77E-05		1.73E-04	
Carnarvon	3.12E-04	0.97	1.33E-04	0.95	9.68E-05	0.44	4.87E-05	0.34
Clump Point	3.94E-04	0.63	1.53E-04	0.43	6.09E-05		6.11E-05	
Cooktown	1.97E-04		1.32E-04		-1.32E-06		-1.30E-05	
Darwin	1.32E-04		1.16E-04		7.61E-05		9.58E-05	0.29
Derby	-3.34E-04		2.71E-03		-2.61E-04		-9.31E-05	
Devonport	8.39E-04	0.72	2.43E-04	1.67	1.14E-04	0.69	-2.47E-05	
Eden	4.87E-05		-6.32E-06		1.13E-04		4.77E-05	
Esperance	4.52E-05	0.43	4.78E-05	0.35	9.93E-05	0.54	3.30E-05	
Exmouth	3.23E-04		1.56E-04		9.89E-05		-6.07E-06	
Forster	8.72E-05		-1.33E-05		6.18E-05		4.23E-05	
Fremantle	1.87E-04	3.54	1.37E-04	2.88	3.35E-04	1.97	2.32E-04	1.94
Geelong	1.46E-04	0.53	6.80E-05	1.02	1.24E-04	1.2	2.50E-05	
Georgetown	-1.06E-04		1.47E-04		5.79E-05		-6.64E-05	
Geraldton	-3.15E-07		-3.09E-05	-0.64	2.38E-05		6.02E-06	
Gladstone	1.04E-04		3.90E-04	0.91	3.61E-05		-2.92E-05	
Goods Island	6.33E-04	1.18	3.42E-04	1.69	4.91E-04	0.71	4.17E-04	1.01
Harvey	3.62E-04		3.27E-04		1.91E-03		1.34E-03	
Hay Point	6.94E-04	0.39	4.38E-04	0.66	-1.06E-04	-0.27	-7.22E-05	
Hobart	4.52E-04	1.76	6.51E-05	5.39	2.47E-04	1.13	1.75E-04	1.19
Home Island	2.38E-06		1.34E-05		-7.56E-05	-0.51	-3.08E-05	
Ince Point	-1.27E-04		-4.08E-05		-2.31E-04		-5.00E-05	
Jervis Bay	-8.19E-04		-8.43E-05		-1.16E-04		-1.21E-04	
Karumba	1.49E-04		-4.69E-05		6.50E-04		4.08E-04	
Lakes Entrance Inner Bullock Island	2.79E-03	14.75	9.72E-04	17.15	1.29E-03	13.13	8.28E-04	14.48
Lord Howe Island	-2.25E-05		8.77E-05	0.5	4.46E-05	0.32	-2.13E-06	
Lucinda Offshore	3.41E-04	0.49	1.67E-04	0.41	1.06E-05		3.42E-05	
Mackay Outer Harbour	3.82E-05		1.90E-04	0.31	-4.32E-06		-5.79E-05	-0.3

GESLA tide gauge	M2 trend	M2 %	S2 trend	S2 %	K1 trend	K1 %	O1 trend	O1 %
Melbourne Williamstown	3.28E-04	1.36	6.53E-05	1.17	1.65E-04	1.66	8.72E-05	1.25
Melville Bay Gove Harbour	1.13E-04		-1.41E-05		-9.99E-06		9.55E-05	
Milner Bay Groote Eylandt	7.05E-05		-4.37E-05		1.86E-04	0.56	4.12E-05	
Mooloolaba	-2.58E-04	-0.48	1.09E-05		8.12E-06	0	-2.87E-05	
Mourilyan Harbour	2.01E-04	0.34	3.95E-05		-2.93E-05	0	-2.60E-05	
Newcastle	5.73E-04	1.14	1.53E-04	1.21	1.84E-04	1.14	1.22E-04	1.34
Onslow Beadon Creek	-3.04E-05		3.86E-05		8.09E-05	0.39	-1.29E-05	
Peel Inlet	2.37E-04		2.10E-04		1.81E-03		1.29E-03	
Perth Barrack Street Jetty	1.78E-04	5.01	1.47E-04	5.12	3.88E-04	2.5	2.23E-04	2.08
Point Lonsdale	-4.72E-05		5.14E-06		1.81E-05		1.26E-05	
Port Adelaide Inner Harbour	3.00E-04	0.55	3.14E-04	0.58	8.65E-05	0.32	2.80E-05	
Port Adelaide Outer Harbour	4.64E-04	0.89	5.05E-04	0.97	6.74E-05	0.27	4.02E-05	0.23
Port Alma	2.63E-04	0.18	2.69E-04	0.49	4.72E-05		-7.54E-06	
Port Douglas	4.54E-04		1.44E-04		1.07E-04		7.22E-05	
Port Giles	9.65E-05		2.08E-04		3.22E-05		2.79E-05	
Port Hedland	3.80E-04	0.22	2.78E-04	0.27	4.52E-05		-2.50E-07	
Port Kembla	2.36E-04	0.48	3.84E-05		5.62E-05	0.34	7.42E-06	
Port Lincoln	-1.49E-04	-0.63	-8.96E-05	-0.35	4.60E-05	0.19	1.99E-05	
Port Macquarie	-1.85E-04		-1.33E-04		3.02E-05		7.20E-05	
Port Pirie	2.34E-05		1.19E-05		2.33E-04	0.54	1.31E-04	0.45
Port Stanvac	-1.05E-04		-1.90E-04		6.42E-04		3.30E-05	
Port Welshpool Pier	-3.33E-04		6.42E-05		-1.27E-04		5.63E-06	
Portland	9.49E-07		9.83E-05	0.7	3.16E-05		1.18E-05	
Roslyn Bay	-3.17E-05		1.73E-04		3.70E-05		-7.99E-06	
Shute Harbour	3.86E-04	0.38	2.14E-04	0.59	4.63E-05		-3.06E-07	
Spring Bay	-3.66E-04	-1.24	6.07E-05	2	1.80E-05		-2.62E-05	
Sydney Fort Denison	-2.76E-04	-0.55	-5.49E-05	-0.44	-1.64E-05	-0.11	-3.58E-06	
Sydney Port Jackson	-5.89E-04	-1.18	-8.15E-05	-0.67	-1.27E-04	-0.84	-5.18E-05	
Thevenard	-2.12E-05		2.98E-06		5.72E-05	0.29	2.35E-05	
Thursday Island	2.98E-04		5.13E-04		6.06E-04		2.87E-04	
Townsville	5.59E-04	0.74	9.78E-05	0.23	4.11E-05	0.12	2.09E-06	
Turtle Head	9.11E-05		5.18E-05		5.62E-04	0.88	2.81E-04	
Urangan	2.69E-04	0.25	2.53E-04	0.72	1.40E-04	0.59	-2.52E-06	
Victor Harbor	-8.02E-05		-6.11E-05		5.27E-05		5.57E-06	
Wallaroo	-1.51E-04	-0.91	-1.87E-04	-1.16	2.34E-04	0.7	1.57E-04	0.7
Weipa Humbug Point	3.10E-04	0.84	1.13E-04	1	2.57E-04	0.57	1.41E-04	0.46
Western Port Stony Point	-5.13E-04	-0.57	-3.04E-05		-4.68E-05		-2.69E-05	
Whyalla	-1.65E-04		-1.23E-04		-7.43E-05		6.87E-05	
Wyndham	-1.23E-04		1.80E-04		1.71E-04	0.26	1.77E-04	0.52
Yamba	-4.09E-04	-0.87	-1.10E-04	-0.84	-6.34E-05		-1.00E-04	-1.07

Percentage change per decade is only provided for locations where a statistically significant result was obtained and having at least 30 years of data.

Table S3: Observed water levels (WL) and counterfactual water levels (CF1-7) for each coastal flood day in metres Australian Height Datum (AHD).

Flood day	WL	CF1	CF2	CF3	CF4	CF5	CF6	CF7
26-Apr-2009	0.88	0.79	0.84	0.74	0.87	0.78	0.83	0.73
16-May-2009	0.75	0.67	0.71	0.63	0.74	0.66	0.7	0.62
2-Jul-2009	0.73	0.65	0.69	0.61	0.72	0.64	0.68	0.6
3-Jul-2009	0.78	0.69	0.74	0.65	0.77	0.68	0.73	0.64
4-Jul-2009	0.77	0.68	0.73	0.63	0.76	0.67	0.72	0.62
22-Jul-2009	0.77	0.63	0.73	0.58	0.76	0.62	0.72	0.57
21-Aug-2009	0.73	0.64	0.69	0.59	0.72	0.63	0.68	0.58
26-Aug-2009	0.7	0.67	0.66	0.63	0.69	0.66	0.65	0.62
27-Sep-2009	0.96	0.92	0.92	0.87	0.95	0.91	0.91	0.86
14-Jul-2010	0.76	0.63	0.72	0.59	0.78	0.65	0.73	0.6
16-Sep-2010	0.71	0.66	0.67	0.61	0.73	0.68	0.68	0.63
20-Dec-2010	0.76	0.69	0.72	0.64	0.78	0.71	0.73	0.66
21-Dec-2010	0.76	0.68	0.72	0.63	0.78	0.69	0.73	0.65
5-Jun-2011	0.72	0.6	0.68	0.55	0.69	0.57	0.65	0.52
6-Jun-2011	0.73	0.62	0.69	0.57	0.7	0.59	0.66	0.55
4-Jul-2011	0.73	0.61	0.69	0.56	0.7	0.58	0.66	0.53
5-Jul-2011	0.83	0.71	0.79	0.66	0.8	0.68	0.76	0.63
6-Jul-2011	0.84	0.73	0.8	0.68	0.81	0.7	0.77	0.65
10-Jul-2011	0.88	0.78	0.84	0.74	0.85	0.76	0.81	0.71
27-Nov-2011	0.7	0.64	0.66	0.59	0.67	0.61	0.63	0.56
10-Jan-2012	0.71	0.61	0.67	0.56	0.69	0.58	0.64	0.54
11-Jan-2012	0.77	0.67	0.73	0.62	0.75	0.65	0.7	0.6
6-Feb-2012	0.7	0.59	0.66	0.55	0.68	0.57	0.63	0.52
23-Mar-2012	0.73	0.68	0.69	0.63	0.71	0.65	0.66	0.61
5-Jun-2012	0.71	0.58	0.66	0.53	0.69	0.56	0.64	0.51
6-Jun-2012	0.82	0.69	0.77	0.64	0.8	0.67	0.75	0.62
7-Jun-2012	0.86	0.74	0.81	0.69	0.84	0.71	0.79	0.66
8-Jun-2012	0.82	0.71	0.77	0.66	0.8	0.69	0.75	0.64
9-Jun-2012	0.74	0.62	0.69	0.57	0.72	0.6	0.67	0.55
2-Jul-2012	0.7	0.57	0.65	0.52	0.68	0.54	0.63	0.5
9-Jan-2013	0.72	0.61	0.67	0.56	0.7	0.58	0.65	0.54
5-Jul-2013	0.81	0.71	0.76	0.66	0.79	0.69	0.74	0.64
6-Jul-2013	0.78	0.68	0.73	0.63	0.76	0.65	0.71	0.6
20-Jul-2013	0.73	0.61	0.68	0.56	0.71	0.58	0.66	0.53
21-Jul-2013	0.76	0.63	0.71	0.58	0.74	0.61	0.69	0.56
22-Jul-2013	0.78	0.64	0.73	0.59	0.76	0.62	0.71	0.57
6-Aug-2013	0.76	0.66	0.71	0.61	0.74	0.64	0.69	0.59
17-Aug-2013	0.7	0.6	0.65	0.55	0.68	0.58	0.63	0.53
18-Aug-2013	0.87	0.77	0.82	0.72	0.85	0.74	0.8	0.69
19-Aug-2013	0.91	0.8	0.86	0.75	0.89	0.78	0.84	0.73
20-Aug-2013	0.82	0.71	0.77	0.66	0.8	0.69	0.75	0.64
23-Aug-2013	0.71	0.64	0.66	0.6	0.69	0.62	0.64	0.57

Flood day	WL	CF1	CF2	CF3	CF4	CF5	CF6	CF7
26-Sep-2013	0.71	0.7	0.66	0.65	0.69	0.68	0.64	0.63
28-Sep-2013	0.71	0.67	0.66	0.62	0.69	0.65	0.64	0.6
1-Oct-2013	0.7	0.67	0.65	0.62	0.68	0.64	0.63	0.59
2-Oct-2013	0.74	0.71	0.69	0.66	0.72	0.68	0.67	0.64
2-Jan-2014	0.71	0.6	0.66	0.55	0.74	0.63	0.69	0.58
4-Jan-2014	0.72	0.61	0.67	0.56	0.75	0.64	0.7	0.59
24-Jun-2014	0.82	0.72	0.77	0.67	0.86	0.75	0.8	0.7
25-Jun-2014	0.79	0.69	0.74	0.64	0.83	0.72	0.77	0.67
26-Jun-2014	0.82	0.72	0.77	0.67	0.86	0.75	0.8	0.7
28-Jun-2014	0.77	0.67	0.72	0.62	0.81	0.71	0.75	0.65
29-Jun-2014	0.78	0.68	0.73	0.63	0.82	0.71	0.76	0.66
10-Jul-2014	0.81	0.69	0.76	0.64	0.85	0.72	0.79	0.67
11-Jul-2014	0.74	0.62	0.69	0.56	0.78	0.65	0.72	0.6
12-Jul-2014	0.71	0.57	0.66	0.52	0.75	0.61	0.69	0.55
31-Jul-2014	0.81	0.73	0.76	0.68	0.85	0.76	0.79	0.71
1-Aug-2014	0.78	0.71	0.73	0.66	0.82	0.74	0.76	0.69
5-May-2015	0.7	0.62	0.65	0.56	0.77	0.68	0.72	0.63
6-May-2015	0.72	0.62	0.67	0.57	0.79	0.69	0.74	0.64
7-May-2015	0.75	0.65	0.7	0.6	0.82	0.71	0.77	0.66
8-May-2015	0.7	0.61	0.65	0.56	0.77	0.68	0.72	0.63
11-May-2015	0.75	0.7	0.7	0.65	0.82	0.77	0.77	0.72
12-May-2015	0.79	0.73	0.74	0.68	0.86	0.8	0.81	0.74
13-May-2015	0.78	0.68	0.73	0.63	0.85	0.75	0.8	0.7
10-May-2016	0.77	0.67	0.72	0.61	0.77	0.66	0.71	0.61
11-May-2016	0.79	0.68	0.74	0.63	0.79	0.68	0.73	0.62
12-May-2016	0.75	0.64	0.7	0.59	0.75	0.64	0.69	0.58
13-Jul-2016	0.83	0.76	0.78	0.7	0.83	0.75	0.77	0.7
22-Jul-2016	0.7	0.59	0.65	0.53	0.7	0.58	0.64	0.53
23-Jul-2016	0.73	0.62	0.68	0.57	0.73	0.62	0.67	0.56
26-Jul-2016	0.74	0.65	0.69	0.6	0.74	0.65	0.68	0.59
5-Nov-2016	0.76	0.73	0.71	0.68	0.76	0.73	0.7	0.67
14-Jan-2017	0.76	0.65	0.71	0.6	0.79	0.68	0.74	0.63
17-Aug-2017	0.75	0.67	0.7	0.61	0.78	0.7	0.73	0.64
18-Aug-2017	0.79	0.69	0.74	0.64	0.82	0.72	0.77	0.67
5-Sep-2017	0.7	0.64	0.65	0.59	0.73	0.67	0.68	0.62
15-Apr-2018	0.79	0.72	0.74	0.66	0.83	0.75	0.77	0.7
16-Apr-2018	0.75	0.67	0.7	0.62	0.79	0.71	0.73	0.65
14-Jun-2018	0.74	0.62	0.69	0.56	0.78	0.65	0.72	0.6
15-Jun-2018	0.83	0.72	0.78	0.66	0.87	0.75	0.81	0.7
16-Jun-2018	0.75	0.62	0.7	0.56	0.79	0.65	0.73	0.59
17-Jun-2018	0.71	0.6	0.66	0.54	0.75	0.63	0.69	0.57
7-Jul-2018	0.71	0.64	0.66	0.58	0.75	0.67	0.69	0.61
8-Jul-2018	0.83	0.75	0.78	0.69	0.87	0.78	0.81	0.73
8-Aug-2018	0.72	0.62	0.67	0.56	0.76	0.65	0.7	0.6
10-Aug-2018	0.7	0.58	0.65	0.53	0.74	0.61	0.68	0.56

Flood day	WL	CF1	CF2	CF3	CF4	CF5	CF6	CF7
23-Nov-2018	0.82	0.78	0.77	0.73	0.86	0.82	0.8	0.76
29-May-2019	0.71	0.63	0.66	0.57	0.74	0.65	0.68	0.59
12-Jul-2019	0.77	0.68	0.72	0.63	0.8	0.71	0.74	0.65
13-Jul-2019	0.71	0.62	0.66	0.56	0.74	0.64	0.68	0.58
14-Jul-2019	0.79	0.7	0.74	0.64	0.82	0.72	0.76	0.66
2-May-2020	0.81	0.72	0.75	0.66	0.83	0.74	0.78	0.68
3-May-2020	0.76	0.64	0.7	0.58	0.78	0.66	0.72	0.6
9-May-2020	0.73	0.62	0.67	0.56	0.75	0.65	0.69	0.59
20-Jul-2020	0.73	0.62	0.67	0.56	0.75	0.64	0.69	0.58
19-Aug-2020	0.71	0.6	0.65	0.55	0.74	0.63	0.68	0.57
20-Aug-2020	0.77	0.66	0.71	0.61	0.79	0.69	0.73	0.63
21-Aug-2020	0.76	0.67	0.7	0.61	0.78	0.69	0.72	0.63
26-May-2021	0.74	0.62	0.68	0.56	0.69	0.58	0.63	0.52
27-May-2021	0.76	0.65	0.7	0.59	0.72	0.61	0.66	0.55
24-Jun-2021	0.76	0.64	0.7	0.58	0.72	0.6	0.66	0.54
25-Jun-2021	0.77	0.64	0.71	0.58	0.72	0.59	0.66	0.53
26-Jun-2021	0.77	0.64	0.71	0.58	0.72	0.59	0.67	0.53
20-Jul-2021	0.82	0.72	0.77	0.67	0.78	0.68	0.72	0.62
23-Jul-2021	0.7	0.57	0.64	0.52	0.66	0.53	0.6	0.47
24-Jul-2021	0.8	0.67	0.74	0.61	0.75	0.63	0.69	0.57
25-Jul-2021	0.84	0.71	0.78	0.65	0.79	0.67	0.73	0.61
4-Aug-2021	0.7	0.63	0.64	0.57	0.66	0.58	0.6	0.52
20-Sep-2021	0.73	0.68	0.67	0.62	0.69	0.63	0.63	0.57
5-Oct-2021	0.79	0.74	0.73	0.69	0.75	0.7	0.69	0.64
14-Nov-2021	0.73	0.68	0.67	0.62	0.68	0.64	0.62	0.58
15-Nov-2021	0.85	0.81	0.79	0.75	0.8	0.76	0.74	0.7
20-Dec-2021	0.73	0.67	0.67	0.61	0.69	0.62	0.63	0.56
21-Dec-2021	0.7	0.63	0.65	0.57	0.66	0.58	0.6	0.52

Coastal flood days are defined as those where WL reaches or exceeds 0.7 m AHD. Counterfactuals CF1 – CF 7 are defined as per Section 3.2.1 in the main paper.