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Marine and Freshwater Research

Supplementary Material

Coastal wetland rehabilitation first-pass prioritisation for blue carbon and associated co-benefits

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Table S1. Approach applied to determining biophysical indicators of BCI including storage, preservation, generation and permanency within estuaries.

BCI component	Geomorphic indicator	Description of indicator	Cell label (value)	Cell description
Storage	Elevation, geology (sedimentary and bedrock)	Mature estuaries have larger volume of sediment accumulated over the Holocene compared to immature estuaries	High (3)	Alluvial plain–estuarine plain + elevation 2–5 m
		Quaternary sediments in mature estuaries have more areas with low slopes (low topographic relief)	Moderate (2)	Alluvial plain–estuarine plain + elevation 0–2 m; or
		Finer grained sediments associated with alluvial and estuarine plains store more carbon than sandy sediments associated with coastal barriers	Low (1)	Alluvial plain–estuarine plain + elevation >5 m
			Nil (0)	Coastal barrier
Preservation	Geology (sedimentary and bedrock)	Estuarine sediments exhibits ideal anaerobic and saline conditions for carbon preservation	High (3)	Bedrock geology
		Alluvial sediments increasingly brackish	Moderate (2)	Estuarine plain sediments
		Marine sediments increasingly oxidized or reworked	Low (1)	Coastal barrier sediments
			Nil (0)	Bedrock geology
Generation	Elevation, geology (sedimentary and bedrock)	Lower intertidal areas support mangrove; upper intertidal areas support saltmarsh	High (3)	Quaternary deposits + elevation 0-1 m
		Saltmarsh in fluvial environments have higher generation capacity than estuarine and marine environments	Moderate (2)	Alluvial plain + elevation 1-5 m
		NB: macrophyte mapping was not used due to inconsistencies in accuracy between estuaries.	Low (1)	Coastal barrier–estuarine plain + elevation 1–2 m
			Nil (0)	Bedrock geology
Permanency	Elevation, geology (sedimentary and bedrock)	Lower elevations and shorelines exhibit greater exposure to wave action	High (3)	Coastal barrier–estuarine plain + Elevation >5 m; or
		Marine drivers exhibit history of operating near coastal and estuarine Quaternary deposits.	Moderate (2)	Alluvial plain
			Low (1)	Estuarine plain + elevation <5 m
			Low (1)	Coastal barrier + elevation <5 m
		Nil (0)	Bedrock geology	

In combination, these factors were used to generate BCI maps.

Table S1. Approach applied to determining socio-economic indicators of blue carbon potential and to generate BCC maps.

Land-use category	Cell label (value)	Description of land-use category	Perceived implications for blue carbon
Conservation area	High (3)	Crown reserve, cultural heritage site, foreshore land, marine park, national park, nature reserve, conservation area, riparian reserve, regeneration area, state forest, state recreation area, tree lot	High conservation status and presumed high supply of ecosystem services.
Cropping	Low (1)	Continuous or rotation cropping, or with fixed irrigation system, sometimes within ephemeral wetland or lake, may include large crop areas of fodder, rice, sugar cane	Significant impact on soil, and disturbance of soil organic carbon.
Grazing	Mod. (2)	Occurs in range of landscapes including flood runners, firebreaks, agroforestry, ephemeral wetland, native vegetation, riparian land, irrigated pastures, rangelands, cleared land, and grassland	Some impact to soil structure, however, soil organic carbon likely to be affected to shallow soil depths.
Horticulture	Low (1)	Plantations of banana, bamboo, eucalypt, cut flowers, grass, nursery, olives, orchards, tea tree, tea, coffee, turf, vegetables, vineyard	Significant impact on soil, and disturbance of soil organic carbon. Land-use activity incompatible with saline substrates and likely to provide disservices.
Intensive animal production	Low (1)	Poultry, abattoirs, cattery, animal production of beef, dairy, poultry, piggery, horse studs, sale yards	Significant impact on soil, and disturbance of soil organic carbon.
Mining–quarrying	Low (1)	Derelict and abandoned mines and quarries, grassland within mining lease, mine and quarry sites, restored mining land	Significant impact on soil, and disturbance of soil organic carbon. Land-use activity incompatible with saline substrates and likely to provide disservices.
Power generation	Mod. (2)	Energy corridors, abandoned power stations, substations, gas supply, and green power	Impacts to wetland vegetation (e.g. pruning), and some impact to soil structure; however, soil organic carbon likely to be affected to shallow soil depths and low stature vegetation could be compatible.
River drainage system	Mod. (2)	Channels, estuarine waters, dams, lakes and lagoons, evaporation basins, marinas, river training, navigation structure, river channel filled with aquatic vegetation, water supply channel, weir	Potential as a carbon sink, but limited in carbon generation capacity, and likely vector for export of carbon from catchments.
Special category	Mod. (2)	Beach, cliff, crown reserve with public access, defense utilities, foreshore protection, aboriginal land, levees, sand spits, land in transition	Very small areas with some capacity for supporting blue carbon services
Transport and communication	Low (1)	Airports, railway, communication facilities, roads and road reserves, trig stations, beacons	Significant impacts to wetland vegetation (e.g. clearance), and significant impact to soil structure at reasonable depths.
Tree and shrub cover	High (3)	Hardwood, pine, poplar, rainforest, softwood plantations, native forest, logged and regenerated native forest, native woody shrub, riparian vegetation, tree lot, tree corridor	Includes forested areas that are likely to support understory of saline vegetation where conditions are suitable. Areas undergoing extensive logging, and likely to have significant impacts on soil organic carbon, do not occur within low-lying regions of the coast.
Urban	Low (1)	Residential, rural residential, landfill, abandoned urban or industrial land, aboriginal settlements, caravan parks, cemeteries, waste dump, recreation, tourism, education	Significant impacts to wetland vegetation (e.g. clearance), and significant impact to soil structure at reasonable depths.
Wetland	High (3)	Floodplain swamp, mangrove, mudflat, oyster leases, saltmarsh freshwater swamp	High conservation status and presumed high supply of ecosystem services.

Table S2. Tributaries (rivers and creeks) in which barriers were identified to have significant influence on tidal exchange.

Tributary	Catchment	Coordinates		Comments
		X	Y	
Alipou Creek	Clarence River	495272	6714838	Earth wall (levee bank) 200 m upstream from Clarence River
Anchorage Creek	Moruya River	239283	6021736	[waterway not recorded in Manly Hydraulics Laboratory, 2012]
Belmore River	Macleay River	498897	6559152	Heavy reed growth stops tide here – 1.7 km upstream from Seale Road
Bilambil Creek	Tweed River	545535	6877533	At Hogans Bridge on road to Upper Duroby
Boambee Creek	Boambee Creek	506730	6643998	140 m upstream from bridge on Lindsays Road
Boggy Creek	Bellinger River	501978	6630518	Tide would get to this vicinity 50 m downstream from corner of South Arm Road and Pacific Highway
Broadwater Creek	Clarence River	509753	6744785	Bund wall across creek, 1.8 km downstream from bridge [bund has been outflanked and some tidal flows now move upstream)
Camp Creek	Clarence River	518524	6740234	Floodgates 5 m downstream from bridge
Chickiba Creek	Richmond River	557376	6809624	Tidal to this vicinity, 2.4 km upstream from North Creek
Christies Creek	Cudgera Creek	553978	6860978	200 m upstream from Kanes Road
Clybucca Creek	Macleay River	497031	6576440	Floodgates at this point, 1.6 km downstream from Pacific Highway, any leakage would disperse into network of creeks and drains above floodgates (Lot 6322 DP 790009 Menarcobrinni Floodgate)
Cobaki Creek	Tweed River	545612	6880759	75m downstream from road bridge
Coldstream River	Clarence River	508593	6714212	At floodgates 0.6 km upstream from The Forks
Condong Creek	Tweed River	541826	6867069	Fully tidal creek connected back to Tweed River via Johnsons Creek
Coolongolook River	Wallis Lake	436630	6433801	At causeway at Locketts Crossing
Crawford River	Myall Lakes	424067	6412766	At tidal barrage, 75m upstream from Myall River (Lot 2, DP 544774)
Croobyar Creek	Narrawallee Inlet	267990	6091613	Downstream side of weir at Avonlea farm
Crookhaven Creek	Crookhaven River	290606	6136840	Downstream side of floodgates
Crookhaven River	Crookhaven River	289186	6131407	Downstream side of floodgates
Cubba Cubba Creek	Manning River	450860	6468498	Earth embankment 700 m downstream from old Pacific Highway (Lot 300, DP 1258073)
Cullendulla Creek	Cullendulla Creek	247616	6047910	Saltmarsh in this vicinity, 3.1 km upstream from Batemans Bay
Dignams Creek	Wallaga Lake	231060	5971790	Downstream side of weir
Dinsey Creek	Tweed River	544722	6869853	[waterway not recorded in Manly Hydraulics Laboratory 2012, tide blocked by a floodgate]
Duck Creek	Lake Illawarra	297407	6176947	Large rise at old culverts under old railway bridge, 1.9 km upstream from Lake
Duck Creek	Richmond River	546675	6805988	550 m upstream from bridge
Duck Creek East Canal	Richmond River	548033	6806751	[waterway not recorded in Manly Hydraulics Laboratory 2012, tide blocked by a floodgate]
Dulguigan Creek	Tweed River	541383	6870587	Fully tidal as creek now joined to Rous River by flood channels
Dunbible Creek	Tweed River	538753	6861411	May get a short way upstream from this vicinity
Dungarubba Creek	Richmond River	538572	6791678	Probably tidal to this vicinity, 875m upstream from bridge on Lismore Road (Lot 1, DP 1161249)
Dungay Creek	Tweed River	537469	6871003	Upstream side of right bend in creek, 760 m NW from Pipeclay Creek junction
Duroby Creek	Tweed River	547782	6876827	Downstream side of rock dam, 100 m from Benevis Place on Naponyah Road [An instream bund structure was removed by Tweed Shire Council as part of a Recreational Fishing Trust project to restore fish passage]
Emigrant Creek Canal	Richmond River	548479	6807506	[waterway not recorded in Manly Hydraulics Laboratory 2012, tide blocked by a floodgate]
Empire Vale Creek	Richmond River	549572	6801581	Tide now stopped by floodgates, 15m upstream from bridge on River Drive
Fernbank Creek	Hastings River	484617	6524761	Tidal to this point 900 m upstream from Hastings River Drive Barrier is located west of Lot 2, DP 1140746
Hursley Creek	Hastings River	476754	6522454	At weir 300 m upstream from Carecorara Inlet on Lot 4, DP 729799
Jellat Jellat Gully	Bega River	223078	5932377	Benooka Lake was tidal but now a weir 450 m upstream from Russels Bridge
Jerrara Creek	Minnamurra River	300177	6164593	Rise in creek directly below eastern side of new raised freeway - creek course not as marked on map so limit may be different when construction finishes
Kinchela Creek	Macleay River	498480	6569573	680 m upstream from floodgates tide stopped by reed growth
Kings Creek (South/Drain)	Brunswick River	550401	6840464	At Mullumbimby–Ewingsdale Road
Kooloonbung Creek	Hastings River	491168	6522258	Tide disperses into wetland above this point, 0.9 km upstream from Lake Road
Lansdowne River	Manning River	454935	6481685	At weir near Lansdowne, 2.0 km downstream from railway bridge Lot 1, DP 223410
Leddays–McLeods Creek	Tweed River	549779	6872055	No apparent leakage through floodgates at Pacific Highway
Leos Creek	Twofold Bay	220546	5889198	At causeway on road crossing
Little Branch Creek	Port Stephens	408010	6395912	At ford where The Branch Lane crosses creek Lot 211, DP 870508
Little Bumbo Creek	Tuross River	230707	6007225	175 m upstream from Bumbo Creek

Tributary	Catchment	Coordinates		Comments
		X	Y	
Macquarie Rivulet	Lake Illawarra	296283	6174793	Large rise at old weir 550 m upstream from Princes Highway bridge (Lot 2, DP 533684)
Maguires Creek	Richmond River	547312	6813230	Southern end of golf course, 1 km upstream from bridge
Malabar Creek	Moruya River	238718	6022695	On downstream side of Highway culvert
Marshalls Creek	Brunswick River	551760	6847112	120 m upstream from Pacific Highway bridge
Mollymook Creek	Mollymook Creek	270494	6086768	Entrance usually closed but tide could get to slight rise, 750 m from entrance
Mondrook Creek	Manning River	445389	6470447	Tide stopped by earth embankment (Lot 85, DP 818028)
Mosquito Creek Canal	Richmond River	554036	6805456	No apparent leakage through floodgates near Mobbs Bay
Mullet Creek	Lake Illawarra	300896	6182365	Large rise at old weir, 400 m downstream from railway line
Mullumbimby Creek	Brunswick River	548066	6839694	At weir 520 m upstream from Poplar Street bridge [weir removed by removed by Byron Shire Council as part of a Recreational Fishing Trust project to restore fish passage]
Nangudga Creek	Nangudga Lake	242296	5985160	Downstream side of weir 100 m downstream from Old South Coast Road
Ocean Shores (South)	Brunswick River	552974	6845754	Small weir 4m upstream from culverts under road going to maintenance sheds
Oyster Creek	Manning River	460370	6464299	Rises in creek then disperses into wetland 80 m upstream from cow track culverts (Lot 300, DP 1258073)
Pelican Bay	Manning River	464127	6474249	Not a closed system connected back to river at this point by culvert
Pipeclay Canal	Manning River	469333	6483407	At crossing on road to Coral Ville.
Poverty Creek	Clarence River	516575	6740294	Some leakage through floodgates at this point but creek connects back to river via Poverty Creek drain at 513440E, 6738520N, so no real tidal limit
Reserve Creek	Cudgen Creek	551701	6865664	Creek would be tidal all the way to Clothiers Creek Road
Saltpan Creek	Crookhaven River	290663	6132597	On upstream side of causeway near bend in Bourmes Lane
Saltwater Creek (West)	Port Stephens	547520	6800136	Bund wall of Racecourse Swamp, 2.5 km upstream from Twelve Mile Creek (Lot 1 DP 1734441)
Saltwater Inlet	Macleay River	398316	6376686	Any leakage through floodgates at this point could get a further 700 m upstream
Satwater Creek	Richmond River	503508	6576306	[waterway not recorded in Manly Hydraulics Laboratory 2012, tide blocked by a floodgate]
Southgate–Alumy Creek	Clarence River	501765	6722950	Tide stopped by weir 100 m from Clarence River
Sportsmans Creek	Clarence River	506257	6735297	Tide gets past barrage 3.5 km upstream from Clarence River and would probably reach at least to this point, 3.7 km downstream from railway bridge (Lot 1, DP 1234389)
Spring Creek	Spring Creek	302600	6162259	Large rise through culverts 900 m upstream from entrance
Stoney Creek	Lake Brou	238098	5997729	250 m upstream from Whittakers Creek
Swan Creek	Clarence River	496253	6717371	At floodgates 20 m upstream from Clarence River
Tandingulla Creek	Shoalhaven River	285843	6143129	Floodgates at Sopers Road in good condition
The Branch River	Port Stephens	407062	6399368	Very small tide measured immediately upstream of old causeway, 800 m downstream from The Branch Lane bridge
Tuckean Broadwater	Richmond River	539489	6793915	Tide in Hendersons Drain would disperse into Tuckean Swamp in this vicinity, 6.5 km upstream from Bagotville Barrage
Victoria Creek	Tilba Tilba Lake	241322	5978684	Old weir 250 m downstream from bridge on road to Sunnyside farm
Wallamba River	Wallis Lake	440824	6447536	Old causeway at Clarksons Crossing, 300 m upstream from Pacific Highway
Watt Creek	Nambucca River	495947	6604999	At start of new drainage works, 1.8 km upstream from Nambucca River
Williams River	Hunter River	381432	6385687	Tide stopped by Seaham Weir, 500 m upstream from The Jim Scott Bridge (Lot 11 DP 542642)

Comments are as copied from Manly Hydraulics Laboratory (2012). Additional notes are in brackets

Table S3. Area (ha) of low, moderate, high, and total cell scores for blue carbon storage, preservation, generation and permanency in catchments.

Estuary	Catchment Area (ha)	Storage				Preservation				Generation				Permanency			
		Low	Mod.	High	Total	Low	Mod.	High	Total	Low	Mod.	High	Total	Low	Mod.	High	Total
Arrawarra Creek	1795	52	81	9	142	52	83	12	147	2	4	9	15	24	7	113	144
Back Lagoon	3175	7	111	16	133	7	122	8	136	1	14	14	29	5	6	122	133
Baragoot Lake	1316	28	43	18	89	28	35	28	91	6	8	15	29	6	24	59	89
Batemans Bay	6249	278	155	42	474	279	100	102	480	17	9	41	67	136	52	287	474
Bega River	194021	41	5297	582	5920	41	5467	440	5948	24	557	806	1388	33	404	5484	5920
Bellinger River	110849	266	7758	2044	10068	269	9737	347	10354	81	2507	335	2923	147	244	9891	10282
Belongil Creek	3068	1330	397	190	1917	1333	125	523	1981	150	10	149	309	925	332	715	1972
Bengello Creek	1633	458	111	35	604	459	146	1	606	5	35	77	116	43	0	561	604
Bermagui River	8562	74	276	64	414	74	225	167	466	23	29	64	116	6	107	300	414
Berrara Creek	3530	8	130	20	159	8	85	67	161	7	1	19	27	6	41	111	159
Black Head Lagoon	200	21	42	11	74	21	46	8	75	2	11	2	15	8	5	63	75
Boambee Creek	4948	659	878	216	1753	660	992	202	1854	94	187	117	398	505	167	1169	1841
Bobundara Creek	1389	4	149	29	182	4	179	0	184	0	29	7	36	2	0	180	182
Bonville Creek	11513	252	2623	271	3146	252	2922	74	3247	7	307	46	360	30	50	3155	3235
Bournda Lagoon	3459	11	241	2	254	11	235	11	258	1	0	6	7	3	6	245	254
Boydton Creek	388	15	2	1	18	16	0	3	19	1	0	2	3	6	2	10	18
Broken Head Creek	117	76	4	3	83	76	0	7	83	10	0	6	15	46	5	31	83
Brunswick River	22993	1154	4877	1508	7540	1159	5641	1045	7845	207	1296	303	1805	657	794	6356	7808
Bullengella Lake	74	1	3	2	5	1	1	3	5	0	0	0	1	1	2	3	5
Bundageree Creek	1013	77	120	6	204	77	111	16	204	4	5	2	10	22	3	179	204
Bunga Lagoon	1168	1	37	6	44	1	40	4	45	1	4	2	6	1	2	41	44
Burrill Lake	6512	72	255	63	389	72	275	50	397	3	49	23	76	26	26	336	389
Butlers Creek	309	5	40	7	52	5	40	7	53	1	4	2	7	3	4	45	52
Cakora Lagoon	1269	137	32	46	215	137	0	82	219	29	0	23	51	75	78	65	218
Callala Creek	1979	341	158	33	533	342	71	121	534	30	10	123	163	127	111	295	533
Camden Haven River	62115	1425	12649	1382	15455	1413	13384	1215	16012	385	1553	803	2740	773	1003	14396	16171
Candlagan Creek	2431	107	379	116	602	107	435	63	606	13	90	69	172	36	39	528	602
Captains Beach Lagoon	319	52	1	0	54	52	2	0	54	1	0	10	11	12	0	42	54
Carama Creek	919	182	260	91	533	182	0	356	538	86	0	241	327	159	312	61	533
Cathie Creek	11925	860	2470	248	3579	865	2062	1217	4144	180	85	397	662	389	1017	2715	4120
Clarence River	2218742	5722	57411	22980	86112	5744	81062	8651	95457	1443	30562	9149	41155	1350	7195	86753	95299
Clyde River	174046	0	2389	374	2763	0	2397	569	2966	52	246	187	485	0	315	2448	2763
Coffs Creek	2450	203	536	66	805	203	583	35	821	15	63	11	88	84	21	711	815
Coila Lake	5476	61	369	88	517	61	389	78	528	15	66	57	139	27	61	429	517
Congo Creek	4332	360	304	130	794	360	330	110	800	26	89	95	210	62	83	649	794
Conjola Lake	14581	94	460	129	683	94	366	237	697	8	84	102	193	5	128	550	683
Corindi River	14834	254	2462	345	3061	255	2486	358	3099	86	192	62	339	100	300	2684	3084
Corunna Lake	3187	4	201	26	232	4	198	39	241	4	20	22	45	4	22	206	232
Crooked River	3227	176	744	334	1254	176	794	273	1242	40	266	126	431	28	168	1058	1254
Cudgen Creek	7076	1266	894	579	2739	1266	756	863	2885	185	294	177	657	527	675	1673	2875
Cudgera Creek	6103	832	911	249	1993	833	1083	97	2013	130	235	75	440	531	71	1408	2010
Cullendulla Creek	1645	37	216	51	303	37	98	175	310	35	12	95	143	34	139	130	303
Curalo Lagoon	2904	36	108	18	161	36	93	36	165	6	10	35	51	26	30	105	161
Currambene Creek	16224	201	907	236	1344	201	749	417	1368	76	135	259	469	76	343	926	1344

Estuary	Catchment Area (ha)	Storage				Preservation				Generation				Permanency			
		Low	Mod.	High	Total	Low	Mod.	High	Total	Low	Mod.	High	Total	Low	Mod.	High	Total
Currarong Creek	1237	32	72	23	127	32	15	80	128	15	2	45	62	9	74	44	127
Cuttagee Lake	5447	10	73	24	108	10	62	41	113	6	13	16	35	9	25	74	108
Dalhousie Creek	633	9	13	6	27	9	2	26	36	3	0	4	7	8	20	8	36
Darkum Creek	617	2	63	9	74	2	63	11	76	1	5	1	8	2	8	66	75
Deep Creek	9153	73	1055	183	1311	73	1177	94	1344	21	194	41	256	42	70	1230	1343
Duchess Gully	1062	67	198	21	286	65	208	11	284	6	26	15	48	41	4	245	289
Durras Creek	594	5	87	12	103	5	20	79	104	4	0	28	32	1	43	59	103
Durras Lake	6213	19	303	55	377	19	175	195	388	20	11	17	48	1	79	297	377
Elliott Lake	1005	41	115	69	226	39	119	59	216	17	32	4	53	37	54	134	226
Evans River	7850	1329	1189	343	2860	1336	847	881	3063	131	184	182	497	539	430	2073	3042
Fiddamans Creek	156	11	14	7	32	12	21	0	33	1	7	3	11	11	0	21	32
Fisheries Creek	654	12	19	2	34	13	10	12	34	2	0	3	5	9	3	22	34
Flat Rock Creek	689	222	52	9	283	222	4	57	283	5	0	31	36	6	42	235	283
Flat Top Point Creek	259	42	24	4	70	43	22	7	71	4	1	3	8	18	7	46	71
Glenrock Lagoon	742	0	2	1	3	1	0	2	3	0	0	0	0	0	1	2	3
Goolawah Lagoon	408	262	27	11	300	262	1	71	334	20	0	20	40	176	51	107	334
Hastings River	368853	10316	32084	4990	47390	10350	35703	5516	51569	1460	5724	3368	10552	6266	2909	42205	51380
Hearns Lake	675	5	99	11	115	5	94	19	119	4	1	4	9	5	19	94	118
Hunter River	2141399	8424	24962	9874	43260	8416	34109	5293	47818	1388	13409	5672	20469	1642	4590	41478	47710
Jerusalem Creek	4864	1365	898	30	2293	1377	909	48	2333	86	26	157	269	571	45	1704	2320
Jervis Bay	15628	887	44	12	943	895	9	50	954	13	3	107	123	126	37	780	943
Jordans Creek	254	4	27	0	31	4	27	1	32	0	0	1	2	3	1	28	32
Karuah River	146630	0	13486	625	14111	0	13323	1249	14572	223	503	362	1088	0	1185	13486	14671
Kellys Lake	218	8	31	5	45	8	28	9	45	2	1	2	5	6	6	33	45
Khappinghat Creek	9192	285	2076	117	2478	280	2064	210	2553	64	109	117	290	208	174	2202	2584
Kianga Lake	767	0	16	6	22	0	13	10	23	1	0	2	3	0	8	14	22
Killick Creek	822	258	192	91	540	258	184	185	626	42	54	55	151	169	106	349	624
Korogoro Creek	979	570	152	108	829	570	10	316	896	79	1	60	140	181	263	450	894
Lake Arragan	1025	195	191	126	512	196	147	179	522	30	28	22	80	87	142	293	521
Lake Brou	4409	9	204	55	267	9	210	56	274	10	42	55	108	8	46	213	267
Lake Brunderee	593	34	58	8	99	34	21	46	101	7	3	48	58	26	43	30	99
Lake Illawarra	27427	299	5072	805	6177	300	5579	275	6154	107	849	258	1213	212	270	5748	6231
Lake Macquarie	71848	574	6776	1235	8586	581	7928	801	9309	159	1180	372	1711	350	744	8015	9110
Lake Mummuga	2741	14	74	16	103	14	64	33	110	6	7	13	26	12	19	72	103
Lake Tarourga	631	6	37	4	47	6	36	6	48	1	2	12	16	3	2	41	47
Little Lake (Narooma)	227	6	11	3	20	6	5	9	21	0	0	0	0	1	3	16	20
Little Lake (Wallaga)	251	3	26	5	34	3	24	8	35	1	2	2	5	2	6	26	34
Macleay River	1131867	5469	28324	5001	38794	5471	46151	5219	56840	811	7685	6284	14781	2833	4203	49734	56769
Maloneys Creek	820	29	49	15	94	29	11	54	94	2	0	2	4	3	18	72	94
Manning River	815922	4810	46907	7233	58949	4753	50101	5555	60409	2148	8976	4879	16003	2911	4853	53118	60882
Merimbula Lake	4350	113	272	45	430	126	250	78	454	22	31	91	145	89	63	278	430
Meringo Creek	538	9	14	4	26	9	7	12	28	1	0	0	1	3	5	19	26
Meroo Lake	2064	1	212	44	256	1	156	106	263	12	14	39	64	1	67	188	256
Merrica River	6068	1	64	2	67	1	62	6	69	0	1	2	3	1	3	64	67
Middle Camp Creek	503	6	16	5	27	8	14	8	30	1	0	0	1	2	6	19	28
Middle Lagoon	2788	10	292	55	357	10	232	120	362	8	37	36	82	9	47	301	357

Estuary	Catchment Area (ha)	Storage				Preservation				Generation				Permanency			
		Low	Mod.	High	Total	Low	Mod.	High	Total	Low	Mod.	High	Total	Low	Mod.	High	Total
Millards Creek	451	0	7	0	7	0	7	1	7	0	0	0	0	0	0	7	7
Minnamurra River	11919	179	1578	477	2235	173	1652	361	2186	79	410	154	643	47	319	1873	2238
Mollymook Creek	272	6	15	0	21	6	11	4	21	0	0	0	0	0	0	21	21
Mooball Creek	10968	1016	1556	451	3023	1021	1400	697	3118	225	120	155	500	760	568	1775	3103
Moona Moona Creek	2871	117	216	127	461	117	153	195	466	35	42	70	147	49	164	248	461
Moonee Beach Creek	348	103	13	0	116	105	13	1	120	1	0	0	1	2	0	113	116
Moonee Creek	4152	212	707	55	973	212	709	68	988	30	38	43	111	152	49	782	983
Moruya River	142982	248	1915	579	2742	249	2283	272	2804	57	514	476	1047	108	214	2420	2742
Munna Munnora Creek	363	3	19	2	24	3	13	5	21	0	0	0	0	1	2	21	24
Murrah River	19660	19	868	142	1029	19	974	45	1038	7	133	69	209	16	31	982	1029
Myall River	93393	13541	14383	1875	29799	13442	14045	2571	30058	1116	1659	1505	4279	3460	1896	25027	30382
Nadgee Lake	1491	103	33	3	139	104	5	32	141	3	1	68	72	15	30	94	139
Nadgee River	5908	51	220	21	292	51	97	148	296	11	0	84	95	5	114	174	292
Nambucca River	131157	1321	14192	1850	17363	1322	16305	590	18217	140	2402	721	3263	640	497	17058	18195
Nangudga Lake	1021	26	129	19	174	26	116	35	178	5	8	17	30	19	22	134	174
Nargal Lake	94	2	1	0	4	2	0	2	5	1	0	1	2	2	1	1	4
Narrawallee Inlet	8196	178	879	263	1320	178	978	175	1331	17	196	34	247	3	96	1221	1320
Nelson Lagoon	2834	17	156	16	190	17	83	97	197	5	6	94	106	15	81	94	190
Nerrindillah Creek	1729	0	55	0	55	0	49	8	57	0	0	2	2	0	2	54	55
Nullica River	5513	158	68	12	238	158	68	14	240	16	9	28	54	93	10	136	238
Oyster Creek	1692	88	205	10	303	88	185	44	318	10	3	14	28	65	29	224	318
Pambula River	30132	6	840	217	1063	6	1007	104	1117	7	208	126	342	0	39	1024	1063
Pine Brush Creek	735	1	76	1	78	1	76	1	78	0	1	0	1	1	0	77	78
Pipe Clay Creek	164	76	10	0	86	76	10	0	86	3	0	2	5	29	0	57	86
Port Stephens	43114	5791	4336	974	11102	5764	2782	2990	11536	949	268	1047	2263	778	2912	7988	11679
Racecourse Creek (Old Bar)	276	55	12	2	68	54	9	4	67	2	0	1	3	22	1	46	68
Racecourse Creek (Ulladulla)	367	7	0	0	7	7	0	0	8			0	0	0	0	7	7
Richmond River	690022	6292	110889	21621	138802	6315	131396	7498	145209	1334	24729	5443	31506	3367	5206	136290	144863
Ryans Cut	492	132	151	73	355	132	89	175	397	38	27	47	112	89	128	179	396
Saltwater Creek (Eden)	1724	3	18	2	23	3	8	13	23	1	0	2	3	3	4	17	23
Saltwater Creek (Frederickton)	1140	448	184	27	659	450	159	61	670	32	5	20	58	165	47	456	668
Saltwater Creek (Rosedale)	282	7	25	2	33	7	25	2	33	1	1	0	2	1	0	31	33
Salty Lagoon	373	205	58	31	294	207	0	119	326	45	0	46	91	172	88	64	324
Sandon River	13414	914	1986	174	3074	919	2010	192	3121	65	112	103	279	208	152	2736	3096
Shadrachs Creek	1324	1	26	4	31	1	30	1	32	0	3	0	3	0	1	30	31
Shoalhaven River	711772	288	12741	4700	17729	289	15151	2460	17900	569	3961	3860	8390	45	2233	15452	17729
Smiths Lake	3798	681	401	52	1134	680	322	137	1140	23	17	27	67	52	96	1012	1159
South West Rocks Creek	461	193	36	12	241	193	1	127	322	14	0	24	37	63	119	138	321
Spring Creek	588	8	23	8	39	8	21	8	36	1	7	2	10	4	4	31	39
St Georges Basin	35666	1071	1766	309	3146	1073	1583	532	3188	67	182	292	542	151	359	2637	3146
Station Creek	2162	386	213	23	622	387	234	3	624	5	23	6	34	45	2	575	623

Estuary	Catchment Area (ha)	Storage				Preservation				Generation				Permanency			
		Low	Mod.	High	Total	Low	Mod.	High	Total	Low	Mod.	High	Total	Low	Mod.	High	Total
Stony Creek	238	218	2	0	220	218	2	0	220				0	0	0	219	220
Swan Lake	3106	78	356	64	498	78	266	161	505	47	13	5	65	7	100	391	498
Table Creek	1735	1	49	3	53	1	44	9	54	0	0	3	3	1	5	47	53
Tabourie Lake	4763	64	718	63	845	64	634	156	855	6	27	11	44	13	45	787	845
Tallow Creek	546	205	110	17	332	205	80	54	339	9	3	8	20	68	24	247	339
Telegraph Creek	429	209	0	1	210	210	0	1	210	1	0	10	11	14	1	195	210
Termeil Lake	1462	17	134	16	167	17	95	58	171	7	3	24	34	12	36	119	167
Tilba Tilba Lake	1827	9	229	39	276	9	228	43	281	10	28	31	70	5	39	233	276
Tilligerry Creek	13522	8616	2030	1025	11671	8599	0	3791	12390	1460	0	1349	2809	2364	3589	6486	12439
Tomaga River	9371	11	540	202	753	11	400	357	768	49	84	113	246	6	262	484	753
Towamba River	102919	5	869	102	976	5	856	125	987	10	91	171	272	4	108	863	976
Tuggerah Lake	79523	1849	8950	1425	12224	1882	10313	446	12641	137	1540	359	2036	466	391	11556	12413
Tuross River	182928	16	4940	632	5589	16	5464	203	5684	18	603	802	1423	16	142	5430	5589
Tweed River	107748	1123	9533	5461	16117	1124	13252	3166	17542	768	6324	1796	8888	850	2661	13801	17312
Twofold Bay	4175	112	10	1	123	114	10	1	125	8	1	20	29	61	1	62	123
Ulladulla	39	2	0	0	2	2	0	0	2	0	0	0	0	0	0	1	2
Wagonga Inlet	10022	6	258	65	328	6	242	106	354	13	33	36	83	6	61	262	328
Wallaga Lake	27314	21	1656	139	1815	21	1657	169	1846	25	102	143	270	15	126	1674	1815
Wallagoot Lake	3051	10	328	51	389	10	246	137	394	11	29	120	161	10	122	256	389
Wallis Lake	129561	9366	25775	2774	37914	9322	25521	4042	38884	1367	2681	2106	6154	3848	3228	32139	39214
Wapengo Lagoon	7218	17	556	124	696	17	415	295	727	22	65	147	234	3	196	497	696
Washerwomans Creek	254	12	6	0	18	12	6	1	18				0	0	0	18	18
Werri Lagoon	1663	18	292	102	412	18	341	43	401	14	100	20	134	4	45	363	412
Willinga Lake	1390	3	168	39	209	3	104	106	213	9	12	26	47	0	56	153	209
Wollumboola Lake	4046	23	191	91	305	23	211	80	314	19	55	37	111	22	66	217	305
Wonboyn River	33977	550	2315	38	2904	551	2148	219	2917	100	2	359	461	516	140	2248	2904
Woodburn Creek	1356	6	173	4	183	6	167	13	186	3	2	10	16	5	12	167	183
Woolgoolga Lake	2118	6	246	10	263	6	240	25	272	2	6	4	12	6	16	248	270
Wooli Wooli River	18374	801	3887	562	5251	803	3982	638	5423	87	508	186	782	179	349	4875	5403
Wowly Gully	619	15	62	19	96	16	1	81	98	11	0	56	67	14	76	6	96

Catchments are listed in alphabetical order.

Table S4. Area (ha) of low, moderate and high cell scores for BCI, BCC and BCP in catchments.

Estuary	BCI			BCC			BCP			Catchment Area (ha)				
	Low	Mod. low	Mod. high	High	Low	Mod. high	High	Low	Mod. low		Mod. high	High		
Arararra Creek	30	32	1	86	4	100	32	261	40	35	2	74	2	1794.5
Back Lagoon	2	2	2	101	26	24	47	33	2	26	28	31	9	3174.7
Baragoot Lake	2	24	3	40	21	18	63	13	16	14	31	20	6	1315.6
Batemans Bay	99	153	26	173	24	267	178	47	222	108	105	34	5	6248.6
Bega River	21	11	10	4529	1351	119	2433	77	31	94	1158	1238	29	194021.0
Bellinger River	113	379	19	6997	2849	976	6741	2744	187	1176	4050	4687	253	110848.6
Belongil Creek	734	555	101	535	54	510	693	1068	985	445	237	300	18	3068.0
Bengello Creek	33	420	16	62	84	28	37	588	50	408	19	51	83	1632.7
Bermagui River	4	69	2	251	89	87	358	33	41	78	200	80	9	8561.8
Berrara Creek	3	3	2	132	18	0	19	147	3	3	17	119	15	3529.6
Black Head Lag	7	15	1	42	11	32	42	1	10	39	22	5	0	199.5
Boambee Creek	397	317	56	869	229	917	433	741	545	645	389	231	54	4947.5
Bobundara Creek	6	2	0	147	31	6	165	69	6	8	126	42	5	1389.5
Bonville Creek	34	314	1	2551	347	615	1397	1563	50	774	1181	1062	177	11512.8
Bournda Lagoon	1	8	2	239	4	10	228	27	2	16	212	21	1	3459.3
Boydton Creek	4	10	1	2	1	2	29	0	4	12	1	1	0	387.6
Broken Head Creek	33	39	5	6	1	14	3	67	41	33	4	6	1	117.4
Brunswick River	566	854	57	4898	1504	2630	4532	1485	808	2683	3122	1208	58	22993.0
Bullengella Lake	1	0	0	4	0	0	5	0	1	0	3	0	0	73.6
Bundageree Creek	17	59	1	122	5	16	11	177	17	74	9	100	2	1012.6
Bunga Lagoon	0	1	0	37	5	0	44	3	0	2	35	6	0	1168.4
Burrill Lake	23	46	2	247	70	95	187	131	50	67	122	116	28	6511.7
Butlers Creek	2	3	1	41	5	20	4	30	2	22	4	21	2	309.3
Cakora Lagoon	63	73	9	70	9	25	39	254	75	61	23	57	6	1268.7
Callala Creek	64	231	46	105	87	129	32	377	174	142	33	99	81	1979.3
Camden Haven River	600	1707	72	11993	1830	1374	9314	5501	740	2663	7511	4646	470	62114.7
Candlagan Creek	29	76	2	338	157	92	243	280	72	73	114	307	34	2431.4
Captains Beach Lagoon	1	41	10	1	0	6	2	48	7	36	9	1	0	318.8
Carama Creek	54	48	80	190	161	4	35	512	56	57	70	199	148	918.9
Cathie Creek	432	1074	46	2431	284	431	776	4314	507	1278	526	1746	206	11924.6
Clarence River	1363	13722	82	41004	39445	18372	44813	36345	3749	26949	21034	36005	7877	2218742.3
Clyde River	0	0	0	2330	433	266	1830	960	0	249	1311	1059	108	174046.0
Coffs Creek	68	142	5	539	68	638	137	82	179	485	123	32	2	2449.9
Coila Lake	15	37	8	342	115	23	413	101	15	67	246	181	0	5475.8
Congo Creek	47	307	14	273	161	50	225	610	79	294	127	185	114	4332.1
Conjola Lake	2	90	3	406	183	117	392	196	13	177	209	265	6	14581.1
Corindi River	90	191	7	2576	239	114	1608	2028	127	220	1303	1288	162	14833.8
Corunna Lake	0	1	3	189	39	16	218	16	1	16	164	43	2	3186.8
Crooked River	103	150	3	819	259	100	1097	289	110	223	632	358	4	3227.0
Cudgen Creek	465	930	40	1078	398	869	1330	926	803	1028	468	563	50	7075.5
Cudgera Creek	356	437	58	909	253	984	633	397	560	883	436	124	7	6102.8
Cullendulla Creek	8	7	22	181	85	43	187	85	10	45	142	74	30	1644.9
Curalo Lagoon	14	13	8	89	36	50	104	14	23	40	53	42	0	2903.6
Currambene Creek	43	136	22	772	371	123	333	928	81	164	220	602	267	16224.4

Estuary	BCI					BCC			BCP					Catchment Area (ha)
	Low	Mod. low	Mod.	Mod. high	High	Low	Mod.	High	Low	Mod. low	Mod.	Mod. high	High	
Currarong Creek	8	23	0	48	47	17	4	110	19	13	2	46	46	1236.7
Cuttagee Lake	5	2	3	72	25	1	97	18	5	6	56	36	1	5447.3
Dalhousie Creek	6	11	1	16	3	5	9	23	8	12	2	13	1	633.2
Darkum Creek	1	3	0	65	7	43	25	21	1	34	22	17	1	616.7
Deep Creek	30	70	6	1011	227	164	968	255	38	213	741	320	33	9152.6
Duchess Gully	42	35	3	194	23	75	180	165	56	54	97	74	13	1061.6
Durras Creek	0	4	0	71	28	1	75	28	1	6	46	48	3	594.4
Durras Lake	1	18	0	331	28	41	97	256	16	27	73	240	10	6213.3
Elliott Lake	32	9	0	156	29	195	28	22	38	144	18	18	4	1004.6
Evans River	470	1047	49	1271	264	671	766	2696	685	1119	336	821	144	7850.0
Fiddamans Creek	11	2	1	13	7	24	3	50	11	19	1	1	1	156.1
Fisheries Creek	5	5	2	20	1	0	23	13	5	7	8	12	0	653.8
Flat Rock Creek	3	217	2	32	29	1	3	286	3	217	4	31	28	689.5
Flat Top Point Creek	14	26	2	26	2	36	13	34	28	25	9	7	1	259.5
Glenrock Lagoon	0	0	0	2	0	1	0	2	0	0	0	1	0	742.4
Goolawah Lagoon	143	137	16	34	4	4	10	320	144	134	16	33	5	407.7
Hastings River	4697	9075	786	29003	8127	2530	27638	23635	5057	10754	18637	14944	2291	368852.8
Hearns Lake	5	3	1	106	4	34	54	92	5	25	34	53	2	674.7
Hunter River	1485	12174	97	16272	17841	11726	29397	13136	3505	16447	9730	14376	3365	2141398.8
Jerusalem Creek	516	902	62	896	33	0	144	3213	513	902	185	772	31	4864.3
Jervis Bay	34	769	83	30	26	26	87	850	58	795	38	38	13	15628.2
Jordans Creek	2	2	1	27	1	13	8	12	3	10	8	9	1	254.4
Karuah River	12	685	0	13336	661	176	7373	7250	17	815	6486	7101	171	146629.5
Kellys Lake	3	3	1	35	2	18	20	11	3	20	17	3	0	217.9
Khappinghat Creek	181	228	24	2034	138	156	769	1781	195	335	639	1324	84	9191.9
Kianga Lake	0	0	0	20	2	3	21	1	0	2	17	2	0	766.8
Killick Creek	113	200	29	204	80	61	183	389	149	194	30	187	66	822.0
Korogoro Creek	141	481	14	213	48	80	59	766	172	475	28	181	41	979.0
Lake Arragan	66	129	9	276	41	0	41	491	65	130	38	249	38	1025.2
Lake Brou	5	1	2	164	95	1	208	69	5	2	118	127	11	4409.1
Lake Brunderee	15	11	8	23	42	0	19	85	15	11	19	17	36	592.9
Lake Illawarra	178	175	24	4930	947	2677	3764	300	253	2176	2936	759	46	27426.6
Lake Macquarie	335	788	15	6513	1498	3459	5778	1378	621	2749	3728	1674	137	71848.4
Lake Mummuga	3	4	6	76	13	9	40	65	4	15	24	53	5	2741.5
Lake Tarourga	3	3	0	26	15	0	30	19	2	2	18	15	6	631.4
Little Lake (Narooma)	0	6	0	14	0	7	14	0	4	5	10	0	0	226.8
Little Lake (Wallaga)	1	1	0	27	3	0	30	6	1	1	24	5	1	250.7
Macleay River	2452	20975	354	20037	13302	2194	37852	19092	3032	21856	14919	13947	3361	1131867.1
Maloneys Creek	2	27	1	63	1	31	10	55	28	4	9	51	1	819.8
Manning River	2425	5299	274	41387	11829	4386	47246	11066	2578	9270	31580	16476	845	815921.5
Merimbula Lake	43	39	31	227	90	114	306	0	82	69	158	73	0	4349.5
Meringo Creek	2	6	0	17	0	0	14	14	2	6	10	7	0	537.6
Meroo Lake	0	0	0	203	52	55	80	133	0	51	51	128	21	2063.7
Merrica River	0	0	1	64	2	0	4	70	0	1	2	62	1	6067.7
Middle Camp Creek	2	4	0	20	1	7	7	25	3	6	2	15	0	502.5
Middle Lagoon	4	2	4	277	70	17	248	104	4	18	187	126	19	2788.3
Millards Creek	0	0	0	7	0	6	0	3	0	5	0	2	0	450.8

Estuary	BCI					BCC				BCP				Catchment Area (ha)
	Low	Mod. low	Mod.	Mod. high	High	Low	Mod.	High	Low	Mod. low	Mod.	Mod. high	High	
Minnamurra River	39	139	6	1609	446	378	1550	296	98	375	1161	478	109	11918.6
Mollymook Creek	0	6	0	15	0	7	0	15	4	5	0	12	0	272.3
Mooball Creek	621	460	61	1839	171	2277	856	693	826	1430	600	270	25	10967.6
Moona Moona Creek	34	73	10	241	102	42	20	411	59	63	16	224	97	2870.8
Moonee Beach Creek	2	101	0	13	0	4	0	118	4	98	0	13	0	348.5
Moonee Creek	118	91	23	713	49	419	459	535	125	409	164	273	20	4152.1
Moruya River	63	158	30	1536	958	509	1853	476	150	449	1065	921	131	142981.7
Munna Munnora Creek	1	2	0	21	0	9	13	2	2	9	13	0	0	363.2
Murrah River	4	6	10	818	192	15	686	79	4	29	442	238	10	19660.0
Myall River	3047	11318	299	14074	2004	2874	12560	19472	5100	9820	7517	7461	584	93393.5
Nadgee Lake	34	91	8	5	31	0	11	136	24	22	9	9	19	1490.5
Nadgee River	3	47	1	159	83	0	16	284	2	47	7	160	74	5908.1
Nambucca River	511	1598	66	13005	3049	1064	13146	4241	665	2295	10088	4644	535	131157.4
Nangudga Lake	10	11	6	128	19	15	162	6	15	18	118	19	2	1021.1
Nargal Lake	1	1	1	2	0	0	2	3	0	0	2	1	0	93.6
Narrawallee Inlet	2	175	1	912	229	78	816	458	12	230	589	454	29	8196.2
Nelson Lagoon	4	4	10	82	91	12	90	97	4	16	30	121	16	2833.7
Nerrindillah Creek	0	0	0	54	2	3	13	45	0	2	11	42	0	1729.0
Nullica River	57	81	20	62	18	1	208	3	58	100	33	17	0	5513.1
Oyster Creek	48	46	9	206	8	26	91	201	49	64	82	118	3	1692.2
Pambula River	0	5	0	724	334	52	592	130	0	57	291	324	32	30132.0
Pine Brush Creek	1	1	0	76	1	44	11	23	1	44	11	22	0	735.3
Pipe Clay Creek	25	50	2	10	0	18	6	62	32	52	2	1	0	164.1
Port Stephens	696	5887	47	4157	961	1995	2335	8110	2250	4538	1225	2967	596	43114.4
Racecourse Creek (Old Bar)	20	35	1	13	0	29	49	18	37	25	1	5	0	276.1
Racecourse Creek (Ulladulla)	0	7	0	0	0	1	0	6	1	5	0	0	0	366.9
Richmond River	2816	9495	263	102806	29860	36502	71398	43471	6142	36219	55635	42510	4711	690021.7
Ryans Cut	60	98	15	166	58	0	61	344	59	100	23	170	44	492.0
Saltwater Creek (Eden)	1	1	1	19	1	0	3	20	1	1	3	16	1	1724.3
Saltwater Creek (Frederickton)	131	315	12	199	12	304	86	314	258	317	35	53	6	1139.6
Saltwater Creek (Rosedale)	1	6	0	25	1	19	16	1	7	11	14	1	0	282.2
Salty Lagoon	124	94	24	76	13	1	12	344	125	93	29	72	12	373.1
Sandon River	196	760	28	2026	143	37	98	4612	197	791	73	1970	116	13413.9
Shadrachs Creek	0	0	0	26	3	6	14	14	1	5	10	14	0	1324.1
Shoalhaven River	25	249	15	9635	7806	1651	13290	3019	157	1603	7077	7406	1388	711772.0
Smiths Lake	42	666	5	419	27	36	107	997	50	668	69	339	6	3798.0
South West Rocks Creek	55	216	3	27	20	42	24	255	73	209	7	17	16	461.2
Spring Creek	3	5	1	25	6	14	23	0	6	10	16	5	0	588.3
St Georges Basin	114	933	25	1625	450	362	850	2029	152	1136	574	1017	228	35666.1
Station Creek	35	346	5	212	24	0	23	618	35	347	11	210	20	2162.2
Stony Creek	0	217	0	2	0	0	0	221	0	218	0	2	0	238.5
Swan Lake	5	72	1	403	17	11	74	430	6	78	65	327	15	3106.0

Estuary	BCI					BCC				BCP				Catchment Area (ha)
	Low	Mod. low	Mod.	Mod. high	High	Low	Mod.	High	Low	Mod. low	Mod.	Mod. high	High	
Table Creek	0	0	0	49	3	0	3	54	0	0	1	48	2	1735.2
Tabourie Lake	9	53	3	746	35	89	182	612	19	113	152	543	10	4762.7
Tallow Creek	55	150	7	123	5	205	46	88	152	131	22	32	1	545.7
Telegraph Creek	3	196	10	1	0	0	1	213	3	195	11	0	0	428.8
Termeil Lake	10	7	3	128	22	30	49	127	10	36	36	74	11	1462.1
Tilba Tilba Lake	3	6	1	208	59	0	264	29	3	6	197	59	9	1826.6
Tilligerry Creek	1833	7643	202	1975	800	1999	3082	7347	3059	6809	1303	1084	132	13521.8
Tomaga River	5	4	2	547	195	230	315	235	9	214	199	251	73	9370.9
Towamba River	2	2	2	710	260	17	502	31	3	21	233	271	1	102919.3
Tuggerah Lake	423	1636	58	8613	1762	5608	6860	1833	1201	4650	4890	1382	253	79523.4
Tuross River	1	2	14	4182	1390	130	3758	533	1	126	2443	1502	158	182927.7
Tweed River	618	1728	108	7036	8059	11467	5414	889	1657	10769	3213	1733	182	107748.0
Twofold Bay	36	58	18	9	2	15	93	19	41	62	16	2	0	4174.6
Ulladulla	0	1	0	0	0	3	0	0	1	0	0	0	0	39.3
Wagonga Inlet	3	1	2	256	67	46	247	70	3	48	150	113	5	10022.0
Wallaga Lake	14	7	3	1557	238	44	1023	186	14	50	737	306	33	27314.3
Wallagoot Lake	1	0	10	239	140	8	278	111	0	10	189	134	50	3050.7
Wallis Lake	3131	7702	331	24557	3594	2915	20428	16744	4175	7909	15913	9674	1313	129560.7
Wapengo Lagoon	2	14	1	469	211	7	614	122	2	20	381	263	25	7217.6
Washerwomans Creek	0	12	0	6	0	0	0	19	1	11	0	6	0	253.9
Werri Lagoon	3	14	1	301	93	50	325	30	14	39	261	79	11	1662.6
Willinga Lake	0	2	0	169	37	15	55	147	0	17	40	123	26	1390.2
Wollumboola Lake	3	4	15	205	77	16	52	248	4	26	32	171	63	4045.8
Wonboyn River	163	124	263	2256	98	2	215	1278	163	130	413	690	56	33977.4
Woodburn Creek	2	2	2	167	11	0	8	186	2	3	4	166	7	1356.5
Woolgoolga Lake	6	8	1	248	9	99	130	63	7	84	115	65	1	2117.7
Wooli Wooli River	156	801	19	3798	657	61	431	5649	166	839	161	3810	455	18374.5
Wowly Gully	5	2	9	34	47	1	7	152	5	5	4	33	47	618.7

Table S6: Proportion of catchment area (%) of low, moderate and high cell scores for BCI, BCC (2007 and 2017) and BCP (2007 and 2017) in tributaries based on the watershed area located above instream barriers.

Estuary	BCI					BCC			BCP			Catchment Area (ha)		
	Low	Mod. low	Mod.	Mod. high	High	Low	Mod.	High	Low	Mod. low	Mod.		Mod. high	High
Arrawarra Creek	1.7	1.8	0.1	4.8	0.2	5.6	1.8	14.5	2.2	2.0	0.1	4.1	0.1	1794.5
Back Lagoon	0.1	0.1	0.1	3.2	0.8	0.8	1.5	1.0	0.1	0.8	0.9	1.0	0.3	3174.7
Baragoot Lake	0.2	1.8	0.2	3.0	1.6	1.4	4.8	1.0	1.2	1.1	2.4	1.5	0.5	1315.6
Batemans Bay	1.6	2.4	0.4	2.8	0.4	4.3	2.8	0.8	3.6	1.7	1.7	0.5	0.1	6248.6
Bega River	0.0	0.0	0.0	2.3	0.7	0.1	1.3	0.0	0.0	0.0	0.6	0.6	0.0	194021.0
Bellinger River	0.1	0.3	0.0	6.3	2.6	0.9	6.1	2.5	0.2	1.1	3.7	4.2	0.2	110848.6
Belongil Creek	23.9	18.1	3.3	17.4	1.8	16.6	22.6	34.8	32.1	14.5	7.7	9.8	0.6	3068.0
Bengello Creek	2.0	25.7	1.0	3.8	5.1	1.7	2.3	36.0	3.1	25.0	1.2	3.1	5.1	1632.7
Bermagui River	0.0	0.8	0.0	2.9	1.0	1.0	4.2	0.4	0.5	0.9	2.3	0.9	0.1	8561.8
Berrara Creek	0.1	0.1	0.1	3.7	0.5	0.0	0.5	4.2	0.1	0.1	0.5	3.4	0.4	3529.6
Black Head Lag	3.5	7.5	0.5	21.0	5.5	16.0	21.0	0.5	5.0	19.5	11.0	2.5	0.0	199.5
Boambee Creek	8.0	6.4	1.1	17.6	4.6	18.5	8.8	15.0	11.0	13.0	7.9	4.7	1.1	4947.5
Bobundara Creek	0.4	0.1	0.0	10.6	2.2	0.4	11.9	5.0	0.4	0.6	9.1	3.0	0.4	1389.5
Bonville Creek	0.3	2.7	0.0	22.2	3.0	5.3	12.1	13.6	0.4	6.7	10.3	9.2	1.5	11512.8
Bournda Lagoon	0.0	0.2	0.1	6.9	0.1	0.3	6.6	0.8	0.1	0.5	6.1	0.6	0.0	3459.3
Boydton Creek	1.0	2.6	0.3	0.5	0.3	0.5	7.5	0.0	1.0	3.1	0.3	0.3	0.0	387.6
Broken Head Creek	28.1	33.2	4.3	5.1	0.9	11.9	2.6	57.1	34.9	28.1	3.4	5.1	0.9	117.4
Brunswick River	2.5	3.7	0.2	21.3	6.5	11.4	19.7	6.5	3.5	11.7	13.6	5.3	0.3	22993.0
Bullengella Lake	1.4	0.0	0.0	5.4	0.0	0.0	6.8	0.0	1.4	0.0	4.1	0.0	0.0	73.6
Bundageree Creek	1.7	5.8	0.1	12.0	0.5	1.6	1.1	17.5	1.7	7.3	0.9	9.9	0.2	1012.6
Bunga Lagoon	0.0	0.1	0.0	3.2	0.4	0.0	3.8	0.3	0.0	0.2	3.0	0.5	0.0	1168.4
Burrill Lake	0.4	0.7	0.0	3.8	1.1	1.5	2.9	2.0	0.8	1.0	1.9	1.8	0.4	6511.7
Butlers Creek	0.6	1.0	0.3	13.3	1.6	6.5	1.3	9.7	0.6	7.1	1.3	6.8	0.6	309.3
Cakora Lagoon	5.0	5.8	0.7	5.5	0.7	2.0	3.1	20.0	5.9	4.8	1.8	4.5	0.5	1268.7
Callala Creek	3.2	11.7	2.3	5.3	4.4	6.5	1.6	19.0	8.8	7.2	1.7	5.0	4.1	1979.3
Camden Haven River	1.0	2.7	0.1	19.3	2.9	2.2	15.0	8.9	1.2	4.3	12.1	7.5	0.8	62114.7
Candlagan Creek	1.2	3.1	0.1	13.9	6.5	3.8	10.0	11.5	3.0	3.0	4.7	12.6	1.4	2431.4
Captains Beach Lagoon	0.3	12.9	3.1	0.3	0.0	1.9	0.6	15.1	2.2	11.3	2.8	0.3	0.0	318.8
Cararma Creek	5.9	5.2	8.7	20.7	17.5	0.4	3.8	55.7	6.1	6.2	7.6	21.7	16.1	918.9
Cathie Creek	3.6	9.0	0.4	20.4	2.4	3.6	6.5	36.2	4.3	10.7	4.4	14.6	1.7	11924.6
Clarence River	0.1	0.6	0.0	1.8	1.8	0.8	2.0	1.6	0.2	1.2	0.9	1.6	0.4	2218742.3
Clyde River	0.0	0.0	0.0	1.3	0.2	0.2	1.1	0.6	0.0	0.1	0.8	0.6	0.1	174046.0
Coffs Creek	2.8	5.8	0.2	22.0	2.8	26.0	5.6	3.3	7.3	19.8	5.0	1.3	0.1	2449.9
Coila Lake	0.3	0.7	0.1	6.2	2.1	0.4	7.5	1.8	0.3	1.2	4.5	3.3	0.0	5475.8
Congo Creek	1.1	7.1	0.3	6.3	3.7	1.2	5.2	14.1	1.8	6.8	2.9	4.3	2.6	4332.1
Conjola Lake	0.0	0.6	0.0	2.8	1.3	0.8	2.7	1.3	0.1	1.2	1.4	1.8	0.0	14581.1
Corindi River	0.6	1.3	0.0	17.4	1.6	0.8	10.8	13.7	0.9	1.5	8.8	8.7	1.1	14833.8
Corunna Lake	0.0	0.0	0.1	5.9	1.2	0.5	6.8	0.5	0.0	0.5	5.1	1.3	0.1	3186.8
Crooked River	3.2	4.6	0.1	25.4	8.0	3.1	34.0	9.0	3.4	6.9	19.6	11.1	0.1	3227.0
Cudgen Creek	6.6	13.1	0.6	15.2	5.6	12.3	18.8	13.1	11.3	14.5	6.6	8.0	0.7	7075.5
Cudgera Creek	5.8	7.2	1.0	14.9	4.1	16.1	10.4	6.5	9.2	14.5	7.1	2.0	0.1	6102.8
Cullendulla Creek	0.5	0.4	1.3	11.0	5.2	2.6	11.4	5.2	0.6	2.7	8.6	4.5	1.8	1644.9
Curalo Lagoon	0.5	0.4	0.3	3.1	1.2	1.7	3.6	0.5	0.8	1.4	1.8	1.4	0.0	2903.6

Estuary	BCI					BCC			BCP					Catchment Area (ha)
	Low	Mod. low	Mod.	Mod. high	High	Low	Mod.	High	Low	Mod. low	Mod.	Mod. high	High	
Currambene Creek	0.3	0.8	0.1	4.8	2.3	0.8	2.1	5.7	0.5	1.0	1.4	3.7	1.6	16224.4
Currarong Creek	0.6	1.9	0.0	3.9	3.8	1.4	0.3	8.9	1.5	1.1	0.2	3.7	3.7	1236.7
Cuttagee Lake	0.1	0.0	0.1	1.3	0.5	0.0	1.8	0.3	0.1	0.1	1.0	0.7	0.0	5447.3
Dalhousie Creek	0.9	1.7	0.2	2.5	0.5	0.8	1.4	3.6	1.3	1.9	0.3	2.1	0.2	633.2
Darkum Creek	0.2	0.5	0.0	10.5	1.1	7.0	4.1	3.4	0.2	5.5	3.6	2.8	0.2	616.7
Deep Creek	0.3	0.8	0.1	11.0	2.5	1.8	10.6	2.8	0.4	2.3	8.1	3.5	0.4	9152.6
Duchess Gully	4.0	3.3	0.3	18.3	2.2	7.1	17.0	15.5	5.3	5.1	9.1	7.0	1.2	1061.6
Durras Creek	0.0	0.7	0.0	11.9	4.7	0.2	12.6	4.7	0.2	1.0	7.7	8.1	0.5	594.4
Durras Lake	0.0	0.3	0.0	5.3	0.5	0.7	1.6	4.1	0.3	0.4	1.2	3.9	0.2	6213.3
Elliott Lake	3.2	0.9	0.0	15.5	2.9	19.4	2.8	2.2	3.8	14.3	1.8	1.8	0.4	1004.6
Evans River	6.0	13.3	0.6	16.2	3.4	8.5	9.8	34.3	8.7	14.3	4.3	10.5	1.8	7850.0
Fiddamans Creek	7.0	1.3	0.6	8.3	4.5	15.4	1.9	32.0	7.0	12.2	0.6	0.6	0.6	156.1
Fisheries Creek	0.8	0.8	0.3	3.1	0.2	0.0	3.5	2.0	0.8	1.1	1.2	1.8	0.0	653.8
Flat Rock Creek	0.4	31.5	0.3	4.6	4.2	0.1	0.4	41.5	0.4	31.5	0.6	4.5	4.1	689.5
Flat Top Point Creek	5.4	10.0	0.8	10.0	0.8	13.9	5.0	13.1	10.8	9.6	3.5	2.7	0.4	259.5
Glenrock Lagoon	0.0	0.0	0.0	0.3	0.0	0.1	0.0	0.3	0.0	0.0	0.0	0.1	0.0	742.4
Goolawah Lagoon	35.1	33.6	3.9	8.3	1.0	1.0	2.5	78.5	35.3	32.9	3.9	8.1	1.2	407.7
Hastings River	1.3	2.5	0.2	7.9	2.2	0.7	7.5	6.4	1.4	2.9	5.1	4.1	0.6	368852.8
Hearns Lake	0.7	0.4	0.1	15.7	0.6	5.0	8.0	13.6	0.7	3.7	5.0	7.9	0.3	674.7
Hunter River	0.1	0.6	0.0	0.8	0.8	0.5	1.4	0.6	0.2	0.8	0.5	0.7	0.2	2141398.8
Jerusalem Creek	10.6	18.5	1.3	18.4	0.7	0.0	3.0	66.1	10.5	18.5	3.8	15.9	0.6	4864.3
Jervis Bay	0.2	4.9	0.5	0.2	0.2	0.2	0.6	5.4	0.4	5.1	0.2	0.2	0.1	15628.2
Jordans Creek	0.8	0.8	0.4	10.6	0.4	5.1	3.1	4.7	1.2	3.9	3.1	3.5	0.4	254.4
Karuah River	0.0	0.5	0.0	9.1	0.5	0.1	5.0	4.9	0.0	0.6	4.4	4.8	0.1	146629.5
Kellys Lake	1.4	1.4	0.5	16.1	0.9	8.3	9.2	5.0	1.4	9.2	7.8	1.4	0.0	217.9
Khappinghat Creek	2.0	2.5	0.3	22.1	1.5	1.7	8.4	19.4	2.1	3.6	7.0	14.4	0.9	9191.9
Kianga Lake	0.0	0.0	0.0	2.6	0.3	0.4	2.7	0.1	0.0	0.3	2.2	0.3	0.0	766.8
Killick Creek	13.7	24.3	3.5	24.8	9.7	7.4	22.3	47.3	18.1	23.6	3.6	22.7	8.0	822.0
Korogoro Creek	14.4	49.1	1.4	21.8	4.9	8.2	6.0	78.2	17.6	48.5	2.9	18.5	4.2	979.0
Lake Arragan	6.4	12.6	0.9	26.9	4.0	0.0	4.0	47.9	6.3	12.7	3.7	24.3	3.7	1025.2
Lake Brou	0.1	0.0	0.0	3.7	2.2	0.0	4.7	1.6	0.1	0.0	2.7	2.9	0.2	4409.1
Lake Brunderee	2.5	1.9	1.3	3.9	7.1	0.0	3.2	14.3	2.5	1.9	3.2	2.9	6.1	592.9
Lake Illawarra	0.6	0.6	0.1	18.0	3.5	9.8	13.7	1.1	0.9	7.9	10.7	2.8	0.2	27426.6
Lake Macquarie	0.5	1.1	0.0	9.1	2.1	4.8	8.0	1.9	0.9	3.8	5.2	2.3	0.2	71848.4
Lake Mummuga	0.1	0.1	0.2	2.8	0.5	0.3	1.5	2.4	0.1	0.5	0.9	1.9	0.2	2741.5
Lake Tarourga	0.5	0.5	0.0	4.1	2.4	0.0	4.8	3.0	0.3	0.3	2.9	2.4	1.0	631.4
Little Lake (Narooma)	0.0	2.6	0.0	6.2	0.0	3.1	6.2	0.0	1.8	2.2	4.4	0.0	0.0	226.8
Little Lake (Wallaga)	0.4	0.4	0.0	10.8	1.2	0.0	12.0	2.4	0.4	0.4	9.6	2.0	0.4	250.7
Macleay River	0.2	1.9	0.0	1.8	1.2	0.2	3.3	1.7	0.3	1.9	1.3	1.2	0.3	1131867
Maloneys Creek	0.2	3.3	0.1	7.7	0.1	3.8	1.2	6.7	3.4	0.5	1.1	6.2	0.1	819.8
Manning River	0.3	0.6	0.0	5.1	1.4	0.5	5.8	1.4	0.3	1.1	3.9	2.0	0.1	815921.5
Merimbula Lake	1.0	0.9	0.7	5.2	2.1	2.6	7.0	0.0	1.9	1.6	3.6	1.7	0.0	4349.5
Meringo Creek	0.4	1.1	0.0	3.2	0.0	0.0	2.6	2.6	0.4	1.1	1.9	1.3	0.0	537.6
Meroo Lake	0.0	0.0	0.0	9.8	2.5	2.7	3.9	6.4	0.0	2.5	2.5	6.2	1.0	2063.7
Merrica River	0.0	0.0	0.0	1.1	0.0	0.0	0.1	1.2	0.0	0.0	0.0	1.0	0.0	6067.7
Middle Camp Creek	0.4	0.8	0.0	4.0	0.2	1.4	1.4	5.0	0.6	1.2	0.4	3.0	0.0	502.5

Estuary	BCI					BCC			BCP					Catchment Area (ha)
	Low	Mod. low	Mod.	Mod. high	High	Low	Mod.	High	Low	Mod. low	Mod.	Mod. high	High	
Middle Lagoon	0.1	0.1	0.1	9.9	2.5	0.6	8.9	3.7	0.1	0.6	6.7	4.5	0.7	2788.3
Millards Creek	0.0	0.0	0.0	1.6	0.0	1.3	0.0	0.7	0.0	1.1	0.0	0.4	0.0	450.8
Minnamurra River	0.3	1.2	0.1	13.5	3.7	3.2	13.0	2.5	0.8	3.1	9.7	4.0	0.9	11918.6
Mollymook Creek	0.0	2.2	0.0	5.5	0.0	2.6	0.0	5.5	1.5	1.8	0.0	4.4	0.0	272.3
Mooball Creek	5.7	4.2	0.6	16.8	1.6	20.8	7.8	6.3	7.5	13.0	5.5	2.5	0.2	10967.6
Moona Moona Creek	1.2	2.5	0.3	8.4	3.6	1.5	0.7	14.3	2.1	2.2	0.6	7.8	3.4	2870.8
Moonee Beach Creek	0.6	29.0	0.0	3.7	0.0	1.1	0.0	33.9	1.1	28.1	0.0	3.7	0.0	348.5
Moonee Creek	2.8	2.2	0.6	17.2	1.2	10.1	11.1	12.9	3.0	9.9	3.9	6.6	0.5	4152.1
Moruya River	0.0	0.1	0.0	1.1	0.7	0.4	1.3	0.3	0.1	0.3	0.7	0.6	0.1	142981.7
Munna Munnora Creek	0.3	0.6	0.0	5.8	0.0	2.5	3.6	0.6	0.6	2.5	3.6	0.0	0.0	363.2
Murrah River	0.0	0.0	0.1	4.2	1.0	0.1	3.5	0.4	0.0	0.1	2.2	1.2	0.1	19660.0
Myall River	3.3	12.1	0.3	15.1	2.1	3.1	13.4	20.8	5.5	10.5	8.0	8.0	0.6	93393.5
Nadgee Lake	2.3	6.1	0.5	0.3	2.1	0.0	0.7	9.1	1.6	1.5	0.6	0.6	1.3	1490.5
Nadgee River	0.1	0.8	0.0	2.7	1.4	0.0	0.3	4.8	0.0	0.8	0.1	2.7	1.3	5908.1
Nambucca River	0.4	1.2	0.1	9.9	2.3	0.8	10.0	3.2	0.5	1.7	7.7	3.5	0.4	131157.4
Nangudga Lake	1.0	1.1	0.6	12.5	1.9	1.5	15.9	0.6	1.5	1.8	11.6	1.9	0.2	1021.1
Nargal Lake	1.1	1.1	1.1	2.1	0.0	0.0	2.1	3.2	0.0	0.0	2.1	1.1	0.0	93.6
Narrawallee Inlet	0.0	2.1	0.0	11.1	2.8	1.0	10.0	5.6	0.1	2.8	7.2	5.5	0.4	8196.2
Nelson Lagoon	0.1	0.1	0.4	2.9	3.2	0.4	3.2	3.4	0.1	0.6	1.1	4.3	0.6	2833.7
Nerrindillah Creek	0.0	0.0	0.0	3.1	0.1	0.2	0.8	2.6	0.0	0.1	0.6	2.4	0.0	1729.0
Nullica River	1.0	1.5	0.4	1.1	0.3	0.0	3.8	0.1	1.1	1.8	0.6	0.3	0.0	5513.1
Oyster Creek	2.8	2.7	0.5	12.2	0.5	1.5	5.4	11.9	2.9	3.8	4.8	7.0	0.2	1692.2
Pambula River	0.0	0.0	0.0	2.4	1.1	0.2	2.0	0.4	0.0	0.2	1.0	1.1	0.1	30132.0
Pine Brush Creek	0.1	0.1	0.0	10.3	0.1	6.0	1.5	3.1	0.1	6.0	1.5	3.0	0.0	735.3
Pipe Clay Creek	15.2	30.5	1.2	6.1	0.0	11.0	3.7	37.8	19.5	31.7	1.2	0.6	0.0	164.1
Port Stephens	1.6	13.7	0.1	9.6	2.2	4.6	5.4	18.8	5.2	10.5	2.8	6.9	1.4	43114.4
Racecourse Creek (Old Bar)	7.2	12.7	0.4	4.7	0.0	10.5	17.7	6.5	13.4	9.1	0.4	1.8	0.0	276.1
Racecourse Creek (Ulladulla)	0.0	1.9	0.0	0.0	0.0	0.3	0.0	1.6	0.3	1.4	0.0	0.0	0.0	366.9
Richmond River	0.4	1.4	0.0	14.9	4.3	5.3	10.3	6.3	0.9	5.2	8.1	6.2	0.7	690021.7
Ryans Cut	12.2	19.9	3.0	33.7	11.8	0.0	12.4	69.9	12.0	20.3	4.7	34.5	8.9	492.0
Saltwater Creek (Eden)	0.1	0.1	0.1	1.1	0.1	0.0	0.2	1.2	0.1	0.1	0.2	0.9	0.1	1724.3
Saltwater Creek (Frederickton)	11.5	27.6	1.1	17.5	1.1	26.7	7.5	27.6	22.6	27.8	3.1	4.7	0.5	1139.6
Saltwater Creek (Rosedale)	0.4	2.1	0.0	8.9	0.4	6.7	5.7	0.4	2.5	3.9	5.0	0.4	0.0	282.2
Salty Lagoon	33.2	25.2	6.4	20.4	3.5	0.3	3.2	92.2	33.5	24.9	7.8	19.3	3.2	373.1
Sandon River	1.5	5.7	0.2	15.1	1.1	0.3	0.7	34.4	1.5	5.9	0.5	14.7	0.9	13413.9
Shadrachs Creek	0.0	0.0	0.0	2.0	0.2	0.5	1.1	1.1	0.1	0.4	0.8	1.1	0.0	1324.1
Shoalhaven River	0.0	0.0	0.0	1.4	1.1	0.2	1.9	0.4	0.0	0.2	1.0	1.0	0.2	711772.0
Smiths Lake	1.1	17.5	0.1	11.0	0.7	0.9	2.8	26.3	1.3	17.6	1.8	8.9	0.2	3798.0
South West Rocks Creek	11.9	46.8	0.7	5.9	4.3	9.1	5.2	55.3	15.8	45.3	1.5	3.7	3.5	461.2
Spring Creek	0.5	0.8	0.2	4.2	1.0	2.4	3.9	0.0	1.0	1.7	2.7	0.8	0.0	588.3
St Georges Basin	0.3	2.6	0.1	4.6	1.3	1.0	2.4	5.7	0.4	3.2	1.6	2.9	0.6	35666.1

Estuary	BCI					BCC			BCP					Catchment Area (ha)
	Low	Mod. low	Mod.	Mod. high	High	Low	Mod.	High	Low	Mod. low	Mod.	Mod. high	High	
Station Creek	1.6	16.0	0.2	9.8	1.1	0.0	1.1	28.6	1.6	16.0	0.5	9.7	0.9	2162.2
Stony Creek	0.0	91.0	0.0	0.8	0.0	0.0	0.0	92.7	0.0	91.4	0.0	0.8	0.0	238.5
Swan Lake	0.2	2.3	0.0	13.0	0.5	0.4	2.4	13.8	0.2	2.5	2.1	10.5	0.5	3106.0
Table Creek	0.0	0.0	0.0	2.8	0.2	0.0	0.2	3.1	0.0	0.0	0.1	2.8	0.1	1735.2
Tabourie Lake	0.2	1.1	0.1	15.7	0.7	1.9	3.8	12.8	0.4	2.4	3.2	11.4	0.2	4762.7
Tallow Creek	10.1	27.5	1.3	22.5	0.9	37.6	8.4	16.1	27.9	24.0	4.0	5.9	0.2	545.7
Telegraph Creek	0.7	45.7	2.3	0.2	0.0	0.0	0.2	49.7	0.7	45.5	2.6	0.0	0.0	428.8
Termeil Lake	0.7	0.5	0.2	8.8	1.5	2.1	3.4	8.7	0.7	2.5	2.5	5.1	0.8	1462.1
Tilba Tilba Lake	0.2	0.3	0.1	11.4	3.2	0.0	14.5	1.6	0.2	0.3	10.8	3.2	0.5	1826.6
Tilligerry Creek	13.6	56.5	1.5	14.6	5.9	14.8	22.8	54.3	22.6	50.4	9.6	8.0	1.0	13521.8
Tomaga River	0.1	0.0	0.0	5.8	2.1	2.5	3.4	2.5	0.1	2.3	2.1	2.7	0.8	9370.9
Towamba River	0.0	0.0	0.0	0.7	0.3	0.0	0.5	0.0	0.0	0.0	0.2	0.3	0.0	102919.3
Tuggerah Lake	0.5	2.1	0.1	10.8	2.2	7.1	8.6	2.3	1.5	5.8	6.1	1.7	0.3	79523.4
Tuross River	0.0	0.0	0.0	2.3	0.8	0.1	2.1	0.3	0.0	0.1	1.3	0.8	0.1	182927.7
Tweed River	0.6	1.6	0.1	6.5	7.5	10.6	5.0	0.8	1.5	10.0	3.0	1.6	0.2	107748.0
Twofold Bay	0.9	1.4	0.4	0.2	0.0	0.4	2.2	0.5	1.0	1.5	0.4	0.0	0.0	4174.6
Ulladulla	0.0	2.5	0.0	0.0	0.0	7.6	0.0	0.0	2.5	0.0	0.0	0.0	0.0	39.3
Wagonga Inlet	0.0	0.0	0.0	2.6	0.7	0.5	2.5	0.7	0.0	0.5	1.5	1.1	0.0	10022.0
Wallaga Lake	0.1	0.0	0.0	5.7	0.9	0.2	3.7	0.7	0.1	0.2	2.7	1.1	0.1	27314.3
Wallagoot Lake	0.0	0.0	0.3	7.8	4.6	0.3	9.1	3.6	0.0	0.3	6.2	4.4	1.6	3050.7
Wallis Lake	2.4	5.9	0.3	19.0	2.8	2.2	15.8	12.9	3.2	6.1	12.3	7.5	1.0	129560.7
Wapengo Lagoon	0.0	0.2	0.0	6.5	2.9	0.1	8.5	1.7	0.0	0.3	5.3	3.6	0.3	7217.6
Washerwomans Creek	0.0	4.7	0.0	2.4	0.0	0.0	0.0	7.5	0.4	4.3	0.0	2.4	0.0	253.9
Werri Lagoon	0.2	0.8	0.1	18.1	5.6	3.0	19.5	1.8	0.8	2.3	15.7	4.8	0.7	1662.6
Willinga Lake	0.0	0.1	0.0	12.2	2.7	1.1	4.0	10.6	0.0	1.2	2.9	8.8	1.9	1390.2
Wollumboola Lake	0.1	0.1	0.4	5.1	1.9	0.4	1.3	6.1	0.1	0.6	0.8	4.2	1.6	4045.8
Wonboyn River	0.5	0.4	0.8	6.6	0.3	0.0	0.6	3.8	0.5	0.4	1.2	2.0	0.2	33977.4
Woodburn Creek	0.1	0.1	0.1	12.3	0.8	0.0	0.6	13.7	0.1	0.2	0.3	12.2	0.5	1356.5
Woolgoolga Lake	0.3	0.4	0.0	11.7	0.4	4.7	6.1	3.0	0.3	4.0	5.4	3.1	0.0	2117.7
Wooli Wooli River	0.8	4.4	0.1	20.7	3.6	0.3	2.3	30.7	0.9	4.6	0.9	20.7	2.5	18374.5
Wowly Gully	0.8	0.3	1.5	5.5	7.6	0.2	1.1	24.6	0.8	0.8	0.6	5.3	7.6	618.7

Tributaries and catchments are listed in alphabetical order.

Table S7. Coefficient of determination (r^2), F -ratio and P -value for linear, exponential and full factorial linear models of relationships between catchment area (ha), estuary type (III or IV) and estuary maturity (A, B, C or D), and response variables of high BCI, BCC and BCP area.

Catchment	Regression	Response variable	BCI High	BCC High	BCP High
North & South Coasts	Linear	r^2	0.7767	0.4845	0.7884
		F -ratio	507.9478	137.2385	543.9484
		P -value	<0.0001	<0.0001	<0.0001
	Exponential	r^2	0.7853	0.4824	0.5229
		F -ratio	504.7016	133.2543	139.1824
		P -value	<0.0001	<0.0001	<0.0001
	Full factorial	r^2	0.7831	0.547	0.7972
		F -ratio	29.5546	9.886	32.1911
		P -value	<0.0001	<0.0001	<0.0001
North Coast	Linear	r^2	0.7661	0.4758	0.784
		F -ratio	193.1959	53.553	214.1552
		P -value	<0.0001	<0.0001	<0.0001
	Exponential	r^2	0.886	0.707	0.7933
		F -ratio	435.3911	142.374	211.1002
		P -value	<0.0001	<0.0001	<0.0001
	Full factorial	r^2	0.7832	0.6268	0.7984
		F -ratio	10.835	5.0392	11.8789
		P -value	<0.0001	<0.0001	<0.0001
South Coast	Linear	r^2	0.9581	0.5137	0.8272
		F -ratio	1942.493	89.7971	406.8621
		P -value	<0.0001	<0.0001	<0.0001
	Exponential	r^2	0.6407	0.2894	0.2041
		F -ratio	142.6852	33.4	17.948
		P -value	<0.0001	<0.0001	<0.0001
	Full factorial	r^2	0.9655	0.7575	0.8612
		F -ratio	132.2904	14.785	29.3733
		P -value	<0.0001	<0.0001	<0.0001

Table S8. Area (ha) of low, moderate, high, and total cell scores for blue carbon storage, preservation, generation and permanency in tributaries based on the watershed area located above instream barriers.

Tributary	Catchment	Watershed area (ha)	Storage				Preservation				Generation				Permanency			
			Low	Mod.	High	Total	Low	Mod.	High	Total	Low	Mod.	High	Total	Low	Mod.	High	Total
Alipou Creek	Clarence River	3361	0	536	172	708	0	719	0	719	0	214	25	239	0	0	719	719
Anchorage Creek	Moruya River	96	0	32	7	38	0	34	4	38	1	6	20	27	0	4	34	38
Belmore River	Macleay River	11446	608	2473	857	3938	608	5019	1493	7120	159	1249	1083	2492	302	1111	5698	7111
Bilambil Creek	Tweed River	31	0	0	0	1	0	1	0	1	0	1	0	1	0	0	1	1
Boambee Creek	Boambee Creek	569	0	100	1	101	0	101	0	101	0	1	0	1	0	0	101	101
Boggy Creek	Bellinger River	71	0	26	40	67	0	54	14	68	4	46	7	57	0	13	54	68
Broadwater Creek	Clarence River	4109	0	565	221	786	0	535	368	903	61	151	86	299	0	316	587	903
Camp Creek	Clarence River	464	0	119	120	239	0	283	0	283	0	174	49	223	0	0	283	283
Chickiba Creek	Richmond River	222	12	47	31	90	12	4	99	115	15	2	13	30	1	82	33	115
Christies Creek	Cudgera Creek	2112	356	310	68	734	356	376	4	736	75	76	40	190	271	0	464	736
Clybucca Creek	Macleay River	27635	0	3563	863	4426	0	8417	157	8574	17	1472	1068	2557	0	154	8402	8556
Cobaki Creek	Tweed River	1022	0	45	4	49	0	49	0	49	0	4	0	4	0	0	49	49
Coldstream River	Clarence River	1492	0	416	190	606	0	707	0	707	0	0	0	0	0	0	707	707
Condong Creek	Tweed River	741	0	102	139	241	0	241	0	241	0	151	3	153	0	0	241	241
Coolongolook River	Wallis Lake	10677	0	1194	14	1208	0	1207	0	1207	0	18	1	19	0	0	1208	1208
Crawford River	Myall Lakes	12195	0	2177	67	2244	0	2131	114	2244	0	80	3	83	0	9	2237	2245
Croobyar Creek	Narrawallee Inlet	3422	0	229	69	298	0	292	9	301	1	66	8	75	0	7	292	298
Crookhaven Creek	Crookhaven River	8681	0	2184	1482	3666	0	3515	166	3681	50	1421	1009	2479	0	159	3507	3666
Crookhaven River	Crookhaven River	1592	0	590	264	854	0	431	429	860	100	154	283	537	0	372	482	854
Cubba Cubba Creek	Manning River	88	0	36	49	85	0	88	0	88	0	72	12	84	0	0	88	88
Cullendulla Creek	Cullendulla Creek	54	0	9	3	12	0	9	3	12	0	2	2	4	0	3	9	12
Dignams Creek	Wallaga Lake	9454	0	228	13	241	0	243	0	243	0	13	3	15	0	0	241	241

Tributary	Catchment	Watershed area (ha)	Storage				Preservation				Generation				Permanency			
			Low	Mod.	High	Total	Low	Mod.	High	Total	Low	Mod.	High	Total	Low	Mod.	High	Total
Malabar Creek	Moruya River	2469	0	320	104	424	0	350	87	437	14	82	140	236	0	75	348	424
Marshalls Creek	Brunswick River	3096	0	689	80	769	0	770	0	770	0	92	5	96	0	0	770	770
Mollymook Creek	Mollymook Creek	265	6	15	0	21	6	11	4	21	0	0	0	0	1	0	20	21
Mondrook Creek	Manning River	13	0	11	2	13	0	12	0	12	0	3	0	3	0	0	13	13
Mosquito Creek Canal	Richmond River	230	108	51	63	222	108	121	0	229	13	92	24	130	71	0	158	229
Mullet Creek	Lake Illawarra	7040	0	1907	179	2086	0	2123	0	2123	0	219	33	253	0	0	2106	2106
Mullumbimby Creek	Brunswick River	2205	0	589	35	624	0	624	0	624	0	36	0	37	0	0	624	624
Nangudga Creek	Nangudga Creek	653	0	104	8	112	0	113	1	114	0	8	1	10	0	0	112	112
Ocean Shores (south)	Brunswick River	11	0	1	1	2	0	0	2	2	0	0	0	0	0	1	1	2
Oyster Creek	Manning River	167	9	1	3	13	9	0	4	13	2	0	1	4	8	4	1	13
Pelican Bay	Manning River	26	0	16	4	21	0	16	9	25	3	8	8	20	0	9	17	26
Pipeclay Canal	Manning River	4179	0	1976	47	2023	0	2010	7	2017	3	56	10	69	0	7	2017	2024
Poverty Creek	Clarence River	935	0	242	198	440	0	497	0	497	0	311	78	389	0	0	497	497
Reserve Creek	Cudgen Creek	4163	0	580	266	846	0	767	84	851	18	241	11	270	0	75	777	851
Saltpan Creek	Crookhaven River	349	0	229	115	344	0	0	344	344	106	0	120	226	0	340	4	344
Saltwater Creek	Richmond River	366	68	49	23	140	68	80	0	148	2	39	14	54	18	0	130	148
Saltwater Creek (West)	Port Stephens	197	14	0	0	14	15	0	0	15	0	0	12	12	0	0	14	14
Saltwater Inlet	Macleay River	46	29	11	4	44	29	10	7	46	1	6	4	11	11	1	34	46
Southgate–Alumy Creek	Clarence River	4698	0	888	961	1849	0	1951	0	1951	0	1240	160	1400	0	0	1951	1951
Sportsman Creek	Clarence River	30284	0	691	398	1089	0	1289	0	1289	0	582	159	740	0	0	1289	1289
Spring Creek	Spring Creek	480	0	15	2	17	0	16	0	16	0	2	0	2	0	0	17	17
Stoney Creek	Lake Brou	1543	0	18	0	18	0	18	0	18	0	0	0	0	0	0	18	18
Swan Creek	Clarence River	198	0	64	87	151	0	160	0	160	0	108	13	121	0	0	160	160
Tandingulla Creek	Shoalhaven River	1823	0	745	150	894	0	897	0	897	0	150	203	352	0	0	894	894

Tributary	Catchment	Watershed area (ha)	Storage				Preservation				Generation			Permanency				
			Low	Mod.	High	Total	Low	Mod.	High	Total	Low	Mod.	High	Total	Low	Mod.	High	Total
The Branch River	Port Stephens	12804	0	3044	1	3045	0	3045	0	3045	0	2	0	2	0	0	3045	3045
Tuckean Broadwater	Richmond River	21707	0	3899	2738	6636	0	5750	1990	7740	349	2488	776	3613	0	1677	6060	7736
Tweed River	Tweed River	57074	0	1707	62	1769	0	1770	0	1770	0	67	2	69	0	0	1770	1770
Victoria Creek	Tilba Tilba Lake	1084	0	129	9	138	0	139	0	139	0	9	1	10	0	0	138	138
Wallamba River	Wallis Lake	27281	0	7100	40	7139	0	7136	0	7136	0	51	2	52	0	0	7141	7141
Watt Creek	Nambucca River	266	0	55	70	125	0	137	0	137	0	85	7	92	0	0	137	137
Williams River	Hunter River	117555	0	926	433	1358	0	1376	0	1376	0	639	113	752	0	0	1403	1403

Tributaries are listed in alphabetical order.

Table S9. Area (ha) of low, moderate and high cell scores for BCI, BCC (2007 and 2017) and BCP (2007 and 2017) in tributaries based on the watershed area located above instream barriers.

Tributary	BCI					BCC 2017			BCP 2017				
	Low	Mod low	Mod	Mod high	High	Low	Mod	High	Low	Mod low	Mod	Mod high	High
Alipou Creek	0	11	0	469	239	151	474	94	0	161	284	238	35
Anchorage Creek	0	0	0	12	27	2	30	8	0	1	10	21	6
Belmore River	305	3528	42	1135	2195	151	2788	4870	363	3567	222	1812	1240
Bilambil Creek	0	0	0	0	1	0	1	0	0	0	0	1	0
Boambee Creek	0	0	0	100	1	73	26	2	0	73	26	3	0
Boggy Creek	0	1	0	14	53	6	62	0	0	7	13	48	0
Broadwater Creek	0	117	0	549	237	5	371	527	0	122	252	393	136
Camp Creek	0	44	0	16	223	239	22	21	35	213	0	25	9
Chickiba Creek	1	37	0	63	15	7	57	62	3	40	24	44	5
Christies Creek	159	162	37	300	78	451	166	119	267	325	128	17	0
Clybucca Creek	125	4130	0	2010	2415	282	5552	3744	234	4161	801	2619	866
Cobaki Creek	0	0	0	45	4	20	28	0	0	20	27	2	0
Coldstream River	0	100	0	122	484	9	259	439	0	110	107	147	343
Condong Creek	0	0	0	87	153	164	76	2	0	164	59	19	0
Coolongolook River	0	0	0	1192	16	44	963	200	0	44	948	216	0
Crawford River	1	2	0	2178	64	118	1025	1120	1	120	970	1146	8
Croobyar Creek	0	0	0	224	74	25	253	28	0	25	190	69	13
Crookhaven Creek	0	0	0	1237	2429	315	2476	896	0	306	813	1951	587
Crookhaven River	0	0	0	417	437	17	403	442	0	16	168	468	199
Cubba Cubba Creek	0	6	0	3	78	4	84	0	0	10	3	75	0
Cullendulla Creek	0	0	0	8	4	1	8	3	0	1	4	6	0
Dignams Creek	0	0	0	225	15	6	210	37	0	6	188	44	3
Dinsey Creek	0	2	0	1	56	56	3	0	2	54	0	2	0
Duck Creek (East Canal)	0	27	0	12	132	141	27	3	25	118	5	22	1
Duck Creek	0	0	0	264	1	27	236	2	0	27	235	3	0
Duck Creek	0	1	0	36	12	1	48	0	0	2	35	12	0
Dulguigan Creek	0	5	0	2	216	217	7	0	5	211	1	7	0
Dunbible Creek	0	0	0	380	9	181	203	5	0	182	196	12	0
Dungarubba Creek	0	59	0	145	198	333	58	11	55	282	37	27	1
Dungay Creek	0	0	0	140	1	69	71	1	0	69	71	1	0
Duroby Creek	0	1	0	49	25	31	43	0	0	31	25	18	0
Emigrant Creek Canal	0	2	0	6	24	22	8	2	2	21	4	4	1
Empire Vale Creek	4	49	0	24	200	243	23	11	47	206	1	23	1
Fernbank Creek	4	57	0	41	211	52	218	51	7	102	8	169	26
Hursley Creek	0	16	0	356	21	73	273	47	0	88	240	64	0
Jellat Jellat Gully	0	0	0	69	232	1	302	3	0	1	66	234	0
Jerrara Creek	0	0	0	11	12	1	22	0	0	1	9	12	0
Kinchela Creek	61	1983	8	226	808	32	1382	1717	67	2004	110	597	308
Kings Creek (south)	0	4	0	3	3	0	10	0	0	4	3	3	0
Kooloonbung Creek	0	0	0	16	3	11	4	3	0	11	4	3	0
Lansdowne River	0	0	0	3881	3	353	3267	264	0	353	3264	267	0
Leddays–McLeods Creek	0	120	0	467	967	1509	46	0	118	1392	27	17	0
Leos Creek	2	1	1	20	3	0	11	0	2	3	3	3	0

Tributary	BCI					BCC 2017			BCP 2017				
	Low	Mod low	Mod	Mod high	High	Low	Mod	High	Low	Mod low	Mod	Mod high	High
Little Branch Creek	0	0	0	1352	3	3	1223	128	0	3	1220	131	0
Little Bumbo Creek	0	0	0	27	1	0	24	6	0	0	22	7	0
Macquarie Rivulet	0	0	0	1938	95	488	1465	144	0	458	1341	227	5
Maguires Creek	0	0	0	44	0	12	32	0	0	12	32	0	0
Malabar Creek	1	0	0	203	221	41	301	95	1	41	125	211	44
Marshalls Creek	0	1	0	673	96	256	525	9	1	240	461	68	0
Mollymook Creek	1	6	0	15	0	7	0	16	4	5	0	12	0
Mondrook Creek	0	0	0	10	2	3	9	0	0	3	8	1	0
Mosquito Creek Canal	48	58	10	8	106	104	48	78	63	125	10	30	1
Mullet Creek	7	20	0	1840	246	933	1336	0	10	820	1127	147	0
Mullumbimby Creek	0	0	0	588	37	82	536	6	0	82	505	37	0
Nangudga Creek	0	0	0	103	10	8	109	1	0	7	95	10	0
Ocean Shores (south)	0	0	0	2	0	2	1	0	0	1	0	0	0
Oyster Creek	6	2	1	4	0	2	7	4	7	2	3	2	0
Pelican Bay	0	8	0	4	14	0	18	7	0	7	2	13	3
Pipeclay Canal	7	1	0	1972	51	73	1500	609	7	63	1303	658	0
Poverty Creek	0	57	0	51	389	248	36	213	20	265	17	38	157
Reserve Creek	0	6	0	594	252	448	398	6	4	445	338	64	0
Saltpan Creek	0	0	0	224	120	11	258	75	0	11	170	134	29
Saltwater Creek	14	61	1	20	51	92	31	25	50	74	11	12	0
Saltwater Creek (West)	12	14	0	0	0	4	0	66	15	11	0	0	0
Saltwater Inlet	8	22	2	7	8	0	7	39	8	22	2	13	2
Southgate–Alumy Creek	0	101	0	449	1400	120	1590	241	1	219	372	1189	169
Sportsman Creek	0	201	0	348	740	2	442	846	0	202	230	301	556
Spring Creek	0	0	0	15	2	6	11	0	0	6	10	1	0
Stoney Creek	0	0	0	18	0	0	14	5	0	0	13	5	0
Swan Creek	0	10	0	30	121	1	158	2	0	10	29	119	2
Tandingulla Creek	0	0	0	542	352	55	783	62	0	54	474	323	41
The Branch River	0	0	0	3044	1	10	1961	1074	0	10	1960	1075	0
Tuckean Broadwater	11	1100	0	3384	3253	1870	3757	2528	163	2586	1824	1976	1199
Tweed River	0	0	0	1700	69	541	1347	23	0	541	1151	76	2
Victoria Creek	0	0	0	128	10	0	147	0	0	0	128	10	0
Wallamba River	0	3	0	7093	45	442	6364	331	0	444	6319	373	0
Watt Creek	0	12	0	33	92	16	73	48	0	28	11	74	24
Williams River	0	75	0	670	658	84	1105	188	4	148	490	683	51

Tributaries are listed in alphabetical order.

References

Manly Hydraulics Laboratory (2012) OEH NSW Tidal Planes Analysis: 1990–2010 Harmonic Analysis. Report MHL2053, October 2012.

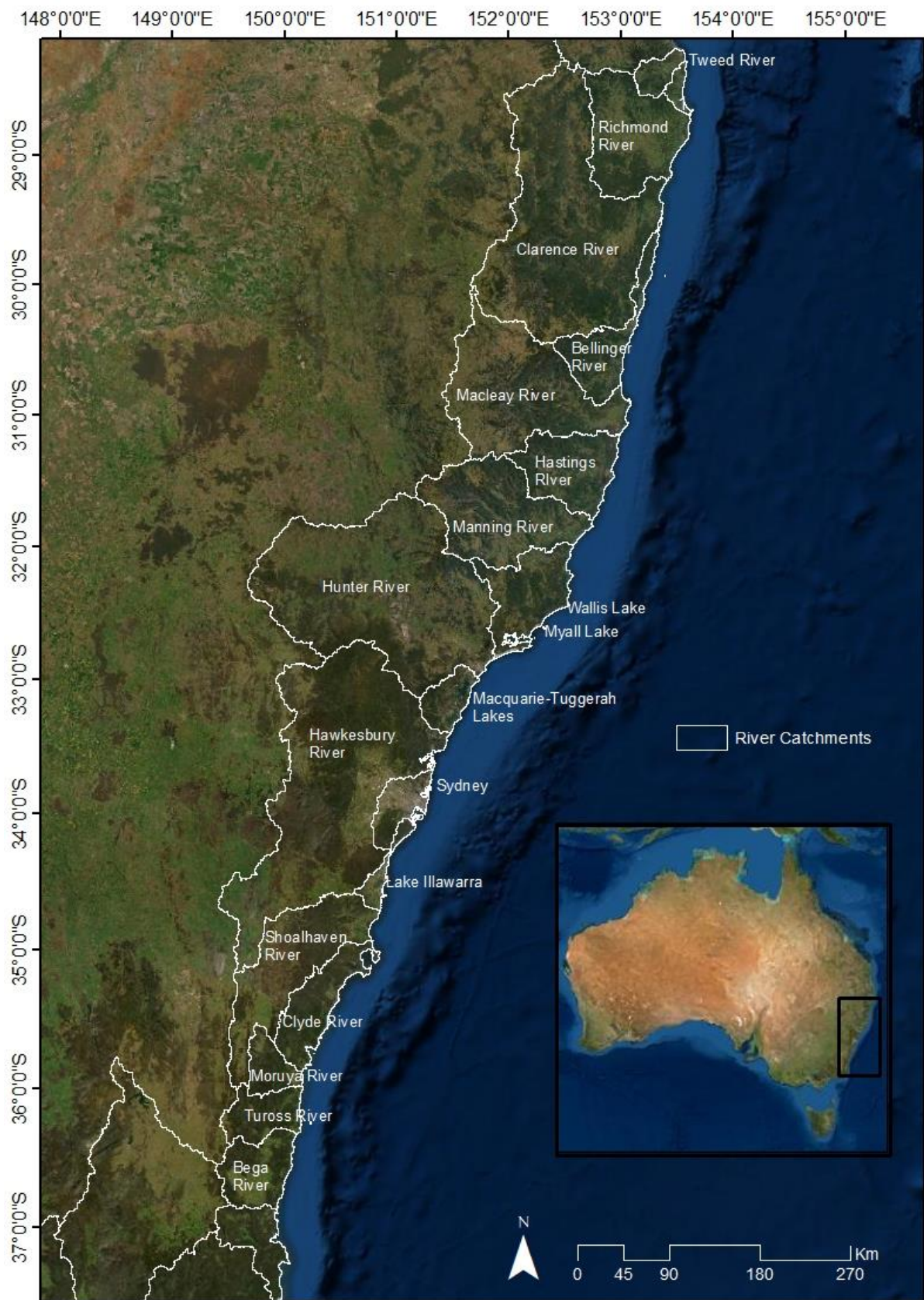


Figure S1. River catchments in this study.

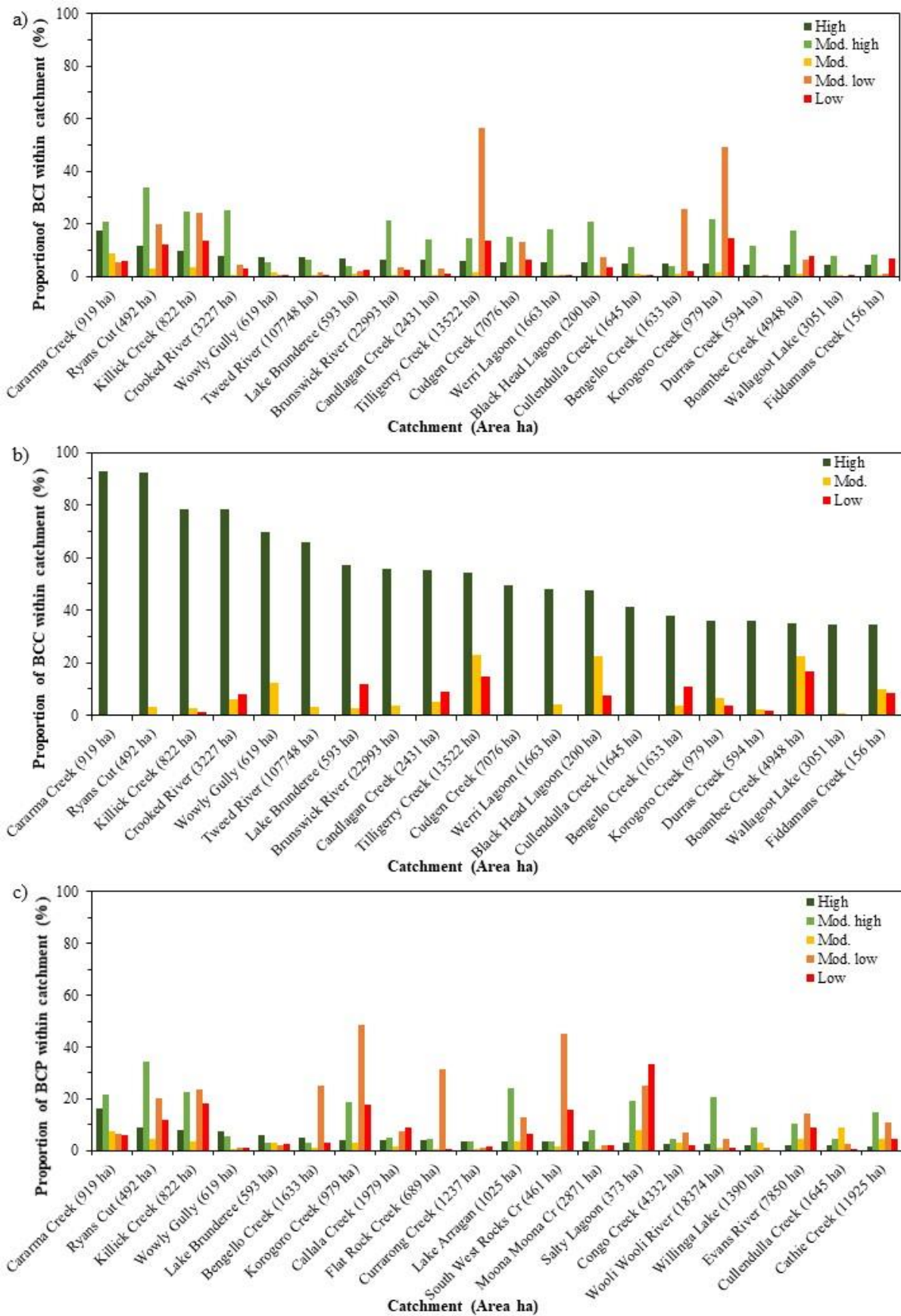


Figure S2. Proportion of BCI, BCC and BCP within catchments, ranked on the basis of the proportion of high BCI, high BCC and high BCP.