Supplementary material to Hogarth 2014: Table of tide gauge sites where data has been extended, and sources (as at June 2014).

Table 1: Showing tide gauge stations where additional data is available, which when extended satisfy >60 years and >75% completeness. These are added to the many more time series in the PSMSL which fit these criteria but where data has not yet been found to allow extension. All series meeting these criteria are used in the overall analysis in Hogarth 2014. The additional time series data are either from recent published work not yet in the PSMSL (Mid 2013), or use composite series created using nearby PSMSL tidal station data where sufficient temporal overlap exists, or use additional "recovered" historical data from old published sources. The full sources are given in the original paper or in the detailed regional notes. The process of extending the global tidal time series has been systematic but not automated.

Cautions:

Some of the time series have been extended using data from old documents and although every effort has been made to accurately transcribe and check this data, errors may exist as this process was manual.

Some time series use older data that has different datums to the more recent ones used by the PSMSL. These offsets must be accounted for when creating a continuous time series. Only data that either has overlap (and small difference values) with other data with known vertical references or that is referenced to bench-marks which can be linked to modern benchmarks has been used. Often this requires separate searches for old bench mark information.

It is accepted that many of the time series will have unrecorded datum shifts which can be difficult to differentiate from vertical variations associated with large scale long period meteorological processes (such as those represented by alternating phases of the Southern Oscillation Index). This is true of all tide gauge data. Wherever possible these time series have been checked against other nearby tide gauge time series or have been checked against local bench mark elevations. Meteorological effects will be common to nearby stations, whereas datum shifts will not.

Extended PSMSL								Original PSMSL						
	PSMSL No.	Total yrs	start yr	span	end yr	SLA		Total yrs	start yr	span	end yr	SLA	Add. yrs	Source for composite or reference
SWINOUJSCIE	2	200	1811	202	2012	0.0101		181	1811	189	1999	0.0099	19	Koserow
SHEERNESS	3	133	1833	174	2006	0.0104		85	1833	174	2006	0.0166	48	Southend metric
CUXHAVEN 2	7	171	1843	171	2013	0.0125		168	1843	168	2010	0.0133	3	UHSLC daily
SAN FRANCISCO	10	159	1855	159	2013	0.0116		158	1855	158	2012	0.0126	1	updated Breaker 2013 and BM various
NEW YORK (The Battery)	12	167	1843	171	2013	0.0173		138	1856	156	2011	0.0099	29	Tuttle 1903, Schureman 1934, Sandy Hook
HELSINKI	14	139	1857	156	2012	0.0097		133	1879	133	2011	0.0270	6	Helsinki metric
LYOKKI	16	154	1858	155	2012	0.0120		78	1858	79	1936	0.0161	76	Rauma
LYPYRTTI	17	154	1858	155	2012	0.0060		77	1858	79	1936	0.0053	77	Turku
JUNGFRUSUND	18	137	1858	154	2011	0.0151		77	1858	77	1934	0.0280	60	Hango
HELLEVOETSLUIS	19	149	1861	152	2012	0.0125							149	Metric Stellendam Buiten and Haringvliet
ABERDEEN II	21	140	1862	151	2012	0.0183		103	1862	151	2012	0.0265	37	Aberdeen I & II
DEN HELDER	23	181	1832	181	2012	0.0064		148	1865	148	2012	0.0037	33	Wahl 2013
DELFZIJL	24	185	1827	186	2012	0.0167		148	1865	148	2012	0.0136	37	Wahl 2013
SODERSKAR	29	147	1866	146	2011	0.0082		71	1866	71	1936	0.0229	76	Helsinki
NEDRE SODERTALJE	31	144	1869	144	2012	0.0042		102	1869	102	1970	-0.0242	42	Landsort
ZIERIKZEE	35	141	1872	141	2012	0.0051							141	Metric Roompot Buiken
BROUWERSHAVEN	36	129	1872	141	2012	0.0093							129	Metric Brouwershaven Gat and Zeebrugge
VENEZIA (San Stefano)	39	134	1872	141	2012	0.0034		46	1872	48	1919	0.1088	88	All Venezia RLR and metric
SEVASTOPOL	42	113	1875	120	1994	0.0155		82	1910	85	1994	-0.0110	31	Metric, BC Poti
MUMBAI / BOMBAY	43	136	1857	156	2012	-0.0008		116	1878	131	2008	-0.0076	20	Okha and Altimeter, GTS India
ADEN	44	105	1880	133	2012	0.0107		62	1880	133	2012	-0.0361	43	Spencer et al 1987
KABELVAG	45	81	1881	132	2012	0.0209		61	1948	64	2011	0.0000	20	Extended, metric (suspect vertical control)
STAVANGER	47	95	1881	133	2013	0.0044		79	1919	93	2011	0.0354	16	Metric, Statkart.no, BM
CASCAIS	52	117	1882	131	2012	0.0081		101	1882	124	2005	0.0135	16	Updated with daily values UHSLC
VAASA / VASA	57	135	1867	146	2012	0.0159		117	1884	128	2011	0.0116	18	Ronnskar
BERGEN	58	102	1883	130	2012	0.0182		88	1916	96	2011	0.0249	14	Metric, Statkart.no
GENOVA	59	113	1884	129	2012	0.0049		85	1884	127	2010	-0.0047	28	Genova II Porto Murizio
MARSEILLE	61	127	1885	128	2012	-0.0014		120	1885	127	2011	-0.0093	7	Updated L'Estartit
OSLO	62	104	1886	127	2012	0.0157		94	1886	126	2011	-0.0213	10	Hirtshals and BM data, Statkart.no
GDANSK/NOWY PORT	64	114	1886	126	2011	0.0302		49	1951	49	1999	-0.0225	65	Hel
SYDNEY	65	140	1873	140	2012	0.0130		108	1886	108	1993	0.0219	32	Russell 1885, Fort Denison I and II
LANDSORT	68	126	1887	126	2012	0.0113		119	1887	119	2005	0.0070	7	Landsort Norra
HANKO / HANGO	71	130	1866	147	2012	0.0179		99	1889	123	2011	0.0236	31	Russaro
YSTAD	72	126	1887	126	2012	0.0004		95	1887	95	1981	-0.0283	31	Klagshamn
VARBERG	73	126	1887	126	2012	0.0025		95	1887	95	1981	-0.0267	31	Ringhals
MEM	75	150	1864	150	2013	0.0194							150	Mem metric, 1936 Pub.Sci. Visby, Marviken

Extended PSMSL								Original PSMSL						
	PSMSL No.	Total yrs	start yr	span	end yr	SLA		Total yrs	start yr	span	end yr	SLA	Add. yrs	Source for composite or reference
STOCKHOLM	78	223	1774	239	2012	0.0067		124	1889	124	2012	0.0146	99	Ekman
BJORN	90	121	1892	121	2012	0.0238		85	1892	85	1976	-0.0051	36	Forsmark
TONOURA	94	118	1894	119	2012	0.0100		85	1894	90	1983	-0.0326	33	Hamada I & II (BC with Sakai)
NORTH SHIELDS	95	116	1895	118	2012	-0.0011		103	1896	117	2012	-0.0001	13	Filled Blythe
HALIFAX	96	96	1852	161	2012	0.0095		86	1842	170	2011	-0.0003	10	Spencer et al 1987
NEDRE GAVLE	99	117	1896	117	2012	0.0165		91	1896	91	1986	0.0153	26	Filled Forsmark
KLAIPEDA	118	134	1865	147	2011	0.0167		103	1898	114	2011	0.0593	31	Liepaja
HORNBAEK	119	118	1891	122	2012	0.0229		109	1898	114	2011	0.0303	9	DMI update, extended to 1891
GEDSER	120	129	1882	131	2012	0.0008		112	1898	114	2011	0.0120	17	DMI extended 1892, Marienleuchte metric
DRAGHALLAN	122	114	1898	115	2012	0.0272		70	1898	70	1967	0.0206	44	Spikarna
ABURATSUBO	130	117	1895	118	2012	0.0115		80	1930	83	2012	0.0225	37	Metric and Japan GSI
WAJIMA	132	118	1895	118	2012	0.0048		81	1930	83	2012	0.0727	37	Metric and Japan GSI
HOSOJIMA	133	117	1894	119	2012	-0.0028		81	1930	83	2012	0.0115	36	Metric and Japan GSI
KUSHIMOTO	134	83	1895	118	2012	0.0096		54	1958	56	2013	0.2025	29	Metric and Japan GSI
DUNEDIN	136	87	1900	113	2012	0.0116		66	1900	112	2011	0.0120	21	Filled Dunedin II
FUKABORI	141	86	1894	119	2012	0.0102							86	GSI, Misumi, Nagasaki, Sasebo
Manila/Cebu	145	77	1902	110	2011	0.0098		84	1902	110	2011	0.2315	-7	Cebu (Tentative!)
AUCKLAND II	150	112	1899	114	2012	0.0094		92	1904	109	2012	-0.0161	20	Hannah 2010
KAOHSIUNG	152	106	1904	109	2012	0.0131		16	1974	16	1989	-0.1474	90	Metric, CWB, altimeter and Tseng 2012
KEELUNG	153	114	1899	114	2012	0.0049		39	1956	39	1994	0.4490	75	Metric, CWB, Macau, altimeter, Tseng 2012
HONOLULU	155	116	1878	136	2013	0.0049		107	1905	108	2012	-0.0137	9	Lyons 1901-1904 (tentative datum <1892)
BUENOS AIRES	157	114	1871	142	2012	0.0109		83	1905	108	2012	0.0454	31	Palermo, Dobson 1899
LAGOS	162	90	1909	104	2012	-0.0099		69	1909	79	1987	-0.0402	21	Cascais and daily values from UHSLC
BALBOA	163	104	1908	105	2012	0.0002		98	1908	99	2006	0.0141	6	Altimeter
TOFINO	165	93	1905	108	2012	-0.0026		74	1910	103	2012	0.0006	19	Dawson 1905.1923
VICTORIA	166	106	1891	122	2012	0.0089		100	1910	102	2011	0.0005	6	Spencer et al 1987
CRISTOBAL	169	103	1907	106	2012	0.0134		71	1909	71	1979	0.0349	32	UHSLC, Cartagena and Altimeter
MANTYLUOTO	172	120	1889	124	2012	0.0154		97	1911	101	2011	0.0346	23	Reposaari
QUEBEC (LAUZON)	173	95	1895	117	2011	0.0289		71	1911	101	2011	0.0000	24	Spencer et al 1987
VANCOUVER	175	94	1895	118	2012	0.0180		83	1911	102	2012	0.0000	11	Spencer et al 1987, Dawson 1905
SMOGEN	179	118	1895	118	2012	0.0231		101	1911	101	2011	0.0384	17	Backevik
KEY WEST	188	108	1846	167	2012	0.0082		99	1913	100	2012	0.0026	9	Maul and Martin 2006
POINT ATKINSON	193	78	1895	118	2012	0.0028		70	1915	97	2011	0.0000	8	Spencer et al 1987
PIETARSAARI	194	119	1889	124	2012	0.0258		92	1915	97	2011	0.0389	27	Ykspihlaja
SAINT JOHN, N.B.	195	88	1895	117	2011	0.0064		53	1929	71	1999	-0.0271	35	Spencer et al 1987
FURUOGRUND	203	119	1892	121	2012	0.0249		95	1916	97	2012	0.0614	24	Rattan

	PSMSL No.	Total yrs	start yr	span	end yr	SLA		Total yrs	start yr	span	end yr	SLA	Add. yrs	Source for composite or reference
KARACHI	204	121	1855	158	2012	0.0195		50	1868	145	2012	0.0522	71	Spencer et al 1987
CHENNAI / MADRAS	205	79	1880	133	2012	-0.0026		40	1953	57	2009	0.0535	39	Spencer et al 1987
ALICANTE II	208	126	1874	137	2010	0.0171		28	1952	45	1996	0.1814	98	Metric
CADIZ	209	100	1880	133	2012	0.0216		35	1882	106	1987	0.0013	65	Marcos 2011
WELLINGTON	221	114	1891	122	2012	0.0274		60	1945	67	2011	0.0430	54	Bell and Hannah 2012
QUEQUEN	223	96	1912	101	2012	0.0131		64	1918	65	1982	-0.0031	32	Mar del Plata, metric Puerto Deseado
KETCHIKAN	225	102	1909	104	2012	0.0047		92	1919	94	2012	-0.0099	10	Spencer et al 1987
BOSTON	235	134	1830	183	2012	0.0205		89	1921	91	2011	-0.0171	45	Freeman 1903, Schureman 1928
FOGLO / DEGERBY	249	138	1866	146	2011	0.0088		80	1924	88	2011	0.0186	58	Soderskar
LYTTELTON II	259	73	1900	112	2011	0.0078		59	1924	77	2000	-0.0239	14	Hannah
TENERIFE	303	78	1927	86	2012	-0.0159		56	1927	63	1989	-0.0958	22	Marcos 2013
NARVIK	312	71	1929	84	2012	0.0083		70	1929	83	2011	0.0120	1	Metric and use chart datum, Statkart.no
HAMINA	315	119	1889	123	2011	0.0149		79	1929	83	2011	0.0083	40	Vyborg
TALLIN	321	141	1842	154	1995	-0.0053		11	1928	11	1938	-0.0723	130	Suursaar 2011
OOSTENDE	413	97	1835	178	2012	0.0121		68	1937	74	2010	0.0584	29	Lebbe 2008
VISHAKHAPATNAM	414	60	1879	127	2005	0.0081		54	1937	69	2005	0.0167	6	Spencer et al 1987
COCHIN	438	63	1886	127	2012	0.0097		56	1939	69	2007	-0.0303	7	Spencer et al 1987
PORT ADELAIDE	448	107	1882	131	2012	0.0216		69	1941	71	2011	-0.0332	38	Chapman & Inglis 1903, Marine Bd. Reports
CHERBOURG	467	129	1860	153	2012	0.0153		35	1975	38	2012	0.0884	94	Spencer et al 1987
ST JEAN DE LUZ	469	108	1889	124	2012	0.0092		34	1943	68	2010	0.0069	74	Spencer et al 1987
KOLOBRZEG	643	187	1811	201	2011	0.0063		49	1951	49	1999	0.0768	138	Hunicke 2012
LEIXOES	791	79	1892	117	2008	0.0171		31	1956	40	1995	-0.1093	48	Araujo 2012
NEWCASTLE NSW	837	114	1890	123	2012	0.0125		63	1926	63	1988	-0.0360	51	Russell 1893-1904, Coghlan 1913,1917
POLYARNIY	2027	82	1906	106	2012	0.0143		60	1926	65	1990	0.0348	22	Metric and Vardo
NEDRE STOCKHOLM	2131	132	1806	162	1967	0.0098							132	Metric and Stockholm RLR
GOTEBORG-RINGON	2133	125	1887	126	2012	0.0152		71	1887	72	1958	-0.0295	54	All Goteburg RLR
Amsterdam (1)	a	296	1700	312	2011	0.0061							296	Updated van Veen 1945
Kronstadt (1)	b	190	1777	236	2012	0.0017							190	Updated Bogdanov 2000
Pertius d'Antioche (2)	c	86	1824	188	2011	0.0213							86	Gouriou 2013
Hansweert (3)	d	147	1862	147	2008	0.0124							147	Kuiper 2013, Rijkswaterstaat
Terneuzen (3)	e	147	1862	147	2008	0.0133							147	Kuiper 2013, Rijkswaterstaat

Note 1: Records from Amsterdam and Kronstadt are currently available in the PSMSL ancillary “other long series”.

Note 2: Pertius d’Antioche is a composite series.

Note 3: Hansweert and Tereuzen are half tide (MTL) records from Rijkswaterstaat, also used to buddy check and evaluate datum step in 1884 in PSMSL series for Vlissingen

BC = Primary Buddy Check station