

## Appendices

**Appendix A:** This appendix lists all results from the creek network morphometric analysis performed at 10 MR schemes in the UK, utilising the semi-automated creek parametrisation algorithm for each available lidar dataset.

### *Appendix A1: Morphological characteristics of the creek network for 10 MR sites*

Site	Year	RS order ( )	Number of creeks per order (N)	Total Length (m)	Mean Length (m)	Bifurcation N/N+1	Sinuosity Ratio ( )	Mean junction angle (°)	Mean channel width (m)	Mean channel depth (m)	Mean cross-sectional area (m)	A/D ( )	W/D ( )
Abbots Hall	2015	5	41	1456.82	35.53	2.28	1.08	93.29	5.00	0.54	1.23	2.29	9.28
	2015	4	18	1082.99	60.17	0.90	1.50	90.52	9.89	0.76	2.59	3.39	12.94
	2015	3	20	2549.70	127.48	2.86	1.16	95.34	8.74	1.24	1.99	1.60	7.03
	2015	2	7	1387.14	198.16	2.33	1.05	83.66	9.52	1.81	5.48	3.03	5.27
	2015	1	3	157.38	52.46		1.14		37.64	2.01	6.43	3.21	18.77
	2014	5	53	1652.97	31.19	3.31	1.06	92.50	5.44	0.43	0.99	2.33	12.76
	2014	4	16	853.68	53.35	1.00	1.14	95.12	9.72	0.74	2.37	3.18	13.07
	2014	3	16	2724.10	170.26	2.67	1.07	92.33	9.46	1.30	2.71	2.08	7.28
	2014	2	6	1323.31	220.55	2.00	1.05	87.05	8.27	1.64	4.50	2.74	5.03
	2014	1	3	153.45	51.15		1.14		36.23	1.23	4.37	3.55	29.45
	2013	5	47	1630.83	34.70	3.92	1.07	89.35	6.30	0.62	1.26	2.03	10.16
	2013	4	12	764.74	63.73	0.57	1.13	90.18	12.18	0.98	4.01	4.11	12.49
	2013	3	21	2857.55	136.07	3.50	1.17	98.81	8.03	1.10	3.08	2.79	7.27
	2013	2	6	1190.91	198.49	2.00	1.04	101.49	13.35	1.63	2.23	1.37	8.19
	2013	1	3	112.53	37.51		1.01		21.10	0.96	6.87	7.16	21.98
	2008	5	50	1411.48	28.23	3.33	1.06	70.86	5.87	0.48	1.07	2.23	12.26
	2008	4	15	1617.89	107.86	1.36	1.10	85.09	8.36	0.53	1.01	1.92	15.85
	2008	3	11	2156.76	196.07	2.75	1.16	89.62	12.83	0.74	1.61	2.17	17.26
	2008	2	4	807.31	201.83	1.33	1.02	97.07	8.26	0.09	0.05	0.62	93.18
	2008	1	3	128.61	42.87		1.05		26.90	0.62	1.18	1.90	43.23
	2002	4	34	1433.29	42.16	3.78	1.07	90.86	5.87	0.95	1.75	1.85	6.20
	2002	3	9	1154.83	128.31	0.75	1.12	77.08	9.16	1.30	2.74	2.10	7.04
	2002	2	12	2485.97	207.16	4.00	1.11	93.65	10.54	1.52	5.03	3.30	6.92
	2002	1	3	606.81	202.27		1.03		7.99	1.27	1.35	1.06	6.28
Alkborough	2015	4	39	1839.48	47.17	3.55	1.05	90.25	6.31	0.42	0.18	0.43	15.17
	2015	3	11	1601.27	145.57	11.00	1.05	91.55	3.65	0.46	0.47	1.03	7.96
	2015	2	1	293.02	293.02	1.00	1.07	92.79	20.26	0.59	4.48	7.65	34.64
	2015	1	1	938.62	938.62		1.18		34.04	1.00	16.16	16.16	34.04
	2012	4	37	1046.84	28.29	4.11	1.05	92.54	7.40	0.48	0.31	0.64	15.50
	2012	3	9	968.79	107.64	3.00	1.08	84.05	6.90	0.34	1.58	4.60	20.11
	2012	2	3	632.68	210.89	3.00	1.06	93.13	6.83	0.22	0.28	1.29	31.77
	2012	1	1	917.00	917.00		1.18		34.48	0.47	11.62	24.72	73.37
	2010	3	19	615.00	32.37	6.33	1.03	90.47	9.97	0.55	0.61	1.10	18.10
	2010	2	3	418.26	139.42	3.00	1.04	108.90	20.57	0.14	0.24	1.66	143.52
	2010	1	1	1023.00	1023.00		1.13		31.93	0.23	1.39	5.94	136.59
	2007	3	25	695.37	27.81	5.00	1.04	69.00	8.61	0.49	0.18	0.36	17.60
	2007	2	5	526.28	105.26	5.00	1.01	81.67	13.60	0.15	0.88	5.90	91.04
	2007	1	1	1729.32	1729.32		1.09		53.24	0.43	11.67	27.01	123.23
Allfleet	2015	4	150	2780.37	18.54	4.55	1.02	89.78	4.25	0.35	0.53	1.51	12.13
	2015	3	33	3077.62	93.26	2.54	1.14	89.40	7.20	0.56	1.93	3.43	12.84
	2015	2	13	3088.48	237.58	3.25	1.13	91.32	11.69	1.26	8.07	6.40	9.27
	2015	1	4	783.17	195.79		1.14		15.19	1.86	15.30	8.24	8.18
	2013	4	129	2747.07	21.30	4.45	1.03	83.75	5.75	0.47	1.30	2.78	12.29
	2013	3	29	2742.12	94.56	2.42	1.09	92.99	6.20	0.45	1.62	3.63	13.86
	2013	2	12	3480.46	290.04	3.00	1.12	94.53	13.46	1.42	12.86	9.09	9.51
	2013	1	4	94.84	23.71		1.05		14.95	1.36	10.11	7.46	11.03
	2011	4	128	3118.22	24.36	4.00	1.04	82.39	4.88	0.43	0.83	1.93	11.41
	2011	3	32	3450.74	107.84	2.91	1.11	89.50	7.06	0.61	2.43	3.99	11.59
	2011	2	11	2958.90	268.99	2.75	1.14	93.14	10.17	1.26	7.27	5.76	8.05
	2011	1	4	1249.21	312.30		1.07		14.90	1.47	13.60	9.24	10.12
	2007	3	34	700.48	20.60	3.40	1.02	90.92	3.23	0.72	1.17	1.63	4.49
	2007	2	10	1295.07	129.51	2.50	1.09	87.17	7.61	1.01	3.49	3.44	7.50
	2007	1	4	550.48	137.62		1.02		9.39	1.37	6.51	4.74	6.84
Chowder Ness	2016	3	46	857.84	18.65	4.18	1.04	89.47	5.15	0.20	0.21	1.04	25.31
	2016	2	11	501.17	45.56	3.67	1.08	90.81	9.82	0.53	0.61	1.15	18.39
	2016	1	3	371.26	123.75		1.13		13.18	0.89	1.66	1.87	14.86
	2015	4	40	510.29	12.76	4.00	1.05	88.18	5.49	0.27	0.10	0.36	19.99
	2015	3	10	348.17	34.82	3.33	1.05	99.31	8.16	0.36	2.10	5.83	22.67
	2015	2	3	289.29	96.43	1.50	1.19	84.21	10.78	0.67	1.94	2.87	16.01
	2015	1	2	221.19	110.60		1.03		23.87	1.63	2.70	1.65	14.64
	2013	3	17	327.89	19.29	3.40	1.04	103.72	4.68	0.39	0.45	1.17	12.08
	2013	2	5	328.68	65.74	1.67	1.08	87.95	5.86	0.41	0.47	1.14	14.21
	2013	1	3	245.61	81.87		1.20		7.10	0.44	0.93	2.11	16.15
	2012	3	39	474.69	12.17	4.33	1.03	89.79	4.77	0.13	0.10	0.76	37.11
	2012	2	9	484.86	53.87	4.50	1.08	91.13	8.05	0.22	0.51	2.35	36.92
	2012	1	2	529.65	264.83		1.15		33.47	0.82	4.43	5.38	40.65
	2011	3	22	324.53	14.75	4.40	1.05	75.18	4.81	0.27	0.35	1.30	17.94
	2011	2	5	569.34	113.87	2.50	1.19	90.00	7.76	0.36	1.71	4.72	21.44
	2011	1	2	183.79	91.90		1.04		16.04	0.51	1.98	3.92	31.77
	2010	3	16	370.81	23.18	3.20	1.08	92.95	4.95	0.24	0.26	1.11	21.04
	2010	2	5	284.68	56.94	2.50	1.09	110.40	15.95	0.53	2.45	4.58	29.84
	2010	1	2	103.02	51.51		1.03		20.61	1.43	3.98	2.79	14.45
	2009	3	20	393.12	19.66	4.00	1.03	84.15	7.12	0.36	0.45	1.25	19.97
	2009	2	5	179.21	35.84	2.50	1.06	95.03	7.55	0.26	0.44	1.68	29.06
	2009	1	2	256.33	128.17		1.16		21.27	1.47	2.41	1.64	14.43
Freiston	2007	2	9	312.15	34.68	4.50	1.05	87.61	9.97	0.45	1.52	3.36	21.99
	2007	1	2	266.58	133.29		1.14		26.17	1.36	9.47	6.96	19.24
	2014	4	83	3250.65	39.16	3.77	1.04	97.89	4.68	0.60	1.07	1.80	7.84
	2014	3	22	2731.56	124.16	2.75	1.09	97.81	6.39	0.99	2.50	2.53	6.47
	2014	2	8	1309.71	163.71	2.67	1.07	89.08	17.39	1.60	11.07	6.90	10.84

	2014	1	3	783.91	261.30		1.07		30.05	2.22	35.46	15.95	13.52
	2013	4	89	3084.46	34.66	3.30	1.03	79.55	4.49	0.50	0.92	1.83	8.93
	2013	3	27	3203.29	118.64	2.70	1.08	94.36	7.17	0.92	2.39	2.59	7.76
	2013	2	10	1268.01	126.80	3.33	1.08	93.77	11.13	1.47	7.02	4.78	7.57
	2013	1	3	829.90	276.63		1.07		28.81	1.82	27.56	15.12	15.81
	2011	4	89	3352.75	37.67	3.71	1.03	85.38	4.92	0.59	1.18	1.98	8.28
	2011	3	24	3058.01	127.42	2.67	1.12	100.99	6.15	0.91	2.33	2.57	6.77
	2011	2	9	1327.82	147.54	3.00	1.07	97.92	8.85	1.38	5.47	3.96	6.40
	2011	1	3	617.92	205.97		1.07		27.91	2.08	29.97	14.38	13.40
	2009	4	73	2361.08	32.34	3.65	1.03	103.02	4.34	0.42	0.48	1.15	10.37
	2009	3	20	2842.54	142.13	4.00	1.07	97.29	6.54	0.99	2.50	2.52	6.60
	2009	2	5	559.03	111.81	1.67	1.03	87.46	11.63	1.62	5.78	3.57	7.19
	2009	1	3	759.09	253.03		1.06		27.92	2.02	25.13	12.44	13.82
	2002	4	56	1754.03	31.32	5.09	1.03	86.25	5.86	0.28	0.37	1.31	20.72
	2002	3	11	1541.23	140.11	2.20	1.06	83.52	7.29	0.40	1.00	2.52	18.43
	2002	2	5	1507.08	301.42	2.50	1.08	97.78	21.53	0.72	5.38	7.48	29.93
	2002	1	2	72.84	36.42		1.04		14.84	0.62	4.49	7.19	23.77
Hesketh Out Marsh W	2014	5	318	5844.64	18.38	4.82	1.03	72.10	4.59	0.56	0.85	1.53	8.21
	2014	4	66	6788.97	102.86	3.88	1.09	80.40	7.27	0.87	2.63	3.04	8.40
	2014	3	17	3710.87	218.29	1.89	1.11	86.05	12.06	1.49	8.59	5.76	8.07
	2014	2	9	2109.88	234.43	9.00	1.11	88.74	22.07	1.94	22.35	11.53	11.39
	2014	1	1	237.15	237.15		1.19		113.64	3.64	162.18	44.53	31.20
	2011	5	179	5863.73	32.76	3.89	1.04	72.54	7.76	0.44	1.43	3.22	17.48
	2011	4	46	5817.19	126.46	4.18	1.10	80.46	10.37	0.54	2.43	4.50	19.21
	2011	3	11	3267.11	297.01	5.50	1.13	84.64	16.61	1.10	8.88	8.09	15.14
	2011	2	2	1220.75	610.37	2.00	1.17	84.68	20.24	1.83	19.89	10.90	11.09
	2011	1	1	241.15	241.15		1.18		100.66	3.51	175.09	49.93	28.70
	2010	4	115	4779.30	41.56	3.83	1.04	62.35	9.50	0.45	1.82	4.07	21.24
	2010	3	30	4917.96	163.93	3.33	1.11	78.90	13.23	0.59	3.69	6.26	22.44
	2010	2	9	4677.57	519.73	9.00	1.08	92.86	27.13	1.40	17.68	12.61	19.35
	2010	1	1	220.76	220.76		1.15		46.24	3.27	76.44	23.39	14.15
	2009	4	113	4449.55	39.38	3.77	1.04	62.53	9.28	0.52	2.24	4.34	17.95
	2009	3	30	6042.06	201.40	4.29	1.10	78.38	13.60	0.73	5.32	7.24	18.53
	2009	2	7	3155.94	450.85	7.00	1.09	95.53	24.97	1.09	16.64	15.24	22.86
2009	1	1	242.15	242.15		1.13		79.31	2.16	107.44	49.77	36.74	
Paul Holmes Strays	2014	4	135	3813.54	28.25	3.86	1.03	90.93	5.18	0.30	0.27	0.91	17.32
	2014	3	35	5107.24	145.92	2.50	1.11	89.63	10.88	0.63	3.40	5.37	17.21
	2014	2	14	2099.30	149.95	4.67	1.15	92.38	14.00	0.99	5.87	5.92	14.13
	2014	1	3	1343.51	447.84		1.28		18.11	0.92	10.22	11.14	19.76
	2013	4	125	3834.00	30.67	3.47	1.04	87.98	5.64	0.31	0.55	1.80	18.39
	2013	3	36	6577.34	182.70	4.00	1.09	76.53	9.30	0.51	2.01	3.90	18.08
	2013	2	9	1668.24	185.36	3.00	1.09	85.39	13.26	1.07	5.55	5.19	12.40
	2013	1	3	905.10	301.70		1.10		20.17	0.83	7.29	8.81	24.40
	2012	4	132	3816.91	28.92	4.00	1.03	77.81	5.56	0.29	0.61	2.11	19.06
	2012	3	33	4300.43	130.32	2.20	1.07	84.99	8.01	0.48	2.03	4.26	16.79
	2012	2	15	2707.65	180.51	3.75	1.35	88.59	14.28	0.86	3.29	3.83	16.65
	2012	1	4	1032.82	258.20		1.15		35.91	0.92	9.54	10.33	38.86
	2010	4	79	2891.26	36.60	4.39	1.04	66.87	7.12	0.25	0.63	2.50	28.21
	2010	3	18	4123.08	229.06	3.60	1.16	74.32	7.46	0.50	1.58	3.15	14.85
	2010	2	5	1158.33	231.67	1.25	1.03	85.29	10.96	1.07	5.47	5.12	10.24
	2010	1	4	878.48	219.62		1.09		25.82	0.58	6.78	11.63	44.28
	2007	4	68	2104.32	30.95	3.58	1.04	82.10	5.97	0.25	0.55	2.17	23.68
2007	3	19	3413.89	179.68	2.38	1.06	73.62	9.45	0.71	2.79	3.93	13.32	
2007	2	8	1866.09	233.26	8.00	1.14	77.77	31.30	0.84	5.81	6.94	37.38	
2007	1	1	529.97	529.97		1.12		28.46	0.87	12.92	14.87	32.75	
Steart	2016	4	49	4272.66	87.20	4.90	1.06	94.91	13.08	0.69	3.89	5.68	19.07
	2016	3	10	2746.90	274.69	5.00	1.09	79.06	22.26	1.26	13.31	10.57	17.68
	2016	2	2	2084.64	1042.32	2.00	1.07	101.90	54.17	1.23	39.94	32.56	44.16
	2016	1	1	184.00	184.00		1.00		101.00	5.99	222.89	37.24	16.87
	2015	4	40	3505.05	87.63	3.64	1.03	83.96	12.28	0.85	6.18	7.26	14.44
	2015	3	11	2978.96	270.81	5.50	1.09	63.77	24.06	1.44	17.89	12.41	16.69
	2015	2	2	2040.56	1020.28	2.00	1.06	89.25	70.58	1.78	51.58	28.98	39.65
	2015	1	1	245.57	245.57		1.05		101.02	5.97	204.27	34.22	16.92
	2014	4	54	3429.59	63.51	3.18	1.03	89.85	11.00	0.91	6.06	6.69	12.14
	2014	3	17	3069.72	180.57	3.40	1.07	78.38	18.09	0.90	12.94	14.45	20.20
	2014	2	5	2598.27	519.65	5.00	1.05	101.16	32.09	1.33	12.33	9.29	24.17
	2014	1	1	222.77	222.77		1.04		100.58	1.96	115.32	58.84	51.32
Tollesbury	2016	4	73	1306.44	17.90	3.48	1.03	100.32	5.06	0.61	0.69	1.13	8.33
	2016	3	21	964.03	45.91	3.50	1.03	87.50	5.49	0.92	0.90	0.98	5.96
	2016	2	6	1002.32	167.05	6.00	1.15	88.21	17.76	2.07	2.69	1.30	8.56
	2016	1	1	66.67	66.67		1.07		27.31	2.81	1.41	0.50	9.71
	2015	4	55	1194.91	21.73	4.23	1.04	67.54	5.06	0.63	0.61	0.96	7.98
	2015	3	13	883.32	67.95	1.86	1.07	100.99	5.07	1.23	1.48	1.20	4.11
	2015	2	7	719.39	102.77	7.00	1.09	79.10	10.88	1.76	3.54	2.02	6.20
	2015	1	1	81.94	81.94		1.03		30.87	2.62	11.71	4.46	11.77
	2014	4	44	788.21	17.91	3.67	1.04	85.86	4.34	0.65	0.54	0.82	6.64
	2014	3	12	884.32	73.69	1.71	1.04	103.53	5.03	1.07	1.05	0.98	4.69
	2014	2	7	908.85	129.84	7.00	1.14	94.22	13.25	1.97	3.02	1.54	6.74
	2014	1	1	97.25	97.25		1.03		34.50	2.49	11.84	4.76	13.88
	2013	4	41	1111.15	27.10	3.73	1.03	83.08	3.78	1.03	0.68	0.66	3.68
	2013	3	11	827.03	75.18	1.57	1.07	118.77	5.98	0.74	1.60	2.15	8.04
	2013	2	7	543.81	77.69	7.00	1.06	89.06	14.56	1.85	3.99	2.16	7.89
	2013	1	1	68.08	68.08		1.09		47.51	2.50	5.92	2.36	18.97
	2012	4	42	1049.07	24.98	3.23	1.03	93.60	4.45	0.69	0.56	0.81	6.41
	2012	3	13	527.20	40.55	2.17	1.05	85.01	6.56	1.08	1.91	1.77	6.07
	2012	2	6	927.38	154.56	6.00	1.10	101.22	11.75	1.85	3.45	1.87	6.36
	2012	1	1	45.70	45.70		1.08		31.30	1.99	7.68	3.85	15.71
	2009	4	34	874.25	25.71	3.40	1.05	102.73	4.43	0.77	0.91	1.19	5.78
2009	3	10	1125.77	112.58	2.00	1.09	85.55	6.88	1.25	1.93	1.55	5.52	
2009	2	5	343.50	68.70	5.00	1.08	101.25	17.2					

	2012	2	5	879.72	175.94	2.50	1.12	110.87	19.81	0.58	2.10	3.62	34.16
	2012	1	2	213.00	106.50		1.00		26.83	0.35	1.24	3.53	76.67
	2011	4	49	1053.84	21.51	4.08	1.04	93.43	7.50	0.16	0.39	2.38	45.57
	2011	3	12	1023.44	85.29	3.00	1.11	93.21	7.41	0.25	0.58	2.28	29.14
	2011	2	4	697.74	174.44	2.00	1.11	103.92	15.60	0.38	2.17	5.72	41.05
	2011	1	2	141.54	70.77		1.10		34.89	0.37	0.97	2.64	95.58
	2010	4	34	710.49	20.90	3.09	1.02	96.08	5.98	0.19	0.23	1.20	31.52
	2010	3	11	707.24	64.29	2.75	1.10	105.10	6.98	0.16	0.22	1.38	42.83
	2010	2	4	551.90	137.98	2.00	1.18	82.85	22.53	0.18	1.56	8.62	124.32
	2010	1	2	83.00	41.50		1.06		38.50	0.12	0.20	1.60	314.29
	2009	4	36	885.41	24.59	3.60	1.05	97.01	6.29	0.17	0.20	1.17	36.10
	2009	3	10	636.54	63.65	2.50	1.11	91.10	9.61	0.24	0.62	2.54	39.69
	2009	2	4	406.50	101.63	2.00	1.13	89.77	29.74	0.31	2.35	7.53	95.16
	2009	1	2	91.00	45.50		1.04		10.00	0.06	0.16	2.75	166.67
	2007	3	27	631.69	23.40	3.38	1.06	95.76	8.86	0.11	0.12	1.07	77.79
	2007	2	8	345.95	43.24	4.00	1.06	99.45	16.38	0.17	0.44	2.56	94.59
	2007	1	2	224.00	112.00		1.06		29.07	0.30	1.04	3.45	96.57

## Appendix A2: Morphological characteristics of the creek network for each MR

scheme and each available year (continued)

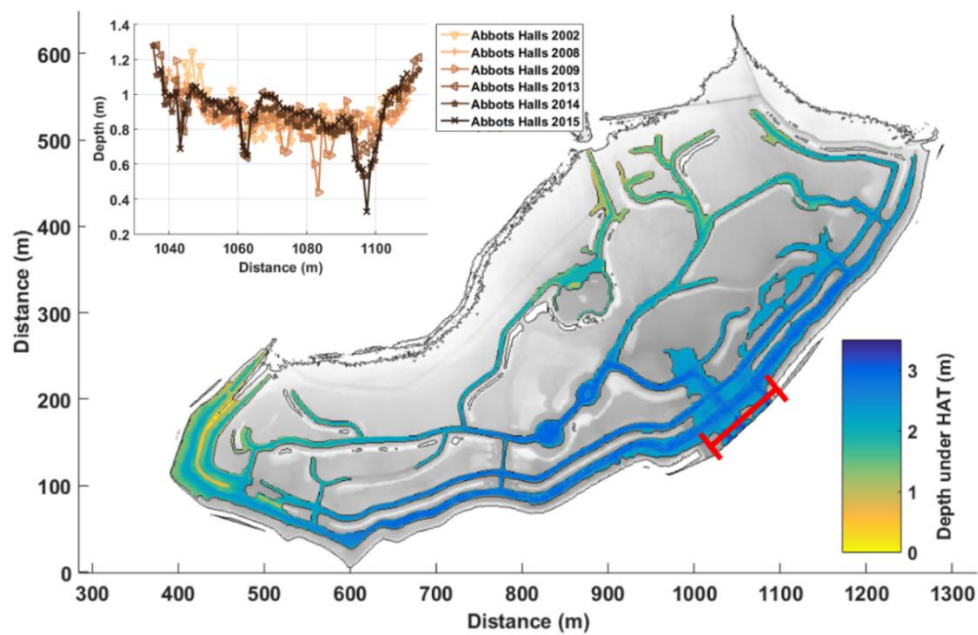
Chowder Ness			Allfleet				Aliborough				Abbots Hall				Site	
2015	2016		2007	2011	2013	2015	2007	2010	2012	2015	2002	2008	2013	2014	2015	Year
13.57	17.19		2.62	11.03	9.29	9.99	0.82	0.57	1.02	1.30	22.80	23.96	27.64	27.89	27.65	Drainage density (km/km²)
1368.94	1730.26		2546.03	10777.06	9064.50	9729.64	2950.97	2056.26	3565.31	4672.39	5680.90	6122.05	6556.56	6707.51	6634.02	Total Channel Length (m)
0.10	0.10		0.97	0.98	0.98	0.97	3.61	3.61	3.50	3.59	0.25	0.26	0.24	0.24	0.24	Catchment area (km²)
55	60		48	175	174	200	31	23	50	52	58	83	89	94	89	Number of creeks (n)
148.72	156.13		374.63	642.41	625.13	642.03	1848.91	1491.19	1460.56	1772.81	534.47	575.91	575.47	560.31	573.47	Main channel length (largest breach) (m)
423.19	480.28		857.19	1962.53	1941.13	1994.03	1848.91	1491.19	1460.56	1772.81	534.47	575.91	575.47	560.31	573.47	Main channel length (all breaches) (m)
1.29	1.36		1.40	1.60	1.55	1.63	1.08	1.12	1.11	1.09	1.55	1.54	1.51	1.48	1.55	Main channel sinuosity ratio (l)
1.88	1.99		-1.30	-1.32	-1.18	1.63	3.09	3.46	3.16	3.24	-0.36	0.65	0.44	0.27	0.10	Main channel gradient (%)
1938.64	1104.54		8926.56	49468.10	53767.35	44302.13	20762.25	1891.30	12679.29	17565.59	18998.84	6812.05	17343.61	17662.99	18293.67	Tidal Prism (m³)
2.89	2.24		84.36	85.23	87.05	72.24	16.26	20.11	22.10	30.01	16.03	19.08	24.26	27.15	24.53	Mouth cross sectional area (largest breach) (m²)
4.16	4.16		179.47	214.16	222.99	199.25	16.26	20.11	22.10	30.01	16.03	19.08	24.26	27.15	24.53	Mouth cross sectional area (sum of all breaches) (m²)
0.83	0.70		2.15	2.47	2.63	2.77	0.90	1.14	1.21	2.29	0.45	0.41	0.64	0.75	0.95	Mouth creek depth (m)
10.63	7.81		44.18	48.17	50.16	43.10	38.01	38.01	41.62	34.41	77.10	83.49	90.55	91.97	84.90	Mouth creek width (m)
3.18	3.26		0.96	0.99	1.06	1.17	2.33	2.41	2.58	2.67	1.39	1.34	1.49	1.43	1.47	Mean elevation above MWS (m)
33.06	30.10		116.36	54.68	58.45	56.15	774.16	796.28	768.72	540.24	26.35	22.26	16.35	17.01	16.89	Overmarsh Path Length (m)
3.61	3.69		1.42	1.44	1.51	1.62	3.56	3.63	3.80	3.89	2.01	1.95	2.11	2.05	2.09	Mean elevation under HAT (m)
2.77	2.44		4.05	3.84	3.74	3.25	2.69	3.16	3.26	2.65	6.83	4.65	5.01	5.06	5.15	Mean slope under HAT (%)
2.92	2.59		8.56	8.35	8.25	3.25	4.02	4.02	4.02	4.02	5.58	3.40	3.76	3.81	3.90	Cth (%)
3.46	3.54		0.96	0.98	1.05	1.16	3.21	3.28	3.46	3.54	1.57	1.52	1.68	1.62	1.65	H2th (m)
			0.17	0.19	0.26	0.37	2.88	2.95	3.13	3.21	0.96	0.90	1.06	1.00	1.03	L2th (m)
11530	13215		72184	79968	77820	76597	64561	57116	47185	48327	42026	53701	55541	52351	50368	Platform area (m²)

Tollesbury	Stear			Paul Holmes Strays					Hesketh Out Marsh West					Freiston									
	2014	2015	2016	2007	2010	2012	2013	2014	2009	2010	2011	2014	2002	2009	2011	2013	2014	2007	2009	2010	2011	2012	2013
17.35	4.44	3.96	4.41	9.84	11.18	14.73	16.16	15.39	8.74	9.19	10.35	12.05	6.92	9.60	11.84	11.89	11.44	5.73	8.20	7.50	10.68	15.06	8.95
3339.46	9320.36	8524.57	9288.20	7914.28	9051.15	11857.80	12984.68	12363.58	13889.71	14595.60	16409.92	19117.22	4875.18	6771.85	8356.50	8385.65	8075.82	578.73	828.66	758.51	1077.67	1489.20	902.17
0.19	2.10	2.15	2.10	0.80	0.81	0.81	0.80	0.80	1.59	1.59	1.59	1.59	0.70	0.71	0.71	0.71	0.71	0.10	0.10	0.10	0.10	0.10	0.10
101	77	53	62	96	106	184	173	187	151	155	239	411	74	101	125	129	116	11	27	23	29	50	25
580.00	2527.66	2542.38	2543.72	873.56	888.47	932.03	1072.53	1070.53	1120.34	1106.28	1230.19	1253.69	408.13	597.94	564.50	606.41	568.88	273.47	256.47	239.34	187.03	143.75	147.41
580.00	2527.66	2542.38	2543.72	1200.84	1329.31	1501.34	1874.44	1860.31	3760.72	3867.94	4224.31	3957.25	1128.22	1456.13	1568.88	1721.31	1686.63	273.47	317.47	434.94	436.13	466.06	439.19
1.23	1.09	1.09	1.09	1.48	1.42	1.43	1.40	1.40	1.30	1.30	1.37	1.41	1.11	1.23	1.25	1.23	1.21	1.23	1.25	1.12	1.37	1.31	1.32
1.69	5.51	4.23	5.42	0.57	0.91	0.91	0.92	1.06	2.19	1.19	0.93	0.91	3.14	3.16	2.84	3.00	2.67	1.06	1.45	2.29	1.45	2.25	1.72
4556.24	118255.97	230352.69	177489.53	28345.96	20654.78	29850.61	31181.94	44428.62	120644.17	126437.47	118021.35	140373.80	10619.64	30541.19	36859.57	42270.93	52622.06	2999.48	872.32	1204.11	1449.95	2641.08	530.71
68.15	240.26	248.77	291.99	152.90	145.60	163.24	146.49	137.27	122.09	121.45	140.32	152.67	11.52	115.63	110.75	126.79	128.45	9.22	9.74	9.03	3.65	12.96	2.81
68.15	240.26	248.77	291.99	170.22	167.84	186.81	169.34	158.87	211.38	228.83	253.44	273.40	35.03	190.30	188.51	199.48	209.26	9.22	9.74	9.11	3.95	13.78	3.63
3.39	6.40	7.14	7.26	1.99	2.27	2.58	2.61	2.56	2.10	3.20	3.32	3.43	0.85	3.87	3.68	4.23	4.53	1.45	1.26	1.11	0.91	0.88	0.86
45.34	101.02	99.13	99.13	149.31	140.77	149.31	137.62	136.69	98.11	98.11	81.99	81.12	26.42	41.59	42.94	44.29	44.29	19.21	27.02	24.21	7.81	56.22	3.61
1.25	5.51	5.56	5.51	2.86	2.82	2.94	3.01	3.08	4.21	4.24	4.31	4.42	2.55	2.54	2.60	2.62	2.64	2.33	2.56	2.64	2.76	3.04	2.87
37.40	84.64	85.15	82.40	57.33	58.36	29.02	24.92	25.24	53.23	46.10	36.28	43.51	110.09	57.34	50.32	49.91	43.37	101.22	106.41	69.59	50.50	29.60	40.08
1.77	5.87	5.91	5.86	3.11	3.06	3.18	3.26	3.33	4.05	4.09	4.16	4.27	3.02	3.01	3.07	3.08	3.11	2.76	2.99	3.07	3.19	3.46	3.30
3.40	2.84	2.69	1.71	2.96	2.32	3.01	3.22	3.28	4.77	2.16	2.50	4.44	3.28	3.28	3.42	4.35	4.82	2.87	2.91	2.84	3.15	2.19	3.00
6.42	8.19	8.04	7.06			3.65	3.87	3.80	11.74	9.13	9.47	9.10	3.45	3.45	3.59	4.52	4.99	3.02	3.07	2.99	3.30	2.35	3.15
1.67	5.80	5.85	5.80	2.70	2.68	2.80	2.88	2.95	4.03	4.06	4.13	4.24	2.97	2.97	3.02	3.04	3.07	2.61	2.84	2.92	3.04	3.31	3.15
1.25	5.28	5.33	5.28	2.00	1.98	2.10	2.18	2.25	3.33	3.37	3.44	3.55	2.55	2.55	2.60	2.62	2.65	0.00	0.00	0.00	0.00	0.00	0.00
24787	253896	252646	251422	84001	69716	95979	100495	106740	184429	183394	185100	173500	43137	45000	57477	62549	60001	5859	7197	7059	5459	11790	4559

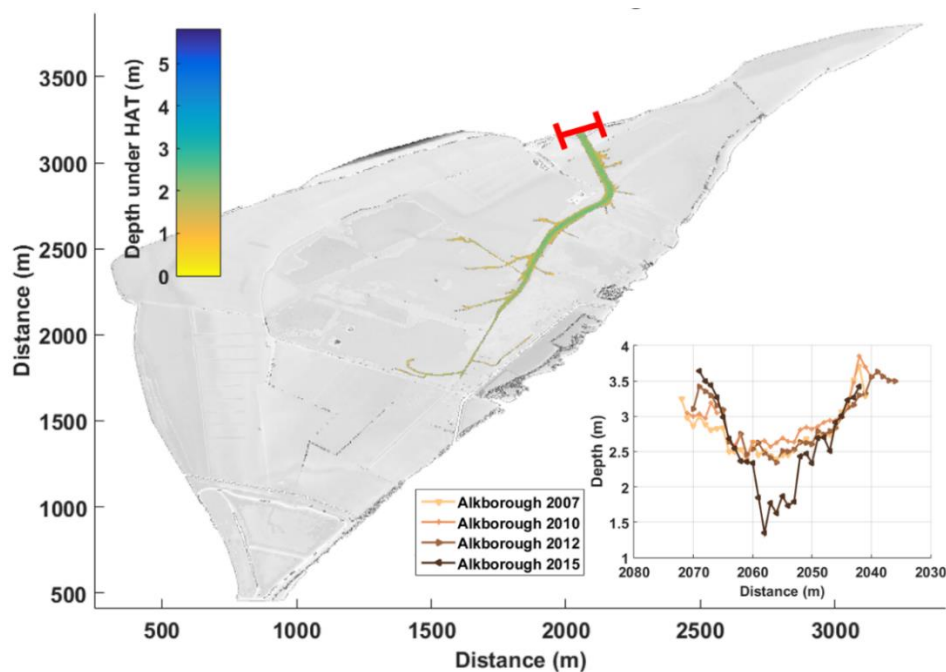


Welwick											
2007	2009	2010	2011	2012	2013	2014	2002	2009	2012	2013	2015
2.21	3.72	3.77	5.37	6.44	7.38	7.21	11.82	12.24	13.25	13.27	14.98
1201.64	2019.45	2052.64	2916.56	3496.74	4004.59	3913.32	2264.64	2357.18	2549.35	2550.08	2678.63
0.54	0.54	0.54	0.54	0.54	0.54	0.54	0.19	0.19	0.19	0.19	0.19
37	52	51	67	83	97	99	49	50	62	60	76
234.88	559.59	566.19	737.69	738.66	771.94	778.03	660.91	556.03	555.38	549.03	574.16
404.91	753.34	833.84	1006.34	1034.25	1090.69	1095.88	660.91	556.03	555.38	549.03	574.16
1.13	1.55	1.56	1.65	1.57	1.82	1.83	1.31	1.15	1.14	1.14	1.13
1.81	2.27	2.36	2.49	2.47	2.60	2.62	0.97	-0.18	1.32	1.42	1.40
463.15	1544.65	1198.99	2658.83	2866.25	3474.49	6066.43	3109.73	4688.62	5153.96	4645.56	5254.51
9685	130.27	123.24	124.94	134.92	127.17	124.59	34.12	49.79	64.29	63.02	65.34
176.63	210.99	161.30	198.59	231.92	200.25	195.70	34.12	49.79	64.29	63.02	65.34
0.95	1.15	1.11	1.11	1.17	1.24	1.13	2.01	3.05	3.27	3.32	3.39
144.81	147.96	147.96	152.09	155.50	158.40	159.36	41.11	42.52	45.34	45.34	45.34
2.43	2.43	2.44	2.48	2.44	2.52	2.60	0.86	0.99	1.10	1.21	1.22
261.75	201.62	183.34	126.73	122.50	119.42	116.00	53.07	56.25	49.16	50.06	46.80
2.65	2.65	2.66	2.70	2.67	2.75	2.83	1.38	1.51	1.62	1.73	1.74
1.82	1.94	1.87	2.03	2.08	2.17	2.34	3.94	3.35	3.56	3.67	3.69
3.44	3.56	3.50	3.65	3.71	3.80	3.97	6.97	6.38	6.58	6.69	6.75
2.44	2.44	2.45	2.49	2.46	2.54	2.62	1.28	1.41	1.52	1.63	1.59
1.97	1.97	1.98	2.02	1.99	2.07	2.15	0.86	0.99	1.10	1.21	1.22
17782	22331	19477	27531	34443	36970	38679	16602	18240	19223	19098	19838

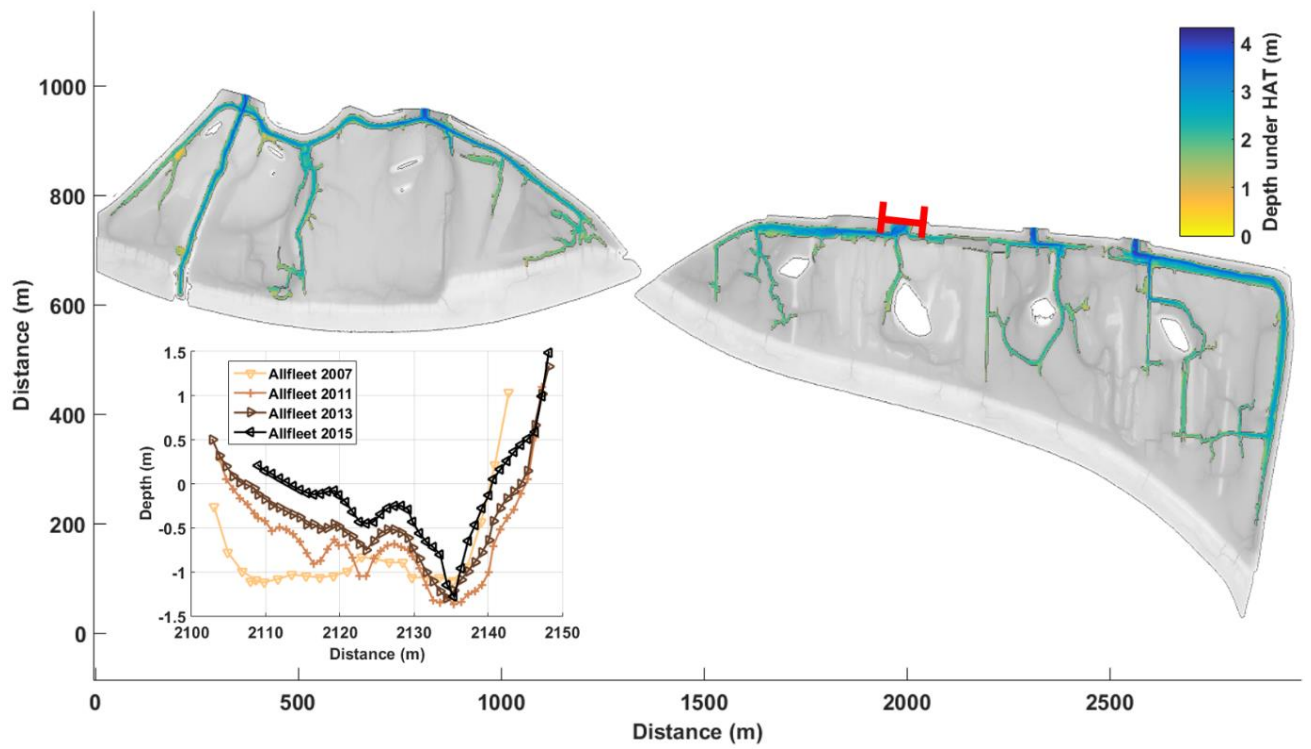
**Appendix B:** This appendix provides cross-sections of the largest entry channel mouth for all available years for the 10 MR schemes.



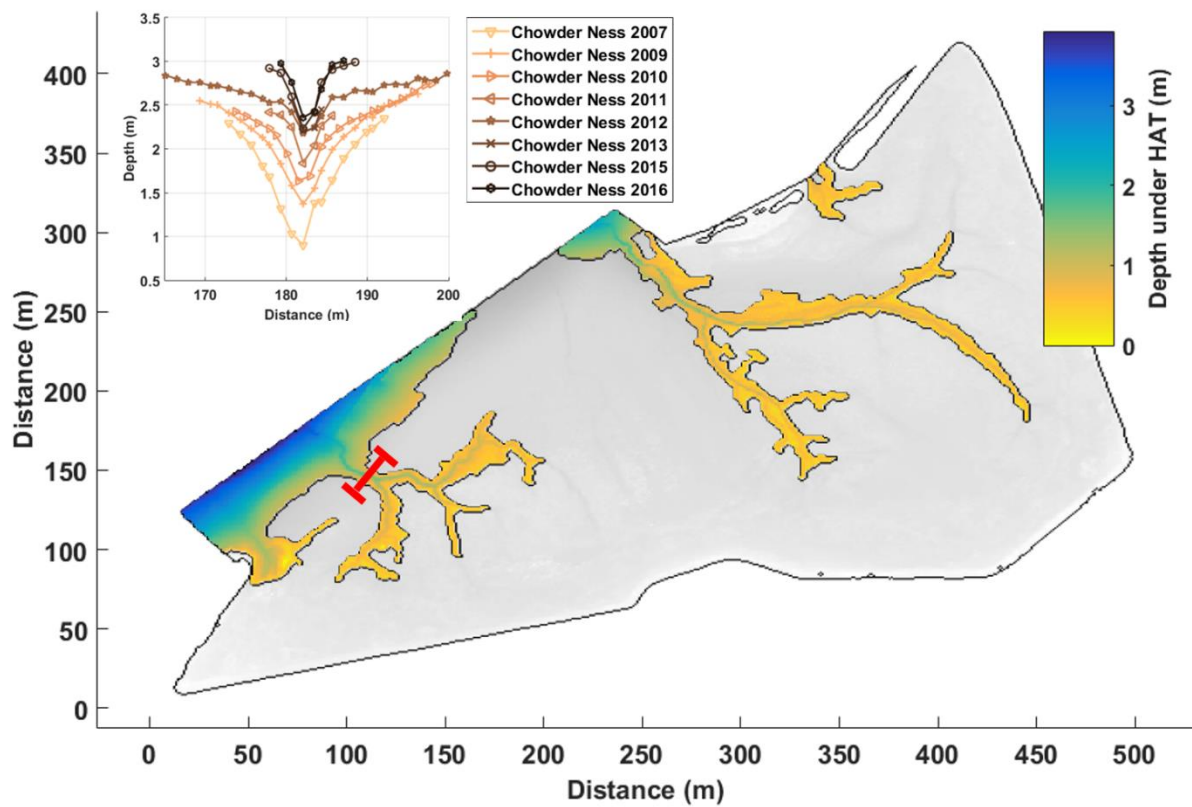
*Appendix B1: Cross-sections of the largest entry channel mouth for Abbots Hall for all available years (marsh in greyscale, creek extent for the last available year in colour, entry channel cross-section in red)*



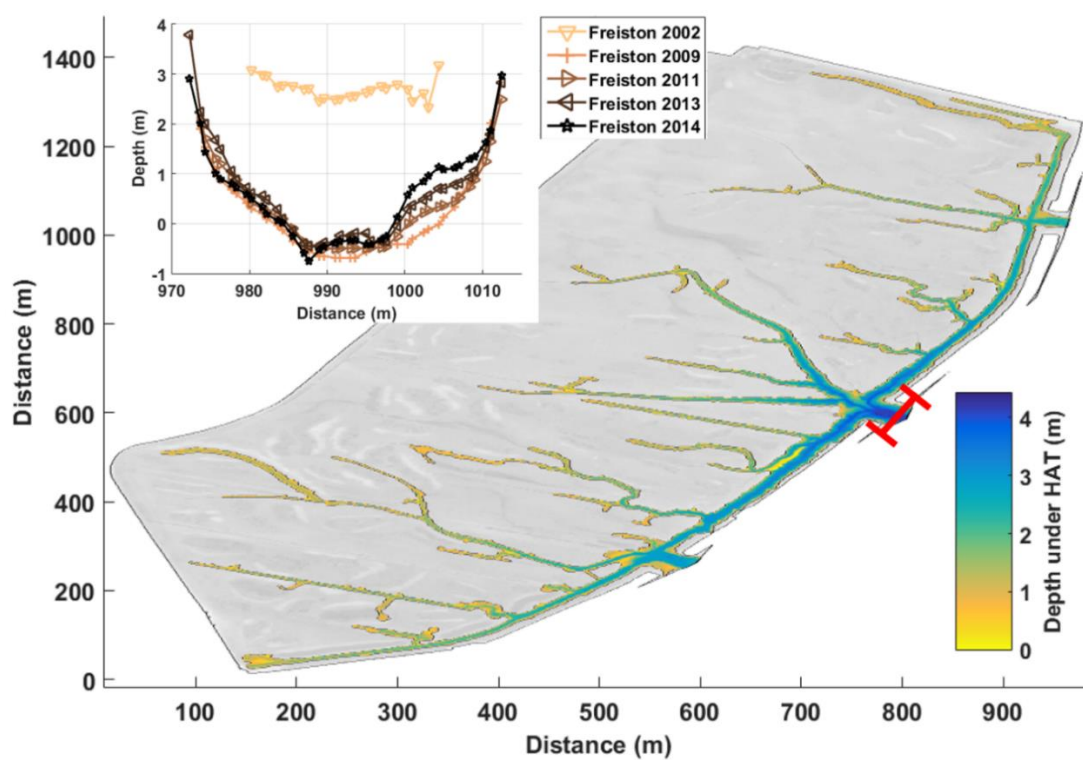
*Appendix B2: As Appendix C1 but for Alkborough*



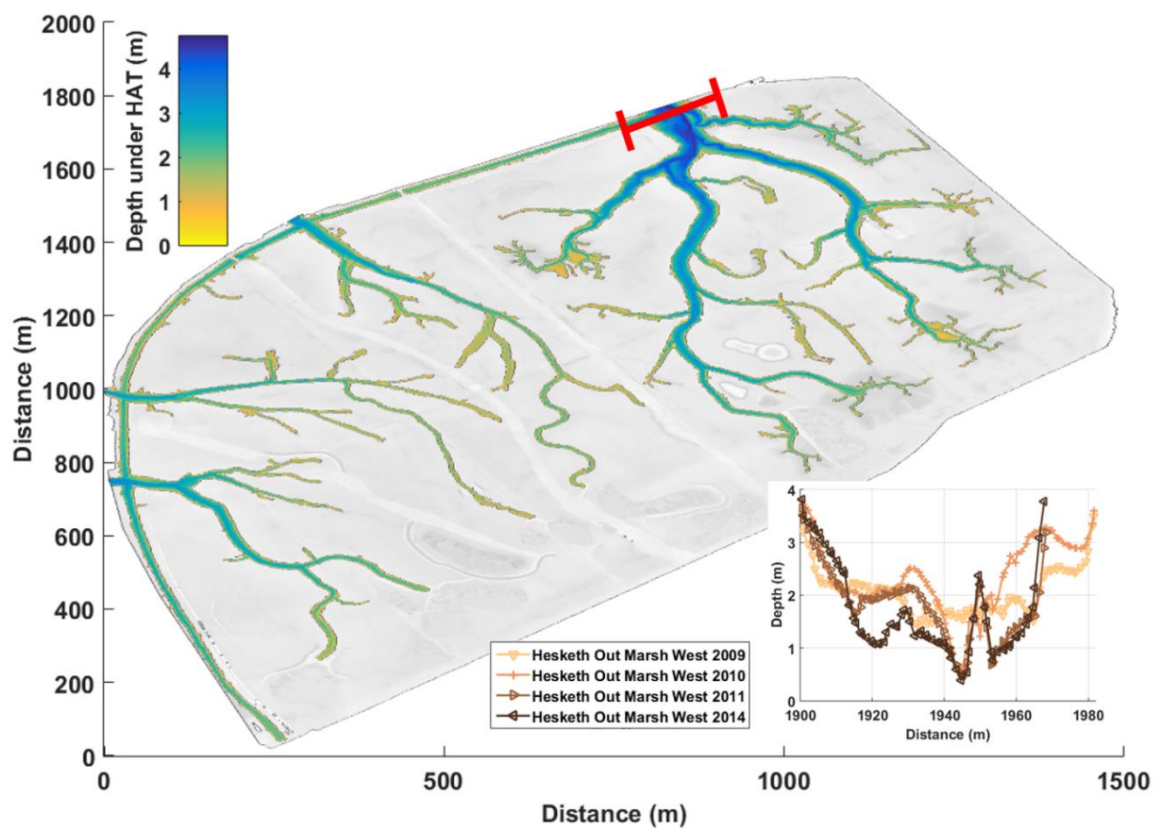
Appendix B3: As Appendix C1 but for Allfleet



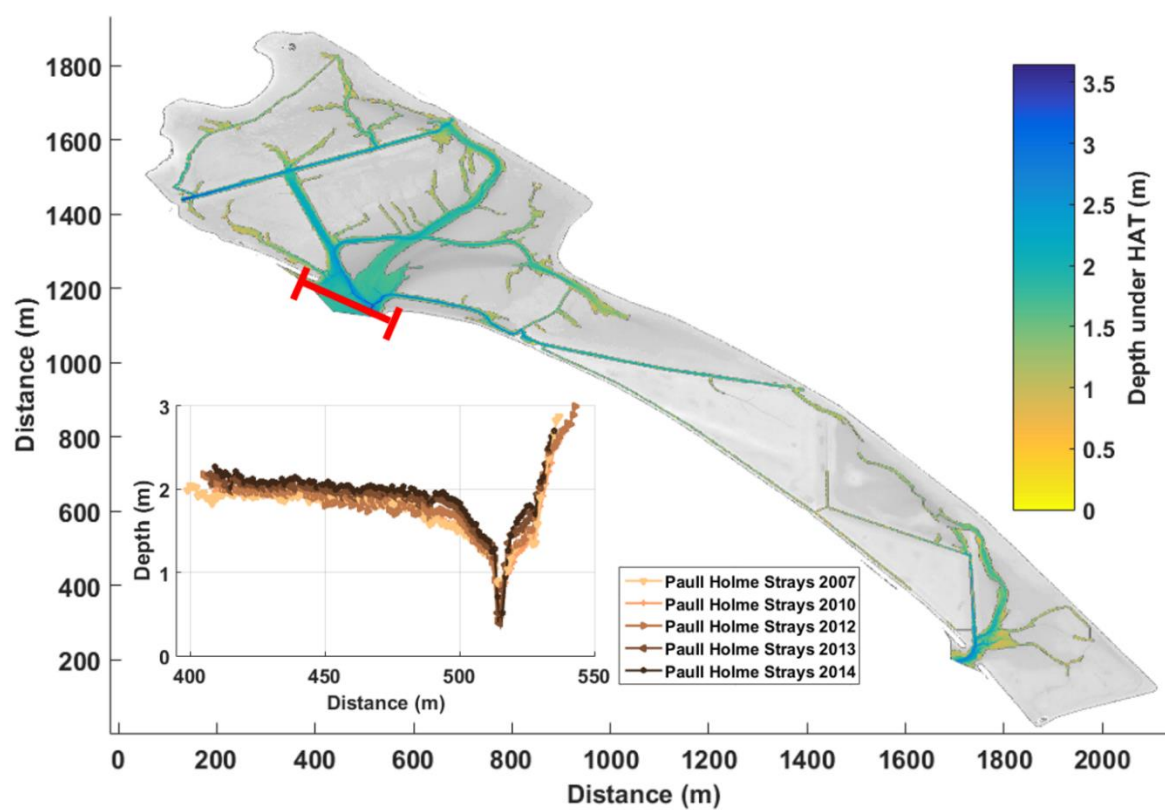
Appendix B4: As Appendix C1 but for Chowder Ness



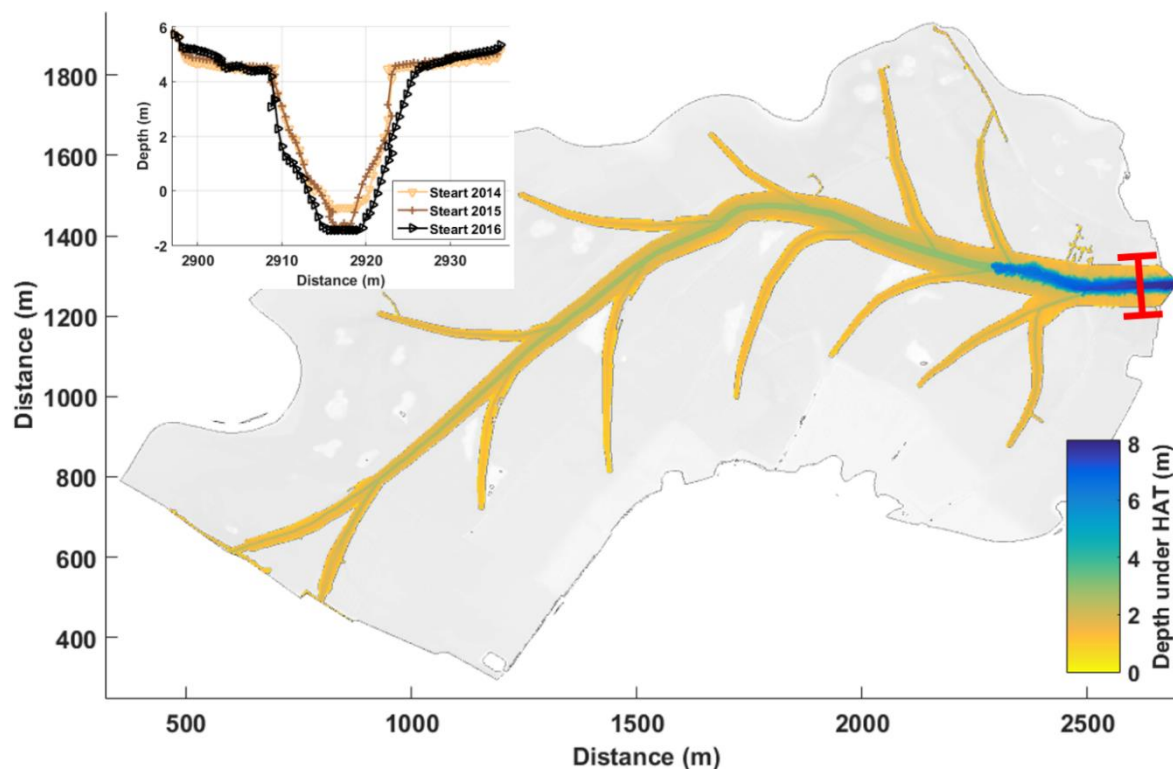
Appendix B5: As Appendix C1 but for Freiston



Appendix B6: As Appendix C1 but for Hesketh Out Marsh West

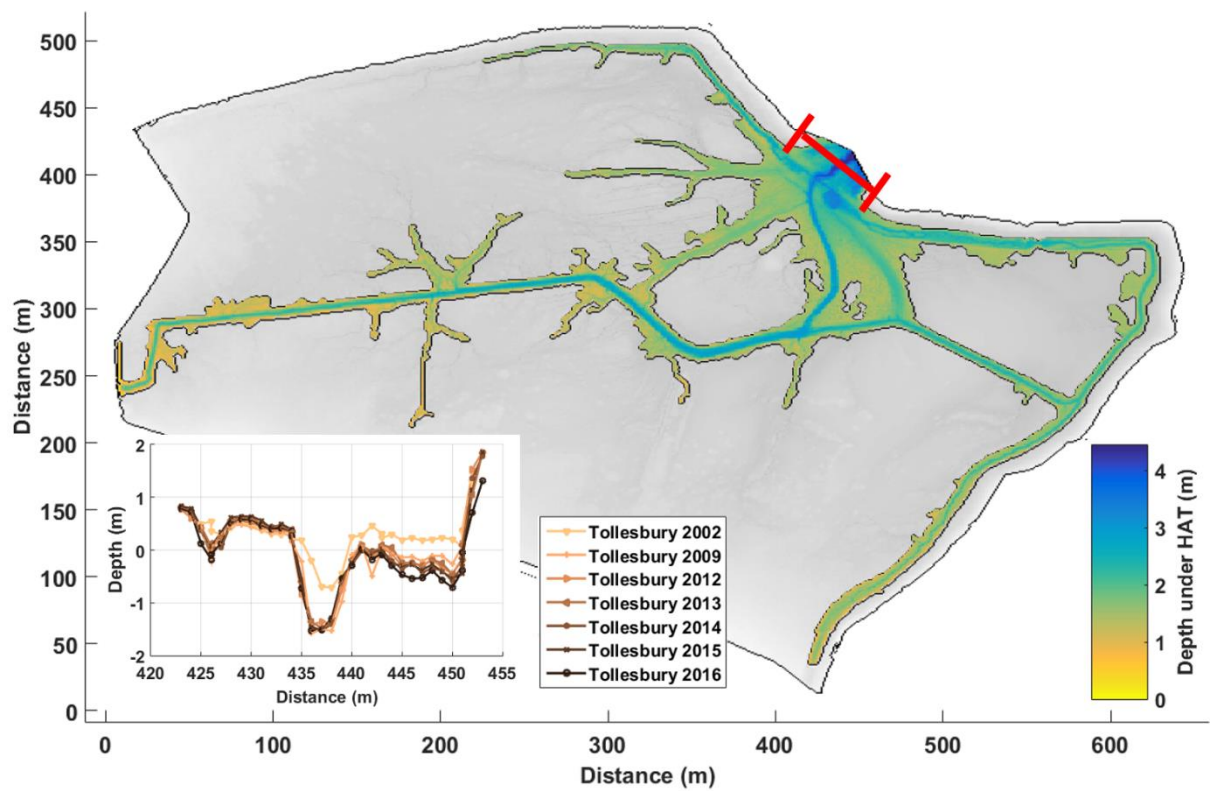


Appendix B7: As Appendix C1 but for Pauli Holme Strays

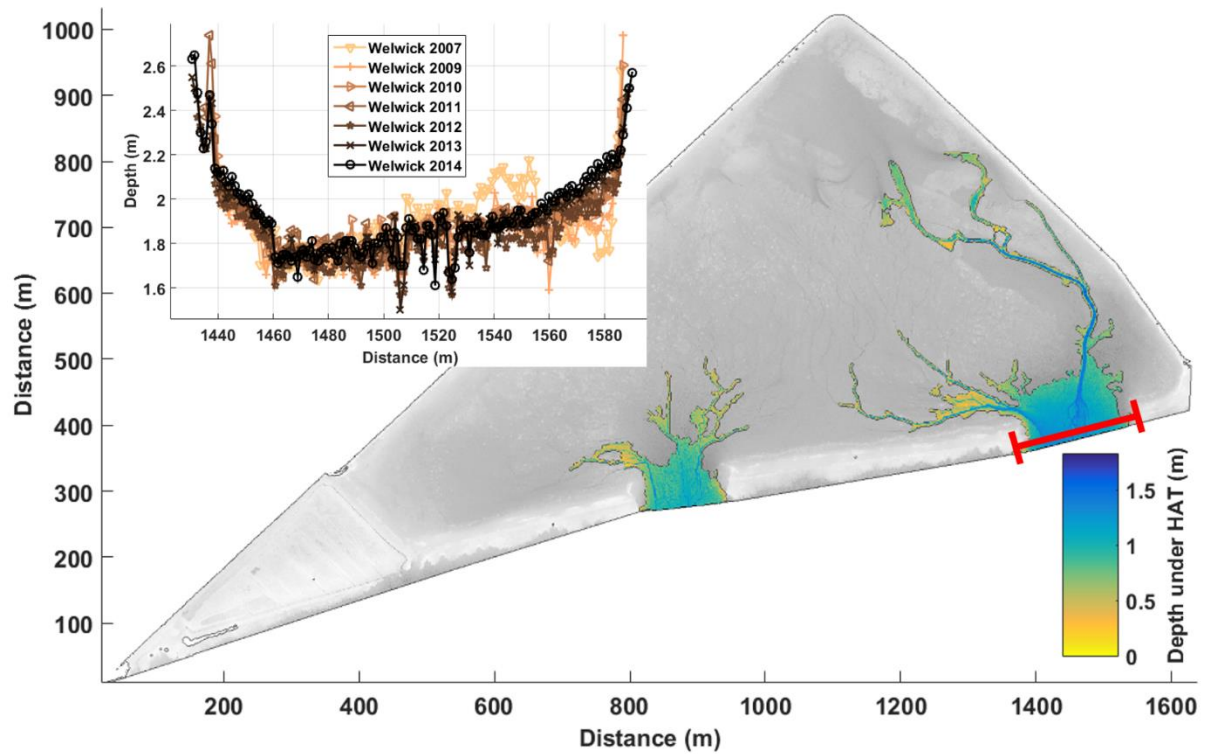


Appendix B8: As Appendix C1 but for Steart



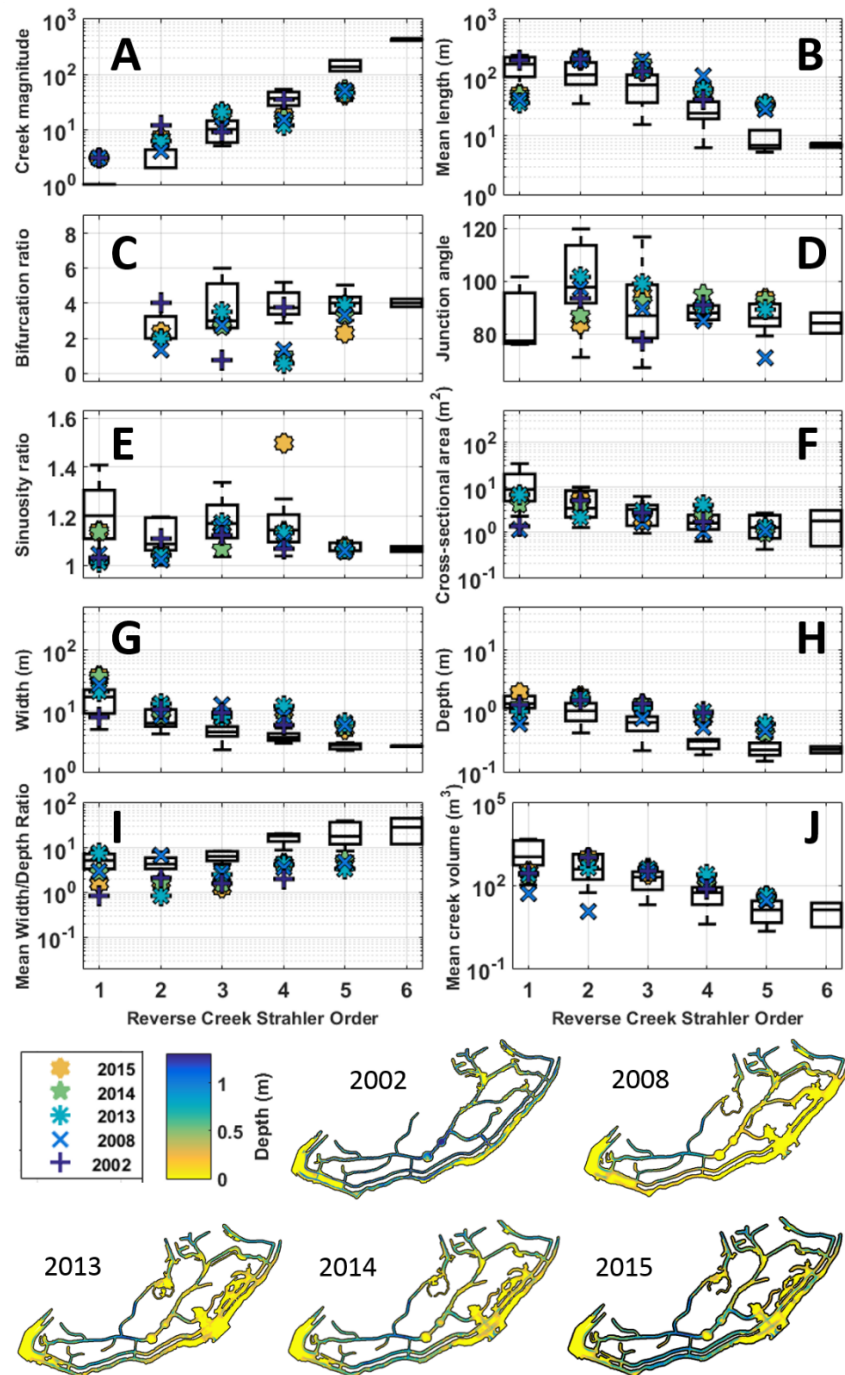


Appendix B9: As Appendix C1 but for Tollesbury

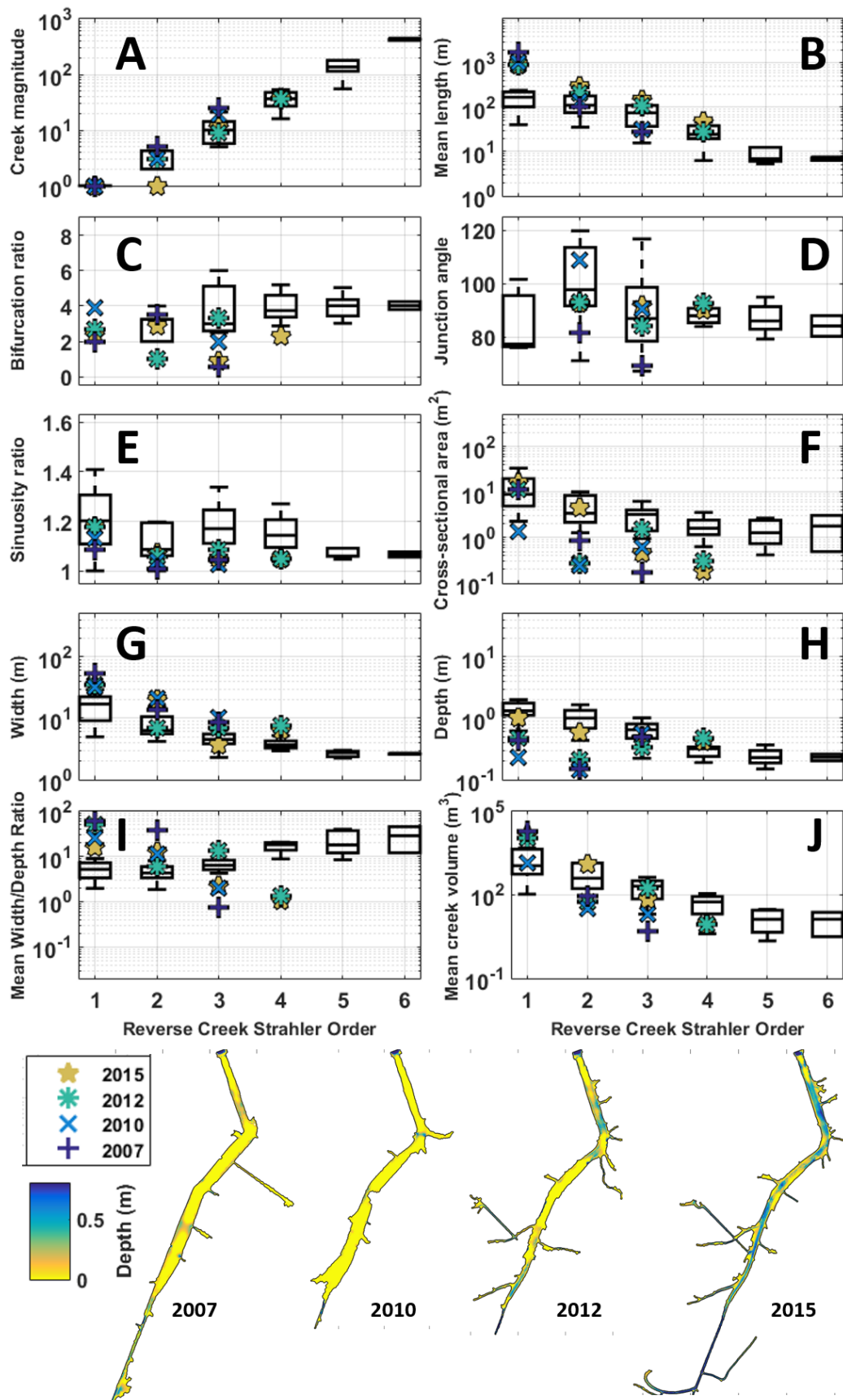


Appendix B10: As Appendix C1 but for Welwick

**Appendix C:** This appendix shows the evolution of MR creek morphometric parameters per RS order over the years, plotted against the 95% spread of natural creek parameters.

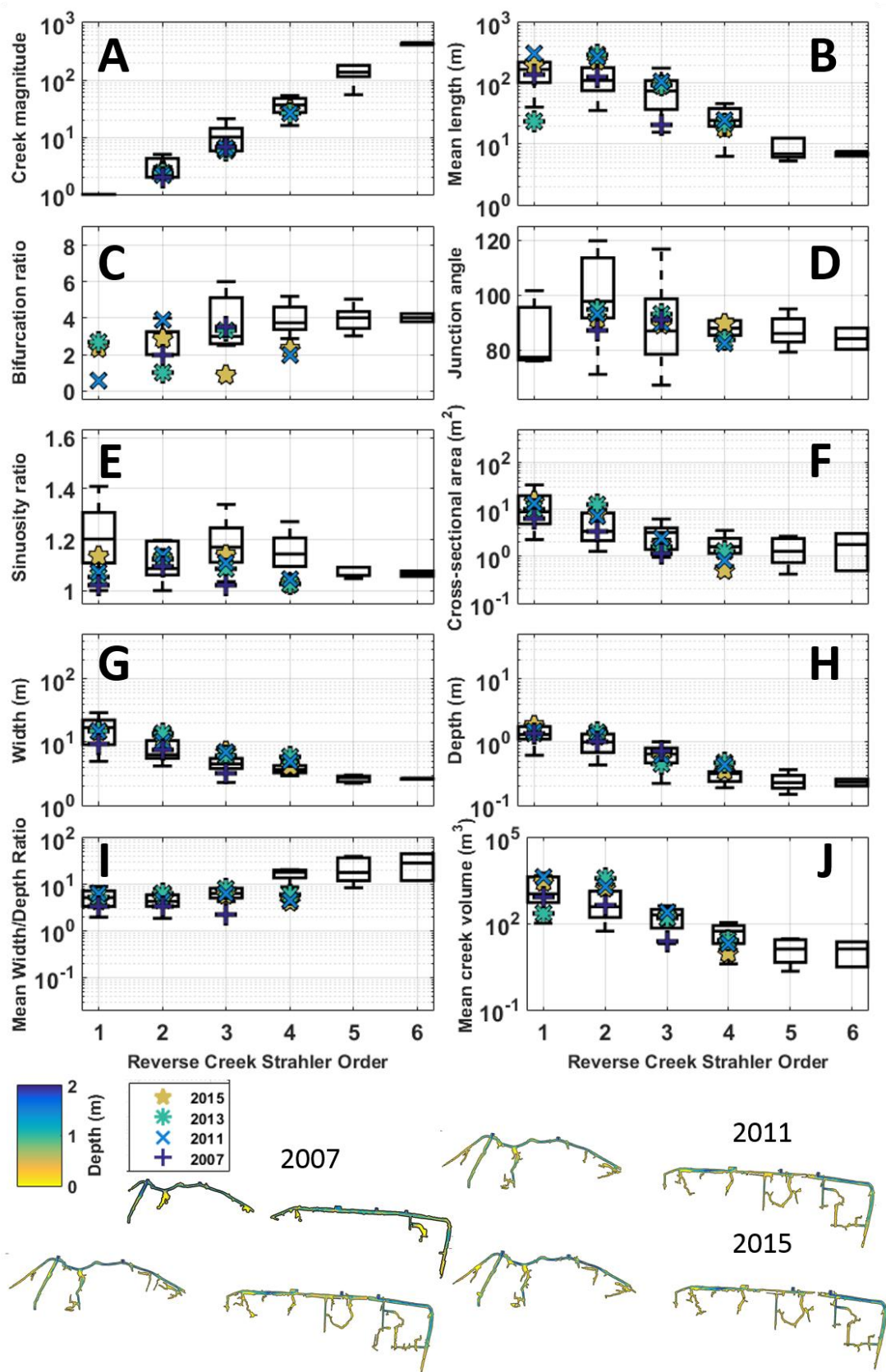


*Appendix C1: Morphometry parameters per Reverse Strahler order plotted against the 95% spread of natural creek parameters and creek extent for each available year for Abbots Hall*

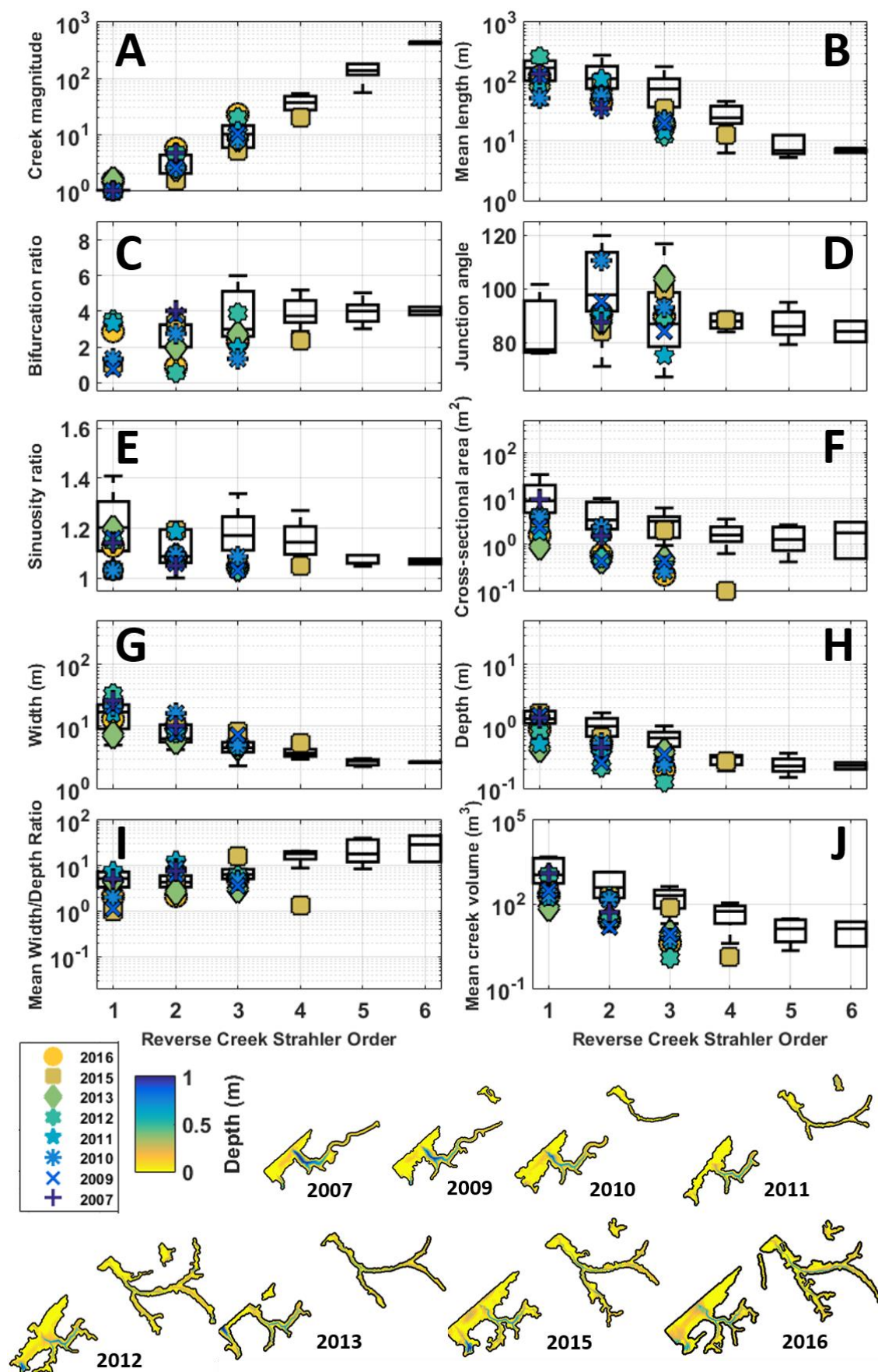


Appendix C2: As Appendix C1 but for Alkborough

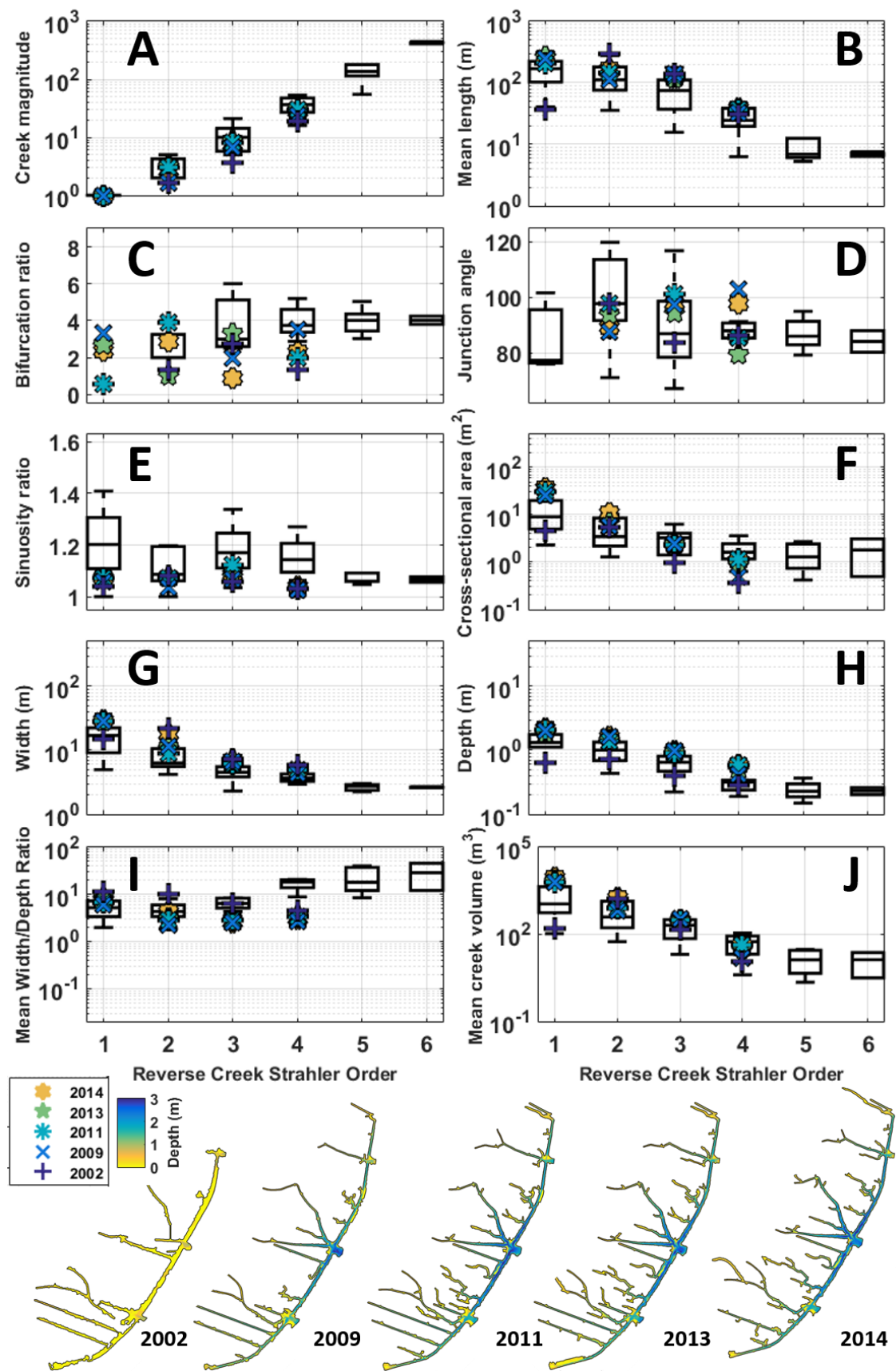




Appendix C3: As Appendix C1 but for Allfleet

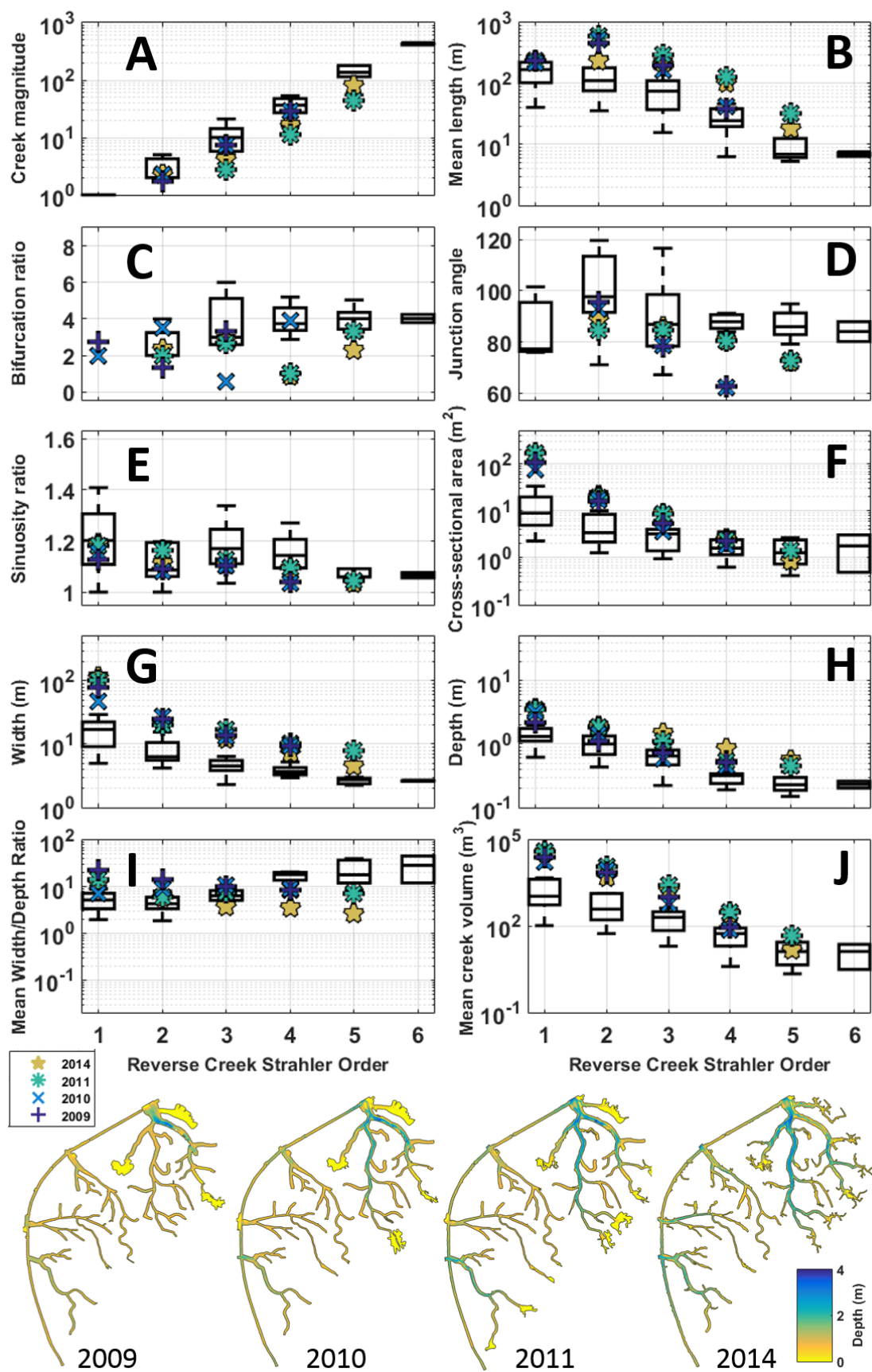


Appendix C4: As Appendix C1 but for Chowder Ness

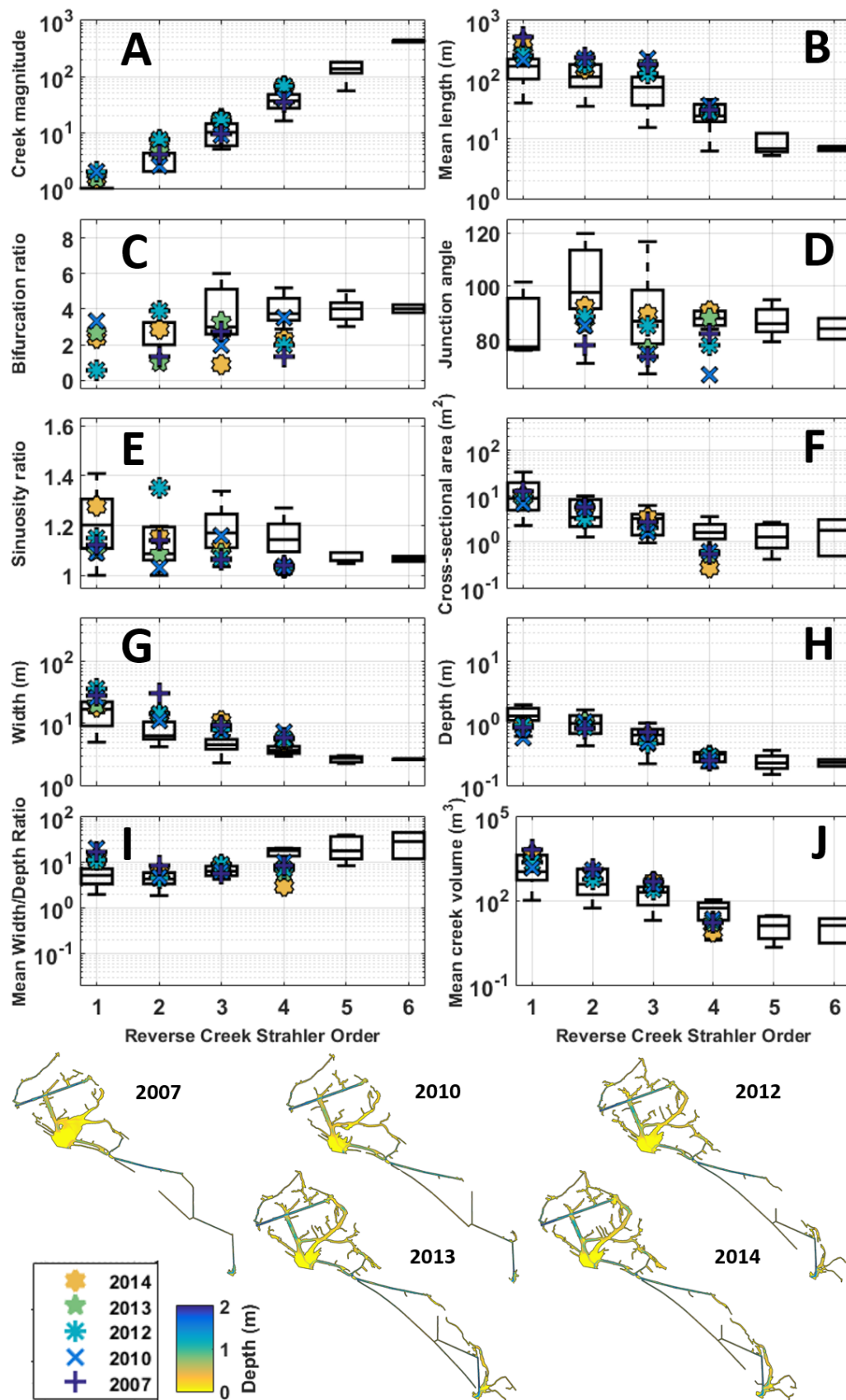


Appendix C5: As Appendix C1 but for Freiston

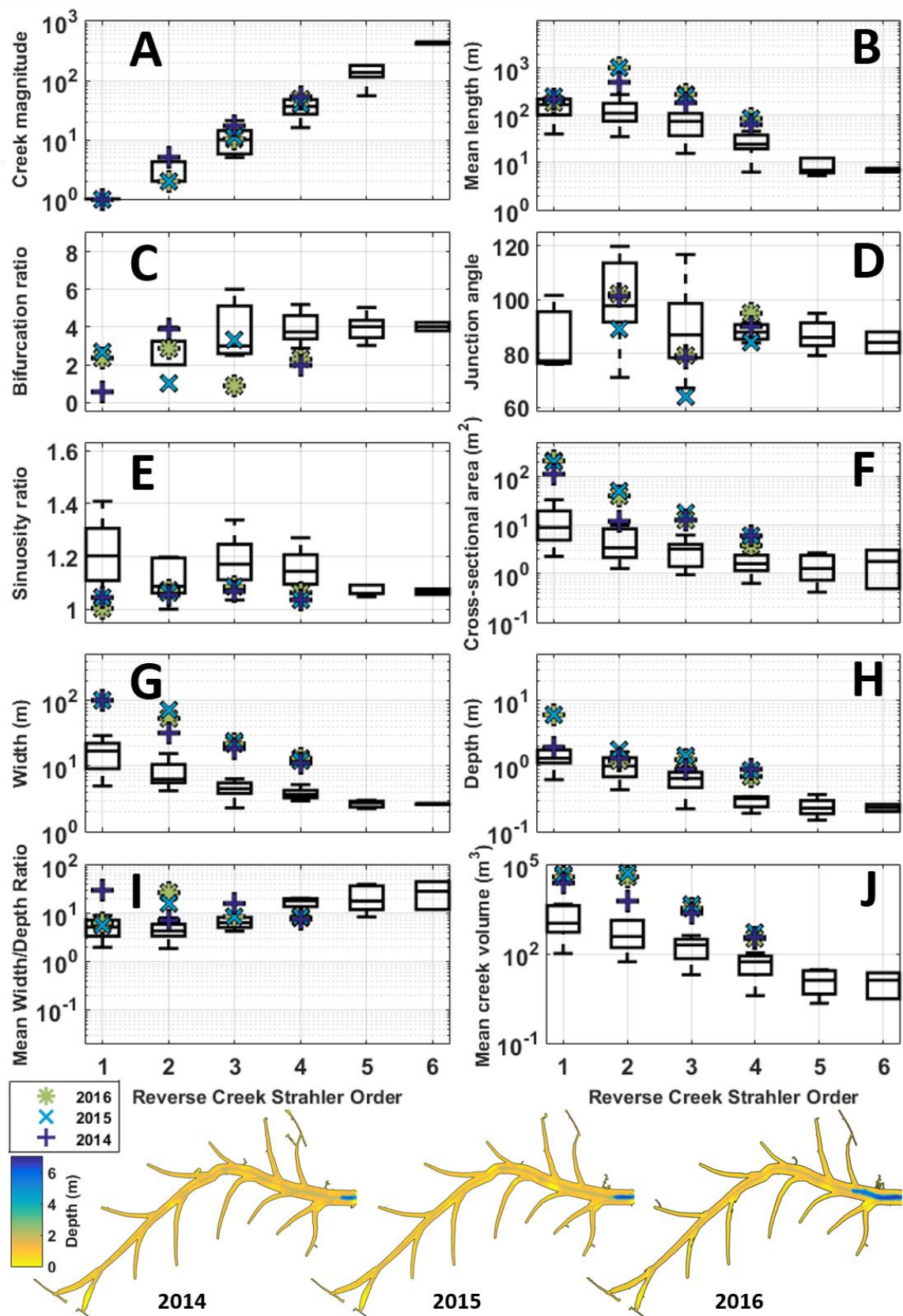




Appendix C6: As Appendix C1 but for Hesketh Out Marsh West

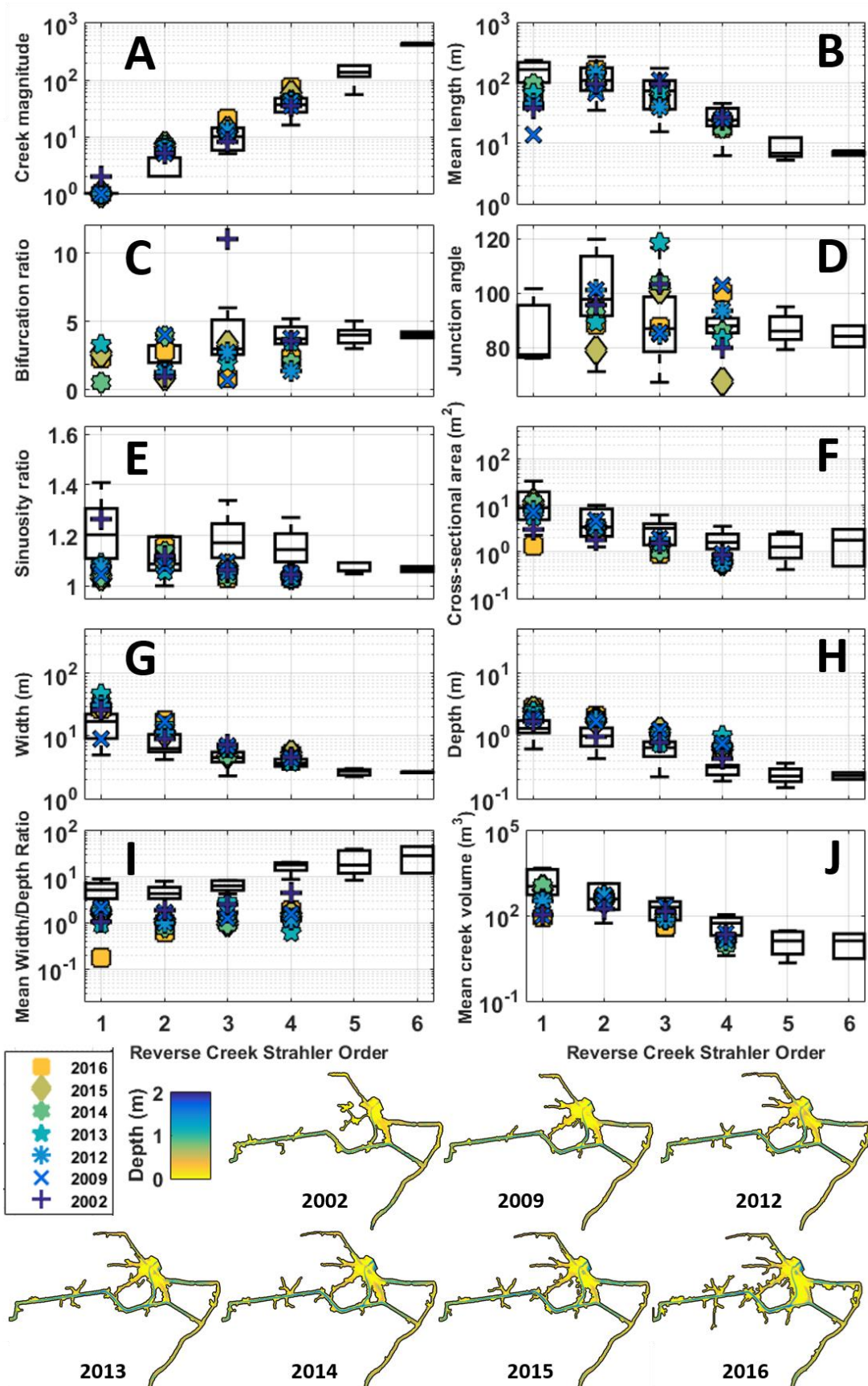


Appendix C7: As Appendix C1 but for Paull Holme Strays

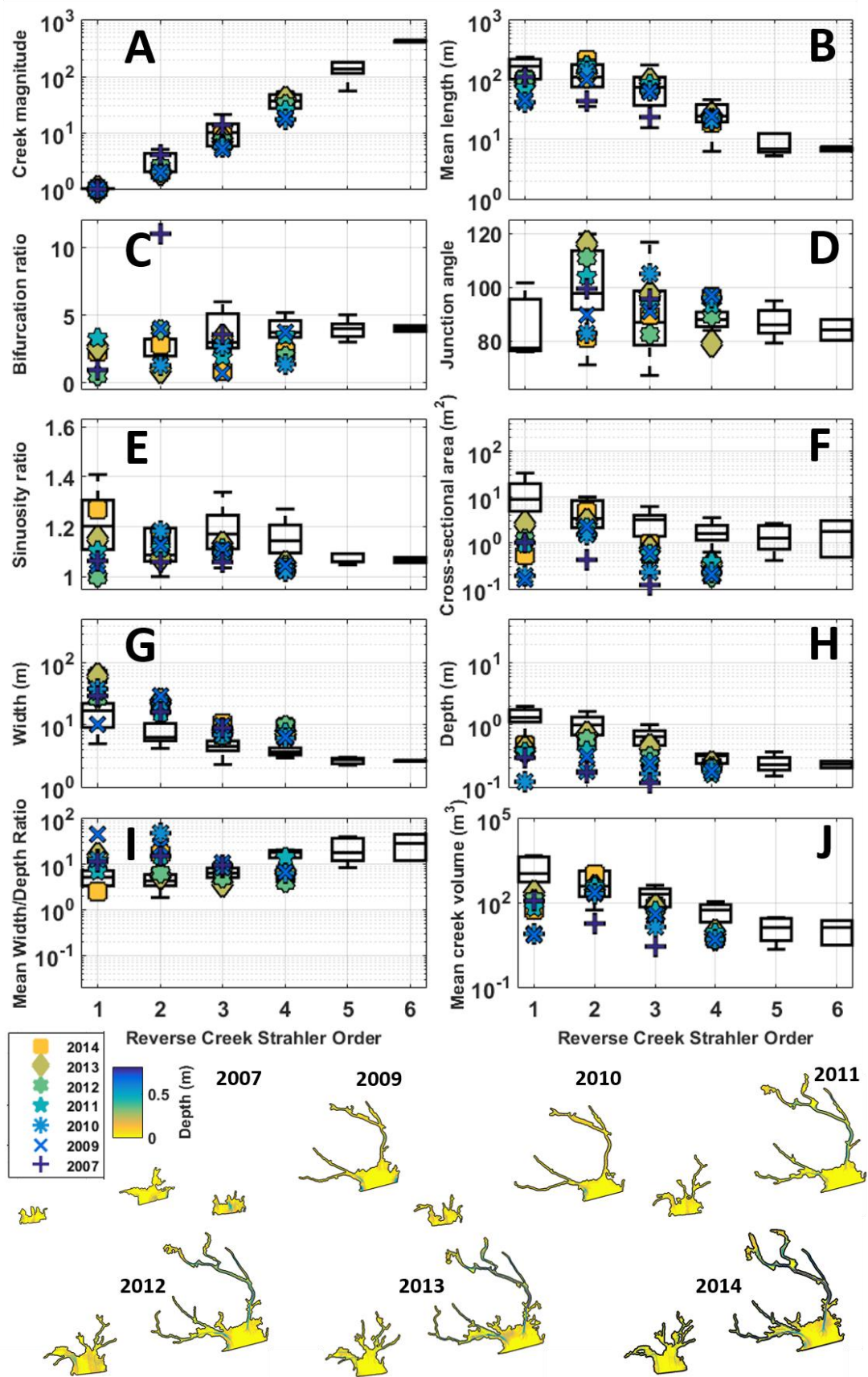


Appendix C8: As Appendix C1 but for Steart





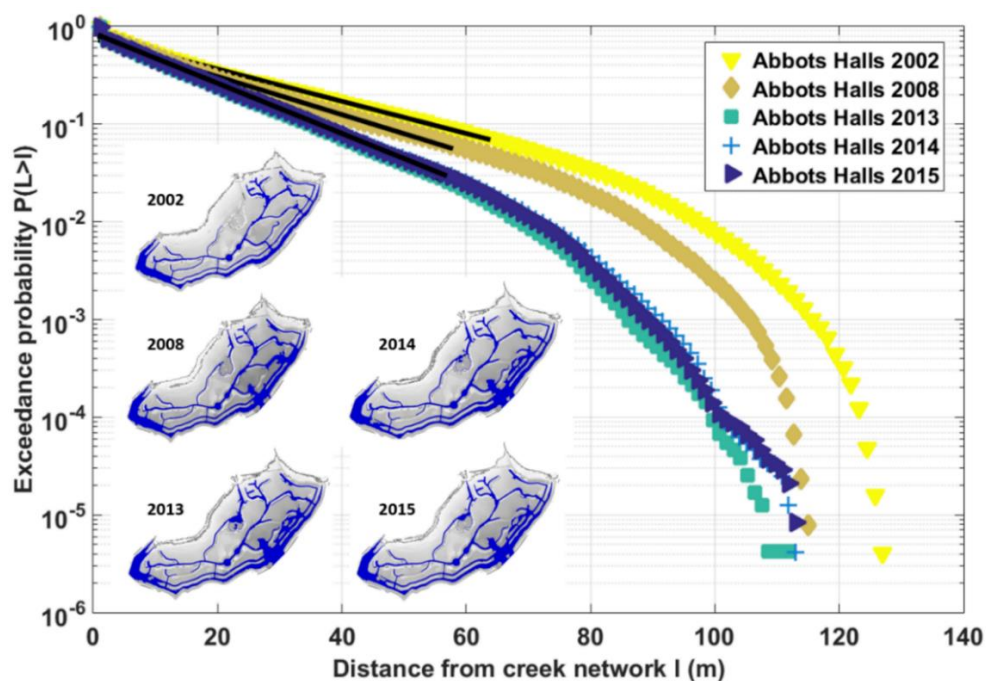
Appendix C9: As Appendix C1 but for Tollesbury



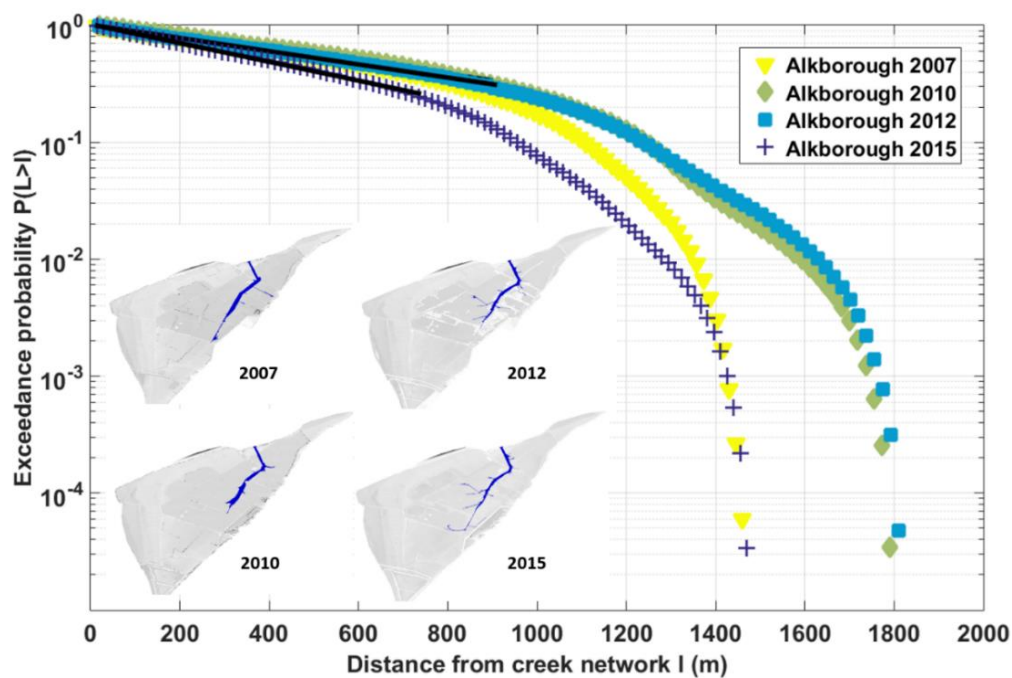
Appendix C10: As Appendix C1 but for Welwick



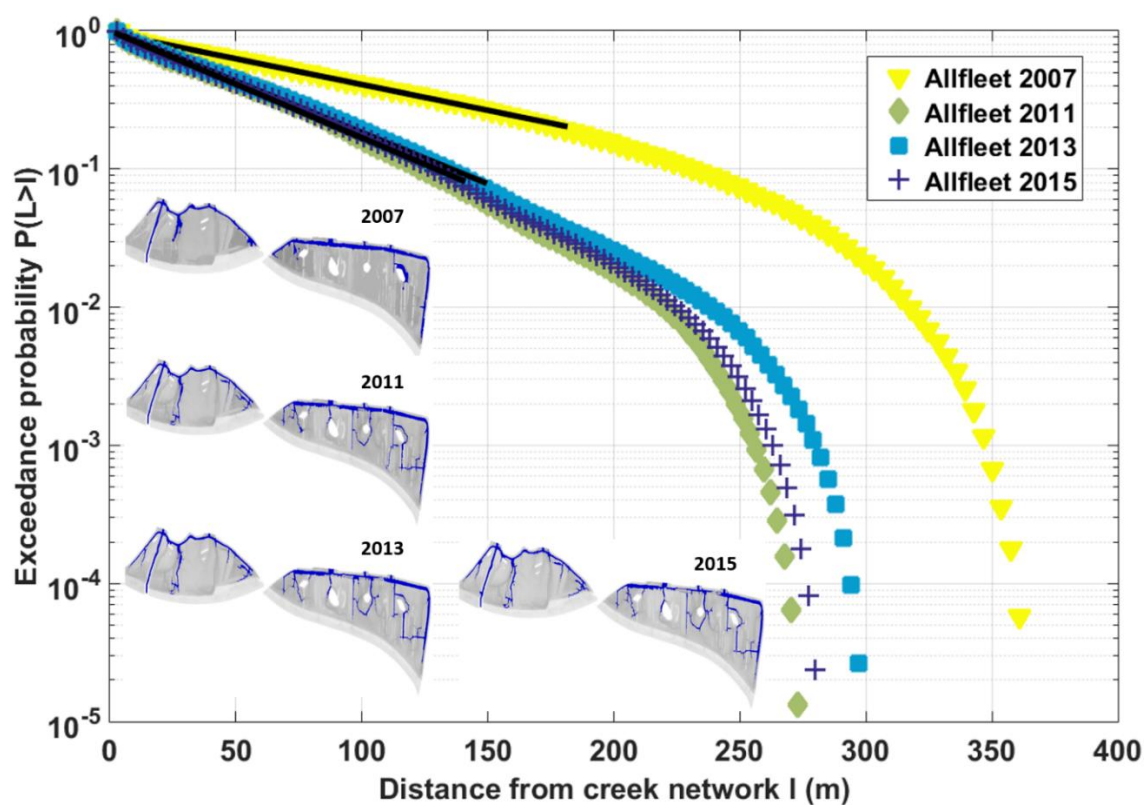
**Appendix D:** This appendix shows the evolution of the MR creek extent, unchanneled length and overmarsh path length over the years for all sites.



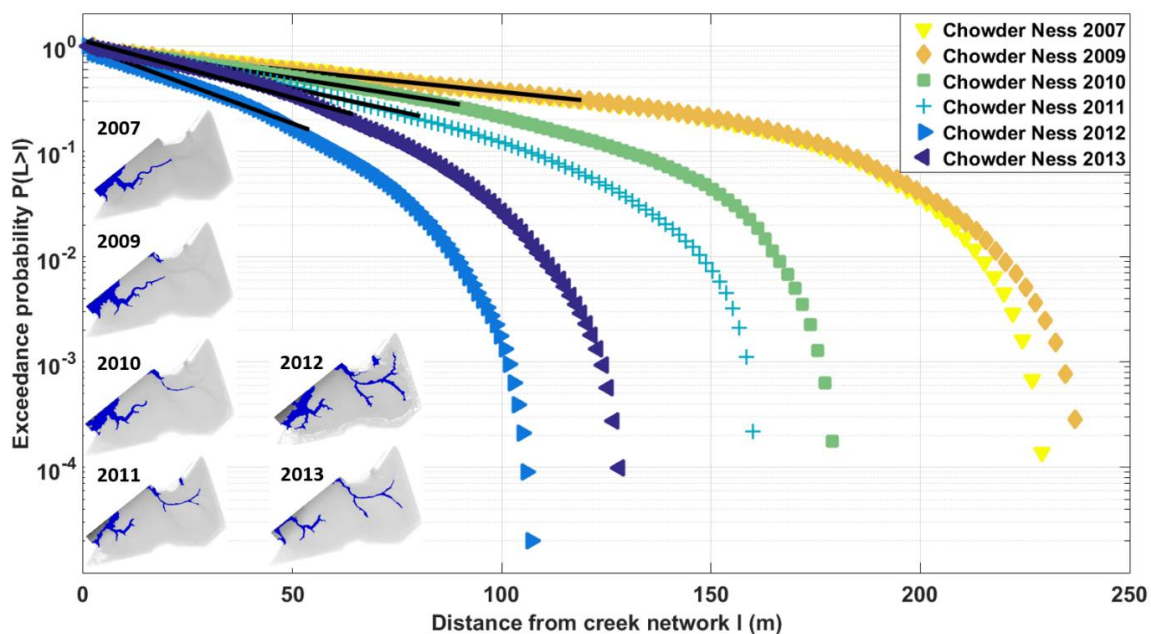
*Appendix D1: Creek extent (shown in dark blue on the maps), unchanneled length distribution and overmarsh path length evolution for each available year for Abbots Hall*



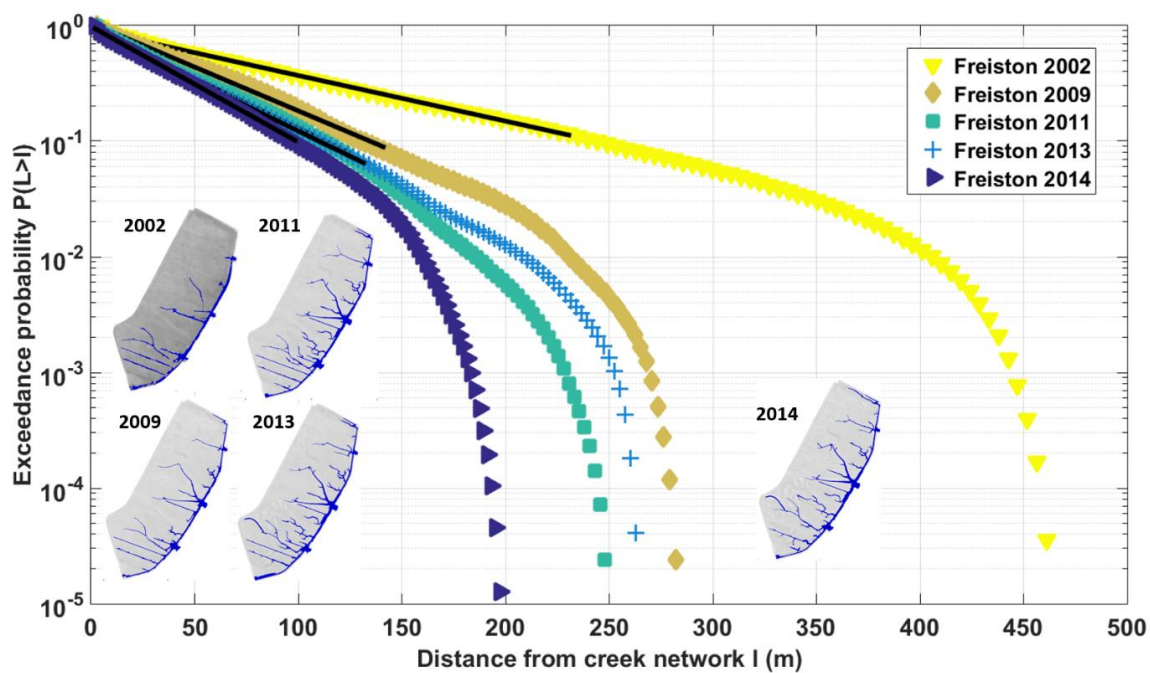
*Appendix D2: As Appendix D1 but for Alkborough*



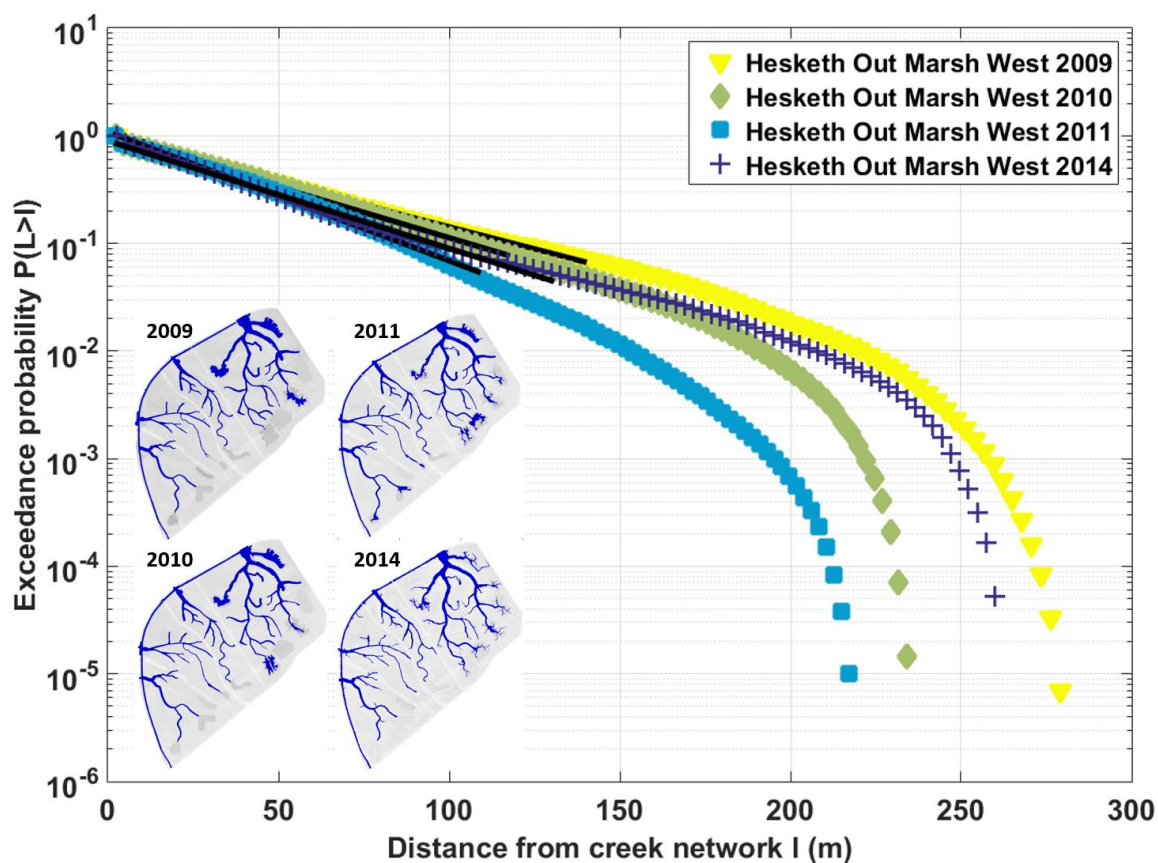
Appendix D3: As Appendix D1 but for Allfleet



Appendix D4: As Appendix D1 but for Chowder Ness

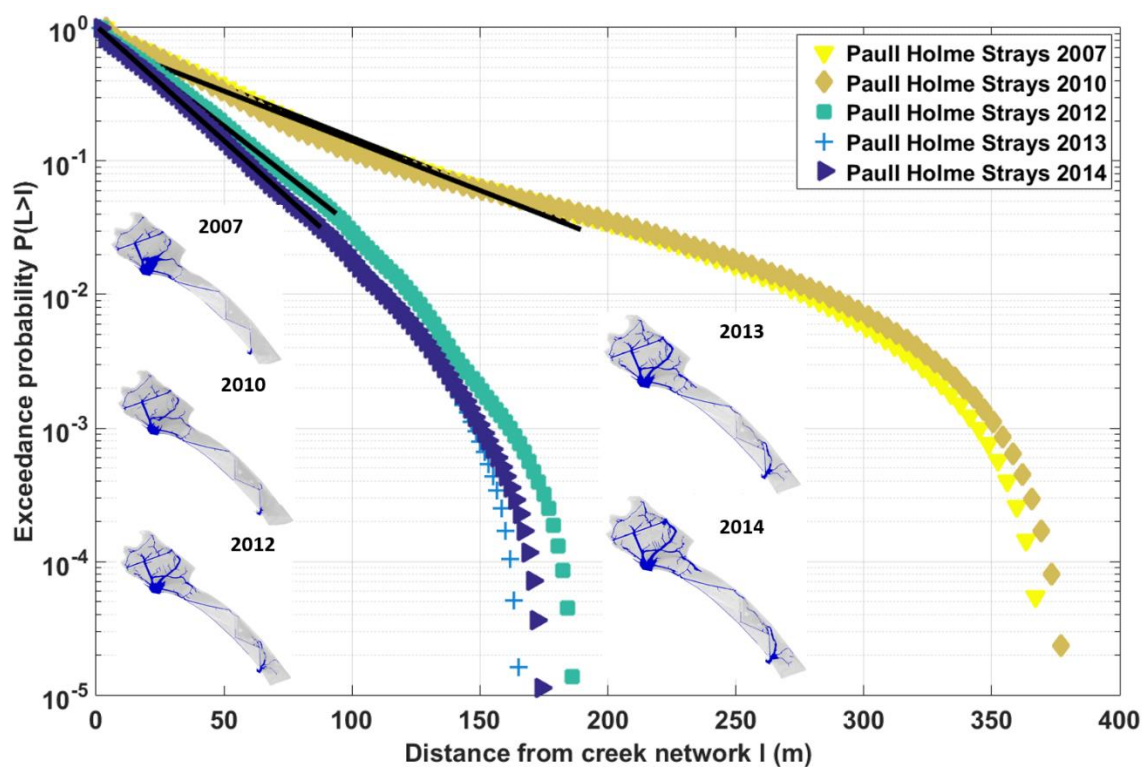


Appendix D5: As Appendix D1 but for Freiston

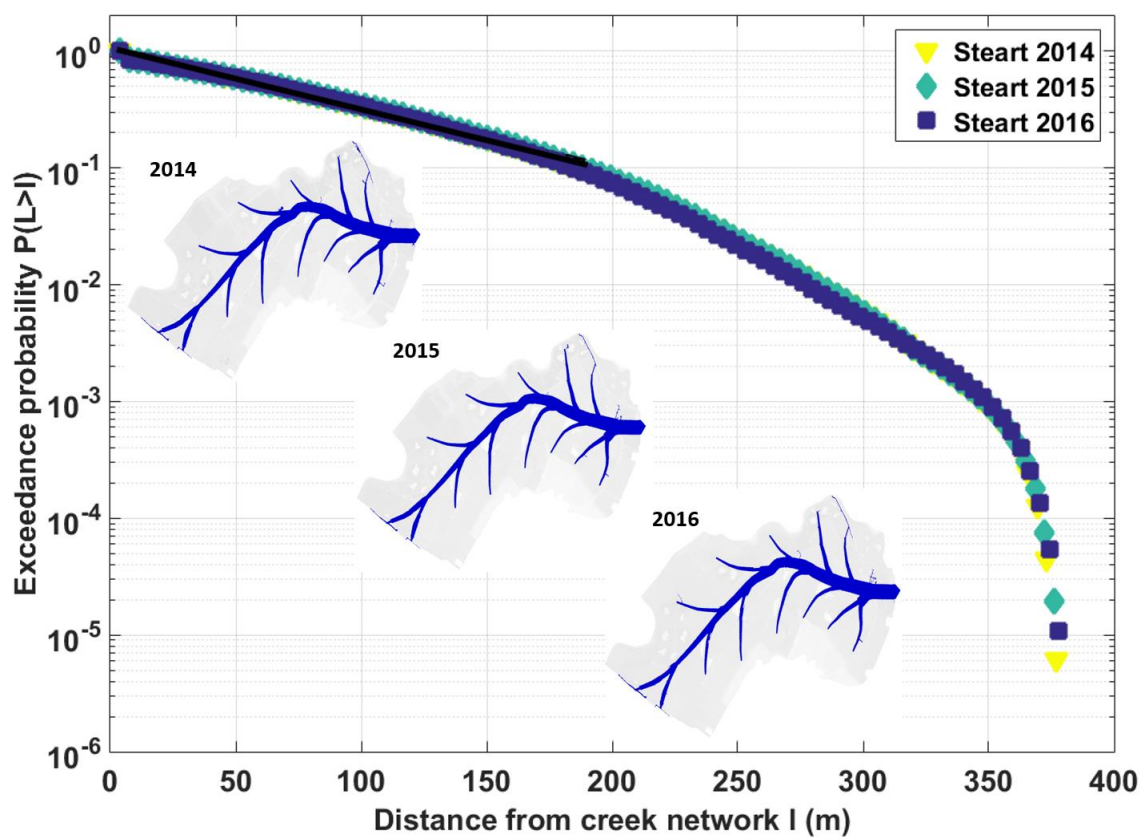


Appendix D6: As Appendix D1 but for Hesketh Out Marsh West

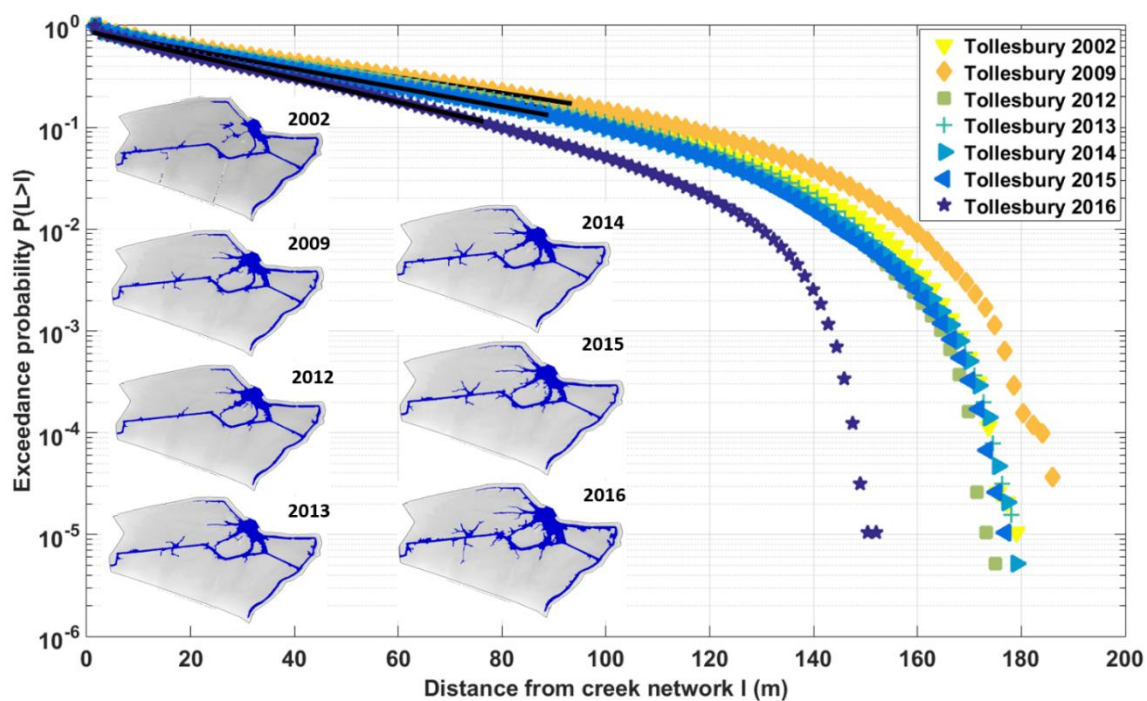




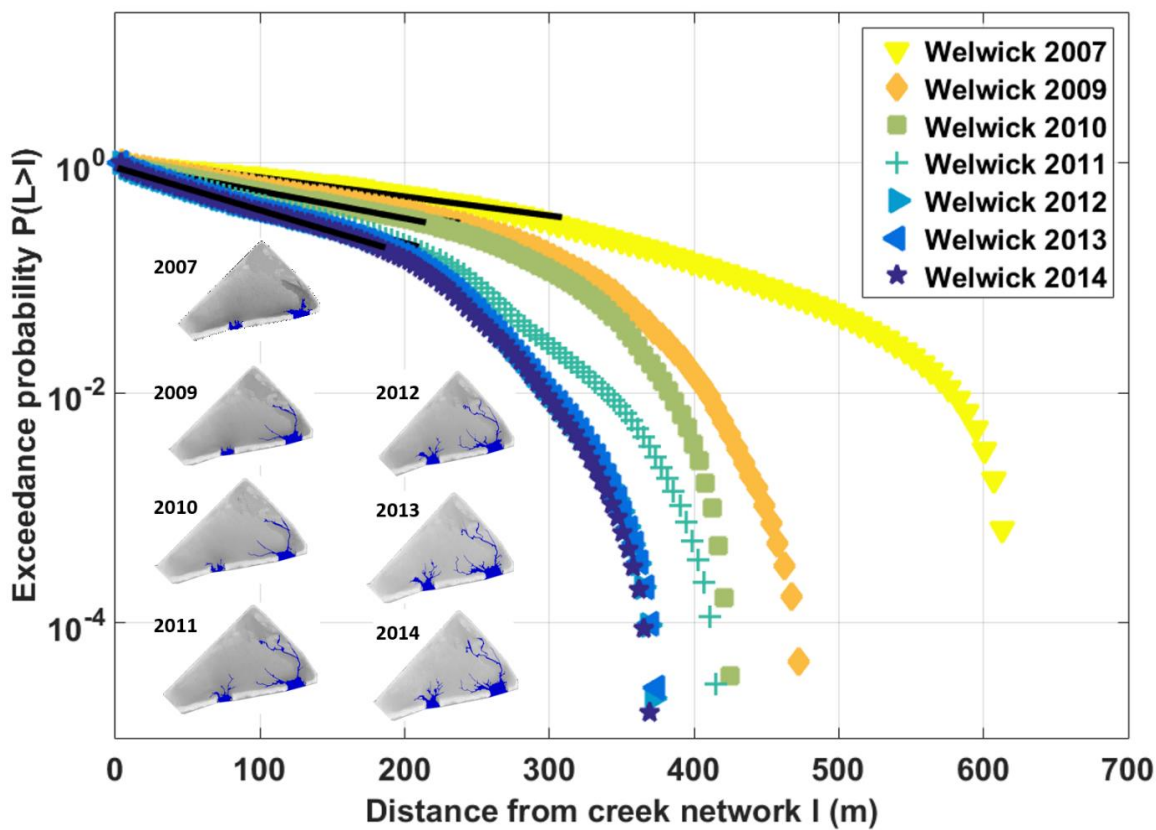
Appendix D7: As Appendix D1 but for Paull Holme Strays



Appendix D8: As Appendix D1 but for Steart

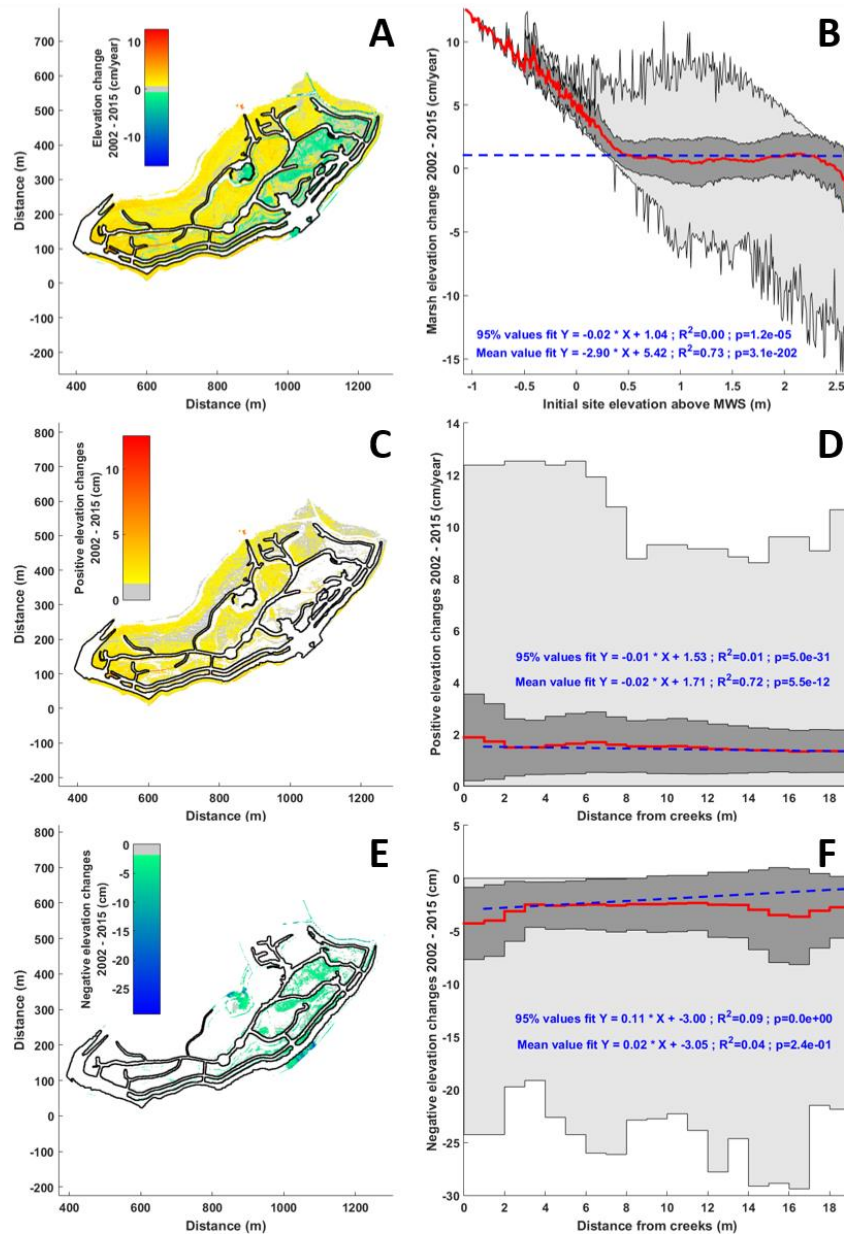


Appendix D9: As Appendix D1 but for Tollesbury



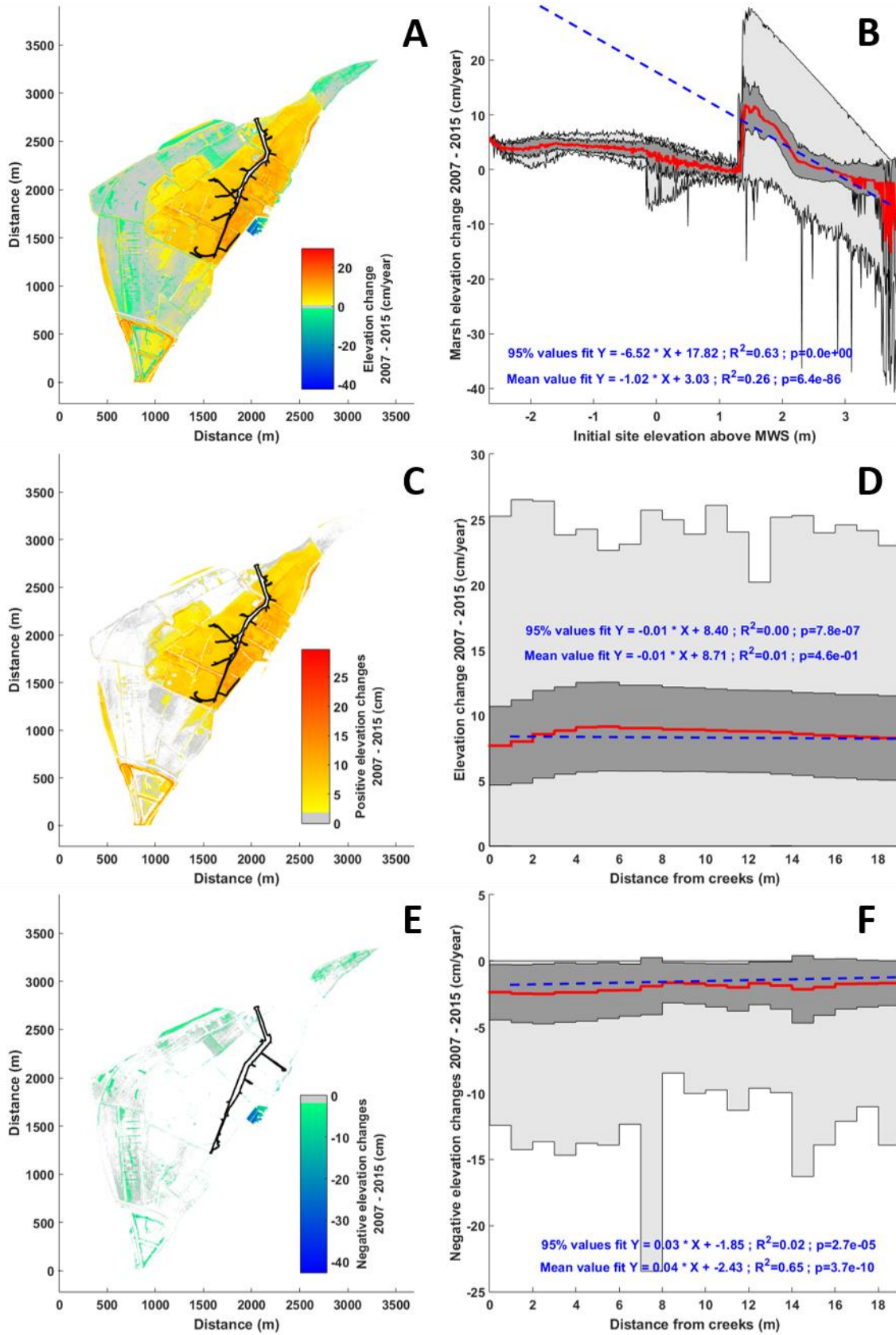
Appendix D10: As Appendix D1 but for Welwick

**Appendix E:** This appendix shows the elevation gains and losses of all MR sites between the first and the last year considered, and correlates them to the initial site elevation and distance to creeks to analyse creek forming processes. The effect of creek proximity on the creek network is evaluated up to 20 m away from the creeks to reduce the impact of site elevation or of multiple creek influence on the results. Positive elevation changes are correlated to the most recent creek extent and negative elevation changes to the initial creek extent.



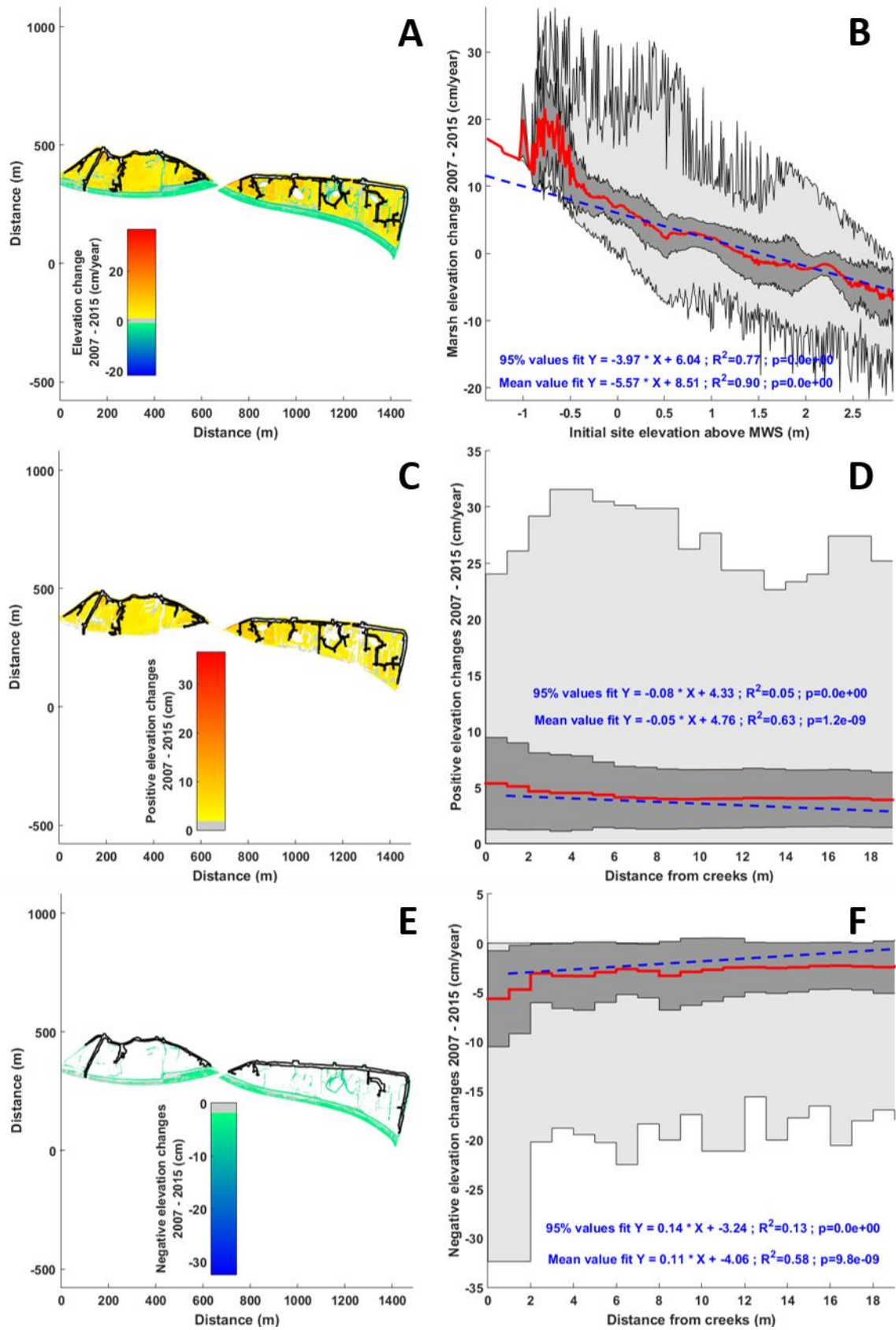
*Appendix E1: Linear correlation tests at Abbots Hall for the 95% data spread and for the mean values between (A) marsh elevation changes versus site elevation; (B) marsh elevation gains versus distance up to 20 m to the final creek network; and (C) marsh elevation losses versus distance up to 20 m to the initial creek network. Red line: mean value of elevation change; dark grey envelope: 95% spread around the mean value; light grey envelope: total data spread. The marsh elevation changes correspond to the last versus first lidar dataset, divided by the number of years between the two.*



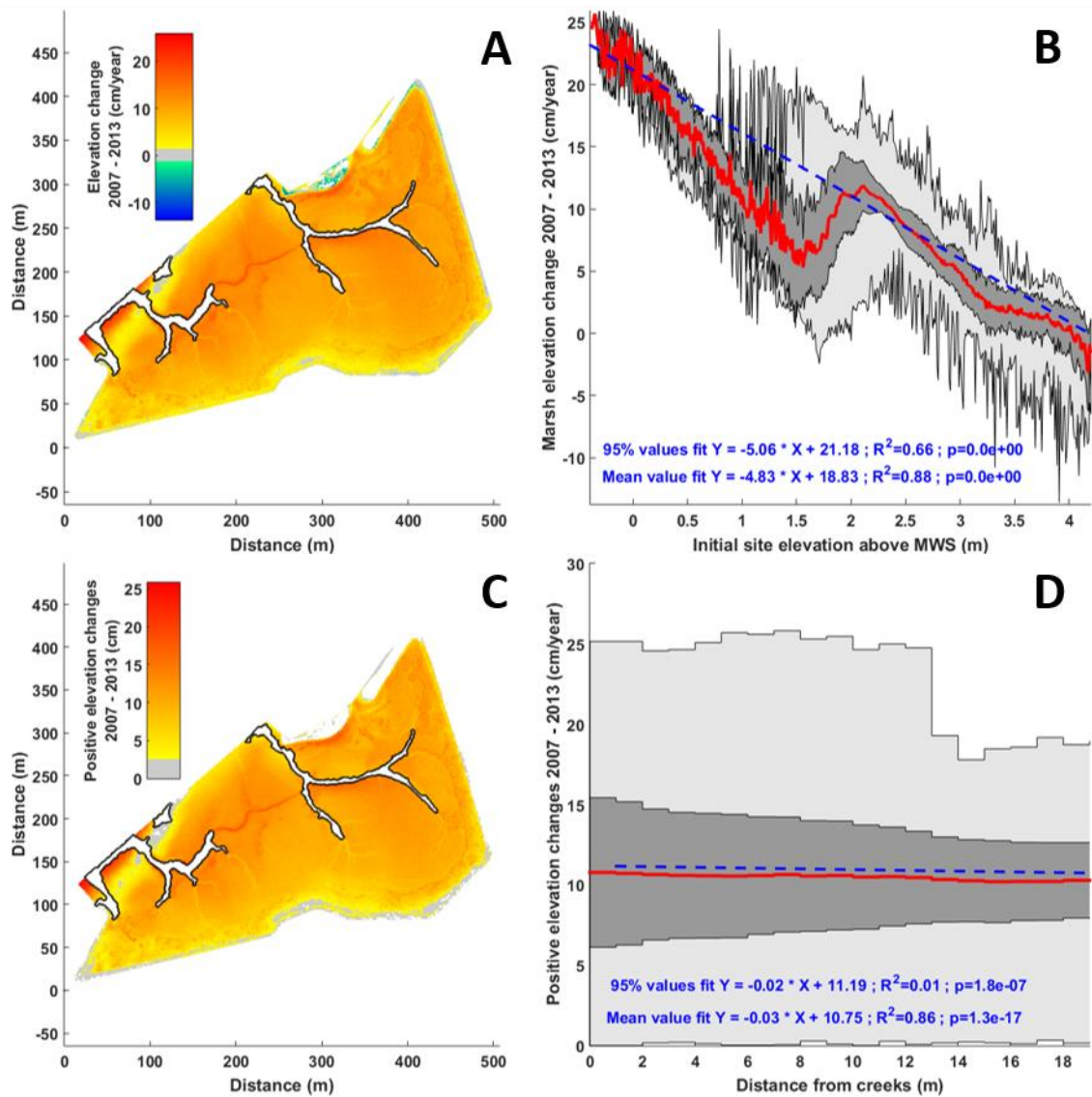


Appendix E2: As Appendix E1 but for Alkborough

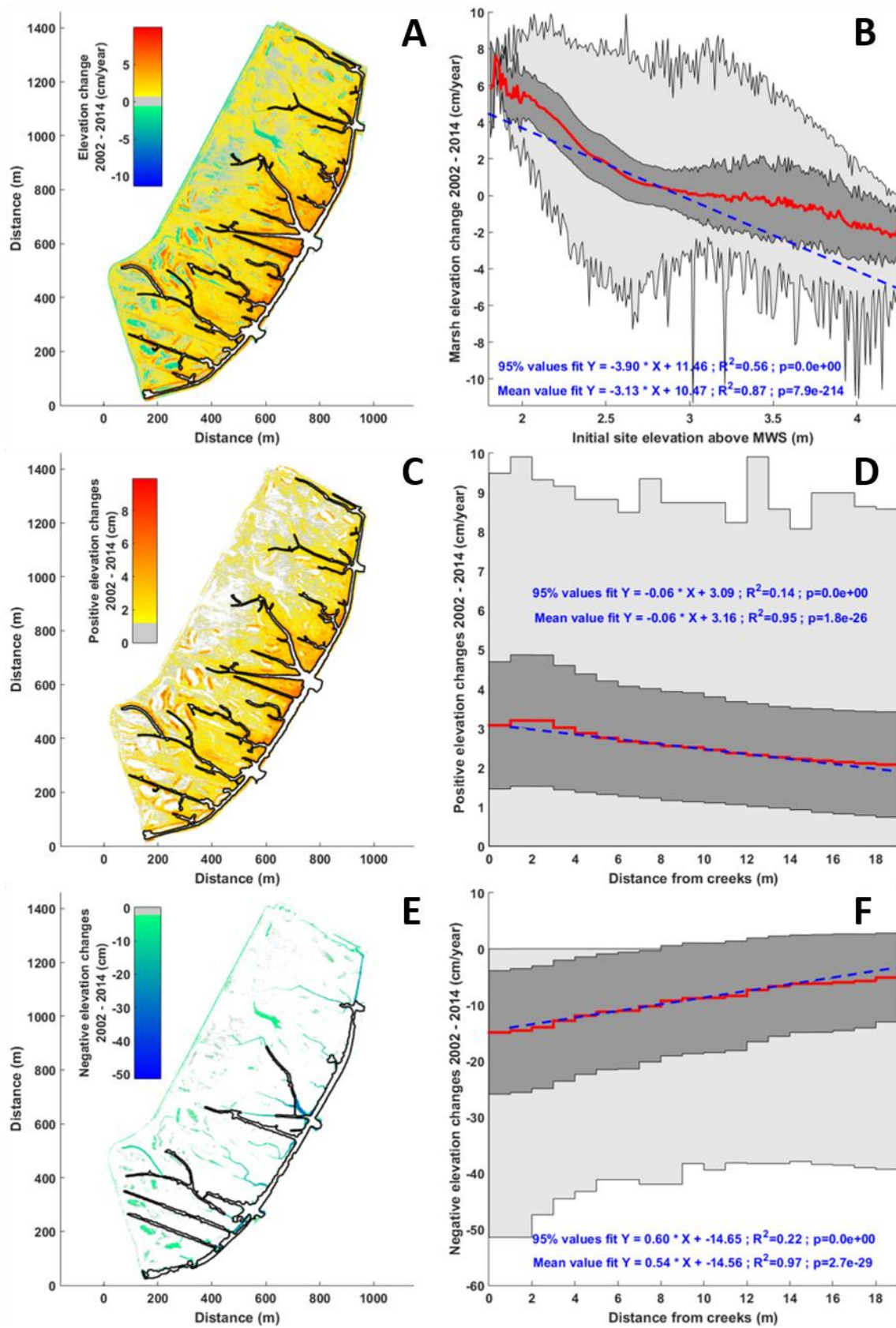




Appendix E3: As Appendix E1 but for Allfleet

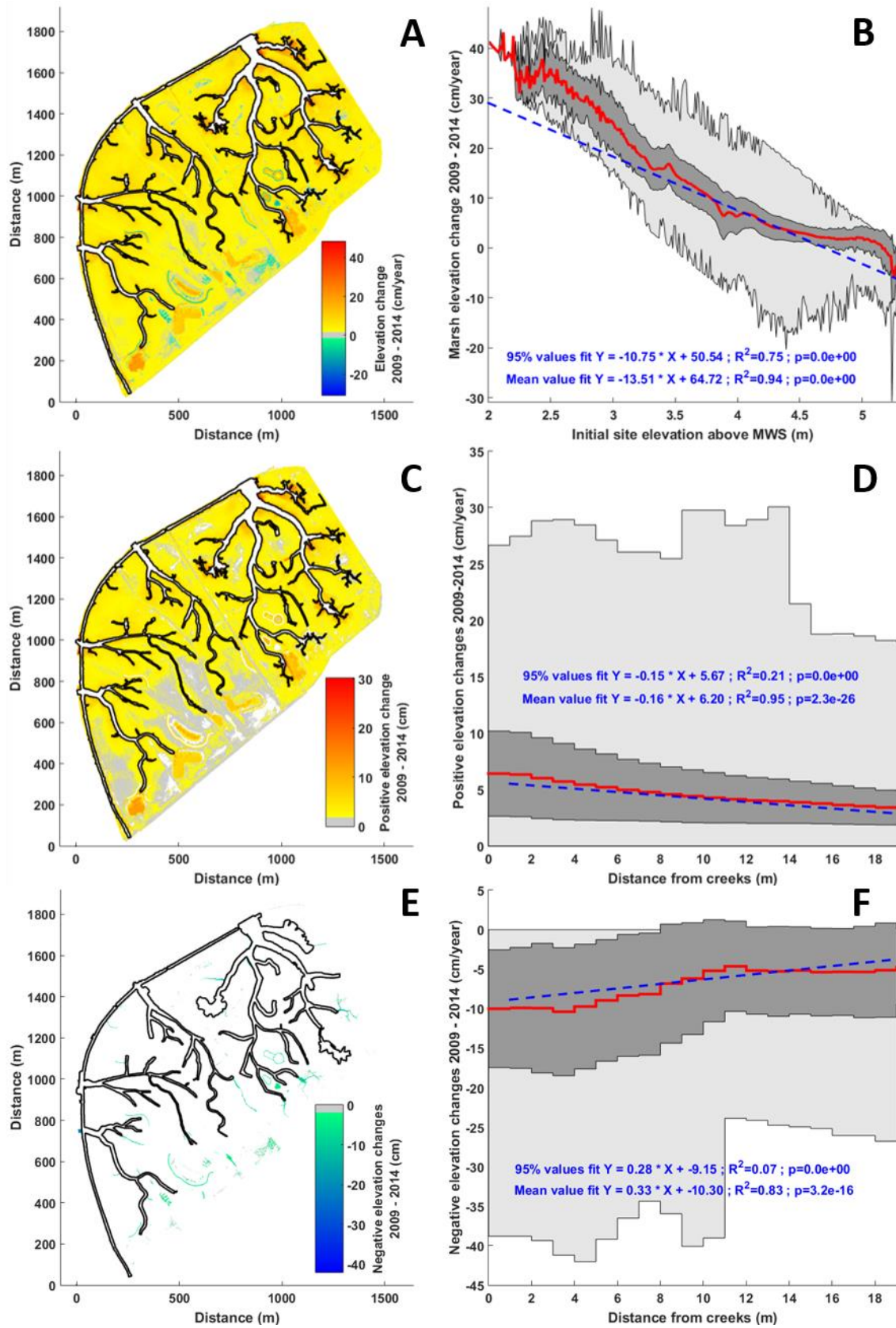


Appendix E4: As Appendix E1 but for Chowder Ness (no visible elevation loss)

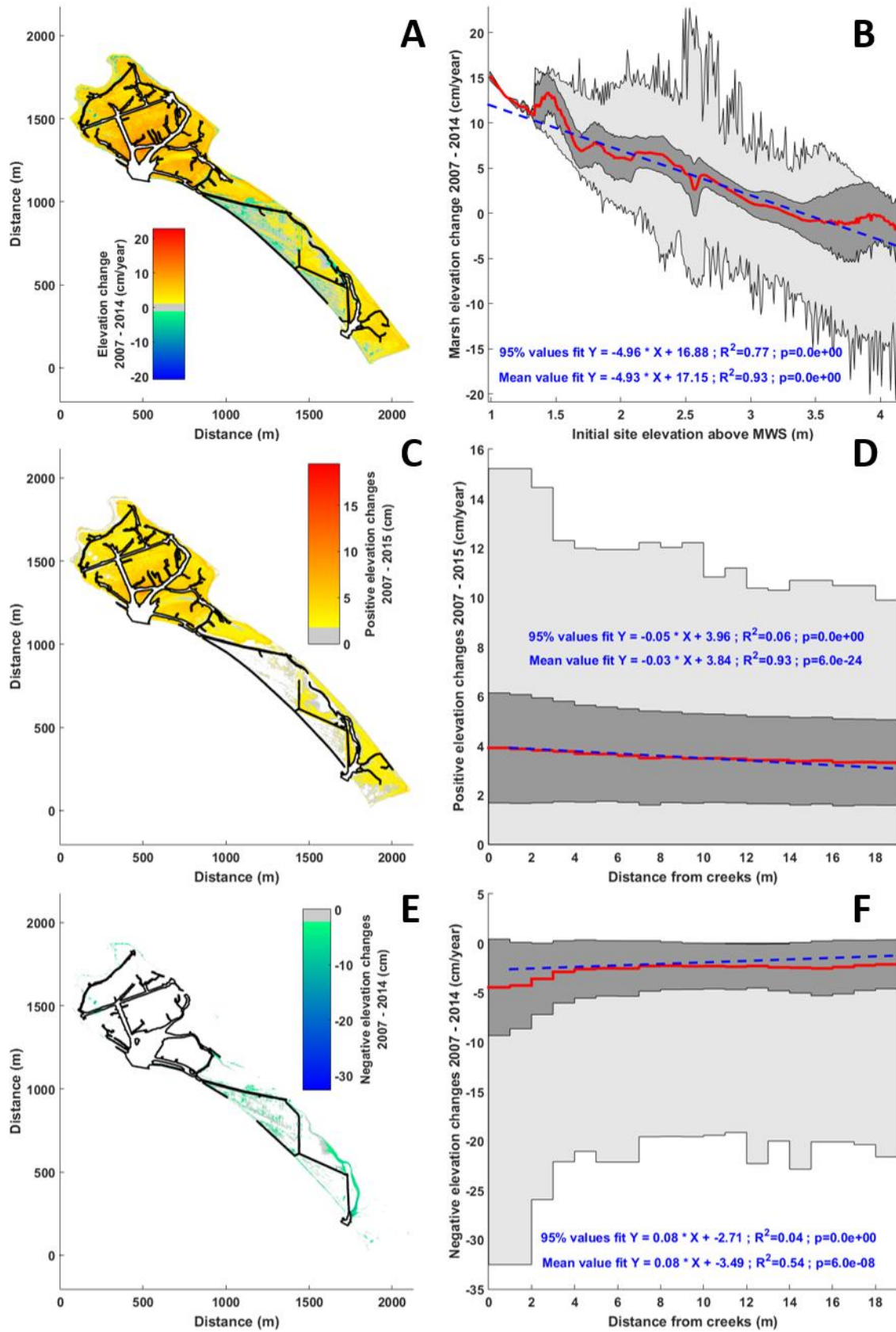


Appendix E5: As Appendix E1 but for Freiston

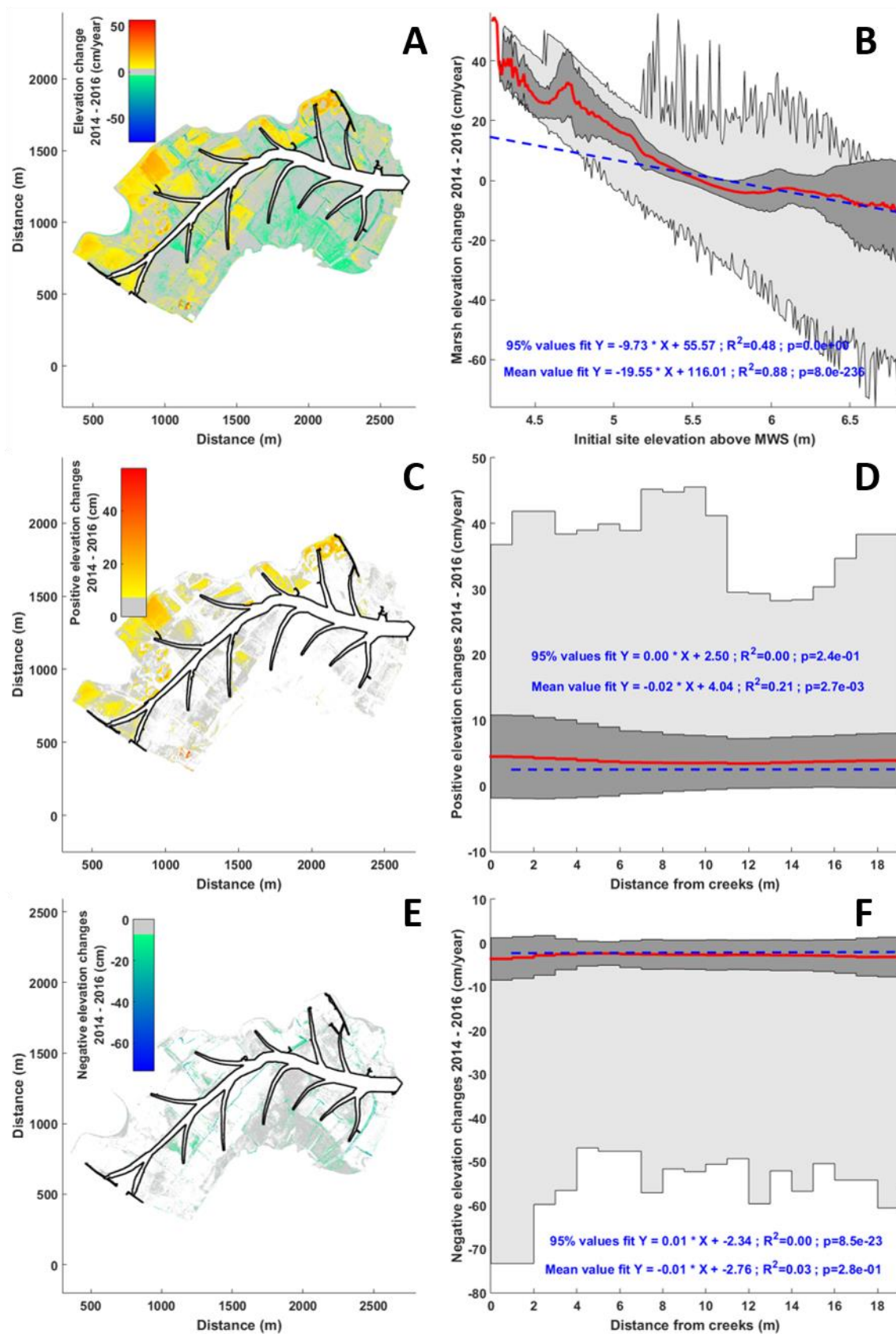




Appendix E6: As Appendix E1 but for Hesketh Out Marsh West

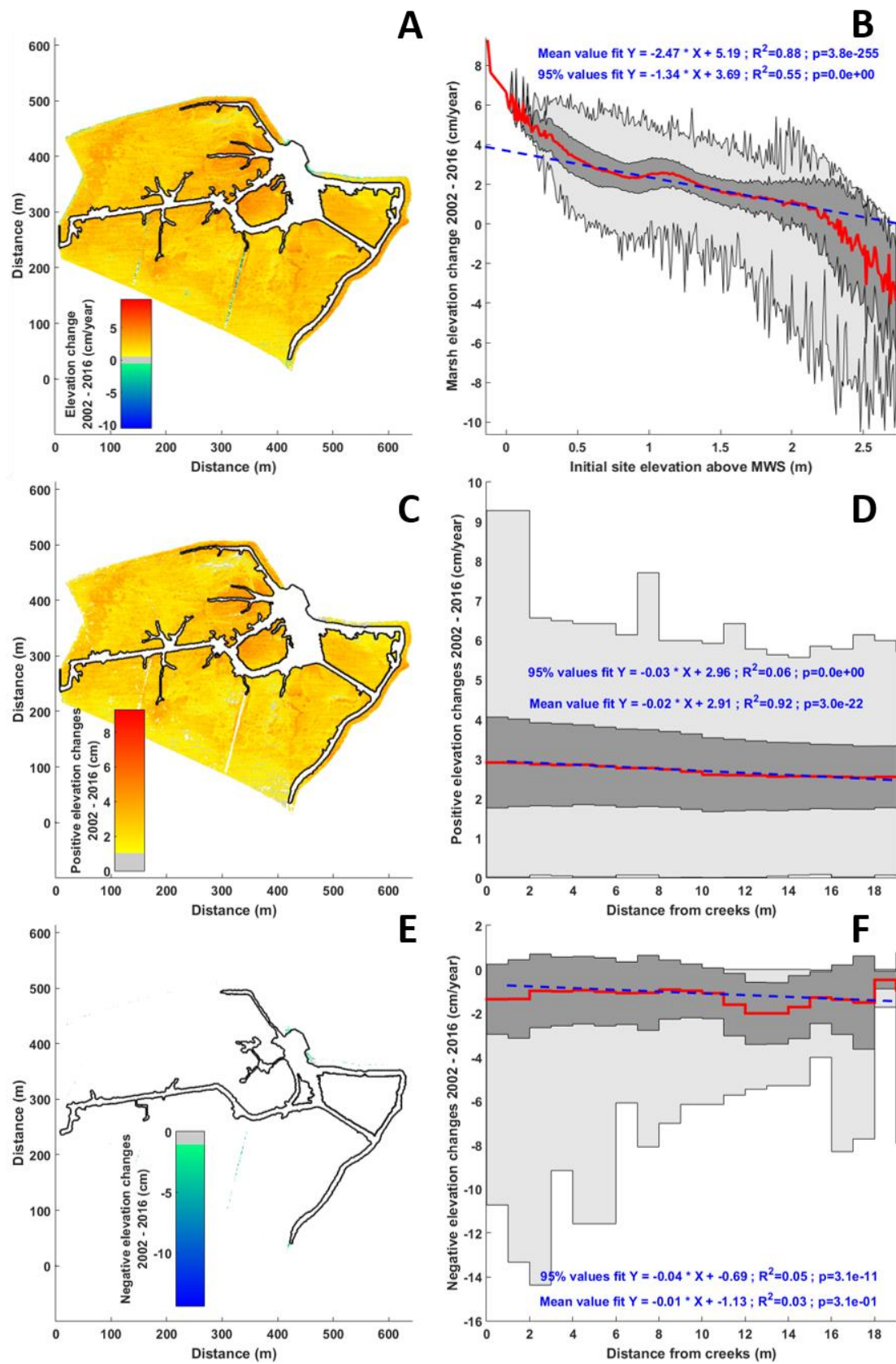


Appendix E7: As Appendix E1 but for Paul Holme Strays

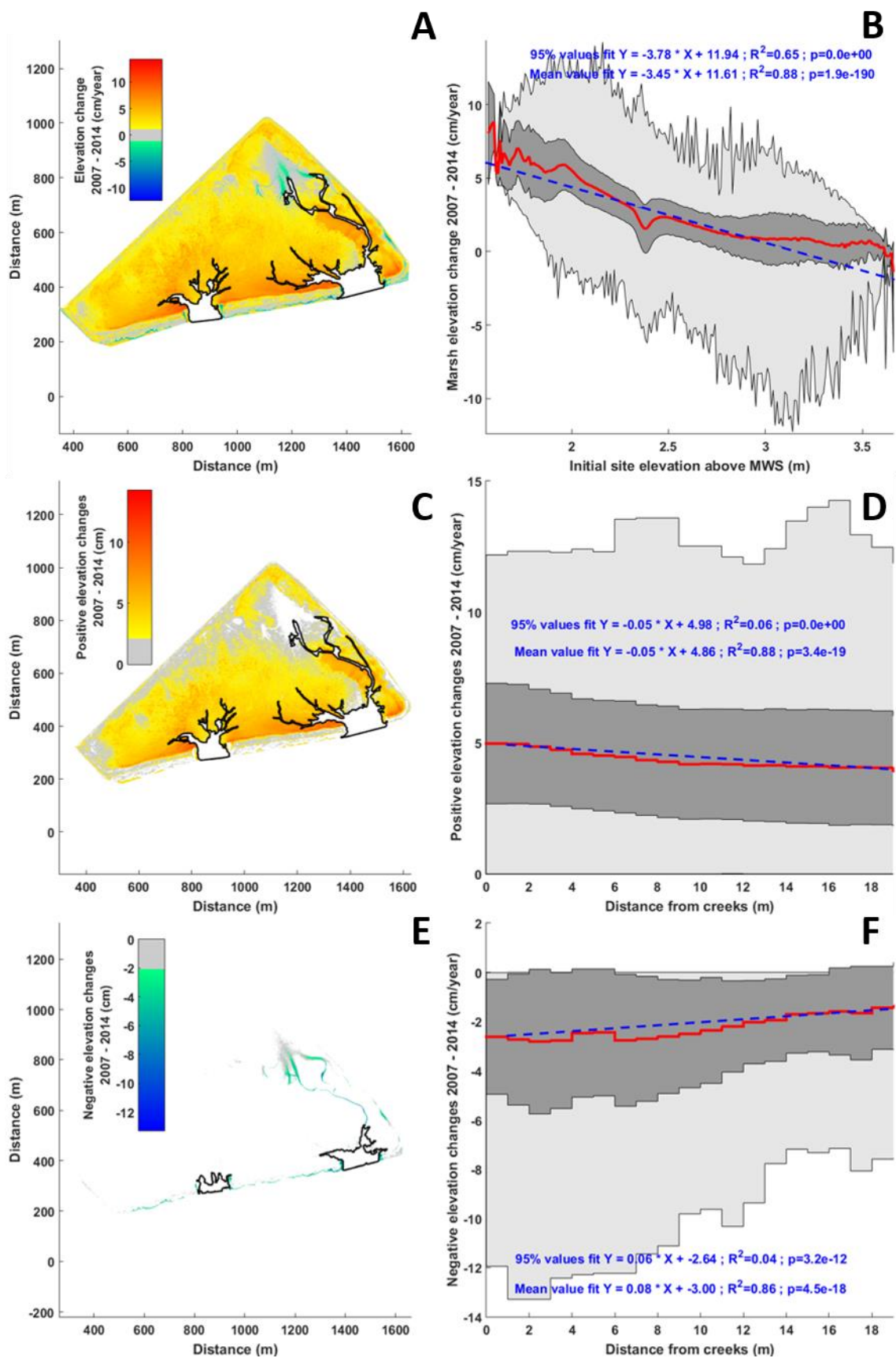


Appendix E8: As Appendix E1 but for Steart





Appendix E9: As Appendix E1 but for Tollesbury



Appendix E10: As Appendix E1 but for Welwick