Assessing the extreme risk of coastal inundation due to climate change: A case study of Rongcheng, China

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Supplementary Information includes:

Table S1 Increase percentage of inundated area (a), expected direct losses (b) and affected population (c) and GDP (d) exposed to inundation risk in future compared to the current (unit: %).

(a)

Time scale	Recurrence period (years)	RCP 2.6		RCP 4.5		RCP 8.5	
		low	high	low	high	low	high
2050	50	3.39	6.31	3.77	6.51	4.35	7.50
	100	3.23	6.17	3.62	6.37	4.20	7.41
	200	3.23	6.61	3.62	7.05	4.20	9.14
	500	3.32	9.38	3.98	9.64	5.42	10.64
	1000	5.02	9.34	5.71	9.51	7.30	10.35
2100	50	5.13	12.31	6.31	15.83	8.95	19.87
	100	4.98	14.21	6.17	15.83	10.08	19.54
	200	5.01	14.08	6.61	15.55	12.09	19.26
	500	6.78	13.81	9.38	15.30	11.90	18.50
	1000	8.24	13.53	9.34	14.98	11.73	17.87

(b)

Time scale	Recurrence period (years)	RCP 2.6		RCP 4.5		RCP 8.5	
		low	high	low	high	low	high
2050	50	12.75	24.49	14.32	25.20	16.64	29.29
	100	12.21	23.37	13.68	24.13	15.89	27.95
	200	11.69	22.38	13.09	23.12	15.21	26.84
	500	11.09	21.41	12.42	22.11	14.47	25.64
	1000	10.79	20.76	12.10	21.44	14.08	24.83
2100	50	19.76	43.28	24.49	50.17	34.96	66.95
	100	18.86	41.46	23.37	48.01	33.41	63.92
	200	18.06	39.81	22.38	46.05	32.13	61.21
	500	17.23	37.87	21.41	43.74	30.63	58.08
	1000	16.74	36.56	20.76	42.21	29.62	56.00

(c)

Time scale	Recurrence period (years)	RCP 2.6		RCP 4.5		RCP 8.5	
		low	high	low	high	low	high
2050	50	5.98	10.58	6.56	10.90	7.46	12.48
	100	4.95	9.52	5.57	9.84	6.47	11.47
	200	4.97	10.82	5.57	11.64	6.47	13.87
	500	5.03	12.07	6.57	12.36	8.72	13.64
	1000	7.24	11.50	7.82	11.74	8.97	12.89
2100	50	8.70	20.58	10.58	23.53	14.77	29.01
	100	7.69	19.64	9.52	21.80	16.09	27.10
	200	7.72	18.94	10.82	21.05	16.29	28.03
	500	10.02	17.87	12.07	20.24	15.37	26.70
	1000	10.05	17.42	11.50	21.15	14.64	25.33

(d)

Time scale	Recurrence period (years)	RCP 2.6		RCP 4.5		RCP 8.5	
		low	high	low	high	low	high
2050	50	4.18	7.54	4.61	7.76	5.26	8.90
	100	3.66	7.01	4.11	7.24	4.77	8.43
	200	3.68	7.86	4.12	8.41	4.78	10.95
	500	3.74	9.46	4.80	9.67	6.44	10.58
	1000	6.09	9.01	6.47	9.19	7.20	10.04
2100	50	5.64	13.43	6.88	15.95	9.66	19.43
	100	5.30	13.96	6.56	15.37	11.01	18.88
	200	5.71	14.38	7.86	15.92	12.51	20.50
	500	8.14	13.66	9.46	15.30	11.83	19.48
	1000	7.96	13.28	9.01	15.61	11.33	18.49

Table S2 Expected direct losses (million, dollar) to main land-use types in 2050 and 2100 given the high degree of RCP 8.5 scenario

T	Current				2050 RCP8.5 (high degree)				2100 RCP8.5 (high degree)			
(years)	R	F	W	G	R	F	W	G	R	F	W	G
50	**436.81**	65.61	18.88	9.48	**564.82**	84.09	24.82	11.97	**729.55**	106.69	33.19	14.91
100	**467.90**	69.93	20.29	10.08	**598.77**	88.66	26.45	12.58	**767.32**	111.50	35.25	15.53
200	**499.18**	74.21	21.72	10.66	**633.29**	93.17	28.15	13.17	**805.05**	116.26	37.35	16.14
500	**540.85**	79.80	23.68	11.41	**679.63**	99.05	30.55	13.94	**855.30**	122.43	40.16	16.92
1000	**572.00**	83.99	25.16	11.97	**714.13**	103.44	32.39	14.51	**892.63**	127.03	42.27	17.51

Abbreviations: R, residential land; F, farmland; W, woodland; G, grassland.

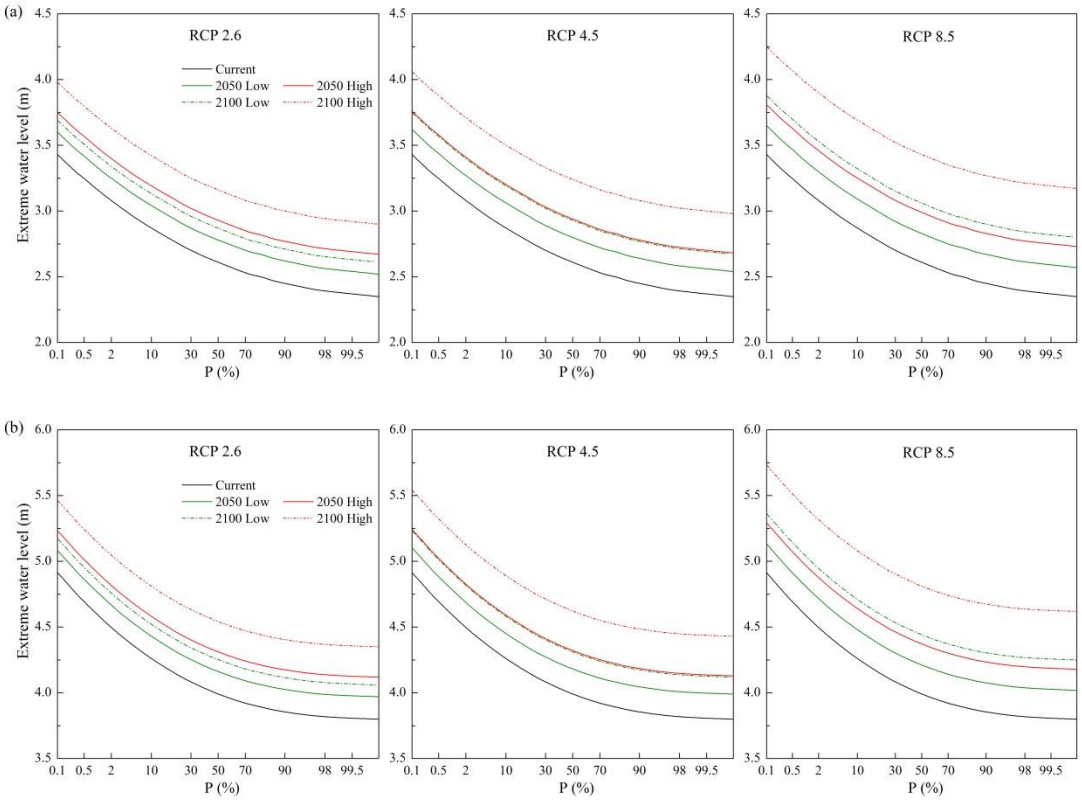

Fig. S1 Cumulative probability distributions of extreme water levels for Chengshantou (a) and Shidao (b) stations.

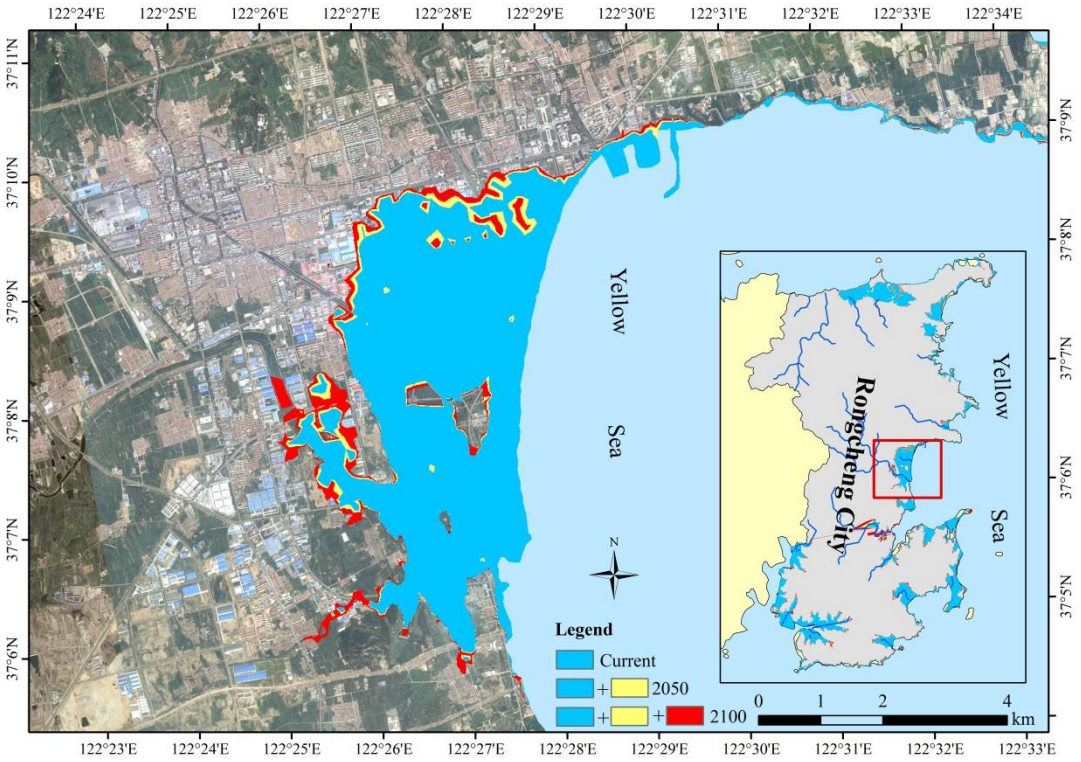

Fig. S2 Inundation map for Rongcheng City in 2050 and 2100 given a 100-year recurrence period of extreme water level.