

Impacts of Land Use Changes on Wetland Ecosystem Services in the Tumen River Basin

Table S1. The information list of landsat image data.

Sensor	Pathway	Time	Resolution	Band	Cloud
Landsat MSS	123/30	19 July 1976	60m	4	0%
Landsat MSS	124/29	20 July 1976	60m	4	6%
Landsat MSS	124/30	25 August 1976	60m	4	1%
Landsat MSS	124/31	25 August 1976	60m	4	1%
Landsat MSS	125/29	21 June 1975	60m	4	0%
Landsat MSS	125/30	21 June 1975	60m	4	1%
Landsat MSS	123/30	19 July 1975	60m	4	0%
Landsat OLI	114/30	9 August 2016	30m	11	2%
Landsat ETM+	115/30	7 July 2016	30m	8	0%
Landsat OLI	115/31	15 July 2016	30m	11	14%
Landsat OLI	116/30	6 July 2016	30m	11	4%
Landsat OLI	116/31	1 July 2016	30m	11	4%
Landsat OLI	114/30	30 July 2018	30m	11	1%
Landsat OLI	114/31	29 September 2017	30m	11	1%
Landsat OLI	115/29	19 August 2017	30m	11	2%
Landsat OLI	115/30	19 August 2017	30m	11	6%
Landsat OLI	115/31	16 June 2017	30m	11	15%
Landsat OLI	116/29	25 July 2017	30m	11	13%
Landsat OLI	116/30	26 August 2017	30m	11	63%
Landsat OLI	116/31	27 September 2017	30m	11	13%

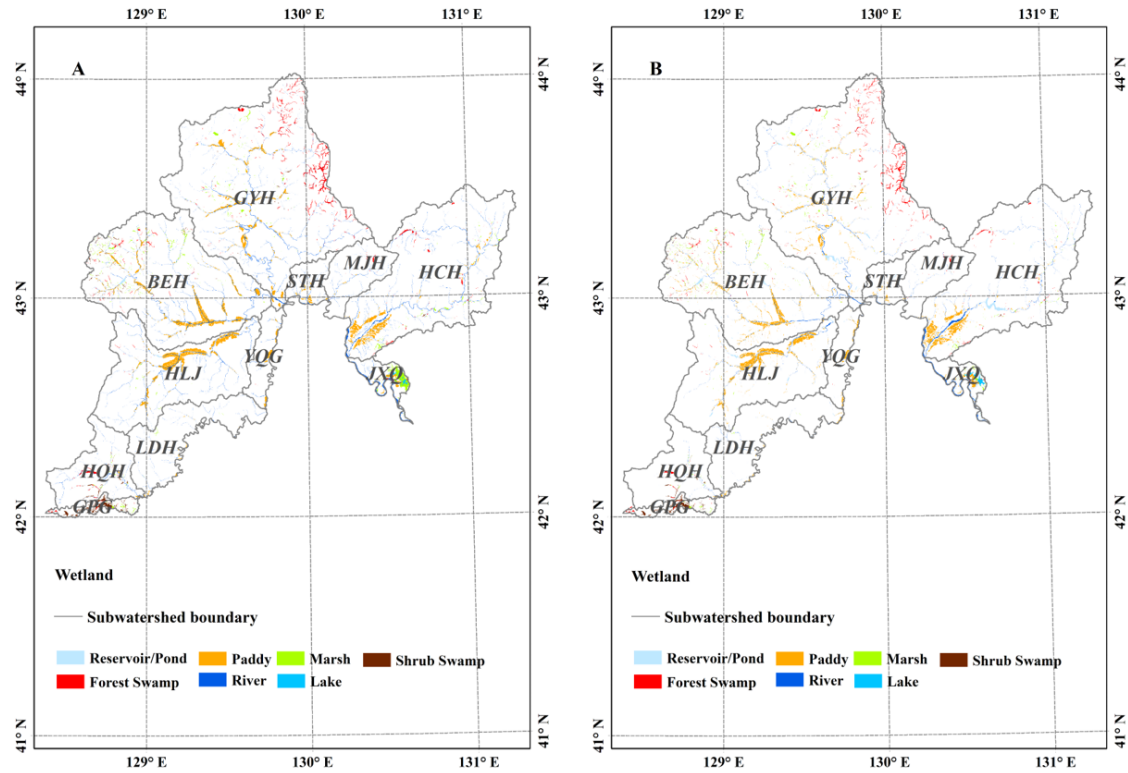


Figure S1. Wetland in the TRB. (A) is the wetland use data in 1976, and (B) is the wetland use data in 2016.

Table S2. Threators.

Threats	Max_dist (km)	Weight	Decay
Farmland	1	0.7	Linear
Construction land	3	1	Exponential

Table 3. Sensitivity table.

Land Use	Habitat	Threators	
		Farmland	Construction land
Grassland	1	0.3	0.5
Forest swamp	1	0.7	0.8
Shrub swamp	1	0.8	0.7
Marsh	1	0.7	0.8
Lake	1	0.8	0.7
Reservoir/pond	1	0.7	0.7
River	1	0.8	0.9
Paddy	0.4	0.3	0.5
Farmland	0.4	0.3	0.5
Construction land	0	0	0
Bare land	0	0	0
Woodland	0.8	0.7	0.5

Table S4. Land use and carbon density(t/ha).

Wetland	Carbon Density			
	C_above (t/ha)	C_below (t/ha)	C_soil (t/ha)	C_dead (t/ha)
Grassland	2.33	7.30	43.72	3.80
Forest swamp	51.12	1.70	169.77	2.49
Shrub swamp	4.49	2.12	221.42	0.70
Marsh	2.32	1.84	197.49	0.74
Lake	2.75	0.00	144.13	0.00
Reservoir/pond	2.30	0.00	88.14	0.00
River	3.25	0.00	53.70	0.00
Paddy	4.70	0.00	33.46	0.00
Farmland	4.70	0.00	33.46	0.00
Construction land	0.00	0.00	0.00	0.00
Bare land	0.00	0.00	0.00	0.00
Woodland	60.03	30.01	160.92	2.16

Table S5. The datasets used for the water yield model.

Land Use	Kc	Root_Depth (mm)	Vegetation
Grassland	0.6	2600	1
Forest swamp	1.2	5000	1
Shrub swamp	1.2	5000	1
Marsh	1.2	4000	1
Lake	1	1	0
Reservoir/pond	1	1000	0
River	1	1000	0
Paddy	1.2	2000	1
Farmland	0.6	700	1
Construction land	0.1	1	0
Bare land	0.1	300	0
Woodland	1	7000	1

**Figure S2.** Status of drainage and reclamation of marsh wetlands in the TRB. (The black soil is the bare ground after the wetland vegetation was burned, and the white area is a drainage channel.)