Supplementary Material for

Investigating Aeolian Sand Erosion in the Arid Region of Xiliugou Tributary

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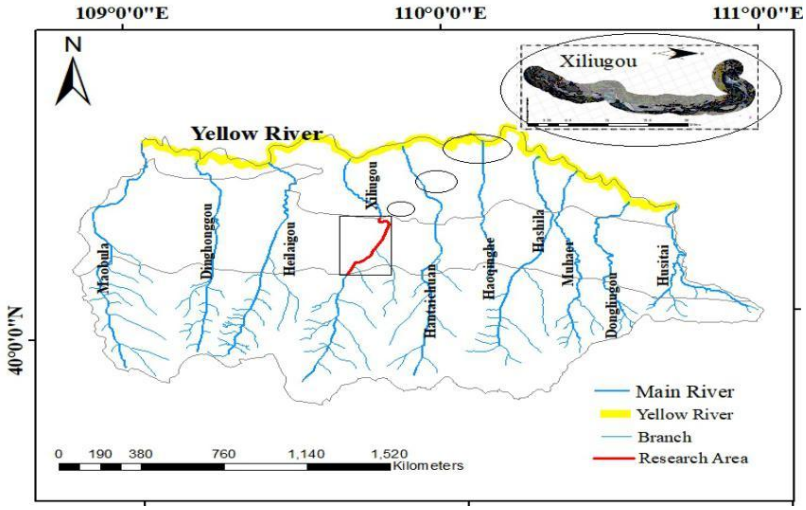
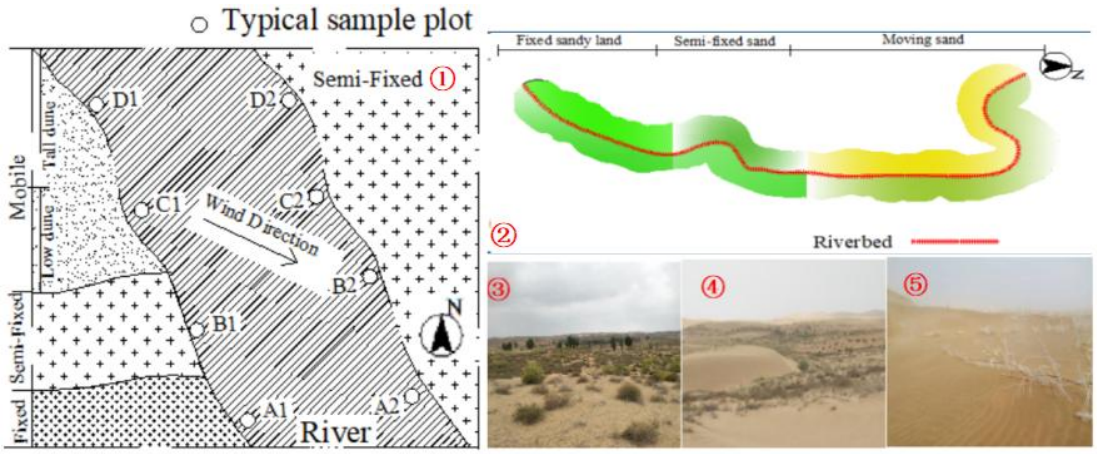
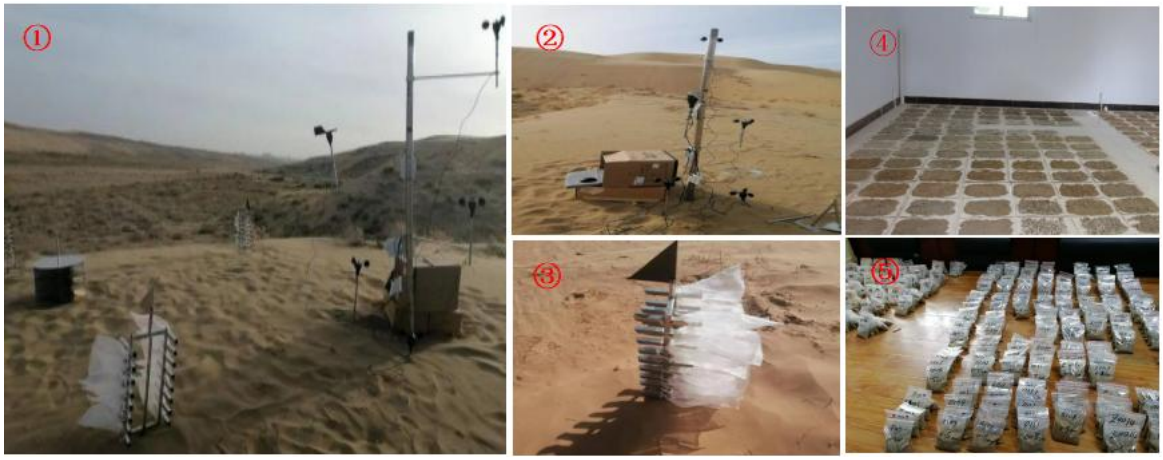


Fig .1 Location of the Xiliugou Tributary



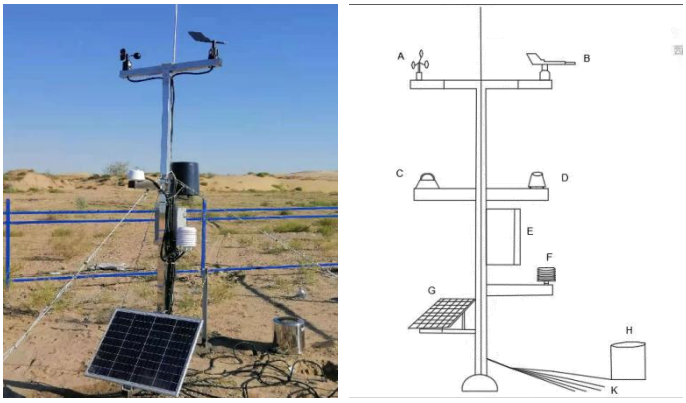
①Schematic layout of sample site;②Vegetation cover characteristics of underlying surface;③Fixed sand;④Semi-fixed sand;⑤Mobile sand

Fig.2 Observation point location layout and underlying surface feature diagram



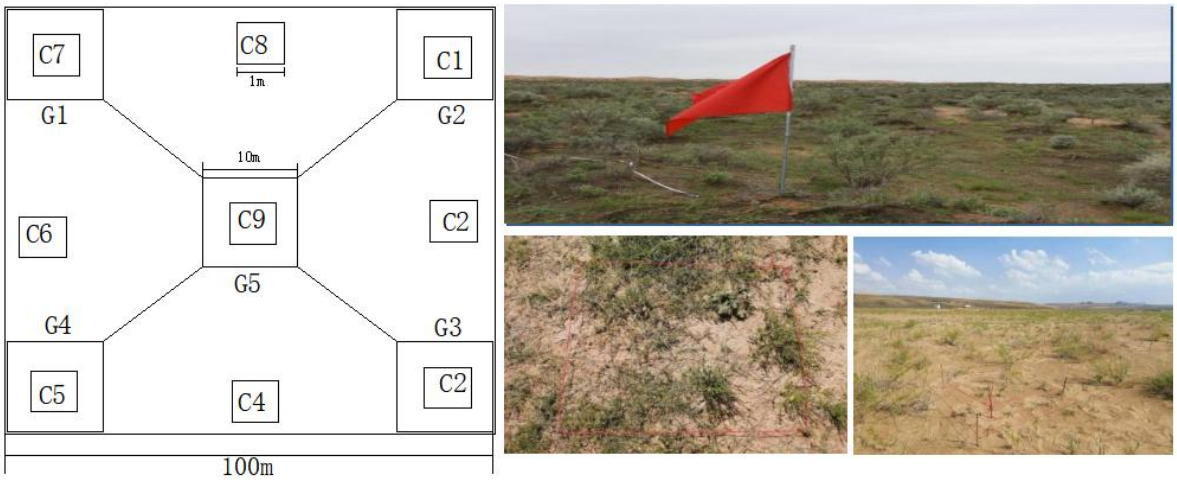
①Observation field instrument layout;② weather station(HOBO);③Sand collector;④~⑤Soil sample

Fig. 3 Schematic diagram of instrument layout in observation site

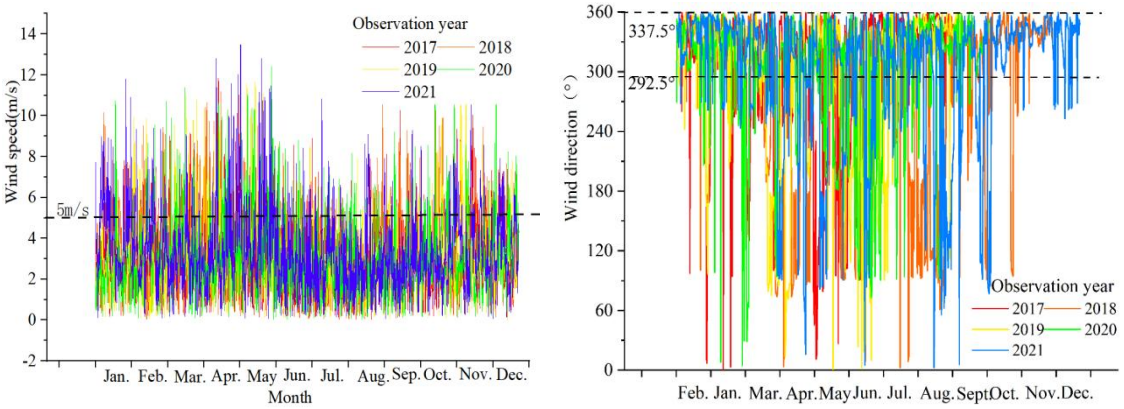


A：Wind cup
B：Weather vane
C：Solar radiation sensor
D：Rainfall sensor
E：Data acquisition box
F：Humidity sensor
G：Solar panel
H：Evaporation sensor
K：Geothermal sensor

Fig. 4　Operational monitoring indicators of automatic weather stations



①Diagram of quadrat((C1-9: Herbaceous quadrat; G1-5 Shrub quadrat));②sample selection; ③ Herb quadrat; ④ Shrub quadrat
Fig.5　Plot layout and survey



1-a. Annual wind speed variation characteristics

1-b. Characteristics of sand wind direction

Fig. 6　Chart of sand driving wind speed and wind direction variation in the study area

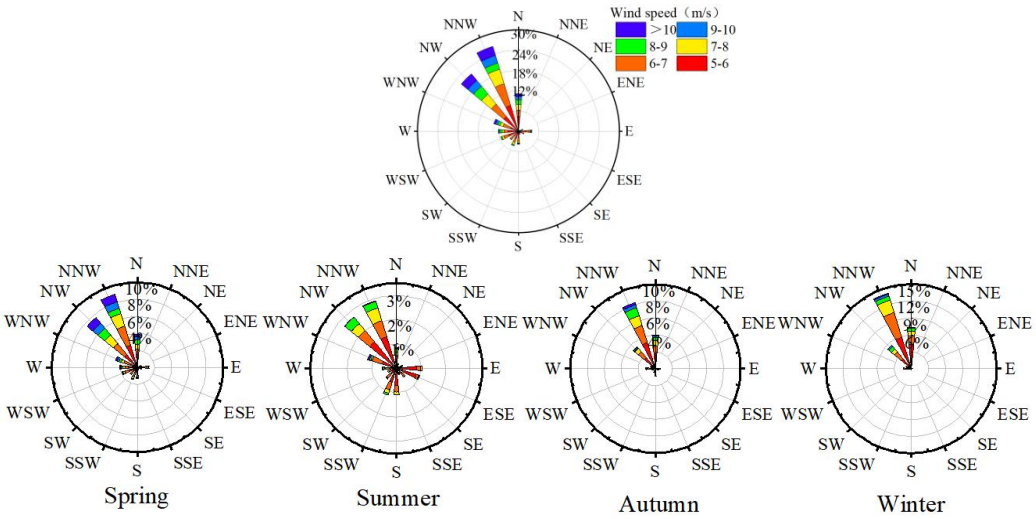
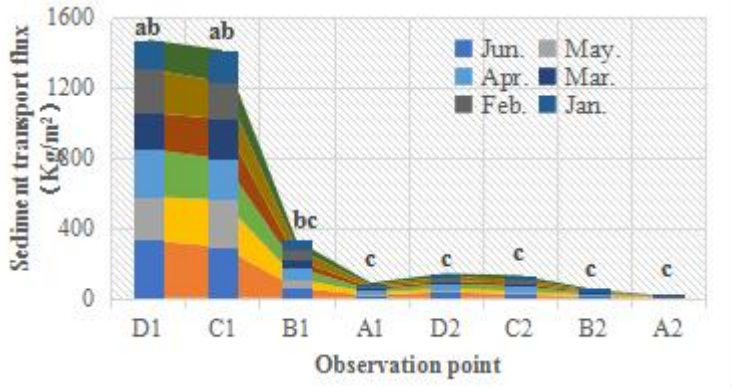


Fig. 7　Rose charts of annual and seasonal sand-driving wind conditions in the study area



Note: Different lowercase letters a.b.c indicate differences; The capital letter A.B.C.D indicates the monitoring site number (the same below).

Fig. 8 Variation characteristics of sediment flux on unit section of different underlying surfaces

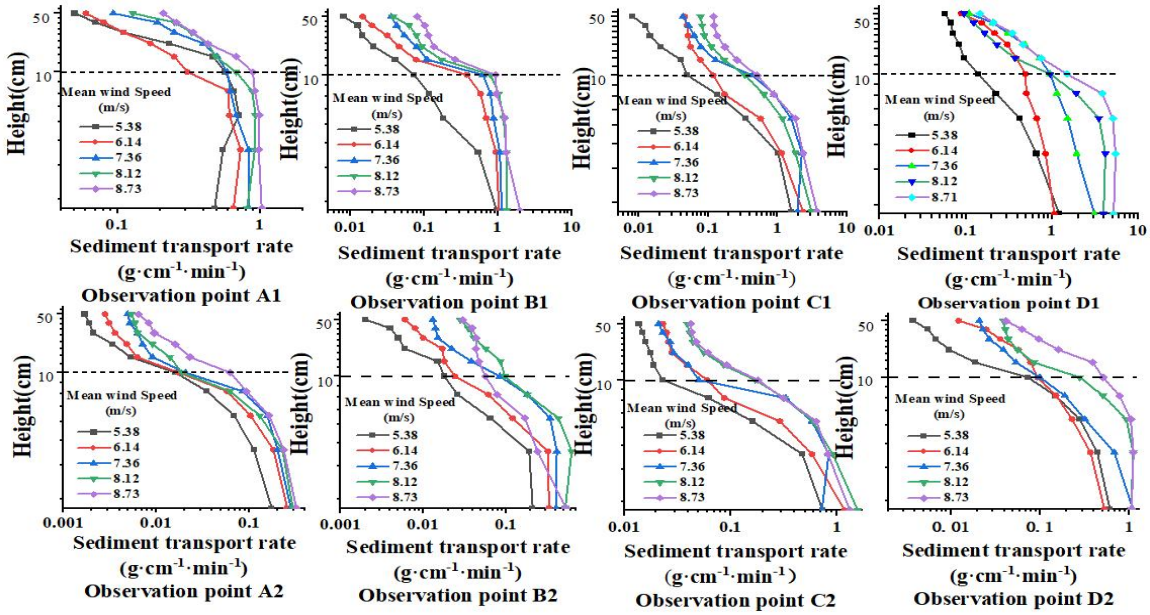


Fig. 9　Vertical line variation of pore conversion and sediment transport rate within 0~50cm height

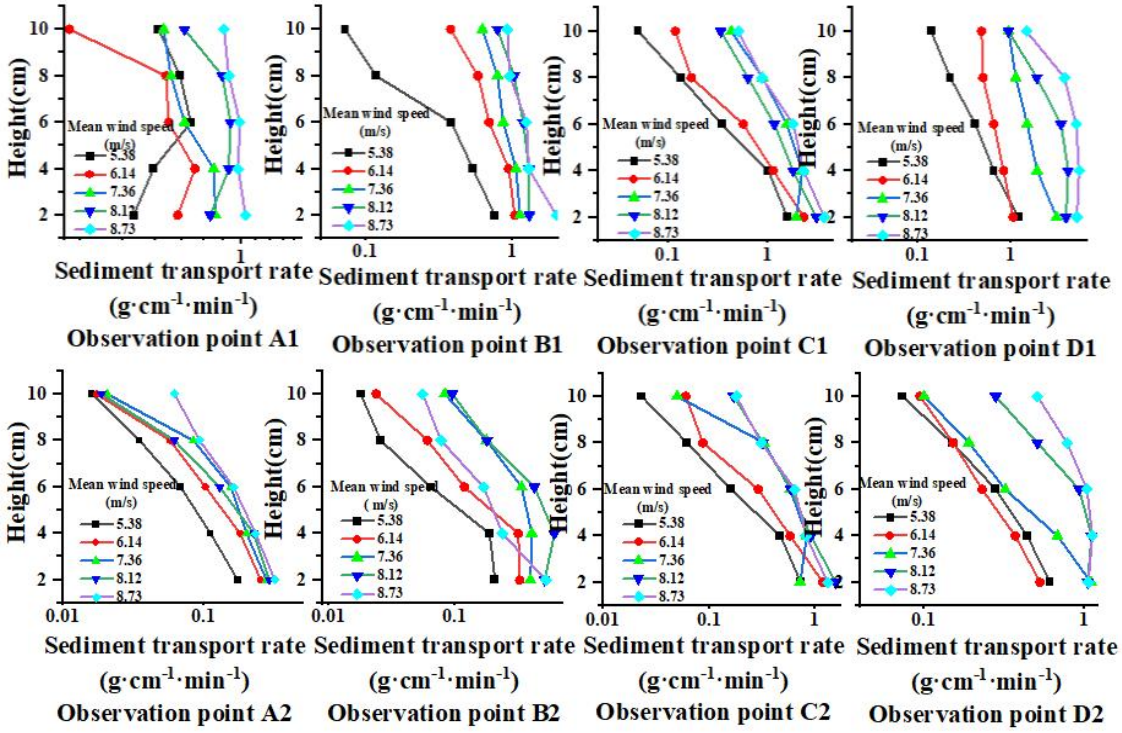


Fig. 10 Vertical line variation of pore conversion and transport rate within 0~10cm height

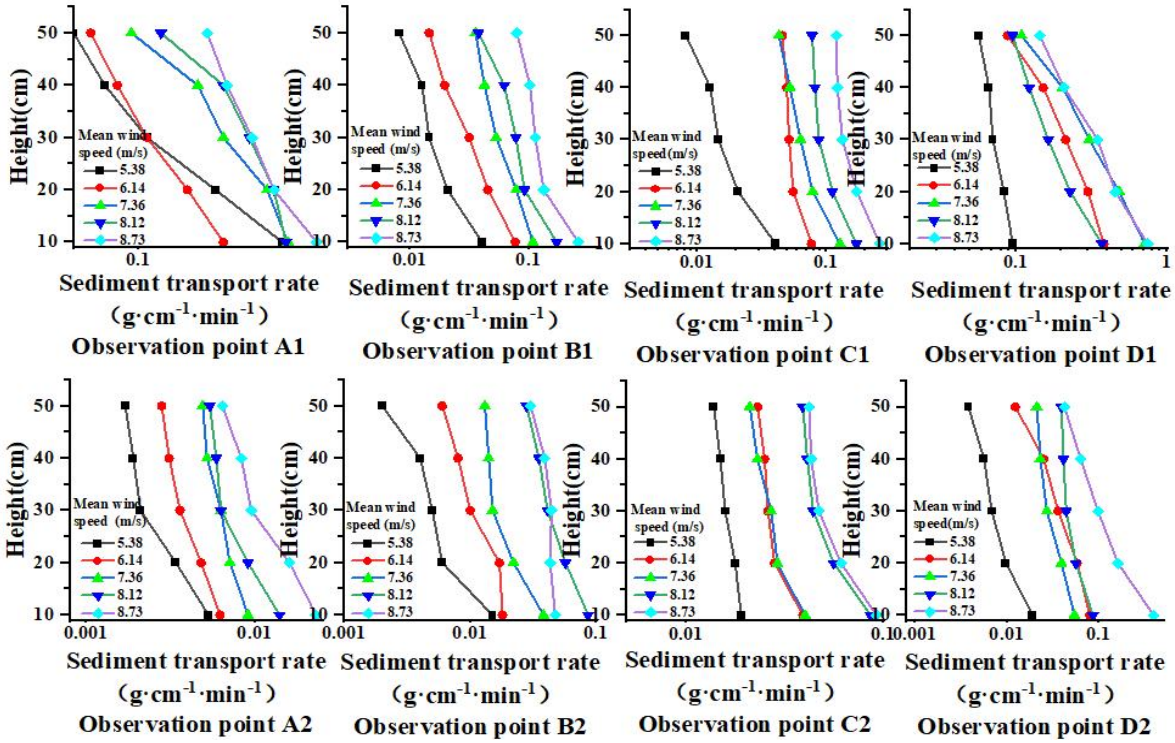


Fig. 11 Vertical variation of pore conversion and sediment transport rate within 10 to 50cm height

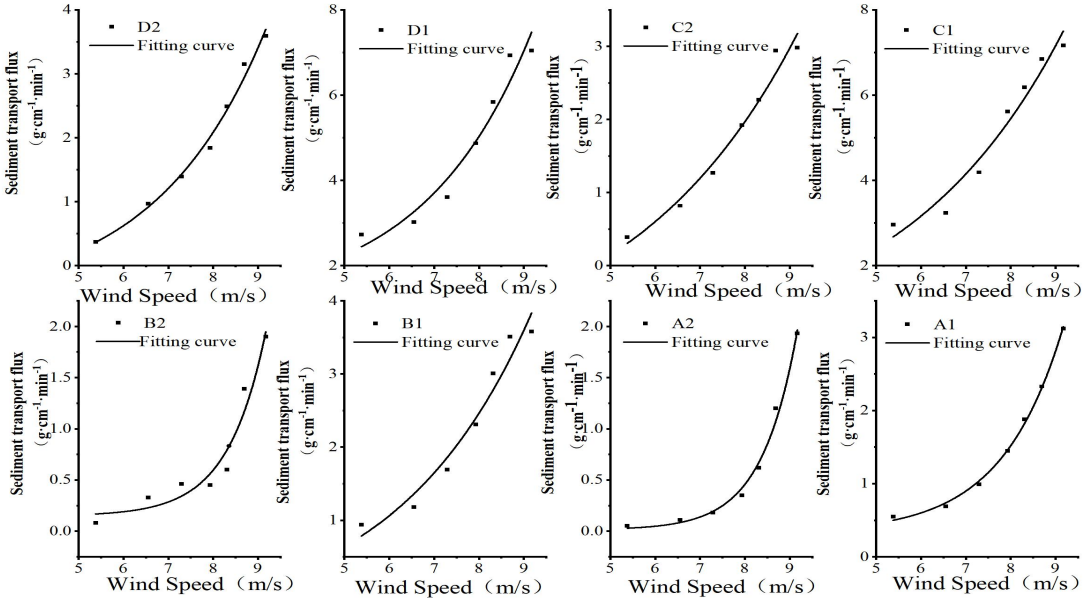


Fig. 12 Variation trend of downwind sediment transport rate on different underlying surfaces

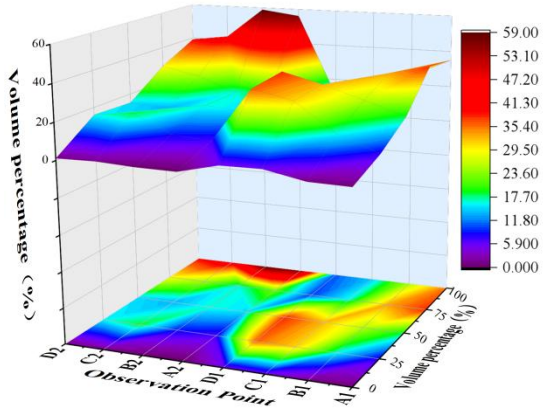


Fig. 13 Characteristics of wind-eroded sand particle size on different underlying surfaces

Fig. 14 Factors affecting human activities

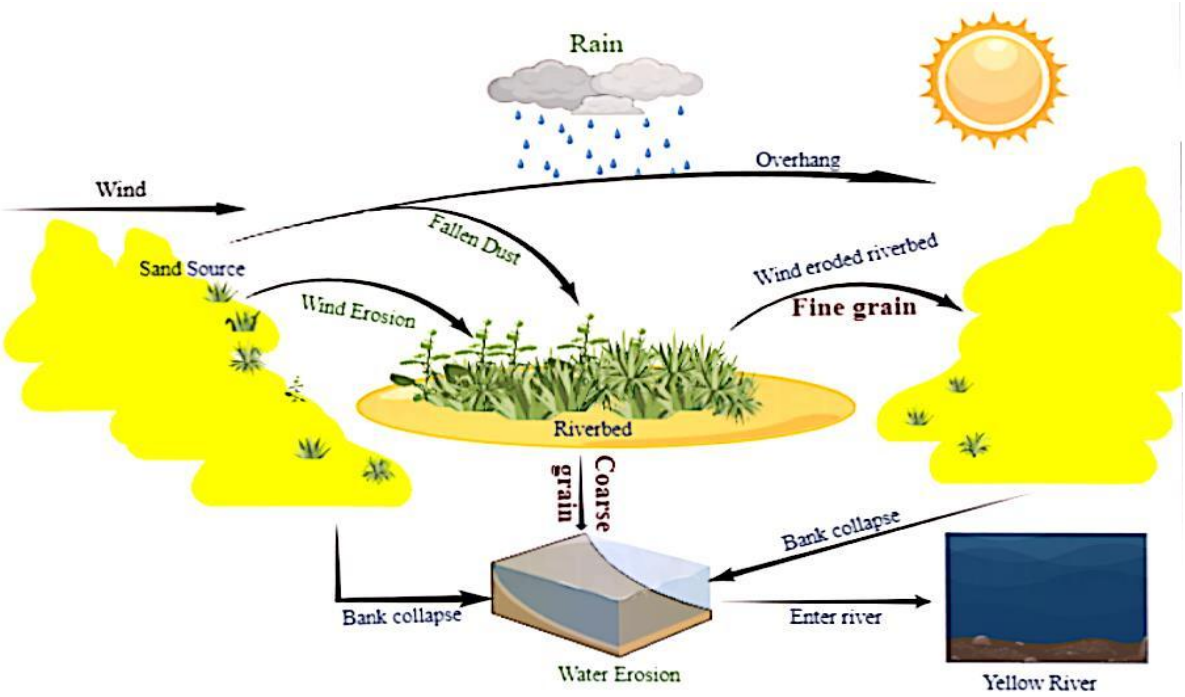


Fig. 15 Schematic diagram of wind-eroded sand deposition process in the channel

Tab. 1 The underlying surface characteristics of the study area

Characteristic	Site type		Fixed sandy land	Semi-fixed sandy	Moving sandy land
Community characteristics	Community type	Unit	*Caragana korshinskii* +*Artemisia ordosica* −*Corispermum hyssopifolium*	*Artemisia ordosica*−*Psamm ochloa villosa* r	-
	Quantity	Strain	14~23	16~23	-
	Height	m	0.55~1.76	0.37~0.71	0.55~0.73
	Major axis	m	0.77~4.12	0.31~1.16	0.74~1.48
	Minor axis	m	0.69~3.18	0.28~1.01	0.54~1.38
	Coverage	%	30.81~44.42	19.37~27.52	-
Riverbed characteristics	Width	m	0.35	0.38	0.52
	Length	m	2.27	5.49	10.37
	Area	km^2	0.99	0.97	5.37

Tab. 2 The fitting function of total sediment transport rate and wind speed on different underlying surfaces

Type of underlying surface		Point	Formula	Correlation coefficient R^2
Fixed sandy land		A1	y = 0.065e0.4778x	R^2 = 0.9619
		A2	y = 0.0002e0.9792x	R^2 = 0.9656
Semi-fixed sand		B1	y = 0.1294e0.3987x	R^2 = 0.9653
		B2	y = 0.0016e0.7539x	R^2 = 0.9216
Moving sand	Low dune	C1	y = 0.6421e0.267x	R^2 = 0.9506
		C2	y = 0.0201e0.5644x	R^2 = 0.9845
	High dune	D1	y = 0.714e0.2867x	R^2 = 0.9317
		D2	y = 0.0071e0.5955x	R^2 = 0.9849