

Table S1. The decadal mean frost-free season (FFS) in representative wine growing sites

Representative site	Decadal mean FFS ^a				
	1967-1976	1977-1986	1987-1996	1997-2006	2007-2016
Tsitsihar	150.6 ±9.6	150.0 ±10.2	157.3 ±11.0	167.8 ±14.7	161.4 ±8.2
Wuwei	163.4 ±13.1	165.3 ±13.4	163.8 ±8.9	172.3 ±16.7	190.1 ±13.2
Shihezi	169.8 ±9.8	170.2 ±6.5	178.7 ±11.7	184.4 ±16.9	190.9 ±7.5
Yinchuan	172.3 ±13.4	169.4 ±10.3	182.7 ±6.1	181.0 ±10.3	201.0 ±15.0
Wuhai	180.6 ±10.3	176.4 ±8.7	186.6 ±16.9	185.7 ±15.6	183.6 ±10.8
Yanqi	174.8 ±14.9	184.0 ±12.1	183.4 ±13.4	191.8 ±16.0	186.6 ±13.7
Huailai	180.0 ±13.0	185.6 ±10.6	200.0 ±9.1	206.1 ±10.0	202.1 ±13.9
Xiaxian	202.7 ±21.0	210.3 ±15.3	204.1 ±9.8	206.3 ±9.4	210.8 ±10.0
Changli	208.1 ±7.8	208.2 ±9.8	214.6 ±13.0	220.1 ±9.4	211.8 ±11.9
Jingyangu	217.8 +13.1	222.9 ±8.8	227.2 ±11.7	237.3 ±12.9	245.8 ±17.7
Minquan	223.6 ±17.8	227.5 ±14.4	220.2 ±13.8	241.1 ±10.1	254.5 ±16.8
Penglai	224.6 ±21.5	231.5 ±12.1	240.5 ±12.8	243.4 ±9.2	240.3 ±17.9
Derong	274.3 ±10.5	268.5 ±11.2	280.4 ±13.2	286.7 ±13.6	282.8 ±12.6

^a indicated by mean value ± standard deviation

Table S2. The decadal mean dryness index (DI) during growing season (1st April-30th September) in representative wine growing sites

Representative site	Decadal mean DI ^a				
	1967-1976	1977-1986	1987-1996	1997-2006	2007-2016
Changli	0.9±0.5	0.9±0.4	1.0±0.3	1.3±0.5	1.1±0.3
Minquan	1.1±0.3	0.9±0.3	1.0±0.3	1.0±0.3	1.1±0.3
Penglai	1.1±0.5	1.3±0.4	1.4±0.6	1.4±0.7	1.2±0.4
Xiaxian	1.6±0.2	1.2±0.3	1.5±0.4	1.6±0.6	1.4±0.3
Tsitsihar	1.6±0.4	1.4±0.3	1.3±0.3	1.6±0.6	1.4±0.4
Jingyang	1.4±0.3	1.3±0.4	1.4±0.4	1.8±0.6	1.5±0.5
Huailai	1.8±0.7	1.8±0.5	1.8±0.6	1.8±0.4	1.8±0.6
Derong	2.1±0.1	2.0±0.7	1.8±0.4	1.4±0.3	1.9±0.7
Wuwei	3.9±0.2	3.9±0.3	3.4±1.2	3.4±1.0	4.7±0.7
Yinchuan	4.0±0.5	4.0±0.8	3.5±1.2	4.5±2.4	3.6±0.8
Shihezi	4.4±0.2	5.1±0.4	4.3±1.3	4.5±1.5	5.0±0.0
Wuhai	5.3±0.8	5.5±0.0	5.6±2.0	5.6±1.5	7.4±0.4
Yanqi	16.0±7.3	15.3±4.2	7.2±2.5	9.4±4.5	14.4±9.8

^a indicated by mean value ± standard deviation

Table S3. The mean value and variation rate of extreme low temperature (ELT) throughout the year in representative winegrowing sites from 1967 to 2016

Representative site	ELT		
	Mean (°C) ^a	Rate (°C/10 years)	Sig ^b
Tsitsihar	-31.0±3.1	0.3	**
Shihezi	-30.8±3.1	0.4	NS
Yanqi	-22.7±2.9	0.7	*
Wuhai	-22.6±3.4	0.2	NS
Wuwei	-21.5±3.0	0.5	NS
Yinchuan	-20.4±2.6	0.6	+
Huailai	-18.8±2.0	0.8	**
Changli	-16.6±2.8	0.5	+
Xiaxian	-15.8±2.0	0.8	*
Minquan	-11.6±2.2	-0.3	NS
Jingyang	-11.2±2.5	0.5	*
Penglai	-10.9±2.2	0.4	NS
Derong	-4.9±1.2	0.5	*

^a indicated by mean value ± standard deviation

^b Significance: ** for $p < 0.01$, * for $p < 0.05$, + for $p < 0.1$, NS for $p \geq 0.1$

Table S4. The mean value and variation rate of accumulated effective temperature (AET) during growing season (1st April-30th September) in representative winegrowing sites from 1967 to 2016

Representative site	AET		
	Mean (°C) ^a	Rate (°C/10 years)	Sig ^b
Wuwei	1429±160	91	***
Tsitsihar	1427±113	52	***
Yinchuan	1674±137	72	***
Yanqi	1724±92	42	***
Derong	1802±99	23	+
Huailai	1809±120	40	***
Penglai	1908±125	61	***
Shihezi	1922±140	72	***
Wuhai	1955±116	34	***
Changli	1969±122	49	***
Jingyang	2159±117	39	**
Xiaxian	2225±109	36	*
Minquan	2310±96	-10	NS

^a indicated by mean value ± standard deviation

^b Significance: *** for $p < 0.001$, ** for $p < 0.01$, * for $p < 0.05$, + for $p < 0.1$, NS for $p \geq 0.1$

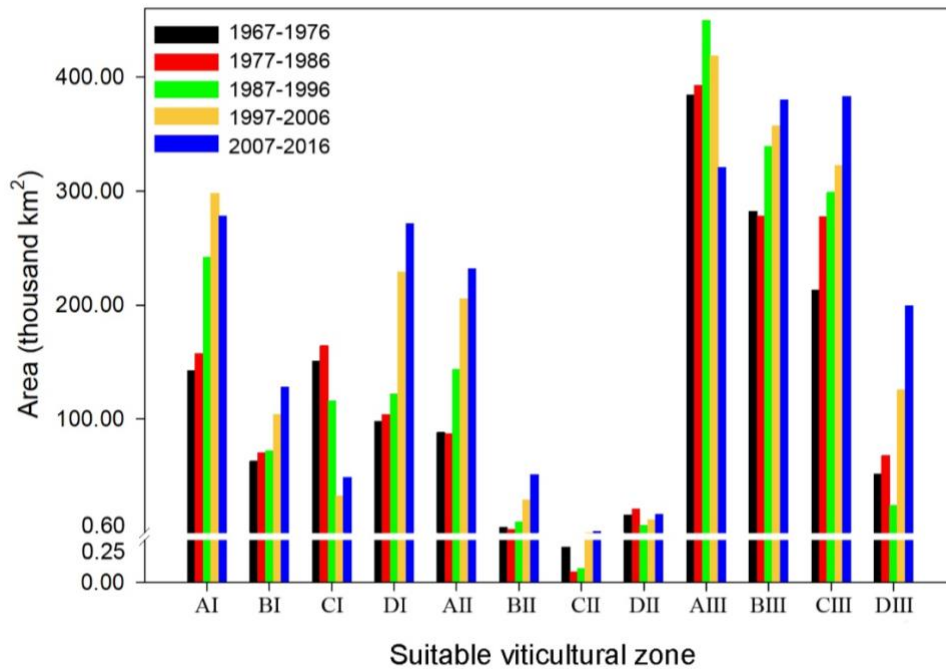


Figure S1. The decadal variation of the area of different climate type in suitable viticultural zone

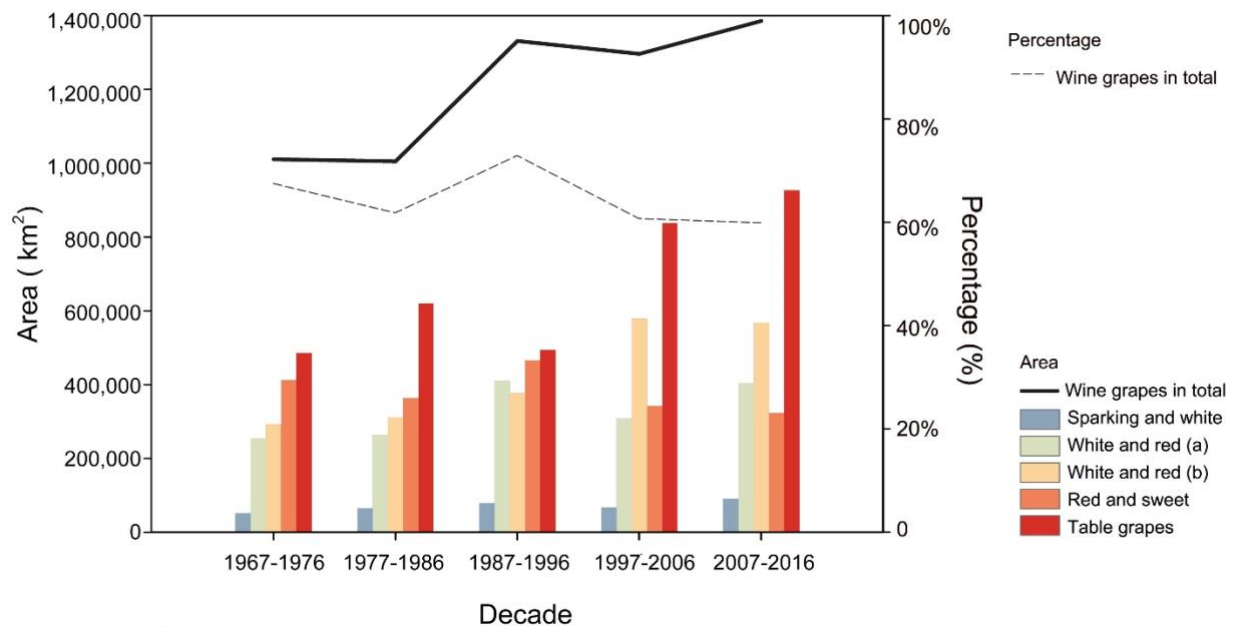


Figure S2. The decadal variation of the area of different wine type zone and the percentage of wine grapes. White and red (a) represents wines with fresh flavor, medium alcohol and medium body, while white and red (b) represents wines with the style of strong flavor, high alcohol and full body