

Supplemental Information:

	Rt (g C/m ²)		Rh (g C/m ²)	
	Shrub	Invaded	Shrub	Invaded
2011 growing season (Sep - Aug)	695 (51)	1050 (44)	445 (26)	428 (19)
2010 (Mar-Jun)	307 (18)	423 (13)	177 (14)	203 (20)
2011 (Mar - Jun)	315 (28)	475 (24)	195 (12)	218 (9)
Entire measurement period (Feb 2010 - Aug 2011)	1136 (69)	1646 (55)	714 (25)	732 (43)

Table S1: Cumulative respiration for Rt and Rh in invaded and shrub areas in four time periods; the 2011 growing season (Sep 10 – Jul 11), spring of 2010 and 2011 for comparison of similar periods in different years, and the entire measurement period (Feb 10 – Jul 11). Numbers in parentheses are standard error based on four replicate chambers.

	Rh		Rt	
	shrub	invaded	shrub	invaded
<i>ln flux = B0 + B1*VWC + B2*VWC^2</i>				
R²	0.21	0.016	0.456	0.427
B0	0.387	0.727	-0.0541	-0.0750
B1	0.0941	0.0299	0.217	0.267
B2	-0.003586	-0.00118	-0.00773	-0.00978
<i>ln flux = B0 + B1*temp + B2*temp^2</i>				
R²	0.271	0.192	0.448	0.439
B0	0.0608	-0.248	0.105	-0.122
B1	0.110	0.119	0.170	0.198
B2	-0.003365	-0.00284	-0.00584	-0.00556
<i>ln flux = B0 + B1*temp + B2*VWC + B3*VWC*temp</i>				
R²	0.33	0.261	0.56	0.58
B0	1.422	0.822	2.259	2.489
B1	-0.0437	-0.0126	-0.0906	-0.0895
B2	-0.0709	-0.0567	-0.118	-0.144

Table S2: The fit and parameters of quadratic curves between soil moisture (VWC) and temperature (°C) and Rt and Rh in shrub and invaded areas.

	Rh		Rt	
	shrub	invaded	shrub	invaded
VWC >15%				
VWC and Temp R ²	0.433	0.509	0.49	0.651
Temp partial corr ²	0.377	0.479	0.489	0.65
VWC 10-15%				
VWC and Temp R ²	0.276	0.518	0.19	0.521
Temp partial corr ²	0.276	0.517	0.181	0.517
VWC <10%				
VWC and Temp R ²	0.147	0.031	0.428	0.432
Temp partial corr ²	0.03	0.032	0.067	0.017

Table S3: The linear fit between respiration, soil temperature and moisture for Rh and Rt in invaded and shrub areas and the partial correlation of temperature after moisture effects have been accounted for at VWC >15%, 10-15% and <10%.