



Supplement of

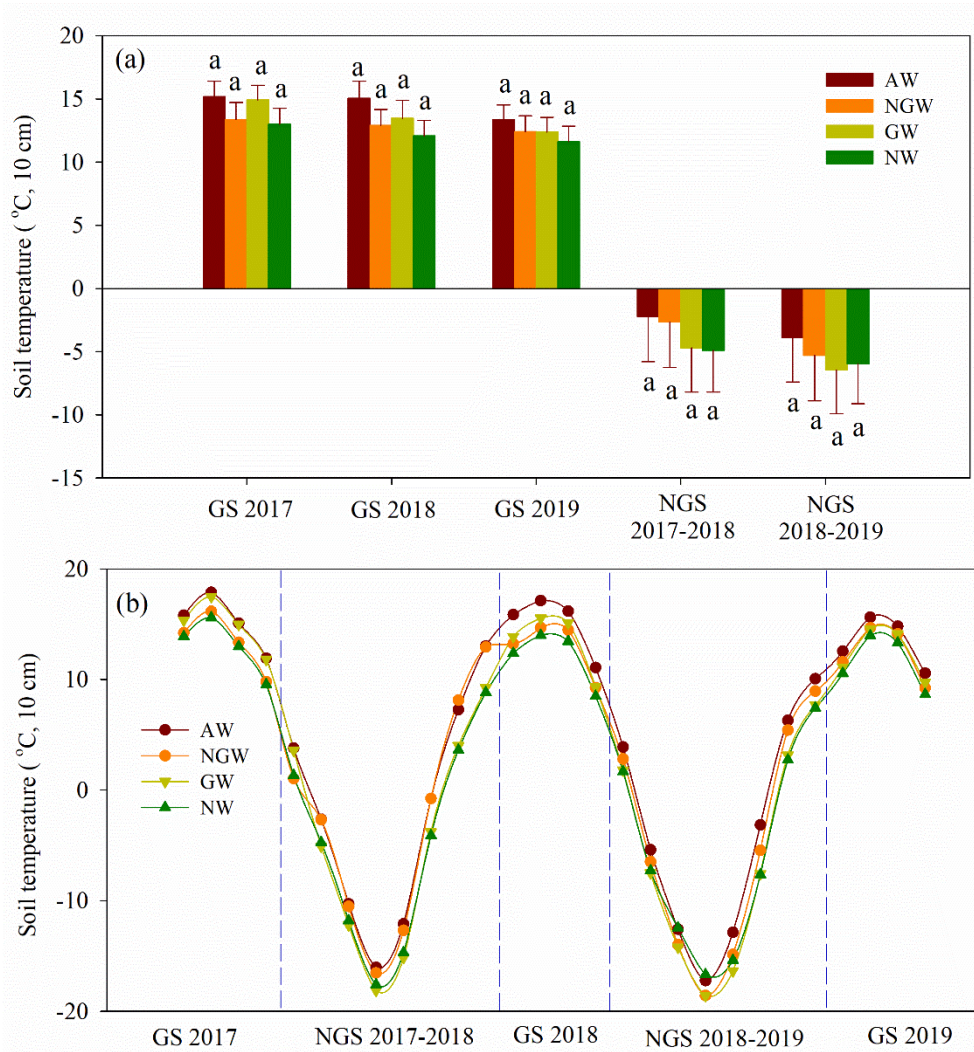
Different responses of ecosystem CO₂ and N₂O emissions and CH₄ uptake to seasonally asymmetric warming in an alpine grassland of the Tianshan

Yanming Gong et al.

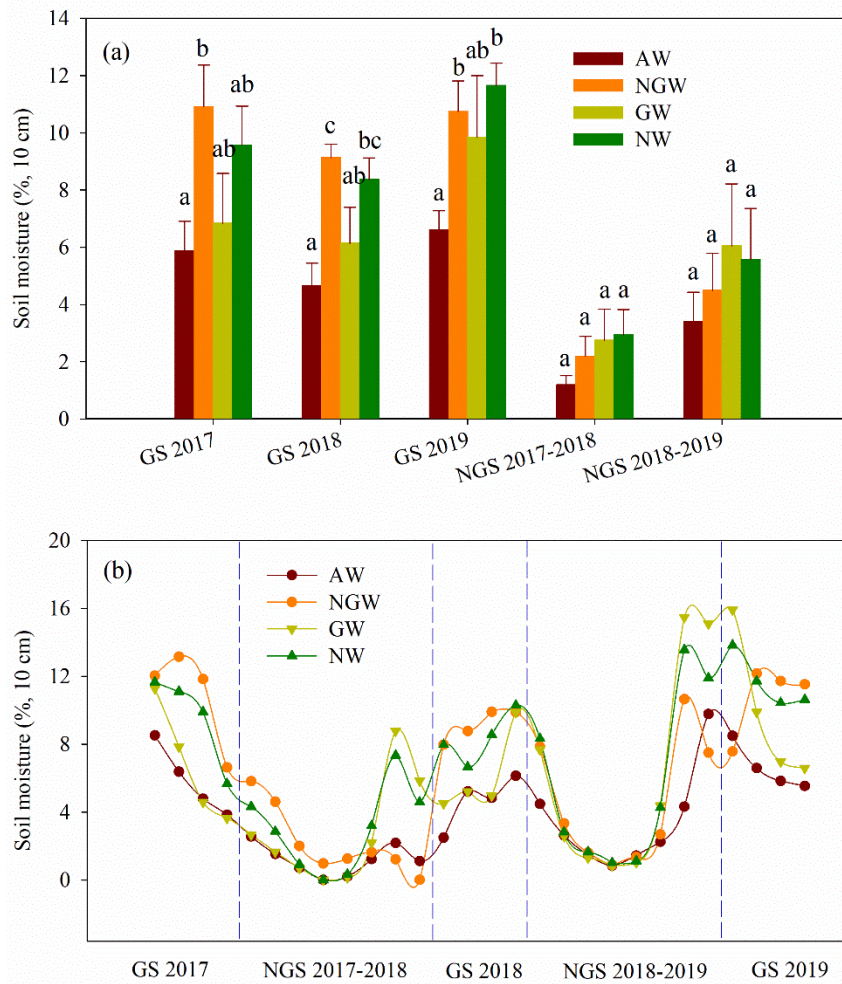
Correspondence to: Yanyan Liu (liuyany@ms.xjb.ac.cn)

The copyright of individual parts of the supplement might differ from the article licence.

1 **Different responses of ecosystem CO₂ and N₂O emissions and CH₄ uptake to**
 2 **seasonally asymmetric warming in an alpine grassland of the Tianshan Mountains**



3
 4 Figure S1 Variation in soil temperature (at 10-cm depth) under four treatments in
 5 alpine grassland from June 2017 to September 2019. GS, growing season; NGS, non-
 6 growing season; AW, warming throughout the year; NGW, warming in non-growing
 7 season only; GW, warming in growing season only; NW, non-warming. Significant
 8 differences among AW, NGW, GW, and NW from analysis of variance (ANOVA) are
 9 denoted as bars within the same season with different lowercase letters, $P < 0.05$; data
 10 points are the mean \pm standard error.



11

12 Figure S2 Variation in soil moisture (at 10-cm depth) under four treatments in

13 alpine grassland from June 2017 to September 2019. GS, growing season; NGS, non-

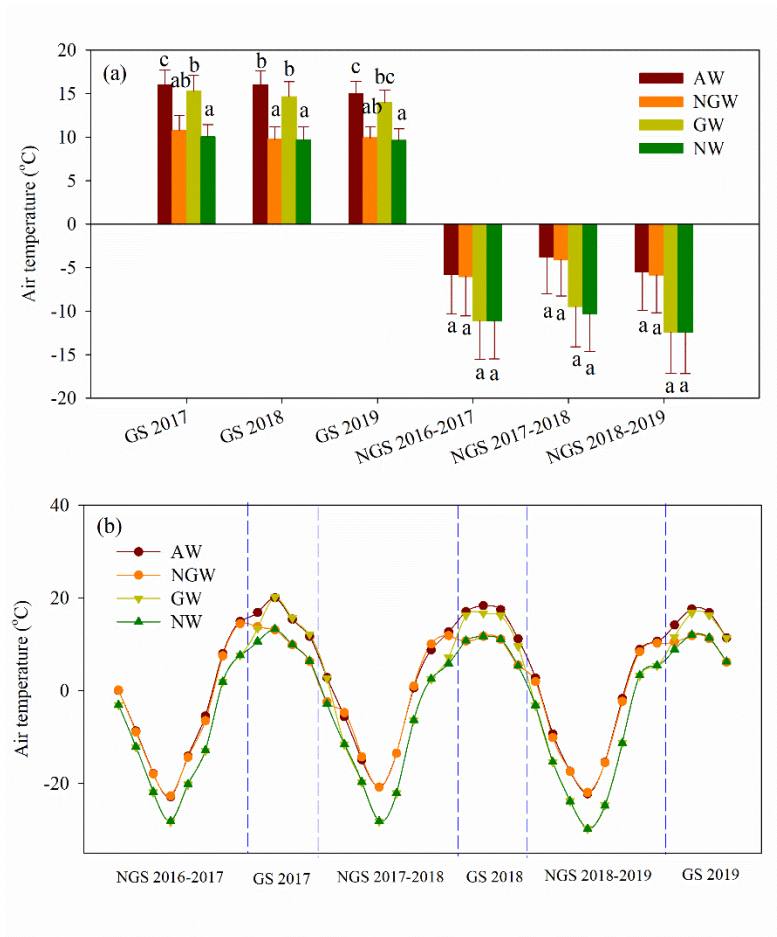
14 growing season; AW, warming throughout the year; NGW, warming in nongrowing

15 season only; GW, warming in growing season only; NW, non-warming. Significant

16 differences among AW, NGW, GW and NW from analysis of variance (ANOVA) are

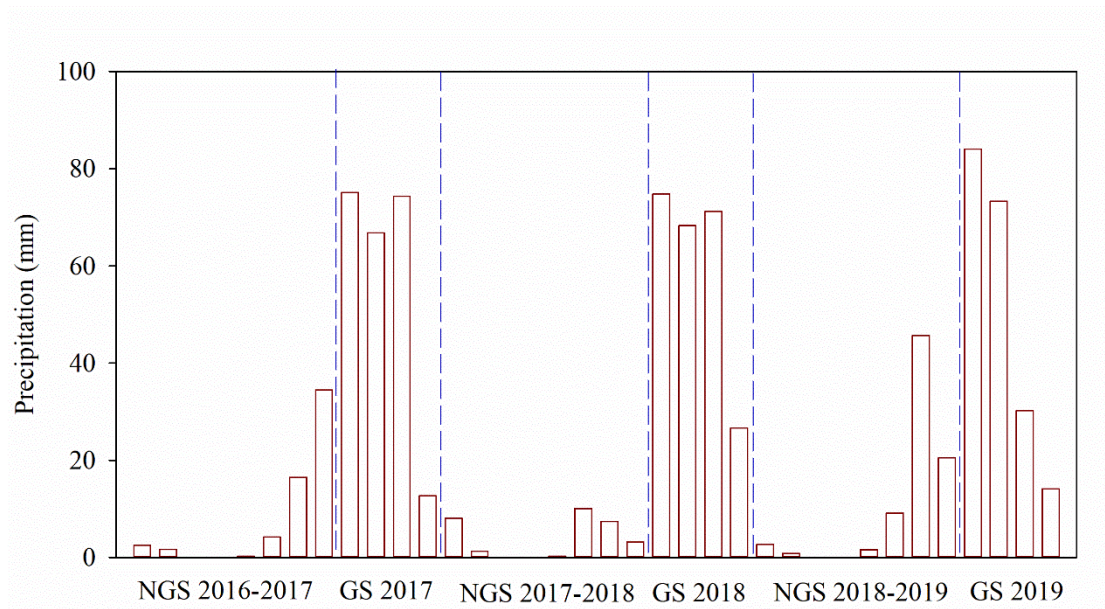
17 denoted as bars within the same season with different lowercase letters, $P < 0.05$; data

18 points are the mean \pm standard error.



19

20 Figure S3 Variation in air temperature (inside the open-topped chamber, OTC, 50
 21 cm above the ground) under four treatments in alpine grassland from October 2016 to
 22 September 2019. GS, growing season; NGS, non-growing season; AW, warming
 23 throughout the year; NGW, warming in non-growing season only; GW, warming in
 24 growing season only; NW, non-warming. No significant differences among AW, NGW,
 25 GW and NW from analysis of variance (ANOVA) are denoted as bars within the same
 26 season with a common lowercase letter, $P < 0.05$; data points are the mean \pm standard
 27 error.

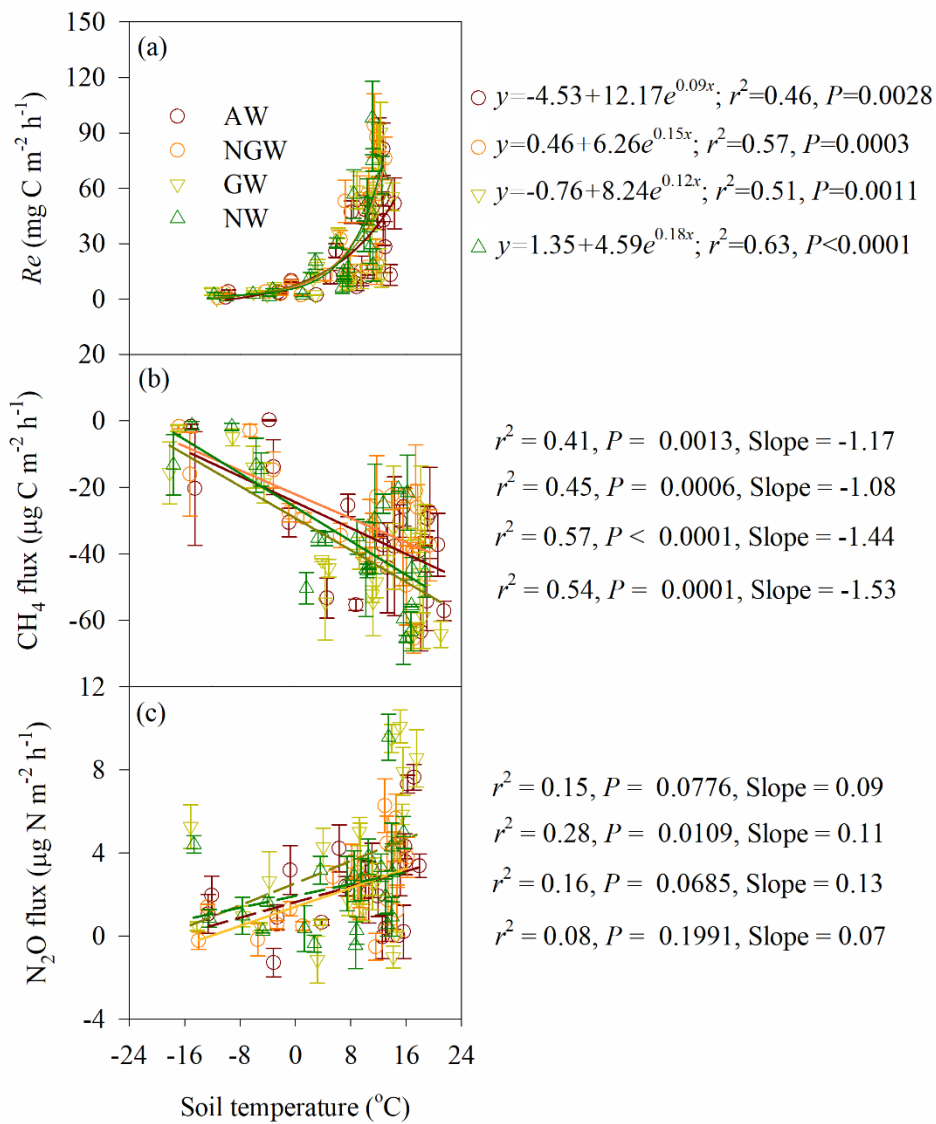


28

29

30

Figure S4 Variation in precipitation in the alpine grassland from October 2016 to September 2019. GS, growing season; NGS, non-growing season.



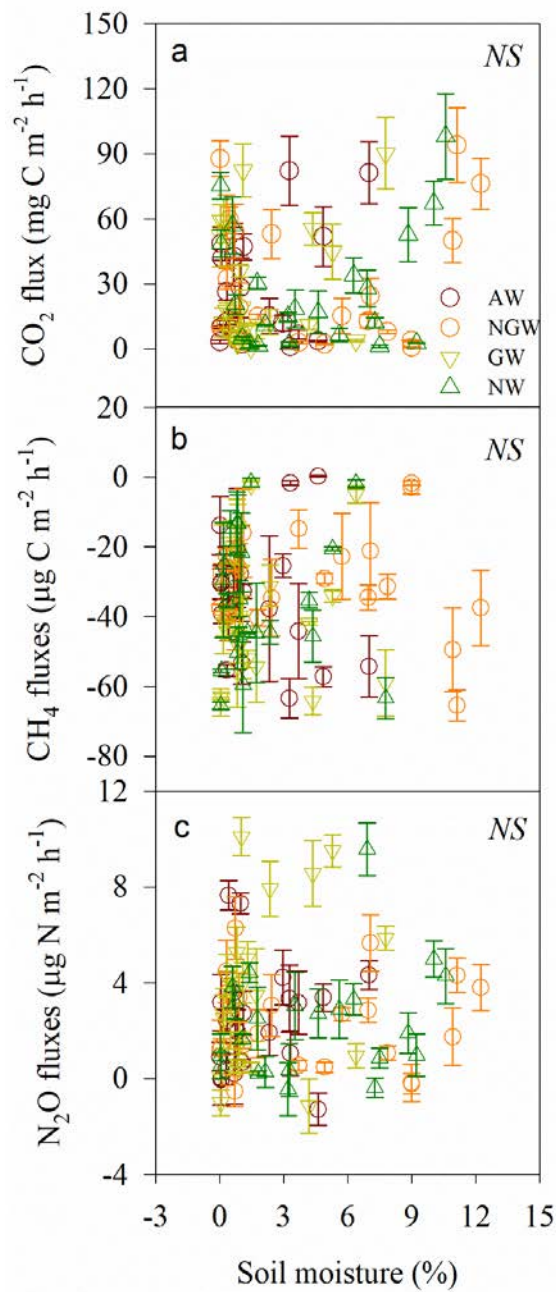
31

32 Figure S5 The relationship between ecosystem respiration (*Re*), CH₄ uptake and

33 N₂O emissions and soil temperature (at 10-cm depth) from October 2016 to September

34 2019. AW, warming throughout the year; NGW, warming in the nongrowing season

35 only; GW, warming in the growing season only; NW, non-warming.



36

37 Figure S6 The relationship between ecosystem respiration (Re), CH_4 uptake and
 38 N_2O emissions and soil moisture (at 10-cm depth) from October 2016 to September
 39 2019. AW, warming throughout the year; NGW, warming in the nongrowing season
 40 only; GW, warming in the growing season only; NW, non-warming.