[Water Resources Research]

Supporting Information for

Simulating the role of biogeochemical hotspots in driving nitrogen export from drylands watersheds

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Figures S1, S2, S3 and S4. Table S1.

Introduction

Figure S1 are supplementary figures to support results of vegetation initialization. Figures S2, S3 and S4 are supplementary figures to support the results of sensitivity analysis. Table S1 is to support the result of hotspots abundance effect on N fluxes.

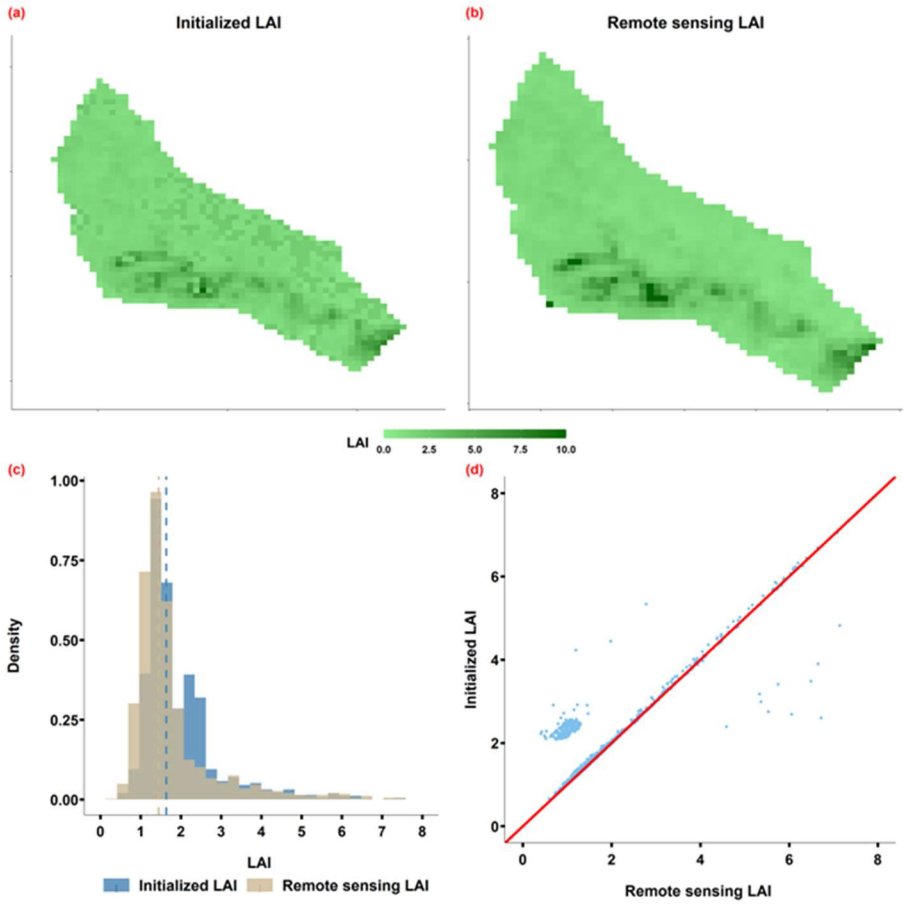

Figure S1. *Vegetation initialization results for Bell 4: (a) initialized LAI from RHESSys, (b) target LAI calculated from a NAIP image from April 26, 2010, (c) comparison of density distributions between target and simulated LAIs; the dashed line is the mean of the two LAI distributions, and (d) scatter plot showing target LAI vs. initialized LAI for each patch.*

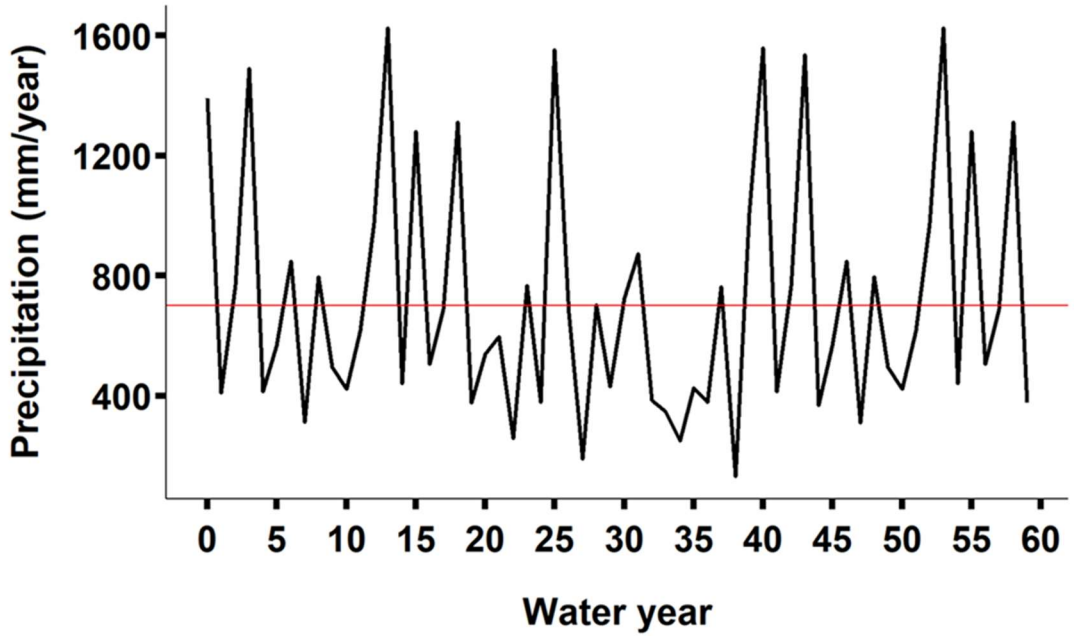

Figure S2. Timeseries of annual precipitation over 60 years. The red line represents the average precipitation over 60 years (710 mm/year), used as the cutoff precipitation to determine wet vs. dry years. Years above the red line are wet years used to illustrate N fluxes in figure 6.

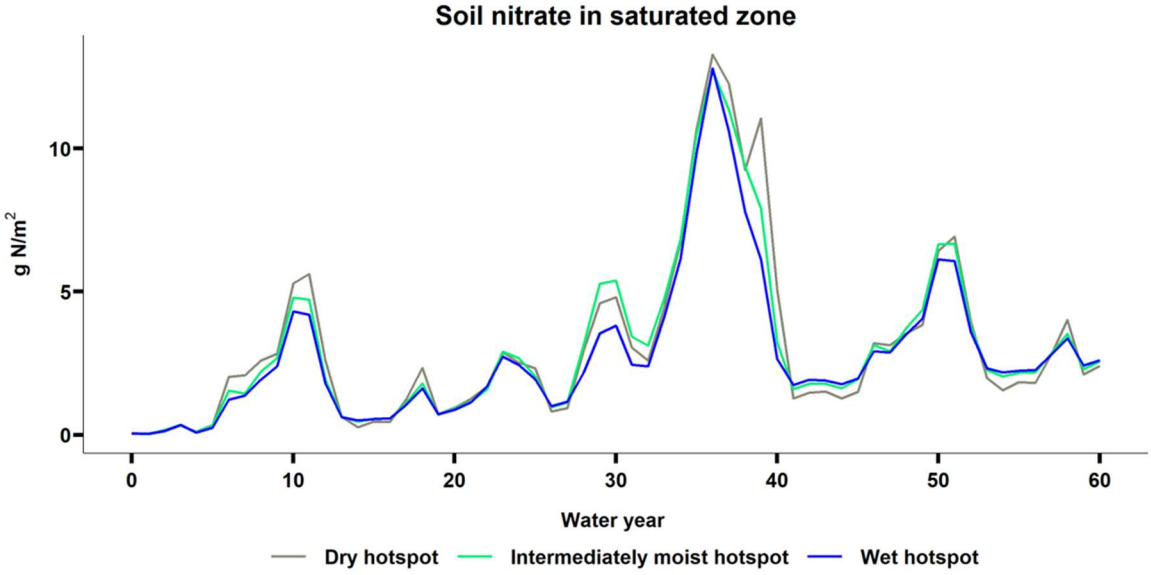

Figure S3. N processes for the three scenarios focused on the rate at which water diffuses from hotspots as soils dry down: one where hotspots were saturated most of the time (i.e., the slow diffusion, wet hotspot scenario), one where water diffused more rapidly from hotspots during the dry season (i.e., the rapid diffusion, dry hotspot scenario), and one where diffusion was intermediate (i.e., the intermediately-moist hotspot scenario).

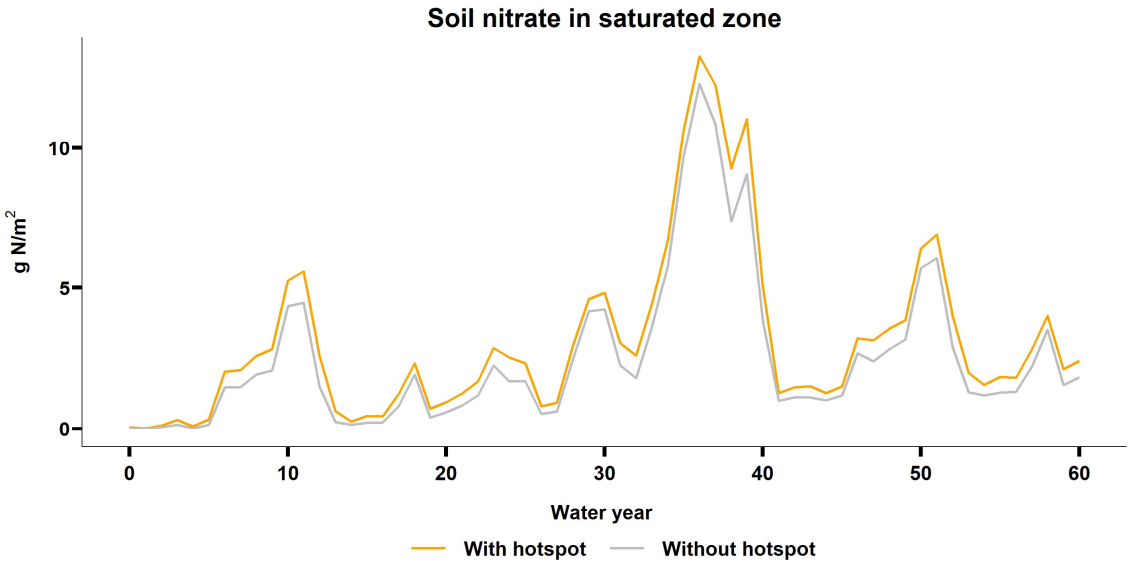

Figure S4. Soil nitrate in saturated zone for with and without hotspot scenarios at the full basin scale.

Table S1. The interquartile range (IQR) of N flux distributions for different hotspot percent cover scenarios.

Percent of hotspots	Nitrification	Denitrification	Streamflow nitrate
0%	2.26	0.010	1.04
2.2%	2.29	0.015	1.15
4.5%	2.32	0.020	1.30
6.8%	2.29	0.025	1.35
9.1%	2.42	0.030	1.48
11.4%	2.52	0.031	1.45
13.7%	2.64	0.033	1.49