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Spatial and temporal variability of turbulence dissipation rate in complex terrain

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1. Wind roses from 10-m sonic anemometers at the Physics Site

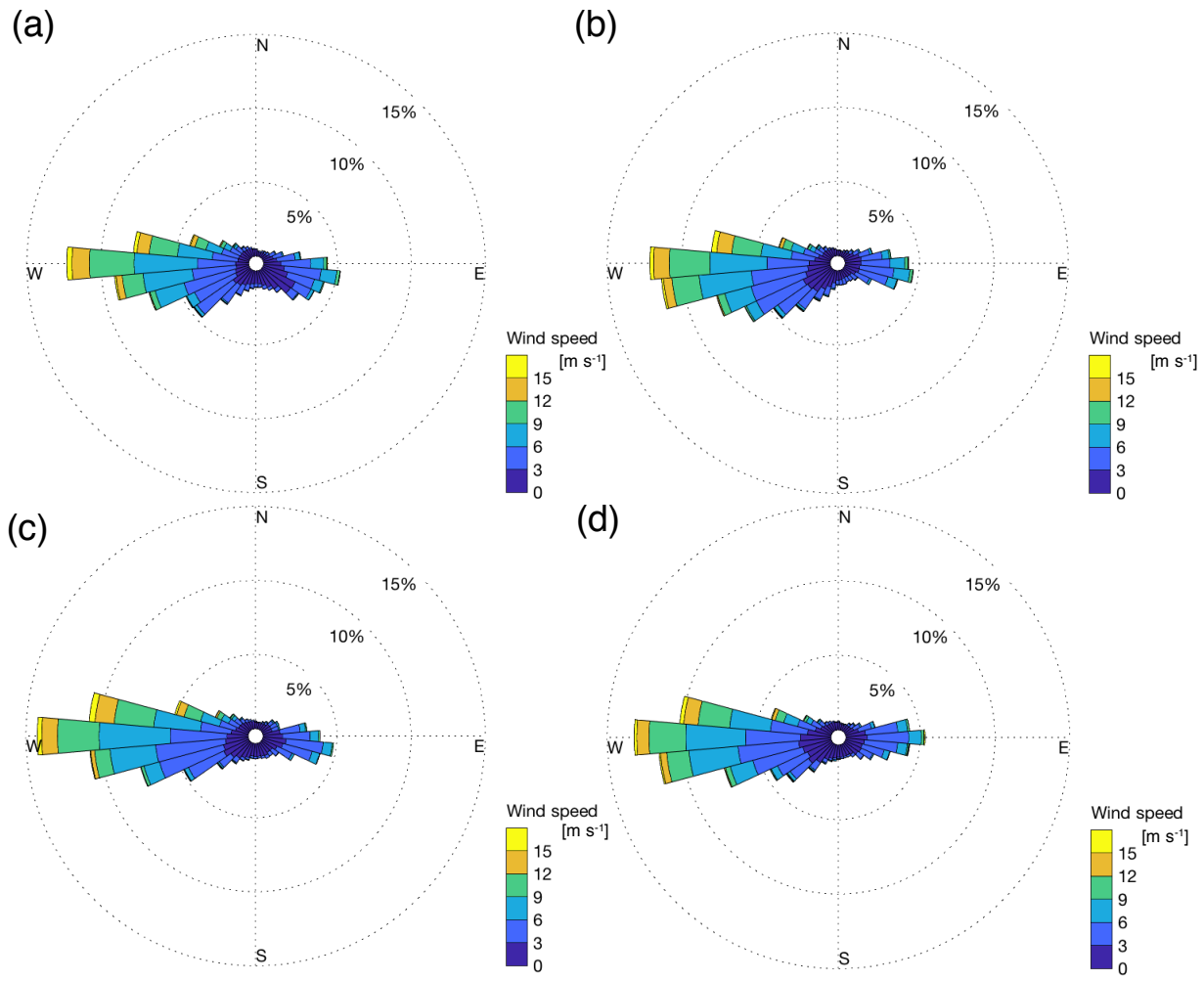

Figure S1: Wind rose computed from the data recorded by the 10-m sonic anemometers on the meteorological tower P04 (panel a), P05 (panel b), P09 (panel c), and P10 (panel d) at the Physics Site.

2. Microscale variability: correlation coefficient as a function of differences in elevation

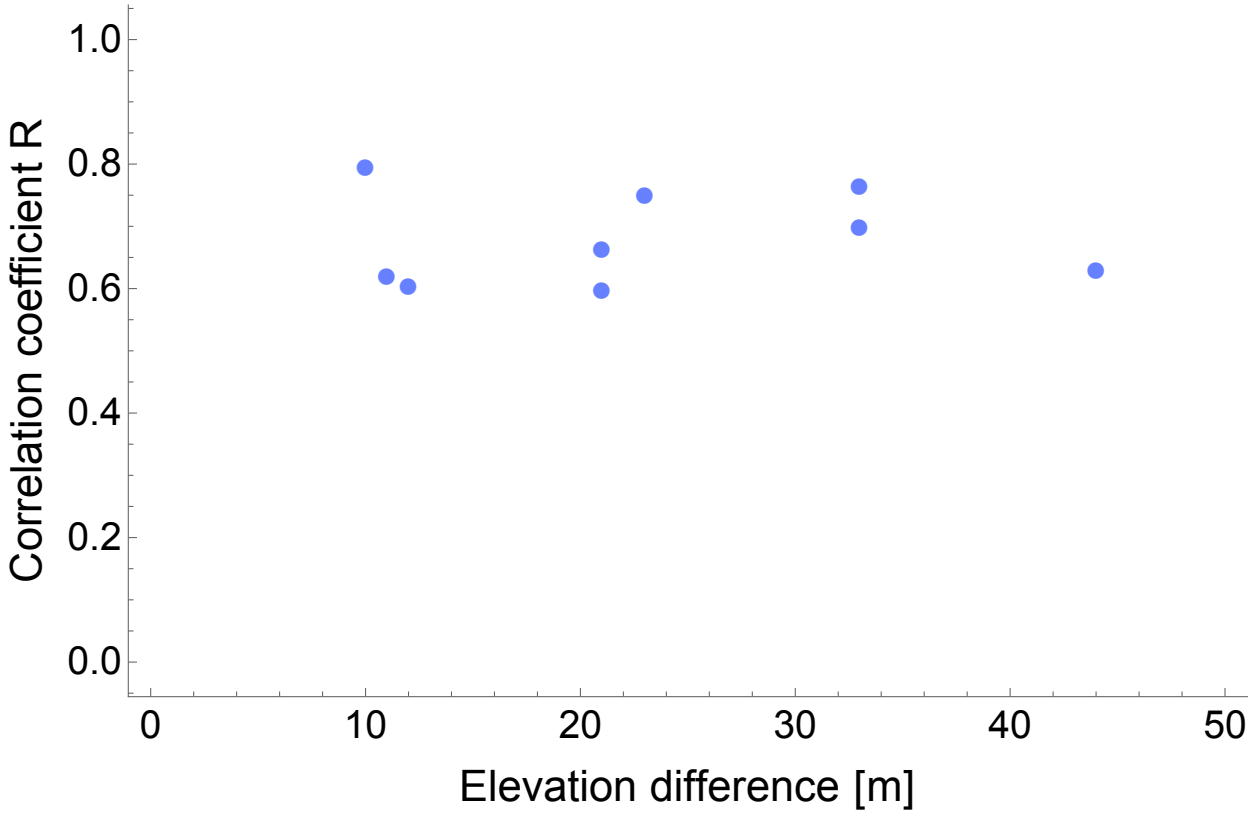

Figure S2: Correlation coefficient R between log(ε) from different pairs of sonic anemometers at the Physics Site as a function of the difference in elevation between the single meteorological towers.

3. Annual cycle of wind speed at 10m AGL (sonic anemometers at the Physics Site)

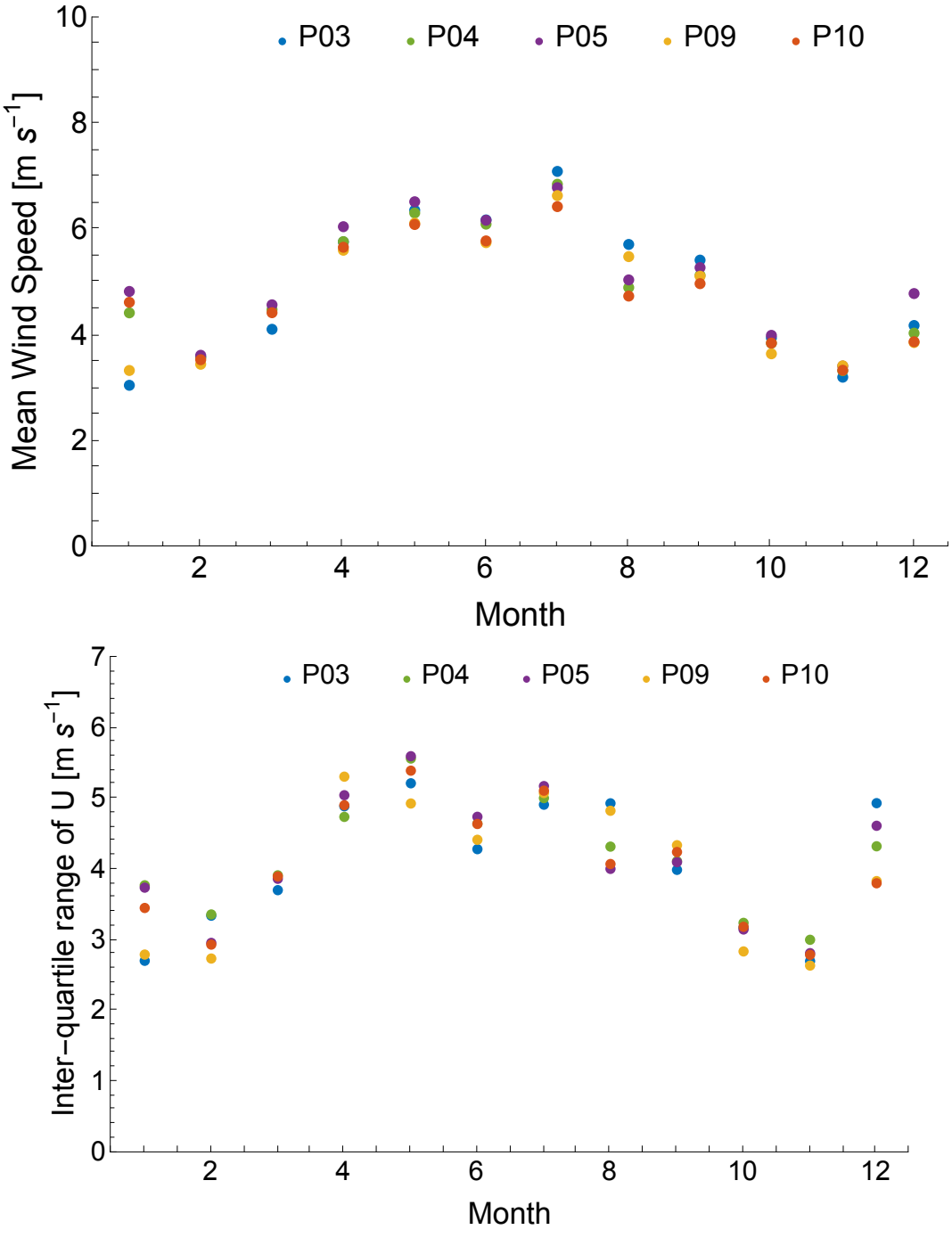

Figure S3: *Mean wind speed (top) and its interquartile range (bottom) for each calendar month and each considered 10-m sonic anemometer at the Physics Site.*

4. Annual cycle of wind speed at 100m AGL from the lidars

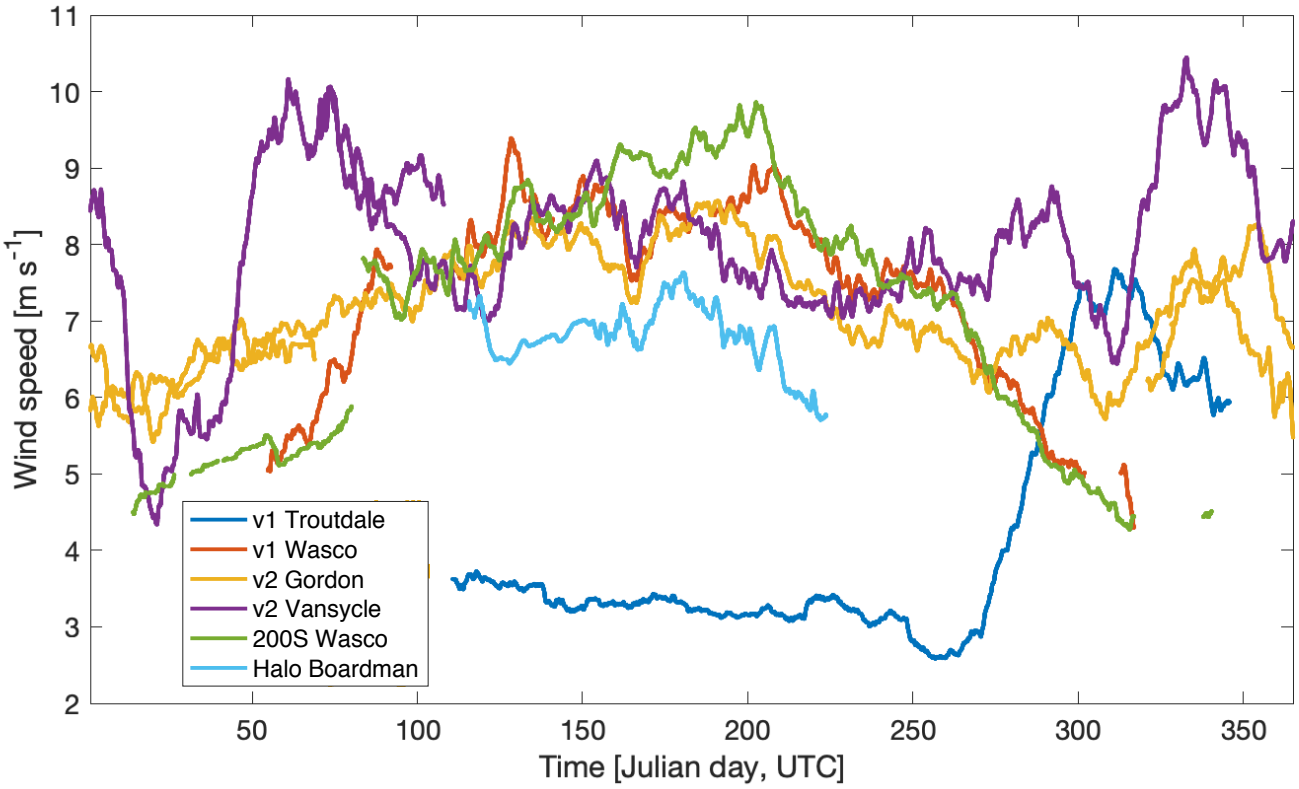

Figure S4: Low-pass filtered (with a 15-day moving average) time series of wind speed from the four considered profiling lidars and the two scanning lidars as a function of the calendar day, at 100m AGL.

5. Wind roses and ϵ roses from the profiling lidars

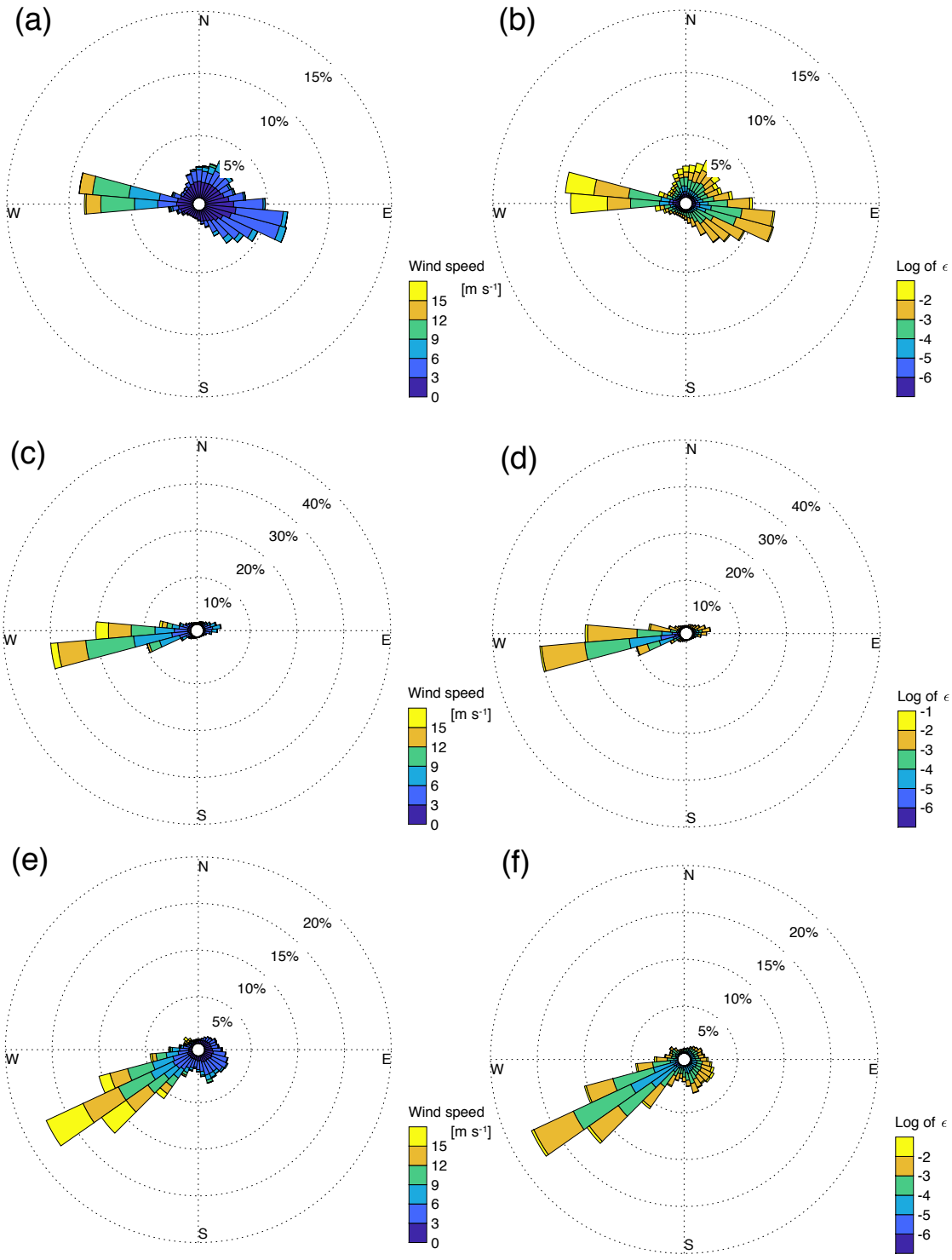

Figure S5: on the left, wind roses at 100m AGL from the lidars at Troutdale (panel a), Wasco (panel c), and Vansycle Ridge (panel e). On the right, roses of turbulence dissipation rate roses at 100m AGL from the lidars at Troutdale (panel b), Wasco (panel d), and Vansycle Ridge (panel f).

6. Data availability for diurnal climatology plot

	Summer				Winter	
	Troutdale	Wasco	Gordon Ridge	Vansycle Ridge	Gordon Ridge	Vansycle Ridge
40m AGL	0.69	0.72	0.18	0	0.42	0
60m AGL	0.85	0.83	0.28	0.95	0.45	0.55
80m AGL	0.89	0.88	0.47	0.95	0.45	0.50
100m AGL	0.86	0.88	0.47	0.84	0.41	0.40
120m AGL	0.72	0.79	0.32	0.67	0.32	0.30
140m AGL	0.44	0.56	0.21	0.47	0.24	0.21
160m AGL	0.24	0.33	0.17	0.26	0.21	0.18
180m AGL	0.17	0.18	0.07	0.16	0.17	0.09
200m AGL	0.06	0.06	0.10	0.05	0.09	0.07
220m AGL	0.03	0.03	0.12	N/A	0.06	N/A
240m AGL	N/A	N/A	0.01	N/A	0.07	N/A
260m AGL	N/A	N/A	0.02	N/A	0.03	N/A

Table S1: data availability of the data used to make the daily climatology analysis (Figure 10 in the manuscript) for the four profiling lidars, in the different considered seasons.

7. Map of Gordon Ridge

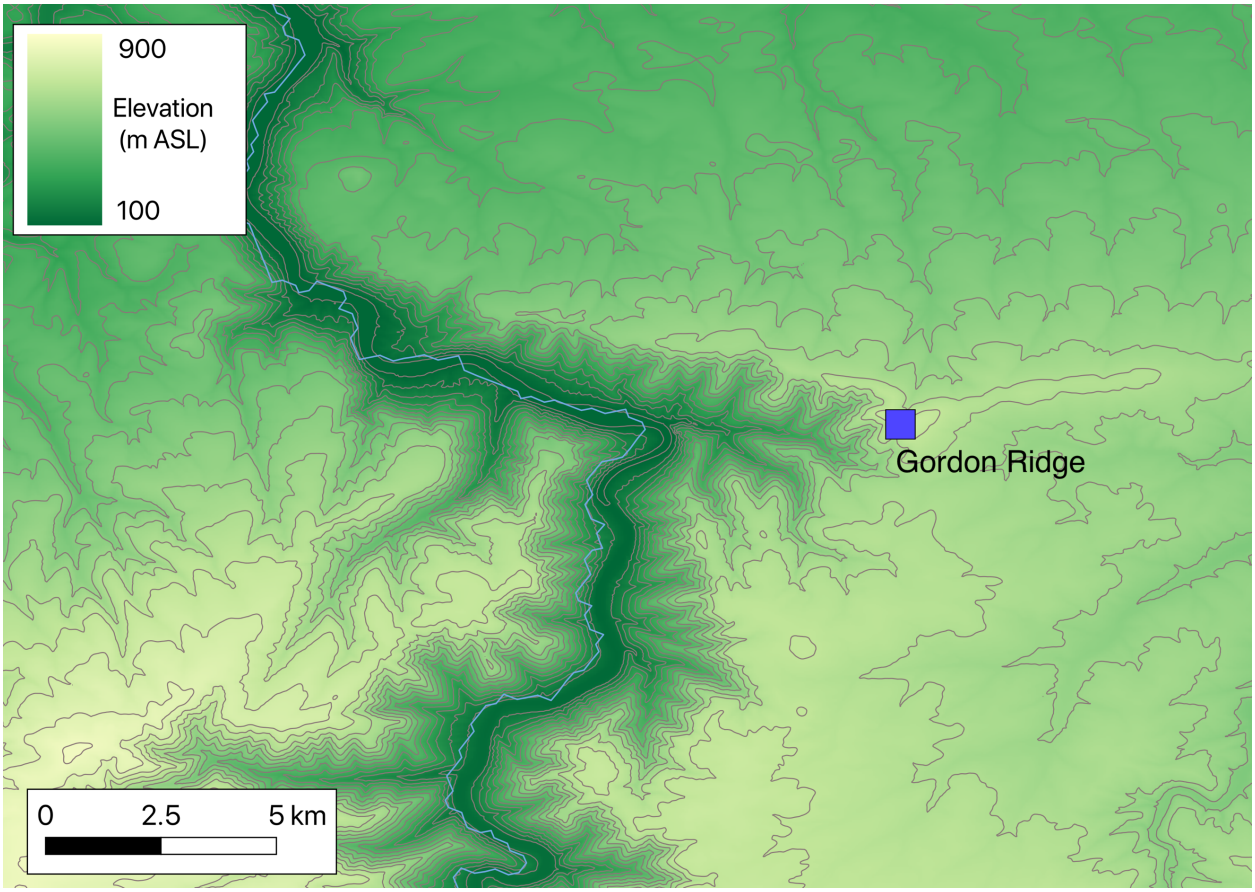

Figure S6: detailed map of the topography at Gordon Ridge.