

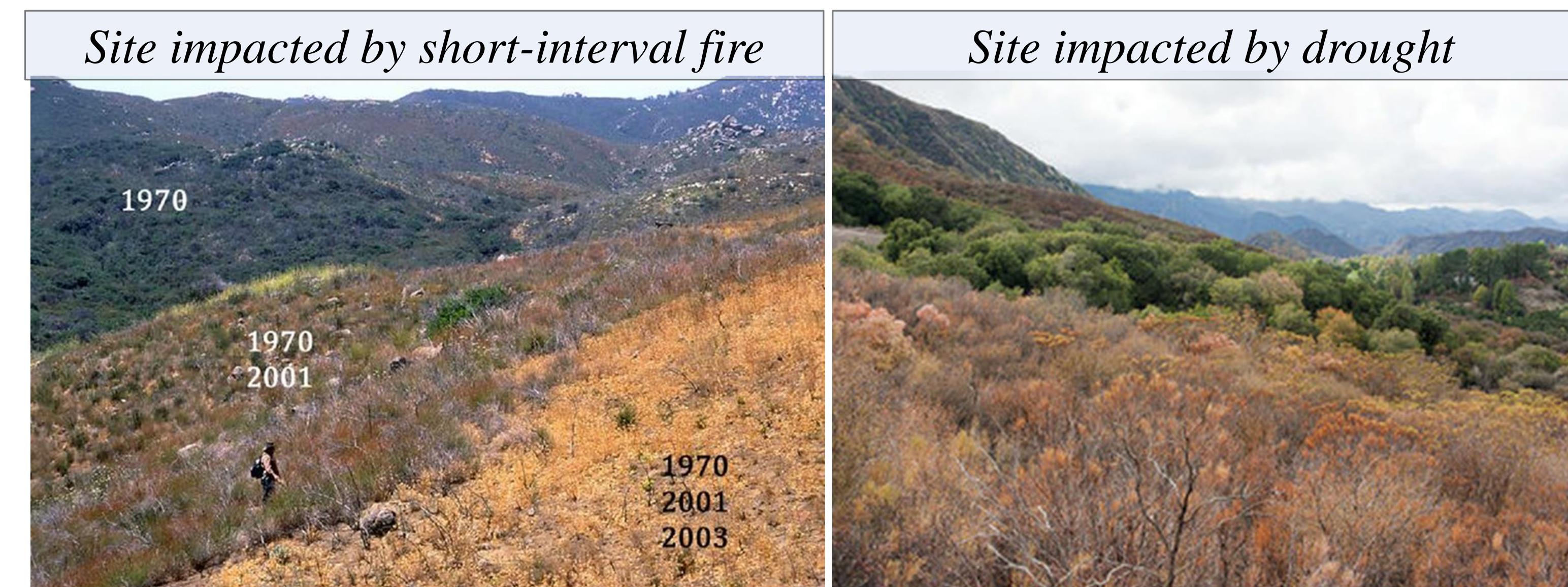
Evaluating Response of Southern California Chaparral Landscapes to Short-Interval Fire and Drought (1984-2018)

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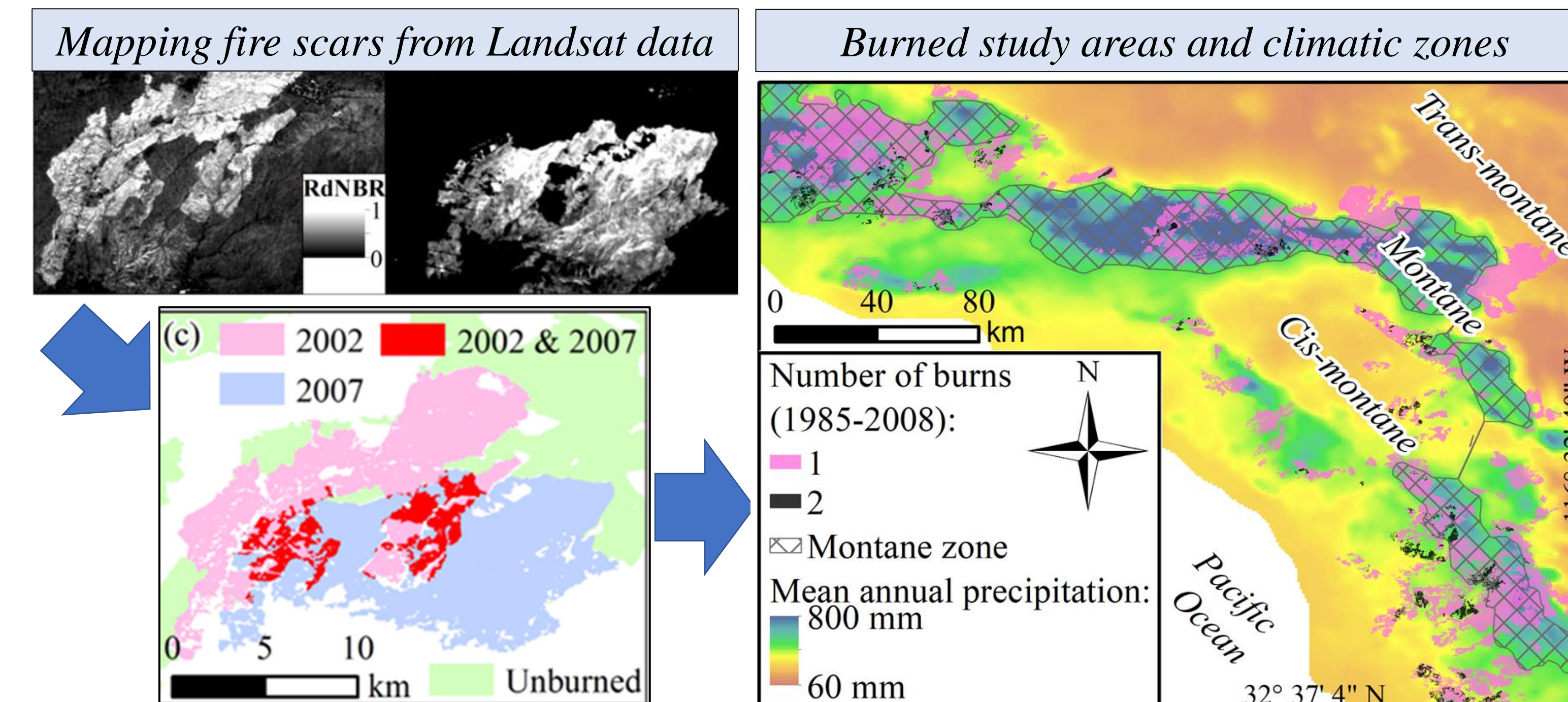
Rationale & Study Areas

Rationale

- Postfire vegetation recovery is *critical* to ecological resilience and stability
- Chaparral shrublands are subject to *frequent fires* and *severe droughts*
- *Low resilience* and *conversion* to exotic grass observed in *small-scale studies*
- Regional *pattern* and *controls* on resilience are poorly understood
- Satellite remote sensing enables *regional-scale* evaluation of recovery

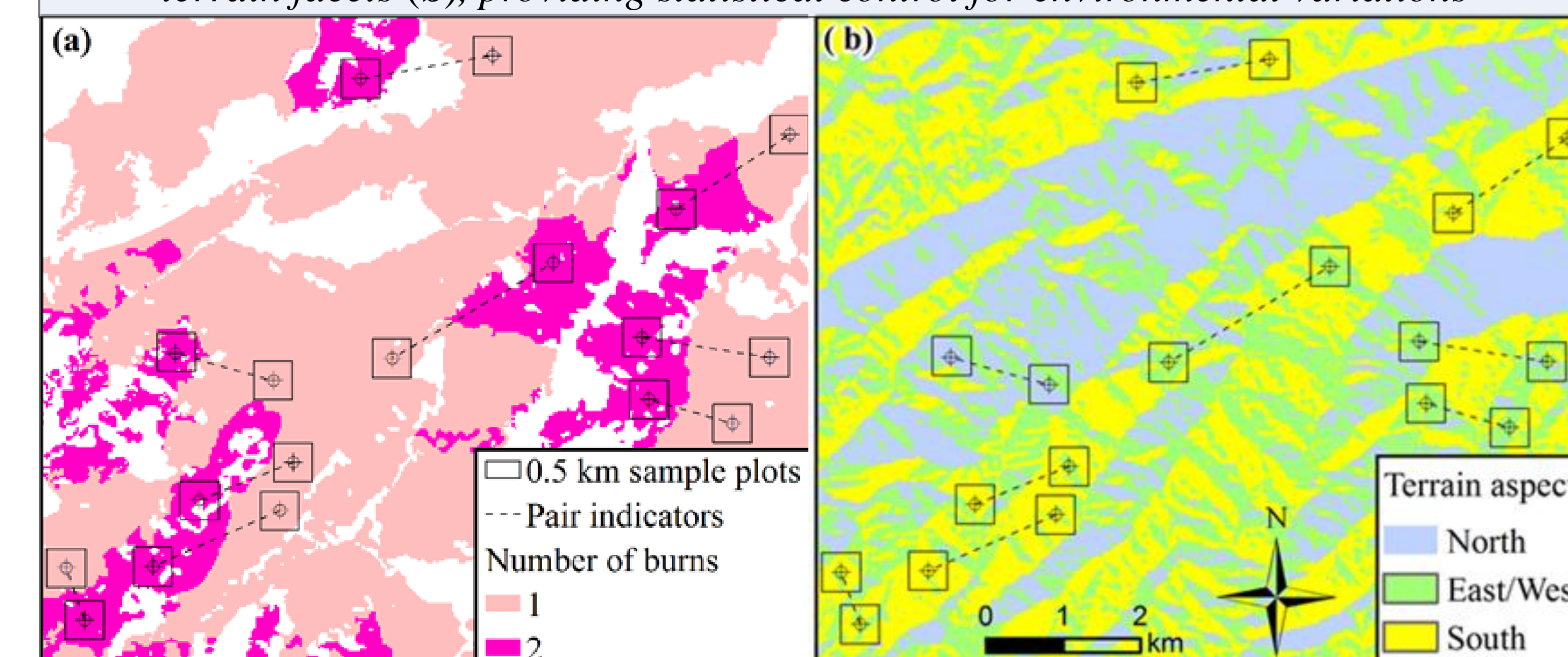


Regional fire history



Analysis site selection

Selection of sample plots from neighboring 1-burn and 2-burn sites (a), on consistent terrain facets (b), providing statistical control for environmental variations

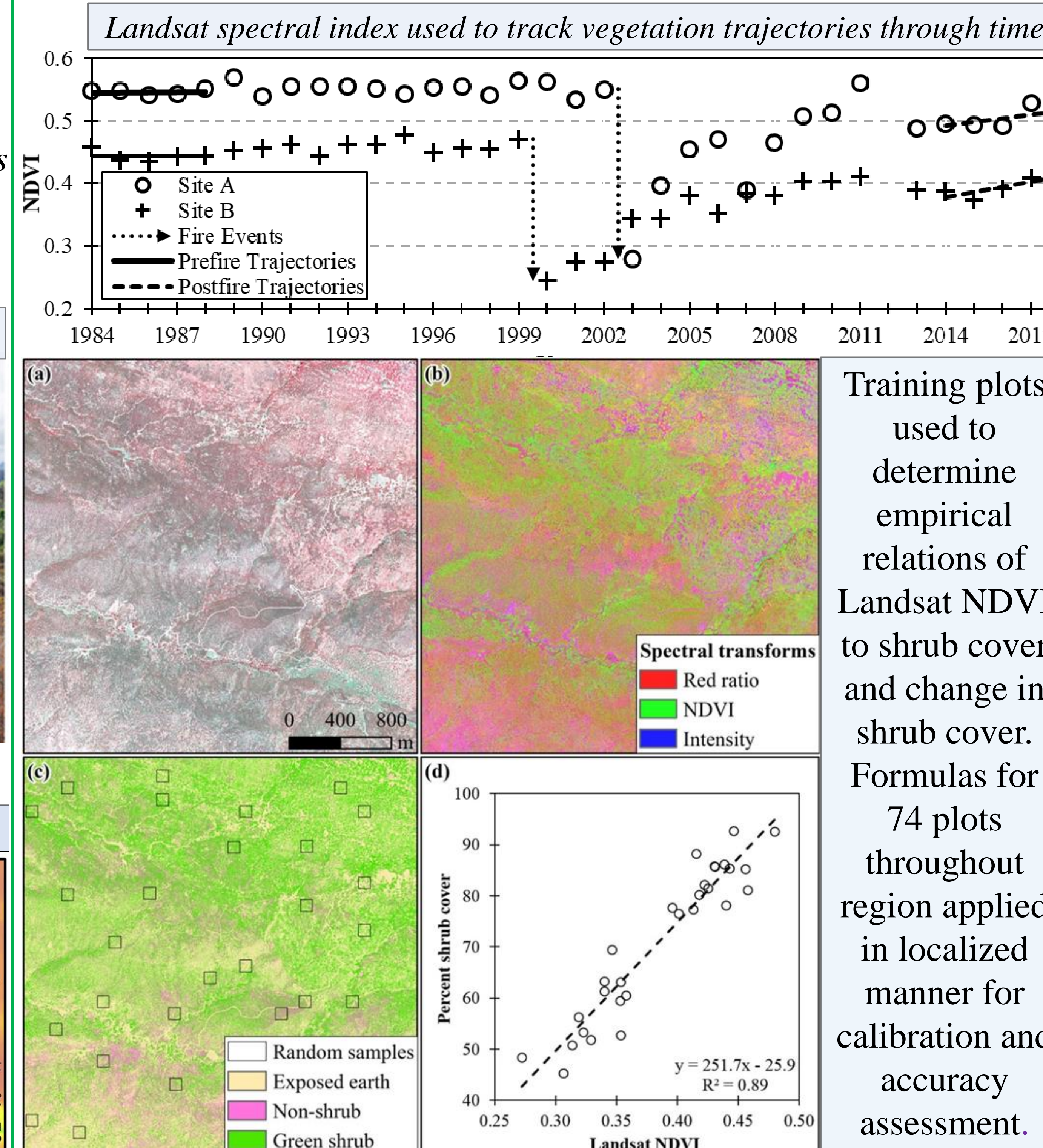


Research Questions

1. Do short-interval fires significantly diminish postfire recovery?
2. How do severity and timing of drought affect recovery?
3. Which variables best predict drought impact at landscape scales?

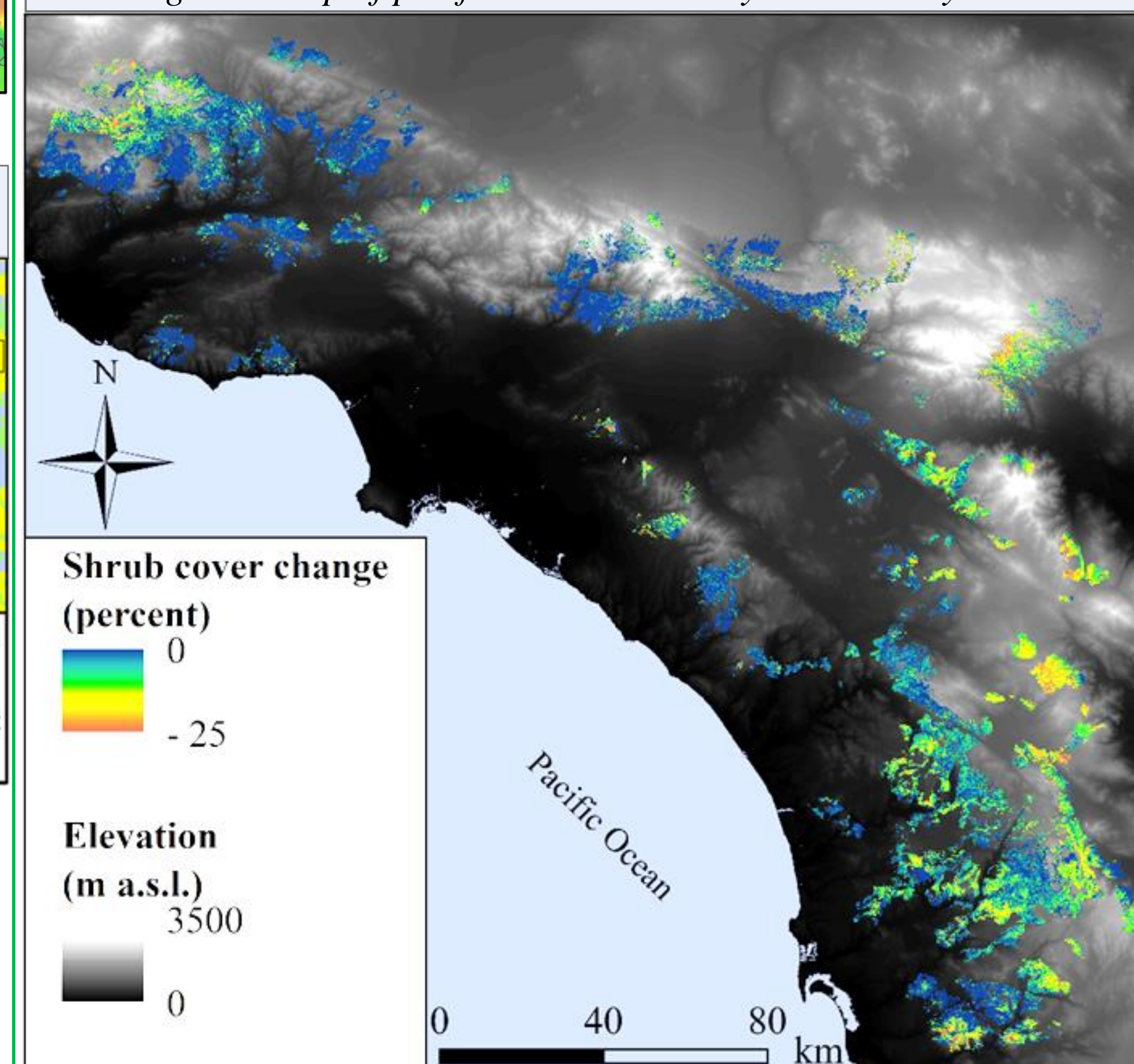
Methods, Validation, & Data Product

Landsat pixel-based estimates of postfire recovery



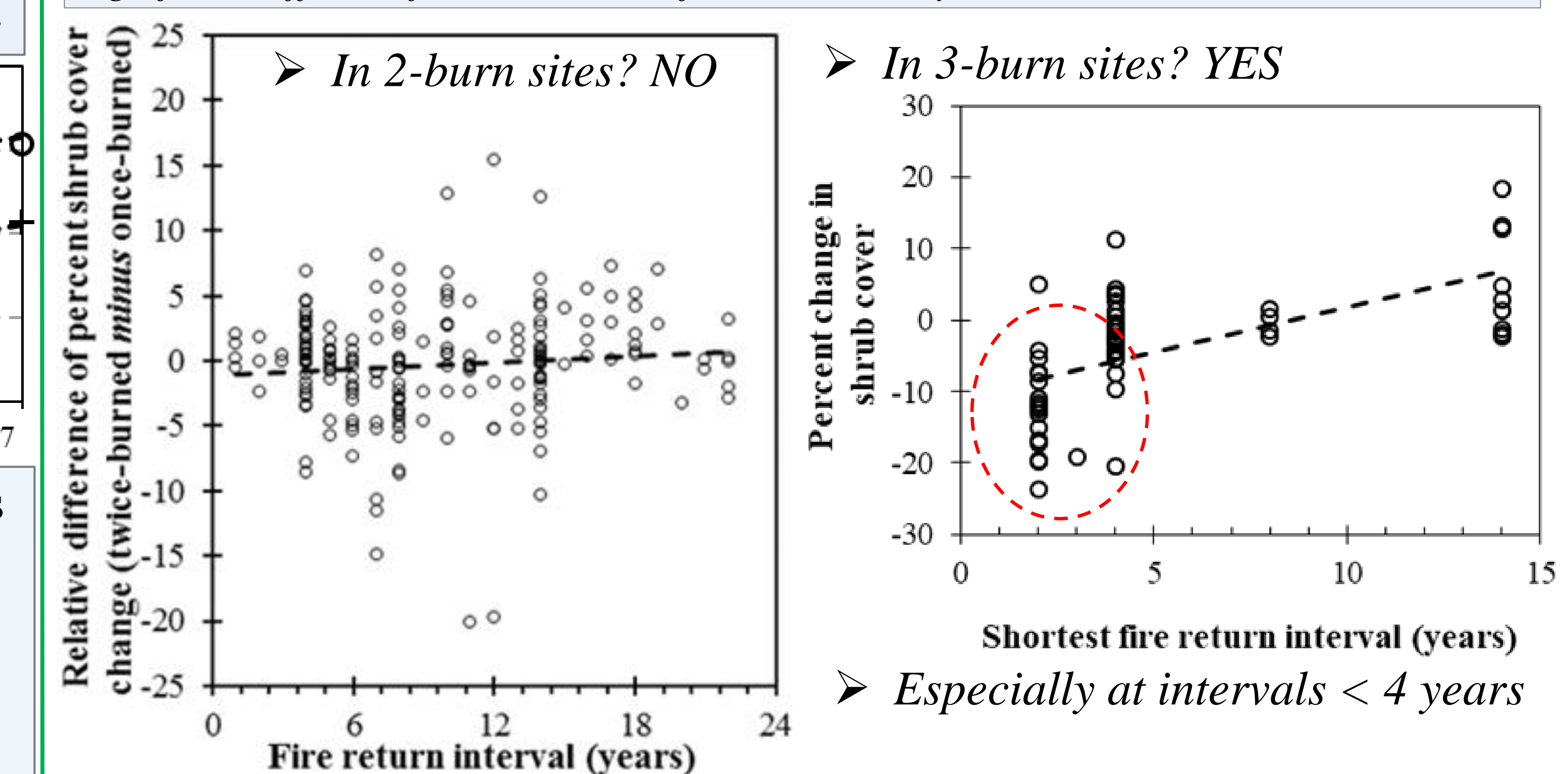
Results

Regional map of postfire shrub recovery within study areas

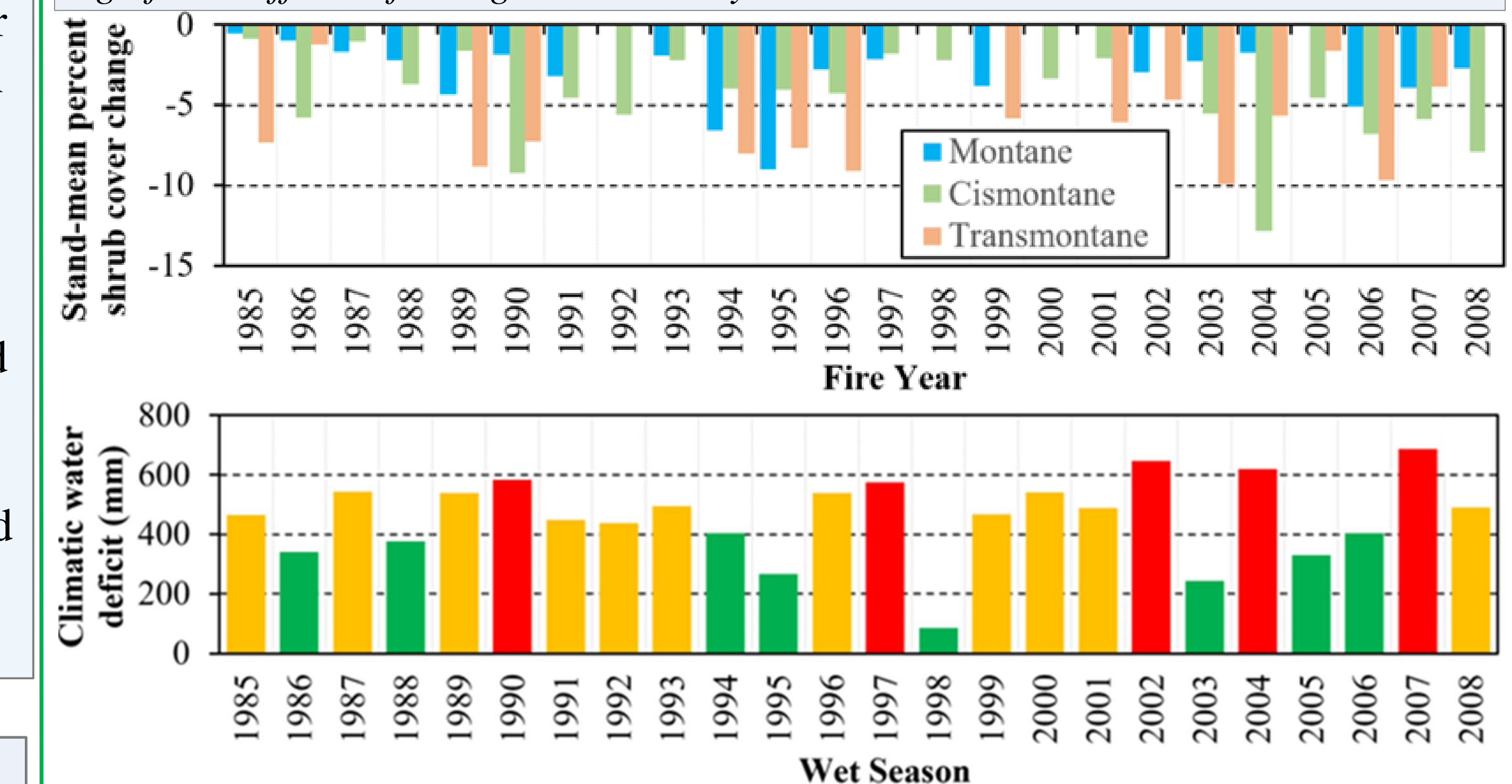


Statistical Analysis & Interpretations

Significant effects of short-interval fire on recovery?



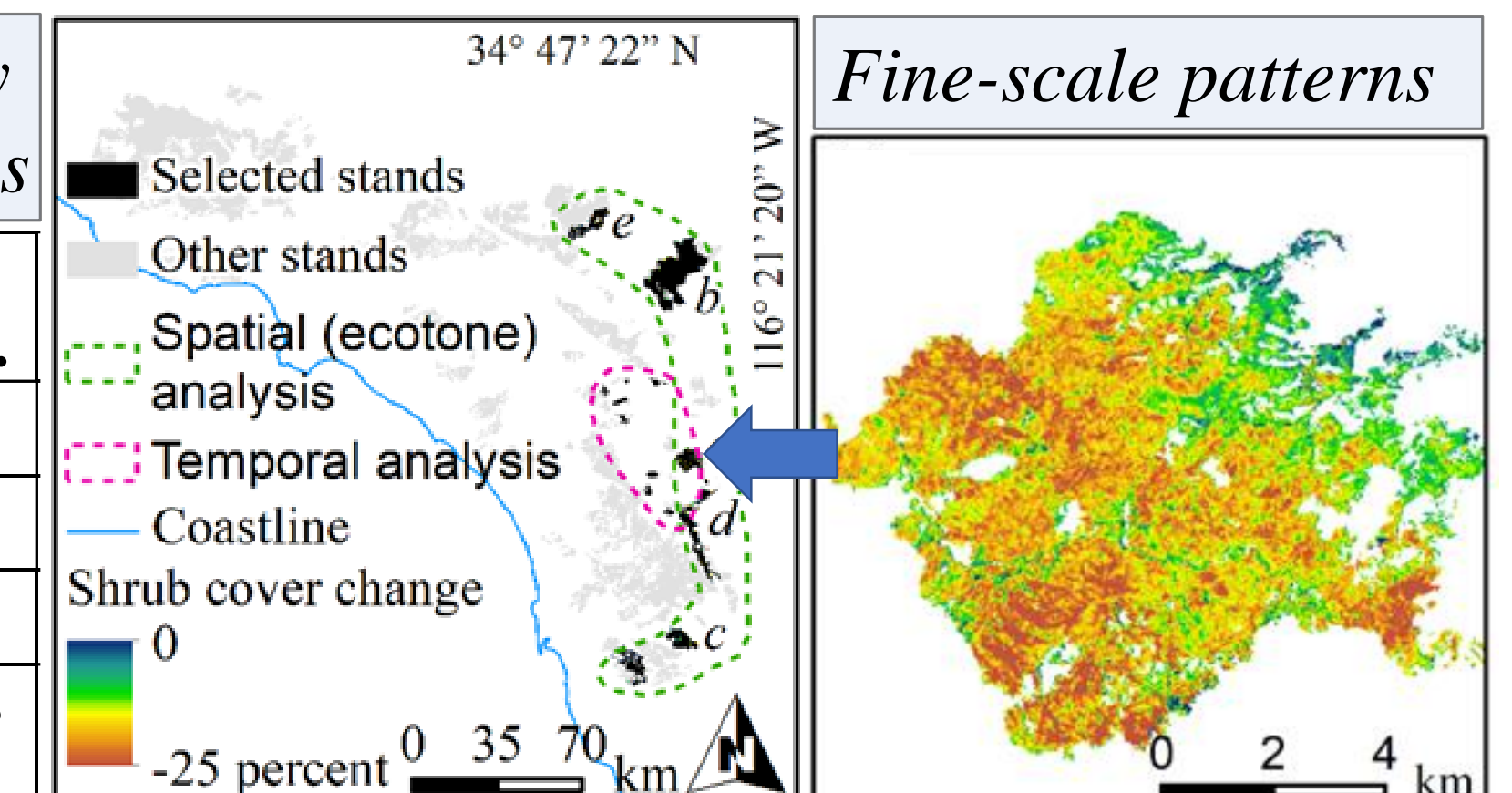
Significant effects of drought on recovery?



- Climatic zone, soils, and plant community explain 30% of regional pattern
- Drought accounts for ~40 percent of recovery variation amongst xeric sites

Landscape-scale predictors of recovery in drought-impacted, xeric ecotone sites

Variable	p	t	β	Coef.
Elevation	<0.001	-6.00	-0.35	
Plant community	<0.001	10.27	0.12	
Soil Permeability	<0.001	-7.85	0.14	
Visible Atmospherically-Resistant Index	<0.001	18.45	-0.38	



Conclusions

- Drought is a significantly greater control on recovery than fire interval
- Drought impact most severe near inland deserts, at middle elevations
- Landscape-scale drought impact somewhat predictable from spatial data
- Conservation and fire control should focus on vulnerable sites

Acknowledgements

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