

Repackaging Soil Survey for Nutrient Management Decisions in Winegrape Production

by

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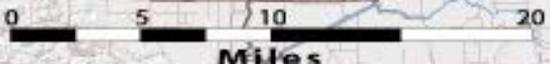
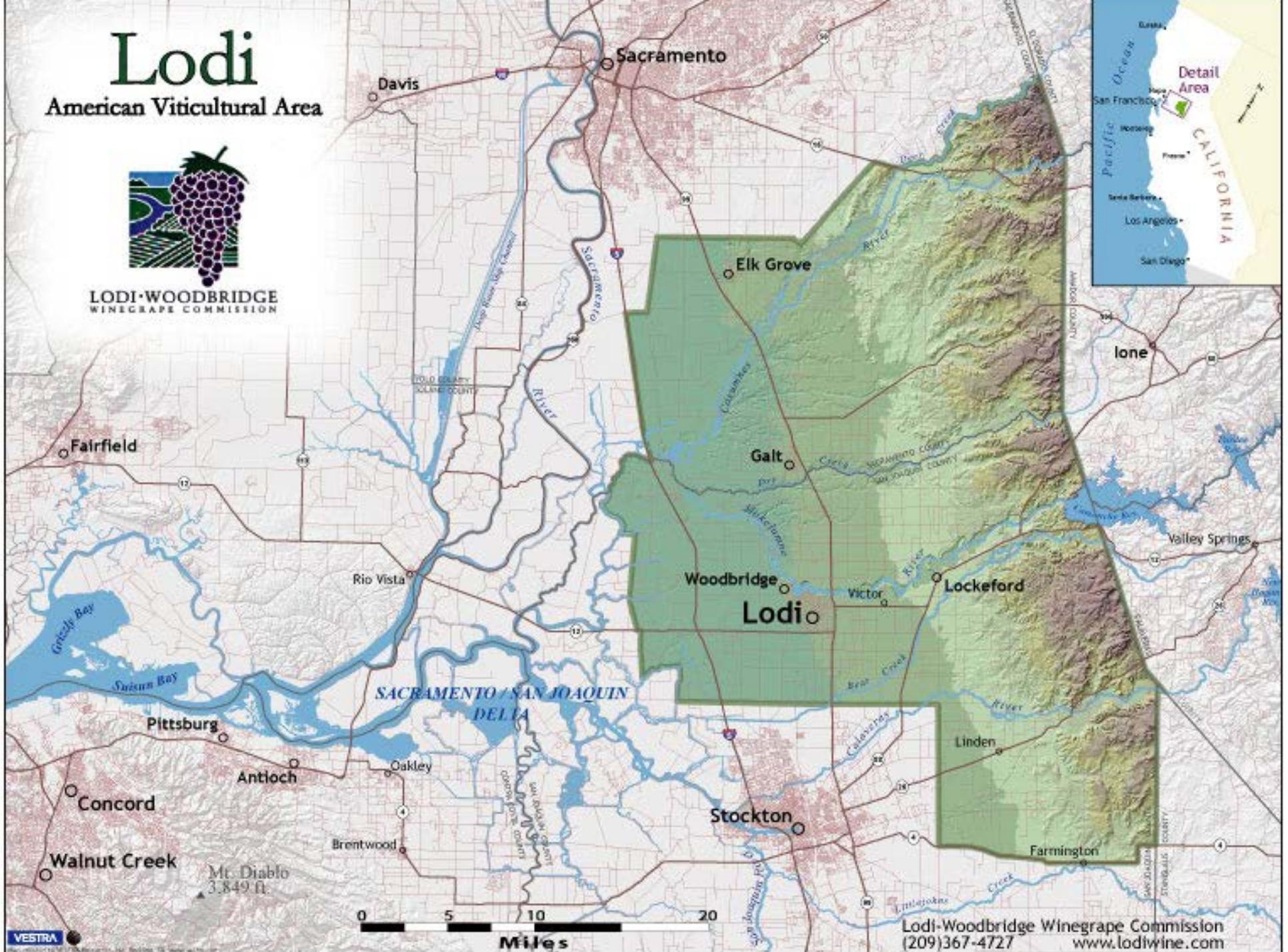


Lodi

American Viticultural Area

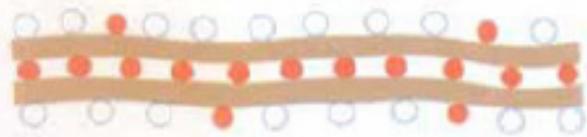


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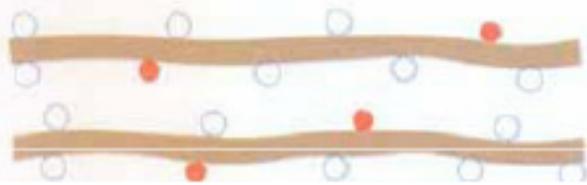


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Effects of clay minerals on the fate of K



Vermiculite-intermediately weathered soils



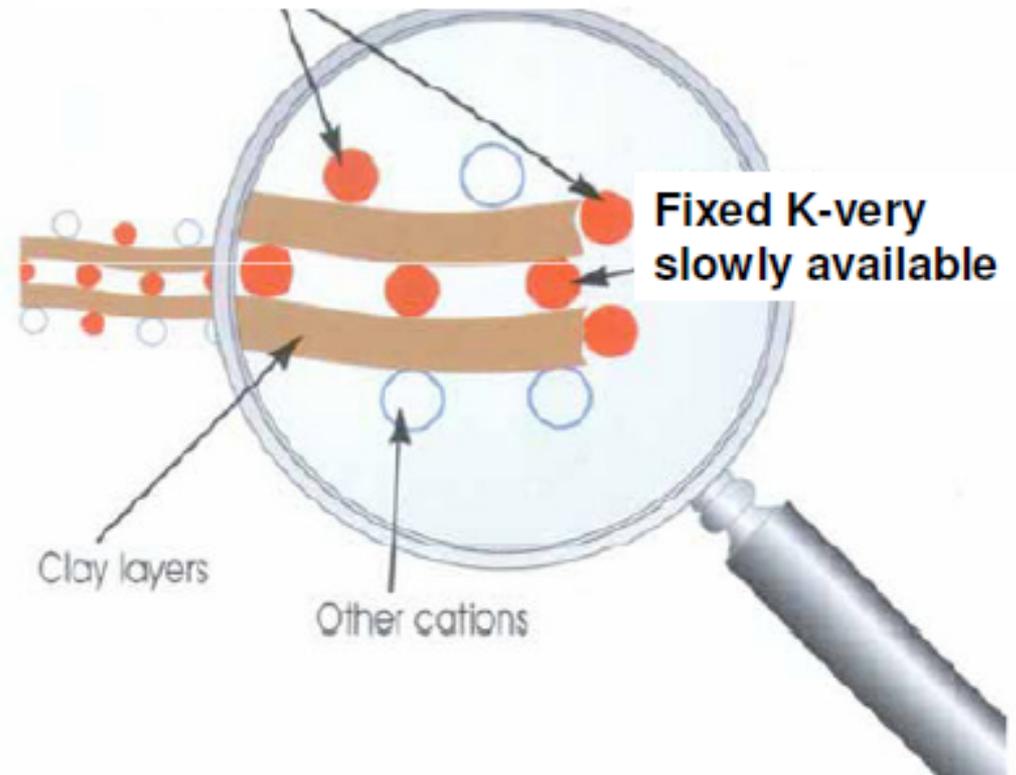
Smectite-shrink swell clays



Kaolinite-old, highly weathered soils

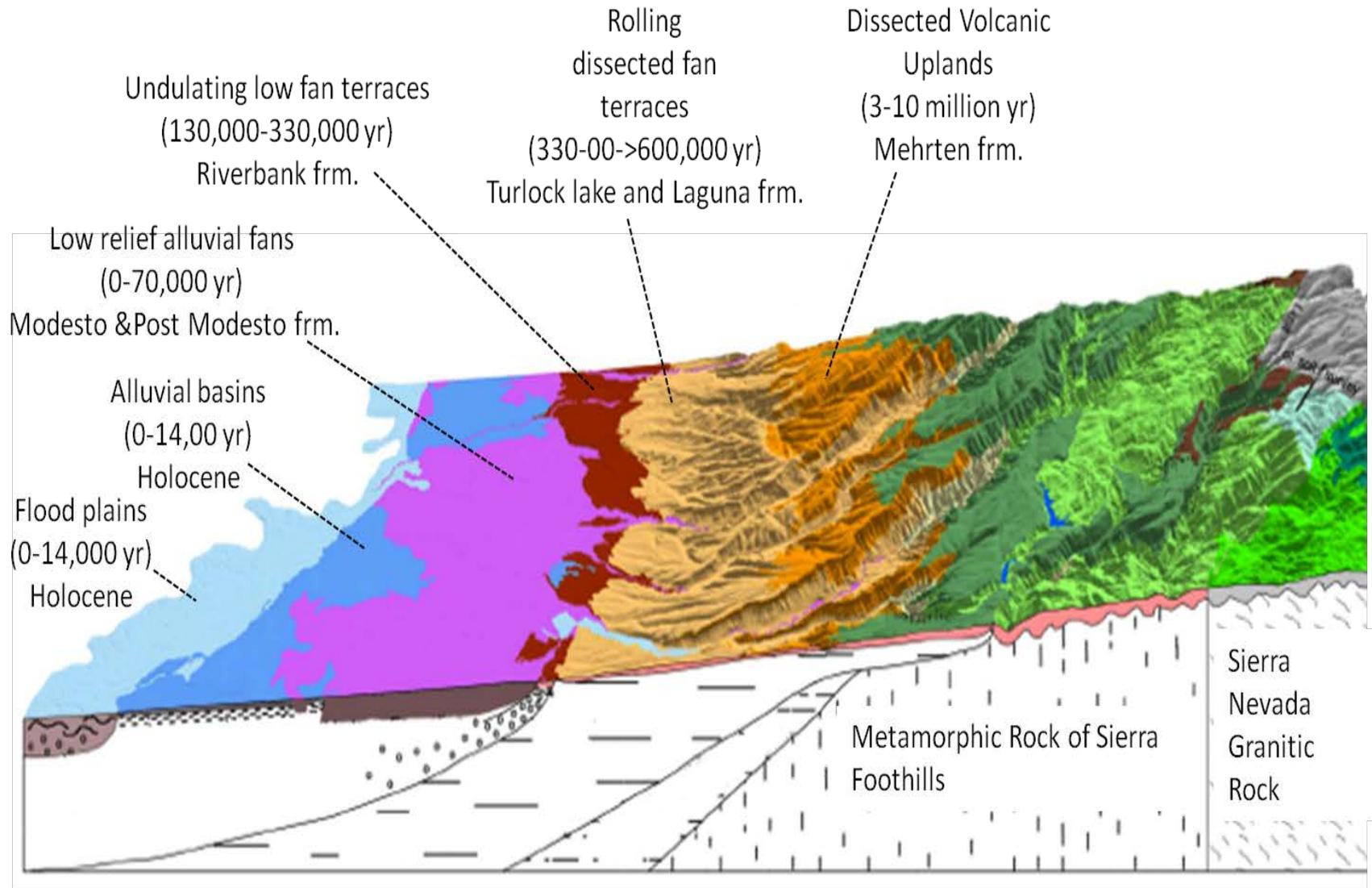
- Potassium ions
- Other cation
- Clay mineral

Exchangeable K on clay surface & edges



Source: Potash for heavy soils, 1999 (PDA publication)

Chrono-lithosequence of the Eastern Great Valley



West

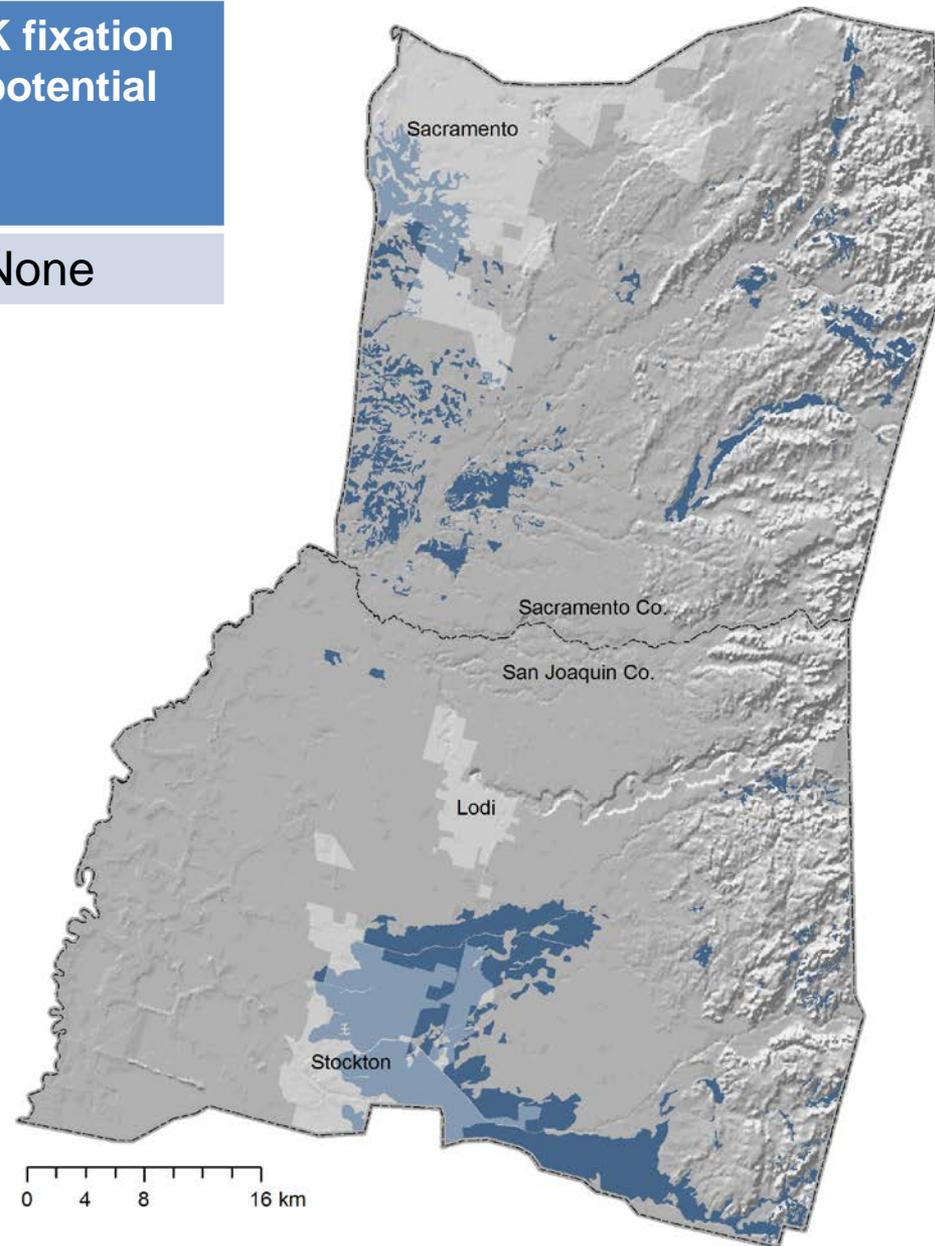
East

Adapted from a figure developed by Andrew Conlin

Region 1: Basin alluvium, 0-14,000 yrs

K-rich weatherable minerals	Weathering intensity	Exchangeable K	K fixation potential
Moderate	Low	High	None

 Vertisols & other soils with smectitic mineralogy class

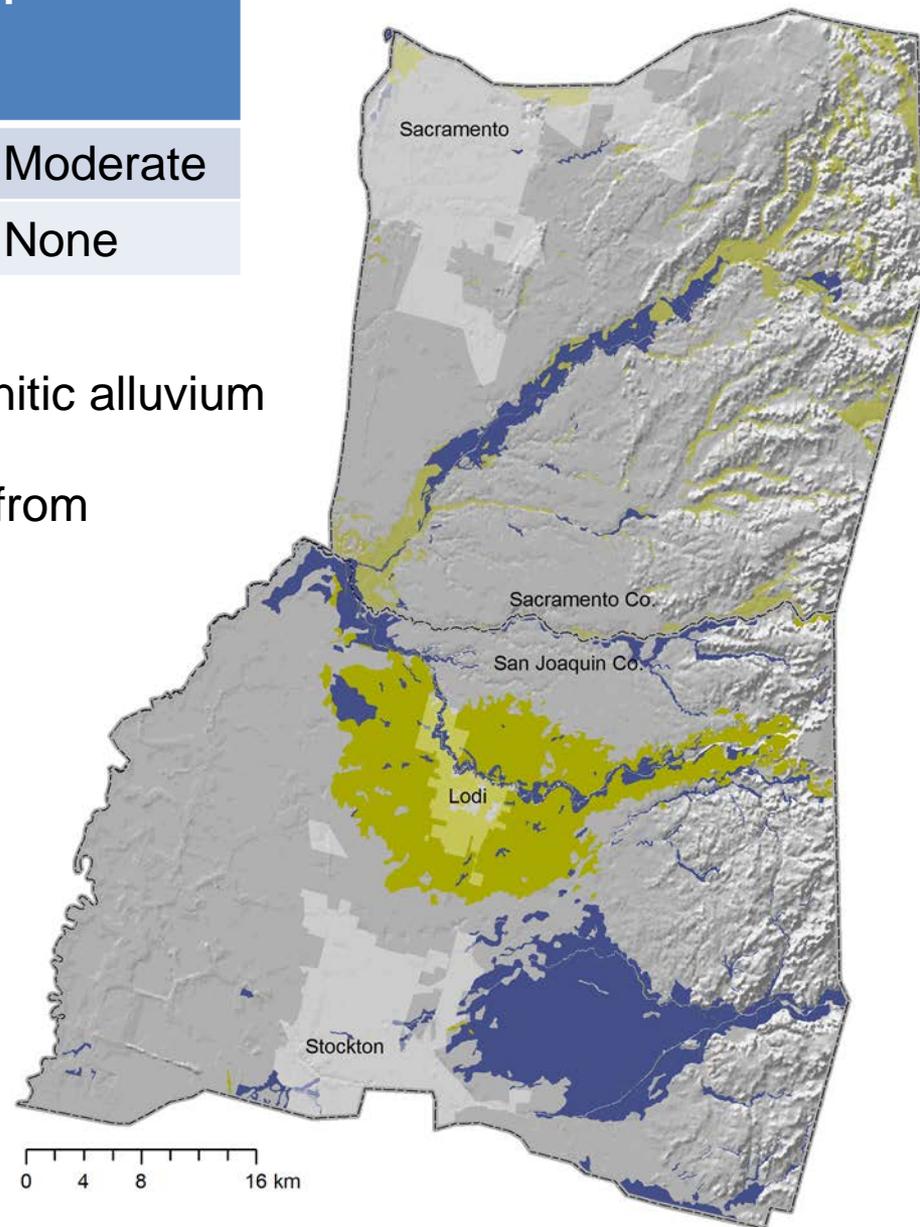


Region 2-Alluvial fans; 0-70,000 years

K-rich weatherable minerals		Weathering intensity	Exchangeable K	K fixation potential
2a	High	Low	Moderate/low	Moderate
2b1	Low	Low	Moderate	None

 2.a. Coarse loamy soils derived from granitic alluvium

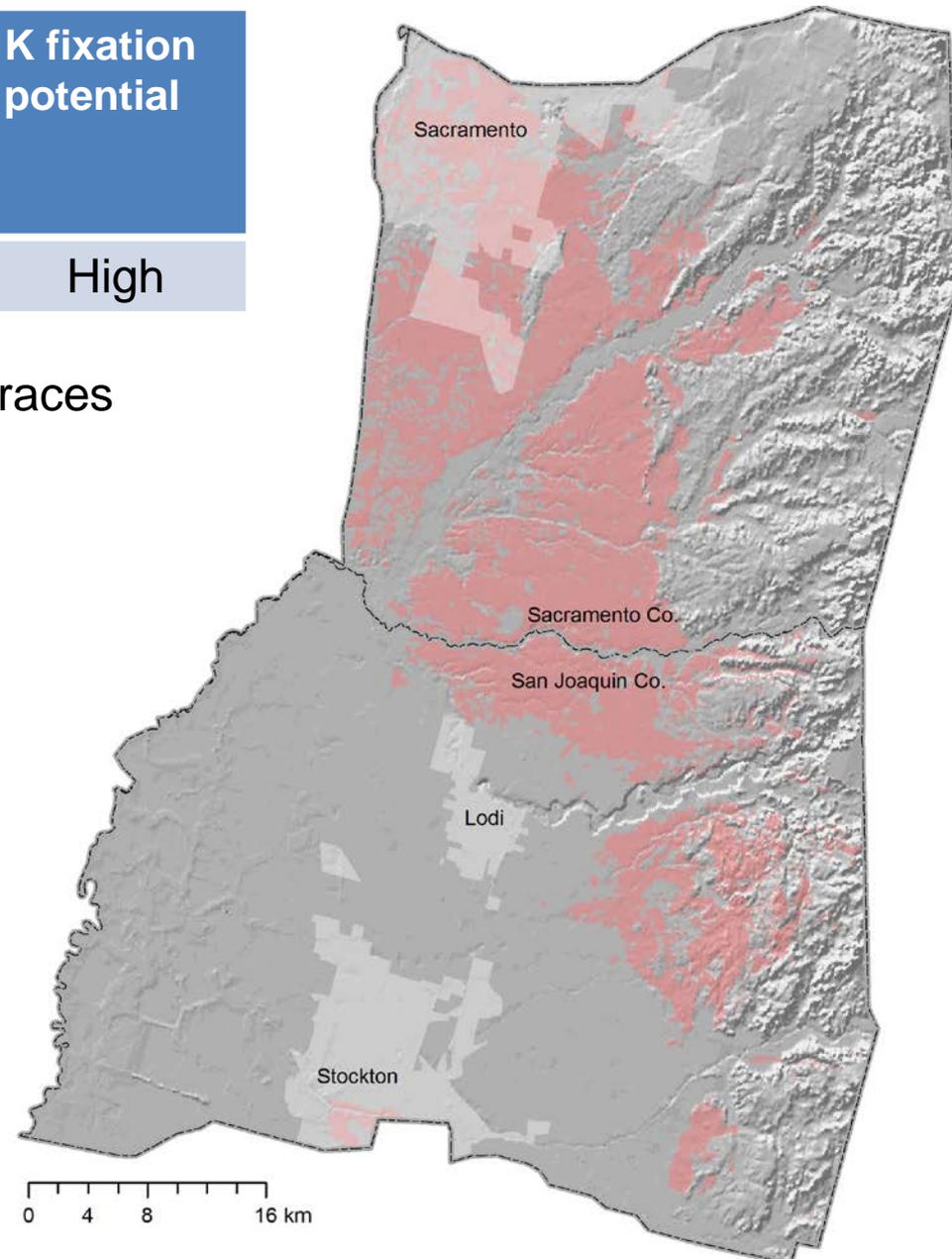
 2.b. Fine silty & fine-loamy soils derived from metasedimentary alluvium



Region 3-Low terraces; 130-330,00 yrs

K-rich weatherable minerals	Weathering intensity	Exchangeable K	K fixation potential
Moderate	Moderate	Low	High

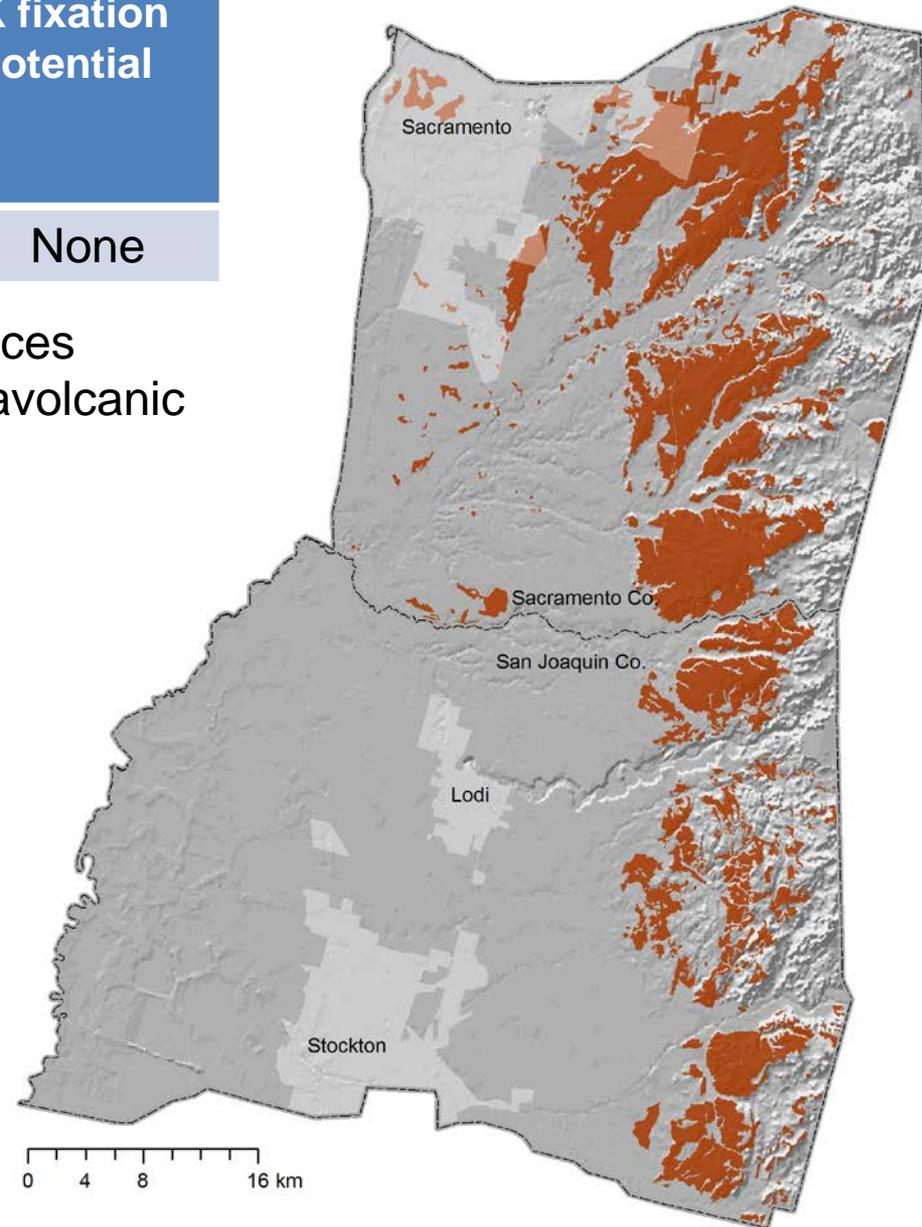
 Moderately developed soils on low terraces derived from granitic alluvium



Region 4-High terraces; >600,00 yrs

K-rich weatherable minerals	Weathering intensity	Exchangeable K	K fixation potential
Low	High	Moderate	None

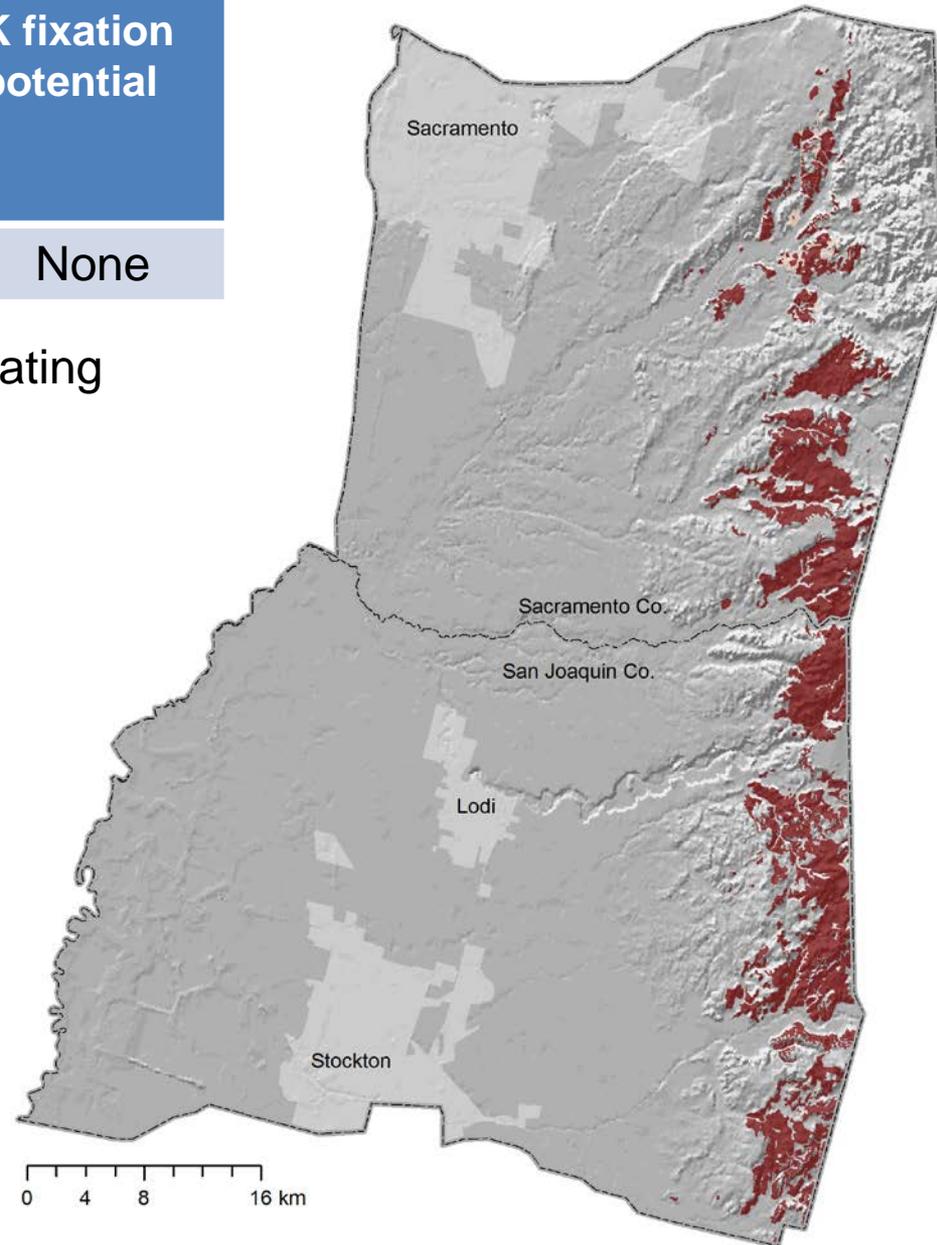
 Highly developed soils on old, high terraces derived from metasedimentary and metavolcanic



Region 5-Volcanic terrain; 3-10 million yrs

K-rich weatherable minerals	Weathering intensity	Exchangeable K	K fixation potential
High	Low	High	None

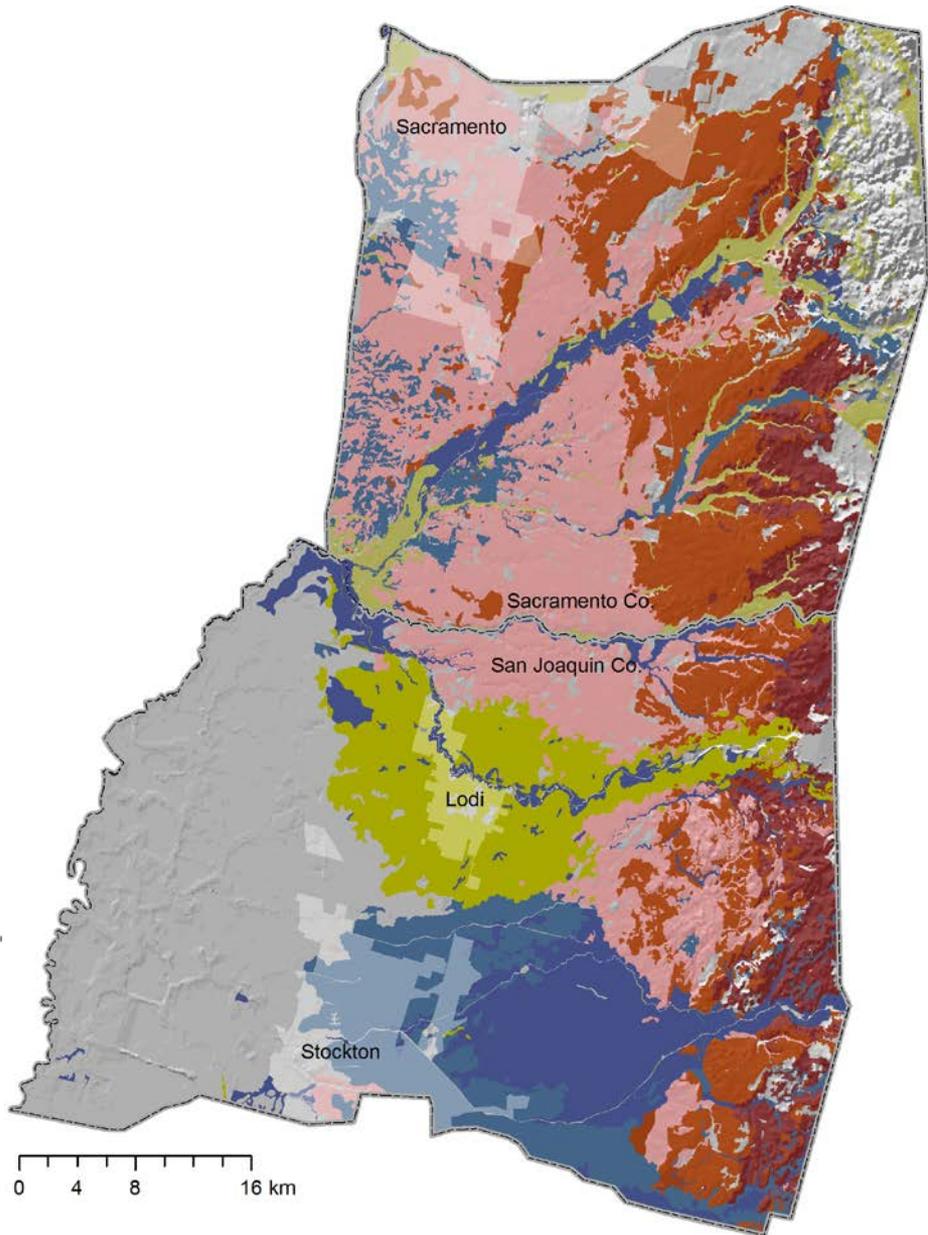
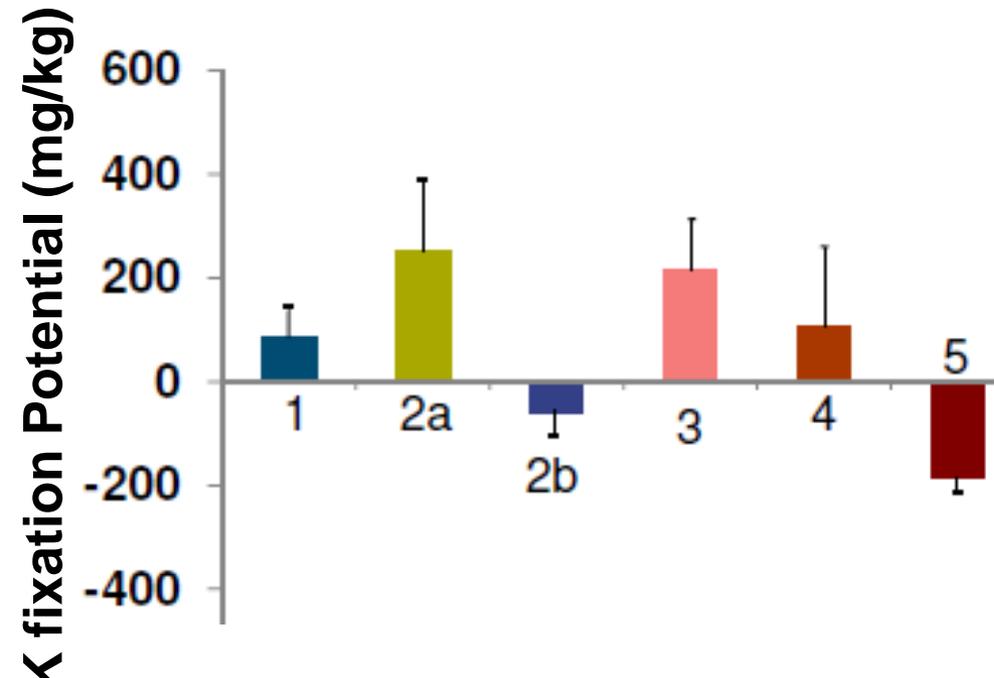
 Weakly developed soils formed in undulating volcanic terrain



Model Validation

Region K Fixation potential

1	None
2a	Mod.
2b	None
3	High
4	None
5	None



Thank you



**Acknowledgements: Jiayou Deng, Paul Verdegaal, Chuck Engels
Project was funded by the Lodi Wingrape Commission.**