



**WESTCARB Annual
Business Meeting**

**An Update on Geologic CO₂
Storage Characterization in
California**

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Anchorage, AK
October 1, 2008

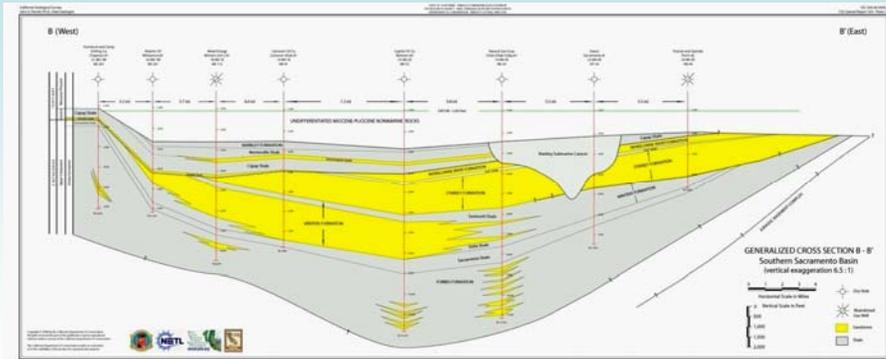


CGS / WESTCARB - Phase II

As part of the WESTCARB Phase II study, CGS prepared isopach maps for three Cretaceous formations and related overlying shales in the Sacramento Basin. We applied filters of regional geology, depth $\geq 3,300$ ft (1,000 m), and seal thickness ≥ 100 ft (30 m). These formations included:

- The Mokelumne River Formation
- The Starkey Formation
- The Winters Formation

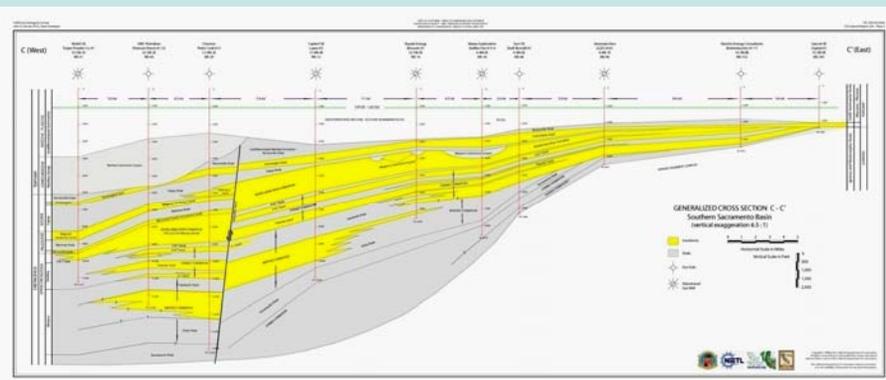
Generalized Cross-Section of the Southern Sacramento Basin



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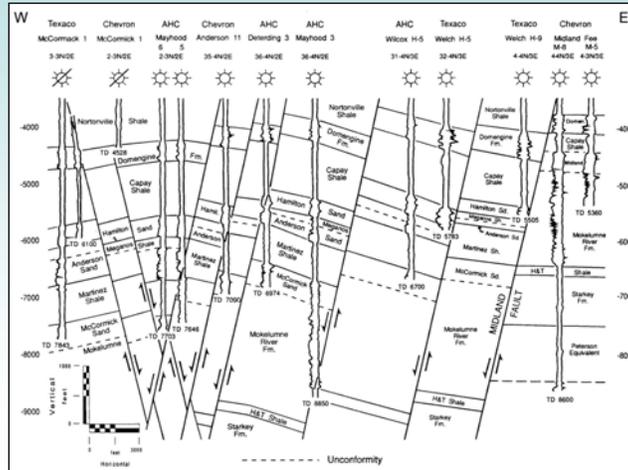
Generalized Cross-Section of the Southern Sacramento Basin



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Generalized Cross-Section of the Rio Vista Gas Field

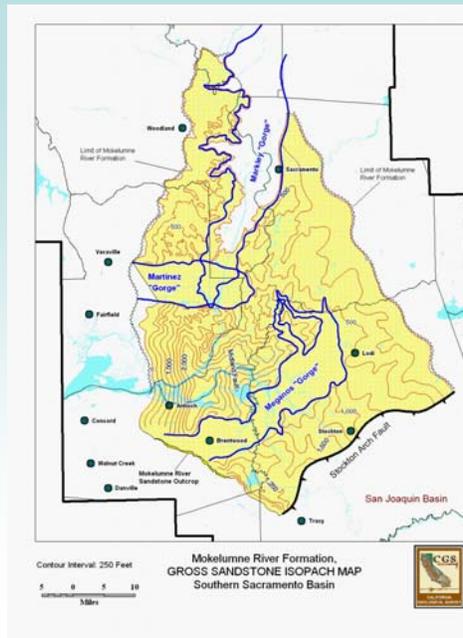


After Pepper & Johnson, 1992

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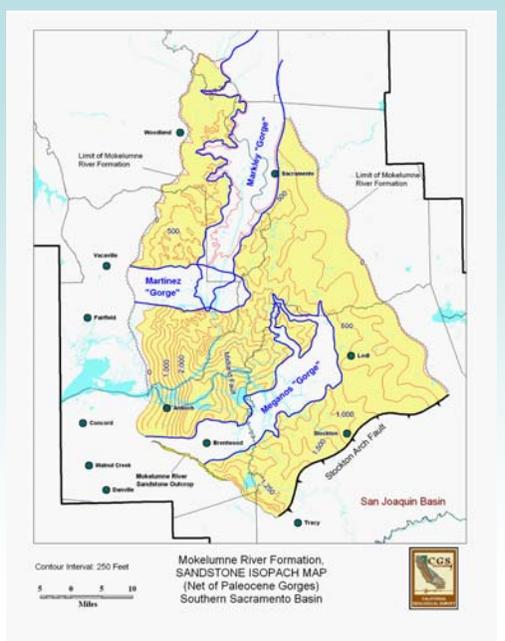
Mokelumne River Formation Gross Sandstone Isopach Map



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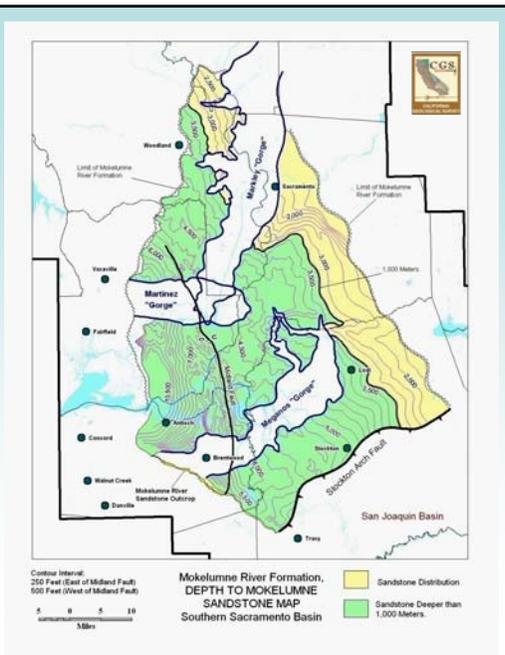
Mokelumne River Formation Sandstone With Gorges Removed



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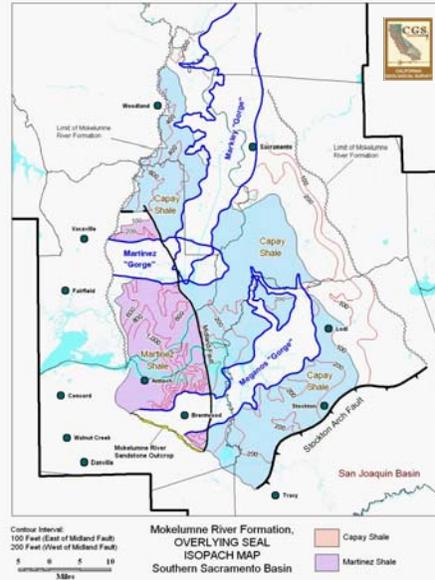
Mokelumne River Formation Greater than 3,300 ft (1,000 m) Deep



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Mokelumne River Formation Seal Isopach Map (≥ 100 ft or 30 m)



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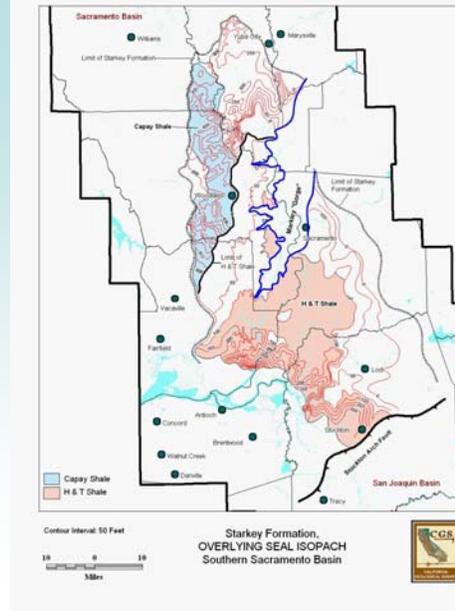
Mokelumne River Formation Summary

	Total Area	% of Total Area
Gross sandstone area	1,908 mi ²	100%
Less area of gorges	1,528 mi ²	80%
Deeper than 3,300 ft (1,000 m)	1,075 mi ²	56%
With 100+ feet (30+ m) of seal	1,045 mi ²	55%

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Starkey Formation Seal Isopach Map (≥ 100 ft or 30 m)



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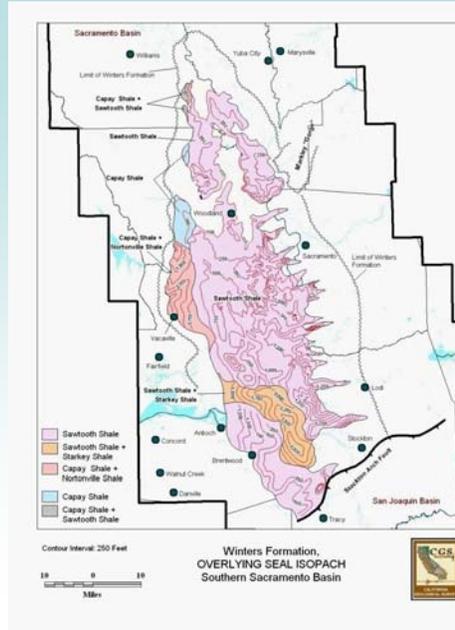
Starkey Formation Summary

	Total Area	% of Total Area
Gross sandstone area	2,321 mi ²	100%
Less area of gorges	2,214 mi ²	95%
Deeper than 3,300 ft (1,000 m)	1,416 mi ²	61%
With 100+ feet (30+ m) of seal	920 mi ²	40%

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Winters Formation Seal Isopach Map (≥100 ft or 30 m)



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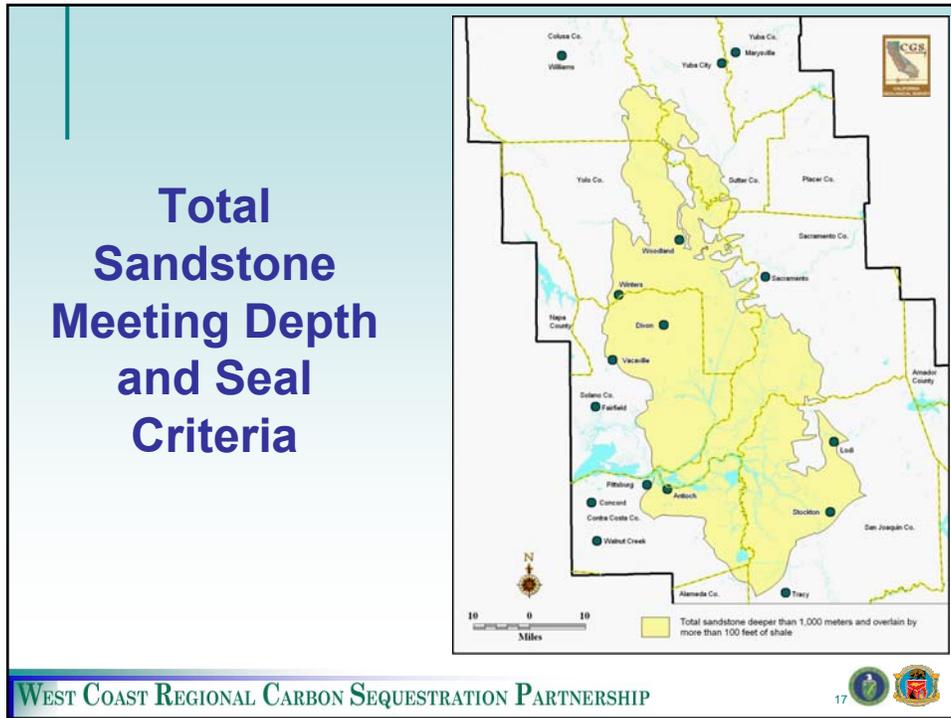


Winters Formation Summary

	Total Area	% of Total Area
Gross sandstone area	1,771 mi ²	100%
Less area of gorges	1,771 mi ²	100%
Deeper than 3,300 ft (1,000 m)	1,681 mi ²	95%
With 100+ feet (30+ m) of seal	1,524 mi ²	86%

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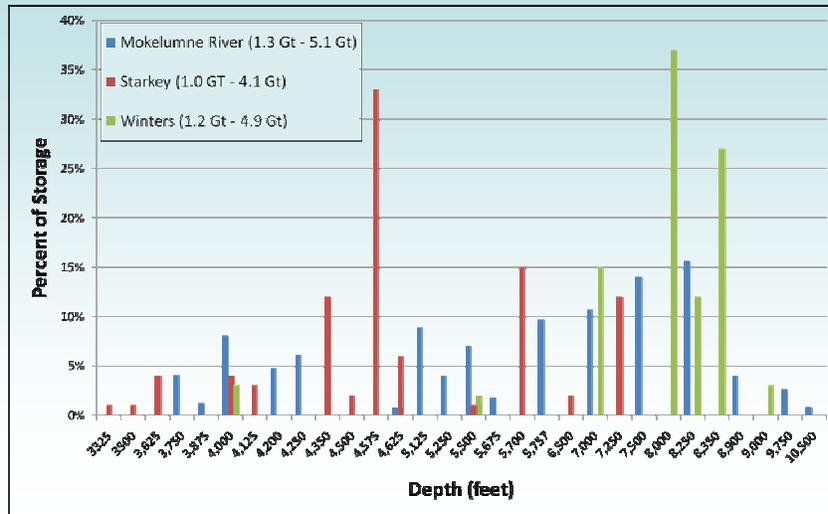
CO₂ Storage Resource Estimates*

Formation	Gigatons CO ₂ (1% pore vol.)	Gigatons CO ₂ (4% pore vol.)
Mokelumne River	1.3	5.1
Starkey	1.0	4.1
Winters	1.2	4.9
Total	3.5	14.1

*For sands greater than 3,300 ft (1,000 m) deep with at least 100 ft (30 m) of overlying shale.

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Storage Resources vs. Depth



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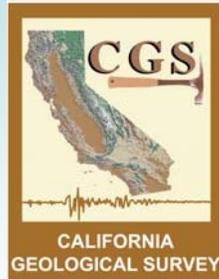
Summary and Conclusions

- In Phase II, CGS took a closer look at three specific formations in the southern Sacramento Basin and applied filters of regional geology, depth $\geq 3,300$ ft (1,000 m), and seal thickness ≥ 100 ft (30 m)
- This resulted in reductions of about 14% to 60% in the area of potential CO₂ reservoirs in the three formations
- Total storage resource estimates for the three formations range from 3.5 to 14.1 gigatons of CO₂
- Additional more-detailed studies will be required prior to site selection for sequestration projects

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Department of Conservation California Geological Survey



<http://www.conservation.ca.gov/CGS/>

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