

HYDROGEOLOGY OF STRUCTURALLY EXTENDED TERRAIN  
IN THE EASTERN GREAT BASIN  
OF NEVADA, UTAH, AND ADJACENT STATES  
FROM GEOLOGIC AND GEOPHYSICAL MODELS

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Regional ground-water movement in the eastern Great Basin is dominated by flow through thick Paleozoic carbonate-rock aquifers. The present-day distribution of these rocks and aquifers is largely a result of late Cenozoic structural extension and consequent thinning of the sedimentary-rock sections in parts of the region. Current geologic descriptions of extensional remnants in the eastern Great Basin provide numerous geographic links and relations between extended terrains and regional ground-water flow systems. In particular, some of the larger areas of slight extension underlie regional ground-water flow systems and are situated so that they connect the upgradient recharge-rich parts of these systems with their distal discharge areas. Other areas of slight extension are not connected to recharge areas and contain only minor or local ground-water flow systems. Areas of extreme extension generally underlie areas noted for single-basin flow systems with discharge from broad areas of basin fill rather than from springs issuing from carbonate rocks. Further, current concepts of extension provide simple hypotheses for explaining the relations between regional-flow patterns and extended terrains. The conceptual geologic models are supported by geophysical modeling to reproduce observed gravity and magnetic fields.

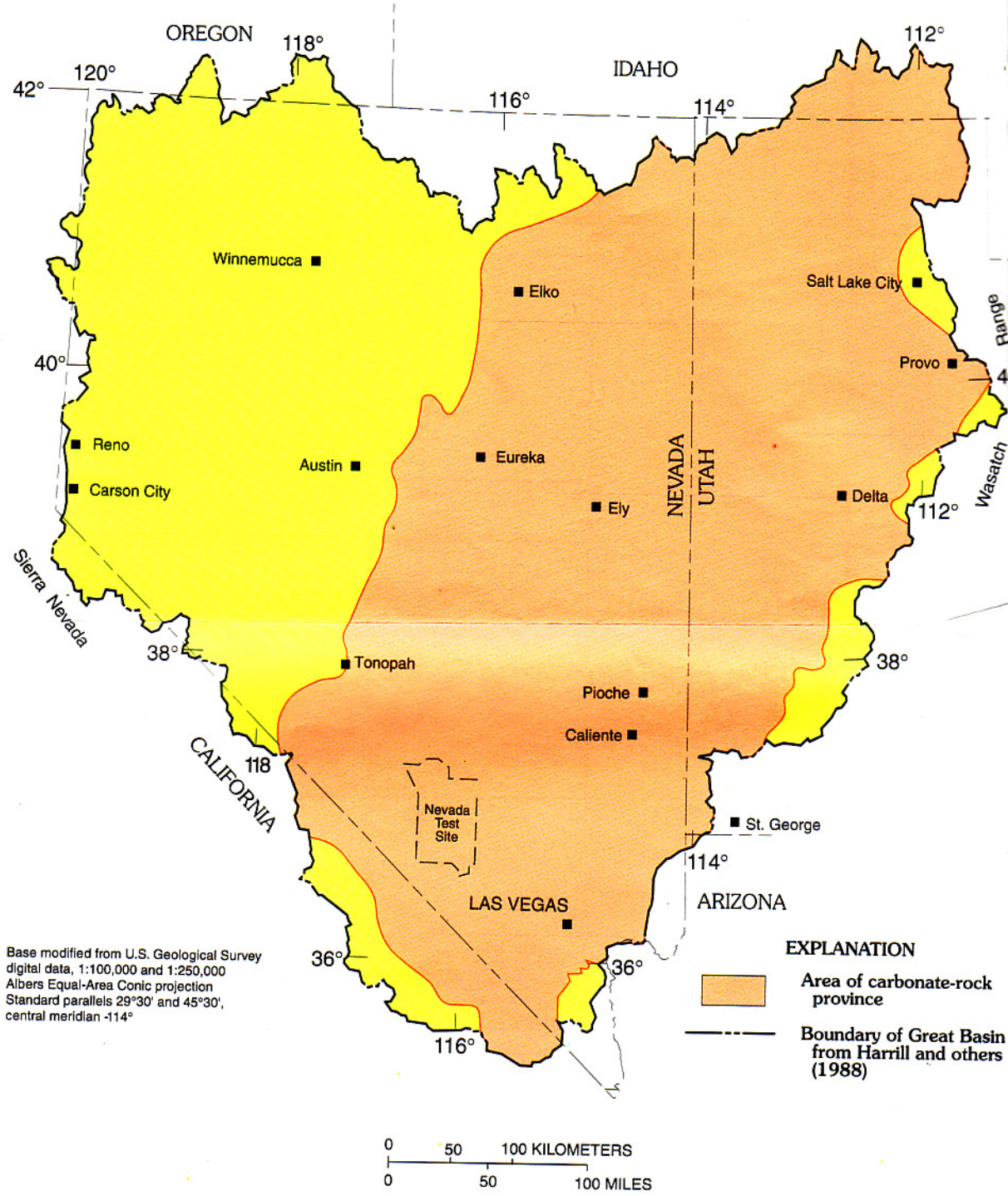
*Abstract of*

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reliable surface-water sources have been allocated for use. The most commonly used aquifers are sand-and-gravel basin-fill deposits in structural basins of the region. In many basins, pumpage from the basin-fill aquifers is as much as (or more than) the safe yield.

Consequently, aquifers other than basin fill are being assessed in the eastern Great Basin to

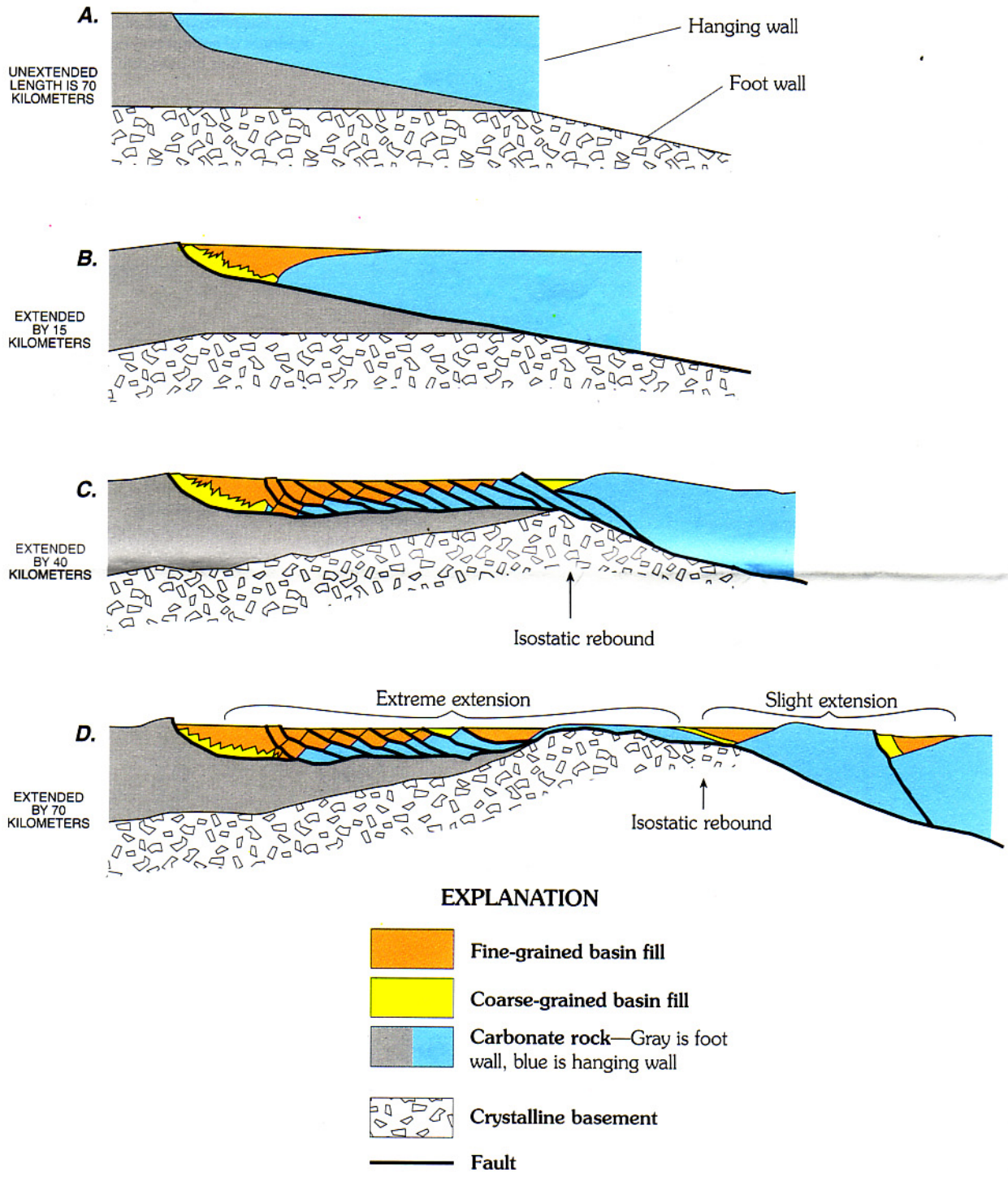
geologic and hydrologic features of structural extended terrains in the eastern Great Basin. First, the model is described and major structural features are compared with regional groundwater flow patterns. Second, the validity of conceptual hydrogeologic model is evaluated using geophysical data and geologic models derived from geophysical profiles.



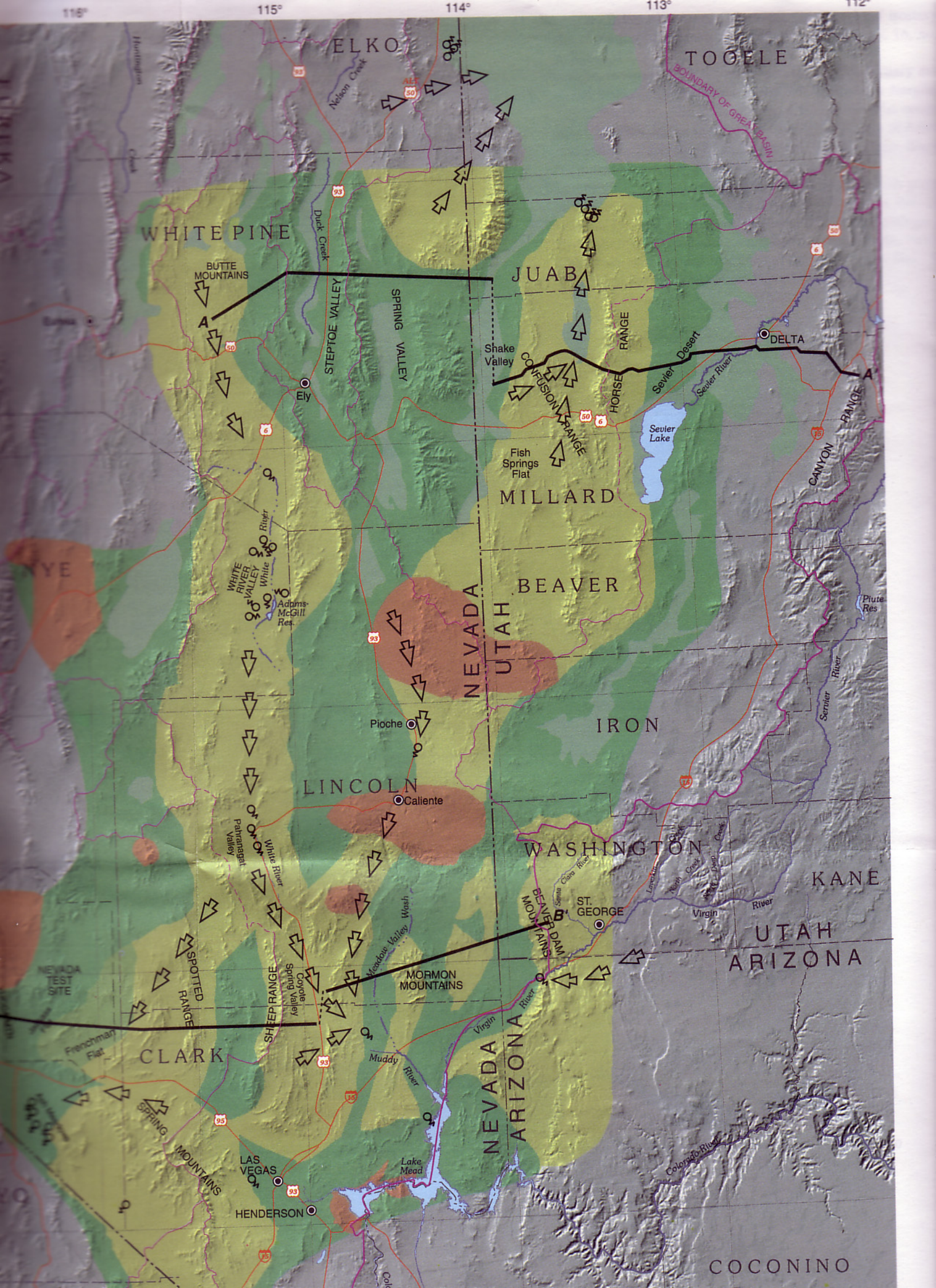
**Figure 1.** Location of carbonate-rock province in eastern Great Basin.



**Figure 1.** Location of carbonate-rock province in eastern Great Basin.



**Figure 2.** Diagrammatic geologic sections showing hypothetical progressive extension of a crustal block. Modified from Wernicke (1985) and Hamilton (1988).



## EXPLANATION



Area of slight extension



Area of transition between slight and extreme extension



Area of extreme extension



Caldera or volcanic complex



Evapotranspiration from basin floor



Line of hydrogeologic section—See figures 3,4,8, and 9.  
Dashes indicate lateral offset between segments



Regional flow-system boundary—Dashed where inferred



Regional flow direction



Major regional spring

