FLUVIAL-LACUSTRINE OIL RESERVOIRS IN THE MIDDLE MEMBER OF THE EOCENE GREEN RIVER FORMATION, SOUTH-CENTRAL UINTA BASIN, UTAH

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Anastomosing, low gradient distributary channels produce about 30 gravity, paraffinic oils from the Middle Member of the lacustrine Eocene Green River Formation in the south-central portion of the Uinta Basin. This localized depocenter was situated along the fluctuating southern shoreline of Lake Uinta, where complex deposits of marginal-lacustrine to lower delta plain accumulations are characteristic.

The Middle Member contains several depositional cycles approaching 30 to 35 feet in individual thickness that can be recognized in outcrop, core, and downhole logs. These cycles represent 100,000-year periods based on limited absolute age dating. Multiple 100,000-year cycles typically form larger cycles that are about 60 to 120 feet thick, and are bounded above and below by oolitic and/or ostracodal grainstone deposited during lake-level highstands. Distributary channels within the cycles are the reservoirs. The subaerial to subaqueous channels commonly possess an erosional base and exhibit a fining upward character. Bedding features commonly range from large-scale trough and planar cross-bedding or lamination at the base, to climbing ripple assemblages near the uppermost reservoir boundary. The best reservoir quality is found within the laminated to cross-stratified portions, and the poorest reservoir quality is within the climbing ripple phase which usually possesses more deleterious micas and/or detrital clays.

Diagenesis also exerts a major control on reservoir quality. Certain sandstone beds were cemented by an early, iron-poor calcite cement, which can be subsequently leached. Intense compaction, silicic and iron-rich carbonate cements, and authigenic clays serve to reduce reservoir quality to marginal economic levels. Secondary intergranular porosity (up to 20%) is largely responsible for the 10 to 100 md reservoir rock, which is the objective for both primary and secondary oil production.

ACKNOWLEDGMENTS

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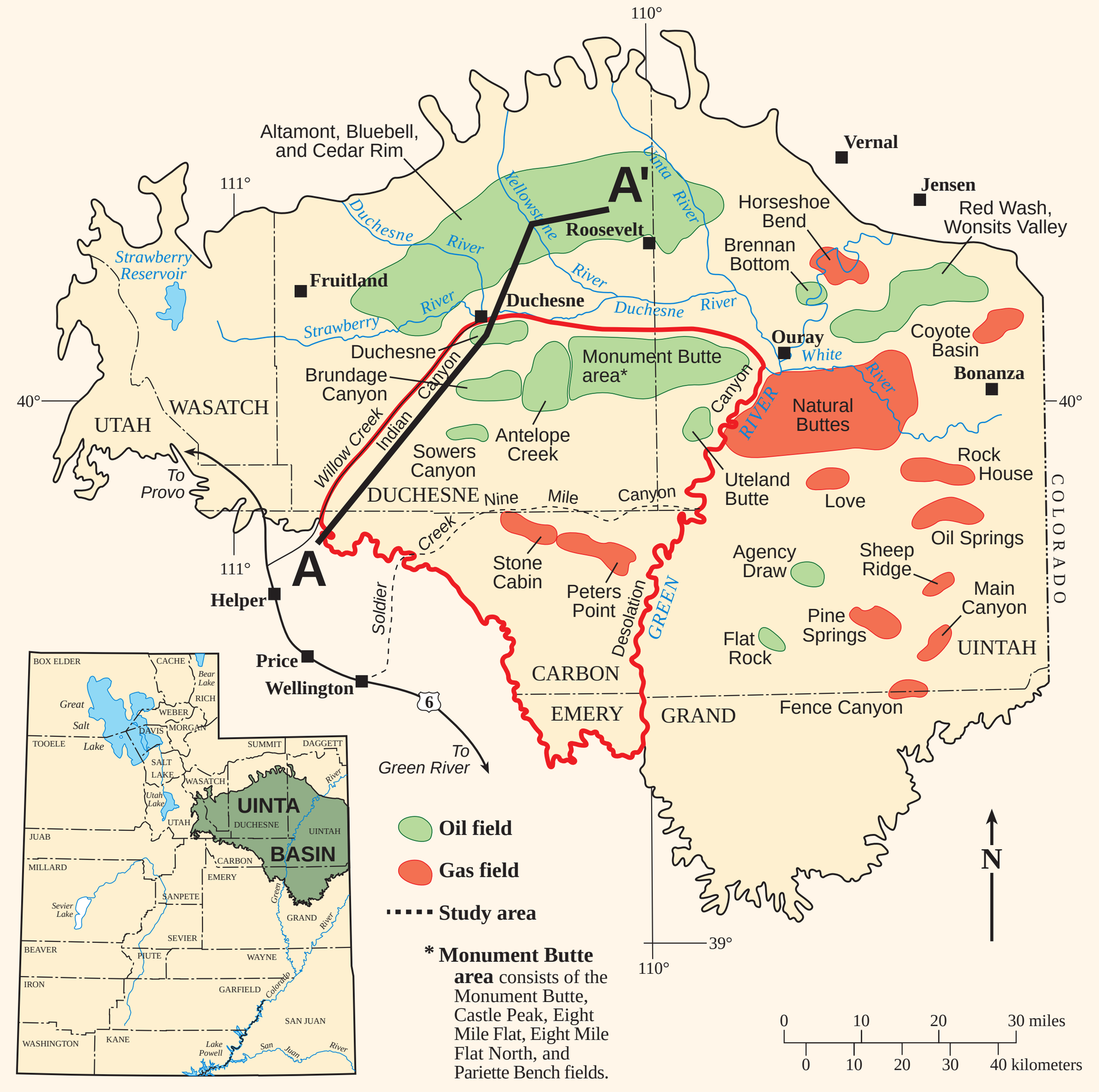
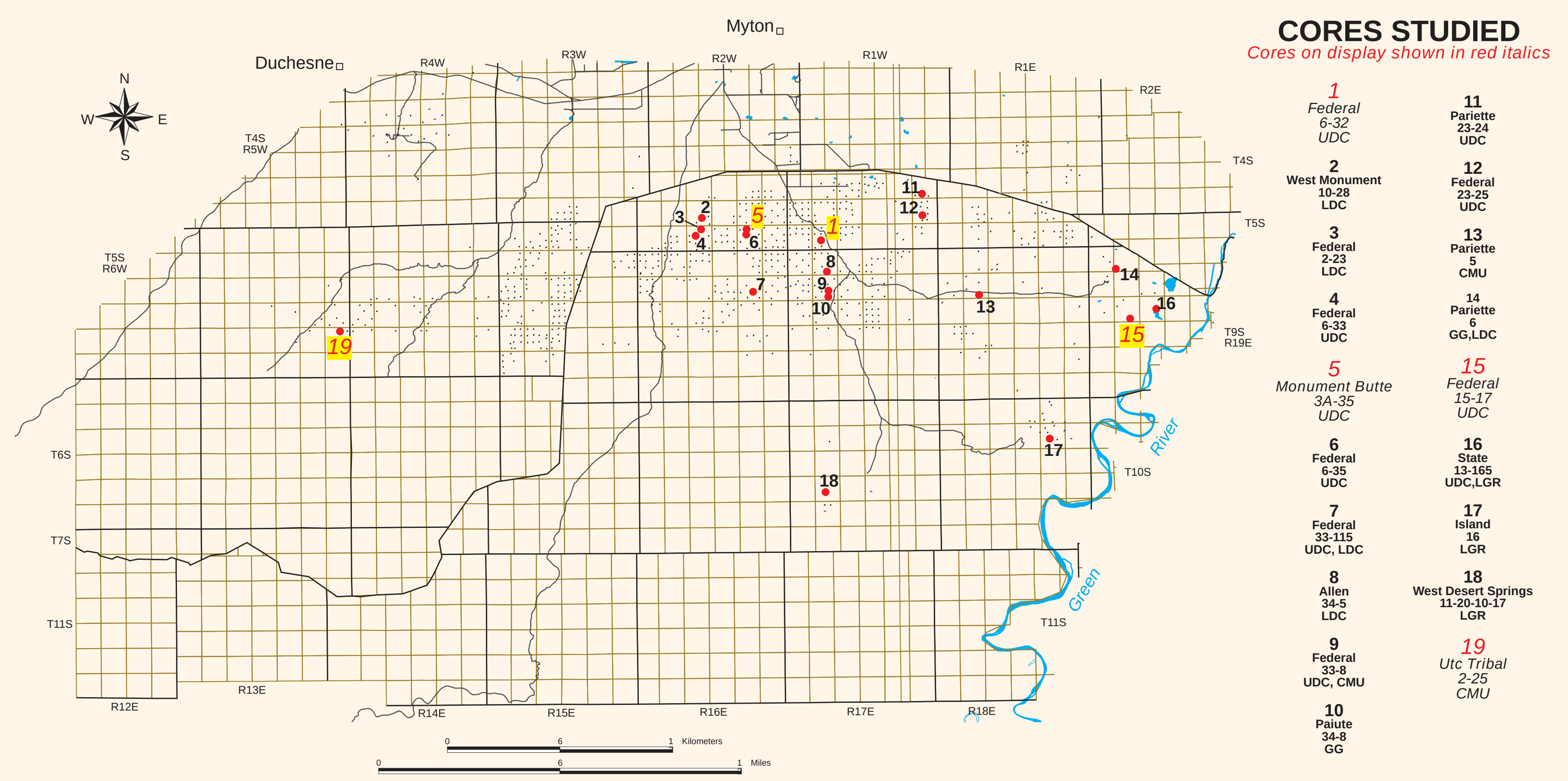
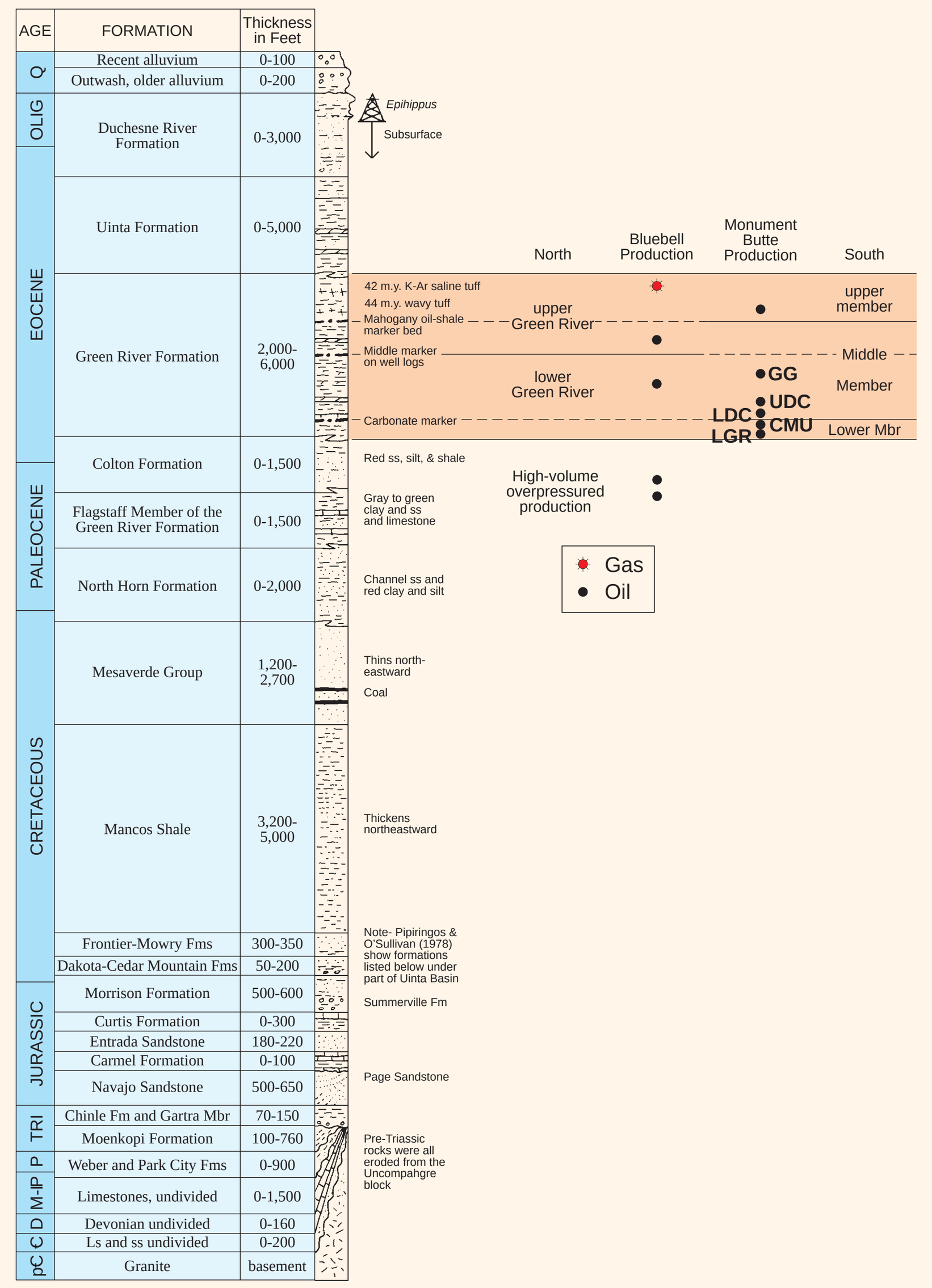




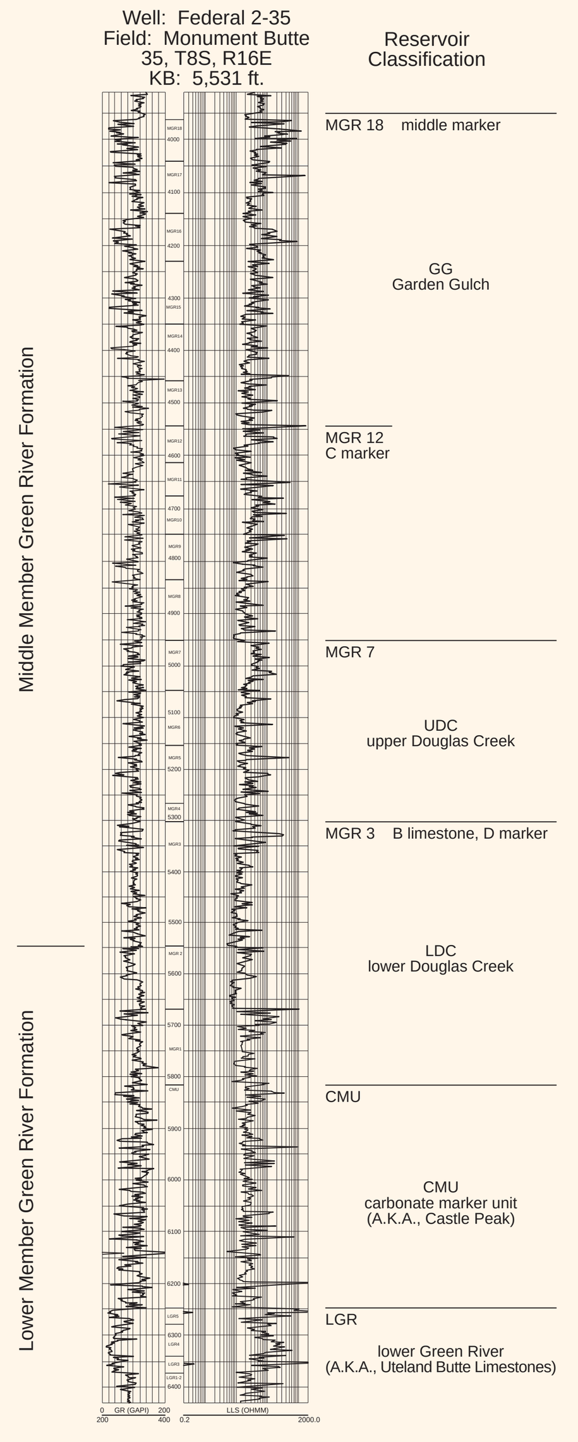
STRATIGRAPHIC NOMENCLATURE

Bradley 1931	Picard 1957	Weiss 1990	Remy 1992	Lomax unpub.	UGS 1999	Reservoir Classification
base of the Mahogany Oil Shale zone						
?			transitional facies	Garden Gulch		Garden Gulch (GG)
			C marker		MGR 12	
delta facies	Green Shale Facies	Middle Member	delta facies		MGR 7 (Middle Member)	
				Douglas Creek		upper Douglas Creek (UDC)
			D marker	B limestone	MGR 3	
				lower Douglas Creek		Lower Douglas Creek (LDC)
Carbonate marker bed						
second lacustrine tongue	Black Shale Facies	Lower Member	CMU (carbonate marker unit)	Castle Peak	CMU (carbonate marker unit) (Lower Member)	carbonate marker unit (CMU) A.K.A. Castle Peak
Colton Tongue						
first lacustrine tongue				Uteland Butte	LGR 1-5	Lower Green River (LGR) A.K.A. Uteland Butte

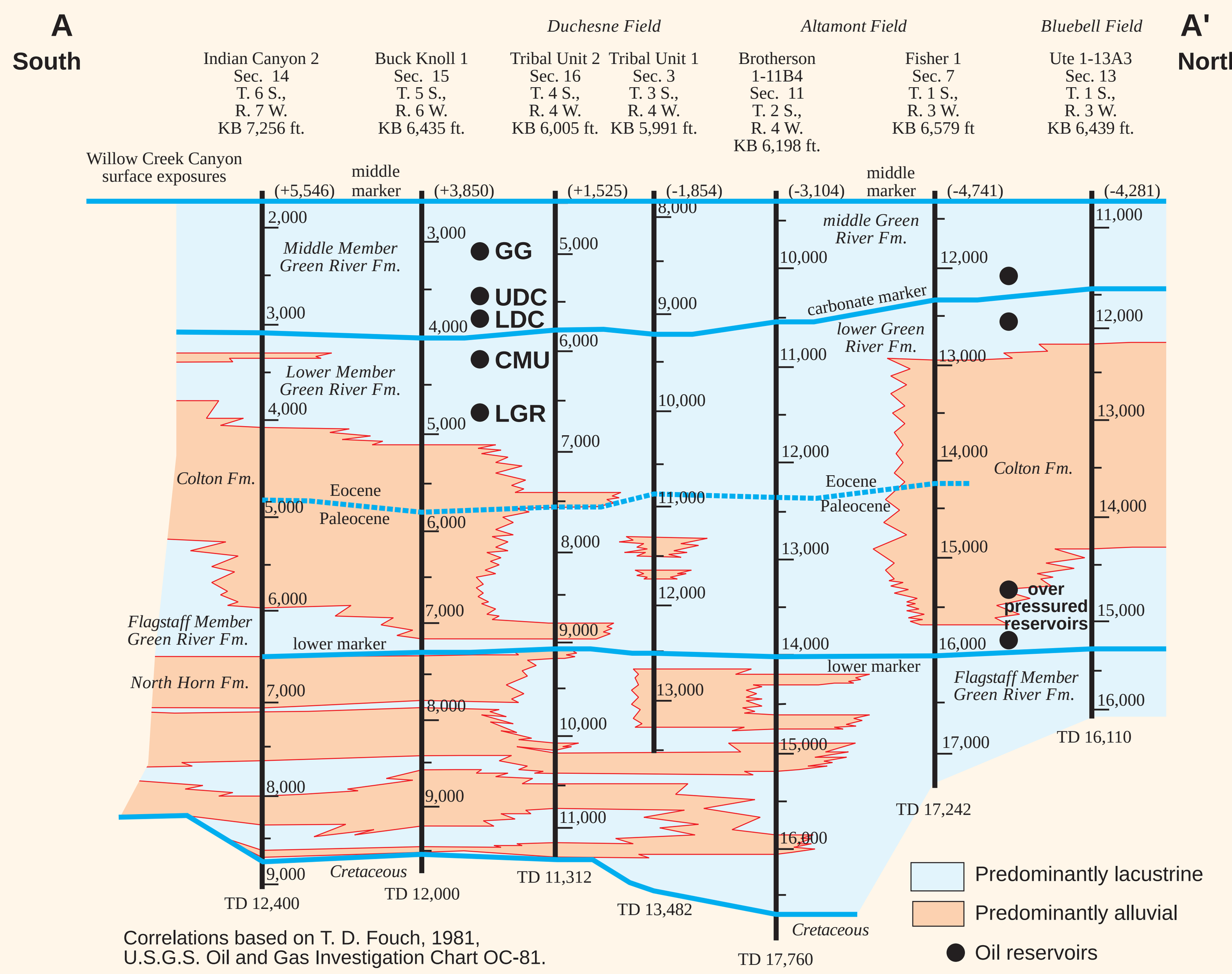
STRATIGRAPHIC COLUMN


Modified from L.F. Hintze, 1988, Geologic History of Utah

TYPE LOG

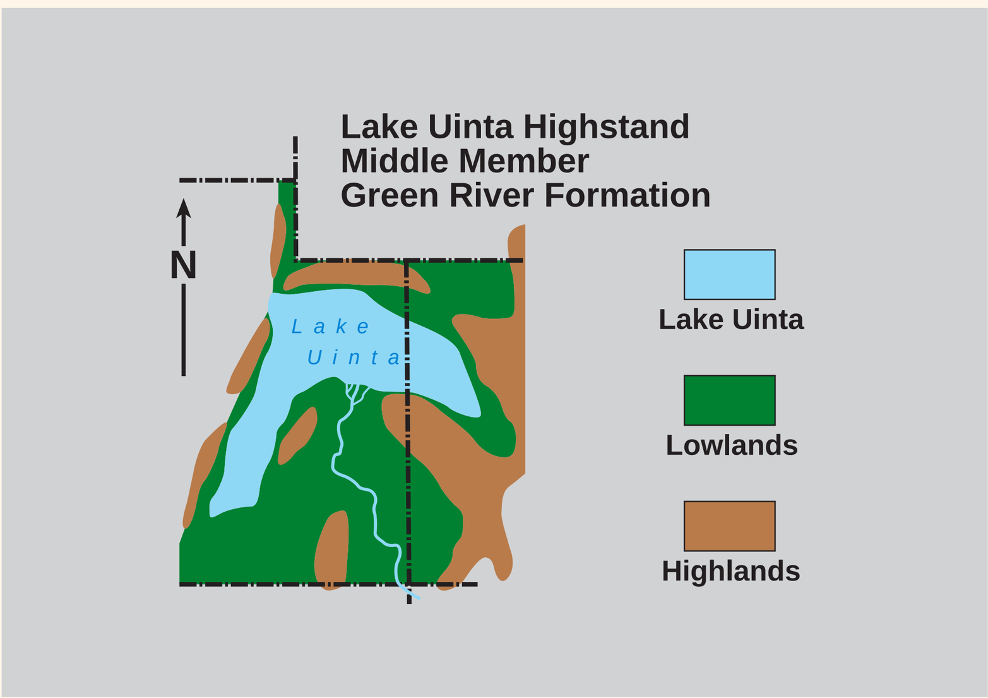


STRATIGRAPHIC CROSS SECTION

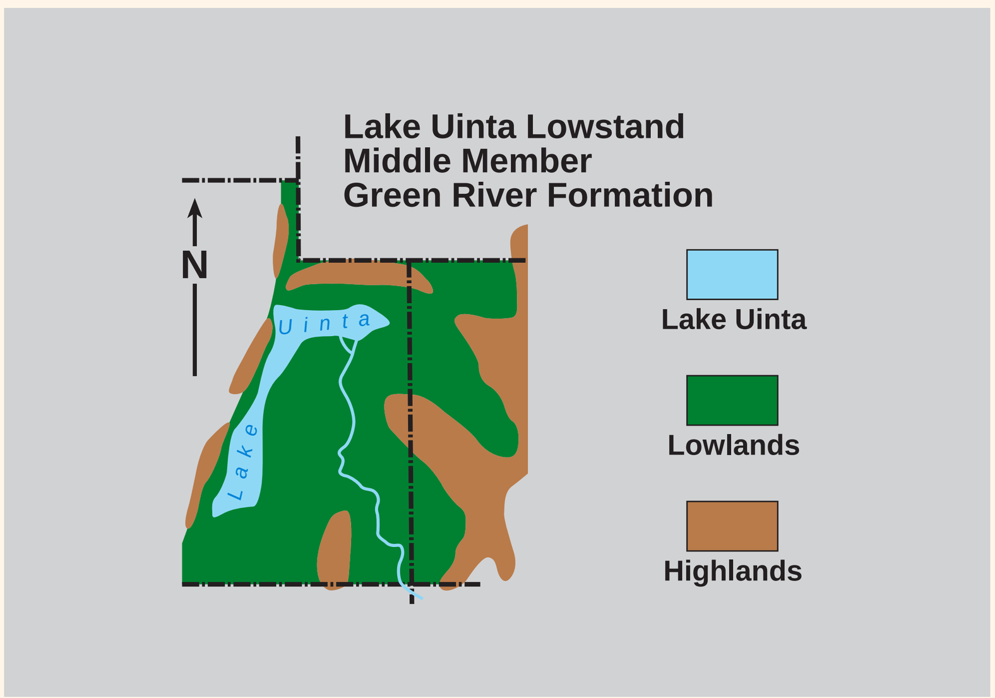


Correlations based on T. D. Fouch, 1981, U.S.G.S. Oil and Gas Investigation Chart OC-81.

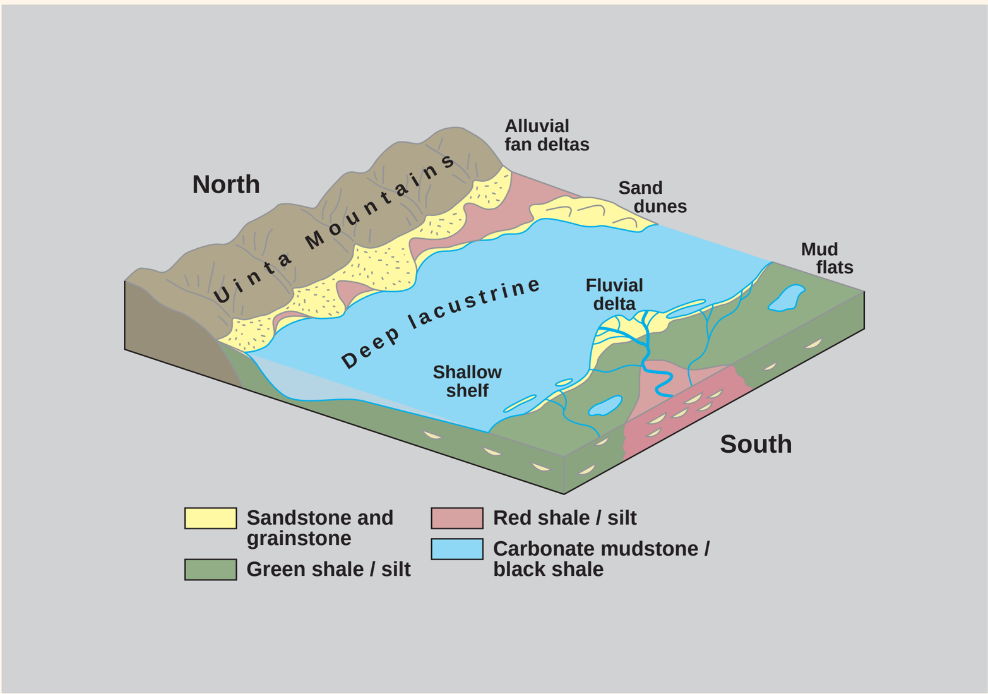
HIGH LAKE LEVEL

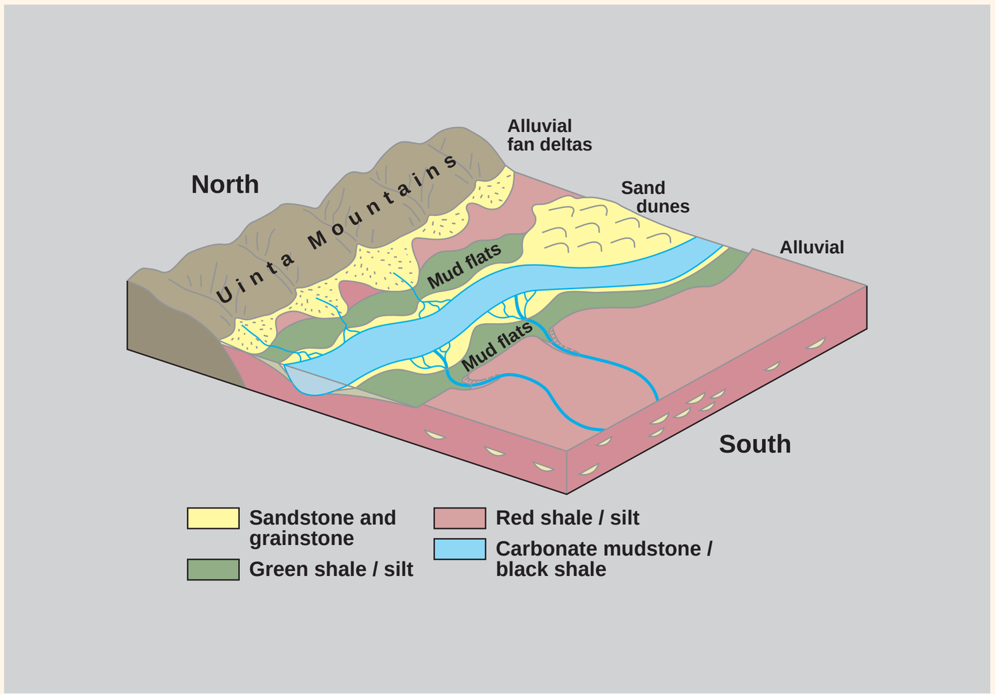


LOW LAKE LEVEL

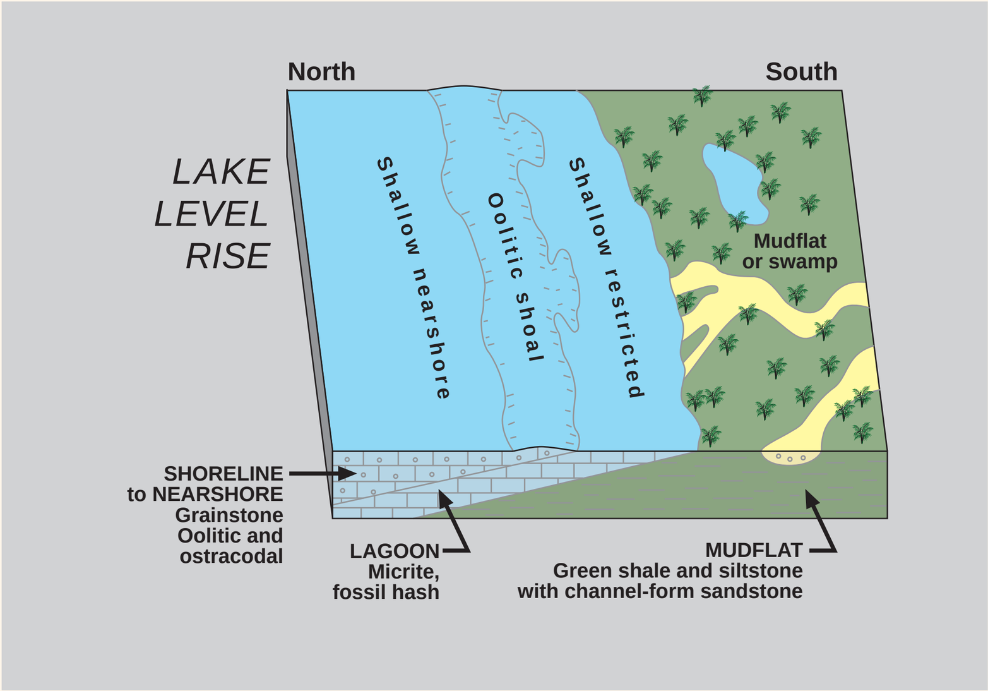


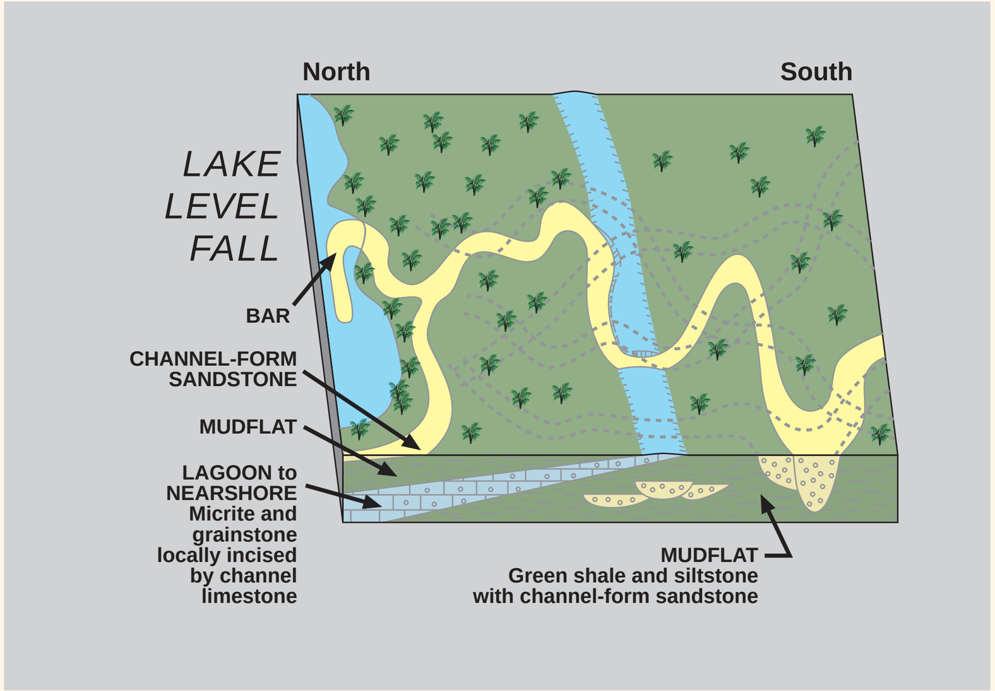
R e g i o n a l   S c a l e





B a s i n   S c a l e





S h o r e l i n e   S c a l e

UGS