# Depositional Systems, Soils, and Subsurface Water Storage

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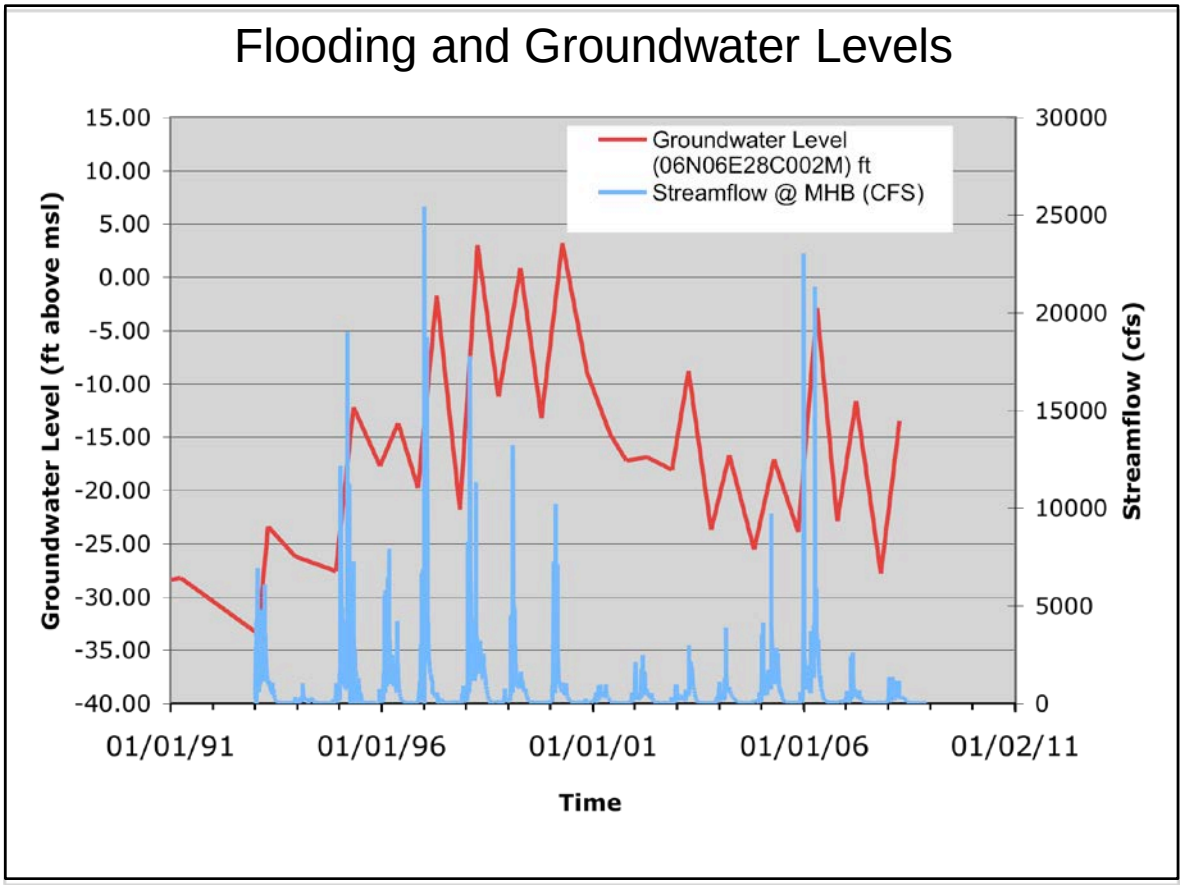
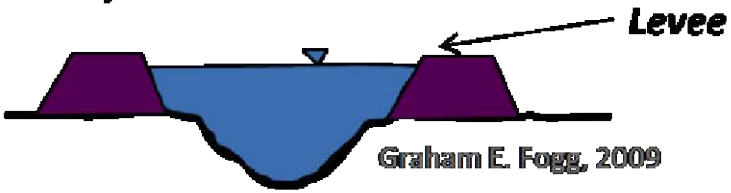
# Sutter Bypass, Sutter Co., 1997 flood

# *Climate Change and Groundwater: Higher Flooding Risks BUT Greater Recharge??*




1997, 1995 Flood Events
Sacramento County, CA

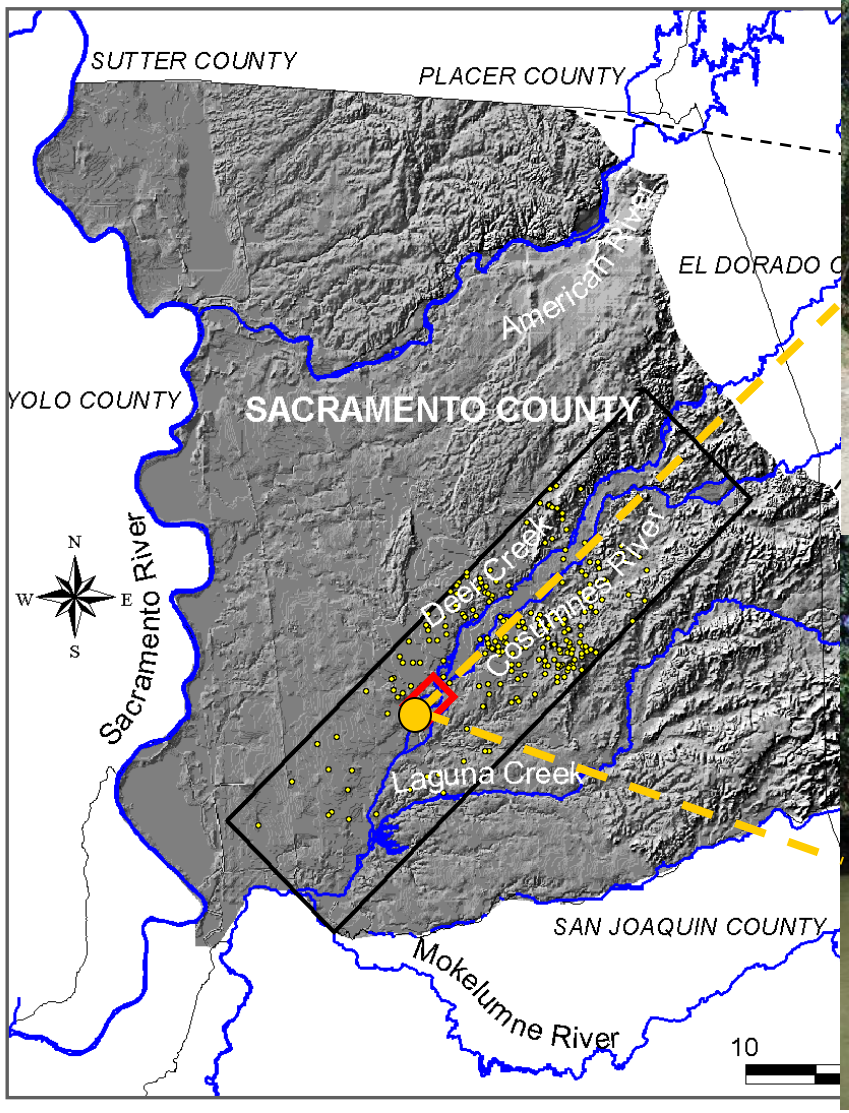
***No Floodplain:***



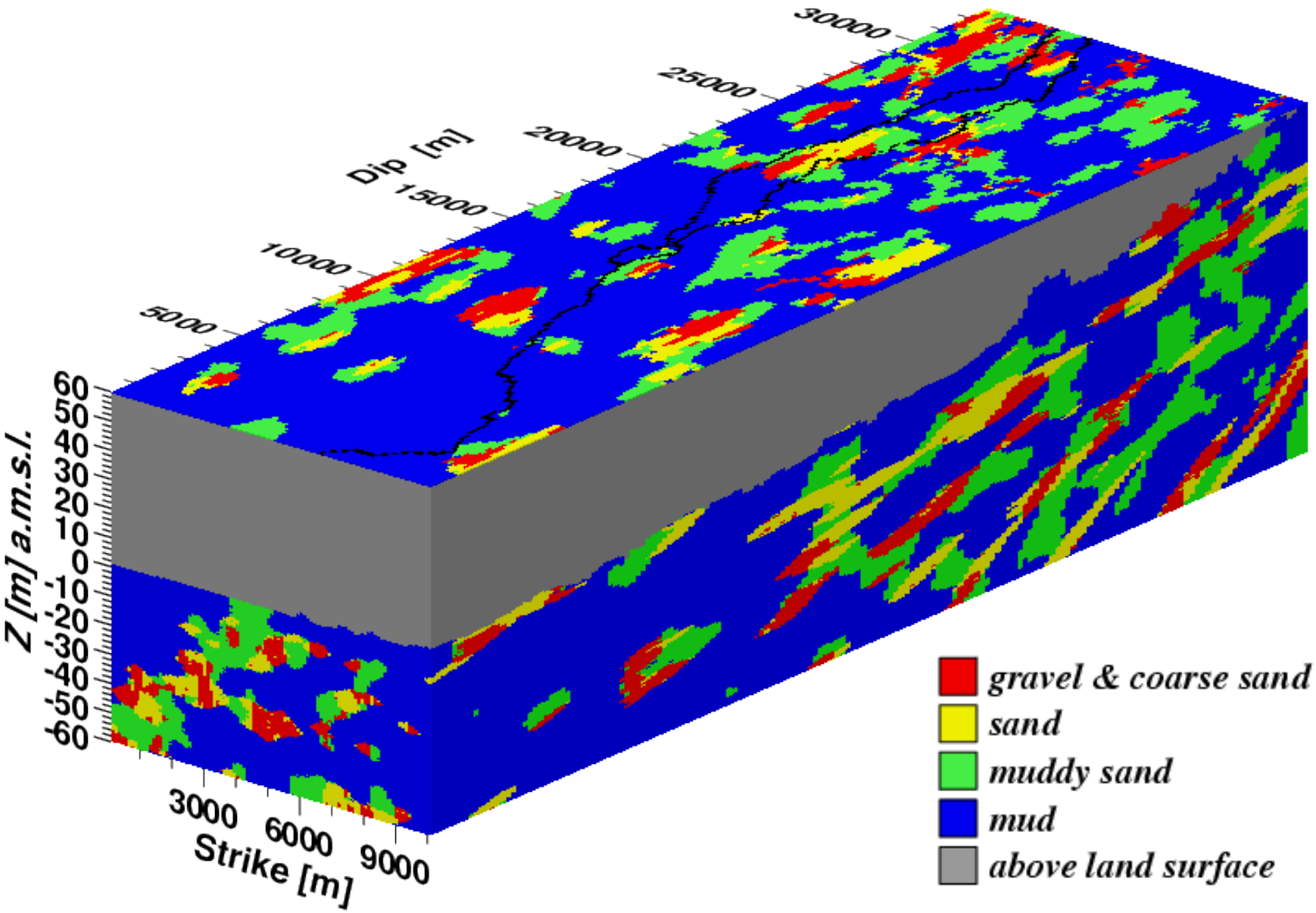

***----------VERSUS:----------***

***Floodplain w/ set-back levees:***

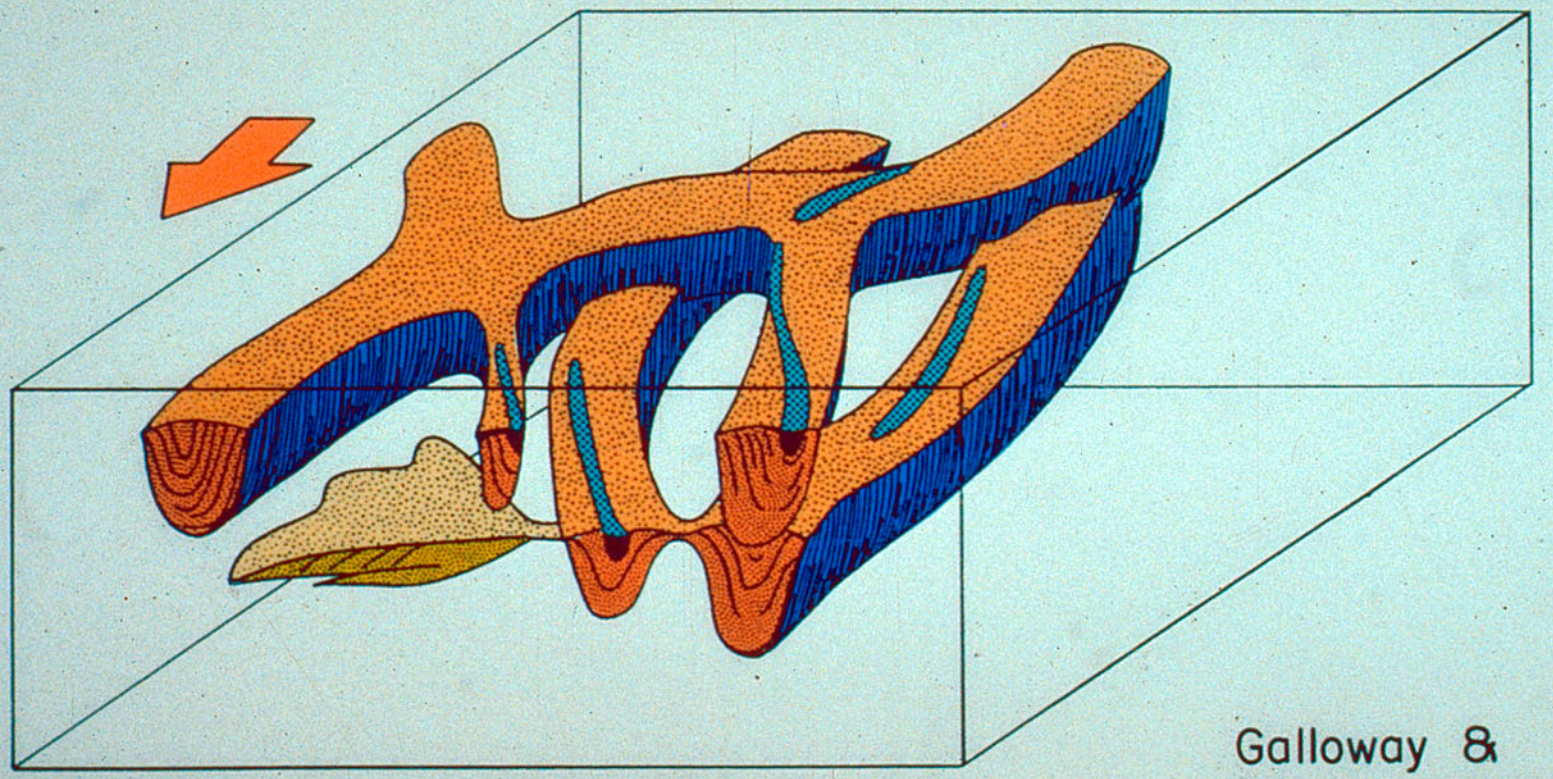
# *Case study - Cosumnes River, California*



# TPROGS Realization 2



# FACIES ARCHITECTURE

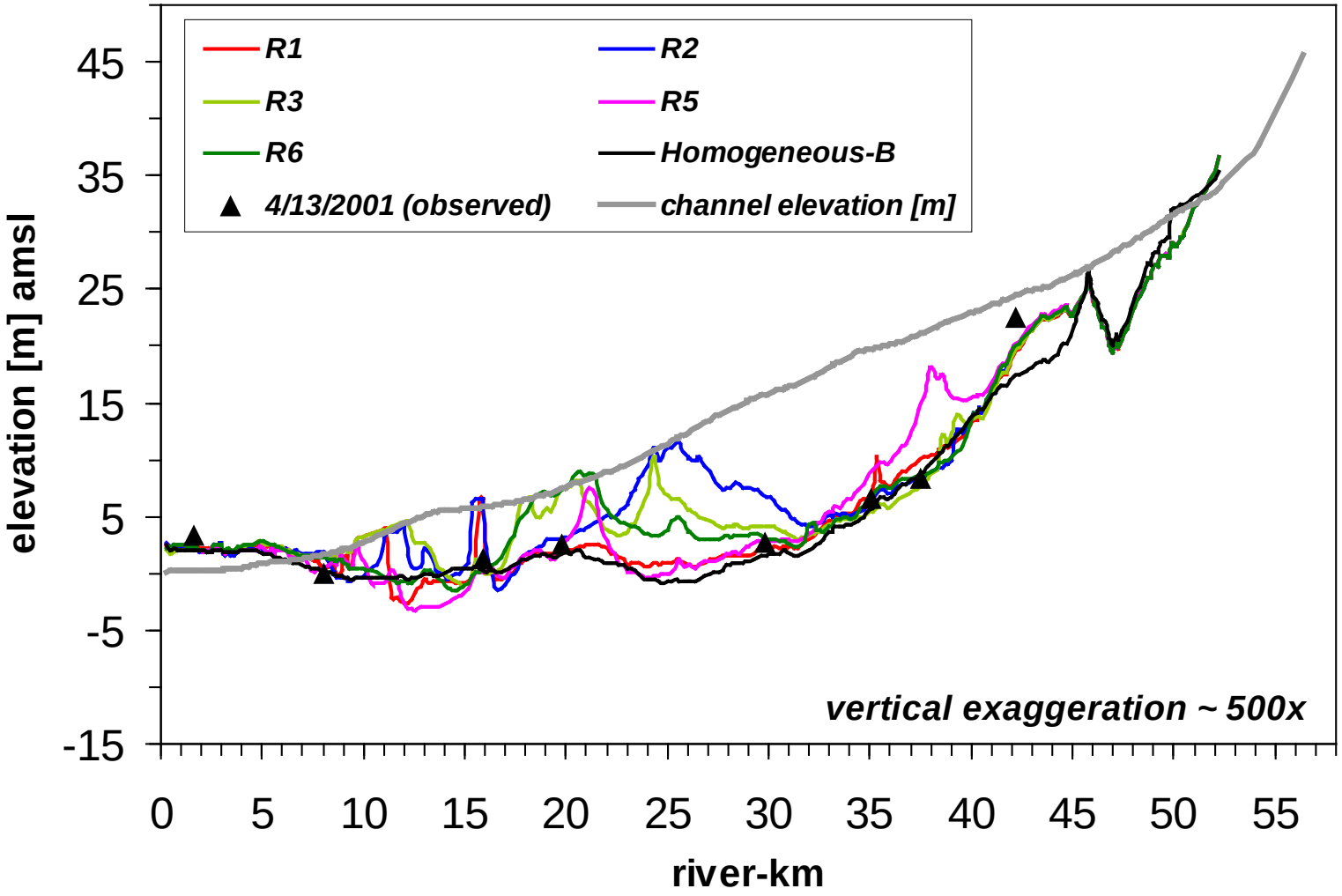


Galloway & Hobday 1983

## Suspended-load channel

Bureau of Economic Geology QA-2480

# *River model – simulated water table*




*Fleckenstein, J.H., Niswonger R.G., & Fogg, G.E., Ground Water,44(6), 2006*

# Kings River Alluvial Fan/Plain Example

# Understanding Alluvial Fans: A Sequence Stratigraphic Approach

**Gary S. Weissmann**

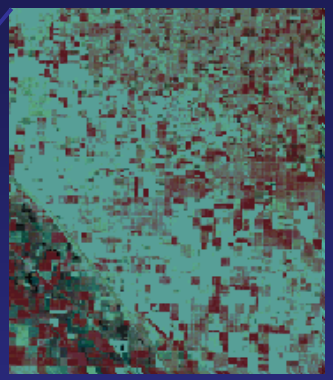
**Hydrologic Sciences**
**University of California, Davis**

Graham E. Fogg, 2002

Weissmann and Fogg (1999)
Weissmann, Carle and Fogg (1999)
Weissmann, Mount and Fogg (2002)

# Kings River Fan Aquifer System

- Stream-dominated alluvial fan system (fluvial depositional system);
- Located southeast of Fresno, California;
- Study area located in medial fan area.



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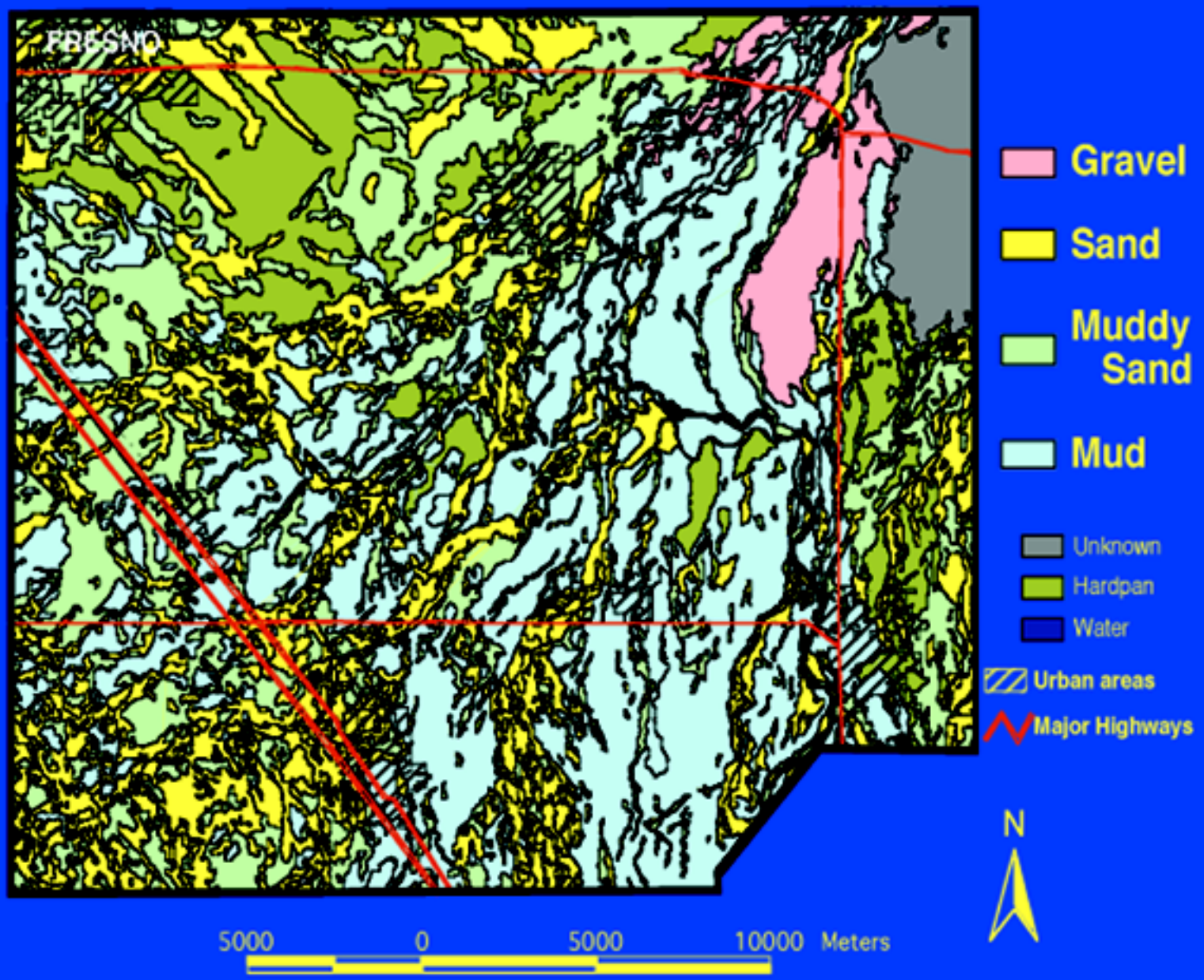
# Kings River Alluvial Fan



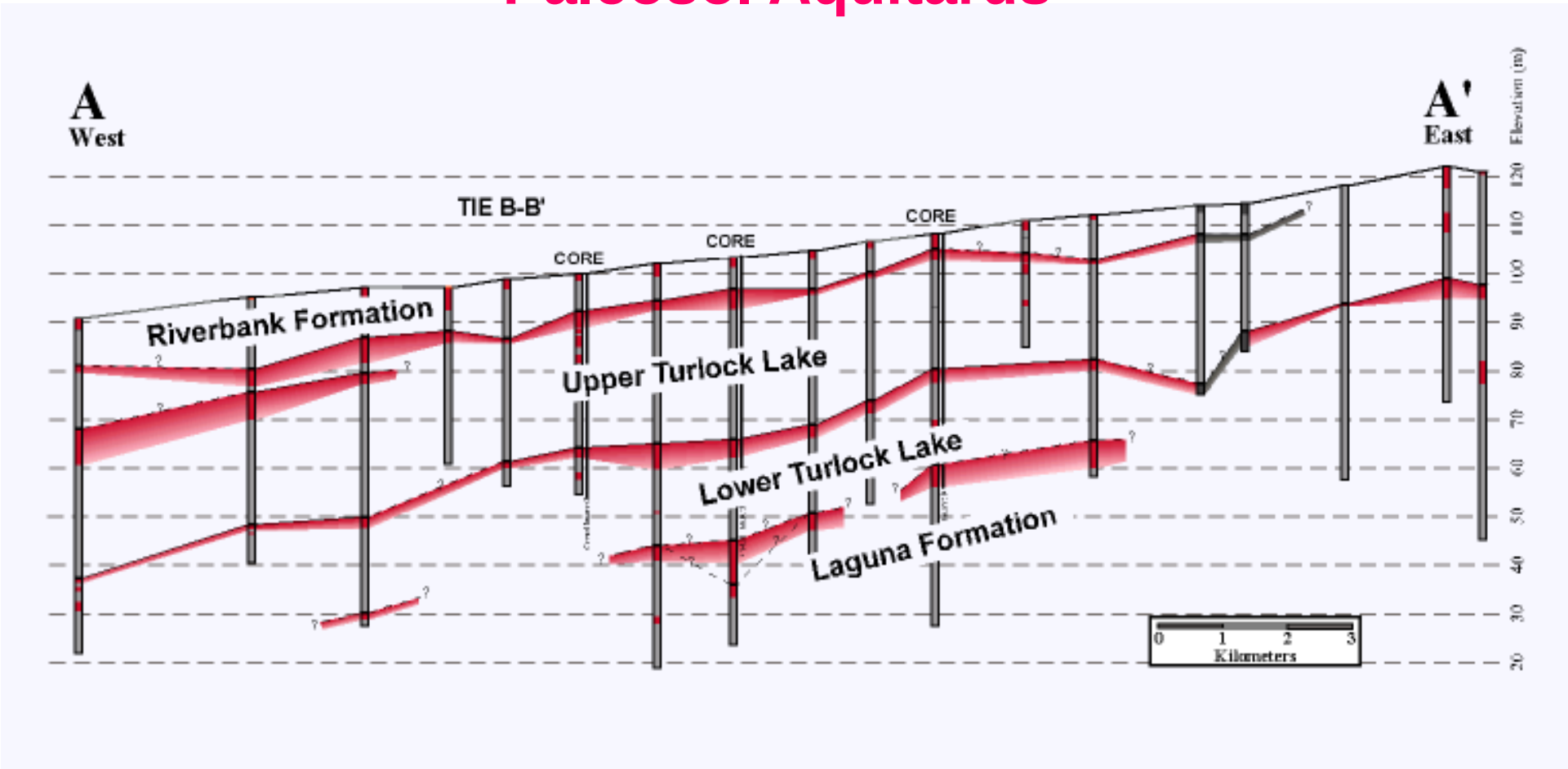

Graham E. Fogg, 2002

6 m
20 ft
16 m
8 m
25 ft
18 m
24 m
50 ft
26 m
34 m
80 ft
85 ft
36 m
110 ft
115 ft
44 m
140 ft
145 ft

15 cm
USGS WELL B-5
85 ft

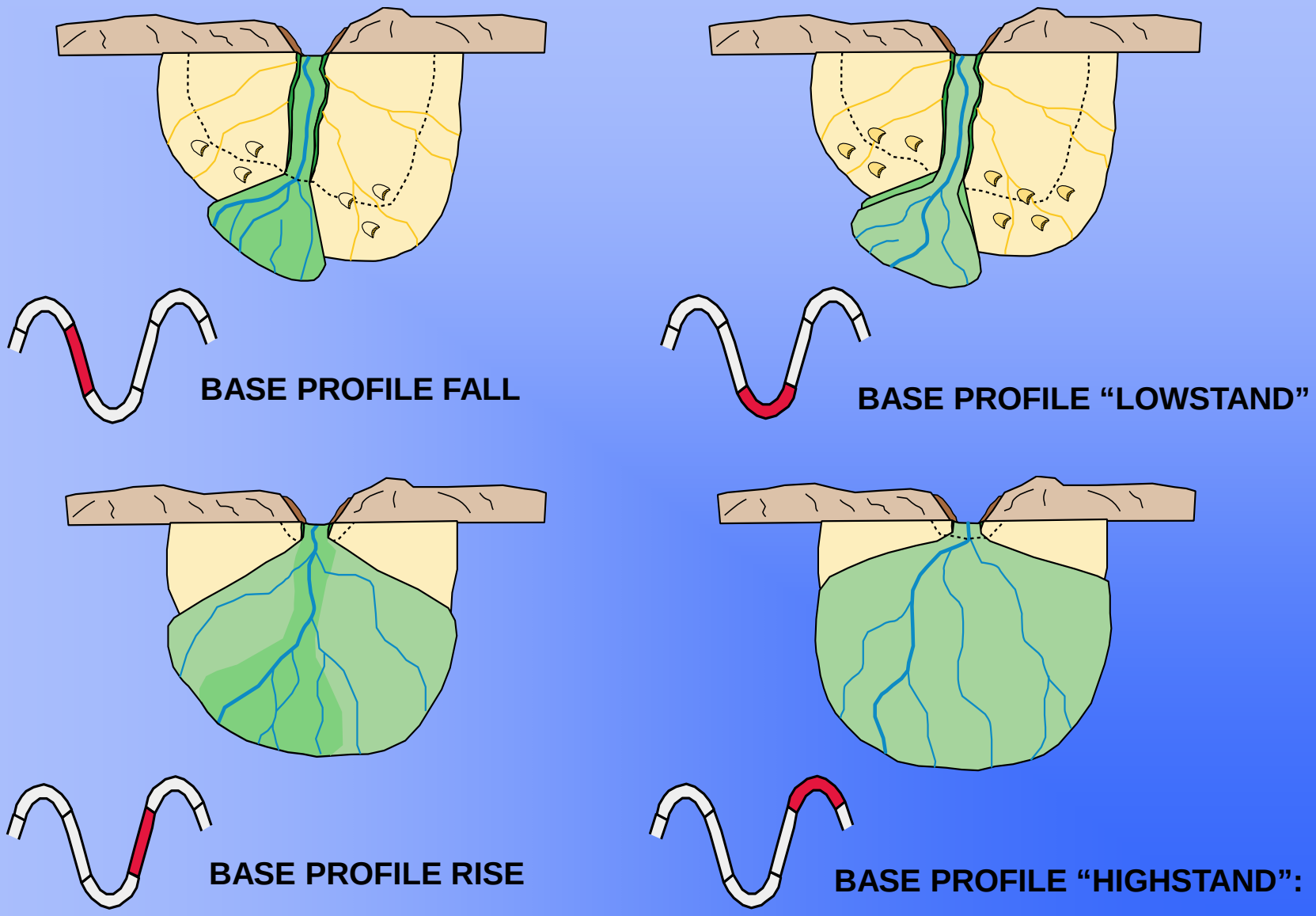
# Sequence Stratigraphic Organization;

# Paleosol Aquitards



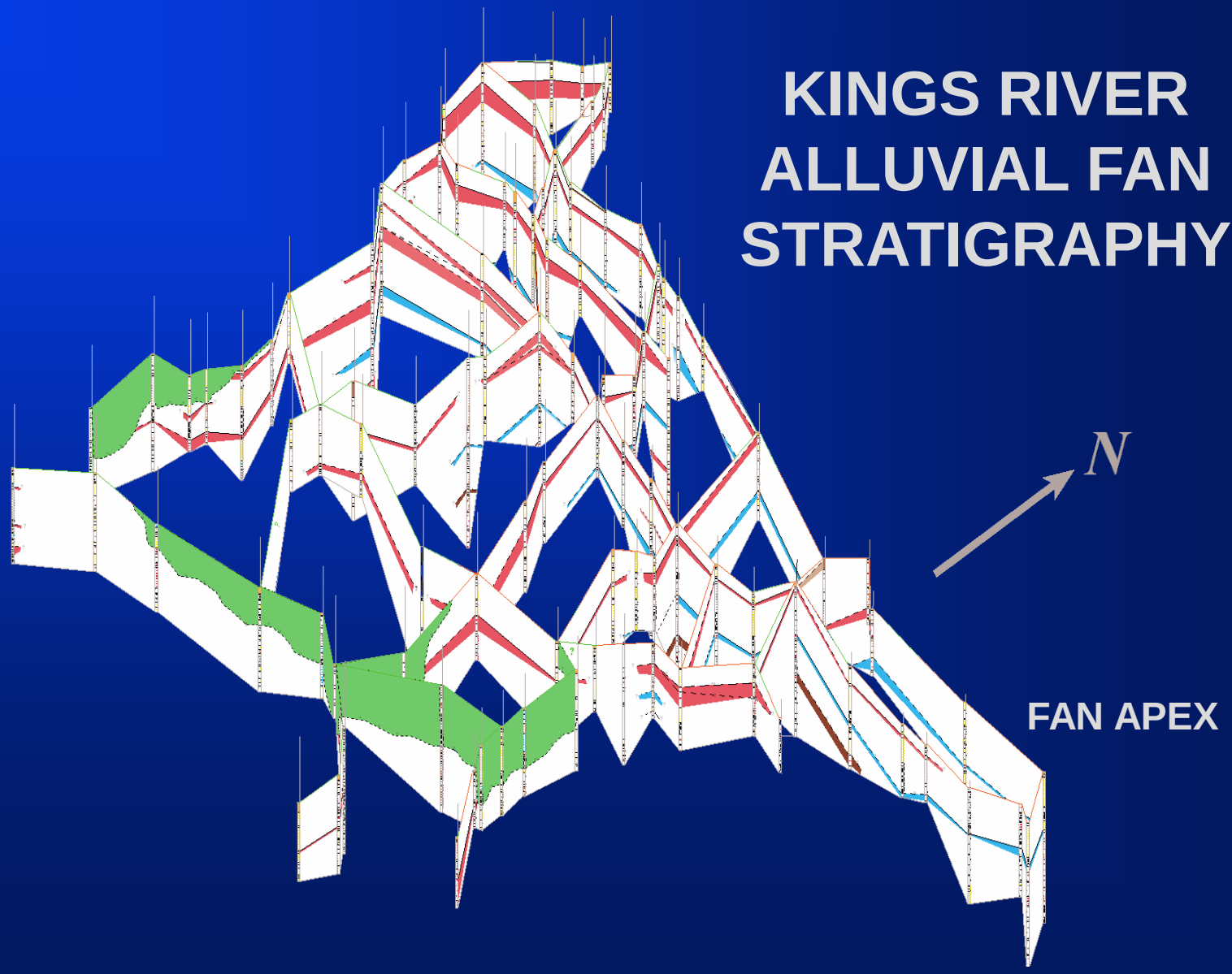

Weissmann & Fogg, 1999

Graham E. Fogg, 2002




Graham E. Fogg, 2002

# KINGS RIVER ALLUVIAL FAN STRATIGRAPHY

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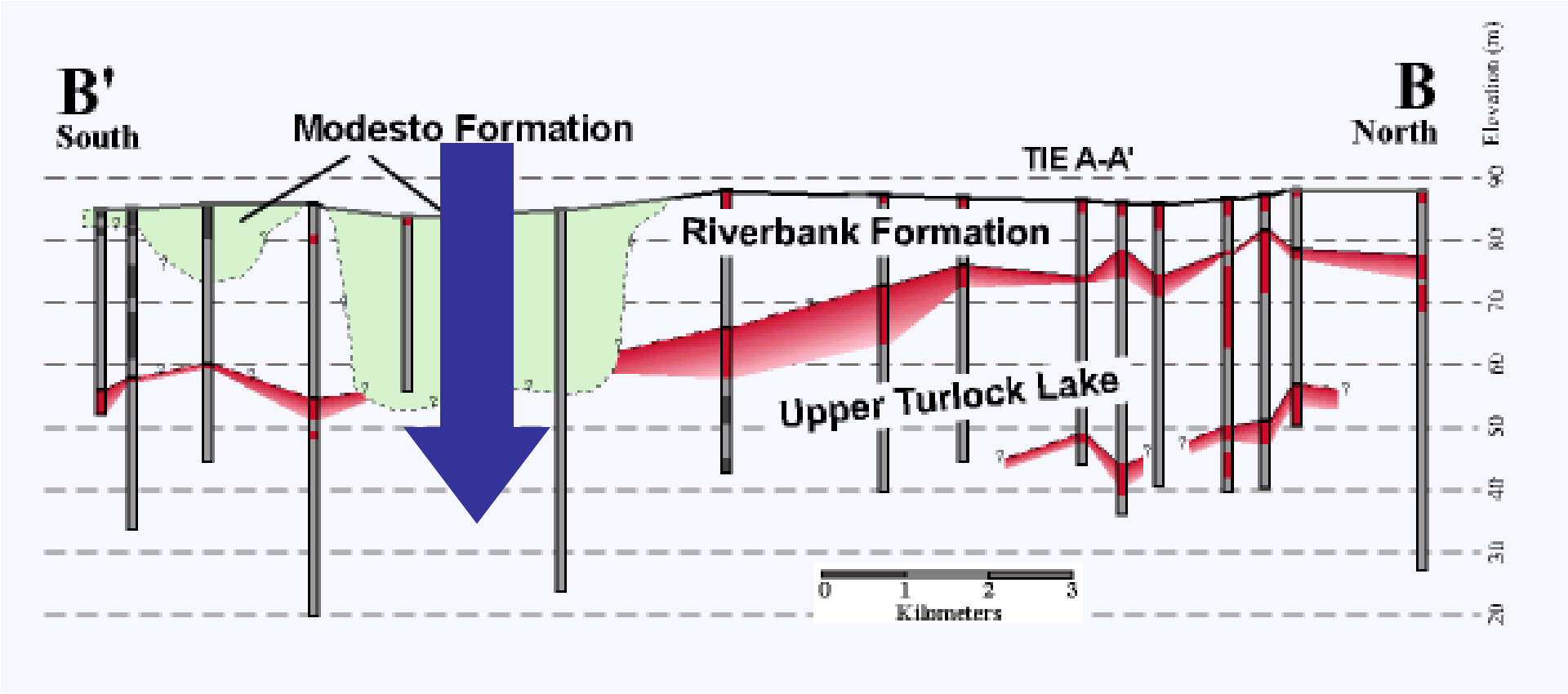
# Where Paleosols Channeled Out,

# Vertical Flow Enhanced

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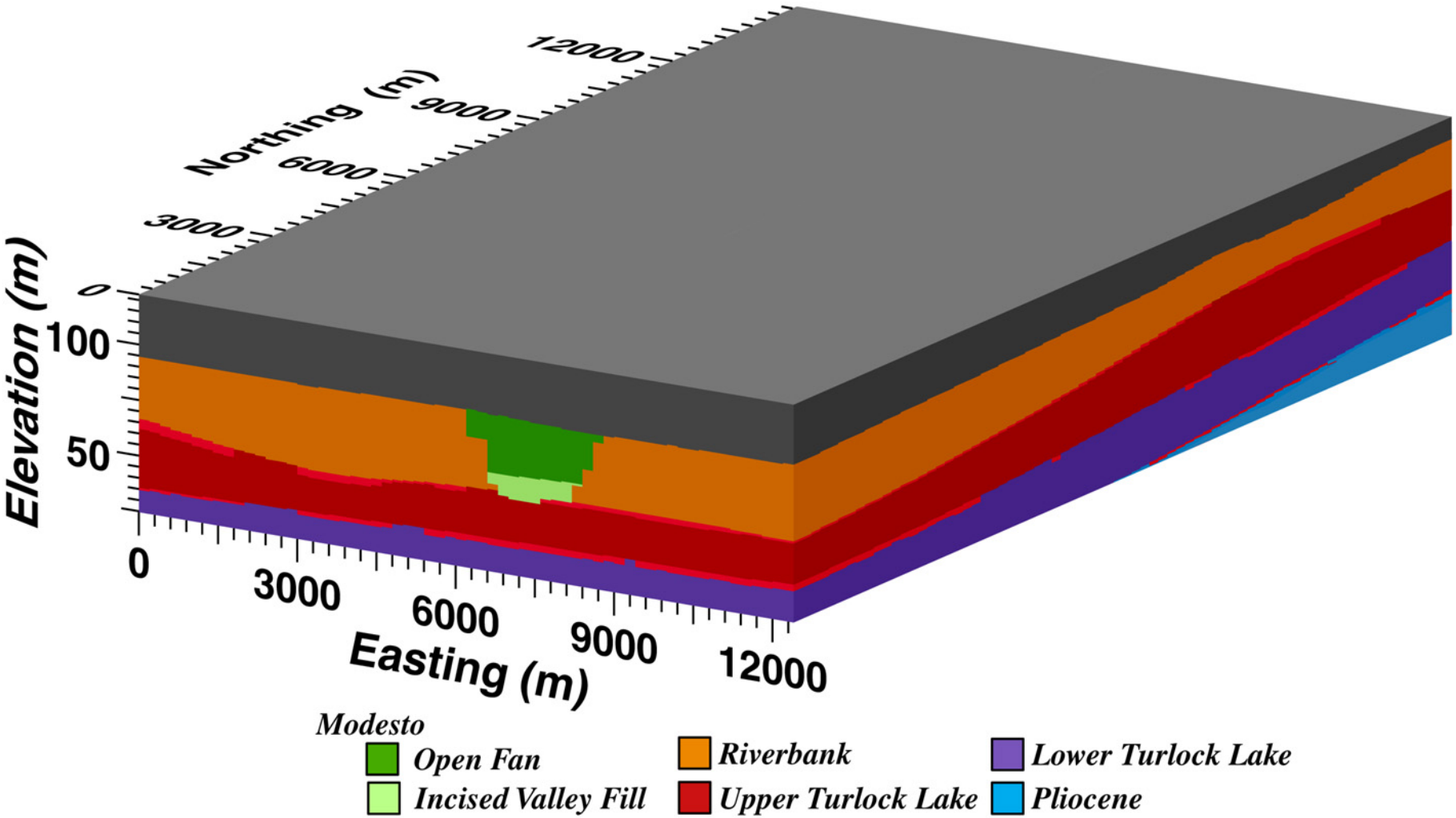
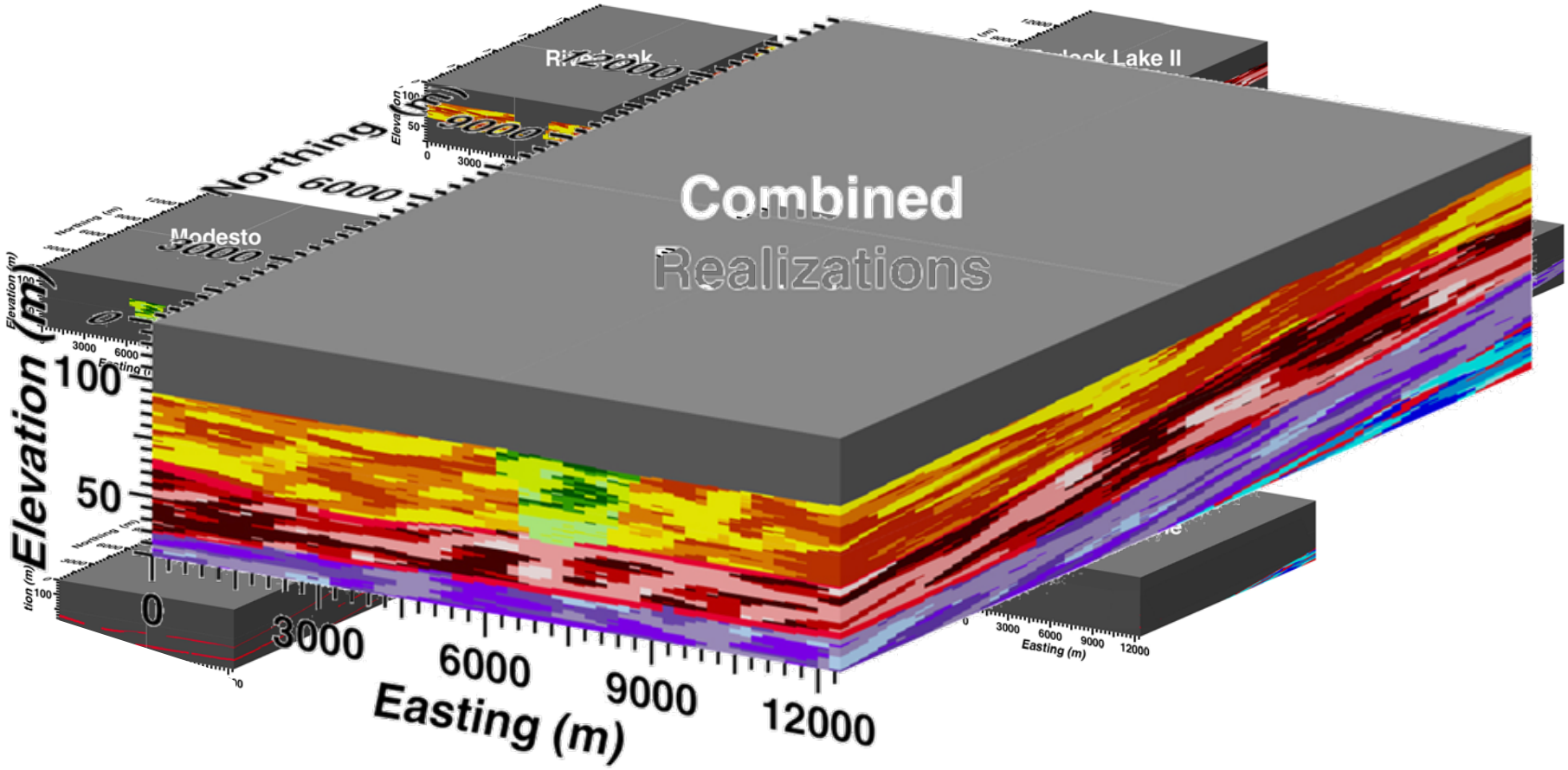
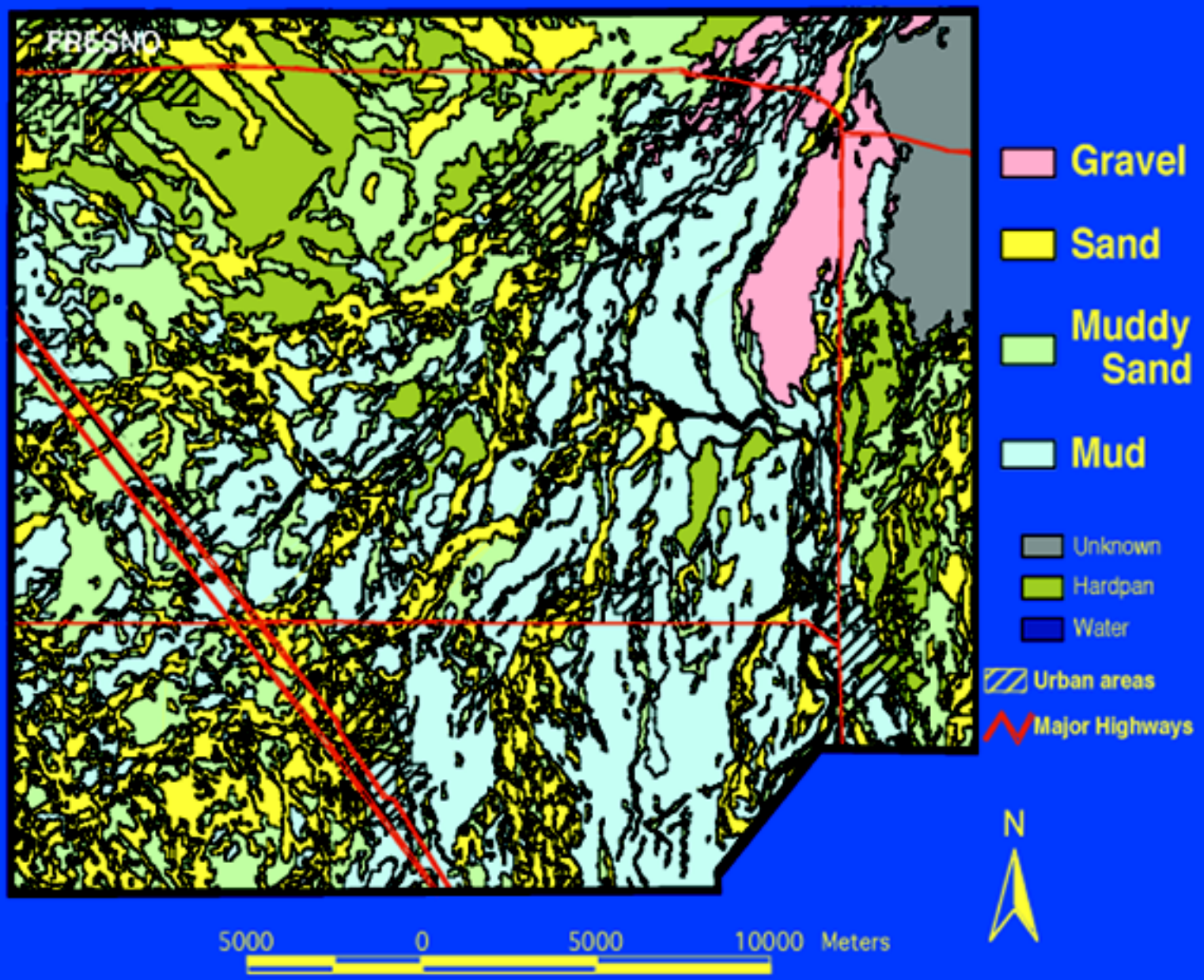
# Sequence Stratigraphic Units for Non-Stationary Conditional Simulation




Combined
Realizations
Modesto
Elevation (m)
100
50
0
Easting (m)
3000
6000
9000
12000
Northing (m)
6000
9000




Graham E. Fogg, 2002