

# General Levalle Basin

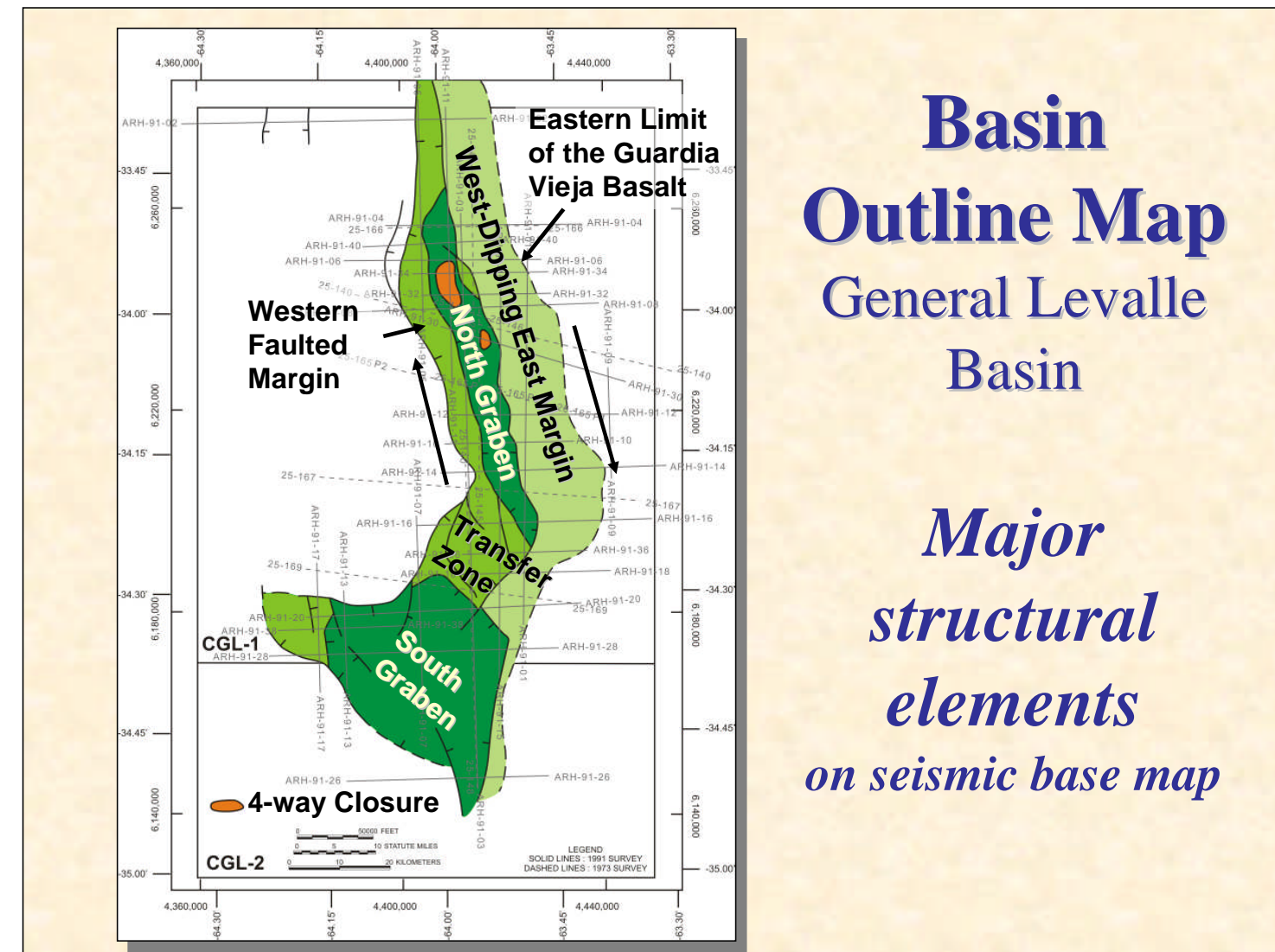
## Geologic Setting

### General Levalle Basin, Argentina: A Buried Lower Cretaceous Rift

The General Levalle Basin forms a long, narrow, and deep Lower Cretaceous intracratonic rift in southern Cordoba province, Argentina. It trends approximately north-south for over 150 km, ranges from 5 to 50 km wide, and is over 6,500 m deep. Below a prominent mid-Cretaceous unconformity, steeply dipping normal faults bound tilted graben and half-graben fault blocks.

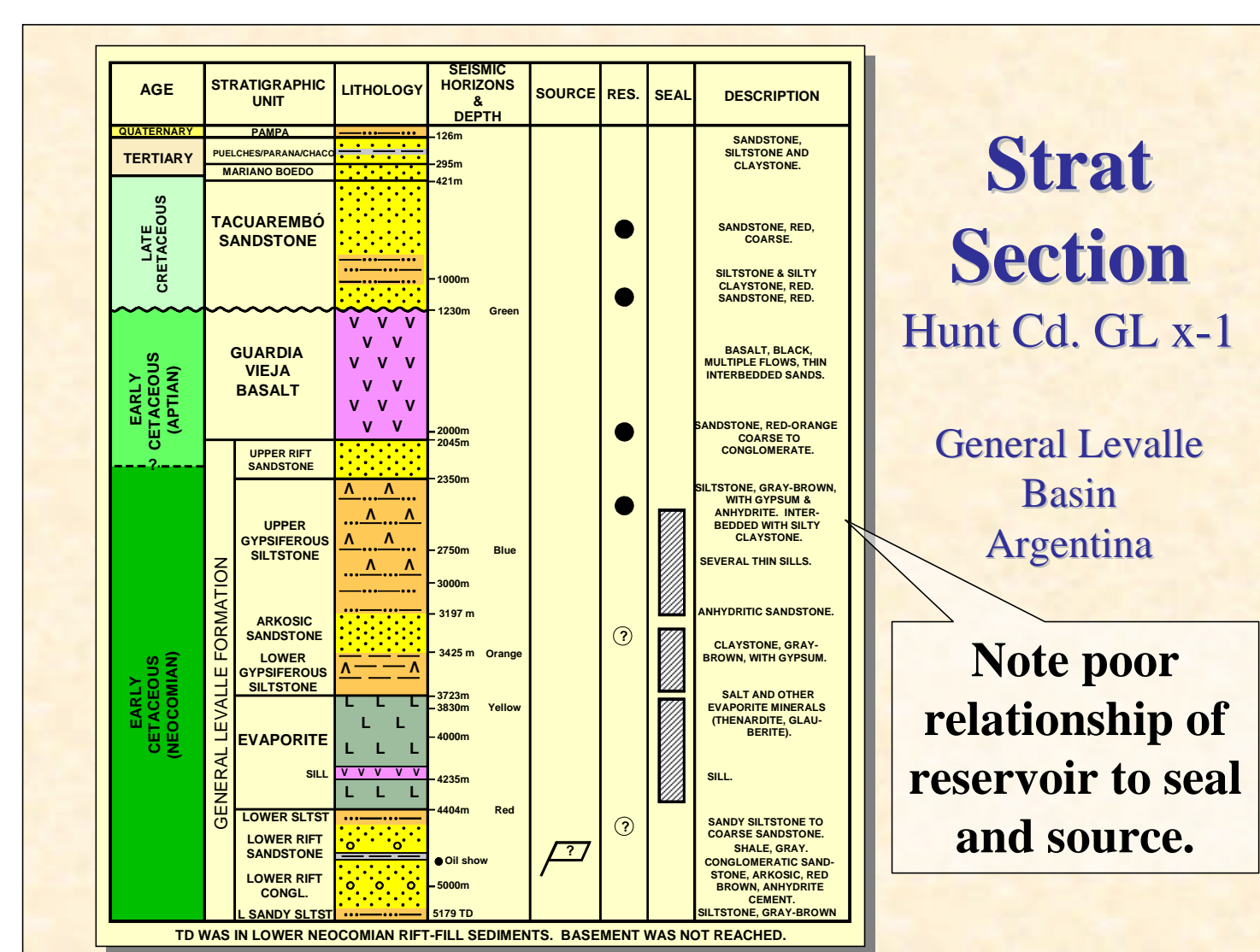
The lower rift-fill section, the General Levalle Formation, is a Valanginian-Hauterivian aged clastic-evaporite package over 3,200 m thick. It was deposited in an arid, restricted, rift basin that included a hydrologically-closed saline lake. Nine lithology-based members represent one continuous cycle of deposition, with a lower coarse clastic sequence gradually fining upwards into an evaporite member and then coarsening upward again to an upper sandstone. The uppermost rift fill sequence, the Guardia Vieja Formation, is a series of Aptian basalt flows and sills over 800 m thick with some clastic interbeds. Unstructured Pleistocene to Upper Cretaceous strata overlie the buried rift basin.

In 1995-96, the first exploratory well in the basin tested a deep-seated anticline to 5,179 m but encountered just one minor show. Reservoir-quality sandstone occurred only in the upper rift sandstone member, but this lacked adequate seals. Basin-center dark shale below the evaporite member was thin, surprisingly low in TOC, and overmature. Given the narrow, deep depocenter, unfavorable reservoir-seal relationships, and the lack of source facies, an effective petroleum system remains unproven in the basin.



**Basin Outline Map**  
General Levalle Basin

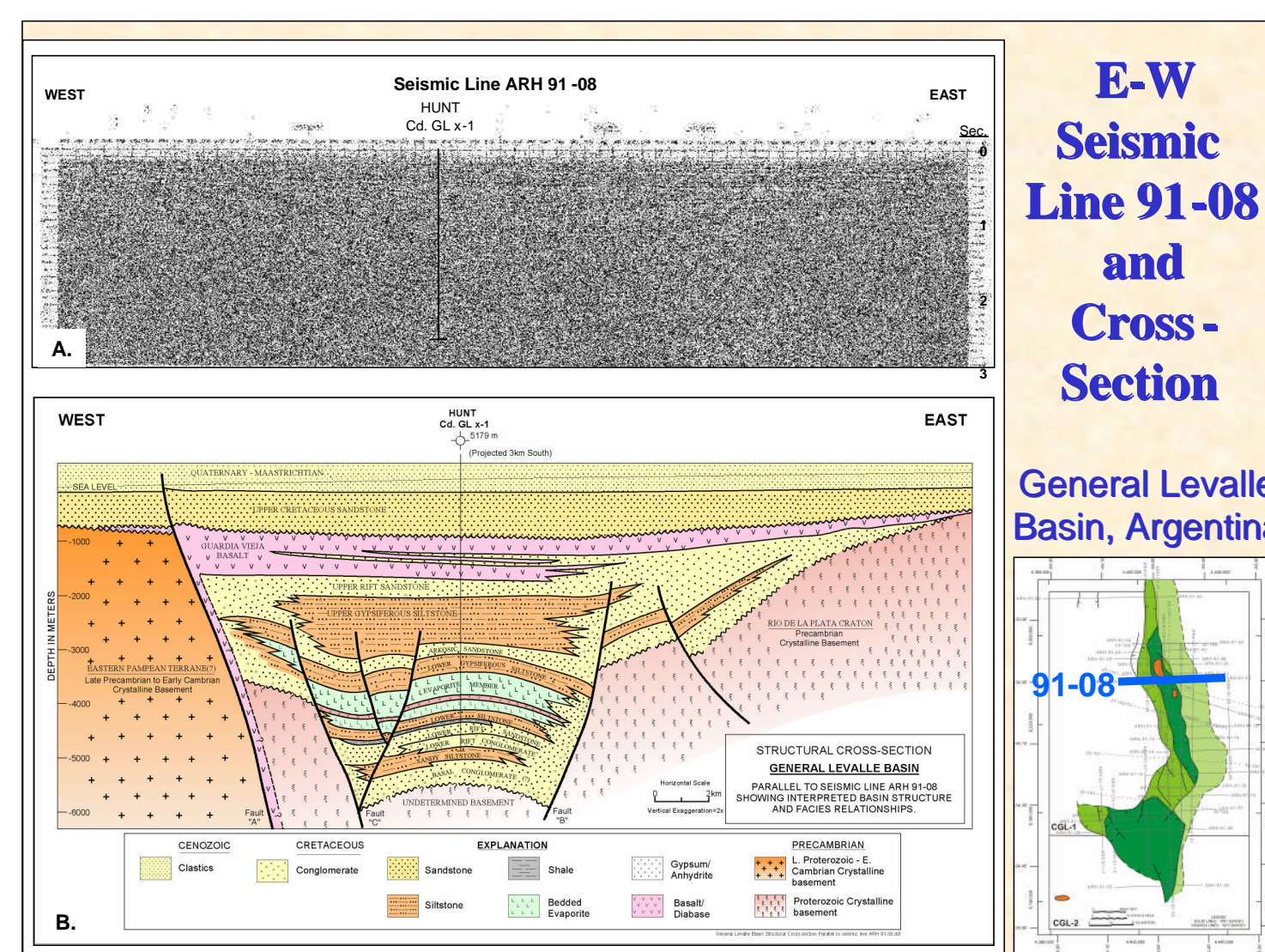
*Major structural elements on seismic base map*



**Strat Section**  
Hunt Cd. GL x-1

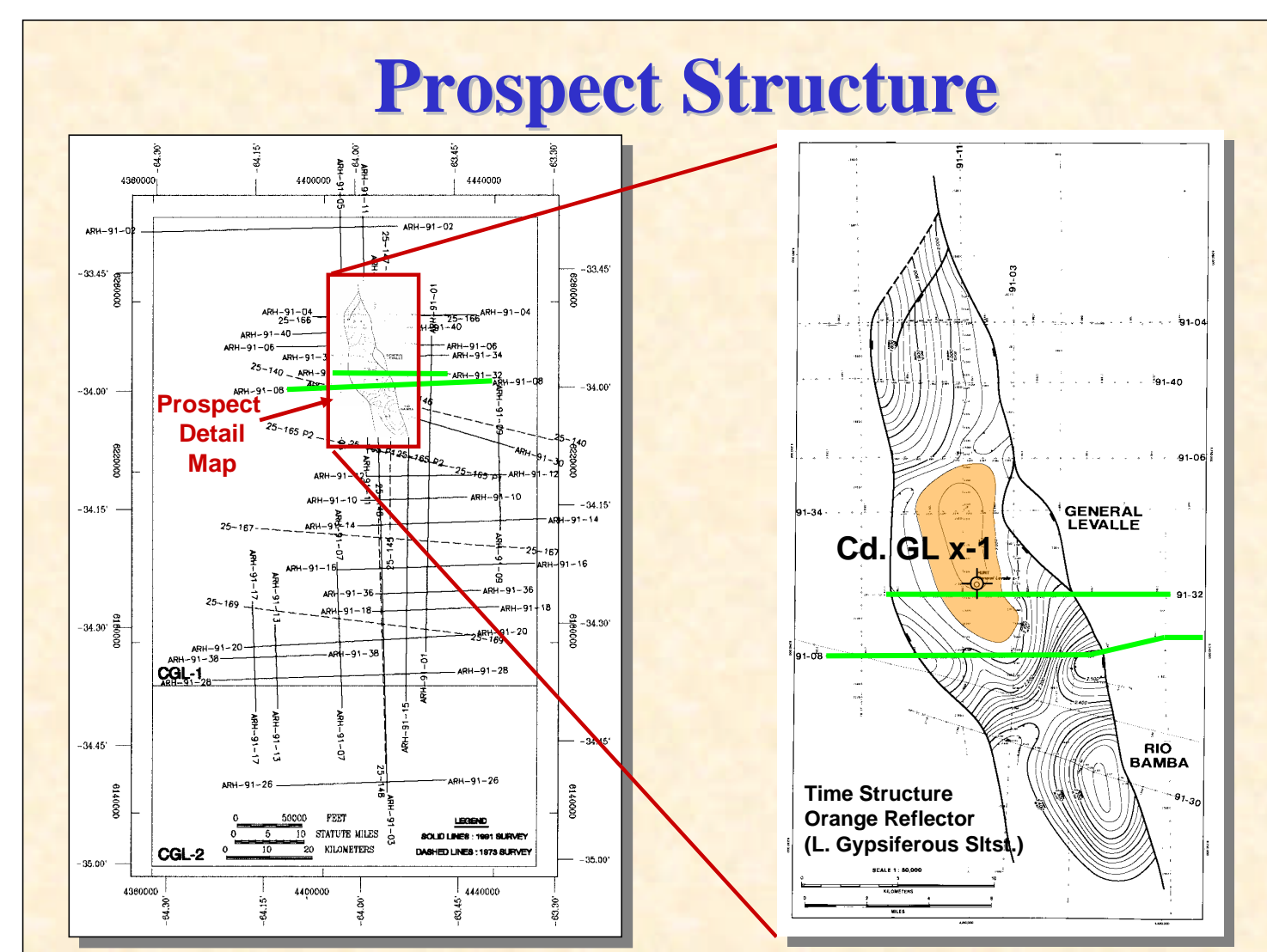
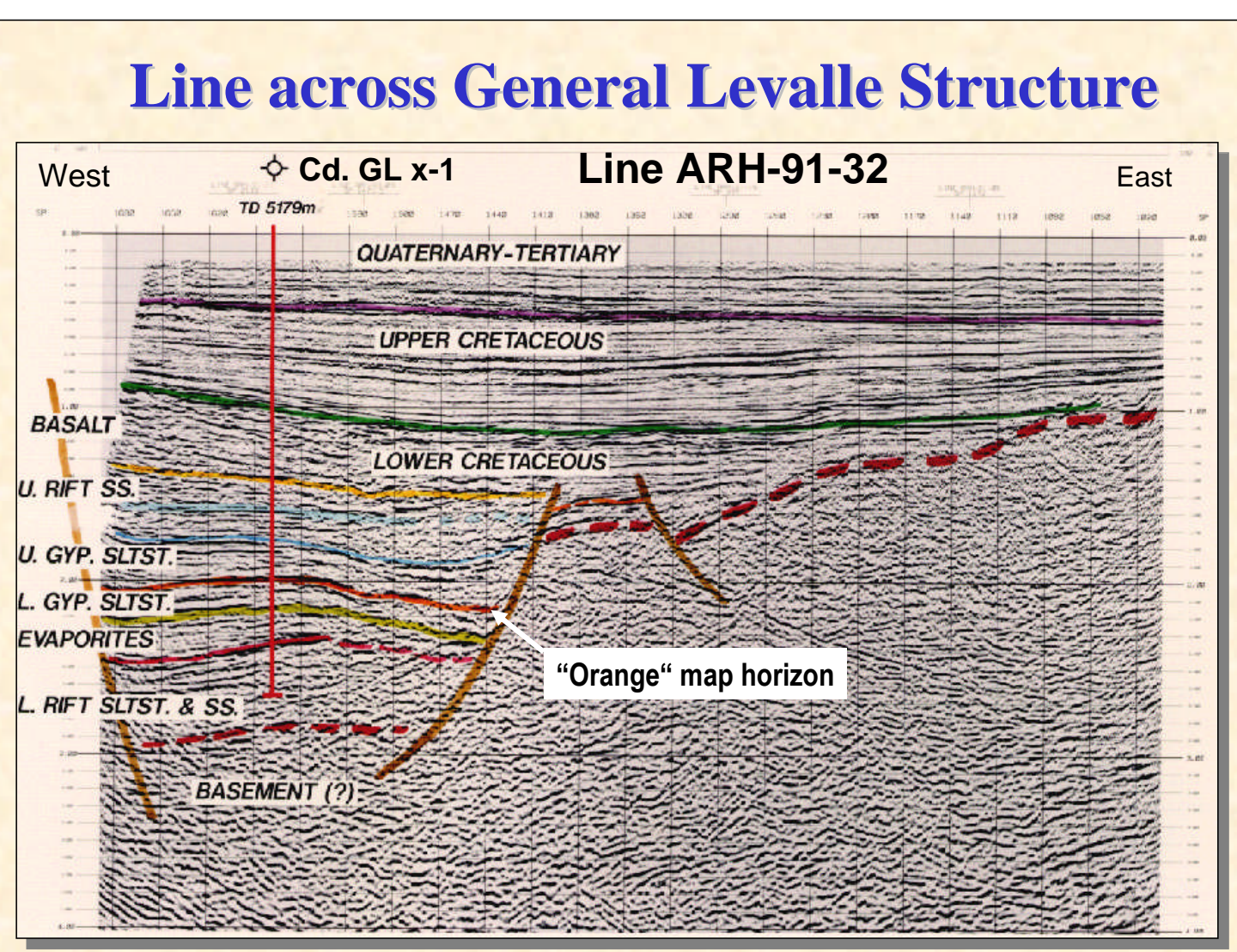
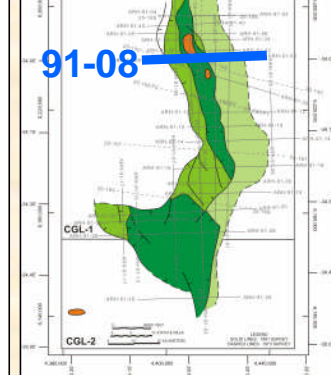
General Levalle Basin Argentina

Note poor relationship of reservoir to seal and source.



**E-W Seismic Line 91-08 and Cross-Section**

General Levalle Basin, Argentina



# Paleogeography & Climate

## Different Perspectives

### Late Cretaceous Paleogeography

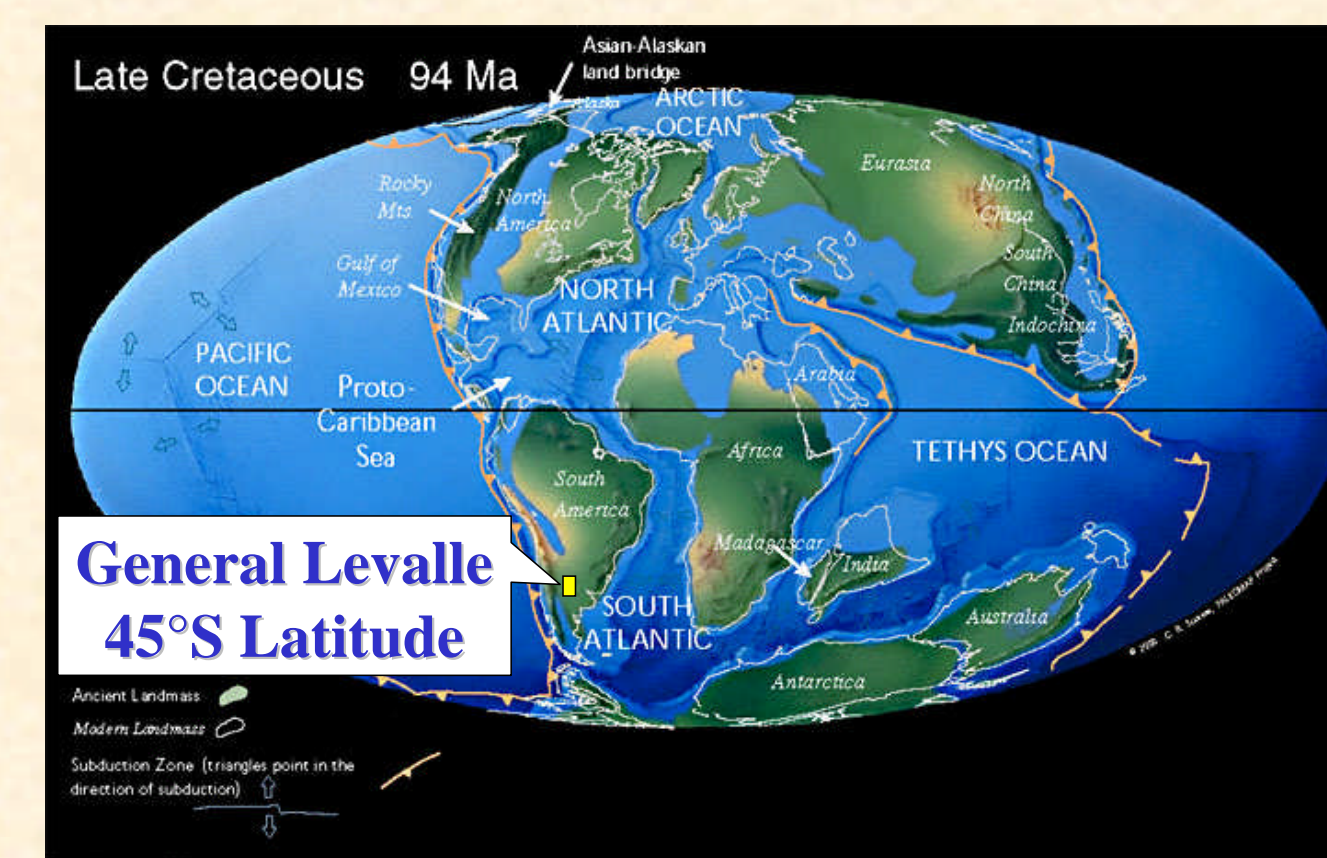


Image from Christopher Scotese, The Paleomap Project, <http://www.scotese.com/cretaceo.htm>

### Early Cretaceous Paleogeography

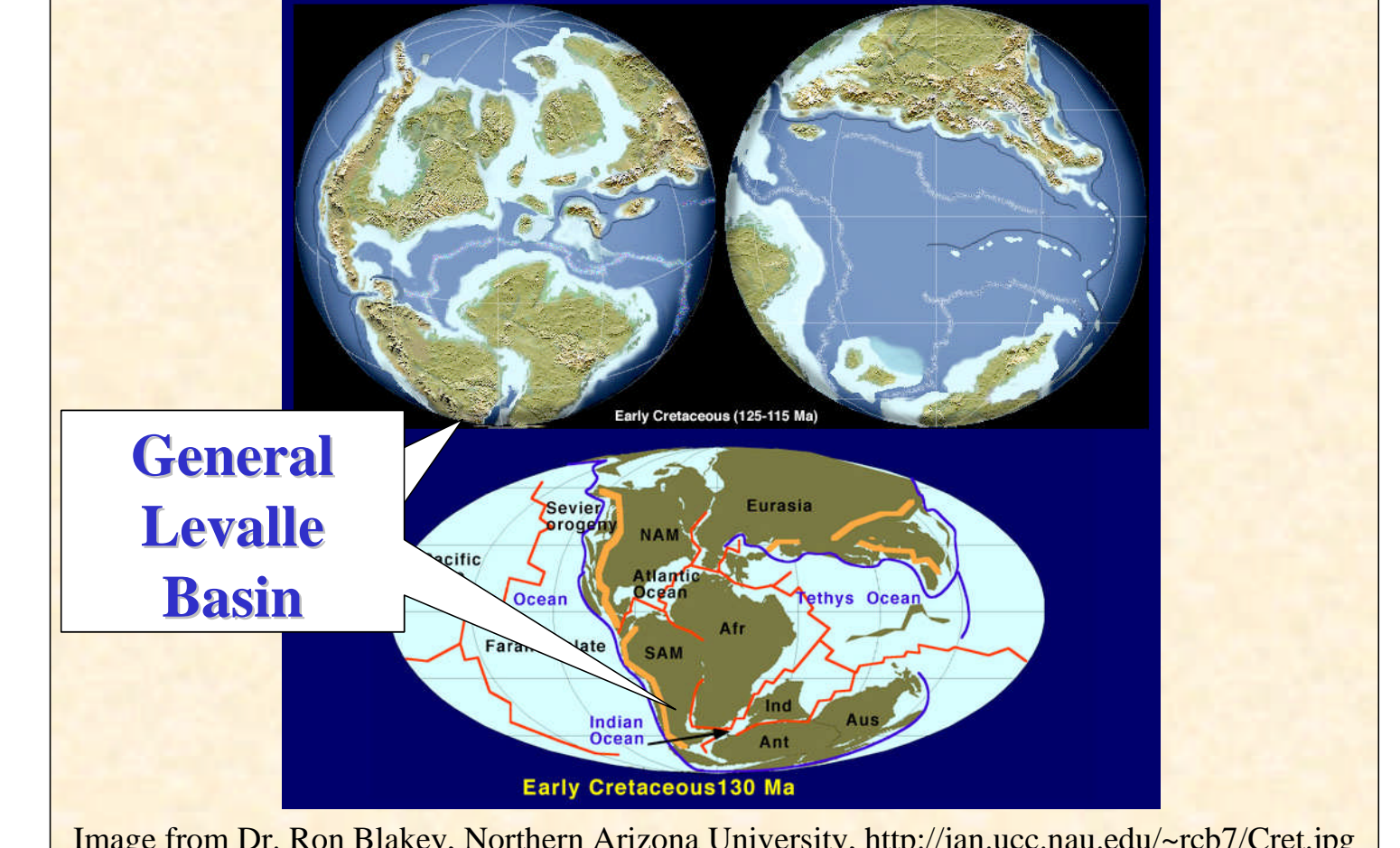
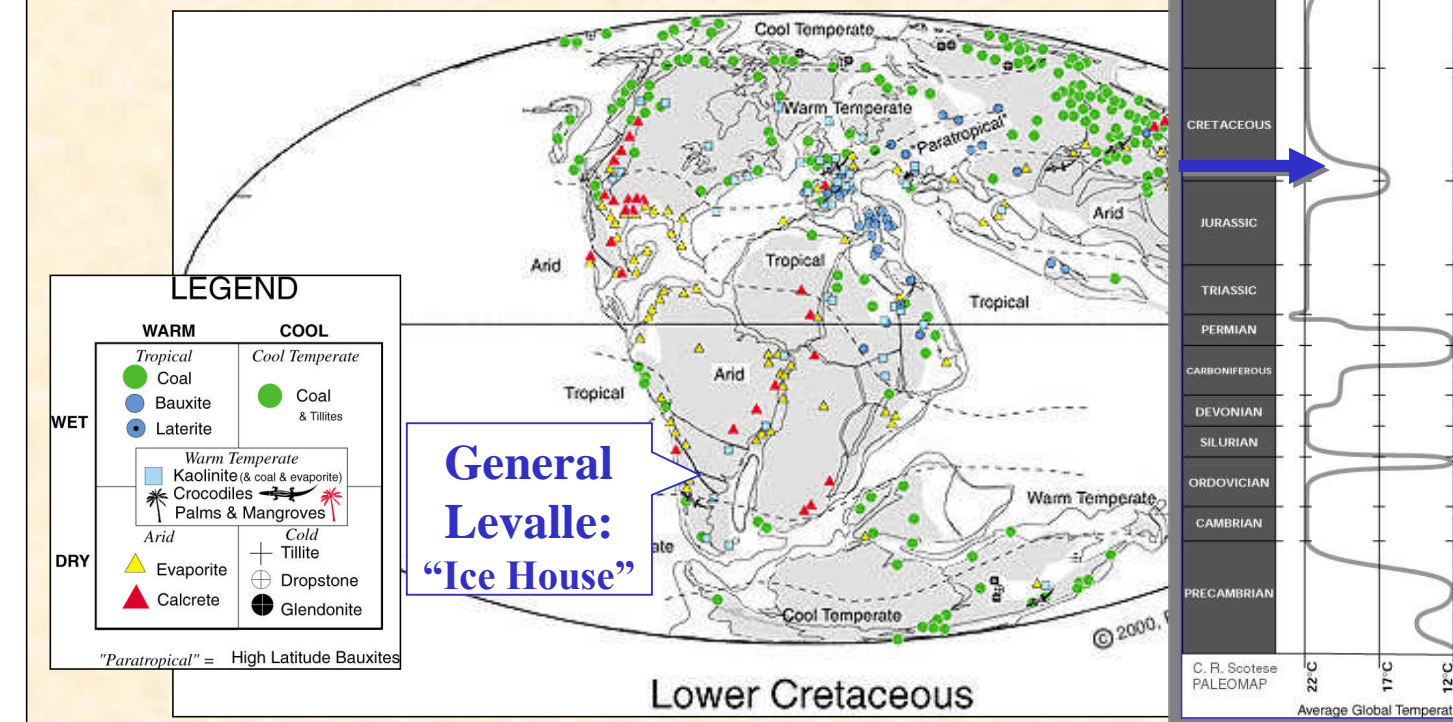


Image from Dr. Ron Blakey, Northern Arizona University, <http://jan.ucc.nau.edu/~rcb7/Cret.jpg>

### Early Cretaceous Climate



Mild "Ice House" conditions existed in southern Gondwana in the Early Cretaceous, probably with snow and ice during the winter season.

Images from Christopher Scotese, The Paleomap Project, <http://www.scotese.com/cretcli.htm>

### Early Cretaceous (Berriasian, 140 Ma)

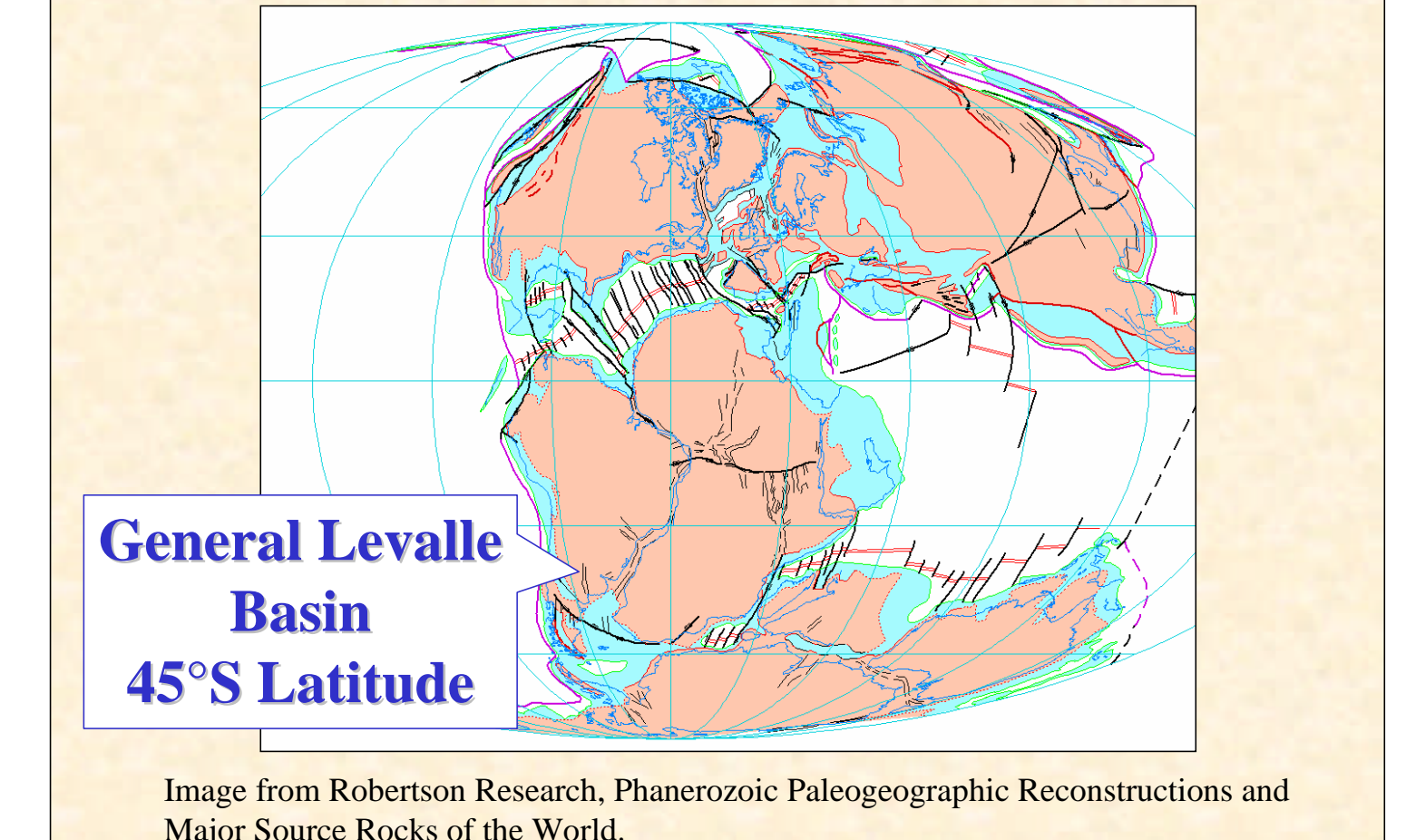
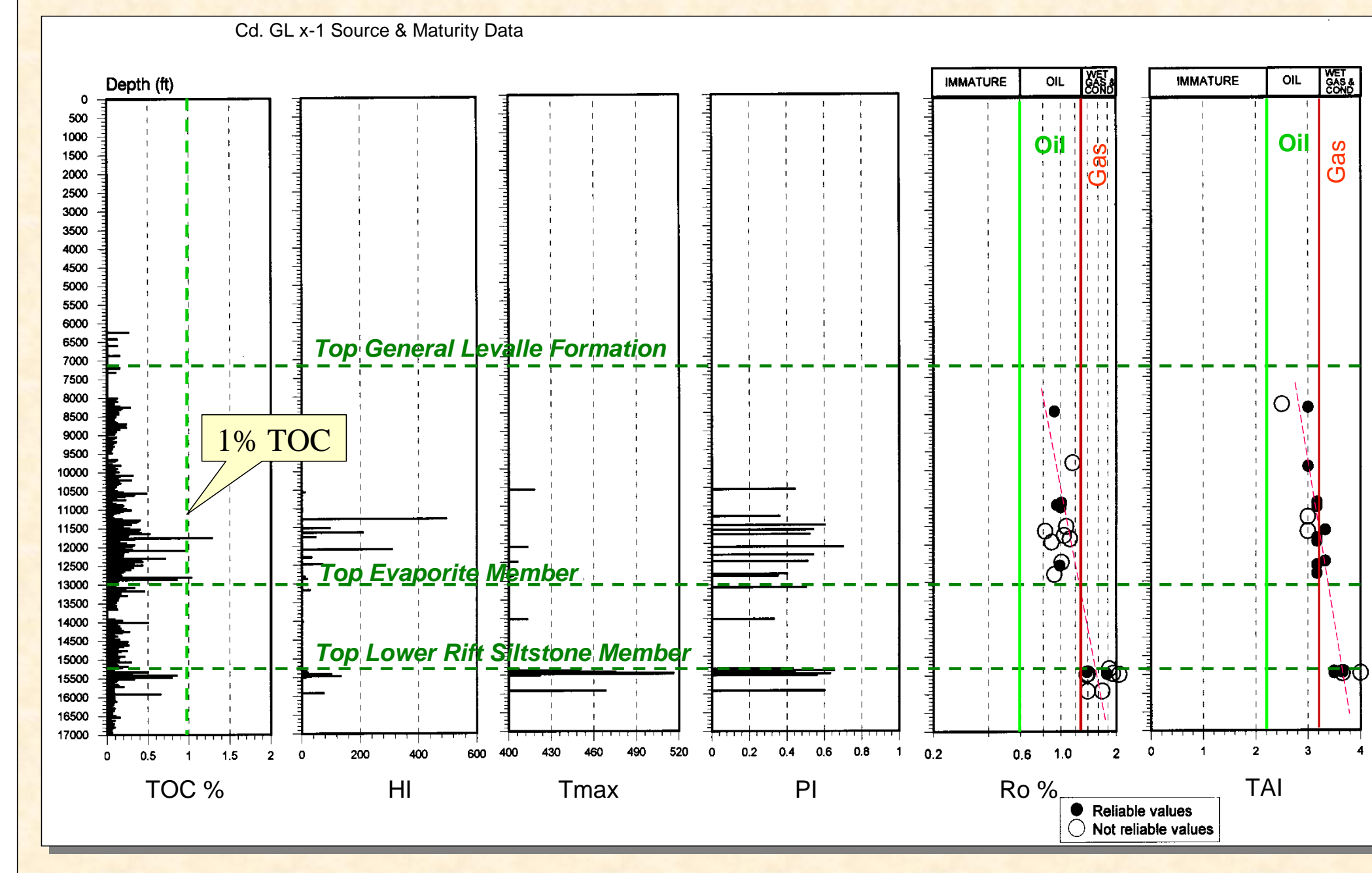


Image from Robertson Research, Phanerozoic Paleogeographic Reconstructions and Major Source Rocks of the World.

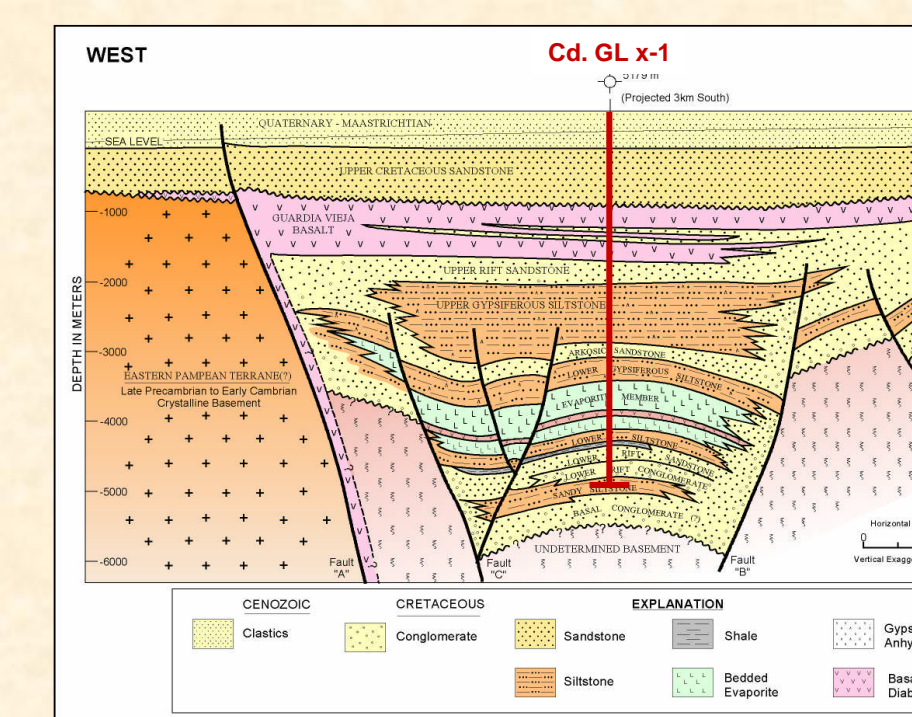
# Source Bed Geochemistry

### Source & Maturity Data Hunt Cd. GL x-1 well



### Drilling Results General Levalle Basin

Cross-Section along Line 91-8



- Lower Cretaceous (Neocomian) rift fill.
- Poor source rock found: Lean Type III/IV.
- Lower rift shales overmature for oil.
- Only 1 minor oil show.
- Good evaporite seal in middle rift section.
- Reservoirs below seal are tightly cemented.
- **Poor petroleum system.**

### Van Krevelen Diagram showing kerogen to be Type III/IV

