

Sequence Stratigraphy

- Nine parasequences and two sequence boundaries have been identified.
- Parasequences are separated by parasequence boundaries. Parasequence boundaries represent a relative rise in sea level.
- Parasequences are characterized by lateral facies changes (from distributary channel to proximal delta front to distal delta front).
- Parasequences average 4 m in thickness and have been correlated across the 15 km of outcrop exposure.
- When coal or paleosol surface is present, the parasequence boundary corresponds to the top of either one of these surfaces.
- Two sequence boundaries are identified by relative falls in sea level. Two incised valley-fills are described.



Parasequence
PSB
Coal bed



Parasequence
PSB
Coal bed



Parasequence (deltaic)
PSB
Parasequence (deltaic)



incised valley-fill
SB
SB
Parasequence



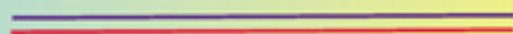
Parasequence
PSB
Paleosol
Parasequence

Vertical stacking pattern of parasequences



Interpreted section in Chaffee Creek

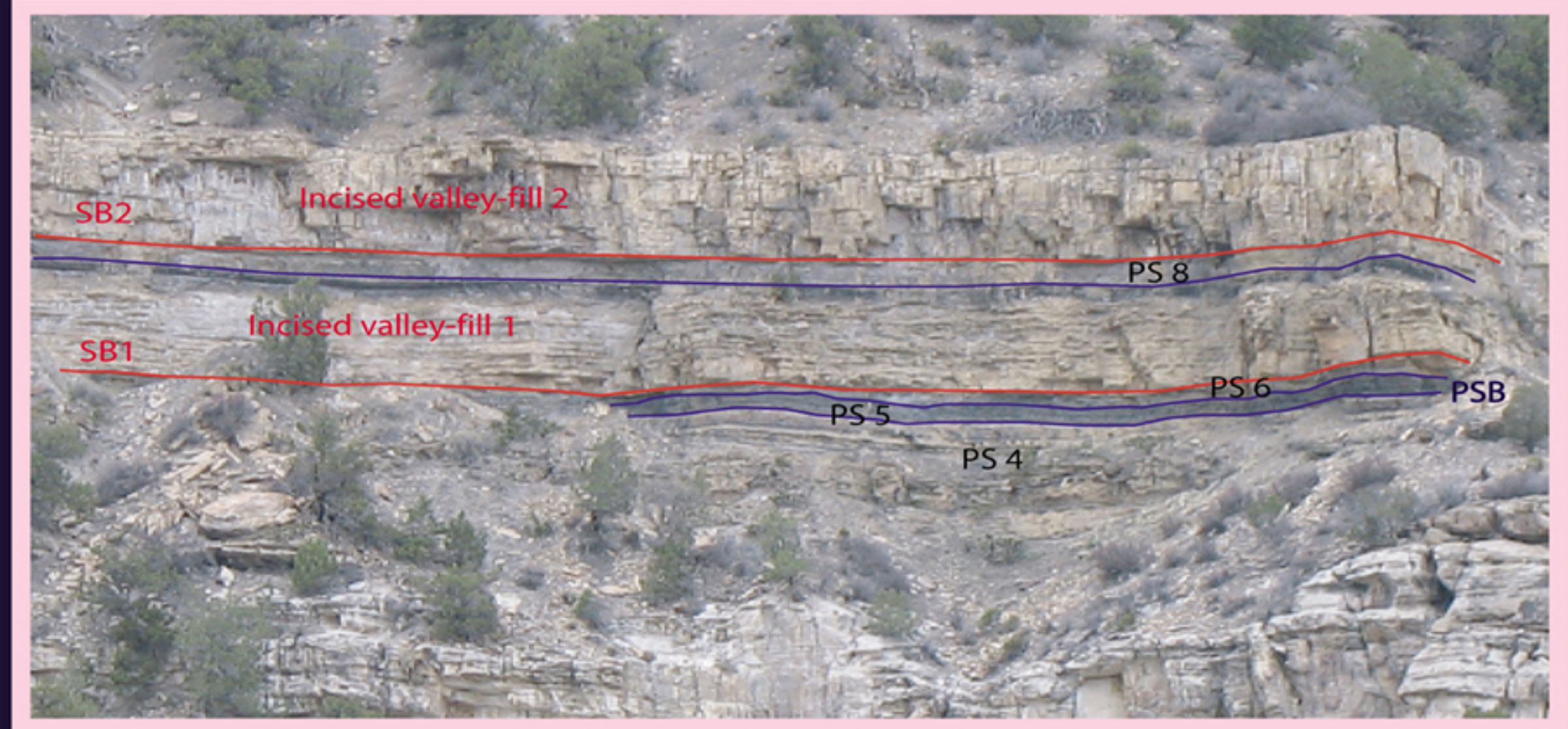
Aggradational stacking pattern between parasequence 8 and 9



Progradational stacking pattern of facies between parasequences 3, 4, 5, 6 and 7



Retrogradational stacking pattern, backstepping of facies between PS1 and PS2 (marine deltaic sandstone abruptly overlies the fluvial channel)



Interpreted section in Dallas Creek showing two incised valley-fills

- White lines are formation contacts
 - Blue lines are parasequence boundaries
 - Red lines are sequence boundaries
 - PS 1, 2 and 3 cannot be distinguished in both photos
 - PS 6 (part of it) and PS7 are cut by incised valley-fills in the Dallas Creek section
- /P Progradational stacking pattern

↑A Aggradational stacking pattern

↘R Retrogradational stacking pattern

Conclusions

The Dakota Sandstone in southwest Colorado is dominated by river dominated deltas.

It is subdivided into nine parasequences (PS). The lower PS contains fluvial and flood plain deposits. The upper eight parasequences are deltaic, with wave influence at the top of the succession.

The vertical trend identified from the parasequence stacking pattern is interpreted to reflect an overall gradual landward movement of the shoreline across the study area.

The parasequences are characterized by complex lateral facies changes.

Parasequence boundaries are correlated between measured sections. When coal is present, the parasequence boundary is placed above the coal surface.

The parasequence stacking pattern is complex and contains progradation, aggradation and retrogradation of facies.

Two sequence boundaries have been identified. The sequence boundaries represent a fall in sea level and formation of incised valley-fill cutting into the underlying parasequences.

Facies analysis and sequence stratigraphic approach allows for a better understanding of the complexity related to the deltaic Dakota Sandstone. Using the same approach, reservoir predictability in other deltaic environments will be easier to study.

- Acknowledgment:
- Ridgway State Park, Co
 - Burlington Resources Foundation