# geologic perspectives on how the Colorado River carved Glen Canyon and Canyonlands

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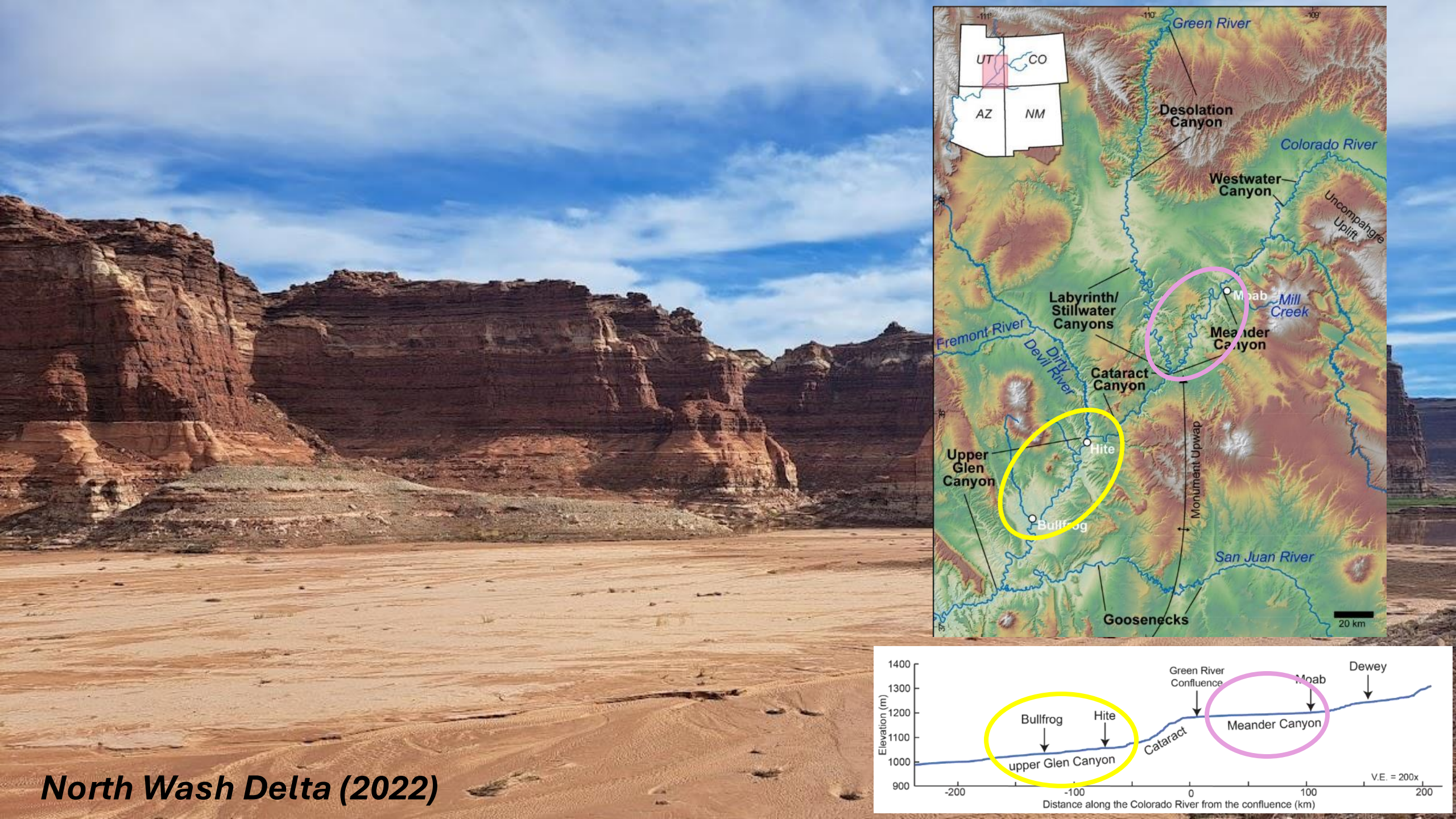


***North Wash Delta (2022)***

# Hite Overlook (2017)

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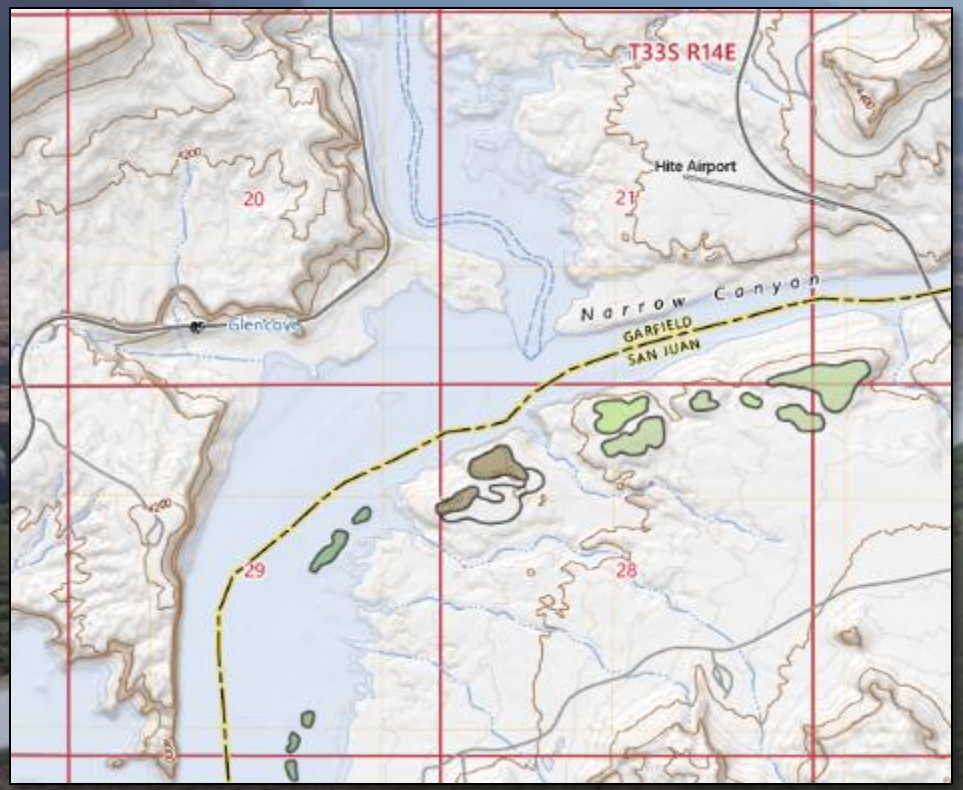
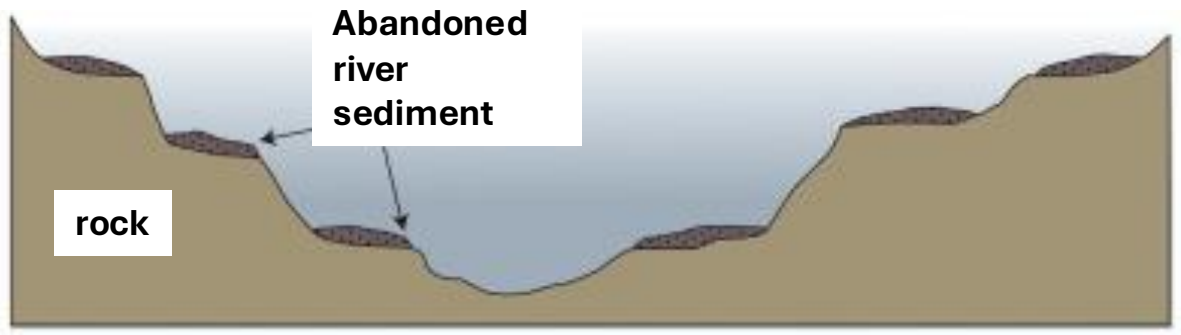


# River Terraces: remnants of abandoned floodplains


*Jackson Hole, Meander Canyon*

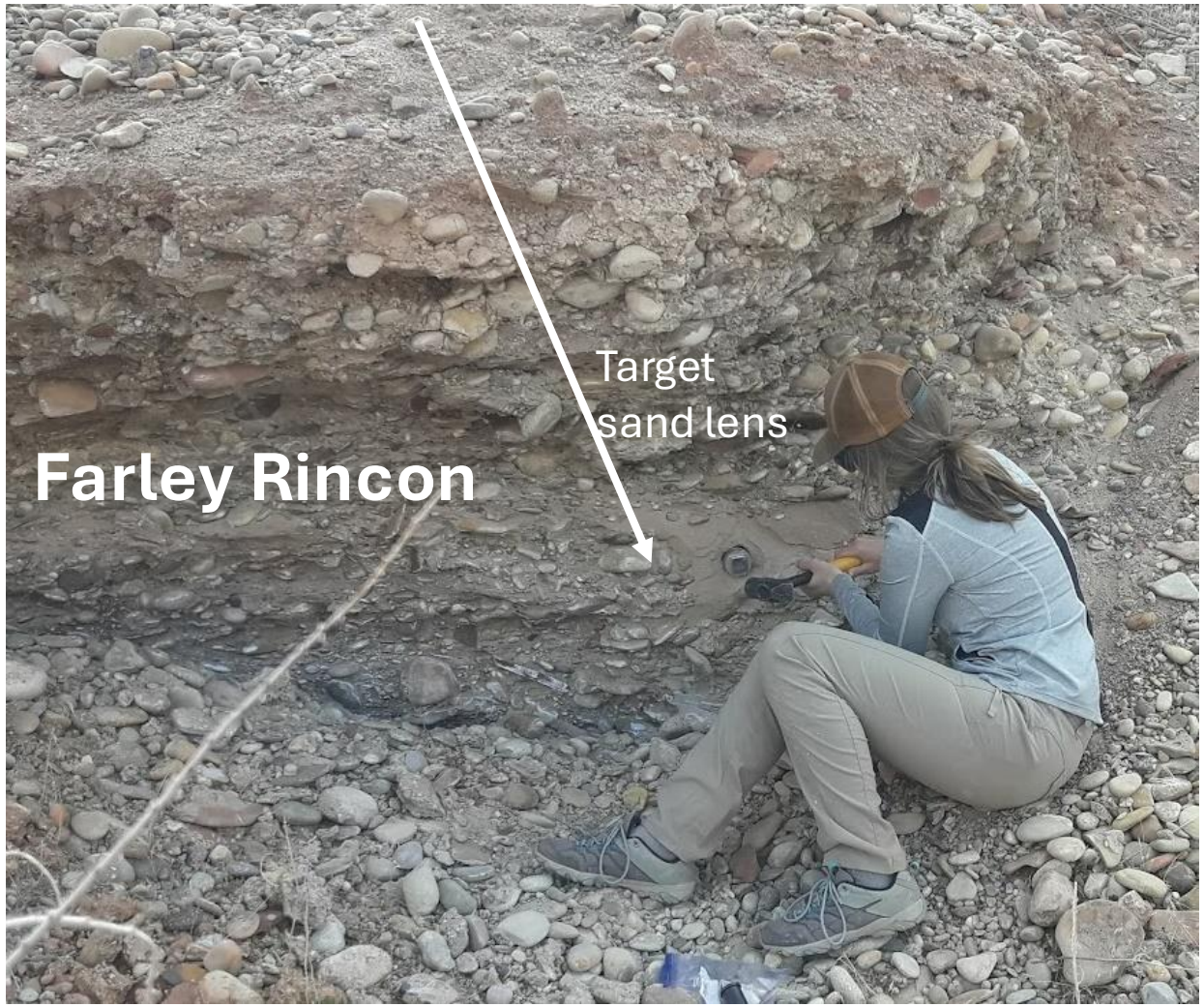



*To calculate incision rates:*

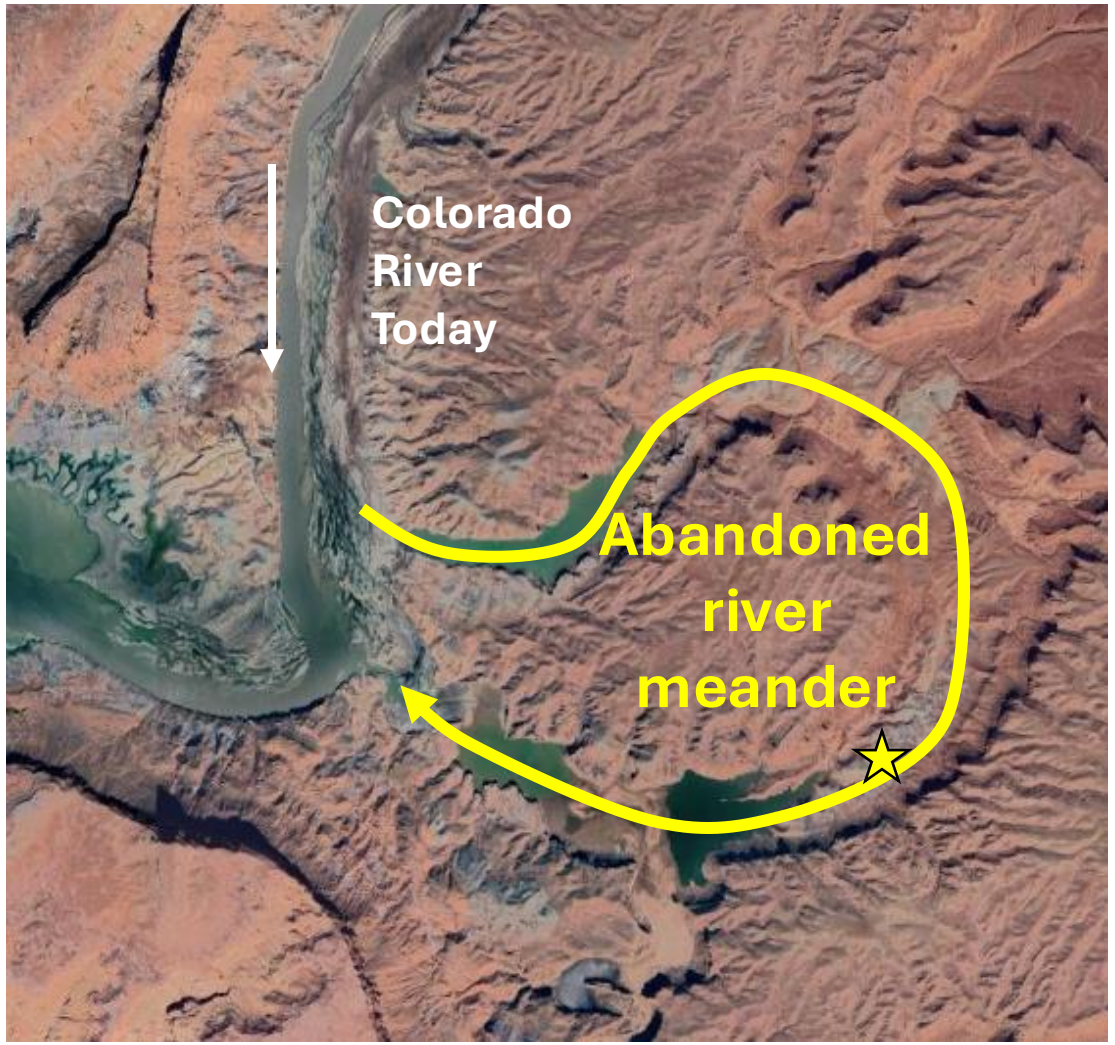
1. *Map & elevation above river level*
2. *Date the terraces*

# Dating when the sediment was deposited and buried under gravel

*2 techniques: Luminescence dating and cosmogenic nuclides*



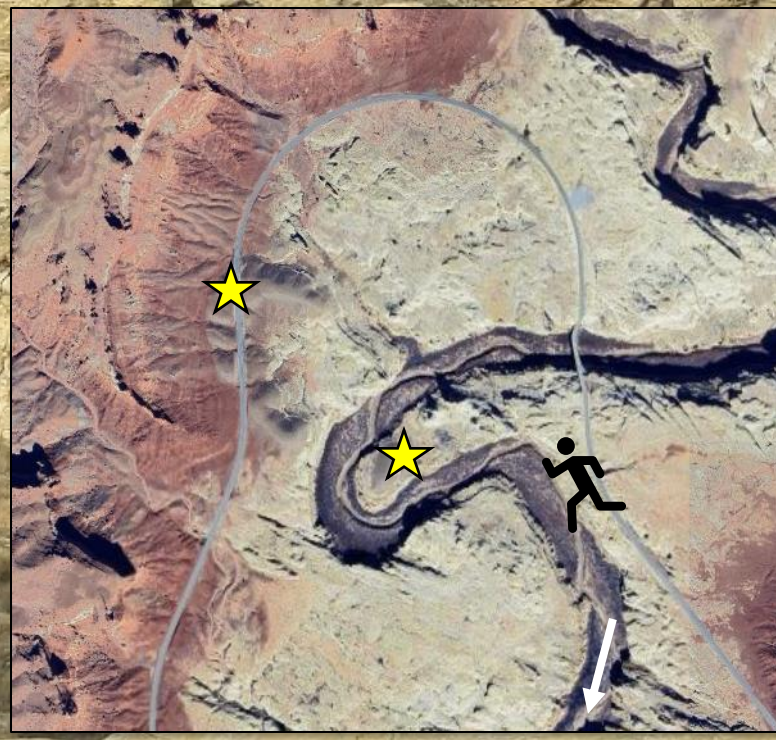

***154,000 years, 64 m***



*Looking upstream of Dirty Devil mouth*

**261,000 yrs, 98 m**

**154,000 yrs, 63 m**

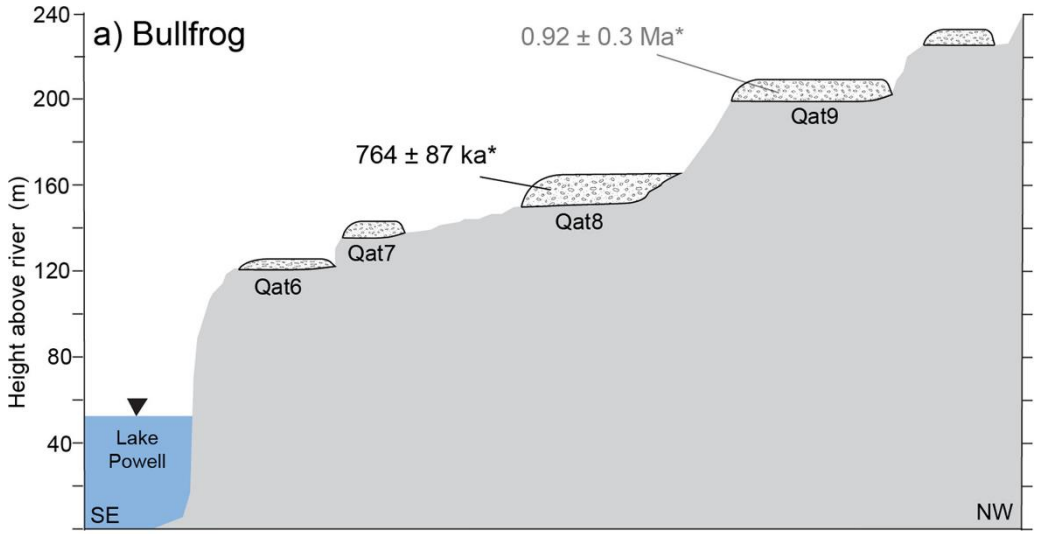


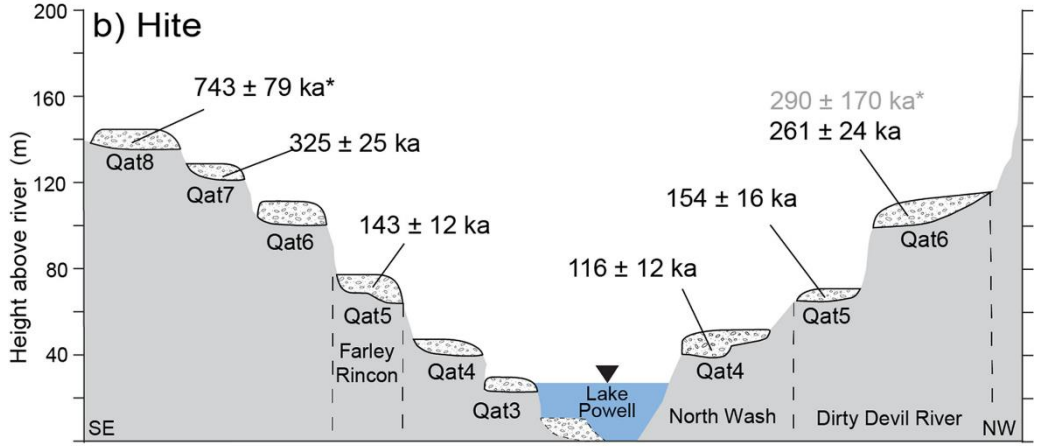


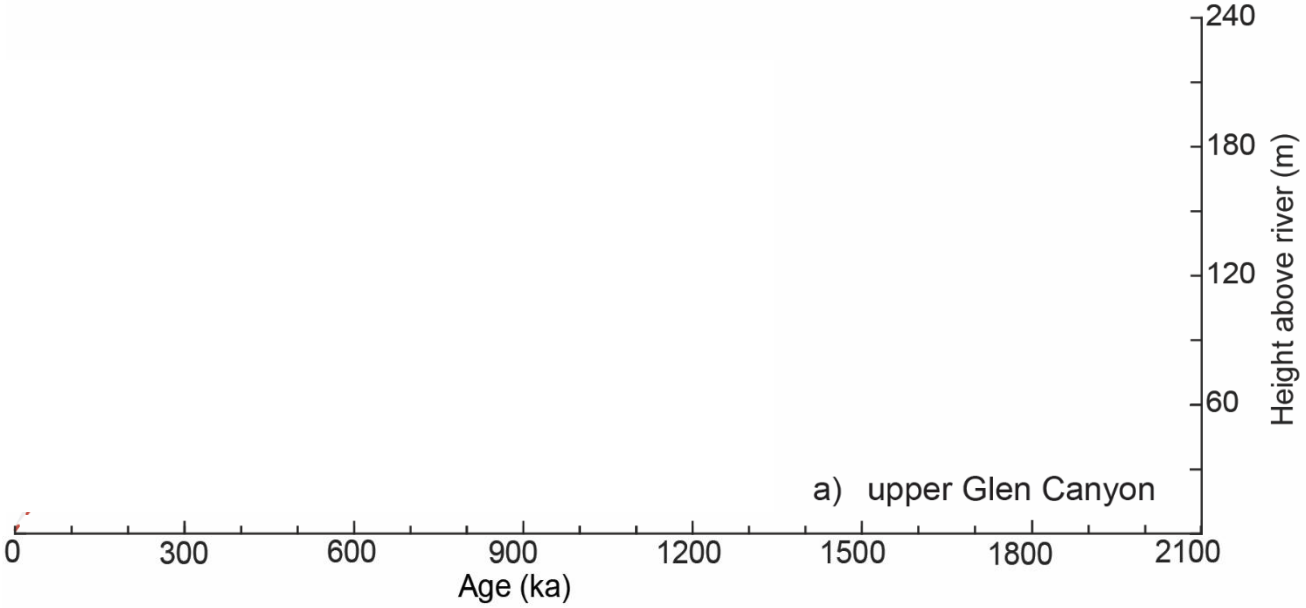
# Looking upstream mouth of North Wash (Oct 2022)

*116,000 yr, 43 m*

# Incision history for Glen Canyon: unsteady and rapid!



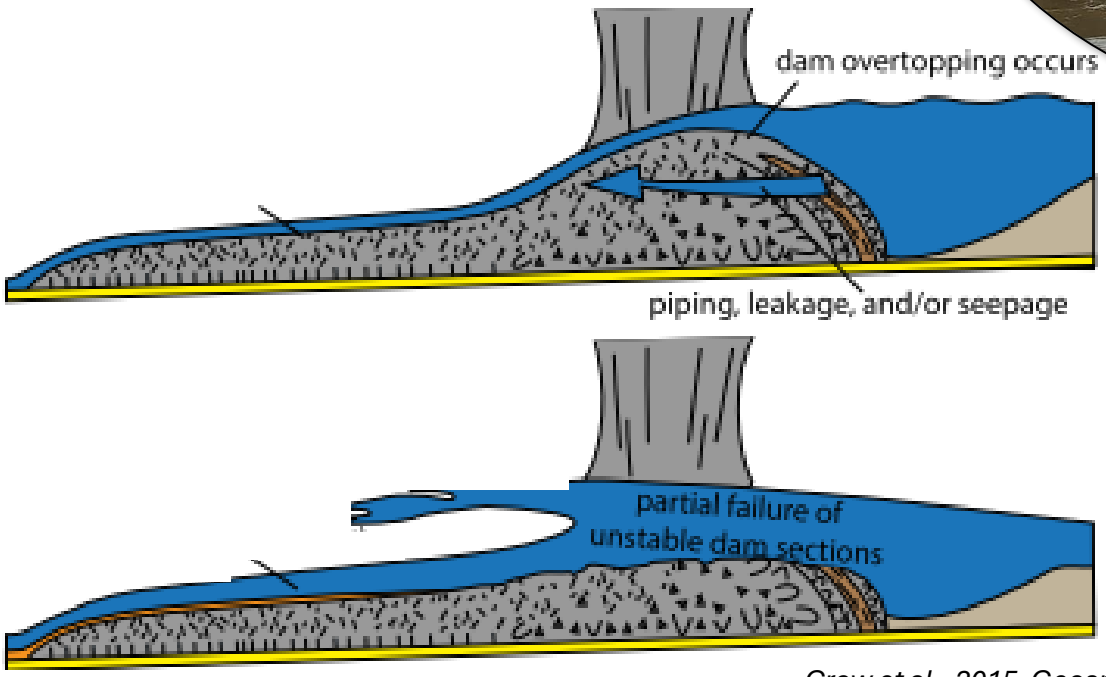




*Why slow incision 700,000 – 400,000 years ago?*

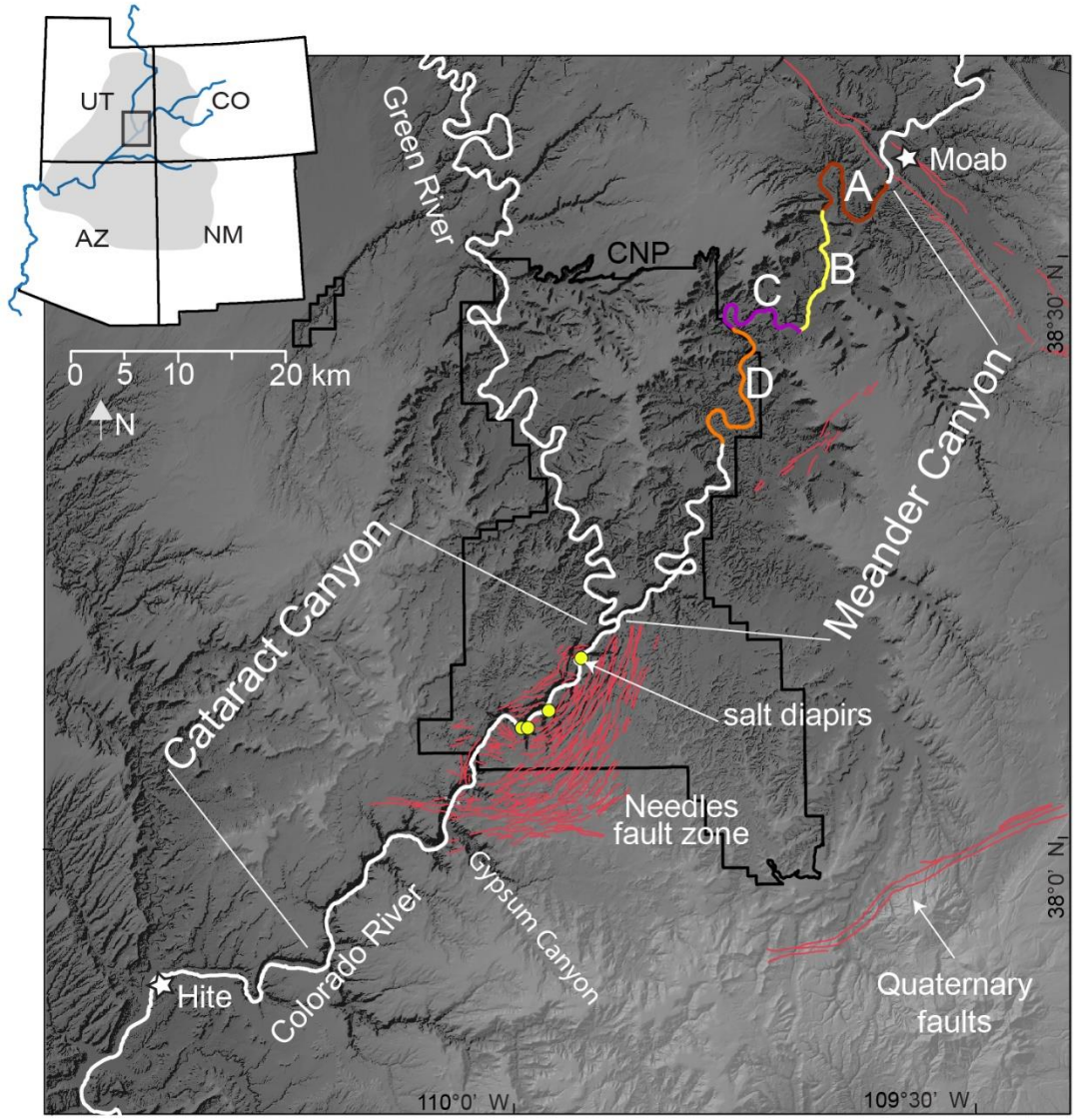
# *Potential cause for slow incision in Glen Canyon: Grand Canyon lava dams?*

- 17 different lava flows
- Peak at 400,000 – 700,000
- Caused baselevel high, slows incision upstream during emplacement

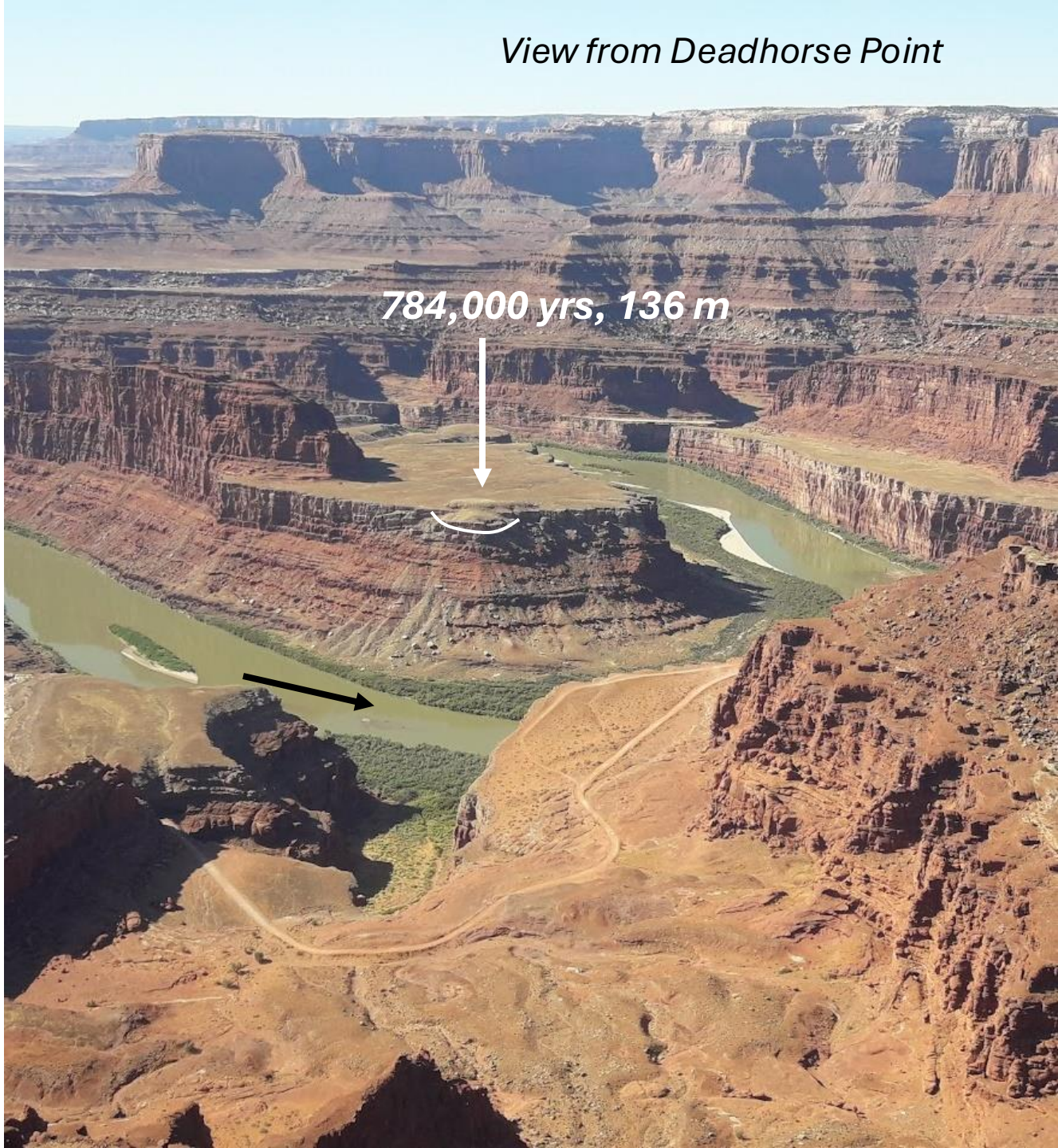



*Crow et al., 2015, Geosphere*

# *What about Canyonlands?*

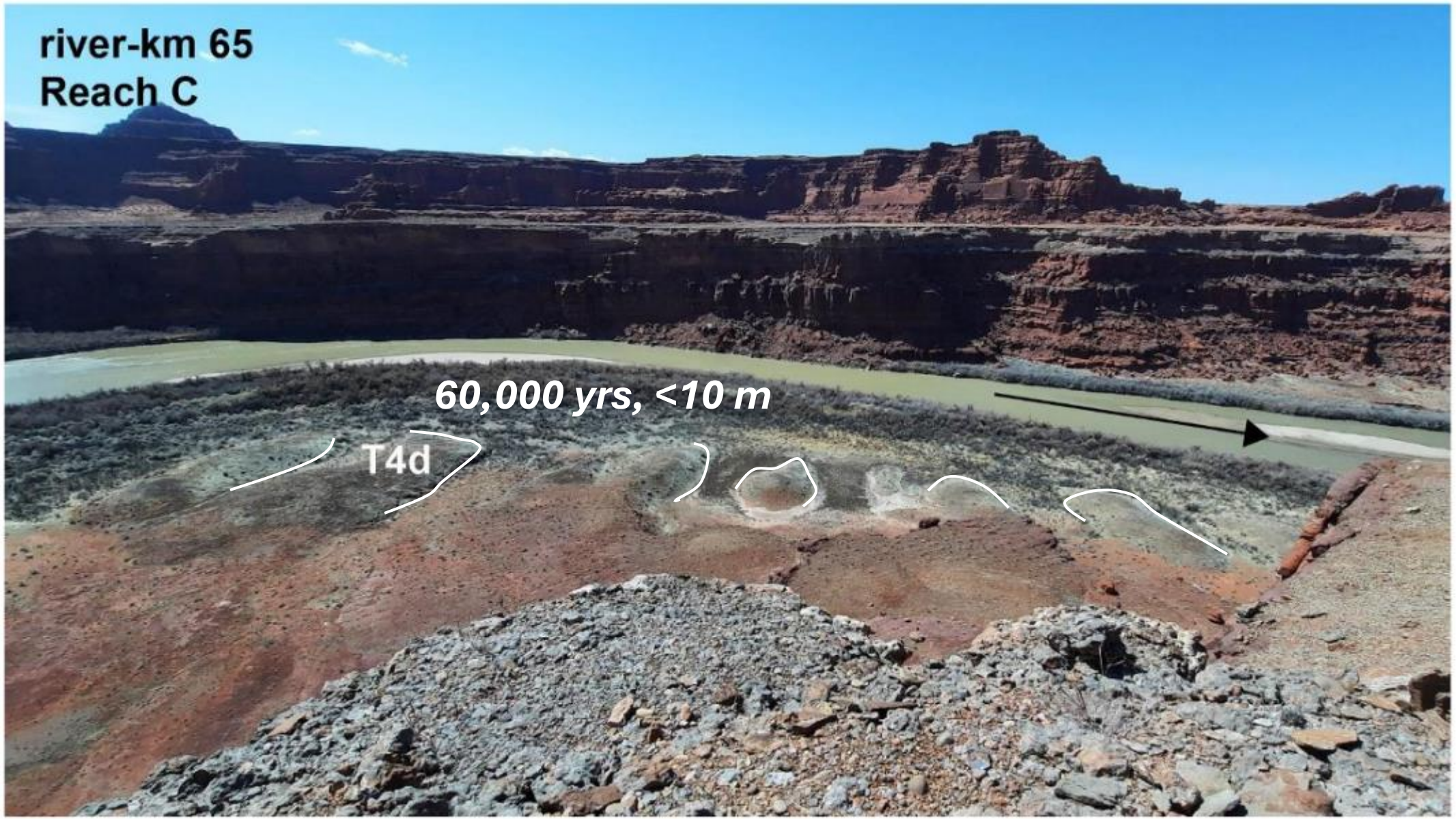



*View from Deadhorse Point*



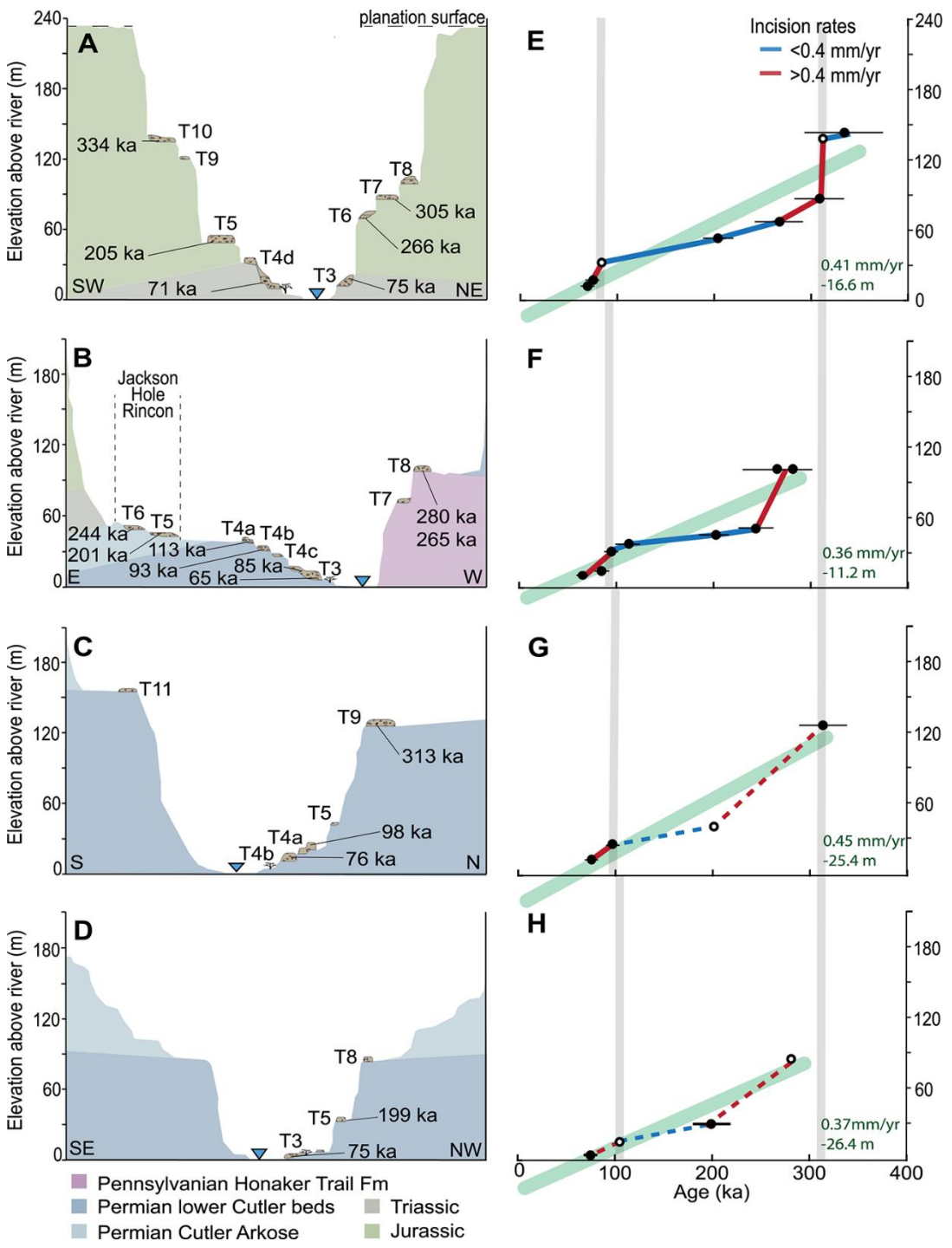

river-km 96
Reach A
160,000 yrs, 50 m
T5

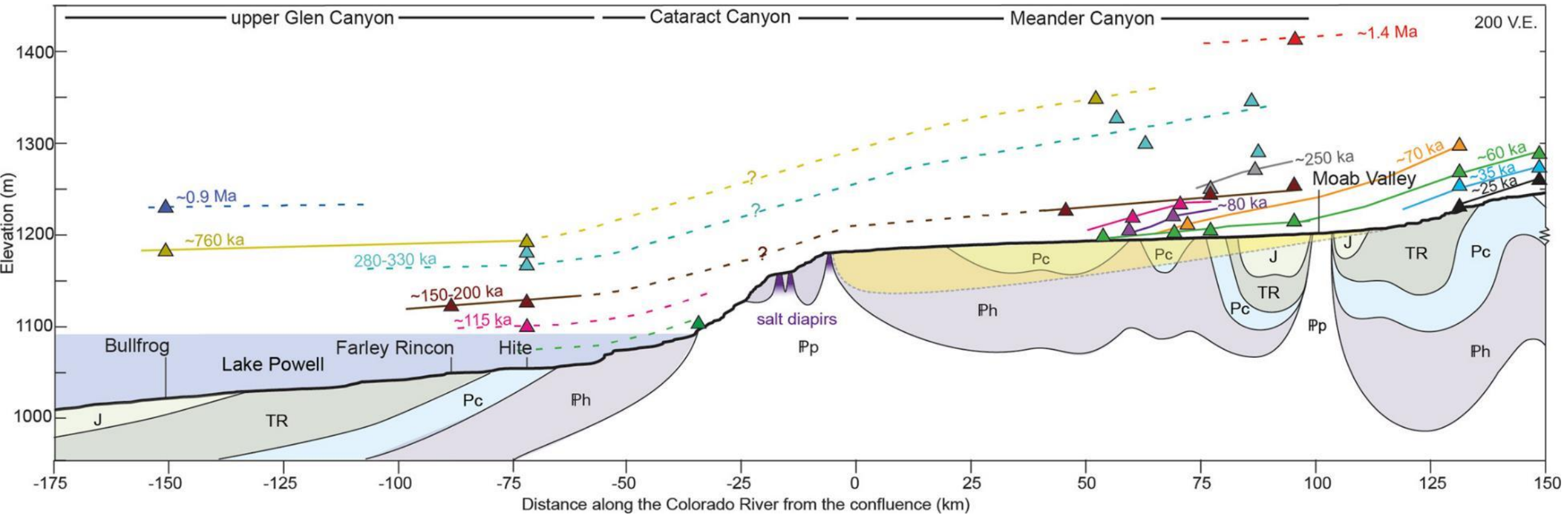

river-km 88
Reach A
T5
T6
266,000 yrs, 66 m
T7
305,000 yrs, 85 m


river-km 65
Reach C
60,000 yrs, <10 m
T4d

- Complex history of slow and rapid incision

- WHY?
  - Do lava dams still have an affect this far upstream?
  - Or….






**Salt tectonics**

**Mass-wasting**

*Joel Pederson, Tammy Rittenour, Alan Hidy, James Mauch, Sherman Young, Coleman Hiett, Micheala Shallue*

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