



## Colorado Plateau Coring Project (CPCP) Workshop

**Dates:** The CPCP Workshop will take place from 7:00 PM on the evening of November 13 to 5:00 PM on the afternoon of November 16. Participants should plan to arrive on the afternoon of November 13 and to leave on the evening November 16 or the morning of November 17.

**Place:** The hotel and conference location is the Hilton Garden Inn in St. George, Utah. The city of St. George is located on the southwestern edge of the Colorado Plateau nestled among spectacular outcrops of early Mesozoic continental sedimentary rocks. It is 130 mi northeast of McCarran International Airport at Las Vegas, NV, which is about a 2 hr drive, and 41 mi west of Zion National Park, which is about a 50-minute drive. We will arrange a shuttle from McCarran International Airport at Las Vegas to the Hilton Garden Inn in St. George and back a limited number of times depending on demand on November 13th, 16th, and 17th.

Hilton Garden Inn in St. George, Utah Address: 1731 Convention Center Drive, St. George, Utah, USA 84790, Tel: +1-435-634-4100, Fax: +1-435-634-4101  
Hotel Website:

We have a block of 60 rooms reserved at the Hilton Garden Inn and reservations **MUST** be made by **October 17**.

**Workshop Organizers:** Paul E. Olsen, Lamont-Doherty Earth Observatory of Columbia University, New York, NY ([polson@ldeo.columbia.edu](mailto:polson@ldeo.columbia.edu))  
Dennis V. Kent, Department of Geological Sciences, Geological Sciences Labs Building, Rutgers University, Piscataway, NJ ([dvk@rci.rutgers.edu](mailto:dvk@rci.rutgers.edu))  
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**Costs:** We have received grants from DOSECC and NSF to offset workshop costs. Participants are responsible for making their own travel and lodging reservations. The cost of the ice-breaker, banquet, and one lunch will be directly covered by us. All other meals will be responsibility of the participants. We have NSF and DOSECC funds to offset travel, food, and lodging costs up an amount as yet to be determined. Funds left over from unused domestic travel reimbursement will be used to subsidize any additional travel costs incurred by our international colleagues.

***Please note:*** The funds supplied to us for participant support are from the US National Science Foundation and fall under the rules of US Law 49 USC §40118, which is commonly referred to as the “Fly America Act”. Under this law ALL travelers supported by U.S. government funds are required to use United States carriers. In specific, tickets (or documentation for electronic tickets) must identify the U.S.-Flag air carrier’s designator code and flight number. This seems to be true even if the non-U.S. carrier has a U.S. partner.

The text of the pertinent NSF rule is given in the attachment and at the following web site: [http://www.nsf.gov/pubs/policydocs/pappguide/nsf08\\_1/aag\\_6.jsp](http://www.nsf.gov/pubs/policydocs/pappguide/nsf08_1/aag_6.jsp) - VIG1

**Website:** [http://www.ldeo.columbia.edu/~polsen/cpcp/CPCP\\_home\\_page.html](http://www.ldeo.columbia.edu/~polsen/cpcp/CPCP_home_page.html)

We have set up a web site to advertise to the scientific community and to communicate with participants. Please periodically check in to catch any changes to the itinerary.

## **CPCP WORKSHOP CONCEPT, OBJECTIVES, AND TENTATIVE SCHEDULE**

**Concept:** The Colorado Plateau is the textbook example of layered sedimentary rocks in North America, representing the depositional history of the western Cordillera during much of the Paleozoic and Mesozoic. Although visually striking in the walls of canyons and mesas (e.g., Grand Canyon), the strata are difficult to access for continuous descriptions, appropriate sampling density, and logs of environmentally significant proxies necessary to understand their history, despite more than two centuries of geologic, paleontologic, and resource exploration. This is especially true for Early Triassic to Early Jurassic age strata, which are part of a vast (~2.5 million km<sup>2</sup>) mostly non-marine depositional basin in the western part of Pangea that record regional and global tectonic and biotic evolution events including one of the five largest extinctions of the Phanerozoic. A scientific coring project concentrated on this time-stratigraphic interval on the Colorado Plateau would provide quintessential continuous reference sections to place the regional and global events of more than 60 million years of Earth History, as well as the 200 years of previous geoscience study, in a more precise chronostratigraphic and paleogeographic context.

## **Why the Triassic-Jurassic ?**

- Massive plate tectonic reorganization with initial stages of the breakup of Pangea
- Emplacement of at least 3 giant flood basalt provinces (Siberian, CAMP, Karoo-Ferrar)
- End member of Earth's climate system - extreme greenhouse conditions with no evidence of polar ice
- Evolution of all major extant groups of terrestrial vertebrates
- Establishment of modern extant invertebrate groups in present ecological roles
- Two major and one minor mass extinctions (Permo-Triassic, Triassic-Jurassic, end-Pliensbachian)

## **Why the Colorado Plateau ?**

- It is the textbook example of layered sedimentary rocks
- It has some of the thickest and best studied Triassic-Jurassic continental sequences
- It has some of the most fossiliferous continental strata in the world
- The strata represent a diverse suite of depositional environments of tropical Pangea
- The deposits span the Triassic-Jurassic boundary, one of the five largest extinctions of the Phanerozoic
- But, further progress is impeded by the striking lack of temporal resolution and uncertainties in global correlations
- Especially true of the tectonic history recorded by strata, including sequence boundaries and block rotations

## **Drilling Rationale**

Of all the tectonic provinces in the western Cordillera, the Colorado Plateau has the thickest and most well studied Paleozoic and Mesozoic continental sequences as well as some of the most fossiliferous strata. Classic exposures of the Moenkopi Formation (Early and Middle Triassic age), Chinle Group (Late Triassic), and Glen Canyon Group (latest Triassic and Early Jurassic) in the American Southwest contain abundant megafossil plants, palynomorphs, microfossils, marine and non-marine invertebrates, and abundant and classic vertebrates (Lucas, 1998). These deposits represent a diverse suite of depositional environments and ecological niches of tropical Pangea, many of which are not represented in other Pangean basins. Obtaining sufficiently detailed chronostratigraphic and lithologic logs should allow the local response to Milankovitch forcing to be worked out by correlating the fluvial, eolian, and shallow lacustrine Colorado Plateau strata with established cyclicity in the contemporaneous eastern North American Early Mesozoic lacustrine sections. At least locally, deposition seems to have been essentially continuous across the Triassic-Jurassic boundary. Despite the long history of productive work, further progress is impeded by the striking lack of temporal resolution and uncertainties in global correlations with other lower Mesozoic strata, specifically on a global scale, and this deficiency hampers integrating the vast amount of information from the region into the global picture. Although the American Southwest, including the Colorado Plateau, is justifiably famous for spectacular exposures and striking badlands, many of the thickest sections are in the subsurface and the most continuous outcrops are either in inaccessible vertical cliffs or

are heavily weathered, making sampling at the appropriate level of resolution practically impossible.

A focused coring program in Triassic through Lower Jurassic strata on the Colorado Plateau and off its eastern flank would result in a quantum leap in our insight into issues of Pangean chronology, paleogeography, paleoclimate, and biotic evolution that also include those associated with the Triassic-Jurassic boundary.

### **Workshop Goals (can be modified during meeting)**

1. Identification of clear, major hypotheses testable by coring the Early Mesozoic on and off the Colorado Plateau.
  - How are the hypotheses ranked?
2. Plan for complete cored section of the lower Mesozoic of the Colorado Plateau
  - How many coreholes?
3. Rational for selecting youngest stratigraphic level to core
  - Science and logistical issues for selection
4. Plan for complete cored section of Triassic off Plateau
  - How many coreholes?
5. Strategy to assure sufficient stratigraphic overlap between cores to assess lateral continuity
  - How much overlap?
6. Plan for coring in appropriate proximity to sources of surface data to assure registry
  - How close?

### **Tentative Basic Schedule**

Tuesday, November 13:

Participants arrive  
Ice breaker and overview in evening

Wednesday, November 14:

Plenary Session: Introduction, Science questions  
Definition of break-out groups  
Naming of rapporteurs:  
Lunch  
Breakout groups meet  
Supper  
Evening discussion

Thursday, November 15:

Brief progress reports by rapporteurs  
Continue work on breakout reports  
Lunch at The St. George Dinosaur Discovery Site at Johnson Farm  
Field Trip to Zion National Park  
Supper  
Evening discussion

*Cont'd*

Friday, November 16:

Presentation of breakout reports by rapporteurs

Tune up reports:

Lunch

Breakout reports completed.

Final remarks and meeting closure

Workshop Banquet at the Gun Barrel Steak and Game House

Some participants may wish to depart

Saturday, November 17:

Most participants leave

Organizers assemble workshop report

### **Important Dates**

Oct 1. Commitment of participants to meeting

Oct 17. Last day to confirm reserved rooms

Oct 25. Deadline for abstracts on plenary talks

Oct 25. Deadline for reserving space on field trip

Oct 25. Deadline for sending flight information and reserving DOSECC van shuttle

Nov 13. Arrive at workshop

Nov 14. First full day of workshop

Nov 15. Field trip to Zion

Nov 16. Last day of Workshop

Nov 17. Most Participants leave

*If you wish to attend*, please email Paul E. Olsen, Lamont-Doherty Earth Observatory of Columbia University, New York, NY ([polсен@ldeo.columbia.edu](mailto:polсен@ldeo.columbia.edu))

**Please Note:** Please check periodically the workshop's www site for updates.

[http://www.ldeo.columbia.edu/~polсен/cpcp/CPCP\\_home\\_page.html](http://www.ldeo.columbia.edu/~polсен/cpcp/CPCP_home_page.html)