and crocodyliforms) become more diverse and are characterized by larger taxa immediately following the extinction horizon. Smaller species are proportionately rarer during development of maximum anoxia.

We conclude that the early Toarcian fish fauna is more sensitive to basinal oxygen fluctuations than to factors directly associated with the e-TOAE, whereas the higher trophic level marine reptile fauna appears to be controlled by a more complex set of variables. Different responses to the same environmental perturbations imply a degree of trophic dissociation between the marine reptiles and fishes.

Poster Session IV (Saturday, October 17, 2015, 4:15 - 6:15)

MORPHOLOGICAL AND TAXONOMIC DIVERSITY IN ORNITHOMIMIDS REFERRED TO *STRUTHIOMIMUS ALTUS* FROM THE CAMPANIAN OF ALBERTA

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Struthiomimus altus from the late Campanian Dinosaur Park Formation of Alberta has been one of North America's most iconic "ostrich dinosaurs" since the first relatively complete skeleton was referred to this species in 1917. However, although numerous partial skeletons have been referred to *Struthiomimus altus* over the years, substantial anatomical variation in this sample has not been described, and many referrals of material have not been explicity justified by shared derived characters. A relatively small partial skeleton from the lower Dinosaur Park Formation is removed from *Struthiomimus altus* and identified as a new ornithomimid genus and species, characterized by the following autapomorphies: a short contact for the jugal on the maxilla, caudal vertebrae with very reduced neural spines over the transition point, a fully fused and convex contact between the ischia, a larger medial condyle than lateral condyle of the tibia, and a distinctive third metatarsal lacking a distal groove on the flexor side. Another partial skeleton combines a straight distal pubic shaft with a very short anterior process of the pubic boot, differing from more complete material referred to *Struthiomimus altus* but further supporting the presence of *Qiupalong* or a related taxon in the Dinosaur Park Formation. A core group of specimens generally regarded as *Struthiomimus altus* may be diagnosed by a more anteriorly projecting pubis with the pubic boot ahead of the antilium rather than under it, and a more sinuous profile of the third metatarsal. In this group variation is present in the development of a ginglymoid distal articulation of the first metacarpal. Although the fragmentary type specimen of *Struthiomimus altus* exhibits potentially diagnostic characters of the pedal phalanges, the evidence previously used to link it to the referred material is not secure, and the validity of this taxon requires careful reconsideration. The Dinosaur Park Formation contains the most diverse assemblage of Ornithomimidae currently recognized, but their diversity may be underestimated in other formations.

Technical Sesion XV (Saturday, October 17, 2015, 8:00 AM)

NEW SOUTH AMERICAN NATIVE UNGULATES (LITOPTERNA: MACRAUCHENIIDAE) FROM THE MIDDLE MIOCENE (SERAVALLIAN; LAVENTAN SOUTH AMERICAN LAND MAMMAL AGE) OF QUEBRADA HONDA, BOLIVIA

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The Macraucheniidae are a moderately diverse and long-lived family of native South American ungulates of the order Litopterna. Their fossil range extends from the late Eocene until the late Pleistocene and possibly the early Holocene. The family shows a pronounced evolutionary trajectory throughout the Cenozoic, marked by an increase in body size and a reduction of the nasals, among other features. The basal members of the family (subfamily Cramaucheniinae), such as *Theosodon*, are known from many Oligocene and early Miocene deposits throughout the continent. Macraucheniines, such as the Pleistocene *Macrauchenia*, are known from late Miocene and younger deposits. Unfortunately, the fossil record of this family is poor for the middle and late Miocene, a time during which many of the morphological changes that distinguish the two subfamilies began to evolve. Recently discovered, well-preserved macraucheniid remains from the late middle Miocene (Serravallian age, Laventan South American land mammal age) site of Quebrada Honda in southern Bolivia help bridge this gap by documenting two new species. One of these species (Species A) is represented by a partial hind limb and a nearly complete cranium that preserves most of the upper dentition. It is distinguished from most other macraucheniids by its lack of a complete postorbital bar and lack of a diastema between I3 and C. Species B is represented by a specimen that includes a complete right dentary preserving the entire tooth row and mandibular symphysis, partial fore- and hind-limbs, and parts of the axial skeleton. It differs from other macraucheniids in having a hypolophulid and paralophid of similar size in p4 and a well-developed entoconid on m3. Species B is also smaller than most other macraucheniids (based on m2 length) and about 35% smaller than Species A based on femoral intercondylar and trochlear widths. The two Quebrada Honda species were added to the character-taxon matrix of a recently published phylogenetic analysis of Macraucheniidae to test their evolutionary relationships. Species A plotted within Macraucheniinae, basal to *Oxyodontherium* but crownward of *Scalabrinitherium*. Species B was part of a polytomy of cramaucheniine genera that includes *Cramauchenia*, *Coniopternium*, and *Pternoconius*. Quebrada Honda may be unique among South American fossil localities in preserving the co-occurrence of both a cramaucheniine and a macraucheniine.

Grant Information
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Poster Session III (Friday, October 16, 2015, 4:15 - 6:15)

USING A CONSERVATION FRAMEWORK TO EXAMINE LANDSCAPE DIVERSITY, CLIMATE, AND VERTEBRATE RICHNESS

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We have not yet developed sufficient methods for predicting how millions of species will need to shift their distributions to respond to rapidly changing climate. Thus, it is difficult for practitioners to create conservation priorities for maximizing future biodiversity. Some conservation biologists have recently begun utilizing a framework that prioritizes landscape diversity, with the idea that it will provide a rich stage for future biodiversity. In exploring how to best conserve future biodiversity, we have been analyzing the correlations between modern landscape diversity and biological richness. We have thus far found inconsistent relationships between these metrics. We compare the favored method in conservation biology today, which clusters landscape variables into discrete landforms, with random forest models, which use individual, continuous variables. We find that neither method outperforms the other for using landscape to predict vertebrate diversity. The missing factor here, which is not yet being considered by conservation biologists, is climate gradients and how these co-vary with landscape and biological diversity. If we as paleontologists begin framing our analyses about how vertebrate diversity shifts through time in terms of the methodology and needs of the conservation community, our research becomes mutually beneficial for both paleontology and conservation biology. From a paleoecological perspective, we are exploring the basic biology that underlies the interactions between landscape, climate, and vertebrate richness patterns. From a conservation perspective, we are validating and improving upon land parcel prioritization methods that are critical for purchase justifications.

Grant Information
Work on this project was funded by the Doris Duke Foundation.

Colbert Prize (Wednesday - Saturday, October 14-17, 2015, 4:15 - 6:15)

CHANGING STRUCTURAL PROPERTIES AND MORPHOLOGY THROUGH EVOLUTIONARY DIGIT REDUCTION IN THE EQUIDAE (PERISSODACTYLA)

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Extant horses are a single genus of large-bodied, monodactyl, cursorial grazers. However, their fossil record shows remarkable diversity in terms of diet, body size, and digit state. Specifically, digit reduction evolved multiple times. Proposed explanations for this reduction include a greater emphasis on straight-line locomotion instead of lateral agility and increased locomotor economy, both in response to the spread of grasslands. As a first step in investigating these and other potential evolutionary drivers, we used micro-CT scanning and linear measurements of the distal limb bones in fossil equids, extant equids, and extant tapirs to investigate 1) intraspecific variation in distal limb dimensions, 2) an appropriate side digit to center digit ratio as a single 'toedness' value, and 3) evolutionary changes in the cross-sectional geometry of digit III, the primary weight-bearing digit.

The least variable distal limb elements were ungual phalanx (proximal width), proximal phalanx (length, proximal width), and metapodial (proximal width). From these dimensions, species-average values were calculated to determine a 'toedness' ratio for each species. Initial results show that these ratios reliably reflect degree of digit reduction, with high values for the tapir, moderate values for the more tridactyl horse species, and low values for *Equus*.

Structural properties of the digit III cross-section give unexpected results. We predicted increased resistance to bending and torsion as side digits were reduced, with the highest values in *Equus*, because a single toe bears the force of locomotion. Counterintuitively, we found that the multi-toed extant tapir had the highest resistance to bending and torsion, followed closely by *Equus*. In contrast, small-bodied fossil horses show significantly lower values than either tapir or *Equus*. This discrepancy may reflect the gracility of these early equids, which have lower body mass relative to digit proportions. Future work on other fossil horse species, including those that attain large body size while retaining side digits and the converse, will shed more light on these patterns of internal geometric bone properties.

Technical Sesion XV (Saturday, October 17, 2015, 8:00 AM)

RADIATIONS AND EXTINCTIONS OF TEMNOSPONDYLI AND THE AMPHIBIAN RESPONSE TO THE END-PERMIAN MASS EXTINCTION

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The effects of the end-Permian mass extinction, in terms of rates of species origination and extinction, were examined for the clade Temnospondyli. Temnospondyls are a species-rich group of non-amniote tetrapods with an abundant and global fossil record that crosses the end-Permian mass extinction near the middle of the lineage's range (Viséan to Aptian). As non-amniotes tend to be more susceptible to changes in environment and climate than amniotes, temnospondyls are an ideal taxon in which to examine the effects of environmental change at the Permian-Triassic boundary. To do this, a new clade-wide phylogenetic analysis of Temnospondyli was performed using a matrix of 112 ingroup taxa scored for 283 morphological characters, the colosteid *Greererpeton burkemorani* and the lepospondyl *Microbrachis pelikani* were used as outgroup taxa. The resulting phylogenetic hypothesis was then mapped against stratigraphic ranges correlated to the global geochronologic time scale for each taxon to identify ghost lineages and estimate ages of internal nodes. Using these data, origination and extinction rates were calculated per geologic stage and per million years. The effects of sampling bias were estimated by Spearmann's rank correlations between the number of sampled localities and rates of origination and extinction. Results show the largest radiation within Temnospondyli was during the latest Permian and continuing through