OPEN ACCESS
Article

JCTS
SERIES C

CGS Annual Conference Abstracts 2022

Does Hopi Lake Hold Water?

S.A. Austin[1], E.W. Holroyd III[2], T.F. Folks[3], and N. Loper[4]
[1]Austin Research Consulting
[2]Carmel Consulting
[3]Field Consultant
[4]Canyon Ministries

For more than 150 years geologists have been pondering the notion that a lake once occupied a large part of Bidahochi Basin in the Painted Desert region of northeastern Arizona. In 1936 Howel Williams named it Hopi Lake. Are strandlines from a Pliocene lake imprinted on limestone slopes of Kaibab Formation in western Bidahochi Basin? Our inquiry led us to study Google imagery from Coconino County just east of Flagstaff, Arizona. We surveyed a 25-square-kilometer tract, assembled a composite image, and overlayed a digital elevation model. The compiled image file has 0.5- meter resolution with 2-meter contour overlay. We discovered several fields of linear, nearly horizontal, ridgelike landforms on Kaibab Formation slopes at elevation of ~1750 m (5740 ft). We selected several landforms for on-the-ground study. Adjacent to Buffalo Range Road on the north side of Wagon Box Draw we surveyed the limestone dip slope of a gently plunging syncline south of an anticline. "Nate's Hill" (lat/long: 35.099, -111.181) is our name for the largest landform field. Landforms are expressed upon slopes as much as 0.08 (rise over run). Landforms are ridgelike and linear being composed of three elements: berm, face and flat. The berm contains the crest line of exposed limestone that is the high point of the structure with the line of the berm crest expressing nearly horizontal orientation. The face is the dipping plucked limestone surface just downslope of the berm. The flat is the nearly horizontal soil surface just downslope of the face. The berm and face expose light-beige-colored limestone, whereas the flat is covered by darker brownish aeolian soil with short xerophytic shrubs. Landform lineation is impressive on high-resolution satellite photos and low-altitude drone photos because of the color and texture contrast between the rocky ridgelike berm and adjacent soil-covered flat. Typical spacing between berms is 20 m (+/- 5) over the ground. Height of the landform between adjacent berms is up to 1 meter with landforms occurring in steplike terraces ascending the limestone slope. These three landform elements are deflected by topographic irregularities as if a shoreline of a lake rose over the curved surface of limestone forming coves and points. Sometimes a very thin calcite crust ("tufa") remains accreted to the face element of the landform.

Within the 25-square-kilometer tract around Wagon Box Draw, we identified the durable and persistent "limestone platform unit" that is less than 3 meters thick. This distinctive stratum occurs within the upper Harrisburg Member of the Kaibab Formation observed at a few places about 3 meters beneath the Moenkopi Formation. Outcrop strike and dip measurements at Nate's Hill clearly demonstrate that the dip angle of limestone bedding is concordant with the step exposure of the landform. That means that numerous outcrop ledges express the strike line exposure of a single stratum, and disproves the notion that outcrop ledges are caused by a succession of outcropping strata. Nate's Hill must be the syncline's dip slope dominated by the limestone platform marker unit from the uppermost Harrisburg Member.

Landforms on the dip slope are not controlled by vertical limestone joints, because landform alignments deviate greatly from steady joint orientation. Could hummocky, dunelike or boudinage bedding structure within the limestone cause ridges to be expressed on the dip slope? We have not found hummocks in the uppermost Harrisburg Member with 20-meter spacing. Reflect upon the improbability that crests of ancient limestone hummocks, dunes or boudins would follow present topographic contour. Remarkably, linear landforms strongly parallel the 2-meter topographic contour overlay except where the limestone is deformed adjacent to faults. We observed a berm structure that could be traced 1 kilometer along the limestone dip slope yet its elevation appeared to vary by less than a meter. The limestone dip slope at Nate's Hill is terminated on its northeastern edge by the graben structure hosting Buffalo Range Road, with the associated landforms northeast of the graben having 15-meter lower elevation compared to the southwestern side. We interpret these Wagon Box Draw landforms to be old strandlines carved within the limestone slope as Hopi Lake rose to fill Bidahochi Basin. Could Bidahochi Basin have held a large post-Flood lake? Could complete filling of Hopi Lake have initiated spillover erosion of Grand Canyon? Our ongoing project seeks to answer some of these important and persistent questions.

Landform overflight video posted at: https://www.youtube.com/watch?v=wbKdxMW9NgY

Biostratigraphy and the Post-Flood Boundary Question

M. Ross[1] and C. Arment[2]
[1]Liberty University
[2]Independent Scholar

Various criteria have been proposed to identify the Flood/post-Flood boundary at local, regional, and even global scales (biological, geomorphological, geological, geophysical,

Citation: *Journal of Creation Theology and Science Series C: Earth Sciences* 12:1-4.

paleontological, tectonic, etc.). Currently there is little consensus on the methods that ought to be employed and there is much disagreement over the priority that should be given to various classes of evidence. Properly formulated, Flood boundary proposals are testable hypotheses. Biostratigraphy offers a variety of powerful methods to test them, and recent biostratigraphic studies have:

1) Tabulated boundary-crossing genera at the Cretaceous-Paleogene (K-Pg) and the Pliocene-Pleistocene boundaries in North America (Ross 2012, 2014, and Ross in Walker and Ross 2014)

2) Traced the intra-baraminic fossil record of North American colubrid and viperid snake monobaramins (Arment 2014)

3) Calculated the probabilities of organisms migrating from the Ark to geographic locations preserving same-genus fossils in their underlying sedimentary record. (Arment 2020b)

4) Evaluated the implications of a N-Q boundary using the fossil record of unclean terrestrial carnivores (extant and fossil; Arment 2020a).

These studies have concluded that placing the Flood/post-Flood boundary at or near the N-Q boundary is untenable and that a K-Pg boundary resolves these tensions. Moreover, the application of specific and defined methods allows these findings to be tested using similar surveys on unstudied groups.

There has been a significant response to these studies, critiquing both their findings and their methods (e.g., Oard 2022; Walker in Walker and Ross 2014). Others present arguments that various stratigraphic, tectonic and/or geomorphological features are incommensurable with a post-Flood origin for the Cenozoic record (e.g., Clarey and Werner 2019 and Oard 2022) and prefer either a N-Q or loosely defined and locally variable "late Cenozoic" termination to the Flood (herein "late Cenozoic" for both). These critiques vary in strength but frequently downplay the statistical challenge from, and the overall robustness of, the biostratigraphic data, Notably, late Cenozoic adherents have not grappled with the consequences that a high post-Flood boundary raises vis-à-vis the number of "kinds" brought aboard Noah's ark: this number would rise dramatically, given that multiple genera of the same "kind" frequently cross any boundary placed in the late Cenozoic, requiring a downward shift of the "kind" from the rank of Family to that of Genus (or requiring more than two animals from each "kind"). Moreover, there are several cases where adherents assert paleontological support for a late Cenozoic boundary (e.g., whale distributions and South American paleofauna; e.g., Tomkins and Clarey 2021) that are far better explained in a post-Flood recolonization setting.

The data from biostratigraphy seem incompatible with a late Cenozoic placement of the Flood/post-Flood boundary. While we do not address the geological/tectonic/geomorphological arguments here, we note that numerous YEC geologists have presented evidence that the Cenozoic record is indeed resolvable as a product of post-Flood activity (see the writings of Steven Austin, Paul Garner, John Whitmore, Andrew Snelling, and Kurt Wise), and that much of this is derived from on-the-ground, field-based research. Combining these insights with additional data from other branches of the biological and geological sciences should aid YECs in further clarifying the nature of the Flood's terminus, which was likely highly dynamic and regionally variable.

Arment, C. 2014. Fossil snakes and the Flood boundary in North America. *Journal of Creation* 28(3):13–15.

Arment, C. 2020a. Implications of Creation Biology for a Neogene-Quaternary Flood/Post-Flood Boundary. *Answers Research Journal* 13:241–257.

Arment, C. 2020b. "To the Ark, and Back Again? Using the Marsupial Fossil Record to Investigate the Post-Flood Boundary. *Answers Research Journal* 13:1–22.

Clarey, T.L., and D.J. Werner. 2019. Compelling Evidence for an Upper Cenozoic Flood/Post-Flood Boundary: Paleogene and Neogene Marine Strata that Completely Surround Turkey. *CRSQ* 56(3):68–75.

Oard, M.J. 2022. Does Paleontology Nullify Geological Arguments for the Location of the Flood/Post-Flood Boundary? Setting the Record Straight. *Journal of Creation* 36(2):81-88.

Ross, M.R. 2012. Evaluating Potential Post-Flood Boundaries with Biostratigraphy—the Pliocene/Pleistocene Boundary." *Journal of Creation* 26(2):82–87.

Ross, M.R. 2014a. A Preliminary Biostratigraphic Analysis of the K-Pg Boundary as a Post-Flood Boundary Candidate. *Journal of Creation Theology and Science Series C: Earth Sciences* 4:1.

Tomkins, J.P. and T.L. Clarey. 2021. South American Paleontology Supports a Neogene-Quaternary (N-Q) Flood Boundary. *Journal of Creation* 36(1):18-21.

Walker, T., and M.R. Ross. 2014. Forum on the Flood/Post-Flood Boundary. *Journal of Creation* 28(2):60-68.

Geomagnetic Radiation Shielding and Higher Air Pressure: An Environmental/DNA Damage Hypothesis of Biological Longevity

D.W. Seely
Mississippi State University

Two primary environmental factors are proposed to facilitate the longevity recorded in the Genesis account of the pre-flood world: (1) radiation shielding from increased geomagnetic field strength, and (2) higher atmospheric surface pressure. Higher air pressure provides two coupled effects: additional shielding from exoplanetary radiation and increased oxygen partial pressure at sea level. Two intracellular mechanisms account for maintaining genetic integrity: decreased tissue and genetic molecular damage rate from ionizing radiation and increased genetic repair rate mediated by an increased gas pressure limited metabolism.

Werner syndrome, marked by premature aging, has been associated with a defect in the WRN gene coding for a DNA helicase essential for excision-based DNA repair pathways. Elimination or reduced efficiency of DNA repair functionality causes DNA damage to accumulate faster, correlated with symptoms of premature aging. Serving as a gene knockout experiment for the DNA repair pathway, Werner syndrome supports the DNA hypothesis of aging.

Endogenous sources of reactive oxygen species (ROS) cause damage to cellular DNA, proteins, and other macromolecules and this damage accumulates with age. Somatic mutation frequency in human lymphocytes is about 9 times greater in elderly people than in neonates. (Grist et al. 1992) Analysis of free DNA nucleotide bases in urine (the breakdown byproducts of DNA excision repair) has shown a modern rate of 10,000 DNA oxidative damage injuries are repaired per cell per day in humans. ROS, a normal byproduct repair processes, positively correlate with metabolism. Thus, higher metabolism traditionally corelates with increased damage. However, many ROSs spill over from systems dedicated to repair of molecular and system damage, the population of which is proportional to repair activity. If the overall molecular damage rate is reduced, then fewer repair systems are recruited when metabolism increases, reducing metabolic associated damage.

Exogenous sources of cellular damage from ionizing radiation include UVA, UVB, and background radiation from local radioisotope decay and food ingestion. However, damage from primary Galactic Cosmic Rays (GCRs), high energy secondary particles, and Solar Energetic Particles (SEPs) induce greater localized ionization along ray paths. Previous work using molecular dynamics simulations has shown genetic damage results from locally high concentration of ionization products (e.g. H+, superoxide, hydrogen peroxide, and OH- radicals) causing oxidative damage.

GCRs are fully ionized atomic nuclei traveling through interstellar space at extremely high velocities having energy spectra peaking near 500MeV but stretching to more than 500GeV. SEPs directed toward the Earth during geomagnetic storm events add to the flux of GCR particles although at lower peak energies (100keV-100MeV). The geomagnetic field strength and latitude dependent field orientation limits the flux of both GCRs and SEPs that reach the outside of the atmosphere. Previous work has shown geomagnetic field strength has decreased by ~7% over the last century and may have been as much as 18 times stronger at the creation.

As GCRs and SEPs penetrate into the atmosphere, they lose energy through elastic, inelastic, and spallation collisions with nuclei of atmospheric gas molecules. The total mass and associated density profile of an atmospheric column of gas determines the total attenuation of GCR and SEP flux passing through the column to reach the surface causing radiation dose to be altitude dependent.

A model framework for longevity is proposed where organism viability is defined as the preservation of a minimum viable genetic library for somatic to transcribe all functional proteins required to maintain organ and system function. Each local library is subject to time evolving damage and repair. The dominant term for genetic damage is proportional to local ionization from GCR and SEP in rate form. This term is inherited from a local habitat environmental model considering shielding from geomagnetic and atmospheric models. The dominant term for repair is proportional to local atmospheric pressure in rate form. The model assumes the maximum genetic repair rate is dependent on the maximum cellular metabolic rate, which in turn is rate limited by Oxygen partial pressure, and by extension, local atmospheric pressure and oxygen concentration. This model framework can be used to simulate a multistage lifecycle model for organism somatic tissue includes the following stages: incubation (the period from conception to birth), childhood (Rapid Growth), Adolescence (rapid growth), Young Adult (structural maturation), Mid-Life (Sustained maintenance-damage accumulation), Old-Age (damage accumulation passes threshold).

Grist, S.A., M. McCarron, A. Kutlaca, D.R. Turner, and A.A. Morley. 1992. "In Vivo Human Somatic Mutation: Frequency and Spectrum with Age." *International Commission for Protection against Environmental Mutagens and Carcinogens* 266 (2): 189–96. https://doi.org/10.1016/0027-5107(92)90186-6.

Geosynchronous Moon Disruption—Comparing Static Tide Loss with Ocean Flow Patterns During Collisionless Planetesimal Encounters

D.W. Seely
Mississippi State University

A Genesis flood scenario incorporating extra-terrestrial planetesimal encounters must consider not only direct perturbations on the Earth but also secondary consequences of perturbing Lunar orbit, giving attention to four subdomains: the solid mantle, surface water bodies, the liquid outer core, and the solid inner core. Evidence strongly suggests the Lunar orbit has changed over time, begging the question,. "Does the Moon occupy the same orbit today as before the Genesis flood?" Neither the Hebrew word for month, *Chodesh* (שֶׁדֹח), nor the specific name for the Moon, *Yarech* (חֵרָיֵ), appear in the Genesis 1 creation account, but rather the identifier "lesser light," *haqatan hamaor* (רוֹאָמַה ןֹטָקָה), and the purpose of signs and seasons, *wehayu ulemoadim* (וּיָהְו םיִדֲעוֹמְלוּ). The first use of Chodesh as a specific period occurs at flood initiation and may refer to Lunar months or 30-day annual calendar subdivisions as used in the Egyptian civic calendar. A small decrease in period from a hypothetical created synodic month to modern (e.g., from 30 days to 29.5304 days) effects a 3% increase in tidal magnitude, which is less than the effect of Lunar orbital eccentricity. Yet changes in both the annual orbital period of the Earth (up to ±6 days) and Lunar orbital period (up to ±49 days) were shown in three body dynamic calculations during a planetesimal encounter (up to Mars mass) by exchange of orbital angular momentum (OAM) with the Earth-Moon system, while effecting negligible change in terrestrial rotation period. However, damaging tides would result from an original Lunar period shorter than 20 days, limiting the Lunar orbit to no less than 50 Earth radii. One exception to this orbital limit is the special case of a geosynchronous, geostationary, equatorial Lunar orbit. At 6.67 Earth radii, the Lunar orbital period matches the sidereal rotation rate of the Earth at 23hr:56min:4.1s. The magnitude of the ellipsoidal tidal bulge peaks at 267 meters above mean sea level (MSL) on the equator at the sublunar and anti-sub-lunar points, while a tidal minimum of -134 meters below MSL occurs along the great circle intersecting the poles and the equator ±90° from the sublunar point. This tidal potential is 751 times greater than the modern mean tide, but rather than diurnal frequency, this tide is stationary. Finite element calculations show a similar solid body tidal peak magnitude of 40 meters with minimum of -20 meters. This tidal potential figure, superimposed with the polar flattening caused by Earth's rotation defines the geodesic of the synchronous configuration. Shorelines along preflood continents would be referenced to this geodesic surface, along with the ecological zones proceeding upland. Synchronous Lunar orbit may be physically disrupted and transferred to the modern Lunar orbit by gravitational encounter with a planetesimal (mass range between 3 and 10 Lunar masses), temporarily captured, and subsequently ejected after a minimum of 2 orbits. The "Planet Five Hypothesis" attributes the late heavy bombardment on the Moon to disruption by Mars of an object within this mass range likely sourced from a region identified as a long-term stable orbit just beyond Mars.

Ocean tidal flow patterns have three phases in a disruption scenario: (1) Slow loss of Lunar orbital synchrony during planetesimal approach, (2) Initial capture into eccentric orbit, (3) subsequent perigee passes and final orbital ejection. Phase one predicts cyclic regression and transgression (400m peak-to-trough), low deposition volume restricted to a band centered at the equator, diminishing poleward, and vanishing at ±55° latitude comprised of marine sediments. This pattern is consistent with patterns observed in paleocontinent reconstruction by Clarey and Werner (2018) for the first three megasequences (Sauk, Tippecanoe, and Kaskaskia). Phase two predicts at least one large transgression/regression cycle (2000 m peak-to-peak) with a broad deposition band centered on the ecliptic, spanning the tropics, diminishing poleward, and vanishing at ±79° latitude. From ±79° poleward, one regression/transgression event below MSL. Much higher deposition volume is predicted mixing land and marine fossils. This pattern is consistent with Clarey and Werner's observation for the Absaroka megasequence. Phase three may include more than one megasequence equivalent in magnitude and pattern to phase two but must include the last major encounter with Earth ejecting the planetesimal from temporary capture. Each with deposition patterns consistent with those described by Clarey and Werner for Zuni and the Tejas.

Clarey, T.L. and D.J. Werner. 2018. Use of sedimentary megasequences to recreate pre-Flood geography. In Whitmore, J.H., ed. *Proceedings of the Eighth International Conference on Creationism*. Creation Science Fellowship, 351-372.