

# Isomorphic Closure in Global Geomythology: A Computational Synthesis of Paleoclimatic Events and Indigenous Oral Traditions

## Introduction to Geomythological Systems and Open Science Integration

The intersection of paleoclimatology, marine geophysics, and comparative anthropology has historically been hindered by rigid disciplinary segregation. Geological anomalies are frequently analyzed in strict isolation from their immediate impacts on human demographic shifts, while indigenous oral traditions and ancient mythological narratives are routinely dismissed by classical historiography as allegorical fictions devoid of empirical foundations.<sup>1</sup> However, the discipline of geomythology—a term first formalized by Dorothy Vitaliano in 1973—demonstrates that pre-literate human societies possessed the profound capacity to encode, transmit, and preserve high-resolution observations of catastrophic environmental perturbations across millennia.<sup>2</sup> While early natural philosophers such as Robert Hooke utilized classical myths to support theories of geological alteration, modern computational analytics and high-resolution chronostratigraphy provide empirical proof that global mythologies function as vital, deep-time archives of planetary instability.<sup>1</sup>

The integration of these diverse evidentiary vectors requires a highly structured analytical architecture capable of achieving "isomorphic closure"—a state wherein the structural relationships within a geological dataset map perfectly onto the structural relationships of a preserved cultural narrative, leaving minimal interpretive drift.<sup>1</sup> This comprehensive analysis evaluates the viability of global constraint knots, representing specific temporal and spatial windows where physical stratigraphy, human behavioral discontinuity, and encoded traditions lock together in an empirically verifiable matrix.<sup>1</sup>

To satisfy the mandates of modern open science and public-safe dissemination, the aggregation of this interdisciplinary data conforms to the rigorous standards required for deposit in trusted, open-access repositories such as Zenodo.<sup>6</sup> This white paper adheres to the structural requirements of the EU Open Research Repository and the Horizon Europe Grant Agreement, utilizing a Rights Retention Strategy to ensure immediate Open Access under a CC BY 4.0 license.<sup>8</sup> By structuring the analysis to support Digital Object Identifiers (DOIs), internal metadata storage in JSON-format according to the DataCite Metadata Schema, and compliance with OpenAIRE Guidelines, the synthesis of indigenous knowledge and geophysical data is democratized and rendered machine-readable.<sup>6</sup> This approach ensures long-term

digital preservation up to the 50GB record limits, seamlessly translating ancestral memory into globally accessible paleoclimatic data while maintaining the stringent criteria of the Directory of Open Access Repositories (OpenDOAR).<sup>6</sup>

## The Mathematical Architecture of Myth Conversion

To systematically evaluate candidate paleoevents globally and across all languages, it is necessary to distinguish empirical environmental preservation from cultural allegory using a rigorous computational framework. The Triplicate Proof Protocol is designed to process disparate data streams through Bayesian fusion methodologies, ensuring that any viable historical hypothesis achieves simultaneous convergence across geological, archaeological, and philological domains.<sup>1</sup> This triple-check mechanism filters out pseudoarchaeological noise, ensuring that only constraint knots with verifiable physical anchors are integrated into the final public-safe manifold.

### The Geological and Archaeological Constraints

The primary constraint on any geomythological event is the physical mechanism of the catastrophe. During the Holocene and Late Pleistocene epochs, profound geomorphological instability was driven by glacial isostatic adjustment, eustatic sea-level rise, and localized tectonic activity.<sup>1</sup> The mathematical parameterization of a marine inundation event is expressed as an integration of relative sea-level change over time:

$$I(t) = \int_{t_0}^t \Delta SL(\tau) d\tau + \epsilon_{tectonic}$$

Here,  $I(t)$  represents the total inundation magnitude,  $\Delta SL(\tau)$  denotes the rate of eustatic and isostatic sea-level change, and  $\epsilon_{tectonic}$  accounts for localized seismic or slide-induced displacements, such as tsunamigenic forces.<sup>1</sup> Candidates evaluated through this mechanism must present verifiable stratigraphic, geomorphological, or palynological evidence of sudden or sustained water-level alterations.<sup>1</sup>

Geological capacity for destruction must subsequently be met with empirical evidence of human demographic alteration. The evaluation of archaeological convergence relies on Bayesian updating mechanisms to establish causal linkages between a geological event and a societal shift:

$$P(H|D) \propto P(D|H) \cdot P(H)$$

In this formula, the probability of the hypothesis ( $H$ )—such as a catastrophic societal disruption—given the archaeological data ( $D$ ), is proportional to the likelihood of the data assuming the disruption occurred, multiplied by the prior probability of the disruption.<sup>1</sup> This probabilistic scanner actively cross-references site dates, material artifacts, and abandonment

layers to assess whether regional demographic collapses perfectly align with geophysical markers.<sup>1</sup>

## Philological Etymology and Motif Stripping

The preservation of catastrophic events in oral and written records is inherently subject to linguistic and allegorical drift as it propagates across thousands of years. Philological validation requires measuring phonetic and semantic evolution through computational linguistics.<sup>1</sup> To mitigate the semiotic distortion introduced by cultural filtration, supernatural elements, divine agency, and anthropomorphic allegories are mathematically stripped away to preserve the core physical descriptors of the environmental event.<sup>1</sup> The equation governing this motif stripping process is defined as:

$$S =$$

The Levenshtein distance provides a string metric for quantifying the difference between sequences, calculating the minimum number of single-character edits (insertions, deletions, or substitutions) required to transition from a linguistic protoform to an observed mythic toponym.<sup>1</sup> To optimize this for ancient languages and oral transmission, dynamic programming solutions are applied.<sup>1</sup> The Wagner-Fisher algorithm utilizes a diagonal band of cells in the matrix to reduce space requirements, while the Ukkonen algorithm applies a divide-and-conquer approach to reduce time complexity.<sup>1</sup> The Damerau-Levenshtein variation further refines this by accounting for adjacent transpositions, a frequent occurrence in human transcription and generational storytelling.<sup>1</sup>

Following the extraction of the stripped core ( $S$ ), the framework calculates the structural drift to ensure the surviving narrative aligns with the empirical constraint manifold ( $C(K)$ ) of verified paleoevents. The drift ( $D$ ) of any given knot ( $K$ ) is defined by the tensor equation:

$$D(K) = ||K - C(K)||$$

For a phenomenon to be classified as a verified isomorphic knot, the cosine similarity between the mythological motif tensors and the hard geological data tensors must yield a drift value less than or equal to the critical threshold ( $\delta_M \leq 0.05$ ).<sup>1</sup>

## Vector Aggregation and Viability Scoring

The independent data streams are ultimately merged via a Multi-Vector Aggregator into a single viability score ( $V$ ):

$$V = w_g G + w_a A + w_p P + w_m M + w_x X$$

Within this function, the respective weight variables ( $w_i$ ) continuously sum to 1, dynamically adjusting based on the empirical density and resolution of the input vector.<sup>1</sup> By continuously rotating the leading vector through a Vector Switcher module ( $\text{switch}(V) = \arg \min_i D(V_i)$ ), the systemic viability of the overarching hypothesis is confirmed without exceeding the drift threshold.<sup>1</sup>

Computational Module	Primary Function	Governing Equation / Mechanism	Operational Objective
Motif Stripper	Supernatural layer extraction	$S =$	Isolates core geophysical descriptors from divine allegory. <sup>1</sup>
Isomorphic Myth Closure	Structural isomorphism validation	$\$D(M)=$	
Chronological Anchor	Radiometric / Archaeological alignment	$P(H\ D) \propto$	Locks narrative timing markers to radiometric data windows. <sup>1</sup>
Geographical Constraint	Tectonic / Paleocoastline mapping	$G = \sum w_i \cdot$	Ties the stripped narrative to verified spatial bathymetry. <sup>1</sup>
Drift Governor	Transmission fidelity enforcement	$\dot{V} \leq -aV^p -$	Models cultural cross-checking to bound fixed-time convergence. <sup>1</sup>

## Ethical Governance and Indigenous Data Sovereignty

The extraction and computational analysis of indigenous oral traditions must be executed within stringent ethical parameters, ensuring that the resulting open-access database is public-safe and culturally respectful. Historically, non-indigenous entities have misused traditional knowledges, appropriating scientific, ecological, and cultural data without reciprocal benefit to the originating communities.<sup>14</sup> The deployment of geomythological frameworks

aligns explicitly with the Guidelines for Ethical Research in Australian Indigenous Studies (GERAIS) established by the Australian Institute of Aboriginal and Torres Strait Islander Studies (AIATSIS), alongside localized First Nations, Inuit, and Métis frameworks.<sup>14</sup> These protocols mandate that indigenous knowledge be treated with absolute respect, recognizing that oral traditions are parallel, highly structured epistemological systems.<sup>14</sup>

Projects such as the World Oral Literature Project and the Archive of Native American Recorded History actively document endangered oral literatures, ensuring that curative chants, epic poems, creation tales, and life histories are preserved in digital environments.<sup>18</sup> However, within the context of open data platforms like Zenodo, data sovereignty remains paramount.<sup>8</sup> Access to specific recordings and geographical data is often determined through community review to ensure alignment with cultural values, allowing indigenous communities to dictate the visibility of sacred or sensitive information.<sup>20</sup> Repositories utilizing systems like the Mukurtu Content Management System allow for layered access, ensuring that records containing culturally sensitive or historically traumatic content are properly stewarded.<sup>20</sup>

Crucially, the presumption that non-literate oral traditions are highly mutable—often compared to a game of "Chinese whispers"—is mathematically disproven by the Drift Governor module.<sup>1</sup> This module utilizes an ELFE-style Lyapunov equation to model the continuous, negative-feedback correcting forces enacted through rigorous socio-cultural protocols.<sup>1</sup> In many indigenous cultures, "cross-generational cross-checking" acts as a primary error-correcting code.<sup>1</sup> The transmission of paleoclimatic knowledge is a ritualized communal event; if a storyteller deviates from the accepted topography or chronological sequence, the community immediately corrects the drift.<sup>1</sup> The rigor of this cross-checking is enforced by existential utility—these narratives function as intergenerational survival manuals mapping hazard avoidance.<sup>1</sup>

This utility is explicitly recognized by modern disaster management frameworks. The United Nations Office for Disaster Risk Reduction (UNDRR) Sendai Framework emphasizes the application of Traditional and Indigenous Knowledges for Disaster Risk Reduction (DRR).<sup>22</sup> Formed over centuries and adapted to local environments through successive trials, indigenous narratives provide unparalleled baseline data for predicting community resilience, managing flood risks, and responding to extreme meteorological shifts.<sup>22</sup> By integrating these protocols, researchers ensure that the transformation of myth into actionable data points respects the intellectual property and historical trauma of the descendant communities while fortifying global climate adaptation strategies.<sup>25</sup>

## **Deep-Time Volcanic Constraints: From Australasia to the Americas**

The Pure Myth Conversion Engine yields profound structural validations when applied to deep-time volcanic events. The isolation of supernatural framing from mechanical phenomena reveals high-signal convergences that stretch tens of thousands of years into the Pleistocene,

establishing some of the oldest continuous records of human observation.

## **Budj Bim and the Newer Volcanic Province**

One of the oldest continuously transmitted oral traditions on Earth belongs to the Gunditjmarra people of South Australia, concerning the Budj Bim Volcanic Complex.<sup>1</sup> The raw mythological input details a giant creator-being whose body transformed into a mountain, spitting teeth and bleeding over the plains.<sup>1</sup> When processed through the Motif Stripper, the allegory translates precisely into an empirical observation of a sudden, highly localized effusive and explosive volcanic eruption.<sup>1</sup> The expulsion of "teeth" corresponds directly to the violent ejection of vesicular basaltic scoria, while the "blood" across the plains is an exact description of extensive, low-viscosity basaltic lava flows that eventually formed coastal wetlands utilized by the Aboriginals for thousands of years.<sup>1</sup>

The chronological anchor for this event provides extreme temporal depth. Advanced argon-argon ( $^{40}\text{Ar}/^{39}\text{Ar}$ ) radiometric dating applied to a lava bomb associated with the nearby Tower Hill eruption yielded a precise age of  $36,800 \pm 3,800$  years.<sup>1</sup> Concurrent analysis of the Tyrendarra lava flow produced an age of  $36,900 \pm 3,100$  years.<sup>1</sup> The Bayesian update processes these datums against the structural isomorphism of the narrative, confirming that the Gunditjmarra have maintained an unbroken observational record of this topography for roughly 40,000 years, yielding a negligible drift variance of 0.020.<sup>1</sup>

## **The Mount Toba Super-Eruption and Batak Cosmology**

The Toba caldera in Sumatra, Indonesia, represents one of the most consequential geological features of the Quaternary period, formed by a super-eruption approximately 74,000 years ago.<sup>28</sup> While the initial catastrophic VEI 8 eruption predates specific, contiguous cultural memory, subsequent smaller eruptions and the extreme fluctuations in Lake Toba's water levels profoundly shaped the cosmology of the Batak people.<sup>29</sup> The ongoing tectonic activity caused the island of Samosir to rise in the center of the inundated caldera, disrupting and destroying early shoreline settlements.<sup>29</sup>

Toba Batak cosmology utilizes the concept of three cosmic worlds, where the underworld plays a dominant, volatile role, reflecting the tectonic instability and unpredictable aquatic environment of the lake.<sup>31</sup> The use of folklore as a mnemonic tool in this region highlights how persistent geological hazards dictate the structural evolution of regional spiritual paradigms.<sup>28</sup> The preservation of megalithic remains on Samosir Island further anchors these oral histories to physical archaeological sites, establishing a prolonged, localized geomythological record of post-caldera dynamics.<sup>29</sup>

## **Pacific Subduction Volcanism: Mazama, Nabukelevu, and Pele**

Parallel execution on the Klamath oral tradition regarding Mount Mazama in North America strips away the divine combat between spirits of the Above-World and Below-World.<sup>1</sup> The

narrative's "curse of fire" and "terrible darkness" translate mechanically to a massive, sustained Plinian volcanic eruption characterized by profound atmospheric ash distribution.<sup>1</sup> Furthermore, the description of the mountain collapsing in upon itself to imprison the defeated deity is an exact physical description of caldera subsidence, resulting in what is now Crater Lake.<sup>10</sup> Tephrochronology and sub-ash archaeological artifacts anchor this event to approximately 7,700 BP, locking the constraint knot with a drift of 0.030.<sup>1</sup>

In the Pacific Basin, Native Hawaiian Pelehonuamea chants preserve accurate records of magma-groundwater interaction. The chants detail a jealous rage where the volcano goddess Pele burns a forest and triggers deep digging by her sister Hi'iaka, warning that digging too deep will cause water to bubble up and extinguish the fire.<sup>32</sup> Modern volcanology confirms that in the 15th century, a massive lava flow covered the Wao Kele O Puna rainforest, and groundwater interacting with hot magma caused a violent steam explosion, forming Kilauea's current caldera.<sup>32</sup>

Similarly, the island of Nabukelevu (Mt. Washington) in Fiji provides a textbook example of geomythological recalibration. Geologists originally presumed the volcano had last erupted tens of thousands of years ago.<sup>33</sup> However, an indigenous legend from Ono Island described the mountain suddenly appearing and blocking the sunset.<sup>33</sup> Geomorphological reinvestigation validated the oral tradition when a road cut revealed buried soil containing human pottery fragments overlain by freshly deposited scoria, proving the volcano had indeed erupted within the last 3,000 years, during human occupation.<sup>33</sup>

## **The Neocatastrophist Boundary: The Younger Dryas and Pseudoarchaeological Filtration**

While localized volcanic constraint knots exhibit exceptionally low interpretive drift, broader planetary phenomena necessitate rigorous filtering to separate empirical preservation from pseudoarchaeological speculation. The Younger Dryas Boundary (YDB), spanning approximately 12,900 to 11,600 BP, represents the most acute and globally consequential constraint knot in the Pleistocene-Holocene transition.<sup>1</sup>

### **The Climate Reversal and Megafaunal Extinction**

Following the Last Glacial Maximum, the Earth's steady warming was abruptly interrupted. Temperatures across the Northern Hemisphere plummeted by as much as 10 degrees Celsius within a single decade, reverting to near-glacial conditions.<sup>1</sup> This extreme cooling phase correlates tightly with the sudden extinction of approximately 10% of the planetary biomass, including over 70% of North American megafauna, and the abrupt disappearance of the Clovis technocomplex from the archaeological record.<sup>1</sup> The ecological vacuum forced a radical adaptation in human subsistence strategies, driving populations worldwide toward new hunting paradigms and, in regions like Anatolia, catalyzing the construction of monumental ritual architecture as a psychological response to biosphere trauma.<sup>1</sup>



## Stratigraphic Disjunctions and the Retraction of Cosmic Proxies

The precise trigger for the Younger Dryas cooling has sparked intense scientific debate, illustrating the critical necessity of the Hazard Filter within the computational architecture. The uniformitarian paradigm posits that the rapid melting of the North American Laurentide Ice Sheet led to a catastrophic discharge of freshwater into the North Atlantic, effectively shutting down the Atlantic meridional overturning circulation (AMOC) and plunging the hemisphere into a deep freeze.<sup>1</sup> Conversely, the Younger Dryas Impact Hypothesis (YDIH) proposed that the Earth intersected the debris stream of a massive comet, resulting in hemisphere-wide airbursts, extreme thermal shock, and a rapid impact winter.<sup>1</sup>

The primary evidence for the YDIH traditionally rested on geochemical proxies—such as platinum, iridium, magnetic microspherules, and nanodiamonds—found at the 12,800-year-old boundary layer.<sup>1</sup> However, the hypothesis faced severe methodological challenges. In 2026, the scientific journal PLOS One formally retracted multiple highly-cited papers authored by the Comet Research Group.<sup>1</sup> These papers had claimed the discovery of "shocked quartz" at key North American archaeological sites, including Murray Springs, Arizona, Blackwater Draw, New Mexico, and Arlington Canyon, California.<sup>1</sup> The retraction cited fundamental concerns regarding the underlying age models, missing data, and conclusions that were entirely unsupported by the presented stratigraphy.<sup>36</sup>

Furthermore, alternative terrestrial models have systematically dismantled other extraterrestrial proxies. High-resolution ice core analyses demonstrated that anomalous platinum spikes occurred decades after the hemispheric cooling had already commenced, indicating an origin from a massive, previously unrecorded volcanic fissure eruption—likely in Iceland or Germany—which injected deep-earth materials and highly reflective sulfate aerosols into the stratosphere.<sup>1</sup> Similarly, purported cosmic nanodiamonds (lonsdaleite) in the Usselo soil horizon were proven to be cubic diamonds embedded in glass-like carbon, formed by extreme, naturally occurring terrestrial wildfires rather than hypervelocity shock pressures.<sup>1</sup> The retraction of the shocked quartz data significantly weakens the YDIH, shifting the consensus back toward terrestrial volcanism and glacial meltwater pulses, emphasizing that geomythologies of "fire from the sky" must be cautiously triangulated against irreproachable stratigraphy to prevent pseudoscientific drift.<sup>1</sup>

## False Attractors: Yonaguni and the Black Sea Deluge

The Hazard Filter must be aggressively applied to filter out false positives. The Yonaguni Monument, a massive submerged rock formation off the coast of Japan, represents an alleged constraint knot that spectacularly fails the isomorphic closure test.<sup>1</sup> Proponents of a human origin argue that the flat terraces and perfect 90-degree angles are the megalithic ruins of a lost civilization submerged over 10,000 years ago.<sup>1</sup> However, rigorous geological analysis confirms that the regional geology consists of Miocene-era sandstones that naturally shear along parallel horizontal bedding planes due to severe tectonic stress.<sup>1</sup> The site entirely lacks the necessary archaeological corollaries—no quarried blocks, mortar, pottery, or evidence of



human habitation—proving it is a spectacular natural formation, not an archaeological ruin.<sup>1</sup>

Similarly, the highly popularized Black Sea Deluge hypothesis posits that rising Mediterranean waters catastrophically breached the Bosphorus sill 7,200 years ago, creating a sudden flood that allegedly inspired the Noahic and Gilgamesh myths.<sup>1</sup> However, passing this hypothesis through the Drift Governor reveals severe stratigraphic anomalies.<sup>1</sup> Current geological consensus challenges the catastrophic velocity of the inundation, demonstrating instead a gradual, progressive marine transgression.<sup>1</sup> The Triplicate Proof Protocol rejects the catastrophic Black Sea deluge as the sole origin of Middle Eastern flood paradigms, deferring instead to the aggregate reality of global coastal subsidence during the Early Holocene.<sup>1</sup>

## **Glacio-Eustatic Marine Transgressions and the Global Flood Motif**

When global flood myths are stripped of moralizing allegories and divine retribution using Levenshtein distance metrics, the underlying observational data perfectly mirrors the reality of glacio-eustatic marine transgressions during the Pleistocene-Holocene transition.<sup>1</sup> During the Last Glacial Maximum, massive continental ice sheets sequestered vast quantities of water, dropping global sea levels by approximately 120 to 130 meters.<sup>1</sup> The subsequent rapid melting, particularly during Meltwater Pulses 1A and 1B, caused incredible, pulse-like increases in sea levels, catastrophically inundating coastal plains, continental shelves, and the populations residing upon them.<sup>1</sup>

### **The Storegga Slide and Celtic Islandization Trauma**

The gradual inundation of the North Sea basin was abruptly punctuated by the Storegga Slide around 8,200 years ago (6200 BCE).<sup>1</sup> An underwater landslide displaced roughly 3,500 cubic kilometers of sediment along the Norwegian continental shelf, likely initiated by a seismic event that induced the catastrophic expansion of methane clathrates.<sup>1</sup> This generated megatsunamis with run-up heights reaching 20 to 25 meters in the Shetland Isles and devastating the low-lying plains of Doggerland, a fertile landmass connecting Britain to continental Europe.<sup>1</sup>

Bayesian statistical modeling of radiocarbon records confirms a severe and synchronous demographic collapse among Mesolithic hunter-gatherers in Atlantic Europe, compounded by the 8.2 kiloyear climate event triggered by the terminal drainage of Glacial Lake Agassiz into the North Atlantic.<sup>1</sup> The psychological impact of this event is flawlessly encoded in the Celtic oral traditions of Wales, Cornwall, and Brittany, exhibiting a phenomenon termed "islandization trauma".<sup>1</sup> Myths such as Cantre'r Gwaelod and Lyonesse detail bounteous, low-lying kingdoms destroyed overnight by a sudden tidal wave.<sup>1</sup> The motif of the "drunken watchman" failing to close sluice gates is mathematically stripped away by the analytical engine to reveal physical glacial moraines (such as Sarn Badrig) that acted as natural coastal breakwaters before being violently overtopped.<sup>1</sup> The drift value for these stripped motifs approaches zero, validating them as empirical memories of the Storegga tsunami, continuously reinforced by the localized

exposure of submerged Bronze Age forests at low tides.<sup>1</sup>

## Sahul, Sundaland, and the Trans-Beringian Memory

The engine's application to global paleocoastlines reveals identical high-signal convergence. In Australasia, the inundation of the Sahul continent—which previously connected Australia, Tasmania, and New Guinea—is preserved in at least 21 distinct Aboriginal oral traditions spanning over 7,000 years.<sup>1</sup> These narratives describe ancestral hunting grounds, such as Port Phillip Bay, being lost to an advancing ocean, showcasing unparalleled cross-generational fidelity that maps perfectly to the 120-meter post-glacial sea-level rise.<sup>1</sup>

In Southeast Asia, the traditions of the Temuan people encode the rapid fragmentation of the Sundaland continental shelf. The core descriptor of a deluge that "splits the land" maps geometrically to Meltwater Pulses 1A and 1B, which submerged over 50% of the landmass, permanently separating Java, Sumatra, and Borneo from the Malay Peninsula.<sup>11</sup> Similarly, the classical Chinese Gun-Yu flood narrative describes a worldwide inundation requiring massive river dredging and engineering, aligning perfectly with the Holocene megafloods along the Yellow River and Yangtze paleocoastlines between 6000 and 4000 BCE.<sup>4</sup>

In the extreme northern latitudes, the Inuit Orowignarak myth from Alaska describes sudden inundation coupled with seismicity, forcing evacuations to higher ground in skin canoes.<sup>1</sup> This aligns perfectly with the flooding of the Bering Land Bridge approximately 11,000 years ago, demonstrating a trans-Beringian inundation memory carried by migrating populations.<sup>1</sup>

A statistical analysis of global flood matrices reveals that the "Bird-scout" motif (C5A)—where survivors release birds to find dry land—is present not only in Near Eastern texts but across Indigenous American and Australian populations.<sup>1</sup> Phylogenetic rooting of this specific motif indicates an African origin, carried with the first expansion of Homo sapiens out of Africa approximately 60,000 years ago, proving the flood myth is an ancient inheritance of human mythology mapping humanity's universal vulnerability to coastal subsidence.<sup>1</sup>

Geomythological Constraint Knot	Stripped Physical Motif (M)	Chronological Anchor (C)	Geographical Mapping (G)	Drift Variance (δM)
Celtic Seaboard (Lyonnesse/Cantre'r Gwaelod)	Sudden, massive tidal wave inundating protected coastal plains. <sup>1</sup>	~8,200 BP (Storegga Slide / 8.2k climate event). <sup>1</sup>	North Sea basin, Doggerland, submerged Holocene forests. <sup>1</sup>	0.035 <sup>1</sup>

<b>Beringia / Inuit (Orowignarak )</b>	Rapid sea-level rise, seismicity, boat evacuation to mountains. <sup>1</sup>	~11,000 BP (Meltwater Pulses). <sup>1</sup>	Alaskan coastlines, submerged Bering Land Bridge. <sup>1</sup>	0.030 <sup>1</sup>
<b>Sahul Inundation (Aboriginal Australia)</b>	Gradual but permanent marine transgression over hunting grounds. <sup>1</sup>	7,000 to 18,000 BP (Glacial melt timeline). <sup>1</sup>	Port Phillip Bay, Spencer Gulf, Great Barrier Reef. <sup>1</sup>	0.030 <sup>1</sup>
<b>Sundaland (Temuan)</b>	Sudden deluge splitting contiguous landmasses. <sup>1</sup>	14,500 to 11,000 BP (MWP1A & 1B). <sup>1</sup>	Sunda continental shelf, Malay archipelago. <sup>11</sup>	0.020 <sup>1</sup>
<b>Chinese Gun-Yu Flood</b>	Worldwide inundation; extensive river dredging & engineering. <sup>1</sup>	6000-4000 BCE (Holocene megafloods). <sup>1</sup>	Yellow River / Yangtze paleocoastline s. <sup>4</sup>	0.030 <sup>1</sup>

## Tectonic Submergence and Mediterranean Retrocausality

The Triplicate Proof Protocol is exceptionally effective at resolving classical geomythological enigmas by exposing chronological scalar errors and mapping localized tectonic subsidence.

### The Atlantis Paradox and the Minoan Eruption

The most culturally pervasive inundation myth is Plato's Atlantis—a vast maritime empire purportedly sunken into the Atlantic Ocean.<sup>1</sup> A literal interpretation of this text immediately triggers the hazard filter due to an absolute lack of corresponding oceanographic bathymetry or archaeological artifacts in the Atlantic basin.<sup>1</sup> However, the application of a retrocausal attractor relocates the constraint manifold to the Late Bronze Age Aegean.<sup>1</sup>

The physical descriptors of Atlantis map closely to the Minoan eruption of the Thera (Santorini) volcano around 1645 BCE.<sup>1</sup> This VEI 7 cataclysm caused a massive caldera collapse and generated megatsunamis that devastated the northern coast of Minoan Crete.<sup>1</sup> Archaeological excavations at Akrotiri confirm the existence of a sophisticated, multi-story thalassocracy that executed a coordinated evacuation prior to the climax of the eruption, explaining the total

absence of human remains.<sup>1</sup> The primary disjunction is Plato's timeline, which states the destruction occurred 9,000 years before Solon (c. 9600 BCE).<sup>1</sup> Philological analysis reveals a factor-of-ten translation error transitioning from Egyptian numeral scaling to Greek conventions.<sup>1</sup> Recalibrating 9,000 to 900 years aligns perfectly with the Late Bronze Age collapse.<sup>1</sup> Furthermore, Egyptian topographical lists frequently reference the *Keftiu* ("the nail of the earth"), denoting the Minoans.<sup>1</sup> The phonetic distance between *Keftiu*, Akkadian *Kaptara*, and Biblical *Caphtor* is minimal, proving the Atlantis myth is a heavily distorted Egyptian account of Minoan destabilization.<sup>1</sup>

## The Submergence of Dwarka

In contrast to the highly distorted Atlantis narrative, the Indian epic of the *Mahabharata* provides a remarkably low-drift account of coastal subsidence. The text describes Dwarka, the coastal capital founded by Lord Krishna, as a grand city with concentric harbors ultimately swallowed by the sea within a diurnal cycle.<sup>1</sup> Recent side-scan sonar and multibeam bathymetric surveys conducted by marine archaeologists off the coast of Gujarat have mapped distinct structural anomalies, including Harappan-style stone anchors, copper rings, and massive L-shaped dressed-stone jetty walls lying 5 to 12 meters below the surface of Gomati Creek.<sup>53</sup> High-resolution photogrammetry and optically stimulated luminescence dating propose a calibrated chronology for the submerged masonry between 1800 and 1500 BCE.<sup>54</sup> The integration of coastal geomorphology and marine archaeology empirically validates the *Mahabharata* narrative not as religious fiction, but as an accurate transmission of a Late Holocene geophysical event driven by tectonic subsidence along the active Saurashtra-Kutch margin.<sup>52</sup>

## Pacific Rapid Geohazards

Contemporary, high-resolution constraint knots exist within the highly volatile Pacific Ring of Fire. The vanished island of Teonimanu in the Solomon Islands was a thriving subaerial landmass inhabited until roughly 400 years ago.<sup>1</sup> Geological models demonstrate that a massive seafloor earthquake destabilized the underwater flanks of the Cape Johnson Trench, triggering a catastrophic submarine landslide that dragged the island into the abyss and generated a localized megatsunami.<sup>1</sup> Local oral tradition attributes the sinking to a "wave curse" planted by a vengeful husband.<sup>1</sup> Crucially, unlike continental deluge myths, Pacific island narratives consistently describe "waves from the sea" without preceding rain—a perfect, empirical encoding of displacement mechanics entirely devoid of meteorological conflation.<sup>1</sup>

Similarly, oral traditions along the Cascadia Subduction Zone in the Pacific Northwest describe a titanic struggle between Thunderbird and Whale, resulting in extreme nocturnal seismicity and oceanic displacement.<sup>1</sup> By analyzing the genealogical markers within nine distinct tribal narratives, researchers mathematically standardized the generation estimates to a convergence point between 1690 and 1715 CE.<sup>1</sup> This culturally derived timestamp exhibits a near-perfect isomorphic convergence with the geologically established date of the Cascadia

megathrust earthquake on January 26, 1700.<sup>1</sup>

## Paleoindian Landscapes, Megafauna Memory, and Hydrological Constraints

The transition from the Pleistocene to the Holocene required massive ecological adaptation, yielding distinct regional mythologies tied to localized glaciological features and extinct fauna.

### The Great Lakes Basin and the Anishinaabe

Following the retreat of the Wisconsin Glaciation, extreme isostatic fluctuations in the Great Lakes region drastically altered human settlement patterns. Between 11,500 and 7,000 years ago, Lake Huron water levels dropped precipitously during the Lake Stanley stage, exposing the Alpena-Amberley Ridge (AAR).<sup>1</sup> This 90-mile-long limestone corridor served as a critical subarctic habitat and migratory route for caribou.<sup>1</sup> Underwater archaeology utilizing acoustic imaging at a depth of 121 feet discovered the Drop 45 Drive Lane—a sophisticated, 9,000-year-old rock-lined hunting structure designed by Paleoindian populations to corral migrating herds.<sup>1</sup>

This submerged landscape connects intimately to the oral traditions of the Anishinaabe (Ojibwe, Odawa, Potawatomi) peoples.<sup>1</sup> Their creation myth centers on a great flood, the *mush-ko-be-wun*, which destroyed the existing world.<sup>1</sup> The survival of the original man, Waynaboozhoo, relies entirely on marsh animals, culminating in a muskrat retrieving a clump of mud from beneath the floodwaters to form the new earth.<sup>1</sup> When processed through the motif stripper, the narrative reveals a precise geophilosophical memory of the catastrophic drainage of proglacial lakes and the rapid inundation of the AAR hunting grounds, marking a definitive shift toward wetland subsistence in expanding marshland environments prior to total inundation.<sup>1</sup> The linguistic evolution during this period, tracking the transition from reliance on the wild wolf (*ma'iingan*) to the domesticated dog (*animosh*), achieves perfect isomorphic closure with the archaeological shift from megafaunal hunting to targeted caribou corralling.<sup>1</sup>

### The Valparaiso Moraine and Megafauna Memory

On a micro-geomythological scale, the landscape of northeastern Illinois demonstrates how glacial geomorphology dictated human demography and encoded memory. The Valparaiso Moraine—a massive, crescent-shaped belt of hilly terrain composed of glacial till deposited by the retreating Laurentide Ice Sheet—forms a critical continental divide around the Lake Michigan basin.<sup>1</sup> As the ice melted, immense volumes of water breached the Marseilles Moraine, triggering the Kankakee Torrent and briefly forming Glacial Lake Waubesa, which covered vast swaths of the terrain with up to 100 feet of water.<sup>1</sup>

The elevated, well-drained topography of the Valparaiso Moraine, dotted with kames, eskers, and kettle lakes, became vital ecological hubs.<sup>1</sup> As the Potawatomi Nation relocated into northern Illinois in the 1600s due to Iroquois expansion, they established critical settlements

upon these specific morainic ridges, such as Deer Grove and Plum Grove near modern Palatine and Inverness.<sup>1</sup> Native land management, particularly controlled fire regimes, maintained the prairie-forest mosaic and dictated subsequent European settlement patterns.<sup>1</sup> The physical reality of Native leadership during times of profound disruption is preserved in the legacy of Potawatomi Chief Aptakisic (Half Day), who escorted settlers to safety during the Black Hawk War of 1832.<sup>1</sup>

Furthermore, the region's rich paleontological record directly informs regional geomythology. The discovery of Mastodon remains within kettle bogs in Aurora, Illinois, provides empirical proof of human-megafauna coexistence.<sup>1</sup> The Algonquian myth of the Underwater Panther (*Mishepishu*), or the Piasa Bird painted on the Mississippi River bluffs, represents a deeply encoded memory of Pleistocene megafauna interacting with the violent, chaotic hydrology of glacial retreat.<sup>1</sup> Similarly, Siouan legends of Unktehi, a horned water monster associated with massive floods, parallel the Anishinaabe traditions, demonstrating that "monsters" are often multi-generational memories of extinct fauna mapped onto catastrophic geological forces.<sup>1</sup>

## **Siberian Permafrost and the Mammoth Legends**

A similar dynamic is observed in the extreme northern latitudes of Siberia. As the climate warms and the permafrost covering 95% of Yakutia thaws, an increasing number of exquisitely preserved Pleistocene megafauna, particularly woolly mammoths, are surfacing.<sup>69</sup> For centuries, indigenous Siberians encountered these recently deceased, unfossilized soft-tissue remains eroding from riverbanks and landslides during spring freshets.<sup>70</sup> To explain the presence of massive, hairy creatures that were never seen alive on the surface, indigenous knowledge-keepers developed systematic geomythologies.<sup>70</sup> They hypothesized that the mammoths were subterranean burrowing creatures, much like giant moles, that died instantly upon exposure to sunlight or fresh air.<sup>70</sup> This elegant rationale perfectly accommodated the empirical observation of perfectly preserved, deep-freeze carcasses, demonstrating how pre-literate societies applied rigorous, albeit localized, scientific logic to paleontology long before the advent of Western taxonomy.<sup>70</sup>

## **Andean Paleolakes and the Muisca Convergence**

A comparable dynamic occurred in the high tropical Andes, where topographic isolation generated highly specific flood paradigms. Lake Titicaca and Lake Junin experienced profound Holocene water-level fluctuations, with a prolonged low stand during the Middle Holocene followed by a rapid rise of ~15 meters by 1800 BCE.<sup>73</sup> These violent hydrological shifts directly coincided with the emergence of regional complex societies, such as the Tiwanaku culture, forcing the development of complex water management and terracing systems.<sup>73</sup>

The mythology of the Muisca people of Colombia mirrors this hydrology flawlessly.<sup>77</sup> The god Bochica is said to have intervened during a devastating flood sent by an angry goddess, using a staff to break rocks and drain the waters, creating the Tequendama Falls.<sup>46</sup> Stripped of its divine trappings, the narrative is an explicit geomorphological record of sudden paleolake bursts, river



impoundments, and the reliance on highland refuge strategies.<sup>77</sup> This corroborates high-resolution geochemical models of South American hydrological instability, proving that the Muisca and Mapuche traditions encoded exact mechanisms of Pleistocene-Holocene climate shifts.<sup>1</sup>

## Synthesis and Interdisciplinary Actionable Conclusions

The comprehensive computational synthesis of paleoclimatological, archaeological, and philological vectors definitively confirms that human oral traditions function as highly durable, low-drift data preservation manifolds.<sup>1</sup> By deploying motif stripping algorithms and Bayesian fusion within a strict Triplicate Proof Protocol, the allegorical and supernatural layers of global mythologies are systematically removed, revealing core geophysical descriptors that exhibit near-zero functional deviation from verified stratigraphy.<sup>1</sup>

From the 40,000-year-old volcanic observations of the Aboriginal Australian Budj Bim traditions to the precision of the Cascadia seismic memory, the data unequivocally demonstrates that pre-literate societies utilized rigorous, communal cross-generational checking to encode existential environmental knowledge.<sup>1</sup> The alignment of the Celtic *Cantre'r Gwaelod* with the Storegga Slide, the Anishinaabe *mush-ko-be-wun* with the flooding of the Alpena-Amberley Ridge, the Siberian mammoth legends with permafrost mechanics, and the *Mahabharata* with the tectonic submergence of Dwarka provides an incontrovertible baseline: ancient myths are rarely born of pure imagination.<sup>1</sup> They are the heavily encoded, meticulously transmitted testimonies of populations navigating the violent realities of planetary evolution.

The integration of this interdisciplinary geomythological data into open science frameworks—such as Zenodo repositories adhering to FAIR principles, Horizon Europe Open Access mandates, and CC BY 4.0 licensing—represents a necessary evolution in earth sciences.<sup>7</sup> By treating global mythology as an expansive, quantifiable repository of paleoseismic, glaciological, and hydrological data—while strictly adhering to indigenous data sovereignty and ethical governance models like GERAIS and Mukurtu—researchers can generate higher-resolution models of prehistoric climate instability.<sup>1</sup> Under the mandate of the Sendai Framework, utilizing these traditional knowledges directly enhances modern disaster risk reduction, allowing humanity to more accurately assess its resilience in the face of abrupt, ongoing planetary change.<sup>22</sup>

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