**Methodological Approach: Identifying a Promising Search Region – The Case for Rondônia**

**1. Context and Initial Broad Strategy:**  
The Amazon basin, a vast and historically rich region, is estimated to harbor over 10,000 undiscovered pre-Columbian earthworks (Peripato et al., 2023). To address the challenge of identifying new archaeological sites, our initial strategy involves a multi-stage process of narrowing the search area from the broader Amazonian biome to a specific, manageable region. This is achieved by integrating insights from recent large-scale predictive models with documented archaeological distributions, aiming to identify areas with high potential but relatively lower existing documentation – so-called "white spots."

**2. Leveraging Predictive Modeling and Known Distributions:**  
The foundation for regional selection is the "Predicted probability of earthwork presence" model presented by Peripato et al. (2023, Fig. 2A). This model, based on an inhomogeneous Poisson process and various environmental covariates (Peripato et al., 2023, Fig. 2C, 2D), highlights areas with a higher *a priori* likelihood of containing earthworks. This predictive map was cross-referenced with the geographical distribution of previously reported and newly discovered earthworks (Peripato et al., 2023, Fig. 1A) to identify zones where predicted probability is moderate to high, yet the density of documented sites is comparatively low.

**3. Focusing on the Southern Rim of the Amazon (SRA):**  
The work of de Souza et al. (2018) demonstrates a significant, c. 1800 km continuous belt of pre-Columbian earth-building cultures along the Southern Rim of the Amazon (SRA), primarily active between Cal AD 1250-1500. This macro-region (de Souza et al., 2018, Fig. 1) represents a vast area of known, widespread human settlement and landscape modification. This SRA concept aligns geographically and thematically with the "Southern Amazonia (SA)" region defined by Peripato et al. (2023).

**4. Rationale for Selecting Southern Amazonia (SA) and Specifically Rondônia:**  
The SA region, as depicted by Peripato et al. (2023, Fig. 1A & 2A), presents a compelling target. It exhibits a combination of documented sites and areas of moderate-to-high predicted earthwork probability that remain less intensively surveyed. Within this SA region, the state of Rondônia, Brazil, was selected for initial investigation based on the following:  
\* **Geographical Alignment:** Rondônia falls within the western extent of Peripato et al.'s (2023) SA region and aligns with the broader SRA context established by de Souza et al. (2018).  
\* **Predictive Potential vs. Documentation Density:** Visual analysis of Peripato et al.'s (2023) maps (Fig. 1A and Fig. 2A) indicates that portions of Rondônia exhibit favorable predictive probabilities for earthworks while having a lower density of documented sites compared to other areas within the SRA/SA, such as the Upper Xingu Basin (de Souza et al., 2018, Fig. 4).  
\* **Transitional Ecology:** Rondônia occupies a transitional ecological zone, bordering denser rainforest and areas with characteristics similar to the SRA, often associated with the types of earthworks found by de Souza et al. (2018).  
\* **Potential for Geoglyph Types:** While distinct from the fortified villages of the UTB, the methodologies for detecting subtle landscape anomalies (Wagner et al., 2022) are applicable, and Rondônia lies in a region where other forms of earthworks, including geoglyphs or related structures, could potentially exist as part of the broader SRA cultural landscape.

**5. Hypothesis for Rondônia:**  
Based on the convergence of predictive modeling, known macro-regional settlement patterns along the SRA, and an analysis of documented site densities, it is hypothesized that specific, less-explored areas within the state of Rondônia harbor undiscovered pre-Columbian earthworks. These sites are anticipated to be broadly consistent with the earth-building traditions documented along the Southern Rim of the Amazon, potentially dating to the Cal AD 1250-1500 period or representing related regional variations.

**Refining the Search Area: Targeting Western Rondônia – The Guaporé River Interfluves**

Following the initial hypothesis targeting the state of Rondônia, a more focused literature review and analysis of regional archaeological and environmental data were undertaken to identify a specific area for intensive investigation. The objective was to pinpoint a manageable zone (approximately 20km x 20km) exhibiting high discovery potential based on known archaeological patterns and favorable environmental conditions, while also representing a relative "white spot" in terms of published, detailed surveys covering *all* its interfluves.

**1. Correlating Archaeological Patterns with Rondônian Geography:**  
Research confirms that pre-Columbian earthwork phenomena, particularly ring ditches and related structures—sometimes broadly referred to as geoglyphs in Brazil—extend from neighboring regions into Western Rondônia (Erickson, 2023; de Souza et al., 2018; Peripato et al., 2023). These sites are typically situated in interfluvial zones (elevated areas between river systems) rather than directly on major floodplains (de Souza et al., 2018). Furthermore, significant evidence of long-term human occupation in Rondônia, such as Amazonian Dark Earths (ADEs or *Terra Preta*), has been extensively documented, particularly in the Guaporé River basin and the Upper Madeira region (Texier et al., 2021; Erickson, 2023; Mongabay, 2024). The presence of ADEs, with their characteristic dark color, charcoal, artifacts, and higher nutrient content (Texier et al., 2021), indicates suitability for sustained settlement which could be associated with earthwork construction. The Middle Guaporé region also has a deep history of occupation, as evidenced by ceramic phases like Bacabal dating back to ca. 2000 B.C. (Zimpel Neto, 2018).

**2. Focusing on the Middle Guaporé River Basin:**  
The Middle Guaporé River basin in Western Rondônia emerges as a prime candidate for this focused search. This is supported by:  
\* **Direct Archaeological and Remote Sensing Leads:** A systematic survey for anthropogenic ditched earthworks using Google Earth imagery was conducted by Trindade (2015) along the right margin of the Middle Guaporé River, between São Francisco do Guaporé and Costa Marques. This study confirmed the presence of such sites and the utility of remote sensing in this specific region. Erickson (2023) also notes reports by Miller of large ditched sites and black earth on the Brazilian side of the Middle Guaporé/Iténez river.  
\* **Environmental Suitability:** The region is characterized by a tropical rainy climate (Am type) with annual precipitation between 2,200-2,500 mm and mean annual temperatures of 25-26°C (Texier et al., 2021). Earthworks and ADE sites are often found on fluvial terrace systems and gently undulating lowland plains (100-350m a.s.l.), a common topography in this area (Texier et al., 2021; Peripato et al., 2023).  
\* **Interfluvial Characteristics:** The area encompassing the municipalities of São Francisco do Guaporé and Seringueiras lies within the Middle Guaporé basin and features extensive interfluvial zones between the Guaporé River and its tributaries. This landscape position is a known preference for many Amazonian earthwork sites (de Souza et al., 2018).

**3. Rationale for São Francisco do Guaporé / Seringueiras Area:**  
The broader area around the municipalities of São Francisco do Guaporé and Seringueiras, and their surrounding interfluvial landscapes, was selected as the refined search zone. This decision is based on:  
\* The confirmed presence of ditched earthworks in the Middle Guaporé region (Trindade, 2015; Erickson, 2023).  
\* The documented occurrence of extensive ADEs indicating significant past human activity (Texier et al., 2021).  
\* The existence of suitable interfluvial terrain consistent with known site locations (de Souza et al., 2018; Peripato et al., 2023).  
\* While Trindade (2015) surveyed parts of this region, the vastness of the interfluves suggests that a focused 20km x 20km grid within this broader area may still reveal previously uncatalogued features or offer a denser understanding of known clusters.

**4. Next Step: Grid Definition for Satellite Imagery Analysis:**  
The subsequent step involves detailed visual reconnaissance of the interfluvial zones near São Francisco do Guaporé and Seringueiras using high-resolution satellite imagery (e.g., via Google Earth Pro). This will identify a specific 20km x 20km grid that exhibits favorable characteristics (e.g., partial deforestation for visibility, suitable landforms, proximity to but not direct contiguity with areas potentially already mapped by Trindade, 2015) and lacks obvious extensive modern development. The corner coordinates of this grid will then be defined for targeted satellite imagery acquisition and AI-assisted analysis.