Starter Pack: OpenAI to Z Challenge

We'd love to send you off with a small bundle of sources, tips, and tricks to leverage as a starting point and begin this quest.

Some sources to get you started as you begin your adventure:

Satellite imagery and map sources:

Google Earth Engine (GEE): one-click access to Sentinel-1/-2, NICFI, GEDI, SRTM, and Landsat.
European Space Agency: a surplus of incredible open-source data collected over the last decades.
NASA: The NASA catalogue is open to use and home to 25,000+ data sets.
OpenTopography LiDAR for High-res canopy-penetrating elevation (1-10m).
Sentinel-2 optical imagery for 10m, 13-band scenes (good for vegetation scars).
AWS CLI: covers swaths of western Amazon.

Archaeological point data:

The Archeo Blog shares sampled data already drawn from the Amazonian region.

Academic references with links:

Clasby, Ryan, and Jason Nesbitt, eds. *The Archaeology of the Upper Amazon: Complexity and Interaction in the Andean Tropical Forest*. University Press of Florida, 2021. https://books.google.com/books?hl=en&lr=&id=B4DSEAAAQBAJ&oi=fnd&pg=PP1&dq=amazon+lidar+archaeology&ots=oK0FItet27&sig=oFAGRog0cFkX9MooeDiaoRvVWzs#v=onepage&q=amazon%20lidar%20archaeology&f=false

Anna Cohen, Sarah Klassen & Damian Evans. (2020) Ethics in Archaeological Lidar. *Journal of Computer Applications in Archaeology* 3:1, pages 76-91. https://journal.caa-international.org/articles/10.5334/jcaa.48

de Souza, J.G., Schaan, D.P., Robinson, M. *et al.* Pre-Columbian earth-builders settled along the entire southern rim of the Amazon. *Nat Commun* 9, 1125 (2018). https://www.nature.com/articles/s41467-018-03510-7

Denise Maria Cavalcante Gomes. Urban Archaeology in the Lower Amazon: Fieldwork Uncovering Large Pre-Colonial Villages in Santarém City, Brazil. *Journal of Field Archaeology* 0:0, pages 1-20. **https://www.tandfonline.com/doi/full/10.1080/00934690.2025.2466877**

Jose Iriarte, Mark Robinson, Jonas de Souza, Antonia Damasceno, Franciele da Silva, Francisco Nakahara, Alceu Ranzi & Luiz Aragao. (2020) Geometry by Design: Contribution of Lidar to the Understanding of Settlement Patterns of the Mound Villages in SW Amazonia. *Journal of Computer Applications in Archaeology* 3:1, pages 151-169**.** **https://journal.caa-international.org/articles/10.5334/jcaa.45**

Khan, S., Aragão, L., & Iriarte, J. (2017). A UAV–lidar system to map Amazonian rainforest and its ancient landscape transformations. *International Journal of Remote Sensing*, *38*(8–10), 2313–2330.

https://www.tandfonline.com/doi/abs/10.1080/01431161.2017.1295486

Prümers, H., Betancourt, C.J., Iriarte, J. *et al.* Lidar reveals pre-Hispanic low-density urbanism in the Bolivian Amazon. *Nature* 606, 325−328 (2022)
https://www.nature.com/articles/s41586-022-04780-4

Vinicius Peripato et al, (2023) More than 10,000 pre-Columbian earthworks are still hidden throughout Amazonia. *Science* 382:6666, pages 103-109
https://www.science.org/doi/10.1126/science.ade2541

Fabien H. Wagner, Vinícius Peripato, Renato Kipnis, Sara L. Werdesheim, Ricardo Dalagnol, Luiz E.O.C. Aragão & Mayumi C. M. Hirye. (2022) Fast computation of digital terrain model anomalies based on LiDAR data for geoglyph detection in the Amazon. *Remote Sensing Letters* 13:9, pages 935-945.
https://www.tandfonline.com/doi/full/10.1080/2150704X.2022.2109942

Robert S. Walker, Jeffrey R. Ferguson, Angelica Olmeda, Marcus J. Hamilton, Jim Elghammer & Briggs Buchanan. (2023) Predicting the geographic distribution of ancient Amazonian archaeological sites with machine learning. *PeerJ* 11, pages e15137.
https://peerj.com/articles/15137/

Per Stenborg, Denise Schaan, Camila G. Figueiredo, Contours of the Past: LiDAR Data Expands the Limits of Late Pre-Columbian Human Settlement in the Santarém Region, Lower Amazon, Journal of Field Archaeology, (2018) Vol. 43, No. 1, 44–57
https://www.tandfonline.com/doi/full/10.1080/00934690.2017.1417198

Online Research Repositories :

Internet Archive Sources for a library of text, audio, and video material to sort through
Library of Congress public-domain expedition books – contains detailed river-mile diaries and Indigenous village positions you can geocode

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General Hand-off prompts for o3: *(Tweak sizes, keywords, and confidence scales as you iterate.)*

“Scan this LiDAR raster for geometric shapes (rectangles, circles, straight ditches). Return rough center coordinates for anything ≥ ~80 m across.”

“Read this diary text and extract every sentence that mentions a river, compass direction, or distance travelled.”

“Given a coordinate and the matching Sentinel-2 scene, tell me in plain English whether the surface patterns look man-made or natural. Include a 0–1 confidence.”

Sample submission:

Lat: -12.56740 , Lng: -65.34210

Rationale (≤200 chars): : LiDAR shows concentric 120 m ditch + raised platform; GEDI canopy dip and 1920 expedition diary waypoint align within 250 m; Sentinel-2 soil scar confirms anthropogenic earthwork. Final conclusion and explanation attached in our document upload.

Tips & tricks

Read about archaeological remote sensing: Look at the academic reports to see what approaches worked for remote sensing teams in the region.

Archaeologists go from the known to the unknown: This applies during excavation and in remote sensing work. Develop methods using the sample datasets and known sites to test what works and what does not, and then expand to new regions.

Negative evidence matters: cross-check against published geoglyph databases and academic reports so you're not "rediscovering" known sites.

Look at where things are appearing and search for patterns: Archaeological sites tend to appear in similar places (along waterways, in higher elevations, along trade routes). Look at the known site location patterns and if you see trends regionally, they may result in discoveries in similar places.

Keep a notebook: log file names, dates, and prompt versions—you'll need them to reproduce results for judges.

Record a video when you think you have made a cool discovery: We want the moment captured to share your excitement!

Don't over-tune prompts: start broad, then add constraints only when noise overwhelms the signal.

FAQ:

What dates do I need to know?
Challenge submissions are due no later than 9p PST on June 29th, 2025. Later submissions will not be considered or eligible for participation.

Where can I find more background on this effort?
Feel free to use all the resources available publicly. "The Lost City of Z" and many others are myths that may be false, but the cultures and history of the Amazonian region is very real. Feel free to access anything you can find whilst abiding by our terms and conditions.

Can I share my progress on social media?
Yes! Use the hashtag #OpenAItoZ on any platform to have a chance at a shout-out from an OpenAI account.

I have made some progress, who do I inform about this?
Feel free to submit anything you have made progress on as well as **join our community**. We understand that this challenge is difficult and may not present any right or wrong answer. We are really excited to

partner with you in continuing to push the frontiers of AI to solve mysteries in the real world - please share whatever you've come up with.

Why did you decide to start this project?
Leveraging AI to solve long-lost mysteries has been a deep passion for many members of our team. Following many discussions about archaeological breakthroughs internally, we've decided to encourage all developers to think big and push the boundaries of what is possible with o3 and our new models. Uncovering the secrets of the Amazon is a great way to encourage more efforts in this space and to scale the efforts of archaeologists. We are in a golden age of archaeological discovery, and there are now tools available for the world to be more fully engaged—in a race against time, as sites are threatened by looting, encroachment/development, and climate change.

Can I publish my results?
Yes. Ensure you are abiding by our Official Rules.