

COP16 Dispatch: Week 2 Open Source and LLMs, Reflections from the Back Row of COP16

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Large academic conferences have not strongly attracted me for years. That, combined with the limited direct overlap between my research and public environmental policies, as well as lack of financial support, has kept me away from attending COP or similar events. Even though my research is mostly question-driven with a primary focus on ecology and evolution, analytical methods have always been an excuse for me to learn from other domains of knowledge.

A multidisciplinary event featuring plenary sessions, talks, discussions, and forums across various disciplines has been on my radar for a while now. Therefore, this time, I decided to join the [Lovejoy Center](#) at the University of Arizona and the Ecological Society of America (ESA) delegation to attend COP16 in Cali, Colombia.

I have three takeaways from attending roughly a week of negotiations, talks, and other events. As I have not attended every single session at COP16 (which is not humanly possible)—my thoughts are based on selected sessions with topics summarized by the following keywords: “biodiversity,” “collaboration,” “commitments,” “tools,” and “indicators.”

1. Tradeoffs: Code complexity and open source at COP16

A key challenge in engaging diverse audiences lies in determining the optimal amount of information and detail to present during a session. Too much information risks turning the discussion overly technical, potentially stifling new perspectives. Too little, and the session may become shallow and irrelevant, depending on the context and attendees. These tradeoffs are ever-present at every session of the COP, but one in particular caught my attention.

I attended an interesting session that presented an analytical pipeline, and an associated dashboard designed to automatically infer, describe, and depict species geographical ranges. This tool maps biodiversity across the globe based on extensive publicly available datasets (at least mostly from what I recall).

The project was deeply rooted in standard and robust academic procedures and methodologies. Data sourcing, integration, visualization, collaboration structures, and partnership mechanisms were aspects that the authors had carefully considered.

First, given the massive amount of data being sourced and analyzed, the need for extensive curatorial work on species ranges and the long-term implications to society and conservation of such a service, I expected at least a brief discussion around equity-related aspects—licensing, open access, and open-source code. However, the framework is not expected to be publicly available because of “its complexity.” From what I heard, the reasons include the intricacies of the back-end and front-end

systems, the complexity of data retrieval and integration, and the analyses involved. For tools like Ensembl, Galaxy Project, and Nextstrain—which are potentially even more complex—are open source. Complexity, from my perspective, is not a valid excuse for keeping tools proprietary.

Second, developers expect experts—scientists and people who understand where species are located, such as Indigenous communities—to contribute at some point to curating results from computational models. This expectation introduces an intrinsic bias in how information flows. Although the tool collects critical input from users, it does not clearly and proportionally reciprocate to contributors.

Third, some of the basic tools being used to develop these dashboards and inferences of biodiversity are proprietary. In fact, some of this software reflects a long and socially troublesome history between geography and policing (e.g. Ersi). While proprietary software may offer convenience, it can perpetuate historical power imbalances and limit transparency. Therefore, is key to understand not only the outcomes of the tools being used but also the production, contradictions, and broader context inherent in those tools to avoid perpetuating existing biases and systemic inequities—if that is indeed the goal of scientists working on these technologies.

If developing tools to understand and conserve biodiversity is central to the mission of COP16—and if biodiversity and conservation measurements affect people in various ways—then data and code backing up decisions and agreements should be required to be publicly available.

While recognizing situations where proprietary tools may offer potential benefits, supporting open-source tools and transparent practices is not merely a technical preference but a moral imperative that should be clearly prioritized and justified.

2. LLMs and historical power dynamics

I arrived at the session one minute late. As I opened the door, I noticed everyone's hands were raised. People were smiling at each other. The question on the slide: "Have you used ChatGPT?" I found a place to sit. This time, the talk was related to "commitments" and "collaboration." I quickly realized that it was not what I expected. In this session, a new tool was being developed, prototyped, and tested. The goal was clear: How do we ensure that the conservation measures implemented and

described by a given country are in agreement with a particular set of policies? At that point, I realized that the answer was outlined in Slide 1. In fact, a large language model (LLM) was being trained in Europe to accelerate the comparison between government-specific policies and those defined at COPs.

The presenter, smiling throughout the entire talk and barely containing their excitement—an enthusiasm shared by some of the attendees—highlighted how much time, resources, and effort could be saved by deploying this tool. Recordings of testimonies from various environmental offices across the globe at different political levels were presented at the end. As English was not the common language for that section of the talk; voices from the Global South resonated.

From the subtitles, it was clear that the excitement of employees at those small, isolated, and underfunded environmental offices was tied to being able to certify compliance with predefined expectations. In these testimonies, resource constraints or pressures to comply with international standards were the norm. Collaboration, in this context, was about deploying a tool to support these efforts. Multiple questions still resound in my head from this episode. Should LLMs be reviewing compliance with environmental laws? How pervasive are these power dynamics in such conferences?

The use of LLMs in this manner raises concerns about reinforcing historical power patterns. For instance, language models trained in Europe might not account for local contexts, languages, or indigenous knowledge systems that could ultimately reflect compliance when carefully examined.

Relying on AI tools for policy compliance could sideline human judgment and diminish opportunities for genuine collaboration. It could also exacerbate existing inequalities, as underfunded offices may become dependent on tools developed elsewhere, without the capacity to contribute to or modify them according to their needs. Clearly, LLMs directly increase efficiency and support for overwhelmed agencies. However, the question is not just about efficiency or innovation; it's also about who holds the power to define and assess compliance.

3. Academics in the Back Row

At the end of one of my first days at COP16, I heard a colleague describe one of the formal plenaries and working group sessions happening in one of the main rooms at the venue (Amazonia in Blue Pavillion). Up to that point, my role had been very similar to attending an academic conference. I would select sessions and talks to join, take notes, talk to people, and make connections. Unlike many of my colleagues, I did not have a talk to deliver, so it was mostly on me to actively look for opportunities to interact.

The next day, I decided to join one of those negotiations. I was curious. There were two main doors to access the room—one for the delegates at the front of the auditorium, and one for (presumably) the rest of the attendees, which gave access to the back of the room. Seating was reserved in accordance with your role at the COP. As I walked into the auditorium, I realized that I could have easily sat on the farthest seat in the back of the room if I wanted to. That was in fact the area designated for

academies and researchers. The seating arrangement, from back to front, was as follows. Academia and research, Business and Industry, NGOs, faith-based organizations, women, Indigenous peoples and local communities, OACPS, COMSEC, UNEP (I might be missing more), and the parties.

From what I know, the public typically do not intervene during plenary or working sessions. I asked myself two questions. Does the order of these groups have an actual meaning? If so, was it a statement to have academia and research at the very end of the room in these sessions?



Meeting in the Amazonia Room at the Centro de Eventos Valle del Pacífico, Cali, Colombia, during COP16, October 2024. Photo: Cristian Román.

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