

Mapping Climate Change Rhetorics in Data Center Ecologies

This story was made with *Esri's Story Map Journal*.
Read the interactive version on the web at <https://arcg.is/1mLCbq0>.



Designed to call attention to what we call *the environmental unconscious of digital composing*, this map journal is a companion to our article in *Enculturation*. We highlight climate change rhetorics in data center ecologies, mapping locations, news articles, and documents in connection to "The Big Four" tech companies: Amazon, Apple, Facebook, and Google.

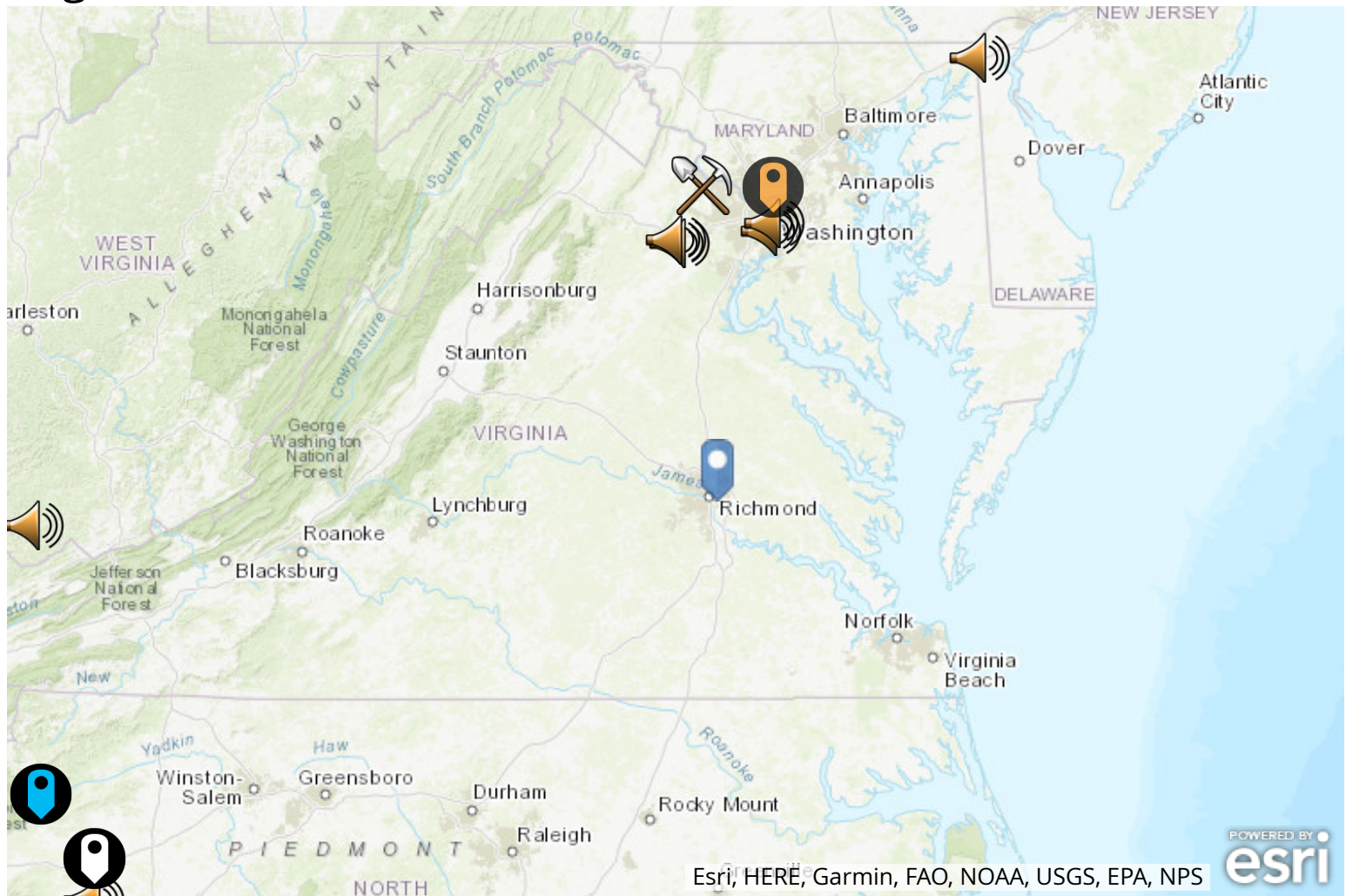
This section depicts a global view of our custom map.

- Use the zoom buttons at the top left of the map to create custom views.

- Click on the symbols (e.g., Amazon in South Africa) to learn more about each location.
- <- Click on bubbles to left to advance the journal sections.

View our legend [here](https://www.dropbox.com/s/8wasrpvsys2n7cp/Legend.pdf?dl=0) (link: <https://www.dropbox.com/s/8wasrpvsys2n7cp/Legend.pdf?dl=0>).

Regional Redirections



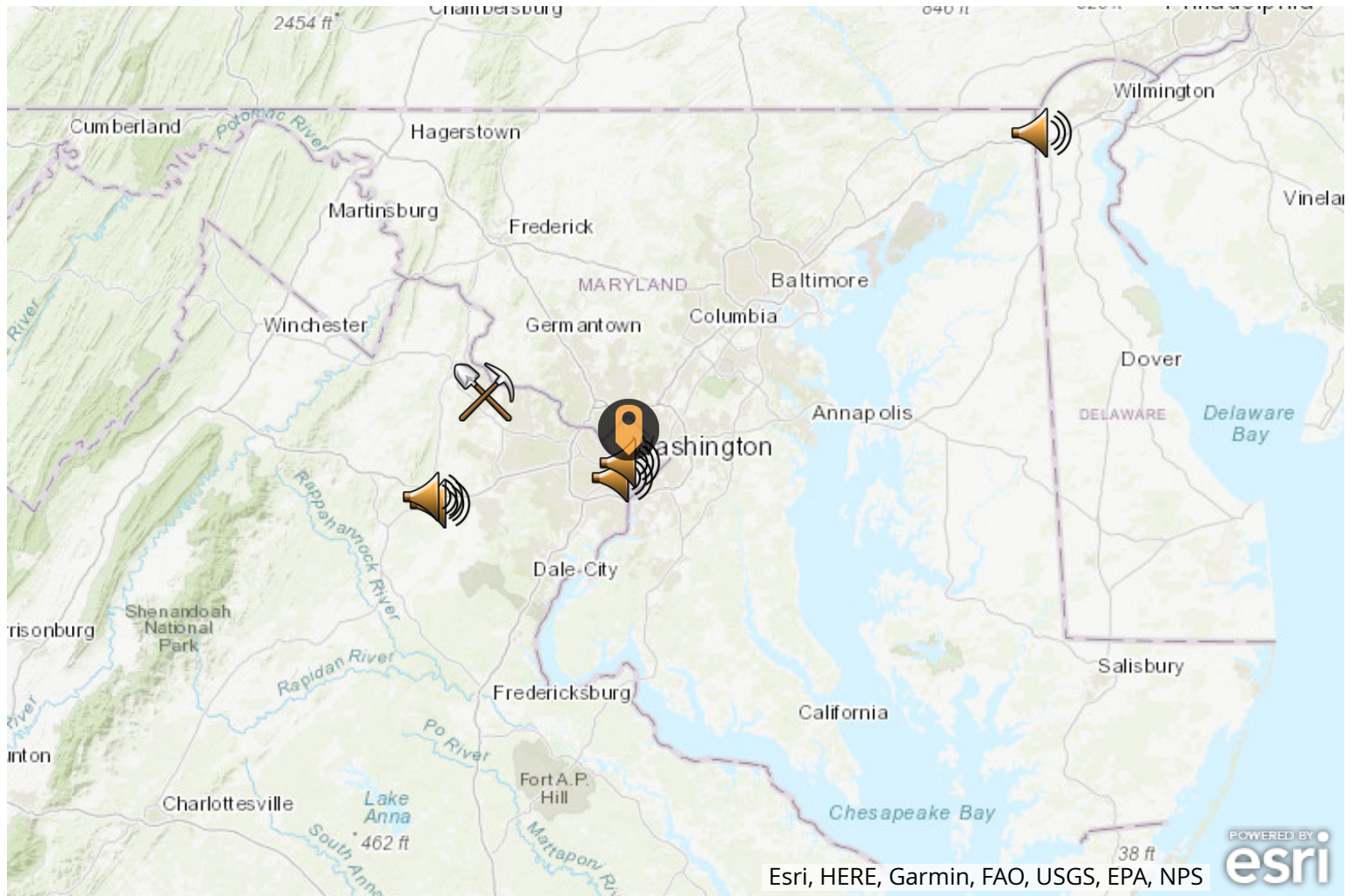
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Rural and metropolitan regions of the world are becoming central to data center ecologies, no longer exclusive to Silicon Valley. Loudoun County in Northern Virginia, for example, is considered "Data Center Alley" where companies are incentivized by low-energy costs and tax exemptions. Loudoun County officials claim that more than 3,400 companies operate there and "13.5 million square feet of data centers are currently operational with another 4.5 million square feet under development," also noting that "more than 70 percent of the world's internet traffic passes through Loudoun's digital infrastructure, making us a key player in the world's technology economy." The word "player" is interesting here, for we see the county as an omnipresent body whose landscapes and energy sources are being reconfigured to facilitate the high demand of internet traffic. In light of Loudoun's role, the coal mining industry is shrinking, while the data center industry is expanding, reshaping the region's economy. Put differently, shovels and coal-stained bodies are being replaced with wires and signal traffic that also pulse through the earth.

Canadian cities such as Toronto and Montreal (link available only in online story) are also becoming data center ecologies, as enterprises and companies there also exploit Canada's low-energy costs. There are many reasons why data center industries place their infrastructure in strategic regions in the world (e.g., ensuring connectivity, reducing lag time to certain regions of the world, mitigating risk in case of system failures, etc.). One important reason is to spread the toll of energy and water consumption. While citizens in more established data center regions (e.g., Data Center Alley) have become vigilant of environmental factors, tech firms can move to new regions of the world with a relatively fresh slate, touting the potential for regional flourishing while downplaying environmental concerns. Montreal, for example, recently became a Google Cloud region, a private network of data centers that "provides a high-bandwidth, highly reliable, low-latency link to each region across the world." Google spent millions to get that region off the ground, even committing to \$4.5 million to the Universite de Montreal and its Montreal Institute for Machine Learning. In a way, big tech's government relations and seemingly infinite financial resources shape the master narrative of the data center industry, thereby drowning out bodies that protest it.

Image caption and description: A map of Data Center Alley in northern Virginia. Orange, blue and white icons represent data center locations by Amazon, Apple and Facebook. Megaphone icons indicate news articles and activist documents.

Planned Protests



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Among data center ecologies in the United States, those on the east coast have drawn the most contention. Data Center Alley, located in northern Virginia, and surrounding areas have seen protests concerning power lines, gentrification, and noise. Tree-bodies and farmlands are under threat by big tech (see Greene (link: <https://loudounnow.com/2019/02/21/farmland-to-data-centers-switch-worries-neighbors/>)). Interestingly, protests and related coalitions are often organized via social media and within the very tech companies often criticized. On September 19, 2019, **Amazon** (link: <https://medium.com/@amazonemployeesclimatejustice/amazon-employees-are-joining-the-global-climate-walkout-9-20-9bfa4cbb1ce3>) and **Google** (link: <https://medium.com/@googworkersac/google-workers-are-striking-for-climate-sept-20-7eba2100b621>) employees published open letters on Medium, calling for walkouts and protests for climate action by their respective companies. Elsewhere, The Coalition to Protect Prince William County and No Newark Power Plant both took to Facebook to protest data center activity, demonstrating that big tech is omnipresent in online activism. As Nick Couldry and Ulises A. Meijias observe in *The Costs of Connection*, "The greatest threat that data colonialism poses is that, in time, it works too well for us

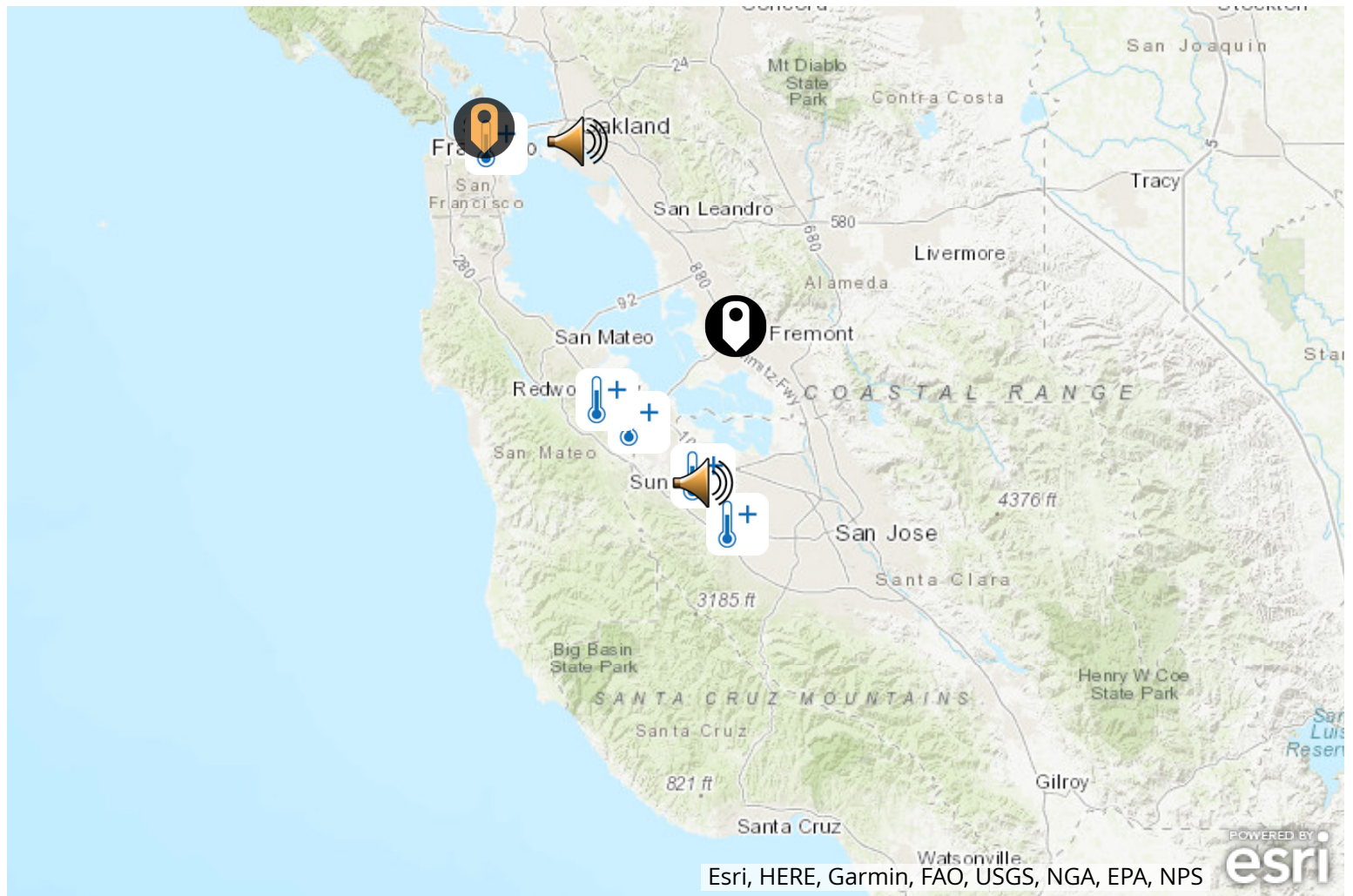
to want to live any other kind of existence, so that our complicity in losing hold on the possibility of freedom becomes complete” (215). Put differently, even if communities don’t want data centers looming over them or colonizing their lands, many still rely on them for everyday rhetorical activities.

Parts of Europe--**notably, Ireland (link available only in online story)**--have also contended with companies such as Google and Apple. In fact, in 2018, Apple cancelled plans for a data center in Athenry. Today, the company has a data center location in Denmark and a plan to open facilities in China. In such areas, protests seem nonexistent, calling forth questions about city-company agreements, news circulation, and activist agency. These are but a few commonplaces in North American ecologies; mapping data center ecologies from a distance is a gateway to ground-level investigations (see our main article's conclusion) of potentially silenced bodies.

See also: Protests in **Pacific Northwest (link available only in online story)**.

Image caption and description: This is a map of Data Center Alley in northern Virginia. A shovel icon indicates a promotion article by Loudoun County. An orange icon indicates an Amazon data center. Megaphone icons indicate news articles and protests in the area.

Climate Control



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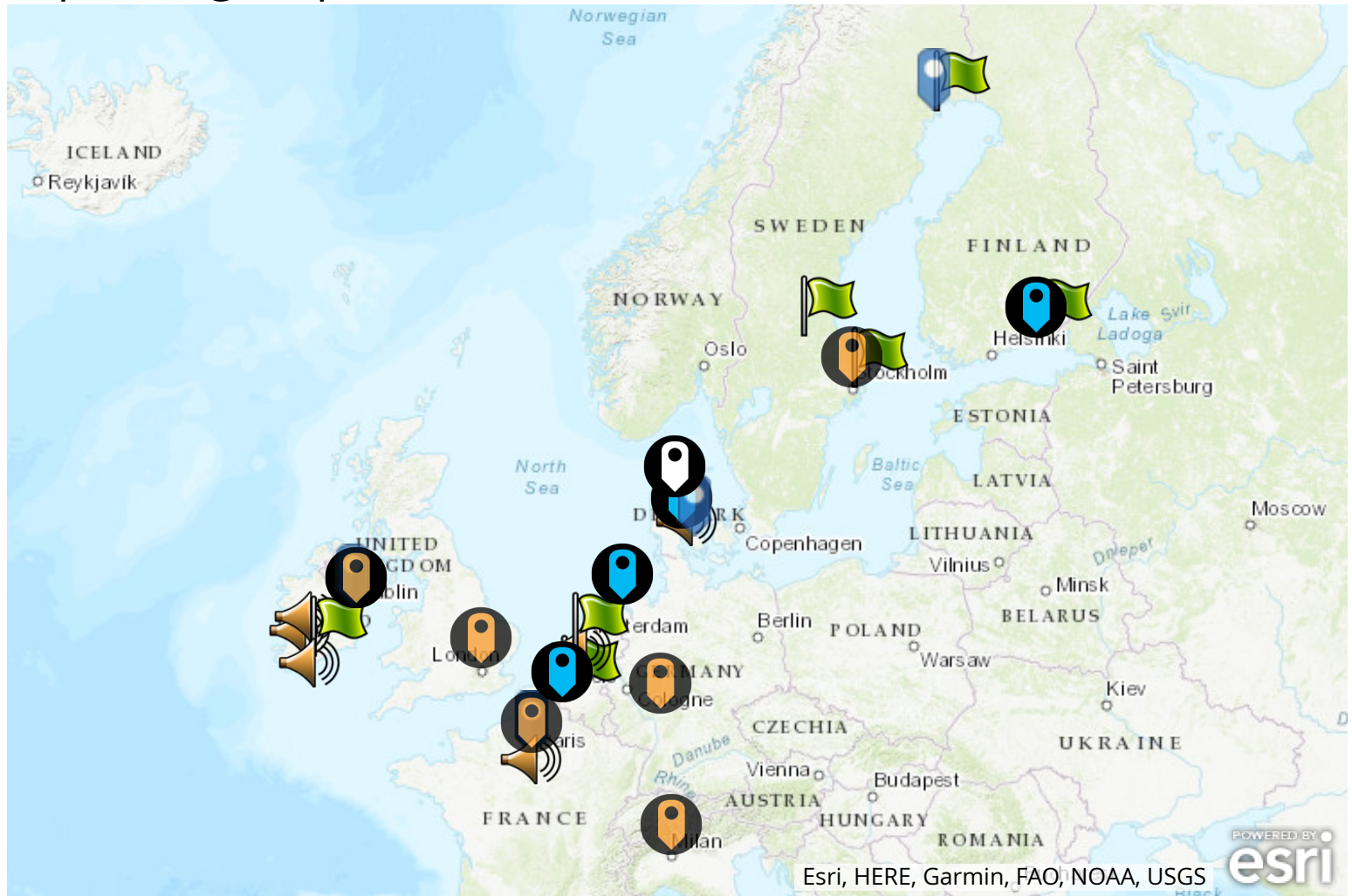
In response to growing rhetorics of climate change, whether by national organizations, protest groups and internal stakeholders, Amazon, Apple, Facebook and Google have published sustainability and "green" reports on data centers. Furthermore, future rhetorical analyses might pay attention to the visual arrangement or numbers that the Big Four emphasize in their technical documents. (link available only in online story) Every sentence, every font change, every colorful photo, is doing some rhetorical work, for better or worse. Google, for example, argues that it wants to "design out waste and pollution" ("A Circular Google") and Apple contends that "we avoided the equivalent of more than 466,000 metric tons of carbon dioxide emissions by using 100 percent renewable energy for our data centers." Stories of green commitments and innovation dominate such reports.

But a closer look at sustainability reports reveals a more complex story. While the big four makes claims of adding renewable energy to power grids and building more efficient servers to cut carbon

emissions, the reports demonstrate a capitalist ethos of relentless expansion. Just because data companies are investing in sustainable energy (wind, solar) does not make them somehow energy neutral; adding renewable energy to a grid does not ensure that they will be powered exclusively by the same renewable energy. As Google admits in its sustainability documents, “The places with the best renewable power potential are generally not the same places where a data center can most reliably serve its users. And while our data centers operate 24/7, most renewable energy sources don’t — yet (“Renewable Energy”). Our inference: bodies of renewable energy cannot keep up with relentless expansion. In South Carolina, for example, farmers and big tech are competing for bodies of water, making neutrality a moot point. To recall Nathaniel Rivers, there will always be footprints; claiming neutrality is rarely possible.

Image caption and description: This map shows blue and white thermometer icons, which include climate change reports by Facebook, Apple and Google.

Expanding Empires



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As the need for increased data storage and non-lagging data transfer increases, so too do data companies' expanding empires. We use the term "empires" purposefully, for scholars such as Dwayne Winseck and Nicole Starosielski have argued that tech companies' global reaches reflect historical and ongoing imperialist strategies of control and dominance. While the big four has been able to temper sustainability concerns by positioning themselves as corporations that are responsive to climate change, the fact remains: they are ensuring a path for future growth by buying land, securing water rights, and cutting deals with local and national governments.

In ways that mirror logics of manifest destiny of conquest and control, data center companies are expanding their operations by extracting value out of particular land-climate-water bodies. European countries are ripe with data centers from the likes of Amazon, Google and Facebook. The Scandinavian region is of particular interest to companies because of its proximity to the North Pole, insofar as Lulea, Sweden has been deemed the "Node Pole." Subzero temperatures and waters

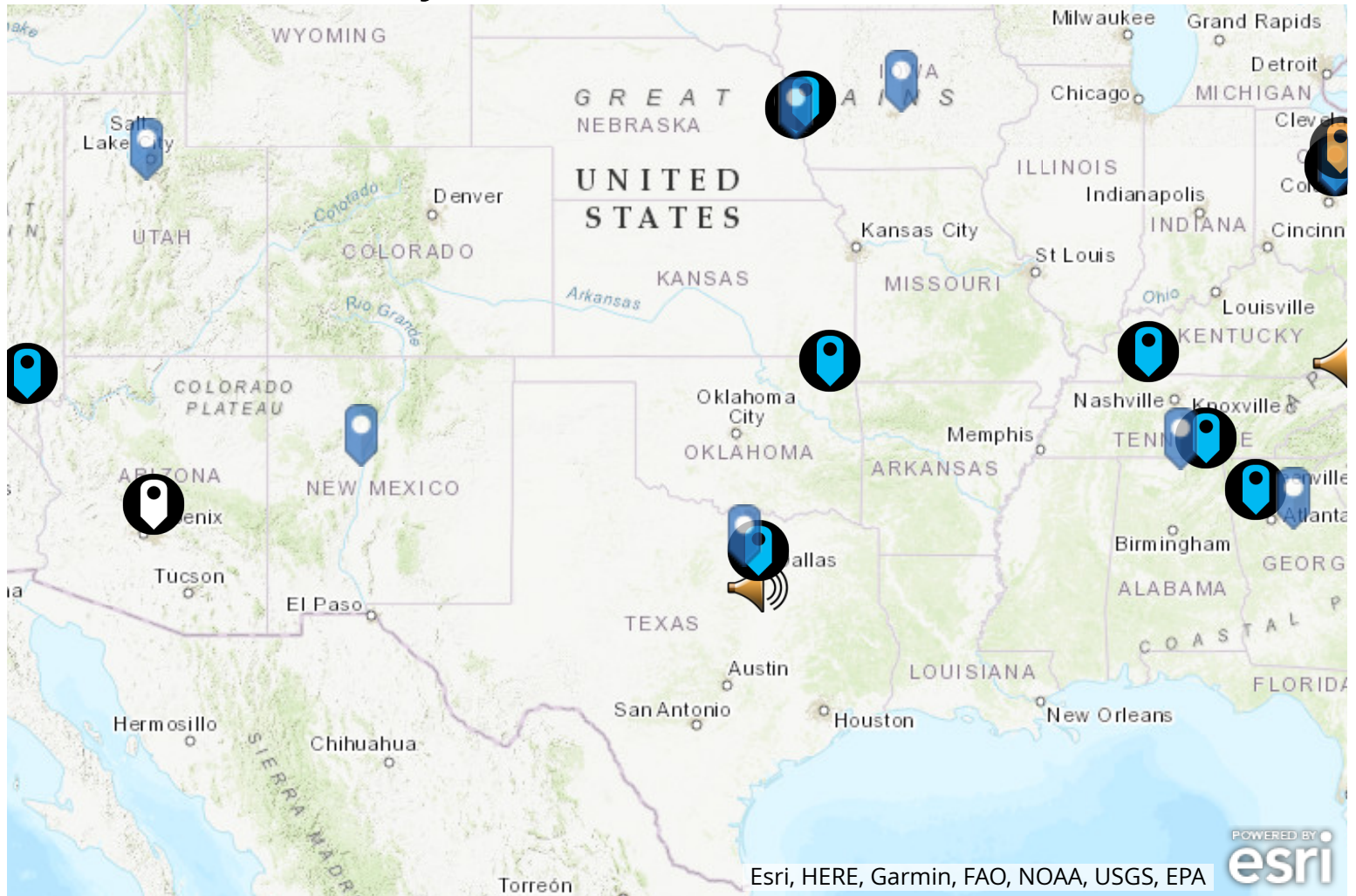
naturally chill data centers that run hot. Bodies of water are paramount to big tech. While, in some places, the heat produced by the computational work of servers is being recycled into a commodity that heats homes, businesses, and swimming pools (Velkova), the impact of data heat in this region remains to be seen. Elsewhere, [regions of Asia \(link available only in online story\)](#) are part of the big four's growing empires.

In contrast to its Node Pole infrastructure, Facebook is investing \$1 billion in new cooling technology and solar rooftops for a data center in Singapore. As the company acknowledges, "When we look at what we can do, framed against the country's electric grid and space constraints, rooftop solar is one of the most impactful solutions available in Singapore." Furthermore, the building's cool technology will take advantage of outside air and evaporation to cool the building's servers. Colonization of the city-state's tech industry and natural resources, however small, warrants innovation, the kind that should be explained in public. As we show in the next section, big tech struggles with making its plans transparent.

See also: [South America \(link available only in online story\)](#) and [Africa \(link available only in online story\)](#).

Image caption and description: A map of data centers and news articles in Europe. Orange, white and blue icons represent Amazon, Apple, Facebook, and Google. Megaphones represent news articles and activist documents. Green flags indicate articles on green data centers and innovation.

Secrets and Security



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Whether concerned about opposition or security (it's not entirely clear), companies such as Google and Facebook have initiated data center plans under codenames. For example, Google operated under the codename Sharka LLC when developing plans for a data center in Midlothian, Texas. This rhetorical secrecy has, understandably, been uncovered by reporters and the non-profit Partnership for Working Families, implicating how companies release information for public knowledge--and debate. (link available only in online story) As one source told *The Washington Post*, "'I'm confident that had the community known this project was under the direction of Google, people would have spoken out, but we were never given the chance to speak,' said Travis Smith, managing editor of the *Waxahachie Daily Light*, the local paper. 'We didn't know that it was Google until after it passed.'"

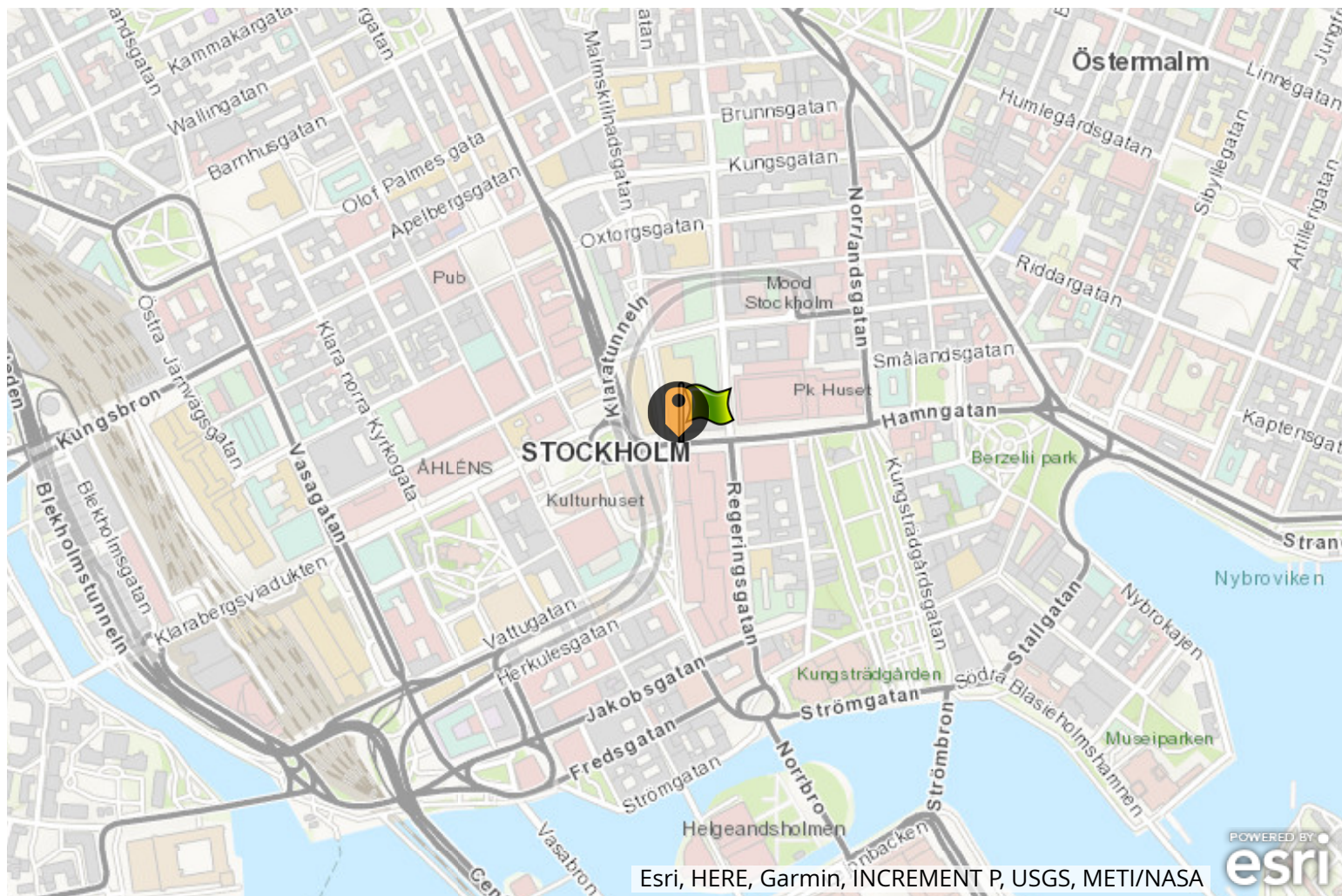
Perhaps the most secretive company among the Big Four is Amazon. While Google and Facebook list out most of the data center locations, Amazon offers an interactive map (link available only in

online story) that outlines regions of its data center activity. Given its massive audience, perhaps its reasoning is due to customer privacy or activist scrutiny. Or both.

Data center ecologies—“the cloud,” in popular parlance—are often purposefully made cloudy. While mapping has allowed us to pinpoint certain themes related to climate change rhetorics, the secretive nature of data centers further obscures their relationship to particular local ecologies. While our mapping methods are an opening to the environmental unconscious, the secretive dimensions of the data center industry occasions the need for further listening to the ecologies that remain closed off from public view.

Image caption and description: A map of data centers in the US. Orange, white and blue icons represent Amazon, Apple, Facebook, and Google. Megaphones represent news articles and activist documents.

Elsewhere Excavations



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We hope this map journal raises awareness about the rhetorics and infrastructures circulating within and through data center ecologies. As we mention in our companion article, this map journal project is designed to be invitational and flexible for future scholars and students. There are a host of other data centers throughout the world. **Microsoft was not part of our data collection, but it is very much part of data center ecologies.** (link available only in online story)

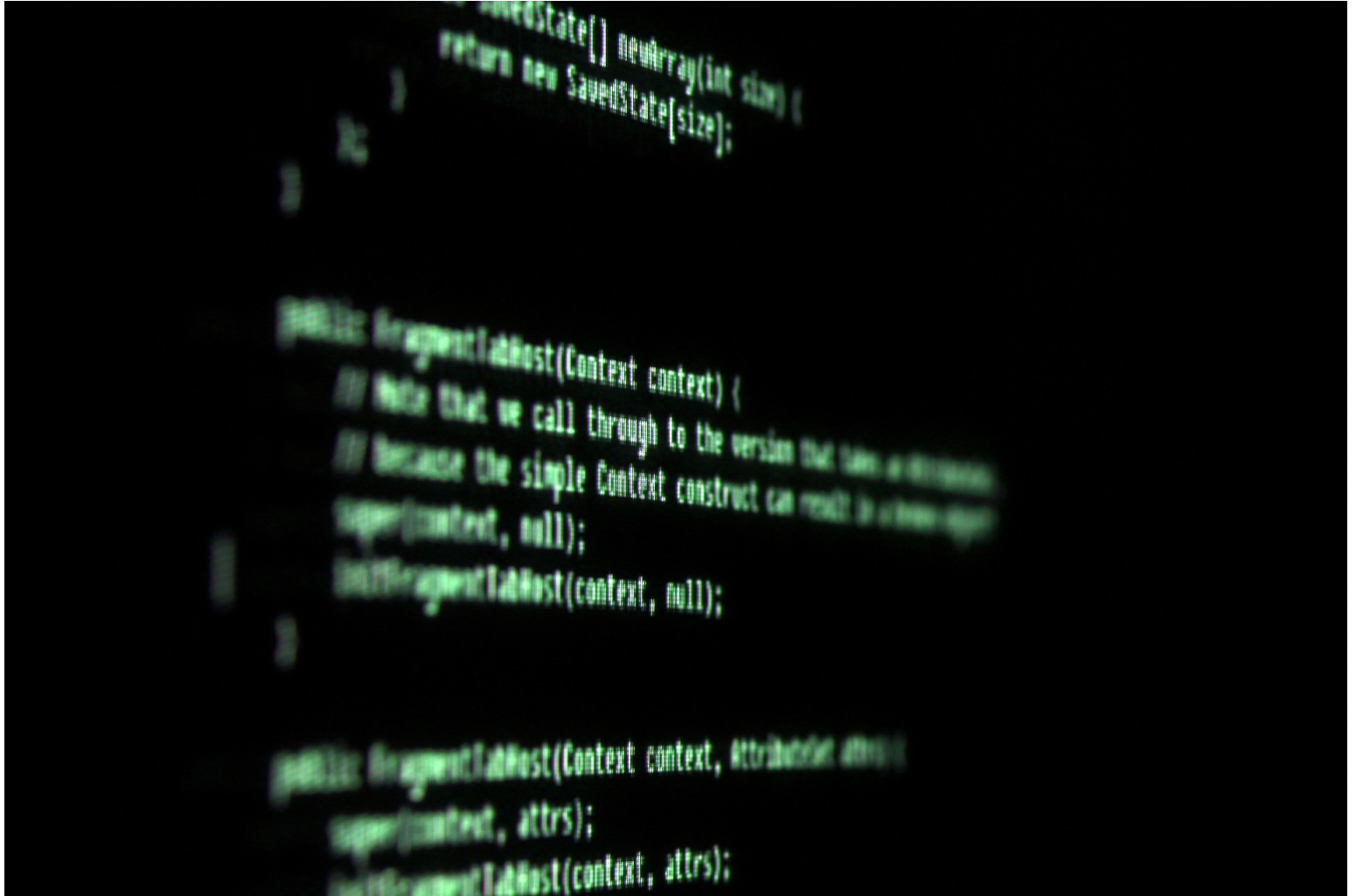
See also: **Microsoft's underwater data center.** (link: <https://news.microsoft.com/features/under-the-sea-microsoft-tests-a-datacenter-thats-quick-to-deploy-could-provide-internet-connectivity-for-years/>)

Furthermore, colocation and lesser known data center companies are of interest to us. Equinix and Digital Realty are two of the larger colocation companies, meaning they house and move data for many a client—including the big four when necessary. **Digital Realty, for example, claimed Toronto's largest data center when it acquired The Toronto Star's former printing plant,** (link

available only in online story estimated to be 711,000 square feet. **(link available only in online story)** Elsewhere, companies in Stockholm are working with officials to heat homes with water that cools down data centers. **Start-up company EcoDataCenter is heating homes in Falun, Sweden (link available only in online story)**, while **Nerdalize in the Netherlands was heating showers with servers (but it recently filed for bankruptcy) (link available only in online story)**. From a global view, the big four's data center ecologies are most visible and thus subject to scrutiny, but perhaps more attention ought to be paid to colocation and start-up bodies.

Image caption and description: A partial map of Stockholm, Sweden. An orange icon represents Amazon's data center region, while a green flag icon represents an article on green data centers and innovation.

Return to Our Main Article



Click [here](http://enculturation.net/environmental_unconscious) (link: http://enculturation.net/environmental_unconscious) to go back to our *Enculturation* main text.

Thanks for mapping with us.

Image caption and description: A photo depicting computer code in black and green.