



Putting Data Centers on the Map: An Interview with Karen Edelstein

[Karen Edelstein](#) is the Eastern Program Coordinator at the [FracTracker Alliance](#). As a GIS specialist, she's mapped oil and gas infrastructure, community responses, and clean energy transitions along the East Coast. Recently, driven by the [potential impact of data centers](#) on frontline communities and their regulatory loopholes, her attention has turned to [mapping data center projects nationwide](#). In this interview with Policy & Communications Fellow Sean Wang, she talks about the value, impact, and challenges of mapping as a tool for public advocacy and how she's applied it to hot-button issues—from cryptocurrency mining to data centers.

This interview was conducted on August 6, 2025. It has been lightly edited for length and clarity.

Sean: *Hi Karen, before we begin, could you please briefly introduce yourself and the work that the FracTracker Alliance does?*

Karen Edelstein: Hi, I'm Karen Edelstein. For 15 years, I have been working with FracTracker Alliance: prior to 2023, I was the Northeastern Coordinator for FracTracker's activities, and I was working in the southeast and down into the Gulf quite a bit.

Our mission at FracTracker is largely about data and data visualization, and so what we do is share our maps, our data, and analyses to communicate environmental and public health impacts of the oil and gas industry and adjacent issues, which is how I got into monitoring cryptocurrency mining and data center development. We partner with academia, researchers, frontline and grassroots communities, and environmental organizations, both the small local ones and the big ones. We work with, especially with the smaller groups, at no charge, but we do some contract work with larger organizations.

We use both data that's in the public sphere and develop our own data sets based on our research, which includes doing Freedom of Information requests, interviews, and media monitoring. We're obviously very concerned about the data sets that have been impacted by the federal government, and, you know, did quite a bit of scurrying in the lead-up to January to make sure that we had the stuff that we needed as well. We haven't had a lot of problems finding stuff, fortunately, for the stuff that we're using. But I don't think that's any guarantee that's not going to come back and get us a little bit.

Sean: *What are some of the projects you've worked on at FracTracker Alliance?*

Karen: Well, my big entry was during the time that high-volume hydraulic fracturing was being debated in New York state, going back to 2010 through 2014. At that point, I was working with grassroots groups across New York

State and tallying the local resistance movements, and [getting those all into a map](#). I think the lesson from that experience and that mapping project put me on the track that I continue to be on today. Showing a movement or an incident in one place does not have the same compelling power to change policy and minds as it does to show patterns across space and in time, to some extent. During that time, we were so concerned about hydro fracking. I started mapping the municipalities where there were local bans or moratoriums against high-volume hydraulic fracturing. It started with three, and it increased to almost 200 by the time the ban was passed. So it was this growing web of communities that were united against this happening.

We have something called Home Rule. And so zoning decisions here in New York state get made on a municipality-by-municipality basis. There could potentially be fracking in one town, and just over the town line, it could be banned. By making this map, it showed our Department of Environmental Conservation that the public will was pretty united, or that in some places, where it was a checkerboard, it was going to be financially and policy-wise, a bad idea. They cited my map in the decision to ban fracking. It was one of my proudest moments in my career, I have to say. That was the lesson learned from that: showing what's going on on a large scale both influences policy, and it also provides a sense of unity to the individual communities that are struggling against an external threat.

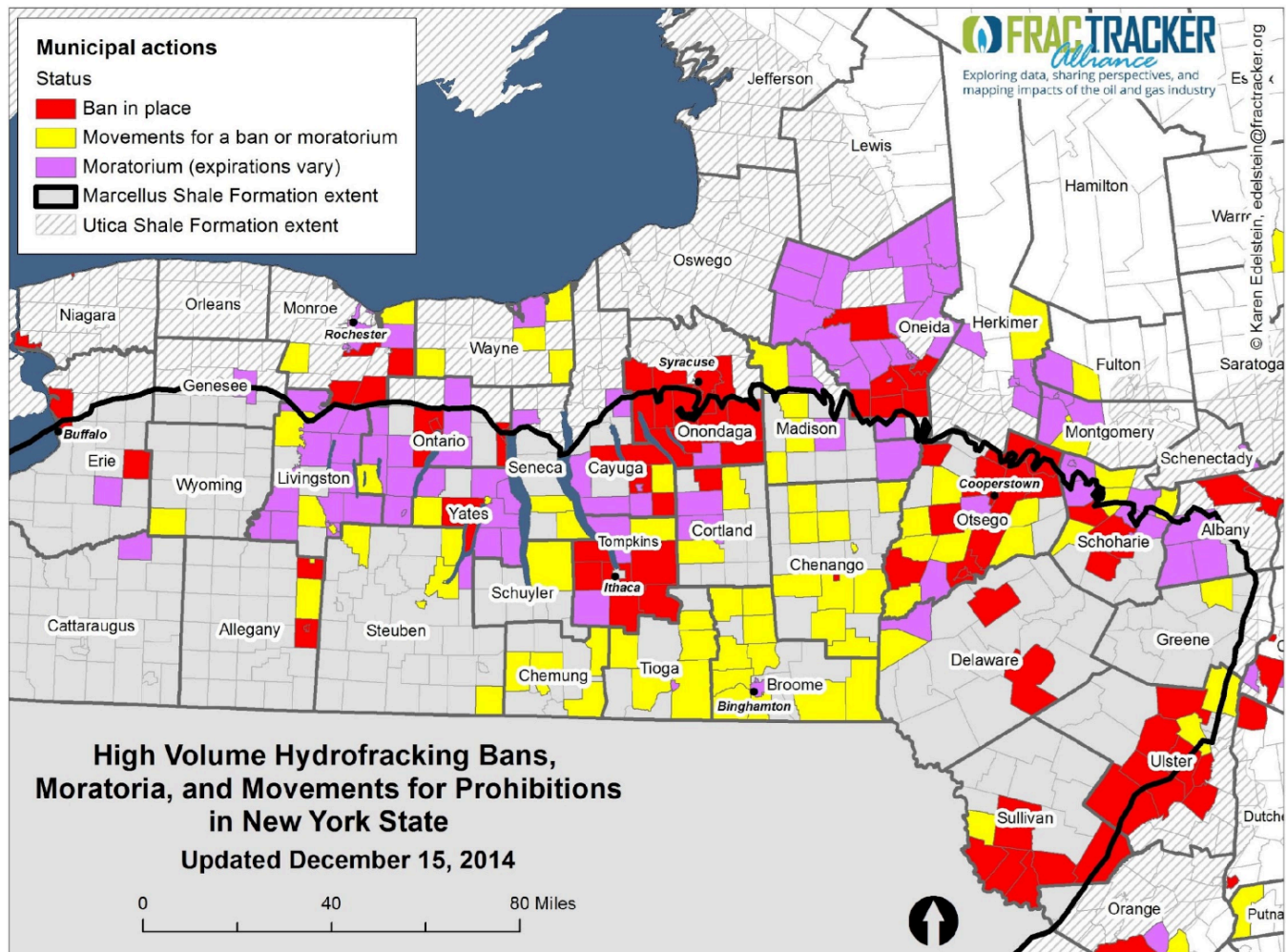


Figure 1: Static map of the bans and moratoria ([NYS Bans and Moratoria](#))

Karen (continued): It started here in Tompkins County with a couple of towns. Then there was another town near Cooperstown, New York, that had its first ban. They were sued by the industry, saying that the ban was illegal. And over those three years, it spread like wildfire. I have done an animation of this. Every week, sometimes two or three more towns would individually pass these bans. And so in this map, the red is showing full bans. The purple is a moratorium, which is anywhere from six months to a year, sometimes two years. And then the yellow was where people were debating. It wasn't quite there to pass any local legislation, but it was in play.

So when the Department of Environmental Conservation was weighing this, they looked at this and they thought, "You know, this is where the hot spot is." They were going to potentially encounter so much resistance or ambivalence, at the very least, that it just was not going to be a great option. There was inconsistent evidence that it was going to be profitable from a geological standpoint, but from a sociological and political standpoint, it was just not great. And so we have not, we have not been targeted yet.

Sean: *FracTracker initially focused on fracking in Western Pennsylvania. It's extended to related issues such as cryptocurrency mining and data centers. Could you explain a little bit more about how these interests have grown over time?*

Karen: Well, you can't have cryptocurrency mining, and you can't have data centers without a source of power. Cryptocurrency started taking off in the US about five or six years ago. It's such an intense power hog to run all of these mining computers. And when you have a lot of mining computers running at once, you also need a cooling source. There was a feeling that the cryptocurrency was going to be largely happening at retired, or soon-to-be-retired, power plants, because they could maybe restart these power plants, or at the very least, the electric wires were there, so they could bring power in from the grid. This power, in most cases, especially five years ago, was coming from fossil fuels.

If you direct fossil fuel-derived energy towards cryptocurrency mining, there's going to be deficits elsewhere, and that drives the need for more oil and gas drilling and more construction of power plants. And so, you know, the pie essentially keeps getting bigger, but it is a false solution to what our energy landscape should be looking like. And so that's, that's the connection these days. A lot of places that are centers of cryptocurrency mining and data centers are in Texas, and there's a big movement for putting solar farms up and marketing these operations as clean green energy, which is all fine and good. But that's clean energy that should be going to power towns and houses, and schools. There are only so many directions that the energy can go in after we build whatever facility. In my way of looking at it, it's really a justification for ongoing drilling, for hydrocarbons.

There's an interesting wrinkle in all of this. I was working for several years exclusively [tracking cryptocurrency mining](#), and I stopped finding evidence that there were just standalone cryptocurrency mines going in. Then, all of a sudden, there are these huge, hyper-scale data centers going in. I think "data center" has become more of an umbrella term. There may be cryptocurrency mining happening within that, but with the scale of some of these data centers—which is sometimes more than a million square feet of mining space—once the power is coming in, they can do all sorts of things within those walls. So I have just pivoted to focusing on data centers in general, but trying to track down where they are is a slippery process.

Sean: *What was your experience mapping these data centers?*

Karen: Firstly, back to cryptocurrency mines, the first one that I got involved with was one at a retired power plant quite close to where I live, 45 minutes away, that was known in the community. That was easy because it was firsthand knowledge. But then these coalitions of other communities that were dealing with similar local issues formed, and I started mapping, like with the fracking ban map, so that people could see where their sister communities might be. That was largely done through word of mouth and also media searches.

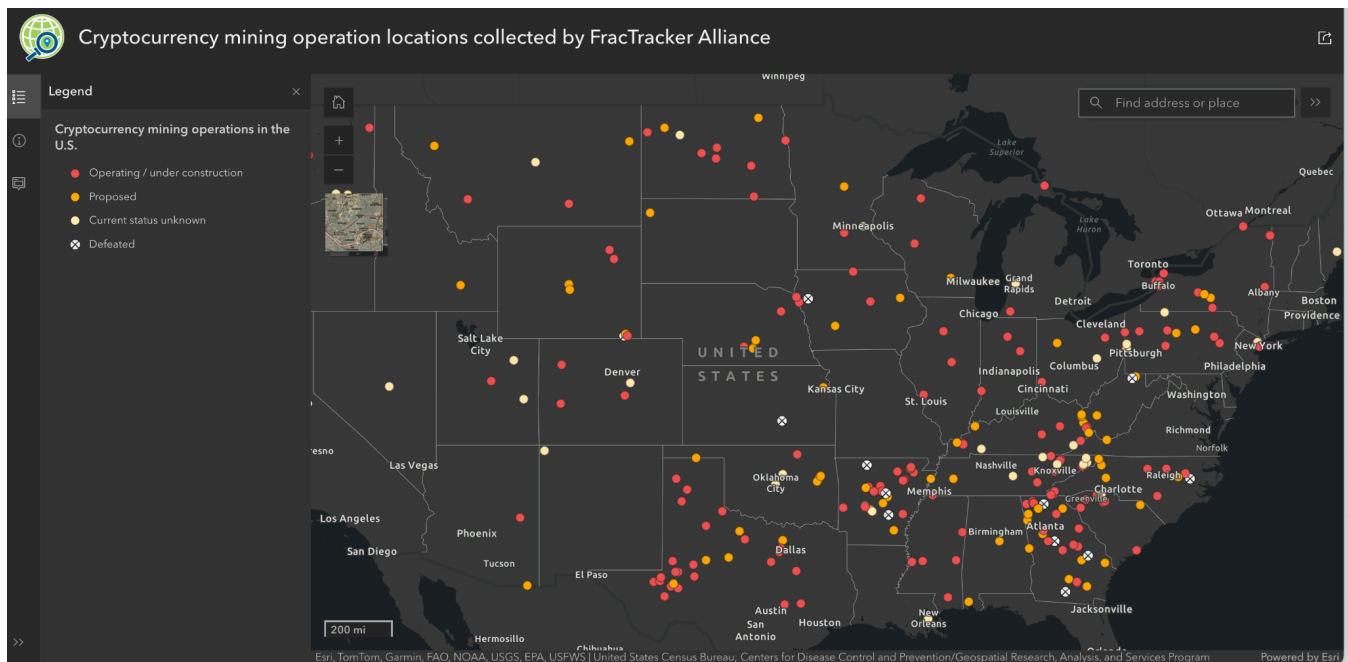


Figure 2: Screenshot of Cryptocurrency mining operations map ([Cryptocurrency Mining](#))

When my colleagues and I at FracTracker got interested in mapping the data centers, we started looking online. There are a number of websites that show where data centers are. They're created by industry. There are somewhere around 6000 data centers collectively that the industry has on its maps. We thought, as an organization, "Oh, this is great. We should be able to download that information and put it on our maps." But no, it's not open source. You have to go in and click individually on each dot and maybe get an address 6000 times, which is not a practical solution for a small non-profit organization. And then we thought, "Oh, well, you know, we've got smart people. Well, maybe we can go in and develop code and scrape the data off their sites." And then we saw that every single one of these sites has very strict terms and agreements, and we can't do that. We're not going to break the law or get in a position of being sued by the industry. We can't afford that and those maps are already out there for the public to view.

So we decided that, aside from what we can pick out by going on Google Maps and finding the data centers that way, we're going to focus on the existing data centers. We're going to focus more on current proposals. And that's where we're at now. It would be wonderful somehow to be able to clone the map that industry puts out. But it's not well advised legally to do that. So we point people to the industry maps, and we also say, "Here's the stuff that's in play right now." There are a lot of fast-moving targets because, in some of these cases, the industry changes its mind. In some cases, I've seen pushback locally, and some of these data centers have changed locations or scaled them back or come up with some sort of alternative.

So it's hard to, at any point in time, say this is exactly what's going on, which is why, in the map that I built, I'm trying to be as transparent as possible and put dates on each entry. If somebody was looking at this, they could both look at the sources, articles, and documents that got that point on the map. They could also find out when and where in time that entry was made, because I don't know what the long-term maintenance of this map is going to look like. I'm spending hours every day adding new sites.

Sean: *It's interesting to have such a feature built into the map. Were there any other considerations and features you were thinking about when you were creating this map? If you think about this map as compared to other mapping projects you've done in the past, is there something unique about it?*

Karen: This one does have a crowdsourcing function to it. On the details page, there's a link to a Google form where people can fill out a heads-up that feeds back to staff and to me. And then I'll go and vet the suggestion and put it on the map, which I did probably 10 of over the weekend. At least eight out of the 10 hadn't come up in the sources that I was looking for. So it's, by nature, an imperfect thing for our one organization to do. Hopefully, we will have a better product the more people participate in this.

Sean: *Since this crowdsourcing feature is new, is there something about the data centers or the way the projects are being developed that makes this crowdsourcing necessary? Why is the information not popping up online or in the normal pathways you usually use?*

Karen: I have a number of different ways of doing searches. We have a service called [Meltwater](#) that we subscribe to. You can put in keywords and combinations of keywords, similar to Google searches that you can set. But sometimes you can get up to several 100 hits a day, and sometimes you miss things. I would say maybe one out of every 40 hits actually is something. It's a matter of time to be able to sort through all of these things. And considering I'm supposed to just be working six hours a week, I can easily put in six hours a day. It's a time management thing and also, because people are passionate about what's happening to their communities, we want to leave that open as well as a participatory avenue.

A sort of sideways way of locating where these data centers are are through air permits—if they have them, how they get their permits, and how they apply for them. These air permits are necessary because even if the data center is grid-tied, they need to have backup generators to run them, and those are diesel or gas-powered on-site, so they need air permits in order to build these places. Something we ran into when doing the Freedom of Information request for the data center air permits is that the codes were really ambiguous. The [article](#) that FracTracker published about this data center mapping last week talked about that a lot. Whether it's intentional or not, I have no idea, but the way they code what the air permit is being made for can help the data centers hide in the policy and legislation, and process. Sometimes it's straightforward. But there are other places that they either don't know about or how to apply the codes, or even what the right coding structure is. This makes them harder to find, and we have a lot of freedom of information requests for these air permits that are still outstanding. It's a process that's been going on for months now, and we're just putting stuff up as we get it.

Sean: *What do you think is so special about mapping as a visualization tool and the way that they present information to the public?*

Karen: Well, think about looking at an image compared to looking at a table of latitude and longitude. The data sets that drive the maps are important, but I don't think that our brains can process tables and make sense of where things are spatially without a good way of visualizing. We and so many other organizations choose this as a way to step in and paint a bigger picture as an entry point to engagement. I think FracTracker shines in that respect.

With the map of fracking bans back in 2011 to 2013, there was always a sense of empowerment. If a community were considering doing a ban, they could look at this map, find the community where a ban had taken place. In most cases, if you clicked on each of the municipalities, the documentation and the language of that legislative piece were there. And so a community could refer to the language for how to make a ban that sticks in New York state. It was a reference tool as well. I also think that there was a beauty in being able to see, well, "Who are my

nearby neighbors who've done something similar?”. That's going to lead me to start searching who to talk to, and also have the support, indirectly, from the legal team that developed the language that worked.

Sean: Looking at another resource that the FracTracker Alliance has, could you describe the data library and what it does?

Karen: It's a sort of ever-evolving thing, but we do post many of our data sets publicly. I'm not on the inside of this right now, but I think that there's an effort underway to create an even more accessible interface where those data sets can be downloaded. Often in the articles that we write on the blog, they will link directly to the data sets that may be either Excel CSV spreadsheets or the GIS shape files directly. So we do that, but we're also working on putting something together, so it's a more comprehensively searchable data library.

For example, every night, New York State publishes a [CSV](#) of where all the wells are. I don't look at it every day. I look at it once a year, but it's in a CSV. That spreadsheet is going to be of minimal use to the public. Or if they go to the New York State oil and gas site, they can look at one well at a time. Every year, I download that CSV, [I turn it into a spatial data set](#). I create a map out of it so that it's viewable, it's queryable. One could also download the whole thing intact and look at it in whatever mapping software they happen to have on their desk and manipulate that however they want. But the fact is, the CSV Excel spreadsheet that the state publishes in the name of transparency is not particularly useful to anyone who would want to see what's going on in New York State. We make it viewable, and we do this for every single state in the United States that has available oil and gas data. Those are not easily available in most places.

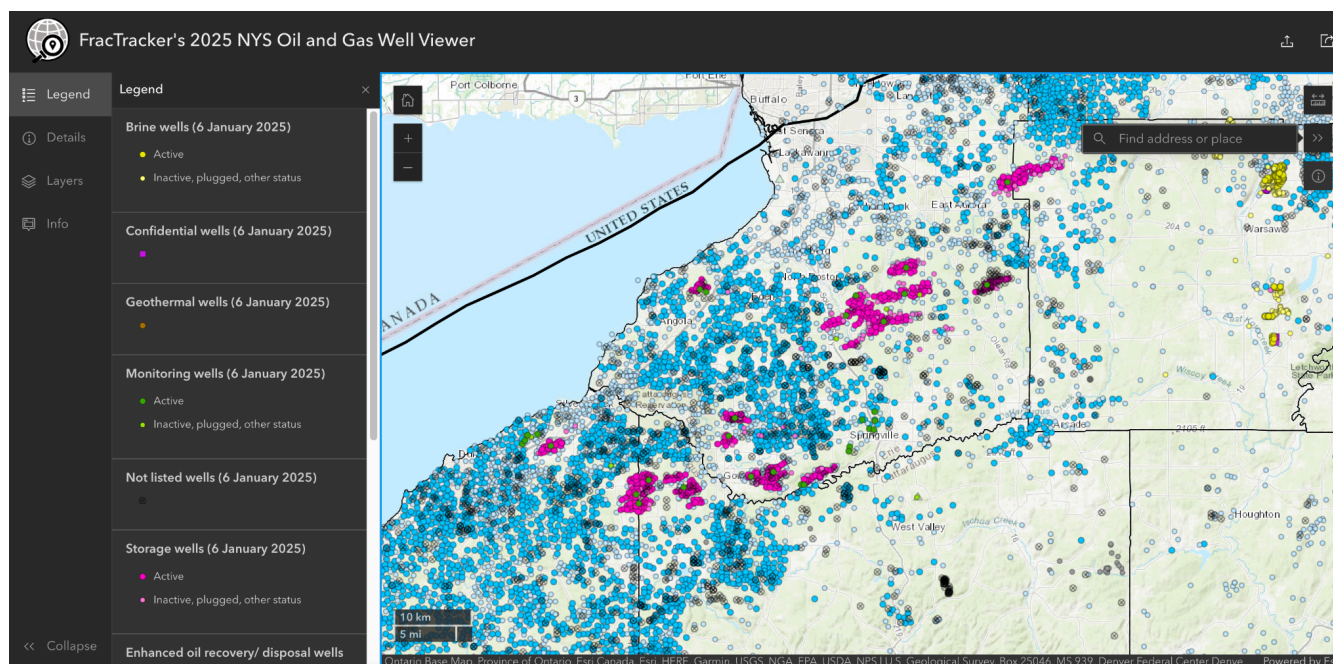


Figure 3: Screenshot of NYS Oil and Gas Well Viewer ([NYS Oil and Gas viewer](#))

Sean: In terms of community engagement, you mentioned how crowdsourcing is a participatory feature. Could you walk me through the community response for the different maps?

Karen: When I was doing the cryptocurrency maps, I was getting input from cryptocurrency community groups. There are a couple of listservs. There's a New York state one, and there's a national one. I'm on both of those listservs. I would circulate an invitation to these groups that, if they were aware of something or needed to see

what else was nearby, to please contact me or take a look at the interactive map. That was sort of more of an internal group.

This data center thing seems to be broader than that. The difference, I think, with the cryptocurrency, was that it was already-impacted communities that were getting in touch with me. Back to the early 2010s, when I was doing the fracking bans in moratoria, that tapped into New York State listservs of people who were fighting fracking. There were probably four different listservs that were all aware that this map was in process, and people were excited to see their towns light up purple or red on that map. It was a real source of pride to sort of join that. It felt like a tsunami how fast that movement grew, and people were excited to see their own locality showing up on it.

Sean: *With all the different maps you've made in your career, do you feel that any stakeholders should be more involved? Are there any barriers that are preventing certain stakeholders from being involved in these issues?*

Karen: Sure. You have frontline communities that don't have access to the technology. There may be language issues, or trust issues. I think that's a reason why peer-to-peer is so important. There are barriers to access to information, the governmental debate processes, and the community. Some people are just not comfortable going to town meetings where things like this are being discussed, and they don't find out about gigantic projects being built until the survey flags are in the ground. This is an effort to get ahead of that. But it's an ongoing effort. It's such a big country, and there are so many communities. It can always be improved upon. In California, we've started doing some stuff in Spanish. We also have a FracTracker mobile app for mobile devices. There is a mobile version of our maps that has as many pipelines as we know about on it. It does have all of the known state wells on it. We try to make this information accessible to the public, but it is still contingent on having a mobile device, having internet, and having the knowledge that something like that is out there. There's always going to be barriers, and we try to try to do what we can.

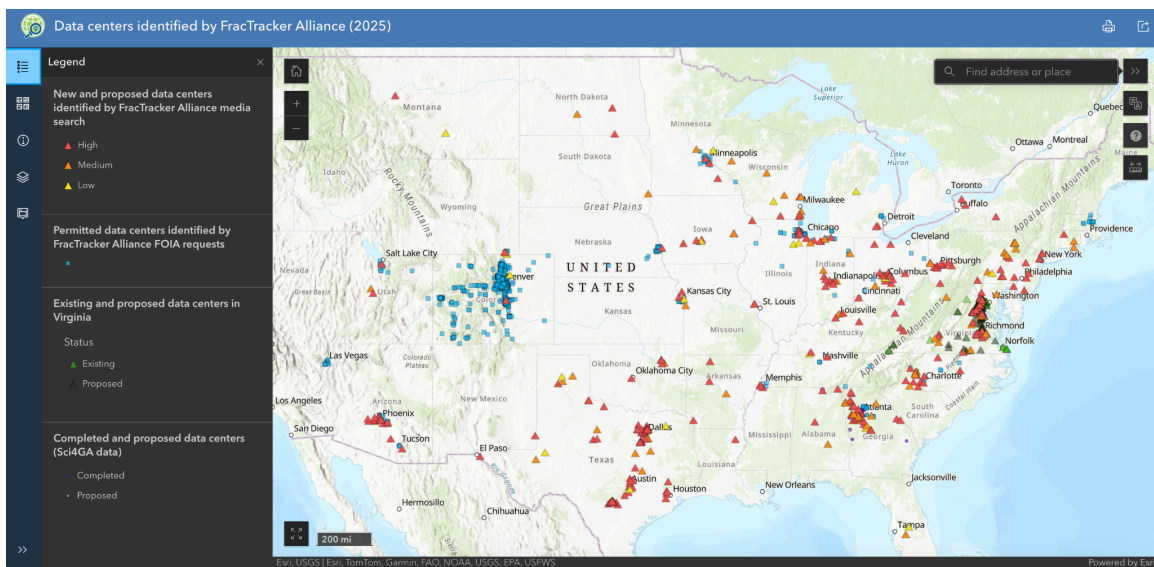


Figure 4: Screenshot of the Data Center Map ([Data Centers Identified](#))

Sean: *Returning to the earlier topic about the data center map: when creating this map, did you have a certain goal in mind for how communities could use it? Was there a target audience?*

Karen: No, because these things are going on in rural communities, 20-30 miles from the largest cities. They're going right across from schools and housing developments. These types of things can impact in proximity to

where people live, anywhere. There's a bigger issue about the energy draw and how that may impact everywhere in the country, about decisions about how energy is created, produced, and allocated that affect everybody. There's getting to be a deeper awareness of the water issues and how much this may deplete aquifers in places that are not next to a river or a great lake. Cooling is a real issue when you're running that many computers, and there is a drawdown of the water table that may also impact people's health and well-being, as well as water access. It's sort of a multi-headed concern. So I don't think that there's any geography in the end to it because there are so many different aspects that can create the hardships.

So showing everything spatially is important. In an article, you need to dig and see: "What was the town? Where are the crossroads? Where does this thing exist?". I often have to look at three or four or five different sources and piece them together to figure out where a site is going in. And sometimes, they're particularly crafty. For example, in southeast Arizona, as hard as you look, it's impossible to find a specific part of the town within 1000 acres of where sites are going in. It's what takes a lot of the time, and why cross-referencing my sources is always something that's just part of the work.

Sean: *What hopes do you have for the data center map? How do you see it developing in the next few months or years as you work on the project?*

Karen: Empowering communities to push back is one goal of it. Creating a national discussion about energy and water use and what our priorities need to be with the changing climate, in particular, is another really big overarching goal. This is an ongoing discussion for everyone. It is a personal one, about what role we want AI to have in our lives, and when too much is too much. The ironic part of it is, I know that as I'm doing Google searches for these data centers, I'm using AI to do that. So it's, you know, the catch-22, and the irony is not lost on me as I'm doing this. It's an ethical question, as much as it is a scientific question.

Sean: *One fun question that we like to end on is, what are you currently reading, watching, or listening to?*

Karen: So much stuff, I can't even begin to answer that. Honestly, I'm doing a lot of work, when I'm not working on FracTracker stuff, on indigenous language revitalization, which has nothing to do with data. I'm also a garlic farmer.

P.S. from Karen, sent by email

Also, another thing I forgot to mention, since my head has been so in the data center mapping world is that for the past 8 years, I've been mapping new and proposed oil and gas pipelines, with a great attention to accuracy, sometimes using as many as 500 industry alignment sheets. By contrast, the federal version of the pipelines from EIA looks like a box of "[Pick Up Sticks](#)" was tossed on the floor (link because I bet this possibly a generational thing you might not have played), and those are the very generalized routes. After I map the pipeline—usually at the request of community groups impacted by it, I do a mapped version of an environmental assessment... looking at impacts based on populated places (schools, hospitals, etc.) and also natural features like waterbodies. Sometimes I'll generate a mailing list of the properties that are within a set blast or evacuation zone of the route, and then that list will be used for direct mail by the frontline organizers. Sometimes it's just to mobilize awareness, other times to get the stakeholders to come to [FERC hearings](#). In the past 2 years, FracTracker has teamed up with the [Environmental Integrity Project](#) to develop [Oil and Gas Watch](#).

Here's an example of one of my community organizing maps, this one for the [DeLa Pipeline](#) in Texas.