Using Satellite Imagery for Data Center and Land Use Tracking
Webinar
February 24, 2026

TRANSCRIPT BEGINS

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Hi, folks. Welcome. We'll get started in a minute.

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Welcome. Welcome, folks. Thank you for joining today's training using satellite imagery for data center and land use tracking.

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Next slide, please. If you have audio problems, you can attend the webinar by phone.

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listed here. All participants will be muted during the webinar. If you have any questions for our panelists, you may enter them in the Q&A box at the bottom of your screen.

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The webinar is being recorded and will be shared after the event. Members of the press may be joining today's webinar.

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Next slide, please. My name is Sophie Loeb, and I'm a policy analyst at the Center for Progressive Reform. Welcome.

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The webinar will introduce attendees to an open source pipeline to acquire, export, and process satellite images, as well as some case studies that showcase the potential for this approach.

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The webinar will also serve as a training opportunity, providing an overview of the basic concepts and opportunities these tools enable. We aim for this to be a starting point in satellite imagery and GIS applications.

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Panelists will introduce the audience to what satellite imagery is, explain the necessary steps for constructing a pipeline to acquire images and use them to create other visual outputs, and walk attendees through some relevant case studies where these resources show their real value. Thanks again for joining us today, and I'd like to introduce our two leading voices here.

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Thank you, Sophie. Thank you so much. Thank you, everyone, for being here.

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Here today, we're going to try to answer the question, at least on the surface on why we could be using satellite imagery and GIS for data center monitoring.

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And just to show you, showcase a couple of tools that are relevant and that could be useful for folks working in this space.

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So what is stellate imagery? So satellite imagery is basically images of the earth taking from satellites that come together to create visual representations of the Earth.

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and provide new perspectives on climate, geography, and human structures.

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Critically, these representations cannot be obtained from cameras at ground level, and that's why they are so valuable.

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By using satellites, we can track the physical environment, water, air, land, vegetation, and the changing human footprint across the globe.

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So in that sense, we can use satellite images to measure, to identify, and to track human activity.

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But what are the advantages for us working in this space? So we are interested in two key advantages that satellites provide for us. One of them is accessibility, and the other one is the rate of update in the data.

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So in this webinar, I will show you some tools that are free and open source, which really shows that we can lower the barrier, we can lower the entry barriers to working on satellite imagery and GIS. In those cases that I will be using tools that are proprietary or that are not free and open source, I will.

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also mention what options are there for you to rely on that don't require any sort of licensing.

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Another advantage that we'd like to highlight is the rate of updates, or how often we get new images for each point we are interested in. Sentinel-2 satellites, which are the satellites that we will be using, and the pipelines that rely on.

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The pipelines that we have developed rely on Sentinel-2 satellites. Those are part of the European Union's Copernicus program and provide systematic coverage of the Earth.

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Uh, every 5 days. So the rate of update is really, really good.

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So how do we acquire this data? All we need is actually a way to connect the computer, your personal computer, to a satellite.

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And the way… the way to do it is, or at least one way that we want to show you how to do it, is via a combination of Google Earth Engine, Python, and R. And it's in R where you will be inputting the parameters of interest, such as your coordinates and the desired resolution of your images.

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to make things easier, really, really easy. We have decided to avoid any sort of coding in the Earth Engine itself, and rather just use the API to acquire those images.

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You will see that once you run the 1st part of the code in R, which initializes and authenticates your credentials to connect to the Google Earth Engine API. But you will be redirected to a sign in Google page automatically.

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So this is the first caveat. If you don't have a Google Earth account, you will need to sign up and register.

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What you will do before doing anything else is to… is go to the Google Earth Engine website, click Get Started, and sign in with your Google account. You will see here, for example, that next to choose your account, that's my work.

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account, which is a Google account. So I did… I used that account, that email account, to register a new project. And this is what you will need to do. You will register a new cloud project, and this is where you will choose what type of license.

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unit. Us, and I would guess many of the folks who joined us today will qualify for a non-commercial or research slash learning license. So that's a good resource to have. So for us being a nonprofit, we were able to select this type of.

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license and I suspect that many of the folks joining us today will do too.

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Once you sign in with your account, you will need to provide cool earth engine access to your Google account, and you will be prompted to generate a token to copy paste into our.

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and connect to the API. After clicking Generate Token, you will see this.

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So at the bottom, you will see that says authorization code. You will copy this code into R.

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You will hit enter. And if everything goes well, and it should, you will see this.

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Basically, this is a snippet of the R console that says that you were able to authenticate your Google Drive credentials, that you were able to, um… Verify your Google Earth account, and you have a valid Python path.

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So that's what we want to see. So what we have done is develop a pipeline in R.

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that allows users to export high-resolution Sentinel-2 tiles. And when I say tiles, I basically mean a square, an image, um… For two time periods for a given center using Rg.

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These sentinel tiles, these images are high resolution. They have a resolution of 10 meters, which is it's really, really good. And what… This allows users to do is basically to download images and export both locally and directly to Google Drive.

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depending on their preference. And to make things even easier for folks who want to use these tools, we have split the code into 3 different scripts.

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The first one includes all the necessary core functions for the download.

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The second one is a processing pipeline that connects to Google Earth, creates the box, the tile, and downloads the image.

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And then a third script, which is the one that I suspect folks will interact with the most, and it's a definition of key parameters for download, including the dates, the county that you're interested in, the coordinates of the center point that you want to download.

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and some other temporal information. So once you're faced with this R script, basically, there are a few key steps that you need to follow.

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You initialize your RG. which includes the interactive authentication, which is those steps that I mentioned a minute ago, with all the tiny screens.

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you define your key parameters of interest. Basically, you need to tell the computer where to look at, how big the tile needs to be, some temporal information, and where to store data.

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and then run. or county tile, which is the name of the function that actually processes all these commands.

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We have coded this in a way that is intuitive, or that we hope it's intuitive for folks, and that allows a high degree of flexibility.

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So, when you go there to import your parameters, you will be able to choose county, those coordinates, the size of the box that you want to create to download, that's in kilometers, the resolution.

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and some other temporal parameters that will determine how the data is acquired.

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and processed. So I will now switch my screen, and I want you guys to take a look at how at the script itself, and a few more things that.

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you will be able to do once we have those outputs created.

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So I have just stopped sharing my screen. And I will restart.

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Right now, and oops.

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Sorry about that. Okay. Now we start the screen sharing.

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There we go. And now folks should be able to see my R code.

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So I will walk you very briefly over the building blocks of this very short script.

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And you should… you should be able to… get a primer on what are the building blocks and how to use it. So… The first building block is initializing RG and authenticating.

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Once you run, you will install your packages, and once you run the authenticate.

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R will automatically prompt you to a new tab in your browser.

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And you will be led to the Google Earth Engine website to.

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get the token that you will then copy-paste here, and you will able to initialize RGE.

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Once you have done that. The second building block is configuring those parameters of interest. So here we have the county FIPS code, which is that 5-digit number that each county or county equivalent area in the US has.

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Then we have our center coordinates. This is the coordinate pair that sits at the middle of your tile, of your… of the image that you will be downloading. So you have a square image, and if you do… if you take both diagonals of that square, the intersection of those diagonals, that's the center coordinate point.

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That ideally should be sort of at the center of the project that you're interested in looking at.

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We have the side of the box in kilometers. This, for example, this command creates a 6 kilometer by 6 kilometer box.

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We have the scale in meters. and some other important, um… some other important variables that define where you want to store your your information, the bands that you want to download, and how to name it.

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Our building block number 3 relates to functions. So, as I said earlier, we have created a pipe. We have created. We have split the entire pipeline into 3 different files, a really short, intuitive one, which is this one that is easy to manipulate.

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And it's not really that long. And then we have a second one with core functions and a third one which implements the full pipeline.

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So you will source these 2, and then we have created another optional function that changes how the images are blended together. And.

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create a final image that you will download. This is not necessary, but it's a it's a good way to improve.

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the final form of the data that you download, especially if you're worried about high cloud coverage, which is something that happens a lot.

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And finally, our final building block is this one which is chunk of code basically runs the pipeline using the parameters that you have already defined.

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I will not run the pipeline right now, because we it takes about 3 to 5 min each time, and we're going to be looking at 2 case studies.

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That adds up to 6 to 10 minutes, and we don't have 6 to 10 minutes in the webinar. Um, so… We're going to move on to seeing what happens when you do actually run the code, what happens.

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Next. Once you run the code and you download your images, the script will create one folder.

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For each application. Each time you run the code, you will get a folder that will contain 4 files.

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you will see 2 tiff images. Those are the rasters that are created by.

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the from from extracting the satellite images and then other 2 files which are the metadata. And these 2 are super important, too, because they provide a lot of geo-referenced information that we need for the next.

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steps. So… Once we have these data, what can we do?

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Okay, we're going to grab them, and we're going to drag them and drop them into our GIS.

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Software. Take a second, it will load. you will see here that I am working… with.

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ArcGIS Pro. If you don't have access to ArcGIS Pro, if you, for whatever reason, don't want to use ArcGIS Pro, the same functions, the same tasks can be achieved with QGIS, which is open source.

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And free. So, if you don't have access to this software, there is an alternative.

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So we brought in our images. And by dragging and dropping, they are automatically geo referenced, and that is great.

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because now we have information about the land cover of our area of entrance.

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I want us to look at two specific tools for this webinar. Again, this is just an introduction.

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There, this is an entire field. So what I want to show today is basically 2 very easy to use, very intuitive tools.

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that, once combined with other forms of data, they become really powerful, and they are basic building blocks for more complex applications. So.

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The 2 cases that I want to talk about are a case in which we have very little information about a potential project, about a future project.

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where all the information that we really have is an outline of where the project boundaries are.

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And a second case in which we have more information, and in fact, we have a rendering of all the.

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organization of buildings and impervious surfaces and landscaping where we can actually see it.

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We can see in space how all those structures are distributed. Those are 2 radically different case scenarios, because they provide radically different amounts of information.

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So the first one has to do with the outline.

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So I was able to find.

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in a trade magazine. a very, very basic, very pared down.

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outline of one of the projects that we will be looking at.

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This project, the Amazon Web Service data center in Richmond County in North Carolina.

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And we can see here that we see an outline.

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But this is this is nothing. This is just an image. We cannot do anything with this. So we need to find a way to actually extract this boundary information to be able to use it, manipulate it.

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The way to do this is by creating a new feature layer.

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To create a new feature layer, we are going to go to our.

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geodatabase here on the right side of the screen, we're going to right-click it.

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Hit new. and create a new feature class.

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We're going to name it. are going to give it a very intuitive name.

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And we're going to store this as a polygon feature class. And this is important because we need to draw those polynomials.

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Once we have done this. And they have a… I may already have a layer defined like this.

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Once we have done this, we're going to create this feature layer that will appear.

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here. So I created earlier today. a new feature layer called… data center footprint. It's the same type.

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a feature layer and it allows us to do a very important thing, which is once we create it.

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We're going to be able to edit it. by creating new.

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polygons. So once we create our feature layer. We're going to click.

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We're going to select edit, create. Polygon.

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It's very important that you have your… your editable layer selected. And once we have selected this, we can actually trace.

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those polygons, those outlines. and create a new layer that we can then edit, manipulate, and intersect with other.

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sources of information. You need to do this.

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With care, you need to zoom in and do it really carefully.

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And it's something that you can do on your own. So once we have done this.

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what we're gonna have… It's a it's a polygon layer.

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that matches the information that we have, right? And once we have this.

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We can actually intersect it with other sources of information, like our, for example, the National Land Cover Database here.

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We can also… overimpose it to other source of information like transmission, electrical transmission information. And be able to derive inferences that go beyond this very basic outline.

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That we just created. This is example number one. Example number 2 is.

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and those or apply to those cases in which we actually have more information, such as renderings of future.

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land uses. So in this case.

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We were able to find an actual proposal. We're in a new data center.

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Um, which is the Kingsborough. net zero data center also in North Carolina. And for this one we actually were able to mine more information about it.

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Uh, this is a case study that Rania will address in much more detail later.

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But if we look at this. We can see that we actually have.

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A rendering of how this project is meant to in a way affect the landscape.

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And remember, this is all about using simple tools to extract information and basically magnify or maximize the information available and how we can use it later. So… When we think about this particular data center, we have a few important pieces of information at our disposal. We have the address, right? We have an address that is very easy to find.

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So we know where this place will be located, or at least in the ballpark where this place will be located.

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We also, if we look here at the right-hand side of the rendering.

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We can see that it says US Highway 64.

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And on the opposite side. We can see here that this is another property line. So we know that.

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This US 64 and this other property line are sitting at an angle.

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And we have an address, so that's 2 pieces of information.

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Another important piece of information is here at the bottom. This is the scale. So we know that for each.

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millimeter, centimeter. that each side of this rendering has. That means a given number of feet or meters.

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So we know how big these sides are. We know the dimensions of this data center, of this project.

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And finally, we have what appears to be a stream, a creek, a river, something here. So.

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In that way, every time we add more information, we're constraining those degrees of freedom, and we can actually start to to realize where this specific.

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place is located in space. Now, how is this helpful?

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So the second technique that I want to introduce you to today is something called.

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georeferencing, or more colloquially rubber sheeting. So imagine that this image is a rubber sheet and you start stretching it to match the underlying shape of whatever it's enveloping, right? It's a similar idea.

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So once we have these geographic queues, we can go back to our Gis software.

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We can find… A better… base map that shows more information.

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and… We're going to zoom to layer.

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So the reason why we zoom to layer is because this.

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is another one of those tiles that we can download using the script.

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and… If we zoom in and we look at the underlying map.

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Here. Okay, we knew that based on the address of this of this project that put the the data center somewhere around here. In fact, I think.

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I think the address is… is somewhere around here. If you can see my cursor there on on the highway, I think the address was around there. But we don't know if it's… On top, at the bottom, we have no idea. But we also knew that this Highway 64 and this property line here at the bottom.

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Those were at an angle. So so we can use that as a cue as well.

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We had this property line. We also, if you remember, we had a scale at the bottom that basically gave us a conversion between the drawing and the actual and the actual distance. So we can measure that.

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to make sure that these sides, for example, would be consistent with the rendering.

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And finally, with all those cues in mind, we also had.

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an image that resembles some sort of creek or watercourse, right? And we have that water course running.

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right here. So what can we do with that? Well, we will take the image from those.

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from those, uh, that proposal, that project proposal. And we're going to take a point there that we are fairly confident of, for example, this corner right here, or this corner right here, and use it as the first anchor to georeference.

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our image. So… We take the rendering. We go to imagery. And we go to georeference.

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Right. Once we go to georeference and again, this is something that I did earlier today to stretch out that canvas. But this pair of points right here.

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Right up here is the first point that I use to anchor this image.

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Once you have that, imagine that you are staking.

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the footprint of a tent. Once you have a corner, you can stretch it out all that you want, but one corner will remain fixed. So that's that needs to be your best guess of where this place is located.

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And then you start adding points to stretch out that canvas to match the underlying geographical features. To do that you will add a control point.

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You will pick the point on the canvas that you want to stretch out, and then the point.

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on the map that you want to keep stretching out until you have.

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a result that for… that is consistent, that it makes sense, and that gives you the best possible approximation to the actual.

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footprint of these… of these places. Given how scarce the information is.

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Sometimes an approximation is the most useful and most important 1st step.

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Once we have that, again, we can track those outlines, those footprints, and… We can start manipulating this and intersecting it with.

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other important information.

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So… Once we have those outputs, both the satellite images.

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And… these other layers that we can edit, that we can manipulate. What can we do?

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I want to talk about 3 very concrete actions that we can take.

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Now that we know how to redraw those footprints and reposition and modify.

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available renderings. We will continue focusing on the state of North Carolina and we will be looking at three very.

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Very important actions or tasks that we can take.

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So the 1st thing that we can do with these tools is detecting change.

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What does change detection actually mean? So I will show you 2 pictures here, or 2 images. And I wanted to pay attention to those red circles that you see there. The first picture, the one that you're seeing here is from November 2024.

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This is for the Amazon Web Service Energy Way.

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And this, the second image, the one to the right, is for November 2025.

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Here, we can clearly see the impact on land cover and the rate of change when it comes to this specific project.

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So when we think about detecting change. We are basically trying to understand how something, say, tree cover, is replaced by something else.

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And that sounds very basic, but it's a very important idea.

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Here, what was at some point tree cover is now likely barren or disturbed soil, which will later become something else, buildings, parking lots in impervious services, grass, landscaping.

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These changes are very important, because they have. Literal downstream effects.

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Now, these tools, for example, this allow us to monitor, measure, and track how these projects impact the land.

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Another very important application has to do with communication. And in particular with communicating the scale of these projects.

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I am a fairly spatially oriented individual. I like to think spatial.

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But if I hear that a new development is 100 acres, 150 acres in size.

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I don't really know what that means. I know conceptually what it means.

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But I don't really have a benchmark against which to compare it.

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and I would be willing to bet that that's also the case for many members of the public and advocates that hear about these developments for the first time.

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So how can we communicate the magnitude of these projects in a way that is easy to grasp?

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What are those cues that are readily available and that we can use to show the scale?

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I think we can do better than football fields. So we can take, for example, our georeferenced satellite images and our polygon layers.

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and use other geographical features that people may already be familiar with that are not.

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football fields, especially those people living in the vicinity of the developments.

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So, for example, what if instead of football fields, we used the nearest town?

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And so the scale of these projects. in a completely different perspective.

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This project is not… 150 acres. It's not whatever the equivalent is in football fields. It is half of your town.

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So that puts the things differently. And finally, the true power of these tools really shines when we can combine all the different layers to estimate impacts and other information that is not readily available. And sadly, this tends to be the norm.

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As we know, the impact of these projects can be huge.

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And there are so many of these impacts that tend to go unnoticed, or that are not disclosed.

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So if we can build models. If we can build representations of these complex relationships.

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We can estimate some of these impacts. So if we can combine information of the proposed land use project boundaries, land cover socioeconomic data, etc. We can say something about all these additional costs.

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that are part of the data center development. That also must be considered, but rarely are.

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So, for example, we can inform policy in terms of habitat degradation, tree and forest cover laws, increased runoff, water depletion and its impact on water supplies at different levels.

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greenhouse gas emissions and our pollution, etc. So this is the next logical step. And it is something that we will continue working on.

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In the near future. So with this, I will pass it back.

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to Sophie. So she can introduce our next speaker. I will stop sharing, and Sophie.

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Take the mic back.

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Thanks, Fede. That was super informative. I just also want to give folks a chance to introduce themselves in the chat. I skipped over that at the beginning. So if you want to tell us where you're zooming in from, we'd love to hear from you.

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And without further ado, I will pass this over to Rania to give us some case studies out of North Carolina. Over to you.

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Thank you so much. Let me start sharing my screen.

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And here we go. Thank you so much for the invitation. Thank you for the time. Thank you for all of you who are attending this this webinar.

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So let's see how we can actually use satellite images for ongoing data center fights. My name is Raniel Masri. I'm co-director of the North Carolina Environmental Justice Network, and Loma Kennedy, our communications manager, did extensive research in presenting the information and the images that you see next.

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communities that that we are organizing with in North Carolina have raised a number of concerns regarding the impacts of data centers. Of course, water pollution and consumption, we're very familiar with, because data centers consume vast amounts of water for cooling systems, which constrain.

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Local water supplies and potentially introduce thermal pollution or treatment-related contaminants into nearby water sources.

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Data centers also contribute to air pollution, both indirectly and directly.

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But in addition to all that, data centers have significant environmental impacts, including massive continuous energy consumption, persistent noise pollution, increased runoff and flooding from impervious surfaces, loss and fragmentation of natural and agricultural land.

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And intensified urban heat island effects, all while a vast majority of states in the United States, 36 states to be exact, including North Carolina, offer data center sales and usage tax exemptions.

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In many areas of North Carolina, these are all cumulative impacts on already deliberately disenfranchised communities.

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Today, we are only addressing impacts that relate to water, air, and energy.

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This map shows the location of the 17 proposed data centers, and the location of the three withdrawn proposals as far as we know.

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You can also see three areas, Gates County in the east, Chatham County in central North Carolina, and the town of Canton and Haywood County in the west, all of which very recently passed a one-year moratorium on data centers.

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Please note that the count that we're providing in this map includes data center sites, also problematically called campuses, as one point because they have the same address. So each site that you see might have up to five buildings.

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It's also very important to point out that the popular data center mapping websites may not be fully accurate. We ran into numerous errors in reporting on those websites. For example, the same data center site is noted several times. So we strongly recommend that every state does its own data collection.

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In this presentation, we're going to be sharing data that is relevant to two North Carolina communities with whom NCEJN is actively working. The compelling and reliable data that we are sharing is available on county and national websites. So we start with the new Hill Data Center.

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This is proposed by the Nutelli Investments LLC, and it's our first case study. It's in southwest Wake County in central North Carolina, and is about a third of the way down the Cape Fear River basin.

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So in the case of water pollution and consumption, anything that happens here will impact a lot of communities downstream of this facility. The proposed site is between Harris Lake and Jordan Lake, and in close proximity to the Sharon Harris nuclear power plant.

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The site is 189 acres and is bisected in blue right in the middle. It's bisected by Thomas Creek, which is a Class C Creek. In other words, its waters are protected for aquatic life, wildlife, recreation, and agriculture.

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The image on the left here shows the current state of the property. It's been a farm for more than 200 years. The image on the right is the proposed design rendering. You can see the exaggerated tree sizes in these renderings, which is a common tactic.

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Used by developers to create this idealized, lush, finished look that does not match the immediate reality of a project. These buildings will be, at the very least, an aesthetic eyesore for decades, but I wish that's the only problem.

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Look at here. They are proposing four 200,000 square feet buildings. In other words, 800,000 square feet of buildings, or if you prefer metric, more than 74,000 square meters just of buildings.

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So I know Fide says, let's not use football fields, but for you athletes out there, that's three and a half football fields, or for someone like me that I don't know size, I know how long it takes me

to walk, that's 30 minutes walking just to walk around the perimeter of the buildings, 30 minutes.

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That's a very large size. The yellow illustration down below shows the scale of the building compared to mature lovelolly pine trees. If you look up in North Carolina, you can see the majesty of these trees. The loblolly pine trees here.

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Take 20 to 30 years to grow to that height. So we are talking about data center buildings that are as high as mature loblolly pine trees. You can also see an average human family right below. So just to understand how huge.

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These data center buildings would be. Well, what about energy? They are energy hungry. The energy requirement for this 300 megawatt facility is approximately equal to the energy use of 200,000 North Carolina homes running continuously.

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That is the energy use of approximately 400,000 people.

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As a reference, the Sharon Harris Nuclear Power Plant produces a net electrical output of 928 megawatts. So, in essence, this data center would take up a third of the output of the nuclear power plant, or a very large coal plant at full capacity.

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Now, let's remember, recently Duke Energy announced plans to build more natural gas-fired generation capacity, and to consider nuclear power, all while delaying the retirement of some coal-fired facilities.

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According to Duke Energy's load forecast and its 2025 Carolinas Resource Plan, data centers will account for 80% of Duke Energy's projected energy demand, 80%.

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These energy requirements directly impact human health. As you can see here, data centers produce air pollution in different ways, either from generators that more often than not run continuously, and from evaporated water that very likely has bacteria or PFAS.

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This data center proposed in New Hill will use diesel-burning generators, which will emit carbon dioxide, nitrogen oxides, particulate matter with a diameter of 2.5 micrometers or less, and benzene, which is a carcinogen.

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All these will have detrimental effects on the respiratory system and the brain, causing cognitive decline and neurodegenerative conditions such as Alzheimer's and Parkinson's.

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Reports have told us that by 2030, that's in 4 years, air pollution from data centers in the United States alone could cause an additional 600,000 asthma cases.

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annually. That's an estimated 1,300 premature deaths. So that's energy. Well, what about water?

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The new health data center is definitely water thirsty. For the past 5 years. North Carolina has been experiencing alarming drought conditions. Currently, as of last week, 97 of the state's 100 counties are in drought. Wake County, like 71 other counties in North Carolina, is in severe drought. It's in that orange color.

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In the past 5 years, Wake County has experienced abnormally dry to severe drought conditions. You can see Wake County, it's the border surrounded by black.

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Now, the average household in Wake County consumes approximately 250 gallons of water a day. This data center wants to consume 1 million gallons of water a day. But in reality, in the summertime, when we consider the increased cooling that it will need.

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That could increase to 3 million gallons of water a day. So, in very simple math, does Wake County have enough water to support this data center?

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Water comes from Jordan Lake, and current percent allocation data is not clear. That's already inadequate information right there. Some reports say that 100% of Jordan Lakes water is already allocated. Others say it's 91%.

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Either way, the data is clear that the lake will not be able to sustain the increasing population alone because the drought is directly affecting the elevation of the reservoir. This graph tells us that Jordan Lake is 6.5 feet below what it was in August of last year.

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6.5 feet for a very large lake is a huge volume. This is further evidence of drought, further evidence that our water supply levels are not stable. And let us remember that when the water gets low, more chemicals are dumped into the water due to algal blooms, further impacting human and ecological health.

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The second case study we have is the Kingsborough Net Zero campus that Dr. Fide also talked about. This is proposed by energy storage solution. The energy storage solution wanted to put it in Tarborough, the city of Tarborough rejected it. So then it came to to Edgecombe County.

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Both those projects would be in the Tar River Pamlico watershed. So the proposed site is located in the Kingsborough Select mega site. We don't even know the full size of this site.

Some claim 120 acres, other reports say 300 acres. So imagine that basic bit of information is not yet available.

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What we do know is that Walnut Creek runs through part of it, and Walnut Creek is a water supply 4, which means it's a source of water that could be used for drinking or food purposes when a water source 1, 2, or 3 classification is not feasible.

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And we know that Walnut Creek is still protected for recreation and aquatic life.

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And if you look at this diagram. The developers proposing what they call a net zero greenwashing project. The developer claims they will use a cogeneration and carbon sponge, their words, not mine, clean energy system to capture 130% of the carbon dioxide and other emissions.

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as a, quote, green sequestration system. The community doesn't buy it, the science doesn't buy it, and the community has additional concerns. Can the developer, for example, guarantee the continuous supply of natural gas?

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This very sad graphic here shows four data centers and a lot of other infrastructure that raises issues about flooding and other problematics. So, let's look at energy.

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The energy requirement for this 900 megawatt facility is 3 times that of the new hillside.

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That's approximately equal to the energy use of 600,000 North Carolina homes, or 1 million people.

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It's equal to the total continuous output of a single large nuclear reactor or a major coal-fired power plant.

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This is huge. What's going to be the impact on human health?

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Another difference from the previous case study is that this one will be using so-called natural gas.

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A fossil fuel composed primarily of methane. Methane, as we know, is more potent greenhouse gas than carbon dioxide, and much more combustible. Right now, North Carolina simply does not have enough pipes and facilities for it, which means more drilling.

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More pipelines, and more damage and risks to the environment and communities. As we all know, the byproduct of using methane and their impact on human health is very similar to that of diesel byproducts, and we know that they're also very intense water consumers.

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And where is this happening in Edgecombe County, a heavily agricultural county. You can see it encircled in black.

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Agriculture in that county is vital for its local economy, and the data shows that this county has had more instances of severe drought over the past five years than Wake County.

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Now, the developer claims that they will only need 500,000 gallons per day, but research is showing us that data centers of this scale actually use up to 5 million gallons of water per day, 5 million gallons.

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Per day is quite significant. The entire city of Rocky Mount, the largest city in this county, uses 1 million gallons of water.

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This is simply unsustainable, and will cause problems, particularly as the climate crisis accelerates for an already impacted community. Let us remember, Edgecombe County is an environmental justice community, and according to the 2022 census.

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Almost a quarter of the Edgecombe County residents live below the poverty line, which is much higher than the state or national average of poverty.

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What about water? Kingsburg community relies on the city of Rocky Mount to provide its water, and this water is pumped from the Tar River to two treatment plants.

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This culturally significant river called the Tau by the Tuscarora people, is already impacted by industry, development, and of course drought.

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Now, this story is a bit complicated because of multiple variables, and we still have numerous questions. We know that Rocky Mount supplies water to Nash and Edgecombe County. We know that the town of Tarboro also takes its water from the Tar River. We know that we've got multiple treatment plans for multiple municipalities.

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Both providing water to industrial and domestic usage from the same river. We also have agricultural operations pumping water directly out of the Tar River. Is this volume taking into account when calculating capacity of the river to provide water?

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We simply do not know if the water is enough.

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So here we raise the question of what is the precautionary principle here? Do we welcome an industry when we don't know if the water will be enough?

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What happens when the river is low, and the data center is running a 5 million gallons of water per day? Who will end up getting the water?

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And even though the plants have the permits to take that much water, here I'm referring to the wastewater treatment facilities, water protector operations are very… water protector organizations, sorry, water protector organizations are very much against this.

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So, simply put, how will the city sustain itself with such a consumptive industry?

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It doesn't seem that it can. So, what we suggest for you all is be prepared to dig deep for reliable data, and the reliable data makes our cases very strong to call for moratoriums for data centers.

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You can get a copy of this slideshow, and if you want to keep up with EJ News events and critical analyses, please do subscribe to our newsletter. Please note, there are links to every source of data at the bottom of some of these slides.

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In addition to huge thanks to Luma Kennedy for all her extensive work on this presentation. We also want to extend thanks to Bill Dam and Katie Zimmerman for their guidance and support in the information.

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Back to you, Sophie.

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Thank you so much, Rania. And we'll now have time for Q&A. So we have a couple questions here in the chat.

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One says, can we send out the slideshow to our people and organizations?

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Yes, absolutely, yes.

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I'm just going to go with yes. Yes, and that's part of the next question of can you? Are you going to be able to share your scripts and material?

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Yes, absolutely. What we have done is create a GitHub repo and the three scripts that I that I introduced are in there and also a README file that explains, describes the code and explains everything in more detail. But everything will be shared after the webinar.

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Excellent. Thank you. And this might be for Rania. Fyi data center coalition is going to commissioners in my state and telling them environmentalists are overestimating water use by data centers.

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Providing no evidence of their claims and fighting transparency legislation.

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We do know that data center developers are presenting a lot of false information. So I want to stress again the importance of presenting the data as we know it, and not to trust what the developers are saying, but rather to talk with the Water Quality Commissioners in your community.

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To talk to other scientists in the state, and if in doubt, to raise questions. So when we do have the information we present it, but when the information isn't available, the industry shouldn't get the permit, right? It shouldn't be rezoned if we don't have the information.

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So both of these become important issues for us to be raising.

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Thanks, Rania. I have another question here. I think this for FedEx. Can you please talk a bit about what is the exact indication or information from the GIS output to detect water depletion or pollution?

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Um, yes, I can definitely speak to that, but I want to see the question again. Exact indication or information from the JS output to detect what depletion or pollution. So… There is no, with the information that we have, there is no yet indication.

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that what are the depletion or pollution is already happening. What we can do due to the conditions in which these things are proposed, usually.

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which is with very little information how the environmental impacts will play out in the future associated to land use change and water use, what we can do is try to estimate those impacts, right? So we can create models to sort of bring all these variables together and try to estimate within a range of possible values what is the expected impact in terms of water depletion?

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and pollution and greater environmental impacts of these developments. Again, within a number.

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a confidence level. And that will allow us to say something of the potential and expected impacts. Now, if for whatever reason, developers disagree with our estimations, well, this is also an incentive for them to be transparent.

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with their own estimations and provide their methods, and provide their assumptions, which is absolutely key to understand how things will affect the environment in the future. So that's.

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My perhaps no so satisfactory answer, but it's my answer.

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Thank you so much. I think we've gotten through all the Q&A questions, but I just wanted to pause for a moment, make sure we didn't miss any.

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or folks had anything else they'd like to ask.

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Um, do you see the open source GIS information being of more use to policy and activist groups? How can individuals make use of these tools, or is there some level of interpretation needed?

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Oh, that's a great question. I hope that the the use increases. One of our motivations was to try to lower the entry barrier to these tools like clearly because these tools are open source and free.

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The inter-barrier is not directly financial. But nonetheless, there's a huge.

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a huge entry barrier that comes from other sources. Time, expertise, uh, etc, etc, etc. So we try to.

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lower that infrared in some way by creating these pipelines that are self-contained, by using software that is not.

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that you don't have to pay for, and other resources that are free and open source. I think that.

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There is an opportunity there, and there's a gap. And I hope.

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This is in in a way an excuse for folks to explore it and and reach out to us if you're interested.

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But I hope they become more and more useful because the information out there is vast and the tools are incredible. Just need to use them.

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Thank you. There's some other questions related to any assessments, water, environmental, economic.

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done prior to data centers arriving in communities, and then also, is there a good tracker of U.S. Data center development available?

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Um, we haven't found one good tracker. I would suggest check them all, and then double check with the details with folks on the ground. So use it as one tool, but don't depend on it 100%, but I haven't found a fully reliable.

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Um, data center impact, you know, data center website out there. And what was the other question, Sophie?

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I think, um, actually, Luma just answered it. So I think we're set on that one.

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I think we have time for maybe these last 2 here. Just pulling the images through R and connecting to the satellite allow you to get more updated images. And if you just went on Google Earth and looked on the platform, because those images seem to only be updated every few months.

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Yeah, this is an awesome question. It's something that I didn't get the chance to answer… that I didn't think about while I was doing my presentation. Google Earth and Google Maps gets gets updated every few months, and depending on where you live and where you are, the rate of updates, it's a little bit different.

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The advantage that we presented, the advantage of the method that we presented is that the Sentinel 2 satellites, which are the ones that we used those update every point on the surface of Earth every five days.

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So you can get updated information at a rate that just cannot be matched by Google Maps.

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Uh, so that's the advantage. Let me see if I'm… If I updated images.

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Yeah, that's the advantage. That's actually why we decided to follow that path.

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Thanks, Fede. And the last question. Are you aware of any efforts to create a data center impact index map or more quantitative approach beyond case studies and anecdotal information?

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Uh, oh yeah, we would… we would love to do that.

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I'm laughing because, yes, the three of us would love to do that basically. So that was a great sum up. Yeah.

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Yeah.

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Absolutely. Yeah, we are very aware of many, many efforts happening simultaneously, for sure.

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But could could I add on that that what's needed is also a cumulative impact assessment. So we cannot be looking at data data centers as an industry in and of itself, because in a lot of in a lot of places, these data centers are coming to rural communities that have already been burdened by other industries.

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So, yes, this is an ongoing need as we need to be building these cumulative impact assessments, these data center impact assessments, all while we continue with the information we have in fighting to pass moratoriums in our communities.

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Thank you so much. And with that I'd like to just thank our presenters again for their wonderful expertise and time today. And as of course, as we mentioned, we'll send all the links and resources out via email, including any resources that were dropped in the chat. And if you have any follow up questions or comments, please feel free to email myself, Fede or Rania. We'd be glad to hear from you.

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And the emails will also be in that recording and some of email.

00:59:05.000 --> 00:59:15.000
Thank you so much. Thank you for being here today. And thanks for joining us.

TRANSCRIPT ENDS