UC GIS Week
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4 PM – 4:30 PM
California Tree Species Range Atlas Workshop

Speakers:

- How to use the California tree species range map atlas | Speaker: Clancy McConnell, Jason Whitney, and James Thorne - UC Davis | Pg. 1 | Video Timestamp: 00:00:31.670

Maggie Tarmey, Moderator: Hello, everybody! Welcome to our final session of our first day of UCGIS Week. If you were here this morning, you will see a familiar face in Clancy McConnell, and Clancy and his team are going to do a workshop session for us on the California Tree Species Range Atlas.

Maggie Tarmey, Moderator: I'm really excited for this, we got a sneak peek of it this morning in the presentation, and clancy, take it away.

How to use the California tree species range map atlas

Speaker: Clancy McConnell

Abstract:

In GIS Week 2024, we presented the construction of updated range maps for all of California's tree species, including data sources, GIS methods, and biogeographical concepts. This is the first time in over 50 years that comprehensive tree species range maps have been made for California. In the last year, we have completed nearly every new range map and have established most of the technical and social infrastructure required to disseminate them. We have also begun using the maps to assess each species' place-based climate exposure, fire risk, and seed supply/demand. At this year's GIS Week, we will show attendees how to view, download, and use the range maps in a website, mobile apps (FieldMaps, Avenza), ArcGIS Online, and ArcGIS Pro. We will also share examples of how these maps are already being applied in various research and reforestation projects.

Transcript: Video Timestamp: 00:00:31.670

Clancy Robert McConnell: Thank you, Maggie. I know it's, like, end of the day, people are getting tired. I, I have, I have a little treat.

Clancy Robert McConnell: This is one of our, lab mascots here, my dog, Opie. So, anyway...

Clancy Robert McConnell: Face is getting blurred out, but...

Clancy Robert McConnell: That's your reward for coming to the Range Map Workshop, 4pm.

Clancy Robert McConnell: Anyway, yeah, there's another one around here somewhere, but she's hiding.

Clancy Robert McConnell: So, welcome to the workshop. It's gonna be a little bit of a follow-along.

Clancy Robert McConnell: like our presentation this morning, it's a round two. The last year, we presented the methods for building this range map atlas. We're not done yet, but last year we gave you an idea of

Clancy Robert McConnell: the nitty-gritty of building all these maps. This time, I'm going to show you how we're deploying those maps.

Clancy Robert McConnell: And a website, ArcGIS Online, and ArcGIS Field Maps.

Clancy Robert McConnell: There are some other ways that we're using the maps as well in research. We'll get a little bit of an intro of that in a few minutes.

Clancy Robert McConnell: And my colleague Jason, who has built our website and really helped deploy all of these data out, will be joining us as well, and he'll give you a tour of the website itself. So, now, without further ado, I will give you a little background on...

Clancy Robert McConnell: There we go, looks like I'm screen sharing on...

Clancy Robert McConnell: kind of what this is all about. So, before we start, as I'm talking, I totally don't mind, actually be helpful for the last 15 minutes to talk if you were to... if you want to follow along.

Clancy Robert McConnell: Go to your phone, go to the Play Store, the Apple Store, download ArcGIS Field Maps. This is if you have an institutional login, like a UC login. Download ArcGIS Field Maps. Log in if you can. If you can't, that's okay, I'll show you how later.

Clancy Robert McConnell: Open ArcGIS Pro, you don't have to do any of this. Well, you can just watch if you want. Open ArcGIS Pro and make sure you're logged in.

Clancy Robert McConnell: And then also log into ArcGIS Online. So those are your three homework tasks, because I'm kind of giving you some background on this.

Clancy Robert McConnell: We built these range maps for all 100-ish California native tree species.

Clancy Robert McConnell: Starting with the Griffin and Critchfield map series, and this was state-of-the-art 50 years ago, and it's actually still being used as sort of the go-to source for range maps in the state of California.

Clancy Robert McConnell: In fact, there was a book that was just published this year, can't remember the name of it. It just came out a couple months ago, that still is using the Griffin and Critchfield maps as the range maps for tree species.

Clancy Robert McConnell: But we've come up with better range maps, so we scanned, geo-referenced, and digitized this, and actually, our amazing team of undergraduates did most of that work.

Clancy Robert McConnell: this is an old slide, we've since collected more data, we've compiled millions, over 6 million records beyond just the Griffin and Critchfield map, so it's the largest...

Clancy Robert McConnell: distribution... largest data set of tree species distribution ever compiled in the state of California. We have a lot of amazing partners. We actually have over 100 collaborators between agencies and private research individuals that have contributed to this, so it's a big, big effort.

Clancy Robert McConnell: Just as compiled point data, that gives you an idea for one tree species alone.

Clancy Robert McConnell: how much data goes into this. These are just points. We also have polygons, we have the Griffin and Critchfield, we have another medium-scale vegetation map, there's a lot that goes into it. We merge all of that together in our projects.

Clancy Robert McConnell: grid format. In our case, that's 90 meter cells, because it aligns with our climate data, which we have a whole bunch of other research going on. Merge all that data together and clip it out.

Clancy Robert McConnell: Actually, today, right now in the lab, we have two awesome undergraduate analysts working on these maps using this exact process. So this is literally live, we're making this live.

Clancy Robert McConnell: These new maps are a lot better than what existed before. You know, old range maps, shown on the left, the kind of dark gray, so there's a light gray that's the state of California, the dark gray being the old range map for Redwood, and then the black being the new range map that we made.

Clancy Robert McConnell: So, the gray... the dark gray does kind of a good job of showing you where you might find redwood, but the outline in black says, no, this is actually where we have

Clancy Robert McConnell: actual fine-scale vegetation mapping, or points, or plots of redwood. So it does a much better job of telling you where there actually is a tree, rather than where there might be a tree.

Clancy Robert McConnell: So, what are some uses of this? You think, well, it's nice to just make a map, but every map has some purpose.

Clancy Robert McConnell: These have a lot of purposes, and right here in the lab, we're using them to do climate exposure analysis over different time periods, up to 2100, to inform reforestation strategies.

Clancy Robert McConnell: The old map on the left climate exposure compared to the new map on the right climate exposure gives you an idea that just, you know, because this is sampling 100,000 points out of this map.

Clancy Robert McConnell: it really makes a big difference having a better map, because that will affect the climate exposure and the distribution, as there's a normal distribution of those values across space. So that affects the climate exposure.

Clancy Robert McConnell: also affects the landscape genomics. We're partnering with a couple people to study redwood, scrub oak, some other species, and how they're...

Clancy Robert McConnell: genetic variability across the range is tied to climate, different climate variables, perhaps hydrological variables, salinity, metals, that sort of thing. And we're able to do that now because we have a great range map, and we have great climate data to go along with it.

Clancy Robert McConnell: This was a starting slide for our talk this morning. We're using the range maps to do

Clancy Robert McConnell: To inform reforestation through this big, complex prioritization framework that's helping reforest California, under Climate Adaptive Strategies.

Clancy Robert McConnell: partnering with CAL FIRE, they have this, cool thing called the Assessment of Need, and that tells them how much

Clancy Robert McConnell: they need to reforest every single seed zone elevation band in the state with each species. You can see on the right here, each species,

Clancy Robert McConnell: how many bushels they have in the seed bank for that. Well, we're able to tell them exactly how much range is in every seed zone elevation band. They can come up with really much better metrics by seed zone elevation band if they have a really good range map, because they haven't had one yet.

Clancy Robert McConnell: We're also informing cone collection on the ground, where people actually go collect it.

Clancy Robert McConnell: And that's kind of the end of my intro, and let's see, is Jason here?

Clancy Robert McConnell: Lisa Whitney.

Clancy Robert McConnell: You might have had trouble getting on the call, I know he was traveling. Well, that's okay, I can share with you,

Clancy Robert McConnell: the... the cone scouting tool range map. So this is where you can follow along just on your web browser, or you can just,

Clancy Robert McConnell: You can just watch.

Clancy Robert McConnell: If you like.

Clancy Robert McConnell: Okay, looks like I'm screen sharing.

Clancy Robert McConnell: So...

Clancy Robert McConnell: This morning, you saw the range maps, and those form the basis of the risk maps. We gave you a tour of the risk maps, you can look at those, and if there's time later, we can go over questions, because I know this morning in the presentation, there weren't times for questions there.

Clancy Robert McConnell: So, on the range map page, Jason showed a little bit of this this morning, right now, I just have, Redfur, Abees Magnifica, highlighted. You can search from the dropdown here on the left. Right now, it's sorted by genus.

Clancy Robert McConnell: We're not sure yet how we want to be able to group these species, and we might have other metrics, or sorry, other groupings in the future where you could, say, look at all of the conifers, or look at all of the hardworts, or look at all of the riparians, which don't necessarily neatly fit into genuses and that sort of thing.

Clancy Robert McConnell: So it will turn off red fur, turn on white fur,

Clancy Robert McConnell: You can... you can clear these, add all... add an entire genus.

Clancy Robert McConnell: Clear all... let's see, let's look at all the oaks. Everyone likes to look at oaks. California's famous for oaks. So here are the 10 oaks that we've finished so far. We have a few others we're working on.

Clancy Robert McConnell: So you zoom in, it takes a second to load this. It's probably taking... we have this on a basic

Clancy Robert McConnell: A basic server right now, so the website might be a little bit slow to load.

Clancy Robert McConnell: And if you click on a spot on the map, it'll show you which 3 species can be found at that location.

Clancy Robert McConnell: Super handy if you want to actually go find that location. Let's say you're an ecologist doing field work, and you need to find places where all three species can be found. This is a really great resource for that. You know, you want to find an exact vegetation type with

Clancy Robert McConnell: So you need to... you need to study black oak and lower montane hardwood

Clancy Robert McConnell: can use this to search for that, find directions to that location. And this also does give a link to the CAST tool. That's also... we also have that linked in our risk maps, and the CAST tool just is another reforestation

Clancy Robert McConnell: tool.

Clancy Robert McConnell: In the upper right, you can change the basemap. It's very similar to... Arcgis, or...

Clancy Robert McConnell: other GIS applications, so depending on what your use case is.

Clancy Robert McConnell: Maybe you need to know where there are protected lands.

Clancy Robert McConnell: can use, the hybrid National Geographic aerial imagery, anyway.

Clancy Robert McConnell: We're trying to, you know, add new features, so if you see something on here that you'd like to suggest, please send it my way, and we can try to add it.

Clancy Robert McConnell: Are there any questions on the, on the website?

Amy Work: Clancy, this is Amy, and I just have a question of, like, I'm trying to follow along, and there's a little bit of a lag, but I'm only seeing two species, I think, in my selective species. Is that...

Amy Work: Maybe I'm not in the right space.

Clancy Robert McConnell: Oh, yes, so on the, on the top.

Clancy Robert McConnell: there are 3 tabs. There's an About Risk Map and Range Map. Go to the Range Map tab.

Amy Work: Okay, thank you.

Clancy Robert McConnell: Yes. Yes.

Clancy Robert McConnell: Yeah, the Risk Map tab only has two, demo species right now. We're in the process of putting all of those through our triage workflow. So, soon, you'll see most of the species on Risk Map that are on the Range Map tab.

Clancy Robert McConnell: Yeah, there's a little bit of a lag, because right now, as we build the website, we don't have a server designed for large demo sessions like this. It will work, it'll eventually load, it's just... it's a little bit lagging right now.

Clancy Robert McConnell: Alright.

Clancy Robert McConnell: Well, it's pretty straightforward. If there are no questions here, we can move on to where you can find the range maps elsewhere.

Clancy Robert McConnell: Alright, well, the next thing that I'll show you is in ArcGIS Pro.

Clancy Robert McConnell: So if you have...

Clancy Robert McConnell: if you have ArcGIS Pro, I know some of you may not, everyone in the UC has institutional access to ArcGIS Pro.

Clancy Robert McConnell: You don't have to have institutional access, though. If you have any access to ArcGIS Pro, you can find our range maps on there, and I'll show you, it's really easy.

Clancy Robert McConnell: Right now, the range maps are not available for direct download, they're really just for view only. You can use them for navigating in the field, that sort of thing, but because we haven't yet published the data in a...

Clancy Robert McConnell: you know, Dryad repository, that sort of thing. Nothing is yet available for download.

Clancy Robert McConnell: Okay, so now I'll share you my ArcGIS Pro.

Clancy Robert McConnell: Okay, so, pardon all of my junk I have going on over here. This was the...

Clancy Robert McConnell: section Jason Jason is going to be presenting, so...

Clancy Robert McConnell: Over on the catalog pane on the right.

Clancy Robert McConnell: over here, there are 4 different tabs at the top. You'll see Project, which is where

Clancy Robert McConnell: Almost all of the work is done in ArcGIS Pro and all the data, but there's another tab called Portal.

Clancy Robert McConnell: So if you click on the Portal tab.

Clancy Robert McConnell: There are a whole bunch of options here at the top.

Clancy Robert McConnell: Some of you might use these quite a bit. If you have institutional data sets, they're sort of shared between

Clancy Robert McConnell: Many different users, and you're all working on them at the same time.

Clancy Robert McConnell: But many of you also, especially in Intro to GIS, like LDA 150 here at UC Davis, or other similar courses at other UCs.

Clancy Robert McConnell: you pull in data from the Living Atlas, which is pretty much ArcGIS Online's, you know, portal with all the public datasets that you can use, some of which are downloadable, some of which you can edit, some of which are just view-only.

Clancy Robert McConnell: So let's go over to the cloud that's the most plain-looking of these, called ArcGIS Online.

Clancy Robert McConnell: So it's just the The cloud without any other symbols on it.

Clancy Robert McConnell: And...

Clancy Robert McConnell: type in... let's see, anyone want to suggest... well, you know what, actually, no, we don't have all the species yet up, so I'll just pick a species for us.

Clancy Robert McConnell: So you type in incense cedar.

Clancy Robert McConnell: See if this'll pull it up.

Clancy Robert McConnell: Yep, here it is.

Clancy Robert McConnell: Alright, so all of our data sets are organized with the same naming scheme.

Clancy Robert McConnell: So... This Calisidris Decurrens, Incense Cedar Range Raster K27, that's how you know it's ours.

Clancy Robert McConnell: It's got the scientific name.

Clancy Robert McConnell: Calisidris Decurrens, incense cedar, which is the common name.

Clancy Robert McConnell: it... we have in there range raster. We've got two different types. We've got range raster and range vector. Raster is the one that you'll usually want to use because it's... it,

Clancy Robert McConnell: That's its native format, is raster.

Clancy Robert McConnell: And then it's also got the USDA plant code, so that's how you know that it's one of the range maps that we just built. And so you can drag and drop this right onto your map.

Clancy Robert McConnell: And there it is.

Clancy Robert McConnell: There's our range map and, our 90 meter pixel format.

Clancy Robert McConnell: Takes a second to load once it's on there.

Clancy Robert McConnell: Unfortunately, you'll see if you go over to the contents pane on the left, you can't change the symbology of these layers. It's one of the downsides to the way that everything is set up in ArcGIS Online. If you're using a hosted feature layer, or a hosted vector... sorry.

Clancy Robert McConnell: raster layer, tile layer, they're called, you can't change the symbology from someone else's layer. So that, in that case, you would have to download the range maps, which will be coming in a few months, or go to our

website, where you can easily change the symbology and the transparency of the range maps to suit your use case.

Clancy Robert McConnell: But if you just wanted the range map.

Clancy Robert McConnell: In this black and white format, just for viewing purposes.

Clancy Robert McConnell: You know, black is a great color to use on maps, because you can use it with colorblind folks. It goes, you know, has really nice contrast, so you can have a light-colored base layer, so if you needed to display a single range, it's at least good for that, and it's good for comparing to other data sets.

Clancy Robert McConnell: So that's how you would add a range map, just right now on ArcGIS Pro to your project for, you know, viewing purposes or building a map layout, that kind of thing.

Clancy Robert McConnell: Are there any questions on the ArcGIS Pro portion before we move on?

Clancy Robert McConnell: If you... oh, yeah, Nick.

Maggie Tarmey, Moderator: Nick, you're muted. I do see... oh, you don't have a mic. I'll read Nick's question out loud from the chat. Nick says they see a, quote, tile layer and a, quote, tile package version in the search results. What is the difference between the two?

Clancy Robert McConnell: Yeah, good question.

Clancy Robert McConnell: I don't fully understand the way that ArcGIS Online works with these packages. The tile layer is the one that I added.

Clancy Robert McConnell: I would recommend going with, you know, if you're gonna use these maps in ArcGIS Online, you have really just the two options that I would recommend. The one that says Tile Layer.

Clancy Robert McConnell: Or the one that says Feature Layer.

Clancy Robert McConnell: feature layer is the vectorized version of this raster range map. And that's...

Clancy Robert McConnell: It's, you know, it's okay, it's... you're gonna see it has some, like, blurring, and some of the, like, pixels get compressed in weird ways,

just because that's, you know, in the conversion of a really high-resolution data set like this, you'll get kind of weird issues. So, between the two, I would recommend the tile layer over the feature layer, but you can use either one of those.

Clancy Robert McConnell: And if you want a list of which species we have published in ArcGIS Online, you can reference

Clancy Robert McConnell: That from our website, from the cone scouting tool.

Clancy Robert McConnell: Which I realized I should put in the chat for you.

Clancy Robert McConnell: You can also just search for it by typing in the cone scouting tool, and it will come up.

Clancy Robert McConnell: Okay, in the interest of time, I think we should move on.

Clancy Robert McConnell: Okay, let's see, what... we're gonna do ArcGIS Online next.

Clancy Robert McConnell: And don't worry, because this is recorded, you can come back and follow along later if you get a little bit behind.

Clancy Robert McConnell: So if you want to... and I'm gonna set you up with ArcGIS Online, because... well, some of you make story maps, first of all, and you can use hosted feature layers from elsewhere in... if you're making a story map, or maybe you're working on a group class project or something like that, and want to use a range map.

Clancy Robert McConnell: This will help you with that, but more importantly, doing this is going to set you up to use our range maps in the field on field maps. So if you want the

Clancy Robert McConnell: you know, to use our range maps on your phone, you'll have to understand this next step. So, you go to ArcGIS Online, you're signed in.

Clancy Robert McConnell: You'll go to the map, Tab on the top.

Clancy Robert McConnell: And once you've opened a map like this, you'll... it's really simple, you just click the Add button to add a layer.

Clancy Robert McConnell: And this... this next step is important. When... when you're... before you search for something, you have to click right here at the top. It's... its default is My Content. You want to go down to ArcGIS Online.

Clancy Robert McConnell: So very similar to ArcGIS Pro, you need to make sure you're searching in the right place for the data that you want. So, make sure it's set to ArcGIS Online, and let's type that same one in.

Clancy Robert McConnell: Incense Cedar... oh, and there it is. Incense Cedar...

Clancy Robert McConnell: This one says range vectored, that's not the one we want.

Clancy Robert McConnell: Want... Scroll down, see if we can find it.

Clancy Robert McConnell: Well, that's okay, we can add it... we can add it here.

Clancy Robert McConnell: Doesn't make a big difference.

Clancy Robert McConnell: Might take a second to load.

Clancy Robert McConnell: There we go. Well, there's the... the raster version is down here, the tile layer. So I've added the tile layer to the map. There it is.

Clancy Robert McConnell: Now, let's say you want to view this on your phone.

Clancy Robert McConnell: Next... it's very... it's super simple, you just... you have to go over to Save.

Clancy Robert McConnell: The save button is on the left, it does not look like a save button.

Clancy Robert McConnell: So it's all the way on the left, there's a vertical menu bar. You go down to the one that says Save and Open, so click Save As.

Clancy Robert McConnell: And then you have to add a title to it.

Clancy Robert McConnell: Oh, we'll just call this...

Clancy Robert McConnell: Let's just add a title to it.

Clancy Robert McConnell: Save.

Clancy Robert McConnell: And once this is saved, you can come back to this map anytime, you can add as many as you want.

Clancy Robert McConnell: Remember, you can't change the symbology of the...

Clancy Robert McConnell: of the maps on here. So you can add a whole bunch of maps, but when you open it in ArcGIS Online or on your phone, you just have the one black color for now.

Clancy Robert McConnell: So, now that we're done with this section of ArcGIS and Line, we're going to pivot, so hopefully those of you who want to follow all the way along and through have downloaded Field Maps on your phone.

Clancy Robert McConnell: Are there any questions on this portion before we go to field maps?

Clancy Robert McConnell: Alright, good.

Clancy Robert McConnell: Okay, so just to clarify, now we're done with the computer, hopefully you've got your phone ready and in front of you, and don't worry, I've taken screenshots already, we're ready to go. So...

Clancy Robert McConnell: When you open Field Maps, you gotta sign in, and it's very similar to signing into ArcGIS elsewhere with the UC. You do your Kerberos login, type in the name of your institution, and then you're logged in.

Clancy Robert McConnell: So I'll give you a second just to do that, because there's not a... there's not a whole lot.

Clancy Robert McConnell: Again, once you've opened it.

Clancy Robert McConnell: Alright, so once...

Clancy Robert McConnell: Once you've logged in and you've made and saved a map for ArcGIS Online, you're gonna see this screen.

Clancy Robert McConnell: when you open up. It's not going to look exactly like this. It depends on which maps you've made in ArcGIS Online, if any. I've made a whole bunch. Obviously, these were some of my testing maps, symbolizing things in different ways. But here's the current map that I made.

Clancy Robert McConnell: I favorited this so it pops up at the top, and this is one I made yesterday.

Clancy Robert McConnell: So, you'll see that pop up only once you've saved your map in ArcGIS Online. And in order for it to show up, usually you'll have to, like.

Clancy Robert McConnell: You know, you save your map, you'll have to...

Clancy Robert McConnell: open field maps after you've saved the map in ArcGIS Online. If it doesn't show up, just close the app and reopen it, because it takes a second to refresh.

Clancy Robert McConnell: So once you... once you've done that, tap on that map at the top, and then it will open up that range map

Clancy Robert McConnell: in its entirety, filling most of the screen. And Field Maps is designed

Clancy Robert McConnell: primarily for data collection. There's this, map functionality called Markup.

Clancy Robert McConnell: So it's kind of like, you know, ArcGIS has

Clancy Robert McConnell: not ArcGIS, sorry, Esri has a number of different data collection products for smartphone use. And the primary one is called Survey123, which is...

Clancy Robert McConnell: Very, very, very bad at visualizing information.

Clancy Robert McConnell: I mean, just terrible. But it's really good at collecting lots of attributes about a thing that you see in the field.

Clancy Robert McConnell: field maps is more for visualizing data and navigating in the field, and it's not so good at collecting data compared to Survey123. So, that's just the way that Esri has developed it. Survey123 is for

Clancy Robert McConnell: Really good for high, you know, high precision, lots of attribute data collection, and field maps is more for navigating, and you can still collect data with it.

Clancy Robert McConnell: So you can zoom in and out on the map, you know, I encourage you to explore and kind of figure out how field maps work, because if

you go do field research, more and more ecologists and geographers are using apps like this out in the field instead of

Clancy Robert McConnell: Tablets or data collection, it can all be done on the smartphone.

Clancy Robert McConnell: You can change the base map, visualize things in different ways, measure. This one has personal markup. There are ways that you can change markup and which fields that you want available. You can do... you can actually also find maps on ArcGIS Online, existing maps, that people have already set up

Clancy Robert McConnell: the data collection fields. So, like, you can type in tree data collection into ArcGIS Online and search for maps that people have made, and there's a template that they've already built for collecting tree height, the species, diameter, breast height, that sort of thing.

Clancy Robert McConnell: And once you've saved a copy of that map to your profile, and you can open it in ArcGIS, it's got all of those attributes that you can collect in the field very easily, instead of having to set up your own system, if you just kind of want to experiment. But you can add any layers you want, like our species range map. So let's say you want to contribute to this Range Map Atlas project, which we encourage.

Clancy Robert McConnell: You could go and add something like Valley Oak.

Clancy Robert McConnell: And put that map in there, in that tree location map, and go collect data out in the field to see where the map shows it is, and then if you find new specimens in the native range.

Clancy Robert McConnell: You know, send them our way.

Clancy Robert McConnell: I think I have a few more things on here. Yeah, the way that you can turn layers on and off is in this little symbol at the top that I've circled in red there. That pretty much opens the contents.

Clancy Robert McConnell: And, you know, it's kind of rough. It's not... it's got a lot of functionality in the phone.

Clancy Robert McConnell: If you want to reorder the layers, you have to do that in the ArcGIS Online map first.

Clancy Robert McConnell: and then open it on the phone, and that will reorder your layers. You can't reorder them on the app.

Clancy Robert McConnell: This personal markup just has real basic functionality, but you can do more by learning more about the ArcGIS Field Maps markup from, you know, a tutorial page, something like that.

Clancy Robert McConnell: Alright, any questions there?

Maggie Tarmey, Moderator: We have a question in the chat from Mike Mahoney, asking, how will you be updating these range maps with new observations over time?

Clancy Robert McConnell: Yes, yes, excellent question. We... We are getting new data.

Clancy Robert McConnell: All the time. It's pretty much every few weeks now that new data rolls in.

Clancy Robert McConnell: It depends a little bit on the context. Right now, as we're still building the Atlas.

Clancy Robert McConnell: the goal is, before we update maps, the goal is to get the Atlas finished.

Clancy Robert McConnell: Then, once it's finished, there will be a plan for, are we doing annual updates? Are they going to be every other year, every 5 years?

Clancy Robert McConnell: How often are we going to do this? It isn't that difficult to update one map.

Clancy Robert McConnell: With one or two or three, you know, or with a few data sources.

Clancy Robert McConnell: But to systematically update all of the range maps in the collection with a large data source.

Clancy Robert McConnell: is kind of difficult. You know, you... we have a system, once we've merged all these datasets together, they get combined into tables, and

then sorted, and we search them in Python, and then that gets split out by species. It gets quite complicated, and if we have to do that for every dataset that comes in.

Clancy Robert McConnell: it becomes a bit of a chore. So, to answer the... long answer your question.

Clancy Robert McConnell: likely our long-term solution is going to be setting up a system, a partnership with one of the state agencies that has long-term funding to host the Atlas.

Clancy Robert McConnell: and also provide support for us to vet the data sources as they come in, make sure that they're... they follow, you know, their appropriate standards, and then once we view the data, it's a very long process to view the data as it comes in in ArcGIS and make sure it's all corroborated, it fits within the range as we know it.

Clancy Robert McConnell: So that we'll set up a system for us to vet that data, and then probably do periodic updates. I don't yet know how often that will be, but it will be at a rate where... I mean, these maps are going to be the best that have been made for California tree species, so it'll be a good product to start with.

Clancy Robert McConnell: But as they're updated.

Clancy Robert McConnell: I would say, you know, every few years would probably be reasonable to expect updates for at least the major species, the, you know, the common and dominant, and especially the timberland species.

Maggie Tarmey, Moderator: Thanks for that, Clancy, and I want to note, we are coming up on, time as well, if you would like to, wrap up soon.

Clancy Robert McConnell: No.

Clancy Robert McConnell: Yeah, I don't have more content, so it's really just up to if anyone

Clancy Robert McConnell: has, questions or anything like that, I'm here, I'm happy to... Help.

Clancy Robert McConnell: point you in the right direction. We love collaborating with folks. We have a lot of people collaborating on research projects, applied forestry.

Clancy Robert McConnell: We've gotten a lot of our best data from one-off sources, so...

Clancy Robert McConnell: In fact, actually, just today, I got an email about... let's see, it's in the Dateline UC Davis.

Clancy Robert McConnell: about Hugh Safford's hunt for these Jeffrey Pines at, you know, some of the highest peaks in the state. We've got that data set, it's in our Range Map Atlas, it's on our website.

Clancy Robert McConnell: So...

Maggie Tarmey, Moderator: That's really fantastic to hear, and, you know, that's the type of, community engagement that we're hoping to help support through events like, UCGIS Week, so it's always, always great to hear about things like that.

Maggie Tarmey, Moderator: And I do want to note that we are about at time. I believe, Clancy, your email contact is also available, if folks would like to reach out to you directly. I want to say thank you for taking the time to put this together and share it with us. I know I found it quite easy to follow, which is certainly not the case for many workshops.

Maggie Tarmey, Moderator: I can certainly think of ways to utilize it as well.

Maggie Tarmey, Moderator: And, thank you again. This is our last session of day one of UCGIS Week.

Maggie Tarmey, Moderator: Please check out our schedule and join us both tomorrow and Thursday if you're available for some more excellent GIS presentations, lightning talks, and workshops.

Clancy Robert McConnell: Thank you for hosting, Maggie, and... Thanks, everyone, for showing up!