

Geospatial Learning Pathways Presentation
Montana Oil and Gas Field Mapping Toolbar

by

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This is a Bureau of Land Management Geospatial Learning Pathways Presentation. The Montana Oil and Gas Field Mapping Toolbar is presented by the Montana State Office. This presentation will introduce the functionality found within the oil and gas toolbar. Your presenter is Donna Degner of the Montana State Office.

This is the customized application. It was developed by the Bureau of Land Management and it's to automate the production of oil and gas field maps. It allows the user to access spatial and tabular data that is stored in the oil and gas SDE Geodatabase.

This, that you are seeing on the front of your screen right now is the user's guide. To access the application itself, you would go to the Citrix access platform and go, if you were on the main screen, when you come in, you'll notice it says Oil and Gas applications. Click that folder and it will bring you here. Now you'll notice on mine that I have one called ArcMap for Oil and Gas. I also have one called wells data entry. Most of you will not see the Wells Data Entry because most of you do not have access to this. This is a limited access application and it's just for those that work up in the wells database doing data entry.

The ArcMap for Oil and Gas, if you were to click it, you would get a blank ArcMap document. So, technically, what does that mean? That means that you could start it either by here or if you went to the ArcGIS desktop and clicked on the ArcMap, you would get the same thing. Both cases would bring you into this document. And on this document, you are not seeing a toolbar. There is not one present at this point. If you were to go up to view, view toolbars, it will give you a list of toolbars that are available. From there, you go down this oil and gas, BLM Oil and Gas Mapping Tool Set, version one. If you were to click that, it brings up this toolbar. This toolbar is, right now, floating. If you want, you can dock it anywhere on your map document itself. At this point, you do not have any data available for starting off. This plus sign, what it does, is it adds the oil and gas layers to start off the view.

So, clicking on that will bring up the SDE township layer as well as the SDE state boundaries layer. From here, you would want to zoom into the area where you are trying to make your oil

and gas field map for. I'm going to go over here in this area. And when you zoom in close enough, it starts --- it adds all of this labeling that shows you the Meridian, Township and Range so that you know that you are selecting the correct one.

You use the selection tool; click on it and you go out and you select the tool, or the map, that you want to create. In this case, I'm selecting four townships. You can select up to nine at this point. There has been a request put in to go up to 12. I have selected four townships that I want to build my map for. So now I'm ready to build the maps.

So I go up to this icon that says create oil and gas field map for the selected townships and ranges. Clicking on that, what it asked me is a map title. That map title is not only the title on the map, but it is also the name of the map document that gets created.

I'm going to say ok, and then it wants to know what Field Office I'm building this map for. I am currently sitting in the Miles City Field Office area, so I'm going to say ok. Here, it is asking me what layers I want to add, which layers of the oil and gas field data set. I'm going to click on all of them. And all of these layers, one of them, you have the CA's, which is the CA polygons 'communitization agreements'. You also have communitization agreements line data which is the excess of the polygon area. We also have oil and gas field boundaries. GSA is gas storage agreements. You have the lot information. Mins stands for the mineral leases. PA's are participation areas. UA's are unit agreements. We have well points and well connector lines.

And I'm going to say ok and the first thing it asks me, is how many lines do I want for my well annotation labels. I'm going to say four. This determines how many lines of labels go with each well point. There are the basic four that we use. First line would be, it's the well number; second line, I believe, is the well operator, abbreviated form of the well operator; and the third line, if it is an abandoned well, then it is the plug-back total depth, otherwise it is - line three and four would be for the producing well - would be the producing formation.

Now, there's also asking me if I want to do classified symbology for mineral leases. At this point, the only one that is using this, the only district that is using the classified symbology for mineral leases is Great Falls. So I'm just going to say no. Now you'll notice that it's doing several different things. On the bottom of the screen it will show that it's running through, over here on the lower-left-hand corner. It tells you it's processing the layer, it's currently working the UA's agreement or unit agreements. Over here, on the right-hand side, is a progress bar that shows the progress of this map. The amount of time that it takes to build a map depends on

how many layers you have, how complex the data is, how many townships and ranges you have, that kind of thing. So it could take a little while for this map to go.

Within this toolbar you'll notice that you have a plus sign which is what I use to add the data, the original data, for township area on there, that's what I'm using to build the map. The hammer, we'll go through this in a little bit, allows me to create proposed wells layer by entering the footage called for the wells that are being proposed.

The last one allows me to update the map. I will tell you right now this is being worked on. It is not currently working properly. I would not suggest anybody use this option.

Also, we have a group that is currently working on --- that we meet once a month over the phone with a conference call and we talk about what changes we would like to see within the programming for this and they are being worked on one at a time. They have been prioritized. Let me see if I can find that document for you. Just to show you an idea of what is currently being worked on.

Question: If you wanted to select a township in Miles City and in North Dakota along the border, which office do you select when it asks you?

Donna: Probably the office that you're currently working for.

Shelley: What if you work here?

Donna: I don't know. Probably whichever office you want to says its in.

Shelley: But, I mean, what does that do for you?

Donna: It doesn't do anything except on the map itself, it shows in the title on the map of the location.

Shelley: Oh, okay. I wasn't sure what...

Donna: It's part of the title. I can show you that when this map finishes building. I had this, right before I came here, it was showing. But I don't see it now.

As you can see now, we're up to 27%. It's currently working on the mineral leases. We have lots, land lines, and unitization agreements currently already done. There are set standards already in place for how the symbology works for most of these. I did not pick symbology, the type that said that I could break down my symbology for the oil and gas leases, so you'll notice it just has a single symbol. And as each layer is built, it's added to this Table of Contents. Also, when selecting just the single Township, you have the option of using, making a 1:24,000 map or a page-size map. Otherwise, any other selection that you make as far as any more than one township, it picks the template for you that it will build. And so, they're all large size maps with exception of maybe a one Township map. You can do that one on a page size.

Donna: While this is running, does anybody have any questions?

Speaker 1: Yeah, Donna. You picked the busiest township in the state.

Donna: Yeah, I know. This is the Cedar Creek Anticline.
And it's the one I run all my tests on.

Speaker 1: That's a good one to pick, for sure.

Right now, it's working on wells. It's telling me that it's exporting all of those wells out. What this does is it pulls all of the data out of the SDE database and it clips it into a location for you. So that it becomes a shape file. When you update the map, then it goes back to that SDE database and tries to retain all of the current information and update what is, really, within the SDE database.

Speaker 1: Donna, I do have a question. I was doing a, trying to do an update to one of my current MXEs, using a little bench tool. You know where you update your MXE that you made out of here, and I couldn't, I kept getting an error.

Donna: That's right. I said right up front with this thing was that the update process is not working. It is being worked on and I do not recommend anybody using it because it blows up your whole map.

Okay, now that is has added all of the layers that I have asked for of the oil and gas layers, you'll notice that I have well connectors, I have wells, and there are all of the symbology has been created for them. It now asks me if I want to select any additional layers. What this is, is

this is every layer that's within SDE so it allows the user to select any layers that they want to add to it. Like rivers or transportation; all of the other layers that are available. I am not going to select these and I will warn you that if you select a layer that has a lot of data such as rivers, or transportation, that kind of thing, it's going to take awhile to clip it to that area.

So I'm just going to say okay and go on through. You do not say cancel. Cancel will take you out of the operation completely. If you don't want one, just say ok. Otherwise, go ahead and select one. This one allows the user to select additional raster layers that they would like to show on this. I will tell you that the DRGs 24 & 100k have symbology attached to them. The others, you're kind of on your own. If you select them, it will still clip them, but the symbology will not be set.

Again, I'm not going to select any, I'm just going to say ok. And from now, it's going to start building the actual layout of the map. Right now we just have, we're in the data view and it's going to now create what is called the layout view of the actual map itself that will be printed or plotted.

On the bottom it says, you can see where it says, it's adding annotations. So it always tells you, pretty much, on the bottom what it's currently working on. What annotation is, is it's like all the labeling for the 4-line labels on the well point. Labeling that goes with the oil and gas leases, lots are annotation, land lines, unitization agreements, it's pulling all of those labels and converting them to annotation. The reason that we convert them to annotation is so that when we do the update, if you have moved well label to a different location, it retains that well label location even when you update the map. So that you don't have to move all of your labeling again.

Speaker 2: Donna, is this still syncing or, you know, for example, it says oil and gas lease and you don't actually see any on the map, is it still syncing and waiting to add those in?

Donna: I'm pretty sure that it will, yeah. I mean there's obviously, this is a very busy set of townships and ranges, so, yeah, there's got to be oil and gas leases on them.

Speaker 2: Okay.

I don't think it's finished plotting everything up. It kind of just stopped. It looks like it's got lots on there. Participation areas are on there. Well lines and whatnot, well lines and points are on there. Although, I don't see the points either, I just see the lines.

Now it's being the actual layout. It got through the annotation part and this, like they said, is a very busy map. Of course, we're on a small screen here, so once it's plotted, it's going to look a whole lot different. It's now creating, right now it's setting Arc Hydro Environment and we're kind of checking into whether we need to have that on the Citrix environment or not. It seems to be causing some issues on things. It creates an additional database.

Speaker 1: And I noticed the map is, you know, it's not quite rotated. Didn't we used --- Oh, okay, there it is.

Donna: Yeah, that was one of the recommendations of the group that got together. They wanted the rotation. It is being done programmatically not always does it fall exactly straight as one would hope. So, you know, the program can only do so much. This one came out pretty good. It also tells me the total time that it took to build that map and then I say ok and then it finishes moving the legend where it's supposed to be. It does a couple other things after that.

Now you'll notice this is the map that we have. If you wanted to, you could use the layout toolbar here and zoom in to certain areas to see a little bit better what's going on within the map. You'll notice here, I mean there's a whole lot of well points in here so I'm going to zoom a little bit tighter. And you'll see here are all of your oil and gas leases, the labels here, and then these look like they're CA labels. And these are you line labels for your wells. And you'll notice like right here, this well, these labels over-write each other. So if I take this, oh, I need to be over in the other view, data view, to do that.

So if I zoom in on the data view, I'm going to go back up here where I've got labels over the top of each other. If I use this selection tool and select, you'll notice how it's got that little blue highlighting around it. I can take that label and move it, all three lines of that label, move it the same time. Sometimes it's a little are to tell which label goes to which point, though. I mean that's where oil and gas people come in and know which label goes where.

I can also use the identify tool on that well point right there to find out. In fact, let's go ahead and do that. This one here tells you that it's the Williston Basin Institute which is one of these

WBI labels and it's well No. 428. So, if you go up here and select this guy, that's the one that goes with him, with that well point. So it would take some work the first time you build the map. But that's also the reason that we do them as annotations, so that when you update the map, you don't have to move everything around again. Also, what you see here versus what you might see on your plot, might be different just because of the size and the scaling differences.

I'm going to go back to the full map again, and I'll show you how the proposed wells creation works. I click on the hammer and the first thing it wants me to do is it wants me to give it a name of a file. The other thing to be careful for is that you do not try to save a file to the C-drive. I know you guys have been told this before, but I'm going to reiterate it. You always go to your X-drive to save your files off of the Citrix. And so I'm going to call this well points Props. And then it brings up this form. What I do on this form is I enter my Meridian, Township, and Range information. And then from there I have the option to add, I believe there's eight lines here. I can add up to eight wells at a time on this form.

And so, what I've done here is I've just added one well into Section 1 of Meridian 20, Township 5 North 60 East, which is one of the Townships and Ranges I selected on here. I'm going to say ok. It goes out and it creates that well and then it puts it into that file and then it asks me if I want to add more wells. Let's say I want to add one to Township 5 North. So basically you can do any number, or you can do eight wells at a time for a particular Meridian, Township and Range. For each Township and Range that you do, you're going to have to have a separate form. So we'll put this on also in Section one and about the same location and say ok. And then I'm going to tell it that I don't want to create anymore. And then it asks me if I want to add that shapefile and I'm going to say yes, I want it added.

Now, I'm also going to shut off some of these things so we can see things a little bit better, some of these layers. Because this is a really busy map. And then I'm going to change the color of this proposed wells so that that's larger and different color so it shows up a little better for you. I shut these wells off, too. I think the old ones, the real ones. And if you open this attribute table, you'll see that we have two wells. If a person wanted to add information to this shape file, they could do that just like they do any other table. They could go into options and add fields and put additional information into that attribute table. I'm not seeing the wells themselves, are you? Oh, there they are. They're down here, can you see them back here in the corners? If I zoom in, I'll just zoom into this one location, and there's that well, one of the wells that I created.

Donna: That's pretty much the whole program in a nutshell. Does anybody have any questions?

Speaker 1: If we wanted to adjust the size of the annotation, can we do that?

Donna: If you want to adjust the size the annotation?

Speaker 1: Yeah, like the well labels.

Donna: Yeah, we have a standard, however, and the reasons for this standard is just so that most of the maps look the same. Obviously, for some maps, symbology or whatever the labeling, might be too big just because there are so many wells in one place. So sometimes they do have to adjust.

The other thing I was going to let you guys know, too, was that if you have, you know, if you're working with this and you have some areas that you see are problems or whatever, you maybe need to contact Corinne Walter of Dickinson and she is in charge of this group that oversees what changes and stuff need to be made. That spreadsheet for you that showed what changes are being requested at this time and as they're being worked on, we're marking them off. She can put you on that list or add you to the agenda for the next meeting and we discuss and debate whether to add that as a change or not.

Donna: Any other questions?

Corinne: Could you run one, Donna, maybe just to show them as far as, like, just a single Township and then add one of those other layers in? Like, maybe, transportation or rivers or something?

Donna: We can try one.

Corinne: Okay.

Donna: Hey, we have a request for a specific Range and Townships from within the room. So, we're going to go ahead and go for that. And she just wants the leases to 32 North 20 West.

While that's coming up, let's go over how you print this. If you go into the file page and print set up, you'll notice here that it has a standard size. It says it's a custom, 47 x 35 inches and it's landscape. So, when you got ready to print, you would have to print or pick the plotter that you were going to plot on. I think that's ours here, and then you would need to change this to be a size, a paper size that would fit. And if you look over here in this little box, it shows you --- this is standard ArcMap type stuff that you would be doing. If you have a problem with it, you might get in touch with your GIS specialist in the area to help you a little bit. But you'll also notice when I did that, that it's, it went to landscape as well and it's all sitting right there in that box so that would be the appropriate size. And then you would just say ok and print it.

Still bringing up the ArcMap, first thing that we're going to do when it comes up, is we're going to hit that plus sign to bring in our oil and gas base data, as I call it. So, we're going to hit this plus sign and it's going to bring in the state boundaries and the township theme. And then from there, we're going to look for 32 North 20 West, so I'm assuming we're over in this direction. We may not have that Township and Range available. That could be another issue. The townships have not been developed for all areas. It's only been developed for the oil and gas field map areas. And so, that means that you cannot run the map for that one. Within the next week or two those areas will be added.

Speaker 3: Hey, are we using the GCDB lines for townships and stuff here across the state?

Donna: Yes.

Speaker 3: They are, thanks.

Donna: Okay, so on this one, all I selected was the mineral leases. And Corinne, do you know what layer or whatever layer you want to add to that?

Corinne: Roads.

Donna: Roads? So you go down through this list -- and you will have, so you would go down through this list and you have MSL underbar 24K is feature data set that it's located in, and you select that and you say ok. Now, I will tell you that this is probably a very large layer and it will take a little bit of time to clip it out of there. Although, it looks like it ran fairly quickly. You could also do like the DRG 24K. Do

you want to do that, too? We'll go ahead and do that one, too. That one also might take a little bit of time because it's a raster layer.

Donna: Okay, so now this is the point where you get the opportunity to say I want to make it a page size or I want to do a one to 24K. So I would say ok. I'm just going to go with the larger size and now we're waiting for that Arc Hydro again.

Speaker 4: If I wanted one with the well point, could I get one with just the A1 well point?

Donna : No. It automatically brings in all the well points. You could do a further selection before you printed it, though, that would just shut off the other ones.

Donna: It tells me it did not find any mineral leases for this particular Township and Range and it didn't find any transportation. That's why it was so fast. But it has a DRG. And this is one of them that it looks like it didn't rotate completely correct. You see were to zoom in, you can see the DRG lines a little bit better.

That's pretty much it

<MUSIC>

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