Laboratory Practices in Earth Sciences: Landscape Mapping

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Week- 06
Lecture- 26

Hello everyone. So, in our last lab we have understood that how you can identify the different tectonic geomorphological features with the help of the high resolution Cartosat I Eneck cliff and you can identify those features and now in this today's lab we will explain you that how you can trace or digitize those tectonic geomorphological features and you can prepare a detail map by tracing all those features. So, to trace your geomorphological features first you have to identify those features and once you have identified then you have to trace. So, first thing is that all the features which you are going to trace so these all would be in a vector format. So, I will explain to you about the vector and raster. So, this Eneck cliff image in tip format is a kind of raster image because it is associated with the pixel the unit is the pixel.

So, any image is in the raster format but all the shape files which you are going to generate during the tracing part so that would be the vector file. So, this is just a basic difference between the vector and the raster format. So, to generate the to trace the different features you have to first create a new shape file. So, to create a new shape file as I discussed in an earlier lab, you have to go to the layer panel and on the layer, you would see the create layer and here is the new shape file layer.

So, first I would show you how you can trace all the river systems. So, here you have to if you want to trace the river so you have to give the output directory. So, you just give an output directory and you save your file name. So, suppose I want to trace the river so I have to give the file name as a river. So, you just click the save and here you are from the geometry type because in a normal scenario your river is a linear feature but here we would trace the river manually.

So, in that case you have to create a polygon, but mostly when you are extracting your river or drainage system with the help of the DEMon that case you would get a linear file for the river. But here we are going to trace the river manually for this case we have to create a polygon. So, if we are choosing the line option from the geometry type so in that case you would be able to only trace the linear river in a linear format. But here you can see the river have some width so it would be better if you choose the polygon. So, we would choose the polygon to trace the river.

So, the CRS would be your WGS 84. So, keep one thing you should keep in mind that you always put your vector shape file in a coordinate reference frame in which you map the CRS of your map. So, here the anaclyph is in the WGS 84. So, I would also choose my shape file for the same reference system. So, that is your WGS 84 and EPSG 4326.

So now I have to just click ok and from the layer panel you can see one layer has been added that is your river. So, you can simply go to the properties or you can change the color of the river. So, usually you would see that your river is all blue. So, you can choose the blue color from the given option and you can click ok. So, now you would see that your color has been changed.

So, using your properties panel you can simply change all the colors or you can explore the property panel or you would see that different options are given over there. So, you can explore all those options. So, that is basically associated with your shape file only. So, you would be able to change differently. You would be able to do the modification of different kinds of modification you would be able to do with the help of your symbology or the properties panel. So, here you can see your river panel is added. You click over your river panel and you just enable your layer.

So, to enable you just on click on the toggle editing option and once you have opened your toggle editing option. So, you would be seeing one tracing option you can see over here add polygon features. So, you can simply click on the add polygon options and you can start from one corner of your river because I am going to trace the river. So, you have to start from one corner and you have to finish in another corner. So, for example I would start from there.

So, because this is the polygon, you have to close this polygon. So, you can trace you have to simply click. You have to simply click at the bank of the river. First I would trace the one bank and then I would go to another bank. So, you can simply click. So, I am doing very vaguely, but you can do this with precision because this precision will ultimately give you a beautiful or very precise geomorphological map. You do it very precisely and once you have done with one corner or one bank of river you just cross or you go to the other bank or you trace the other bank of the river.

You zoom in and zoom out of the map you simply scroll your mouse when you are scrolling up it will zoom in your map or when you are scrolling down you will it will zoom out your map. This is just opposite for those who have worked on the ArcGIS on the ArcGIS it is just opposite to the opposite on this QGIS. In ArcGIS when you are scrolling up it will zoom out and when you are scrolling down it will zoom in, but on this QGIS when you are scrolling up it will zoom in or when you are scrolling down it will zoom out.

So, it is just the opposite of ArcGIS. ArcGIS, as I already said in one of our labs , is also a GIS software.

You can use ArcGIS also to digitize your map or you can extract different kinds of information with the help of ArcGIS also, but ArcGIS is a paid software. But this QGIS is a freely available software. You can easily download this software or you can install it on your PC. So, here you can see when you finished with the tracing part you just right click on your mouse and you can assign an ID that is your, that is the random number you can assign any number and now you can see your river has been traced. So, this is the portion of the river which I have traced. You can also continue the unfinished part. You can simply whenever you want to trace the unfinished part. So, to delete your node point, suppose you have marked a node point in another place.

So, if you want to delete this node point you simply just click the back space from your keyboard and here you can see this will delete your node point. So, to delete your node point you can use your keyboard. So, this tracing you have to do very precisely again I am telling you that I am doing very vaguely, but you have to when you are preparing your own map you have to do it very precisely you have to zoom at the at very highest level and then you trace your map because this will give you a very high precision or very beautiful map. If you are doing very vaguely like what I am doing right now this will not this will not generate the accurate map. So, to generate the accurate or precise map you have to do it very precisely for the lab purpose. I am doing it very vaguely, but at last I will show you how we are doing this and how we have prepared the map with this with the help of this anaglyph.

So, I will also show you at the end I will import all the shapefile which I have generated or we are doing in our lab. So, that part I am also going to show you. So, for this exercise I am doing it very fast, but you can use your mouse or you can zoom in your map up to the level at which you can identify the features. So, you zoom it to that level and you trace your map. So, once you finish you just click on the right click and you can assign the ID.

So, here you can see your part of the river tracing has been done. So, similarly you can trace all the rivers which you can see over your map. So, once you are done with the river tracing part. So, another feature then you can identify. So, now I will trace the river terraces.

So, the river terraces are one of the important geomorphological features as I told you this river terraces would give you the information regarding the major climatic or tectonic impact on the area. So, the tracing or identification and tracing of these terraces are very important. So, you just simply trace the different level of terraces as I already discussed in the last lecture that whenever your river is incising or changing its base level a new terrace

will form. So, every terrace is giving you a different set of climatic or tectonic impact on this area. So, you have to first identify the different set of river terraces and then you can trace your terraces.

So, you can zoom in any particular area where you are able to identify the terraces. For example, here I can see that here it is one level of terraces and here it is another level of river terrace. So, you can trace this terrace here. This is another level of terraces. So, the simple way is how you would be able to identify the different levels of terraces. The simple way is that you can use your height perception.

So, based on the height perception you can mark the different levels of terraces. So, this is very layman language. I am explaining to you how you can identify the different levels of terraces. So, the low level of terraces if I start with the t0 so that is your low level or the first level of terraces. So, that you will see at the minimum height or it is just beside the river corner. So, that would be your low level of terraces or the first order of terraces and the as you go upward so you would be able to see the higher order of terraces.

So, for example, the t0 and t1 and t2 or like that. So, here you can see for this river so here you first have to see which one is the lower level of terrace for this area. So, here you can see that this is the lowest level which I can identify in this region. So, this would be your t0 terrace and this one would be your t1 terrace. So, if you are starting with the your nomenclature with the t1 so your t1 would be your lowest level of terrace or and some people are also using the t0 as your lowest level and some people are also using the nomenclature they start as the so they use the highest number from the lowest level of terraces.

For example, in this area if you see that I can identify the five levels of terraces so some people are using t5 as your lowest level of terrace and t0 as your highest number of terraces. So, do not confuse it. You just simply see that based on your height perception you can simply identify the level of terraces or accordingly the sets of rules you are going to follow. You just keep it constant for all your mapping parts of one set of rules you should follow. So, we are basically following the we are basically start doing the mapping from the t0 considering as t0 as our first level of terrace and then the it as it going to the higher order. So, accordingly we are giving the number as t1 t2 and t3. So, here you can see this is my t0 terrace so once you identify your terrace part you just create another layer so you just go to the layer panel create layer and new shape file here you assign a name for your file.

So, here I have assigned the terrace as the name of my file. Here you have to choose the polygon because your terrace is also a polygon shape. So, you choose polygon and then

you keep it WGS 84 and here in the new add field so two things you should keep in mind you can separately trace all your level of terraces for example t0 you can create a separate file for t0 t1 t2 or like that and or you can just simply create a single shape file for the terrace and you add the field. For example, here I can use the attribute table or I can assign the different levels of terraces with the help of this attribute table. So, here suppose I just want to add a new field so that would be the type of the terrace. So, what type of terrace is t0 t1 or t2 so I am going to write it in the text you keep it the length or you simply click on the add field.

So, earlier you can see here you can see only the ID and now you have to choose the add to the field. So, here you would see ID and type this type I have just added as a new field so that your information you would be able to see on the attribute table. So, you simply go to the attribute table where you can see the ID and type two features have been added. So, you enable your layer and you can start your tracing part with the help of a tracing tool. So, you can simply trace the corner of the terrace and so here you can see another river is coming from this area so you just follow the river bank and here you can see this is the t0 terrace.

And once you finish you just simply give the ID number any you can give the random number. So, now in this now here you can see another feature has been added that is your type. So, in this type I told you that this is the t0 terrace so you can simply write the t0. So, that would help you to segregate or differentiate your different levels of terraces within a single shape file. So, once I categorize the terraces as a with the help of adding the new field that is a type.

So, here you can assign the nomenclature for that feature. For this case, this is the t0 terrace so I have written the t0 in the type section. So, here you can click and now you can see that this is the t0 terrace you can similarly you can change the color whatever color you want to choose you go to the properties and from the symbology panel you can simply choose the different what kind of color you want to choose or you want to assign for the this terrace you can simply change from there. So, now similarly you have to identify the t1 terrace so here I can see that this is the one level and another level is this one so this would be my t1 terrace. So, to trace the t1 terrace you simply use your tracing tool or you simply trace the boundary of your t1 terrace. So, here I can see that this is at one level so I would trace this one as a t1 terrace.

So, once you complete your right click and so this is my t1 terrace so I will write it as a t1 terrace. So, here you can see both this terrace is in the same color so in a few minutes I will explain to you how you can segregate or separate the different features or different features with the help of the properties panel. So, this one is another level of terrace so you have to

choose this you have to trace this one also. So, whatever level you are able to identify on your image you first identify and then you start tracing part with the help of your tracing tool. So, once you done you can assign the any random number so this id is it is any random number you can assign any number to this id and this is my t2 terrace third level of terrace so because I start from the t0 so that t0 is my first level of terrace then t1 and then t2 is my third level of terrace.

So, here you can see I have traced the t1 terrace. So, similarly you can trace the multiple levels of terraces on your satellite data. So, on this bank also you can identify that this is the t0 terrace. So, here you can see that this one is my t0 terrace so you simply trace the t0 terrace so and now you name it t0 and this one is my t1 terrace. So, when you are tracing the terraces for both the bank of the river you keep in mind that your t0 terrace or t1 terrace so it should be at the same level.

So, your elevation perception or height perception should be the same for both terraces. For example, my t0 terrace should be at the equal elevation or equal height for both the bank. So, if one bank is so, this one was my t0 terrace for the right bank so my t0 terrace on the left bank should be on a similar height. So, this will give you this type of scenario called the paired terraces. So, in paired terraces both the level for both sides of the river would be at the same height.

So, for example the t0 so t0 should be at the same level and then t1 and then t2. So, similarly so if this type of setup is if you can identify so this would call the paired terraces and if your terraces are at different levels so those that will call you the unpaired terraces. So, in this case you can see this is my t0 terrace and similarly this is also t0 terrace this one is t1 terrace and this one is t1 terrace so this system will call the paired terraces. If I am able to identify the different level of terraces suppose three levels of terraces on the right bank and one level of terraces on the left bank so this will be called the unpaired terrace system. So, once you have traced all you're so this one this one was your t1 terrace so another level you can see this one is your this one is your t2 terrace.

So, you have to again. I am telling you that you have to trace this very precisely to generate the accurate map. So, this is my t2 terrace so I have traced the three levels of terraces from the right bank of the river and three levels of terraces on the left bank of the river. Now I will show you how you can categorize or segregate all your different levels of terraces with the help of one single shape file. So, you just go to the properties panel and here you can see your symbology panel here you would see the single level. So, on the single level you would be able to segregate different shape files with the single layer only.

But when you have added the multiple information in only a single shape file so you can

use the categories file and from this category you can choose which type of field or which type of information you want to put in the categorized format. So, for example I have mentioned my level of terrace information in the type panel so you can choose the type and from here you can choose the color and you have to simply classify and here you would see all the information has been added here. So, here you can see the symbol and the value and legend. So, legends are basically when you are generating your final map so what you want to put in your legend format so that you can see over in the legend format. So, in this fourth panel that is all of the data so these are basically you can remove this one from this minus icon or you can delete.

So, now you can see I have added three terraces and here you would see the information regarding all these three terraces. So, you click on the apply and you would see all the terraces you can see over here. So, if you want to change the color you can simply go to the individual color panel and you can change the color from here. So, whatever color you want to choose you choose your color and you just simply click on okay and then apply.

So, here you can see the color has been changed. Similarly, if I change the color for the T2 terrace you can choose any color from the color panel you click okay and then apply. So, here you would see that your color has been changed. So, similarly you can change all your color you can change all your color with the help of the symbology part and you can use this you can trace all your terraces. So, this terrace I have traced for one particular location and you can use your entire image or you can trace all the terraces from your entire scene or then you go to other features. So, today we will stop here and in the next lecture or next lab I will explain to you the mapping of the geology part or the alluvial fan surface or the alluvial fan surface or the faulting part.

So, how you can identify the different tectonic features and you can trace those tectonic features. So, I will stop here and we will meet in the next lecture. Thank you.