Laboratory Practices in Earth Sciences: Landscape Mapping
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Lecture- 31

Hello everyone. So, in the last lecture or in the last lab we have seen how we can set up our base station and in today's lab we will see how we can connect our base station with our rover station. In the last lab we have installed or we have set up our base station and now we will connect the or we will establish the real time kinematics. So, once your GPS receiver is on , you can see the battery information, the bluetooth information, the card information and the signal information. And this signal this arrow is showing that this receiver is receiving a signal from your base station. In our base station we have seen that this light was blinking, but on this rover, this is this receiver the rover receiver.

So, this receiving signal is blinking. So, this means that it is receiving a signal from your base station or this GPS receiver is working as a rover receiver. So, if this signal is blinking on this rover receiver. So, in that case you have to make it this GPS receiver as your rover station.

Blinking of this light means this one is working as a base station, but you have to keep it as a rover station. So, with this function button you can simply change this base station as a rover station. So, that you can change by using this function k. So, once your GPS is on or it is receiving signal from the base station or it is working as a rover receiver. So, then you have to connect this field controller with your GPS receiver.

In this case it is not connected because this green light is being shown once it is connected with the field controller. One blue light you can see over the bluetooth symbol. Now we will go to the field controller and we will see how we can connect the field controller with the GPS rover. So, this was our last setup here you can see the base setup completed and now we have on our base rover and rover receiver and then we now we have to go to the rover. Here two options have been given: the first is the rover and the other is the base station. You have to keep in mind that the CQ quality coordinate quality is currently 4.

9 meter although this receiver rover receiver has been receiving signal from your base station, but the RTK is not initialized. So, you have to initialize RTK or you have to make a communication between your base station and your rover station. To do that you have to first connect this field controller with your rover station. So, you have to simply click on the rover. So, it will show you that the connection with your base station has been lost and

now   it   will   connect   to   your.

So, now you can see one information pop up: the current sensor is operating as a base. Do you wish to operate it as a rover or you connect with the cable and simply disconnect the cable? This information you can see over your screen and you can click on the S option and this will direct you to your rover menu. So, this is your rover menu and this Bluetooth symbol you can see is not connected at. So, if it is not connecting. So, you have to go to the instrument and connect all other connections and here you can change your Bluetooth ID.

So, to change your Bluetooth ID you have to go to the edit option and here you can see the last used rover was 959 this is the Bluetooth ID for the base station. So, you can search this you can search Bluetooth options and here you can see the Bluetooth ID for the rover receiver is 995. So, we will connect with this receiver. So, you click ok. You wait for some time and it will connect with your receiver and here you can see the Bluetooth signal and   your   satellite   signal.

So, now it is connected this field controller is connected with your rover station. So, your rover station is receiving 15 satellites and 14 to 9 satellites are available to give you a precise location on this globe. So, to mark a position on the earth at least 4 satellites you have to need to mark the precise position on the earth. Here you can see the available satellite which will provide you the correct latitude, longitude and elevation for your desired point. So, here this menu you can see is your rover menu, but this 3 DCQ you can see   is   still   6.

5 meters. So, this error is quite high. You have to minimize this error. You have to keep this GPS receiver in a place where this GPS receiver can receive signals very clearly. So, you have to keep in mind certain things you have to avoid the hindrance while receiving the signals from the vegetation or buildings. So, you try to keep your receiver such a place where your receiver is available to receive maximum signals from the satellite. So, in this case this satellite RTK is not initialized. So, you have to put your receiver in an open space.

So, we will move this little bit and we will see where we can see a good signal from the satellite. Now, here you can see the 3 DCQ that is 0.033 meter. So, this is the centimeter level accuracy which we have achieved while connecting your base station with the rover station. So, in this scenario your base station is also receiving signals from the satellites and in real time it is calculating the error associated with its position and that error it is transferring   to   the   river   station.

And the rover station which is also getting signal from the satellite as well as the error

correction from the base station and that error correction it is doing and in real time it is giving you a precise location at a 37 to 30 centimeter level. So, this is a high accuracy high accurate location. So, now in this case we can see that the RTK has been initialized and your system or your setup is ready to collect the data. So, with this accuracy level you can acquire the elevation data from your respective areas or your research areas. So, now we will acquire some data or we will show you how by using this option you can do your survey.

So, in the go to the work option. So, this option is on this option few surveying options are given here you can see the survey stake out survey plus. So, these are the different options available for different kinds of work. So, for our purpose we will simply use this survey option and with this survey option you would be able to acquire or collect the data. The other option is the job and data on the job and data. You can see all your data which you have collected or from this menu you can also export your data.

So, here you can see you can also create a new job. You can view your data from the job properties you would be able to choose to see the information regarding your job or you can also shuffle different jobs which you have created on your controller. You can import data or you can also export data. And the instrument portion on this instrument portion you can see the GPS setting RTK rover wizard the satellite tracking. So, here you can see the GLONASS. So, currently it is receiving signals from the GLONASS as well as the GPS satellites. Here you can see the antenna heights.

So, you can also hear the rover antenna height is, although it is 1.8 you can change this antenna height while you are doing your survey. So, that we will see in a few minutes. So, from the go to the work option here when you will go to the survey option. So, with the survey option you can start your survey.

So, here you can assign the point ID and antenna height. So, the antenna height that I already told you that is set on 1 it is set to 1.8 meter. So, you can change this antenna height. So, this antenna height you can change from this pole.

So, on this pole it is written the height. So, you can change this antenna height by using this lever. So, here one lever has been given on your pole. So, you can press this lever or you can increase or decrease your height.

So, we will keep it at 1.8 meters. So, that information you have to put over here antenna height and you can see the 3 3 D CQ that is your three-dimension coordinate quality in the horizontal and vertical direction. So, when this is at the minimum you can do your measurement. So, this is the survey panel and with the help of the survey panel you can

acquire your data or you can collect your data. So, if I want to collect the data for this point.

So, to collect the data you have to first give the point id you can by default it is GPS 001 you can keep it or when you will click on the measure. So, here you can see one option you can see on your screen that is the RTK position. So, RTK positions are increasing continuously. So, right now it is 20. So, when it is increasing you can see your 3 CQ is going   to   minimum.

So, at the minimum level you have to acquire your data. So, it is 23 centimeters right now. So, at the 23 centimeter you would be able to receive your point data. So, when it is minimum you can click on stop and this information you can see the point GPS 001 has been stored in your job in which you have created the lab RTK 1. So, similarly you can collect multiple points. The other way to collect the points is in the manual mode, the other way   is   the   automatic   mode.

So, you can assign some parameter to the system and that parameter will automatically collect the point based on the parameter which you have assigned to do that you simply go to click the function option with the help of your remote controller and click on the configuration. One you will go once you will go to the configuration option here you can see the log auto point is enabled. So, you can enable or disable this by clicking on the log auto point. So, once you enable now you have to assign some information to the stored point by time whether you want to collect the point or data in a time or distance mode. So, in   time   mode   you   have   to   give   the   log   every   time.

So, you have to tell the instrument at what time or what interval you want to collect data for your survey. You can choose the time from 1 second to 10 second or you can manually put your or you can manually choose your time from the drop-down menu the up to 60 second you can collect. So, this means when you set the automatic point collection with the time mode. So, suppose I choose this for 2 seconds. So, in every 2 seconds your system will automatically collect the point. It does not matter if you are removing your rover station or not it will automatically collect the point. Another option is the distance mode.

So, in distance mode you have to give the distance at what meter you want to collect the data. For example, it is written that the 0.5 means the 50 centimeters. So, suppose if I give it a 1 meter. So, in every 1 meter it will collect data. So, if suppose I set up and now you go to the auto option here you can see you change your point id suppose I assign it 0 0 1.

So, and now you click start. So, you can see it is not a receiver, it is not storing the data because I am not removing my rover station. So, when I remove it and go I will cover it

to 1 meter. In that case it will store the data because we have set the parameter to distance mode and at a 1-meter distance. So, you can see if I remove my rover station and I go as soon as I go to the 1-meter distance or I reach to the 1-meter distance. So, now you can see over here your point has been stored because we have covered 1 meter if you move further. So, it will collect data at every 1 meter and when it is collecting data one beep sound you can hear from your instrument.

So, with this distance mode you can collect data automatically while giving the parameter what at what parameter you want to collect the data. Another mode which I was telling you about is the time mode. So, suppose I choose the time and if I choose it as 2 seconds. So, you click and now you can see you can hear the beep sound. Now here you can see that it is continuously increasing the point ID.

That means I am not removing my GPS rover station, but it is still receiving the or it is collecting the information from this point only because we have given the input parameter as a time and in 2 seconds. So, every 2 seconds our system is acquiring data. Another mode which I was explaining initially was the manual mode. And the manual the data which you are collecting in manual mode that would be more accurate because here on you. In automatic mode or in manual mode one thing you keep in mind is that you have to keep or place this pole at a straight position that you can see on your labeller.

One labeller has been also given on the pole and you try to keep this bubble at the center because that will give you precise information for this point in terms of latitude, longitude and elevation. So, you try to keep this bubble at the center. So, once you have completed all this part now you can start a survey or whether you want to do it in manual mode or you want to do it in automatic mode. So, now we will show you that we will keep one profile in manual mode and then we will collect some points in the automatic mode. So, we will start with the manual mode and in manual mode you have to manually acquire data by pressing on the stored or stored option.

So, you first go to the survey mode and this is your manual mode and this one is automatic mode and another option you can see over here is your map mode. And in the map you can see all the information which you have collected for your reason. Here you can see these are the points which we have collected right now. When we as much as we are collecting more points you can see all the information on your map. So, we will do the survey. We will keep it as a manual mode and it is right now and the GPS 002. So, we will start with this default number and we will collect some points in manual mode. In manual mode you try to fix your bubble at the center and then you can see this 3 CQ is 0.

0.22 meters is quite enough for our purpose and we will click on the measure and once we

click on the measure you can see or you can wait for the RTK positions once it is minimum you click on the stop option. So, we have collected another point at this position. So, we will collect a few more points in manual mode and suppose we want to take another point over this position. So, similarly you have to see your coordinate quality that is 0.020 meter you click on the measure you wait for the RTK positions and once it is minimum you click over you click stop and now you can see the sounds point stored that means your point is been   stored   in   your   job.

 So, here you can again click one another point. You wait for the RTK positions and you click stop. So, we have collected 4 to 5 points in manual mode and now we will collect a few more points in automatic mode and that point we will use to generate the D M that is the digital elevation model. So, we will collect in a time mode we will put the our parameter in time and in every 5 second we will collect we will we will move our rober and in every 5 second it will collect the data in automatic mode and that point we will use to create the digital elevation model with the we will import that data in the QGIS the software which we have learnt in our previous lectures or lab. So, that software we will use and, on that software, we will show you how you can use this high accurate elevation data to create the D M for any respective area. So, we will first go to the auto mode and then   through   the   function   option   this   step   I   already   mentioned   to   you.

 So, I am just changing the time mode and then the log time is 5 seconds. So, when I click a place it is like this for 5 seconds and I will just change this point. So, now it is set and we will click on the start option and it will start acquiring data every 5 seconds. You can see over here it is on auto mode and we have assigned the time mode and the time is given for 5   seconds.

 So, every 5 seconds it will collect the data. So, we will map this area with this time mode and all the information or all the points which we are going to collect at that point will associate highly accurate elevation data. So, that elevation data we will use to generate the D M. So, we will press start and now you can move in any direction or you can simply collect the data. So, we have collected a few points here on the map option. You can see these are all the points you can see over your map. So, this point we will use to generate the   digital   elevation   model.

 So, this data we will import on the Q G S platform and with some QGIS plugins we will show you how we can use this elevation data to generate the D M. So, in coming labs we will also show you or we will give a demonstration that how you can use this data to generate the D M on the Q G S platform. So, here you can see all the point information which we have collected in our survey. So, this point you can export from the job and data option from the job and data option here you can see the one options is been given the

export and copy data from the export and copy data some format has been given over here you can choose the any of this format, but the best format is the export ASCII data because this ASCII file or the ASCII format you can open in excel file or in this file you can also open on the G I S software. So, while going to this you have to choose the data and then you export the data first you have to connect some USB or some external device with your controller.

So, some ports are given over here. So, here you can see some USB ports have been given. So, with this port you can directly place your pan drive over here or you can connect the USB cable and with this port you would be able to export your data from the file from this system. So, with this export file. So, once you export your data. So, this data is given by the   USB   port   and   you   can   export   it   from   the   USB   port.

So, using this data you can open in any excel file text format or you can also import this data on the G I S platform. So, in our coming lab we will show you how using this elevation data we can generate the digital elevation model. So, with the Q G I S plugins. So, we will give a demonstration to the generation of D E M while using this elevation data. Thank you.