

Evolution of the Earth and Life
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Introduction to Google Earth

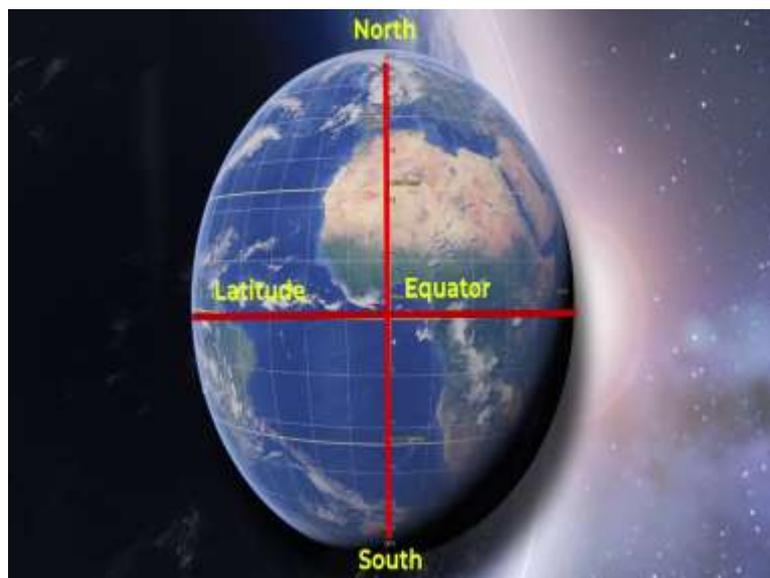
Maps and globes have been used for ages to study paths and find places on the map.

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So if you look at a map, you can find paths and important highways and highlight places on it. Whereas on a globe, you have more important features which can be highlighted for geologic purposes.

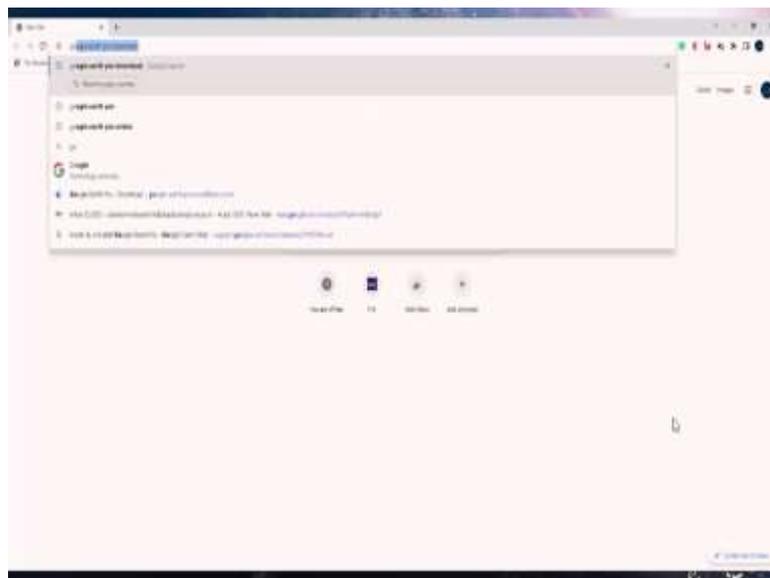
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For example, if you look at the globe, you would see that there are these vertical lines and horizontal lines, which are running all around. So if you look at the horizontal lines, these are the latitudes and the longest latitude is what we call as the equator. They run at the north and south of the equator. Whereas the vertical lines are the longitudes, and you can see that they run on the east and west of the Greenwich Meridian, or the zero meridian. Although these tools are very handy, there are certain limitations of using physical map and globe.

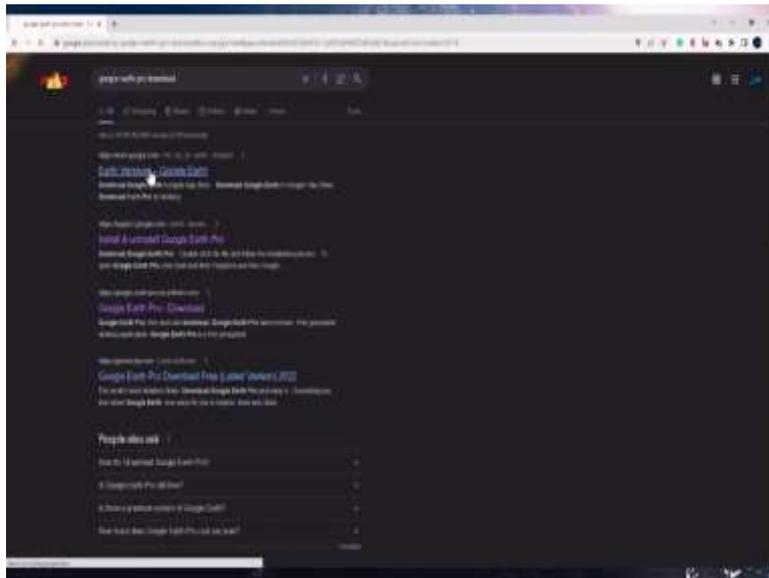
Today through this tutorial, we are exploring a more virtual interactive tool, which lets us go beyond the limitations of these physical maps and globes. And the software is called Google Earth Pro. This tutorial is introductory nature. And would be a revision for those who already know it. But it is important for the assignments, which are part of this coursework. So let us explore the software.

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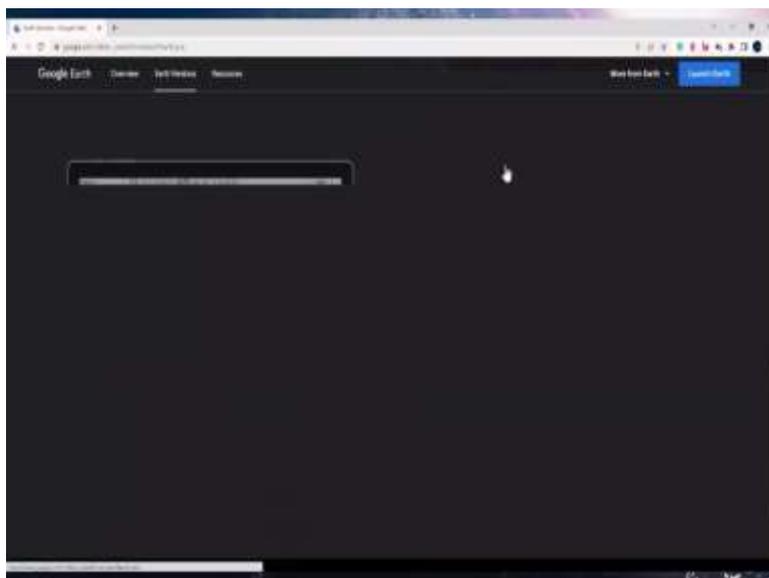
You can find this app in your Play Store by just typing Google Earth Pro.

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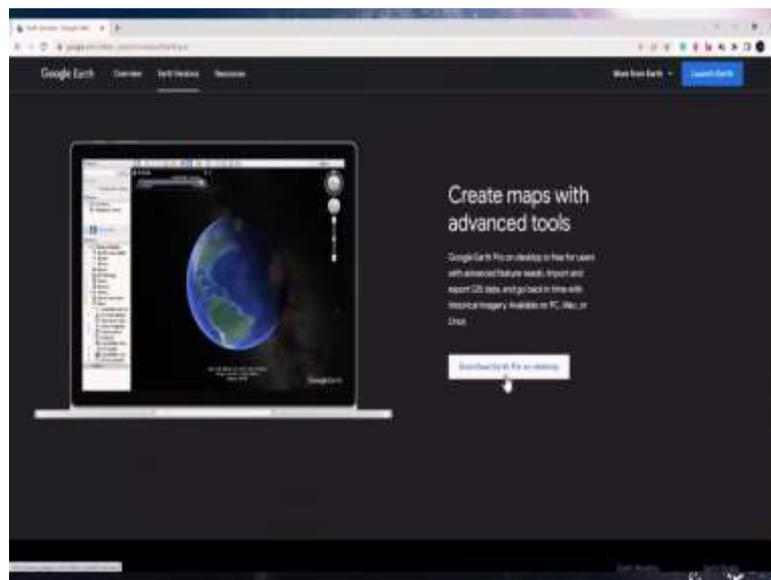
You can click on the first link.

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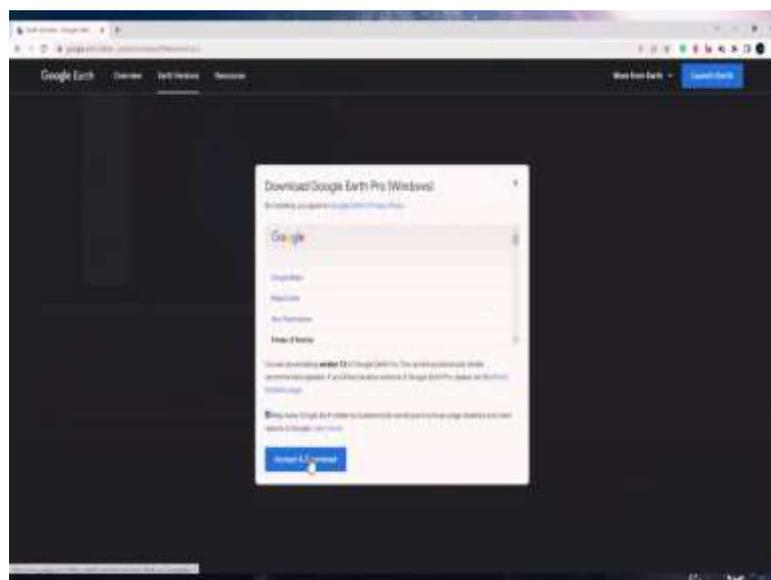
And download the Google Earth Pro on desktop. Although this app can also be accessed on your phone, but there are certain features which are limited and are visible only on desktop or laptop, so we recommend using the Google Earth Pro on desktop.

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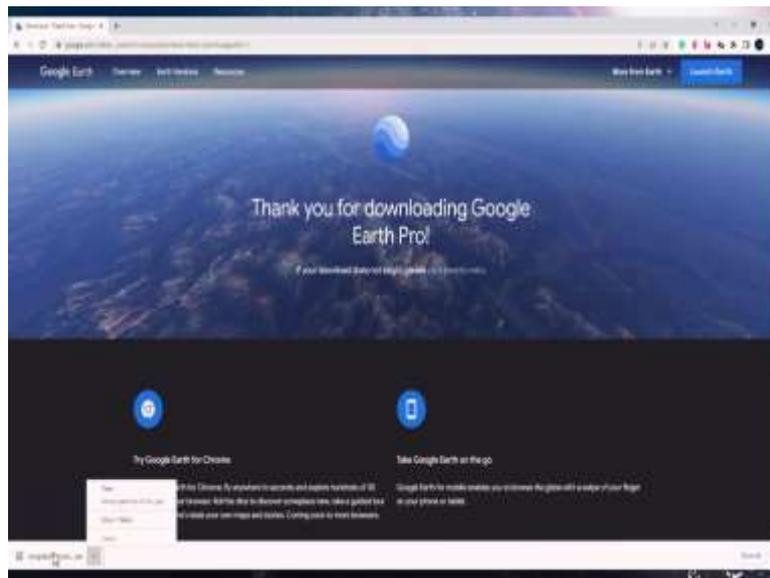
You can click the Download Earth Pro on desktop.

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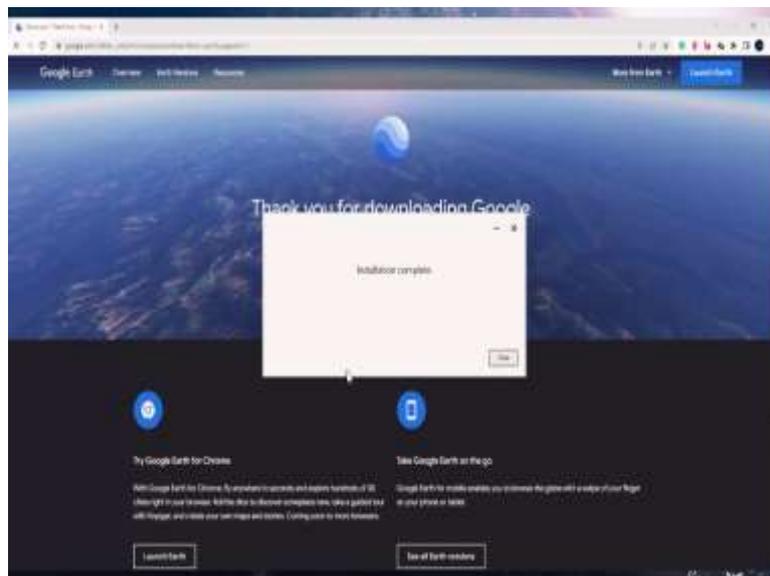
And it should with the acceptance.

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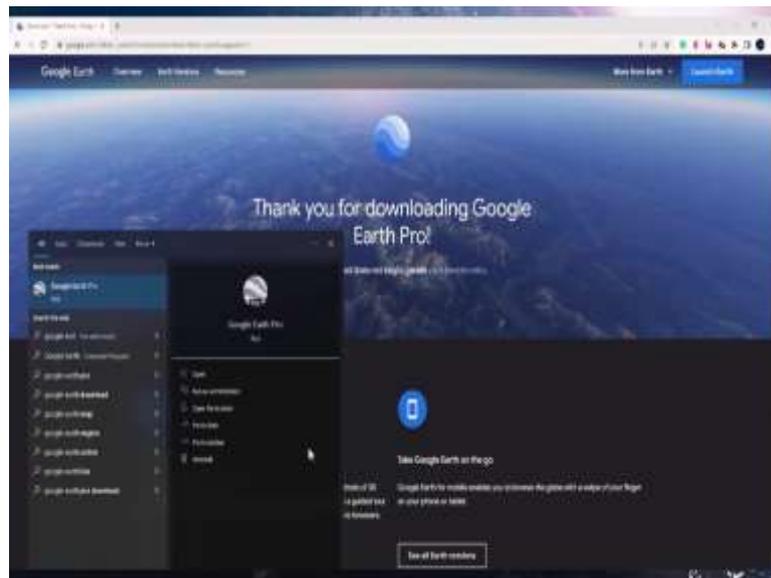
It should automatically start the download. You can see a setup here, which you just have to click and give permission for installing can click Yes, and go ahead with the installation.

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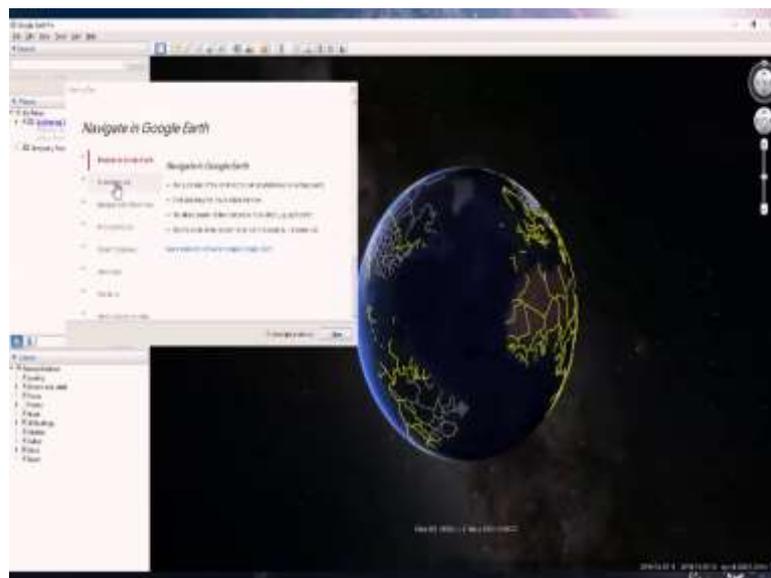
Make sure you have good internet connectivity while using the app. Once the installation is complete.

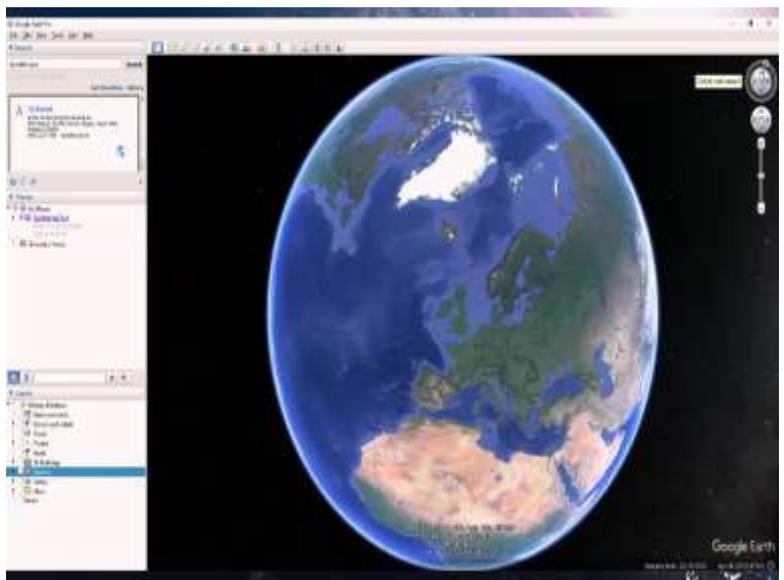
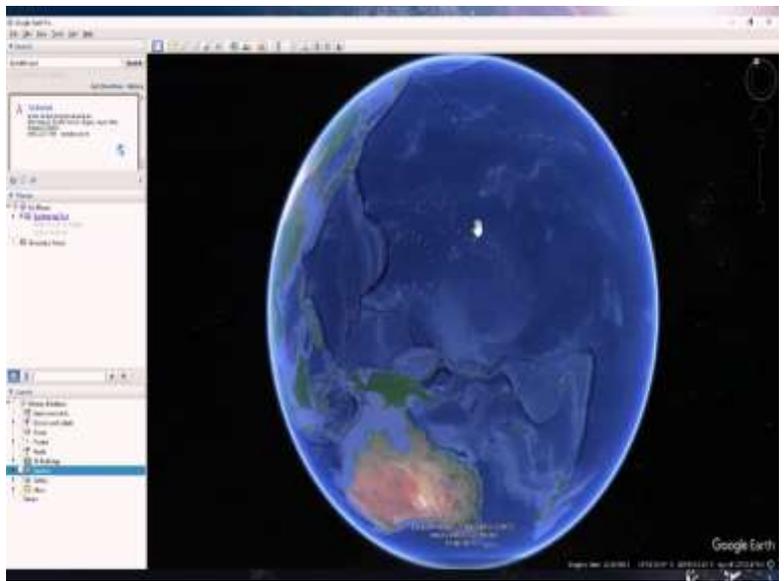
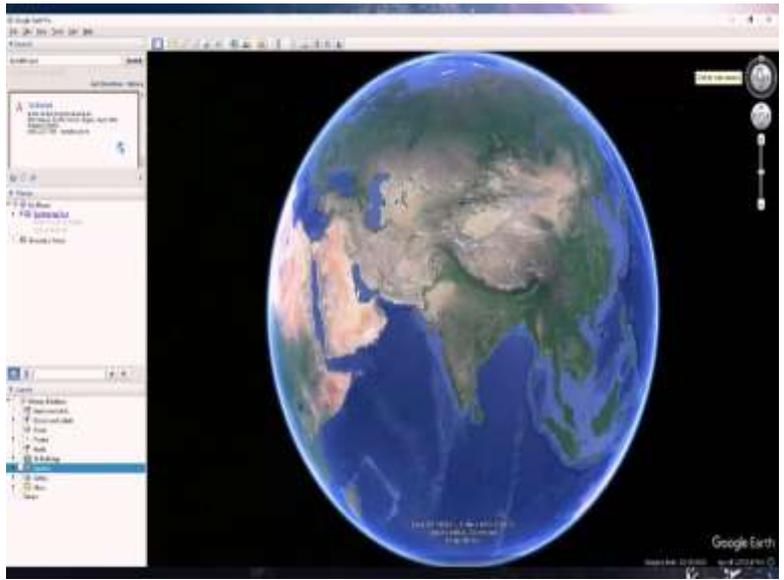
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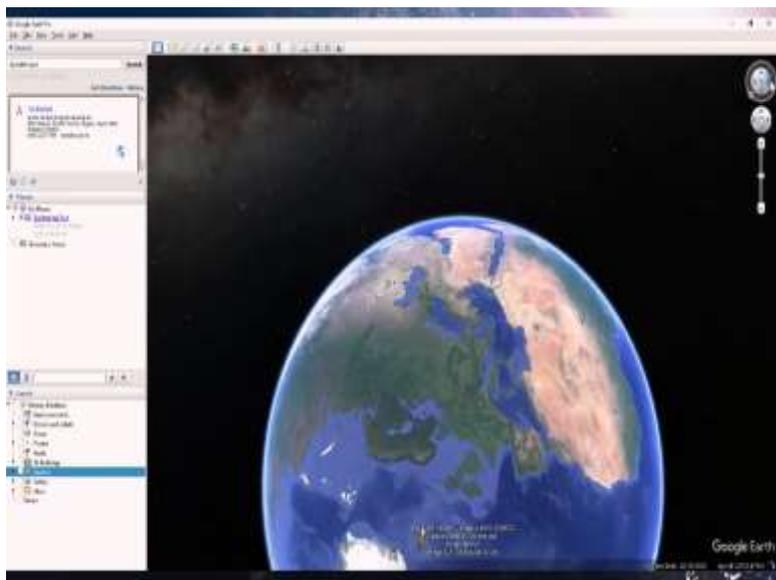
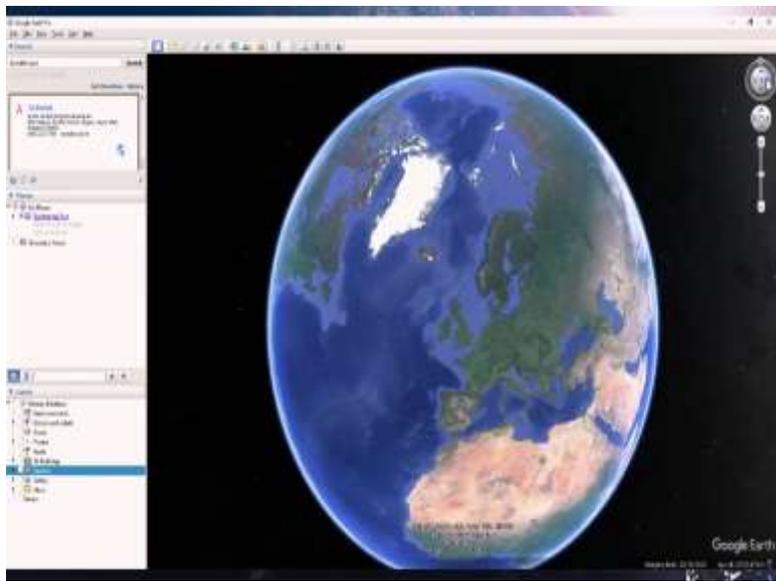
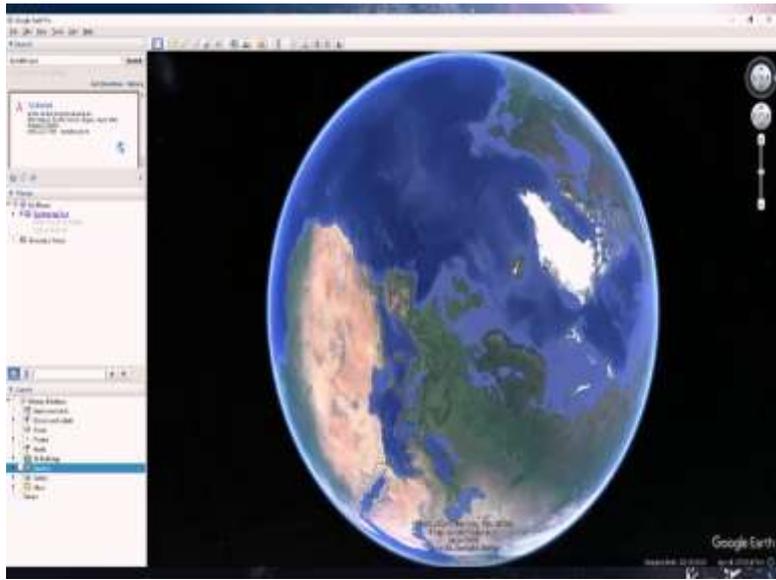


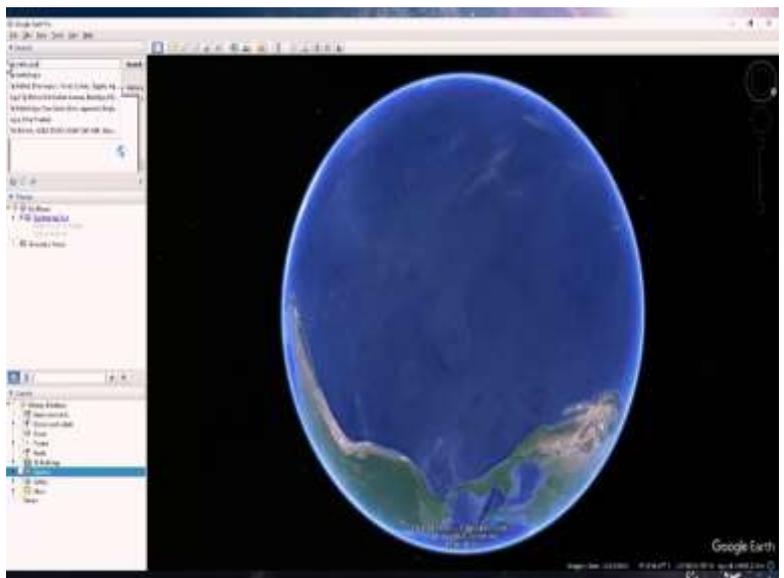
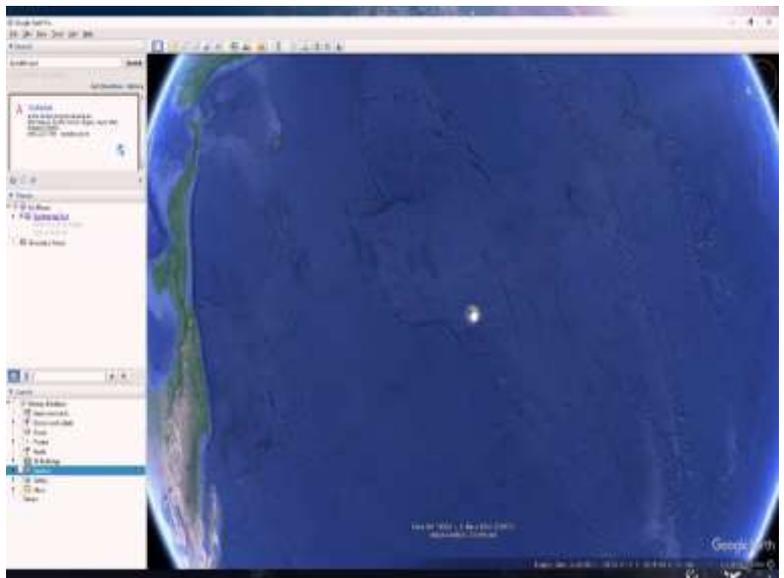
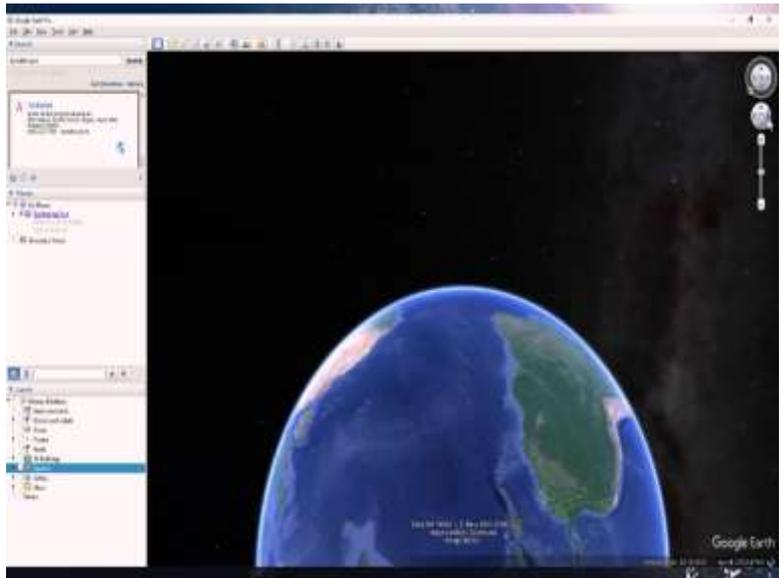
You can open it by just typing the app name.

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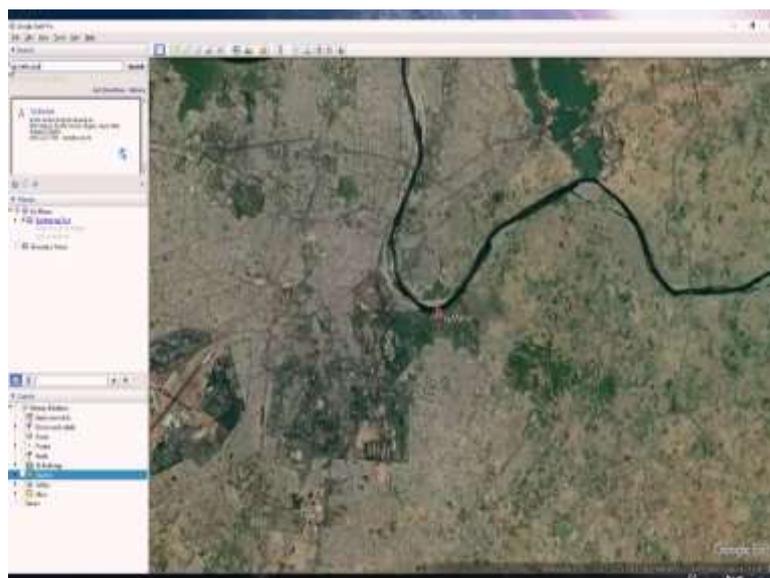


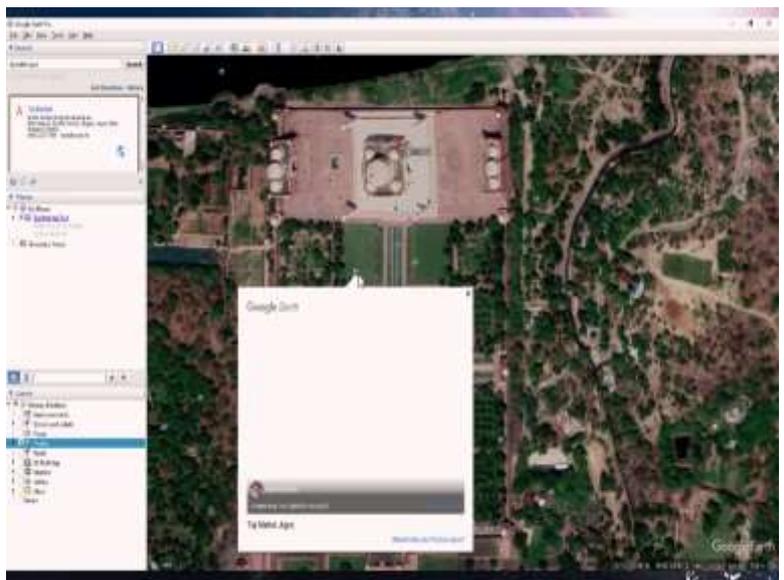
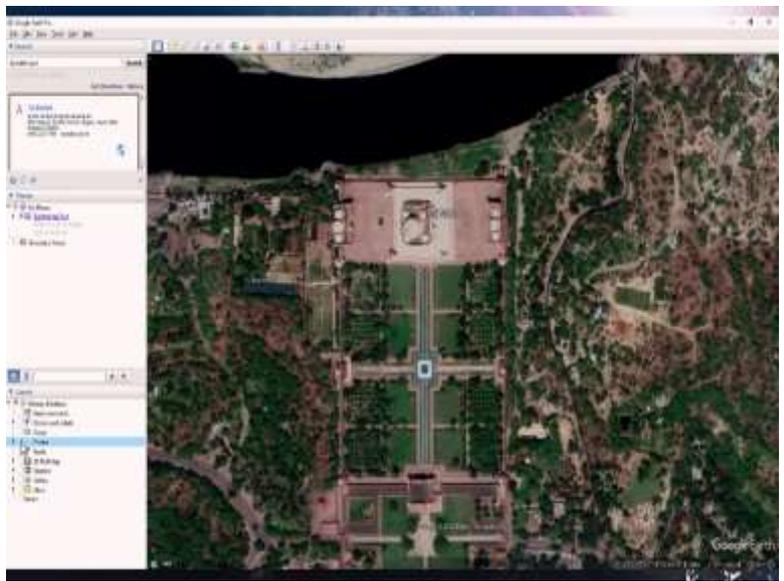
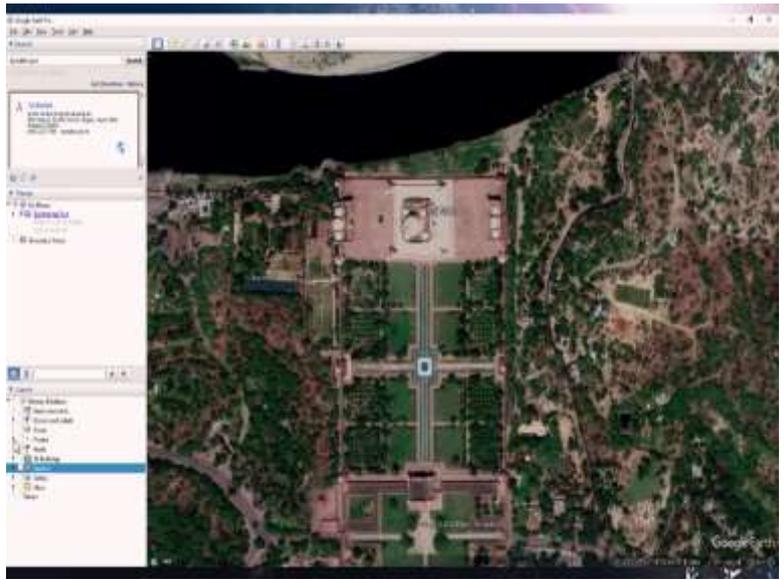
So this is the window of Google Earth Pro, there are certain tools which are available on the top right corner, on the left panel and also on the right corner which are visible as you hover over it. This is our blue planet. And just like the immersive feature you have when you are Spinning the globe, with the hand tool over here, you can just click and drag and spin the globe. Now there is a sophisticated way of doing this. And that is available. When you see these features over here. You can see that the first top features are very similar, but the top feature has an additional ring on it.

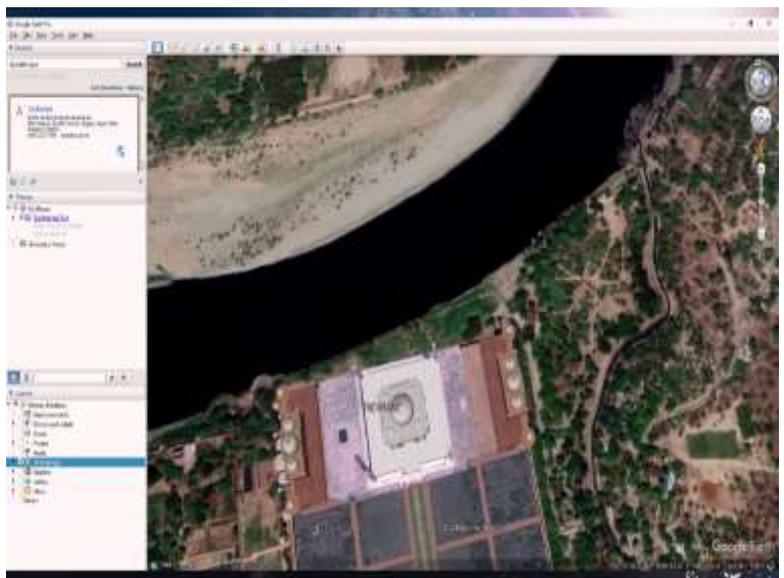
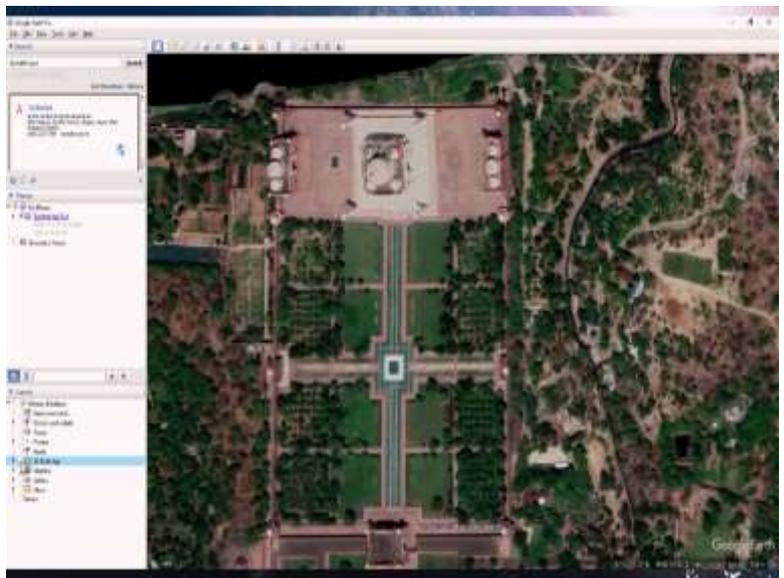
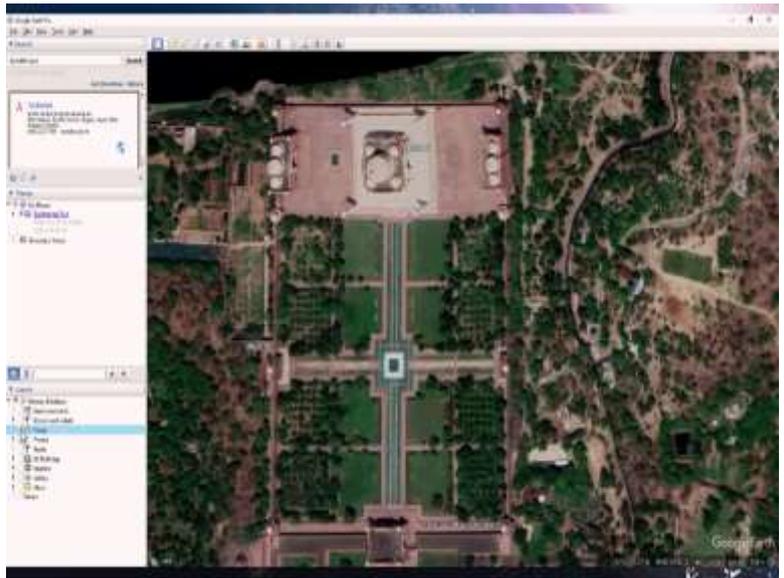
So if you take the N and drag it along the Ring, you can see that the North is spinning along this axis but if you click on the N again, it would be reoriented. Now, if you click and drag to the right, you can see that the angle or the perspective is changing while the location is the same. But if you want to go right or left or up and down. The second feature, which is over here is more useful. So with this, you can gently spin the globe and explore features on it.

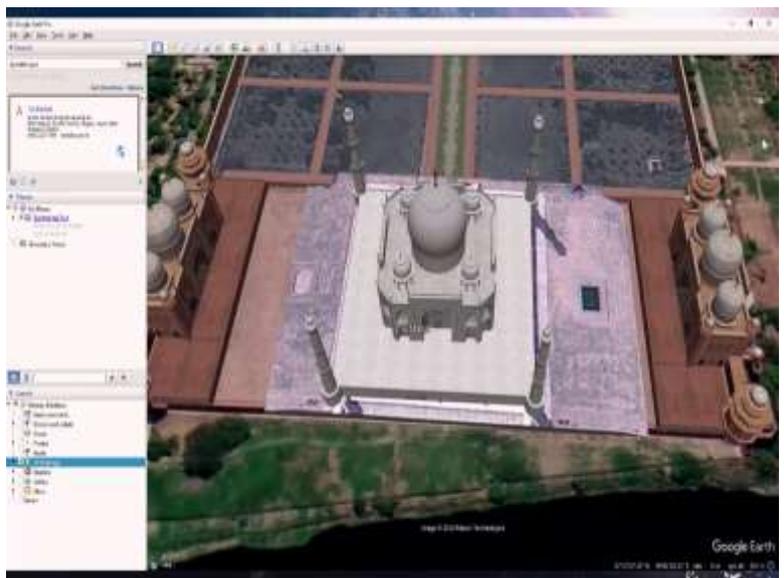
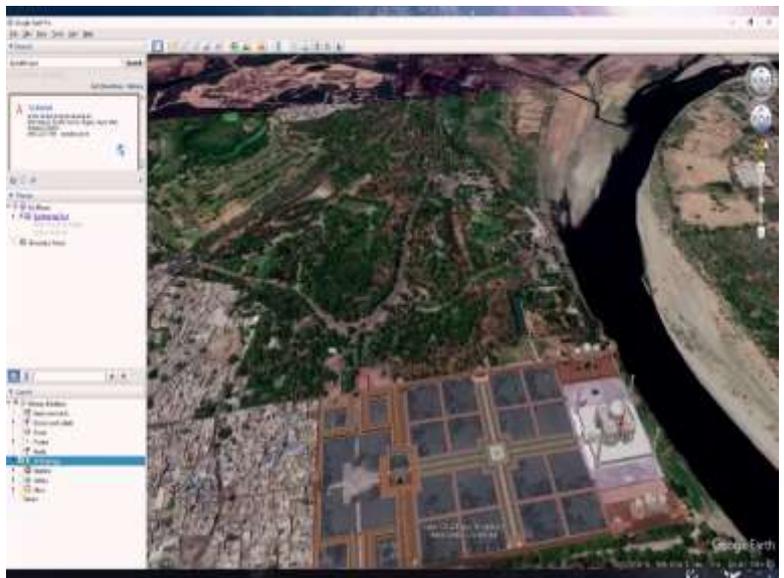
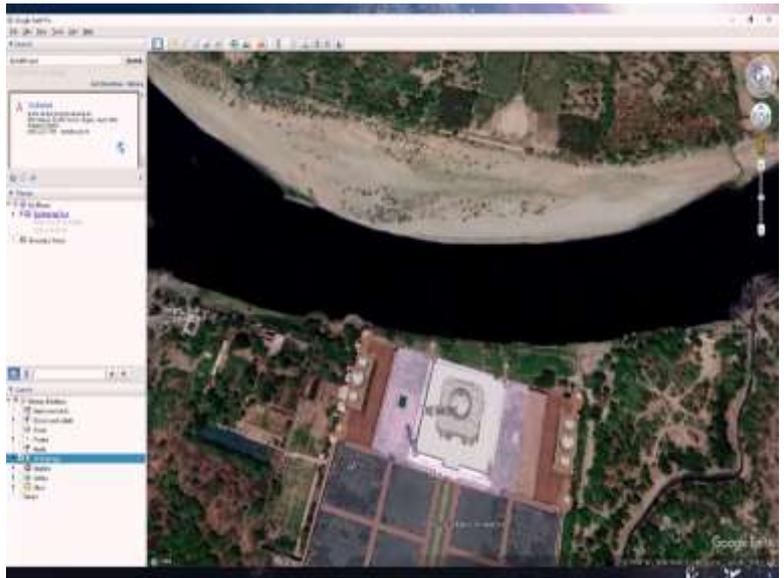
You can also use keyboard features like control and your mouse button to additionally control these, the scroll button would help you zoom in or zoom out. And if you use it in combination of the control button, it would do, it would help you do the same thing with the ring over here. Now let us just go to a location and to do that you can see on the top left corner, you have a search bar so say you go to location. Taj Mahal Agra, and you press enter, it would automatically take you to that location.

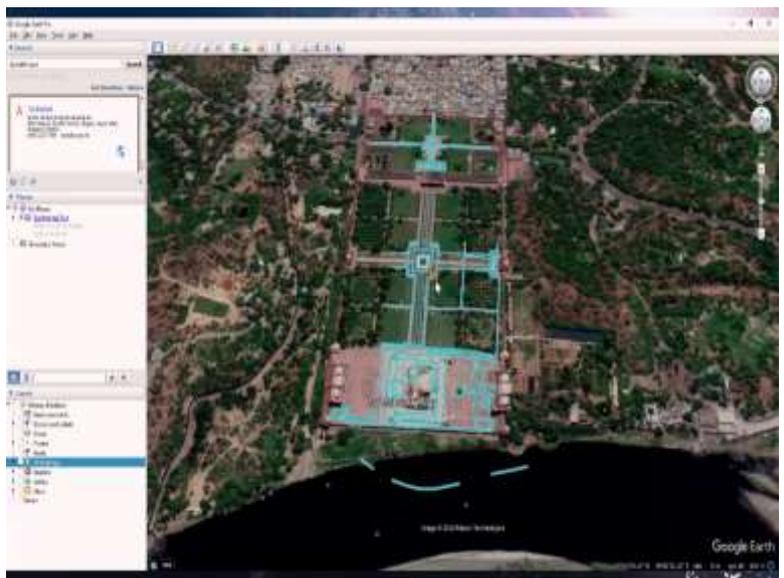
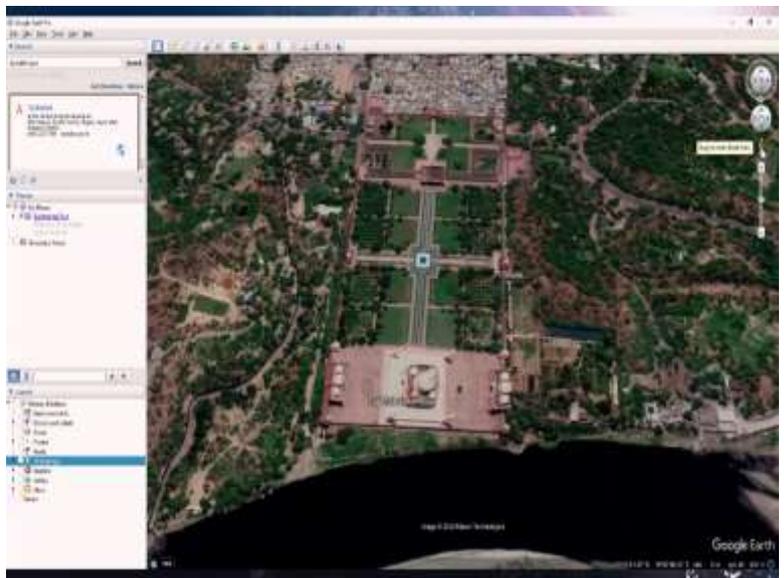
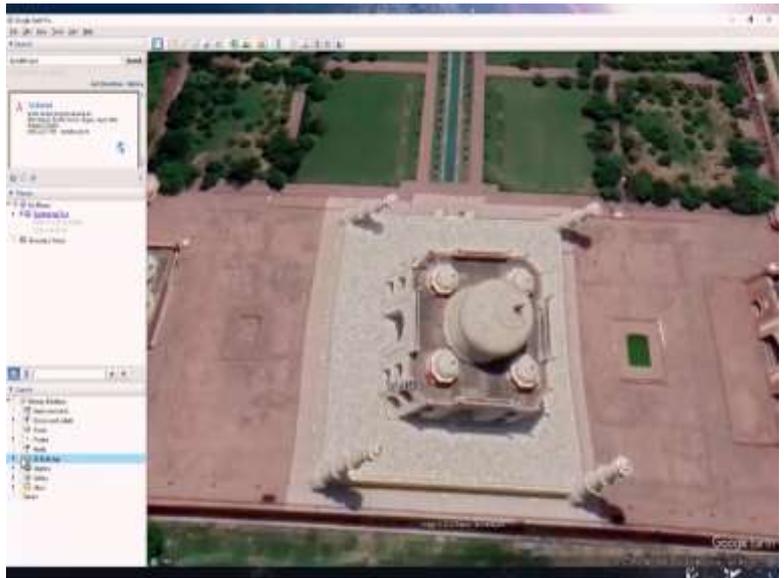
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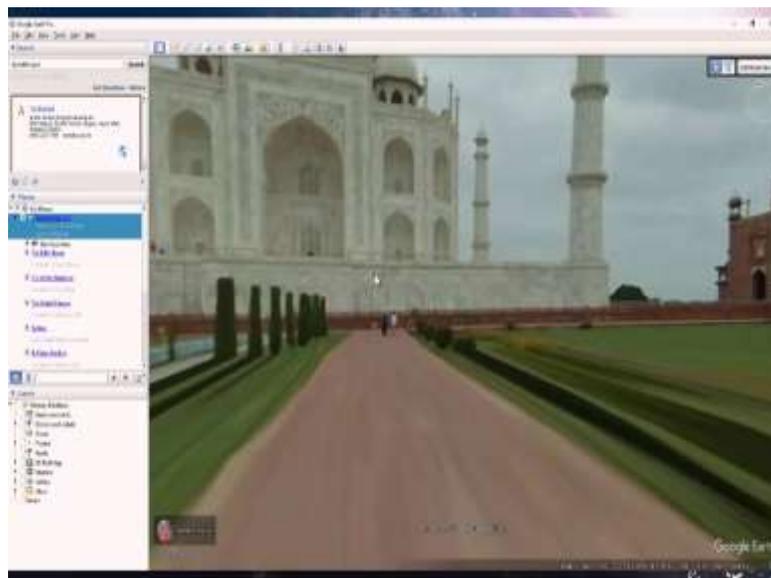
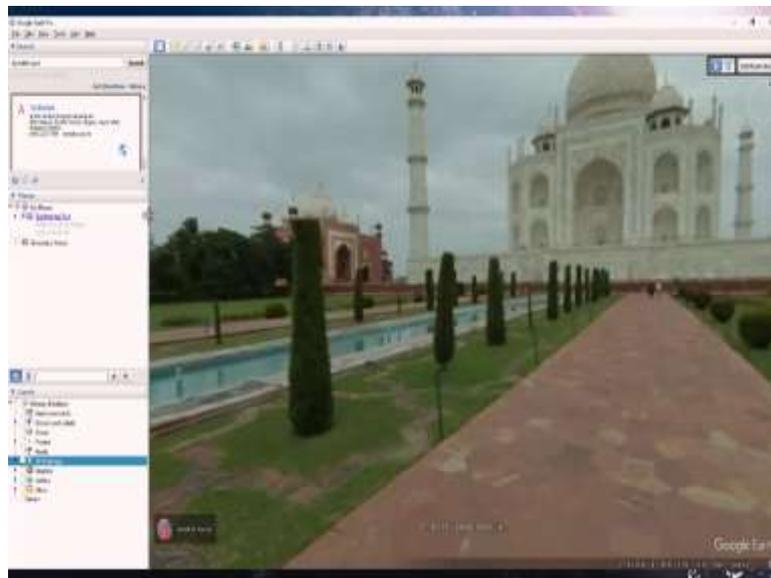
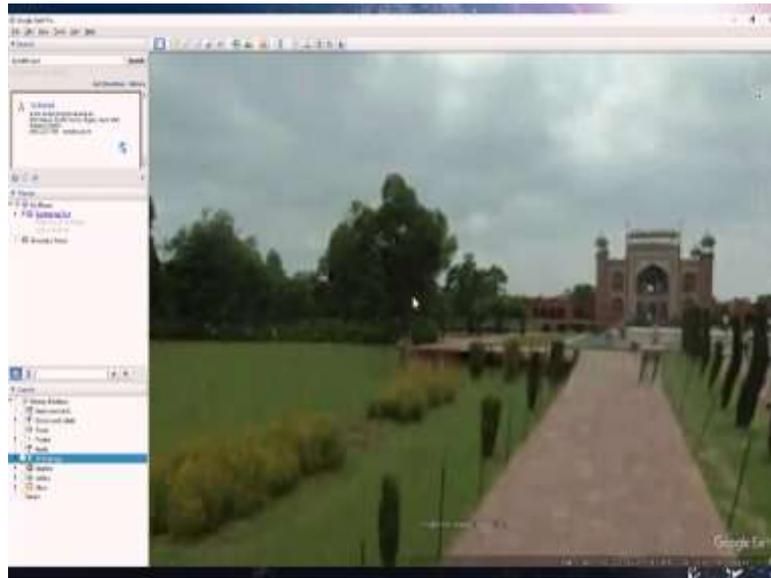


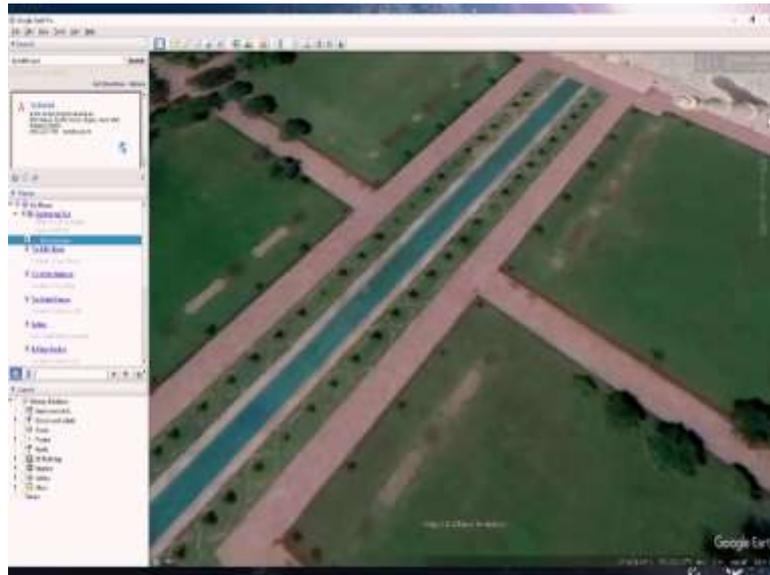












Now you can see the satellite view of Taj Mahal. And there are certain other features which would be visible when you turn them on from the layer panel over here. So on the left corner, you have Layer panel. And if you click on features like photos, and you check them, you would see all the photos which are taken at this location, and you click on any of them, the photo would be visible with the person's name who took it.

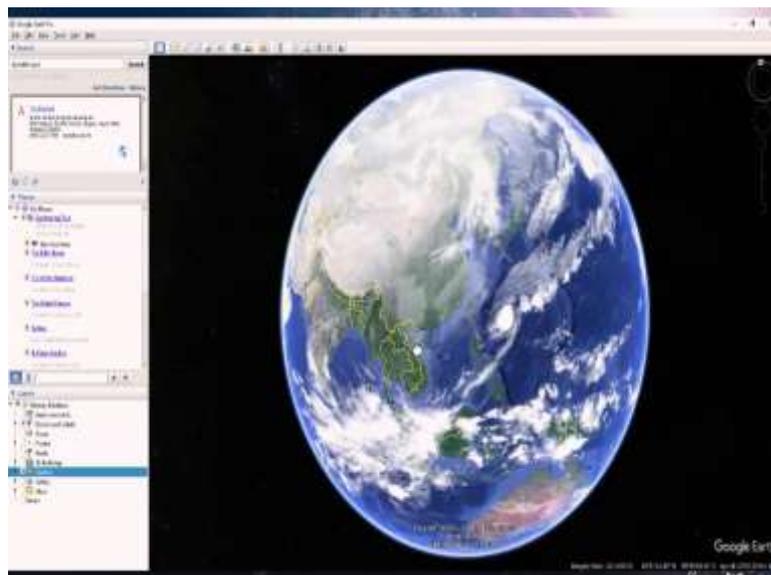
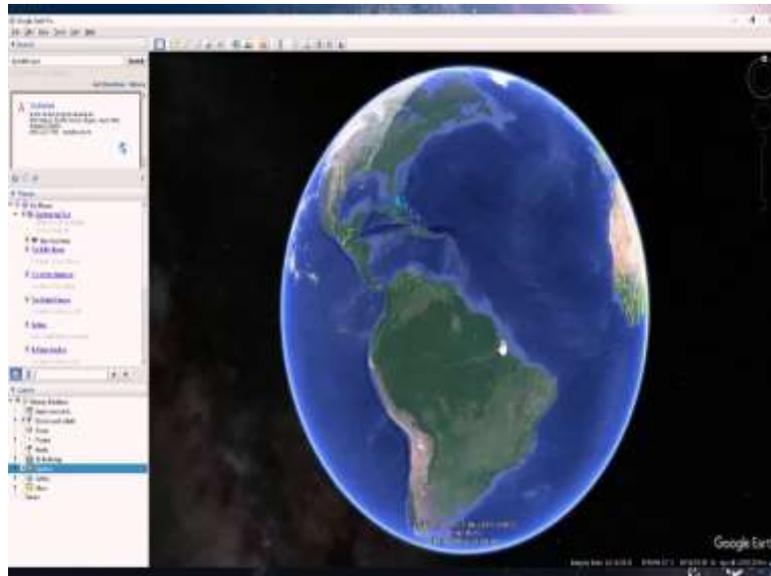
There are also other features like places which would highlight the places around the location. And if you turn on the 3D building version of it, it would give you a 3D rendered image of Taj Mahal. Now if you use this ring, you can change the angle with which you are viewing it. And with the right and left, you can explore the space that you want to see. So if I want to see a different angle of Taj Mahal or different eye a different view of it, you drag the eye panel. And with these, you can explore the area that you want to see. I can also do that here with the hand tool. And with the control and zoom, you can change the perspective with just the scroll, you can zoom in, or you have this zoom feature available over here.

So if you drag it down, it would zoom out and dragging it towards the plus would help you zoom in. So, if you turn off this 3D buildings feature, it would show you the flattened image again. Now let me just zoom out and show you another tool which is available. So along with the ring and these moving buttons and zoom in there is another feature which is available only after zooming in.

And this is the Street View. If you drop this pigment or hover it over the location, you would see if there are any street view which is available in that location. And if you drop it what you would have is a 360 image, interactive image of it. So by just double tapping, you can explore

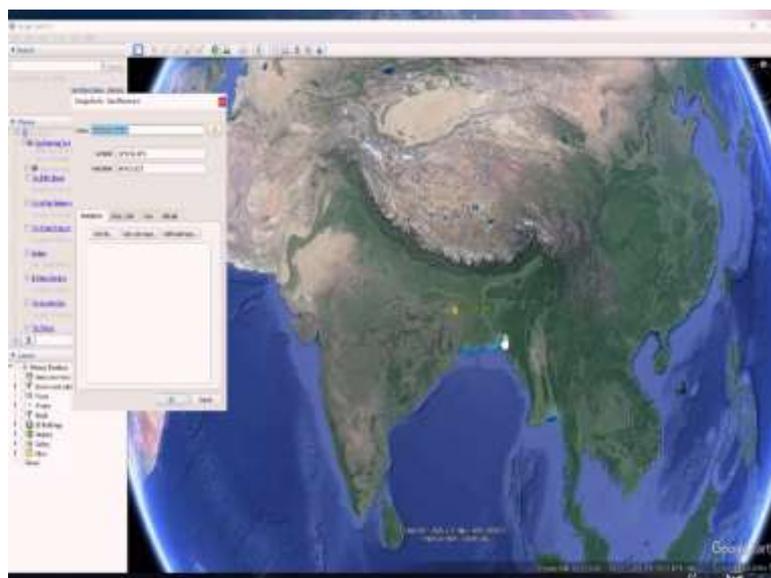
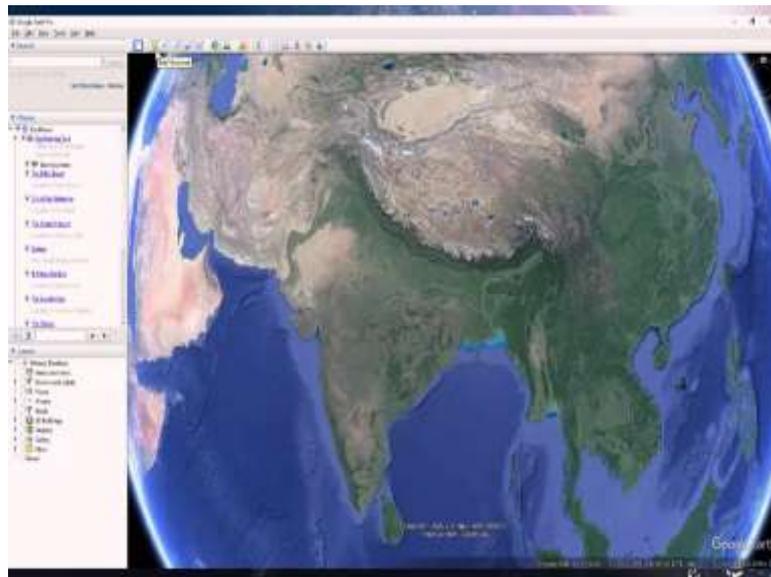
the area and move around. Let me exit the Street View feature and show you other features which are in the layer panel.

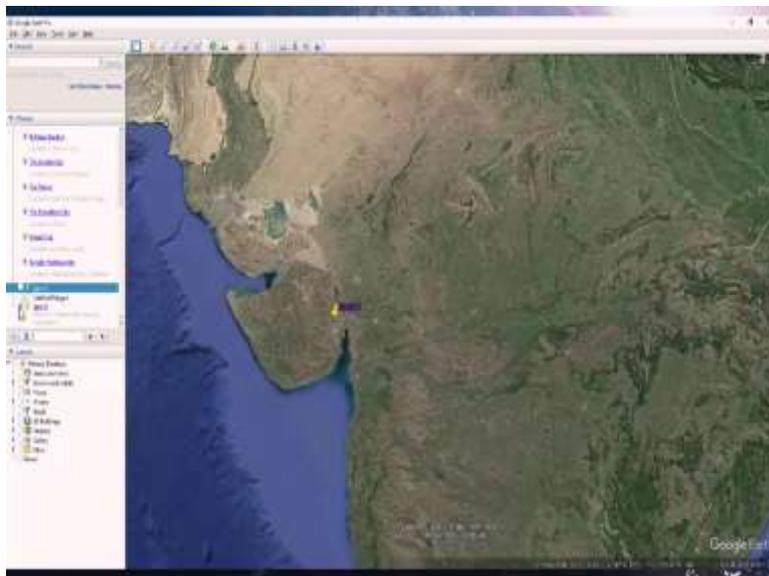
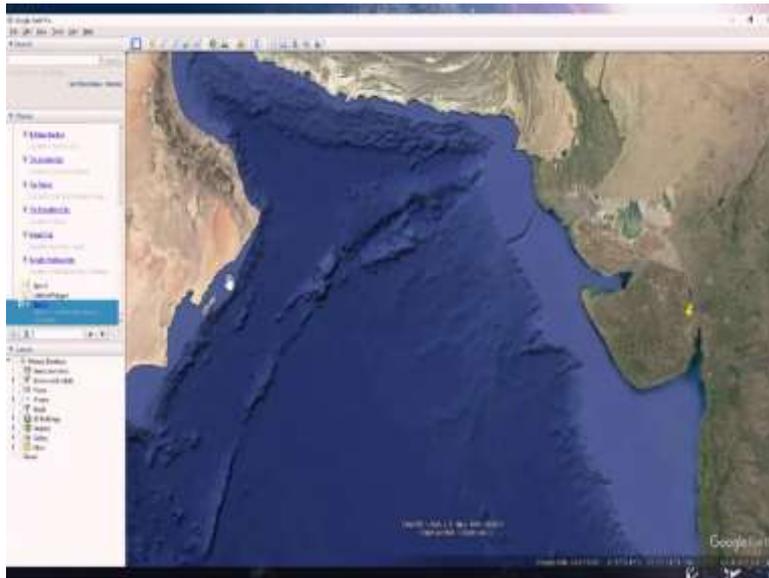
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So there are other interesting features which are better visible if you have a zoomed out panel. If you check the borders and labels, you would see outlines been drawn. And if you check the weather feature, you can see the cloud patterns on any of the locations. These weather pattern would go away if you zoom beyond a certain extent because that would be just like diving through the clouds inside. Now, let us go to the other features, which are at the top corner. At the top panel you have more interesting features. So the first one if you click on it, it hides the sidebar and gives you a full screen version of it.

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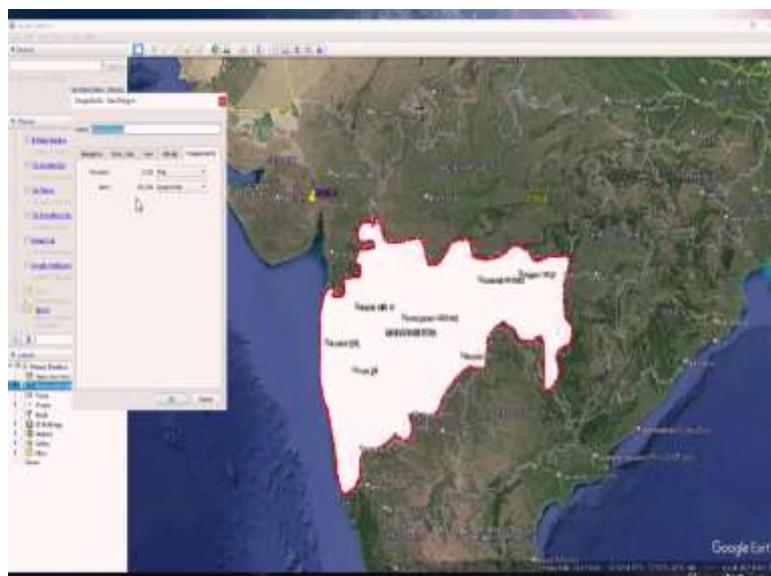
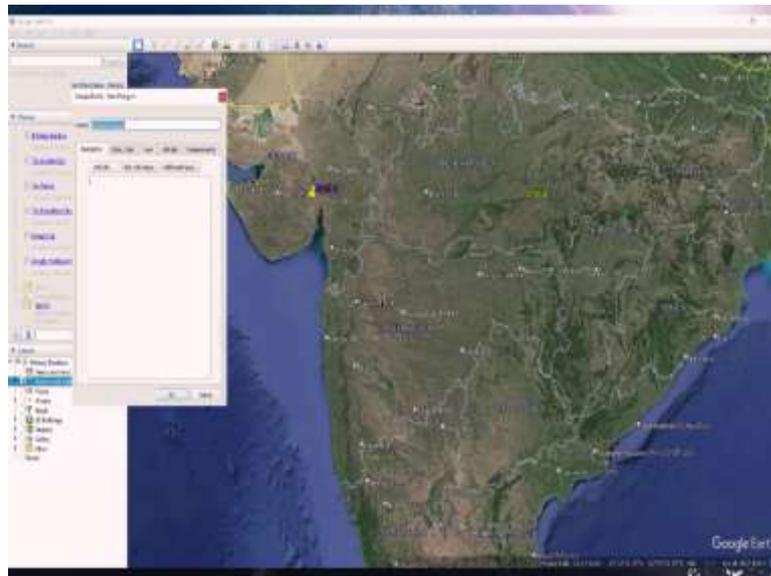
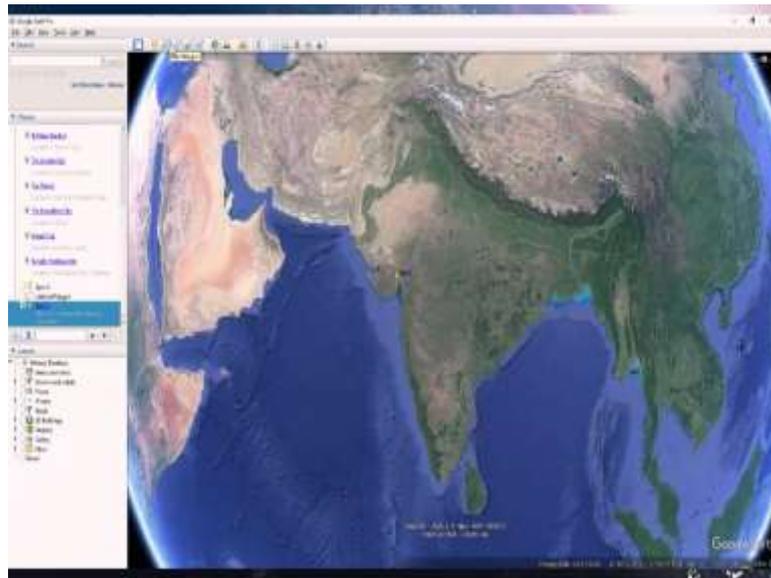


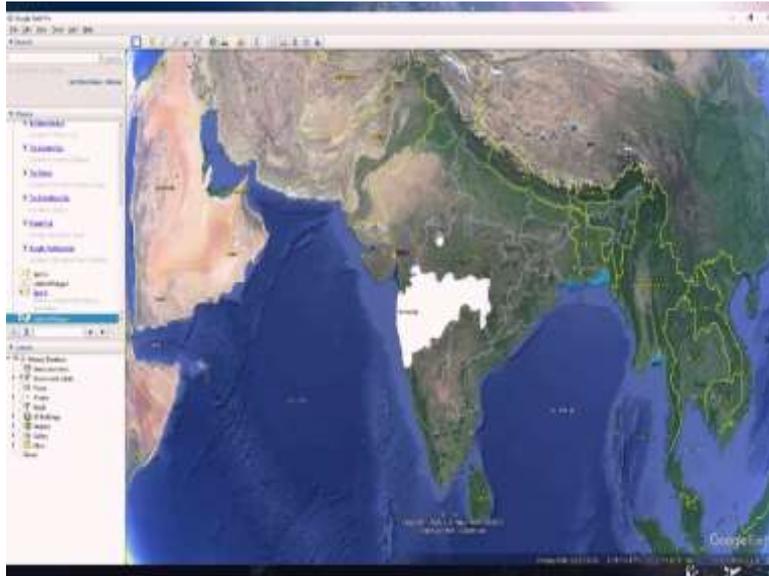


There are more interesting geological tools that you can use which are available on the top panel. So if you have this pin location over here, it would help you pin a certain location on the map. And you can adjust the spot of it by just dragging it with the cursor. If you drop it somewhere, you can see that it would give you the latitude and longitude for the location and you can label that location say spot A.

You can change the colour which is for the text or the pin and you can also check the this you can also write the description of it. Spot A is important for viewing mountains and you can customise the description according to you. Now, once you exit that window, the spot A stays on the map, even if you go away from it, and you can always access it. And you can always access it by going to this places panel where you can check the visibility, you can check and uncheck the visibility of spot A.

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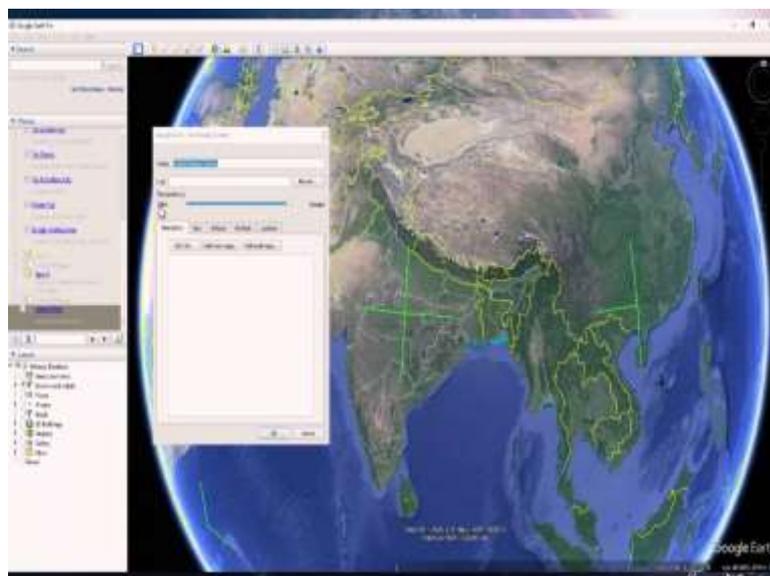
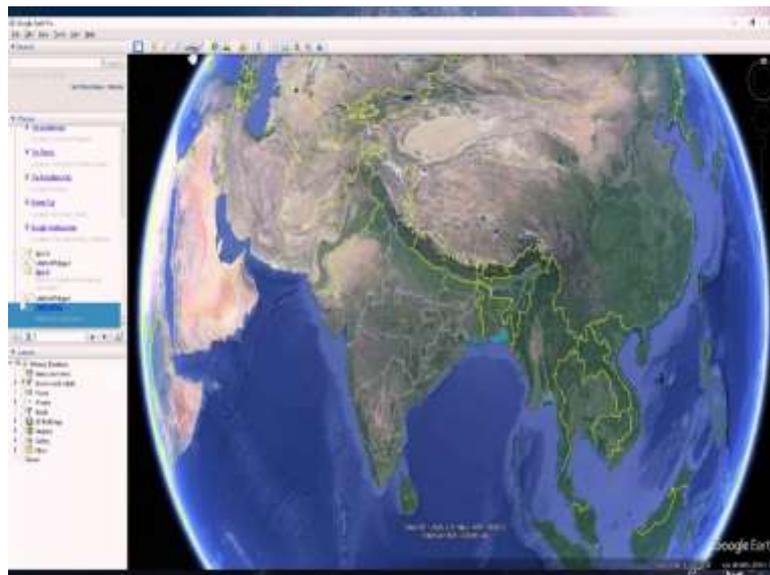


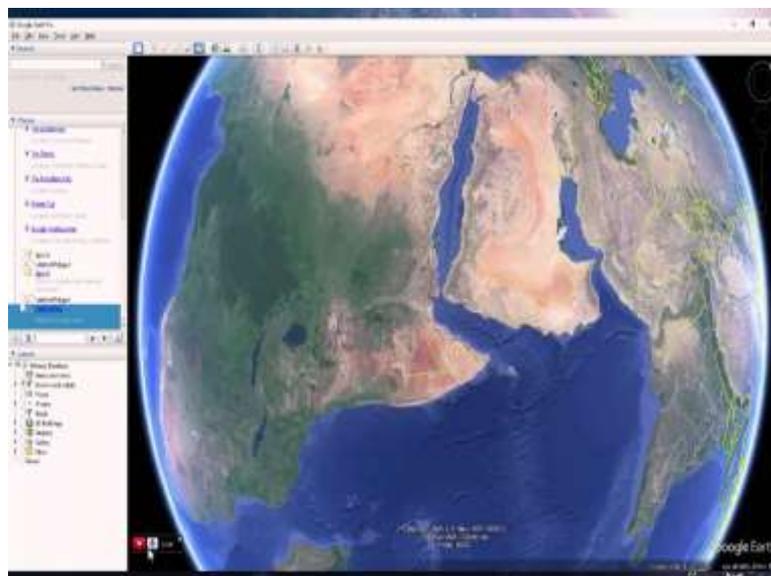
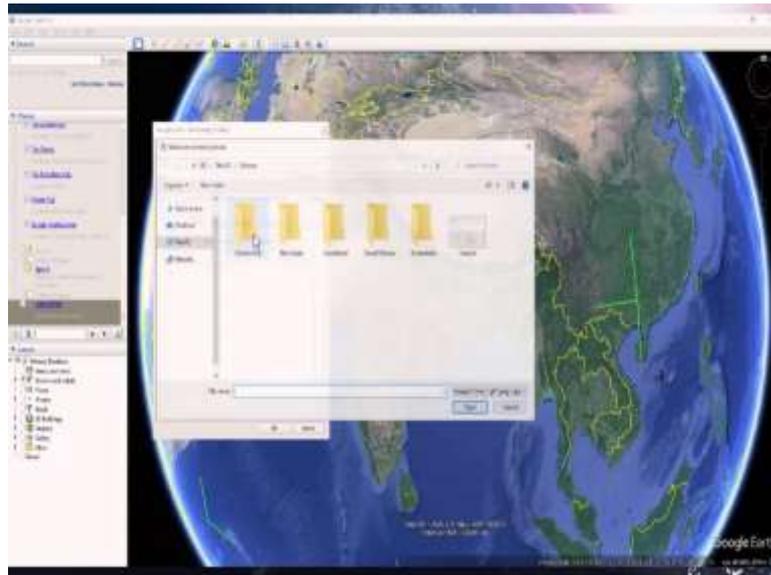
Another tool, which is also important apart from pinning is to map the entire area. And in order to calculate the area and perimeter, the second tool, which is available in the top panel is very important, which is the polygon tool. It lets you draw a polygon along the border that you want. And to do that better, we can actually check the borders and panel feature over here. So say I go to Maharashtra, and I want to calculate the area of it, I can use the polygon feature and go along the outlines of Maharashtra. For now, I will just roughly outline it without doing it properly. But just to show the feature, briefly.

And you can see that if I go to the measurement window over here, it gives me the perimeter and area for this area that you have marked with the polygon. And if you click OK, and exit the window, it would still appear on your window. And just like the spot A you can check and uncheck the visibility of it. Now this is spot an area. But what if you want to go from location A to B, and you want to customise a path for it on your own.

To do that, you can use the third tool, which is over here, which is add path. In add path, it would let you draw a path from any which location that you want. And you can save it, it would also give you a measurement of how long that path is. And just like the spot feature, you can change the colour opacity and write a description about it, marked for exploration. And these features from the panel from the places window can be again, checked and unchecked and the visibility can be altered.

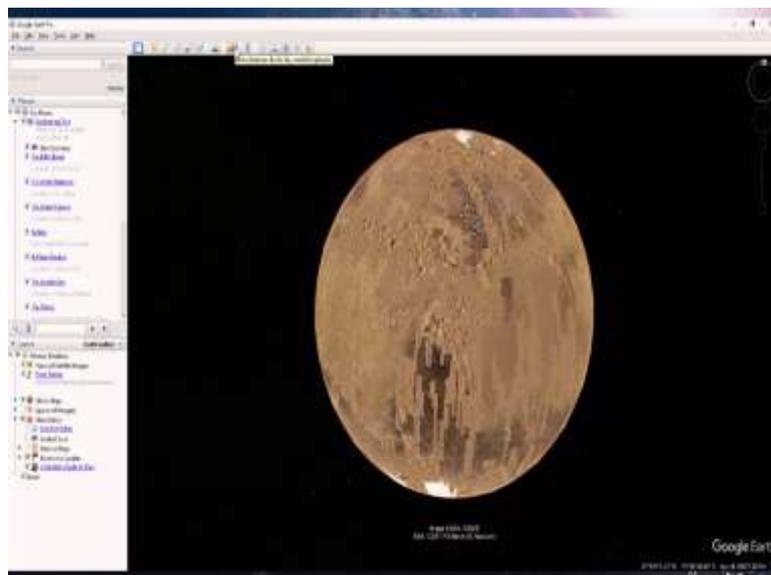
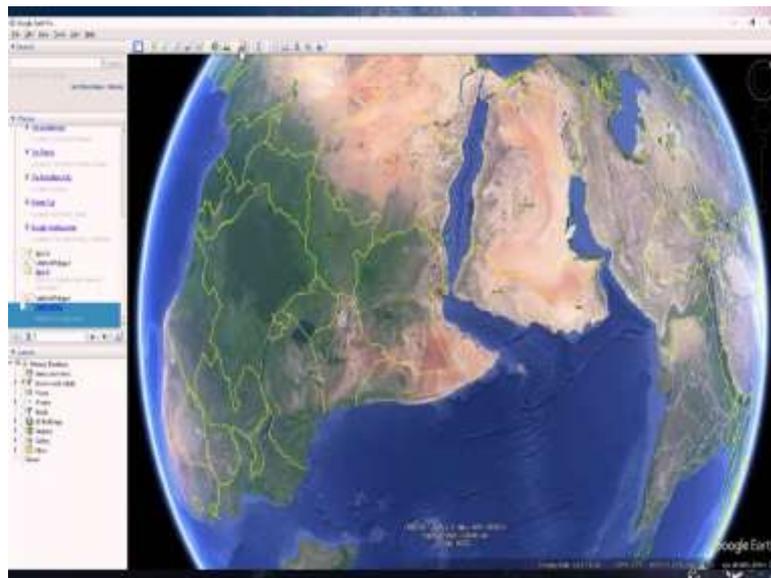
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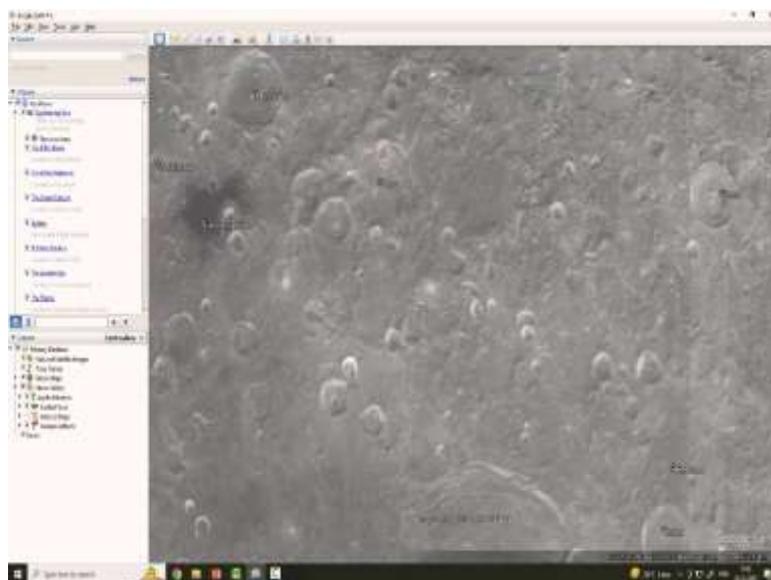
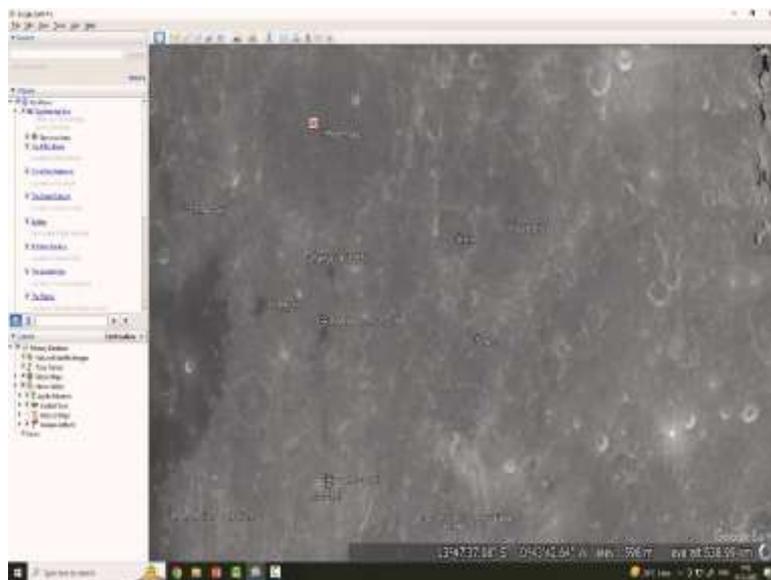
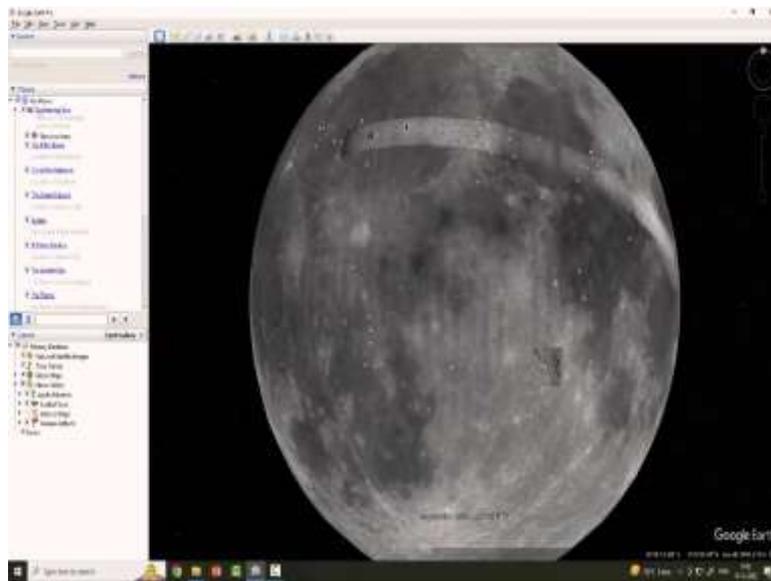


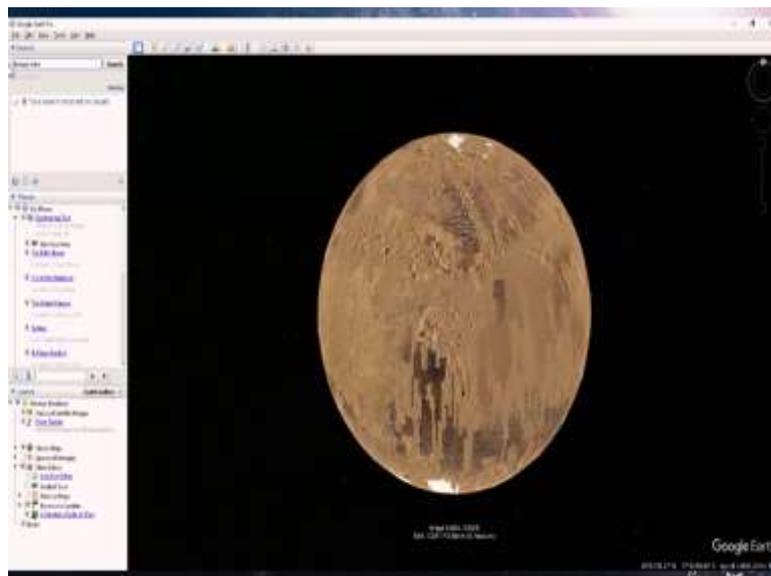
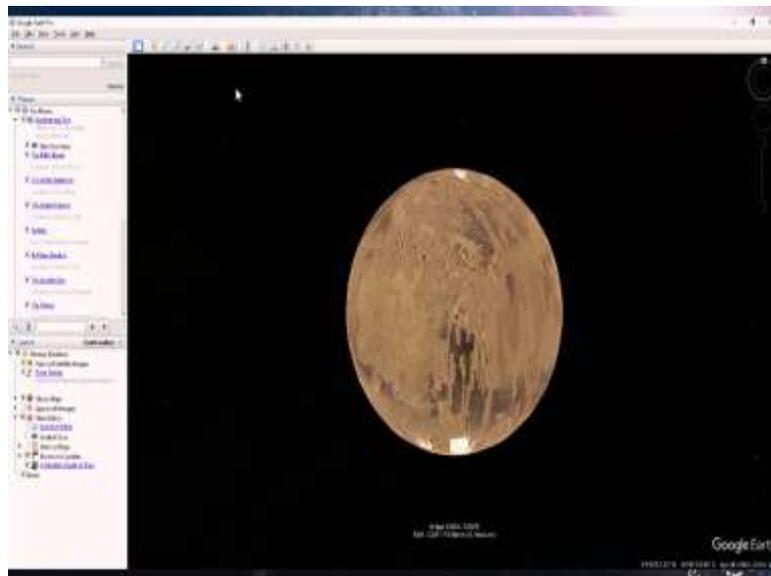
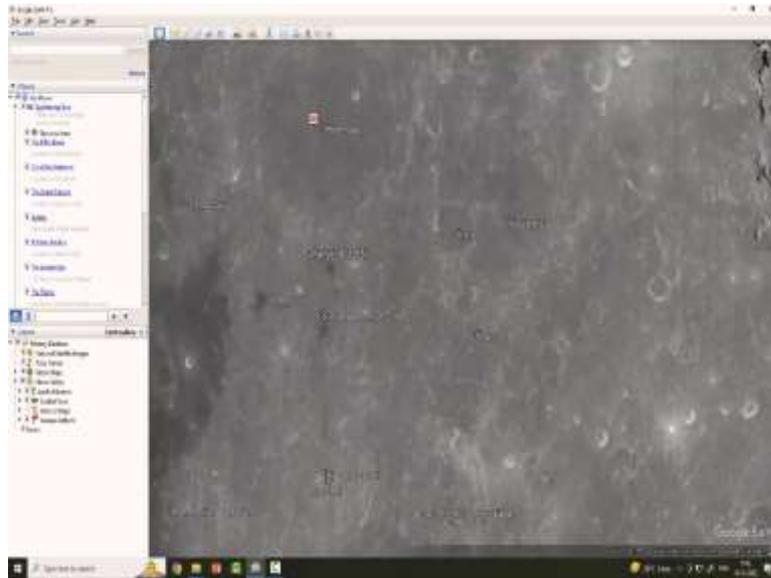


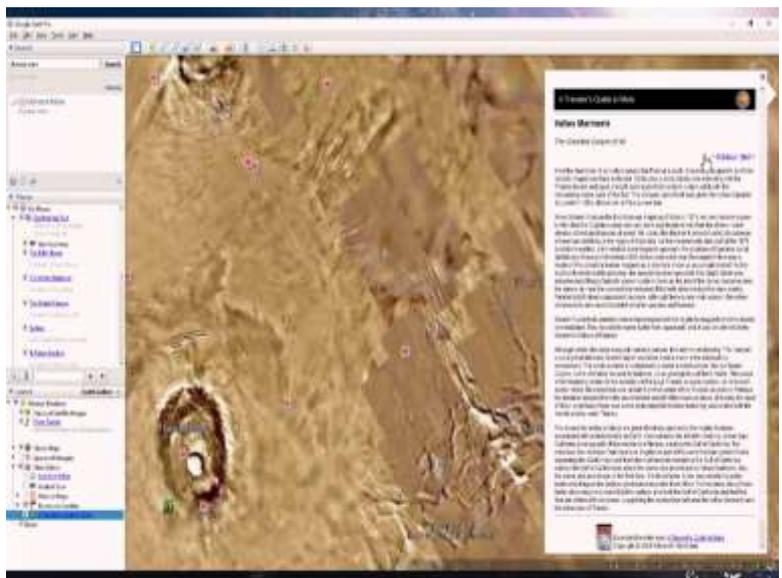
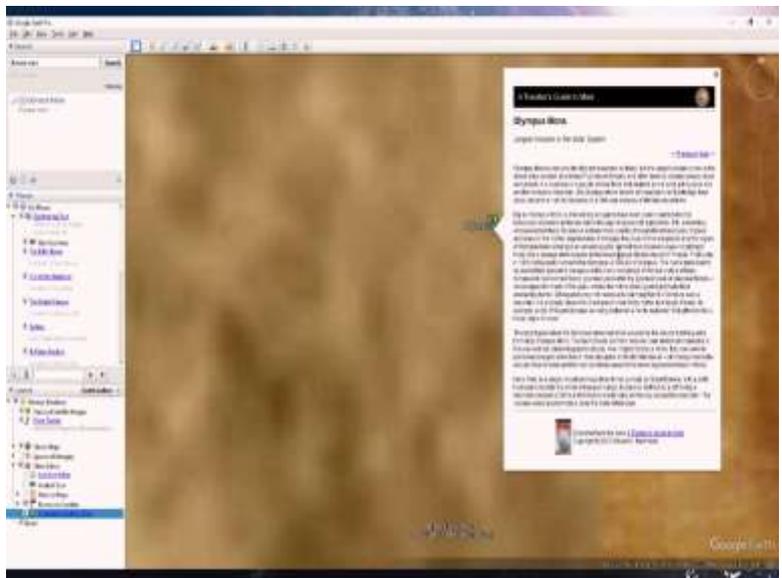
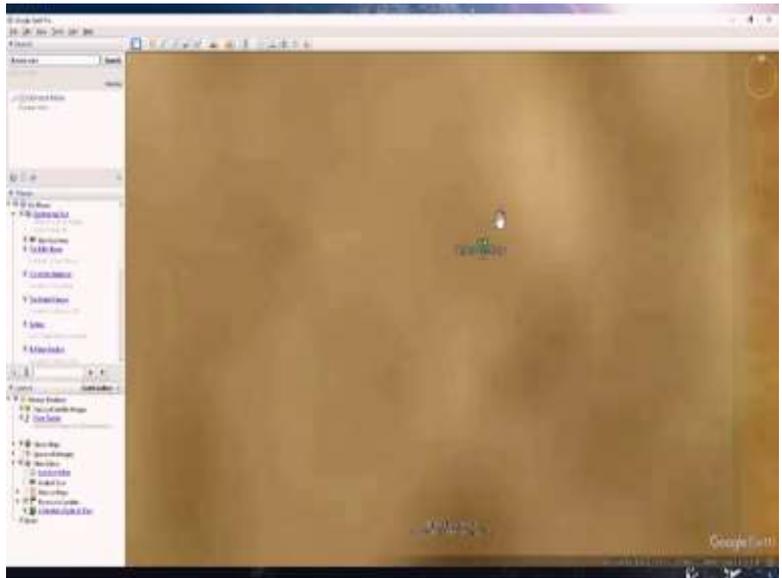
So let us explore another tool which is an image overlay. So it lets you add an image over a location. And you can see that I can add that image from a link URL link. Or I can add it from my desktop. And it would stay on the map and you can also take a snapshot of it. There are certain other tools which are also available where you can record a tour by just clicking on this record button over here. And you can also mute and unmute yourself while you are recording the tour.

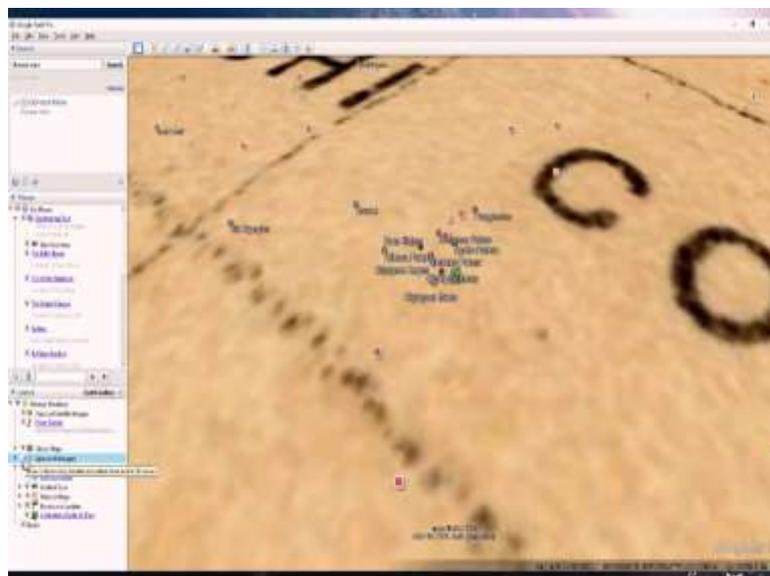
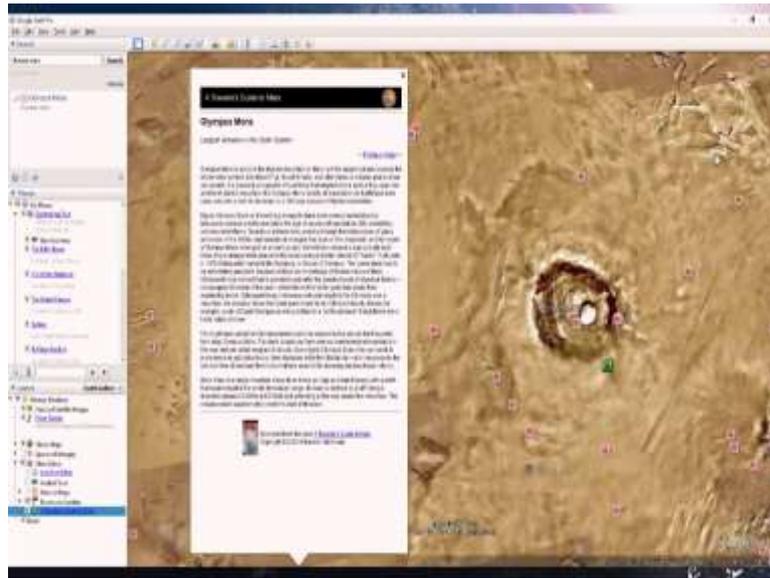
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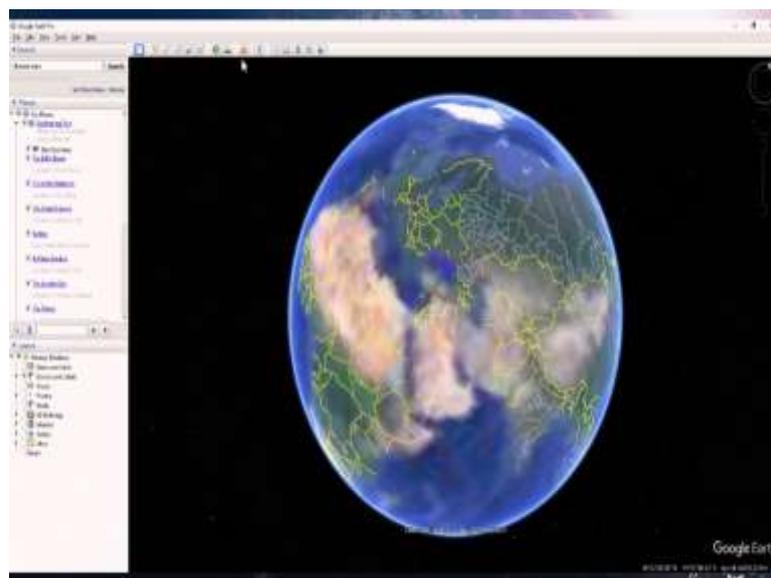
But one of the most important features for exploring geology is this tool over here. If you click on it, it would not just let you explore the features on Earth, but also other systems like Mars, Moon, let me zoom in a little. And you can see that the elevation values here are in negatives and wherever I hover over the craters, it is more visible. As the topology of Moon is much more distorted. You can see that as we hover the cursor over different places on moon, the elevation values can show positives and negatives and highlight the depressions and upliftments in the topology can show the depressions and upliftment in the landscape.

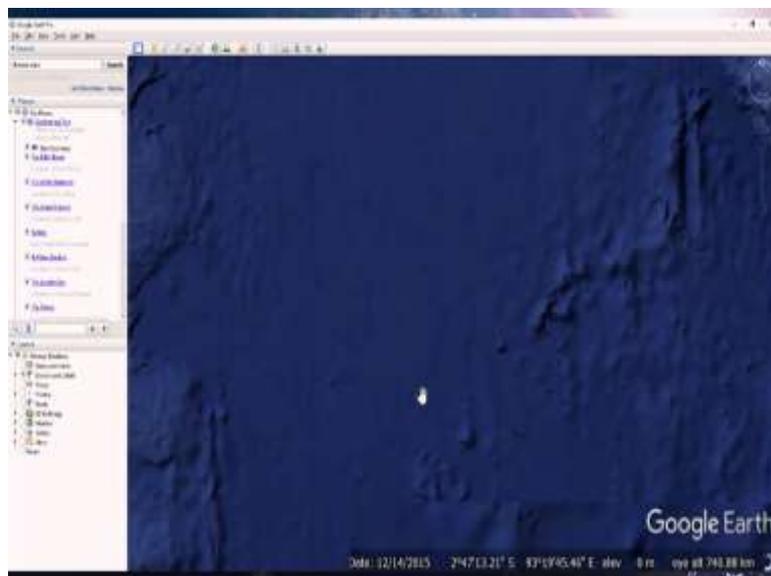
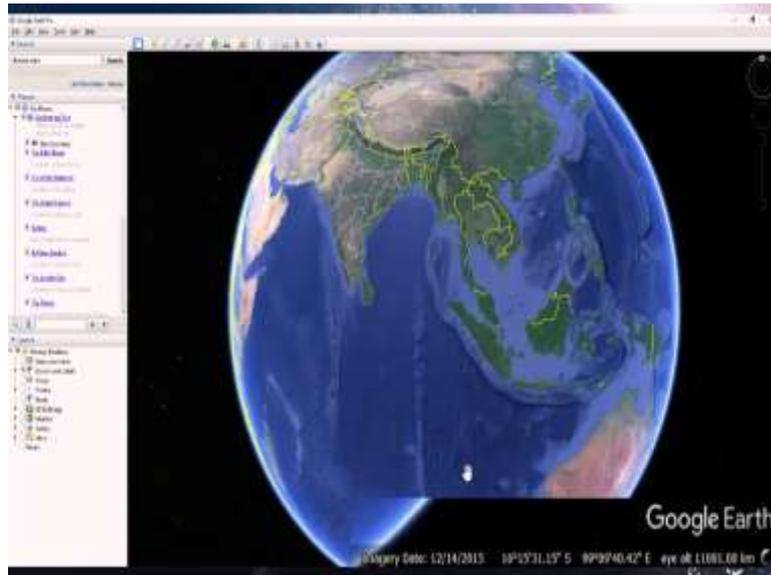
If I go into a critter, it shows me larger values in the negative and also sky these can be essential tools to understand or explore constellations. And if you go on, say Google Mars you can see that in the Layers panel, there are new features which are visible. So let us go to a location which we might know on Mars. Say Olympus Mons. Once you have landed at a

location, you can see that there are sightseeing tours, which is visible over here. If you click on any of these features, you should be able to find a brief information of each of those.

And if you click on the Next button over here, it would give you a sightseeing feature. And you can explore other locations. You can also go back to the previous location turn off this window to view it better. With Google Mars, you also have guided tours, historic maps, and spacecraft imagery, which is visible in the layer panel now.

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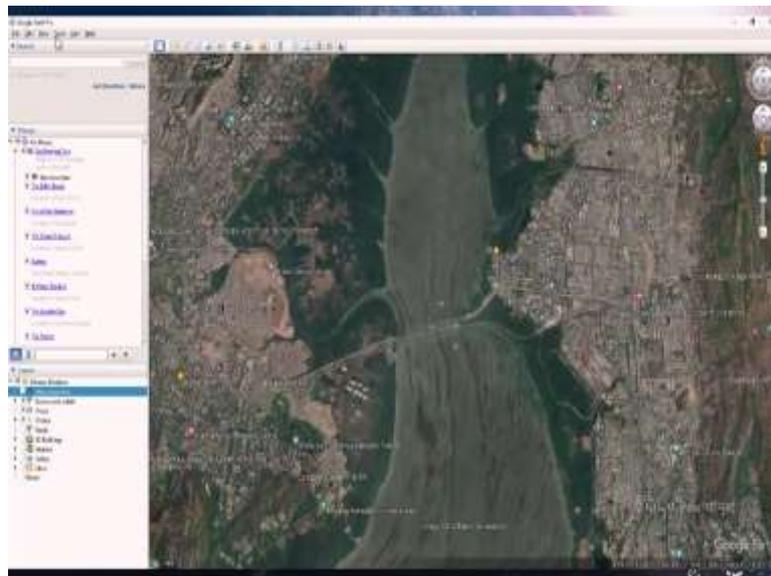
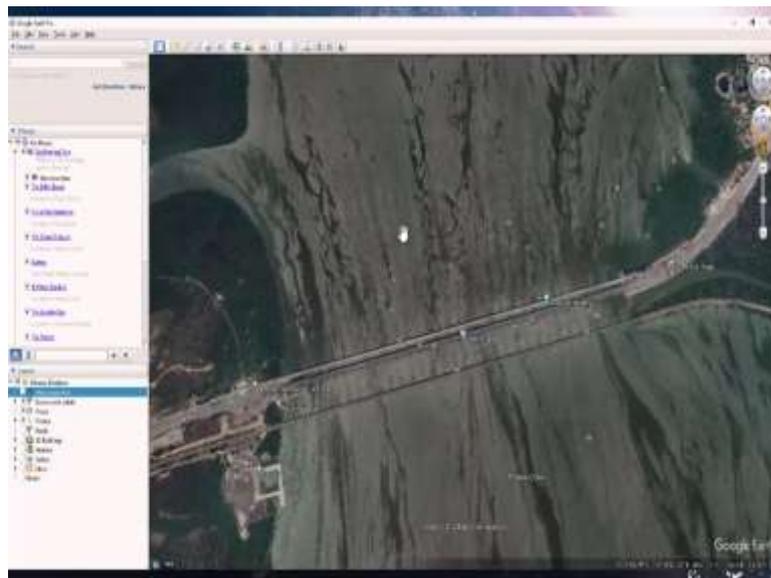


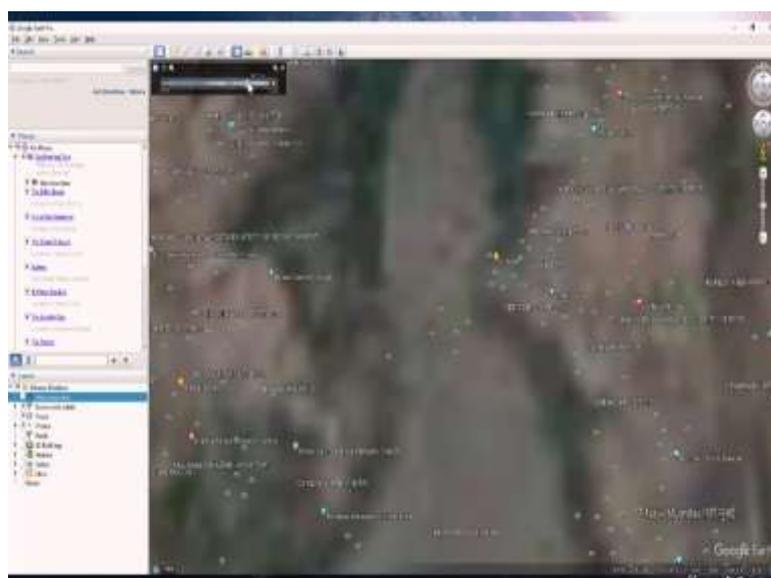
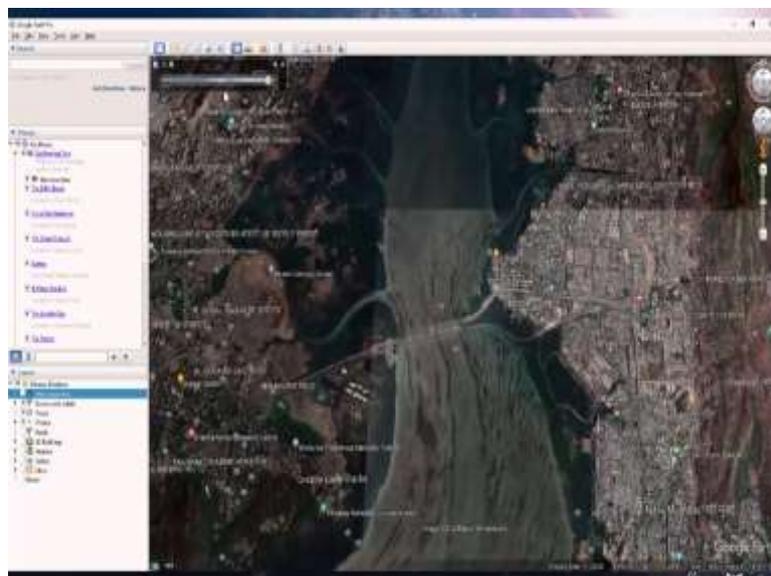
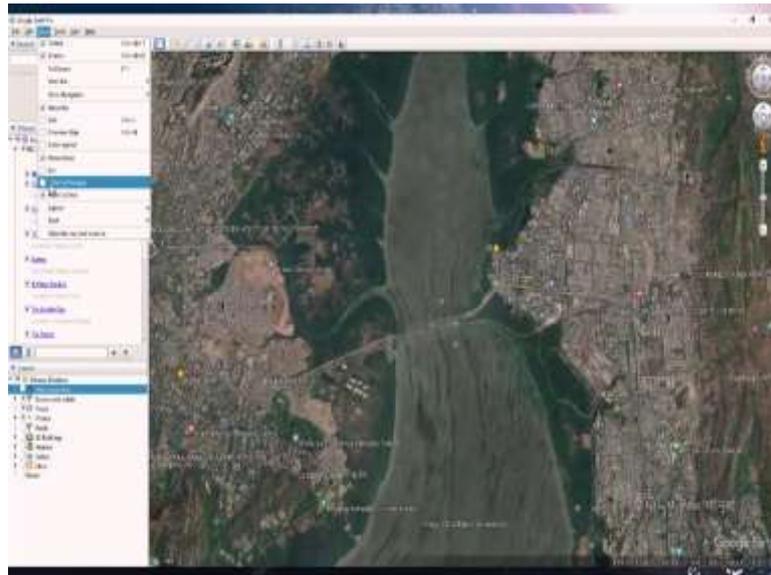


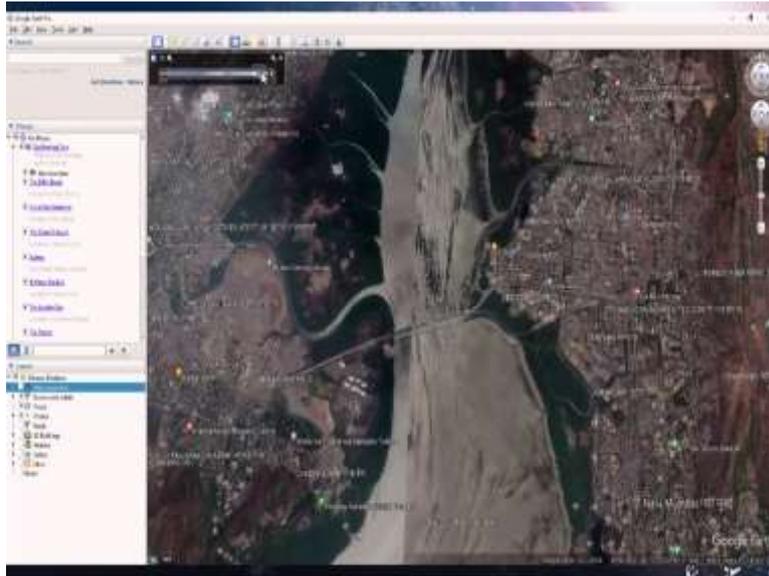
So let us go back to Google Earth. Whether it is Google Earth or Google Mars, there are certain important features you should usually see on a map, you can see that if I hover the cursor at any image location, there are certain values which are changing at the bottom right corner. So if I am at a fixed position, you would see the values for it, which is the latitude and longitude, which is visible over here.

So let me just keep hovering it. And you can see that how if I change it in the northern hemisphere, it would show you the latitude and longitude in that area. But see, I go to the southern hemisphere, it now shows it in a different unit. It would also show you the altitude for each of these points. So if I zoom in the eye altitude is also changing at the bottom right corner.

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There is another interesting feature which you can explore. So if you go to a certain location on the map, you can see how it was visible over ages. So if you go to View and turn on the historical imagery, there would be a bar which is available on the top left corner. And you can see there are more vertical grey bars which are here, the grey bar represents available imagery for that period. So if I scroll it in different times, I would see how that particular location was how that particular location was in say 12 of 2016 and then 4 of 2018. And I can keep hopping in history to see if any features were then present or not.

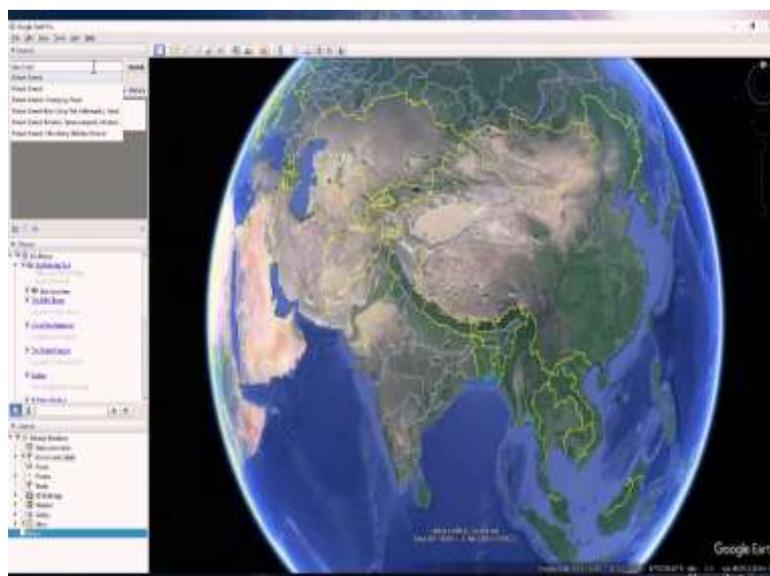
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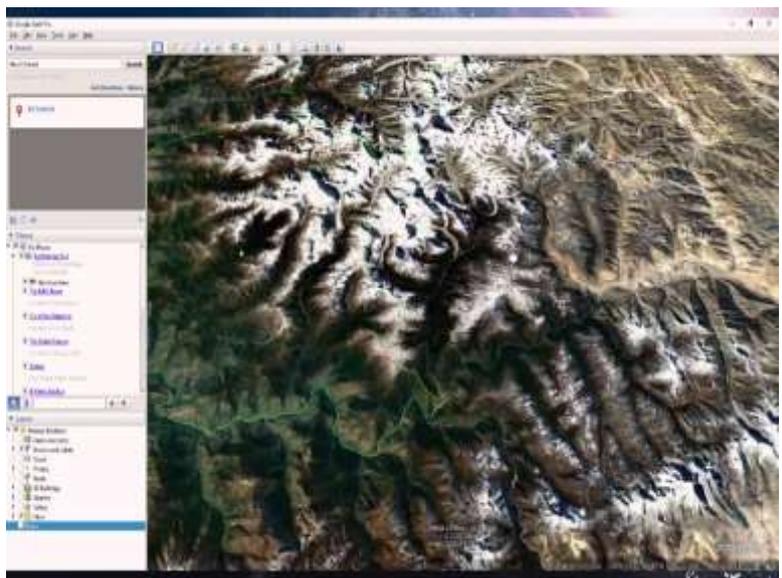
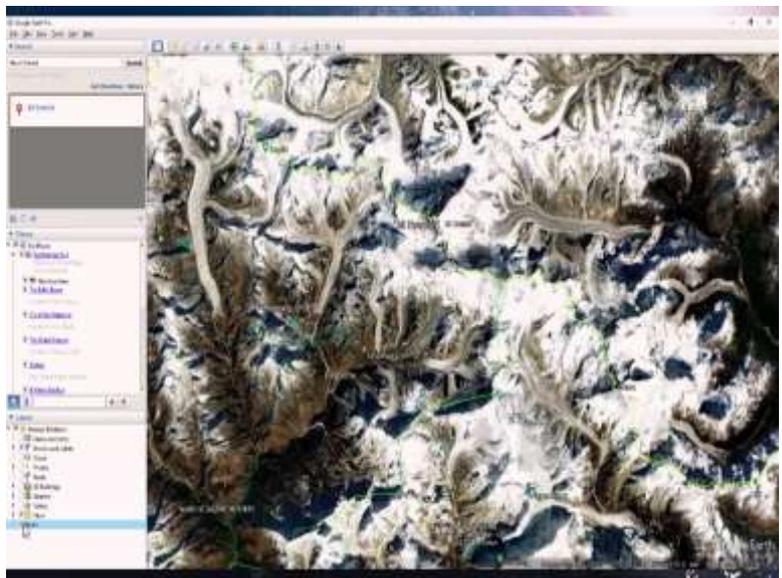
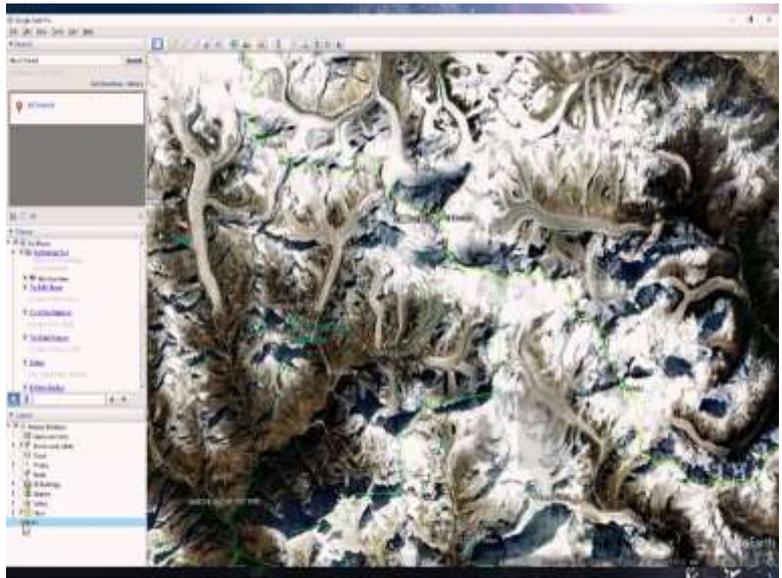


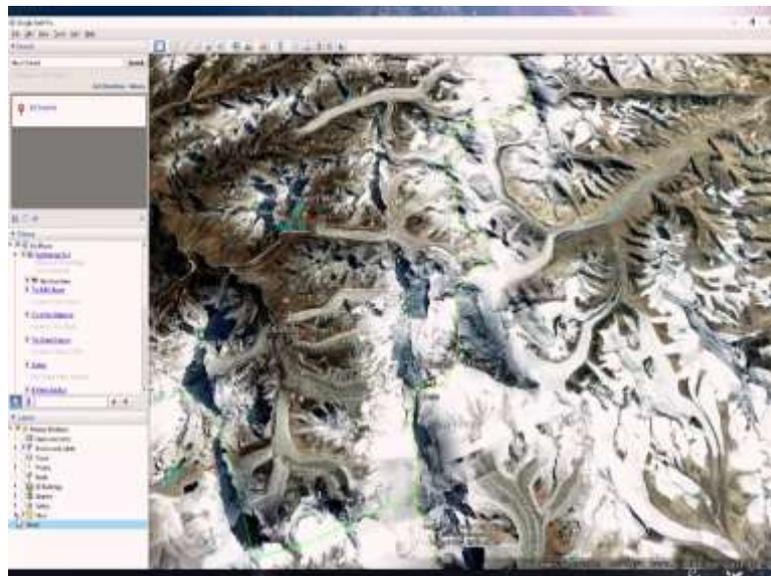
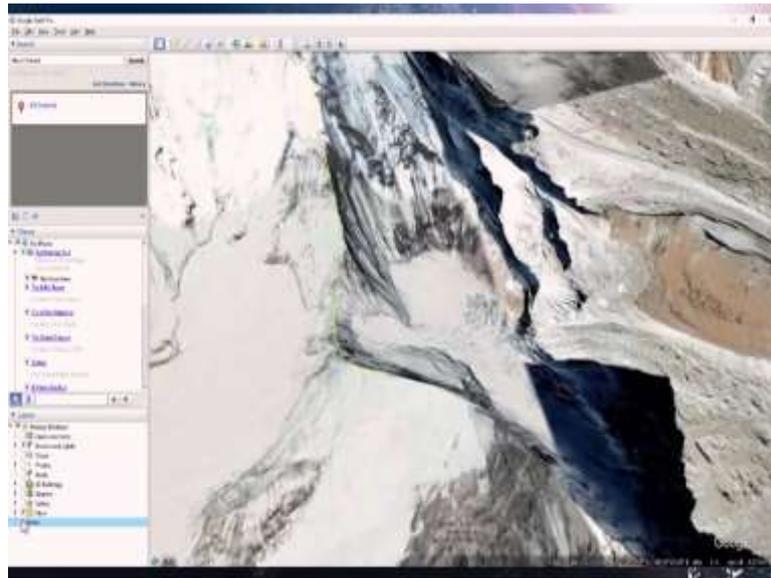


Another geologically relevant feature which you can explore in the Layers panel is the terrain. One of the limitations of physical globe is you cannot see the different geological features which are present on earth, say this part, you do not see Mount Everest, but over Google Earth, you can look at this, and also check the elevation for it. So let us see where these values are usually displayed on the software.

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So if I go to a location, say Mount Everest. Let me zoom out a little. If I now check the Terrain feature, you can see that it is not flat anymore. A better visibility of that is if I change the angle at which I am viewing this, so let me go sideways and change the angle a little. If I turn on this feature, it would give me a 3D perspective of the Terrain. But if I uncheck it, it would flatten the Terrain and it just an image. So this would be an important feature when you are studying geology and you would like to see it in a more altitude perspective.

Hope this video tutorial was useful for the assignments you would be using the latitude, longitude, pinning the location, mapping the area, finding the paths and terrain features. Have fun exploring it. Thank you.