4. Open Street Map

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4.1 Introduction

OpenStreetMap is open source GIS mapping software developed and constructed by volunteers. It covers the entire world and maps have an open content license. Most maps and data are free to the public; mapping and data are accomplished by local people in their own community. The map is not complete and is being updated on an ongoing basis. In this tutorial, we will explain the basics on how to use OpenStreetMap, with screenshots as we progress.

You can used OpenStreetMap for basic navigation and locating features within your community. Or for more advanced students and higher grade levels, OpenStreetMap is an editable map that can be used in your local community to expand features available to users worldwide. We will discuss OpenStreetMap basics and some initial editing capabilities. We will not provide complete details on all OpenStreetMap features and abilities.

We recommend this on-line mapping program for High School level and above. For additional information on OpenStreetMap, see the links at the end of this tutorial.

To access OpenStreetMap, go to https://www.openstreetmap.org
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If you click on Learn More (inside the black rectangle above), you will be taken to a website with more information on the OpenStreetMap Foundation and project.

4.2 Registering to use OpenStreetMap

In the upper right corner, click on Sign Up.

You are taken to this page where you can sign up. Signing up allows you to see what volunteers have contributed to OpenStreetMap and also allows you to contribute to the program. Fill in the required information.

You will then get this screen, please read the agreement in full. If you agree, then click agree.
You will get an email asking you to confirm that you have registered. Click on the provided link, and you will receive a confirmation, it takes you to a *Welcome Page* with basic terms for mapping. Click on *Start Mapping* to log in the first time.
4.3 Navigating in OpenStreetMap

You navigate in OpenStreetMap in many ways. Just like most other open-source GIS software. You can scroll in and out with your mouse wheel. You can also move east, west, north or south by left clicking on your mouse when your cursor is on the map and just dragging. Or you can use the navigation tools in the upper right corner.

To navigate to a specific location, you can use the zoom tools, or the search engine in the upper left of the window:

You can also get direction from one location to another by clicking on the curve arrow at the end of the Search line (red circle above).

We will discuss the Edit, History and Export buttons in another section of this tutorial.

4.4 Understanding the Toolbar on the Right Side of the Screen

We have already discussed the first two buttons, zoom in and zoom out.

The next button is Show My Location. If you click on this button, you will get a message that this website wants to access your computer’s location.

You will need to decide it you want that to occur, or check with your school’s resource or technology officer for instructions.

In the next section, the first button is Layers. When you click on this button, it turns green and the Map Layers’ table of contents opens. Remember, we are at the extent of CONUS, so you see some very general layers. Go ahead and click on each one to see how the map changes at this extent. Don’t zoom in anywhere just yet, we will cover that below.

Next is called Map Key, what we normally think as the map legend. At this extent, only a few things are shown – Motorways, Main Roads and Administrative Boundaries. For this extent, Administrative Boundaries includes a solid purple line for country borders and dotted purple lines for states and provinces within each country.
Now let’s search for a location and see how the map, available layers, and map key change.

Search for Grand Junction, Colorado, don’t forget to click on GO.

As you can see, many layers are now present in the map document – layers that were not present when we first entered OpenStreetMap and were zoomed to the extent of CONUS.

Click on Layers and Map Key to see what has changed.

The Map Key has become quite extensive (note the screenshots below are from using the scrollbar on the right side of the Map Key):
You may have noticed when you clicked on Cycle Map at the extent of CONUS, nothing really showed up. Go ahead and do it now that we are zoomed in. We see features and a Map Key.
Let’s continue with the buttons on the right side of the screen.

Our next button is Share. If you click on this, you get a url link to copy and share.

The last two buttons are Zoom in to add a note to the map and Zoom in to query features. If you are not logged in, neither will be active buttons.

In the following two screenshots, we are not zoomed in far enough to query features. That changes as we zoom in.

But, let’s look at Map Notes first. Click on Map Layers and then underneath Layers, place a check map under Map Notes.

This displays notes on the map where a problem may exist with data that a volunteer mapped. Yes, this is a volunteer project, but map information is verified and if it cannot be verified, a map note is added. In the below screenshot, click on the map note indicated with the orange circle. As you can seen, whoever mapped it, only described it as 5. If you know what the feature is, you can add it in the description box to resolve it. This one would be a difficult one to resolve, so let’s look at another.

Now click on another one, one of the red balloons with an X. Click on the one shown below with the orange circle below it. A problem with this mapping project, a Pizza Hut was noted here, but as you can see from someone’s notes, never was located here. You can type a message in the open box to help resolve this issue. You could also move the X to the correct location.
Now, let’s look at one that is resolved. Click on the Green Balloon with the check mark:

As you can see, this is a resolved note. OpenStreetMap noted a problem with this volunteer mapping and others were able to resolve it.

So what do you do if you find a problem with features that have been mapped by volunteers?

First, uncheck the Map Notes in Layers and close the Layers table of contents.

If you find a mistake in the map, click the little note on the right toolbar, it turns green.

It adds a blank note box on the left and puts a Blue Balloon with a + and an orange circle underneath on the map. In the box, you type the message indicating the problem with the feature mapped. To put the Blue Balloon on the right place, you place your mouse cursor on the Blue Balloon, when you see the crosshairs ☞, hold your left mouse button down and you can move the Blue Balloon to the correct location.

You may need to zoom in to find the exact location.
Why would you be interested in such a project? This could be a mapping project for your students, adding things to the map and resolving issues that the OpenStreetMap has found, or a project involving getting to know your city and navigating around the city from reality to a representation of your city in a map.

4.5 Query Features

Click on the Question mark and it turns green. This is Query Features. You can then left click on any feature and it provides information.

First zoom in on the green rectangle (indicated by the white arrow in the screenshot on the bottom of the previous page). Once it is a bit larger, click on it.
Then look on the left side of the map. It provides details that have been mapped – Enclosing features. Why isn’t there more information? Remember, this is a volunteer open-source mapping project. If Grand Junction, Colorado is the location of your school, perhaps a mapping project for your class would be to add additional features to the map. Within Grand Junction, we have several roadside sculptures that are permanent features. Such things can be added and might be useful to visitors in the city. Perhaps your city does not even have the streets named. Start with your school location and work outwards.

Let’s talk about two additional buttons, then we can start talking about how to do mapping.

Look at the top of your map – three buttons – Edit, History and Export.

History provides details on mapping within this extent. Clicking on it for this extent of Grand Junction – we have a very active mapping community – some were completed just a few hours ago. It shows who did it (your user name that was set when you signed up, so we don’t know the individual people’s identity). Please note that you can join your local group, or form a local group if one does not exist, to help update the map.

Let’s look at Export – just what is sounds. It allows you to export the map. You can export it in the extent showing in the map window (which automatically populates in decimal degrees), you can manually change the extent - - one or all four of the boundary lines. You can also choose what map sources to export. Once you are happy with the choices for your export, you click on Export in the blue box.
Once the export is complete, you will see the following at the bottom of your map document window:

Once the export is complete, you will see the following at the bottom of your map document window:

Click on the ^, then click on open. If you have any difficulty with opening this type of file, please see your IT administration for assistance.

4.6 Editing in OpenStreetMap

You have to be signed in to edit a map. You want to navigate to the area you want to edit and zoom in. OpenStreetMap gives you a step-by-step instruction on editing. Once you click on the down arrow next to Edit, choose Edit with iD.

You will get the following message. You can proceed to Edit Now or Start the Walkthrough. The following screenshots provides the walkthrough.
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Points can be used to represent features such as shops, restaurants, and monuments. They mark a specific location, and describe what's there.

Click the Point button to add a new point.

Areas are used to show the boundaries of features like lakes, buildings, and residential areas. They can also be used for more detailed mapping of many features you might normally map as points.

Click the Area button to add a new area.

Lines are used to represent features such as roads, railroads, and rivers.

Click the Line button to add a new line.

You're now ready to edit OpenStreetMap! You can replay this walkthrough anytime or view more documentation by clicking the Help button or pressing the 'H' key.
Once you have finished the walkthrough, or if you went straight to start editing, you will see the following -- an aerial photo as your base layer and those features already mapped by volunteers.

Now you need to navigate to the specific place you want to edit. In the following screenshot, I have navigated to the local cable company. The building is on the map (red rectangle) but it has not been identified.

Click on the building to highlight it (the nodes were added) and a window on the left pops up, so you can add the detail.
In this screenshot, detail for the building was added.

Then click on Save (red rectangle) and receive a message to review the changes.
Once received, you will be required to add a Changeset Comment (this is what shows up in History as outlined above). You can review before uploading to make sure your comment is correct, and spelled correctly.

Once you are satisfied, click Upload.

You can also change the aerial imagery that shows as your reference information.
Click on Layers and you can see the optional list of available imagery.

Click on DigitalGlobe Standard Imagery and you receive a much more detailed base image. In this case, add a line feature to extend a footpath that is located along a canal, which can be seen clearly with this imagery.

Click on Line (the button turned blue in the above screenshot), then click on the last node to activate the connection -- following the footpath in the base imagery, adding a node each time
the footpath curved, following the footpath exactly. Once you followed the footpath to the end, double click to stop editing. The next two screenshots shows the detailed information added for the footpath on the left -- metadata. When complete and satisfied with the change, click on Save and once satisfied with your review of the information, click on Upload, as before.

Editing a map is an excellent exercise for students to identify features, understand addresses related to features, understand what type of features are found adjacent to others, and their
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relationship. It also allows students to learn and navigate around their local area. Please note that you are contributing to a mapping community, so be sure that your students are of sufficient knowledge and educational level to add accurate information to this open source mapping community.

This concludes this tutorial. You can do many other activities with OpenStreetMap, and this tutorial was just an introduction to get you started.

4.7 For more information and guides to using OpenStreetMap

If you are interested in going a local group or a local chapter, hosting a mapping party or joining the OpenStreetMap Foundation, go to: http://wiki.openstreetmap.org/wiki/How_to_contribute

For more information about OpenStreetMap Foundation, see: http://wiki.osmfoundation.org/wiki/Main_Page

The beginners guide to OpenStreetMap can be found at: http://learnosm.org/en/beginner/introduction/

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Please note that we have not yet completed any YouTube videos related to this chapter.