WORKING WITH OPEN STREET MAP

TOPIC 5: MODIFYING BASEMAPS

VINCENT A. DINOTO, JR.

JEFFERSON COMMUNITY AND TECHNICAL COLLEGE

Vince.dinoto@kctcs.edu

Contents

Table of Contents

Introduction

Open Street Map is an open source mapping software for displaying geographic information. The map objects can be modified and new information created by the user community. There are members of the Open Street Map community that monitor changes in the features to insure that maps have not been hacked. Open Street Map is generally written without spaces. If OpenStreetMap has never been used before the learner should explore (play with) the software prior to moving into the contents of this topic. This mapping software is a cached vector program. This module will include:

- Working with OpenStreetMap through a web interface. https://openstreetmap.org

    - Creating new locations for OpenStreetMap.

    - Editing locations will include the modification, providing addition information, deletion, and correcting the position.

- Use of Mapbox Studio to change the cartographic look of OpenStreetMap. Only the free part of Mapbox Studio will be used to:

    - Change linear display colors

    - Change polygon fill colors

    - Change point symbols

    - Change labels including, color and font face

    - Change the zoom level in which data is drawn

- Use the modified cartography created in Mapbox Studio with a map service from ArcGIS Server or ArcGIS Online.

OpenStreetMap

OpenStreetMap is a vector driven cached web map, which makes an excellent basemap for many mapping projects. OpenStreetMap gives the user the ability to add new map content, like a point for a new restaurant, a line for a new road segment or a polygon for a new park. Modification of exiting content such as the wrong name on a street or road, the naming of unnamed objects, and the modification of area such as a cemetery that has been enlarged. The user can also delete no longer existing item like a school, repurposed items like an old fire station that has been turned into apartments or roads that have been eliminated. Think of OpenStreetMap as the Wikipedia of mapping.

OpenStreetMap Cartography

OpenStreetMap gives the user the ability to modify the cartography of the map, this can be done by using an open source product like Mapbox Studio. Most basemaps give the user no ability to make any type of modification to how the layer is displayed; the user is stuck with the predetermined colors, zoom

levels, fonts, etc. The user must either use what external cartographers have created or create their own basemap layer, which can be very time consuming. OpenStreetMap gives the designer a solid set of information, but also allows for editing and modifying the base layer, as is need for the specific application.

Working within OpenStreetMap

Using a browser the user should visit the Open Street Map website at https://openstreetmap.org. The first step will be to create an account and login so that the user will have full access to the functionality of the software. The user should zoom to a location that they have knowledge about, such as their local community. Explore the community to ensure that a full understanding is obtained. See Figure 1.
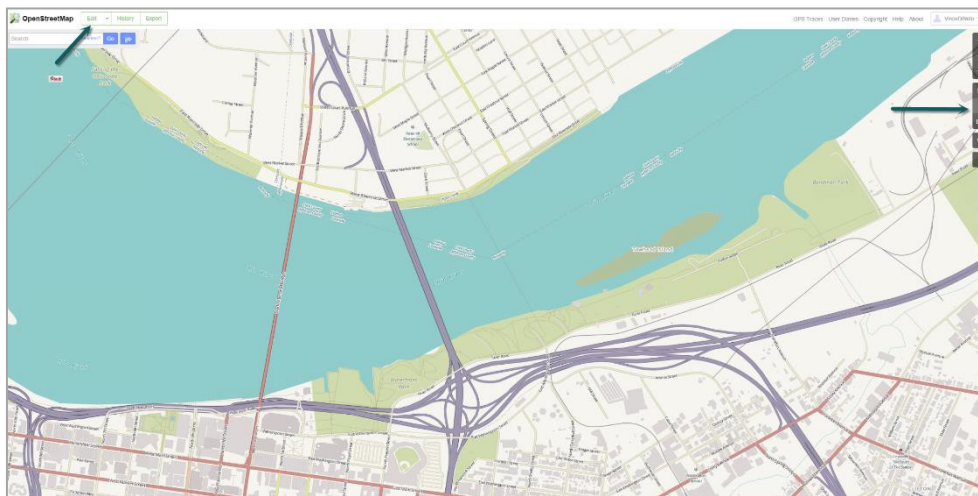
Exploring OpenStreetMap

Figure 1: Opening OpenStreetMap, note the two arrows in the diagram.

See Figure 1 on the far right side of OpenStreetMap there are eight icons. In Figure 2, from the top down, the buttons are grouped together, the first three buttons allow zoom control and users position (if a GPS is connected). The next button allows the user to select the look of their map from predefined templates. The fifth button provides information about the map, which will open a legend when in the standard view only. The sixth button is for sharing, the map can be downloaded, linked or as HTML code. The next button allows the user to add a note to a map; this note will only be visible by the user and not by the entire user community. The last button is used to query the map. These buttons will be used throughout this module.
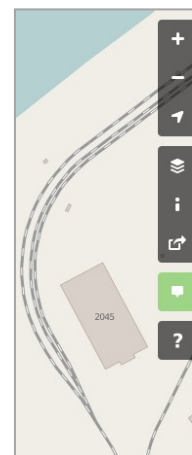

Figure 2: OpenStreetMap Controls

On the upper left side of OpenStreetMap is the Editor tab/button, see Figure 3 this tab is used to edit

existing content and adding new content to the map. OpenStreetMap has three different editors, which can be selected from the list. It is suggested that the third choice be done outside of OpenStreetMap by installing the JOSM editor (Java for OpenStreetMap). The simplest editor will be used in this discussion and is called ID.
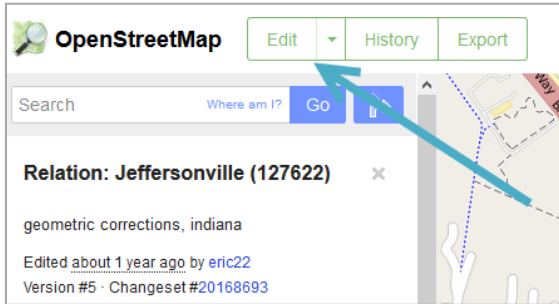
Figure 3: Editor

Creating a Point Location

- Make sure that the user is logged into OpenStreetMap.

- Determine the location of a point to add to the map. This is a location that is currently not be on the map, like a restaurant, etc.

- Click on the edit button and use the ID editor (the default editor). See Figure 4, a toolbar has been added to the top left of the screen, the icons on the far right have changed, and the edit window has opened. The background is now an aerial image. The background image can be changed by the user, but the default will be used.

Figure 4: ID Editor

- Click on the Point icon on the top of the screen.

- When a location is selected for the point, the menu seen in Figure 5 opens for the user to select an icon, also a search box is available.

- The point the author selected was the location of a public library.

  – It was not in the list so the word library was typed.

  – It was found and the icon changes and an information box appears as seen in Figure 6.

- Input information that is correct. Because what is inputted will be added to OpenStreetMap. Click Save and the changes will be uploaded to OpenStreetMap.
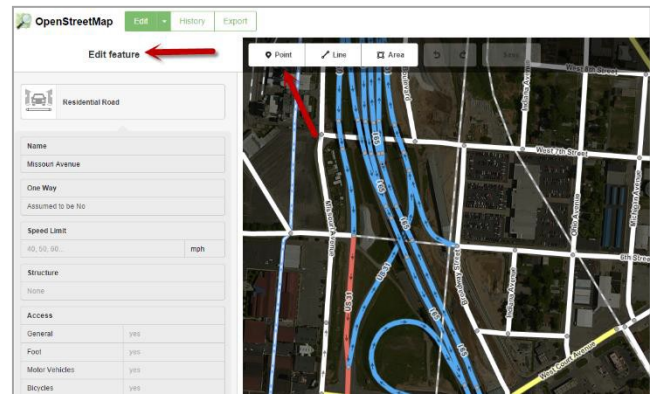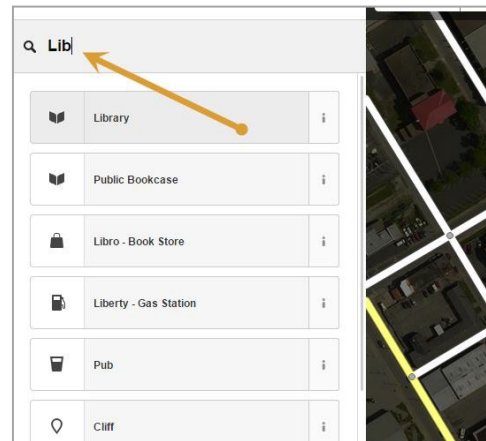

Figure 5: Adding a Point

- Once Save is selected, a dialogue box opens to give a reason for the edits. Input the reason and click save. This needs to be made as clear as possible for the editors.

- The lower arrow in Figure 6 is pointing to the location of the library.

- Leave the edit mode, which may require reloading OpenStreetMap to see the results of the added feature. A few minutes is required for the new point to appear on the map for everyone to see. This point must be added to each cached zoom layer, so it may appear in some layers before others. It will only appear at specific predetermined zoom levels. See Figure 7
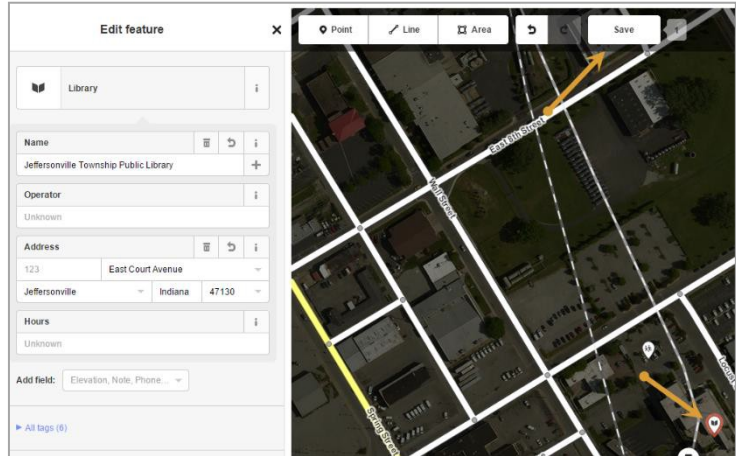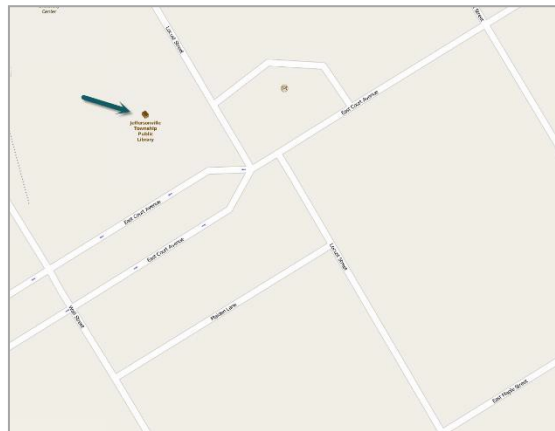

Figure 6: Information Box

Figure 7: Point Creation Results

Steps to the Creation of a Line or Area

- Line creation:
    - Select Line Creation
    - Click the start point
    - Click every point in which the line will have a turn or change in direction (this is a vector and all curves are a series of straight-line segments).
    - Double click to complete the line.
    - Fill in information about the line, similar to the point creation information.
    - If this is not a true feature, do **not** submit it or save it.

- Area Creation:
    - Select Area Creation
    - Click the starting point
    - Click ever location in which there is a change in direction.
    - An area must have at least 3 points to be an enclosed polygon.

- Double click for the last point to close the polygon.
- Fill in information about the polygon, the area could be a building, park or other enclosed feature.
- If this not a true area do **not** save the feature and delete it.

Editing an Existing Feature

- The designer may be working with an existing feature, needing to correct a mapping error.

  - The reasons for the errors can vary, but many times, it is due to the importing of historical or old topographic maps.

- In the edit mode, a feature can be modified.

  - In the editing session, all components of the selected item can be modified, including removing the item from the map. Modifications can be made about position, shape and/or information.
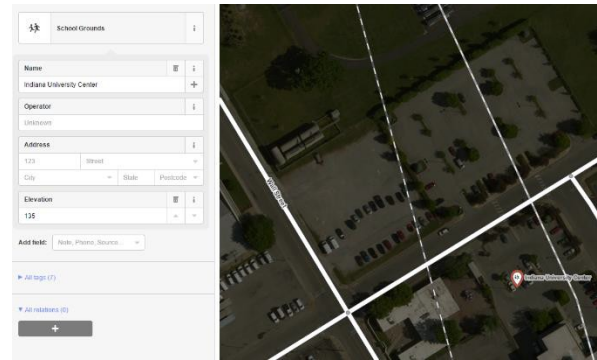

Figure 8: Editing a Feature

- Click on the feature (point, line, area) and on the left side will appear information about the feature, see Figure 8.

- The point that the author has highlighted has not been at this location for more than 30 years and needs to be deleted.

- For this case the point labeled Indiana University Center needs to be deleted, when the point is selected a trash can icon appears and then the point can be removed.

- The name of a feature might be inaccurate, for example:

  - For example, the name of a street might be incorrectly labeled, from U.S. Census Bureau TIGER data.

  - A business has changed name.

- The shape of a feature is wrong (line or area), for example:

  - A park boundary is inaccurately drawn.

  - A road has been extended.

  - A road is going through a polygon, the historical map has a road that has been removed. In my community, recently a new park was constructed eliminating some streets.

- A feature is in the wrong location, for example:

  - When the feature was placed on the map, it was inaccurately located.

- After any editing session, the user must save and give a reason for the edit. Give as much information as possible for changing the feature.

Assignment 6

- Create a series of images of changes made to OpenStreetMap. Include a before and after image.

- On any edits that are done permanently (submitted) provide the location and what was changed. The instructor will not be able to see deletes unless a before image is provided.

- Change/Add a point, line or polygon. Remember if these are permanent edits they need to be done accurately, since a real resource is being modified.

Other Editors

- The Potlach 2 editor and the JOSM editor are both available for editing OpenStreetMap as are other editors.

- The Potlatch 2 editor works from within OpenStreetMap.

- The JOSM editor is a program that runs in the operating system.

- Both of these editors are considered advanced topics and knowledge will only be required at an elementary level.

Potlatch 2

- Under the Edit Tab the second choice is Potlatch 2 editor.

- A set of icons will open on the left, a dialog box in the center, new tools on the upper right and a small tool window on lower right. The dialog box provides helpful hints in using the editor, see Figure 9.
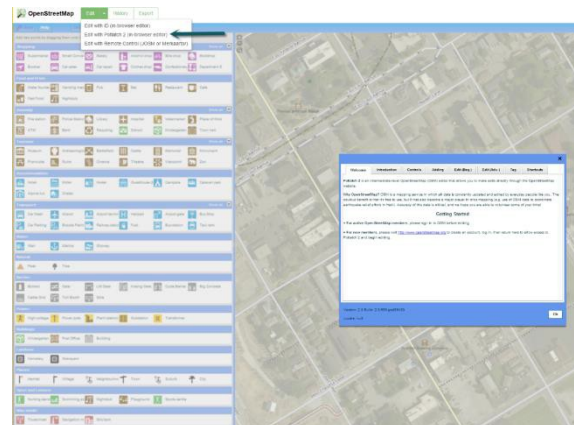
JOSM

- The JOSM editor is a separate installation.

- JOSM is Java OpenStreetMap

- https://josm.openstreetmap.de/

- It works on both Windows and Apple Platforms

Figure 9: Potlatch 2 Editor

- There is an extensive library of plugins, which can expand the functionality of the program.

- The initial screen may vary depending on the version, see Figure 10, this slide shows version 8159.

- To use JOSM download the map and after editing it must be uploaded. The arrow is pointing to these tools. This is only a portion of the display.
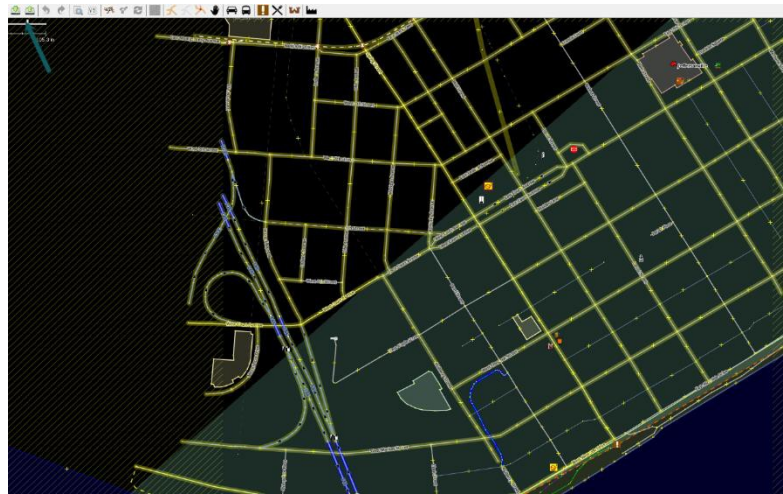

Figure 10: JOSM

Assignment 7

- Create a simple edit, using each of the two advanced editors, in OpenStreetMap, this can be an item which is a real modification and was saved or just a demonstration of the technique. Make sure to always have a before and after image.

  – Create a series of images showing the use of the Potlach 2 editor.

  – Create a series of images using JOSM for editing.

Mapbox Studio

- Mapbox Studio is a cartography program and thus differs from the editors previously discussed in that the purpose is to change the look of the map but not the content.

- Mapbox Studio must be installed

- . The download is about 100 MB and the installation process will take several minutes. https://www.mapbox.com/mapbox-studio is a free download and works within different operating systems (both Windows and Mac).

- Create a Mapbox account; there is no charge for creating an account.

- Depending on the use of uploaded maps, etc. the free limitations could be exceeded, but that should not occur in the assignments in this course.

- Mapbox and Mapbox Studio are not the same product and they serve two different purposes.
  – Mapbox is a general mapping program similar to other mapping programs such as QGIS, ArcMap or ArcGIS Online.

  – Mapbox Studio is designed to be used with OpenStreetMap to create a customized basemap layer by changing the look (cartography) of the basemap (background).

- – Mapbox Studio will utilize CSS code (Cascading Style Sheets) allowing the user the ability to change parameters such as polygon fills, width of lines, colors, font size and styles.

  – The revised cartography can be used as a basemap layer within other applications.

  – Version shown is 0.2.7

- A good tutorial for to reference: http://www.digital-geography.com/mapbox-studio-tutorial-1-installation-gui-first-map/#.VUjVbiFVhBc

- There are numerous already defined styles within Mapbox Studio. To make for an easy starting point it is important to select an initial style, see Figure 11.

- Streets Classic was selected for this example.

- Once selecting the style, the right side shows a series of tabs, see Figure 12. The selected area is the Ohio River at Louisville, KY on the south and Jeffersonville, IN to the north.
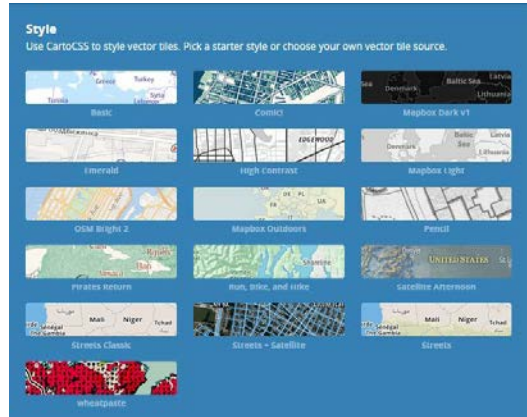
Figure 11: Starting Point

Select the first tab vars (variables), this tab controls all the colors of different variables. Each variable type is in separate sections.

- The variables use RGB codes, in two digit hexadecimal format. The first two digits represent red, the second two for green and last two for blue. For example: 43AF78, 43 would be the red intensity, AF for green and 78 the blue. If

Figure 12: Editing
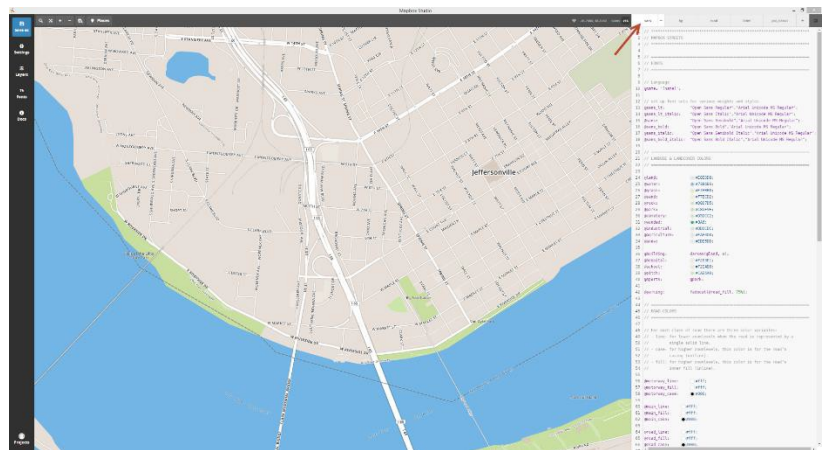
00 is used that color is absent and if FF maximum intensity is used.

- Click on the little circle for @park. See Figure 13, the black point shows the currently used color for the item that has the attribute of a park. Look at Figure 12, there are parks along the river.

- Select a new color, and then select Choose. This can be done by changing the complete family of colors and the intensity. To make it dramatic, the color for parks will be made red.

- The changes are not visible until the map is refreshed or the map is saved, the saves are made to the local computer, see Figure 14.

Figure 13: Color Selection

- Changes are not made to just the visible area on the screen, but on the entire world data set. The changes are only visible to the designer, not the general user community. The modified map can be used as a basemap in other applications.

- Experiment with other changes in color, for example on roads. The designer should also change road widths, labels, etc.

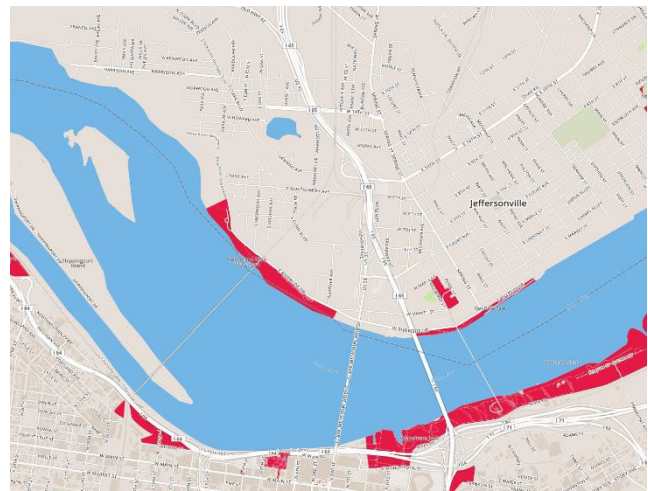- Of course making a park red is not a good cartography.

Figure 14: Color Change

- Here is an example of bad color choices, but the purpose is to show some of the items that can be changed.

    - Bright green for parks

    - Bright deep blue for water

    - Interstates made yellow

    - Major roads made teal green

- Font size, font face, line width can all be modified in the tabs.

Figure 15: Final Results

- Experiment with changing other parameters.

OpenStreetMap as a Basemap

- OpenSteetMap can be used as the base layer on the server or with ArcGIS Online.

- The Mapbox Studio changes can also be used in geospatial program or on websites.

Assignment 8

- Create a modified OpenStreetMap.

- Provide the instructor images of the changes that are made as well as discussing the changes. This should include a before and after image for each change.

- Change

    - Color of items

    - Font Face

    - Font Color

    - Font Size

    - Line Color

    - Line Width

Index