ENTERING YOUR DATA IN GOOGLE MAPS

Summarizing and reporting data – Have students prepare an Excel spreadsheet showing all collected data. An example spreadsheet, which is provided as an Excel Spreadsheet with the curriculum materials, is shown as follows:

<table>
<thead>
<tr>
<th>Sample</th>
<th>Lat</th>
<th>Long</th>
<th>Count</th>
<th>Volume</th>
<th>Bact/100mL</th>
<th>Location</th>
<th>Temp °C</th>
<th>pH</th>
<th>Color</th>
<th>% impervious</th>
<th>Salinity</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>38.939015</td>
<td>-76.556029</td>
<td>33</td>
<td>100</td>
<td>33</td>
<td>Warehouse Creek</td>
<td>11</td>
<td>7.6</td>
<td>murky brown</td>
<td>15</td>
<td>0.2 ppt</td>
</tr>
</tbody>
</table>

The collection points should then be plotted on the MdBioLab Google Map.

![Google Map Screenshot](image)

**Figure 12- MdBioLab Google Map.**

The points can be added to the Google Map by going to [http://maps.google.com](http://maps.google.com) and logging in to the map using the MdBioLabMaps user id. This username and password should only be used by the instructor and not given to the students.

**Userid:** MDbio.Map@gmail.com  
**Password:** teachers

Once logged in, select My places (top of lefthand panel), then MAPS, then MDbio Enterococci. You should see a map with blue markers in the righthand panel and a listing of water collection sites in the lefthand panel (Figure 12). Click on the red EDIT button to add new entries of editing existing ones. If the collection points used for the students had been previously entered, then only the date and count need to be added. If the collection point is being entered for the first time, select the blue data point icon (at the top of the map), and drop it at the actual collection point. The map can be zoomed to make the placement of new markers more accurate. If the icon is dropped at the wrong point, it can be dragged using the mouse. Give the point a name, such as “Main Street Overpass over Blue Creek” so that other classes can easily recognize the location for future collections.

To edit an existing entry (for example to add additional collection dates to a previously visited site), click on the name of the location in the lefthand panel. An editable text box should appear on the map (Figure 13).
Filling in a data point on Google Maps. Please enter the following information. If there is already a data point for this location, simply add in your data, following the guidelines listed below or as seen on the existing data point.

Enter the title of the data point
- Enter the location using as much information as possible
- Provide a descriptor of the body of water being sampled (i.e. creek, water fountain, drainage ditch, pond, etc.)
- A street address or the closest road is preferable; latitude and longitude coordinates can also be entered
- If multiple sites exist, provide a site number and give it a unique descriptor

Enter the data
- Provide the sampling date written as follows: Collected: month/day/year
- Provide the colony count per 100 mL. Depending on your plates, this may be the number of colonies on the 100mL plate or the (number of colonies on the 10mL plate * 10). Give the count as CFU
- Give any other information (i.e. water pH, turbidity, temperature, etc)
- Optional: Enter % impervious surfaces (see below).
Example entries:

Example Creek, off of Imaginary St, Anywhere MD
Collected month/day/year
50 CFU/100mL
Temp: 8C

Example Creek, site #2, off of Woodland Trail, Anywhere MD
Collected month/day/year
0 CFU/100 mL
Temp: 8C

Drainage pond, 123 Made Up Ct, Somewhere MD
Collected month/day/year
212 CFU/100 mL
pH: 7
Weather: light rain

Calculation of Impervious Surface: The amount of impervious surface surrounding each collection site should then be computed by the students. The pair of students for each collection site should work together to complete this activity. A good online educational resource that discusses issues related to impervious surface is MathBench, a series of modules developed at the University of Maryland to teach underlying math skills for the chemical and biological sciences.

To access MathBench:
1. Go to: mathbench.umd.edu
2. Select “Environmental Science”
3. Select “What’s in your Watershed?”
4. Work through the impervious surface exercise

You then should compute the percentage of impervious surface surrounding each water sample collection sitepoint.
1. On the MdBioLab Google Map, Move to the largest zoom level with the collection point centered, then zoom out twice. This gives you the immediate area surrounding the collection site. The scale at the lower left corner of the map should be 100 ft/50 meters.
2. Print out the displayed Google map, preferably in color
3. Use the overhead with gridlines every centimeter (approximately every 50 feet of scale)
4. For each cell in the grid, identify whether the cell is primarily impervious (building, parking lot, road, gravel) surface. For cells where it is approximately half, count it as half impervious. Otherwise, treat it as entirely pervious or impervious.
5. Count up the total number of impervious cells on the map, divided by the total number of cells to compute percent impervious surface
6. If possible, compare data to that computed from Landsat Imagery from the Mid-Atlantic RESAC (http://www.geog.umd.edu/resac/impervious.htm)