

# **Data2Maps (D2M)**

*a custom Excel tool for  
displaying your monitoring data*

## **User Guide**

USEPA Region 5  
rev. August 1, 2007



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# Introduction

Locally led watershed projects need to be able to demonstrate what the water quality data of their local area is in order to attract support. Being able to show people where the problems are in the watershed is an important tool for building public support. Smaller organizations tend to be more focused on implementation and may not have the available personnel expertise or technology to pull together sampling results in a way to clearly demonstrate the water quality of their watershed.

To address this need, working with local watershed groups, USEPA Region 5 developed Data2Maps (D2M). D2M is a custom Excel application in which users can overlay their sampling data on static maps and do preliminary assessment and analyses. By using Excel for this template it allows local organizations without many IT resources to assess their data and present it in a visually engaging manner.

D2M requires a one-time set up for a given project (approximately 1-2 working days by an advanced Excel user). Once the application has been customized, a basic-level Excel user can maintain the application by simply pasting in the monitoring data. The data can then be queried by parameter and by year, and D2M will display the results as:

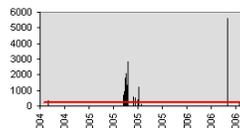
## Maps

Maps/images provide geographic context while color-coded sampling locations show how often a standard has been exceeded



## Charts

Histograms of data, along with standard/threshold line to show frequency and extent of exceedances



## Numerical Summaries

Simple statistics and list of individual data points by sampling location.

n: 27  
avg: 952.22  
st dev: 1122.68  
% exceed: 89%

# data pts > 235 cfu/100 ml  
24

Site	Year	Date	E. coli
2	2004	9/14/2004	360
2	2005	6/21/2005	700
2	2005	6/22/2005	0
2	2005	6/23/2005	600

The outputs can be printed directly from D2M or pasted into other applications (e.g., PowerPoint, MSWord) for outreach and reporting materials.

Because the set-up time is directly related to the number of sampling sites, D2M is best suited for projects with pre-determined and limited (less than 15) sampling locations. While D2M mimics some aspects of a GIS, it is not a true GIS because the maps are not georeferenced. For capabilities beyond those currently built into D2M, a user would still need GIS.

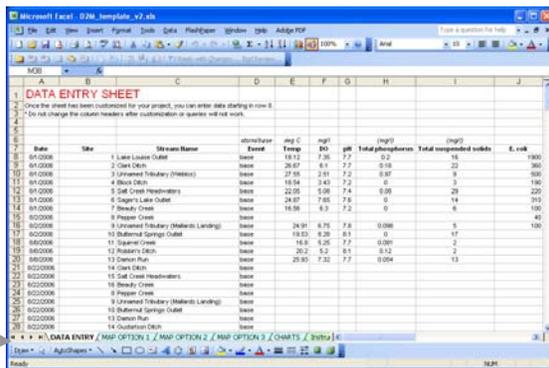
# Overview of Data2Maps

This section gives an overview of how Data2Maps is set up. We highly recommend you read this before opening the file. **Note: If you want to follow along in a Data2Maps file, first go to Pg. 5 for directions on how to avoid Excel security problems when you open the file.**

## D2M Worksheets

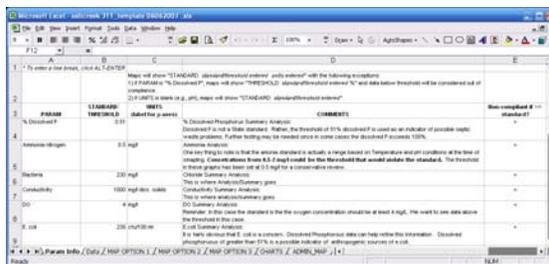
Data2Maps is entirely contained in one Excel file with multiple worksheets.  
(Note: To move through the worksheets, click on the names on the bottom tabs.)

There are 2 data entry related worksheets:



### DATA ENTRY Worksheet

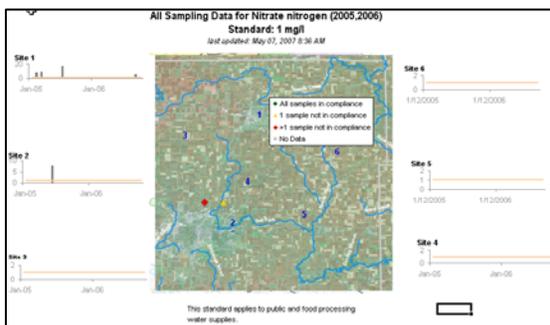
This is where you enter your monitoring data. All maps and charts use the data entered in this worksheet.



### PARAM INFO Worksheet

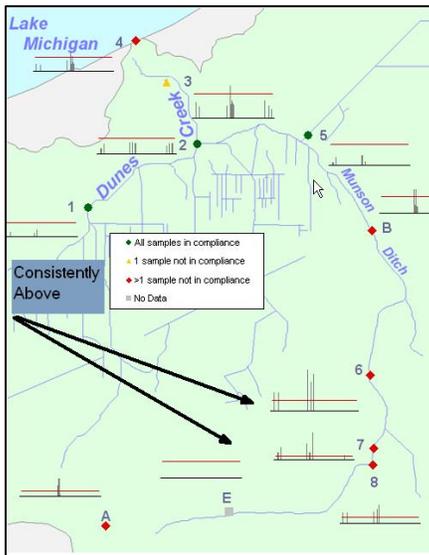
This worksheet contains a list of the sampling parameters and associated information (e.g., units, threshold) and is populated during the set-up process. Users can also enter parameter-specific comments here to be displayed with the maps.

There are 4 worksheets that map and/or chart your monitoring data in different layouts. Deciding which layout to choose depends on the end purpose, as detailed below.



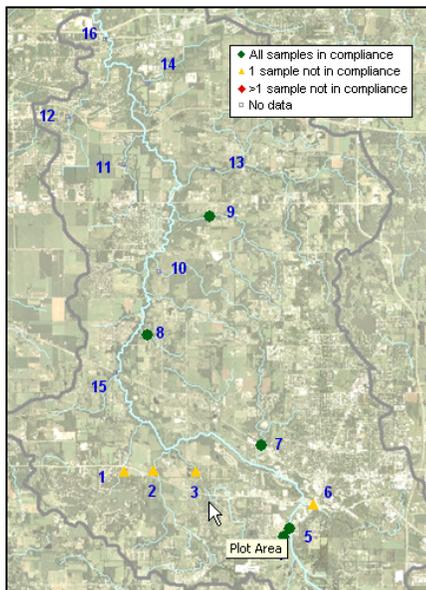
### MAP OPTION 1 Worksheet

Displays a map with sampling locations color-coded by frequency of exceedances above a standard for a chosen time period. Charts for each location are positioned on the side (close to the sampling point on the map for easy association). This can be very helpful as a hardcopy handout at a meeting.



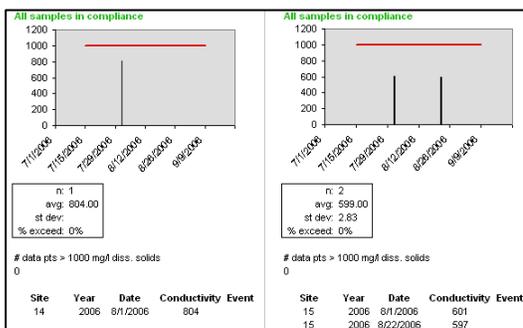
### MAP OPTION 2 Worksheet

Charts are displayed directly on map next to the associated sampling location. The charts show the standard/threshold line, but are stripped of labeling info. These charts are only meant to give a rough sense of frequency and extent of exceedances. In this example, it shows that conductivity is significantly above the standard near sites 6 and 7 (near a road salt storage area!). This layout is recommended if user has few sampling locations (<10). Otherwise the map becomes hard to read.



### MAP OPTION 3 Worksheet

This simple layout does not include charts. It is a good option for public meetings because it is the cleanest and easiest to understand. We would recommend printing out charts (see next worksheet) to use in conjunction with this map so that you can provide more detailed information on each location.



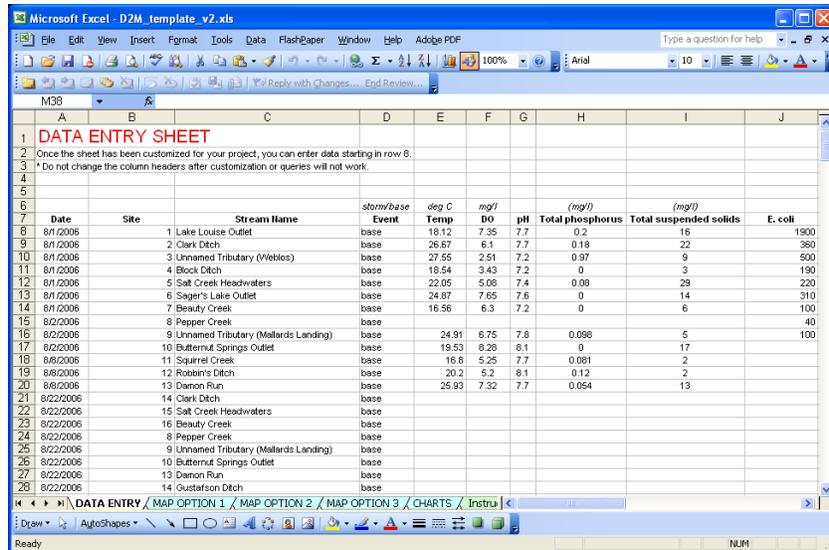
### CHARTS worksheet

This worksheet shows details of each sampling location. The charts on this worksheet are larger than those on the map displays and have the clearest labeling. Underneath each chart are summary statistics for the location and a list of the individual data points (includes date, value, storm events).

The remaining worksheets are general instructions and admin worksheets used for coding.

## Entering Data

During the set-up process, the column headings in the Data Entry worksheet will be labeled with your sampling parameters. You enter your data directly into this worksheet whenever you get a new set of data. Every time you run a data query, all the maps and charts are refreshed with the data entered in this spreadsheet.

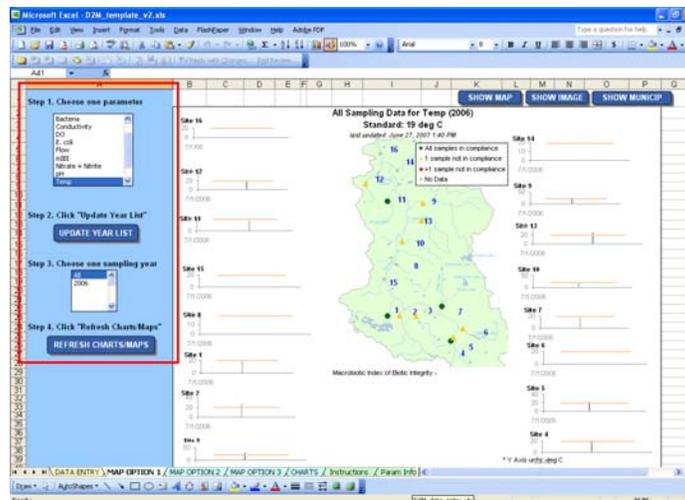


Date	Site	Stream Name	storm/base	deg C	DO	pH	Total phosphorus (mg/l)	Total suspended solids (mg/l)	E. coli
8/1/2006	1	Lake Louise Outlet	base	18.12	7.35	7.7	0.2	16	1900
8/1/2006	2	Clark Ditch	base	26.67	6.1	7.7	0.18	22	360
8/1/2006	3	Unnamed Tributary (Webbos)	base	27.55	2.51	7.2	0.97	9	500
8/1/2006	4	Block Ditch	base	18.54	3.43	7.2	0	3	190
8/1/2006	5	Salt Creek Headwaters	base	22.05	5.08	7.4	0.08	29	220
8/1/2006	6	Sager's Lake Outlet	base	24.87	7.65	7.6	0	14	310
8/1/2006	7	Beauty Creek	base	16.56	6.3	7.2	0	6	100
8/2/2006	8	Pepper Creek	base						40
8/2/2006	9	Unnamed Tributary (Mallards Landing)	base	24.91	6.75	7.8	0.086	5	100
8/2/2006	10	Butternut Springs Outlet	base	19.53	8.28	8.1	0	17	
8/8/2006	11	Squirrel Creek	base	16.8	5.25	7.7	0.081	2	
8/8/2006	12	Robbin's Ditch	base	20.2	5.2	8.1	0.12	2	
8/8/2006	13	Damon Run	base	25.93	7.32	7.7	0.054	13	
8/22/2006	14	Clark Ditch	base						
8/22/2006	15	Salt Creek Headwaters	base						
8/22/2006	16	Beauty Creek	base						
8/22/2006	8	Pepper Creek	base						
8/22/2006	9	Unnamed Tributary (Mallards Landing)	base						
8/22/2006	10	Butternut Springs Outlet	base						
8/22/2006	13	Damon Run	base						
8/22/2006	14	Gustafson Ditch	base						

\* This spreadsheet was not designed to be a database for storing sampling data and only contains information necessary for running D2M. Because it does not include fields for quality assurance or other metadata, you should use a separate database for data management and then import into D2M for visual display and output.

## Querying Data

To query your data by parameter and year, follow the instructions in the left blue section of any of the Maps or Chart worksheets.

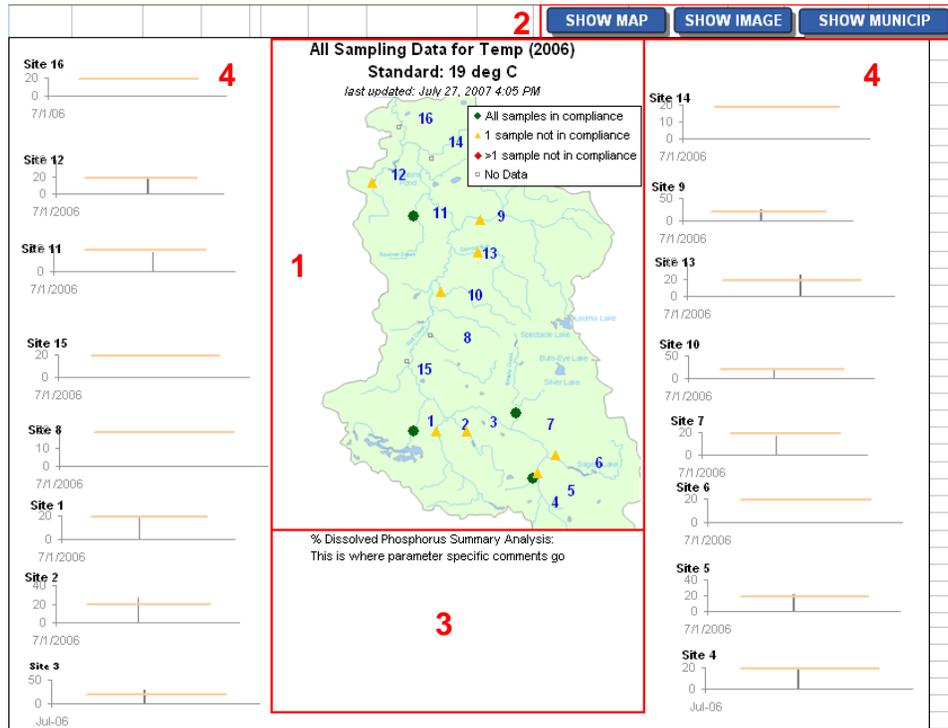


When you click the Refresh Charts/Maps button in the final step, the map and charts will be refreshed using the data query results.

**Note: Running a query from any of the worksheets will refresh the maps and charts in all the worksheets.**

## Viewing Results

After you have gone through the steps above, all the D2M maps and chart worksheets will display your query results. Here are the four components for each map layout:



[1] Map with sampling locations color-coded by how often the standard was exceeded during the time period you specified.

Red	> 1 exceedance at this location
Yellow	1 exceedance at this location
Green	No exceedances at this location

[2] Choice of which map you want to display your sampling locations on

[3] Comments/caveats specific to a parameter

[4] Charts for each of the sampling locations are displayed on all of the map/chart worksheets, except for Map Option 3. The charts include a bar to indicate the user-defined standard/threshold.

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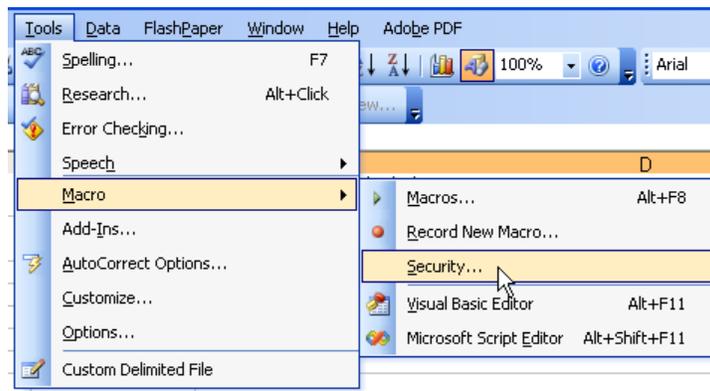
## STEP-BY-STEP: How to Use Data2Maps

This chapter will guide you step-by-step through how to open your D2M file, enter data, query by parameter and year, change your map displays, and print/export your output. These steps only require a basic knowledge of Excel and assume that your D2M file has already been customized for your project.

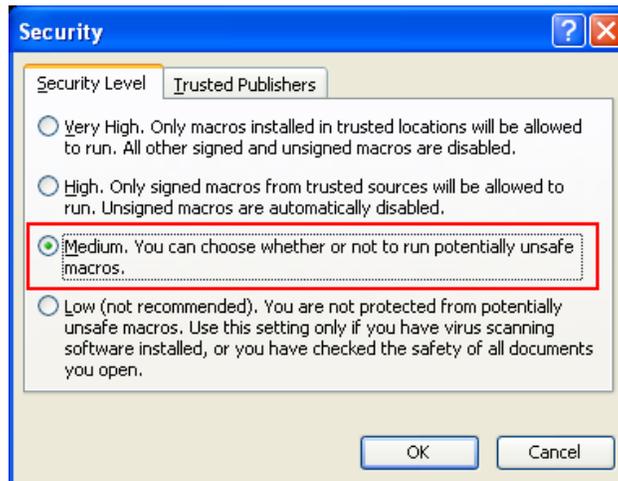
### Setting Excel's Security Level and Opening D2M

Before opening a D2M file, you will need to set your Excel security level setting to “medium”. D2M was developed using macros and VBA(Excel's programming language); a high security setting will not allow these macros to run and will prevent the system from working.

1. In Excel, go to **Tools**, select **Macro**, then select **Security**.



2. Make sure **medium** is selected, and click **OK**.

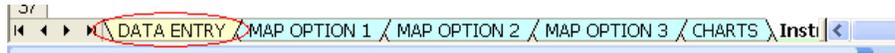


3. If you changed the security setting, you will need to close your Excel application and reopen it for the security level to be applied.
4. Go to **File > Open** and navigate to your customized D2M file. If it has not been created yet, you can use the D2M template “D2M\_template.xls”.

## Entering Data

All your data is entered in the Data Entry worksheet. If your D2M file has been customized for your project, the column headings in this worksheet will be labeled with your sampling parameters.

5. Select the Data Entry worksheet by clicking on the DATA ENTRY tab at the bottom of the window.



6. The Data Entry sheet is now active.

A screenshot of the Microsoft Excel window showing the 'DATA ENTRY SHEET' worksheet. The worksheet contains a table with columns for Date, Site, Stream Name, Event, Temp, DO, pH, Total phosphorus, Total suspended solids, and E. coli. The data is organized into rows, with the first row containing headers and subsequent rows containing sample data points.

Date	Site	Stream Name	Event	Temp	DO	pH	Total phosphorus (mg/l)	Total suspended solids (mg/l)	E. coli
8/1/2006	1	Lake Louise Outlet	base	18.12	7.36	7.7	0.2	16	1900
8/1/2006	2	Clark Ditch	base	26.87	6.1	7.7	0.18	22	360
8/1/2006	3	Unnamed Tributary (Wetkos)	base	27.55	2.51	7.2	0.97	9	500
8/1/2006	4	Beck Ditch	base	18.54	3.43	7.2	0	3	190
8/1/2006	5	Salt Creek Headwaters	base	22.05	5.08	7.4	0.08	29	220
8/1/2006	6	Seger's Lake Outlet	base	24.87	7.65	7.6	0	14	310
8/1/2006	7	Beauty Creek	base	16.56	6.3	7.2	0	6	100
8/2/2006	8	Pepper Creek	base						40
8/2/2006	9	Unnamed Tributary (Mallards Landing)	base	24.91	6.75	7.8	0.098	5	100
8/2/2006	10	Butternut Springs Outlet	base	19.53	0.26	8.1	0	17	
8/6/2006	11	Squirrel Creek	base	16.0	5.25	7.7	0.091	2	
8/6/2006	12	Robbin's Ditch	base	20.2	5.2	8.1	0.12	2	
8/8/2006	13	Damon Run	base	28.83	7.32	7.7	0.084	13	
8/22/2006	14	Clark Ditch	base						
8/22/2006	15	Salt Creek Headwaters	base						
8/22/2006	16	Beauty Creek	base						
8/22/2006	8	Pepper Creek	base						
8/22/2006	9	Unnamed Tributary (Mallards Landing)	base						
8/22/2006	10	Butternut Springs Outlet	base						
8/22/2006	13	Damon Run	base						
8/22/2006	14	Quintanone Ditch	base						

7. If any fake data still exists from the original template, select and delete.
8. Enter your sampling data. All sampling data for a given site and date are entered in one row. You can enter up to 400 rows of data. The fields in the worksheet are listed below, along with allowable values.

<b>Date</b>	Monitoring date (month/day/year)
<b>Site ID</b>	Site ID (as defined in set-up process)
<b>Site Name</b>	Full name of site (Not required. Does not appear in maps or charts)
<b>Event</b>	Enter "storm" or "base", if known. This column will be listed with the individual data points in the Charts worksheet.
<b>Parameter</b>	Enter measured value. <ul style="list-style-type: none"> <li>• Signs (&lt;,&gt;) allowed, but will be omitted in analysis.</li> <li>• No other non-numeric values allowed (e.g., "--", "ND")</li> <li>• Leave blank if no value for that site, date, and parameter</li> <li>• Changing units listed above the parameter will not change units on the maps/charts. To change them in the maps and charts, go into the Param Info worksheet (see next section)</li> </ul>

Note: Site names and parameters are pre-set in maps, charts, and queries during the set up process. If you include any new site names or parameters in this data sheet, they will **not appear** in the maps, charts, or queries.

9. Save your file.

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## Customizing Parameter Information

The Param Info worksheet was customized during the set-up process and contains your list of parameters along with the associated fields defined below.

<b>Param</b>	Parameter name. <b>DO NOT CHANGE.</b> This is how the parameter will be shown in the query tool list. This is how the parameter <b>must</b> be listed in the data entry worksheet for the query tool to work.
<b>Standard/ Threshold</b>	User-defined standard/threshold. <ul style="list-style-type: none"><li>• If none, “No state standard” should be entered.</li><li>• If param is “% Dissolved P” maps will use the label “Threshold”. For all other parameters, maps will use the label “Standard”.</li><li>• Cannot be a range</li></ul>
<b>Units</b>	Units for data and standard/threshold (must be same)
<b>Comments</b>	Comments for a given parameter (if any). Displayed under map when appropriate parameter chosen. <ul style="list-style-type: none"><li>• To enter a line break, click ALT – ENTER</li><li>• Do not format this cell, because formatting will not show up on maps.</li></ul>
<b>Non-Compliant if &gt;/&lt; standard?</b>	Enter “>” or “<” to define non-compliance with the standard threshold. <ul style="list-style-type: none"><li>• Example: for dissolved oxygen, you would enter “&lt;”.</li><li>• Example: for E.coli, you would enter “&gt;”.</li></ul>

You can modify any of the associated fields (The parameter name itself has to be done through the set-up process on pg. 14 under Enter Parameter Information).

10. Select the Param Info worksheet by clicking on the PARAM INFO tab at the bottom of the window.
11. Modify the information in the appropriate cell.
12. Save your file.

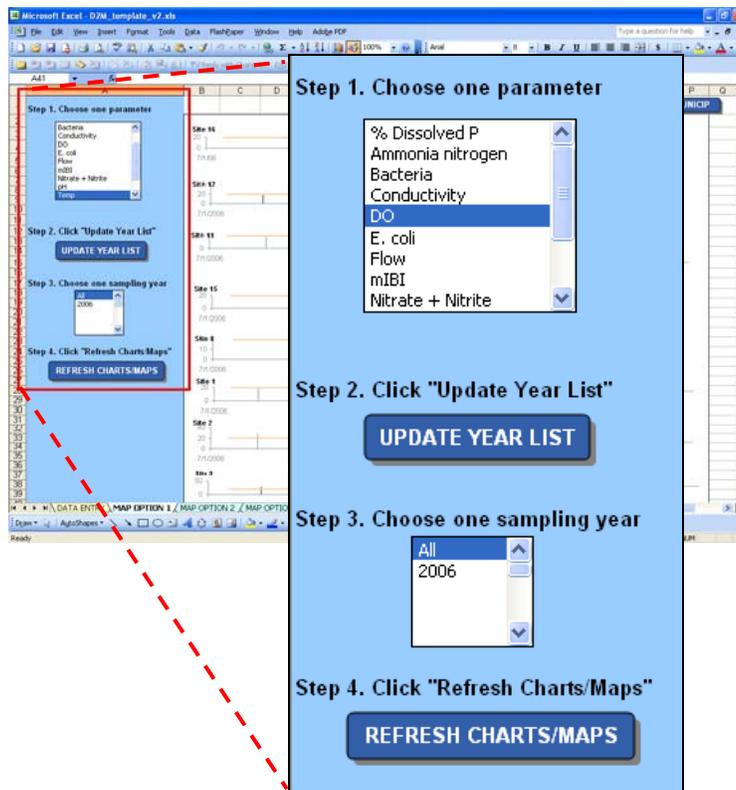
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## Querying Data

You can query your data from any of these worksheets: Map Option 1, Map Option 2, Map Option 3, or Charts. When you run a query from any of the map/chart worksheets, **all** the map/chart worksheets are updated with the query results.

13. Make one of the Map Option worksheets or the Charts worksheet active by clicking on the tab at the bottom of the window.

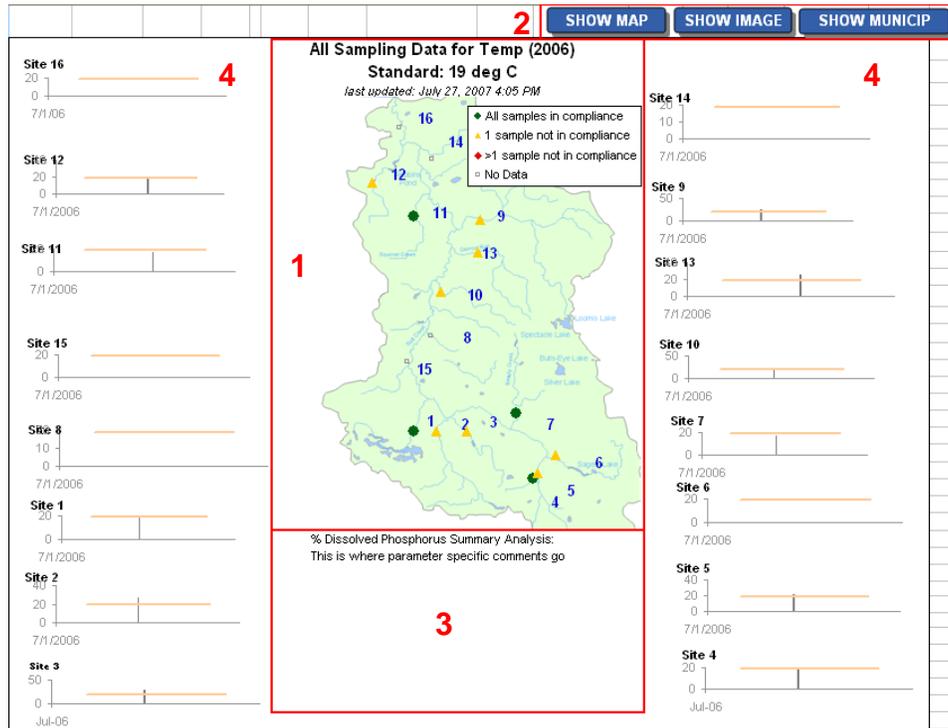
The query tool is available in the blue section on the left.



14. In Step 1, you will see a list of the parameters that were set-up for this project. Click on a single parameter of interest
15. In Step 2, click the “Update Year List” button. This will refresh the choice of sampling years in Step 3.
16. If the list of sampling years in Step 3 is populated, choose one year or “All” if you want to see data over all years. If the list is empty, there is no sampling data for that parameter, and you will have to choose another parameter.
17. In Step 4, click “Refresh Charts/Maps”. Note: Only click this button if you have a parameter and year (or “All”) chosen. Otherwise, you will get a run-time error.

## Viewing Maps/Charts

After you have gone through the steps above, all the D2M maps and chart worksheets will display your query results. Here are the four components for each map layout:



**[1]** Map with sampling locations color-coded by how often the standard was exceeded during the time period you specified.

Red	> 1 exceedance at this location
Yellow	1 exceedance at this location
Green	No exceedances at this location

If a location had no monitoring data, it will be displayed as a hollow square.

**[2]** Choice of which map you want to display your sampling locations on (assuming your D2M file was set up with multiple maps—e.g., graphic map, aerial photo).

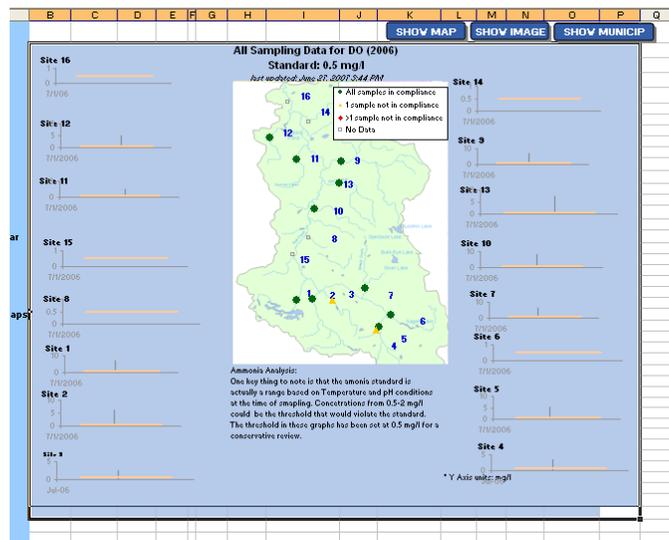
**[3]** Comments or caveats specific to a parameter are displayed under the maps (these comments are entered in the Param Info worksheet)

**[4]** All the map/chart worksheets, except for Map Option 3, display charts for each of the sampling locations. These charts include a bar to indicate the user-defined standard/threshold. All the charts in a worksheet will have the same start and end dates (start date: earliest sampling date over all sample locations; end date: latest sampling date over all sample locations).

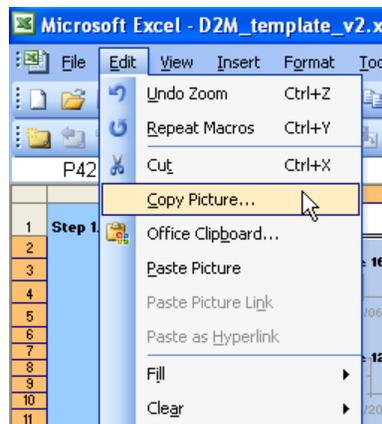
## Exporting

You can paste the map/charts from D2M into another application (e.g., PowerPoint, MS Word) as a picture.

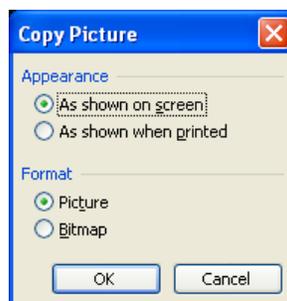
18. On the map or chart worksheet, select the cells or click the chart or object you want to copy (see picture)



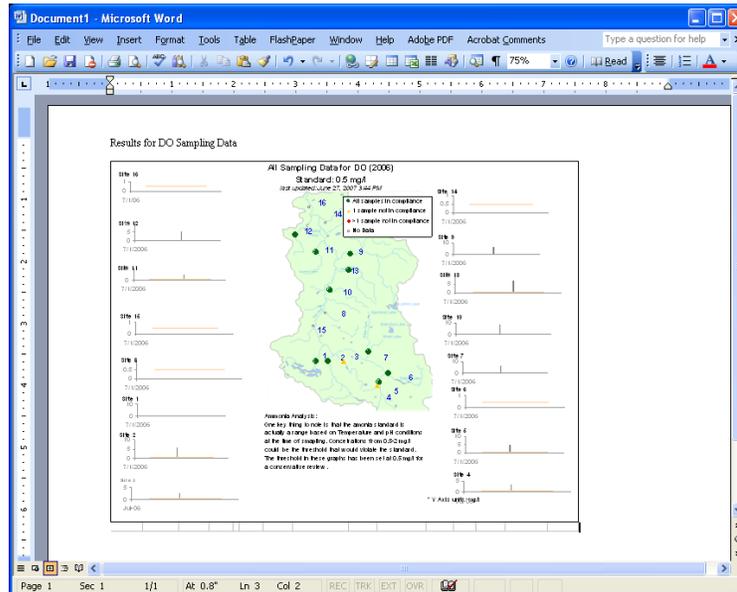
19. Hold down **SHIFT** and click **Copy Picture** on the **Edit** menu.



20. For best picture quality, make sure **As shown on screen** and **Picture** are selected, and then click **OK**.



21. Go to the document where you are pasting into (the picture below shows Microsoft Word) and click where you want to paste the picture.
  22. Click **Paste** on the **Edit** menu. The following picture shows Map Option 1 pasted into Microsoft Word.
- (Mac users—instead of steps 19-22, you should select **Copy** in Excel, then in your other Microsoft application, select **Paste Special**, and **Paste as Picture**)



To make adjustments to an image pasted in a Microsoft application, use the Picture toolbar (Go to **View** > **Toolbars**, and select **Picture**).

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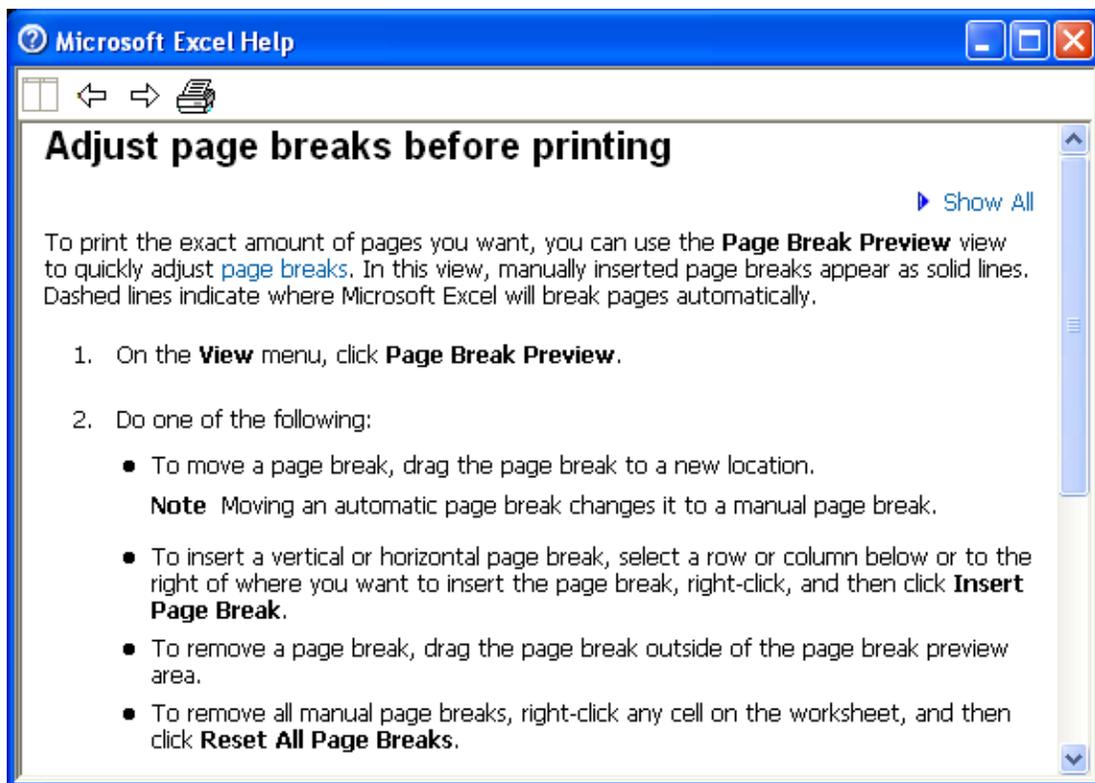
## Printing

Printing Maps: the map worksheets already have the appropriate print area set up.

23. To preview a page before printing, go to **File > Print Preview**.
24. To print a page, go to **File > Print**.

Printing Charts: Before printing charts, you may need to adjust page breaks so that they do not cut off the charts or list of data points.

25. Go to **File > Print Preview** to see page breaks.
26. If the preview is acceptable, go to **File > Print**. Otherwise first follow the instructions below (also found in Microsoft Excel Help) on how to adjust page breaks.



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## STEP-BY-STEP: How to Set-Up D2M for Your Project

This chapter walks you through how to customize D2M for your particular project by following these eight steps.

1. Enter Parameter Information
2. Enter Site Names with Latitude/Longitudes
3. Set Up Data Filters
4. Set Up Embedded Charts in MAP OPTIONS 1 and 2
5. Re-Define Excel Names
6. Modify VBA Code
7. Define Minimum/Maximum Dates for Charts
8. Align Maps with Sampling Locations

As you can see, the set-up procedures require working with Excel data filters, names, charts, formulas and VBA code. While we try to give as detailed instruction as possible, this section will be much less frustrating if done by an experienced Excel user.

Make sure you have all the items in the checklist below and then start on the next page.

### Checklist before You Start

- The D2M Excel file “D2M\_template\_vXX.xls”
- A list of your sampling parameters and, if available, units and relevant standard/thresholds
- A list of your site names and x,y coordinates
  - Unprojected coordinates (lat/long) will be easiest to match up to maps
- Map(s) that include sampling locations for reference
  - Give Appendix B (“Guidelines for Creating Maps for Data2Maps”) to your GIS person.
- Decide which Map Option(s) you will be using
  - Setting up each Map Options is time-consuming, so you should only customize the ones you will be using.

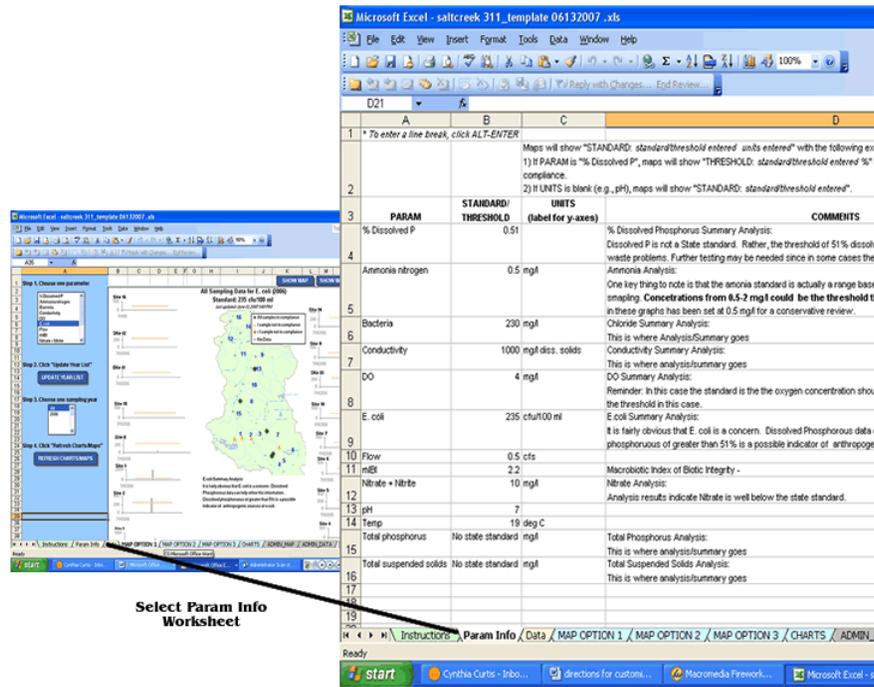
NOTE: If you have 10 or more sampling locations, we recommend you only use Map Option 3. Map Options 1 and 2 include charts for each sampling location and are hard to read with too many sites.

Have what you need? Then let’s begin.

## Enter Parameter Information

In this first section, you will replace the D2M default water chemistry and other parameters with your own project's parameters.

1. Before opening the D2M file, make sure your Excel security level is set no higher than medium to ensure that the macros can run (see Setting Excel's Security Level and Opening D2M on page 5).
2. Open the File called D2M\_template\_vXX.xls. Save as D2M\_yourproject.xls
3. Select the worksheet "Param Info" by clicking on the PARAM INFO tab on the bottom of the page.



4. The Param Info worksheet shows the following columns: PARAM, STANDARD/THRESHOLD, COMMENTS, UNITS, and Non-compliant if ><, standard?

	A	B	C	D	E	F
1	* To enter a line break, click ALT-ENTER					
2	Maps will show "STANDARD: standard <threshold entered="" entered"="" exceptions:<="" following="" td="" the="" units="" with=""> </threshold>					
3	<b>PARAM</b>	<b>STANDARD/THRESHOLD</b>	<b>UNITS (label for y-axes)</b>	<b>COMMENTS</b>	<b>Non-compliant if &gt;&lt;, standard?</b>	
4	% Dissolved P	0.51		% Dissolved Phosphorus Summary Analysis: Dissolved P is not a State standard. Rather, the threshold of 51% dissolve waste problems. Further testing may be needed since in some cases the d Ammonia Analysis: One key thing to note is that the amonia standard is actually a range based on Temperature and pH conditions at the time of smapling. Concentrations from 0.5-2 mg/l could be the threshold that would violate the standard. The threshold in Chloride Summary Analysis: This is where Analysis/Summary goes	>	
5	Ammonia nitrogen	0.5 mg/l		Ammonia Analysis: One key thing to note is that the amonia standard is actually a range based on Temperature and pH conditions at the time of smapling. Concentrations from 0.5-2 mg/l could be the threshold that would violate the standard. The threshold in Chloride Summary Analysis: This is where Analysis/Summary goes	>	
6	Bacteria	230 mg/l		Chloride Summary Analysis: This is where Analysis/Summary goes	>	
7	Conductivity	1000 mg/l diss. solids		Conductivity Summary Analysis: This is where analysis/summary goes	>	
8	DO	4 mg/l		DO Summary Analysis: Reminder: In this case the standard is the the oxygen concentration should be at least 4 mg/L. We want to see data above the threshold in this case.	<	
9	E. coli	235 cfu/100 ml		E.coli Summary Analysis: It is fairly obvious that E. coli is a concern. Dissolved Phosphorus data ca phosphorous of greater than 51% is a possible indicator of anthropogens	>	

5. Enter the parameter information in the columns as defined below. You can add up to 22 parameters.

<b>Param</b>	Parameter name. There is no maximum character length, but try to keep shorter for readability in the query list.
<b>Standard/Threshold</b>	Enter a numerical value in this column if you want to track your data against a state standard or other threshold. <ul style="list-style-type: none"> <li>• If none entered, enter “No standard”</li> <li>• If param is “% Dissolved P” maps will use the label “Threshold”. For all other parameters, maps will use the label “Standard”.</li> <li>• Cannot be a range</li> </ul>
<b>Units</b>	Units for data and standard/threshold (must be same for both)
<b>Comments</b>	Comments for a given parameter (if any) that you would like displayed under the maps when a particular parameter is chosen. <ul style="list-style-type: none"> <li>• Can be entered now or later</li> <li>• To enter a line break, hit ALT – ENTER</li> <li>• Do not format (bold, italicize) text in this cell, because formatting will not show up on maps.</li> </ul>
<b>Non-Compliant if &gt;/&lt; standard?</b>	Distinguishes if a parameter is noncompliant if it falls above or below a threshold. Enter “>” or “<”.

6. After you have added your parameters, if there are still parameters from the original template that you will not be using, select those rows, right click, and select Clear Contents (or Delete).

5				In these graphs has been set at 0.5 mg/l for a conservative rev
6	Bacteria	230	mg/l	y Analysis:
7	Conductivity	1000	mg/l diss. sol	ary Analysis:
8	DO	4	mg/l	alysis: summary goes
9	E. coli	235	cfu/100 ml	alysis:
10	Flow	0.5	cfs	case the standard is the the oxygen concentre
11	mBI	2.2		his case.
12	Nitrate + Nitrite	10	mg/l	alysis:
13	pH	7		s that E. coli is a concern. Dissolved Phosphor
14	Temp	19	deg C	greater than 51% is a possible indicator of ar
15	Total phosphorus	No state standard	mg/l	of Biotic Integrity -
16	Total suspended solids	No state standard	mg/l	indicate Nitrate is well below the state standar
17				s Analysis:
18				This is where analysis/summary goes

Now that you are done entering parameter information, we need to sort the parameters alphabetically so that the data query works correctly.

7. Select all the parameters from column A to E as seen below.

	A	B	C	D	E
1	* To enter a line break, click ALT+ENTER				
2			Maps will show "STANDARD: standard/threshold entered" with the following exceptions: 1) If PARAM is "% Dissolved P", maps will show "THRESHOLD: standard/threshold entered %" and data below threshold will be considered out of compliance. 2) If UNITS is blank (e.g., pH), maps will show "STANDARD: standard/threshold entered".		
3	PARAM	STANDARD/ THRESHOLD	UNITS (label for y-axis)	COMMENTS	Non-compliant if >ic standard?
4	% Dissolved P	0.51		% Dissolved Phosphorus Summary Analysis: Dissolved P is not a State standard. Rather, the threshold of 51% dissolved P is used as an indicator of possible septic waste problems. Further testing may be needed since in some cases the dissolved P exceeds 100%.	>
5	Ammonia nitrogen	0.5 mg/l		Ammonia Analysis: One key thing to note is that the ammonia standard is actually a range based on Temperature and pH conditions at the time of sampling. Concentrations from 0.5-2 mg/l could be the threshold that would violate the standard. The threshold in these graphs has been set at 0.5 mg/l for a conservative review.	>
6	Bacteria	230 mg/l		Chloride Summary Analysis: This is where analysis/summary goes	>
7	Conductivity	1000 mg/l disc. solids		Conductivity Summary Analysis: This is where analysis/summary goes	>
8	DO	4 mg/l		DO Summary Analysis: Reminder: in this case the standard is the the oxygen concentration should be at least 4 mg/l. We want to see data above the threshold in this case.	<
9	E. coli	235 cfu/100 ml		E. coli Summary Analysis: It is fairly obvious that E. coli is a concern. Dissolved Phosphorus data can help refine this information. Dissolved phosphorus of greater than 51% is a possible indicator of anthropogenic sources of e.coli.	>
10	Flow	0.5 cfs			>
11	pH	2.2		Microbiotic Index of Biotic Integrity - Nitrate Analysis: Analysis results indicate Nitrate is well below the state standard.	<
12	Nitrate + Nitrite	10 mg/l			>
13	pH	7			>
14	Temp	19 deg C			>
15	Total phosphorus	No state standard	mg/l	Total Phosphorus Analysis: This is where analysis/summary goes	>
16	Total suspended solids	No state standard	mg/l	Total Suspended Solids Analysis: This is where analysis/summary goes	>
17					
18					
19					

8. Go to Data > Sort, and sort by ascending PARAM (Column A). Click OK.



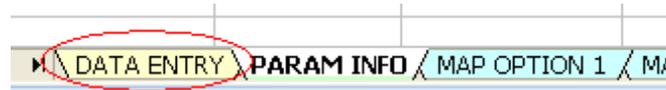
You also need to enter your parameter into the column heading of the Data Entry. To save you time from typing them in again, we will simply copy your parameters from the Param Info worksheet and paste them into the Data Entry worksheet.

9. Select the cells in Column A of the Param Info worksheet that contain all your parameters.

PARAM	STANDARD/THRESHOLD	UNITS (label for y-axis)	COMMENTS	Non-compliant if > standard?
% Dissolved P	0.5		% Dissolved Phosphorus Summary Analysis: Dissolved P is not a State standard. Rather, the threshold of 5% dissolved P is used as an indicator of possible septic waste problems. Further testing may be needed since in some cases the dissolved P exceeds 100%.	>
Ammonia nitrogen	0.5	mg/l	Ammonia Analysis: One key thing to note is that the ammonia standard is actually a range based on Temperature and pH conditions at the time of sampling. Concentrations from 0.5-2 mg/l could be the threshold that would violate the standard. The threshold in these analysis has been set at 0.5 mg/l for a conservative reason.	>
Bacteria	200	mg/l	Chloride Summary Analysis: This is where Analysis/Summary goes	>
Conductivity	1000	mg/l non-solids	Conductivity Summary Analysis: This is where analysis/summary goes	>
DO	4	mg/l	DO Summary Analysis: Reminder: In this case the standard is the the oxygen concentration should be at least 4 mg/l. We want to see data above the threshold in this case.	>
E. coli	200	cfu/100 ml	E. coli Summary Analysis: It is fairly obvious that E. coli is a common. Dissolved Phosphorus data can help inform the information. Dissolved phosphorus of greater than 5% is a possible indicator of anthropogenic sources of e.coli.	>
Flow	0.5	cms		>
pH	2.5		Microbiologic Index of Biotic Integrity -	>
Strate + Nitro	10	mg/l	Strate analysis	>
pH	7		Analysis results indicate Nitrate is well below the state standard.	>
Temp	19	deg C		>
Total phosphorus	No state standard	mg/l	Total Phosphorus Analysis: This is where analysis/summary goes	>
Total suspended solids	No state standard	mg/l	Total Suspended Solids Analysis: This is where analysis/summary goes	>

10. Copy the selection (CTRL + C, or Edit > Copy).

11. Go to the Data Entry worksheet (click on yellow DATA ENTRY tab on bottom).



You can see that in the Data Entry worksheet the parameters are lined up horizontally, while the Param\_Info worksheet listed them vertically. We will to change the orientation of the data when we paste.

12. In the Data Entry worksheet, select cell F7 (and only F7!). Right Click and select **Paste Special**. (Excel will fill that cell and the cells to the right with your copied cells.)

	A	B	C	D	E	F	G	H	I
1	<b>COPY AND PASTE YOUR DATA INTO THIS WORKSHEET</b>								
2	MAKE SURE YOU ALWAYS MAKE CHANGES IN YOUR OTHER SHEET, THEN COPY AND PASTE IN HERE.								
3	If you need to clear cells, do NOT hit Delete. Select the cells, right-click, then choose Clear Contents.								
4									
5									
6				storm/base	deg C	mg/l		(mg/l)	
7	Date	Site	Stream Name	Event	Temp	DO	pH	Total phosphorus	Total s
8	8/1/2006	1	Lake Louise Outlet	base	18.12	7.35			
9	8/1/2006	2	Clark Ditch	base	26.67	6.1			
10	8/1/2006	3	Unnamed Tributary (Webelos)	base	27.55	2.51			
11	8/1/2006	4	Block Ditch	base	18.54	3.43			
12	8/1/2006	5	Salt Creek Headwaters	base	22.05	5.08			
13	8/1/2006	6	Sager's Lake Outlet	base	24.87	7.65			
14	8/1/2006	7	Beauty Creek	base	16.56	6.3			
15	8/2/2006	8	Pepper Creek	base					
16	8/2/2006	9	Unnamed Tributary (Mallards Landing)	base	24.91	6.75			
17	8/2/2006	10	Butternut Springs Outlet	base	19.53	8.28			
18	8/8/2006	11	Squirrel Creek	base	16.8	5.25			
19	8/8/2006	12	Robbin's Ditch	base	20.2	5.2			
20	8/8/2006	13	Damon Run	base	25.93	7.32			
21	8/22/2006	14	Clark Ditch	base					

---

13. Click on the Transpose checkbox, and then click OK.



14. Make the selection (your parameters) bold for ease of reading.

Your parameters are now listed as bold headings in the Data Entry worksheet. If you want, you can also update the units in row 6 of the Data Entry worksheet (by repeating Steps 9-13 using column C from the Param Info worksheet). That is an optional step since all units in the Map Option and Charts worksheets refer to the Param Info worksheet.

15. Save your file.

You have now finished customizing your parameter information for your D2M file.

## Enter Site Names with Latitude/Longitudes

In this section, we will replace the sample locations in the template with the actual monitoring locations in your project.

1. Select the ADMIN\_MAP worksheet.
2. In Column E, paste or type in your monitoring site names under “Site ID”. Site IDs can be any combination of letters, numbers, or symbols. Blanks are allowed between words. Try to keep your site names short for ease of display and data entry. NOTE: You do not need to make changes in the Crit Num column right now.

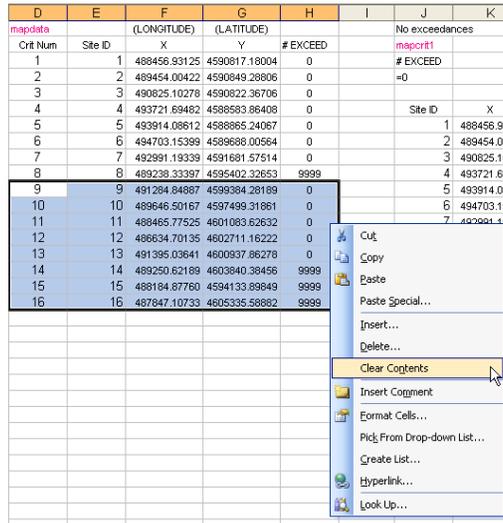
D	E	F	G	H
mapdata		(LONGITUDE)	(LATITUDE)	
Crit Num	Site ID	X	Y	# EXCEED
1	1	488456.93125	4590817.18004	0
2	2	489454.00422	4590849.28806	0
3	3	490825.10278	4590822.36706	0
4	4	493721.69482	4588583.86408	0
5	5	493914.08612	4588865.24067	0
6	6	494703.15399	4589688.00564	0
7	7	492991.19339	4591681.57514	0
8	8	489238.33397	4595402.32653	9999
9	9	491284.84887	4599384.28189	0
10	10	489646.50167	4597499.31861	0
11	11	488465.77525	4601083.62632	0
12	12	486634.70135	4602711.16222	0
13	13	491395.03641	4600937.86278	0
14	14	489250.62189	4603840.38456	9999
15	15	488184.87760	4594133.89849	9999
16	16	487847.10733	4605335.58882	9999

3. In Columns F and G, paste or type in the associated x and y coordinates (**x=longitude, easting | y= latitude, northing**).

D	E	F	G	H
mapdata		(LONGITUDE)	(LATITUDE)	
Crit Num	Site ID	X	Y	# EXCEED
1	1	488456.93125	4590817.18004	0
2	2	489454.00422	4590849.28806	0
3	3	490825.10278	4590822.36706	0
4	4	493721.69482	4588583.86408	0
5	5	493914.08612	4588865.24067	0
6	6	494703.15399	4589688.00564	0
7	7	492991.19339	4591681.57514	0
8	8	489238.33397	4595402.32653	9999
9	9	491284.84887	4599384.28189	0
10	10	489646.50167	4597499.31861	0
11	11	488465.77525	4601083.62632	0
12	12	486634.70135	4602711.16222	0
13	13	491395.03641	4600937.86278	0
14	14	489250.62189	4603840.38456	9999
15	15	488184.87760	4594133.89849	9999
16	16	487847.10733	4605335.58882	9999

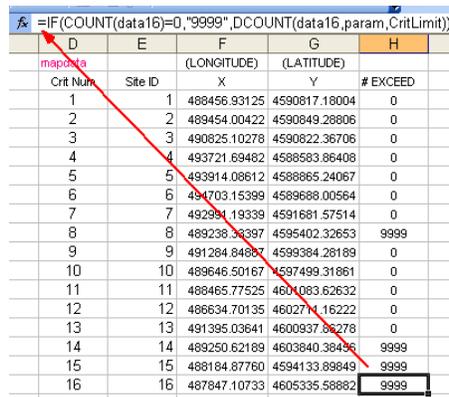
4. If you have less than 16 sites

- 4.1. Select the cells in Columns D-H that contain extra sites (do not select entire column).
- 4.2. Right-click, and choose Clear Contents. (Or if you choose Delete, make sure you choose “Shift Cells Up” when prompted.)
- 4.3. Skip to the section “Set Up Data Filters and Charts on CHARTS Worksheet on pg. 22



5. If you have more than 16 sites, then for each new site:

- 5.1. In Column D (“Crit Num”), enter the next consecutive number. (While this column is not used in the query or charts, it does help you associate each site with the correct chart, formula, code, etc.)
- 5.2. Paste the following formula in Column H (“# EXCEED”):
 
$$=IF(COUNT(dataXX)=0,"9999",DCOUNT(dataXX,param,CritLimit))$$
- 5.3. Change the 2 XX’s in that formula to the associated Crit Num (Column D). To see an example, select Column H for a previous site.



6. Save your file.

---

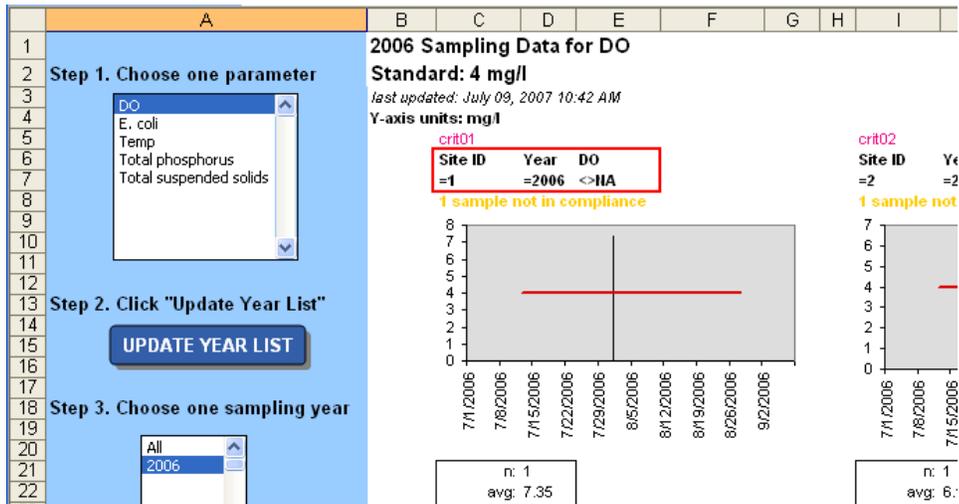
You have finished entering the names and latitude/longitude information of your monitoring sites.

## Set Up Data Filters and Charts on CHARTS Worksheet

The data queries in D2M use customized Excel data filters that are set up in the Charts worksheet. In this section, you will make sure there is one chart and one data filter set up for each of your project's sampling locations.

1. Select the Charts worksheet.

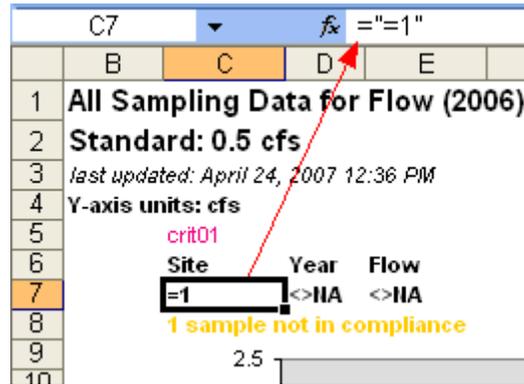
You will see the Charts worksheet which is set up with one data filter and one chart for each of the 16 Site IDs ("1", "2", "3", etc.) that came with the template.



Each time a query is run, each data filter pulls out data for a site that matches the selected year and parameter. For example, the red box in the picture above shows the data filter for site "1" and is currently querying for 2006 DO data. The query results are charted directly underneath.

You will modify these data filters so that the Site IDs reflect the monitoring site names of your project. After that, if you have less than 16 sites, you will delete the extra data filters/charts. If you have more than 16 sites, you will have to copy-and-paste to create additional data filters/charts.

2. Select cell C7. This cell defines the site name for your first site.
3. Look in the formula bar to see the formula for this cell.



The sampling site name in the ADMIN MAP worksheet associated with crit01 (crit\_num = "01") was "1", so this formula shows

= "1"

4. If your first site(the Site ID next to crit\_num 01) is not also named "1", then retype the formula with the site ID so that it looks like

= "site ID"

where *site ID* is the site you have listed on the ADMIN\_MAP worksheet next to crit01, cell D3. It must be typed identically for the Refresh Charts/Maps button to work correctly, so you may want to copy the names from the ADMIN\_MAP worksheet and paste it into the CHARTS worksheet.

5. Repeat step 4 for each of the sites you listed in the ADMIN\_MAP worksheet. For example, if your site IDs on the ADMIN\_MAP worksheet looked like this

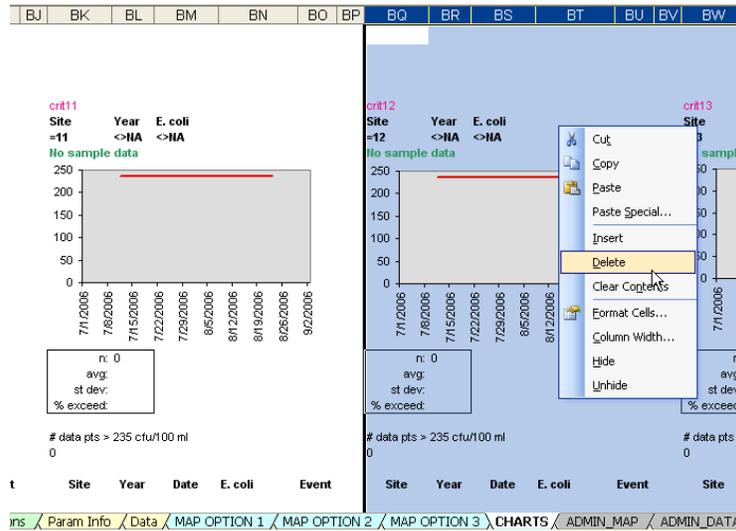
	D	E	F	G	H
mapdata			(LONGITUDE)	(LATITUDE)	
crit_num	Site ID	X	Y	# EXCEED	
01	BBEAR	488456.93125	4590817.18004	1	
02	BEAR	489454.00422	4590849.28806	1	
03	BPINE	490825.10278	4590822.36706	1	
04	HIGH	493721.69482	4588583.86408	1	
05	M55	493914.08612	4588865.24067	1	
06	MANO	494703.15399	4589688.00564	1	
07	MARSH	492991.19339	4591681.57514	1	
08	OLDH	489238.33397	4595402.32653	9999	
09	PINE	491284.84887	4599384.28189	1	
10	RAIN	489646.50167	4597499.31861	1	
11	SICK	488465.77525	4601083.62632	1	
12	SUIC	486634.70135	4602711.16222	1	

you would enter use "BBEAR" as the sitename under crit01 on the CHARTS worksheet, "BEAR" as the sitename under crit02, "BPINE" as the sitename under crit03, etc.

6. Save your file. If you have exactly 16 sites in your project, skip to the next section on pg 28.

7. If you have less than 16 sites,

7.1. Select the columns containing the extra sites and hit “Delete”.

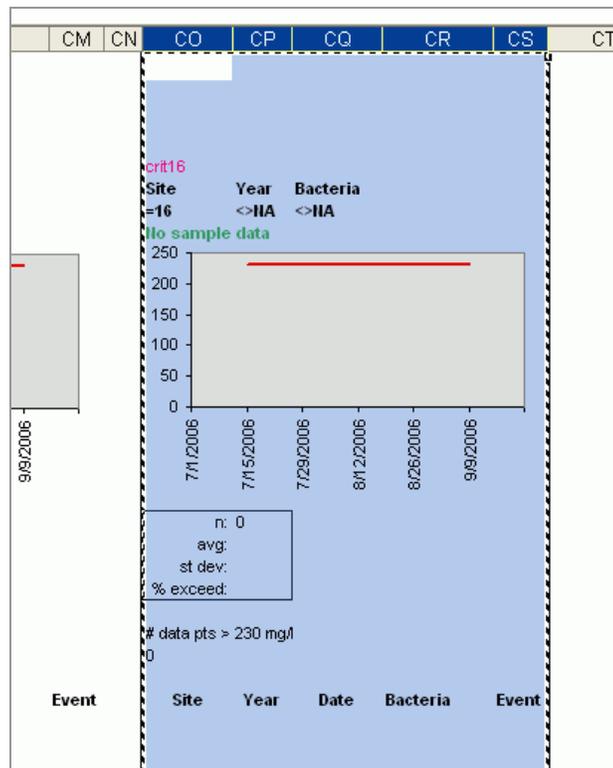


7.2. Save your file.

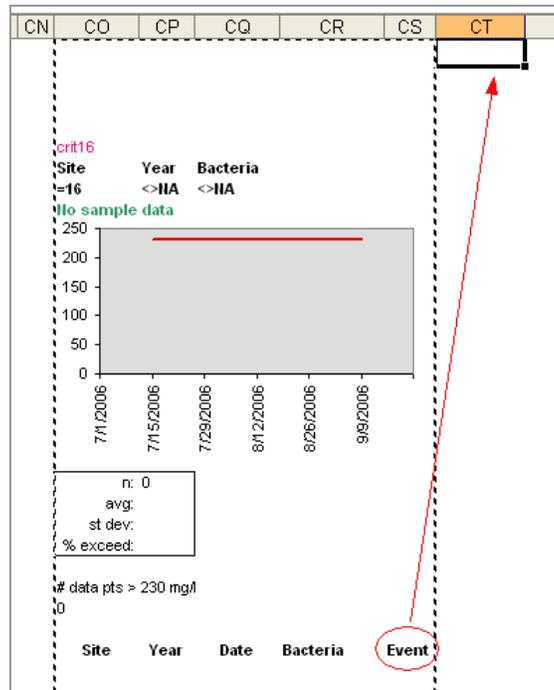
7.3. Skip to the next section on pg. 28.

8. If you have more than 16 sites, you will need to copy and paste in more columns.

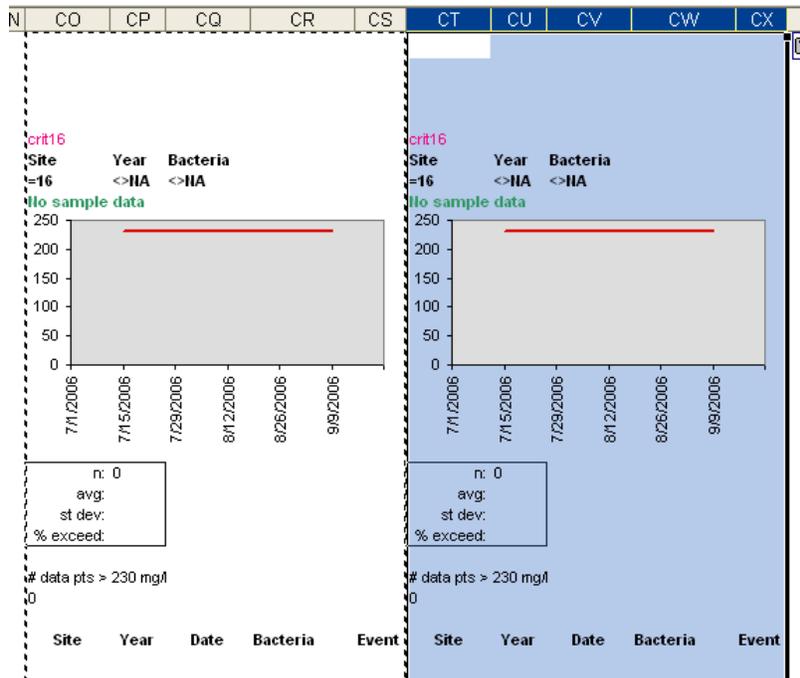
8.1. Select and copy Columns CO-CS.



8.2. Go to the first column after the last “Event” column (in this case, CT), click on the top cell.



8.3. Paste in your selection.



- 8.4. Select the cell with the pink “crit16” label (in this case, CT5). Change this to “critXX” where XX is the number following the crit label from the previous location (in this case, you would enter “crit17”).

	CO	CP	CQ	CR	CS	CT	CU	CV	CW
4									
5	crit16					crit17			
6	Site ID	Year	Ammonia nitrogen			Site ID	Year	Ammonia nitrogen	
7	=16	=0	<>HA			=16	=0	<>HA	

- 8.5. Select the cell that is 2 cells below the pink “critXX” label (in this case, CT7). This cell defines the site name for this site.
- 8.6. Look in the formula bar to see the formula for this cell.

CT7		fx "=16"								
	CO	CP	CQ	CR	CS	CT	CU	CV		
1										
2										
3										
4										
5	crit16					crit17				
6	Site ID	Year	Ammonia nitrogen			Site ID	Year	Ammonia nitr		
7	=16	=0	<>HA			=16	=0	<>HA		
8	No sample data					No sample data				

This was originally the site name in the ADMIN\_MAP worksheet associated with crit16, (originally called “16”), so this formula shows

=”=16”

- 8.7. In this cell, retype the formula with your 17th sitename so that it looks like

=”=sitename”

where *sitename* is the site you listed on the ADMIN\_MAP worksheet in column E, next to crit17. NOTE: It must be typed identical to the listing on the ADMIN\_MAP worksheet in order for the Refresh Charts/Maps button to work correctly, so you may want to copy and paste the name into the CHARTS worksheet.

Next we will redefine the chart for this site so that it is pointing at the correct data columns in the CHARTS worksheet.

- 8.8. Right-click on the chart under the data filter you just set up, and select “Source Data”.

- 8.9. Click on the Series tab.

8.10. In the Values box, change both occurrences of “CR” to the column letters of your new parameter info (in this case, you would enter “CW”).

The screenshot shows an Excel spreadsheet with columns labeled CT through DE. Column CW is highlighted in yellow. To the left of the spreadsheet is a chart titled 'crit17' with a y-axis from 0 to 250 and an x-axis with dates from 7/1/2006 to 9/9/2006. Below the chart is a summary box with statistics: n: 0, avg, st dev, % exceed, and # data pts > 230 mg/l: 0. The Source Data dialog box is open, showing the 'Series' tab. The 'Values' field contains the formula '=CHARTS!\$CR:\$30:\$CR:\$422'. Red arrows point from the 'CW' column in the spreadsheet to the 'CR' text in the dialog box.

8.11. In the “Category (X) axis labels” box of the Series tab, change both occurrences of “CQ” to the column letters of your new date info (in this case, you would enter “CV”).

The screenshot shows an Excel spreadsheet with columns labeled CT through DE. Column CV is highlighted in yellow. To the left of the spreadsheet is a chart titled 'crit17' with a y-axis from 0 to 250 and an x-axis with dates from 7/1/2006 to 9/9/2006. Below the chart is a summary box with statistics: n: 0, avg, st dev, % exceed, and # data pts > 230 mg/l: 0. The Source Data dialog box is open, showing the 'Series' tab. The 'Category (X) axis labels' field contains the formula '=CHARTS!\$CQ:\$30:\$CQ:\$422'. Red arrows point from the 'CV' column in the spreadsheet to the 'CQ' text in the dialog box.

8.12. Repeat Steps 8.1-8.13 for each of your additional charts

8.13. Click OK.

8.14. Save your file.

You have now set up the data filters to look for your Site IDs and the charts are all pointing at the correct data filter results.

---

## Set Up Embedded Charts in MAP OPTIONS 1 and 2

In this section, you will set up the charts in the Map Option worksheets. This entails:

- 1) Adding or deleting charts so that they match the number of your sites, and
- 2) For Map Option 1, re-labeling the charts with your site names

If you have customizing Map Option 2, skip to the next section “Re-Define Excel Names” on page 31. You will return this after you have finished setting up the maps, so that you can align the charts next to the sampling locations.

If you have determined that you will be using only Map Option 3 (which has no embedded charts), skip to the next section “Re-Define Excel Names” on page 31.

### Map Option 1 Worksheet

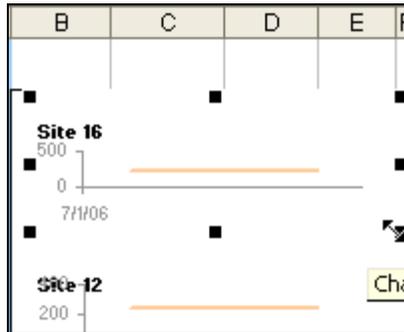
**If you have exactly 16 sites**, go to step 2 on pg. 29 to rename charts.

**If you have more than 16 sites**, go to step 7 on pg. 30 to add charts.

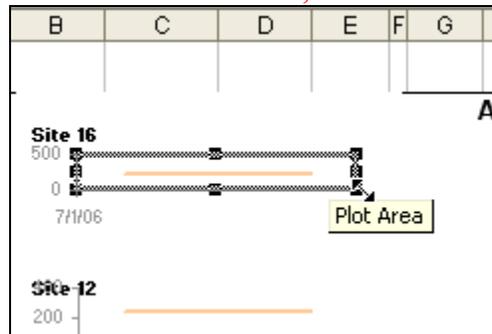
**If you have less than 16 sites**, follow the following directions to delete the extra charts from the template (i.e., those in the template with Site ID greater than your number of charts.)

1. To delete extra charts, do the following:
  - 1.1. Select the chart by clicking just outside the graph. Leave your mouse over the selection for one second and a tool tip will pop up telling you what has been selected. Make sure you have the “Chart Area” selected, not the “Plot Area”

**YES: Chart Area is selected**



**NO: Plot Area selected, not Chart Area**



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This might require a little practice getting used to what chart element you are selecting. This aspect of Excel can be frustrating even when you get the hang of it!

1.2. With the Chart Area selected, hit your “Delete” key.

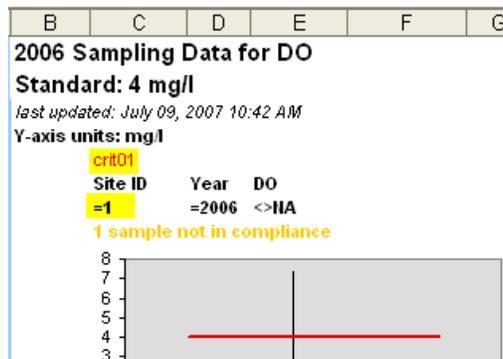
1.3. Repeat with all extra charts.

2. In this step, we will rename the charts, if your sites are differently named than the ones in the template.

To know which site a chart is associated with, go to the Charts worksheet. A chart labeled “Site X” on the Map Option worksheet corresponds to the site listed under “critXX” on the Charts worksheet. For example, in the template, the chart listed as Site 1 on a Map Option worksheet



corresponds to the site listed under “crit01” on the Charts worksheet (simply “1” in this example)



3. (This step is not necessary for Map Option 2 since its embedded charts are not labeled, only the sites are.) For each chart:

3.1. Select the Site Name by clicking on it.



3.2. Type in the site name that corresponds to it in the CHARTS worksheet. You can choose NOT to include the word “Site”.

4. Move charts so that they are well-arranged in the black bordered print area. Note: You may want to wait until your points are mapped in Step 8, since we recommend moving charts as close as possible to the corresponding sampling point on the map.

- 
5. Save your file.
  6. Skip to the next section “Re-Define Excel Names” on pg. 31.

**If you have more than 16 sites**, you will need to make additional charts.

7. For each new chart:
  - 7.1. Select one of the charts on the Map Option 1 worksheet (remember to select the Chart Area)
  - 7.2. Right-click and choose Copy.
  - 7.3. Click on an empty cell (for example, on the top row) so that your chart is no longer selected.
  - 7.4. Right-click and choose Paste. (Note: If your data is being pasted again into the original chart instead of in a new chart, it means you did not unselect your chart in step 7.3).
  - 7.5. Point the chart at the correct data by doing steps 8.8 - 8.11 (pg. 26) on this chart.
  - 7.6. Rename the chart (see step 3.1 on pg. 29).

We will not worry about putting the charts in a particular order until we have added the map(s) and sampling locations.

8. Save your file.

You have now updated your maps to include one chart for each of your monitoring sites for Map Option 1.

#### Map Option 2 worksheet

Since the charts in Map Option 2 need to be positioned next to the sampling locations, we will wait until after you insert and align the maps before we update the charts. So for now, continue with the next section “Re-Define Excel Names” on pg. 31.

#### **AFTER YOU HAVE FINISHED THE REST OF THE SET-UP PROCESS**

The charts in Map Option 2 are layered on top of the map(s). Now that you have lined up your sampling points with your maps, you can align your charts to match.

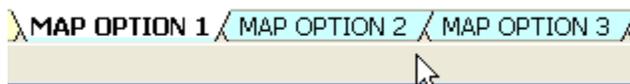
9. The overall sampling points chart has to be sent to the back layer in order for you to be able to select the individual site charts.
  - 9.1. Select the Sampling Point Chart Area\*
  - 9.2. Right-click and select “Send to back”
  - 9.3. Start at Step 1 on pg. 28 for charts in this Map Option. The only difference is that for simplicity sake, we named the sites by number only (instead of “Site XX”). You can name the sites in anyway you choose.
  - 9.4. Save your file.

---

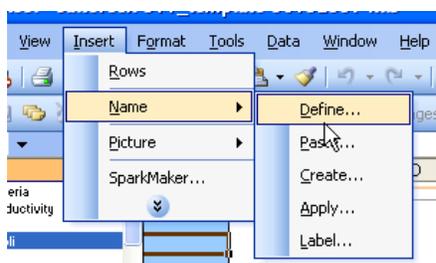
## Re-Define Excel Names

In previous sections, you modified your D2M template so that the chemistry/parameters and site names are appropriate for your project. In this section, we will update the pre-defined Excel “names” in D2M to reflect the changes you made to the chemistry/parameters and site names.

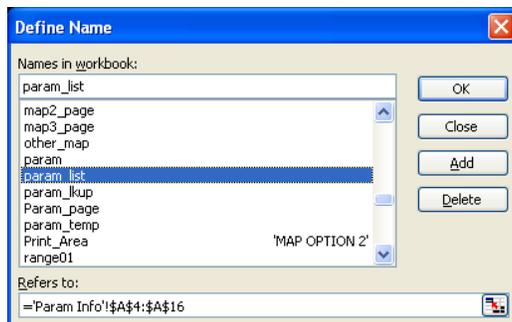
1. If you are not currently on a Map Option worksheet, go to one by clicking on any of the Map Option tab. (This section can be done from any of the Map Option worksheets.)



2. In the Insert menu, point to Name and then click Define.



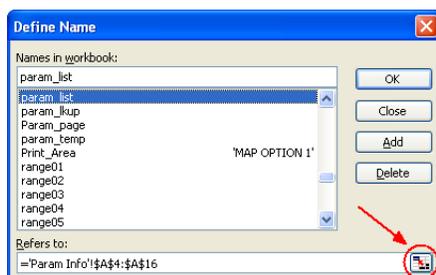
You will see the Define Name dialog box:



3. In this step, we re-define the name “param\_list” so that it points to the parameters you previously entered in the Param Info worksheet in column A. (in Step 5 on pg 15)

3.1. Click on the name “param\_list” from the **Names in workbook** dropdown list.

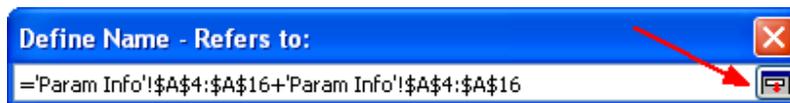
3.2. Click on the  button (right side of the **Refers to** field).



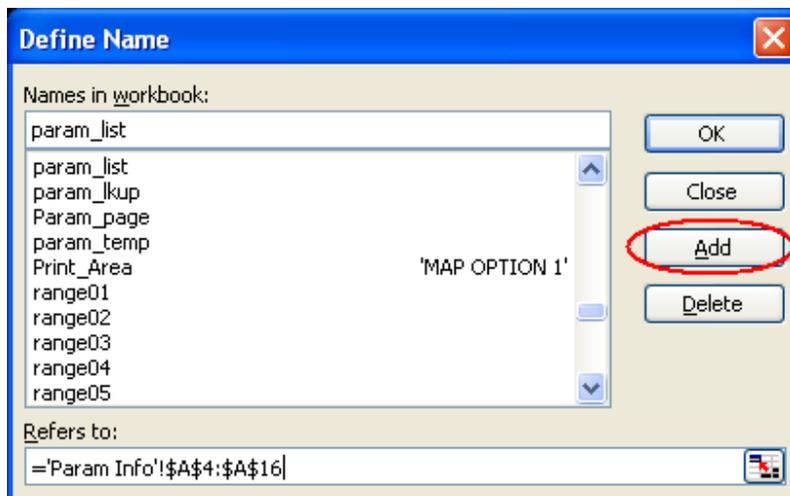
- 3.3. Select the Param Info worksheet (by clicking on the PARAM INFO tab) and then select the parameters you entered in column A.

	A	B	C
1	* To enter a line break, click ALT-ENTER		
2			Maps will show "STANDARD: <i>standard/threshold entered units entered</i> " with 1) If PARAM is "% Dissolved P", maps will show "THRESHOLD: <i>standard/thresh compliance</i> ."
3	<b>PARAM</b>	<b>STANDARD/ THRESHOLD</b>	<b>UNITS (label for y-axes)</b>
4	% Dissolved P	0.51	% Dissolved Phosphorus Summary Analysis:
5	Ammonia nitrogen		One key thing to note is that the ammonia standard is actually sampling. Concentrations from 0.5-2 mg/l could be the three graphs has been set at 0.5 mg/l for a conservative review.
6	Bacteria	230 mg/l	Chloride Summary Analysis: This is where Analysis/Summary goes
7	Conductivity	1000 mg/l diss. solids	Conductivity Summary Analysis: This is where analysis/summary goes
8	DO	4 mg/l	DO Summary Analysis: Reminder: In this case the standard is the the oxygen cor the threshold in this case.
9	E. coli	235 cfu/100 ml	E.coli Summary Analysis: It is fairly obvious that E. coli is a concern. Dissolved Phc phosphorous of greater than 51% is a possible indicator
10	Flow	0.5 cfs	
11	mIBI	2.2	Macrobiotic Index of Biotic Integrity -
12	Nitrate + Nitrite	10 mg/l	Nitrate Analysis: Analysis results indicate Nitrate is well below the state st
13	pH	7	
14	Temp	19 deg C	
15	Total phosphorus	No state standard mg/l	Total Phosphorus Analysis: This is where analysis/summary goes
16	Total suspended solids	No state standard mg/l	Total Suspended Solids Analysis: This is where analysis/summary goes
17			

- 3.4. Click on the  button to return to the Define Name dialog box.

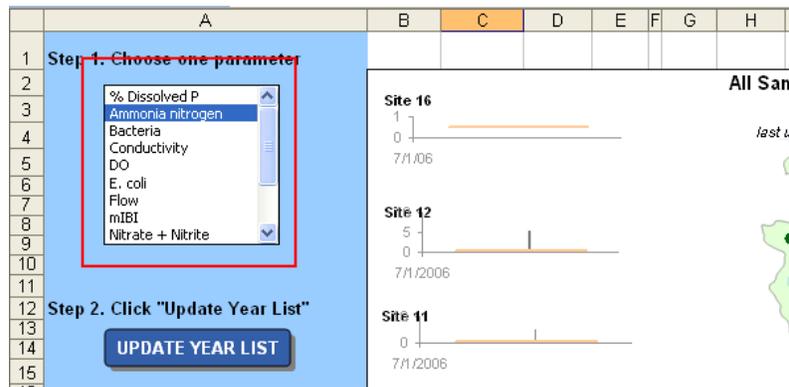


- 3.5. Click on the Add button (Do not forget this step-- otherwise no change will be made!)



- 3.6. Click on the Close button to close the dialog box and return to the Map Option worksheet.

- 3.7. Check the parameter list on the top left of the Map Option worksheet. It should now show your parameters. (You may have to scroll down the list to see all your parameters.)



If you can see your parameters, you have successfully re-defined the name “param\_list”. In the following steps, we will redefine more names.. Refer to the figures in Step 1-3 if you have questions.

4. In this step, we re-define the name “param\_lkup” which allows D2M to look up information associated with each parameter. .
  - 4.1. Go to the Param Info worksheet.
  - 4.2. Open the Define Name dialog box (Insert > Name > Define).
  - 4.3. Click on the name “param\_lkup” from the **Names in workbook** dropdown list.
  - 4.4. Click on the  button (right side of the **Refers to** field).
  - 4.5. Select all the parameters you entered on the Param Info worksheet **ALONG WITH ASSOCIATED FIELDS** (columns A-E).

	PARAM	STANDARD/ THRESHOLD	UNITS (label for y-axes)	COMMENTS	Non-compliant if > <
3	% Dissolved P	0.51		% Dissolved Phosphorus Summary Analysis: Dissolved P is not a State standard. Rather, the threshold of 51% dissolved P is used as an indicator of possible septic waste problems. Further testing may be needed since in some cases the dissolved P exceeds 100%.	>
4	Ammonia nitrogen	0.5 mg/l		Ammonia Analysis: One key thing to note is that the ammonia standard is actually a range based on Temperature and pH conditions at the time of sampling. <b>Concentrations from 0.5-2 mg/l could be the threshold that would violate the standard.</b> The threshold in these graphs has been set at 0.5 mg/l for a conservative review.	>
5	Bacteria	230 mg/l		Chloride Summary Analysis: This is where Analysis/Summary goes	>
6	Conductivity	1000 mg/l diss. solids		Conductivity Summary Analysis: This is where analysis/summary goes	>
7	DO	4 mg/l		DO Summary Analysis: Reminder: In this case the standard is the the oxygen concentration should be at least 4 mg/L. We want to see data above the threshold in this case.	<
8	E. coli	235 cfu/100 ml		E.coli Summary Analysis: It is fairly obvious that E. coli is a concern. Dissolved Phosphorous data can help refine this information. Dissolved phosphorous of greater than 51% is a possible indicator of anthropogenic sources of e.coli.	>
9	Flow	0.5 cfs			>
10	mIBI	2.2		Macrobiotic Index of Biotic Integrity -	<
11	Nitrate + Nitrite	10 mg/l		Nitrate Analysis: Analysis results indicate Nitrate is well below the state standard.	>
12	pH	7			>
13	Temp	19 deg C			>
14	Total phosphorus	No state standard	mg/l	Total Phosphorus Analysis: This is where analysis/summary goes	>
15	Total suspended solids	No state standard	mg/l	Total Suspended Solids Analysis: This is where analysis/summary goes	>
16					

- 4.6. Click on the  button to return to the Define Name dialog box.
- 4.7. Click on the Add button (Do not forget this step-- otherwise no change will be made!).
- 4.8. Click on the Close button to close the dialog box.

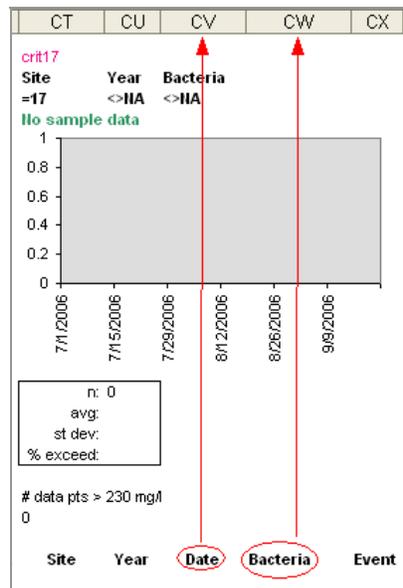
5. Next we re-define the name “mapdata” which allows D2M to categorize each location by frequency of exceedances.
  - 5.1. Go to the ADMIN MAP worksheet.
  - 5.2. Open the Define Name dialog box (Insert > Name > Define).
  - 5.3. Click on the name “mapdata” from the **Names in workbook** dropdown list.
  - 5.4. Click on the  button (right side of the **Refers to** field).
  - 5.5. Select all the sites you entered on the ADMIN MAP along with the associated fields (columns D-H) **and column headings (row 2)**.

D	E	F	G	H
mapdata		(LONGITUDE)	(LATITUDE)	
Crit Num	Site ID	X	Y	# EXCEED
1	1	488456.93125	4590817.18004	0
2	2	489454.00422	4590849.28806	0
3	3	490825.10278	4590822.36706	0
4	4	493721.69482	4588583.86408	0
5	5	493914.08612	4588865.24067	0
6	6	494703.15399	4589688.00564	0
7	7	492991.19339	4591681.57514	0
8	8	489238.33397	4595402.32653	9999
9	9	491284.84887	4599384.28189	0
10	10	489646.50167	4597499.31861	0
11	11	488465.77525	4601083.62632	0
12	12	486634.70135	4602711.16222	0
13	13	491395.03641	4600937.86278	0
14	14	489250.62189	4603840.38456	9999
15	15	488184.87760	4594133.89849	9999
16	16	487847.10733	4605335.58882	9999

- 5.6. Click on the  button to return to the Define Name dialog box.
- 5.7. Click on the Add button **(Do not forget this step-- otherwise no change will be made!)**.
- 5.8. Click on the Close button to close the dialog box.
- 5.9. Save your file.

**If you have more than 16 sites**, you will now add Excel names for each new site. **If you have 16 sites or less**, SKIP to the next section “Modify VBA Code” on pg. 37.

- For each additional site on the CHARTS worksheet, identify the date and parameter columns. For example, if you added a 17<sup>th</sup> site, it would be located under “crit17” on the CHARTS worksheet, and the date column would be CV and the parameter column would be CW.



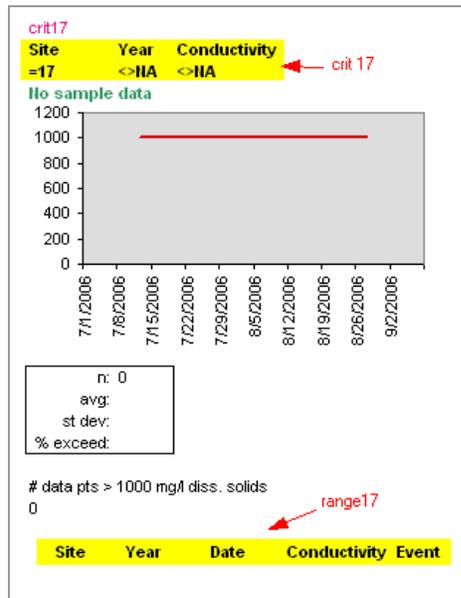
You will need to define 4 names for each site you add. They are listed below, along with the formula you need to paste into the “Refers to” field in the Define Name dialog box. (XX = critXX in CHARTS worksheet)

**dataXX** paste in “= CHARTS!\$*parameter column*\$29:\$*parameter column*\$433”  
(for crit17, the name “data17” would refer to “=CHARTS!\$CW\$29:\$CW\$433”)

**datesXX** paste in “=CHARTS!\$*date column*\$30:\$*date column*\$430”  
(for crit 17, the name “dates17” would refer to “=CHARTS!\$CV\$29:\$CV\$433”)

**critXX** point to CHARTS Worksheet | 3 columns and 2 rows under critXX  
(see following picture)

**rangeXX** point to CHARTS Worksheet | Data headings for critXX  
(see following picture)



7. Add the 4 new names for each new site using the following steps.
  - 7.1. Open the Define Name window (Insert > Name > Define).
  - 7.2. Type the new name in the “Names in Workbook” box.
  - 7.3. Click on the  button under the “Refers to”.
  - 7.4. Select the appropriate worksheet and cells.
  - 7.5. Click on the  button to go back to the Define Name dialog box.
  - 7.6. Click on the Add button (Don’t forget to do this step! Otherwise no change will be made)
  - 7.7. Repeat Steps 7.1-7.6 for each site you added beyond the first 16 that came with the template (that is, crit17 and greater).
8. Save your file.

You have now updated and added all the Excel names necessary for running the D2M query tool.

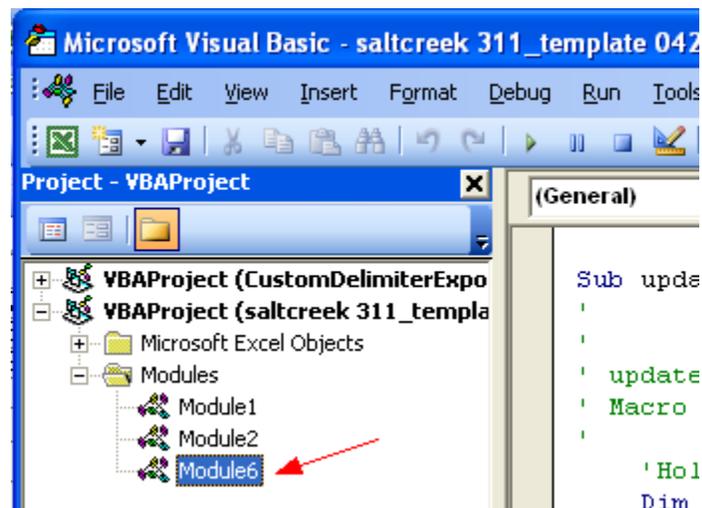
---

## Modify VBA Code

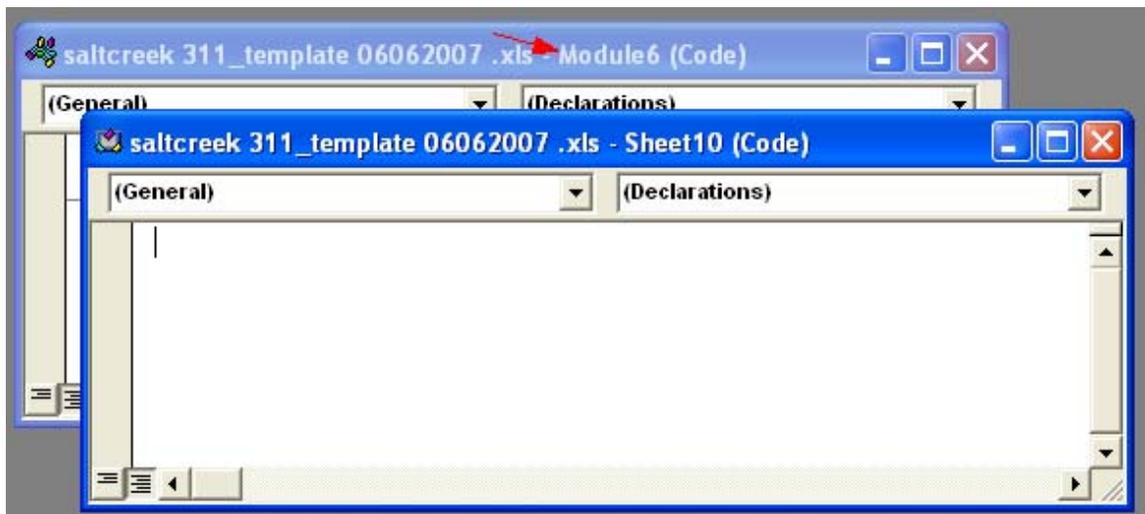
The “Refresh Maps/Charts” buttons are currently set up to query for the 16 sampling locations included in the template. If you have a different number of sampling locations, you will need to modify the VBA code behind this button. Even if you’ve never touched Excel VBA code before, do not be afraid! It’s actually quite simple—just follow these directions.

**If you have exactly 16 sampling locations**, you can skip ahead 2 sections to “Align Maps with Sampling Locations” on pg 42.

1. Go to Tools > Macro > Visual Basic Editor.
2. On the left tree structure, **double click** the Modules folder, and then double click on Module6.



3. If a blank window is on top (see following picture), then look for window titled “Module 6” and click on it to bring it to the front.



4. About halfway down the page, you will see a section that starts with 'Charts: Filter data (see following picture).

```
Selection.PasteSpecial Paste:=xlValues, Operation:=xlNone, SkipBlanks:= _  
    False, Transpose:=False  
Range("year_temp").Select  
Selection.Copy  
Range("year").Select  
Selection.PasteSpecial Paste:=xlValues, Operation:=xlNone, SkipBlanks:= _  
    False, Transpose:=False  
  
'CHARTS: Filter data  
Sheets("CHARTS").Select  
Sheets("CHARTS").DisplayPageBreaks = False  
  
Range("data").AdvancedFilter Action:=xlFilterCopy, CriteriaRange:=Range( _  
    "crit01"), CopyToRange:=Range("range01"), Unique:=False  
Range("data").AdvancedFilter Action:=xlFilterCopy, CriteriaRange:=Range( _  
    "crit02"), CopyToRange:=Range("range02"), Unique:=False  
Range("data").AdvancedFilter Action:=xlFilterCopy, CriteriaRange:=Range( _  
    "crit03"), CopyToRange:=Range("range03"), Unique:=False
```

That section contains code for 16 sampling locations. We will change that code to match the number of sampling locations in your project.

5. **If you have less than 16 sampling locations,**

- 5.1. Delete the pairs of lines starting with Range("data") . . . that include critXX numbers where XX is greater than your number of sampling locations. For example, if you only had 14 sites, you would select and delete the 4 lines highlighted below, because they have critXX where XX is greater than 14.

```
Range("data").AdvancedFilter Action:=xlFilterCopy, CriteriaRange:=Range( _  
    "crit14"), CopyToRange:=Range("range14"), Unique:=False  
Range("data").AdvancedFilter Action:=xlFilterCopy, CriteriaRange:=Range( _  
    "crit15"), CopyToRange:=Range("range15"), Unique:=False  
Range("data").AdvancedFilter Action:=xlFilterCopy, CriteriaRange:=Range( _  
    "crit16"), CopyToRange:=Range("range16"), Unique:=False
```

- 5.2. Skip to step 7.

6. **If you have greater than 16 sampling locations,**

- 6.1. Copy the last 2 lines of that section.

```
Range("data").AdvancedFilter Action:=xlFilterCopy, CriteriaRange:=Range( _  
    "crit15"), CopyToRange:=Range("range15"), Unique:=False  
Range("data").AdvancedFilter Action:=xlFilterCopy, CriteriaRange:=Range( _  
    "crit16"), CopyToRange:=Range("range16"), Unique:=False  
  
' ADMIN_MAP: Filter data  
Sheets("ADMIN MAP").Select
```

- 
- 6.2. Put your cursor on the beginning of the next line and paste in the selection once for each site you have beyond 16. For example, if you have 18 sites, you would paste in the selection 2 times.

```
Range("data").AdvancedFilter Action:=xlFilterCopy, CriteriaRange:=Range( _
    "crit16"), CopyToRange:=Range("range16"), Unique:=False
Range("data").AdvancedFilter Action:=xlFilterCopy, CriteriaRange:=Range( _
    "crit16"), CopyToRange:=Range("range16"), Unique:=False
Range("data").AdvancedFilter Action:=xlFilterCopy, CriteriaRange:=Range( _
    "crit16"), CopyToRange:=Range("range16"), Unique:=False

' ADMIN_MAP: Filter data
Sheets("ADMIN_MAP").Select
```

- 6.3. Replace the XX in the critXX and rangeXX values with the next consecutive numbers.

```
Range("data").AdvancedFilter Action:=xlFilterCopy, CriteriaRange:=Range( _
    "crit16"), CopyToRange:=Range("range16"), Unique:=False
Range("data").AdvancedFilter Action:=xlFilterCopy, CriteriaRange:=Range( _
    "crit17"), CopyToRange:=Range("range17"), Unique:=False
Range("data").AdvancedFilter Action:=xlFilterCopy, CriteriaRange:=Range( _
    "crit18"), CopyToRange:=Range("range18"), Unique:=False

' ADMIN_MAP: Filter data
Sheets("ADMIN_MAP").Select
```

7. Hit Alt + Q (or go to **File > Close and return . . .**) to close the Visual Basic Editor and return to your spreadsheet.
8. Save your file.

You are now done modifying the VBA code so that it refers to the correct number of monitoring sites that you are using.

## Define Minimum/Maximum Dates for Charts

On the ADMIN\_MAP worksheet, there are 2 cells that define the minimum and maximum dates to display on every chart in your D2M file. Every time you run a query, those dates are refreshed to reflect the earliest and latest sampling dates of the query results.

The formulas for the minimum and maximum dates are currently set up for 16 sampling locations. If you have a different number of sampling sites, you will follow the steps in this section to reformulate those two cells to reflect your number of sampling locations.

NOTE: You can also set up your charts to show full calendar year instead of minimum/maximum dates of query results. See instructions at Appendix A: Troubleshooting and Tips on pg. 55.

10. If you have exactly 16 sampling locations, skip to the next section on pg. 42, “Align Maps with Sampling Locations.”
11. Go to the Admin Map worksheet.
12. Select cell A11. In the formula bar above, you will see the calculation of the minimum sampling date. Notice how it refers to all the “datesXX” names you set up in the “Re-Define Excel Names” section.

start_date	=MIN(dates01, dates02, dates03, dates04, dates05, dates06, dates07, dates08, dates09, dates10, dates11, dates12, dates13, dates14, dates15, dates16)-31										
A	B										
1	param_temp	Total phosphorus	mapdata		(LONGITUDE)	(LATITUDE)			No exceedances		One exceed
2	limit_temp	No state standard		Site ID	X	Y	# EXCEED		mapcrrt1		mapcrrt2
3	units_temp	mg/l		1	488456.93125	4590817.18004	0		# EXCEED		# EXCEED
4	stdUnits	liku12		2	489454.00422	4590849.28806	0		=0		=1
5	sign_temp	=		3	490825.10278	4590822.36706	0				
6	param	Total phosphorus		4	493721.69482	4588583.86408	0		Site ID	X	Y
7	limit	No state standard		5	493914.08612	4588865.24067	0		1	488456.93125	4590817.18004
8	units	mg/l		6	494703.15399	4589688.00564	0		2	489454.00422	4590849.28806
9	sign	=		7	492991.19339	4591681.57514	0		3	490825.10278	4590822.36706
10	limit (used in graphs)			8	489238.33397	4595402.32653	9999		4	493721.69482	4588583.86408
11	param	No state standard		9	491284.84887	4593384.28189	0		5	493914.08612	4588865.24067
12	stdUnits	No state standard		10	489646.50167	4597499.31861	0		6	494703.15399	4589688.00564
13	sign			11	488456.93125	4591083.62632	0		7	492991.19339	4591681.57514

### 13. If you have less than 16 samples:

13.1. Select cell A11.

13.2. Go into the formula bar and delete all “datesXX” where XX is greater than your number of sampling locations. For example, if you have 4 sites, the formula would look like

**=MIN(dates01,dates02,dates03,dates04)-31**

13.3. Select cell A12.

13.4. Go into the formula bar and delete all “datesXX” where XX is greater than your number of sampling locations. For example, if you have 4 sites, the formula would look like

**=MAX(dates01,dates02,dates03,dates04)+31**

13.5. Save your file.

13.6. Skip to the section “Align Maps with Sampling Locations” on pg. 42.

---

14. If you have more than 16 samples:

14.1. Select cell A11.

14.2. Go into the formula bar and for each additional site you have above 16, add “datesXX” separated by commas. For example if you have 18 sites, the formula would look like

**=MIN(dates01,dates02,dates03,dates04,dates05,dates06,dates07,dates08,dates09,dates10,dates11,dates12,dates13,dates14,dates15,dates16,dates17,dates18)-31**

14.3. Select cell A12.

14.4. Go into the formula bar and for each additional site you have above 16, add “datesXX” separated by commas. For example if you have 19 sites, the formula would look like

**=MAX(dates01,dates02,dates03,dates04,dates05,dates06,dates07,dates08,dates09,dates10,dates11,dates12,dates13,dates14,dates15,dates16,dates17,dates18)+31**

14.5. Save your file.

Your charts will now correctly display the minimum/maximum dates of your query results.

## Align Maps with Sampling Locations

It's finally time to map out your sampling locations! Here's what you will do to make it happen:

- Enter fake data
- Look at your sampling locations
- Insert your map(s)
- Align your sampling locations with Map1
- Position your legend
- Label the sampling locations
- Position your charts
- Repeat for other layouts (i.e., Map Options), if any

### Enter fake data

In order for us to see our sampling locations, we have to first enter fake data in the DATA ENTRY worksheet for every one of your locations. We will do this by copying all the sites you entered in the ADMIN\_MAP worksheet into the DATA ENTRY worksheet and entering the fake data.

1. Go to the ADMIN\_MAP worksheet.
2. In Column E, select and copy all your site names.

D	E	F	G	H
mapdata				
Site ID	Site	X	Y	# EXCEED
1	1	488456.93125	4590817.18004	0
2	2	489454.00422	4590849.28806	0
3	3	490825.10278	4590822.36706	0
4	4	493721.69482	4588583.86408	0
5	5	493914.08612	4588865.24067	0
6	6	494703.15399	4589688.00564	0
7	7	492991.19339	4591681.57514	0
8	8	489236.33397	4595402.32653	9999
9	9	491284.84887	4599384.28189	0
10	10	489646.50167	4597499.31861	0
11	11	488465.77525	4601083.62632	0
12	12	486634.70135	4602711.16222	0
13	13	491395.03641	4600937.86278	0
14	14	489250.62189	4603840.38456	9999
15	15	488184.87760	4594133.89849	9999
16	16	487847.10733	4605335.58882	9999

3. Go to the DATA ENTRY worksheet and select cell B8 (the first cell under the Site ID heading). NOTE: Even though you are only selecting one cell, when you paste in your selection it will extend across the correct number of cells.

	A	B	C
1	<b>DATA ENTRY SHEET</b>		
2	Once the sheet has been customized for your project, you can enter data sta		
3	* Do not change the column headers after customization or queries will not w		
4			
5			
6			
7	<b>Date</b>	<b>Site ID</b>	<b>Site Name</b>
8	8/1/2006	1	Lake Louise Outlet
9	8/1/2006	2	Clark Ditch

4. Paste in your selection.

- 
15. Make sure that all your sites have a date in column A and these dates all have the same **year**.  
NOTE: These are sample dates to help set up the sites--they do not have to be actual sampling dates.
  16. Make sure that, for each parameter, there is at least ONE sampling value entered. Fake data is fine—this allows us to see all sampling locations when we align the sites to the maps in Step 8.
  17. Delete any extra rows of data that came with the template.
  18. Save your file.

---

## Look at your sampling locations

We are now ready to query our fake data and look at our sampling locations to make sure they were properly entered.

19. Go to the Map Option worksheet you plan to work with.
20. In the blue query section, choose one parameter in Step 1, and then click the “UPDATE YEAR LIST” button.
21. Choose a sampling year in Step 3, and then click the “REFRESH MAPS/CHARTS” button.
22. Cross your fingers.

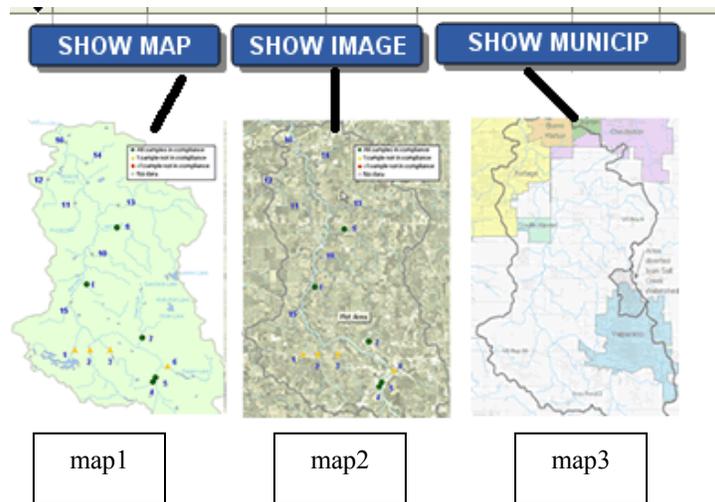


23. The map should now be updated with your sampling locations. Confirm that you see the correct number of sampling points and that they are in approximately the correct relationship to each other (although they will still need to be moved and the extent resized in order to match your maps). If the orientation is not correct, make sure your points have their latitude/longitudes entered in the correct order in the ADMIN MAP worksheet (see Step 3 on pg. 19).
24. Save your file.

NOTE: In all the Map Options, the sampling locations are shown using **scatterplot charts** with latitude as the x-axis and longitude as the y-axis. In each Map Option you plan to use, we will align these scatterplot charts with your underlying maps

## A quick orientation of D2M maps

You can choose up to 3 maps to display under the sampling locations. In the template, the 3 maps are 1) a watershed map, 2) an aerial photo, and 3) a map with municipal boundaries.



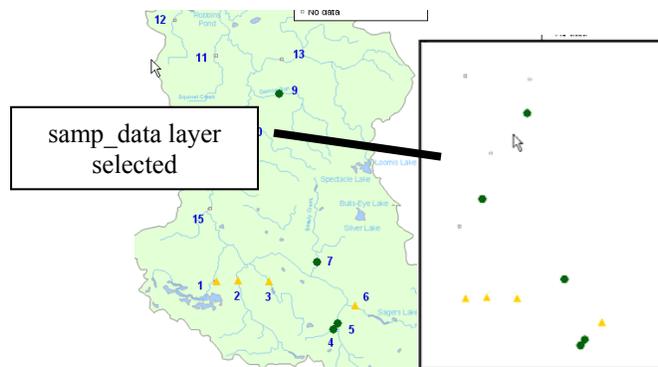
The buttons on the template use the labels “MAP” “IMAGE” and “MUNICIP” and allow you to decide which map should be the top (visible) map layer (the other maps are hidden beneath). In the Excel code, these maps are referred to as **map1**, **map2** and **map3**, respectively.

NOTE: Decide which of your maps will be given the names map1, map2, and map3, because you will be replacing the template maps with yours.

When a map is selected, you can see its coded name in the “name box” in the upper left hand corner of the spreadsheet.



As mentioned before, the sampling location layer is simply an Excel scatterplot with latitude as the x-axis and longitude as the y-axis. The sampling location layer is programmed to always be the topmost layer and is color-coded based on frequency of exceedance. The coded name for this layer is **samp\_data**.



---

## **Insert your map(s)**

We are going to swap out the “map1” currently in the template with the map you have chosen for “map1”

25. In the Map Option worksheet you have been working with, select map1 by typing “map1” in the upper left Name box and hit the “Enter” key. (You have to type in the name manually; map names do not appear in the Names drop-down list.)



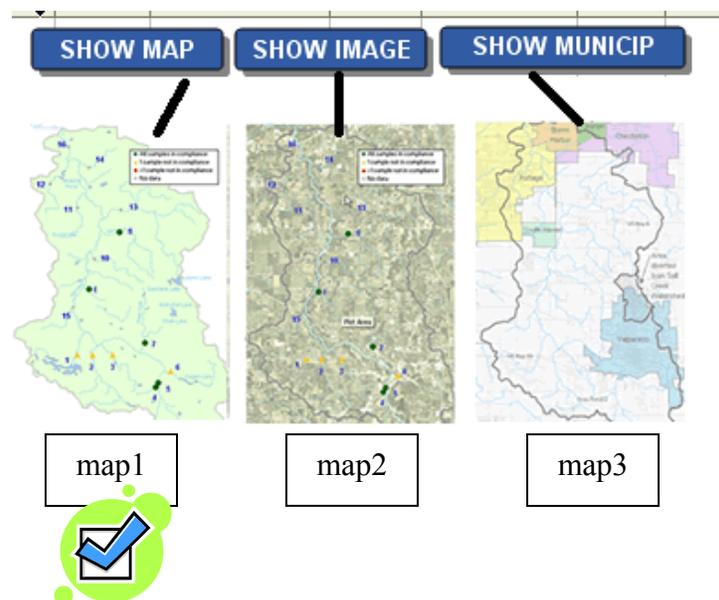
Notice that the map area is highlighted

26. Hit Delete to remove current map1.
27. Go to Insert > Picture > From File, and navigate to the map you have chosen for your “map1”. Click Insert.
28. Move your map1 until it is approximately within the same area that the original map was.

Hint: avoid resizing map images, if possible—that way you will not accidentally change the aspect ratio and you will not have to resize your other maps to match this one. After all the images are in place, you will adjust the sampling location layer (samp\_data) instead.

29. Click on the map to make sure it’s selected, and then type in “map1” in the upper left Name box. Hit the Enter key, and now your map is titled “map1”.
30. Save your file.

Map1 is now correctly added to this worksheet.



If you will be using more than one map, we will now repeat the previous steps.

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31. If you have a map2,

31.1. Repeat Steps 25-29, this time substituting map2 for map1.

31.2. Match the corners of map2 with the corners of map1.

NOTE: Remember, the easiest way to select map2 is by entering “map2” in the Name box.

Assuming that map2 was created with the same extent as map1, matching the corners of the two maps mean that, once the samp\_data sampling points are aligned with map1, they will also be aligned with map2.

32. If you have a map3

32.1. Repeat Steps 25-29, this time substituting map3 for map1.

32.2. Match the corners of map3 with the corners of map1 (or map2).

33. If you are not using all 3 maps, we recommend leaving the template maps in there as a placeholder.

33.1. To make the unused map non-obtrusive, select it (using the Name box) and then resize small enough so that it cannot be seen beyond the extent of your other map(s).

33.2. If you want to make the associated button look non-active, then right-click on the button, choose Format Auto-Shape, go to the Font tab and choose a color which matches the button color. This way the button is still there as a placeholder, but users are less likely to click on it.

33.3. If you are ABSOLUTELY positive you will never use 3 map backgrounds, contact Janice Huang (312-353-8228) for directions on how to remove maps and buttons without causing an error in the coding.

34. Save your file.

Your maps are now inserted in your Map Option and are ready to be aligned with your sampling locations.

---

## Align your sampling locations with Map1

This step is tricky and takes lots of patience. The good news is that once your sampling locations are lined up with map1, you only have to match the corners of map2 (and map3) to the corners of map1 for the sampling locations to be aligned to those maps, too (assuming your GIS person created all your maps with the same extent).

NOTE: You will be moving and resizing the sampling locations chart (“samp\_data”) to align with the maps, NOT the other way around. If you have to resize your map, make sure you drag from the corners, so that the aspect ratio stays constant and your map will not be distorted.

35. First we will get an idea of how much the samp\_data chart needs to be moved.

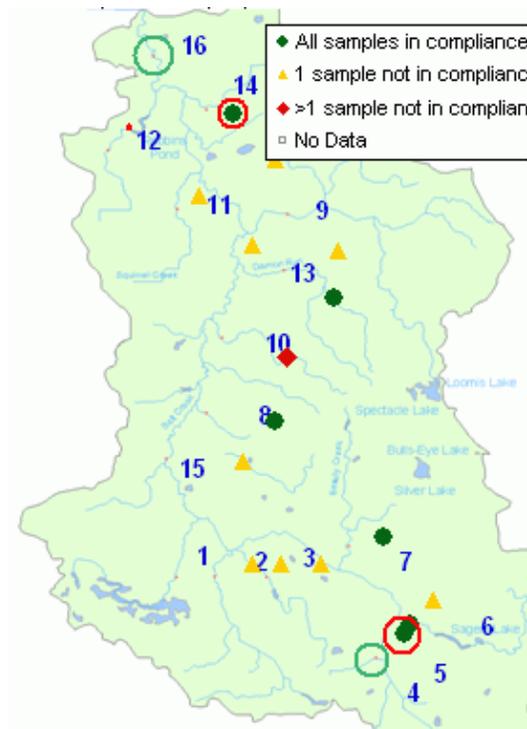
- 35.1. Click on the “SHOW MAP” button. This will bring the samp\_data chart to the top layer with map1 visible underneath.



- 35.2. Compare your sampling locations on the samp\_data chart with the locations on your map to determine what direction the samp\_data chart needs to be shifted and how much it will need to be re-sized.

HINT: Focus on aligning sampling points on **opposite ends** of your extent. (When those look correctly aligned, they you can confirm that the points in between are aligned, too.)

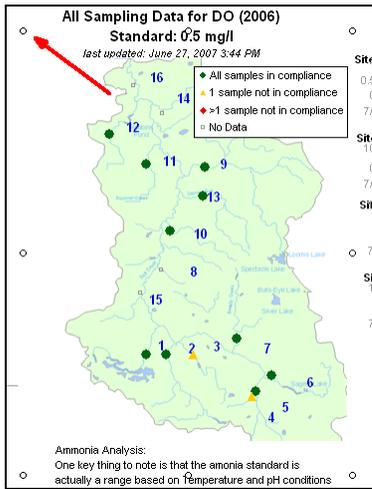
In the example below, we are focusing on site 16 and site 4. We want to move the samp\_data layer until those two sites in the samp\_layer (circled in red) are on top of the two equivalent sites in map1 (circled in green). I can see from Site 16 that samp\_data needs to be moved up and to the left. Then looking at Site 4 tells me that I will probably have to make samp\_data longer and a little bit narrower.



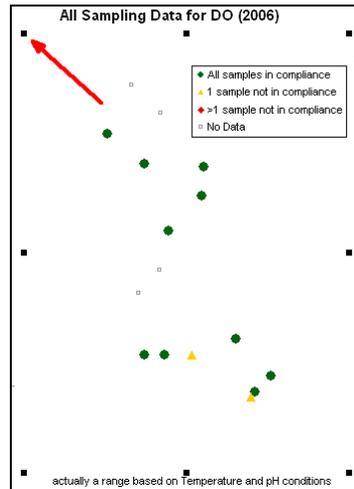
36. Move and re-size the samp\_data chart as needed.

36.1. Select the sampling locations chart area by entering “samp\_data” in the Name box (or by holding down Ctrl while clicking on one of the sampling locations). If the map is no longer visible, do this step again carefully.

YES: Map still visible  
(handles are hollow circles)



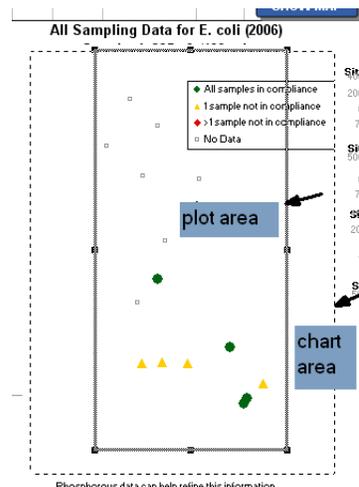
NO: Map no longer visible.  
(handles are black squares)



36.2. Resize and move the sampling locations chart until its sampling points are aligned with the corresponding sampling points on the map. Remember to focus on sampling points on opposite ends of your extent. When those look correctly aligned, they you can confirm that the points in between are aligned, too.

- To resize the chart, click on a handle and drag.
- To move the chart, click in the middle of the chart (double arrows appear) and drag.

Depending how far off your sampling points are, you may have to adjust where the samp\_data’s **plot area** is positioned within its **chart area**.



You can do this by selecting the plot area (click next to, but not on, a sampling location in samp\_data) and following the moving/resizing directions given in Step 36.2. NOTE: The map

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is not visible when the plot area is selected, so you will have to select/deselect to see the results of your adjustments.

- 36.3. If you absolutely have to move or resize the map, enter “map1” in the Name box to select it and follow same directions as in step 36.2. See Appendix A: Troubleshooting and Tips if you need to crop your maps.
- 36.4. Continue doing a combination of all these steps, as needed, until sampling locations in samp\_data are aligned with sampling locations in map1. Yes, this is a time-consuming and tedious.
- 36.5. Save your file.

Phew! You’re done with the hardest part!

### **Align other maps with Map1**

If you moved or resized map1, you will have to do the same modifications to map2 and map3 so that they will still lie directly underneath.

37. If you have a map2:

- 37.1. Click on “SHOW MAP” and “SHOW IMAGE” to see how much and where map2 needs to be moved.
- 37.2. Select map2 by entering “map2” in the Name box.
- 37.3. Resize/move map2 until its edges line up with those of map1.

38. If you have a map3:

- 38.1. Click on “SHOW MAP” and “SHOW MUNICIPAL” to see how much and where map3 needs to be moved.
- 38.2. Select map3 by entering “map3” in the Name box.
- 38.3. Resize/move map3 until its edges line up with those of map1.

39. Save your file.

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## Position your legend

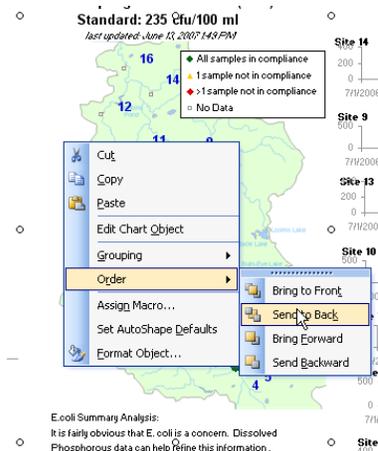
If the legend is covering sampling points or prominent features on your maps, you will need to move it. The legend is an element of the samp\_data chart.

40. Click on the legend to select it. You can move it any area to within the samp\_data chart area. You can also resize it by selecting and dragging the handlebars.
41. Save your file.

## Label the sampling locations

The sampling location labels are contained in a separate layer on the worksheet. This layer is composed of text boxes that have been grouped together. We will ungroup these labels, rename them with your location names, and move them to the appropriate positions.

42. In order to select the labels, you have to send the samp\_data chart to the back (bottom) layer.
  - 42.1. Select the sampling locations by typing “samp\_data” in the Names box. Hit Enter.
  - 42.2. Right click, and choose “Order”, then “Send to Back”.



43. Click on any of the labels. You will see the label selected with hash marks. You will also see hollow circle handles around the full extent of the labels, indicating that the labels are grouped. We will now ungroup these labels so that we can make edits.

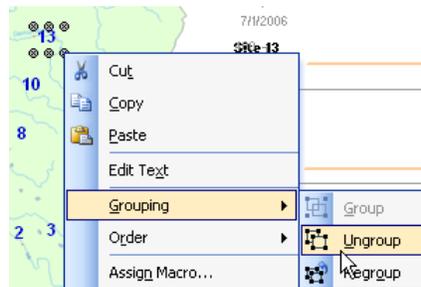


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43.1. Right click on the hash mark border around the label you are changing.



43.2. Choose Grouping > Ungroup. (If Ungroup is grayed out, then choose Regroup and then do Grouping > Ungroup.)



43.3. Deselect by clicking on a cell outside the map.

The 16 site labels on the worksheet are now ready for editing. For up to 16 of your sampling locations, you will rename of the current labels and move it next to the associated sampling location. (see the map with site names created by your GIS person per “Appendix B: Creating Maps for Data2Maps” step 8).

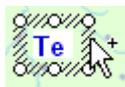
44. With the 16 labels (textboxes) currently on the worksheet,

44.1. Choose a textbox, and swipe over the text in it.



44.2. Type in one of your sampling location names. (Do not click off of it yet).

44.3. Select the textbox by clicking on the hash marks surrounding the selected text.



44.4. If not all of the text is showing, you can resize the textbox by grabbing one of the handles of the selected textbox and dragging it until the entire text is visible.



44.5. Select the label again (by clicking on the hash mark border) and drag it next to the associated sampling location

44.6. If your project has exactly 16 locations, SKIP to Step 47.1.

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**45. If you have less than 16 locations:**

- 45.1. Select each extra label and delete.
- 45.2. Select any label, right click and choose Grouping > Regroup.

**46. If you have more than 16 locations, then for each additional label:**

- 46.1. Select one of the labels,
- 46.2. Copy and then paste onto the map.
- 46.3. Follow the directions in Step 44 to rename the label.
- 46.4. Position the label next to the associated sampling location.
- 46.5. Repeat Steps 46.1 - 46.4 until all your labels are entered and correctly positioned.

**47. Label Features (optional)**

You may want to label or highlight relevant features on your map (e.g., outfalls, facilities).

- 47.1. To add other text labels to your map, add and modify new labels following Step 46.

**48. With all your labeling finished, you will group them together so that they all appear in the top layer (on top of your maps and samp\_data layer).**

- 48.1. Select all the labels by holding down shift and clicking on the individual labels.
- 48.2. Right click on one of them, and choose Grouping > Group.

**49. Save your file.**

**Position your charts**

We have put off positioning your charts until now, because it is best to place them near the actual sampling points. If you are working with Map Option 1, we recommend you order your charts they are as close as possible (and similar orientation) to the associated sampling locations on the map.

**50. Select each chart and position them in an order that mimics sampling location orientation on map.**

NOTE: Make sure the Chart Area is selected before moving chart. Directions in Step 1.1, pg.28.

**51. Save your file.**

NOTE: If you are working with Map Option 2, you will now return to the section “Set Up Embedded Charts in MAP OPTIONS 1 and 2” on pg. 28 to set up your charts and then position them on the map next to the appropriate sampling location.

**You are done customizing Map Option 1!**

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Other Map Option worksheets

If you are customizing Map Options 2 or 3, you will now do all the steps in this set-up section, except for any differences specific to Map Options 2 or 3 noted in each section.

You are now ready to start using this application. Enter data into the DATA\_ENTRY worksheet. Choose the parameter and year on the map options sheet(s) you customized. Voila!

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## Appendix A: Troubleshooting and Tips

### Excel Names

*Problem: I am not allowed to enter text in the Names box.*

Solution: Most likely a non-cell (e.g., map, chart, button) is selected. Click on any cell, and then try entering again.

### Charts

*Problem: Sampling locations are always selected even though I am trying to click on another item.*

Solution: Sampling locations is the top layer and will always be selected when its area is clicked on. Send the sampling locations to the back by typing "samp\_data" in the Names box, right click, and choose "Send to Back". When you want the sampling locations back in the front, typing "samp\_data" in the Names box again, right click, and choose "Bring to Front"

*Problem: I want the charts to show full calendar year(s).*

Solution: You can change the charts to show the full calendar year by entering the following formulas in the ADMIN\_MAP worksheet.

In Cell A11, enter:

=IF(year<>"All",DATE(year,1,1),DATE(MIN(year\_list),1,1))

In Cell A12, enter:

=IF(year<>"All",DATE(year+1,1,1),DATE(MAX(year\_list)+1,1,1))

If you want the charts to show only the sampling date range again, follow steps XXX to return to the original setting.

### Maps

*Problem: I want to crop my map.*

Solution:

1. Select the map by typing its name into the Name box.
2. Go to **Format > Picture** (or hit CTRL + 1).
3. On the Picture tab, enter approximate numbers into the Crop from Left/Right/Top/Bottom boxes.
4. Click OK.
5. Repeat with different crop measurements until the map shows only the extent you are interested in.

NOTE: You will have to enter the exact same numbers into the Crop fields for other maps in that layout so that maps are correctly aligned.

*Problem: It's hard to see the sampling points on top of my map.*

Solution: Tone down your map by selecting it, right-clicking and choosing Format Picture. Under Picture tab, pump up brightness (try 65%) and tone down contrast (try 35%)

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*Problem: Sampling points are not oriented in the correct positions.*

Solution: Make sure your points have their latitude/longitudes entered in the correct order in the ADMIN MAP worksheet. See Step 3 on pg. 19.

*Problem: Instead of a single threshold value, one of my parameters has an acceptable range.*

Known Issue: D2M currently cannot handle comparing values to an acceptable range.

*Problem: I want to change the text on the “SHOW MAP/IMAGE/MUNICIP” buttons.*

Solution: Right click on the button, and choose “Edit Text”. The cursor will show up at the beginning of the button text, and you can type in your changes.

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## Appendix B: Creating Maps for Data2Maps

### What you should have received from the requestor:

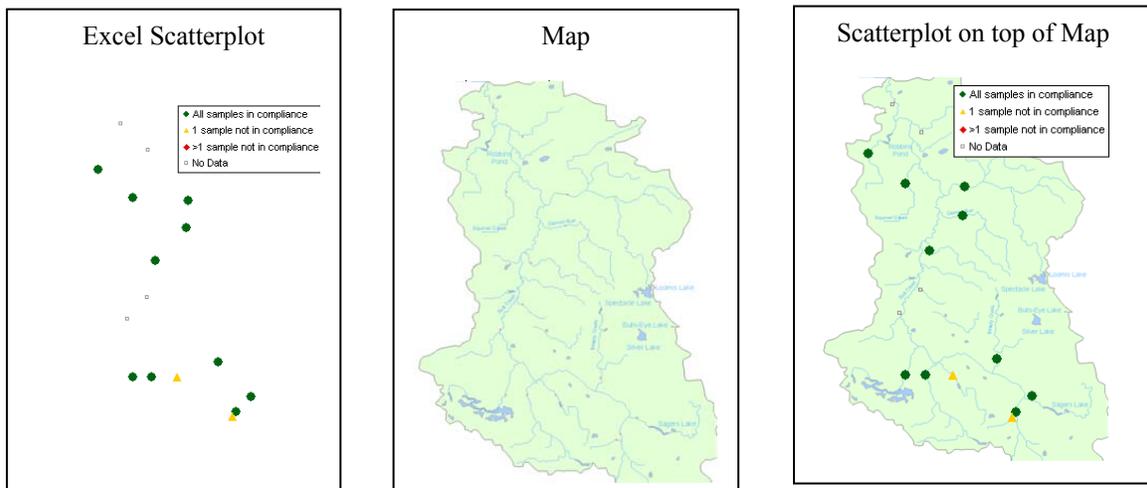
- Lat/longs for sampling locations along with site names
- Type of map(s) desired (watershed delineation, aerial image, etc.)
- Which D2M layout (or Map Option) requestor will be using (this will affect max width/height of maps)

### What you will be producing for requestor:

- Map(s) exported as GIFs that will be used in Excel as a backdrop for sampling locations.

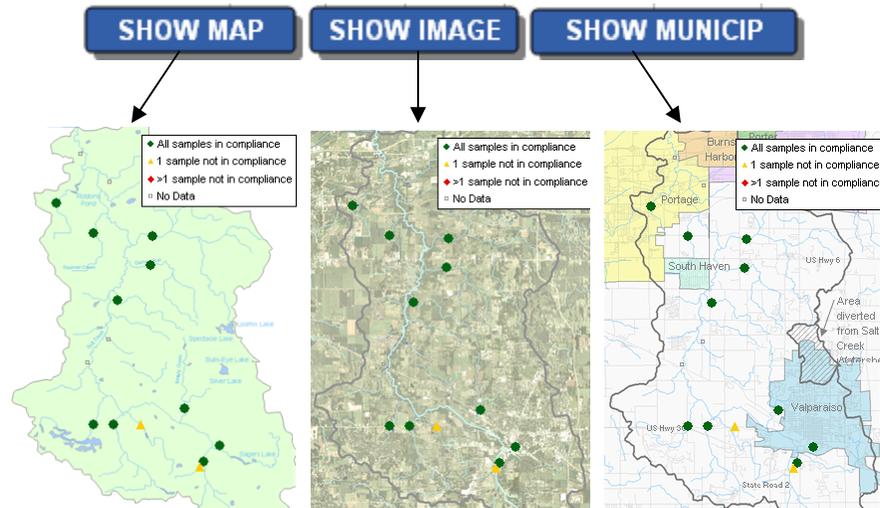
### Overview for GIS Analyst:

The requestor will be pasting the map(s) you produce into a D2M Excel file as a backdrop for sampling location points (the sampling locations are displayed in the Excel file using a scatterplot of the x-y-coordinates with background = “no fill”).



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If the requestor asked for more than one map, that means they will be setting up the D2M file so that they can choose the background map by a click of a button (similar to Google maps)



### Directions:

1. Create a GIS view with sampling locations layer and map layer(s) asked for by requestor.
2. Make sampling points small (maybe 4 pt) since they will need to be totally covered by another set of markers in Excel.
3. If one of your maps is an aerial photograph, make it slightly transparent (you can try 40% transparency as a starting point) so that the sampling points will stand out more.
4. Zoom to the extent desired by the user (most likely the extent of the sampling locations or the extent of the pertinent watershed)

You will now export each of the layers as GIS files. Microsoft products make JPGs fuzzy because they have built-in anti-aliasing (see <http://pptfaq.com/FAQ00065.htm>). In our experience, it seems like images remain clearer when brought in as GIFs.

5. The following export instructions are specific to ArcMap. If you are using another GIS software package, read through the instructions to see what end results you want in your GIS.
  - a. Make the layer you want to export visible, along with the sampling locations layer. All other layers should be turned off. .  
NOTE: The sampling locations layers should not be labeled. We have found it's easier to control the display of the site labels if we add them in Excel.
  - b. Go to File > Export Map
  - c. Change Save as Type to "GIF (\*.gif)"

- 
- d. In the General Tab (on the bottom under Options), make sure that the width and height do not exceed the allowable size for the Map Option your requestor has chosen (see below). If not, close the dialog, make your view smaller, and start at Step b again.

Map Option 1:	max width 340px	max height 385px
Map Option 2 or 3:	max width 500px	max height 575px

6. Save the files as GIF files
7. If requestor is asking for more than one map , repeat Step 5 with the desired layer  
Note: Do not change the extent of your view, as you want all the maps to cover the same extent, so they can be layered on top of one another.
8. If requestor does not already have a map with sampling sites labeled, please make one for them to use in the set-up process.