Deployment Assistance Tool
Guidance Document

Contents

Background

The Deployment Assistance Tool (DAT) was created to support the Water Temperature Working Group in its efforts to systematically and effectively deploy stream temperature loggers throughout Maine's watersheds. The DAT is composed of two parts: an online map and an accompanying spreadsheet. The web map, hosted on ArcGIS Online, allows group members to view the state at the HUC 8 level in order to spatially focus and coordinate efforts.

USGS and USFS modelers have advised the group that drainage area and elevation are two of the most influential variables when it comes to predicting stream temperature. These variables, along with accessibility, were chosen as parameters for logger placement. Both elevation and drainage area have been binned into four classes to simplify the decision process. Group members have also noted the importance of impounded area above sites (i.e. wetlands, lakes, etc.) as well as accounting for known aquifers.

The second component of the tool, the spreadsheet, quantifies the number of loggers needed in each drainage area/elevation category *proportional* to the amount of stream reaches in those categories within your watershed. Members choose their watershed, input the amount of loggers they have available, and then receive an output of the number of loggers they need in each drainage area/elevation category. Cells are colored to match corresponding map symbology (i.e. light blue text in the cells corresponds to streams in drainage areas < 1 square mile, symbolized as a light blue line on the map) to increase consistency between the spreadsheet and the map.

The following document provides instructions on how to view the online map, how to add logger locations during field season to track state-wide efforts, and how to use the spreadsheet in conjunction with the online map to strategically place loggers. If you have any further comments or questions, please contact serena_doose@fws.gov.

Viewing the Map

1. Go to [ArcGIS Online](#) and log-in with your assigned username (**John_Doe_fws_col**) and password.
2. Click on the "Groups" tab on the top navigation bar.
3. Then click on **Maine Water Temperature Working Group**.
4. This is what will appear:
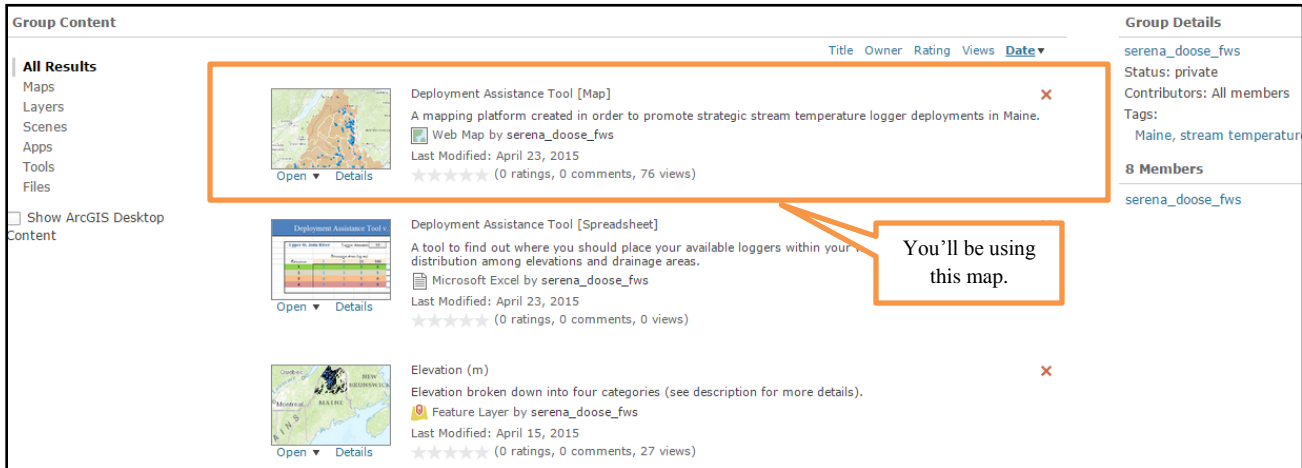

5. Click on the "**Deployment Assistance Tool**."
6. Click [OPEN ▾] and choose the "**Map Viewer**" option to see the map online.

Adding/Editing Your Logger Sites

1. Now you've got the map open and your screen should look like this:
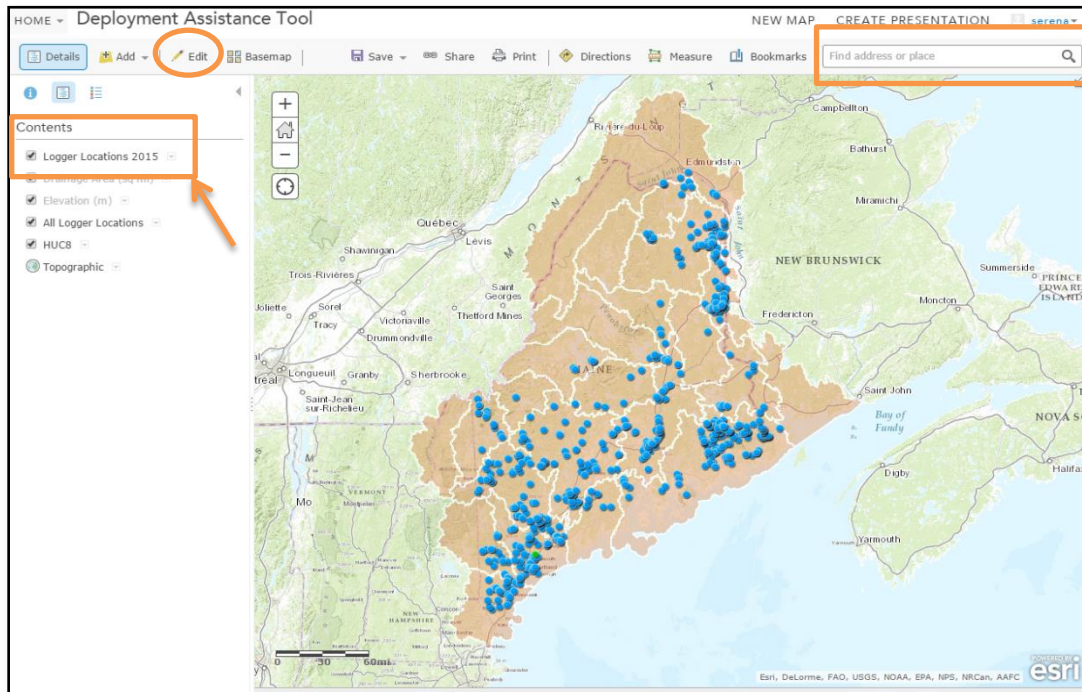
2. Take a look at the "Contents" section on the left side.
    a. **Logger Locations 2015:** This is the layer that you can edit. It represents all the sites where loggers are/will be actively deployed in the 2015 field season.
3. The layers that are grayed out in the legend can only be seen at certain scales.
4. Choose which layers to show by checking/unchecking the boxes next to the names.
5. **To add your logger locations**, click **Edit** at the top of the screen.

Click one of these options to add a point.
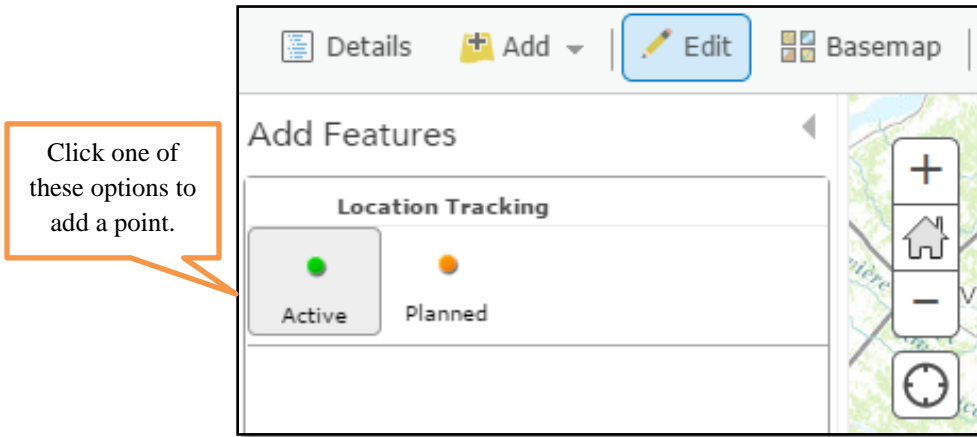
6. Click on the green (active) or orange (planned) dots to start editing.
    a. *You can put a site as "planned" for now, and then change it to "active" later, once the logger has been deployed.*
7. Zoom to your desired location. Use the mouse scroll wheel to zoom in and out. You can also use the search bar in the top, right corner to type in a location.
8. Click on the map to create your point. Clicking and dragging will move the point.
9. Once you add a point, an attribute table will appear:
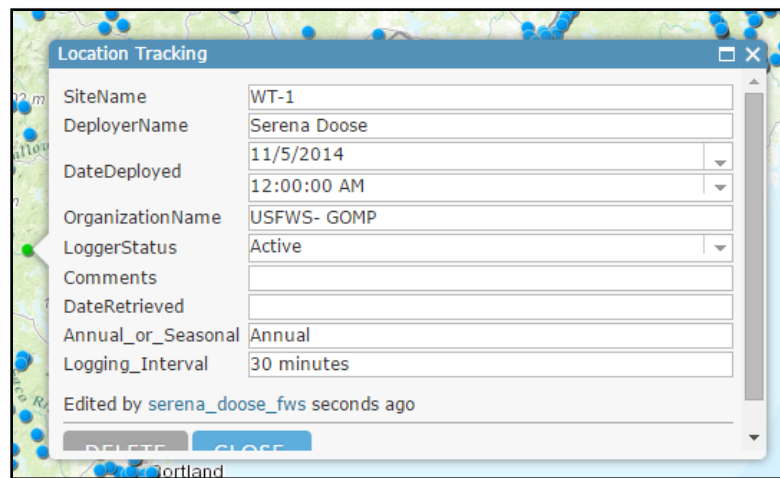
10. **Fill out all of the information**. If you need to edit this later, just click on the point again and choose "edit" at the bottom of the dialog box.
    a. *Logger Status*: Is this site currently active or is it on the map for planning purposes?

b. *Annual or Seasonal***:** Will this logger be left out year-round, or just for the season?

c. *Logging Interval***:** Is the logger recording at 30 minute intervals? 1 hour intervals?

11. To stop editing, close the dialog box and click the "Edit" button. This will save changes.

Using the DAT Tools to Strategically Place Loggers

1. You can download the "*Deployment Assistance Tool [Spreadsheet]*" from the ArcGIS Online Group, in the same location as the online map.
2. Open the spreadsheet.
3. Detailed instructions are located in the text box on the right side of the document.
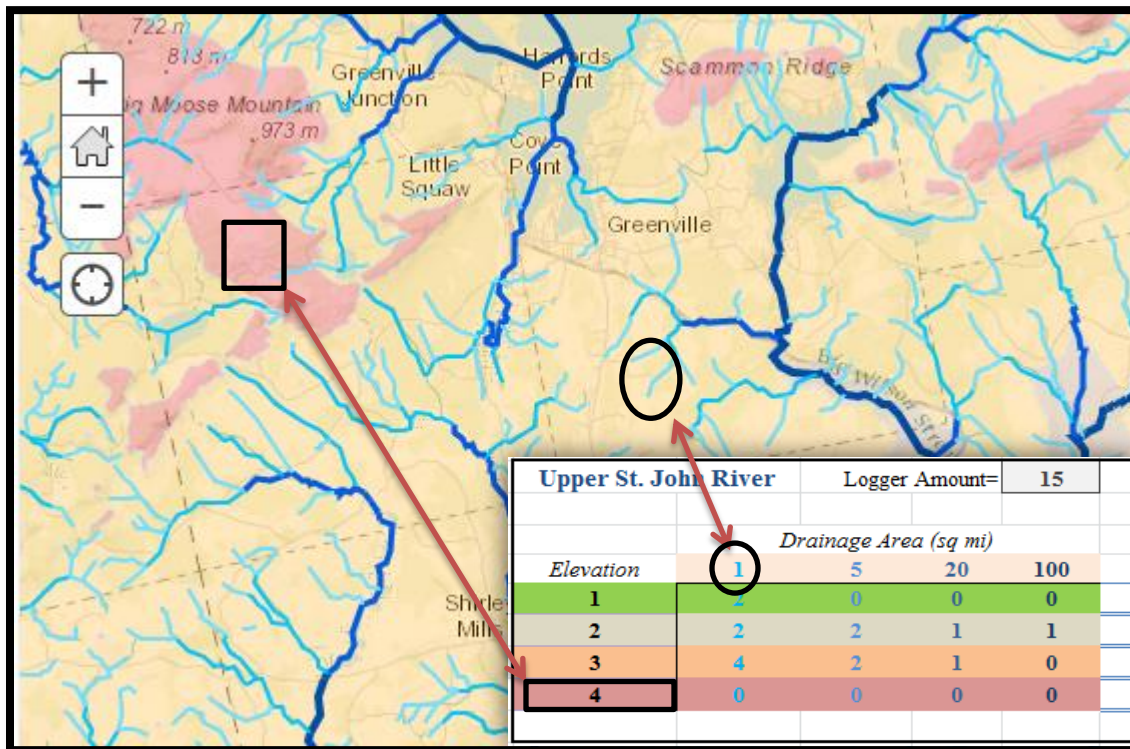4. Pick your watershed.

Deployment Assistance Tool v.1.0

Upper St. John River   Logger Amount= 15

Drainage Area (sq mi)

Elevation	1	5	20	100	
1	2	0	0	0	2
2	2	2	1	1	6
3	4	2	1	0	7
4	0	0	0	0	0

Allagash River   Logger Amount= 0

Drainage Area (sq mi)

Elev (ft)	1	5	20	100	
1	0	0	0	0	0
2	0	0	0	0	0
3	0	0	0	0	0
4	0	0	0	0	0

5. Type the amount of loggers you have available into the "Logger Amount" box.
6. The table will populate with the number of loggers you need in each drainage area/elevation category.
7. The cell colors correspond to symbol colors on the Online Mapper. *It's most helpful to have this spreadsheet and the ArcGIS Online map open at the same time.*
8. Look at your table: the left column has the four elevation classifications. The **background colors** of these cells correspond to the **elevation symbology** in the online map.
   - **Class 1**: 0-100 meters = green.
   - **Class 2**: 100-300 meters = brown.
   - **Class 3**: 300-500 meters = yellow/orange.
   - **Class 4**: 500-1600+ meters = red.

9. Now look at the Drainage Area classes for your watershed. The **text color** in each cell corresponds with the **stream symbology** on the online map. These are all gradations of blue; lighter colors correspond to smaller drainage areas, darker colors to larger drainage areas.

- **Class 1** = drainage area <1 square mile. Lightest blue.
- **Class 5** = drainage area 1-5 square miles. Medium blue.
- **Class 20** = drainage area 5-20 square miles. Darker blue.
- **Class 100** = drainage area 20-100 square miles. Darkest blue.

*Streams in drainage areas > 100 square miles were not included as stream temperature models can't predict temperature for larger water due to the lack of influence of air temperature.

Upper St. John River		Logger Amount=		15
		Drainage Area (sq mi)		
Elevation	1	5	20	100
1	1	0	0	0
2	2	2	1	1
3	4	2	1	0
4	0	0	0	0

10. Use these color combinations to more easily see where your loggers should be placed.
- **Example:** You need to place 3 loggers in streams that are within Elevation Class 3 (orange) and have a 5-20 square mile (dark blue) drainage area. Go to the mapper, zoom in to your watershed and make sure that 3 loggers are in locations with an orange background, on a dark blue stream segment.

Guidance Notes
1. Use the provided layers as *guidance* for your deployment locations. Rely on practicality more than statistical distribution; you will need to access these loggers multiple times over multiple years in a wide variety of conditions. Road access and landowner agreement are both just as important as drainage area and elevation.
2. *Impoundments:* Locations downstream of an impoundment are OK. There is no cut off for locations upstream of an impoundment, so use your best professional judgment when classifying locations as being within impoundments. Any location where the flow of water is influenced by a

downstream structure would be within an impoundment. Note in your location tables when there is a known beaver dam, or potential impoundment influence.

3. Your watershed may only have a few classes of drainage area and elevation represented. In this case, continue to distribute your loggers across a wide area, though you could meet the table output requirements by deploying them close together, in a small area. A wide spatial distribution is an adequate parameter if it becomes difficult to get a good distribution otherwise

4. Once you have decided where your loggers will be placed, edit the layer on the map and **record the locations**. This is important for the coordination of the group. Remember*: you can always come back and edit these points if you need to change location.*