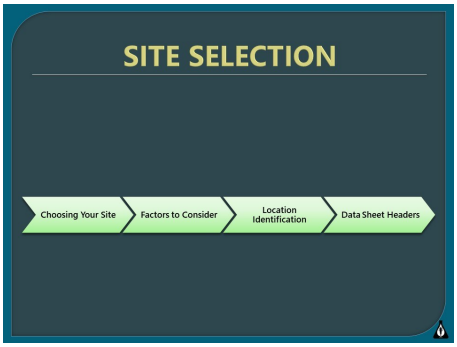
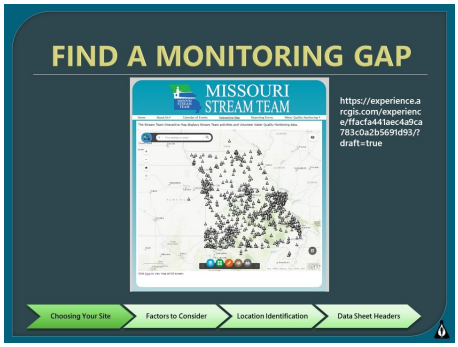
Chapter 2
Site Selection



Before you start monitoring water quality, you must first select a site to monitor. This chapter will explore many factors for selecting an appropriate stream site to monitor. Specifically, we will discuss:

- Varying reasons for selecting a specific site
- Factors to consider when selecting a stream site
- How to identify your site on data submissions
- How to acquire your biological monitoring equipment

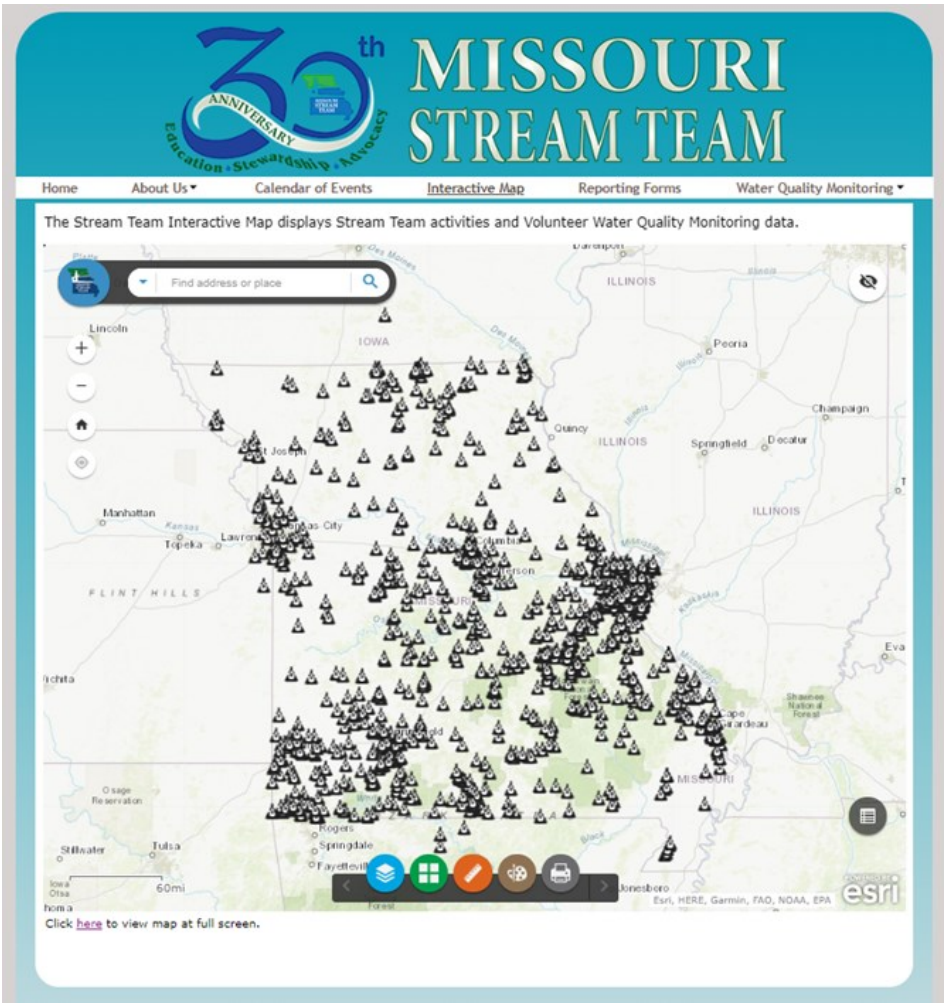


Choosing a Stream Site to Monitor

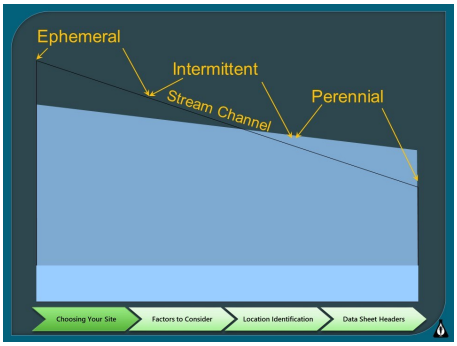
When selecting a site to monitor, choose one you are invested in or that is special to you. Monitors often choose a local stream, maybe one in their own back yard or city park. Monitors are often anglers or paddlers and select their preferred recreational stream. Other volunteers may be concerned about a heavily polluted stream or may want to fill a gap in the Stream Team's current water monitoring efforts. Whatever your reasons, we appreciate your efforts in monitoring the quality of the state's water resources.

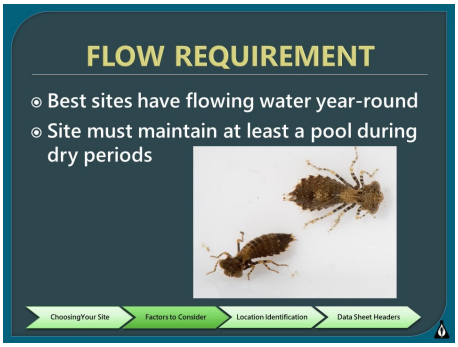
With approximately 110,000 miles of rivers and streams in Missouri, there are numerous stream sites to monitor. Do not be discouraged if the site you have in mind has already been selected by another monitor. If a site does not have data for the last 5 years it is likely abandoned and open for monitoring. You can also contact Stream Team staff to help find a monitoring site. To help you locate those gaps, use the Stream Team Interactive Map at:

mostreamteam.org/interactive-map.html



Factors to Consider When Choosing a Site

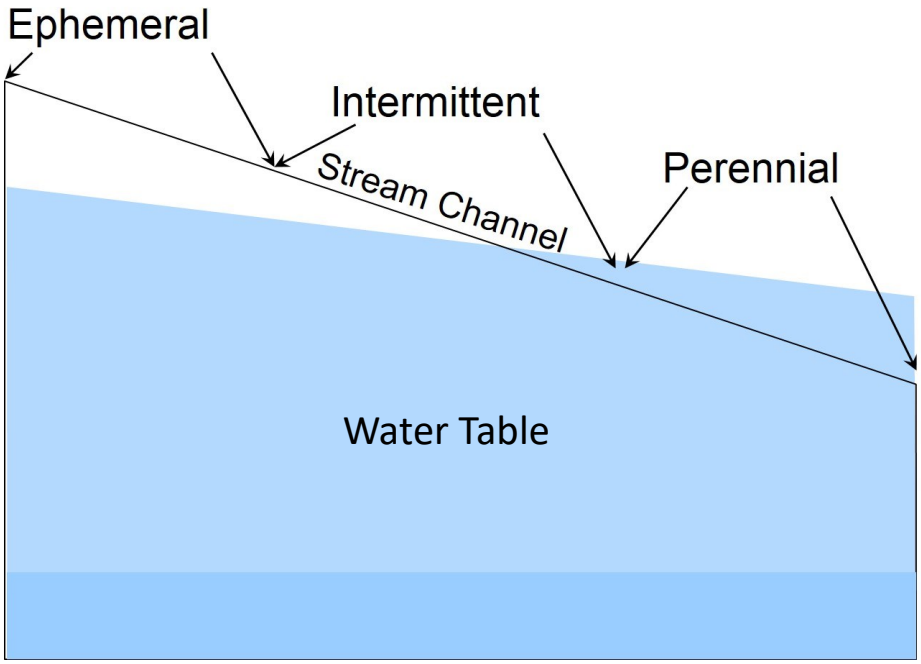




The diagram below describes three types of streams:

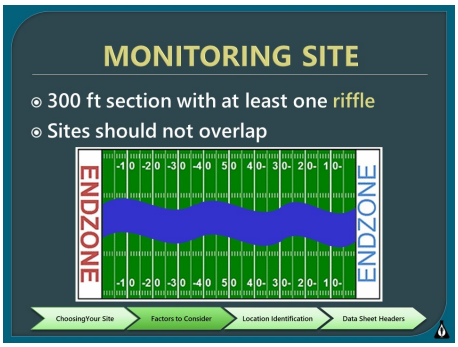
- ***Perennial Streams*** are fed continuously by a water table and will flow all year long.
- ***Ephemeral Streams*** exist above a water table. These streams only contain water after a precipitation or snow melt event. They are sometimes called wet-weather streams.
- ***Intermittent Streams*** receive groundwater flow only part of the year. The flow stops when the water table drops below the channel.

Stream Team protocol is designed for perennial streams, or streams with continuous flow.



There are some important factors to consider when selecting your site:

- ***Flow Requirement:*** The best monitoring locations have permanent water flow throughout the year. However, you can still use a stream site if it maintains pools that can support aquatic life during dry periods. This is important so that you will still be able to sample macroinvertebrates during dry periods. If a stream site completely dries up at any time of the year, it will not be a suitable monitoring location.



Factors to Consider When Choosing a Site

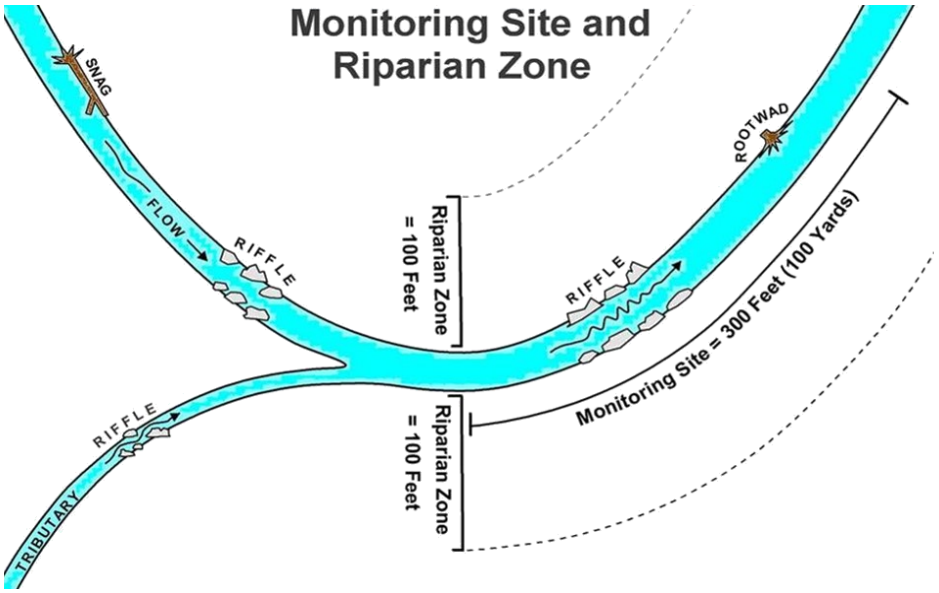
Another important factor to consider when selecting your site:

- ***300-Foot Section With at Least One Riffle:*** Your stream site should be approximately 300 feet long, about the same length as a football field, and not overlap with another stream site. If you decide to monitor two sites on the same stream, be sure the two sites do not overlap. Additionally, your proposed site should include at least one riffle. A riffle is where water breaks over rocks, indicating an elevation drop in the stream bed. Riffles provide an excellent environment when monitoring for macroinvertebrates.

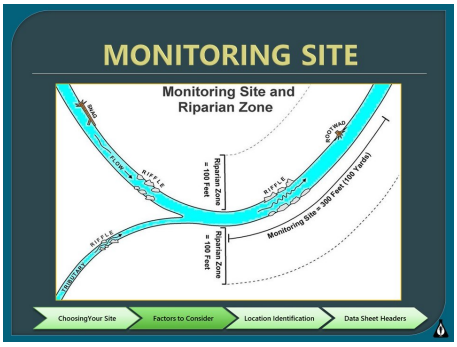
Factors to Consider When Choosing a Site

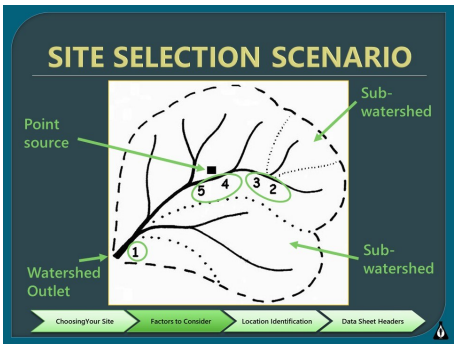
Other factors to consider when selecting your site include:

- ***Goals:*** Choose a site that best reflects your personal goals for monitoring a stream.
- ***Habitat:*** Choose a site that has suitable habitat. The best sites contain riffles. If riffles are not found, you may consider looking for alternative habitats such as a root mat or woody debris.
- ***Point and Nonpoint Sources:*** If you are concerned about a point or nonpoint source of pollution, you may consider choosing two sites. One above and one below a potential pollution source. The upstream site can be used as a reference to compare downstream data.
- ***Tributaries:*** To determine the impact of a single tributary, select sites above and/or below the confluence of the tributary. For example, consider the diagram of a proposed site below. The site sits downstream from a tributary and contains a riffle and a root wad. When monitoring your site, always use the same 300-foot stretch. By doing so, your efforts will produce reliable data.



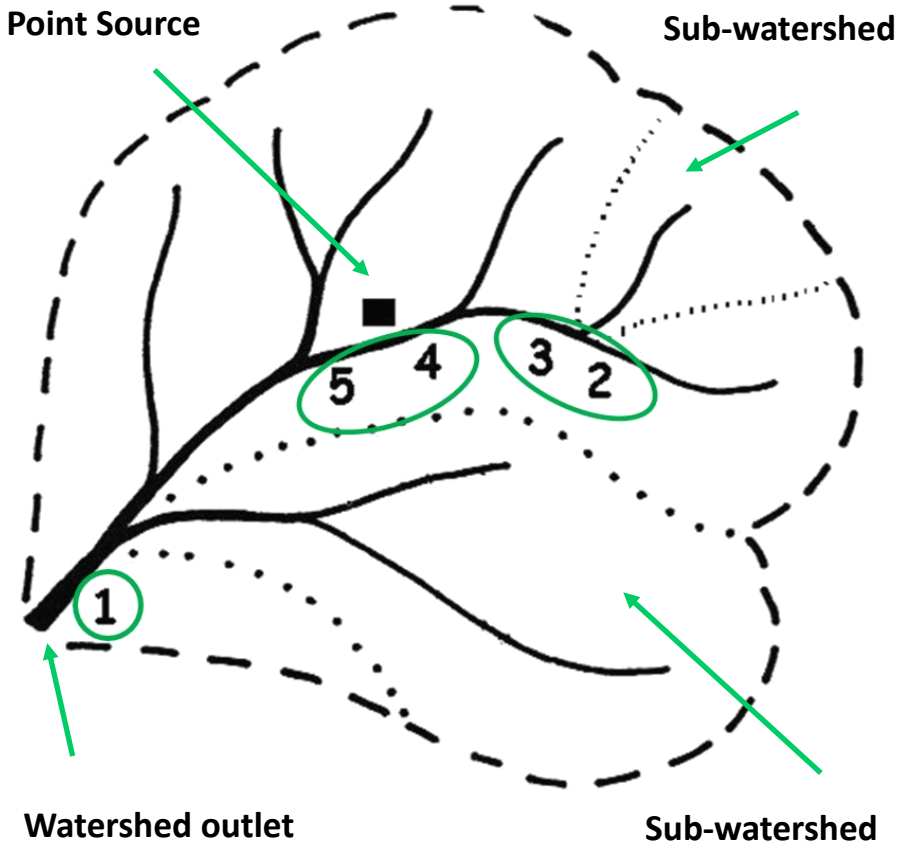
- ***Site Accessibility:*** You cannot monitor a site you cannot access. Whether your site is on private or public land, you will need to seek permission to access the stream. Use the ***Streamside Property Owner Permission Request*** (found on the stream team website at mostreamteam.org) to let a private landowner know who you are, what you are doing, and to gain permission to be on their property. To gain permission to monitor along public land, contact the area manager. Stream Team staff can facilitate communication with public land managers.





Site Selection Scenario

Consider the diagram of a watershed and the proposed sites below where the black square indicates a point source for pollution. Then, complete the table by describing the rationale for choosing each proposed site.



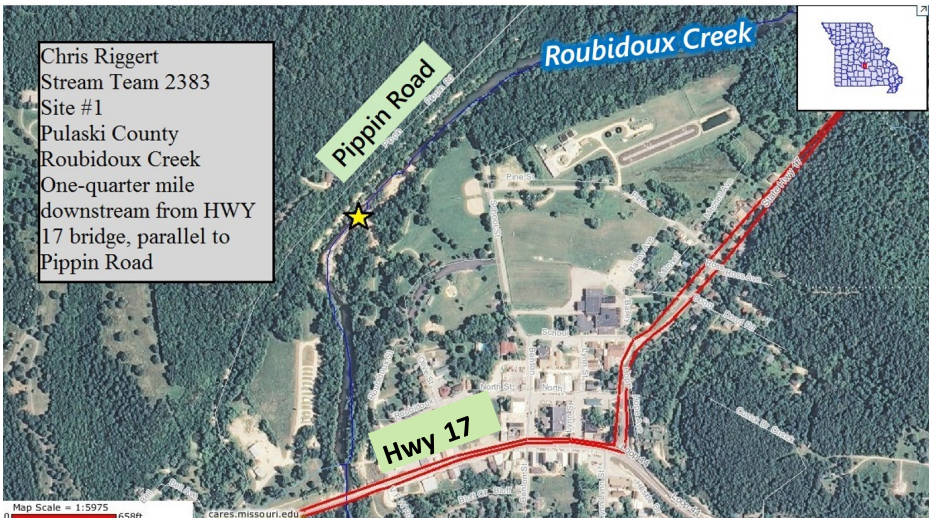
Proposed Monitoring	Rationale for Monitoring Proposed Site
Site 1	
Sites 2 & 3	
Sites 4 & 5	

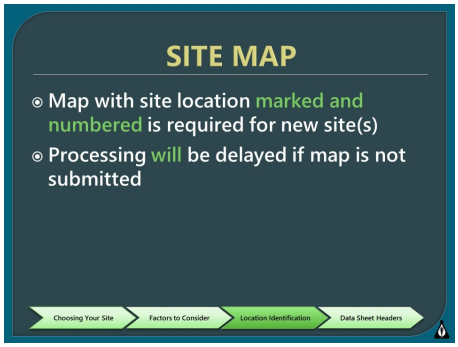
Site Number and Description

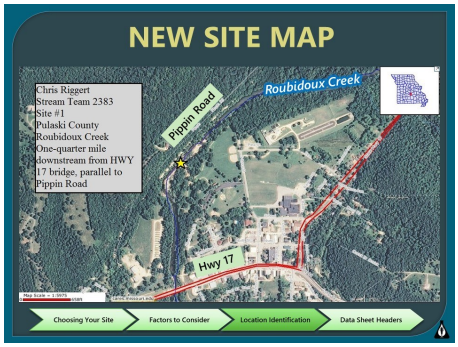
Once you have chosen an appropriate site to monitor, you will need to refer to the site each time you submit data:

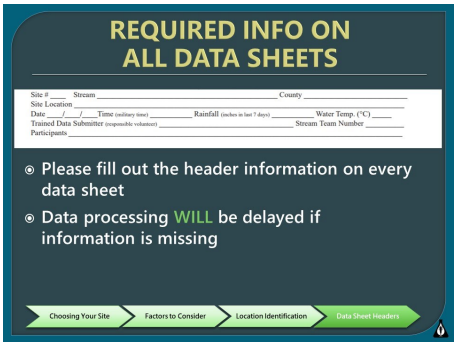
- ***Site Numbers*** are specific to each volunteer monitor. Even though the same site can be monitored by two different volunteers, each volunteer will have an independent number identifying it. For each volunteer monitor, these sites are numbered chronologically starting at Site #1. Everyone's first site will be Site #1. If you decide to monitor an additional site or abandon your first site for another, the next site will be Site #2.
- ***Site Descriptions*** enable Stream Team staff to locate your site on a map. It is important to be consistent with your site description each time you submit data. When describing your site, use the distance upstream or downstream from roadway crossings, distance and direction from major intersections, or distance and direction from permanent landmarks. For example, *300 feet downstream from Highway AA.* Avoid using physical features such as trees or buildings as these are not on maps and can change.
- **Site Map:** For each new site you monitor, you must submit a map with the monitoring site clearly marked and labeled along with your data for the new site. There are many online mapping tools to aid you:
  - Stream Team Interactive Map can be accessed at ***mostreamteam.org***
  - Department of Natural Resources Interactive Map can be found at ***dnr.mo.gov***
  - Google maps can be found at ***maps.google.com***

Below is an example of a map from the Stream Team website with the volunteer's site marked on it. The required information listed on the map will ensure program staff are able to locate your site.









Header Information

All data sheets contain a header, which need to be filled out in its entirety or else data submission will be delayed. The header consists of the following required sections:

- ***Site #:*** The site number is specific to the trained data submitter. Every monitor's first monitoring site is Site #1. Additional sites monitored are numbered chronologically.
- ***Stream:*** State the name of the stream you are monitoring.
- ***County:*** This is the county your stream monitoring site falls within. Some streams cross county boundaries, so reference a map for the exact county of your site.
- ***Site Location:*** Provide a physical description of the monitoring site which will allow staff to find the site on a map.
- ***Date & Time:*** Date is required in month-day-year format. Time is required in military time. For example, 2 PM in military time is 1400 hours.
- ***Rainfall:*** Provide amount of rainfall (in inches) for the 7 days preceding the monitoring date. This information can be measured with a rain gauge near the monitoring site or found online at:

  wunderground.com

  weather.com

  noaa.gov

- ***Water Temperature:*** Record water temperature in degrees Celsius. Always take temperature measurements in the shade. Temperature is not required on the *Initial Site Selection Form* since thermometers are not issued to monitors until this form is submitted.
- ***Trained Data Submitter:*** This is the name of the person responsible for the data who has completed the appropriate level of training. Only the trained data submitter may fill out the data sheets.
- ***Participants:*** List the names of anyone who assisted in collecting the data. These individuals may be trained or untrained.
- ***Stream Team Number:*** State the Stream Team of the trained data submitter.

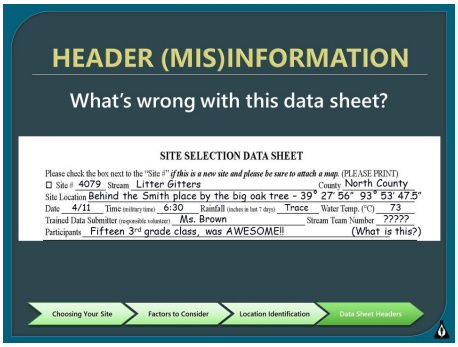
Header Information Scenario

Consider the header information on this data sheet below. Identify 11 inaccuracies of the submitted data.

INITIAL SITE SELECTION FORM

Submit this form with a map and Stream Discharge data sheet to receive biological monitoring equipment.
To establish subsequent monitoring sites, submit a map only.

4079
Site # ~~1~~ Stream Litter Gitters County North County
Site Location Behind the Smith place by the big oak tree 39° 27' 56'' 93° 53' 47.5''
Date 4 /11 / Time (military time) 6:30 Rainfall (inches in last 7 days) trace Water Temp. (°C) 73
Trained Data Submitter (responsible volunteer) Ms. Brown Stream Team Number ?????
Participants Fifteen 3rd grade class, was AWESOME!! (What is this?)



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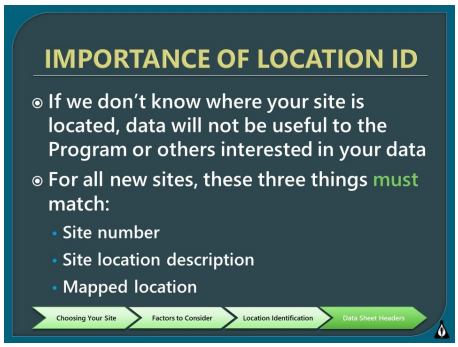

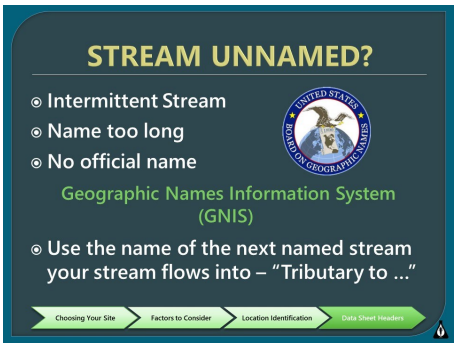

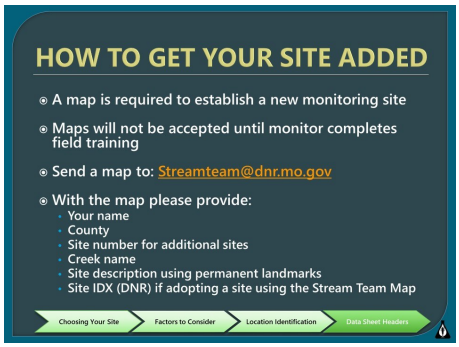

Required Information on All Data Sheets

Each time you submit any data sheet, be sure to include the following required information. Data processing will be delayed if any information is missing from the data sheet header:

- Stream Name
- Site Number
- Verbal Site Description
- Date Monitored
- Name of Trained Data Submitter
- Stream Team number

Unnamed Streams

The sampling protocol for Missouri Stream Team is designed for perennial streams that have permanent flow throughout the year, but it is possible your stream may not have an official name. In this case, your stream is a tributary to the nearest named stream into which it flows. Most intermittent streams are not officially named on a map, even though it may be known to a local community by a certain name. If this is the case, you may want to research your proposed site online with:

Geological Names Information System (GNIS)
geonames.usgs.gov/domestic/index.html

Importance of Location Identification

It is extremely important to the validity of the data you collect that the location of your site is accurately identified. If your site cannot be located, data will not be useful to the program or other interested parties. All new sites must accurately match their site number, site description, and mapped location. Remember to always submit a map with each new site you adopt.

How to Get Your Site Added

To enter data, you must first send a map to Stream Team staff.

A map with your monitoring site clearly marked can be sent to StreamTeam@dnr.mo.gov with the following information:

- Monitor's name
- Monitor's site number
- Stream name
- Stream county
- Verbal site description
- Site IDX number from Stream Team interactive map may be used if adopting an existing site