

**ArcGIS for Schools Workshop**

**Guide for Today’s River Study using Survey123 workshop**

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* 1. Part One: Create a River Study using Survey123

15 Part Two: Collect some Survey Points using Survey123

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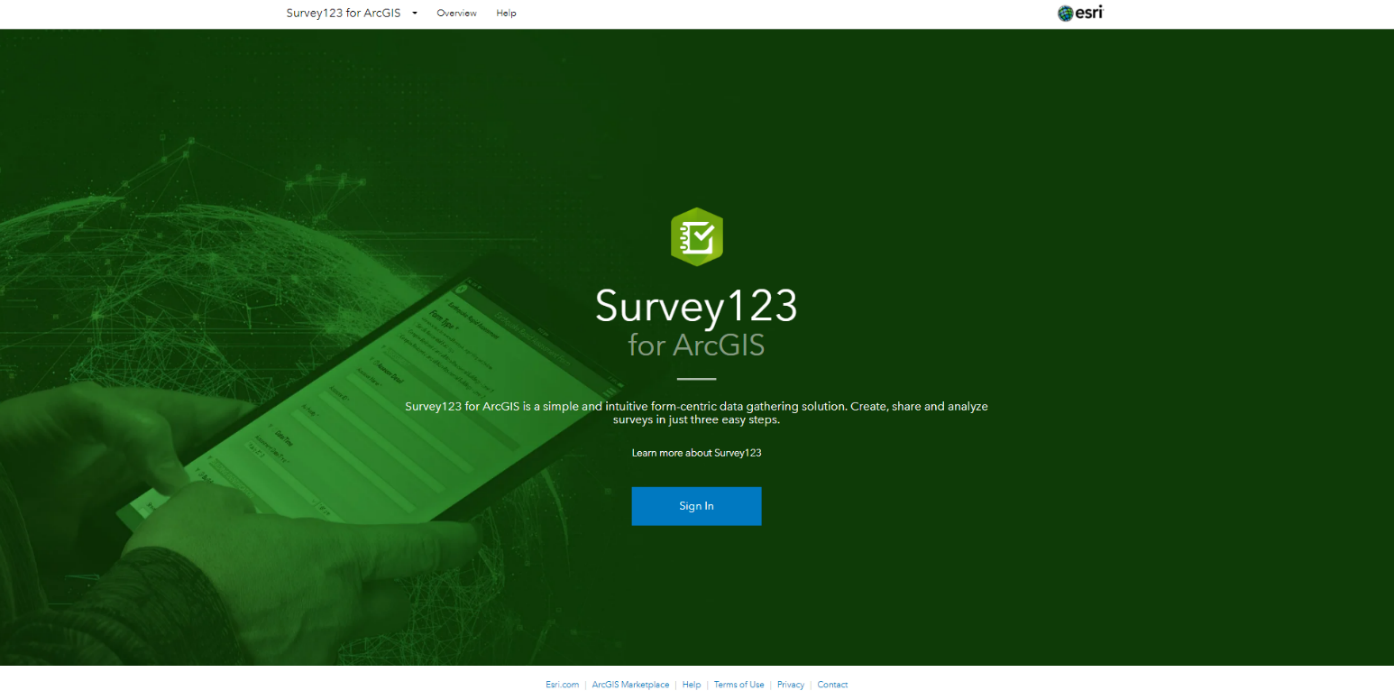
20- 36 Part Four: Calculate Cross Sectional Area, Hydraulic Radius, Velocity and Discharge using ArcGIS Online

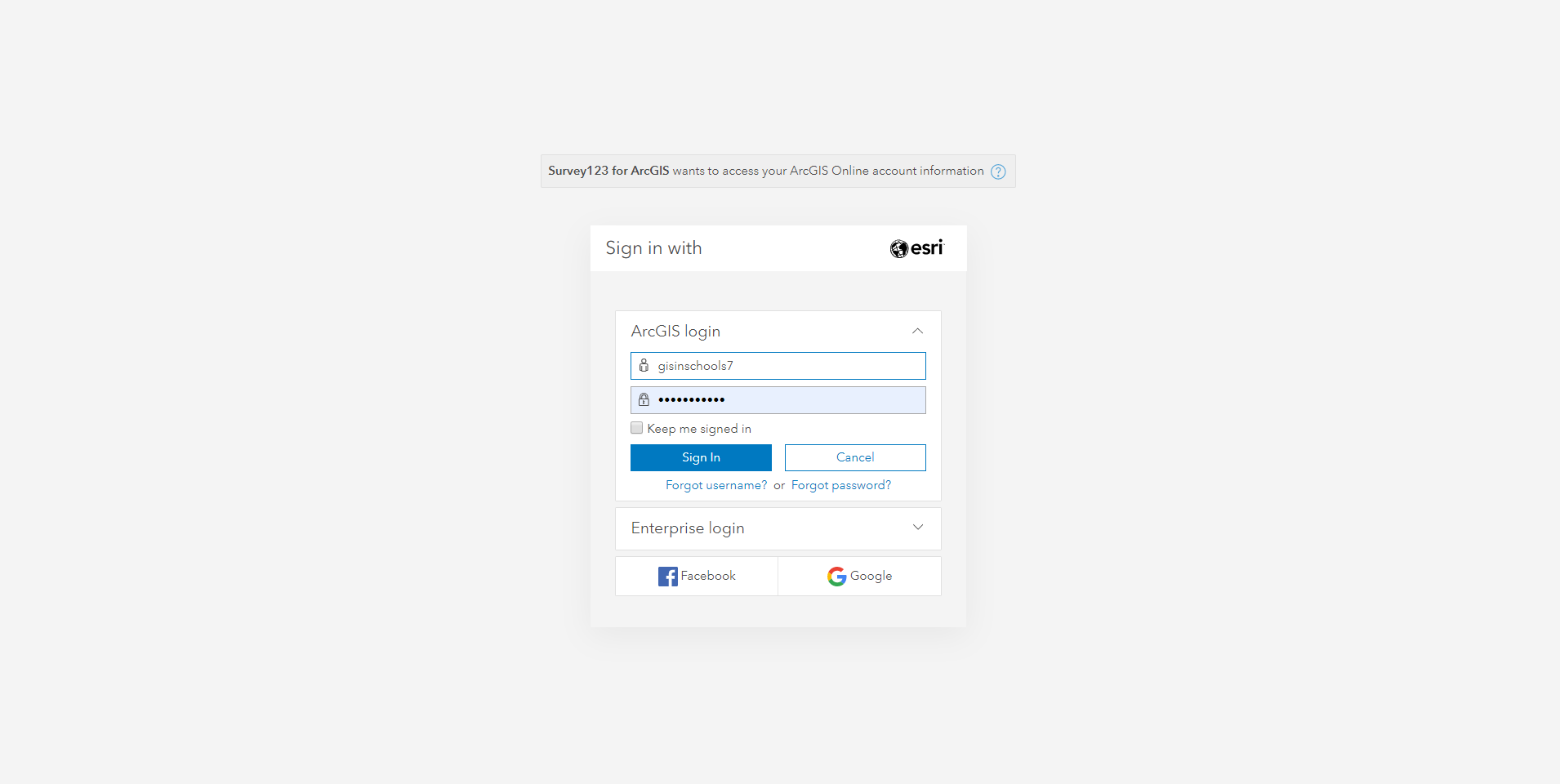
**Part One:**

**Create a River Study using Survey123**

**Set Up Survey123**

* Go to <https://survey123.arcgis.com/> and Sign in with your login details

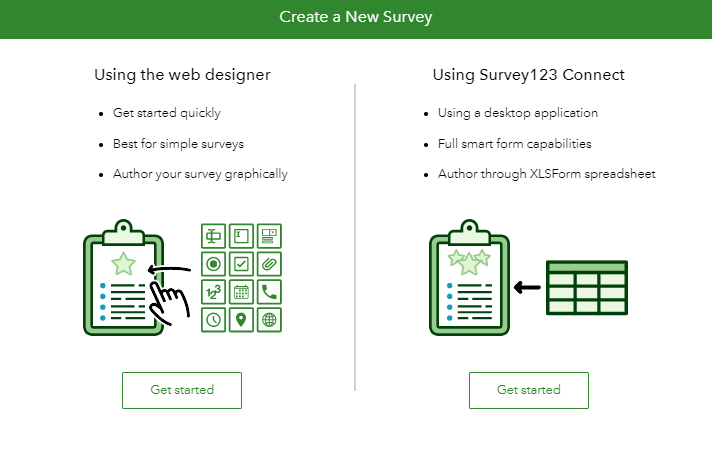




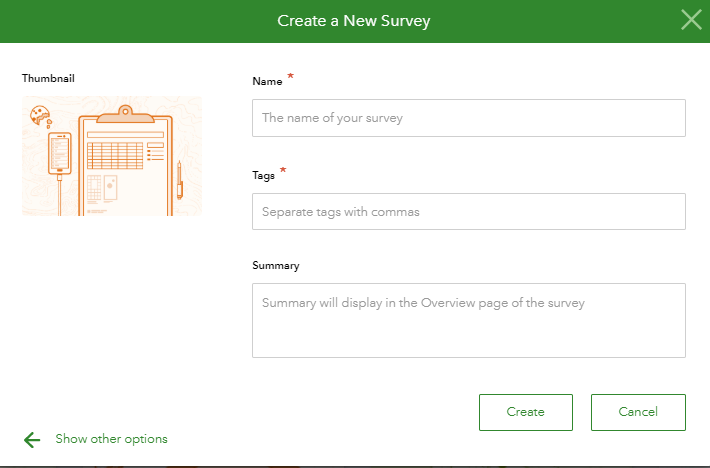
* Click Create a New Survey



* When the box below appears, select Get Started on the Using the web designer



* When the box below appears fill in the following details:



**Name:**

River Study

**Tags:**

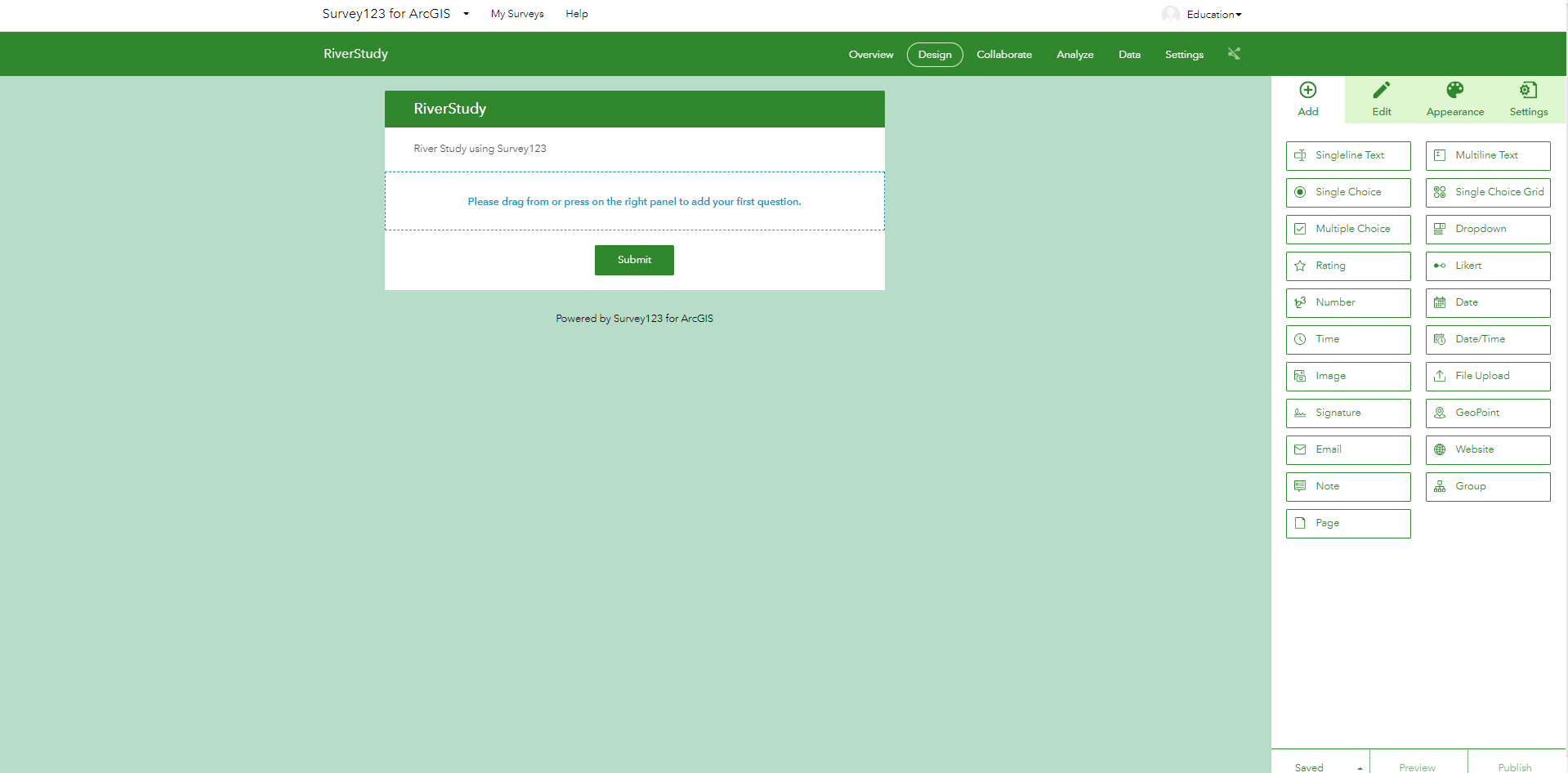
River Study

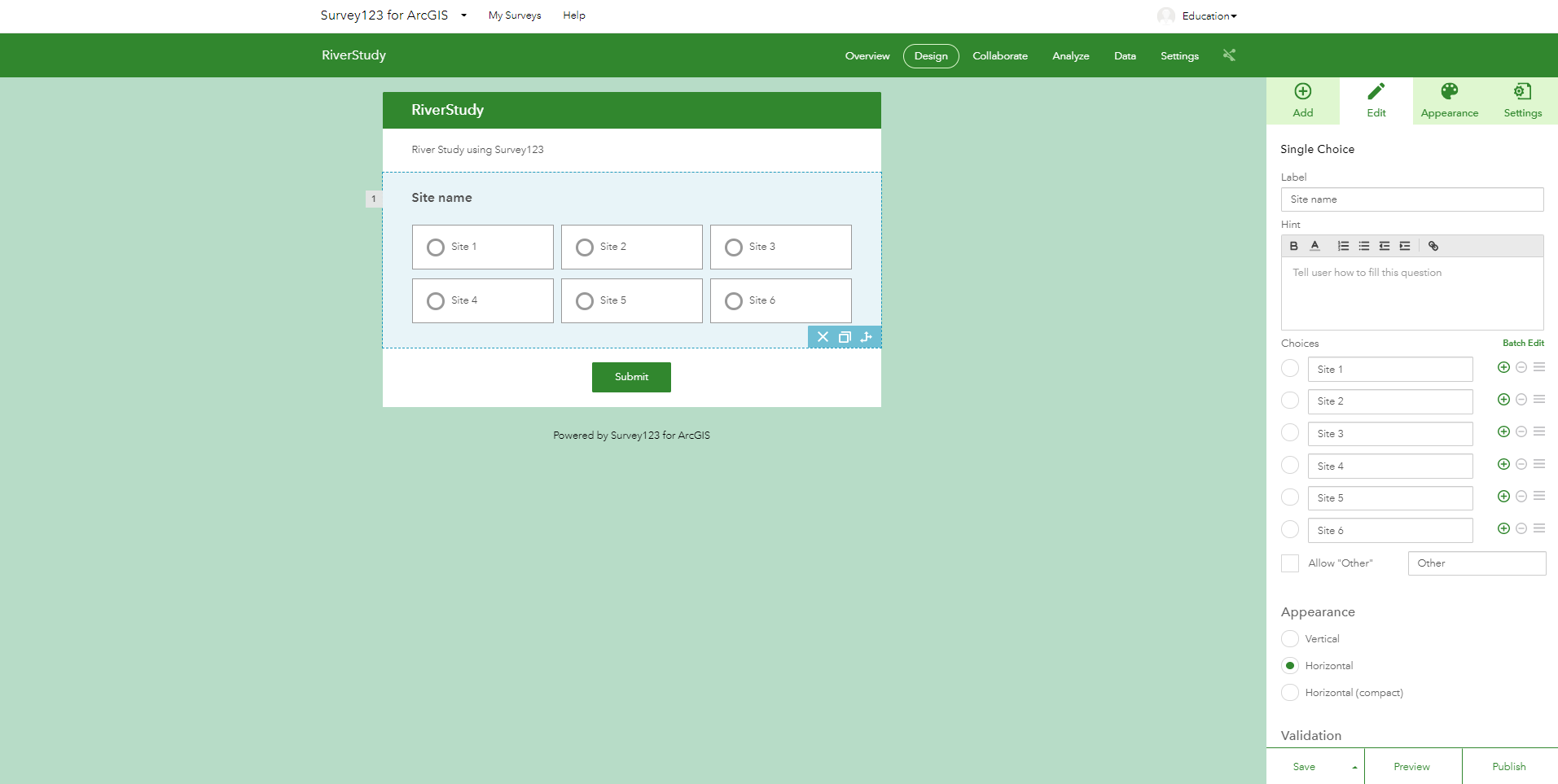
**Summary:**

River Study using Survey123

* Click Create
* Start filling in the questions to get data like the csv file in your lesson pack

**Question One:**

* Click Single Choice Question 
* Drag Question into the first question box



* Fill in the question details like the image above

**Label:**

Site Name

**Choice:**

(Click the plus icon 5 times to give you 6 choices and label them as follows):

Site 1

Site 2

Site 3

Site 4

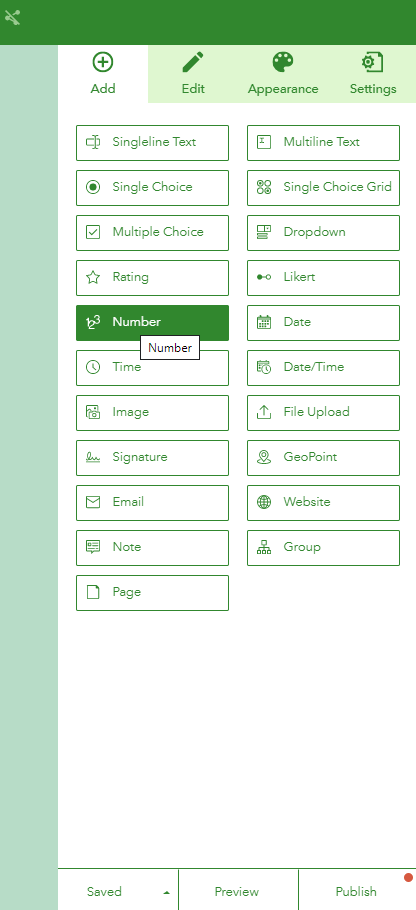
Site 5

Site 6

* For appearance tick Horizontal
* Click Save

**Question Two:**

* Click Add
* Click Number



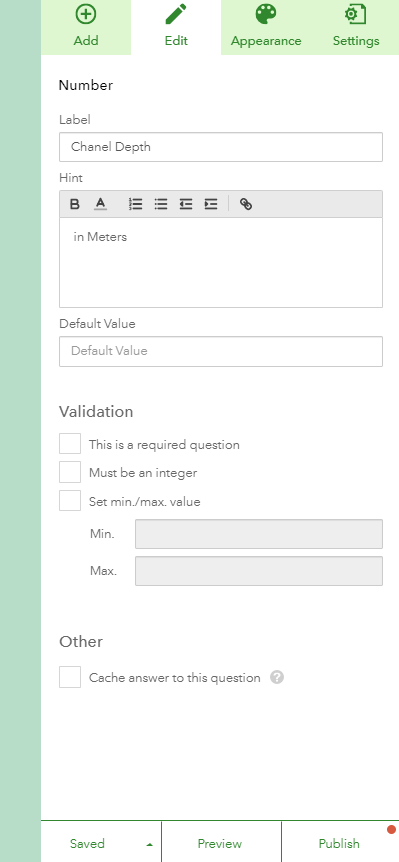
* Fill in question box like below:
* **Label**

Chanel Depth

* **For hint, type in**

In Meters

* Click Save



**Question Three:**

* Click add again,
* Click Number and fill in details like below:

**Label:**

Channel Width

* **For hint, type in**

In Meters

Click Save

**Question Four:**

* Click add again,
* Click Number and fill in details like below:

**Label:**

Wetted Perimeter

* **For hint, type in**

In Meters

Click Save

**Question Five:**

* Click add again,
* Click Number and fill in details like below:

**Label:**

Distance

* For hint, type in

In Meters

Click Save

**Question Six:**

* Click add again,
* Click Number and fill in details like below:

**Label:**

Mean Time

* For hint, type in

In Meters

Click Save

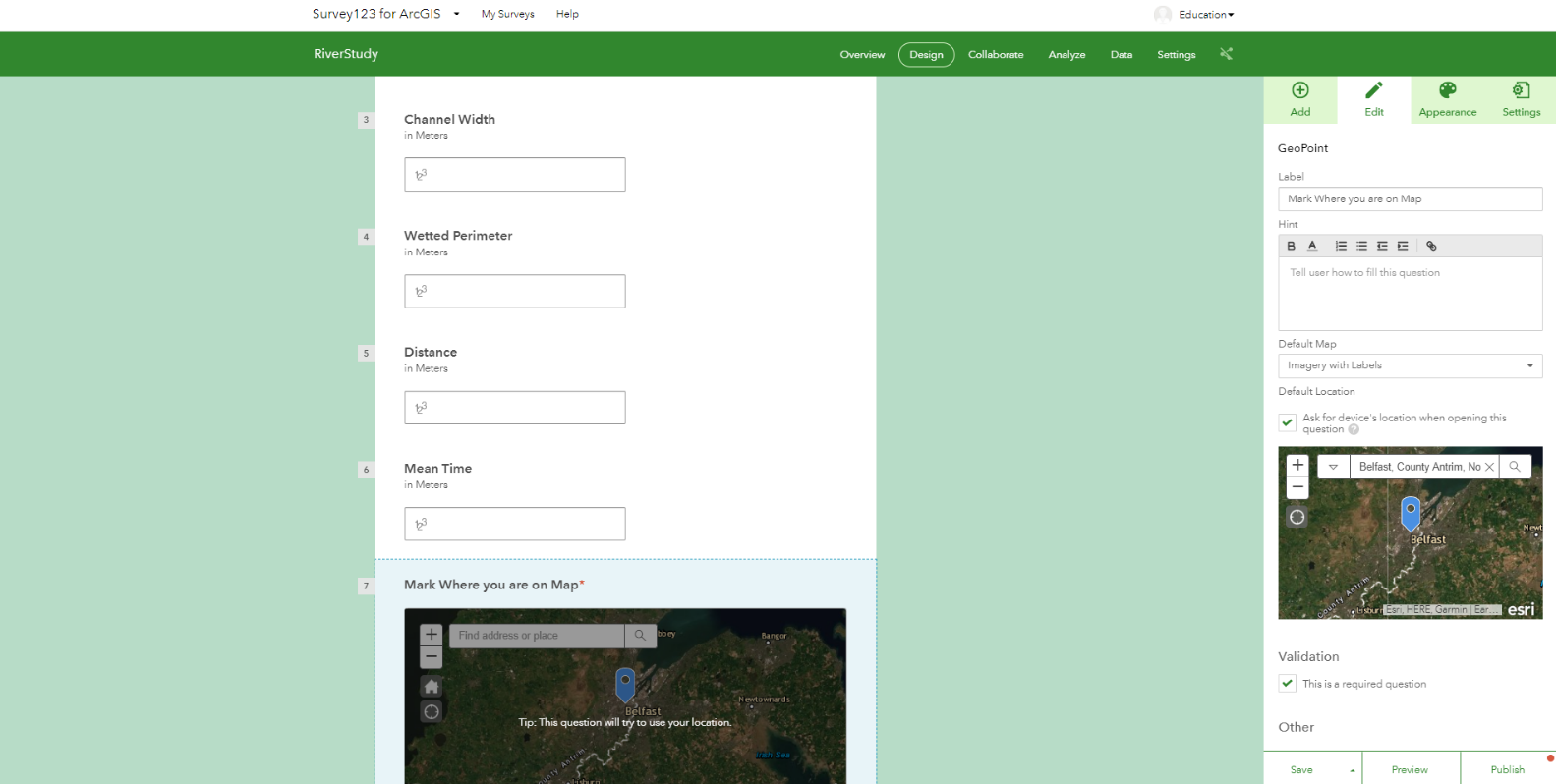
**Question Seven:**

* Click add again,
* Click Geopoint and fill in details like below:

**Label:**

Mark Where you are on Map

* Change the Default map to Imagery with Labels
* Tick the tick box for ask for the device’s location when opening this question
* Set the default location to Belfast
* Tick this is a required question
* Click Save



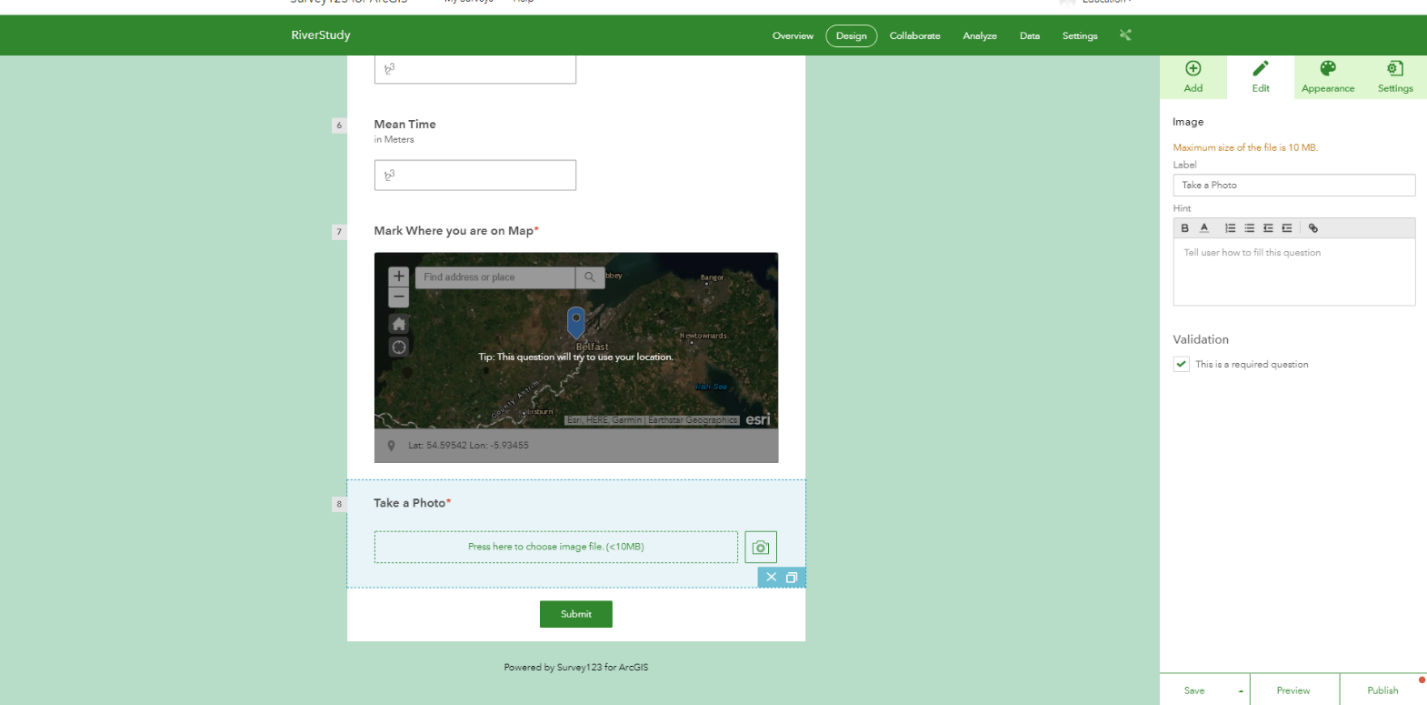
**Question Eight:**

* Click add again,
* Click Image and fill in details like below:

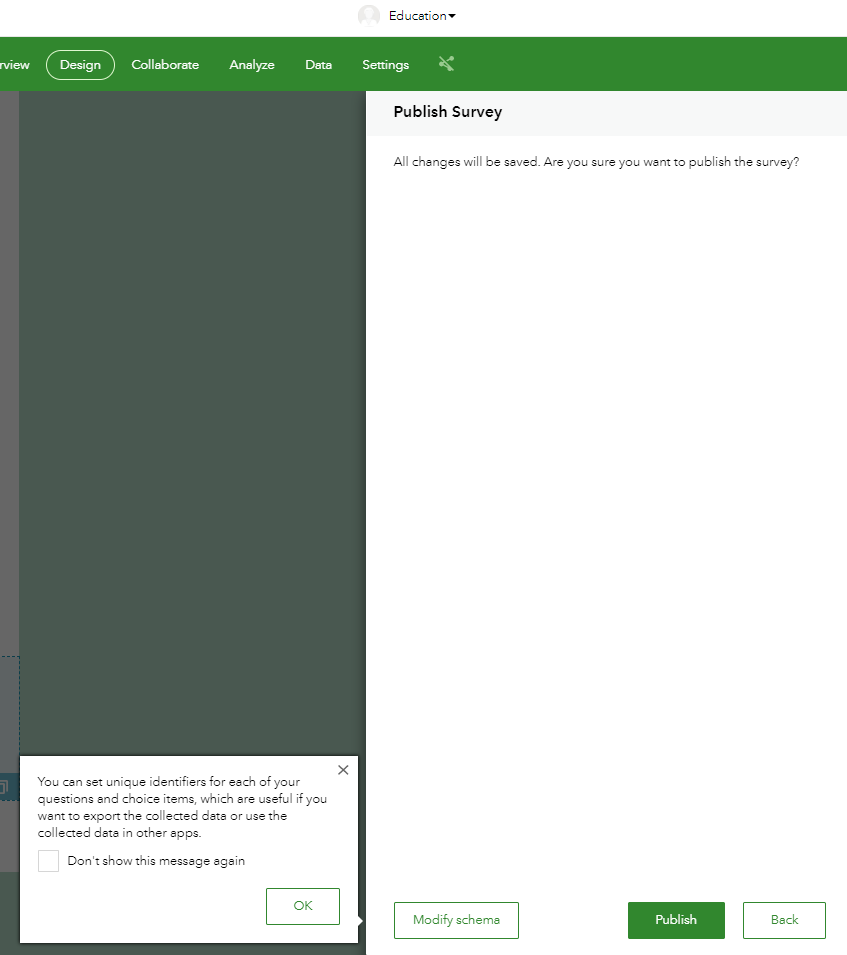
**Label:**

Take a Photo

* Tick this is a required question in all cases if you require a question
* Do not tick it in this example
* Click Save

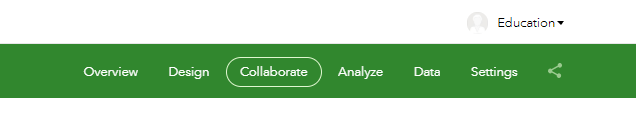


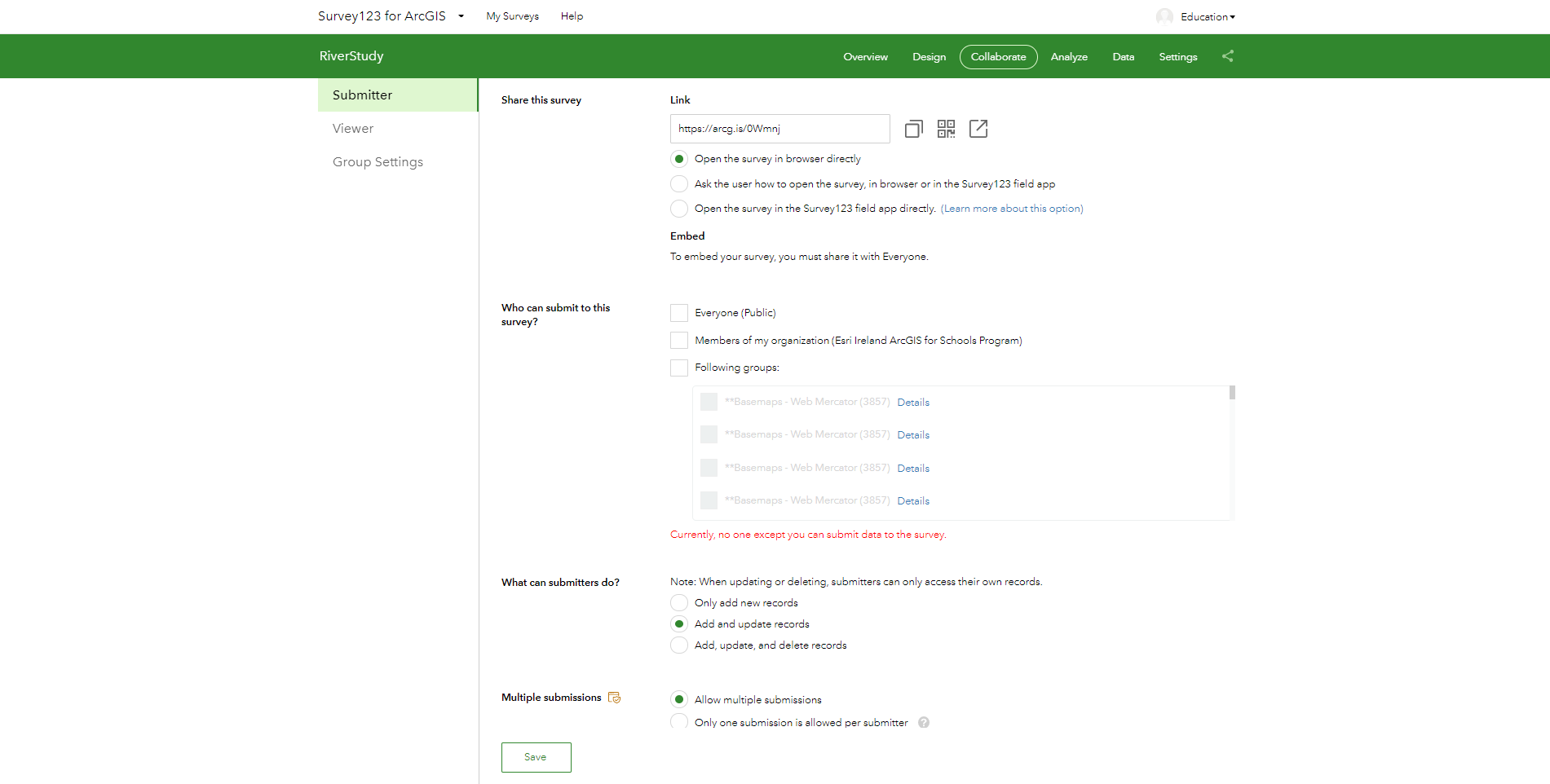
* Click Publish and ok
* This will publish your survey123 survey online so that you can view the survey on the Survey123 app or in a browser
* This will also add the survey into a folder in your **My Content** in your ArcGIS Online account for your school
* The survey will be there when you login to <https://www.arcgis.com/home/index.html> and go to My Content
* The survey will be called a feature layer and if you click on this, it will ask you if you want to view the survey layer in a map viewer. This is how you see the results points on the map collected from your surveys.
* We will do this in the next part of today’s workshop



**Sharing your Survey with you class:**

* Click Collaborate

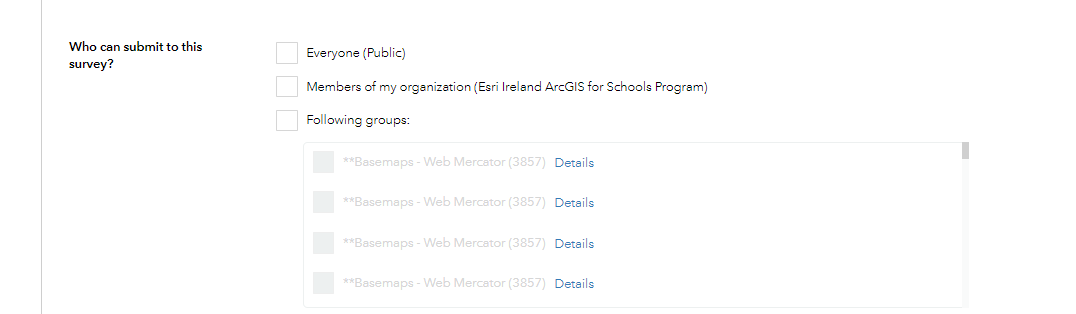




* Click the tick box for:

Who can submit to this survey?

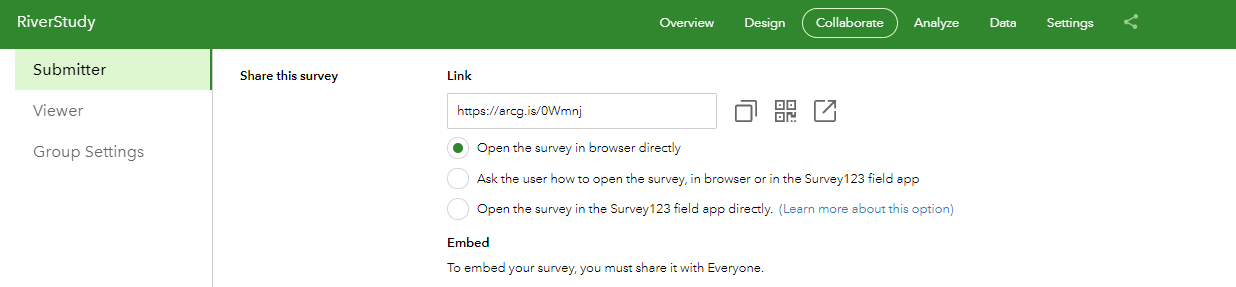
* Tick Everyone
* Tick Save



(Note that you can share survey with only your school or a group of students in your school if you have a class group set up)

* Notice the area in this window called:

**Share this survey**



* You will see a link here to your survey
* Copy short url in link box and paste into your browser to open survey
* Make sure survey is shared publicly

**Part Two:**

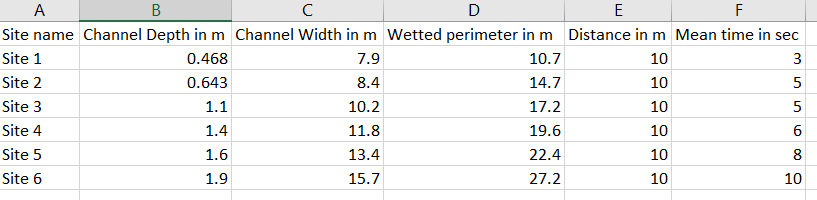
**Collect some Survey Points using Survey123**

* Open the survey you just created in your browser
* We will complete Survey next by filling in the survey 6 times
* Click submit each time you fill in the survey and refresh your browser to open up the survey again to collect a new point
* Pick a River close to you town on the map and fill in 6 Collection Sites along this river using Survey123 and the image below with information for each survey you fill in

i.e.

each row in the table below is a new survey

There are 6 rows in the image below meaning 6 surveys

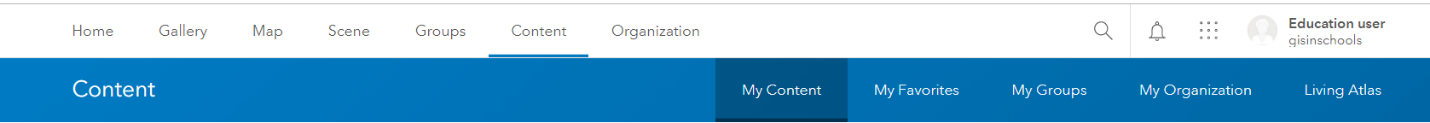


**Part Three:**

* **How to do analyze River Study Results once back in the Classroom using ArcGIS Online**
* Imagine you are now back in the office after completing your survey
* Login to ArcGIS Online with the login you were given today

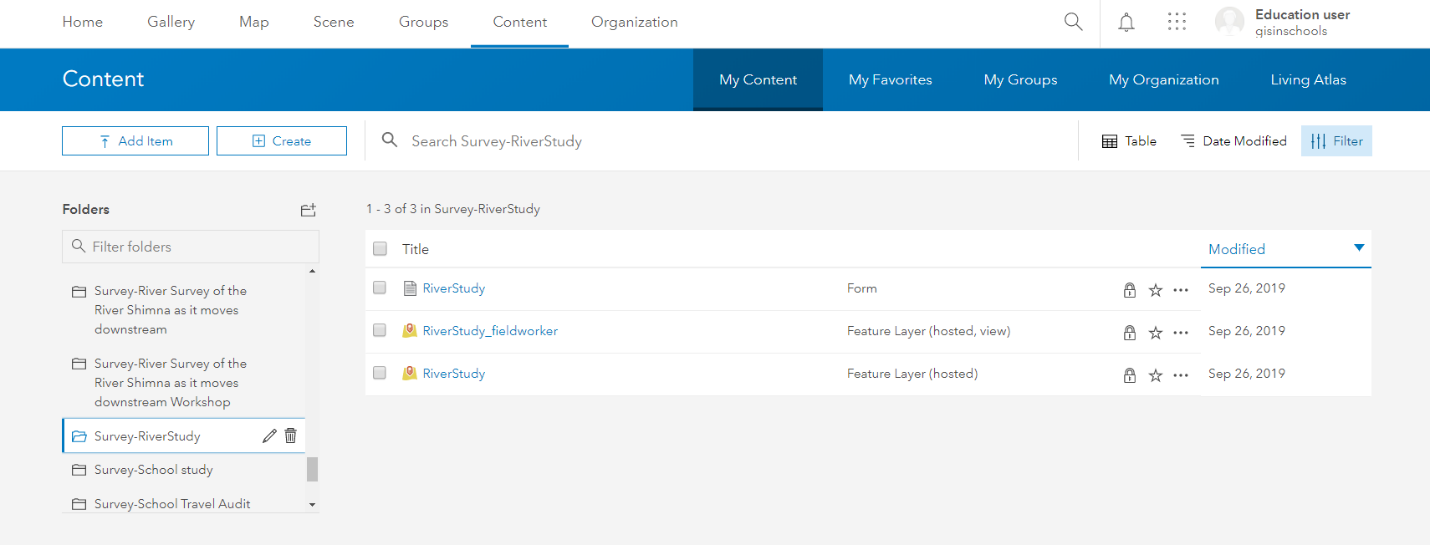
<https://www.arcgis.com/home/index.html>

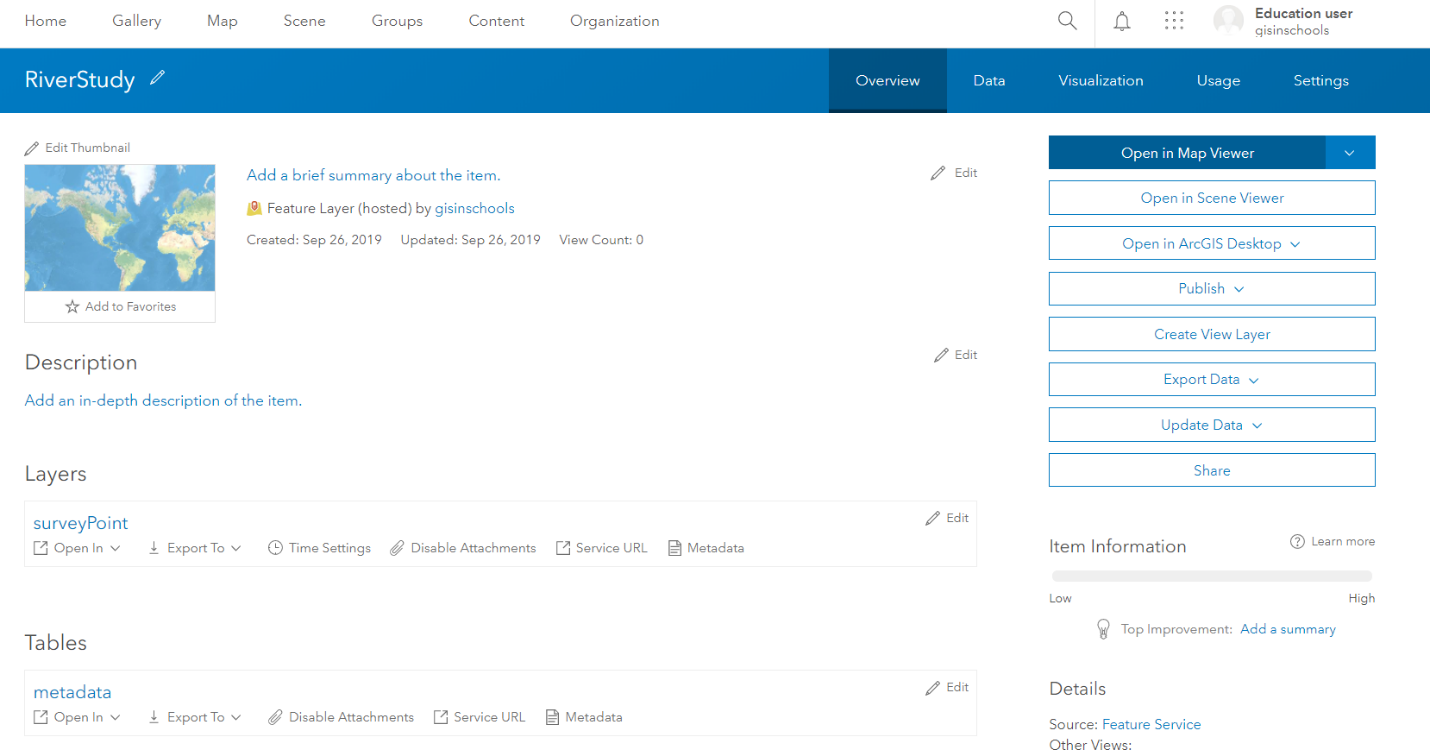
* Click Content
* Click My Content



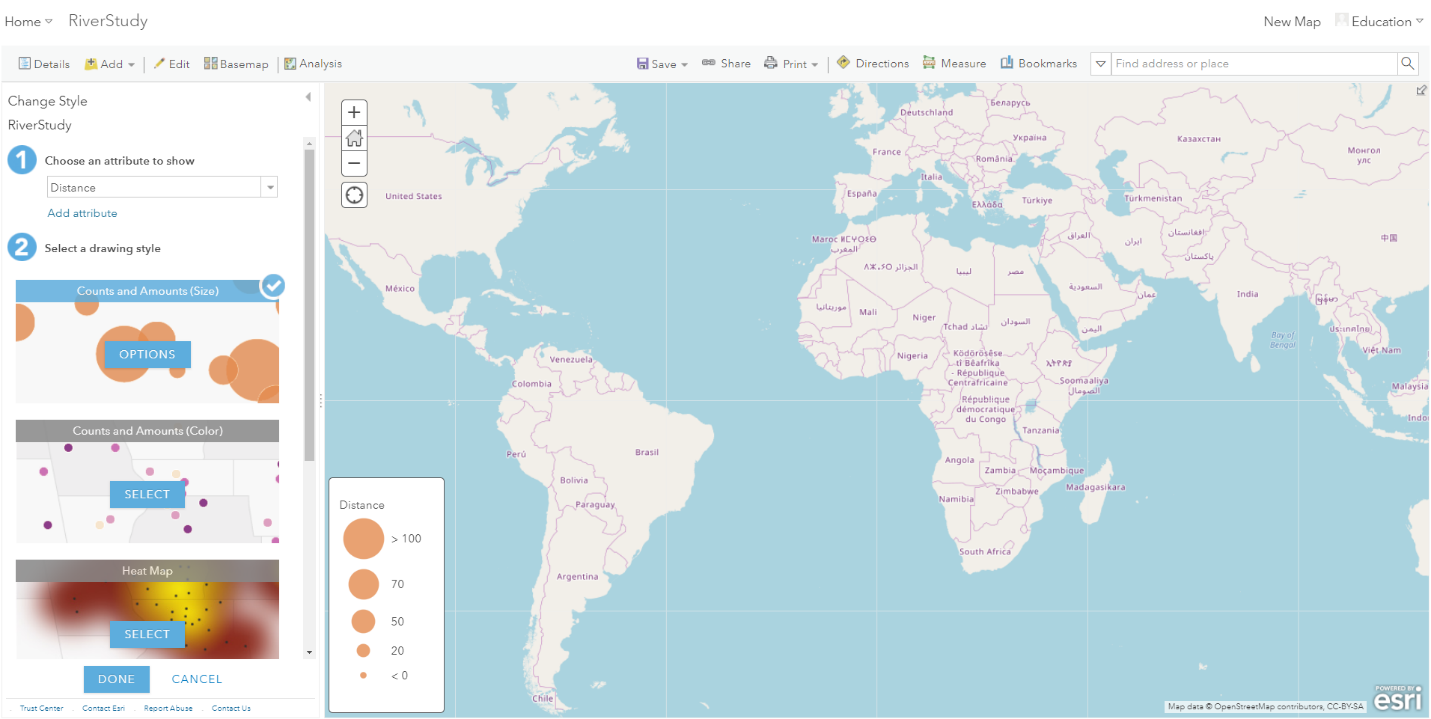
* See folders and notice your RiverStudy folder
* Click on it to view files
* Click on

RiverStudy Feature Layer (hosted)





* Your Map viewer will open and you will see your 6 survey points that you just collected on the map

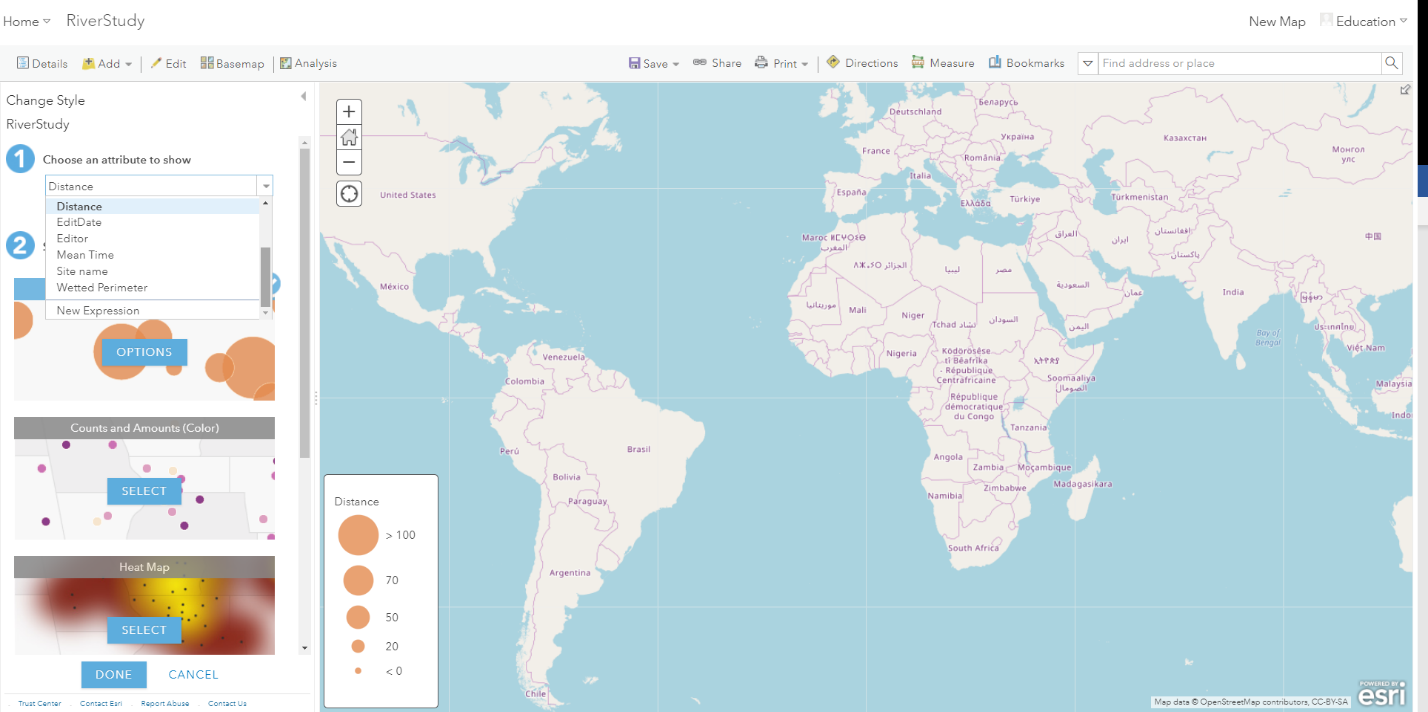


* Smart Mapping in ArcGIS Online will try and symbolize your questions

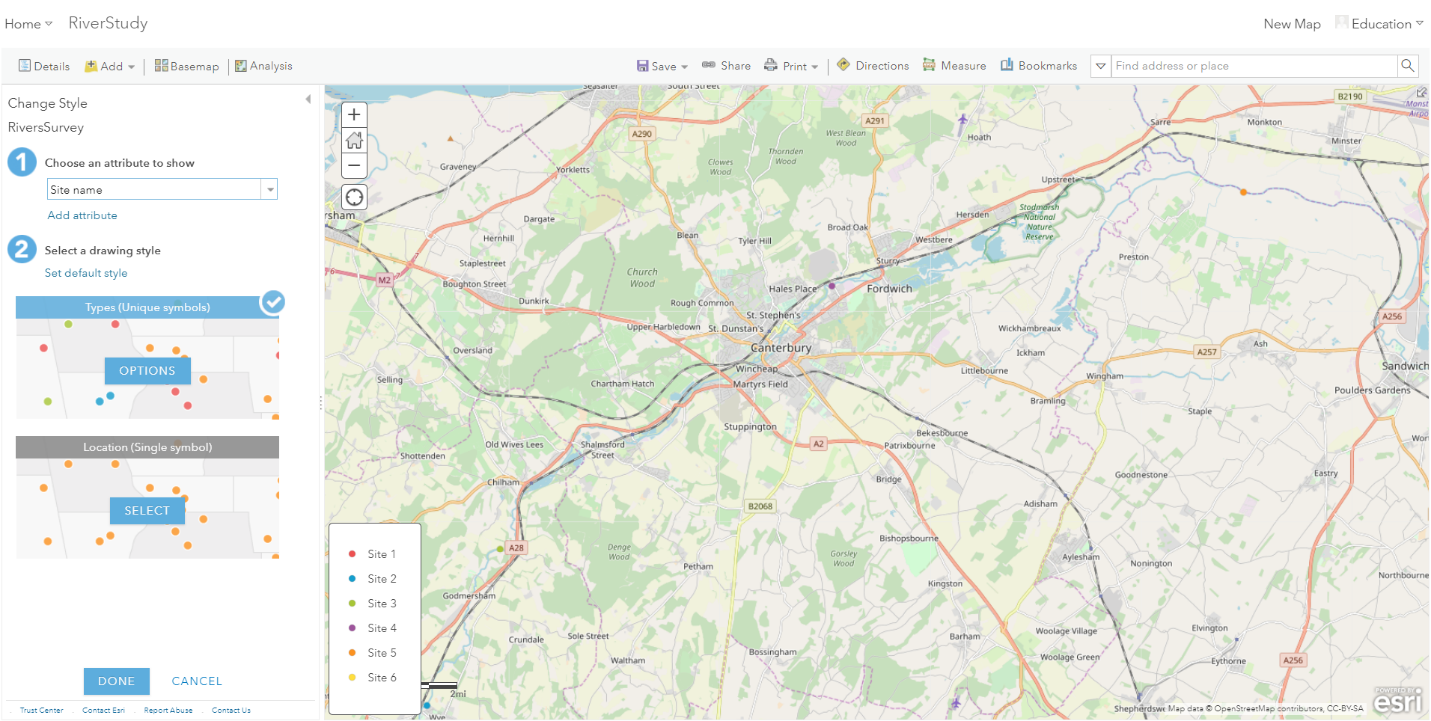
For example: Distance

* Scroll Through the questions in the:

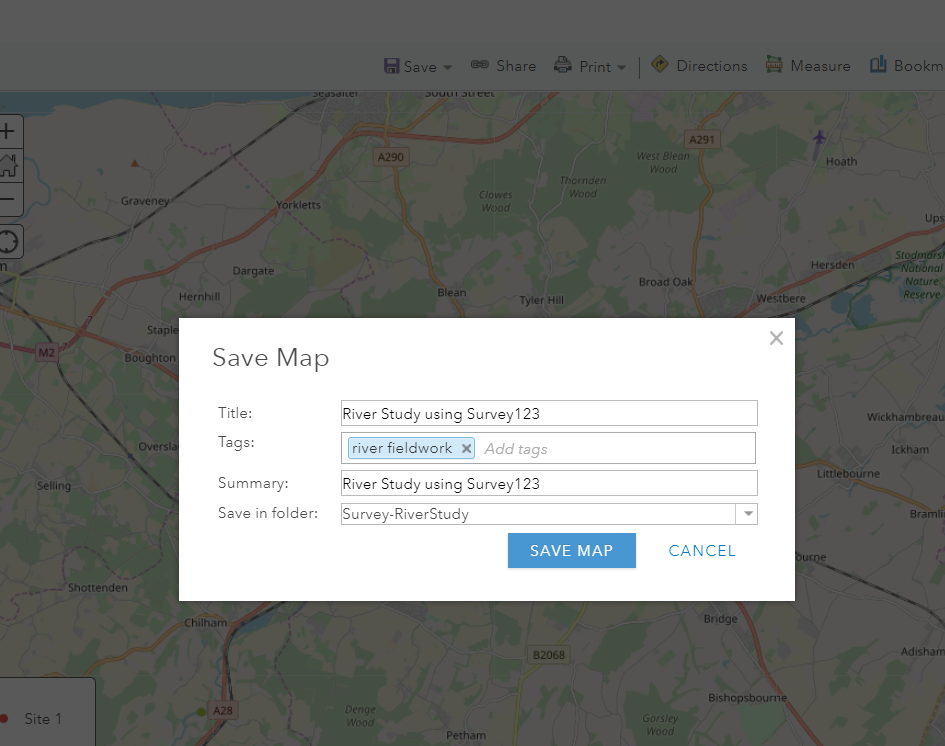
Choose an attribute to show dropdown:



- Pick Site name



* Click Done
* Click Save
* Click Save As
* Fill in the save as box that appears like below image and click save as:



* Next we will explore these points and do some analysis of our results

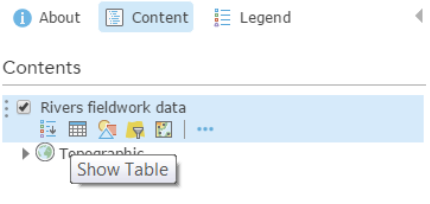
**Part Four:**

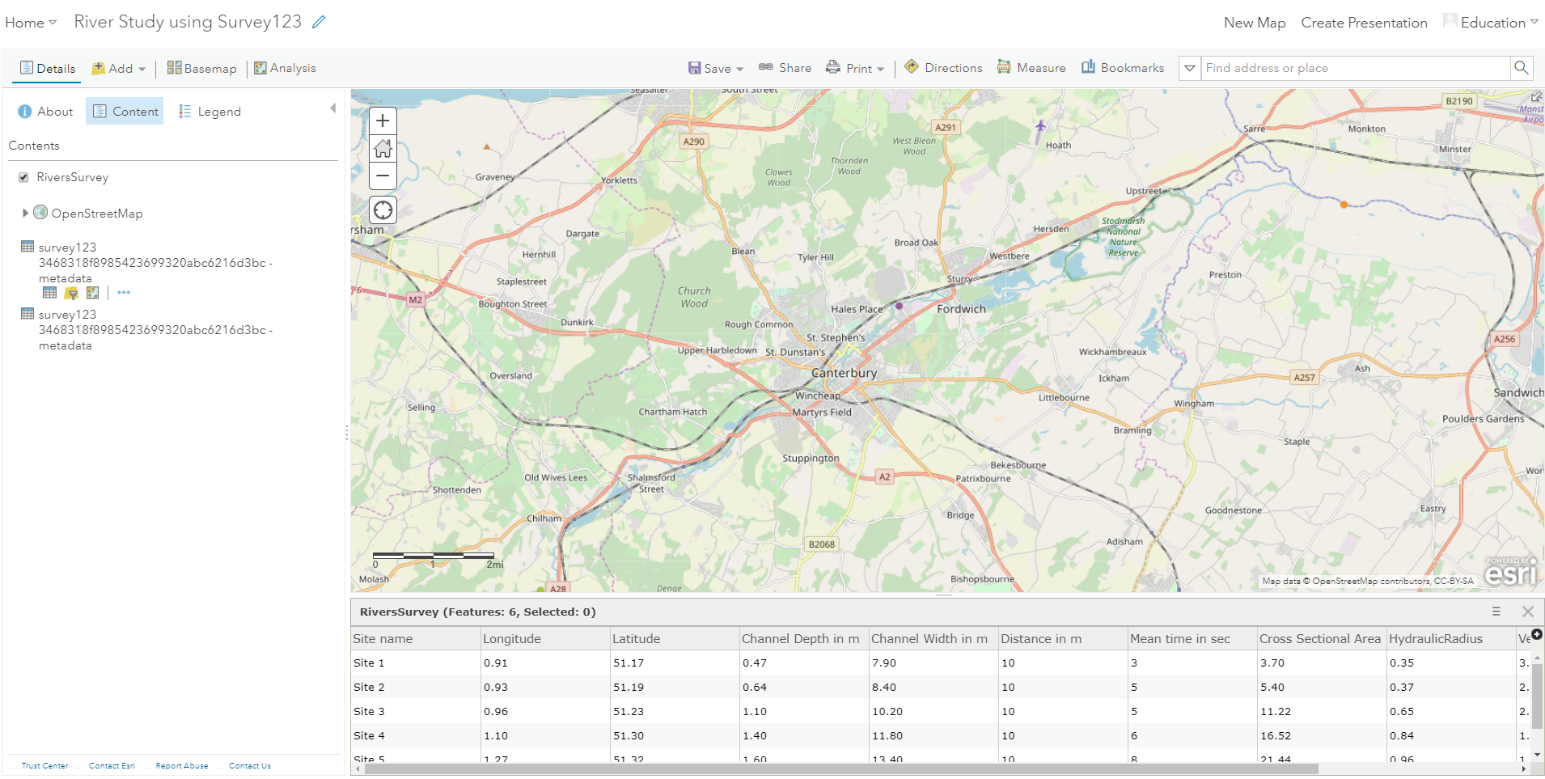
**Calculate Cross Sectional Area, Hydraulic Radius, Velocity and Discharge using ArcGIS Online**

* The following steps are outlined in the link below:

<https://sway.office.com/KE5jPcfwYEgvhTic>

* The sample data used in todays workshop is from the river Stour in kent
* The fieldwork spreadsheet given to you in your lesson pack today contains all of the data required to calculate the Cross Sectional Area, Hydraulic Radius, Velocity and Discharge of a river
* To get started with your calculations you will to open the Table of the data from your surveys on your map by clicking the Spreadsheet icon





* Next we are going to start working with our tables of data in ArcGIS Online
* The formula for calculating the Cross Sectional Area of a river is:

**Channel width x Channel depth**

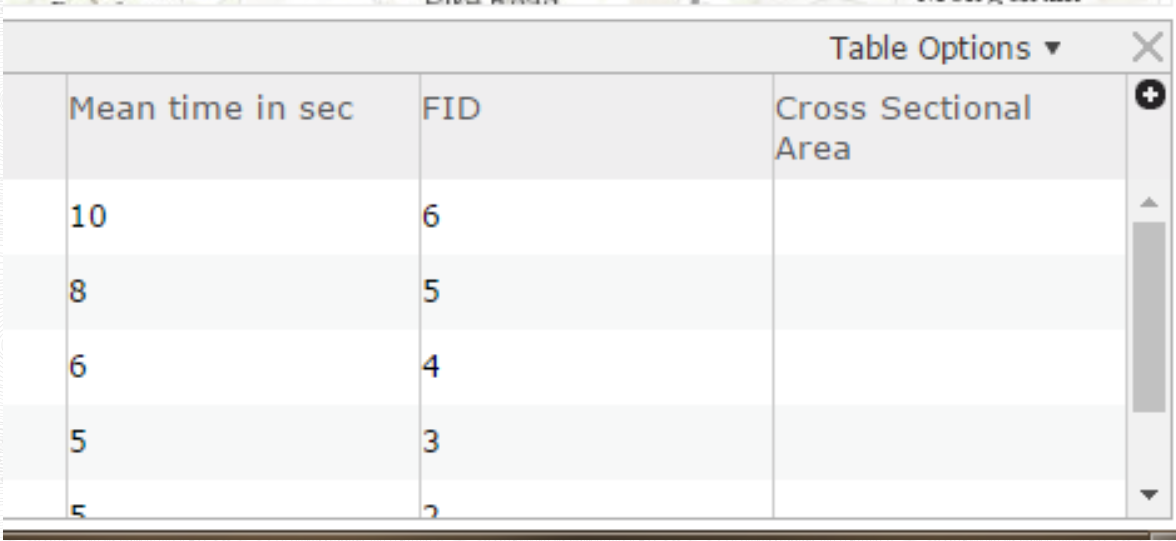
* The answer to this calculation needs to go into a new column in the data table.
* This is done by selecting Table Options
* Click Add Field



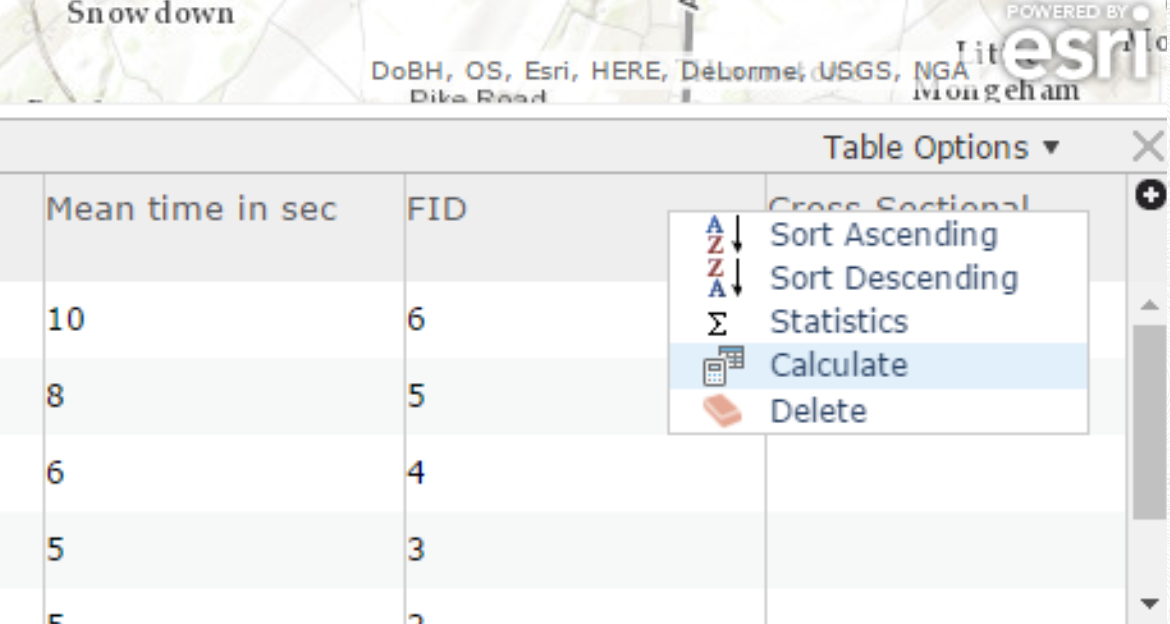
* In the Add Filed window fill in the boxes as shown in the image above and click Add Field

Note: Double means numbers with decimal places

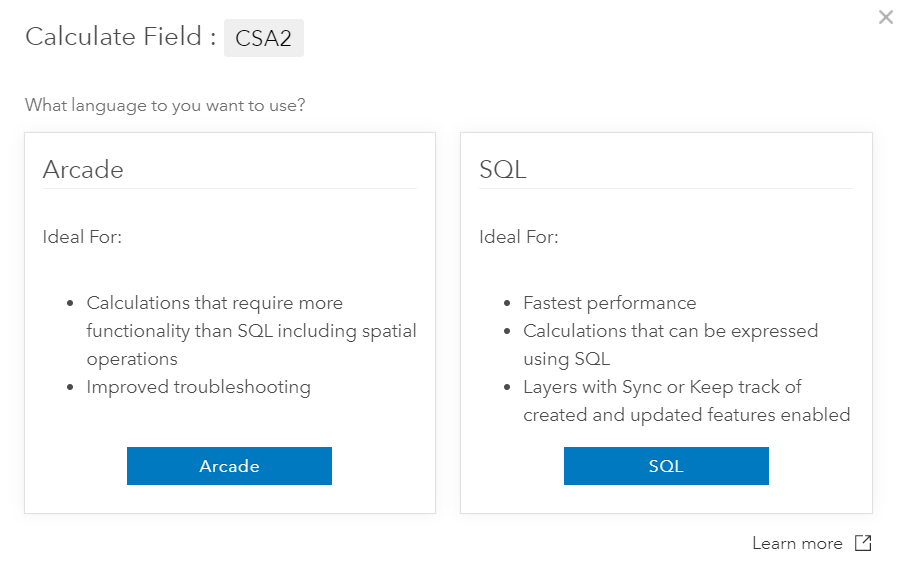
* You can see a new filed being added to the table



* Next we will start to calculate new primary data
* To open the calculation Expression Builder click Calculate as shown in the image below:



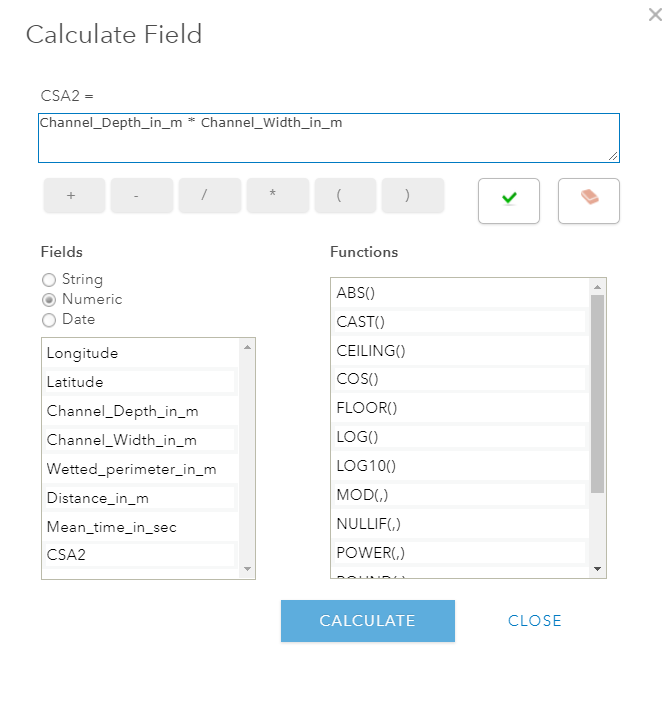
* Click SQL when the box in the image below appears:



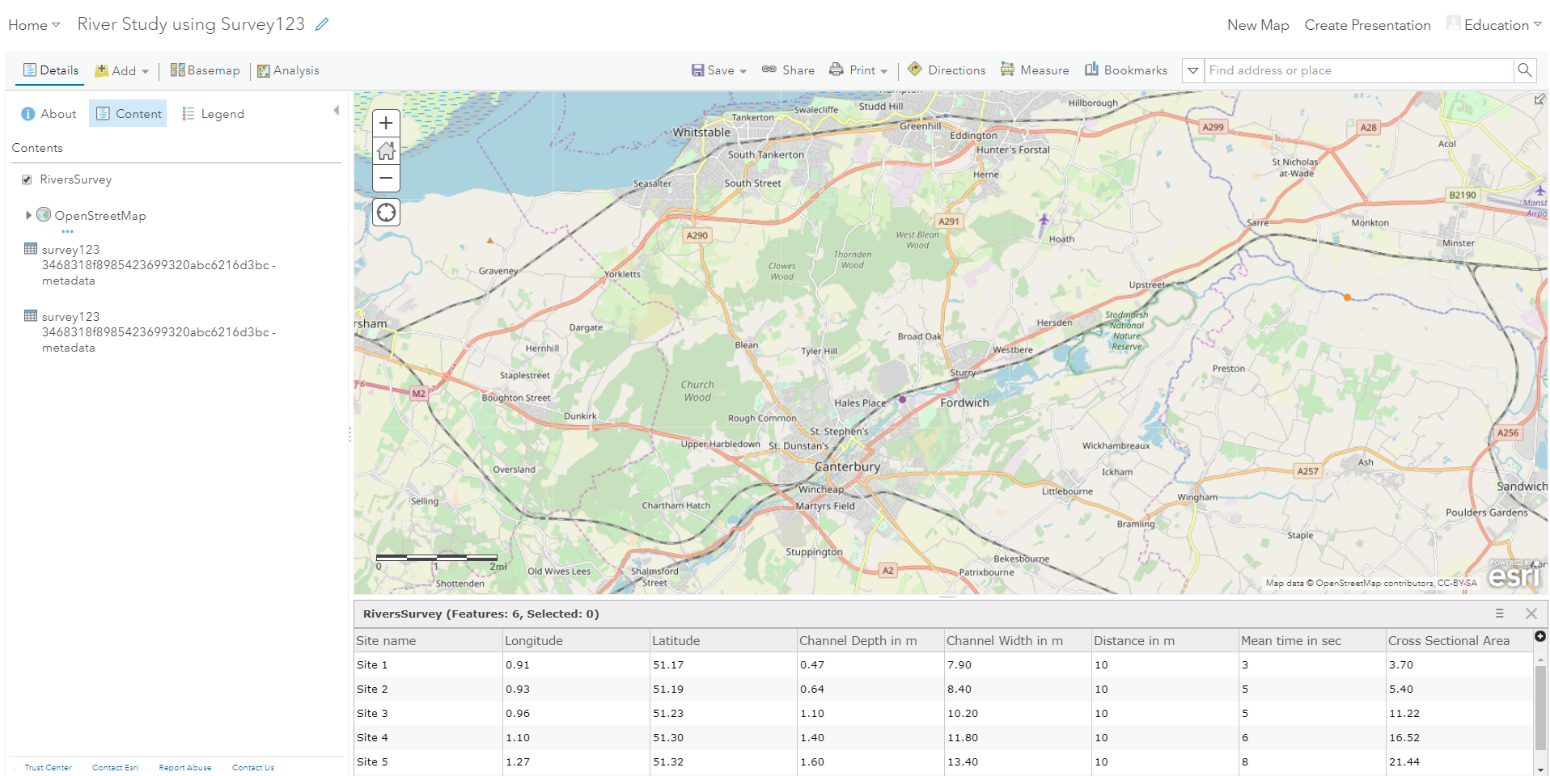
* In the Expression Builder simply click on the items that need to be calculated, in this instance:

**Channel\_Depth\_in\_m \*Channel\_Width\_in\_m**

\* equals multiply



* Once you click calculate and click on the table for the layer, you will see that the Cross Sectional Area has been calculated for all of the fieldwork locations



**Calculating Hydraulic Radius, velocity and Discharge:**

Using the process set out above and the formulae set out below, calculate:

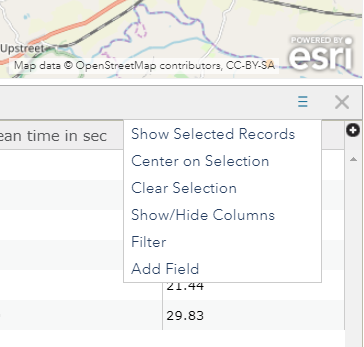
1. Hydraulic Radius = cross sectional area ÷ Wetted perimeter
2. Velocity = distance ÷ Mean time
3. Discharge = mean velocity x cross sectional area

**Calculating Hydraulic Radius:**

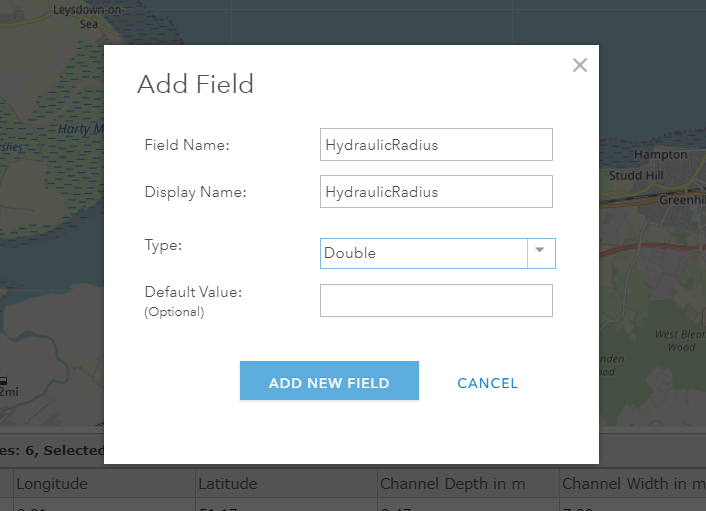
* Click the table icon again on the RiverStudy layer
* When the table opens click the



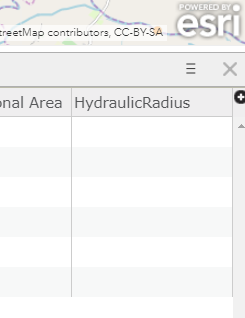
* Click Add Field



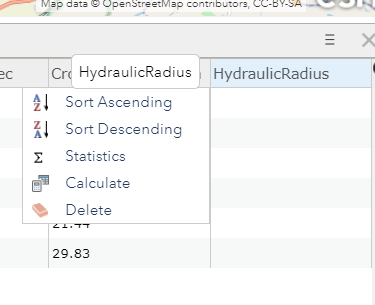
* Fill in the field box like below, calling it Hydraulic Radius and making it a Double field



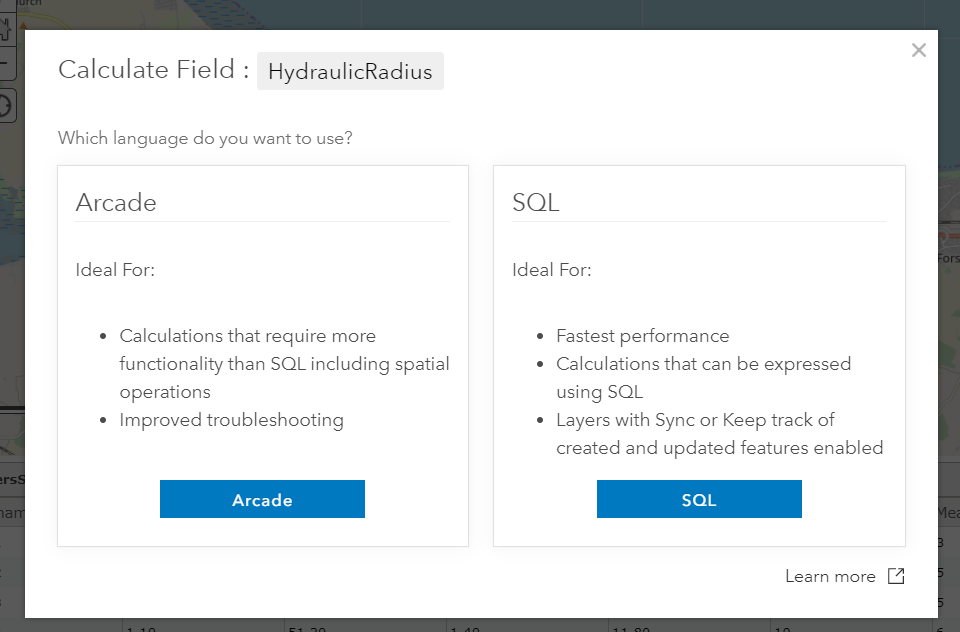
* Click Add field



* Click on the Hydraulic Radius field to see options

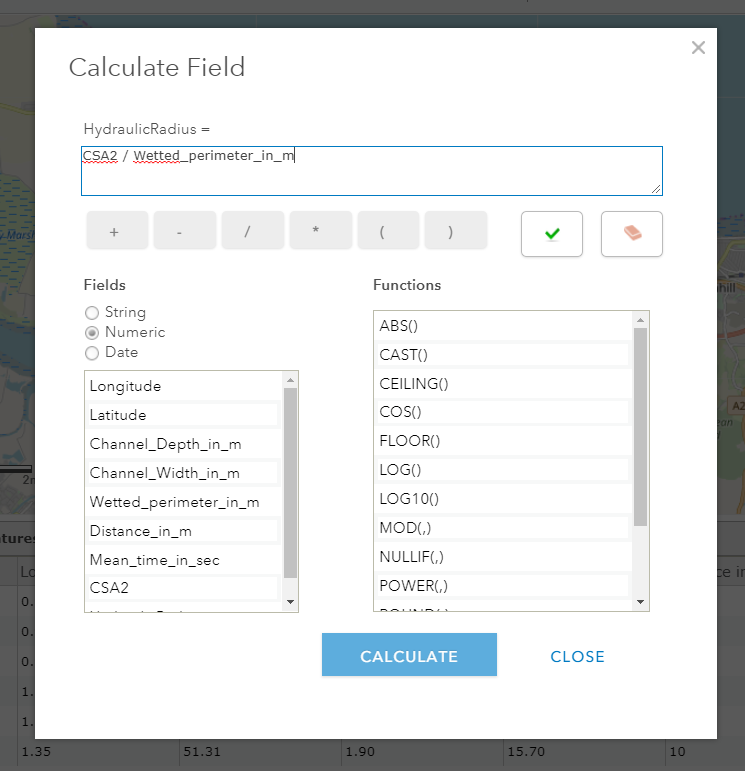


* Click Calculate
* Click SQL

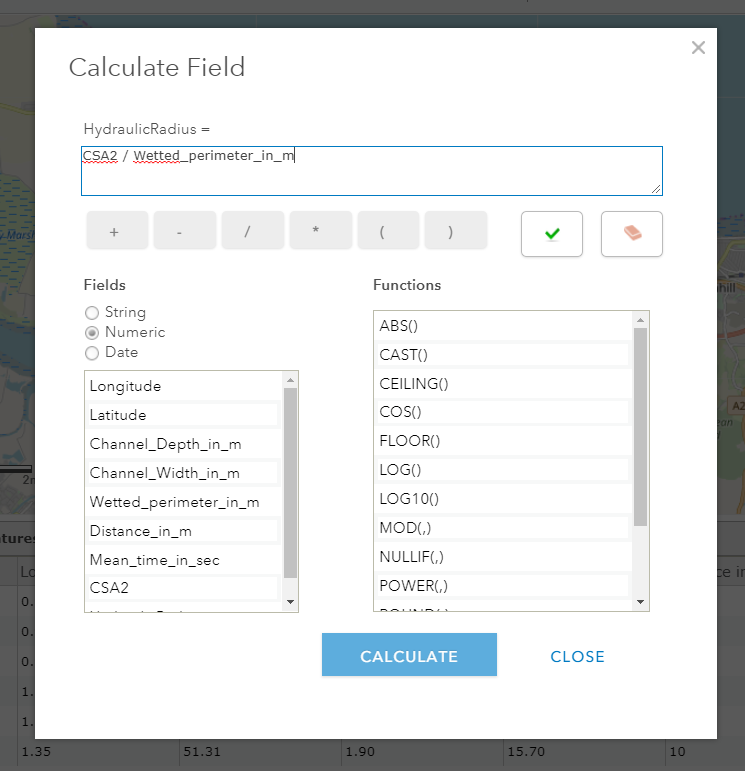


* Fill in the equation like the image below:

CSA / Wetted\_Perimater\_in\_m



* Click Calculate

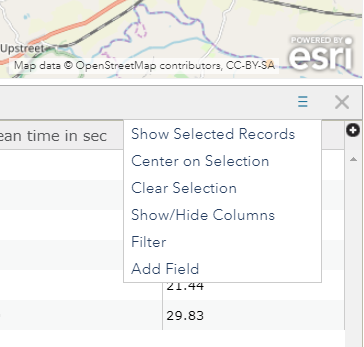


**Calculating Velocity:**

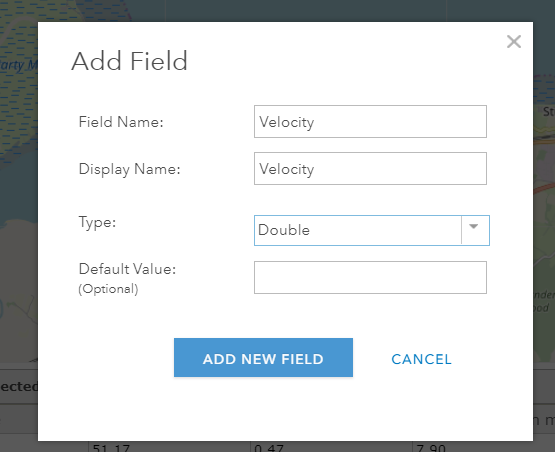
* Click the table icon again on the RiverStudy layer
* When the table opens click the



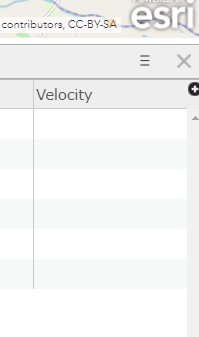
* Click Add Field



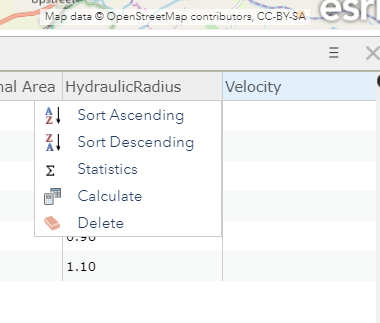
* Fill in the field box like below, calling it Velocity and making it a Double field



* Click Add field

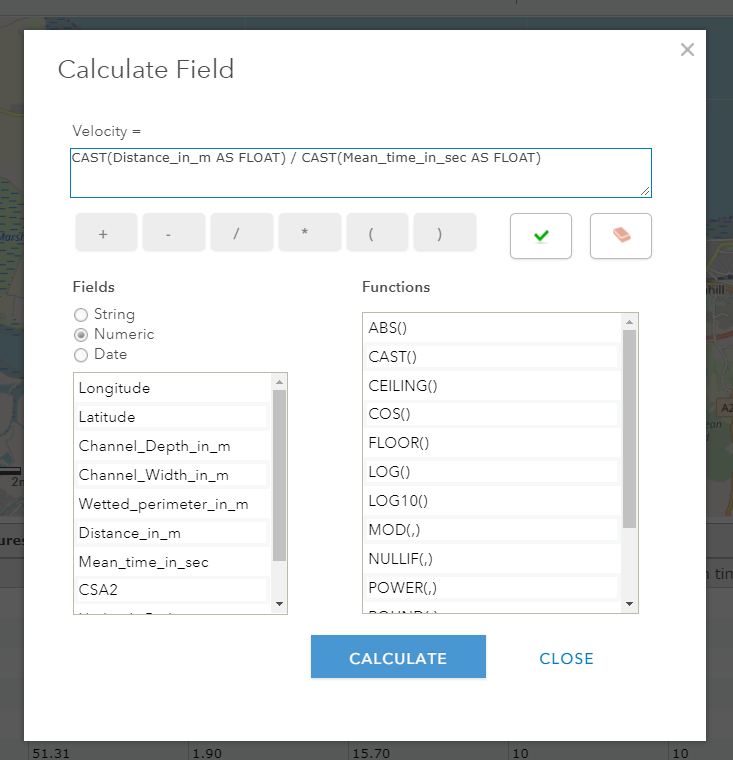


* Click on the Velocity field to see options

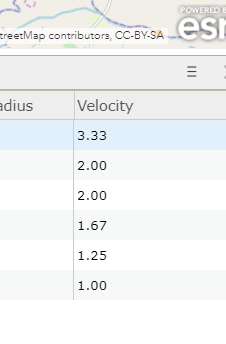


* Click Calculate
* Click SQL
* Fill in the equation like the image below:

Velocity = Distance\_in\_m / Mean\_time\_in\_sec



* Click Calculate

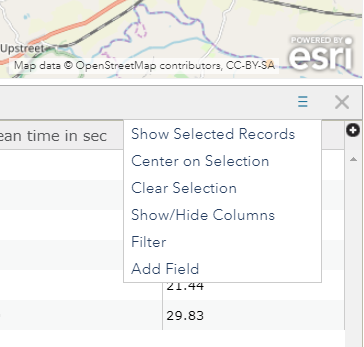


**Calculating Discharge:**

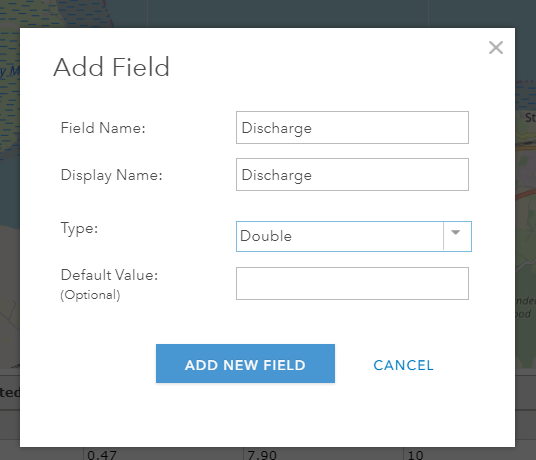
* Click the table icon again on the RiverStudy layer
* When the table opens click the



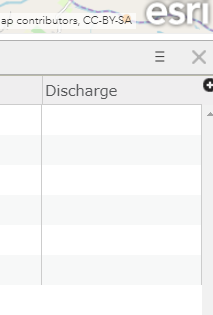
* Click Add Field



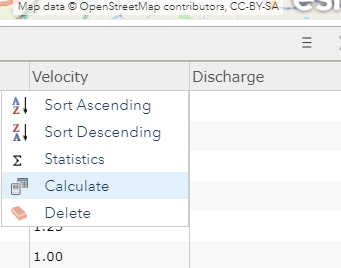
* Fill in the field box like below, calling it Discharge and making it a Double field



* Click Add field

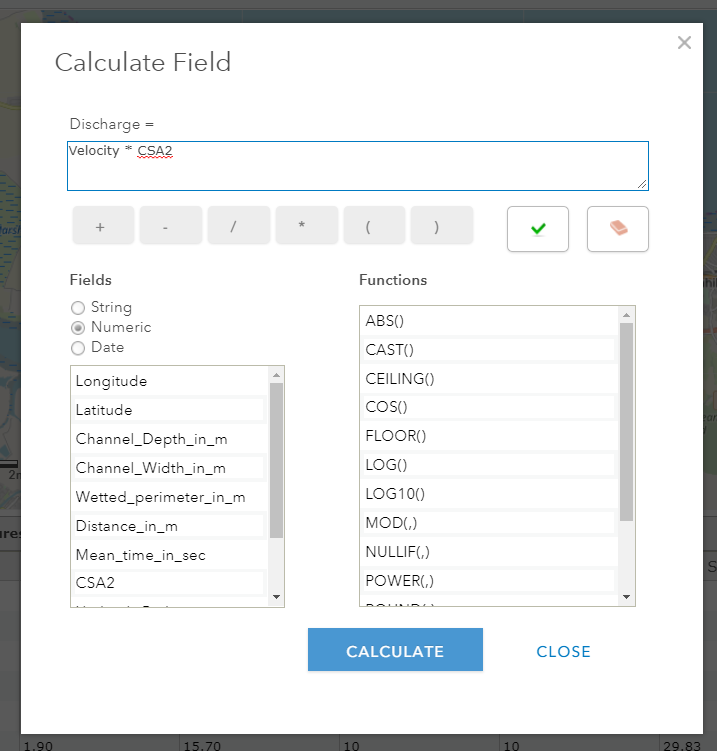


* Click on the Discharge field to see options

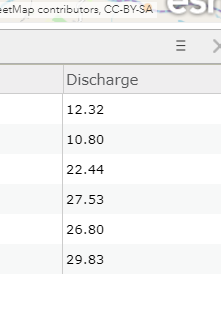


* Click Calculate
* Click SQL
* Fill in the equation like the image below:

Discharge = mean velocity x cross sectional area



* Click Calculate



**Thanks to the Field Studies Council for the Formulas**

<https://www.field-studies-council.org/>

**Credit to Jason Sawle – Schools Education Manager at Esri UK who put together the River study guide in the link below that this guide was adapted from:**

<https://sway.office.com/KE5jPcfwYEgvhTic>