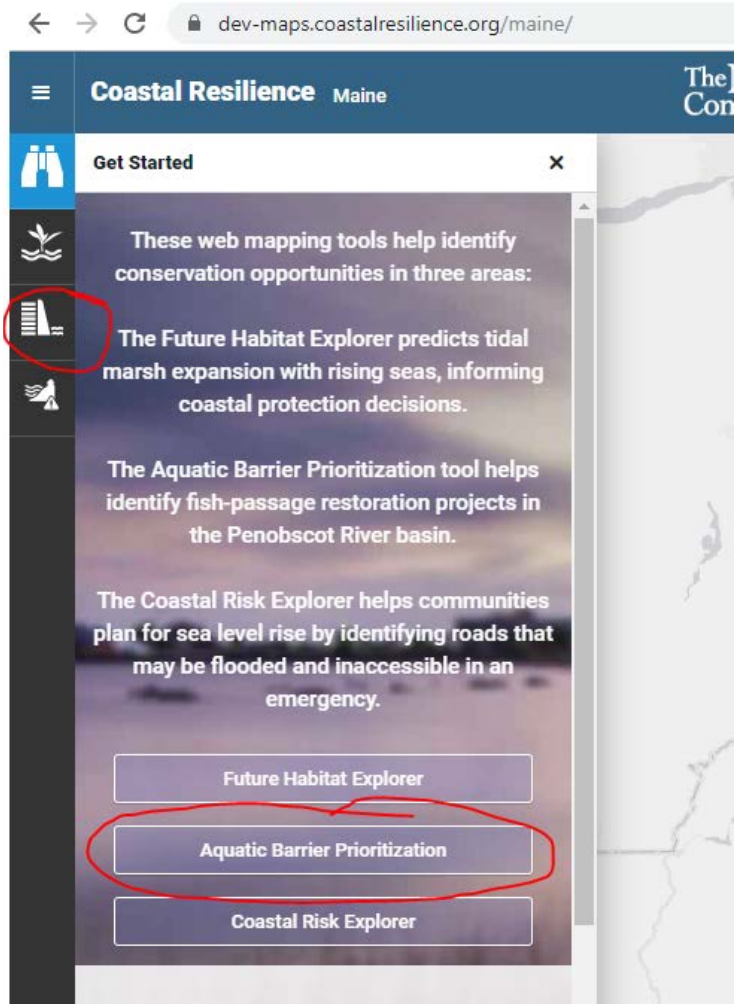
Basic instructions to use the Statewide Aquatic Barrier Prioritization Tool

Welcome to the Maine Statewide Aquatic Barrier Prioritization tool. This tool is designed to help the stream restoration community in Maine identify stream barriers whose removal could most benefit fish and other aquatic organisms. Information is also included on road-stream crossings (culverts) that may be at a higher risk of overtopping a road under flood conditions.

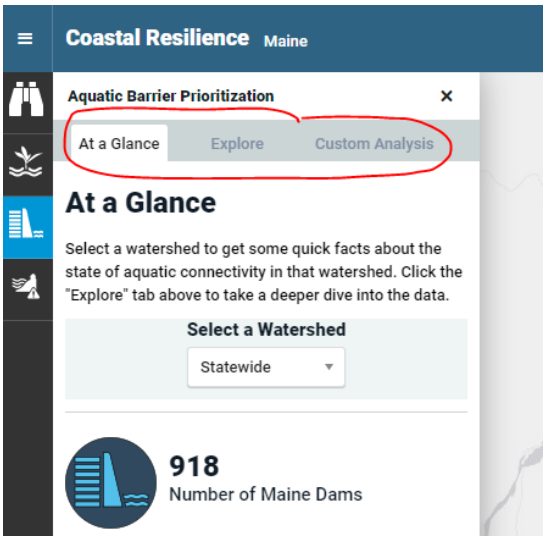
Importantly, the data and results in the tool are based on the best available regional data and do not incorporate any data on social, feasibility, or economic factors. It is intended to provide screening-level support and should not be considered a substitute for local-scale information.

Accessing the tool

Once on the site select “Aquatic Barrier Prioritization” or click on dam icon on the far left to enter the tool.



High-level navigation



There are 3 tabs within the tool:

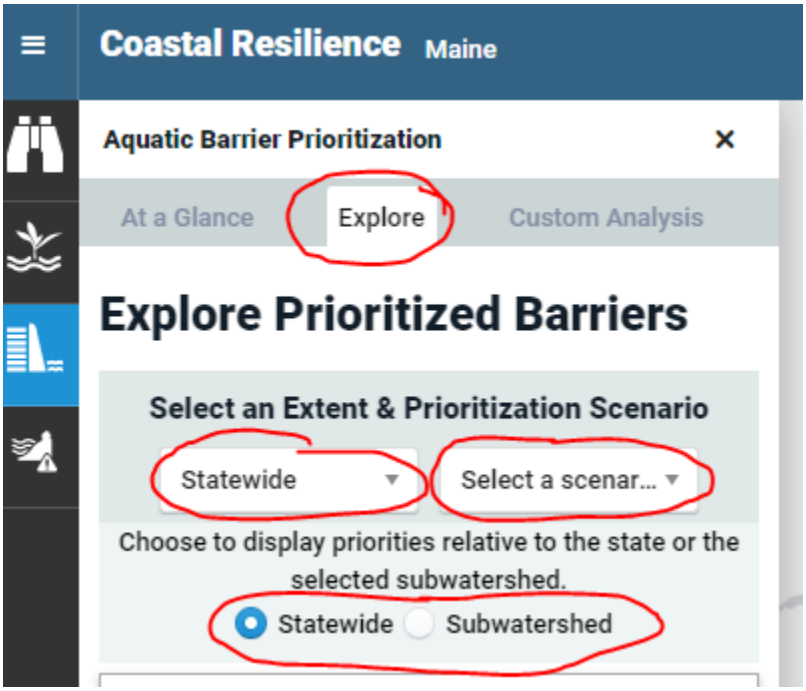
- *At-A-Glance:* provides simple, high-level summary info
- *Explore:* view and explore the details of the 5 consensus prioritization scenarios
- *Custom Analysis:* Run custom analyses using your own parameters

At A Glance

The At A Glance tab provides simple, high-level summary info for the whole state or by watershed on the tool pane on the left. Selecting a watershed from the dropdown will update the number of dams in Maine, number of public road-stream crossings barriers, and the average length of the functionally connected network in the watershed. The barriers displayed in the map (dams as black squares and road-stream crossings as black crosses) are updated and the watershed boundary appears when the selected watershed is changed.

Explore

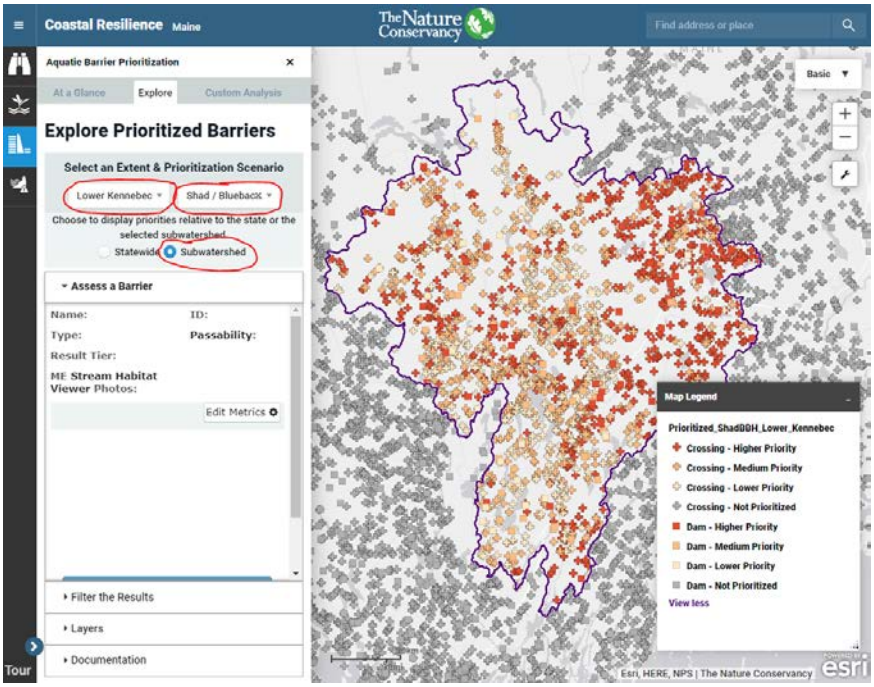
The explore tab contains the core functionality of the tool, allowing users to visualize, query, filter, and download the prioritized barrier data. After the Explore tab is clicked, the next step is to select an extent (statewide or a watershed), a scenario to display, and whether the results should be shown relative to the entire state or to the watershed.



When a watershed is selected, the map will automatically zoom to that watershed and display the watershed boundary. When a scenario is selected, a popup window will first provide a brief explanatory note about that scenario. Finally, if the option to display the priorities relative to the watershed is

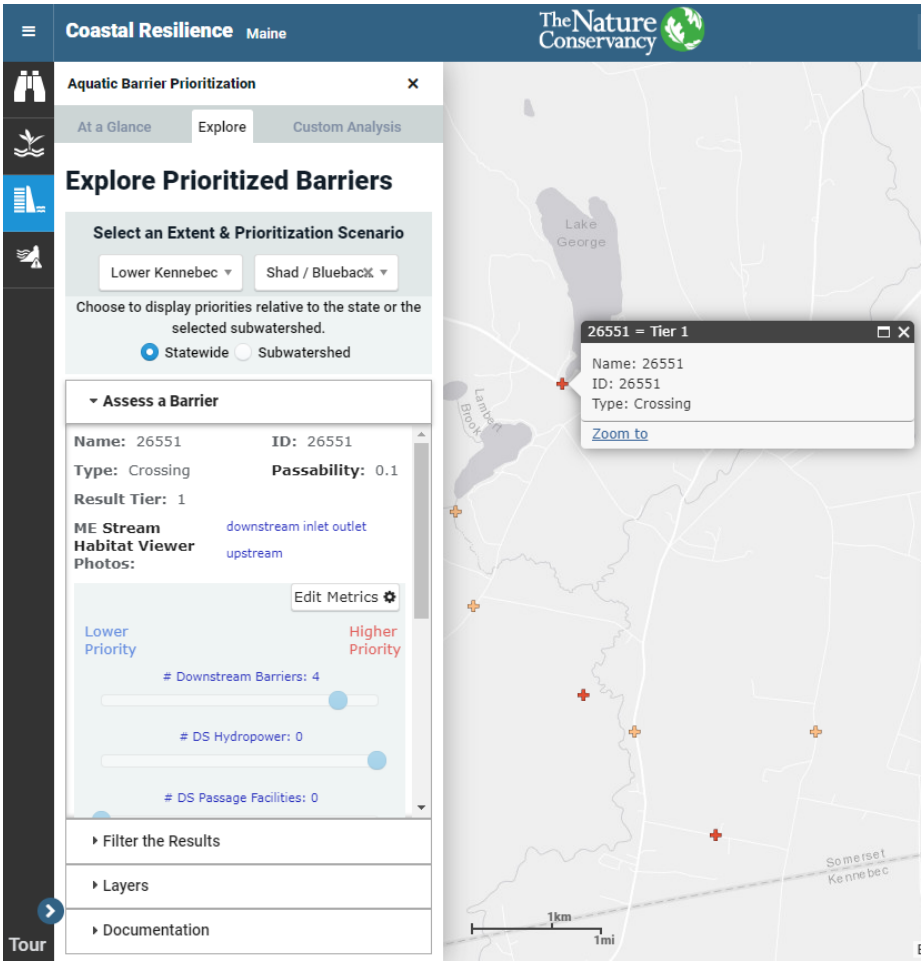
selected, the results in the map will be relative just to that watershed (e.g. a medium priority relative to the whole state may be a high priority relative to the watershed) .

Figure 1 The shad/blueback herring scenario displayed relative to the Lower Kennebec watershed

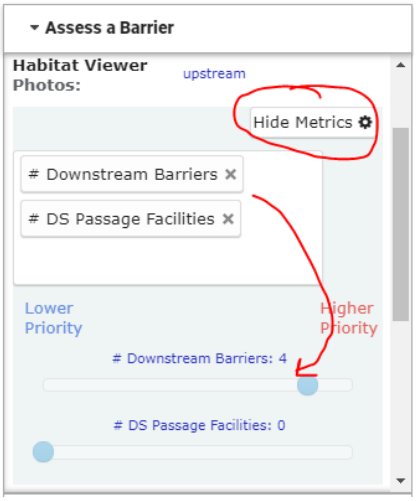


Similar to the At A Glance tab, dams are represented by a square while road-stream crossings are represented by a cross. The color of the symbol represents its priority for the selected scenario. Dark red barriers are the highest priority, relative to the selected extent, while lighter shades of red are relatively lower priorities. Gray symbols are barriers that were not prioritized in that scenario. This could be due because they were explicitly excluded (e.g. only coastal barriers are assessed in the coastal anadromous scenario) or because they couldn't be prioritized due to a lack of data (e.g. some of the metrics used in the inland brook trout scenario are not available for barriers on large rivers).

When a barrier on the Explore tab is clicked, information about that barrier is displayed under the “Assess a barrier” pane of the tool. Information displayed includes the name, ID, type of barrier, passability score, and result tier (relative to the selected extent) of the barrier. If available, links to photos of the barrier on the Maine Stream Habitat Viewer are included. Below this header information, individual metric values are displayed. In the screenshot at left, for example, the selected barrier has 4 other barriers downstream. The blue dot below the metric name indicates how that barrier performs relative to other barriers (in the selected extent) for that metric. The further to the right the blue bot is, the higher priority the barrier is, based on that metric. So in this example having 4 other barriers downstream of it places this barrier towards the “higher priority” end of the spectrum.



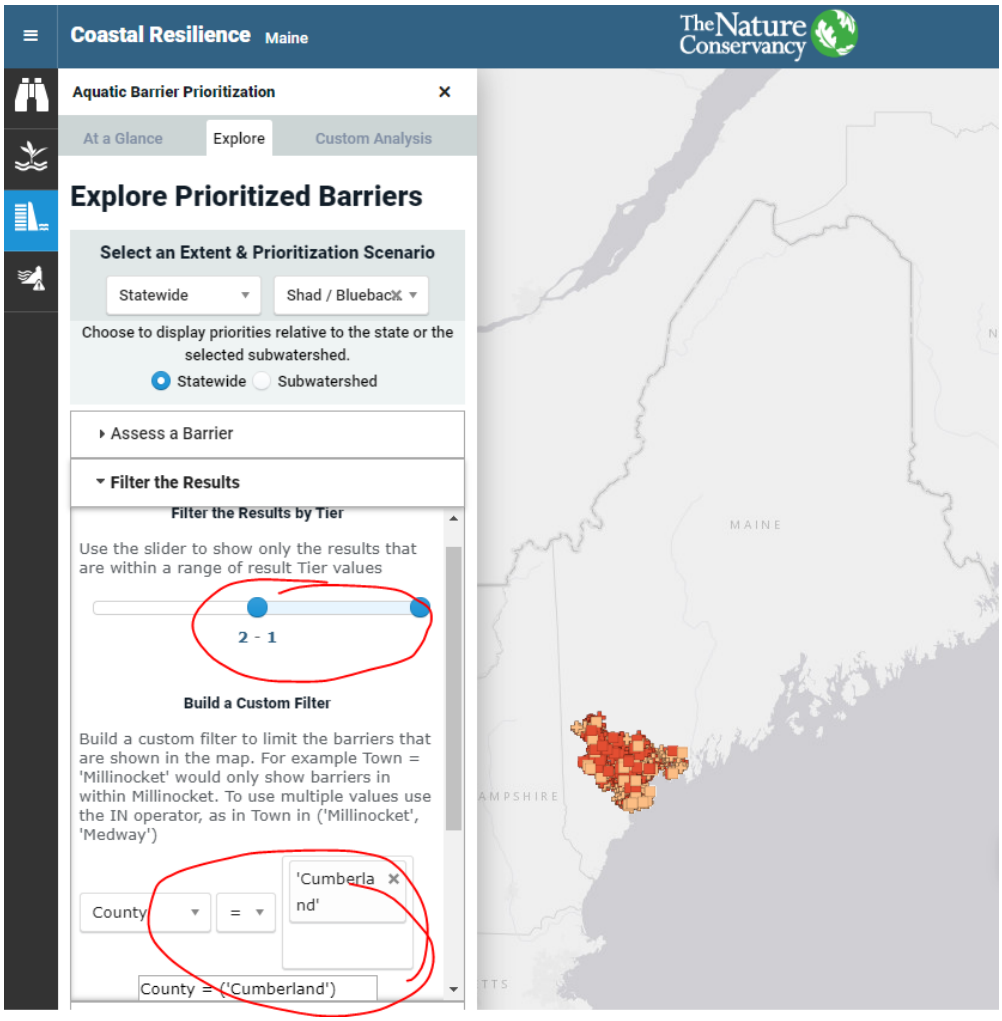
By default, the metrics that are displayed when a barrier is clicked are those that were used in the selected scenario (shad / blueback herring in this example). If the scenario is changed and the barrier is clicked again, the metrics displayed will correspond to the new scenario. Alternately, the “Edit Metrics” button can be clicked and the metrics that are displayed altered. Here, the metrics have been altered so only two are being displayed. Clicking in the white



space will expose a dropdown menu with the full list of metrics that can be chosen.

Finally, at the bottom of the "Assess a barrier" pane are buttons to download the consensus results in either Excel format or as a zipped file geodatabase for use in GIS.

Below the "Assess a barrier" pane is a pane that presents the option to "Filter the Results" in the map. This can be done either using a slider to show only, for example, medium and higher priority barriers, or by building an expression to apply a more complex filter. The slider and expression work together. In the example at left, only barriers in Tiers 1 & 2 in Cumberland County are shown in the map.



Below the filter pane is the Layers pane, which includes options to turn on other contextual layers and adjust the transparency of all layers.

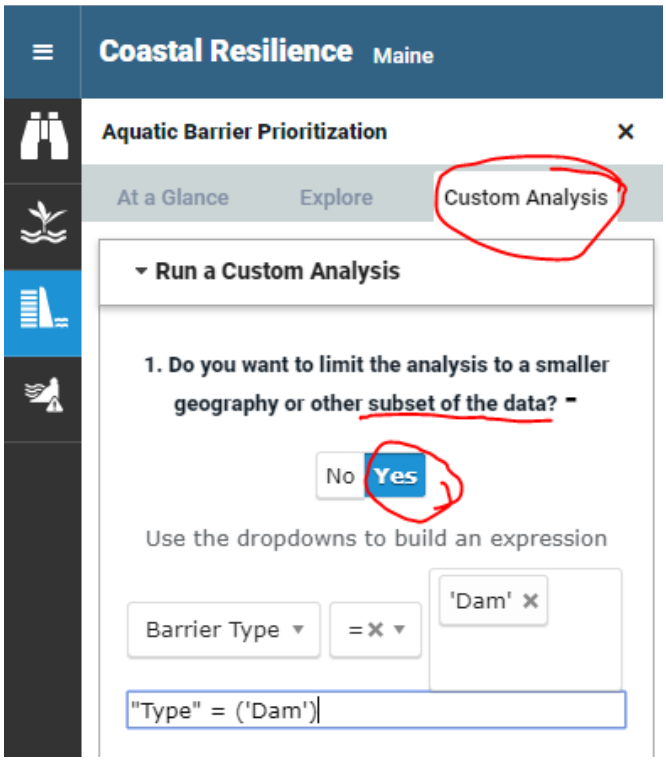
Finally at the bottom of the tool window is a Documentation pane which includes descriptive text about the tool.

Custom Analysis

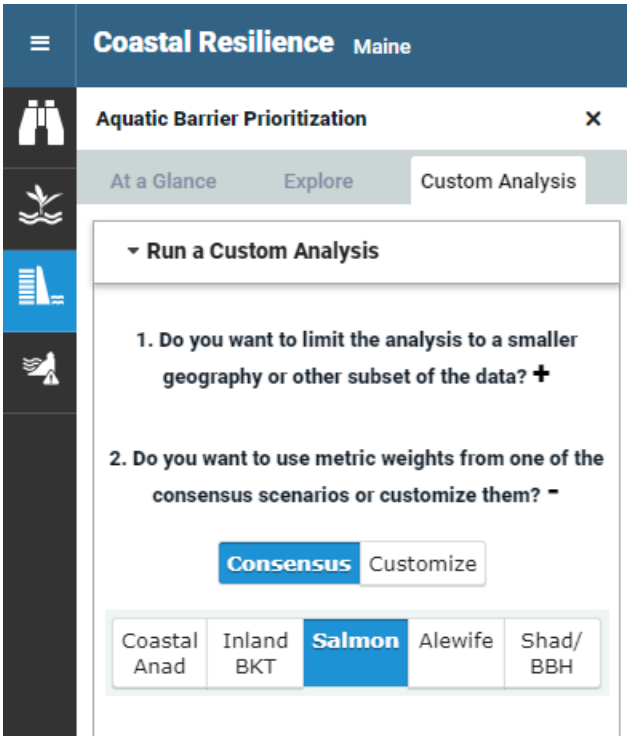
The Custom Analysis tab provides an interface for running a custom prioritization scenario. The interface is set up as a series of questions to guide the user through the process of entering parameters for a custom analysis.

The first question asks: "Do you want to limit the analysis to a smaller geography or other subset of data?". Clicking on the question expands a toggle button where you can answer yes or no. If you select

yes, a dialog, much like the filter dialog in the "Explore" tab, is exposed where you can define what barriers you want to include in the analysis. These can be by geography (e.g. County = 'Cumberland' will only prioritize barriers in Cumberland County) or by some other attribute (e.g. Barrier Type = Dam will only prioritize dams). Using the dropdown menus will help insure correct syntax, though it is also possible to type directly into the input box. Filter expressions must comply with ArcGIS definition query syntax (see the ArcGIS help for more info.) **Note**: filter barriers does not change the metric values themselves, only which barriers are being prioritized. So if only dams are included in custom analysis, the "Count of downstream barriers" metric will still include crossings.

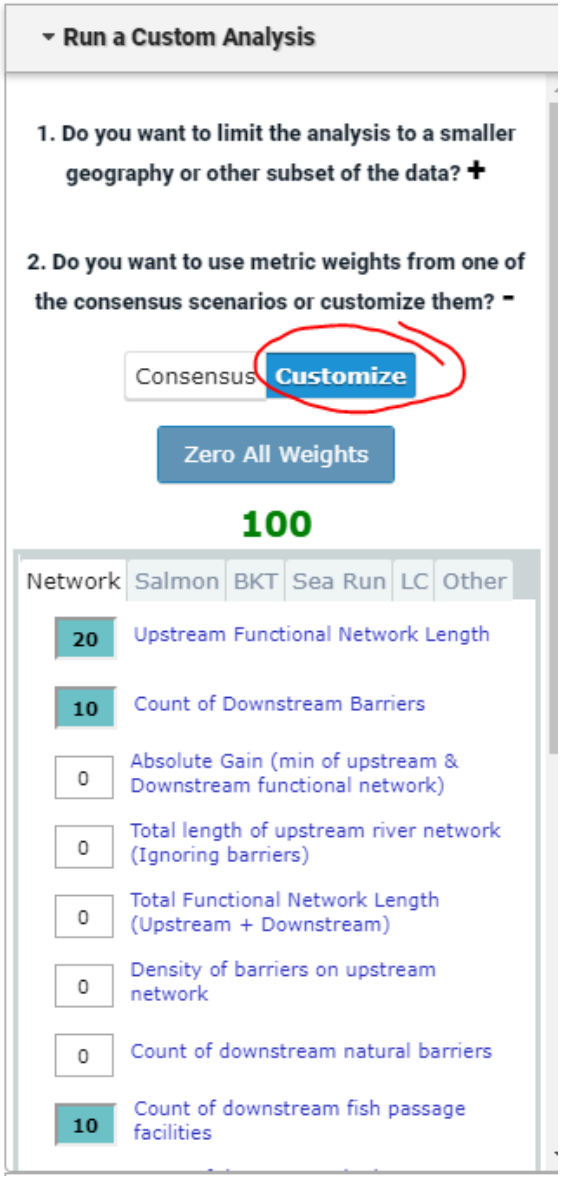


The next question asks if you want to use the metric weights from one of the consensus scenarios or customize them. If you choose to use the consensus weights, you'll be given the option to select one of the 5 scenarios. Here, the "Salmon" scenario has been selected, so the custom analysis will use these weights.

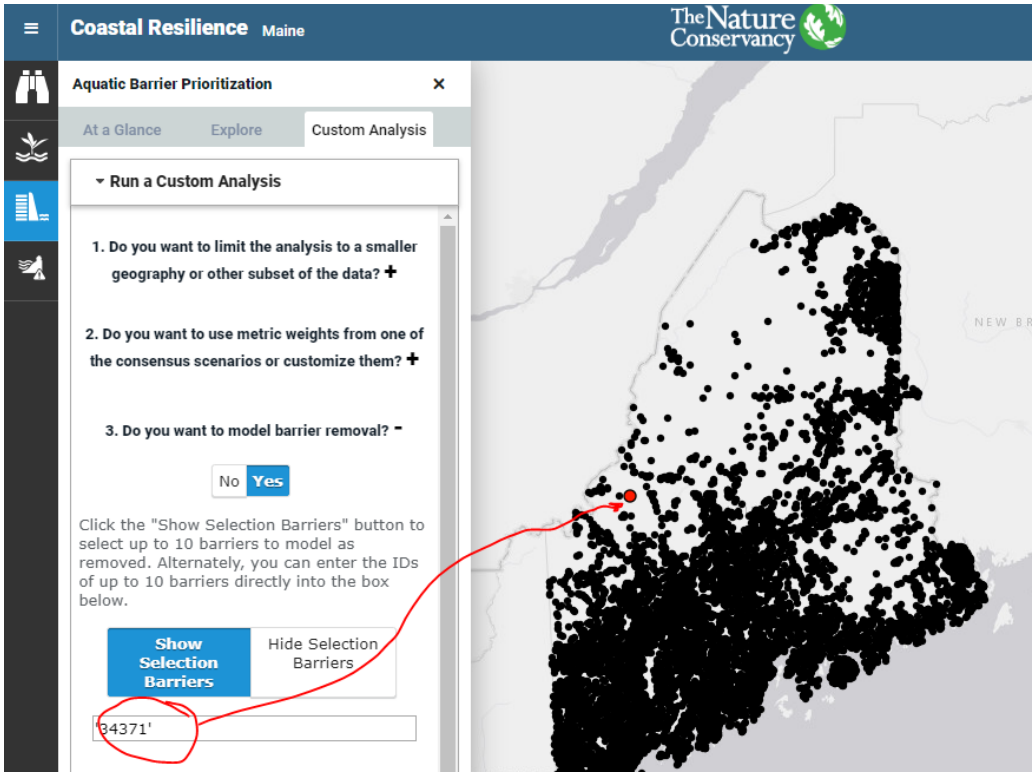


If you choose to customize metric weights, a list of all of the metrics, organized in tabs by theme will be displayed. Weights can be allocated according to your preference, so long as they sum up to 100. If you previously selected a consensus scenario, the weights for that scenario will be displayed.

Clicking on a metric name will bring up a popup with a definition for that metric. [**Note**: metric definition slides are still being developed and are not available for all metrics in the Development version of the tool].

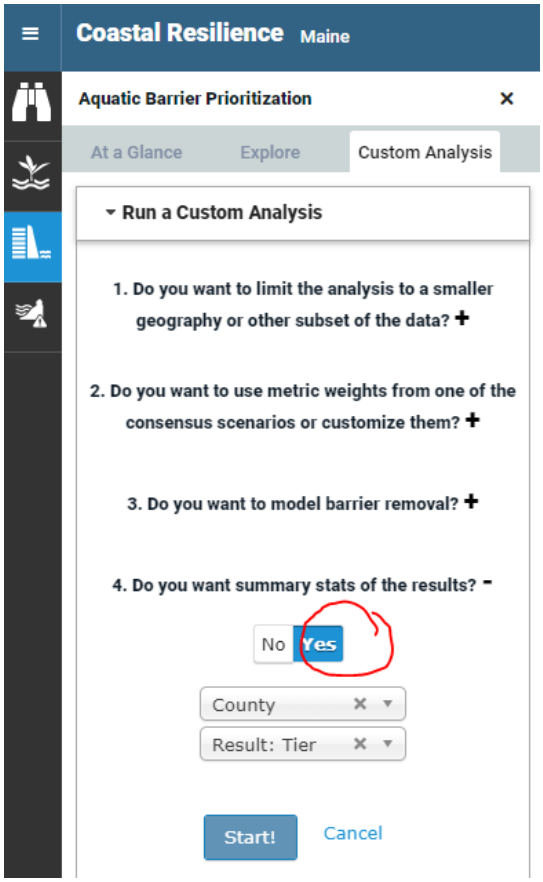


The next question asks if you'd like to model the removal of one or more barriers. Unlike applying a filter to the input barriers (the first question of the custom analysis), if barriers are modeled as removed they are truly removed from the analysis, meaning that the analysis will be run as if they didn't exists. Thus, all metric values for surrounding barriers are updated (e.g. the barriers upstream will have one fewer other barriers in the "Count of downstream barriers"). Selecting "Show Selection Barrier" will display a map of all of the barriers in the state. Clicking on one barrier will add it's site ID to the input box. If known, the SiteID can be type into the box as well. Up to 10 barriers may be modeled as removed in a custom analysis.

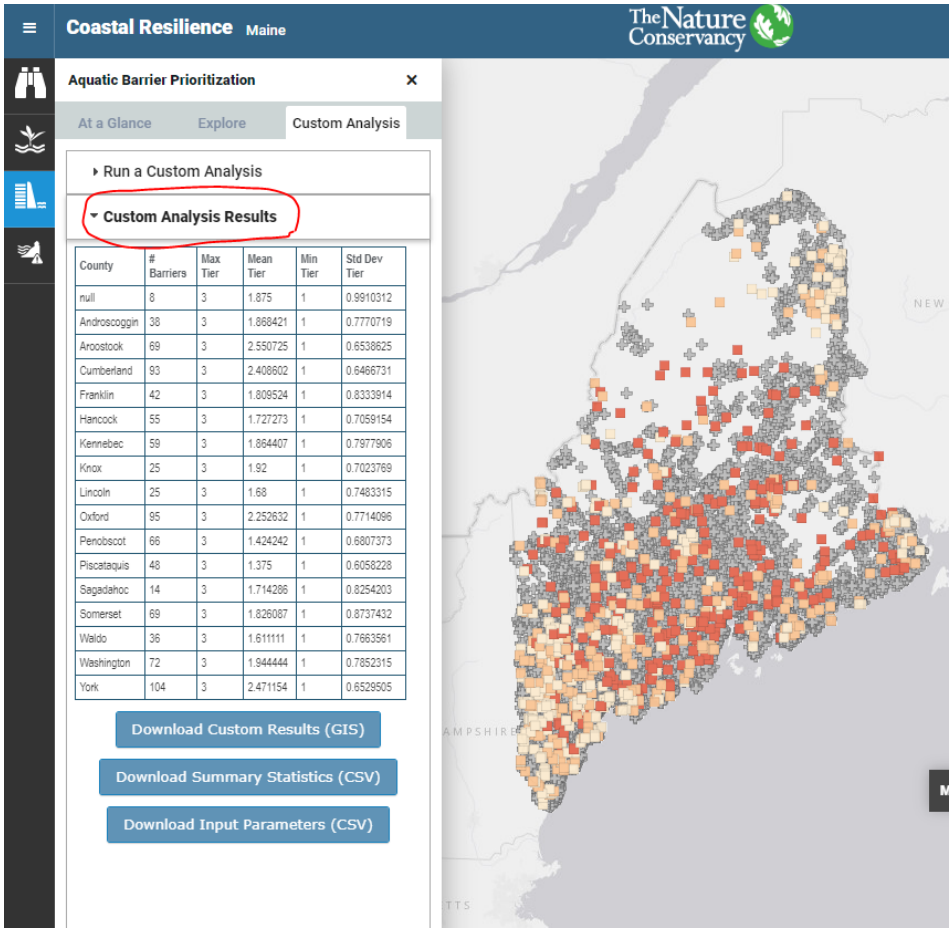


Finally, simple summary stats can be run on the custom analysis results. These stats can be run within a town, county or watershed and can be used to understand if there are, for example, many high priority barriers with a given extent.

Clicking the "Start" button will commence the custom analysis. The time required run the analysis will vary depending on the number of metrics used and especially whether any barriers are modeled as removed and can range from ~10 seconds to a couple minutes.



When complete, the results will display in the and the “Custom Analysis Result” pane will open with buttons to download the custom results and input parameters, as well as a table of summary stats (if used in the analysis). In this example, only dams were prioritized using the salmon scenario weights.



County	# Barriers	Max Tier	Mean Tier	Min Tier	Std Dev Tier
null	8	3	1.875	1	0.9910312
Androscoggin	38	3	1.868421	1	0.7770719
Aroostook	69	3	2.550725	1	0.6538625
Cumberland	93	3	2.408602	1	0.6466731
Franklin	42	3	1.809524	1	0.8333914
Hancock	55	3	1.727273	1	0.7059154
Kennebec	59	3	1.864407	1	0.7977906
Knox	25	3	1.92	1	0.7023769
Lincoln	25	3	1.68	1	0.7483315
Oxford	95	3	2.252632	1	0.7714096
Penobscot	66	3	1.424242	1	0.6807373
Piscataquis	48	3	1.375	1	0.6058228
Sagadahoc	14	3	1.714286	1	0.8254203
Somerset	69	3	1.826087	1	0.8737432
Waldo	36	3	1.611111	1	0.7663561
Washington	72	3	1.944444	1	0.7852315
York	104	3	2.471154	1	0.6529505