



FARM POLLUTANT LOAD ANALYSIS

How to Use CAST to Answer Questions about Your Farm

Abstract




This simple “How-To” document will walk you through 3 scoping questions that can be used to determine what information is in the Phase 6 Chesapeake Watershed Model for your farm and help you calculate the pollutant reductions for your plan.


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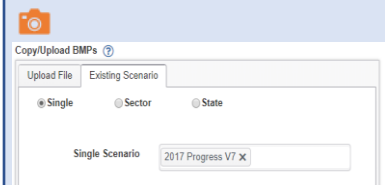
Q1. How can I use CAST to get accurate pollutant loading rates for my farm?


Using [CAST](#), you can determine the pollutant loading rates as pounds per acre. You can then multiply those loading rates by the land uses and acres that are just on your farm to get the most accurate numbers for your pollutant reduction plan or implementation plan.

1. Log in to [CAST](#), and select Add New Scenario.
2. This scenario is your first point of comparison and is a baseline condition.
3. Name your first scenario and add a description that will be useful to you. This scenario will represent your current pollutant loads and land uses.
4. For BMPs Available, select “Planning BMPs” 
5. For Geographic Scale, select what makes sense for your area. If you’re not sure, we recommend starting with “county”. We can apply the results to a more local result later on.
6. Once Geographic Scale is selected, choose your Geographic Area. Multiple areas may be selected.
7. Select the Base Year. This is the year you want to use as your first point of comparison. You probably want to select the current year.
8. Select the Base Condition.  The base condition defaults to “Current Zoning” for all years after 2012. 1984-2012 use “Historic Trends.”
9. Select a Wastewater Dataset. Typically, you will use the same year you used for your Base Year in Step 7.
10. Select Cost Profile. Costs are estimated for each state as well as a watershed average. You also have the option to create your own cost-profile with more locally-appropriate data if you have it. That will not be covered in this document.
11. “Share this Scenario” and “Notes” are not required. You can skip these sections.
12. Copy BMPs from an existing scenario.  This option is under “Copy/Upload BMPs” below the “Notes” box. You can select “single” and select the Base Year that you are used in Step 7. This allows you to see what your pollutant loads and land uses are with all the BMPs that you have already implemented and reported to the Chesapeake Bay Program. Alternatively, you can skip this step if you want to completely isolate the effects of your planned BMPs. If you know that your farm has BMPs already implemented, you can also add just those existing BMPs.

 **Planning BMPs** include some BMPs that are not eligible for Chesapeake Bay TMDL reductions because they are either still under review or have not been approved by the Bay Program partnership.

 **Base Conditions** define the land use, number of septic systems, and number of animals for the selected year.



Copy/Upload BMPs 

Upload File Existing Scenario

Single Sector State

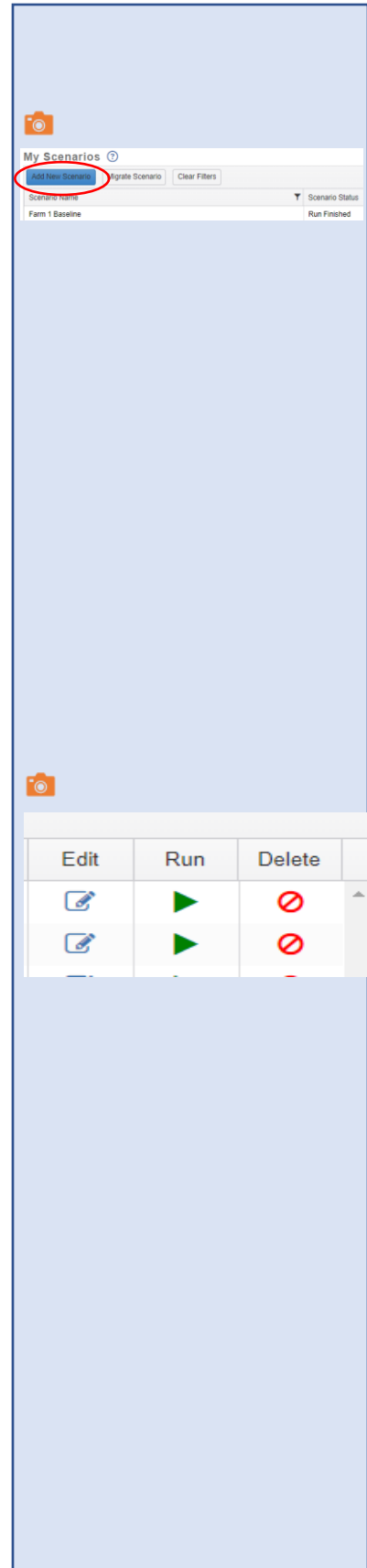
Single Scenario 2017 Progress V7 X

13. Click Save.

➤ Now, create your second scenario for comparison by clicking Add New Scenario button. 📷



1. Click on the button at the top that says Copy Existing Scenario Without BMPs.
2. Select the scenario that you just created from the list. Rename your second scenario something like Farm Plan and add a description that will be useful to you. This scenario will show how your pollutant loads and land uses are projected to look once your plan is implemented.
3. Copy BMPs from the scenario exactly as you did for your first scenario. If you added BMPs to your baseline scenario, select the name of the scenario you just created. Keeping the BMPs the same means that you will be assessing the effect solely of the planned practices.
4. Navigate to the Agriculture BMPs tab under Edit scenario in your plan scenario. Add the BMPs to your scenario that you are planning to implement on your farm.
5. Click Save.


- Click run on both scenarios once they are done validating. 📷
- When both have a scenario status of Run Finished, go to the Results>Compare Scenarios item in the top ribbon menu.
- Select the same Geographic Scale that you did in your two scenarios.
- Select the Agencies of interest. Unless you are a federal agency, you likely will select "Non-federal" or "All Agencies."
- Select the two scenarios you just created. You can add in others if you like, but it is not necessary.
- Select Compare Scenarios
- There are three tabs with results. You can explore the comparison of the acres, loads, loads per acre, and even see the percent change in loads. Tables can be downloaded from these pages.
- If you prefer to see the data all in one place on an excel spreadsheet, go to Results>Reports and download a Loads report. When you select the scenarios, just add both and they will be side-by-side in the downloaded report.

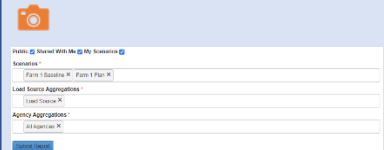


Q2. How can I use CAST to get accurate pollutant loading rates for my farm?

Using [CAST](#), you can determine the pollutant loading rates as pounds per acre. You can then multiply those loading rates by the land uses and acres that are just in your community to get the most accurate numbers for your pollutant reduction plan or implementation plan.

1. On the results menu item in the ribbon at the top, select Results>Reports.
2. Select the report type as “Loads Report”
3. Select the same geographic scale that you used for creating the scenarios in Q2.
4. From the dropdown list on the reports page, select your baseline scenario. Also select the planning scenario you created; both are under “My Scenarios”.
5. For the load source aggregations , select Load Source. “Load Source” is the most detailed choice with all sources reported individually. For the agency aggregations, select All Agencies. “Agency” refers to federal vs. non-federal land. You can use All Agencies to ignore that extra level of categorization. 
6. Submit Report. You will get an email with a report link. You can also go to the top of the screen and see another tab named Download Reports. You can download the report from Download Reports or from the email, whichever you prefer.

 **Aggregation** determines how the data in your report will be grouped and displayed.



The screenshot shows a portion of the CAST web application interface. At the top, there is a camera icon and a 'Print' button. Below that, there are several dropdown menus for configuration: 'Scenario' (with 'Farm 1 Baseline' and 'Farm 1 Plan' selected), 'Load Source Aggregations' (with 'Load Source' selected), and 'Agency Aggregations' (with 'All Agencies' selected). A 'Submit Report' button is visible at the bottom of the configuration area.

7. Once you download the report and open the Excel file, take a look at the tabs. The Source – All Agencies tab will have the detailed load information.
8. In the Source – All Agencies tab, add a column next to the NLoadEOS column. You are inserting next to column J. Calculate pounds per acre by dividing the NLoadEOS by the Amount column for that scenario. The formula in Excel should look like: =I2/G2. Do the same for both scenarios for N, P and Sediment. Copy that formula for all rows. 📷

The screenshot shows an Excel spreadsheet with the following data:

	G	H	I	J		
1	Farm 1 Baseline	Amount	Farm 1 Plan	Amount	Farm 1 Baseline	NLoadEOS
2		3201.549	3201.549	13119.430		4.100
3		7099.952	7099.952	320146.965		46.218
4		12320.343	12320.343	441420.894		36.006
5		11640.914	11640.914	942385.374		80.957
6		11145.684	11145.684	270777.600		51.302
7		11670.609	11670.609	101258.896		8.676
8		233.911	233.911	460948.840		2008.266
9		6703.043	6703.043	131523.778		19.622
10		20019.661	20019.661	267971.671		12.071
11		24320.223	24320.223	318430.896		12.719
12		24.306	24.306	203718.013		8381.655

9. Filter the spreadsheet. The excel button for filter looks like a funnel and is under the Data tab of the menu. You will first need to select the rows and columns that have data. 📷
10. Click on the down arrow button for sector and select “Agriculture” only.
11. You can now see the loading rate for the agricultural load sources. You can see the change between the baseline and plan scenario.
12. Alternatively, you can download a “Loads Per Unit” report. Make the same selections you made when running the loads report, other than the report type. A Loads Per Unit report will calculate the loading rate per acre of each land use for you.
13. Multiply the acres that you know are on your farm by the loading rates you calculated. A sample spreadsheet is available on CAST under How To>[User Documentation](#). Then click on “Getting Started” in the table of contents.

Q8. How can I use CAST to experiment with BMPs and see if they help me reach my pollutant reduction goals?

There are a number of ways to target reductions by location, load source and most effective, least expensive BMP. There is a webinar available on CAST under How To, [Webinars](#) that walks through these three methods. 📷 The webinar covers:

- To evaluate the best locations to target, add the same BMP to two different geographies and compare the results to determine the location with the greatest reduction.
- To determine the load source that carries the highest load, calculate the pounds per acre for each load source in your scenario, then sort to see the one that is highest.
- To select the most effective, least expensive BMP, use the spreadsheet that lists the cost per pound reduced for each BMP. This spreadsheet is on the [Develop a Plan](#) page on CAST's home page.

