Parcel Environmental Benefit Assessment Tool

User Guide

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How to download and open

1. Download the current version of the tool and base data from:
   https://z.umn.edu/pebat-download
   Note: because the tool includes all of the base data required to run it, the file is approximately 2.2 gb when compressed.

2. Extract the contents .zip file using windows explorer or a utility such as 7-zip. The uncompressed file requires approximately 12 gb of free space. Due to the complexity of the files, it may require more than 10 minutes to extract the file.

3. In the extracted folder, double click the file called 'Run'. The tool does not require installation.

The tool uses a portable version of python that contains all of the packages necessary to run the tool. It will not modify your computer or existing python environments. It is compatible with Microsoft Windows XP/7/8/10.

How to run

After clicking run, two windows should appear; a command window with a black background, and the user interface for the tool. The command window can be minimized and ignored, but not closed. The user interface for the tool looks like this:
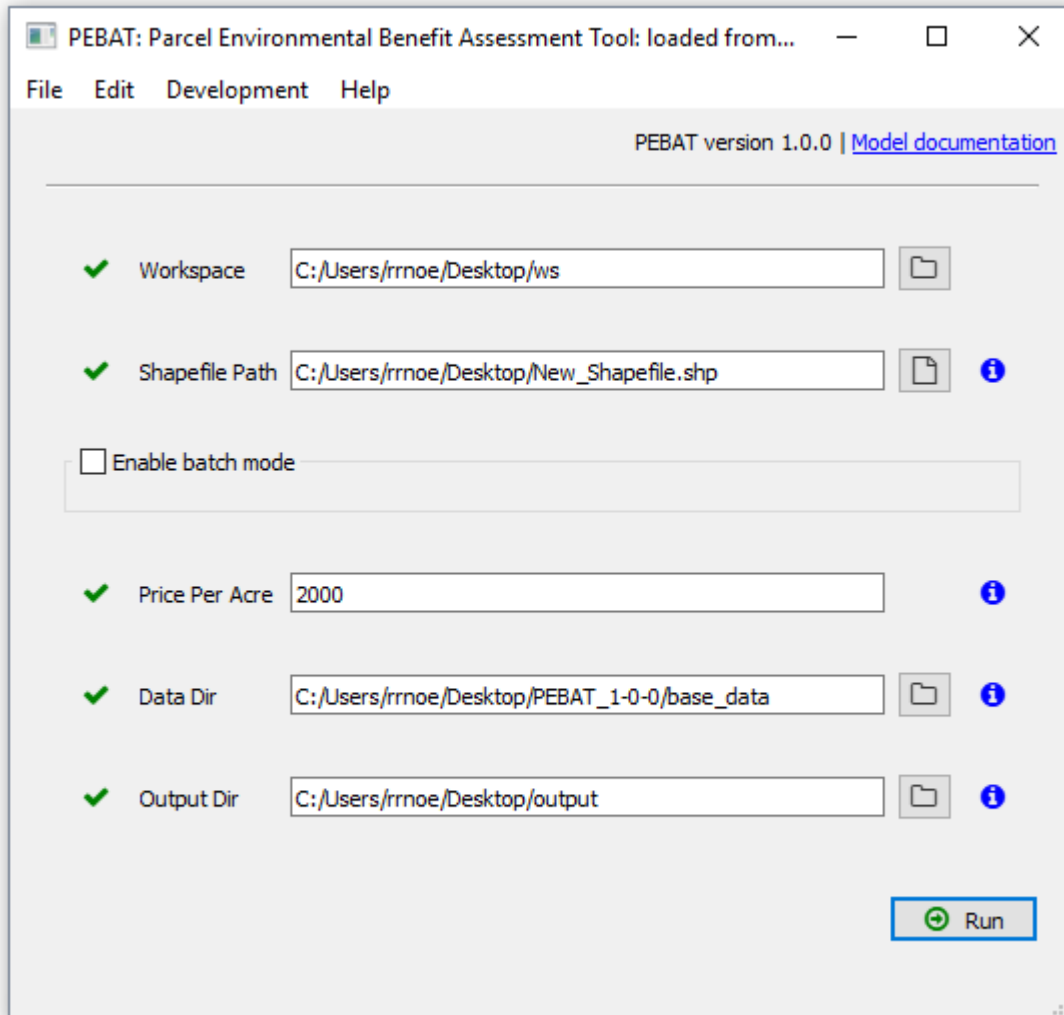
Workspace: Where temporary files the tool generates as it runs are stored. It can be any folder on your computer and can be deleted when complete. This can be left as the default value.

Shapefile Path: The path to the shapefile of your proposed parcel. Click the button to the right of this field to navigate to the file ending in .shp.

Note: if you see two files with the same name that both end in .shp, you likely have Window configured to not show file extensions. The correct one will say Type: SHP file when you hover over it with your mouse. The icon resembles a plain white page.
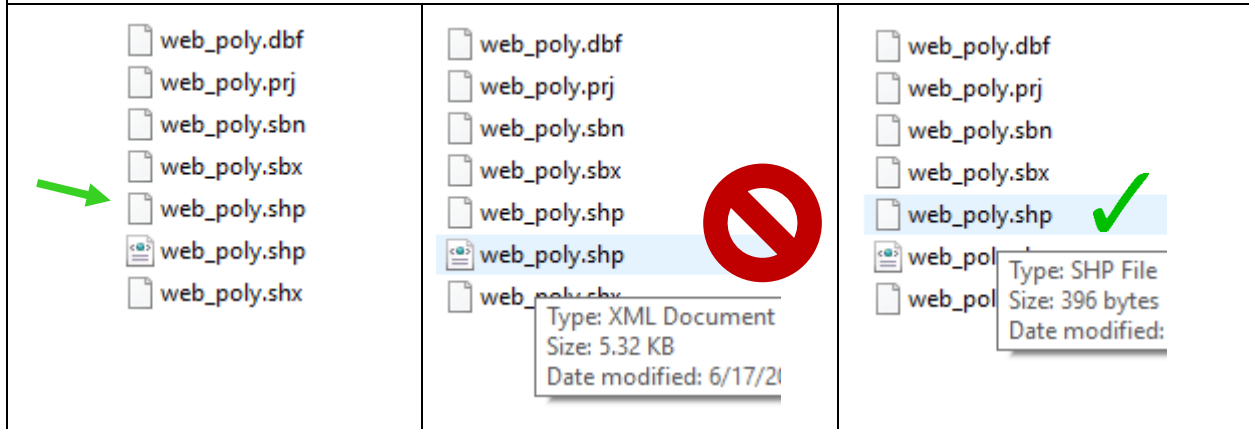
The shapefile coordinate system must be either UTM 15N or WGS 1984. The tool will calculate the average score of all of the features in the shapefile, *so ensure that only the feature(s) of the proposed acquisition are included*.

If you do not have a shapefile of the boundaries of your proposed parcel, see the 'Creating a shapefile' section for resources on the topic.

Enable Batch Mode: Check this box if you want to generate reports for multiple parcels. To use this mode, put all of the shapefiles–one proposed acquisition per file– into one folder and select that folder. *Shapefile Path* is ignored when batch mode is enabled. See the 'How to use batch mode' section for more information on scoring multiple parcels.

Price per acre: Divide estimated total cost of project (including closing costs) by the size of the acquisition in acres. This is compared to the total project cost per acre (including contributions by other organizations) of past LCCMR-funded easements.

Data Dir: The folder of base data that comes with the tool. This can be left as the default value unless you move the base data, or it is not found. In that case, navigate to the location of the base data and select the 'base_data' folder.

Output Dir: The folder where the reports will be saved. Select any folder you wish.

Creating a shapefile

Users familiar with GIS can use their preferred software to create a shapefile of the boundaries of a proposed acquisition. If the proposed acquisition is in a shapefile with other features, the feature(s) that represent the proposed acquisition should be selected and exported to their own shapefile. The preferred projection is UTM 15N, though WGS 1984 is accepted as well.

Users who do not wish to use GIS software can use the web service below to draw the boundaries of a proposed acquisition based on aerial imagery. This service is run by a third party and we cannot guarantee its availability.
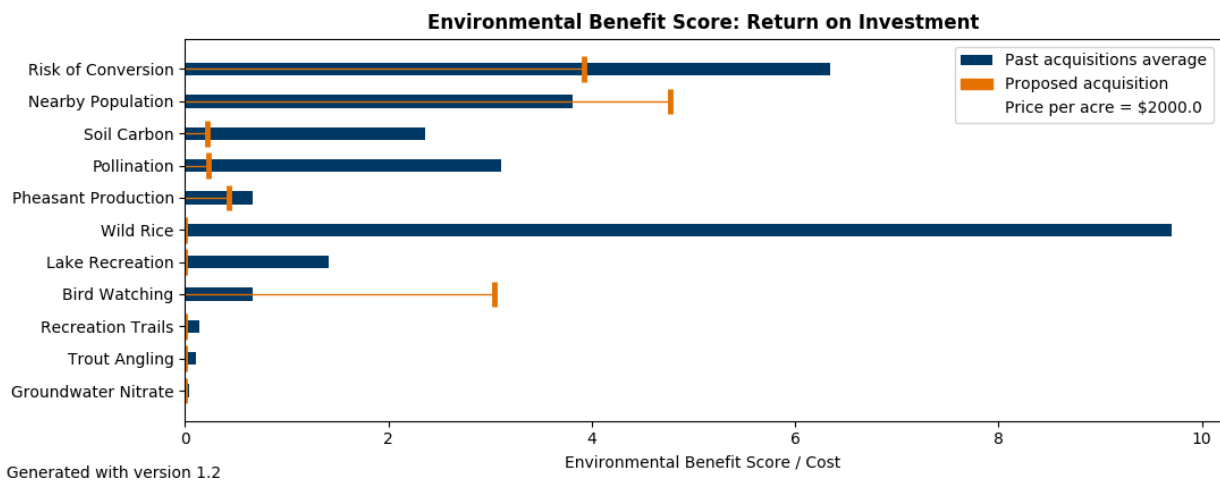
Click2shp

- Click the polygon icon in the upper right corner:
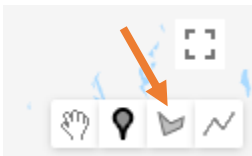
- Turn on satellite imagery with the button in the upper right corner.

- Navigate to the location of the parcel and add points around the outline until your polygon is complete by clicking the first point.

    o If you make a mistake, refreshing the page and starting over is the only way to correct it.

- Enter a filename in the field at the bottom of the page and click 'Generate Shapefile(s)'

- Extract resulting file

Interpreting the report

Comparisons of proposed parcel to all viable parcels

Environmental Benefit Score: Return on Investment
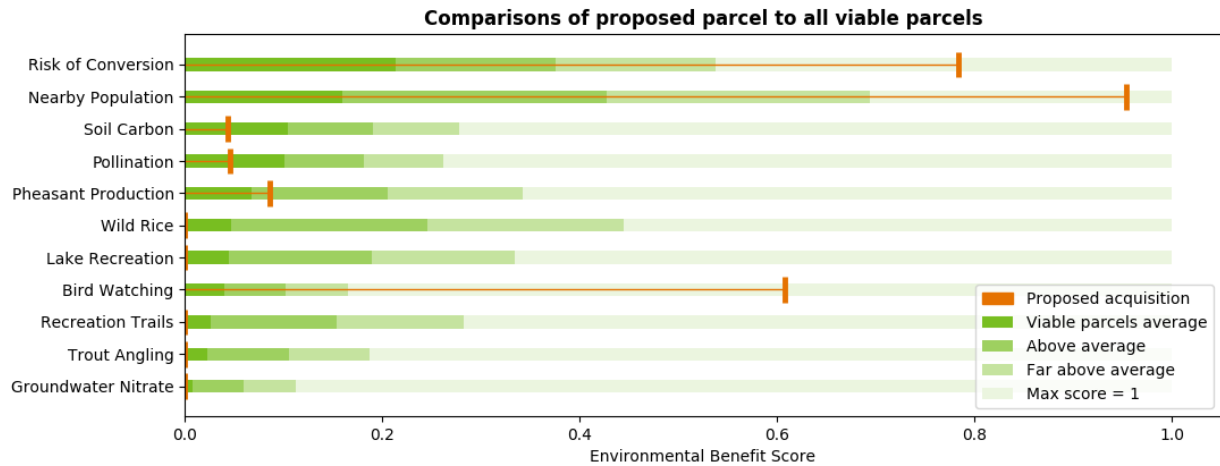
Generated with version 1.2

The top graph compares the benefits score for your parcel (orange bars) to the average benefits scores for other statewide parcels (green bars). The green bars show the statewide average and distribution of scores for each metric on a scale from 0 to 1, where 1 represents the highest scoring parcel in the state and 0 represents the lowest scoring parcel in the state (color variations represent the average plus one and two standard deviations).

Compare the difference between the score for your parcel of interest (orange bar) and the statewide average (green bars). For example, high scores for wild rice are more common than they are for groundwater nitrate. A score of 0.05 is very good for groundwater nitrate, but is below average for wild rice. Compare the length of the green and orange bars for each metric, rather than comparing one metric's score to another. See the documentation to learn more about how metrics were created and how their distributions vary.

The bottom graph compares your parcel of interest to parcels acquired through past LCCMR-funded easements. Here, scores are presented relative to their cost of acquisition (in price per acre). Use this figure to visualize the relative value of your parcel compared to past parcels (benefit per cost). The blue bars are fixed and represent the average return on investment (adjusted for inflation) of past LCCMR-funded easements. Compare your parcel (orange bar) to the blue bars to see how your parcel scores relative to past easements based on its potential return on investment. Note that higher values reflect a better value (more benefit per cost).

As above, compare the orange bar to the blue bar under it, rather than comparing the metrics to each other. Differences in the blue bars does *not* mean that the past acquisitions have been better for some metrics than others. The natural distribution of benefits throughout the state and the methods used to score them mean that scores for one metric are not comparable to another metric.

If a proposed parcel's return on investment is below average on all of the metrics, its asking price may be too high for the benefits it provides. This report is designed to give an overview of a broad suite of benefits for any parcel in the state and it should be considered in conjunction with local knowledge of a parcel's benefits. An easement should not be rejected solely because this tool scored it poorly, rather that should be a starting point for better understanding the perceived values of a parcel.

How to use batch mode

Users who wish to generate reports for many parcels may wish to use batch mode. Batch mode generates a report for every shapefile in a folder, and puts all of the parcel's scores into a .csv file. However, it is not possible to specify a different price per acre for each parcel. When batch mode is enabled, the 'Shapefile Path' field is ignored.

To prepare your data, ensure that each shapefile contains only one proposed acquisition. The proposed acquisition can have more than one feature in it (e.g. two parcels), but only if those features are being considered as part of the same acquisition. The report scores will represent the average environmental benefit scores of all of the land defined by a single shapefile. If you have a single shapefile with many features in it that you would like to score separately using batch mode, it is recommended you use a tool such as the ArcGIS 'Split by Attributes' tool to generate individual files for each feature.

Batch mode is primarily intended for users considering dozens or more acquisitions relative to one another. The .csv file can be used to quickly compare many parcels; however, it does not include comparisons to all viable parcels or past acquisitions that can be found in the .pdf report. As with other reports generated by the tool, scores from different metrics should not be combined or compared.