

Dose Response Calculator for ArcGIS

Installation Instructions

1. Download the archive file "DS631_DoseResponseCalculator.zip" to your computer.
2. In a selected folder (for example, "C:\Tools"), unzip the downloaded file "ds631_DoseResponseCalculator.zip." This will create a directory ("ds631_DoseResponseCalculator") containing a collection of files and folders.
3. You can now safely delete the zip file.
4. At this point, you can use the toolbox in any ArcGIS desktop application using standard functionality.

For your convenience, step-by-step instructions are provided below for adding the toolbox to ArcGIS 10. For more details and information about managing toolboxes within ArcGIS, see the ArcGIS online help article "Adding and Removing Toolboxes."

5. Display the Toolbox window.

From the running application's main menu, select "Geoprocessing -> ArcToolbox." This should display the ArcToolbox window within the application window. If you have already activated the ArcToolbox tab you should click the tab to expand the ArcToolbox window.

6. Add "Dose Response Calculator.tbx" to the application.

In the ArcToolbox window, right-click "ArcToolbox" and select "Add Toolbox" from the context menu that appears. Browse in the resulting dialog box to your folder ("C:\Tools\ds631_DoseResponseCalculator") and select the file "Dose Response Calculator.tbx" Click the "Open" button.

This tool was built on top of standard functionality included in ArcGIS Desktop 10.0 running at the ArcView license level and requires a license for the ArcGIS Spatial Analyst extension. ArcGIS is a commercial GIS software system produced by ESRI, Inc. (<http://www.esri.com>). The Dose-Response Calculator for ArcGIS is not supported by ESRI, Inc. or its technical support staff.

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Usage

You can access the tool the same way standard ArcGIS tools are used: by double-clicking on the name of the tool, or right clicking the tool to access its properties or documentation. The tool uses two raster input datasets representing a predicted response variable and a dose (explanatory) variable (fig. 1). The user must select these two datasets, specify an output folder, an output table name, a multiplier to convert the dose raster dataset into meaningful integer-formatted segments, and select whether to produce a graph output or not. A derived integer-formatted dose raster file is stored in the “IntegerDoseVariable” folder within the Output Folder. Outputs include a table which contains summary statistics for the response variable at levels of the dose variable and if selected a JPEG image of a graph representing the response variable mean (± 1 SD) versus the dose variable (fig. 2). Output tabular data can be used to create custom graphs in a graphics package of choice.

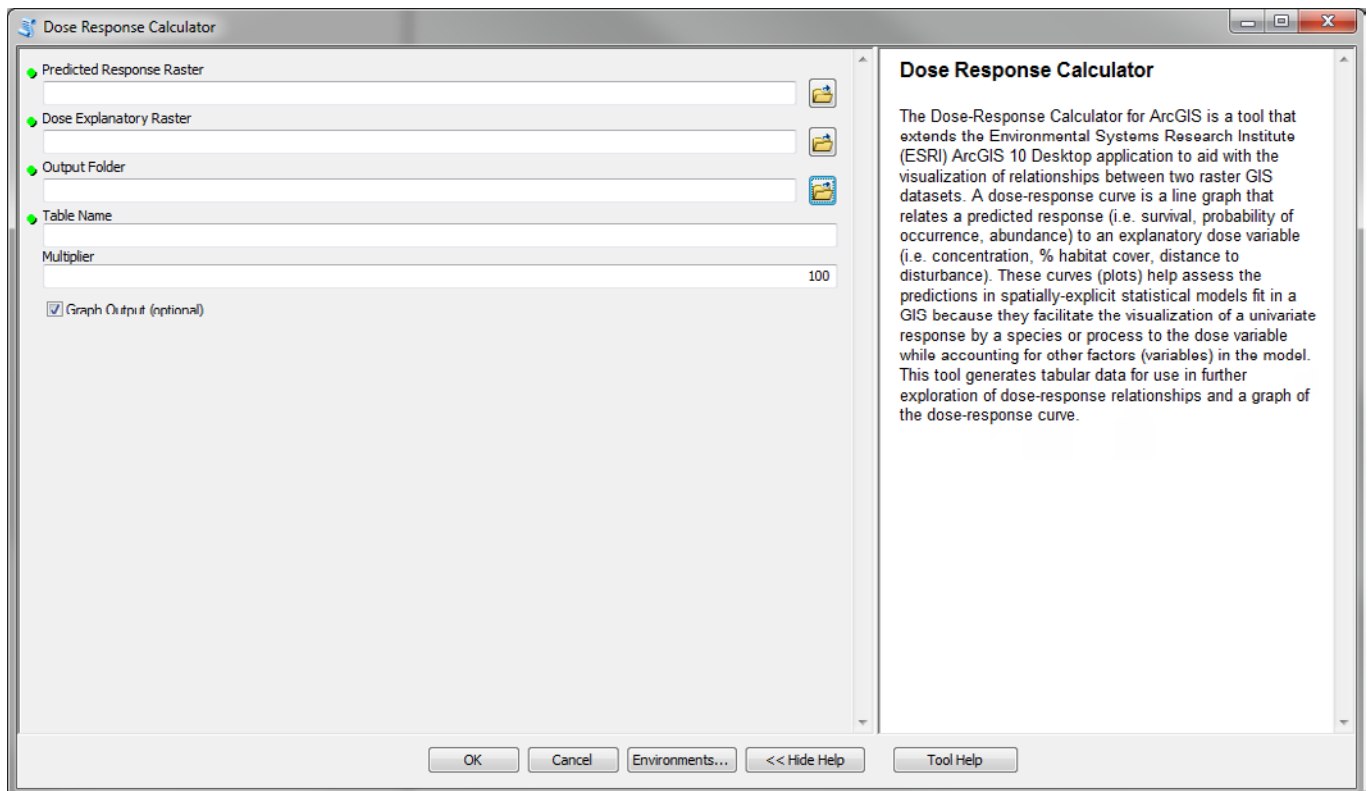


Figure 1. Arc Toolbox interface for the Dose Response Calculator for ArcGIS.

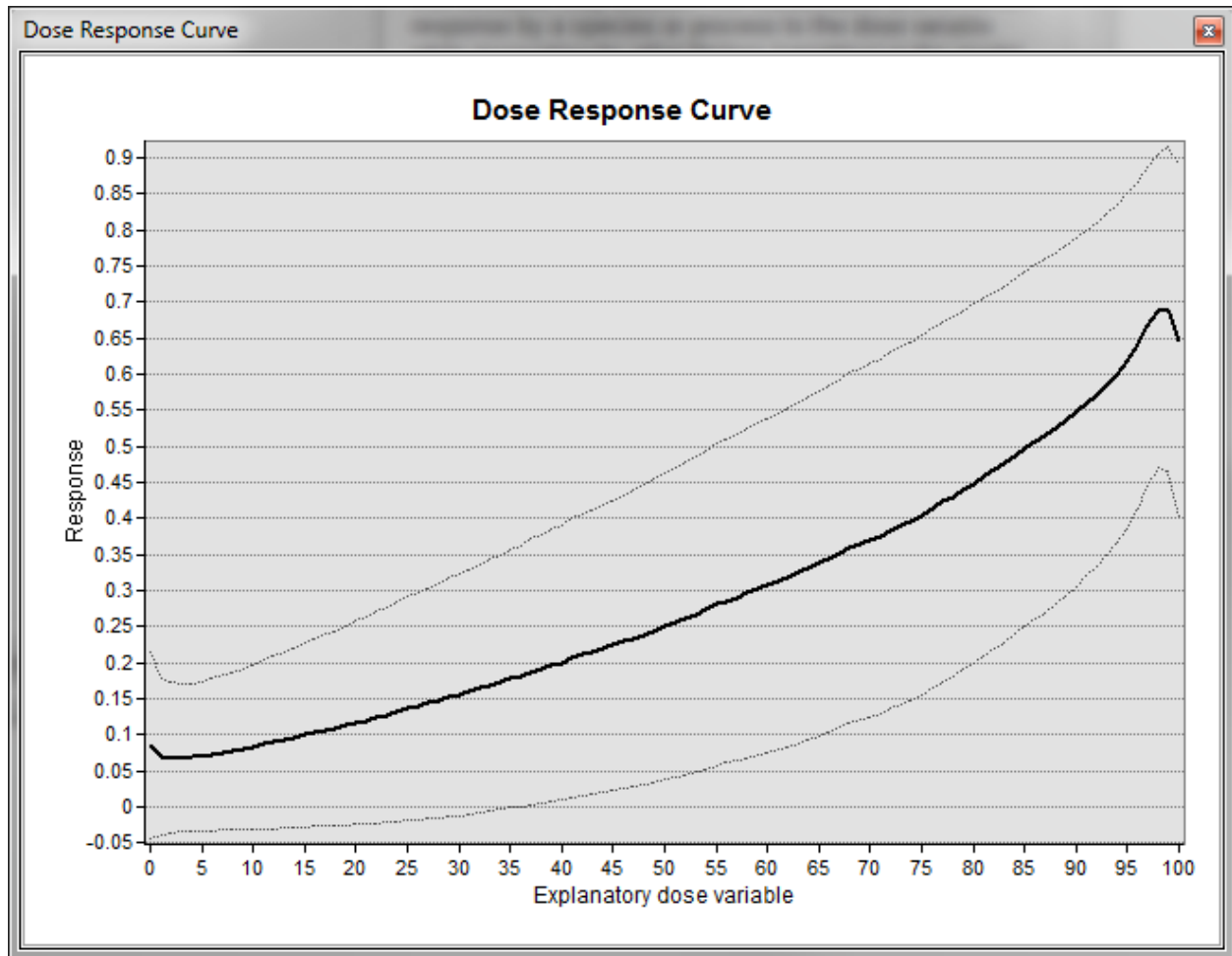


Figure 2. Graph output developed using the Dose Response Calculator for ArcGIS relating probability of occurrence (Response) to the percent of a habitat type in the surrounding area (Explanatory dose variable).

Example

The Dose-Response Calculator for ArcGIS can be used to visualize the relationship between two environmental variables such as elevation (m) and annual mean maximum temperatures (C). Elevation was selected as the dose explanatory variable and temperature as the response variable. An output folder (C:/Temp) and output table name (elev_tmax) were specified. A multiplier of 0.01 was used to convert the elevation raster from the original 1m thematic resolution to 100 m elevation segments for summarization purposes (fig. 3). The output graph displays that as elevation increases mean annual maximum temperature decreases.

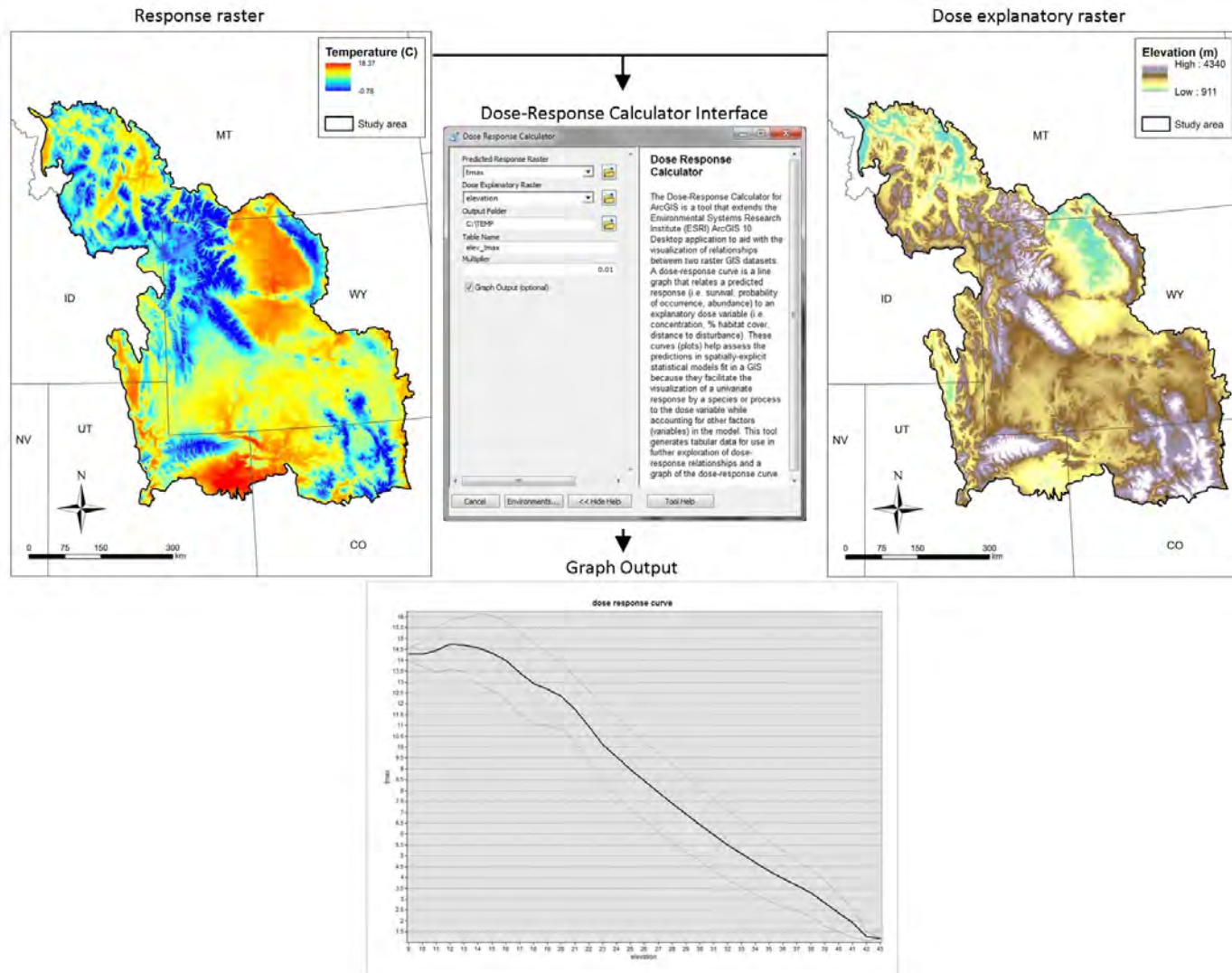


Figure 3. Example application using the Dose-Response Calculator to visualize the relationship between elevation and mean annual maximum temperature.