Energy Zones Mapping Tool
Help Manual
Energy Zones Mapping Tool Manual

Registering for, and Launching the Mapping Tool

1) In order to use the Energy Zones Mapping Tool, you must create a login, which uses your email address and a password. Your activities within the mapping tool will be saved to your account so that your work can continue from one session to the next. From the Home Page, clicking on Login or the Launch Tool icon will bring you to a banner containing the Department of Energy terms and conditions notice. After you have read and agreed to the terms and conditions, click on the I Agree button to continue.

2) Clicking the I Agree button will lead you to the Login page. To register for the tool, click on the Register link in the bottom left-hand corner of the screen.

3) On the Registration page, fill out the information pertaining to your name, organization, and state. Your e-mail address and password will be used as your login information. There are two options at the bottom of the page. By leaving the box next to the User Community page option unchecked, you agree to have your first name, last name, organization, and state listed on the User Community page. If your organization is not already in the Organization list, choose “Other (Enter below)” from the bottom of the drop-down list, and enter your organization in the Other organization box. By leaving the box checked next to the e-mail notification option,
you agree that you would like to be e-mailed occasionally when significant changes are made to the site. After you have completed the registration information, click on Register at the bottom of the page. **You will receive an e-mail confirmation message.** Use the link in that message to confirm your e-mail address, and you will receive a second e-mail when your registration is complete.

4) When your registration is complete, return to the Login page, enter your e-mail and password, and click Login. This will lead you to the “Terms and Conditions” page of the mapping tool.

5) Either accept the terms by clicking Accept Terms or reject the terms by clicking Reject terms and log out. Clicking on Accept Terms will either launch the mapping Tool (if you originally clicked the Launch Tool icon) or will take you back to the home page (if you originally clicked Login) where you can now click the Launch Tool icon (Launch Tool).

6) When the mapping tool launches, a splash screen appears with links to training videos and a link to this document. The check box in the lower left corner controls whether the splash screen will be displayed in later sessions, and it can be accessed at any time by clicking Help at the top right of the page.
Understanding the Default Layout

Launching the mapping tool will open a new tab or browser window with the default layout of the mapping tool.

- The panel on the left side of the screen contains the **Main Menu** and **Map Contents**.
- The **Main Menu** contains the Library, Areas, Corridors, Analyze, and Results icons.
  - The Library icon ( ) is used to add new map layers or model layers to the map Contents dialog (see [Adding Map Layers](#) and [Adding Model Layers](#)).
  - The Areas icon ( ) is used to create analysis areas (see [Creating an Analysis Area](#)).
  - The Corridors icon ( ) is used to run corridor suitability models and generate corridors (see [Creating a Corridor](#) and [Generating Corridor Routes](#)).
  - The Analyze icon ( ) is used to run models or reports (see [Running a Model](#) or [Running a Report](#)).
  - The Results icon ( ) is used to view model and report results (see [Running a Model](#) or [Running a Report](#)).
- The **Map Contents** panel controls the layers displayed on the map.
Layers

The default map only shows analysis area and corridor overlays and base map choices, but over 270 mapping layers are available in the tool. All other layers are added by using the icons in the Main Menu panel.

Adding Map Layers

1) Click the Library icon ( ) in the upper left corner of the Main Menu.

2) A dialog opens, displaying all of the layers contained in the Map Layer Catalog. Click on the plus (+) next to a layer name to display the abstract, publication date, and last date the layer was updated.

3) Place the cursor over a heading (Title, Category, Source, or Resource) and a down arrow appears to the right of the heading name. Click the down arrow to sort or filter the list. The Category and Resource columns list all possible options to sort by. Click the filters that you wish to use. The Title and Source columns allow you to choose a filter term. Place the cursor over Filters and type a word in the box that appears. You can remove the filters by unchecking the boxes at the bottom of the dialog.

4) Click the Map icon ( ) to add a layer to the map. It will also be listed in the Overlays section of the Map Contents dialog.
5) If you would like to see the metadata for a particular layer, click on the PDF icon next to the layer name. A PDF will open containing the metadata for that layer.

6) If you would like to download the layer for local use, click on the Download data icon. A zip file with the GIS files for that layer will be downloaded.

Adding Model Layers

1) If you are interested in viewing the screening layers for a particular model, click the Library icon in the upper left corner of the Main Menu.

2) In the Mapping Library dialog, click the Model Layer Catalog tab. Click on the plus (+) next to a layer name to display the abstract, publication date, and last date the layer was updated.

3) There are two ways to filter the modeling layers in the Model Layer Catalog. The Filter by Model dropdown displays only the modeling layers for the selected model. You can also place the cursor over a heading (Title, Category, or Resource) and a down arrow appears to the right of the heading name. Click the down arrow to sort or filter the list. The Category and Resource columns list all possible options to sort by. Click the filters that you wish to use. The Title column allows you to choose a filter term. Place the cursor over Filters and type a word in the box that appears. You can remove the filters by unchecking the boxes at the bottom of the dialog.
4) Click the Map icon ( ) to add the layer to the map.

5) The selected layer is added to the Map Contents panel.

Removing Layers

- To remove a layer from the map but keep it in the Map Contents panel, uncheck its box.
- To remove a layer from the map and the Map Contents panel, right-click the layer name and then click Remove layer ( red circle with white minus sign). This does not permanently remove the layer from the application, but only from your Map Contents panel. To add the layer again at a later time, repeat the steps listed in the Adding Map Layers and Adding Model Layers sections above.
## Using the Map Tools

The map tools are located at the top of the map and allow you to navigate the map.

<table>
<thead>
<tr>
<th>Tool</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Zoom to Max Extent</strong></td>
<td>Click to display the map at its maximum extent (i.e., zoom out as far as possible).</td>
</tr>
<tr>
<td><strong>Zoom by Dragging</strong></td>
<td>When active, click or click-and-drag on the map to zoom to the selected area. Click the icon again to stop zooming.</td>
</tr>
<tr>
<td><strong>Zoom In</strong></td>
<td>Click to zoom in one level on the map.</td>
</tr>
<tr>
<td><strong>Zoom Out</strong></td>
<td>Click to zoom out one level on the map.</td>
</tr>
<tr>
<td><strong>Identify</strong></td>
<td>When active, click a feature on the map to retrieve more information about that specific feature. If there is more than one layer or feature at the click point, the information for each one will be listed in the results. Click the Identify tool icon again to stop using it.</td>
</tr>
<tr>
<td><strong>Zoom to Previous Extent</strong></td>
<td>Return to the previous zoom level/view.</td>
</tr>
<tr>
<td><strong>Zoom to Next Extent</strong></td>
<td>Go to the next zoom level/view (after going to Previous Extent).</td>
</tr>
<tr>
<td><strong>Measure</strong></td>
<td>Click the black down arrow, choose Length or Area, then click the map to draw a polygon to measure. Click once to draw each point on the line (Length) or polygon (Area). To complete the polygon, double click. Click the Measure tool again to stop measuring.</td>
</tr>
<tr>
<td><strong>Print</strong></td>
<td>Click the print icon to create a PDF file of the layers currently displayed on the map. (Note: Only the Open StreetMap base map option will include the base map in the PDF file.)</td>
</tr>
</tbody>
</table>
### Map Navigation

<table>
<thead>
<tr>
<th>Control</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pan Controls</td>
<td>Use the pan controls to pan the map up and down, left and right.</td>
</tr>
<tr>
<td>Zoom In</td>
<td>Click to zoom in one level.</td>
</tr>
<tr>
<td>Zoom Out</td>
<td>Click to zoom out one level.</td>
</tr>
<tr>
<td>Zoom Slider</td>
<td>Click and drag the slider to zoom in (up) and out (down).</td>
</tr>
</tbody>
</table>

### Creating an Analysis Area

1) Click the Areas icon (_areas_) in the Main Menu panel. The Analysis Areas dialog opens.

2) Click the New Analysis Area icon (New Analysis Area)

3) Add an analysis area to the map by clicking the mouse once for each point and double-clicking to complete the analysis area. Then the Analysis Area dialog will open to assign a name and notes for the analysis area.

4) Click Save. The analysis area will be listed in the Analysis Areas dialog. To display the analysis area on the map, click the box next to My Analysis Areas in the Overlays section of the Map Contents panel. A shaded region will then appear on your map. The analysis area can now be chosen in the Choose Region drop down when you run a report (see Running a Report for instructions).

5) There are several actions to choose in the Actions column of the Analysis Area dialog.
   - The Show/Hide Area icon (Show/Hide Area) controls whether individual analysis areas are shown on the map.
   - The Magnifying Glass icon (Magnifying Glass) zooms the map to the analysis area.
   - The Report icon (Report) runs a report on that analysis area (see Running a Report).
- The Edit icon (_modify) allows the name and notes for analysis area
s  to be edited, and also copy and revise the copies on the map.
- The Delete icon (_delete) permanently deletes the analysis area.

**Corridor Routing**

1) Click the Corridors icon (Corridors) in the Main Menu
   panel. The Corridor Tools dialog opens.

2) Click on the Suitability Models tab. Corridor suitability
   models are used to score how suitable each location
   on the map is for a corridor, based on many siting
   factors. Each available siting factor is represented by
   a screening layer in the models. You can choose an existing corridor suitability model, create one from scratch,
   or modify an existing model.

3) Click on the run model icon (run) to carefully inspect the default suitability models. These default models are
   just starting points and it’s very important to tailor the siting factors to your unique situation. Model
   parameters can be adjusted using the steps in the Running a Model section.

4) To create your corridor, click on the New Corridor icon (New Corridor). Select Draw to draw a corridor with
   multiple segments or Generate from end points to create a corridor in one segment.

5) Add a corridor centerline to the map by clicking the mouse once for each point and double-clicking the last point
   to complete the centerline. Then the New Corridor dialog will open to assign a width, name, suitability surface,
   quality, and notes for the corridor. The quality can either be Draft (low resolution, faster) or Final (high
   resolution, slower).

6) Click Save. View the status of your corridor run by clicking on the
   Results icon. The new corridor will be added to the My Corridors tab of
   the Corridor Tools dialog when complete. From this window, you can
   run reports if you’re interested in more detailed information about the
   corridor.

7) You can repeat this same process to analyze different routing strategies
   by using different corridor suitability model settings. The result of this
   process is macro corridors which are the first step in a more detailed
   study of potential corridor routes.

8) There are several actions to choose in the Actions column of the Corridor Tool dialog.
   - The Show/Hide Area icon (show/hide) controls whether individual corridors are shown on the map.
   - The Magnifying Glass icon (magnify) zooms the map to the corridor.
   - The Report icon (report) runs a report on that corridor (see Running a Report).
- The Edit icon allows the name and notes for corridors to be edited, and also copy and revise the copies on the map (see Copying and Revising Corridors).
- The Delete icon permanently deletes the corridor.

**Copying and Revising Analysis Areas**

In some cases it is useful to copy and revise an analysis area to investigate alternate extents. For example, if a potential issue is found within an analysis area, an adjustment might avoid the issue.

1) Click the Areas icon in the Main Menu panel. The Analysis Areas dialog opens.

2) Click the Edit icon for the analysis area to be copied and revised.

3) The Analysis Area dialog will open, with Copy button added.

4) Clicking Copy displays the instructional dialog shown below. Click OK.

5) Until you click Save in the main dialog, you can change the name and notes and edit the analysis area boundary on the map. On the map, edit handles are shown at each point making up the analysis area. Click and drag these handles to move them. Midway between each point are lighter handles. Clicking and dragging these handles adds a new point to the shape. To delete a point, hold down the mouse button over a handle and hit the Delete key. Click Save when you are finished making changes.

The image below shows an example of an analysis area being revised.
Copying and Revising Corridors
In some cases it is useful to copy and revise a corridor to investigate alternate extents. For example, if a potential issue is found along a corridor route, an adjustment to the centerline or width might avoid the issue.

1) Click the Corridors icon ( ) in the Main Menu panel. The Corridor Tools dialog opens.

2) Click the Copy and Modify icon ( ) for the corridor to be copied and revised. The instructional dialog shown below will appear. Click OK.

3) The New Corridor dialog will open.

4) Until you click Save in the main dialog, you can change the name and notes, change the width of the corridor, and edit corridor centerline on the map. On the map, edit handles are shown at each point making up the corridor centerline. Click and drag these handles to move them. Midway between each point are lighter
handles. Clicking and dragging these handles adds a new point to the shape. To delete a point, hold down the mouse button over a handle and hit the Delete key. Click **Save** when you are finished making changes.

The image below shows an example of a corridor being revised.

![Example Corridor](image)

### Running a Model

1) Click the **Analyze** icon (bolt) in the **Main Menu** panel to open the **Analyze – Run Models and Reports** dialog. All of the available models are listed in the **Models** section of the dialog. Click on the plus (+) next to a model name to display a description of that model.

![Analyze - Run Models and Reports](image)

2) Click on the **Run Model** icon (gear) to the left of a model name to open the **Model Launcher**.

![Model Launcher](image)

3) The default screening layers and weights are displayed in the **Model Launcher** dialog. These settings are based on the recommendations of subject-matter experts familiar with the technology being modeled, but should be reviewed and revised by individual users to meet their analysis goals and assumptions. If desired, adjust the

---

13
relative weights given to each screening layer by increasing or decreasing the numbers to the left of the layer names from 1 to 10, with 1 meaning that the layer should be given the smallest possible influence on the model and 10 meaning that the layer should be given the highest possible influence on the model. You can also remove a screening layer from the model run by clicking the Remove Layer icon ( )

4) Additional screening layers can be added to the model run by clicking the down arrow next to Add Layers(s) To Model Run and clicking the Add layer icon ( ) next to the layer name.

5) To inspect or adjust the suitability values within a screening layer, click on the Edit Suitability Settings icon ( ) to the left of the layer name. The Suitability Adjustment dialog opens. To adjust suitability values for one of the ranges in a screening layer, type a value or use the arrows. Suitability values range from 0 (unsuitable) to 100 (most suitable). Click Save if you have made changes you want to keep, or Cancel, to return to the Model Launcher dialog.

6) If you would like to view a screening layer listed in the Model Launcher dialog on the map, you can add it using the Model Layer Catalog (see Adding Model Layers).

7) Change the default name of the model and add any notes about the model run by typing in the boxes at the bottom of the Model Launcher dialog.

8) Choose to either run a draft model or a final model by selecting the quality at the bottom of the window. Draft models are run at a lower resolution and will not take as long to run. This can be used to test different models before a final, more detailed model is run.

9) Check the box at the bottom of the dialog to add the model to the map after the model run has completed.

10) When you have finished customizing the model run, click Launch. You can view the status of your model run by clicking on the Results icon ( ). The Analysis Results dialog will open. The status will be displayed as an hourglass while the model is running and a check mark when the model is complete.

The Analysis Results dialog also lists default versions of each model as System runs. You can add these model results to the map and view them without having to run the model.
11) There are several actions to choose in the Actions column of the Analysis Results dialog.

- The Add Results icon ( ) allows you to add model results to the Map Contents panel, and the map.
- The Report icon ( ) runs a model results report on that model. See the example report below.
- The Modify Model icon ( ) opens up the Model Launcher dialog with the model settings saved. The settings can be revised and run as a new model.
- The Edit icon ( ) allows you to edit the name and notes for personal model runs.
- The Delete icon ( ) allows you to permanently delete personal model runs.
The Model Results Report is very useful for understanding the results of any suitability model for an analysis area and documenting the specific layers and settings that were used in the model. It displays results for the composite model output and each model input layer. The first graph shows the mean and total range of suitability values in the model output and each input layer for the analysis extent for which it was run. In this example, the overall output in the analysis area was not very suitable (mean of approximately 35) and ranged from unsuitable (0) to about 80. Contributions to the score of each input can be rapidly assessed. Those with higher means were generally more favorable (such as population density), and those with lower means (such as transmission proximity and wind turbine gross capacity factor) were generally less favorable. With one of the most important factors of wind turbine gross capacity factor being unsuitable to marginally suitable for this location, it is doubtful that this region would be advantageous for siting wind turbines.
Advanced Modeling Features

Designing a Model from Scratch

1) Click the Analyze icon (.executeQuery) in the Main Menu panel. The Analyze – Run Models and Reports dialog opens.

2) Click on Create New Model underneath the models section. The Model Launcher dialog opens.

3) Screening layers can be added to the model by clicking the down arrow next to Add Layers(s) To Model Run and clicking the Add layer icon (.executeQuery) next to the layer name.

4) If desired, adjust the relative weights given to each screening layer by increasing or decreasing the numbers to the left of the layer names from 1 to 10, with 1 meaning that the layer should be given the smallest possible influence on the model and 10 meaning that the layer should be given the highest possible influence on the model. You can also remove a screening layer from the model run by clicking the Remove Layer icon (getQuery) .

5) Change the default name of the model and add any notes about the model run by typing in the boxes at the bottom of the Model Launcher dialog.
6) Choose to either run a draft model or a final model by selecting the quality at the bottom of the window. Draft models are run at a lower resolution and will not take as long to run. This can be used to test different models before a final, more detailed model is run.

7) Check the box at the bottom of the dialog to add the model to the map after the model run has completed. Click Launch. You can view the status of your model run by clicking on the Results icon (Results). The Analysis Results dialog will open. The status will be displayed as an hourglass while the model is running and a check mark when the model is complete.

8) There are several actions to choose in the Actions column of the Analysis Results dialog.
   - The Add Results icon (Add Results) allows you to add model results to the Map Contents panel, and the map.
   - The Report icon (Report) runs a model results report on that model.
   - The Modify Model icon (Modify Model) opens up the Model Launcher dialog with the model settings saved. The settings can be revised and run as a new model.
   - The Edit icon (Edit) allows you to edit the name and notes for model runs.
   - The Delete icon (Delete) allows you to permanently delete model runs.
1) Click the Analyze icon ( ) in the Main Menu panel. The Analyze – Run Models and Reports dialog opens. All of the available reports are listed in the Reports section of the dialog. Click on the plus (+) next to a report name to display a description of that report.

2) Select a report by clicking on the Run Report icon ( ) to the left of the report name. The Report Run Launcher dialog opens.

   Note: The Corridor report can only be run for corridors.

3) In the Region section of the Report Run Launcher dialog, use the Type drop-down menu to choose whether to run a report on an analysis area, corridor, state, or county. Then use the subsequent drop-down menu to select the specific choice within that group that you would like to run your report on.

4) Contents of the Parameters section vary, depending on the report. For the report shown, two buffer distances can be specified around the analysis area.

5) You can change the default name of the report and add any notes about the report by typing in the boxes at the bottom the Report Run Launcher dialog.

6) When you have finished customizing your report run, click Launch Report. You can view the status of your report run by clicking on the Results icon ( ). The Analysis Results dialog will open. The status will be displayed as an hourglass while the report is running, and a check mark when the report is complete.
7) There are several actions to choose in the Actions column of the Analysis Results dialog.

- The Display Report icon ( dissemination) allows you to view your report in a new browser tab. See the example Electrical Transmission Report below. The report can be saved or printed using standard browser functions.
- The Edit icon ( edit) allows you to edit the name and notes for your report.
- The Delete icon ( delete) allows you to permanently delete your report.

Exiting the Mapping Tool

To exit the mapping tool, simply close the browser window or tab, or click Logout in the upper right hand corner of the screen. Your layers in your Map Contents panel as well as your model runs and reports are saved as you work and can be accessed the next time you log in to the mapping tool.