Exercise 2: Identify solar energy potential

How can I print an exercise to PDF format?

Technical note

The geoprocessing tools that are used in this exercise are only available in ArcGIS Pro 3.2. To complete the exercise in ArcGIS Pro, you will need to upgrade your version of ArcGIS Pro to 3.2.

Software requirements

- ArcGIS Online
- ArcGIS Pro 3.2
- ArcGIS Spatial Analyst extension

Introduction

Finding climate solutions that reduce and eliminate greenhouse gas emissions is the key to minimizing the impacts of climate change now and in the future.

Electricity production accounts for about 25 percent of the greenhouse gases that are emitted globally. One important mitigation effort is finding alternative ways to produce electricity from clean energy sources, like solar power, to reduce greenhouse gas emissions.

Solar energy has recently been proven to be the least costly option for new electricity generation in many countries. Rooftop solar on residential and commercial buildings is one of the fastest growing clean-energy sources as a result of growing policy support, decreased solar panel costs, and recent improvements in photovoltaic (PV) technology. PV technology is what is used to convert sunlight into electricity.

The Solar Radiation toolset in ArcGIS Pro allows you to map and analyze the effects of the sun over a study area for specific time periods. You can use this toolset to model how much solar radiation a geographic area produces over the course of a set time, allowing you to find ideal locations to install solar panels to create clean energy that then helps reduce greenhouse gas emissions. ArcGIS Pro 3.2 introduces two new solar radiation analysis tools: the Raster Solar Radiation tool and the Feature Solar Radiation tool.

Scenario

Imagine that you work for the Department of Energy and Environment for Washington, D.C., in the United States. A leading strategy for your department is to use rooftop solar energy to achieve the goals laid out in the Sustainable D.C. initiative for the district. You are focusing on the goal of increasing the proportion of energy that is sourced from both clean and renewable supplies.

You will use ArcGIS Pro to identify the solar energy potential of buildings in the Glover Park neighborhood of Washington, D.C. Calculating the solar energy potential could help the department identify the best candidates for solar panels in the neighborhood and then discuss solar panel incentives with building owners.

Note: The exercises in this course include View Result links. Click these links to confirm that your results match what is expected.

Estimated completion time in minutes: 90 minutes

Expand all steps | Collapse all steps

- Step 1: Download the exercise data files

In this step, you will download the exercise data files for the solar energy potential exercise.

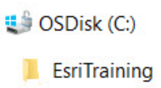
a Open a new web browser tab or window.

b Go to the CLIM Section 2: Solar Energy Potential item page.

Note: The complete URL for the exercise data file is https://www.arcgis.com/home/item.html?id=d7f3680dc39f4df1a10b34ad324c2fae.

c On the right, click Download to download the exercise data ZIP file.

d In File Explorer, extract the ZIP exercise data files to the EsriTraining folder on your local computer.



*Step 1d***: Download the exercise data files.*

Note: Remember that, throughout this course, you will save all your data to this folder. There should not be any spaces or special characters in the folder name.

e After you extract the ZIP file, confirm that the data files are stored in the SolarEnergyPotential folder.

f Close File Explorer.

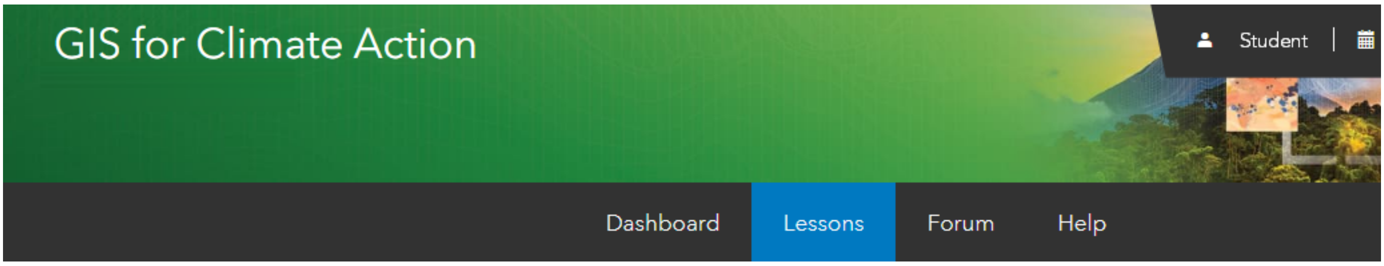
You have downloaded and extracted the exercise data files that you will need to complete the exercise.

- Step 2: Locate your course account to install ArcGIS Pro

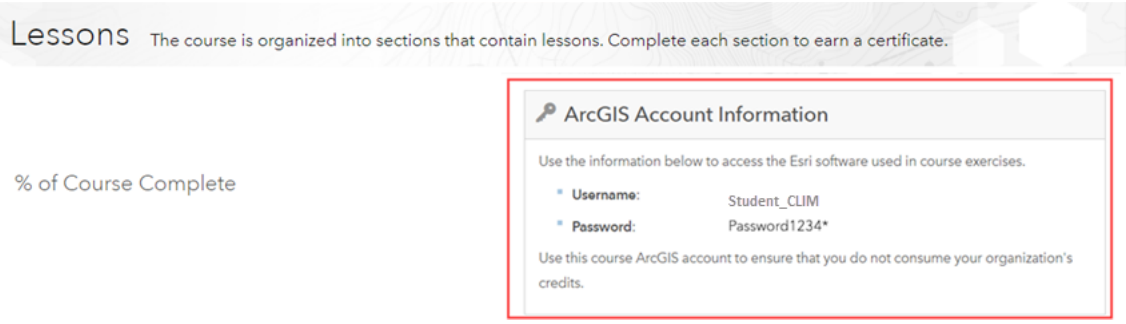
In this step, you will visit the MOOC home page to locate your course ArcGIS account username and password. Then, if necessary, you will install ArcGIS Pro 3.2 from ArcGIS Online.

Note: **If you already have ArcGIS Pro installed, skip this step and proceed to the next step, *Update to ArcGIS Pro 3.2*, to update ArcGIS Pro to the most recent version of 3.2.**

a On the MOOC home page, click the Lessons tab.



b Under Lessons, locate your ArcGIS account information.



You will use your course ArcGIS account username and password to download ArcGIS Pro and complete all the MOOC exercises. The username for your account ends with **_CLIM** (for example, Student_CLIM). You may want to write down this username and password for quick reference; otherwise, you can return to the Lessons tab at any time to locate your credentials.

Note: If you registered in the last few hours, your account may not be ready. Refresh the page in an about an hour to see whether your account information is available.

c Open a new web browser in private or incognito mode.

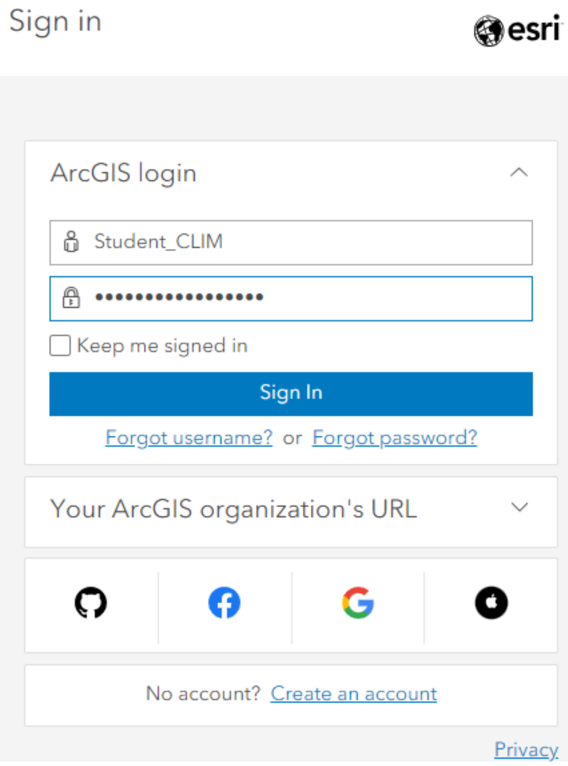
Note: To learn how to enable private browsing, go to How to Enable Private Browsing on Any Web Browser.

d In the address bar, type **www.arcgis.com** and press Enter.

*Step 2d***: Locate your course account to install ArcGIS Pro.*

e Click Sign In.

f Under ArcGIS Login, copy and paste or type your course ArcGIS username and password.

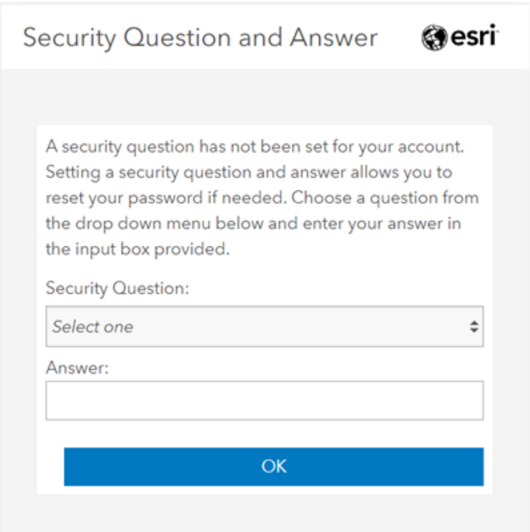


*Step 2f***: Locate your course account to install ArcGIS Pro.*

g Click Sign In.

The first time that you sign in, you may be asked to change your password and set a security question.

h If necessary, follow the on-screen instructions to change your password and set your security question.

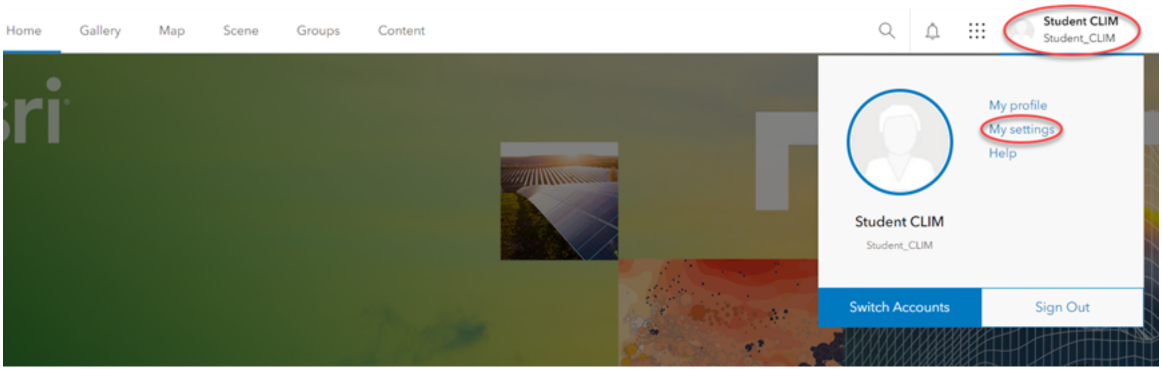


*Step 2h***: Locate your course account to install ArcGIS Pro.*

Note: An automated email will be sent to the email address that is associated with your account, telling you that your account was recently modified. No action is required.

After the sign-in process is complete, you will see the home page of the MOOC organization.

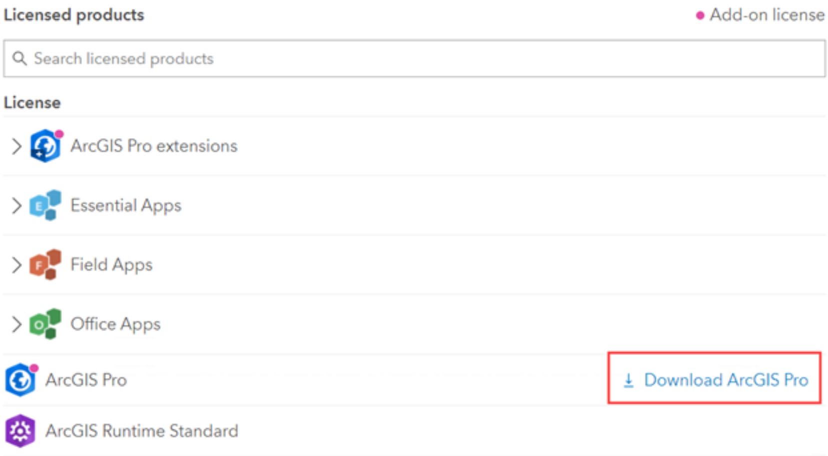
i In the top-right corner, click your account username, and then click My Settings, as indicated in the following graphic.



j On the left side of the My Settings page, click the Licenses tab.

k Under Licensed Products, locate ArcGIS Pro.

l To the right of the software name, click Download ArcGIS Pro, as indicated in the following graphic.



The Download ArcGIS Pro window opens.

m In the Download ArcGIS Pro window, verify that (Version 3.2) is selected.

Note: To run ArcGIS Pro in a different language, click the English (Version 3.2) down arrow and choose your preferred supported language. Keep in mind that this course is taught in English, which means that all screenshots and exercises use the English version of ArcGIS Pro.

n Click Download.

If the default download location does not have enough space, you can change the location by following the steps in How to Change the File Download Location in Your Browser.

o After the download completes, double-click the .exe file.

p Follow the installation instructions, accepting all defaults.

q After you are finished installing ArcGIS Pro, close the incognito web browser window.

You have located your course ArcGIS account and installed ArcGIS Pro 3.2.

- Step 3: Update to ArcGIS Pro 3.2

This step will guide you in updating ArcGIS Pro to version 3.2 if you already have ArcGIS Pro installed on your computer.

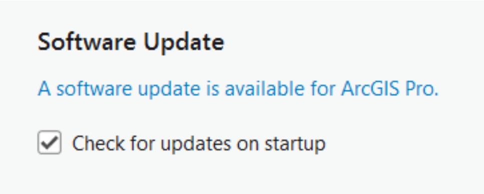
Note: **If you do NOT have ArcGIS Pro installed yet, see the previous step, *Locate your course account to install ArcGIS Pro* .**

a Start ArcGIS Pro.

b If necessary, sign in using your course ArcGIS account username (ending in _CLIM) and password.

c On the left, click Settings.

d Click the About tab and locate Software Update.



*Step 3d***: Update to ArcGIS Pro 3.2.*

e Under Software Update, click Download Now.

f Follow the steps to update ArcGIS Pro to version 3.2.

You have updated ArcGIS Pro to the most current version of 3.2.

- Step 4: Open an ArcGIS Pro project

In this step, you will open the ArcGIS Pro project that you downloaded.

a Start ArcGIS Pro.

b If necessary, sign in using your course ArcGIS account username (ending in _CLIM) and password.

c On the Start page, near Recent Projects, click Open Another Project.

Note: If you have configured ArcGIS Pro to start without a project template or with a default project, you will not see the Start page. On the Project tab, click Open, and then click Open Another Project.

d In the Open Project dialog box, browse to the SolarEnergyPotential folder that you saved on your computer.

- Hint

C:\EsriTraining\SolarEnergyPotential

e Click Solar_In_Glover.aprx to select it, and then click OK.

*Step 4e***: Open an ArcGIS Pro project.*

The map opens, showing the neighborhood of Glover Park in Washington, D.C. The project contains two layers: a digital surface model (DSM) and a Building_Footprints layer.

Raster layers are made up of pixels, or cells, that are organized as a grid, where each cell contains a value representing information. A DSM is a raster layer that shows the elevation of the ground and the features on the ground, such as buildings and trees. The DSM layer represents the neighborhood of Glover Park as a digital surface model.

f In the Contents pane, turn on the Building_Footprints layer.

- Hint

To the left of the Building_Footprints layer, check the box to turn on the layer.

The Building_Footprints layer is a vector, or feature, layer made up of polygons, with each polygon representing an individual building in Glover Park.

g Turn off the Building_Footprints layer.

You have opened the project that you will use to complete your solar radiation analysis of Glover Park.

- Step 5: Run the Raster Solar Radiation tool

The Raster Solar Radiation tool calculates the incoming solar radiation for every raster cell of a DSM.

In this step, you will run the Raster Solar Radiation tool on the DSM layer of Glover Park.

a If necessary, open the Geoprocessing pane.

- Hint

  On the ribbon, click the Analysis tab, and then in the Geoprocessing group, click Tools.

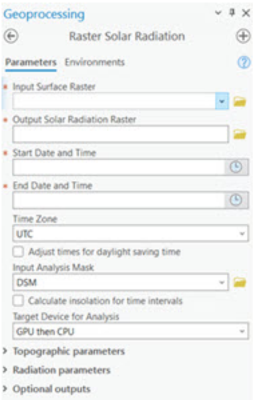
b In the Geoprocessing pane, click the Toolboxes tab.

c Expand Spatial Analyst Tools, and then expand Solar Radiation.

In ArcGIS Pro, tools are organized into toolboxes and toolsets that contain similar tools that are grouped together. The Solar Radiation toolset contains tools that are needed for solar radiation analyses.

You will open the Raster Solar Radiation tool.

d Double-click Raster Solar Radiation.



*Step 5d***: Run the Raster Solar Radiation tool.*

You will set the parameters that are needed to run the tool using the DSM layer as your Input Surface Raster.

e For Input Surface Raster, click the down arrow and choose DSM.

f For Output Solar Radiation Raster, leave the default name.

The tool allows you to set start and end dates and times that consider time zones and daylight saving time. This function allows the tool to calculate the amount of solar radiation that an area will generate over the course of a year based on the sun's positioning throughout the year. You will set the entire year of 2023.

g For Start Date And Time, type **1/1/2023 12:00:01 AM** to set your start date to January 1, 2023.

h For End Date And Time, type **12/31/2023 11:59:59 PM** to set your end date to December 31, 2023.

Washington, D.C., is located in the US Eastern Standard Time zone and uses daylight saving time during a portion of the year.

i For Time Zone, choose US Eastern Standard Time.

j For Adjust Times For Daylight Saving Time, check the box to turn the option on.

k For Input Analysis Mask, choose Building_Footprints.

The Raster Solar Radiation tool can be used to run a solar radiation analysis on an entire raster layer, or you can use a mask—a means of limiting your analysis to a specific area of the raster layer. By using the Building_Footprints layer as the Input Analysis Mask, the tool will only create an output for the buildings and not the entire DSM layer.

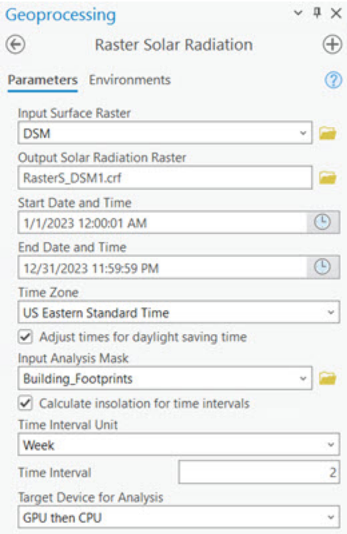
Now you will select the time interval for the tool. The time interval option generates multiple radiation, or insolation, values that are calculated for your specified time interval. The interval that you select will affect the tool's processing time; to reduce processing time but generate time intervals, you will select two weeks as your time interval.

l For Calculate Insolation For Time Intervals, check the box to turn the option on.

m For Time Interval Unit, choose Week.

n For Time Interval, confirm that 2 is set.

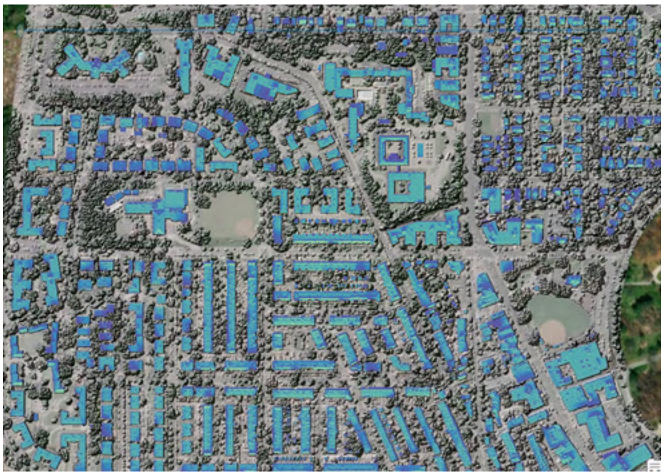
o Leave all other defaults.



*Step 5o***: Run the Raster Solar Radiation tool.*

After setting the tool parameters, you are ready to run the tool.

p Click Run.



*Step 5p***: Run the Raster Solar Radiation tool.*

Note: It may take several minutes for the tool to run.

A new layer is added to your map, showing the results of your solar radiation analysis. The output of the tool provides you with the amount of solar radiation for each cell in the raster layer in units of kilowatt hours per square meter (kWh/m^2); therefore, you would have to complete postprocessing steps to get the total and average solar radiation for a specified area in a raster layer, such as a building rooftop. The layer is symbolized to show areas that receive the most solar radiation in red and the least solar radiation in blue. However, the results are being shown as the solar radiation value average for the entire year.

q Save your project.

You have used the Raster Solar Radiation tool on the DSM layer to run a solar radiation analysis that calculates solar energy potential for building rooftops in Glover Park.

- **Step 6: Review the raster results**

The Raster Solar Radiation tool provides a few ways to explore the results of your analysis. The results can be explored by visualizing the amount of solar radiation over time using the time slider and by reviewing a chart that displays the change in solar radiation over time for the masked DSM layer.

In this step, you will review the results of the Raster Solar Radiation tool, which will allow you to see the aggregate results of the entire DSM layer of Glover Park.

A time slider was added to the top of the map when you ran the Raster Solar Radiation tool. Using the time slider, you can see the amount of solar radiation that a building receives during a set interval. First, you will adjust the settings for the time slider to show the results by month, starting with January 1, 2023.

a On the ribbon, click the Time tab.

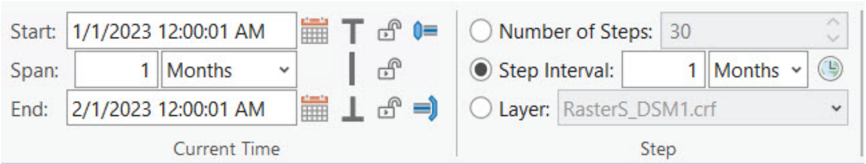
b In the Current Time group, set Start to **1/1/2023 12:00:01 AM**.

c Set Span to 1 Month.

- Hint

To the right of Span, type **1**, and then click the down arrow and choose Months.

d In the Step group, set the Step Interval to 1 Months.



*Step 6d***: Review the raster results.*

You adjusted the settings for the time slider so that you can animate the change in solar radiation per month. You will now visualize the change over time.

e In the Playback group, click the Play All Steps button .

Note: You can click the Play All Steps button again to rewatch the time visualization on your map. You can also adjust the speed of your animation using the Slower Faster bar in the Playback group.

? During which months do the building roofs show the highest amount of solar radiation?

- Answer

The summer months in Washington, D.C., of May, June, July, and August show the roofs receiving the highest amounts of solar radiation, which is due to the position of the sun over Washington, D.C., during these months.

After visualizing the amount of solar radiation over time using the time slider, you want to see the amount of solar radiation generated so that you can identify ideal locations for solar panels. You can do this by viewing a temporal profile chart. The temporal profile visualizes the distribution of solar radiation over time.

You will use a bookmark to zoom to an area on the map to view the temporal profile.

f On the ribbon, click the Map tab, and then in the Navigate group, click Bookmarks and choose the Temporal Profile bookmark.

You will open the Temporal Profile chart.

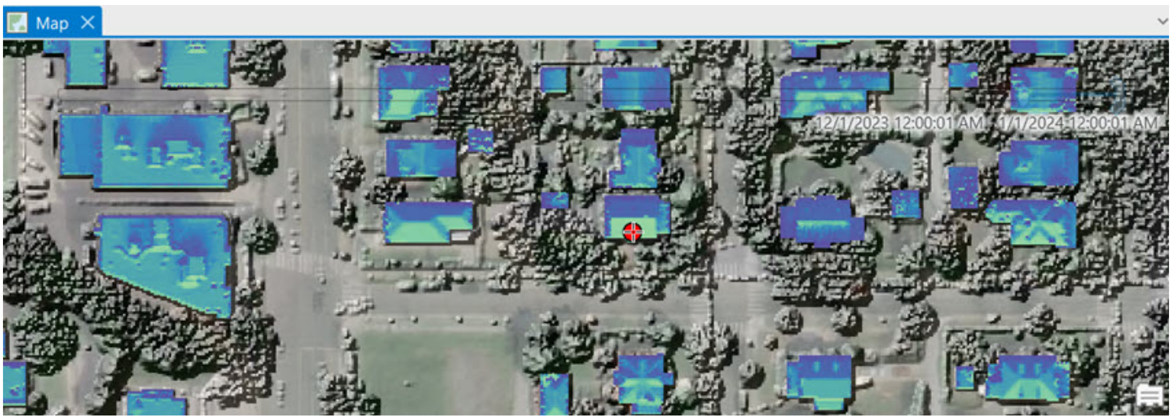
g In the Contents pane, click the RasterS_DSM1.crf layer to select it, if necessary.

h On the ribbon, click the Multidimensional tab, and then in the Analysis group, click Temporal Profile.

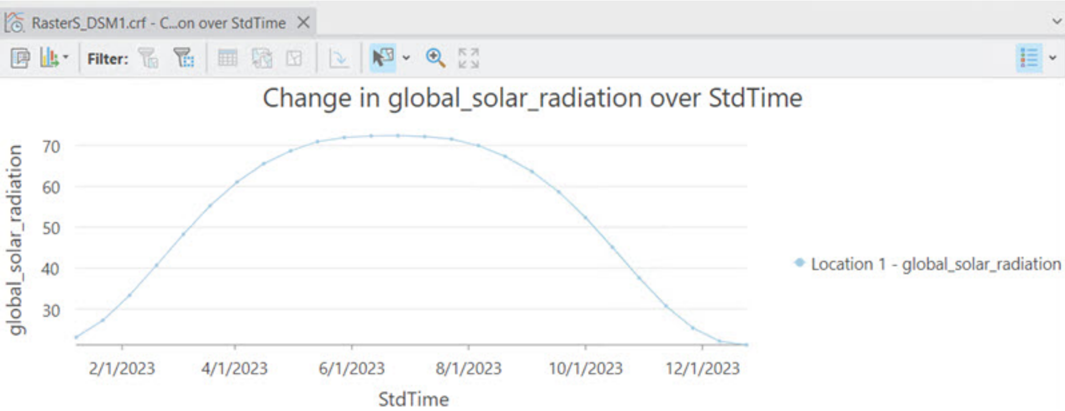
To view the temporal profile graph, you need to select a point or area on the map. You can select multiple points or areas on the graph to compare their temporal profile.

i In the Chart Properties pane, under Define An Area Of Interest, click the Point button .

j Drag your mouse over the lighter color of the roof, as shown in the following graphic.



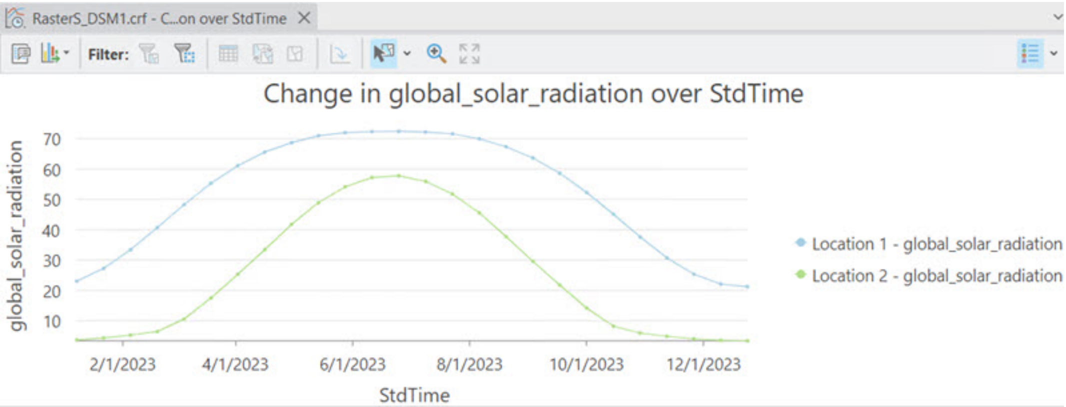
k Click the rooftop to place the point on the map.



*Step 6k***: Review the raster results.*

When you place a point on the map, the temporal profile chart is generated using the data for the point.

l Add a second point to the dark blue area of any roof on the map.



*Step 6l***: Review the raster results.*

The chart shows that the point of the first location generates more solar radiation over the course of the year than if placed on a darker blue area of a roof. Being able to identify the amount of solar radiation that a rooftop can generate over the course of a year and also the best location on a rooftop to place solar panels allow for the best utilization of solar panels. Typically, in the Northern Hemisphere, houses that have south-facing roofs and are clear of trees will generate the most solar radiation and be the best candidates for solar panels. However, with this tool, you can quantify the amount of solar radiation per raster cell.

m Close the chart and save your project.

You have reviewed the results of the Raster Solar Radiation tool. You can use this information to identify the best candidates for solar panels in the neighborhood and then contact building owners about solar panel incentives.

- Step 7: Run the Feature Solar Radiation tool

In a previous step, you used the Raster Solar Radiation tool. The other solar radiation analysis tool is the Feature Solar Radiation tool, which uses data from feature layers to calculate the solar radiation of points or polygon features. You can run the Feature Solar Radiation tool on many polygons at once, using their attribute information for the feature parameters, or you can select a feature and run an analysis on only the selected feature.

In this step, you will run the Feature Solar Radiation tool on one selected feature in the Building_Footprints layer. The Building_Footprints layer contains polygon features for each of the buildings in the neighborhood.

a In the Contents pane, turn off the RasterS_DSM1.crf and DSM layers and turn on the Building_Footprints layer.

b Zoom to the Commercial Feature bookmark.

- Hint

  On the ribbon, from the Map tab, in the Navigate group, click Bookmarks and choose Commercial Feature.

c In the Geoprocessing pane, click the Back button, if necessary, and then search for and open the **Feature Solar Radiation** tool.

You will run the tool on a large commercial building to understand its solar energy potential. To run the tool on only one building, you need to first select the building. When a layer has a selection, geoprocessing tools in ArcGIS Pro will honor that selection.

d On the ribbon, from the Map tab, in the Selection group, click Select.

e Click the building that is highlighted in the following graphic.

To run the Feature Solar Radiation tool, you need an input elevation surface raster so that the tool can identify the elevation of the polygon features of your Building_Footprints layer; you will use the DSM layer of Glover Park.

f In the Feature Solar Radiation tool, set the following parameters:

- For Input Surface Raster, choose DSM.
- For Input Point Or Polygon Features, choose Building_Footprints.
- For Unique ID Field, leave the default.
- For Output Table, leave the default.

This tool also allows you to set start and end dates and times that consider time zones and daylight savings. As mentioned earlier, Washington, D.C., is located in the US Eastern Standard Time zone and uses daylight saving time for a portion of the year. You will set the entire year of 2023.

g For Start Date And Time, set the start date to January 1, 2023, at 12:00:01 AM.

h For End Date And Time, set the end date to December 31, 2023, at 11:59:59 PM.

- Hint

- For Start Date And Time, type **1/1/2023 12:00:01 AM** to set your start date to January 1, 2023.
- For End Date And Time, type **12/31/2023 11:59:59 PM** to set your end date to December 31, 2023.

i For Time Zone, choose US Eastern Standard Time.

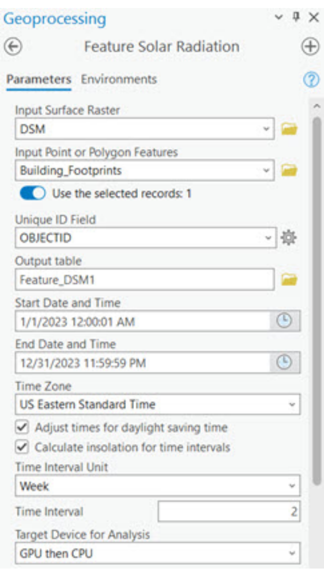
j For Adjust Times For Daylight Saving Time, check the box to turn on the option.

You will set the same two-week time interval for this tool.

k For Calculate Insolation For Time Intervals, check the box to turn on the option.

l For Time Interval Unit, choose Week.

m For Time Interval, confirm that 2 is set.



*Step 7m***: Run the Feature Solar Radiation tool.*

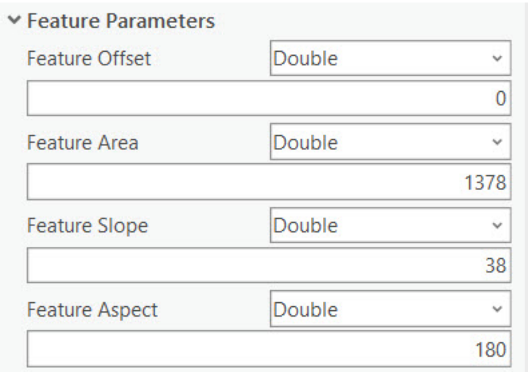
The Feature Solar Radiation tool allows you to use the attributes in a vector layer to specify feature parameters. If your data does not include this type of attribute information, you can specify the feature parameters manually. Below is an explanation of each parameter:

- The offset is the height, or elevation, of the solar panels.
- The area is the amount of area of a rooftop that you will use for solar panels. If you do not specify an area amount, it will use the total area of the polygon as the input. The building that you are using measures about 2,757 square meters and you want to cover about 50 percent of the roof with solar panels, so your area will be 1,378 square meters.
- The slope is the incline at which the solar panels will be installed; it can either be the slope of the roof or the slope that the solar panels will be installed at. Slope is expressed in degrees from 0 to 90. Typically, the ideal slope, or angle, for a solar panel installation is close to or equal to the latitude of the building, which in this case is about 38 degrees. You can view the latitude at the bottom of your map.
- Aspect is the direction that the solar panels will be facing; it is also expressed in degrees from 0 to 360, where 0 degrees is north, 90 is east, 180 is south, and 270 is west. In the Northern Hemisphere, south-facing solar panels will typically receive the most amount of direct sunlight.

You will fill out the feature parameters.

n In the Feature Solar Radiation tool, expand the Feature Parameters section, and then set the following parameters:

- For Feature Offset, leave the default value because the DSM layer is specifying the height of the building.
- For Feature Area, type **1378**.
- For Feature Slope, type **38**.
- For Feature Aspect, type **180**.



*Step 7n***: Run the Feature Solar Radiation tool.*

o Click Run.

The result of the tool is a table called Feature_DSM1 that is added to the Contents pane. The table provides the total and average amount of solar radiation that the selected polygon feature generates during each time interval that you set.

In this step, you ran the Feature Solar Radiation tool on a selected feature in the Building_Footprints layer.

- Step 8: Review the feature results

By default, the Feature Solar Radiation tool output is a table. Alternatively, by enabling an optional parameter in the tool, you could generate an output layer created by joining the output table to the input feature class. This option is beneficial when comparing multiple features, or in this case, buildings.

In this step, you will review the results of the Feature Solar Radiation tool. You only ran the analysis on one feature, so you will use the default output table of the tool to explore the results.

a In the Contents pane, open the Feature_DSM1 table.

- Hint

Right-click the Feature_DSM1 table and choose Open.

Feature_DSM1

Field: Add Calculate Selection: Select By Attributes Zoom To Switch Clear Delete Copy

	OBJECTID *	OBJECTID_	global_tot	global_ave	str_time	direct_tot	direct_ave	diff_tot	diff_ave	dir_dur
1	1	1103	29516.2	21.4196	1/1/2023 12:00:01 AM	24134.08	17.51384	5382.841	3.906271	108.7013
2	2	1103	34996.3	25.39645	1/15/2023 12:00:01 AM	28676.99	20.81059	6319.274	4.58583	113.3063
3	3	1103	43061.87	31.24954	1/29/2023 12:00:01 AM	35365.61	25.66445	7695.727	5.584707	120.6638
4	4	1103	52794.78	38.31261	2/12/2023 12:00:01 AM	43417.72	31.50778	9375.796	6.803916	128.3087
5	5	1103	63009.89	45.72561	2/26/2023 12:00:01 AM	51804.74	37.59415	11201.89	8.129095	136.9692
6	6	1103	72569.75	52.6631	3/12/2023 12:00:01 AM	59545.39	43.21146	13026.67	9.453314	144.6352
7	7	1103	80667.46	58.53952	3/26/2023 1:00:01 AM	65921.71	47.83869	14741.36	10.69765	151.9607
8	8	1103	86860.11	63.03346	4/9/2023 1:00:01 AM	70591.46	51.22747	16266.52	11.80444	158.6545
9	9	1103	91078.27	66.09454	4/23/2023 1:00:01 AM	73524.73	53.35611	17551.79	12.73715	163.7291
10	10	1103	93638.41	67.9524	5/7/2023 1:00:01 AM	75075.43	54.48145	18563.91	13.47163	168.3463

*Step 8a***: Review the feature results.*

The table displays the values for each of the two-week intervals that you specified in the tool. The table provides the total and average amount of solar radiation that the selected polygon feature generates during each time interval. The total values are measured in kilowatt hours (KWh), and the average values are measured in kilowatt hours per square meter (KWh/m^2).

To understand how your data fluctuates over time, you can use the table to create a line chart.

b Close the table.

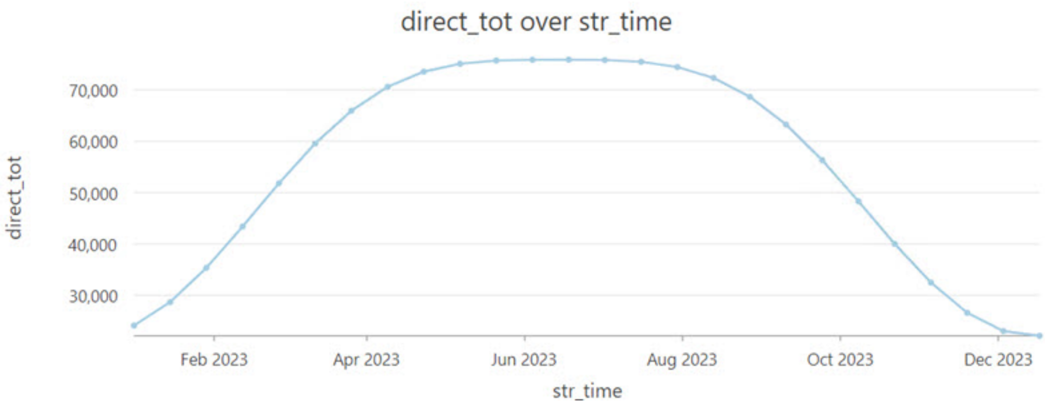
c Right-click Feature_DSM1, point to Create Chart, and choose Line Chart.

An empty chart opens. You will select the variables to include in your chart to show the total solar radiation throughout the year, split into two-week intervals.

d In the Chart Properties pane, for Date Or Number, click the down arrow and choose Str_Time.

e For Aggregation, choose <None>.

f Under Numeric Field(s), click Select, check Direct_Tot to select the total solar radiation of the building's rooftop, and then click Apply.



*Step 8f***: Review the feature results.*

The chart displays a line graph of the total amount of solar radiation that the selected building will generate during each two-week interval. If you place your mouse over a point on the line graph, you can see the total amount of solar radiation generated during that two-week interval in KWh. The line graph also shows that the months from April to August—the spring and summer months in Glover Park—will generate the most solar energy.

g Close the chart and save your project.

In this step, you quickly calculated the total and average amount of solar energy potential for a selected building. Using specific feature parameters gives you a clear understanding of how much clean energy a building could generate from solar power. You can use this information to help decision makers quantify the benefits of switching to solar power.

- Step 9: Share your results to ArcGIS Online

Your analysis showed solar radiation of buildings in Glover Park for 2023. You want to share your results from ArcGIS Pro to ArcGIS Online as a time-enabled web map. The Department of Energy and Environment for Washington, D.C., encourages collaboration among colleagues through ArcGIS Online, so you have been asked to share your work to your ArcGIS Online organization.

In this step, you will prepare your web map in ArcGIS Pro to share it as a time-enabled web map.

First, you will set up your map to show the time-enabled raster layer that you created.

a On the ribbon, from the Map tab, in the Selection group, click Clear to clear the building selection.

b In the Contents pane, turn off the Building_Footprints layer and turn on the RasterS_DSM1.crf layer.

c Zoom to the RasterS_DSM1.crf layer.

- Hint

  Right-click the RasterS_DSM1.crf layer and choose Zoom To Layer.

You are ready to share your time-enabled map to ArcGIS Online.

d Save your project.

e On the ribbon, click the Share tab, and then, in the Share As group, click Web Map.

f In the Share As Web Map pane, specify the following information for the item details:

- For Name, type **Solar Energy Potential_<your first and last name>**.
- For Summary, type **A time-enabled web map of annual solar energy potential for buildings in Glover Park, Washington, D.C.**
- For Tags, type **Solar energy, Time enabled, Climate change**.
- For Select A Configuration, leave the default.
- For Folder, leave the default.
- For Share With, check the box for Everyone.

Filling out the item details with as much information as possible is a best practice when sharing content to ArcGIS Online.

g Click Analyze.

Three errors appear; these errors are mainly addressing that the coordinate system that the scene is projected to has to be updated before sharing to ArcGIS Online. You will resolve the errors before sharing.

h Right-click the 00230 error and choose Update Map To Use Basemap's Coordinate System.

i Click Analyze.

j Right-click the 00374 error and choose Auto-Assign IDs Sequentially.

Note: You can also use the General tab in the Map Properties dialog box to enable the Allow Assignment Of Unique Numeric IDs For Sharing Web Layers option. Enabling this option before sharing your web layer would also resolve this type of error when sharing a web map from ArcGIS Pro to ArcGIS Online.

You have resolved all the errors.

k Click Share.

Note: It may take a few minutes to share your time enabled web map.

l Save your project, and then exit ArcGIS Pro.

You have shared your time-enabled web map to ArcGIS Online.

In this exercise, you used two different geoprocessing tools to identify the solar energy potential for buildings in the Glover Park neighborhood of Washington, D.C. Switching to clean energy sources, such as solar, is a powerful approach to mitigating greenhouse gas emissions.