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How to Create an Oriented Imagery Catalog (OIC)

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This document applies to Oriented Imagery Version 1.1.1 Oriented Imagery and associated tools are currently provided as a prototype and for testing only. The functionality has not been exhaustively tested and is not currently covered under ArcGIS Support. Please address questions or suggestions related to this workflow to GeoNet or to ImageManagementWorkflows@esri.com.

Tutorial: How to Create an Oriented Imagery Catalog (OIC)

This tutorial requires ArcGIS Pro 2.3. If you don't have ArcGIS Pro 2.3, get a free 21-day trial.

In this tutorial, you have a collection of street-level inspection images of the Esri campus that you'd like to visualize on a map. Before you can view them in ArcGIS Pro, you need to manage them in an oriented imagery catalog (OIC). You have a list of the image locations; the actual images are stored in the cloud in a public Amazon S3 bucket. You'll use the Oriented Imagery geoprocessing tools to create an OIC to reference the inspection images and their metadata, which you can then use to visualize and explore your imagery.

Before you get started, make sure you've done the following:

1. Install the Oriented Imagery add-in for ArcGIS Pro
2. Install the Oriented Imagery management geoprocessing tools

Set up your ArcGIS Pro project

1. Start ArcGIS Pro. If necessary, sign in with your ArcGIS Online or ArcGIS Enterprise credentials.
2. Select **Map** under the **Blank Templates** list to create a new project with the Map template. In the **Name** box, type **OICtutorial** and click **OK**.
3. The project opens with the World Topographic basemap already in the display. Click the **Insert** tab on the ribbon above the map view. Click **Toolbox > Add Toolbox** and navigate to the location where you downloaded the Oriented Imagery GP tools: C:\Image_Mgmt_Workflows\OrientedImagery\GPTool\ManageOrientedImagery.pyt. Select `ManageOrientedImagery.pyt` and click **OK**.
4. From the **Catalog** pane, expand **Toolboxes**, then expand the `ManageOrientedImagery.pyt` toolbox you just added. You'll see a list of tools for creating and managing OICs.

Create an empty oriented imagery catalog (OIC)

5. Under the ManageOrientedImagery toolbox, double-click the **Create Oriented Imagery Catalog** geoprocessing tool. Complete the dialog with the following values (leave the other defaults):

Parameter	Value
Catalog Name*	EsriRedlandsCampus
Output Geodatabase	OICtutorial.gdb
Description	Esri Redlands campus inspection images
Copyright	Esri

*__Note__: Don't include spaces in the OIC name.

6. Click **Run** to create an empty OIC. You will see a group layer in the map, with two feature layers added. The **Exposure Points** layer will store the GPS data and metadata of each image and identify on the map where each image was taken. The **Coverage Map** will show the area on the map depicted in each image.

Add images to the OIC from a public Amazon S3 bucket

Note: This tutorial references public imagery that is already stored in the Amazon cloud. If your own workflow started with locally stored images, you could first use the **Copy Images to Web** tool to move them into publicly accessible Amazon or Azure cloud storage before proceeding.

7. Under the ManageOrientedImagery toolbox, double-click the **Add Images to Oriented Imagery Catalog** GP tool. Complete the dialog with the following values. When given the option for the below parameters, select the "set as default" option, which means the value will be used for all images and will be entered into the OIC properties file.

Parameter	Value
Input Oriented Imagery Catalog	EsriRedlandsCampus
Input Type	Image List
Image List	C:\Image_Mgmt_Workflows\OrientedImagery\Tutorial\EsriRedlandsCampus.txt
Oriented Imagery Type	Inspection
Camera Pitch	90
Camera Roll	0
Average Height (m)	1.5
Near Distance	1
Far Distance	20

8. Click **Run**.

   Once complete, you'll see exposure points on the map over the Esri Redlands campus.

9. In the **Contents** pane, double click the **Exposure Points** layer to open the attribute table. Notice the fields Cam Pitch, CamRoll, AvgHtAG,FasrDist, NearDist, OIType are all blank. These values are accessed using the OIC Properties tool discussed in the next section.

10. Close the attribute table.

Edit the OIC properties

11. Under the ManageOrientedImagery toolbox, double-click the **OIC Properties** GP tool.

12. Select `EsriRedlandsCampus` as the Input Oriented Imagery Catalog. You'll see the attribute values for the OIC.

13. Scroll down to **MaxDistance** and change the value to `80`.

    Note: Don't change the names of any of the values in the Property field. A full description of all the properties can be found in the documentation.

14. Click **Run** to update properties.

Create features to represent the coverage of each image on a map

15. Under the ManageOrientedImagery toolbox, double-click the **Create Coverage Features** GP tool.

16. Select `EsriRedlandsCampus` as the Input Oriented Imagery Catalog.

17. Click **Run**.

18. When complete, in the **Contents** pane turn on the visibility of Coverage Map layer (if it's not visible already). You'll see the coverage polygon for each image.

    Note: If the polygons look incorrect, you can use the OIC Properties tool to change the property values before re-running the Create Coverage Features tool. The following fields will affect the coverage area of each point: CamHeading, CamPitch, CamRoll, HFOV, VFOV, AvgHtAG, FarDist, NearDist, and OIType.

Create a coverage map

This tool creates a vector tile package file of the coverage features created in the last section. A vector tile is a more efficient way to show the coverage area. This will be uploaded to ArcGIS Online when the OIC is published.

19. Under the ManageOrientedImagery toolbox, double-click the **Create Coverage Map** GP tool.
20. Select `EsriRedlandsCampus` as the Input Oriented Imagery Catalog.
21. Click **Run**.

Analyze the OIC for errors or optimization options

22. Under the ManageOrientedImagery toolbox, double-click the **Analyse Oriented Imagery Catalog** GP tool.
23. Select `EsriRedlandsCampus` as the Input Oriented Imagery Catalog.
24. Click **Run**. The tool will complete with warnings. Warnings might include the following:

```
Running script Analyzer...
Checking for local images and broken paths...
No Local images found.
⚠Broken paths found!
⚠Please run the Select Broken Paths GP Tool to identify the broken paths.
Checking for default values...
All mandatory fields have values.
Checking if fields need to be hidden in the feature class...
⚠The following field(s) are empty in the feature class, and have values defined in the OIC properties file.CamPitch CamRoll AvgHtAG FarDist NearDist OIType
⚠To Optimize the Oriented Imagery Catalog before publishing, it is recommended to hide these fields.
⚠This can be done by opening the attribute table, Opening the Fields View and turning the Visibilty off.
Completed script Analyse Oriented Imagery Catalog...
```

25. Follow any steps recommended in the warning to hide empty fields.

Publish the OIC to your ArcGIS Online or Enterprise portal.

26. Under the ManageOrientedImagery toolbox, double-click the **Publish Oriented Imagery Catalog** GP tool.
27. Select `EsriRedlandsCampus` as the Input Oriented Imagery Catalog. The tool will autofill the fields based on the way you configured the OIC initially.
28. Select an optional portal folder name in which to store your OIC.

Note: You can't create a folder from here; it must exist in your portal before publishing.

29. Leave the rest of the default values. Click **Run**.

    Note: If there is a previously published OIC with the same name in your organization, you'll also have the option to Publish All – Overwrite.

Your OIC is now available in your ArcGIS Online or Enterprise portal to view with the Oriented Imagery add-in for ArcGIS Pro. To add your new OIC, on the **Map** tab, click **Add Data > Add Oriented Imagery**, select `EsriRedlandsCampus` from your portal and click **Ok**.