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🌐 Lagash Archaeological Survey and Recording System (LASRS) - Creating Collection Forms with ArcGIS Field Maps

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ABSTRACT

By carefully creating a mobile GIS data collection routine for ArcGIS Field Maps, in-field collection of archaeological survey data can be sped up significantly. This protocol outlines how we created such a routine for the Lagash Archaeological Project.

MATERIALS

This protocol was developed for ArcGIS Online.

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Protocol status: Working
We use this protocol and it's working

Created: Jan 31, 2023

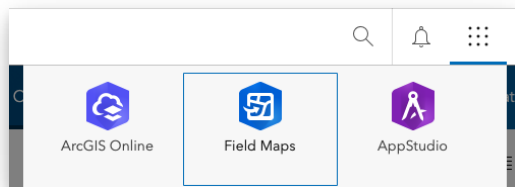
Last Modified: Aug 15, 2023

PROTOCOL integer ID:
76180

Keywords: Archaeology,
Survey, GIS

Create the Field Maps Project

- 1 Log into your ArcGIS Online account with the web browser of your choice.
- 2 Click the **waffle** (grid of dots) menu in the upper right, and select **Field Maps**.



- 3 Click the **New map** button.
- 4 Name the first layer *Samples*, leaving the **Layer type** as *Point layer*.
- 5 Click the **plus button** to create a new point layer named *Notes*, then click the **Next** button at the bottom of the page.
- 6 Turn on **high-accuracy GPS receivers** if you will use an external GPS device (such as an RTK rover) for data collection, otherwise leave this turned off if you intend to use the iPad's internal

GPS.

- 7 Leave **3D spaces** turned off, and click the **Next** button at the bottom of the page.
- 8 Change the **Map title** to something that is appropriate for the project.
- 9 Set the **Feature layer title** to *<Map title> Observations*.
- 10 Optionally, save the map to a particular folder, then click the **Create map** button at the bottom of the page.
- 11 In the Field Maps interface, click on your **avatar** in the upper right, and select **My content**.

Configure the Samples Layer

- 12 Click on the title of the Feature layer created in step 9.
- 13 Click on the *Samples* layer.
- 14 Click on **Data** in the upper right, and switch the view from **Table** to **Fields**.

- 15 Add the four following fields, using all lower-case and no special characters or spaces for the **Field Name**:
- *Status* (string; non-null; default value: Positive)
 - *Surveyor* (string; non-null)
 - *Write-Off Reason* (string)
 - *Explanation (optional)* (string)
- 16 Click the *Status* field and then the **Create List** button. The new list will have the following three values (use the same **Label** and **Code**, for simplicity):
- *Positive*
 - *Negative*
 - *Write-Off*
- 17 Click the *Surveyor* field and then the **Create List** button. Add entries for each member of the team and an extra catch-all entry called *(not listed)*.
- 18 Click on the *Write-Off Reason* field and then the **Create List** button. Add entries for each possible reason why a target location may be written off, plus an extra catch-all entry called *Other*. If data entry will be bilingual, both the English and second language entries must be in the **Label** field, which is what will be presented to the surveyors on their tablets. For Lagash, the following write-off reasons are entered:
- *Berm/Canal* قناة او سائر
 - *Excavation/Spoil Heap* حفر او تراب خارج الحفرة
 - *Field* طريق - غطاء نباتي
 - *Slope* منحدر
 - *Structure* بناية
 - *Vegetation* شجيرات
 - *Water* ماء
 - *Other* اخرى

Configure the Notes Layer

- 19 Click the pull-down menu in the upper left to switch from the *Samples* layer to the *Notes* layer.
- 20 Add the three following fields, using all lower-case and no special characters or spaces for the **Field Name**:

- *Observation* (string; non-null)
- *Surveyor* (string; non-null)
- *Description (optional)* (string)

21 Click the *Surveyor* field and then the **Create List** button. Add entries for each member of the team and an extra catch-all entry called *(not listed)*.

Note

Because ArcGIS Online doesn't provide a way to reference a single list in multiple fields, this list will be a duplicate of the one created in step 17.

22 Click on the *Observation* field and then the **Create List** button. Add entries for each feature or phenomenon that is likely to be observed, plus an extra catch-all entry called *Other*. If data entry will be bilingual, both the English and second language entries must be in the Label field, which is what will be presented to the surveyors on their tablets. For Lagash, the following values are entered:

- *Animal Burrow* حفرة حيوانات
- *Artifact* لقي اثارية
- *Drain/Oven* انبوب فخارية او تنور
- *Tire Tracks/Road* طريق
- *Wadi/Wash* وادي
- *Wall* جدار
- *Other* اخرى

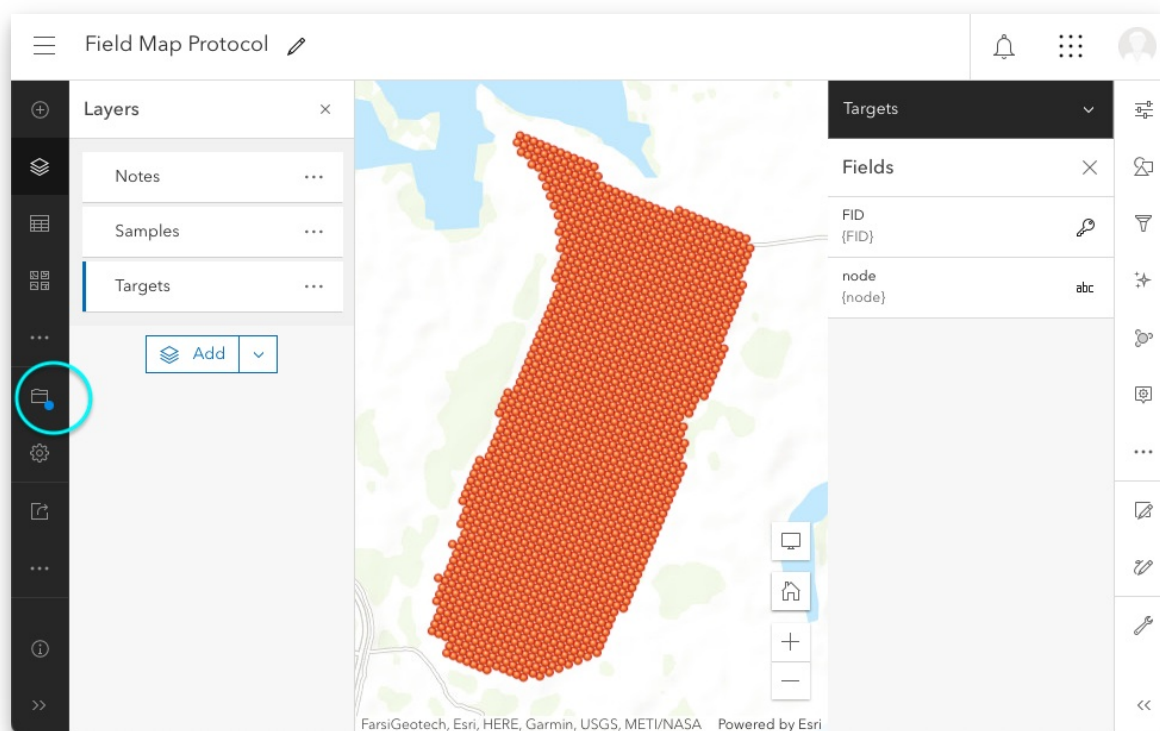
Import the Targets Layer

23 Click on **Content** at the top of the web page.

24 Click on the Web Map item saved in step 8.

25 Click the **Open in Map Viewer** button.

- 26 Click the **down arrow** next to the **Add** button and select **Add layer from file**.
- 27 Locate the zip archive created in the final step of the *Rectangular Survey Grid Creation with QGIS protocol* and upload it as a hosted feature layer.
- 28 In the **Add Layer** screen, set the **Title** to *<Map title> Targets* and click the **Create and add to map** button.
- 29 Click the **three dots** in the newly-created layer and select **Rename**. Change the name to *Targets*.
- 30 Drag the *Targets* layer to the bottom of the stack, and the *Notes* layer to the top then click the **Save and open** (folder with blue dot) button in the left sidebar and save your changes.

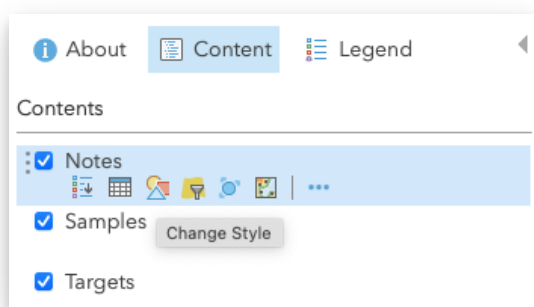


Current state of the example project, with the grid of orange dots on the map showing the imported shapefile, the layers ordered correctly, and the **Save and open** button circled.

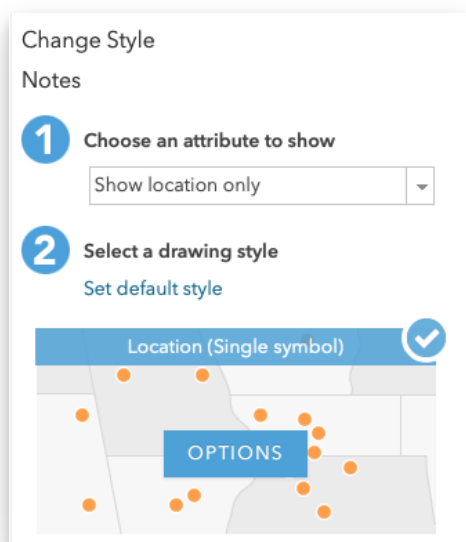
Configure Layer Symbology and Base Map Imagery

31 Click on the Open in **Map Viewer Classic** link at the top of the web page.

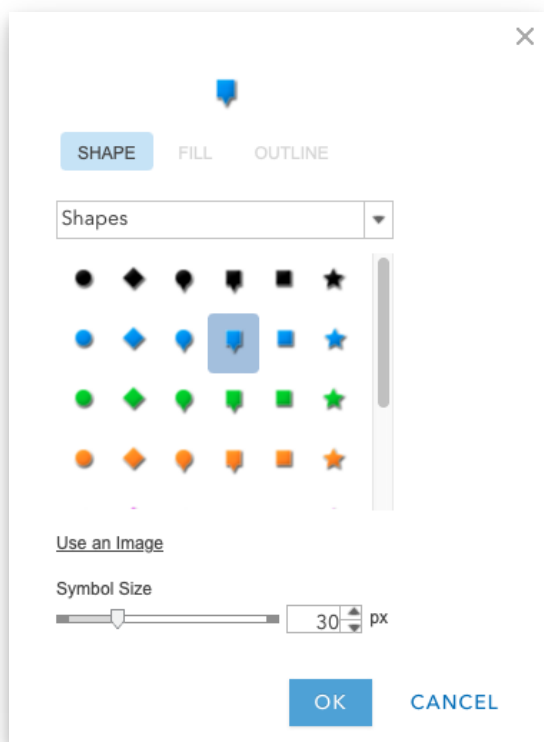
32 Mouse over the *Notes* layer and click the **Change Style** (shapes) icon.



33 Click the **OPTIONS** button in the **Location (Single symbol)** selection under **Change Style**.



- 34 Click the **Symbols** link, and then select the *blue notes icon* in the **SHAPES** panel.



- 35 Set the **Symbol Size** to *30px*, then click **OK**.
- 36 Click the **OK** button in the lower left to accept your changes to the symbology, then click the **DONE** button to return to the layers view.
- 37 Click the **Save** (floppy disk) button at the top of the web page to save your changes.
- 38 Mouse over the *Samples* layer and click the **Change Style** (shapes) icon.

- 39 Under **Choose an attribute to show** click *Status*.
- 40 Click the **OPTIONS** button in the **Types (Unique symbols)** selection under **Change Style**.
- 41 Drag the statuses so that *Positive* is above *Negative* in the list. Leave *Write-Off* at the bottom.
- 42 Click the **blue dot** next to *Positive* to change its symbol, and set the following values, then click **OK**.
- **SHAPE > Symbol Size:** 14px
 - **FILL > Custom Color:** #38A800
 - **OUTLINE > Custom Color:** #000000
 - **OUTLINE > Transparency:** 0%
- 43 Click the **red dot** next to *Negative* to change its symbol, and set the following values, then click **OK**.
- **SHAPE > Symbol Size:** 14px
 - **FILL > Custom Color:** #E60000
 - **OUTLINE > Custom Color:** #000000
 - **OUTLINE > Transparency:** 0%
- 44 Click the **green dot** next to *Write-Off* to change its symbol, and set the following values, then click **OK**.
- **SHAPE > Symbol Size:** 14px
 - **FILL > Custom Color:** #ADADAD
 - **OUTLINE > Custom Color:** #000000
 - **OUTLINE > Transparency:** 0%
- 45 Click the **OK** button in the lower left to accept your changes to the symbology, then click the **DONE** button to return to the layers view.

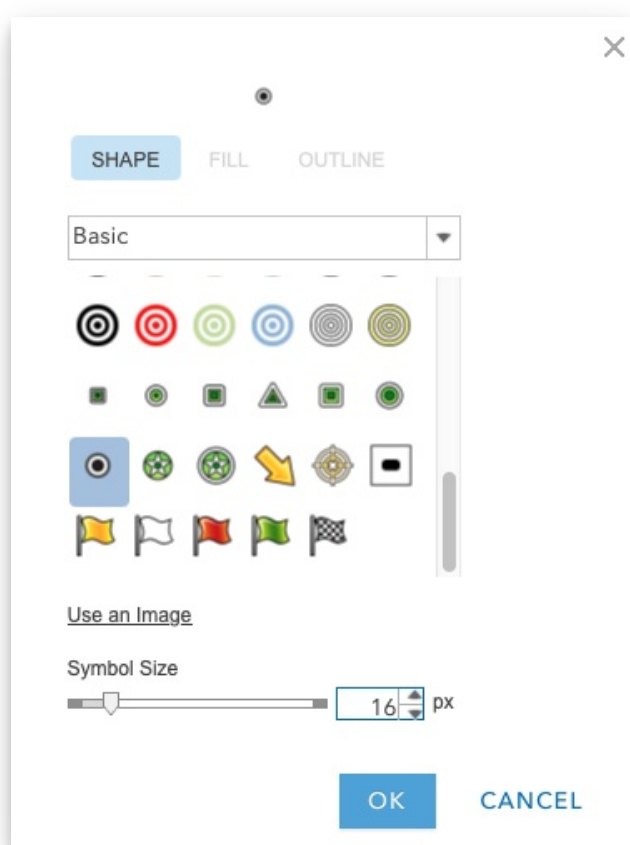
Mouse over the *Targets* layer and click the **Change Style** (shapes) icon.

46

47 Click the **OPTIONS** button in the **Location (Single symbol)** selection under **Change Style**.

48 Click the **Symbols** link, and then select **Basic** from the **Category** menu in the **SHAPES** panel.

49 Select an appropriate black-and-white icon, adjust its **Symbol Size**, and click **OK**.



50 Click the **OK** button in the lower left to accept your changes to the symbology, then click the **DONE** button to return to the layers view.

- 51 Mouse over the *Targets* layer, click the **three dots** on the right, and select **Create Labels**.
- 52 Enable the **Halo** for readability.
- 53 Choose the alignment that makes the most sense for the orientation of your grid.
- 54 Set the **Visibility Range** to *Street (1:5,000)* or smaller, depending on your grid spacing.
- 55 Click the **OK** button in the lower left to accept your changes to the labels.
- 56 Click the **Save** (floppy disk) button at the top of the web page to save your changes.
- 57 Click the **Basemap** icon at the upper left of the web page and choose **Imagery**.
- 58 Click the **Save** (floppy disk) button at the top of the web page to save your changes.

Configure the Notes Popup and Data Collection Form

59 Click the **Open in Map Viewer** link at the top right of the web page.

60 Click on the *Notes* layer to open its properties, then click on the **Popups** (gear in a dialog box) icon on the right hand edge of the web page.



61 Change the **Title** from Notes to *Note*.

62 Expand the **Fields list** panel and then click the **Select fields** link to select the following four fields, then click the **Done** button.

- *CreationDate*
- *Observation*
- *Surveyor*
- *Description (optional)*

63 Drag the *Surveyor* field above the *Observation* field.

64 Click the **Fields** icon in the right hand edge of the web page (see step 60 for identification of the buttons).

- 65 Click the *Description (optional)* item and change its **Display name** to *Description*, then click **Done**.
- 66 Click the **Labels** icon in the right hand edge of the web page (see step 60 for identification of the buttons).
- 67 Turn *off* the **Enable labels** option.
- 68 Click the **Forms** (lightning bolt) icon in the right hand edge of the web page (see step 60 for identification of the buttons).
- 69 Click the **Add all (3)** link.
- 70 Drag *Surveyor* above *Observation*.
- 71 Change the **Form title** and the **Display name** of each field to be bilingual.
- 72 Select the *Description (optional)* field and change its Input type to **Text - Multiline**, then click the **OK** button in the lower right of the web page.

The fully-configured Notes form.

Configure the Samples Popup and Data Collection Form

- 73 Click on the *Samples* layer to open its properties, then click on the **Popups** (gear in a dialog box) icon on the right hand edge of the web page.
- 74 Change the **Title** from Samples to *{status}*.
- 75 Expand the **Fields list** panel and then click the **Select fields** link to select the following four fields, then click the **Done** button.
 - *CreationDate*
 - *Surveyor*

- *Write-Off Reason*
- *Explanation (optional)*

- 76 Click the **Fields** icon in the right hand edge of the web page (see step 60 for identification of the buttons).
- 77 Click the *Explanation (optional)* item and change its **Display name** to *Explanation*, then click **Done**.
- 78 Click the **Labels** icon in the right hand edge of the web page (see step 60 for identification of the buttons).
- 79 Turn *off* the **Enable labels** option.
- 80 Click the **Forms** (lightning bolt) icon in the right hand edge of the web page (see step 60 for identification of the buttons).
- 81 Click the **Add all (4)** link.
- 82 Drag *Status* above *Surveyor*.
- 83 Change the **Form title** to *{status}* and the **Display name** of each field to be bilingual.

- 84 Select the *Status* field, then expand the **Conditional visibility** panel, and add the following expression: *Status Is Empty*. Name this rule *Hide the Status Selector* so that you can identify it easily.
- 85 Select the *Write-Off Reason* field, then expand the **Conditional visibility** panel, and add the following expression: *Status Is Write-Off*. Name this rule *Show Write-Off Reason if Status is "Write-Off"* so that you can identify it easily.
- 86 Select the *Explanation (optional)* field, then expand the **Conditional visibility** panel, and add the following expression: *Status Is Write-Off*. Name this rule *Show Explanation if Status is "Write-Off"* so that you can identify it easily.
- 87 Change the **Input type** of the *Explanation (optional)* field to **Text - Multiline**, then click the **OK** button in the lower right of the web page.
- 88 Click the grey area below the *Explanation (optional)* field then expand the form settings option in the lower right and check the **Preserve values when fields are hidden with conditional visibility rules** box.

Configure form

×

{status}

Status *

Surveyor الأسم *

Write-Off Reason السبب لخارج الاعتبار

No value

Explanation (optional) تفسير اختياري

Form builder

Form elements

Group

Fields

Fields store values within the layer

REQUIRED

OPTIONAL

No fields available

Form settings

Field values

☒ Preserve values when fields are hidden with conditional visibility rules

Cancel

OK

The fully-configured Samples form.

Configure the Targets Popup

- 89 Click on the *Targets* layer to open its properties, then click on the **Popups** (gear in a dialog box) icon on the right hand edge of the web page (see step 60 for identification of the buttons).
- 90 Change the **Title** from Field Maps Protocol Targets - Field Maps Protocol Targets to *{node}*.

- 91 Click the **three dots** on the right side of the **Fields list** panel and then choose **Delete**.
- 92 Click the **Save and open** (folder with blue dot) button in the left sidebar and save your changes.

Note

Unlike *Notes* and *Samples*, *Targets* is a read-only layer used just for reference, so there is no data collection form associated with it.

Configure the Web Map for Field Maps

- 93 Click the **waffle** (grid of dots) menu in the upper right, and select **Field Maps**.
- 94 Select the current project from the **My maps** list.
- 95 Click on the *Notes* layer, then switch to the **Templates** panel.
- 96 Click on **New Feature**, and set its Display name to *Note ملاحظة*.
- 97 Click the **Save** (floppy disk) button for the template.

- 98 Click on the *Samples* layer, and switch to the **Templates** panel if it's not already selected.
- 99 Click on *New Feature*, set its **Display name** to *Positive* *أيجابي*, and set its description to *Artifacts were collected at this location*.
- 100 Mouse over the *Positive* *أيجابي* template item, and click the **Duplicate** (overlapping boxes) button.
- 101 Click on *Positive* *أيجابي* *_copy*, set its **Display name** to *Negative* *سلبي*, and set its description to *No artifacts were collected at this location*.
- 102 Set the **Default Value** for *Status* to *Negative*.
- 103 Mouse over the *Negative* *سلبي* template item, and click the **Duplicate** (overlapping boxes) button.
- 104 Click on *Negative* *سلبي* *_copy*, set its **Display name** to *Write-Off* *خارج الاعتبار*, and set its description to *Collections could not be attempted at this location*.
- 105 Set the **Default Value** for *Status* to *Write-Off*.

Click the **Save** (floppy disk) button for the template.

106

107 Click **App settings** in the left hand side of the web page.

108 Expand **Collection**, and turn *off* **Snapping** and **Streaming**.

109 Expand **Feature actions**, and turn *off* **Collect here**.

110 Expand **Map tools**, and turn *off* **Edit multiple**.

111 Click the **Save changes** (floppy disk) button in the upper right.

Next Steps

112 Set the ArcGIS Online sharing permissions on the files created to something that's appropriate for the project, and make sure that the Web Map can be accessed in ArcGIS Field Maps on the mobile devices that you will be using.