

ESRI EXTERNAL

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Limiting Access to Public Survey123 Responses

Version 2.0

Esri Software Security and Privacy

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Abstract

This document provides guidance for GIS administrators and survey owners involved in implementing a public survey with respect to privacy and security. The following guidance highlights best practices, public survey layer discoverability, details specific scenarios, and provides contextual discussion around the various configuration options to be considered to protect your data prior to announcing a public survey where individual responses are to remain secure.

Document Shortcuts

Ideally, everyone could read documentation end-to-end, but we know that is not realistic, so we provide targeted use case suggestions below:

- Triage public survey responses Read page 6. Confirm your organization only
 publicly exposes the survey responses you want, and triage access as needed.
- Beginner users <u>Read pages 5-10</u>. Basics for secure, private survey response collection, terminology and guidance for using the primary survey creation mechanism: Survey123.arcgis.com.
- Power users <u>Jump to page 11</u> and read on from there. If you are already familiar with Survey123.arcgis.com workflows or use tools like Survey123 Connect to create custom forms.
- Other content creators Users with publicly accessible and editable content will benefit from the general guidance presented in this document.

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Survey Basics

What is a survey form item?

Surveys created by ArcGIS Survey123 are designed to enable rapid collection with predefined questions that use logic and provide easy-to-fill answers, embedded audio and images, and offer support for many languages. Surveys consist of survey form items and survey feature layers. In ArcGIS Survey123 a survey form is fillable form containing questions and lists of static or free form response types. Responses to questions asked in surveys are collected in survey layers. Survey results are aggregated from survey responses and used to help make decisions. Users should never share the source survey layer. Only survey feature layer views should be shared.

What is a survey feature layer?

A survey layer is a <u>feature service hosted on ArcGIS Online</u> or <u>ArcGIS Enterprise</u> which contain the database schema and records and other objects collected from users completing the survey form.

How are surveys created?

<u>The Survey123 Web Designer</u> is the primary focus of guidance for this doc. The Survey123 Web Designer helps users create simple surveys using a user-friendly, drag-and-drop configuration user experience. The Survey123 Web Designer is for users who do not require map-centric forms or in-depth understanding of geospatial layer management to create smart forms.

<u>Survey123 Connect</u> is for power users who understand advanced geospatial layer management. Survey123 Connect is a desktop app that allows users to author surveys using a spreadsheet application like Microsoft Excel. Survey123 Connect offers less automation, but provides more fine-grained control for creating smart forms with custom capabilities.

Other apps, like <u>ArcGIS Hub</u> and <u>ArcGIS Experience Builder</u> incorporate widgets or embedded apps that integrate with Survey123, where survey responses are also secure by default.

What do we mean by a 'public survey'?

By definition, a public survey is accessible to anyone who wants to submit data to it, but that does not always mean that anyone should be able to look at the data that has been submitted.

- A frequent use case is anonymously collecting survey data, but only select users or survey owners should be allowed to review the responses.
- Sometimes, the intent of the survey may be to immediately publish the data collected.

This guide seeks to provide guidance for the former scenario, anonymous surveys with controlled access responses.

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How might data be compromised in public surveys?

Improperly configured public surveys containing survey layers with the 'update' and 'query' capabilities enabled allows unauthorized individuals to change, delete, export, or add incorrect or misleading data to your survey layers via the ArcGIS Rest API. These activities may result in significant adverse effects to data security and survey respondent privacy. With this configuration, there is NO assurance of the origin, authenticity, and integrity of survey responses. NEVER configure your survey layers with these settings when collecting critical or sensitive information, otherwise your organization's reputation may be impacted and/or subjected to regulatory penalties such as under GDPR or CCPA. *Take the time to validate your survey configuration now.*

Quick Fix: Discover and turn off public survey response access

For large ArcGIS Online or ArcGIS Enterprise customers with many users and substantial published content, it can be time consuming to navigate through all the survey forms and layers hosted in organization to validate each item's sharing and editor settings. To make discovery more manageable, the Esri Software Security and Privacy Team has developed a "Public Survey123 Check" module for the ArcGIS Security Advisor. The ArcGIS Security Advisor's purpose is to provide customers with security awareness regarding their ArcGIS Online or Enterprise organization's configuration settings and content.

With no install required, discovering, and quickly removing public access to survey responses is only a few clicks away as described below:

- 1. Browse to https://Trust.ArcGIS.com and click the blue "Launch Security Advisor" button.
- 2. Click either ArcGIS Online or ArcGIS Enterprise depending where your surveys are.
- 3. Enter your organization administrative credentials and click "Sign In".
- 4. Click "Public Survey123 Check" application module on left side of screen.
- 5. All publicly accessible survey responses for your organization will be listed. For each survey response you don't want publicly exposed simply:
 - a. Click "[Review Survey Settings"] and the Survey123 editor interface will open.
 - b. Change "What can submitters do?" to "Only add new records" and click Save.
 - c. Return to Security Advisor, click "Scan" and the survey will be fixed/gone.
 - d. Repeat steps a-c until the "Public Survey123 Check" is only showing surveys you want to have responses exposed publicly.

Step 5 above is a triage mechanism for customers to quickly eliminate public access to survey results. If you want to dive more deeply into the security setting options available and see corresponding screen settings, continue to the next section.

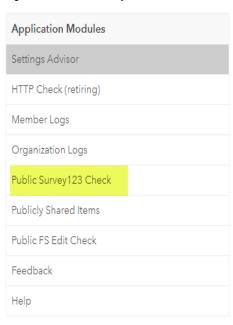
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Detailed Survey Permission Guidance

Discovering public survey layers

To access the Public Survey123 Check tool, first navigate to the ArcGIS Security Advisor from the <u>ArcGIS Trust Center</u> and click the Sign-In button.

Figure 1: ArcGIS Security Advisor Modules

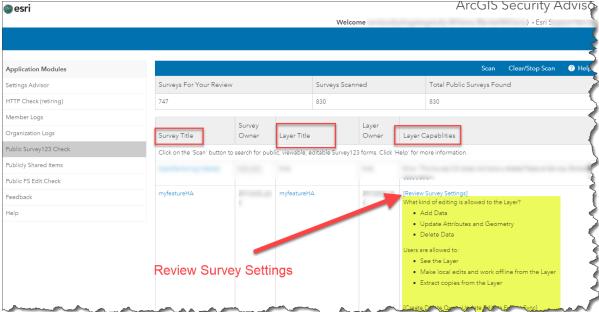


Sign in using a member of your ArcGIS Online or ArcGIS Enterprise organization with administrator role privileges and select the Public Survey123 Check module.

The Public Survey123 Check module allows an ArcGIS Online or ArcGIS Enterprise Organization administrator to quickly see all survey results which are accessible to the public and quickly resolve configuration concerns.

Administrators may click the "Review Survey Settings" link (See Figure 2) to open the survey settings in the Survey123 application and update the editing options as needed. The next section of the document dives into the Survey123 settings in more detail.

Figure 2: Survey responses are **publicly accessible** for every survey listed here



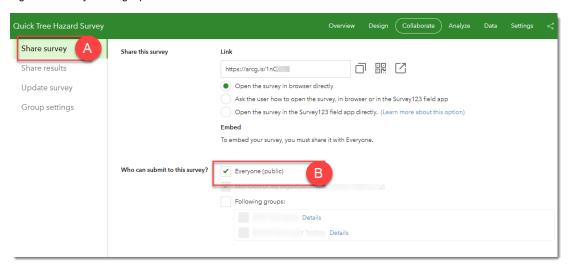
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Configuring public survey permissions with ArcGIS Survey123 web designer

First, a survey owner will need to share the survey form to the public to allow the audience to submit information without providing authorization credentials. To do this, the survey owner will need to access the ArcGIS Survey123 website at https://survey123.arcgis.com.

- 1. To ensure that your survey is shared with the public, log into the ArcGIS Survey123 website, and open the Collaborate tab in your survey.
 - From the Collaborate tab, ensure the Share Survey module is selected (A), and then
 - Check the Everyone' checkbox (B) next to the 'Who can submit to this survey?'
 option.

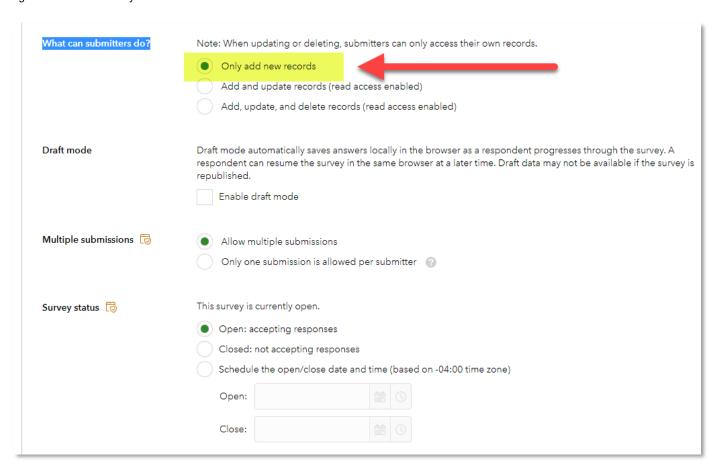
Figure 3: Survey Sharing Options



- Review the additional options for what submitters can do with the survey. Surveys
 where sensitive information is collected should be configured to allow submitters to
 only add new records.
 - ✓ When a survey is publicly accessible, the "Add and update" or "Add, update, and delete records" options should be disallowed (unchecked).
 - ✓ When a survey is publicly accessible, the "Add and update" or "Add, update, and delete records" options allow users to query the survey layer and potentially export or modify data.
 - ✓ **WARNING:** Survey owners, be aware that enabling these options with publicly accessible surveys allows the public to view individual survey responses, which may have unexpected privacy implications.

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Figure 4: What can survey submitters do?



If the option to ether allow submitters to "Add and update records" or "Add, update, and delete records" is selected, survey owners are cautioned twice – once when selecting the option, and again when saving:

Figure 5: Caution! Responses are publicly accessible!



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Figure 6: Upon save, additional Warnings are provided to ensure the selected capabilities are intended:

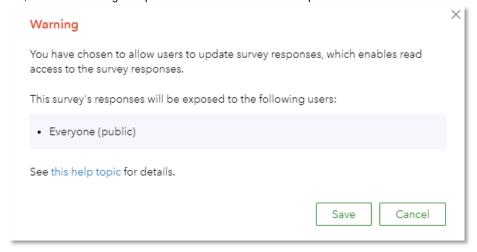


Figure 7: Survey123 help topic regarding these options

• Everyone (Public)-Allows anonymous users to submit responses to the survey. ⚠ Caution: If your public survey contains sensitive information, you should configure your survey to prevent users in the public domain from downloading, querying, or modifying its data. For more information about the best practices for securing your data, see the Securing data in public surveys (Survey123 web designer) and Securing data in public surveys (Survey123 Connect) blog posts. By default, responses that are submitted anonymously cannot be viewed by anonymous users. You can manage permission to view anonymous responses through the feature layer settings. For more information, see Manage editor settings. Configuring permissions through the feature layer settings may lead to unexpected issues. Changes to feature layer settings are lost if you republish your survey. Note: A user cannot share a survey publicly if their role in their organization lacks the **Share items** publicly privilege, or their organization has disabled the Allow users to share items publicly security setting.

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Advanced Topics

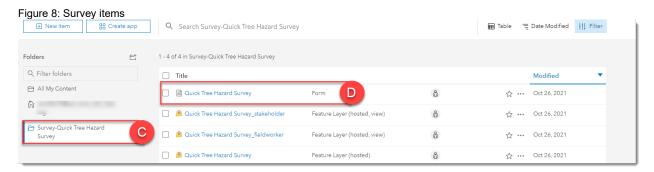
Manual Survey Layer Configuration

- Configuring your survey layer using the ArcGIS Online Organization or your ArcGIS Enterprise Instance Home application is an <u>ADVANCED OPTION</u>.
- Only use this option if you are intimately familiar with creating and securing hosted feature layer views.
- Configuring your survey layer using the ArcGIS Online Organization or your ArcGIS Enterprise is <u>rarely required</u> for successful Survey deployment
- Misconfigured security options may result in embarrassing and costly data leaks
- Survey123 Connect does not create views. <u>Views</u> must be manually created when using Survey123 connect.
- Configuring Survey123 connect views is discussed in the "Secure workflows for Survey123 Connect" topic below
- Understand your Survey requirements before proceeding
- If there is any doubt, use Survey123.arcgis.com to manage your surveys

Controlling permissions in the survey layer

Advanced users may choose to configure the security options for underlying survey layers that support the survey. These options are defined in the survey layer's properties in their item detail pages in either the ArcGIS Online Organization or the ArcGIS Enterprise instance. To configure these options, use the ArcGIS Online Home app to navigate to the survey layer settings.

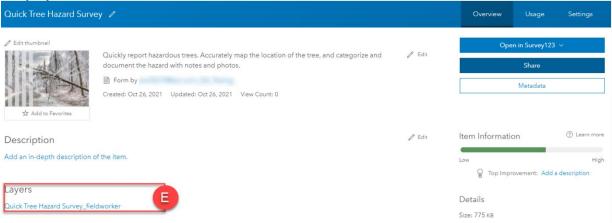
- Log into ArcGIS.com or your ArcGIS Enterprise portal and navigate to the Content tab.
- Open your survey's folder. Note that your survey's folder name will have a "Survey-"
 prefix followed by the name of your survey. (C) Click on the Form item within your
 folder to access the item details page of your Form item (D).



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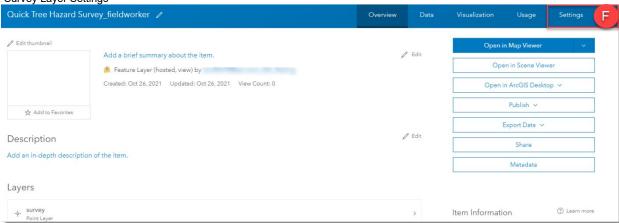
 Next, in the Form item details page, click on the Layer name (under the Layers heading) to open the details page of your survey layer (E).

Figure 9: Survey Layers



In the details page of your survey layer, click the Settings tab (F) and scroll to the bottom.

Figure 10: Survey Layer Settings



The Layer Settings tab exposes fine grained controls over permissions for your survey layer. If the survey was created using the wizard on <u>Survey123.ArcGIS.com</u>, the survey layer will be a <u>fieldworker view</u>.

The Fieldworker view is generated upon survey creation at survey123.arcgis.com. A Stakeholder view may be generated upon modifying sharing settings using survey123.arcgis.com.

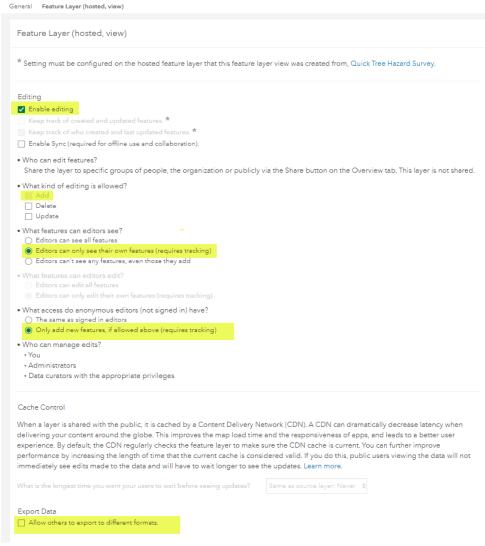
WARNING: Review survey layer options carefully. To ensure data collected (Survey responses) are not exposed to others, use the default values (see Figure 11). Refer to the <u>"editor settings"</u> <u>documentation</u> for a full description of the various settings available.

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Figure 11: Survey Layer Editor Default Options (Survey responses NOT exposed)

Option	Value
Enable editing	Checked
Enable sync	Not Checked
What kind of editing is allowed?	"Add (Inherited from parent feature service)"
What features can editors see?	"Editors can only see their own features"
What access do anonymous editors have?	"Only add new features"
Allow others to export to different formats?	Not checked

Figure 12: Survey Layer Editor Interface



- In the lower right corner, click to SAVE your changes to the survey layer to persist them and to ensure that the data that you've collected will not be exposed through your survey or the underlying survey layers.
- As best practice, it is recommended to validate that any changes made to the feature layer settings are persisted in Survey123.arcgis.com.

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Feature Layer views

The ability to create a <u>feature layer view</u> is a powerful feature in ArcGIS Online and ArcGIS Enterprise. Hosted feature layer views allow you create multiple unique windows into your data and customize them to fit your audience. Views you create reference the same primary feature layer so there is no duplication of data. Hosted feature service views can be used to allow survey owners to anonymize results, change symbols, and otherwise display data in different ways depending on the audience and use case.

Hosted feature layer views are ideal for helping you control access to the hosted feature data; you can allow editing access to only those users who need it. You can make your hosted feature layer editable and share it with only those groups whose members need to edit the data. Then you can create hosted feature layer views from the hosted feature layer, don't enable editing on them, and share the views to audiences with appropriate access to the data you've collected.

Using Feature Layer views to summarize results

After completing the steps to configure your survey and survey layers, you may choose to create a new view layer. The view layer may be referenced in a dashboard, web map, or other application for review. To create a feature layer view, first access the item details page of your survey layer, just like you did in step "b" above.

• To the right of the item details page in the "overview" tab, click "Create a View Layer"

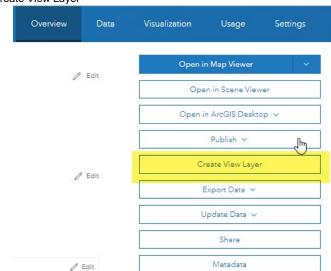
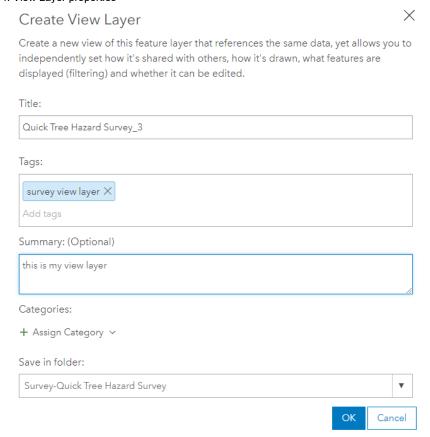


Figure 13: Create View Layer

Provide a title and metadata for the view layer and click "ok"

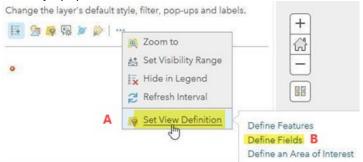
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Figure 14: View Layer properties



- Open the "Visualization" tab in the new View Layer.
- Click the ellipsis, then select "Set View Definition" (A),
- then "Define Fields" (B)

Figure 15: View Layer properties



 Check the boxes next to the fields that should be available in the View layer. Make sure to only check the option to display fields users that the audience of this view layer should access.

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Define Fields: Quick Tree Hazard Survey_3

Define the fields that will be available in this layer. Unselected fields are completely hidden to others. If the field is grayed out in the list, its visibility can't be changed.

	Field Name
4	ObjectID
4	GlobalID
~	CreationDate
	Creator
~	EditDate
	Editor
V	Survey date
~	Does this tree represent a hazard?
~	Does this hazard require immediate attention?
	Comments

APPLY

CLOSE

- Explore the other options in the <u>Visualization tab</u> to aggregate features, create heat maps, and further anonymize data to reduce or eliminate any personally identifying information as your mission requires. Using the Visualization tab, you can make changes to the default properties of a feature layer without having to open the layer in Map Viewer. You can change the layer's style, apply a filter, configure pop-ups, or label the features in the layer. You can also hide the layer in the legend or change the refresh interval. As in Map Viewer, the Visualization tab provides navigation tools to explore the layer, access to the basemap gallery, and a search box to find an address or place.
- Finally, add the view layer to a new web map to be consumed by a dashboard, application, or other WebGIS client.

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Secure workflows for Survey123 Connect

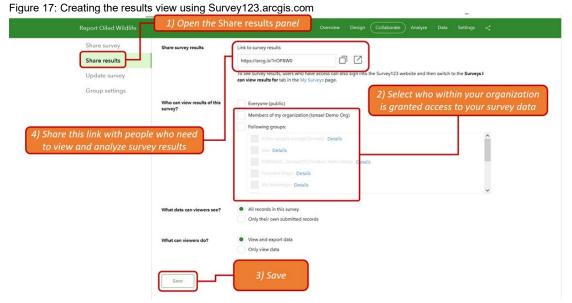
Survey123 Connect does not create views and does not manage views well when surveys are deleted or modified. Improvements are planned to address these issues in a future release.

When creating surveys using Survey123 Connect, feature layer views must manually be created to protect survey response data from being accessible by others. Views should be created when the survey is finalized. Survey design is an iterative process. Survey owners add, change and remove questions from surveys frequently. Some of these changes affect the schema of the surveys feature layer. If your survey is configured with views, Survey123 Connect will not be able to change the schema of the source layer. Delay creation of views until survey design and development with Survey123 Connect is complete.

At least two views will need to be created - one for users who will review survey results through the Survey123 website, and another for users to submit data through the Survey123 web and/or field apps. Start with the view to control access to the survey results.

To build the view:

- Login into the Survey123 website
- Navigate to the Collaborate tab of your survey
- Switch to the Share results panel, select who should have access to your survey results and what privileges you want to grant to these users.
- Click Save.



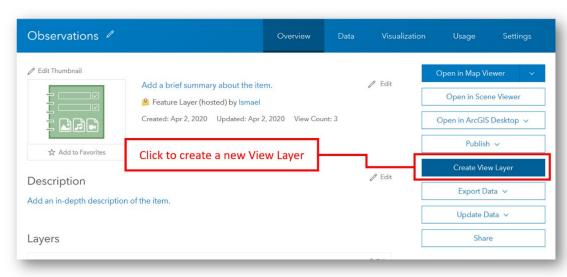
This new view will control who can use the Survey123 website to review the survey results. Use the *Share results* panel in the *Collaborate* tab of the Survey123 website to manage rights to this view layer. It is not recommended to modify the properties of this view via the ArcGIS Online home application, as the Survey123 collaboration tools will keep form sharing and stakeholder view properties in synch.

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Next, the views for the Survey123 web and field apps should be created. These views must manually be built.

- Log into the <u>arcgis.com</u> website and click on the My Content tab.
- Click on the Form item to open its item details page.
- Look for the Layers section and click on your survey feature layer link. This will open the item details page for your surveys feature layer.
- Click on Create View Layer. You can choose any title for your feature layer view.

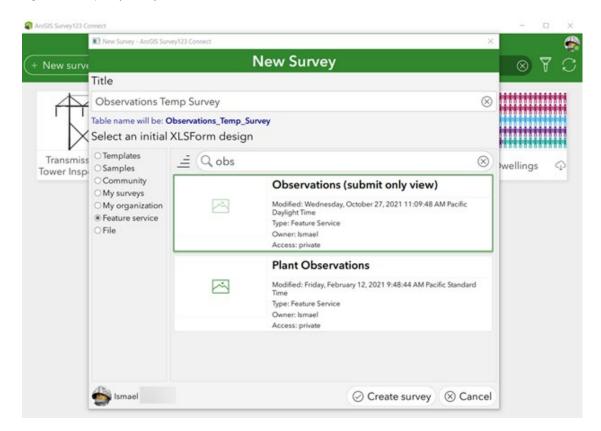
Figure 18: Creating the survey view using the ArcGIS Online Home application



- Go into the Settings tab, Public Data Collection and make sure Enable editing is checked.
- To make your survey work against your own feature layer view, configure the *submission url* and *form id* XLSForm settings in your survey:
- Next, in Survey123 Connect, from the survey gallery, click on New Survey and then choose the Feature Service option.
- Look for the feature layer view you just created and give your new survey an arbitrary name, eg: "temp" or "delete me".

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Figure 19: Temporary survey



- Open the XLSForm of your temporary new survey and switch to the settings worksheet.
- Copy the values in the *form_ld* and *submission_url* cells into a text editor or a safe place. They will be pasted later into the original survey.

Figure 20: updating XLS form



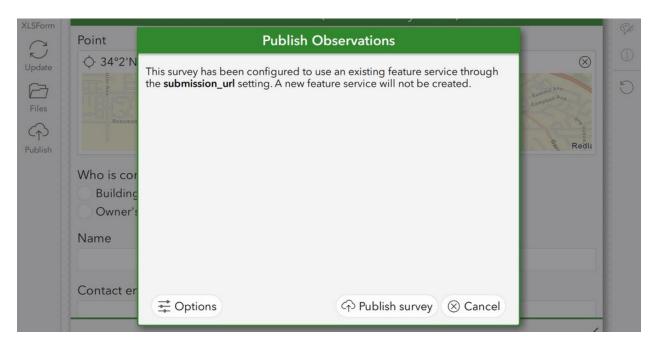
The *submission_url* value defines the feature layer (or feature layer view) that the survey is targeting. If empty, Survey123 Connect will create a new feature layer when you publish the survey. If a value is provided, the survey is published targeting the specified layer by the *submission_url*. The *form_id* value defines the sub-layer in your feature layer that drives the questions in your survey.

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- Back in Survey123 Connect go back to survey gallery and open the survey to be made public.
- Open the XLSForm, paste the *submission url* and *form id* values.
- Save your XLSForm and publish your survey again.

The Publish dialog will indicate that your existing survey will be updated to use a custom feature service as specified by the submission URL, as shown in the next screenshot.

Figure 21: Publish dialog



Now that your survey has been updated to target your own feature layer view, you can share your survey publicly with confidence. Do that from the Survey123 website. You may share both the survey and the aggregated survey results. Sharing individual results is not recommended. For most use cases. It is generally more appropriate to anonymize and generalize results when sharing survey results to the public.

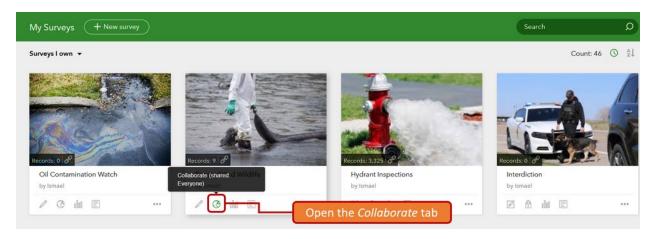
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Sharing your survey publicly

Whether using Survey123 directly or embedding a widget into apps like <u>ArcGIS Hub</u> and <u>ArcGIS Experience Builder</u>, the following guidance applies to safely collecting survey requests publicly.

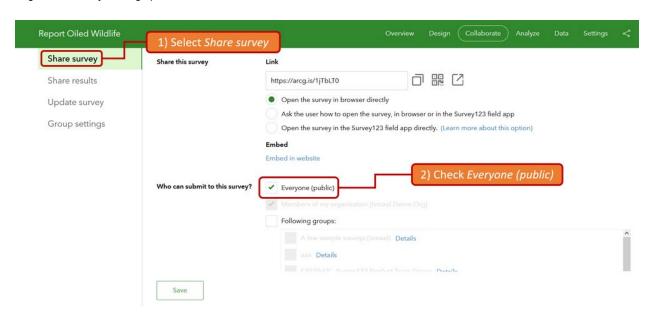
- Log into the Survey123 website at survey123.arcgis.com.
- From the survey gallery, open the Collaborate tab of your survey

Figure 22: Survey Collaboration tab



• The Share survey panel controls who can submit data to your survey. While in the Share survey panel, look for the section named 'Who can submit to this survey?' and check the *Everyone (Public)* option to share your survey publicly.

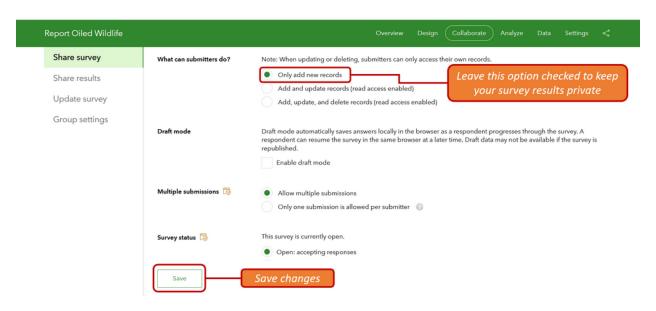
Figure 23: Survey sharing options



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- Scroll down the page and look for the What can submitters do? section. Note that by default, the selected option is 'Only add new records'. This guarantees that your survey layer will not expose your survey results.
- Click on Save at the bottom to persist all changes.

Figure 25: Survey sharing options



Your survey is now shared publicly, allowing anyone to submit data through both the Survey123 web and field apps.

Because 'Only add new records' is defined in the Collaborate tab, it will not be possible use the view to query, update, delete or download survey responses through the Survey123 web or field apps. Your survey's parent feature layer will also be secure, preventing any type of access (other than adding new records) from other Esri apps, third party apps or programmatic access.

If you go back to My Content in arcgis.com and check your survey folder, you will find that your feature layer view and the Form item are now shared publicly, while the feature layer remains shared only with you, the owner. **Do not share the source feature layer if you want to keep your data safe.**

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Sharing your survey results in web applications and dashboards

The same technique used to create a feature layer view for the Survey123 web and field apps can be replicated to support other apps such as ArcGIS Experience
Builder. Note however, these apps must also be shared appropriately (ie. public view access) to facilitate public survey collection. See the following guidance for how to share these apps publicly:

- ArcGIS Experience Builder: Change share settings
- ArcGIS Hub Give view access

Survey Feature Service Re-Use

It is not good practice to reuse the feature layer view that was just created or to share the source feature layer. Instead, build new views, restrict access to data as appropriate to the needs of the web app and share accordingly.

Webhooks

<u>Webhooks</u> are a widely supported method used to allow multiple applications to interact with each other, using HTTP POST requests to pass callbacks between them. For more information, see <u>Wikipedia's page on webhooks</u>. Common uses for webhooks include sending notifications via email or SMS, posting messages to social media, automatically writing records to a spreadsheet, and updating enterprise databases.

In ArcGIS Survey123 webhooks can be set up and activated when a survey response is submitted. For example, after a successful submission of information to the feature layer, the webhook could be called and trigger another action, such as sending a notification email, appending the survey content to a spreadsheet, and sending an alert.

WARNING: Webhooks are frequently a source of data overexposure for applications across the Internet and should only be utilized for production after extensive research, testing, and security validation with non-production information sets by experts of webhooks and the applications.

We strongly encourage thorough provider review before using Webhooks with public surveys. Only ArcGIS Survey123 forms protected by authentication should be utilized with Webhooks. **Webhooks attached to public surveys are subject to potential abuse by malicious users.** Some providers are not suitable for use that have data sovereignty obligations, as credentials may be stored and data may be processed in countries not governed by the rules, regulations and jurisdictions the survey provider may be required to adhere to.

Alternative options to using a public survey with Webhooks include leveraging a survey in conjunction with secured <u>ArcGIS Hub</u> sites, which requires users to sign up with a <u>community identity</u> to access the survey via the Hub community with their credentials.

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Summary

To guarantee that your sharing and permissions are consistent and set to your preferences, it is highly recommended that you always use the Collaborate tab in the ArcGIS Survey123 website to define who can submit data to your survey.

Advanced users may enable access to your survey data for use within your organization or share certain data (rows or fields). It is strongly recommended those advanced users create new Feature Layer views on top of your survey layer and control permissions and access separately for that purpose.

The advice and steps provided in this document will help prevent unintended consequences related to exposing your survey response data to the public while at the same time enabling anyone to submit data through your Survey123 form.

Additional Resources

Survey123 documentation

- Guided Tour
- Hosted Feature Layer Views
- Sharing Surveys

Securing public survey data blogs

- Survey123 web designer
- Survey123 Connect

Product security and privacy guidance

ArcGIS Trust Center



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