

# NSGIC

*Webinar*



## The Future of Metadata: Maximizing Data Potential



Jill Saligoe-Simmel, Esri



Jordan Duft, Esri





# Open Vision

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*We believe that **sharing, collaboration, and interoperability** are crucial to addressing today's challenges with urgency.*



# FAIR data principles

Metadata is fundamental...



**F**indable

**A**ccessible

**I**nteroperable

**R**eusable

Metadata

Machine-readable

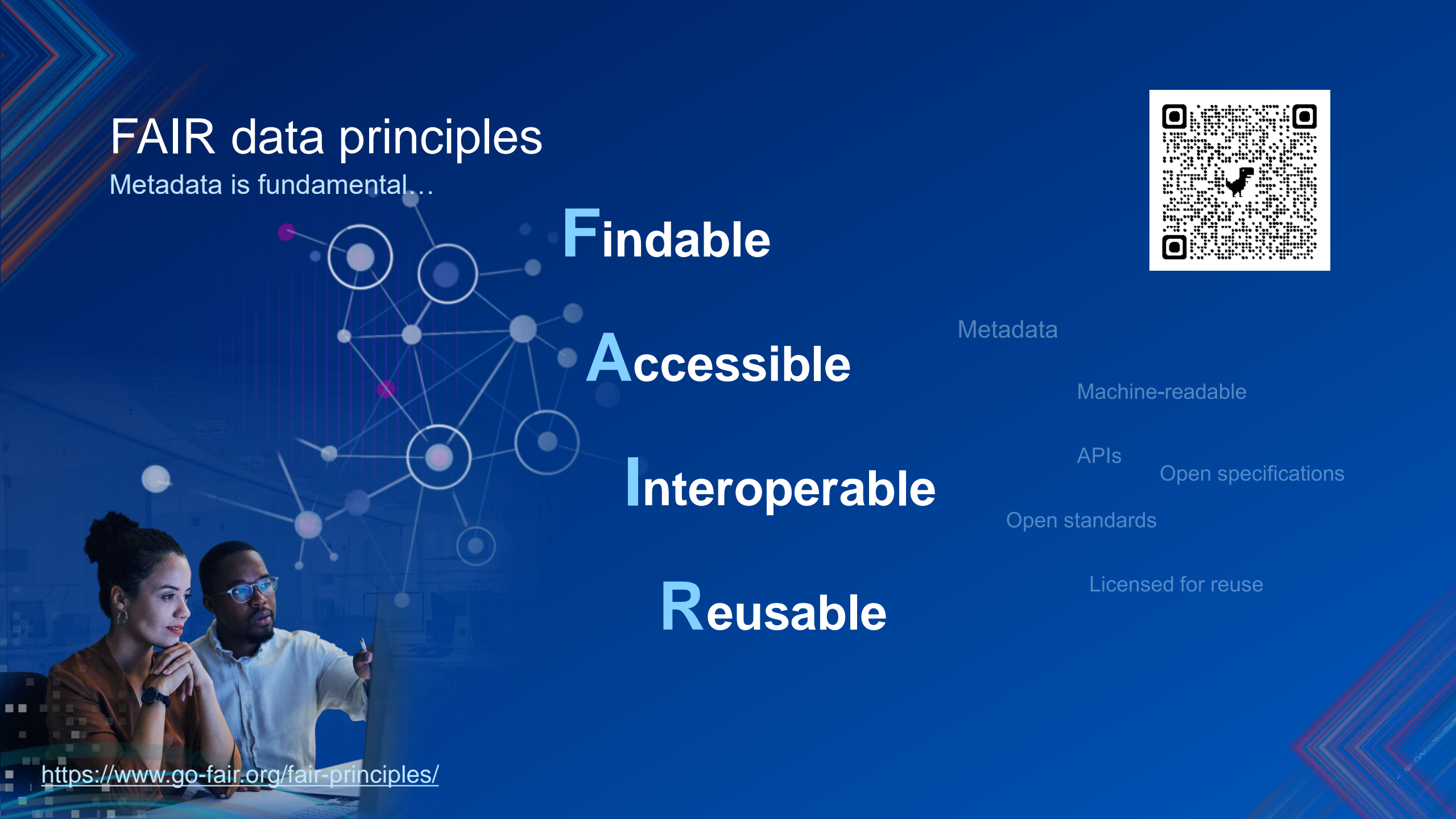
APIs

Open specifications

Open standards

Licensed for reuse

<https://www.go-fair.org/fair-principles/>

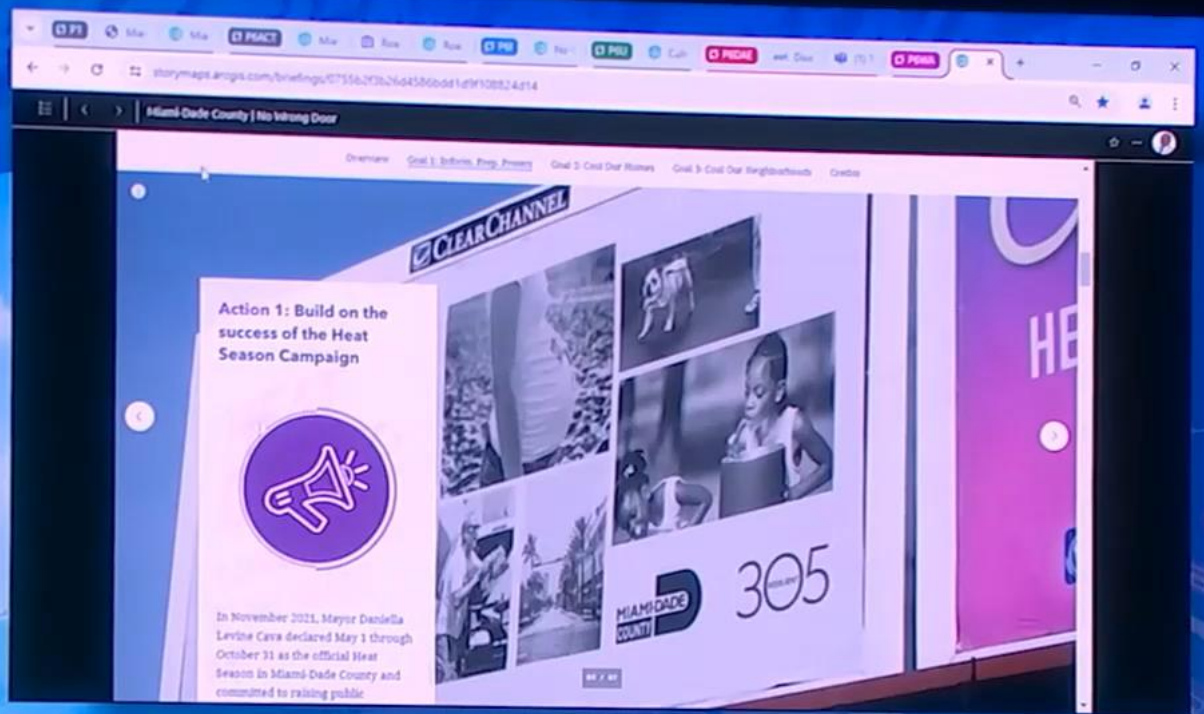


# Metadata drives search, discovery, and reuse

The image is a collage of several screenshots from different ArcGIS and data platform interfaces, illustrating metadata-driven search and discovery. The central focus is on the search results for "cdc social vulnerability" across various platforms.

- Data.gov:** A screenshot showing a search for "cdc social vulnerability" resulting in 175 datasets. The top result is the "CDC Social Vulnerability Index (SVI)".
- ArcGIS Living Atlas of the World:** A screenshot showing a search for "CDC Social Vulnerability Index" with a list of related layers and a map view.
- ArcGIS Online:** A screenshot showing a search for "CDC Social Vuln" with a list of layers and a detailed overview for the "CDC/ATSDR Social Vulnerability Index 2020 USA". The overview includes a summary: "2020 Social Vulnerability Index (SVI). Created by the Centers for Disease Control and Prevention (CDC) / Agency for Toxic Substances and Disease Registry (ATSDR) / Geospatial Research, Analysis, and Services Program (GRASP)." and a status of "Authoritative" and "Living Atlas".
- ArcGIS Hub:** A screenshot showing search results for "social vulnerability" with filters for "Type: Feature Service" and "Location". It lists several datasets, including "Social Vulnerability Index" from the Nature Conservancy and "Overall Social Vulnerability" from the City of Los Angeles.
- ArcGIS For AutoCAD:** A screenshot showing a search for "flood" with a list of related layers, including "USA Flood Hazard Areas" and "USA SSURGO - Flooding Fr...".
- Other Screenshots:** Various other screenshots show search results for "Hurricane Matthew", "Social Vulnerability Index 2020", and "Social Vulnerability Index Layer".

In the bottom left corner, there is a QR code and the text "Best Practices for Authoritative Data Providers".



# Metadata in the ArcGIS system

Working with metadata



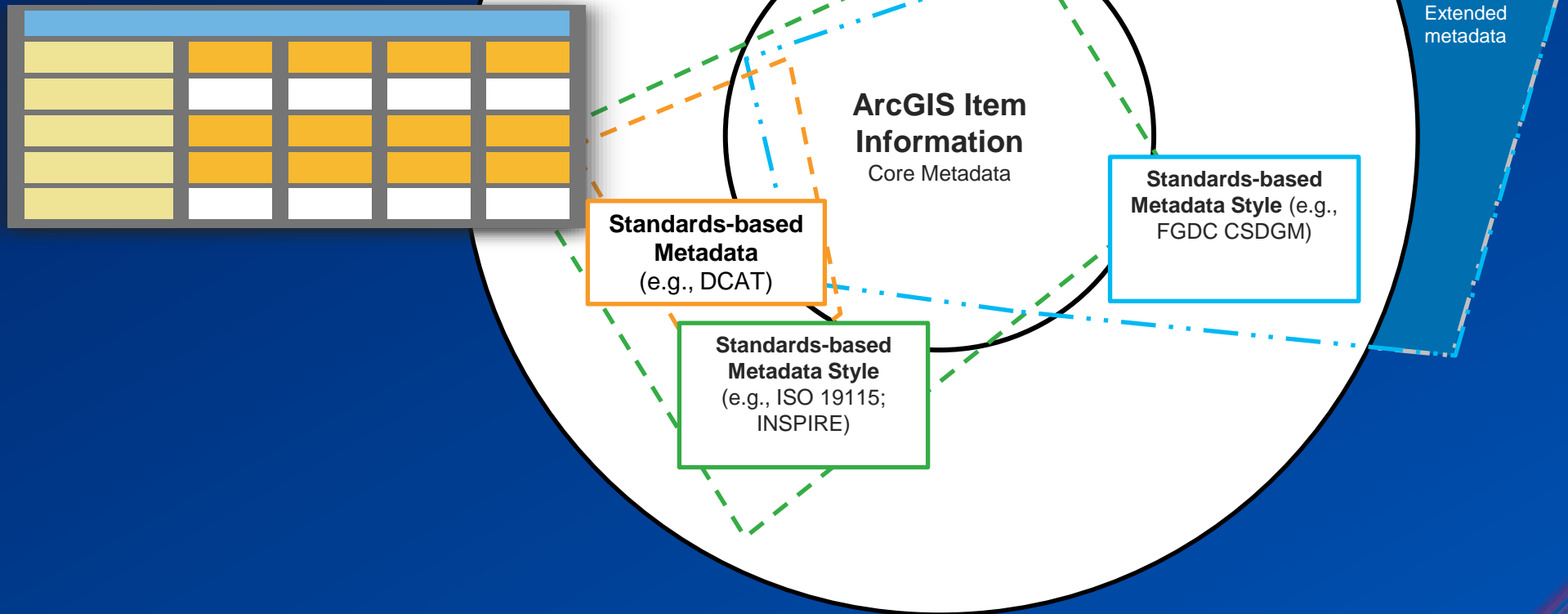
## Esri's Metadata Vision

We believe (meta)data management can be a **delightful** experience, producing results that are:

- **Relevant** and **fit for purpose**
- Meet customers' **technical requirements**
- Facilitate **search, discovery, sharing, collaboration**, and (re)use
- Support future **innovation**

# ArcGIS Metadata superset

Internal metadata storage and schema

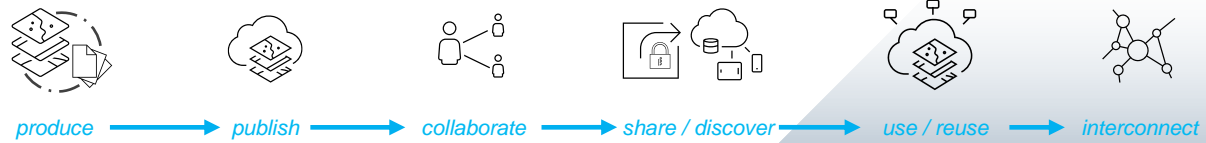


... A comprehensive superset of metadata elements.

Users & (Meta)data



Workflows

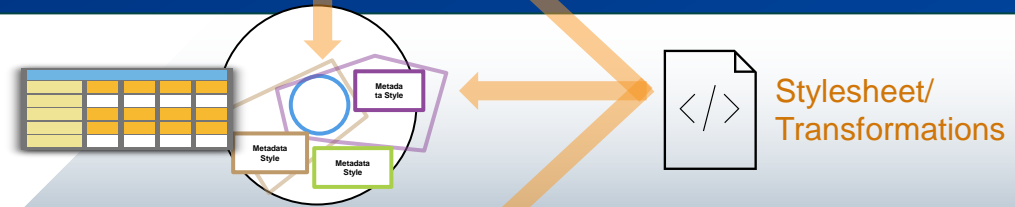


Editing



Metadata Editor

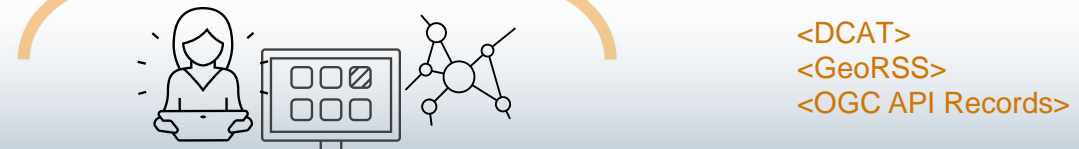
ArcGIS Metadata superset



Metadata Records

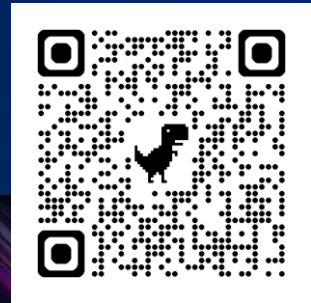


Catalogs / Federation



# Metadata, Catalogs and Search in ArcGIS

Introduction and engagement resources...



A screenshot of the Esri Community website. The page title is "Metadata, Catalogs and Search". It features a search bar, a breadcrumb trail (Home &gt; All Communities &gt; Products &gt; Metadata, Catalogs and Search), and a "Browse Metadata, Catalogs and Search" section with three cards: "Metadata, Catalogs, Search Ques." (92 likes, 76.9K views, 24 comments), "Metadata, Catalogs, Search Blog" (94 likes, 12.1K views, 16 comments), and "Metadata, Catalogs, Search Questions". Below this is a "Latest Activity" section with a post titled "Full ESRI metadata schema/superset (all elements!)" by urquidid, an Emerging Contributor, in the "Metadata, Catalogs, and Search Questions" group, last updated 2 weeks ago. The post has 1 like, 0 comments, and 54 views. A "Welcome" message is also visible on the right side of the activity feed.

A video player interface for a presentation titled "ArcGIS: Understanding Metadata, Catalogs, and Searching Across the Platform". The video is from the "ESRI USER CONFERENCE 2024". The presenters are listed as Jill Saligoe-Simmel, Esri, and Jordan Duft, Esri. A large play button is centered on the video frame. The background of the video player shows a stylized map with red and blue areas.

[https://mediaspace.esri.com/media/t/1\\_oj655jgc](https://mediaspace.esri.com/media/t/1_oj655jgc)

<https://community.esri.com/t5/metadata-catalogs-and-search/ct-p/metadata-catalogs-and-search>

# Metadata challenges & solutions

Demonstrations



# CHALLENGE: Creating metadata isn't delightful

Metadata creation should be a delightful experience with a consistent, user-friendly editor

The screenshot shows a web browser window with the URL `https://pm.maps.arcgis.com/home/item.html?id=f432fcdeb06d4e5fa84ab8fe5a88b6bf`. The interface is divided into several sections:

- Thumbnail:** A map thumbnail showing a geographical area with a river. Below it is an "Add to Favorites" button.
- Summary:** A text input field with the placeholder "Add a brief summary about the item." Below it, it says "Feature Layer (hosted) by jduft\_pm".
- Metadata:** A section with a "Metadata" button highlighted in blue. Below it, there is a "Metadata" section with a "Learn more" link and a progress bar showing "Low" to "High" completion.
- Description:** A section with the text "Occurrence of *Cenchrus ciliaris* L. (common name buffelgrass). CC-0 data from GBIF.org (19 March 2023) GBIF Occurrence. Demo data for Esri Environment webinar with Natural Areas Association, April 2023."
- Layers:** A section with a layer named "Buffelgrass Occurrence" and a "Point layer" type.
- Actions:** A vertical list of buttons on the right side: "Open in Map Viewer", "Open in Scene Viewer", "Open in ArcGIS Desktop", "Publish", "Create View Layer", "Export Data", "Update Data", "Share", and "Metadata".

# CHALLENGE: Understanding and leveraging metadata management and flow

Data management is tightly coupled with metadata management

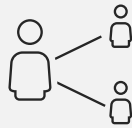
(Meta)data & Analytics



Web Services & Data Layers



People & Partners



Open Data & Catalogs



Maps & Apps / Tools & Solutions



Integrated Geospatial Infrastructure



*produce*

*publish*

*collaborate*

*share / discover*

*use / reuse*

*interconnect*



ArcGIS Pro

Extensions



ArcGIS Enterprise



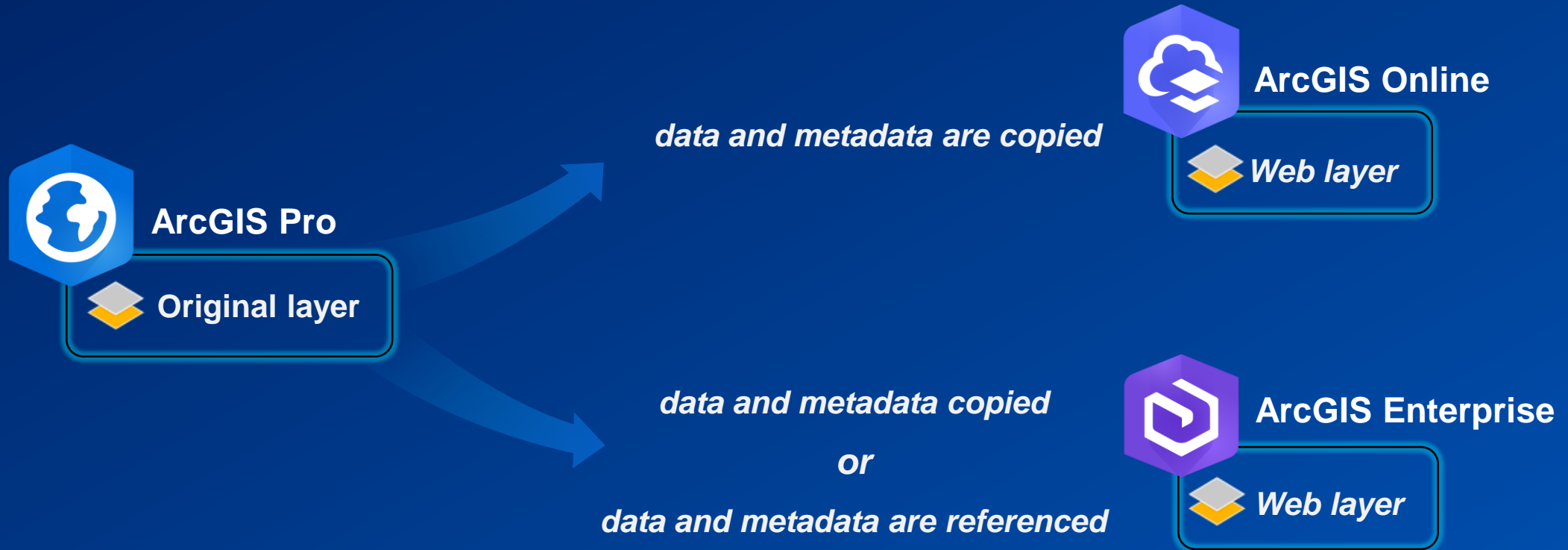
ArcGIS Online



ArcGIS Hub

Geoportal Server

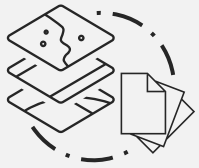
# Metadata flow during publishing



# CHALLENGE: Understanding and leveraging metadata management and flow

Data management is tightly coupled with metadata management

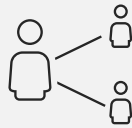
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ArcGIS Pro

Extensions



ArcGIS Enterprise

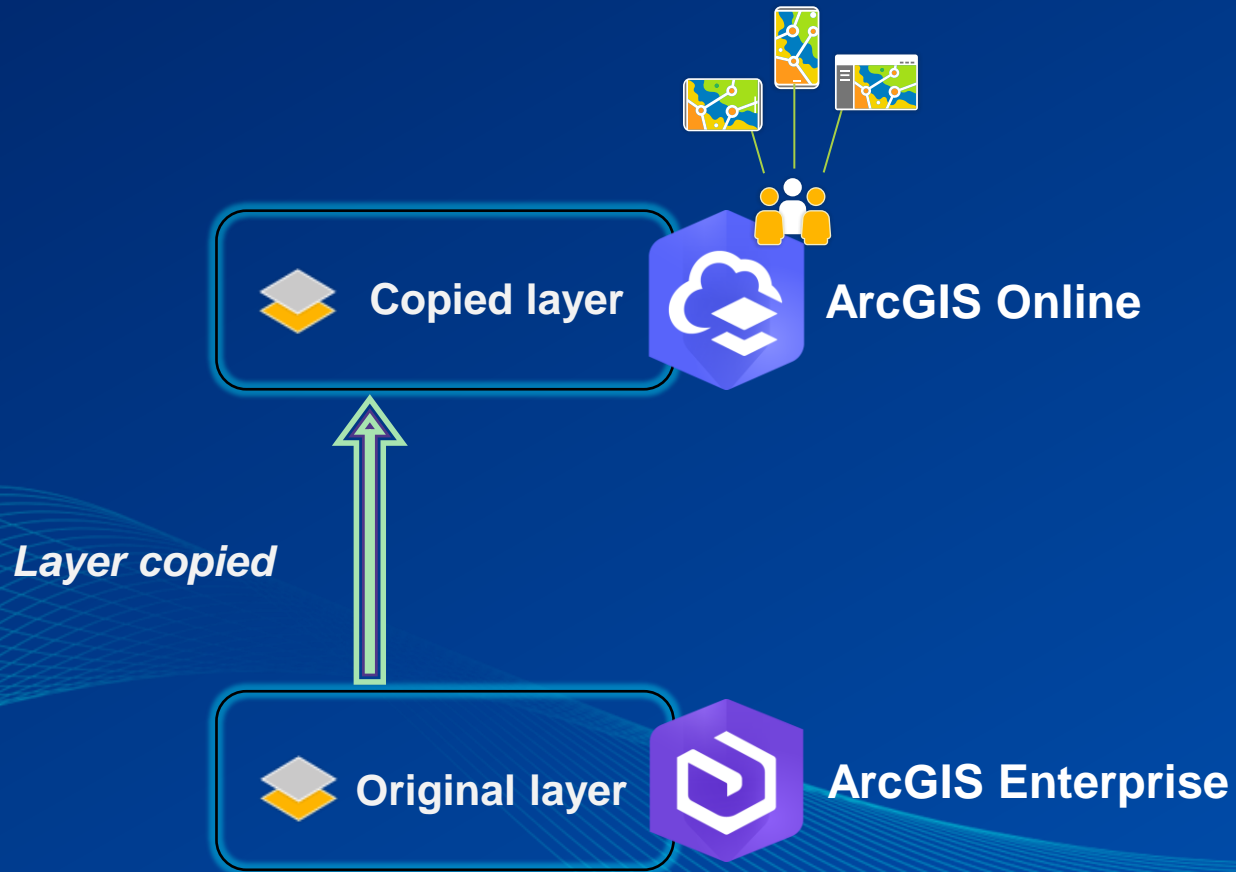


ArcGIS Online

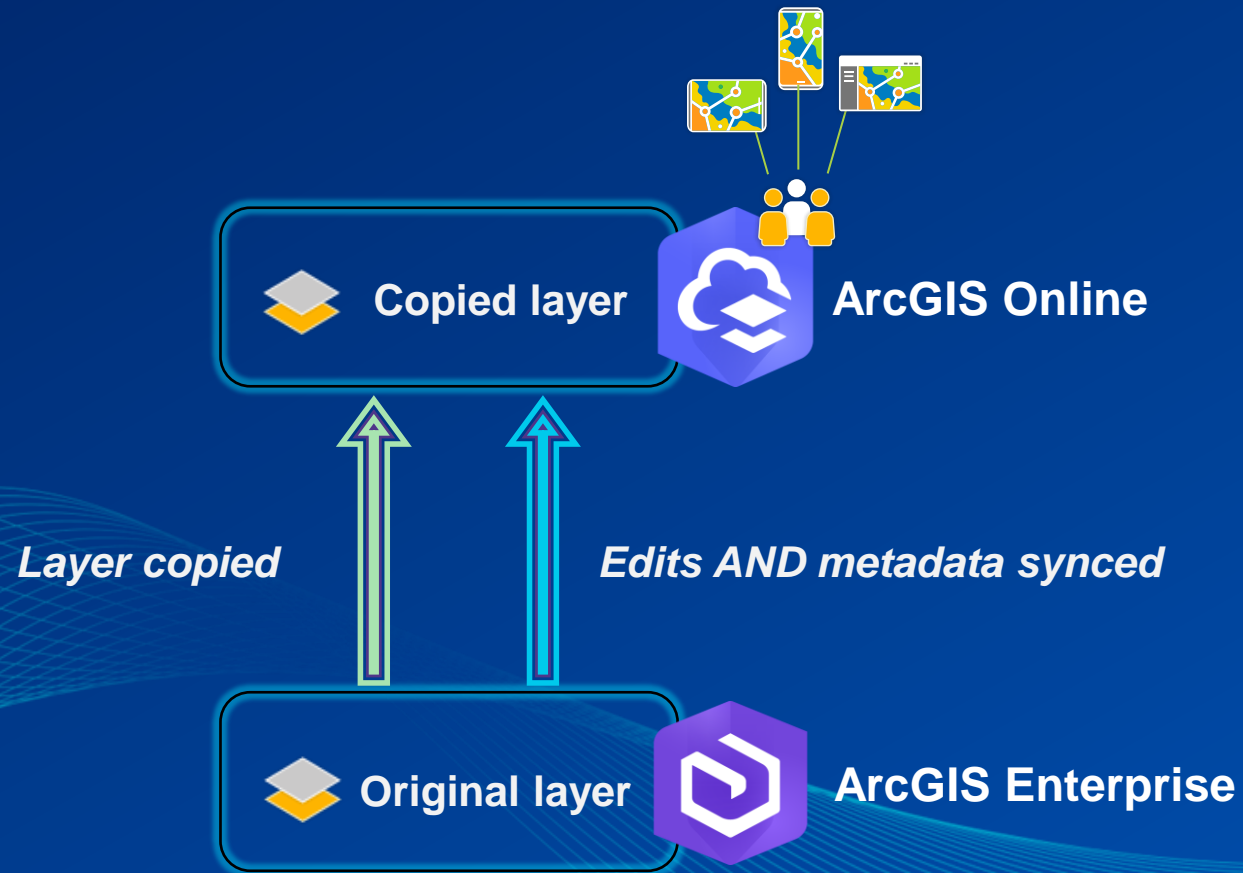


ArcGIS Hub

# Metadata flow during distributed collaborations



# Metadata flow during distributed collaborations



# CHALLENGE: Understanding and leveraging metadata management and flow

Data management is tightly coupled with metadata management

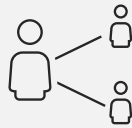
(Meta)data & Analytics



Web Services & Data Layers



People & Partners



Open Data & Catalogs



Maps & Apps / Tools & Solutions



Integrated Geospatial Infrastructure



*produce*

*publish*

*collaborate*

*share / discover*

*use / reuse*

*interconnect*



ArcGIS Pro

Extensions



ArcGIS Enterprise



ArcGIS Online



ArcGIS Hub

# Metadata flow with catalogs and federation

Metadata automatically flow with content you share to your Hub catalog

The screenshot shows the OneMap interface with a search bar at the top containing the URL `https://our-onemap.opendata.arcgis.com`. Below the search bar is a map of Luxembourg with a search bar and a 'Search' button. A metadata panel is open on the right, displaying XML metadata for 'AU Administrative Unit 4th Order Luxembourg AU demo'. The metadata includes details like 'Created: 2021-07-06', 'Updated: 2021-07-06', and 'Records: 102'. A large blue arrow points from the metadata panel towards the DCAT logo at the bottom right.

The screenshot shows the Data.gov website interface. At the top, there is a search bar and navigation links for 'DATA', 'TOPICS', 'RESOURCES', 'STRATEGY', 'DEVELOPERS', and 'CONTACT'. Below the search bar, there is a 'Search datasets...' field and a dropdown menu for 'Order by: Popular'. The main content area displays search results for '242,779 datasets found'. The first result is 'FDIC Failed Bank List' with 1,777 recent views. Other results include 'Dynamic Small Business Search (DSBS)', 'Lottery Mega Millions Winning Numbers: Beginning 2002', and 'Electric Vehicle Population Data'. A large blue arrow points from the DCAT logo at the bottom left towards the search results area.

DCAT

# CHALLENGE: Things change

Auto-populate and syncing metadata elements

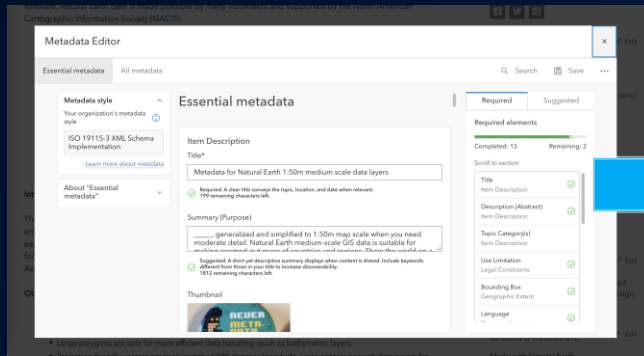
The screenshot shows the ArcGIS Item Details page for an item named "Buffelgrass". The page is divided into several sections:

- Header:** Navigation tabs (Home, Gallery, Map, Scene, Notebook, Groups, Content, Organization) and user profile (Jordan Duft, jduft\_pm).
- Item Title:** "Buffelgrass" with an edit icon.
- Overview Tab:** Active tab, showing a map thumbnail, description, and metadata.
- Map Thumbnail:** A map of the southwestern United States with a red location marker. Includes an "Add to Favorites" button.
- Description:** "Buffelgrass, scientifically known as Cenchrus ciliaris, is a warm-season grass that is native to Africa and has been introduced to many other regions of the world, including the southwestern United States. Buffelgrass is a drought-tolerant and fire-adapted species, making it highly competitive in arid regions where it outcompetes native plant species. FOR DEMONSTRATION USE ONLY." Includes an "Edit" icon.
- Layers:** A list of layers, including "Layer\_1" (Point layer).
- Terms of Use:** "FOR DEMONSTRATION USE ONLY." Includes an "Edit" icon.
- Comments:** "Comments (0)".
- Actions:** A vertical stack of buttons on the right side: "Open in Map Viewer", "Open in Scene Viewer", "Open in ArcGIS Desktop", "Publish", "Create View Layer", "Export Data", "Update Data", and "Share".
- Item Information:** A progress bar showing a score from Low to High. Includes a "Learn more" link and a "Top Improvement: Add a longer description" prompt.
- Details:** Metadata information including Source (Feature Service), Data updated (Dec 12, 2024, 8:06 AM), Schema updated (Dec 12, 2024, 8:06 AM), Size (16 KB), Attachments size (0 KB), and ID (f7155d6ab1b54f0a863ce14afa858a7e).

# CHALLENGE: Improving data layers that don't yet have metadata

Combine existing item information with metadata from a template using 'Overwrite' – *now easier than ever!*

## Template metadata



<https://www.arcgis.com/home/item.html?id=df3f873eca904ddd934c695ed4b80b58>

Home Gallery Map Scene Notebook Groups Content Organization

### Metadata template for Natural Earth 1:50m medium scale data layers

Overview Usage Settings

Open Share Metadata

Edit thumbnail

\_\_\_\_\_, generalized and simplified to 1:50m map scale when you need moderate detail. Natural Earth medium-scale GIS data is suitable for making zoomed-out maps of countries and regions. Show the world on a tabloid-size page. Version \_\_\_\_.

Document Link by Esri\_SDI

Item created: 25 Nov 2024 Item updated: 12 Dec 2024 View count: 13

Add to Favorites

#### Description

<insert more about this layer \_\_\_\_>

#### About Natural Earth

Natural Earth is a convenient resource for creating custom maps. Unlike other map data intended for analysis or detailed government mapping, it is designed to meet the needs of cartographers and designers to make generalized maps. *Maximum flexibility is a goal.*

Natural Earth is a public domain collection of map datasets available at 1:10 million (larger scale/more detailed), 1:50 million (medium scale/moderate detail), and 1:110 million (small scale/coarse detail) scales. It features tightly integrated vector and raster data to create a variety of visually pleasing, well-crafted maps with cartography or GIS software. Natural Earth data is made possible by many volunteers and supported by the North American Cartographic Information Society (NACIS).

- **Convenience** - Natural Earth solves a problem: finding suitable data for making small-scale maps. In a time when the web is awash in geospatial data, cartographers are forced to waste time sifting through confusing tangles of poorly attributed data to make clean, legible maps. Because your time is valuable, Natural Earth data comes ready to use.
- **Neatness Counts** - The carefully generalized linework maintains consistent, recognizable geographic shapes at 1:10m, 1:50m, and

#### Item Information

Learn more

Low High

#### Details

Size: 1 KB  
ID: df3f873eca904ddd934c695ed4b80b58  
☆☆☆☆☆

f t e

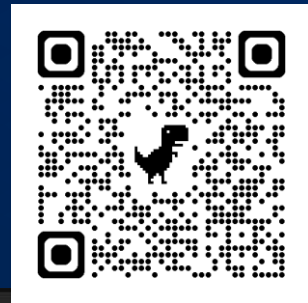
#### Share

Edit

# CHALLENGE: Advanced uses cases when things change

Streamlining Metadata Automation with ArcGIS and Data Interoperability / FME

- Demo: Generating or importing metadata during ETL
- Demo: Bulk update of Esri portal item metadata
- Demo: XML Metadata harvest and updates



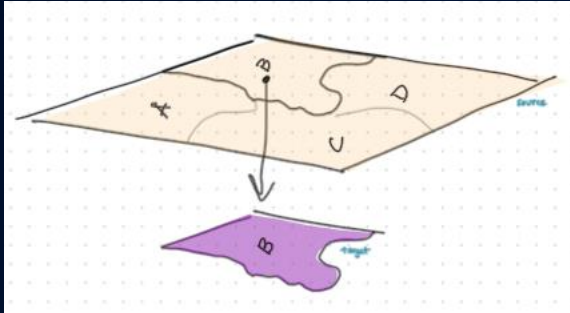
The image shows a webinar player interface. On the left is a video player with a play button and the title "Streamlining Metadata Automation with ArcGIS and FME". The video player has logos for "FME by Safe Software" and "esri". To the right of the video player is a vertical list of participant thumbnails with names: "Frank Harrell", "Elizabeth Manning", "Dean Wertz", and "Jordan Durr". On the far right is a "Table of Contents" section with the following items:

Table of Contents	
Introduction: Why Metadata?	03:56
Demo: Generating or importing metadata during ETL	16:01
Demo: Bulk update of Esri portal item metadata	26:53
Demo: XML Metadata harvest and updates	33:58
Conclusion	46:42
Resources & Next Steps	49:30
Q&A	51:07

<https://fme.safe.com/webinars/streamlining-metadata-automation-with-arcgis-and-fme/>

# CHALLENGE: Web GIS data distribution patterns need data and metadata to flow dynamically

Overwrite metadata from source layer to filtered copy layer



The screenshot shows the ArcGIS Online interface for the CDC Social Vulnerability Index 2018 - USA. The page title is "CDC Social Vulnerability Index 2018 - USA". The user is Jill Saligoe-Simmel (jsaligoe\_esri). The page has tabs for Overview, Data, and Visualization. The main content area shows a map thumbnail of the United States with a color-coded vulnerability index. The description states: "2018 Social Vulnerability Index (SVI). Created by the Centers for Disease Control and Prevention (CDC) / Agency for Toxic Substances and Disease Registry (ATSDR) / Geospatial Research, Analysis, and Services Program (GRASP). Feature layer from Centers for Disease Control and Prevention. Managed by data\_cdc. Item created: 16 Mar 2020. Item updated: 6 Oct 2021. View count: 15,387,896." The page also includes a "Description" section with bullet points, a "What is CDC Social Vulnerability Index?" section, and a "Details" section with metadata.

**Description**

- This feature layer visualizes the 2018 overall SVI for U.S. counties and tracts
- Social Vulnerability Index (SVI) indicates the relative vulnerability of every U.S. county and tract
- 15 social factors grouped into four major themes
- Index value calculated for each county for the 15 social factors, four major themes, and the overall rank

**What is CDC Social Vulnerability Index?**

ATSDR's Geospatial Research, Analysis & Services Program (GRASP) has created a tool to help emergency response planners and public health officials identify and map the communities that will most likely need support before, during, and after a hazardous event.

The Social Vulnerability Index (SVI) uses U.S. Census data to determine the social vulnerability of every county and tract. CDC SVI ranks each county and tract on 15 social factors, including poverty, lack of vehicle access, and crowded housing, and groups them into four related themes:

**Details**

Source: Feature Service  
Data updated: 18 Sept 2023, 15:29  
Schema updated: 18 Sept 2023, 15:29  
Size: 338.867 MB  
Attachments size: 0 KB  
ID: cbd68d9887574a10bc89ea4efe2b8087  
★★★★☆

Share

# Summary and Roadmap





Feb 2024

- Refined extents
- Optimized performance and tech debt
- Metadata style validation
- UI refinement
- Out of Beta (Enterprise 11.3)
- Metadata flow



June 2024

- Delightful UI
- Optimized performance
- Sync properties



Nov 2024

- Simplified
  - Metadata overwrite
  - Constraints and license picker
- Sync properties
- UI refinement



Road ahead

- ArcGIS Pro readiness
- Dublin Core+ metadata style
- Auto-populate and sync of metadata elements
- Metadata flow
- AI metadata assist
- Create custom profiles
- DCAT-US 3
- Retirement of metadata editor classic in 2025

# Moving forward with metadata

Where we see the future

## Reimagining metadata

- Streamlined metadata population and processes with **minimal effort**
- Tightly coupled with data, **powering geospatial ecosystems**

## Active metadata

- Driving **insights** and **suggestions** from data (observability, automation, integration)
- Adapting to change effectively

## Smarter search and discovery

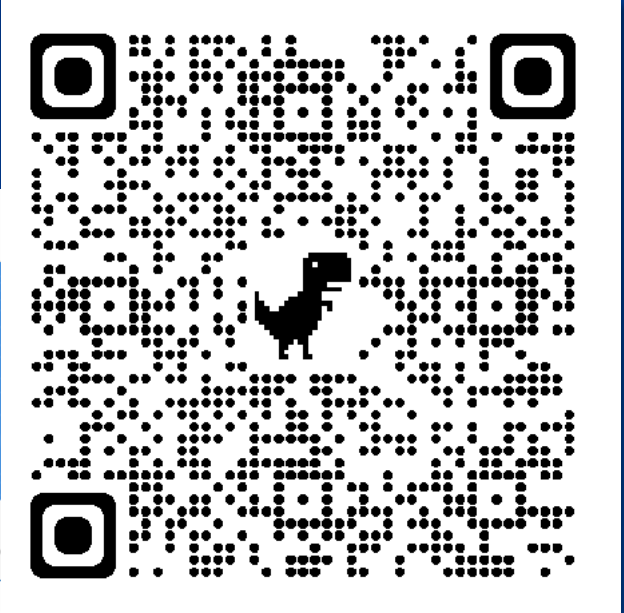
- Supporting **AI-readiness**
- Expanding reach and **system connectivity**
- **Linking** data, information, models, and people

## Strategic alignment with data and goals

- **Effortless access** to essential information to make better decisions
- Enhancing **data strategy alignment**

# Join the Esri Community

The screenshot shows the Esri Community website interface. At the top left is the Esri logo and the word 'Community'. Navigation links include 'All Communities', 'ArcGIS Ideas', 'GIS Life', and 'Community Resources'. A search bar and a 'Sign In' button are on the right. The main heading is 'Metadata, Catalogs and Search'. Below it is a search bar with a magnifying glass icon and a dropdown menu set to 'This place'. A breadcrumb trail reads 'Home > All Communities > Products > Metadata, Catalogs and Search'. A 'Subscribe' button is visible on the right. The main content area is titled 'Browse Metadata, Catalogs and Search' and features a 'Sort/Filter: A-Z' dropdown. Two content cards are displayed: 'Metadata, Catalogs, Search Ques.' with 58 users, 370 views, and 3 comments; and 'Metadata, Catalogs, Search Blog' with 57 users, 127 views, and 2 comments. At the bottom, there is a 'Latest Activity' section with a 'Sort/Filter: Newest' dropdown and a 'Create A Post' button.





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**THE  
SCIENCE  
OF  
WHERE**<sup>®</sup>

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