

# Exploring ArcGIS Data Management Techniques

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 **esri** South Africa

*THE SOUTHERN AFRICA ESRI USER CONFERENCE 2023*



# Topics that we'll cover in our session...

- Understanding data management concepts and best practices
- Organising GIS data using folders and geodatabases
- Creating and maintaining metadata
- Managing feature classes and tables
- Creating and managing relationships between datasets
- Editing and updating data in ArcGIS Pro
- Data backup and recovery
- Sharing and distributing data



# Understanding data management concepts and best practices

Leigh Thomas



Facility type	District	Municipality	Ward	
Hall	iLembe	Ndwe dwe	1	29

It is a hall

Church

hall

SCHHOOL

School

Metadata Geography Table

**Clinics\_5km\_Buffer**

**Type** File Geodatabase Feature Class

**Tags** There are no tags for this item.

**Summary**  
There is no summary for this item.

**Description**  
There is no description for this item.

**Credits**  
There are no credits for this item.

**Use limitations**  
There are no access and use limitations for this item.

**Extent**  
There is no extent for this item.

**Scale Range**  
There is no scale range for this item.

*You are currently using the Item Description metadata style. Change your n*

Contents

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    - KZNHealthLogo.png
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    - MED\_FACS\_KZN.jpg
    - Regional\_Hospitals.jpg
    - Water\_Disruptions.png
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  - Copy of clinic\_catchment.xls
  - Copy of District Catchment Population.xlsx
  - Copy of District Municipality Population Projections\_2011 to 2022.xlsx
  - Copy of Local Municipality Population Projections\_2016 to 2022.xlsx
  - Copy of Regional Catchment Population.xlsx
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    - LM\_POP\_Access\_To\_Clinics\_5km.xlsx
    - LM\_POPULATION.xls
    - Medical Health Facilities\_Quarter 1.xlsx
    - Medical Health Facilities\_Quarter 1\_Clinics.xlsx
    - DOH.tbx

Catalog

Project Folders DOH DOH.gdb

Name

- Clinic\_Catchment
- Clinics\_5km\_Buffer
- Clinics\_Updated
- District\_Catchment\_Population
- District\_Catchment\_Population1
- DM\_POPULATION
- DM\_Population\_1
- LM\_POP\_Access
- LM\_POP\_Access\_To\_Clinics\_5km\_ExcelToTable
- LM\_POPULATION
- LM\_Population\_1
- LM\_POPULATION\_Clip5km
- MedicalHealthFacilities
- MedicalHealthFacilities\_Summary
- regional\_Catchment\_Population
- Regional\_Catchment\_Population1
- Regional\_Hospitals
- Total\_Clinics\_Per\_District

# Data management concepts

## Overview

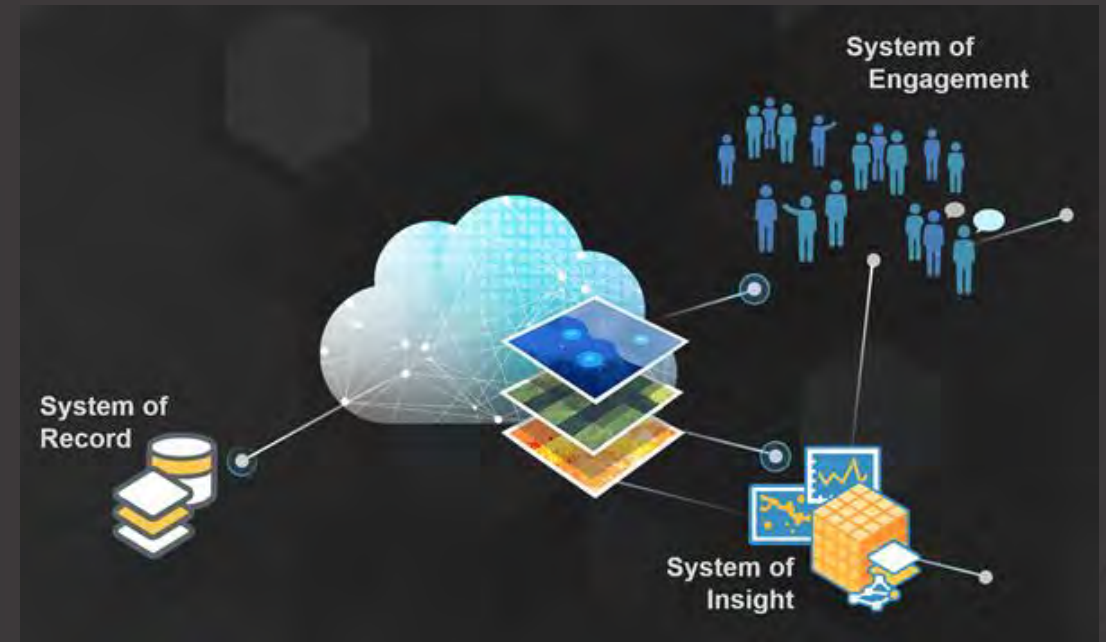
- What is Data management and why is it important?


“Data management is the practice of collecting, storing, and using data securely and efficiently, helping organizations make informed decisions...it is important because organizations are working with more geographic information system (GIS) data than ever before and need safe and efficient ways to gather, organize, and secure it.”

# Data management concepts

## Best Practices

- Leverage the power of geodatabases
- Give your map documents purpose
- Work in workspaces
- Practice proper naming conventions
- Implement quality control procedures
- Create a backup





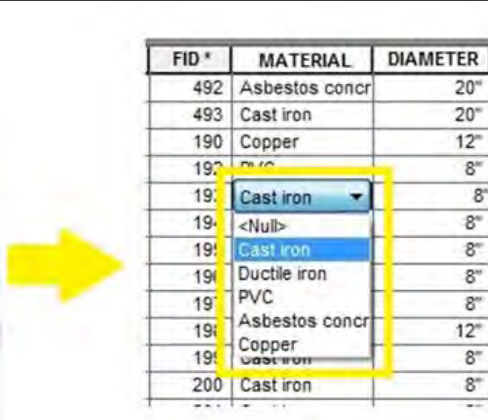
# Organising GIS data using folders and geodatabases; Creating and maintaining metadata; Managing feature classes and tables

Leigh Thomas

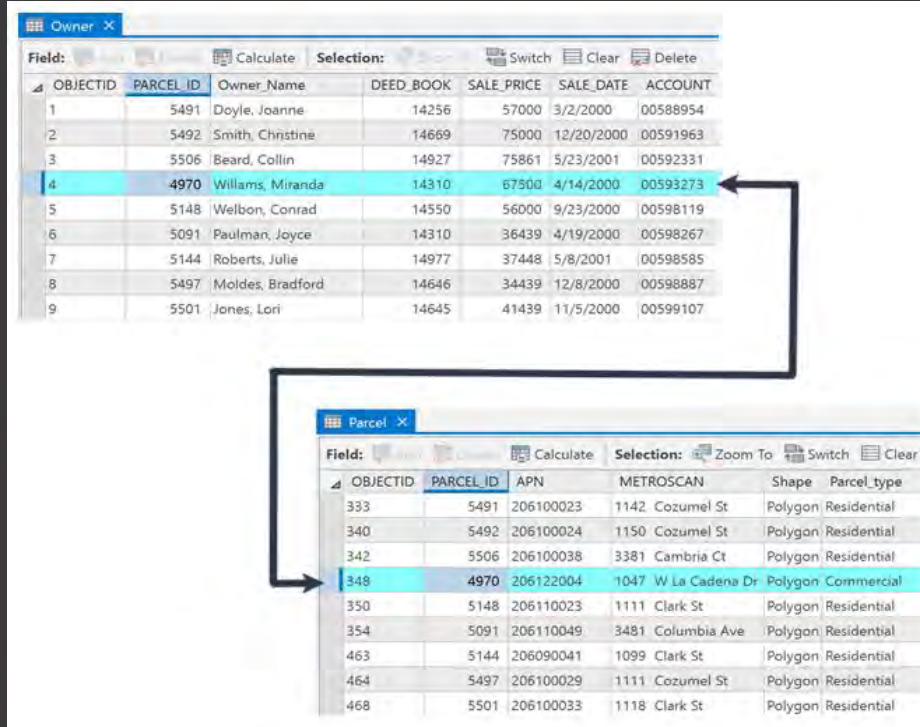
# Organising your data

## Geodatabases and Folders

- Geodatabase = a collection of files in a folder on disk that can store, query, and manage spatial and nonspatial data.
- The data you add can be stored in the following types of datasets:
  - Feature classes
  - Feature datasets (Topology & Networking)
  - Mosaic datasets
  - Raster datasets
  - Tables (nonspatial)
- Subtypes & Domains
- Relationship Classes



FID *	MATERIAL	DIAMETER
492	Asbestos concr	20"
493	Cast iron	20"
190	Copper	12"
192		8"
193	Cast iron	8"
194	<Null>	8"
195	Cast iron	8"
196	Ductile iron	8"
197	PVC	8"
198	Asbestos concr	12"
199	Copper	8"
200	Cast iron	8"



OBJECTID	PARCEL_ID	Owner_Name	DEED_BOOK	SALE_PRICE	SALE_DATE	ACCOUNT
1	5491	Doyle, Joanne	14256	57000	3/2/2000	00588954
2	5492	Smith, Christine	14669	75000	12/20/2000	00591963
3	5506	Beard, Collin	14927	75861	5/23/2001	00592331
4	4970	Williams, Miranda	14310	67500	4/14/2000	00593273
5	5148	Welbon, Conrad	14550	56000	9/23/2000	00598119
6	5091	Paulman, Joyce	14310	36439	4/19/2000	00598267
7	5144	Roberts, Julie	14977	37448	5/8/2001	00598585
8	5497	Moldes, Bradford	14646	34439	12/8/2000	00598887
9	5501	Jones, Lori	14645	41439	11/5/2000	00599107

OBJECTID	PARCEL_ID	APN	METROSCAN	Shape	Parcel_type
333	5491	206100023	1142	Cozumel St	Polygon Residential
340	5492	206100024	1150	Cozumel St	Polygon Residential
342	5506	206100038	3381	Cambria Ct	Polygon Residential
348	4970	206122004	1047	W La Cadena Dr	Polygon Commercial
350	5148	206110023	1111	Clark St	Polygon Residential
354	5091	206110049	3481	Columbia Ave	Polygon Residential
463	5144	206090041	1099	Clark St	Polygon Residential
464	5497	206100029	1111	Cozumel St	Polygon Residential
468	5501	206100033	1118	Clark St	Polygon Residential



# Metadata

## Data about your data

- Who, Why, When, Where?
- Saved with the item it describes
- Best Practice:
  - Assemble a metadata checklist for your organization
  - What legal matter must be included in the metadata?
  - How accurate/recent the item is
  - Restrictions on using and sharing the item
  - Periodic reviews and revisions of metadata guidelines

### Catchment Population - KZN Clinics 2022



**Tags** Clinics, KZN, 2022, Catchment Population

#### Summary

KZN Clinics and their relative catchment population, based on the projected population statistics derived from the 2011 Census statistics.

#### Description

KZN Clinics and their relative catchment population, based on the projected population statistics derived from the 2011 Census statistics.

#### Credits

KZN Department of Health (2022)  
Contact details: 033 330 3300  
Betty Boop  
GIS Manager

#### Use limitations

Copyright to KZN Department of Health

#### Extent

There is no extent for this item.

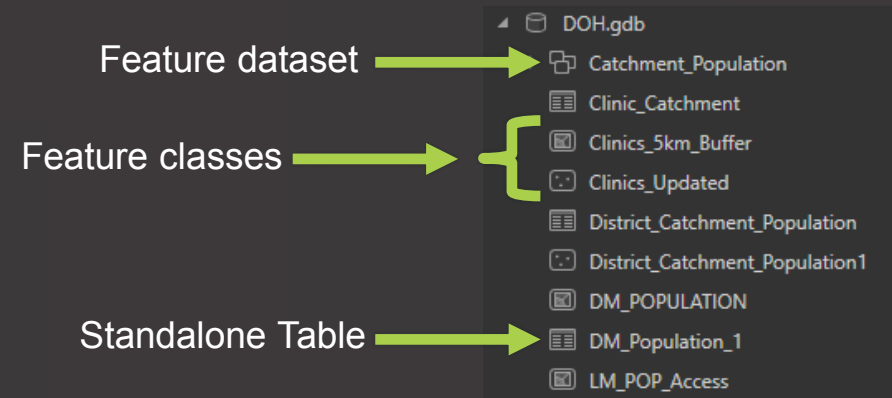
#### Scale Range

Maximum (zoomed in) 1:5,000  
Minimum (zoomed out) 1:5,000,000

# Feature Classes and Tables

## Feature Classes

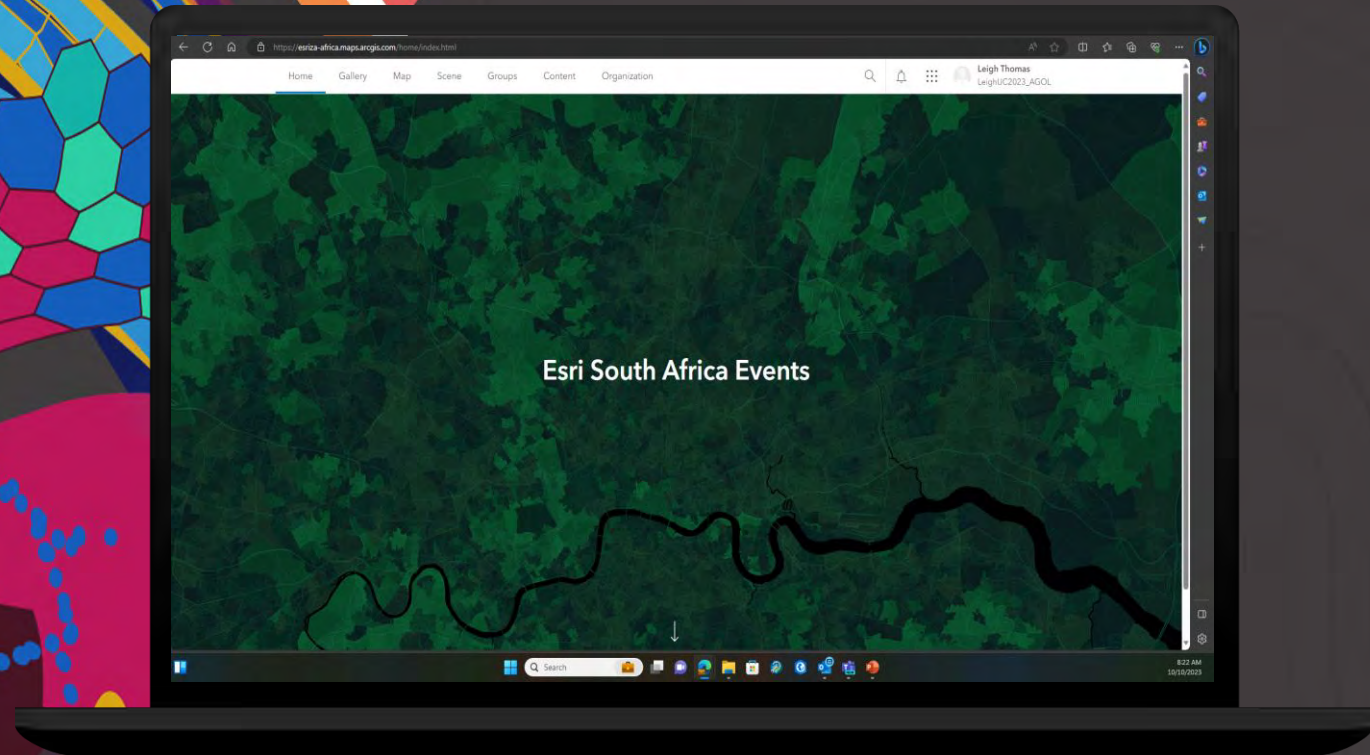
- Feature Classes - homogeneous collections of common features, each having the same spatial representation:
  - Points
  - Lines
  - Polygons
  - Annotation & Dimensions
  - Multipoints (e.g. LIDAR)
  - Multipatches & 3D Objects (3D)
- Feature Datasets
- Shapefile vs GDB Feature Class - domains, topologic relationships (topology, geometric networks, terrains), and the ability to store high precision geometry



# Feature Classes and Tables

## Tables and attribute data

- In the geodatabase, attributes are managed in tables based on a series of simple, yet essential, relational data concepts:
  - Tables contain rows
  - All rows in a table have the same fields
  - Each column has a datatype (integer, decimal number, character, date)
  - A series of functions and operators is available to manage tables and their data elements
- Tables provide descriptive information for features, rasters and traditional attribute tables in the geodatabase
- Geodatabase tables can be related to one another using a common field
- Attribute domains, Subtypes and Versioning (multi-user)



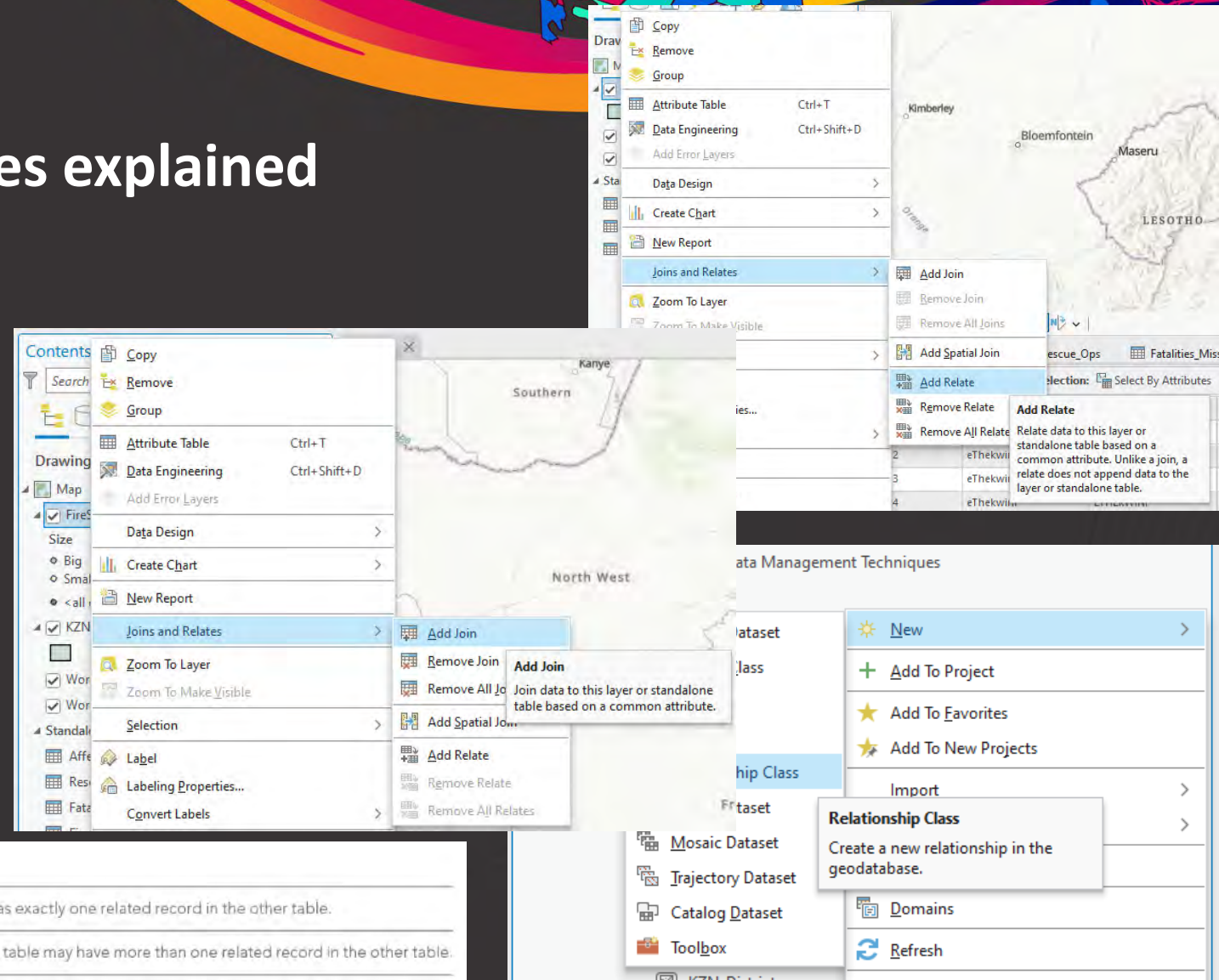
# Demo

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# Relates and relationship classes explained

## Discussions and demo

- Differences
- Cardinality
- Example of a relate
- Example of a join
- Example of a relationship class



# Editing and updating data in ArcGIS Pro

## Discussions and demo

- Edit sessions in ArcGIS Pro
- Services vs database connections
- I can't edit, why?
- That wasn't me. Who was it?

The image shows two overlapping windows from ArcGIS Pro. The top window is the 'Options' dialog box, specifically the 'Editing' section. The bottom window is a data table titled 'FirePersonnel'.

**Options Dialog - Editing Section:**

- Allow ESC to cancel the active tool in Stereo maps
- Touch screen input for new features
- Default tool when deactivating editing tools:
  - Explore
  - Select
- Session
  - Enable and disable editing from the Edit tab
  - Automatically save edits
    - Time interval (minutes): 10
    - Number of operations: 30
  - Save edits when saving project
  - Show dialog to confirm save edits
  - Show dialog to confirm discard edits
  - Deactivate an active editing tool when saving or discarding
  - Make newly added layers editable by default

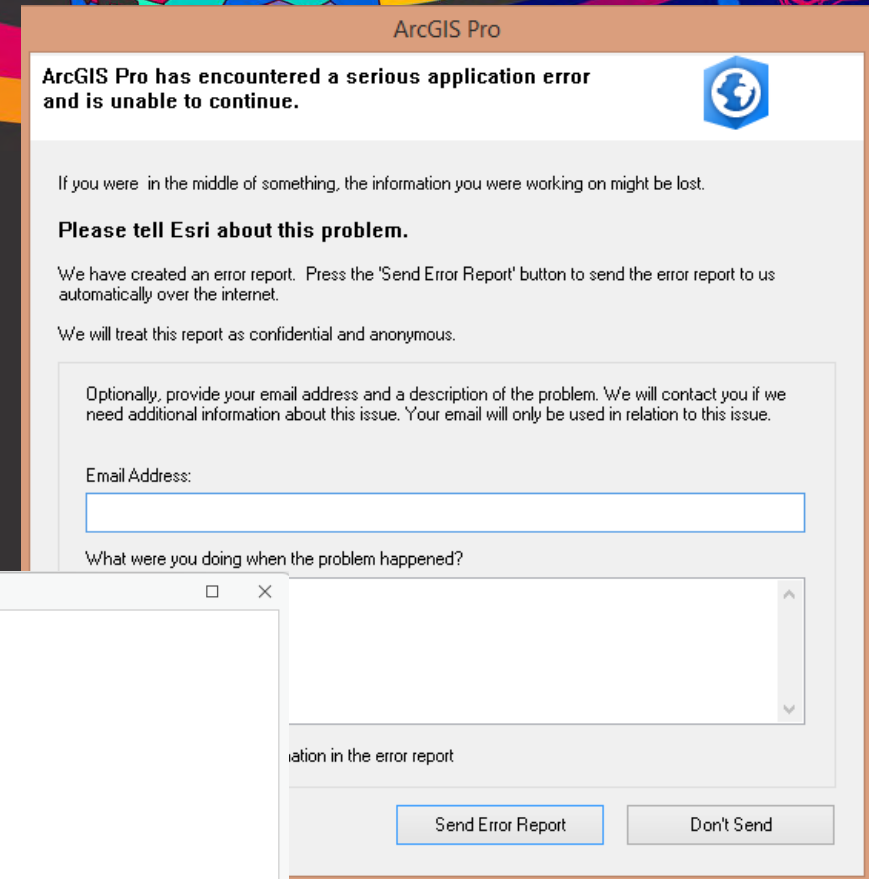
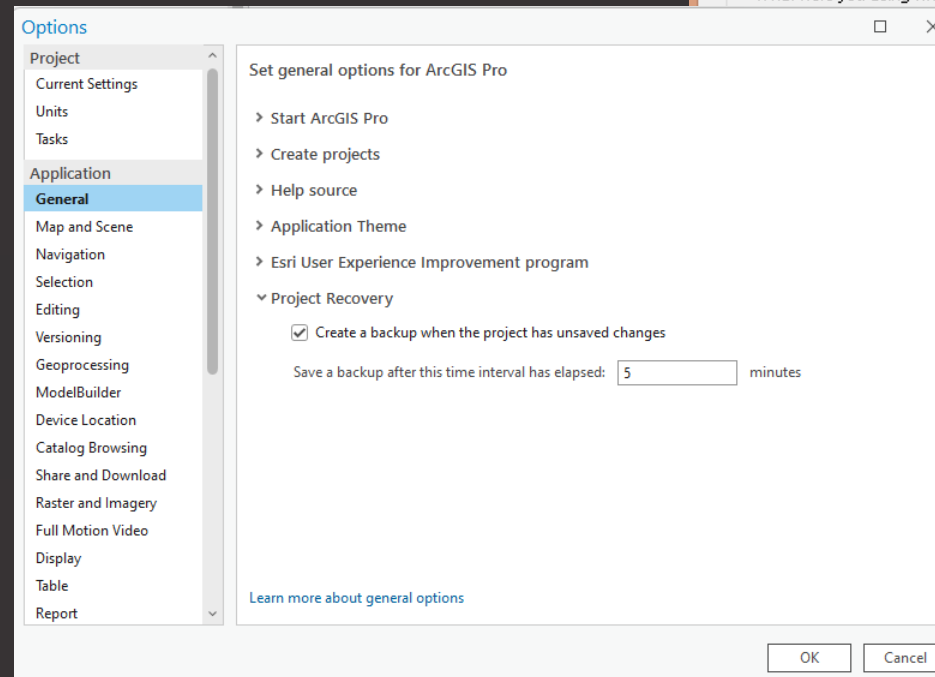
**FirePersonnel Table:**

OBJECTID *	Name	StationID *	Level	GlobalID
1	Leigh	1	Beginner	{015C3A28-B585-4658-...
2	Thabo	1	Expert	{7E520130-0270-4ACC-...
3	Chris	1	Beginner	{2641E325-AC0D-46B2-...
4	Lebo	1	Expert	{EB4D9F15-5E3C-4771-...
5	Lindo	2	Beginner	{C4A1CA32-1344-4B68-...
6	Martin	2	Expert	{6221E430-9A00-47BA-...
7	Vince	2	Beginner	{F7D27F3A-1528-4E75-...
8	Veronica	2	Expert	{3CA6817F-9F68-4600-...
9	Dineo	3	Expert	{B63B12DF-F20A-4F3A-...
10	Nompu	3	Expert	{C44F8293-B43F-4C3A-...
11	Pumi	3	Expert	{615CE0CE-9F5B-4732-...
12	Edmund	4	Expert	

# Data backup and recovery in ArcGIS Pro

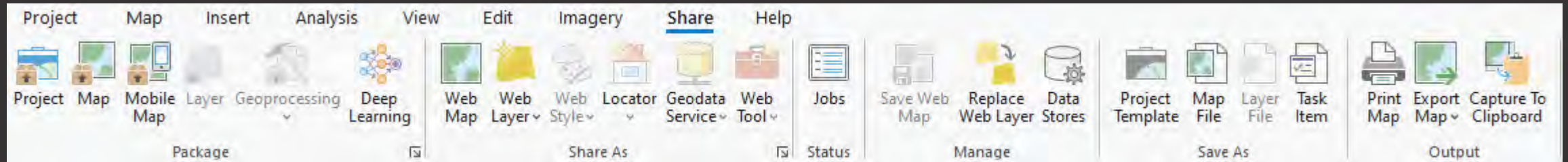
## Discussions and demo

- Unexpected shutdown. What now?
- What can be recovered?
- Options to avoid data loss.



# Sharing and distributing data in ArcGIS Pro

## Discussions and demo



- Share your work with ArcGIS Pro.
  - Most used methods of sharing in organisations.
  - Other methods for your use case.
- Distributing your work with ArcGIS Pro.
  - Why do this in your organisation?
  - Several ways to distribute your work.
  - Replication of databases as an example.



Project **Map** Insert Analysis View Edit Imagery Share Help

Cut Copy Paste Copy Path **Explore** Bookmarks Go To XY

Basemap Add Data Add Graphics Layer

Select Select By Attributes Select By Location Clear Zoom To

Measure Locate Infographics Coordinate Conversion

Pause Lock View Unplaced Convert Download Map Remove

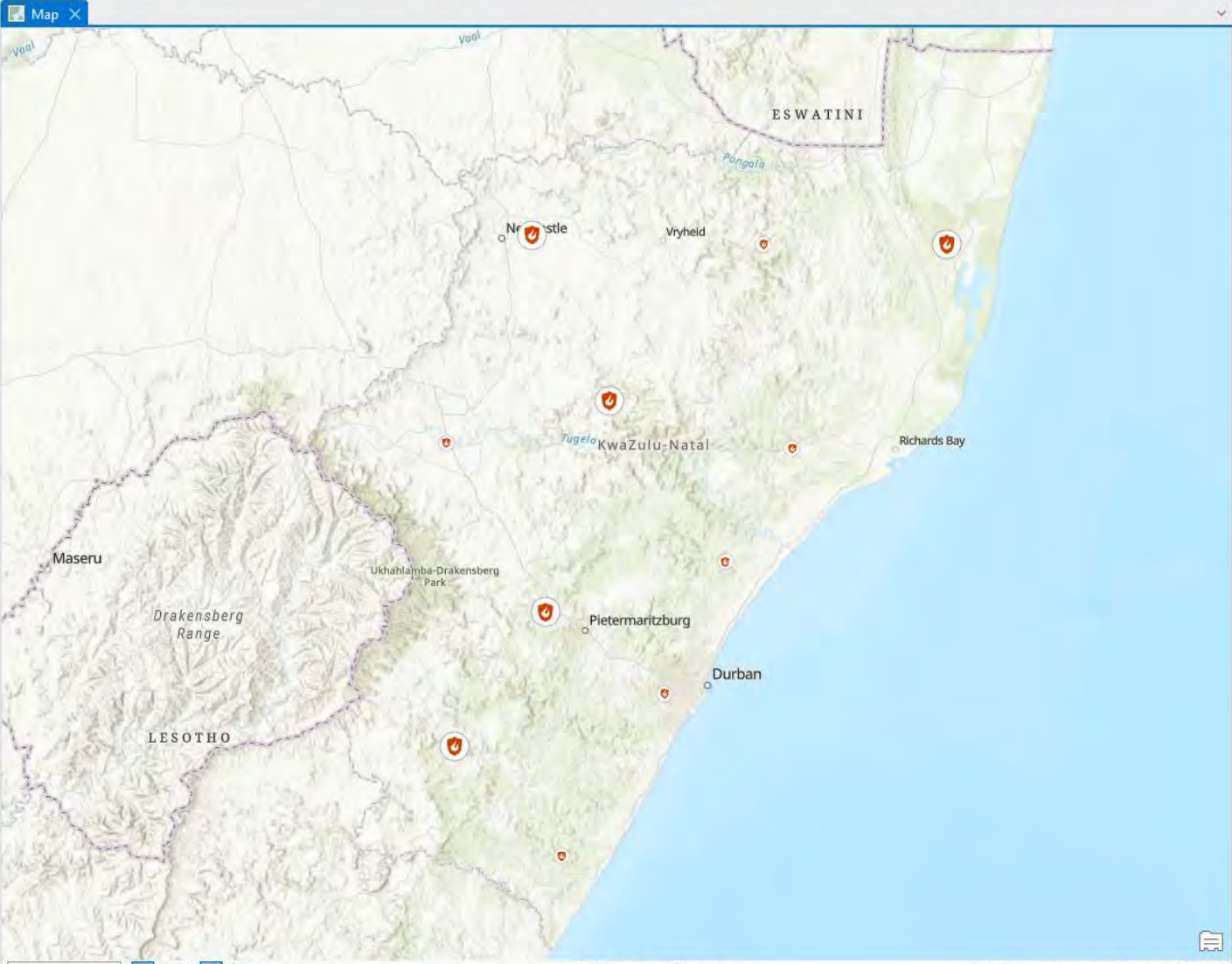
Clipboard Navigate Layer Selection Inquiry Labeling Offline

Contents

Search

Drawing Order

- Map
  - pssde.LDR.FireStations
    - Size
      - Big
      - Small
    - World Topographic Map
    - World Hillshade
  - Standalone Tables
    - pssde.LDR.FirePersonnel



Catalog

Project Portal Computer Favorites

Search Project

- Maps
- Toolboxes
- Databases
- Styles
- Folders
- Locators



# Questions

# Please share your feedback in the UC2023 app

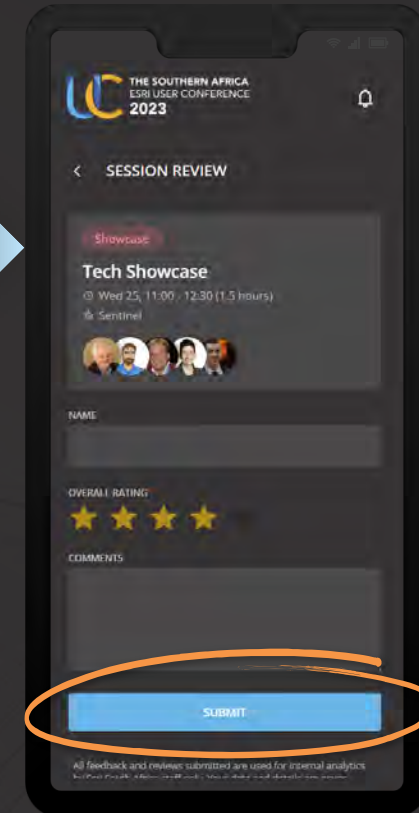
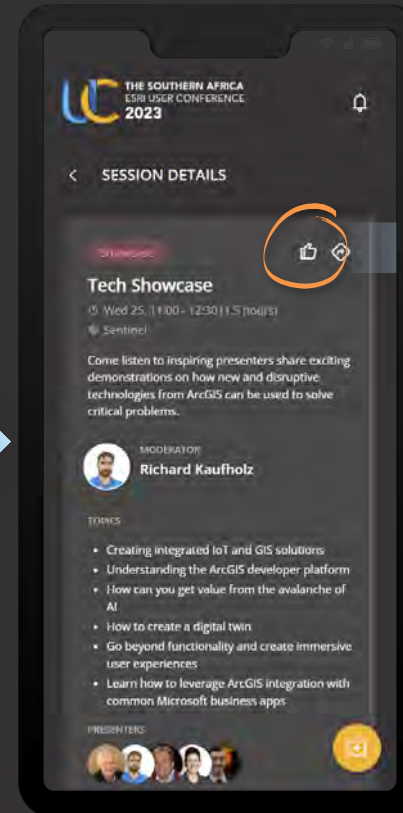
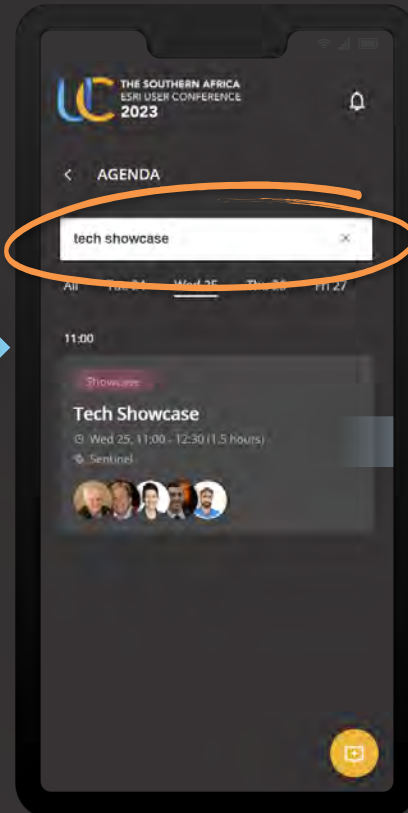
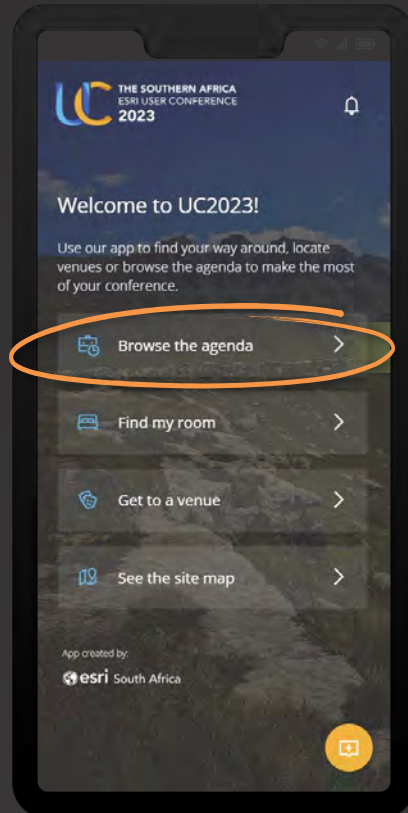


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