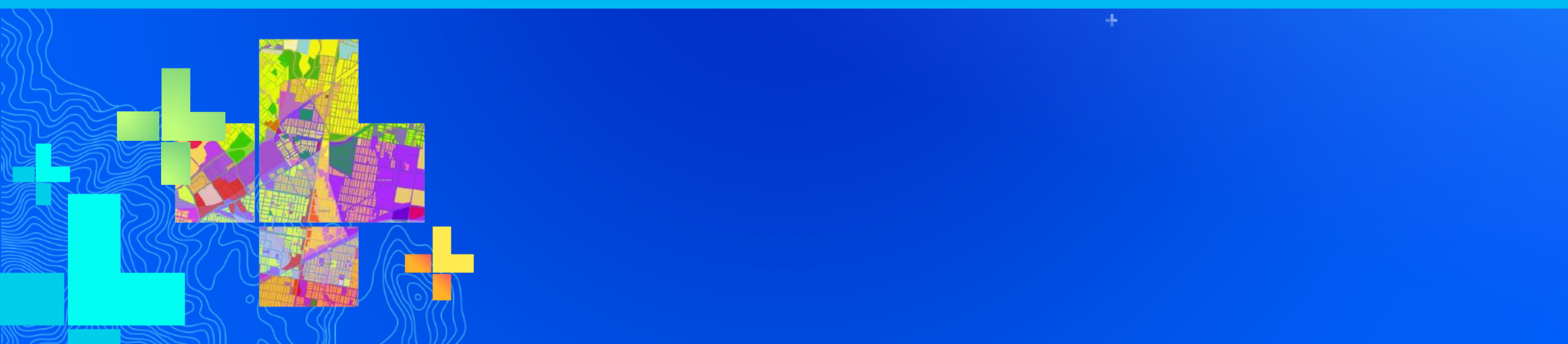




SQL Access Using Native Geometry Types: Tips and Tricks

Afreen Virani & Connor Frieze



Assumptions

Target Audience

- Intermediate knowledge of SQL and relational databases.
- No knowledge of the ST_Geometry data type or functionality is necessary.
- Not covering setup and configuration of ST_Geometry environments.
- Questions at the end of the presentation.





Please silence cell phones



Agenda

- Native Geometry Types
- What is ST_Geometry?
- Why use ST_Geometry?
- How is ST_Geometry Implemented?
- Additional Considerations
- DEMO
 - How to use ST_Geometry
 - How to use SQL Server Geometry type via SQL

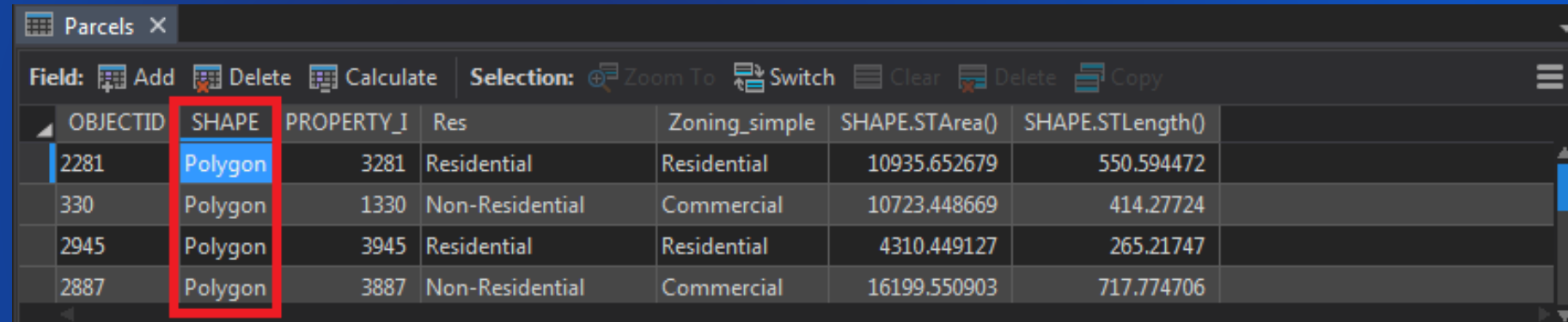
Native Geometry Types (D = Default)

	SQL Server 	Oracle 	PostgreSQL 	SQLite 
Esri ST_Geometry		✓ D	✓ D	✓ D
Esri SDE Binary	✓	✓		
SQL Server Geometry	✓ D			
SQL Server Geography	✓			
Oracle Spatial		✓		
PostGIS Geometry			✓	
Spatialite				✓

What Is ST_Geometry?

- ST_Geometry is a spatial type that stores geometry data in a single spatial attribute

- Spatial Index



The screenshot shows a table titled 'Parcels' with the following columns: OBJECTID, SHAPE, PROPERTY_ID, Res, Zoning_simple, SHAPE.STArea(), and SHAPE.STLength(). The 'SHAPE' column is highlighted with a red box, and the value 'Polygon' in the first row is highlighted with a blue box.

OBJECTID	SHAPE	PROPERTY_ID	Res	Zoning_simple	SHAPE.STArea()	SHAPE.STLength()
2281	Polygon	3281	Residential	Residential	10935.652679	550.594472
330	Polygon	1330	Non-Residential	Commercial	10723.448669	414.27724
2945	Polygon	3945	Residential	Residential	4310.449127	265.21747
2887	Polygon	3887	Non-Residential	Commercial	16199.550903	717.774706

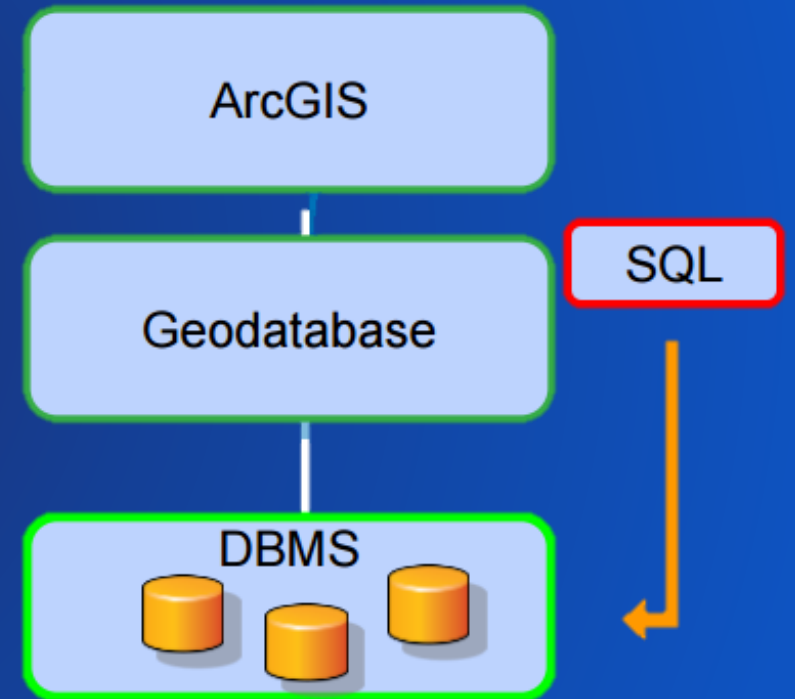
- Relational and geometry operators and functions
 - Constructors
 - Accessors
 - Relationship and Operators

















Why use ST_Geometry?

Benefits of ST_Geometry

- Enhances Efficiency
- Sometimes you want a single result, and not a map
- Interact with data on the SQL level
- Bridge the gap between GIS and non-GIS users
- Accessed using common API's and SQL



How is ST_Geometry Implemented? (D = Default)

	SQL Server 	Oracle 	PostgreSQL 	SQLite 
Esri ST_Geometry		 D	 D	 D
Esri SDE Binary				
SQL Server Geometry	 D			
SQL Server Geography				
Oracle Spatial				
PostGIS Geometry				
Spatialite				

Editing Geodatabase Feature Classes using SQL

Additional considerations

Minimal validation of the objects will be performed

When working outside of ArcGIS, keep in mind:

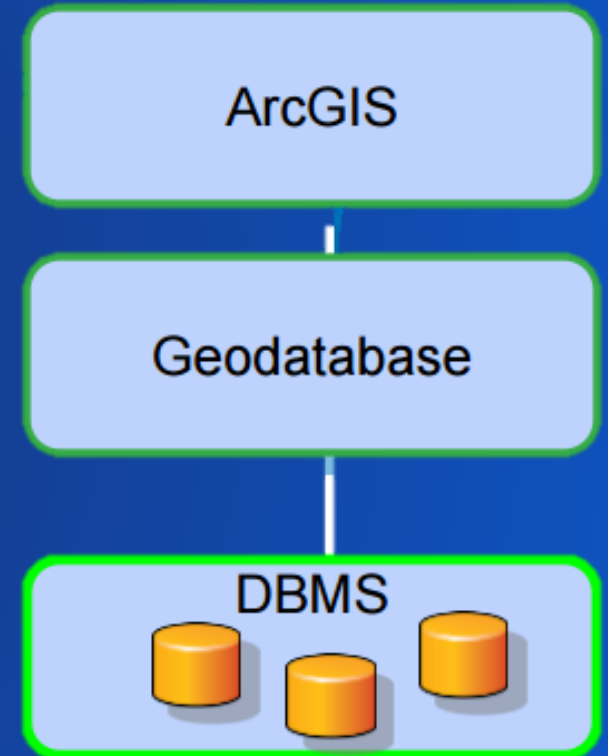
- Only edit simple features (*Is_Simple*)
- Editing versioned tables (*versioned view*)
- Must maintain next ObjectID and GlobalID values (*Next_RowID/Next_GlobalID*)



Rules for creating spatial tables to be used with ArcGIS

Prerequisites

- Unique identifier.
- One geometry column in the table.
- One spatial reference in the table.
- Do not use mixed-case object names.
- Entity type matches the type defined for the spatial column.



ST_Geometry Functions

Relational and Geometry Operators and Functions

- Constructors – Creates new geometry
 - Example: ST_Point, ST_Line, ST_Polygon
- Accessor – Return property of a geometry
 - Example: ST_Area, ST_SRID
- Relationship and Operators – Perform spatial operations
 - Example: ST_Intersects, ST_Buffer



Demo:

1. How to use ST_Geometry Functions
2. How to use SQL Server Geometry type

Connor Friese

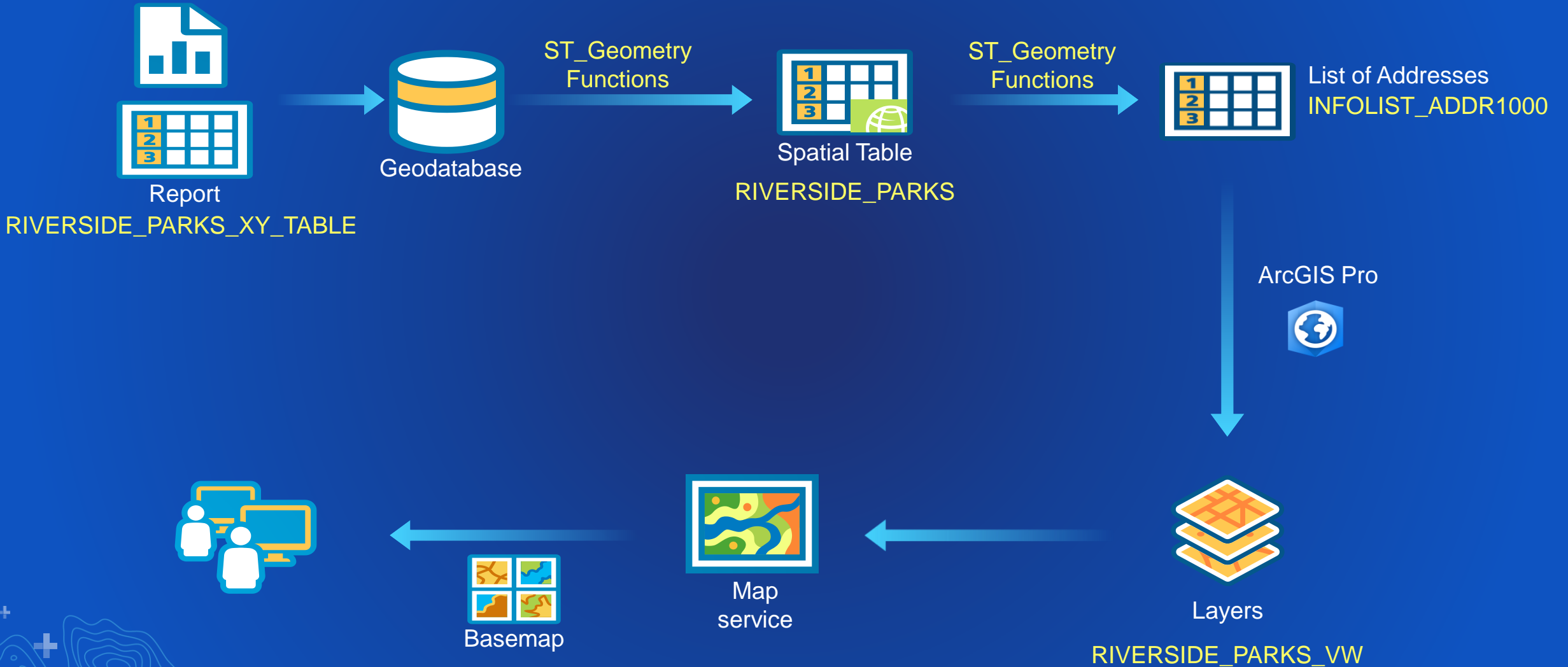


Scenario

- **City needs to renovate parks based on a report, listing locations that need facility improvements**
- **Community outreach program including sending out surveys and organizing an Open House**
- **Identify potential park users**



Workflow:



ST_Geometry functions that will be used and the result

Constructor functions:

ST_Geometry

Accessor functions:

ST_X and ST_Y

Relational functions:

ST_Buffer, ST_Intersects and ST_Transform

Result:

List of addresses



Documentation

Constructor functions for ST_Geometry:

<http://desktop.arcgis.com/en/arcmap/latest/manage-data/using-sql-with-gdbs/constructor-functions.htm>

Accessor functions for ST_Geometry:

<http://desktop.arcgis.com/en/arcmap/latest/manage-data/using-sql-with-gdbs/spatial-accessor-functions.htm>

Relational and geometry functions for ST_Geometry:

<http://desktop.arcgis.com/en/arcmap/10.3/manage-data/using-sql-with-gdbs/a-quick-tour-of-sql-functions-used-with-st-geometry.htm>

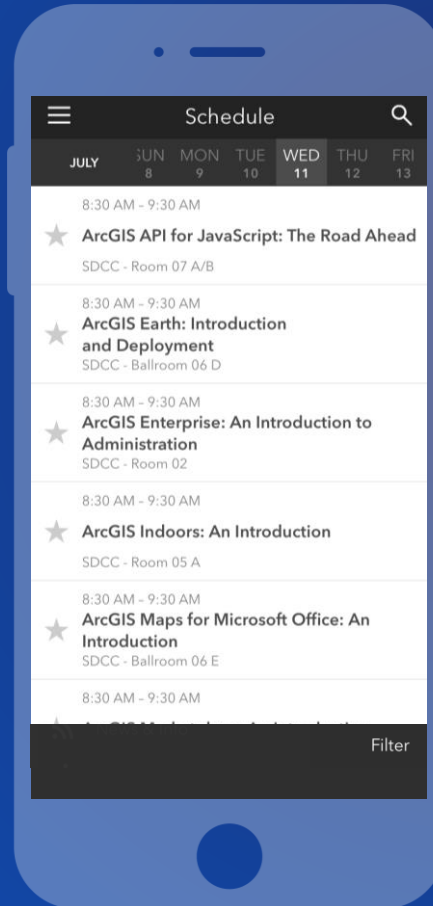


Please Take Our Survey on the App

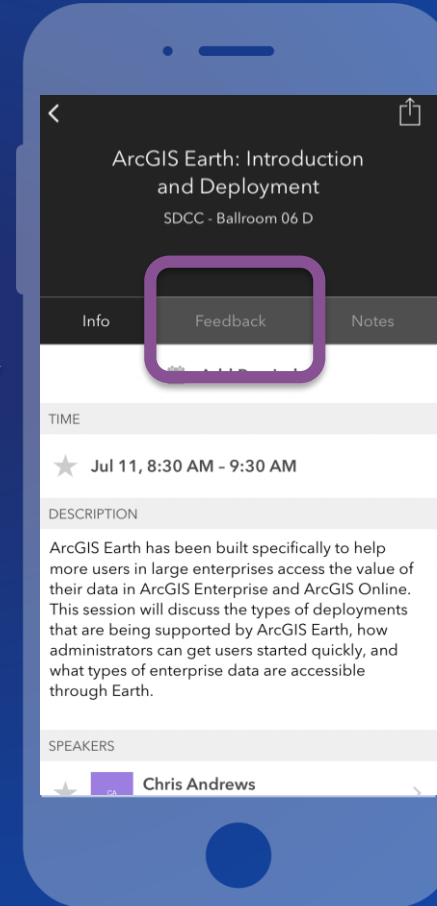
Download the Esri Events app and find your event



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Complete answers and select "Submit"

