Federal GIS Conference

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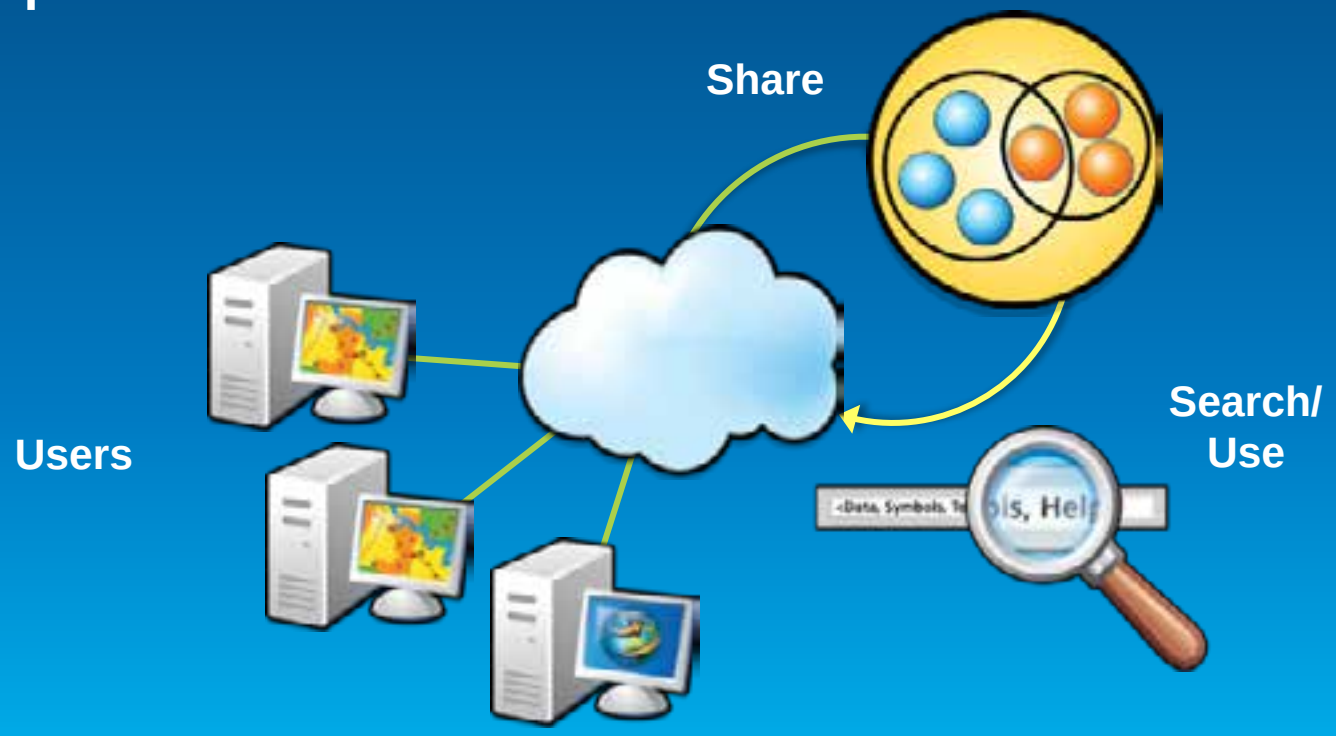
Sharing Tradecraft with Geoprocessing Services

Darren Baird, Suzanne Foss

Sharing

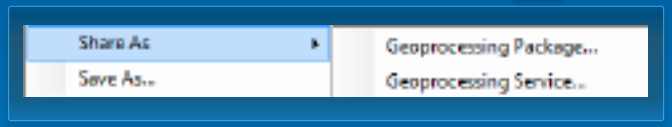
- Information sharing is critical and has been a primary focus for ArcGIS 10.1
- Transparency and easy information access are now expected

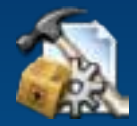


Sharing Analysis

Analysis

Share as…





Package

GIS Professionals

Service

Everyone

Sharing as Services

Professional to Everyone

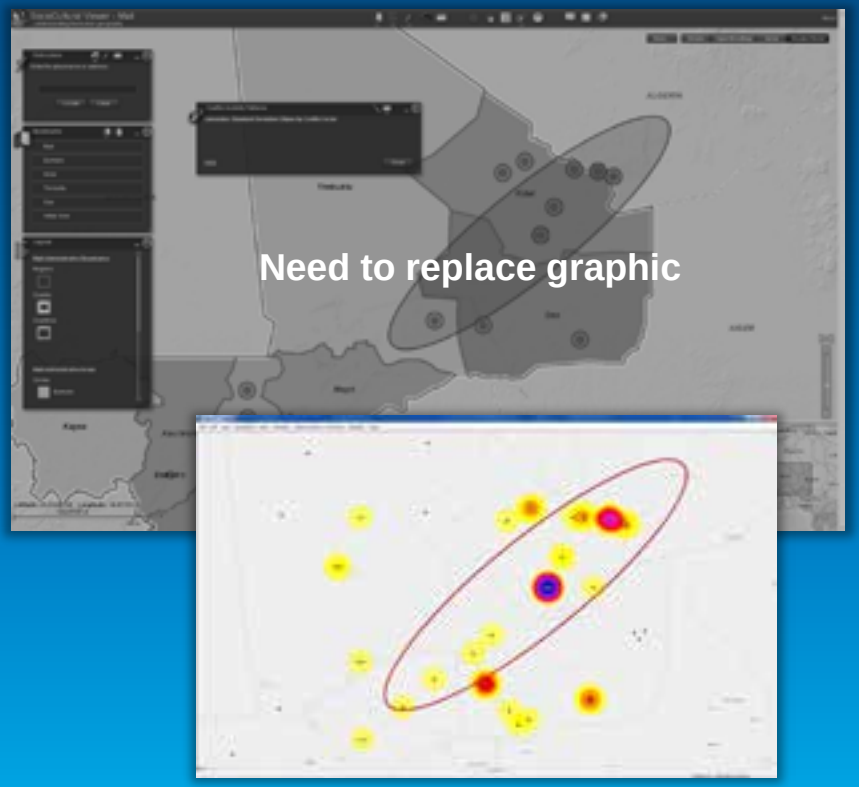
- Make it easier to share GIS resources
  - Unified sharing experience
  - Comprehensive Analysis
  - Sharing to servers in the cloud and to ArcGIS Online

Geoprocessing Services

- A geoprocessing service allows you to publish custom tools to be used via ArcGIS Server
- The service is composed of both the tools and the data needed by the tools
- Endless array of tasks can be created
  - Spatial analysis (vector, raster, network…)
  - Data Management (geodatabase, file based data)
  - Conversion (ETL and data loading)

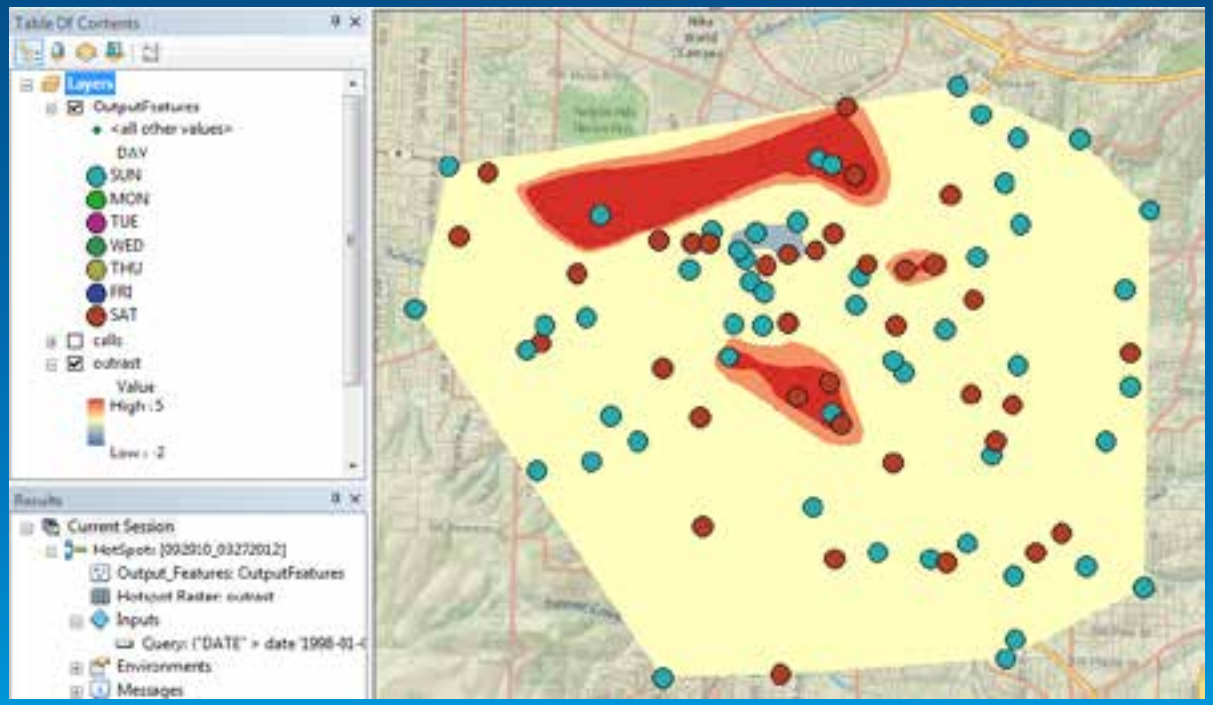
Geoprocessing Services

- Geoprocessing services can be used by many different client applications
  - ArcGIS Desktop
  - Web Applications (REST)
    - JavaScript
    - FLEX
    - Silverlight
  - ArcGIS Engine
  - ArcGIS Explorer
  - WSDL



How to create a service

- All services start from a successful result
- The result acts as a template to build the service



Quick Tour of Publishing: http://esriurl.com/gpSrvQuick

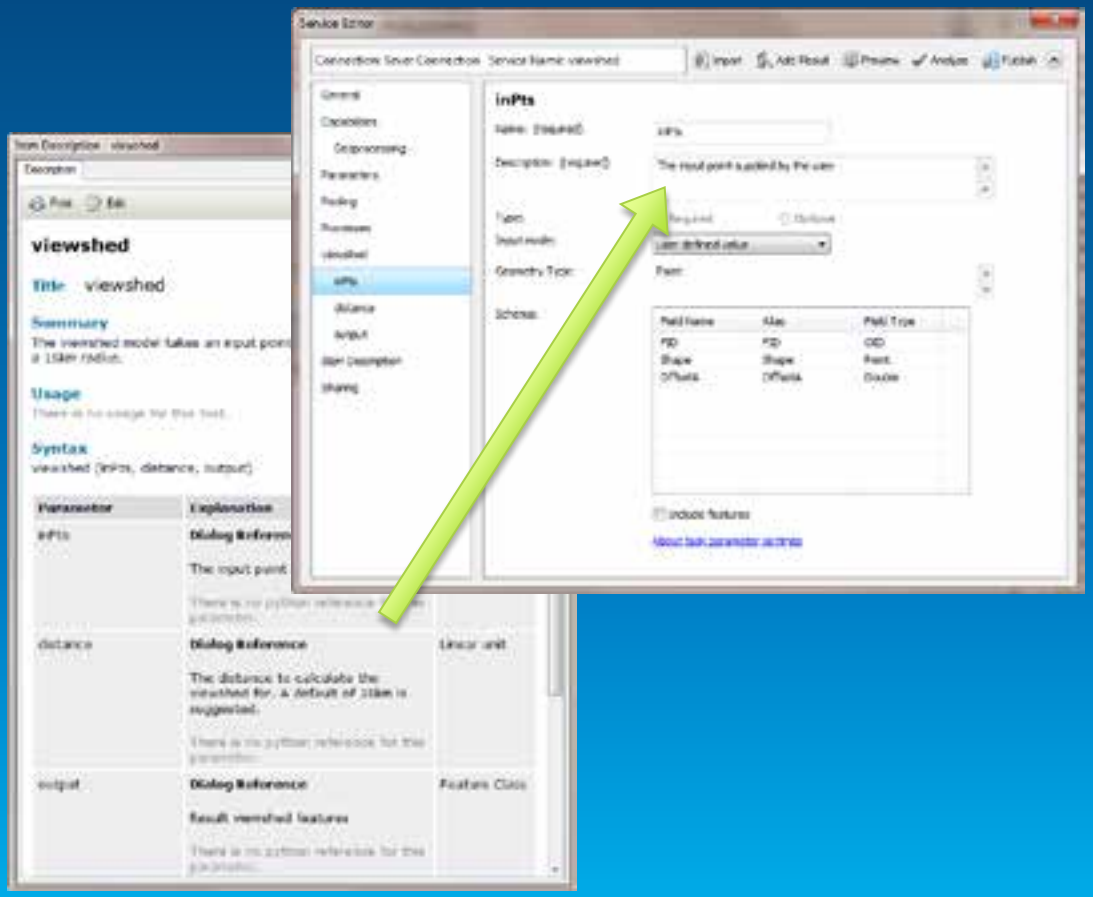
Publishing Wizard

- Manages parameter types
- Makes model or script portable
  - Fixes paths to data inside model and scripts
- Makes sure data is accessible to the service
  - What data is needed is packaged

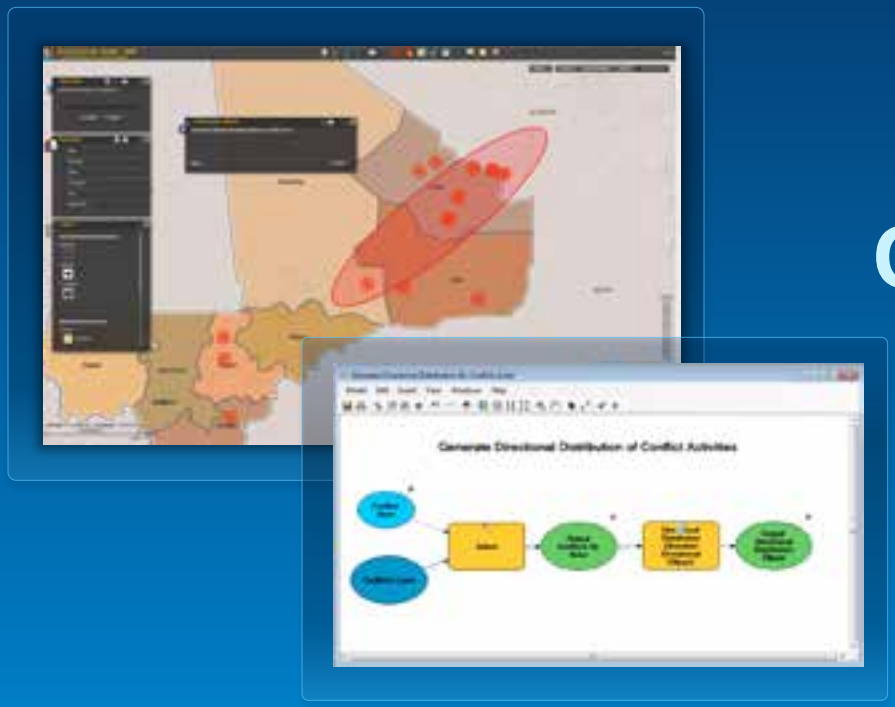
Documenting your task

- All tasks must be documented
- Fill out the Item Description

- You can update metadata specific to the task you are publishing inside the Service Editor



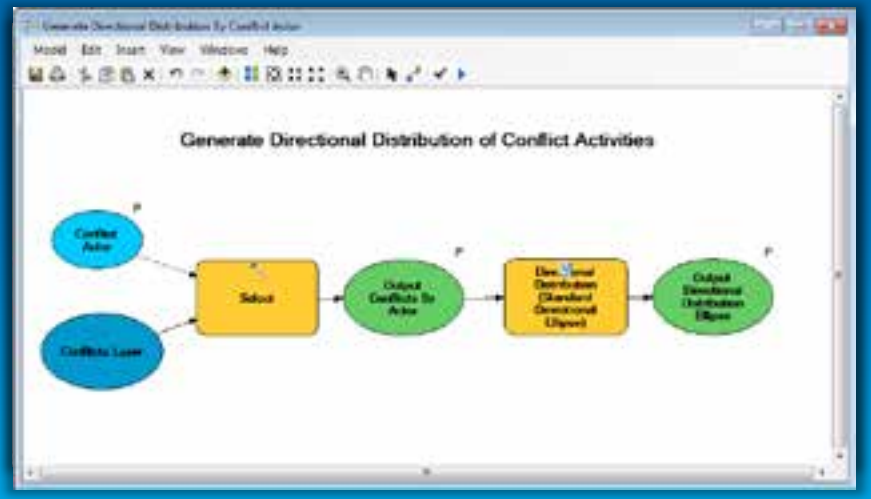
Documenting your service:
http://esriurl.com/gpSrvDoc



Conflict Analysis

Designing the Service

You need to be knowledgeable about using geoprocessing tools to create a good geoprocessing service



Geoprocessing Service Behavior

- Geoprocessing Services are very flexible and allow many different behaviors
- Before Authoring and Publishing, identify what you want your service to do and how you want it to behave with clients. Key questions:
  - Does the input data come from the client or data on the server?
  - Do you want to draw results with map server or download and draw data on the client?
  - Do you want to save data on the server?

Conflict Analysis Characteristics

- Asynchronous
- Inputs: type of conflict
- Project Data: conflict event data
- Output: featureclass (areas of primary activity)

Synchronous vs. Asynchronous

- **Execution mode defines how the application interacts with the geoprocessing service**

- **Synchronous**
  - Application waits until job is completed and results are returned
  - Application always draws results
  - Appropriate for faster processing jobs. (<10 seconds)

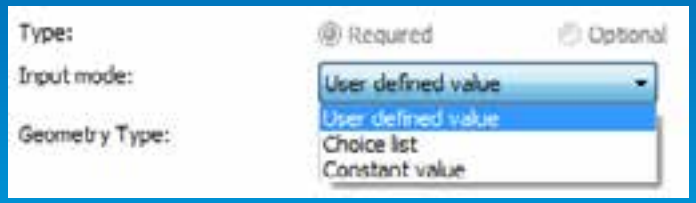
- **Asynchronous**
  - Application is free to do other tasks during this time.
  - Results are saved on the server
  - Results can be drawn by the server
  - Results can also be downloaded if desired
  - Appropriate for longer processing jobs.
  - Can only use a Result Map Service with Async.

What happens during publishing?

- Parameters
  - Transformed
- Project data
  - Copied if not in data store
  - Path updated if registered with the data store
- Output and Intermediate paths
  - Changed to scratchFolder and scratchGDB

Parameter transformation

- Unsupported parameter types are handled through publishing
- You can update the Input Mode depending on the parameter type
- User Defined Value: allows the end user to interactively add features or enter text and number values
- Choice list: allows the end user to select from a list of options or layers already on the server
- Constant value: hard codes the parameter; the end user will not be able to provide input



Accessing your data

- Data Store tells ArcGIS Server about your data
- Without a Data Store entry, all required data is copied to the server
- Data Store acts as a lookup table

• C:\data\analysis • SDE: sqlserver:dtuser	Update Paths	• E:\fileShare\gisdata\landAnalysis • SDE: sqlserver:agsuser
• C:\gisdata\projects • SDE: oracle:sdeuser	Same Paths	• C:\gisdata\projects • SDE: oracle:sdeuser

Data Store: http://esriurl.com/datastore

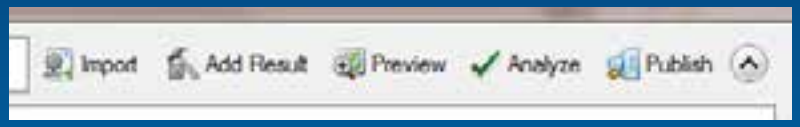
Creating Script Tools

- Paths and data handled the same as models
- Importing of modules
  - First looked in the same folder as source script
  - Second the PythonPath is searched
- Output and Intermediate paths
  - os.path.join(arcpy.env.scratchFolder, “out.shp”)
  - os.path.join(arcpy.env.scratchGDB, “out”)
  - In_memory\out

Authoring GP tasks with PyScripts:
http://esriurl.com/gpSrvPY

Multiple Tasks

- Use Add Result to create a service with multiple tasks



- Use Preview to see how the task would appear to a user consuming the service from ArcMap

Sharing your service

- Make your service discoverable on ArcGIS.com
- Provide good metadata and search tags

Result Map Service

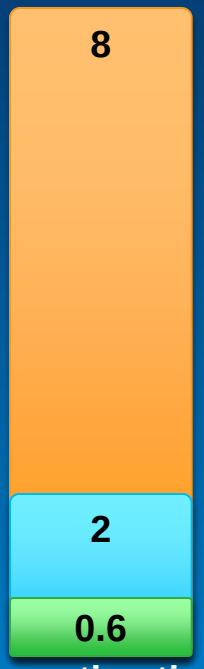
- A result map service (RMS) provides an alternative way to get results from the Geoprocessing Service.
- An image is returned to the client.
  - The data can still be downloaded.
- Use a RMS when:
  - Want better cartography than the client can support
  - It is impractical to render a large dataset in a client.
- Execution must be Asynchronous when using a RMS

Clip, Zip and Ship

Publishing the Service

Wrap Up

Performance Improvements (viewshed service)



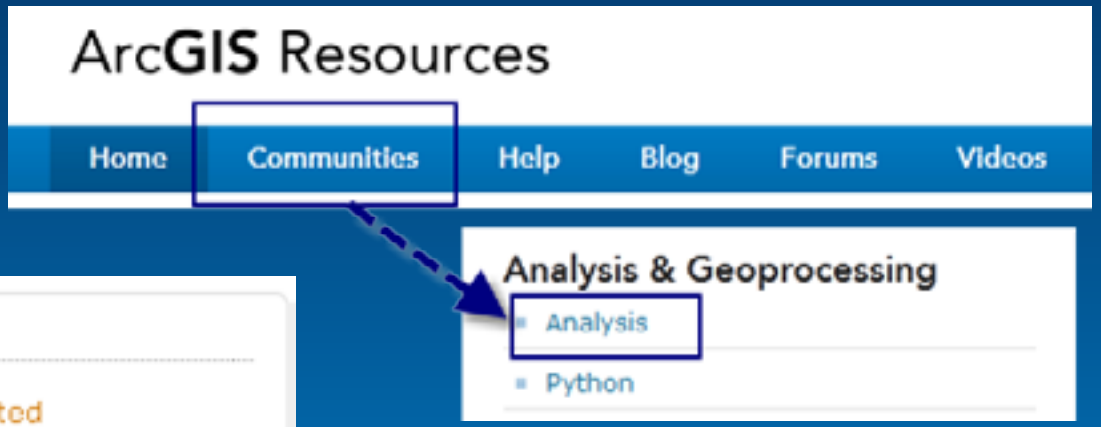
Execution time (seconds)

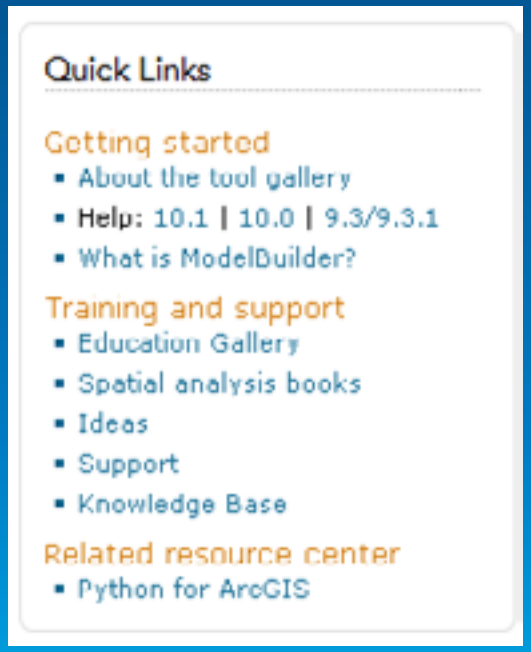
- 9.3 = 8 seconds
- 10 = 2 seconds
  - Spatial Analyst read of geodatabase raster
- 10.1 = 0.6 seconds
  - 25% faster because of 64bit
  - 25% faster because of layer
  - 25% faster because of in_memory output
  - REST handler faster

Enhancements

- Easier publishing
- Native 64bit
- Dynamic legend in Result Map Service
- Local Jobs Directory
  - No longer have to set this. Its automatically used when server participates in multimachine cluster
- Grid path limit expanded
  - Can now use paths of up to 255 characters when working with grids
- Raster supported in_memory workspace
- Multivalue for all supported parameter types
- Better handling of feature sets in the WebAPIs

Analysis and Geoprocessing Resource Center





Quick Links:

Education Gallery: you can find User Conference presentations here

About the tool gallery: learn all about the new gallery of geoprocessing tools and analysis hosted on ArcGIS Online

Wednesday Closing Session

Closing and Hosted Lunch

11:30 AM–1:30 PM

- Ballrooms A–C, Third Level
- Join conference attendees for lunch and closing session
- Closing Speaker Todd Park, U.S. CTO
- Wrap-up and request for feedback with Jack Dangermond.

Upcoming Events

esri.com/events

Date	Event	Location
March 21, 2013	**MeetUp – ArcGIS Platform**	Washington, DC
April 18, 2013	**MeetUp – Location Analytics**	Washington, DC
March 23–26, 2013	**Esri Partner Conference**	Palm Springs, CA
March 25–28, 2013	**Esri Developer Summit**	Palm Springs, CA
July 6–9, 2013	**Esri National Security Summit**	San Diego, CA
July 8–12, 2013	**Esri International User Conference**	San Diego, CA

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Thank You

Please complete a session evaluation form.

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