




Implementing ArcGIS 8.1 for Redistricting

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ESRI Implementation Services



Who, What, Why & When

Who: DynCorp I.S. & ESRI, for USDOJ Civil Rights

What: Migrate 1990's vintage workstation system to standard desktops with core technology

Why: Hardware at end of usable life; advances in off-the-shelf spatial analysis tools/databases

When: Needed by time 2000 Census data released

Redistricting Design Approach

- ◆ Start with user interface requirements: quite similar to the ESRI free extension
- ◆ Data model required to map the Census data to OMB mandates in Voting Rights.
Geographic model of Census Tract/Block
- ◆ Up front, commit to geodatabase design
- ◆ Base development on “core” ArcGIS 8.1

Design Development Phasing

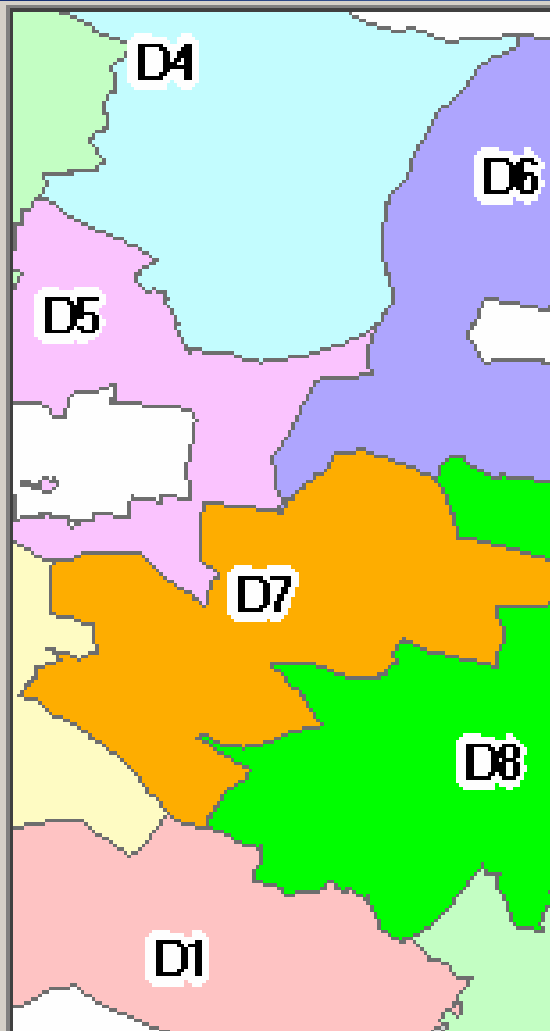
- ◆ Conceptual: Client-only, with key modules
- ◆ Detailed Matrix: Specified all functionality
- ◆ Data Model: Impacts relational database structures, performance & maintainability
- ◆ Client-Server: Integrate front and back end using separately developed / tested modules

Key Functional Capabilities

- ◆ Plan Creation
- ◆ (Plan Import)
- ◆ Plan Analysis
- ◆ Reports and Maps
- ◆ Plan Management

Example screen shots

Create Plan



What type of plan do you want to create or import?

-
-
-

What is the Plan Submission Number?
(e.g., 2000-1234)

-

Help

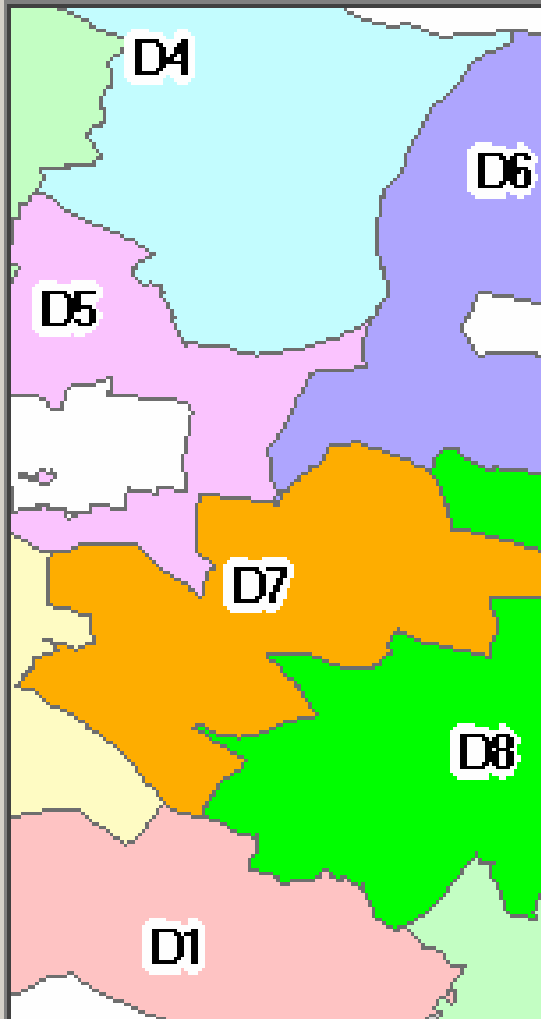
Cancel

< Back

Next >

Finish

Create Plan



What is the plan series?

-
-
-
-

What is the census year?

- 1990
- 2000

Help

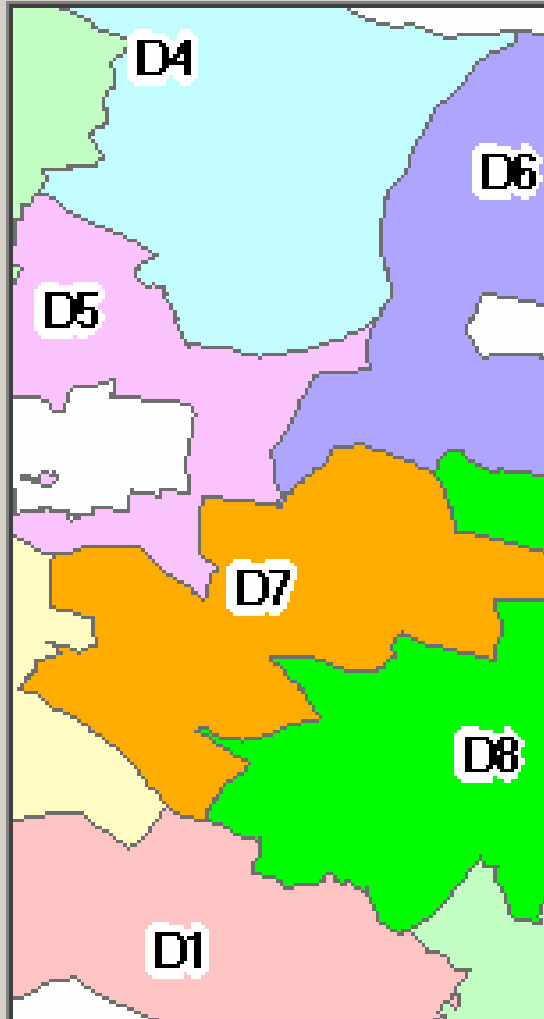
Cancel

< Back

Next >

Finish

Create Plan



Enter the following information about the plan:

District caption:

Plan Description:

Comments:

Help

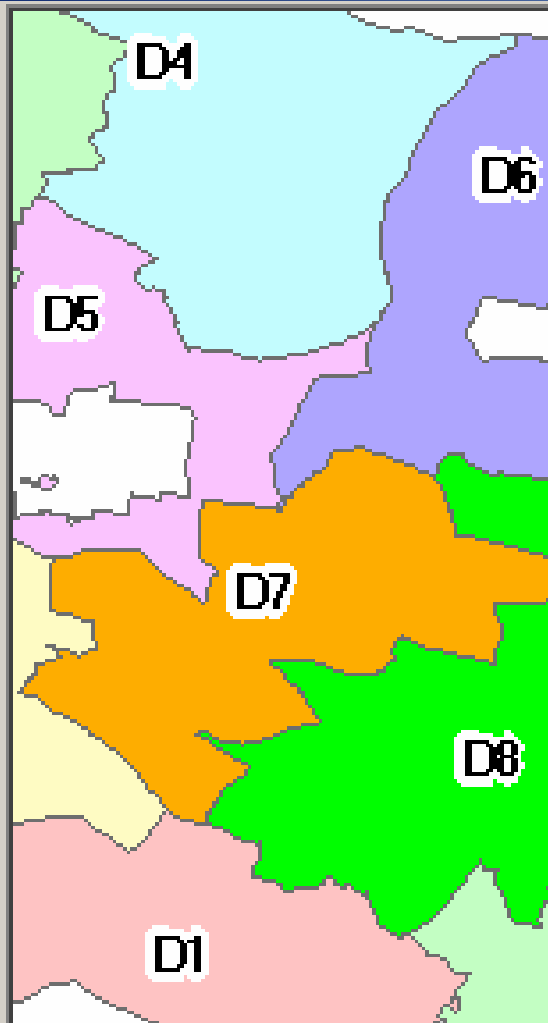
Cancel

< Back

Next >

Finish

Create Plan



What are plan geography type, state, census geography and attribute?

Geography type:

County

State:

Louisiana

Census Geography:

Acadia Parish

- Acadia Parish
- Allen Parish
- Ascension Parish
- Assumption Parish
- Avoyelles Parish
- Beauregard Parish
- Bienville Parish
- Bossier Parish

Help

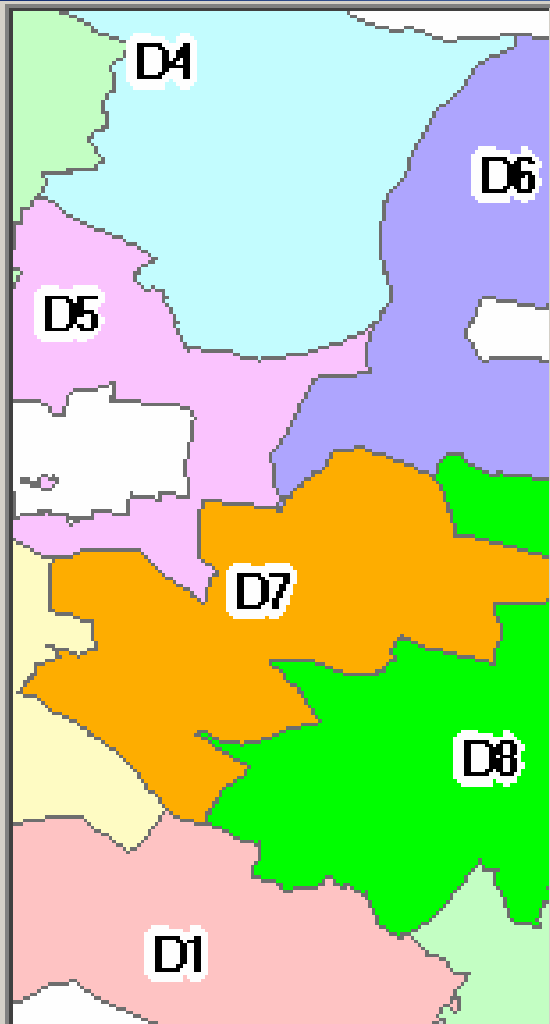
Cancel

< Back

Next >

Finish

Create Plan



Which data fields and what statistics will be tracked for the plan?

Fields in the database:

- Universe
 - TOTAL
 - DEV
 - DEVP
 - TOTAL18
- Standard
 - TOTALHISP
 - TOTALHISPP
 - TOTALNH
 - TOTALNHP
 - WHITENH
 - WHITENHP

Help

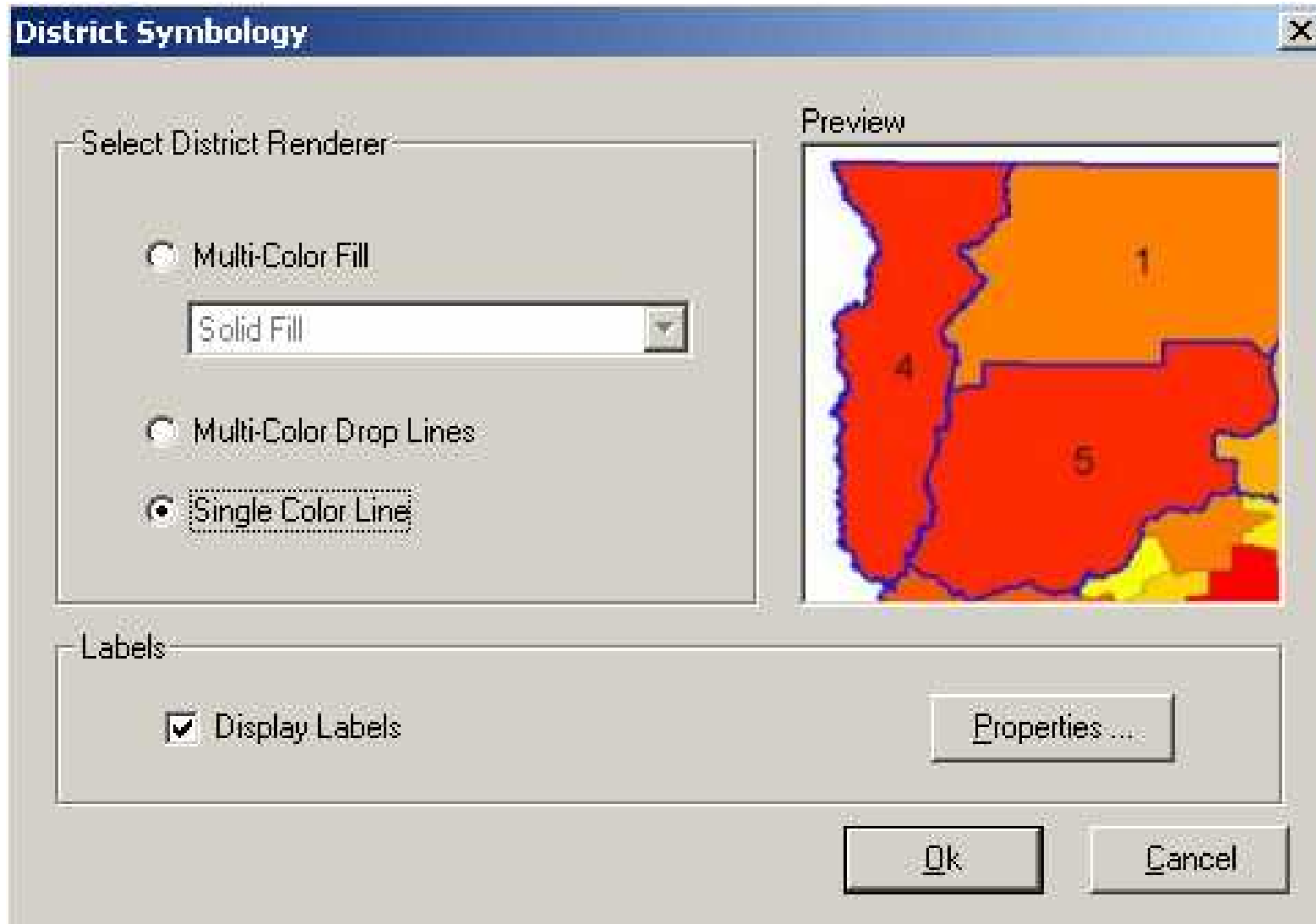
Cancel

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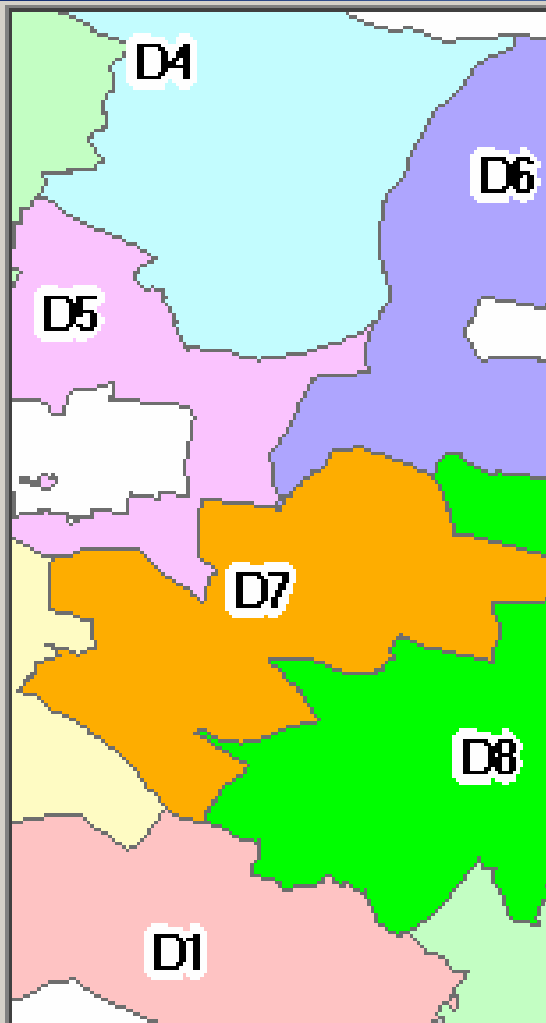
Next >

Finish

District Fill, Line, Label Options



Create Plan



Do you want to define new variables for statistics? If no, press the Next button.

User-defined Variables:

Create

Edit

Remove

Variable Definition:

Save

Load

Help

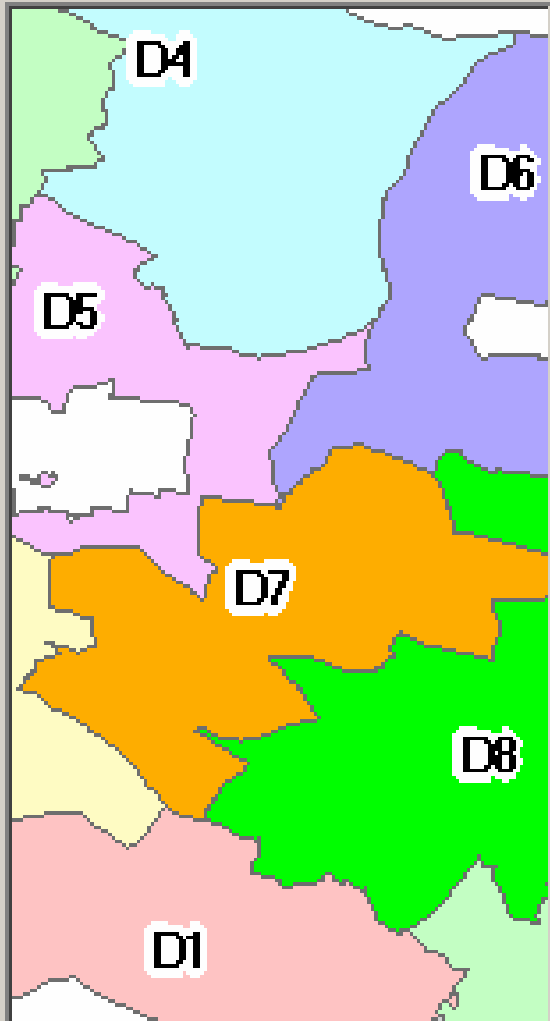
Cancel

< Back

Next >

Finish

Create Plan



Do you want to create or import a plan?

- Create a new plan
- Import an electronic submission

Help

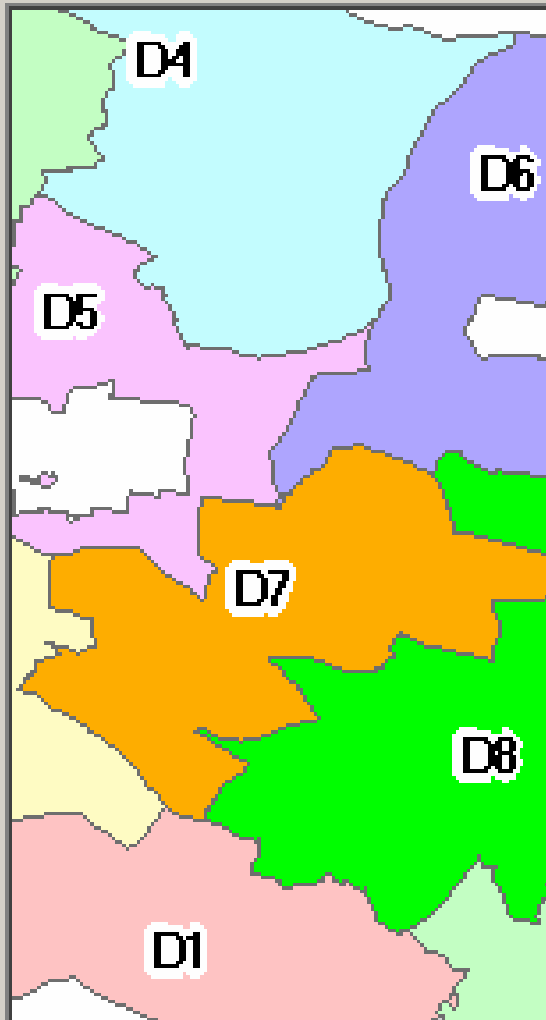
Cancel

< Back

Next >

Finish

Create Plan



What is the number of districts?

The total and ideal population:

Total Population: 4468976

Calculated Ideal Population: 558622

Ideal Population:

Help

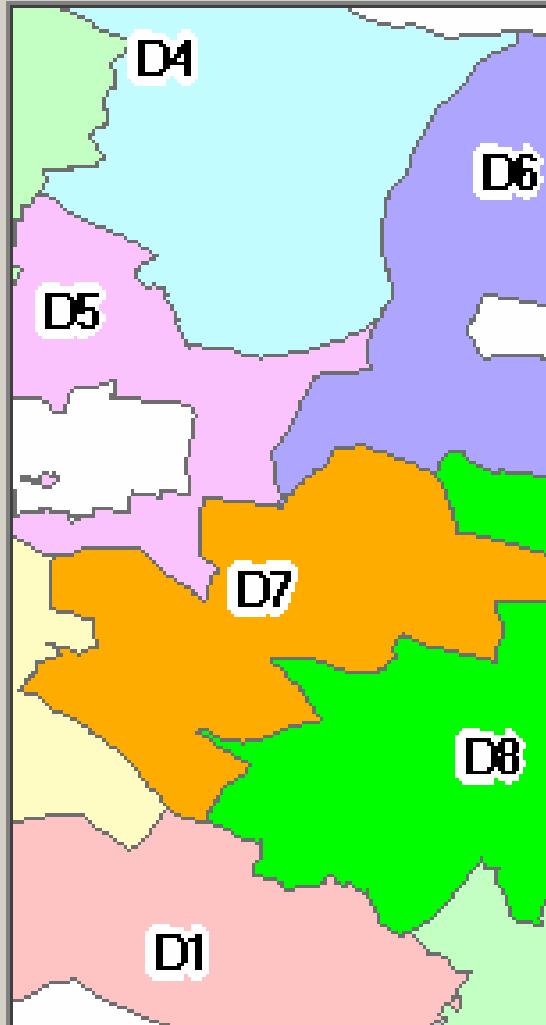
Cancel

< Back

Next >

Finish

Import Electronic Submission



Submitter's Information:

Name:

Organization:

Date:

Address:

Phone:

Email:

Fax:

Help

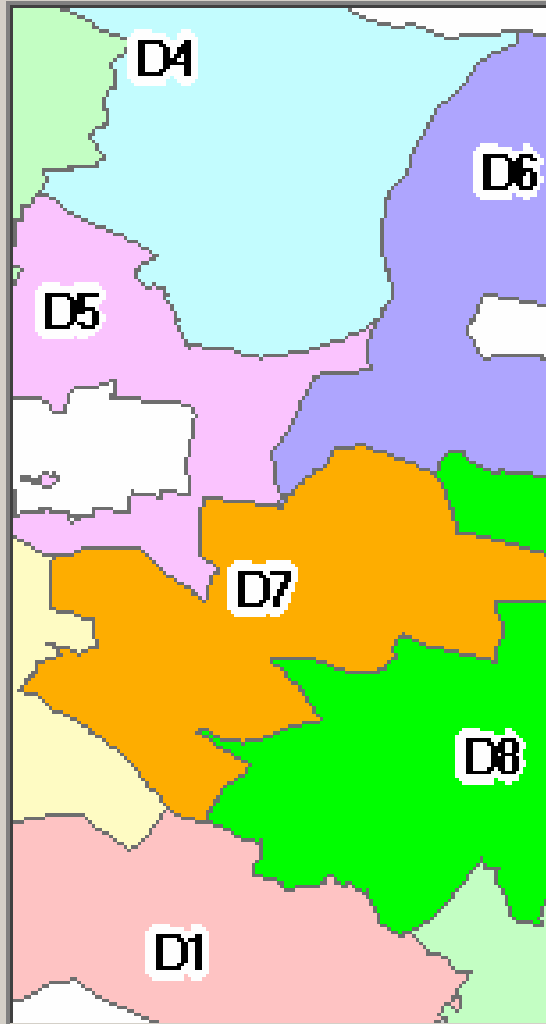
Cancel

< Back

Next >

Finish

Import Electronic Submission



What is the electronic submission file format?

- ASCII (1990 Specification)
- ASCII (2000 Specification)
- DBF (dBASE IV)

Help

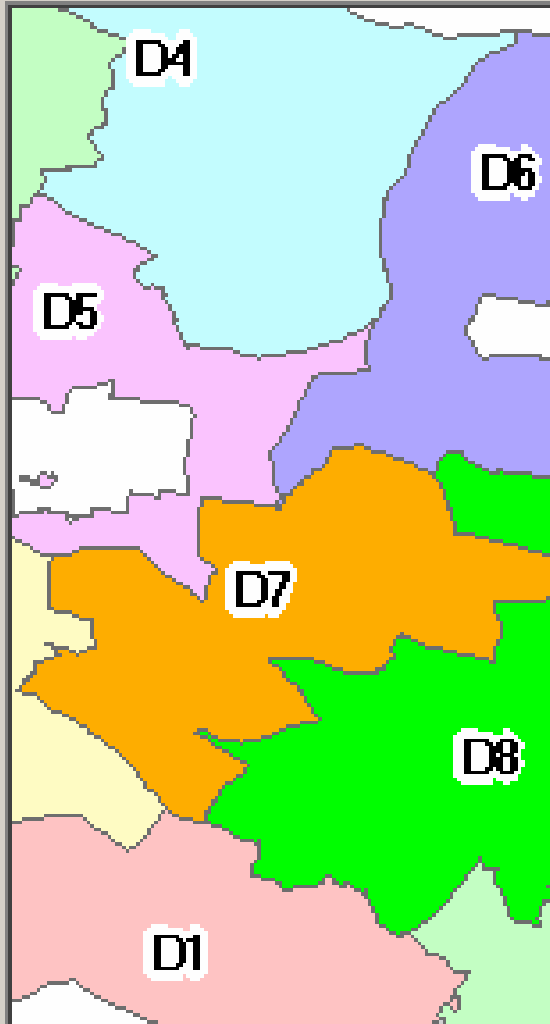
Cancel

< Back

Next >

Finish

Import Electronic Submission



Where is your electronic submission file?



Help

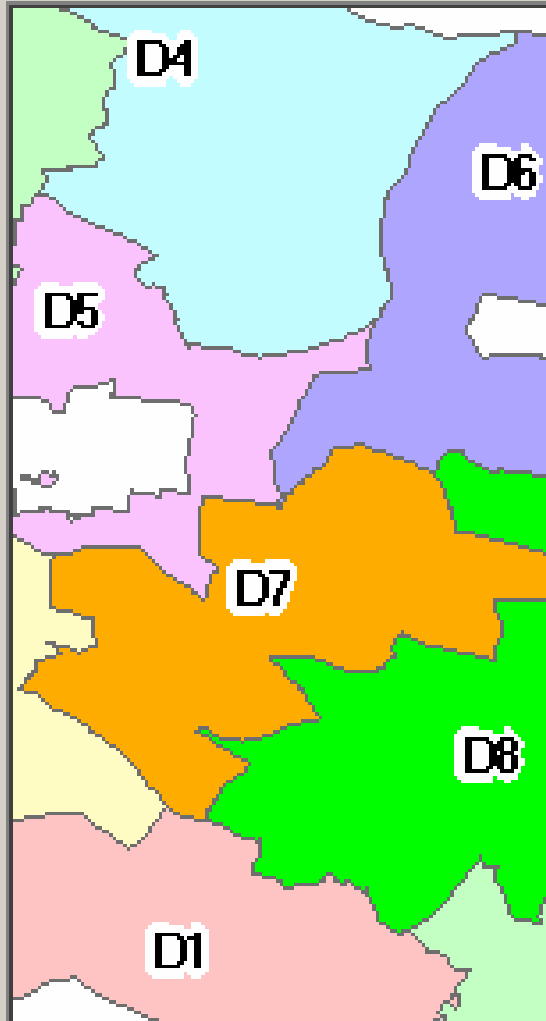
Cancel

< Back

Next >

Finish

Import Electronic Submission



Which plan(s) do you want to import?

Plan Index:

- 1
- 2
- 3

Description for plan 1:

Senate

Comments:

MyPlan1

Help

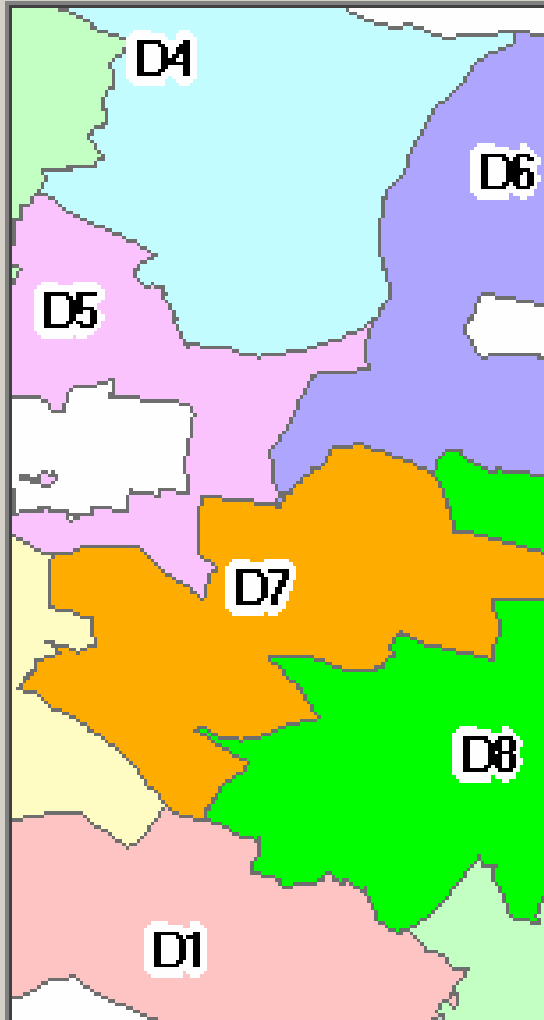
Cancel

< Back

Next >

Finish

Create New Version



What are the plan series, description and comments:

Plan series

Plan Description:

My New Version

Comments:

My Version

Help

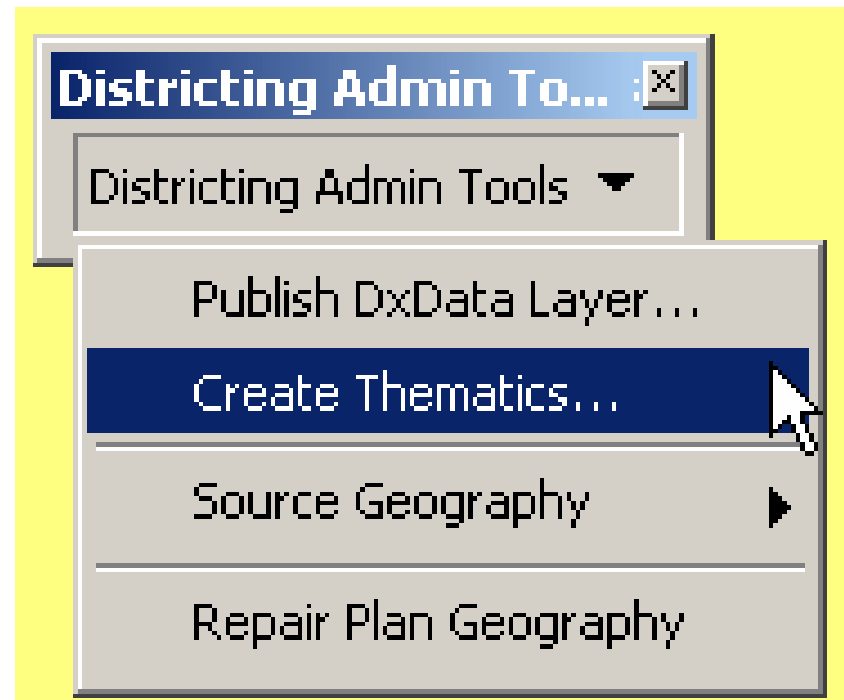
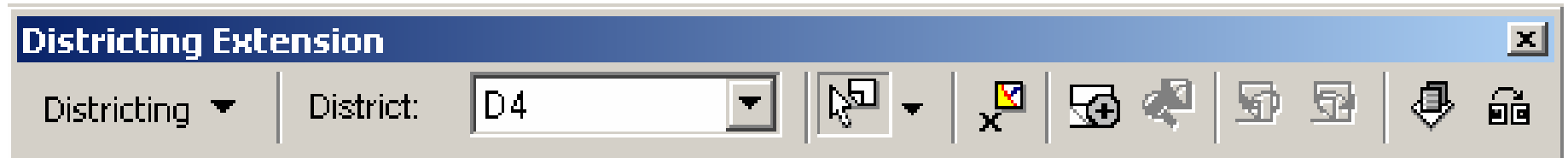
Cancel

< Back

Next >

Finish

Districting Toolbars Available



Plan.mxd - ArcMap - ArcInfo

File Edit View Insert Selection Tools Window Help

1:286,949 Districting Admin Tools 68%

Layers

- Districsts
 - All Districsts
- East Baton Rouge Parish
 - LA.TRACT00_PL.BLACK18
 - 35 - 318
 - 319 - 865
 - 866 - 1487
 - 1488 - 2631
 - 2632 - 4769
- East Baton Rouge Parish
 - LA.COUNTY00_PL
 - BLACK
 - 403 - 11461
 - 11462 - 28627
 - 28628 - 49676
 - 49677 - 166141
 - 166142 - 326952
- Locator View
- Overview

Districting Extension

Districting District: D10

- Start Editing
- Save Edits
- Stop Editing
- Plan Geography
- Plan Properties...
- Symbology
- Locator Tool...
- Report and Layout Tools
- Export...
- Chart Window
- Statistics Window
- Preferences...

Map showing 10 districts (D1-D10) with various colors and boundaries.

Display Source Catalog

Drawing Arial 10 B I U

Current Statistics

Unassigned

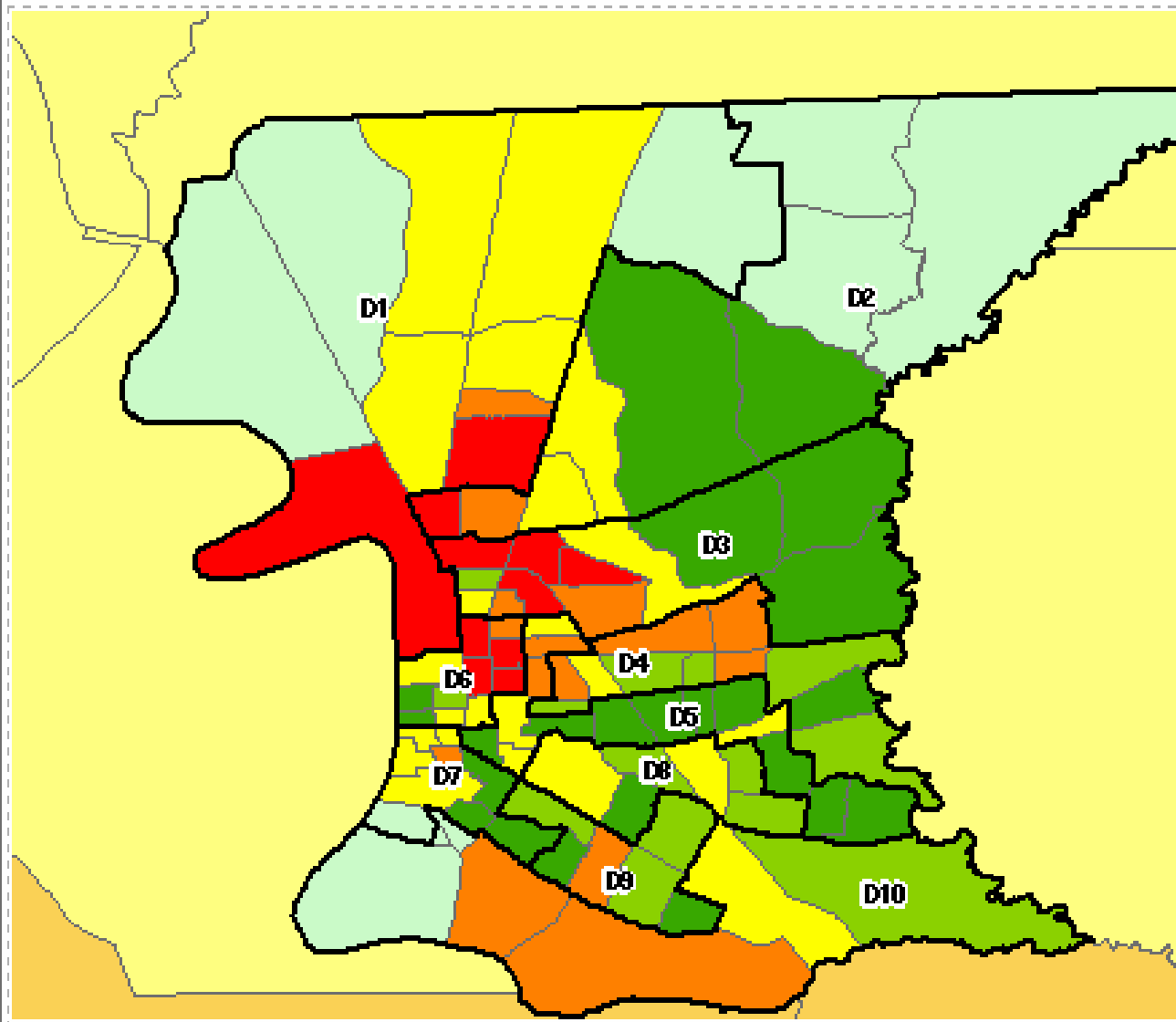
District	Total	Dev	DevP	TotalHisp	TotalHispP
D1	44086	2801	6.78	375	0.8
D2	30219	-11066	-26.8	220	0.7
D3	55141	13856	33.56	551	1.5
D4	50677	9392	22.75	1176	2.3
D5	60745	19460	47.14	948	1.5
D6	33124	-8161	-19.77	218	0.6

Current Statistics Proposed Statistics Assignment Statistics

DISTRICT	TOTAL	DEV	DEVP	TOTALHISP	TOTALHISP
1	44086	2801	6.78	375	0.8
2	30219	-11066	-26.8	220	0.7
3	55141	13856	33.56	551	1.5
4	50677	9392	22.75	1176	2.3
5	60745	19460	47.14	948	1.5
6	33124	-8161	-19.77	218	0.6

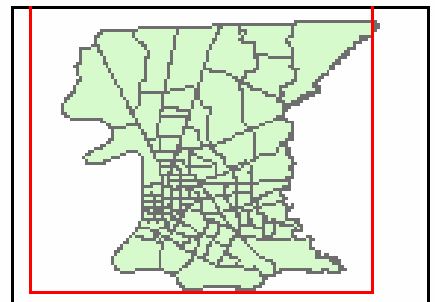
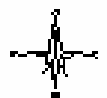
91°22'36.34"W 30°34'35.03"N

Sample Map



Plan Name:

- Districts**
- All Districts
- LA.TRACT00_PL.BLACK 12**
- 25 - 913
 - 913 - 205
 - 205 - 143 F
 - 1433 - 2891
 - 2892 - 4752
 - Cal Baton Rouge Parish
- BLACK**
- 402 - 11491
 - 11492 - 2282 F
 - 22823 - 428 F 0
 - 428 F 1 - 1001 41
 - 1001 42 - 528252



Metadata View: Plan Geography



Metadata View: Plan Statistics

Contents | Preview | Metadata

My New Plan

Properties | **Statistics** | Geography

Click to see a description of the plan statistics

Current Population By Unit:

Universe							
District	TOTAL	DEV	DEVP	TOTALHISP	TOTALHISPP	TOTALNH	TOTAL
	44086	2801	6.78				
1	30219	-	-26.8	375	0.85	43711	99.15
2	55141	11066	33.56	220	0.73	29999	99.25
3	50677	9392	22.75	551	1	54590	99.15
4	60745	19460	47.14	1176	2.32	49501	97.65
5	33124	-8161	-19.77	948	1.56	59797	98.45
6	32710	-8575	-20.77	218	0.66	32906	99.35
7	36168	-5117	-12.39	924	2.82	31786	97.15
8	30917	-	-25.11	861	2.38	35307	97.65
9	39065	-2220	-5.38	690	2.23	30227	97.75
10				1400	3.58	37665	96.45

Total Population: 412852
Ideal Population: 41285

Plan Properties

Ability to modify statistics tracked

Or create custom variables: these typically will be combinations of available stats.

The screenshot shows the PlanProperties dialog box with the following sections:

- Tracked Statistics Fields:** A tree view showing 'Universe' (TOTAL, DEV, DEVP) and 'Standard' (TOTALHISP, TOTALHISP, TOTALNH, TOTALNHP, WHITENH, WHITENHP, BLACKNH, BLACKNHP, AIANNH, AIANNHP, ASIANNH).
- Population Data:** Total Population: 412852, Ideal Population: 41285.
- Custom Variables:** A section for defining custom variables with fields for 'Names' and 'Definition', and buttons for 'Create', 'Edit', 'Remove', 'Save', and 'Load'.

At the bottom, there is a table with the following data:

DISTRIC	TOTAL	DEV	DEVP	TOTALHISP	TOTALH
1	44086	2801	6.78	375	
2	30219	-11066	-26.8	220	
3	55141	13856	33.56	551	
4	50677	9392	22.75	1176	
5	60745	19460	47.14	948	
6	33124	-8161	-19.77	218	

Example Report: Population

R2-Population Summary Report

User: just2585 Date and Time: 5/30/2001 5:12:49 PM
 Room: Report: PopSum.rpt
 Plan: 1234-4512_101

R2-Population Summary Report

District	TOTAL	DEV	DEV%	WHITENHP	TOTALHISPP	BLACKNHP	ASIANNHP	HPINHP	OTHERNHP	MLTMNNHP	TOTALNH	WHITENH	BLACKNH
1	44,086	2,801	6.78	43.75	0.85	54.47	0.33	0.02	0.11	0.16	43,711	19,286	24,014
2	30,219	-11,066	-26.80	59.67	0.73	38.55	0.27	0.03	0.27	0.11	29,999	18,032	11,648
3	55,141	13,856	33.56	34.42	1.00	63.16	0.71	0.01	0.11	0.31	54,590	18,977	34,829
4	50,677	9,392	22.75	50.77	2.32	42.12	3.94	0.05	0.21	0.19	49,501	25,728	21,345
5	60,745	19,460	47.14	71.39	1.56	24.39	1.89	0.04	0.20	0.20	59,797	43,366	14,813
6	33,124	-8,161	-19.77	12.88	0.66	85.40	0.38	0.01	0.08	0.42	32,906	4,266	28,288
7	32,710	-8,575	-20.77	59.32	2.82	30.11	6.23	0.05	0.59	0.45	31,786	19,402	9,849
8	36,168	-5,117	-12.39	80.40	2.38	13.46	2.96	0.04	0.29	0.15	35,307	29,080	4,868
9	30,917	-10,368	-25.11	75.65	2.23	18.54	2.78	0.03	0.35	0.16	30,227	23,388	5,733
10	39,065	-2,220	-5.38	66.35	3.58	25.72	3.10	0.09	0.50	0.28	37,665	25,920	10,048

Total Population: 412,852
 Ideal Population: 41285
 Mean Deviation: 0
 Mean Percent Deviation: 0

Largest Positive Deviation: 19,460
 Largest Negative Deviation: -11,066
 Overall Range in Deviation: 30,526
 Overall Range in Deviation Percentage: 73.94

Export Close

Plan Compare: Show Difference

The screenshot shows the ArcMap interface with the following components:

- Menu Bar:** File, Edit, View, Insert, Selection, Tools, Window, Help
- Toolbar:** Standard GIS tools and a scale of 1:591,095.
- Layers Panel:**
 - Plan Comparison - 1965-0709_301 (Red outline)
 - Plan Comparison - Difference (Red dotted pattern)
 - 1965-0709_401 (Black outline)
 - Districts (All Districts)
 - Acadia Parish (Black outline)
 - County (Orange outline)
 - Tract (Blue outline)
 - Block Group (Green outline)
 - Block (Light Green outline)
- Map:** Shows four districts (D1, D2, D3, D4) with a red outline indicating the difference between two plans. A red dotted area is visible within district D4.
- Statistics Table:**

DISTRIC	TOTAL	DEV	DEVP	TOTALHISP	TOTALHISPF	TOTALNH	TOTALNHP	WHITENH	WHITENHP	BLACKNH	BLACKNHP	AIANN
1	8205	-6510	-44.24	50	0.61	8155	99.39	7824	95.36	291	3.55	
2	16769	2054	13.96	197	1.17	16572	98.83	13620	81.22	2845	16.97	
3	8109	-6606	-44.89	48	0.59	8061	99.41	5639	69.54	2388	29.45	
4	25778	11063	75.18	243	0.94	25535	99.06	20067	77.85	5241	20.33	
- Status Bar:** 92°39'17.34"W 30°2'4.38"N

Plan Management

- ◆ Based on core ArcCatalog
- ◆ Plans created as MXD file, and stored on Unix server
- ◆ Identify plans in progress
- ◆ Metadata summary views of geography and statistics
- ◆ Summary info. on Intranet

Credits

Voting Rights: Bob Berman and Bob Kengle

Administration: Doug Crain and Nancy Sweesy

Onsite GIS: Mario Lopez-Gomez with Jonathan Brooks,
Lew Summers, Sharon Thomas

ESRI Account Manager: Todd Rogers, now Civilian
Federal Manager (& DOJ Account Rep).

Development: Larry Boden with Ryan Bae, Justin Fan,
Craig Ferris, Kevin Kelly, Mike Redpath

Support: Steve Ciampichini, Fatima Awad, Josh Blue,
Jim Anderson, Jim Correll, Spencer Crim, Sean Cononie

DynCorp Information Systems: Doug Cheek with
Kevin Bell, Soo-Ung Kim, Bill Pratt, Lucian Russell

Demo Today at 6 p.m.

Larry Boden and Kevin Kelly from ESRI will demo extensions for ArcView and ArcGIS in Demo Theater 1, located in ESRI Showcase

Follow-up Contact

Bob Andrew (703) 934-3446