Displaying Georeferenced Images in a Flex Web-Mapping Application

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Los Angeles County Dept. of Regional Planning

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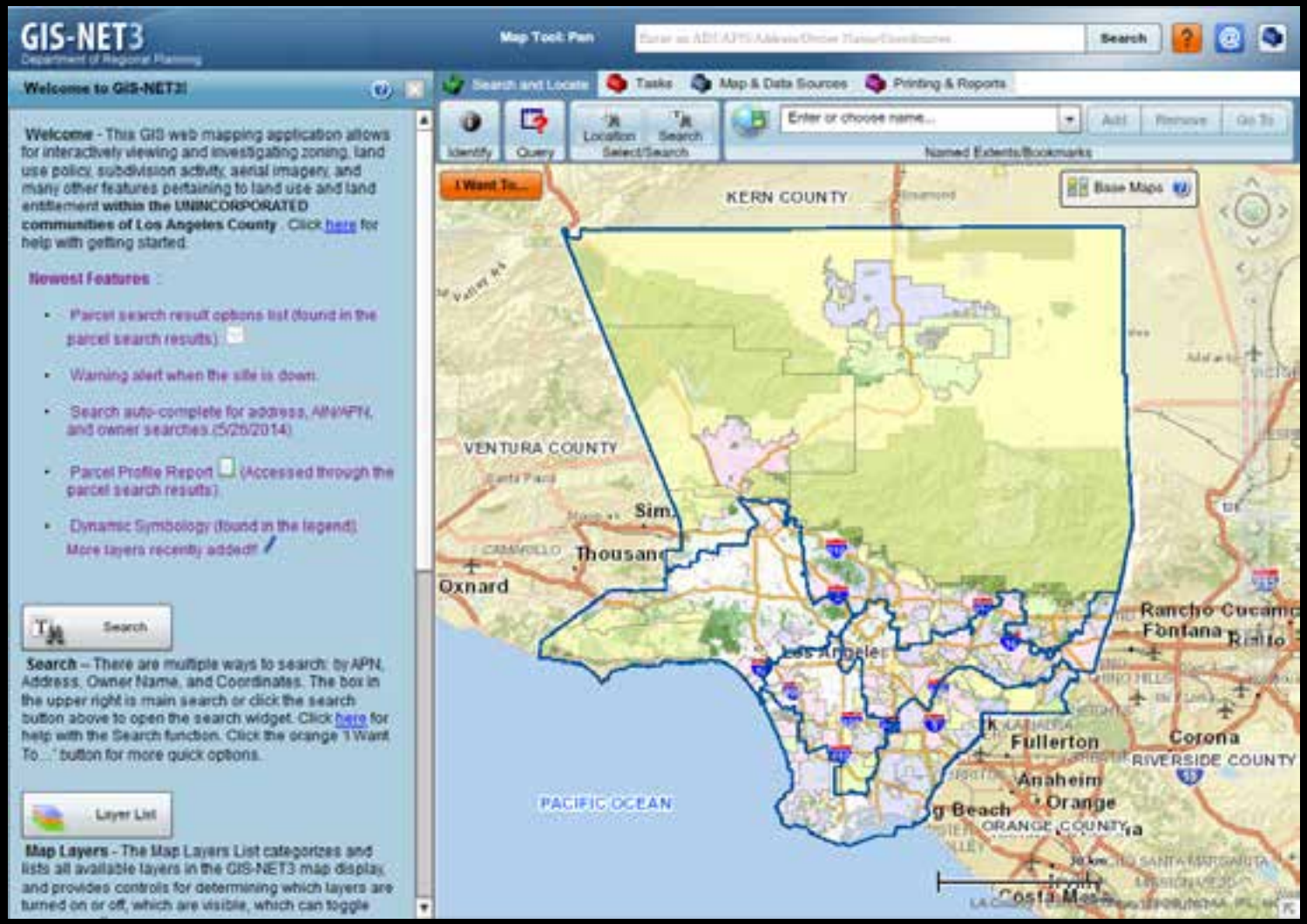
Introduction

- Los Angeles County Department of Regional Planning
- GIS-NET3
  - Flex based web-mapping application using Latitude Geographic's viewer for flex.
  - Robust GIS web-mapping application with over 200 layers, several widgets, and multiple years of imagery.
  - We have both a public and internal version.

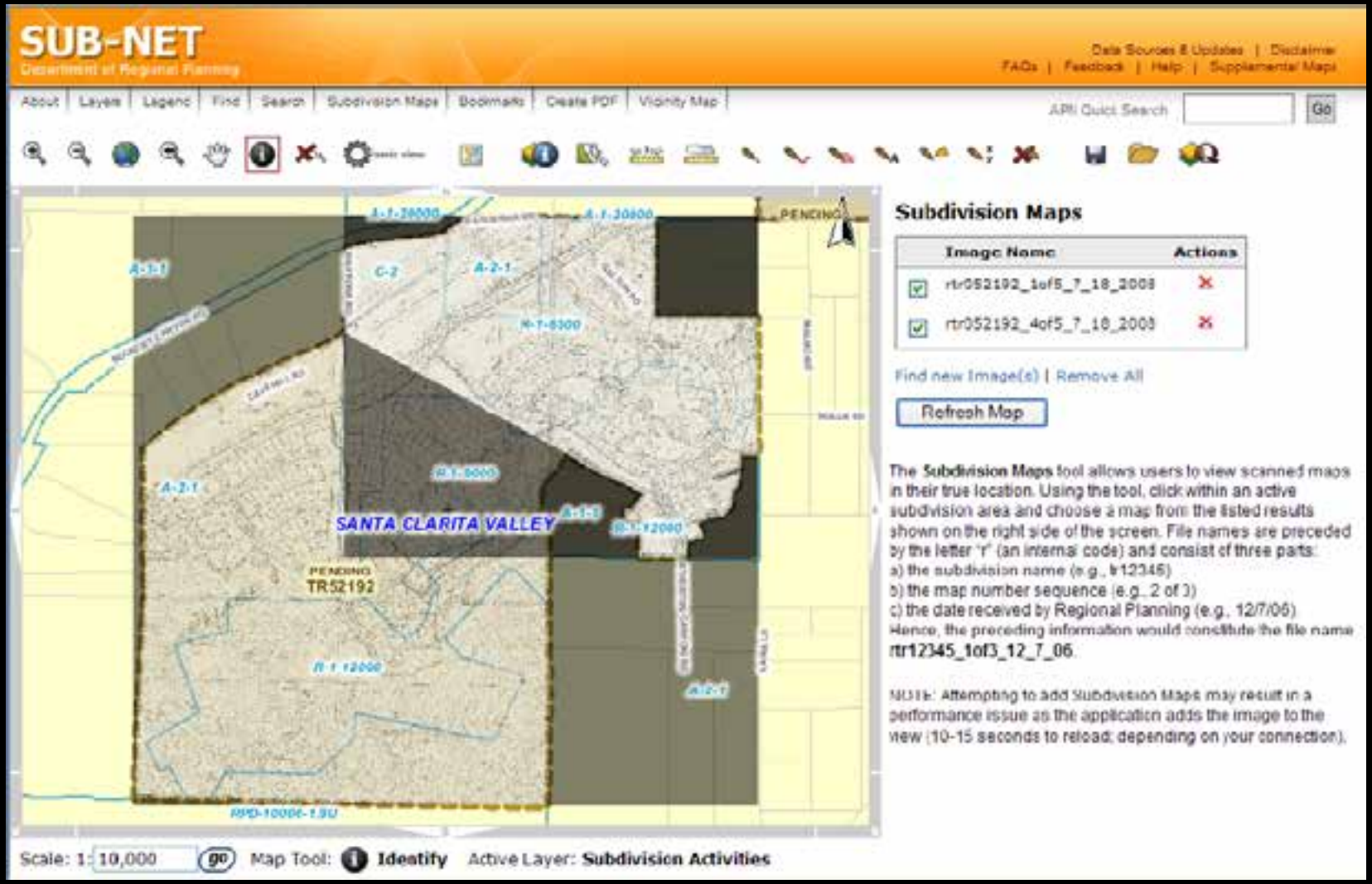
GIS-NET3


GIS-NET3
Department of Regional Planning
Map Tool: Pan
Search
Welcome to GIS-NET3!
Search and Locate
Tasks
Map & Data Sources
Printing & Reports
Identify
Query
Location
Search
Select/Search
Enter or choose name...
Add
Remove
Go To
Named Extents/Bookmarks
I Want To...
Base Maps
Welcome - This GIS web mapping application allows for interactively viewing and investigating zoning, land use policy, subdivision activity, aerial imagery, and many other features pertaining to land use and land entitlement within the UNINCORPORATED communities of Los Angeles County. Click here for help with getting started.
Newest Features:
Parcel search result options list (found in the parcel search results)
Warning alert when the site is down
Search auto-complete for address, APN/PIN, and owner searches (5/25/2014)
Parcel Profile Report (Accessed through the parcel search results)
Dynamic Symbology (found in the legend)
More layers recently added!
Search
Search – There are multiple ways to search: by APN, Address, Owner Name, and Coordinates. The box in the upper right is main search or click the search button above to open the search widget. Click here for help with the Search function. Click the orange 'I Want To...' button for more quick options.
Layer List
Map Layers - The Map Layers List categorizes and lists all available layers in the GIS-NET3 map display, and provides controls for determining which layers are turned on or off, which are visible, which can toggle
KERN COUNTY
VENTURA COUNTY
Oxnard
Fullerton
Anaheim
Orange
Corona
RIVERSIDE COUNTY
ORANGE COUNTY
PACIFIC OCEAN
Rancho Cucamo
Fontana
Rialto

Subdivisions

- Subdivision maps are submitted to the department for approval.
- We needed a way of allowing the public to easily access these maps.
- Several years ago, Latitude Geographics assisted us in developing SUB-NET, an ArcIMS, Web-ADF based web application.
- This allowed us to view these scanned subdivision maps in their true locations.

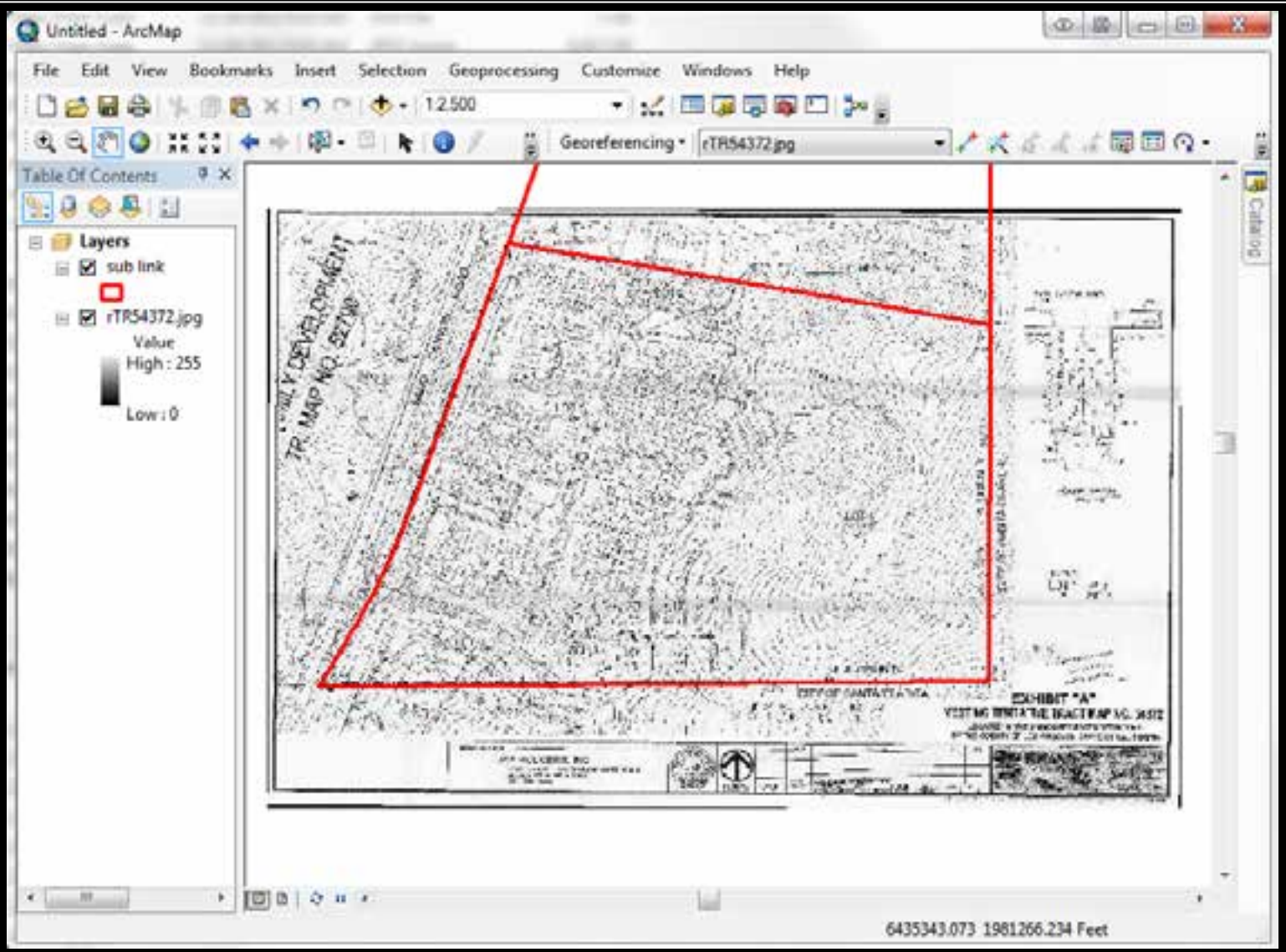
SUB-NET


SUB-NET
Department of Regional Planning
Data Sources & Updates | Disclaimer
FAQs | Feedback | Help | Supplemental Maps
About | Layers | Legend | Find | Search | Subdivision Maps | Bookmarks | Create PDF | Vicinity Map
APN Quick Search
Go
SANTA CLARITA VALLEY
PENDING
TR52192
Subdivision Maps
Image Name
Actions
rtr052192_1of5_7_18_2008
rtr052192_4of5_7_18_2008
Find new Image(s) | Remove All
Refresh Map
The Subdivision Maps tool allows users to view scanned maps in their true location. Using the tool, click within an active subdivision area and choose a map from the listed results shown on the right side of the screen. File names are preceded by the letter 'r' (an internal code) and consist of three parts:
a) the subdivision name (e.g., tr12345)
b) the map number sequence (e.g., 2 of 3)
c) the date received by Regional Planning (e.g., 12/7/06)
Hence, the preceding information would constitute the file name rtr12345_1of3_12_7_06.
NOTE: Attempting to add Subdivision Maps may result in a performance issue as the application adds the image to the view (10-15 seconds to reload, depending on your connection).
Scale: 1: 10,000
go
Map Tool:
Identify
Active Layer: Subdivision Activities

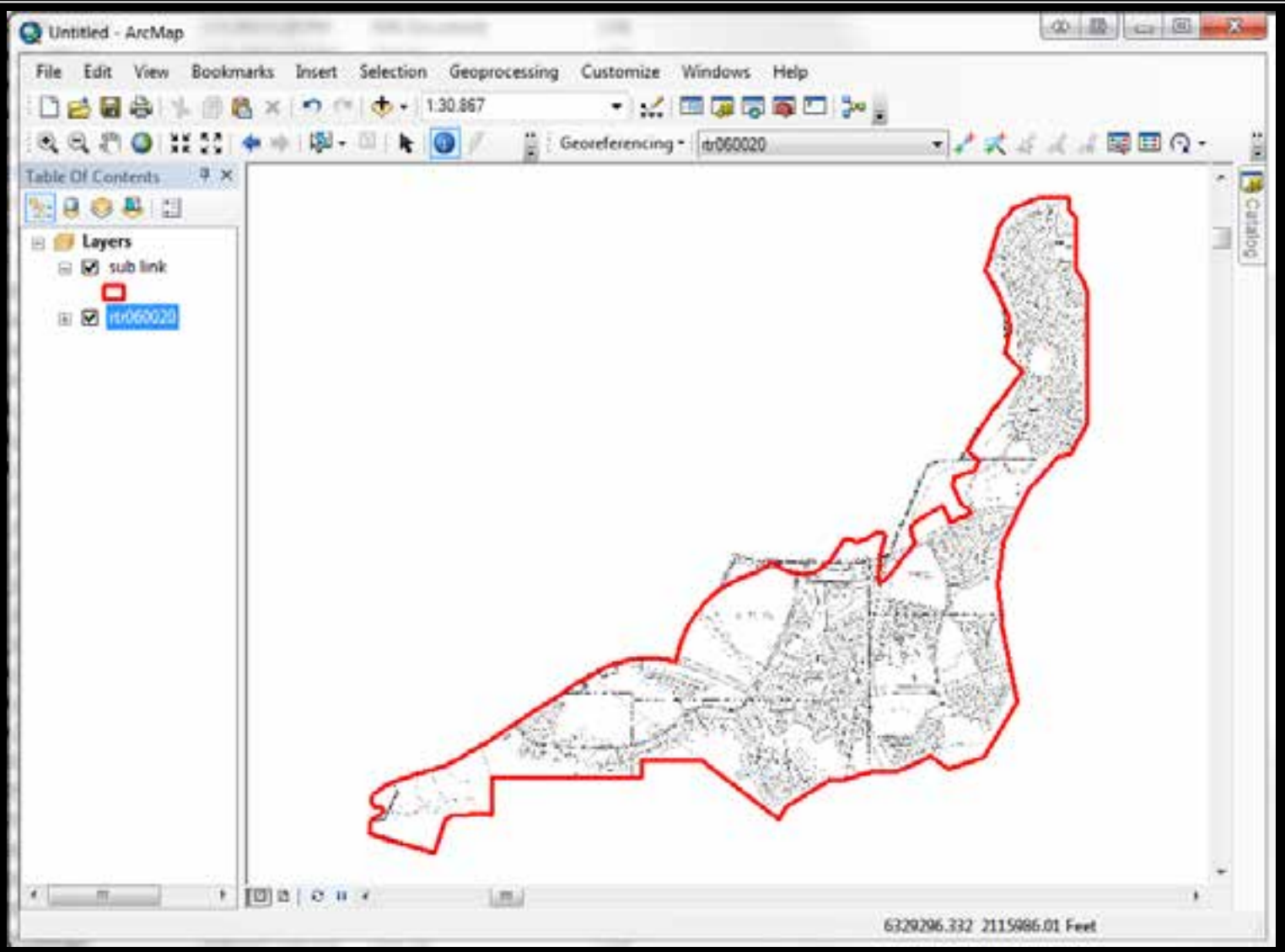
SUB-NET Methodology

1. Scan the map.
2. Georeference the map in ArcMap.
3. Digitize a polygon around the area of interest in each map. Each map will have its own unique polygon.
4. Crop the image using its polygon. This removes unwanted information, like notes that were scribbled onto the edges of the map. These cropped images are stored on a web-server and are accessed via http.
5. We're left with cropped maps, and a feature class containing polygons that represent the location of each map.

Georeferenced Map



Cropped Map


Untitled - ArcMap
File Edit View Bookmarks Insert Selection Geoprocessing Customize Windows Help
1:30,867
Georeferencing
rtr060020
Table Of Contents
Layers
sub link
rtr060020
Catalog
6329296.332 2115086.01 Feet

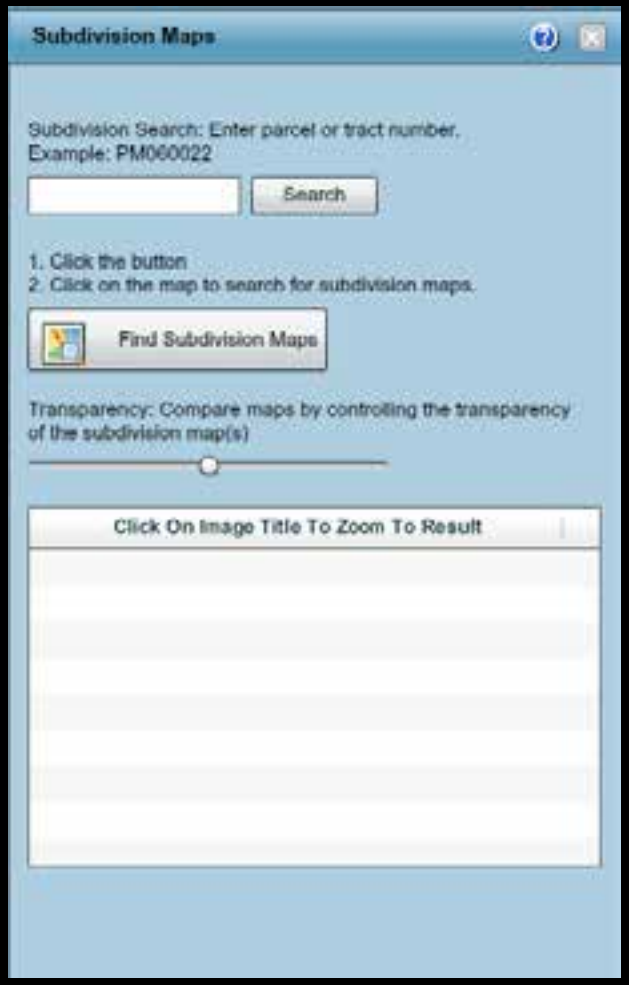
Evolution

- We began transitioning some our web-mapping applications over to ArcGIS Server from ArcIMS in 2011.
- The image display functionality needed to be re-developed into the Flex framework and integrated into our viewer.
- New requirements needed to be written.

General Requirements

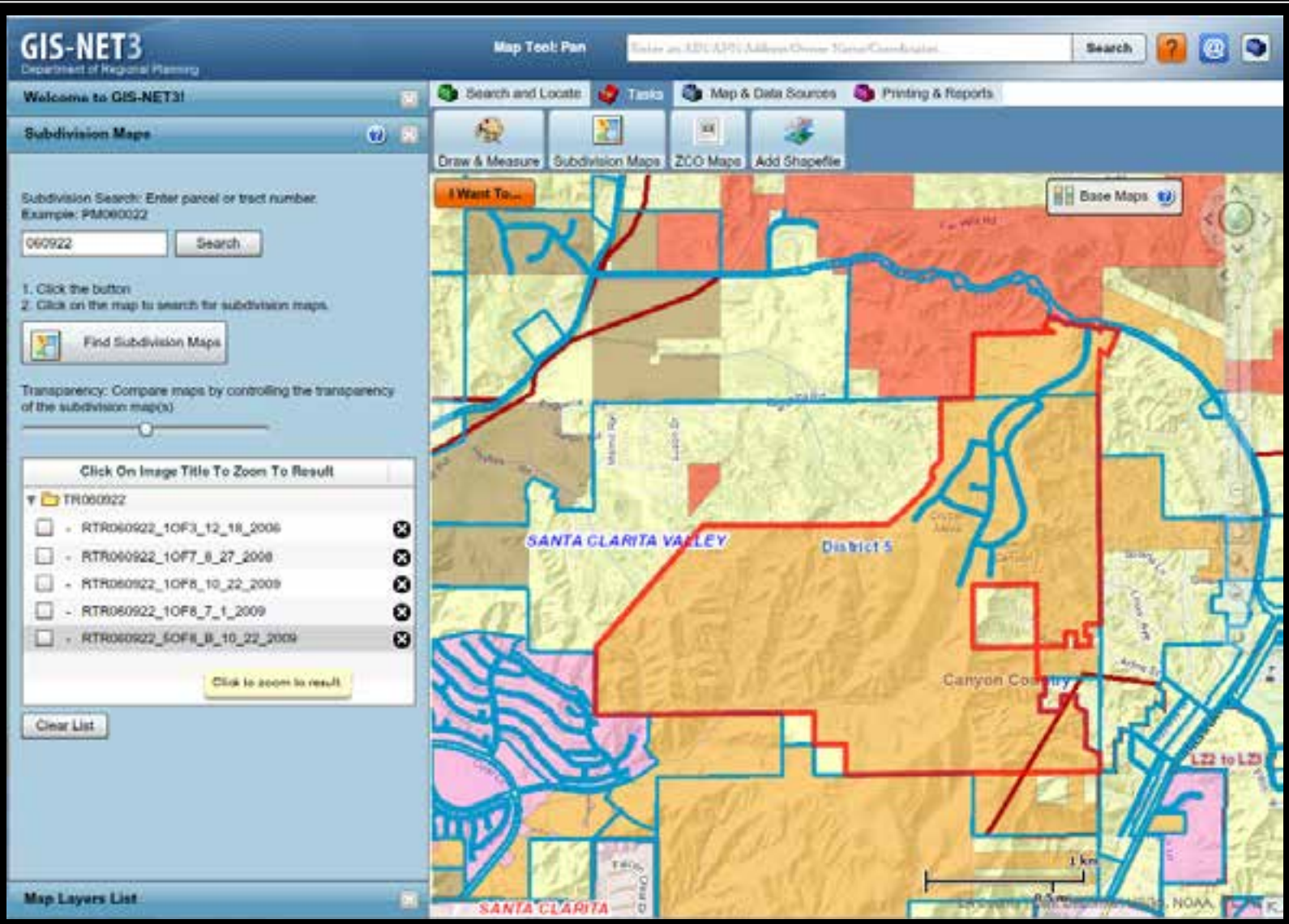
- All code needed to be written in Flex/ActionScript.
- Within the web-mapping application, the user can click an area of the map, and retrieve a list of subdivision maps covering that area.
- User can display the map in its true location.
- User can use a transparency slider to adjust the transparency of the maps in the application.
- Needed to be in a widget, not a stand-alone application.

The Subdivision Widget



- If not already on, the subdivision layer will become visible when the widget is opened.
- The user can search for specific subdivisions.
- The “Find Subdivision Maps” button activates the subdivision map search tool.
- Results display below.

Demo Time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Department of Regional Planning
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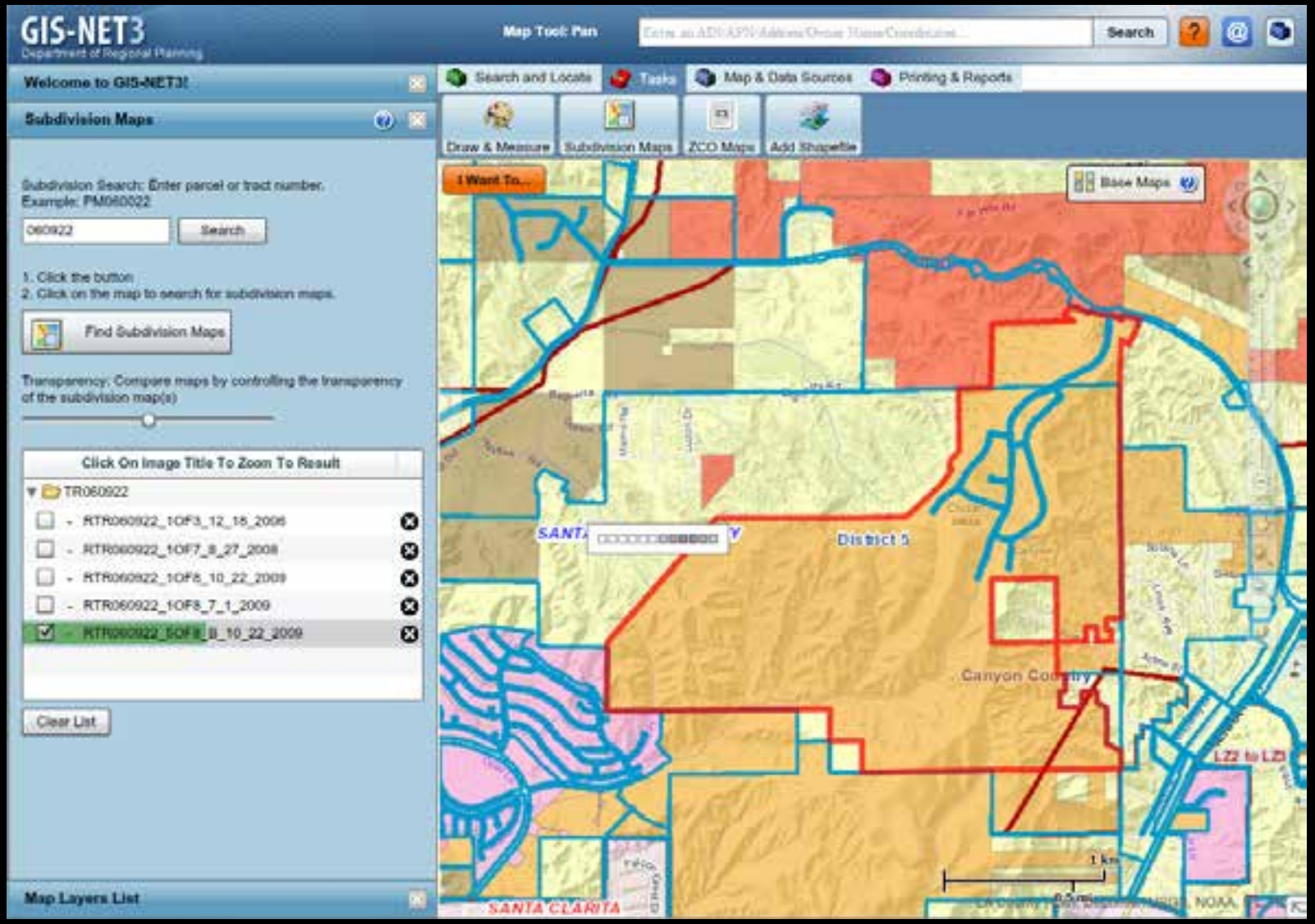
Search
Welcome to GIS-NET3!
Subdivision Maps
Search and Locate
Tasks
Map & Data Sources
Printing & Reports
Draw & Measure
Subdivision Maps
ZCO Maps
Add Shapefile
Subdivision Search: Enter parcel or tract number.
Example: PM060022
060922
Search
1. Click the button
2. Click on the map to search for subdivision maps.
Find Subdivision Maps
Transparency: Compare maps by controlling the transparency of the subdivision map(s)
Click On Image Title To Zoom To Result
TR060922
RTR060922_1OF3_12_18_2006
RTR060922_1OF7_8_27_2008
RTR060922_1OF8_10_22_2009
RTR060922_1OF8_7_1_2009
RTR060922_5OF8_B_10_22_2009
Click to zoom to result
Clear List
Map Layers List
I Want To...
Base Maps
SANTA CLARITA VALLEY
District 5
Canyon Country
SANTA CLARITA

Demo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RTR060922_1OF7_8_27_2008
RTR060922_1OF8_10_22_2009
RTR060922_1OF8_7_1_2009
RTR060922_1OF8_8_10_22_2009
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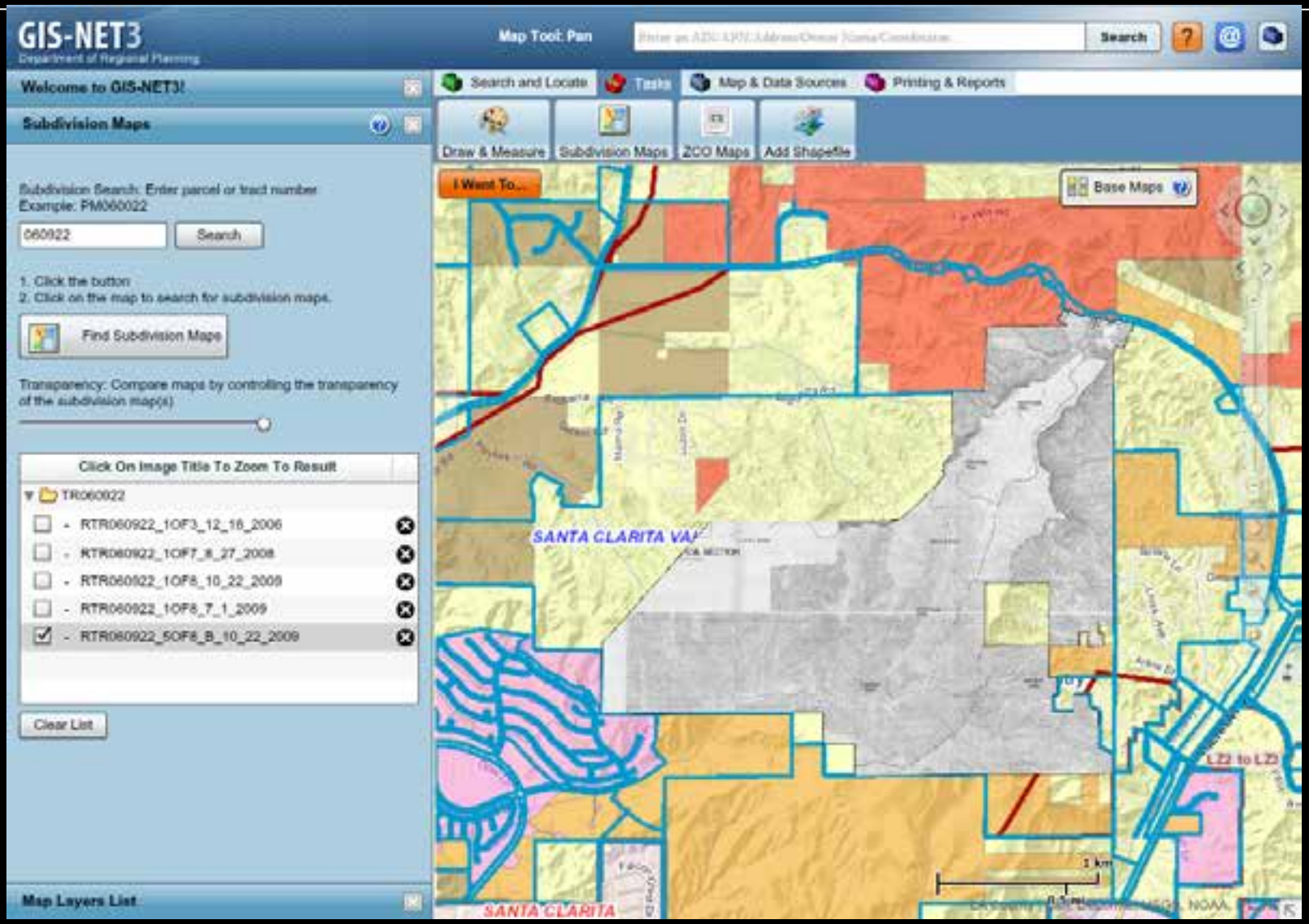
I Want To...
Base Maps
District 5
Canyon Country
SANTA CLARITA
Map Layers List

Demo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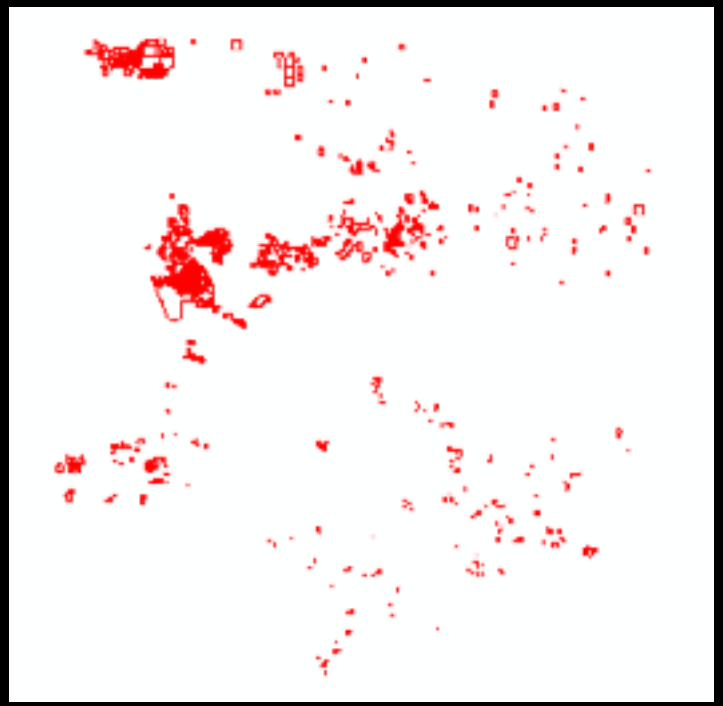
Transparency: Compare maps by controlling the transparency of the subdivision map(s)
Click On Image Title To Zoom To Result
TR060922
RTR060922_1OF3_12_16_2006
RTR060922_1OF7_8_27_2008
RTR060922_1OF8_10_22_2009
RTR060922_1OF8_7_1_2009
RTR060922_5OF8_B_10_22_2009
Clear List
Map Layers List
I Want To...
Base Maps
SANTA CLARITA
1 km
NOAA

How Was This Done?

- A service was published containing the features used for cropping the subdivision maps. We call it “sub link”; one of its attribute fields contains the name of the image that is used in a link field within the application.



How Was This Done?

- When the user activates the "Find Subdivision Maps" tool and clicks on the map, an identify task is executed on the "sub link" layer.
- The identify results are polygons that represent the geographic location of the cropped map, as well as a link where the image can be loaded from.

Table

projects.SDE.PROJ_DRP_SUBDIVISION_LINK

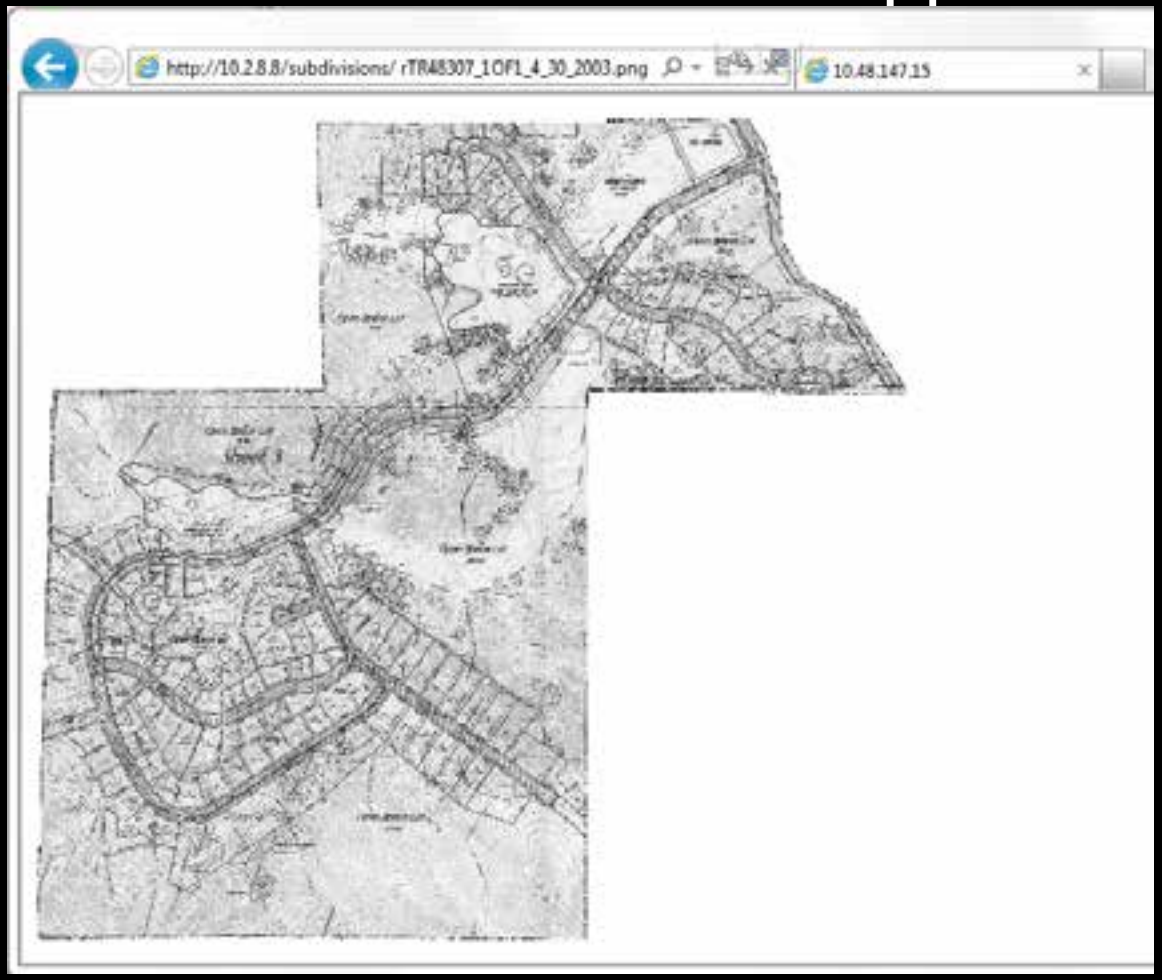
OBJECTID *	TRACT_NO	PNG
216	TR48307	rTR48307_1OF1_4_30_2003.png
6888	TR46443	rTR46443_11OF27_1_5_2000.png
1937	TR062053	rTR062053_4OF8_8_14_2006.png
188	TR060023	rTR060023_8OF24_11_20_2006.png

How Was This Done?

- The PNG attribute is then used to create a link based on a variable populated within the application.
- For example:
  - Link variable: http://10.2.8.8/subdivisions/
  - PNG attribute: rTR48307_1OF1_4_30_2003.png
  - Final link: http://10.2.8.8/subdivisions/ rTR48307_1OF1_4_30_2003.png

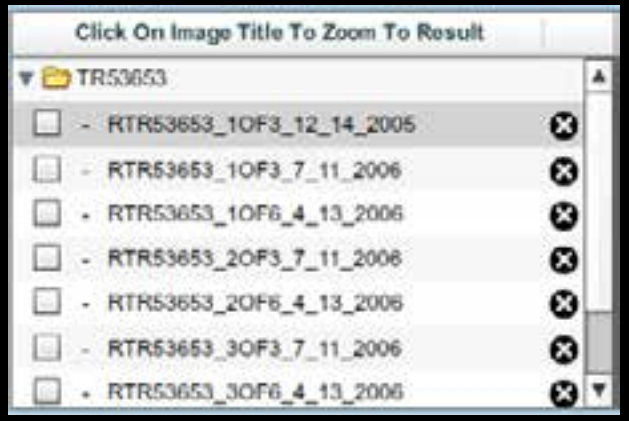
How Was This Done?

- This link is a live link to the actual cropped image:



How Was This Done?

- The identify results are then added to the result list.
- When the cursor is hovered over the result, the polygon shows on the map.



How Was This Done?

- The check box toggles the map's visibility.
- General Methodology:
  - Flex PictureMarkerSymbol class: Used to draw points and multipoints on the graphics layer using an image.
  - Constructor properties:
    - Source: the source of the image (can be url, or a bitmap object)
    - Width: the width (in pixels) of the image
    - Height: the height (in pixels) of the image

How Was This Done?

- Source: The flex loader class uses a URL Request to load the image into a bitmap object.
- Width: We need to convert the polygon's width from map units to pixels; to do this, we divide the polygons width by the current map resolution (map units/pixel). This leaves us with a width in pixels.
- Height: the same conversion is needed…

How Was This Done?

- Once we have the bitmap image object, width, and height, we can instantiate a new PictureMarkerSymbol object with these parameters.
- We then create a new graphic using this PictureMarkerSymbol and add it to the map.

Success!!

How Was This Done?

- We also need to adjust the image whenever the map is panned or zoomed in or out.
- Every time the map is panned or zoomed, we recalculate the width and height of the PictureMarkerSymbol and update on pan or zoom completion.
- Since we already have the image bitmap object loaded, the width and height adjustments happen very quickly and are almost unnoticeable.

Final Thoughts

- Some minor bugs exist within the flex API causing an odd ghosting effect in the loaded images when zoomed out too far.
- This widget has been reused for other types of maps for our internal site.
- We've rewritten the code in javascript so that we can soon incorporate the widget into our HTML5 viewers.
- I created a python script to automate the cropping of images. Our interns used to crop each images one-by-one, but now they can do them in batches.

Questions?
http://planning.lacounty.gov/gis

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