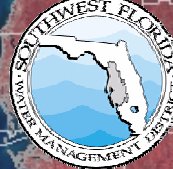


Comprehensive Watershed Management

Presented By
Bruce C. Wirth, P.E.
Deputy Executive Director



Comprehensive Watershed Management

What is CWM?

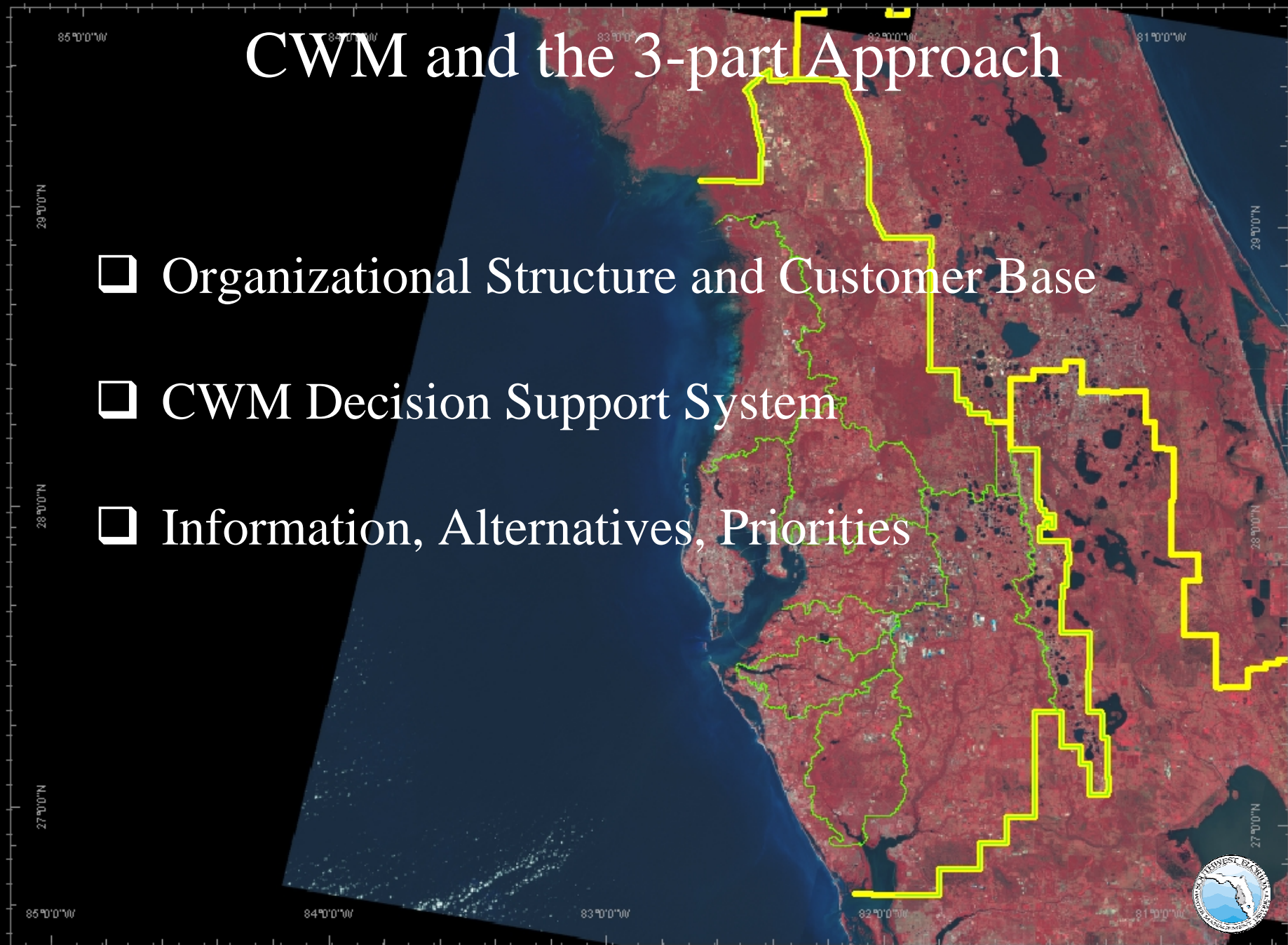
An interdisciplinary approach to water resource management that emphasizes the use of science to support decision making.

- ☐ Started in the mid 1990s
- ☐ Multi-disciplinary Teams
- ☐ Balance between Areas of Responsibility (AORs)
 - ☐ Water Supply
 - ☐ Flood Protection
 - ☐ Water Quality
 - ☐ Natural Systems
- ☐ Geographic Information System (GIS)



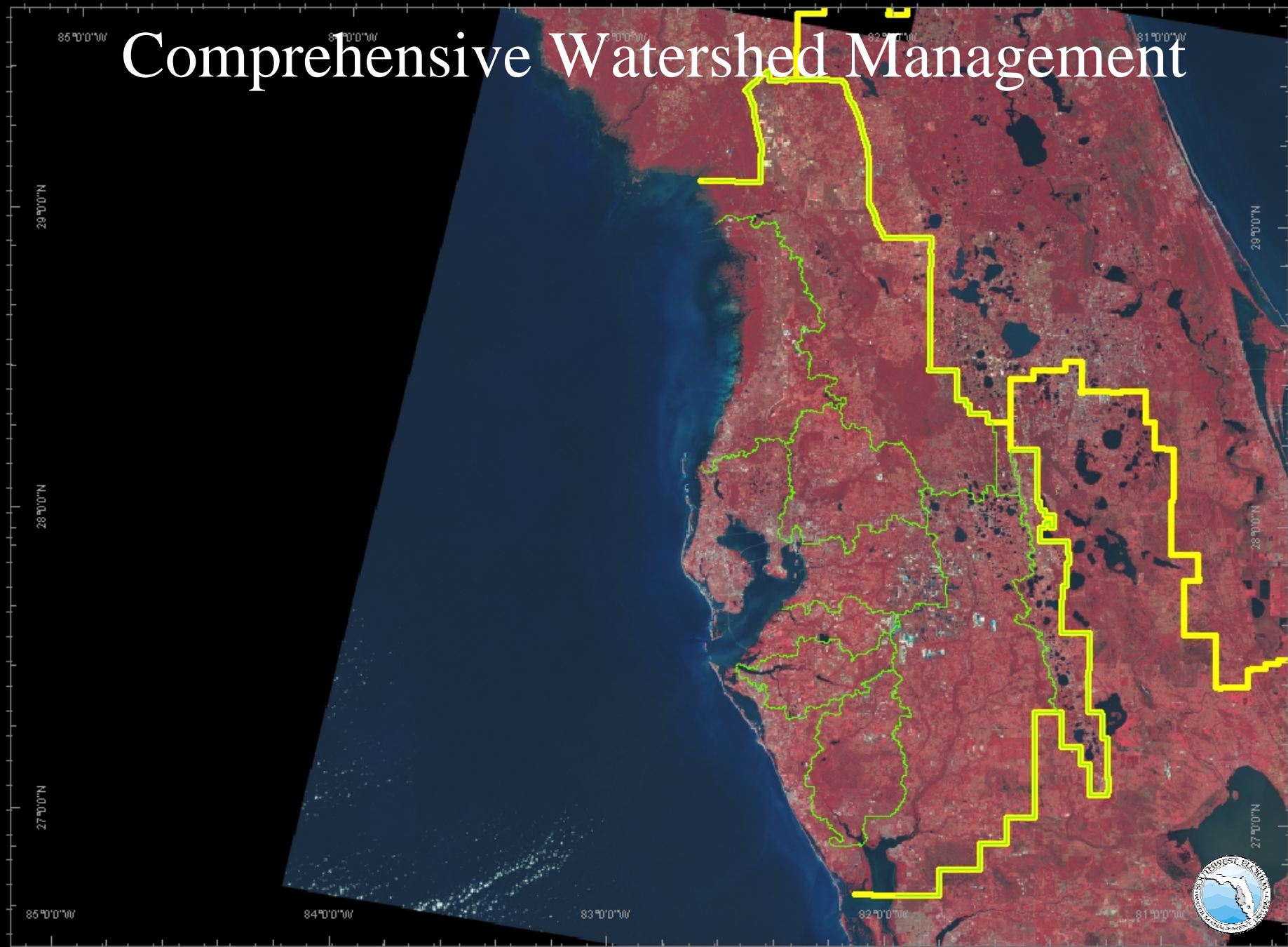
CWM and the 3-part Approach

- ❑ Organizational Structure and Customer Base
- ❑ CWM Decision Support System
- ❑ Information, Alternatives, Priorities



Organizational Structure

Comprehensive Watershed Management



Organizational Structure

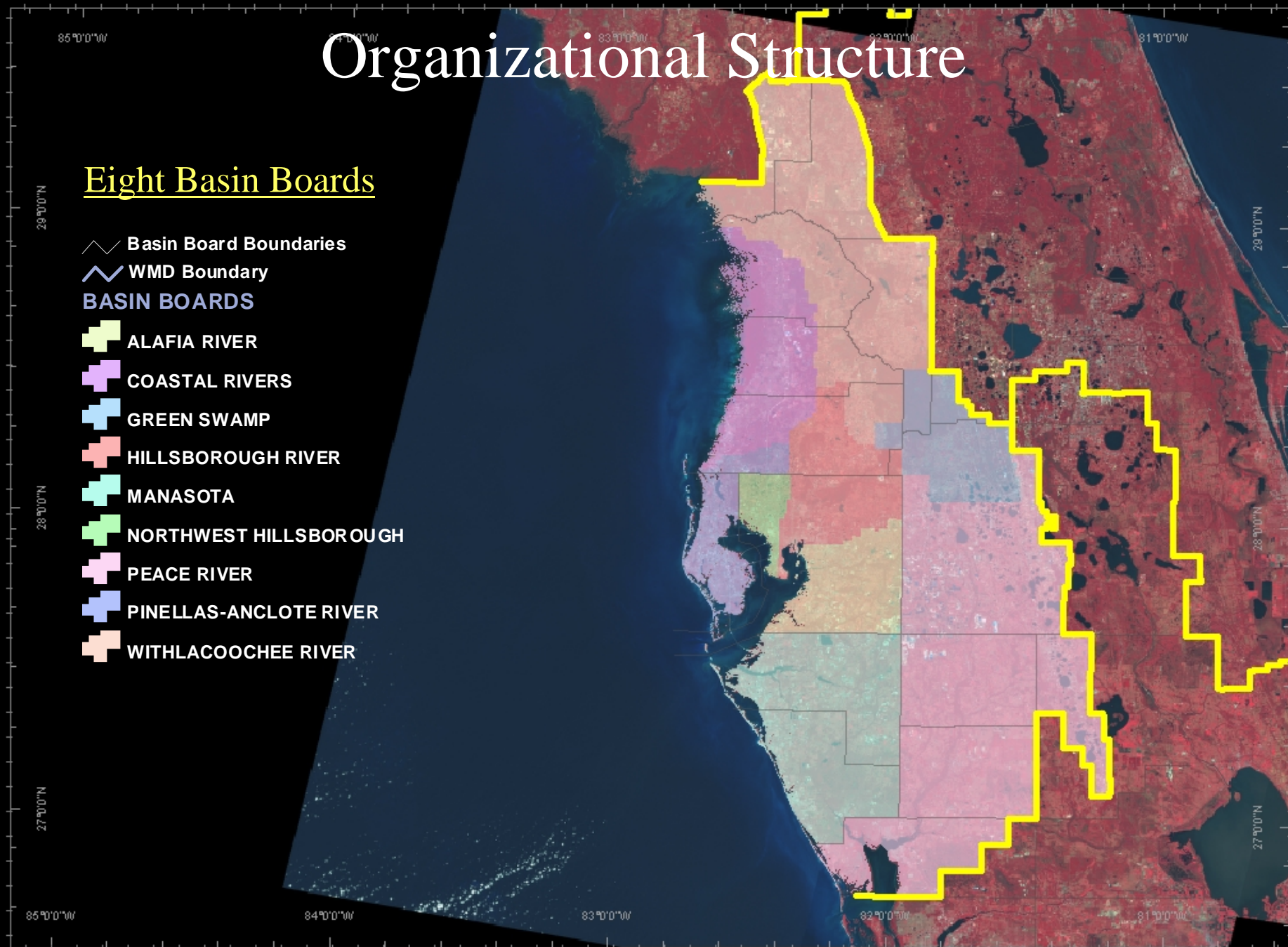
Eight Basin Boards

Basin Board Boundaries

WMD Boundary



BASIN BOARDS

- ALAFIA RIVER
- COASTAL RIVERS
- GREEN SWAMP
- HILLSBOROUGH RIVER
- MANASOTA
- NORTHWEST HILLSBOROUGH
- PEACE RIVER
- PINELLAS-ANCLOTE RIVER
- WITHLACOOCHEE RIVER



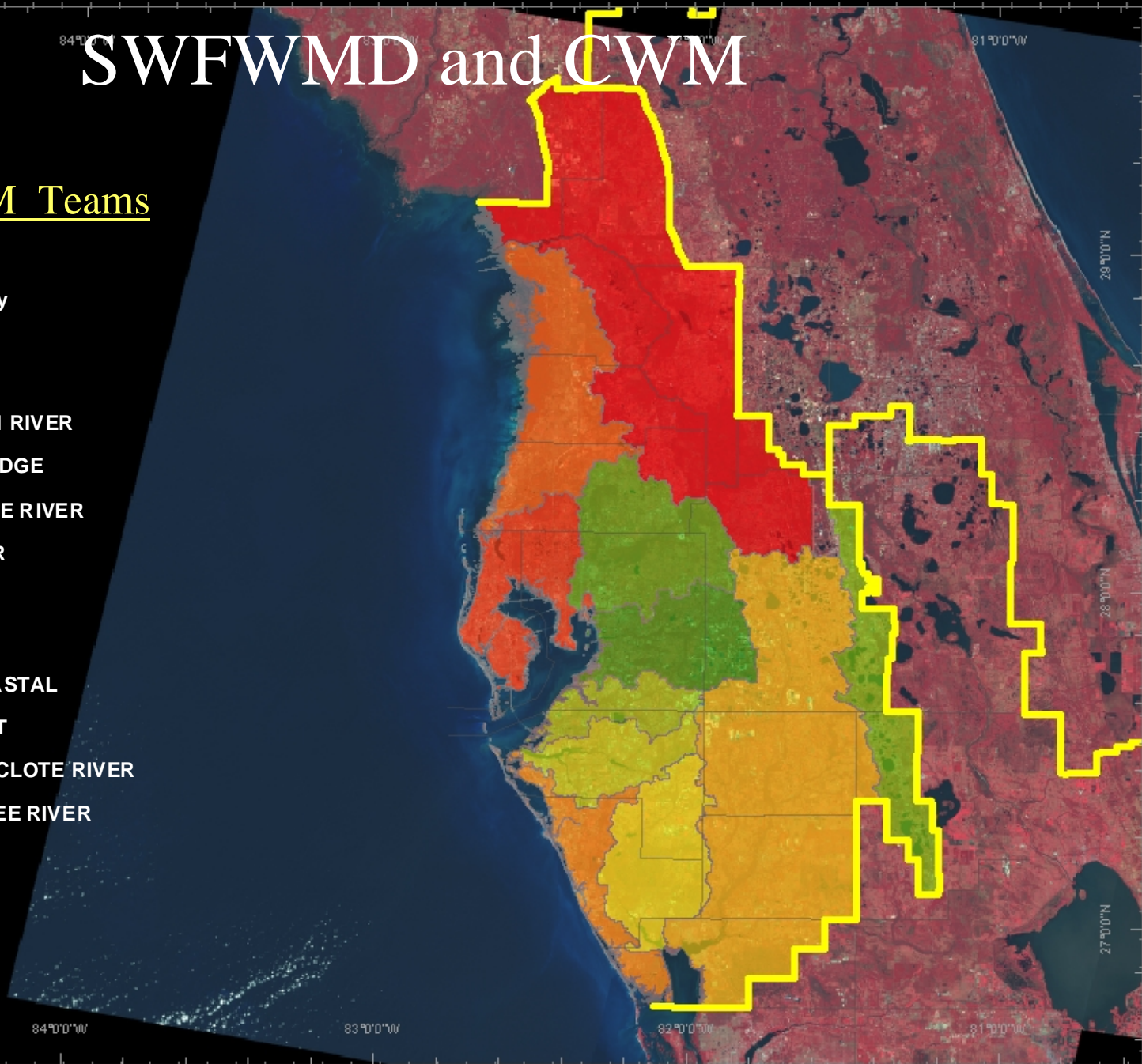
SWFWMD and CWM

Eleven CWM Teams

-  WMD Boundary
-  County Boundary

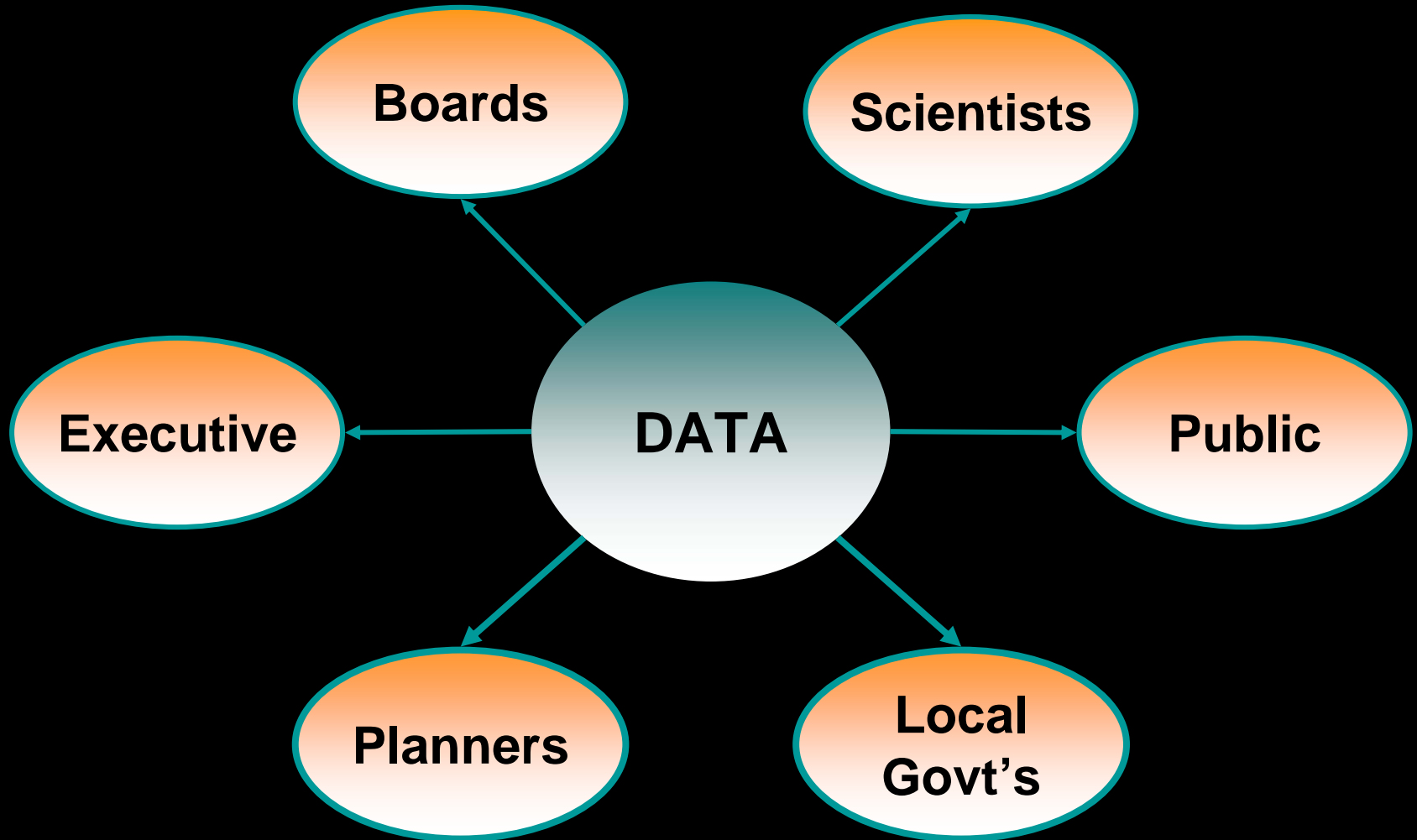
WATERSHEDS

-  ALAFIA RIVER
-  HILLSBOROUGH RIVER
-  LAKE WALES RIDGE
-  LITTLE MANATEE RIVER
-  MANATEE RIVER
-  MYAKKA RIVER
-  PEACE RIVER
-  SOUTHERN COASTAL
-  SPRINGS COAST
-  TAMPA BAY/ANCLOTE RIVER
-  WITHLACOOCHEE RIVER



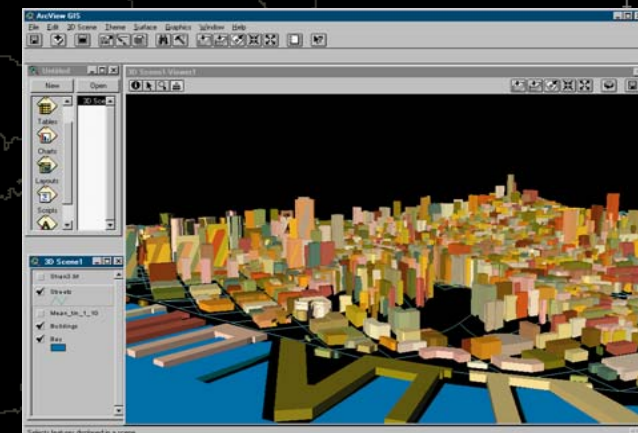
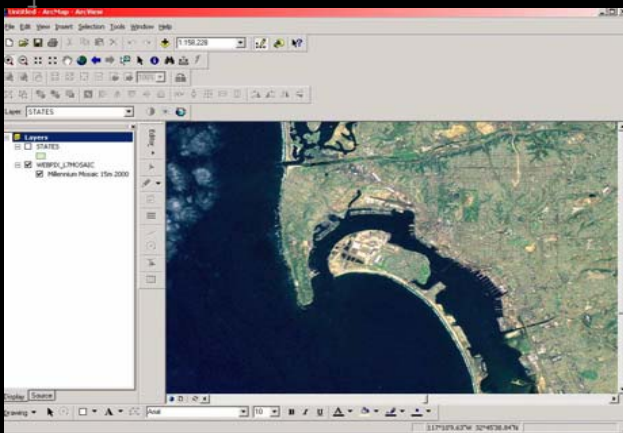
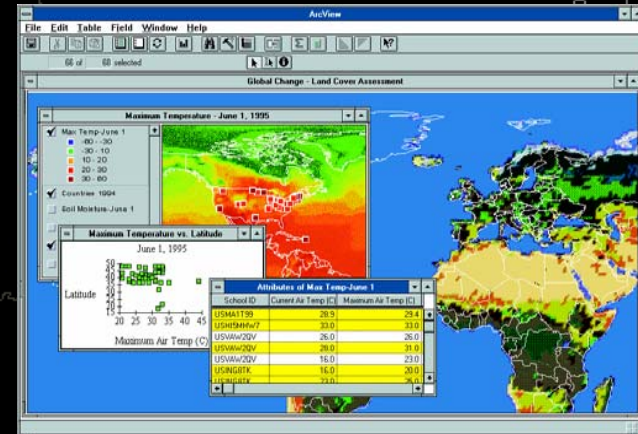
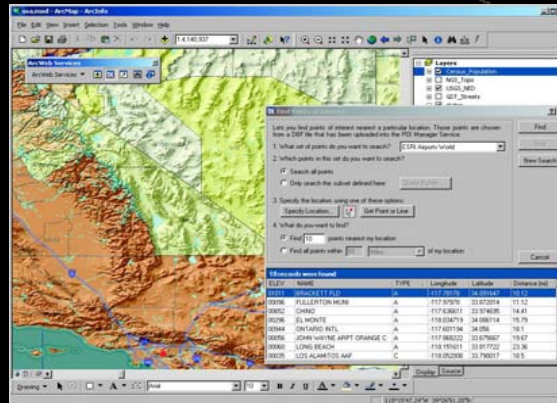
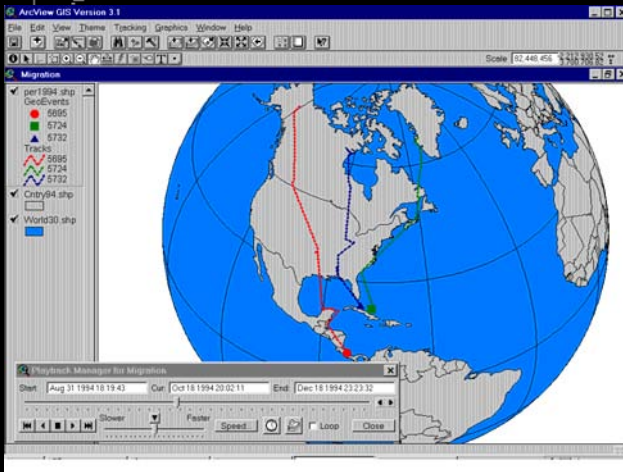
Customer Base

Diverse Customer Base

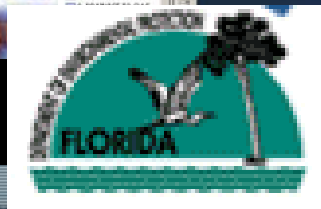
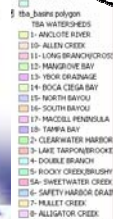


Decision Support System

Emphasis on GIS Technologies



85°0'0"W	CYMA	87°0'0"W	•	D	82°0'0"W	81°0'0"W
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Information Technology and CWM

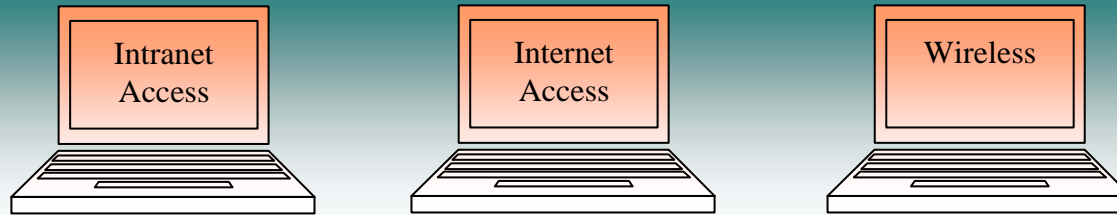
An integrated approach to collecting, managing, analyzing and presenting data in a manner that supports the decision making process.

- Data Collection/Administration
- Data Management
- Data Analysis/Modeling
- Business Processes
- Decision Making

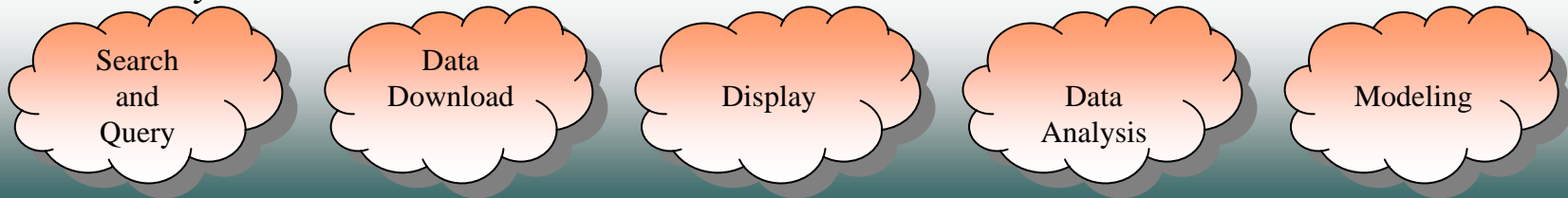


Decision Support System

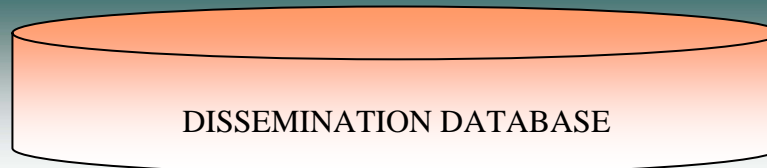
User Access



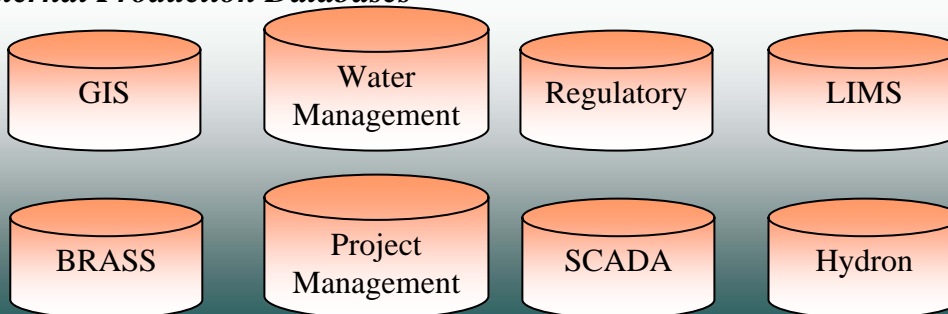
Data Discovery



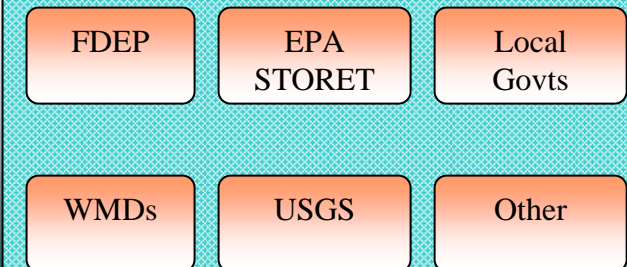
Database Consolidation



Internal Production Databases



External Production Databases



Information, Alternatives, Priorities

CWM Process

*Implementation
(Policy)*

PRIORITIZATION



Decide / Strategic Planning / Funding

*Interpretation
(Staff)*

ALTERNATIVES



Data Discovery / Analysis / Modeling

*Information
Technology*

INFORMATION

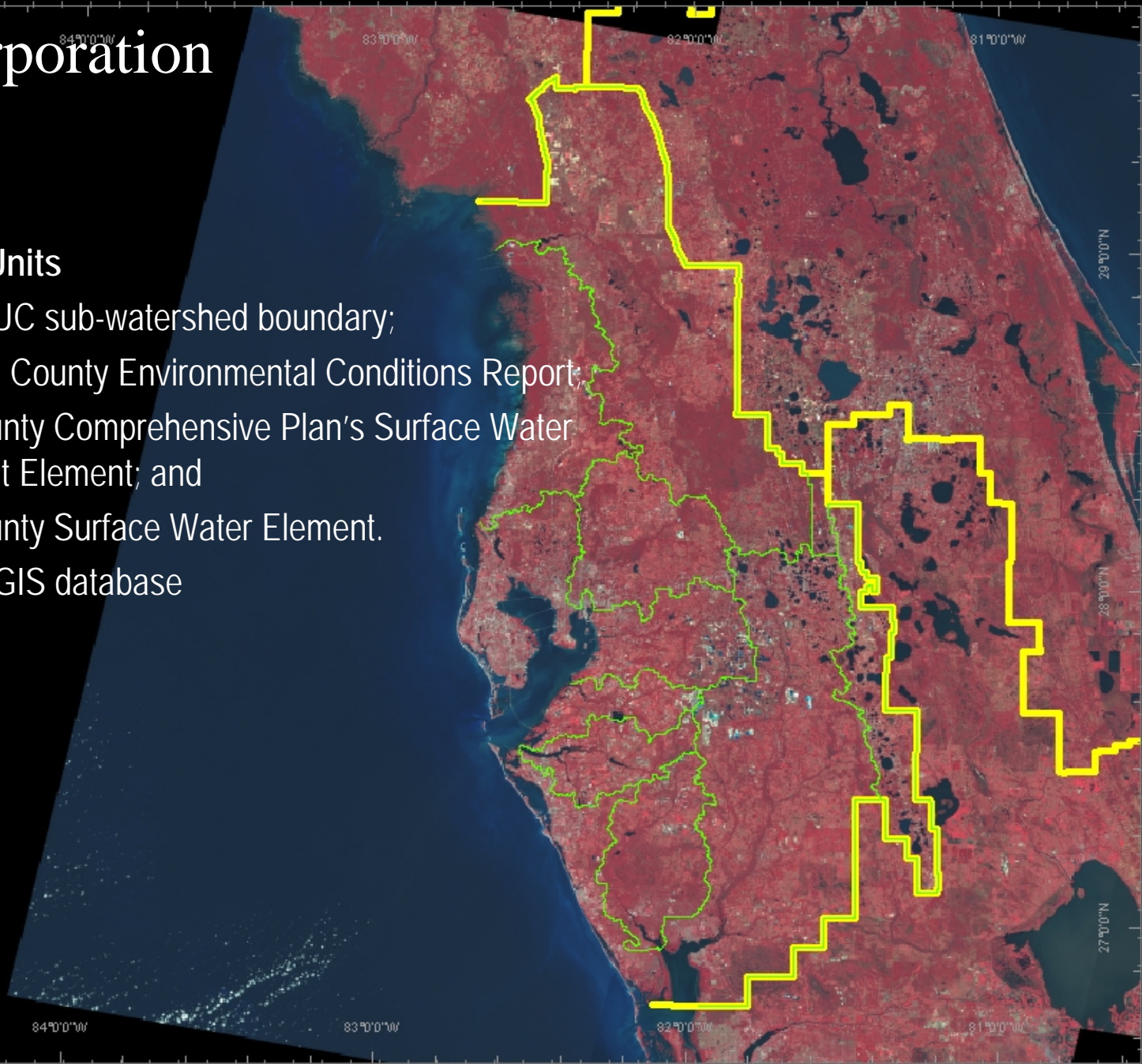


**Databases / Data Warehouse / Data Query and
Analysis / Access**

Data Incorporation

Sub-watershed Units

- ❖ USGS 12 HUC sub-watershed boundary;
- ❖ Hillsborough County Environmental Conditions Report;
- ❖ Pinellas County Comprehensive Plan's Surface Water Management Element; and
- ❖ Pinellas County Surface Water Element.
- ❖ SWFWMD, GIS database



Data Collection Analysis

Attributes of tba_99dry

	FID	Shape*	AREA	PERIMETER	TBANC1999	TBANC19991
	0	Polygon	708955.036454	19685.502183	2	1
	1	Polygon	472.401319	120.722837	3	2
	2	Polygon	6428.112324	295.699588	4	3
	3	Polygon	467.533993	106.357919	5	4
	4	Polygon	61.141143	48.465214	6	5
	5	Polygon	1.081339	5.447998	7	6
	6	Polygon	27742.451383	1076.576286	8	7
	7	Polygon	2053.684156	231.183113	9	8
	8	Polygon	125.224145	97.042543	10	9
	9	Polygon	149.235170	92.516598	11	10
	10	Polygon	159.053842	52.721688	12	11
	11	Polygon	2816.358895	193.037045	13	12
	12	Polygon	334.409248	97.705685	14	13
	13	Polygon	665.181332	149.390616	15	14
	14	Polygon	12514.777515	757.532183	16	15
	15	Polygon	691.629316	133.227371	17	16
	16	Polygon	2208.948085	235.429017	18	17
	17	Polygon	5532.775467	517.348431	19	18
	18	Polygon	19883.042252	792.976213	20	19
	19	Polygon	329.060255	93.136544	21	20
	20	Polygon	1339.939537	139.903649	22	21
	21	Polygon	210198.937538	5726.716900	23	22
	22	Polygon	1774.854190	287.680000	24	23

Record: 1 Show: All Selected Records (4 out of 2138 Selected.) Options

Editor

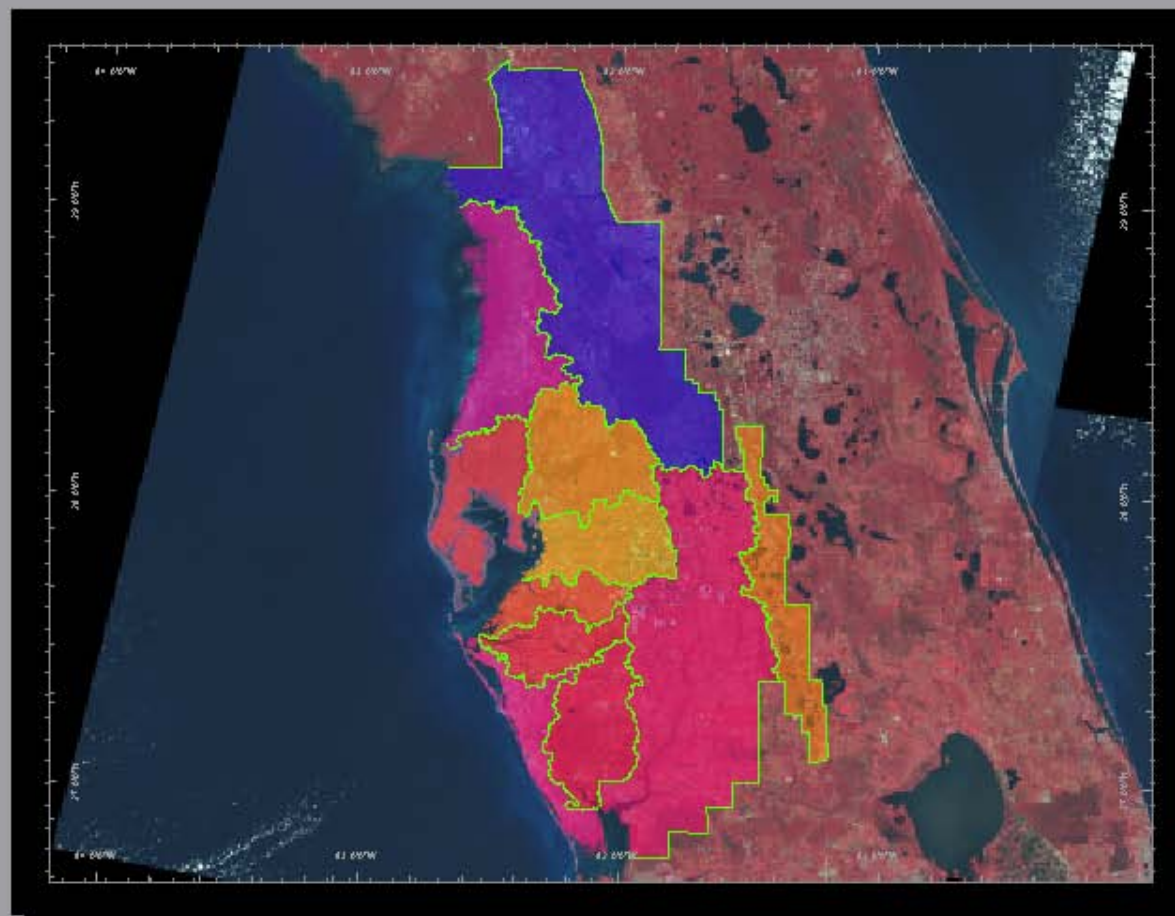
Task: Create New Feature

Target:

SWFWMD

1:1,589,037

- ☐ hydrogen polygon
- ☐ TBA Watersheds
- ☒ Tampa Bay/Anclote River CWM
- ☒ WATERSHEDS
 - WATERSHEDS
 - ALAFIA RIVER
 - HILLSBOROUGH RIVER
 - LAKE WALES RIDGE
 - LITTLE MANATEE RIVER
 - MANATEE RIVER
 - MYAKKA RIVER
 - PEACE RIVER
 - SOUTHERN COASTAL
 - SPRINGS COAST
 - TAMPA BAY/ANCLOTE RIVER
 - WITHLACOOCHEE RIVER
- ☐ CWM WATERSHEDS
- ☐ statecounties_line
- ☐ County
- ☐ distbasins_poly
- ☐ District County
- ☒ tm99cat



Display Source Catalog

Drawing

Arial

10.71

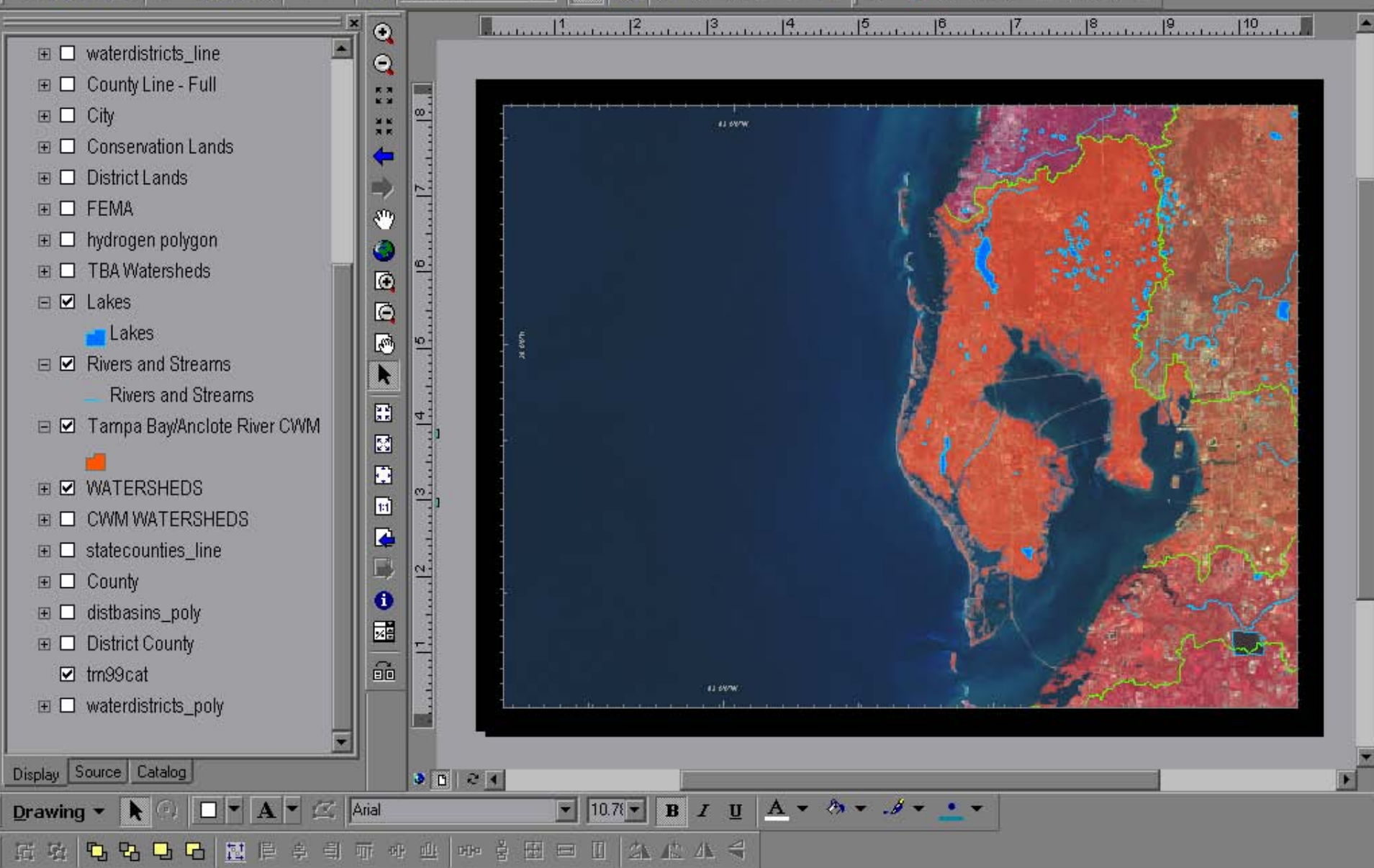
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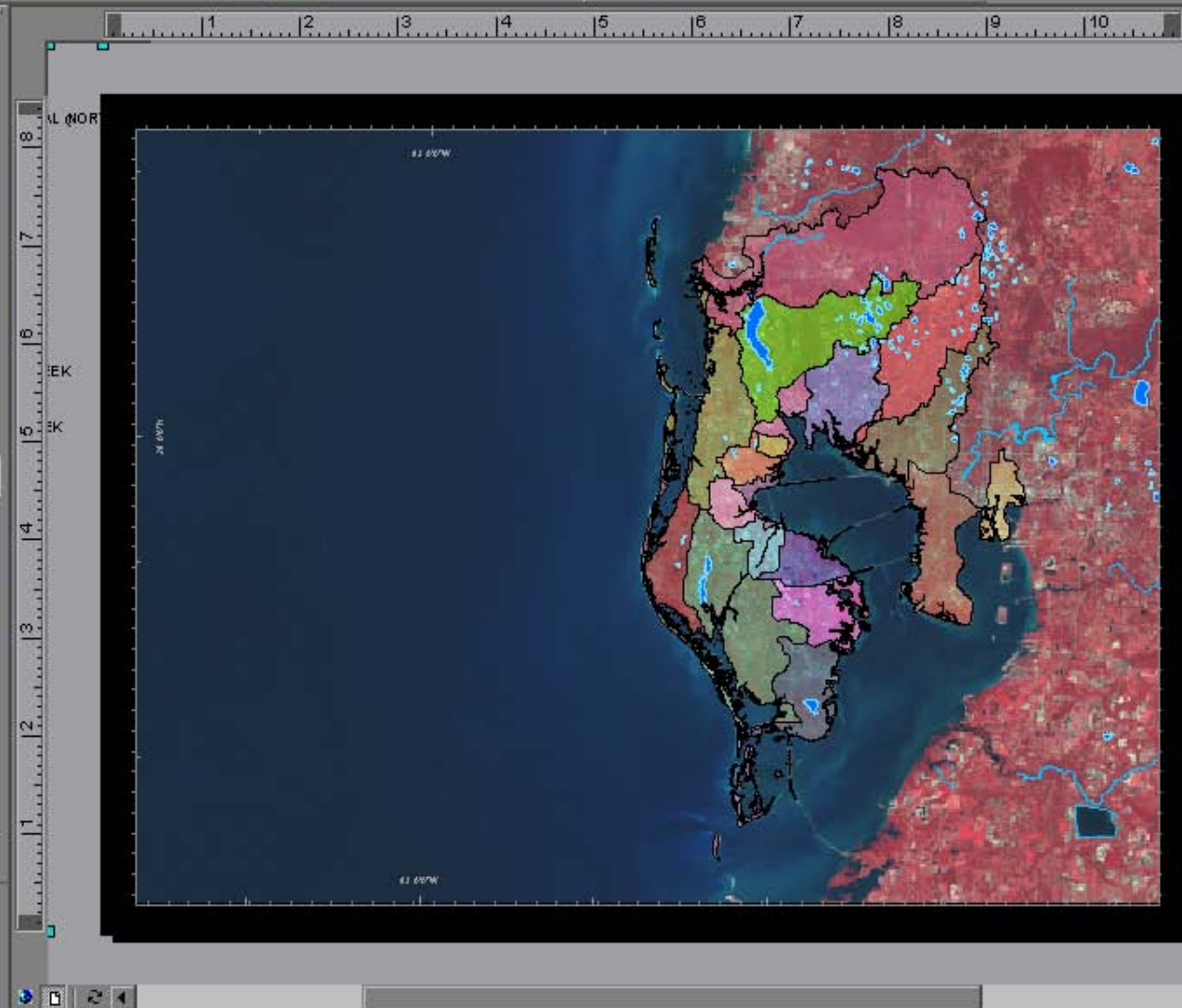
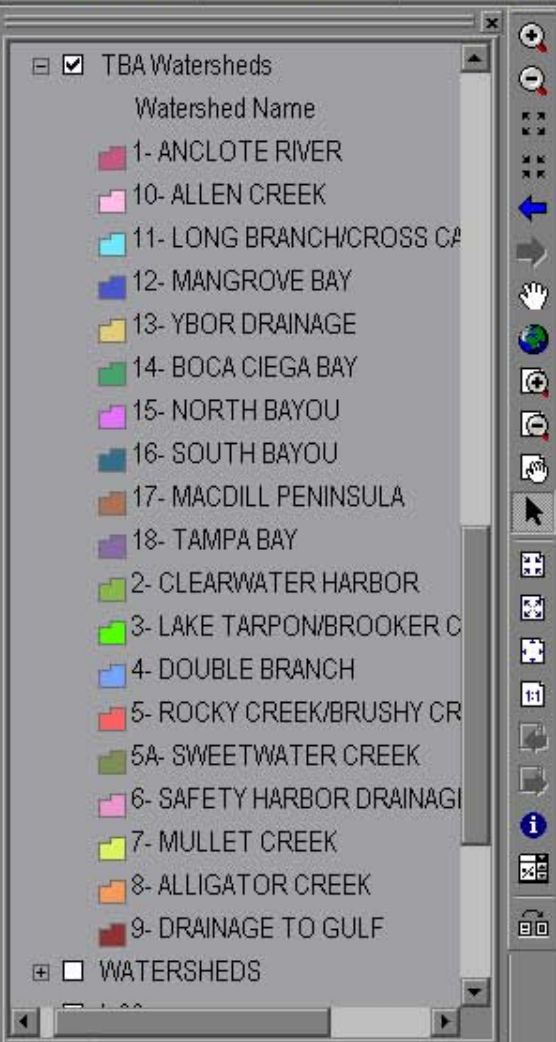
I

U

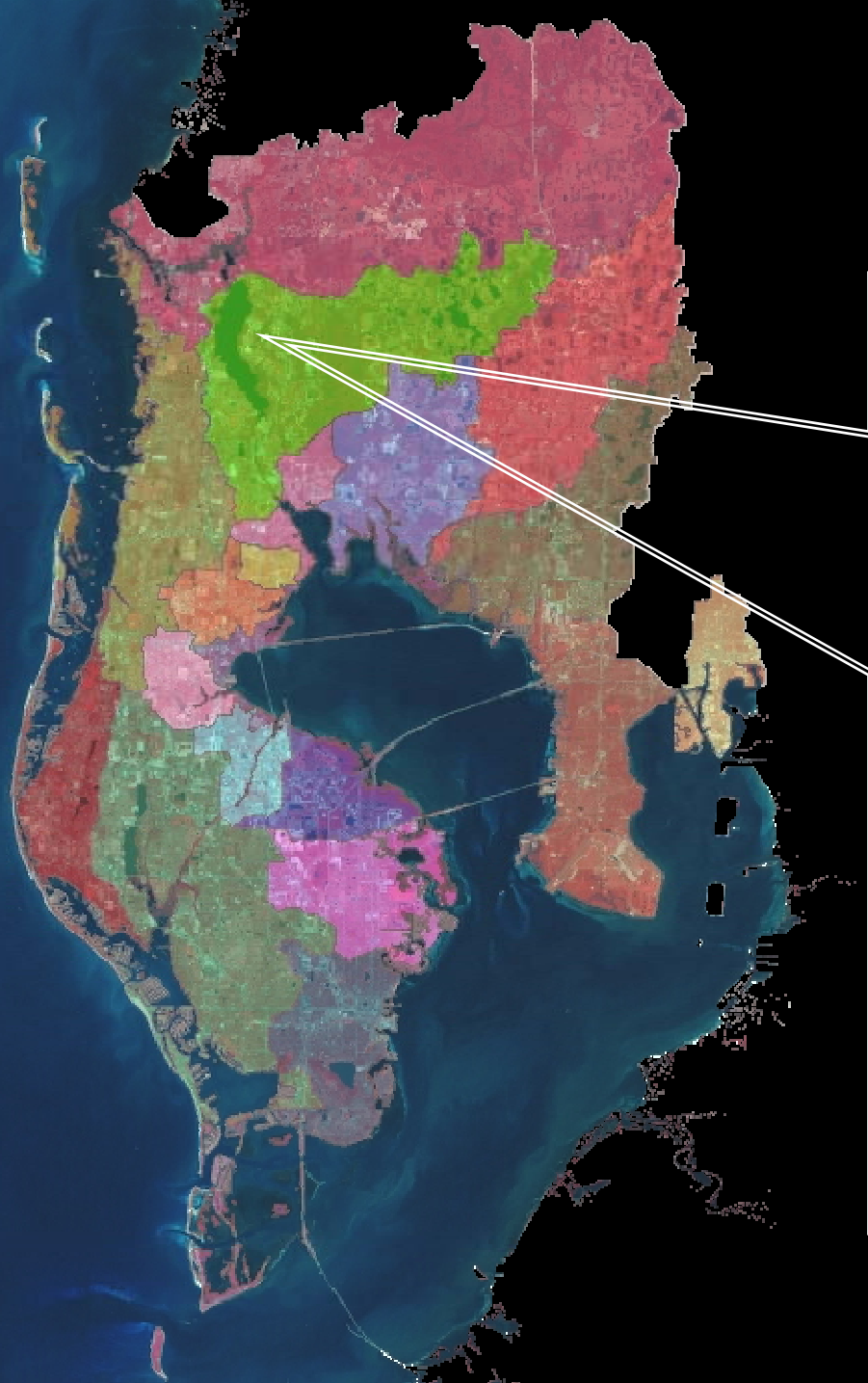
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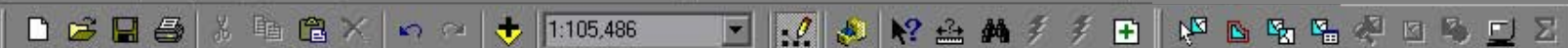
Tampa Bay/Anclore River CWM



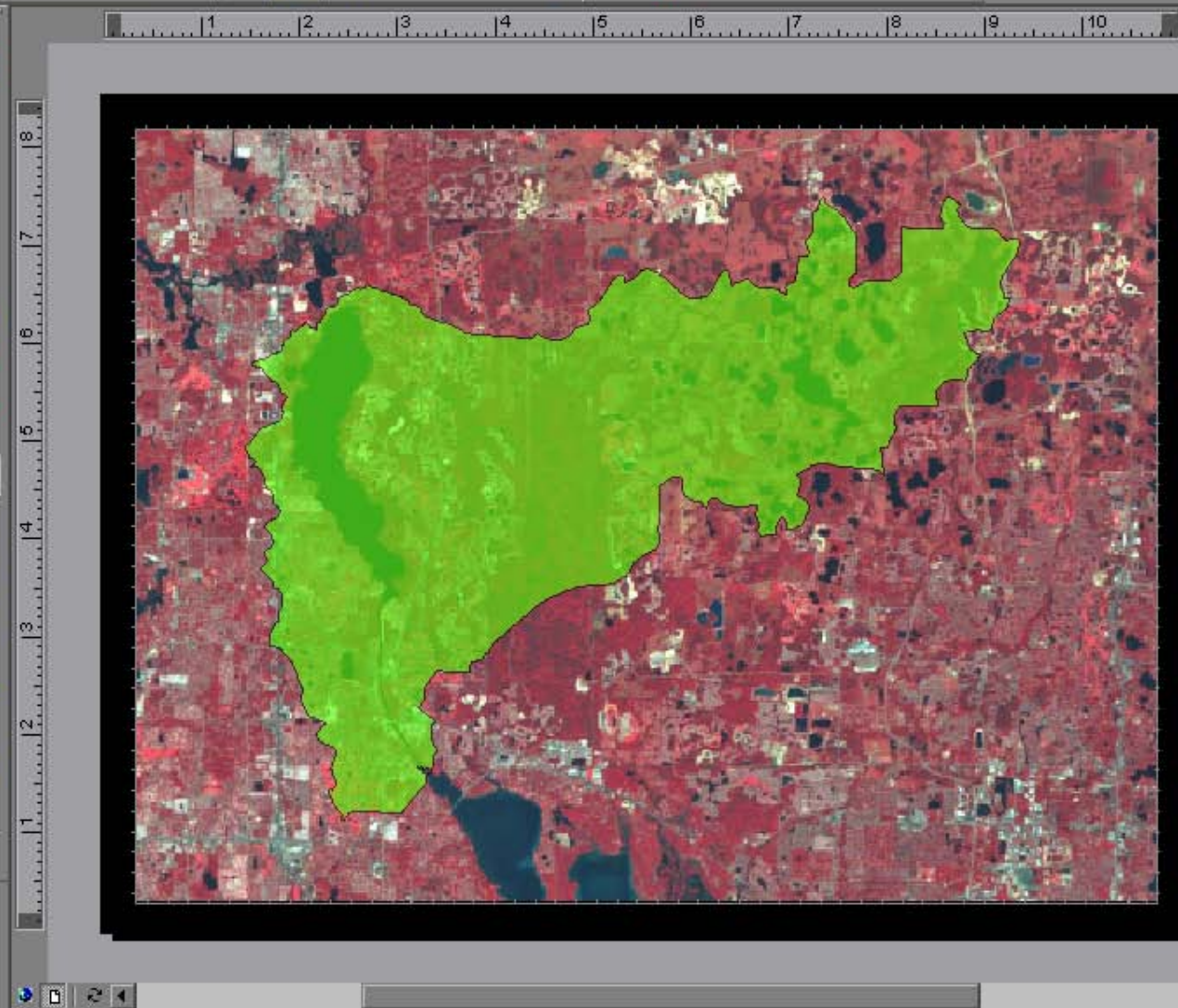
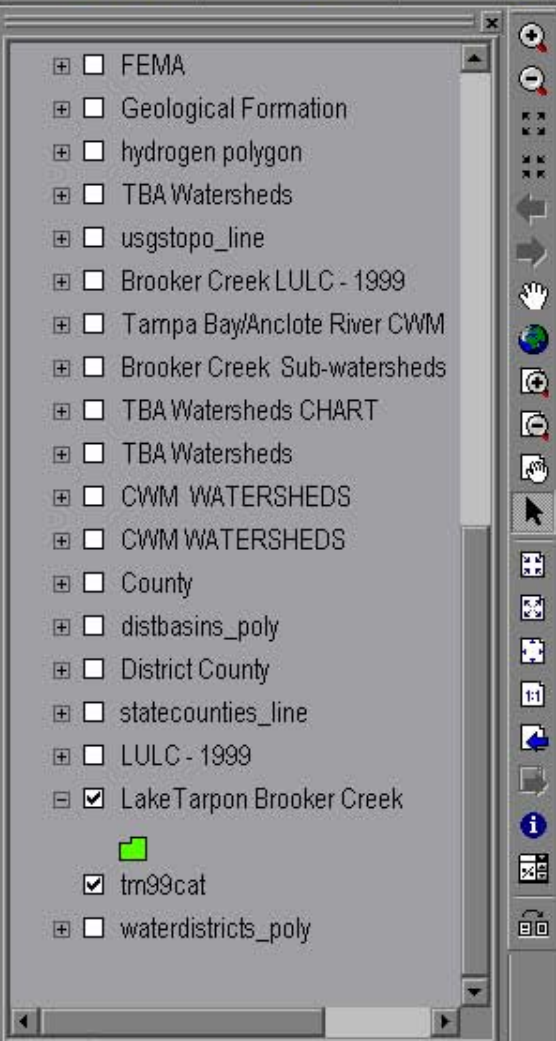


Brooker Creek





1:105,486



Display Source Catalog

Drawing



Editor

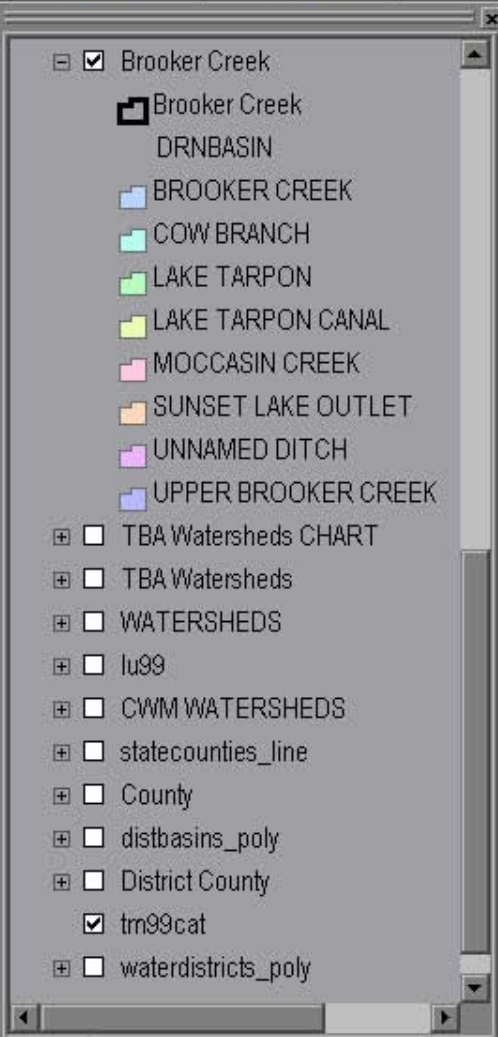
Task: Create New Feature

Target:

Brooker Creek Sub-watersheds

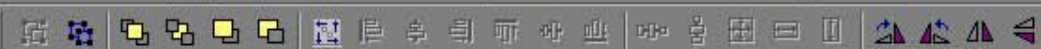


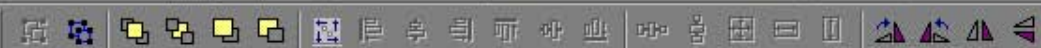
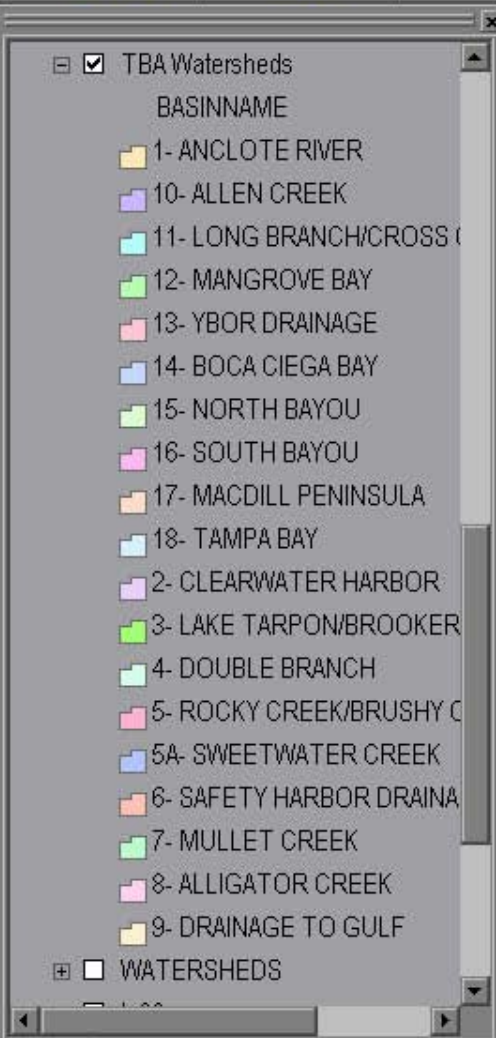
1:105,486



Display Source Catalog

Drawing





Query Builder

Fields:

"EMC_TABLE"
"EMC_MATCH"
"RC_TABLE"
"RC_MATCH"
"RAINFALL"
"Z_NO_RAIN"
"RUNOFF_VOL"
"G_TN"
"G_TP"
"G_TSS"

=

< >

Like

>

> =

And

<

< =

Or

_

%

{ }

Not

SQL Info...

Unique sample values

0.229
0.233
0.234
0.274
0.281
0.287
0.29
0.319
0.32

Complete List

SELECT * FROM tba_99dry WHERE:

"G_TN" > 100
Calculating Total Nitrogen
load/Acre for Brooker Creek...
Please stand by...

Clear

Verify

Help

Load...

Save...

OK

Cancel

Editor

Task: Create New Feature

Target:

Water Quality Data



1:105,486

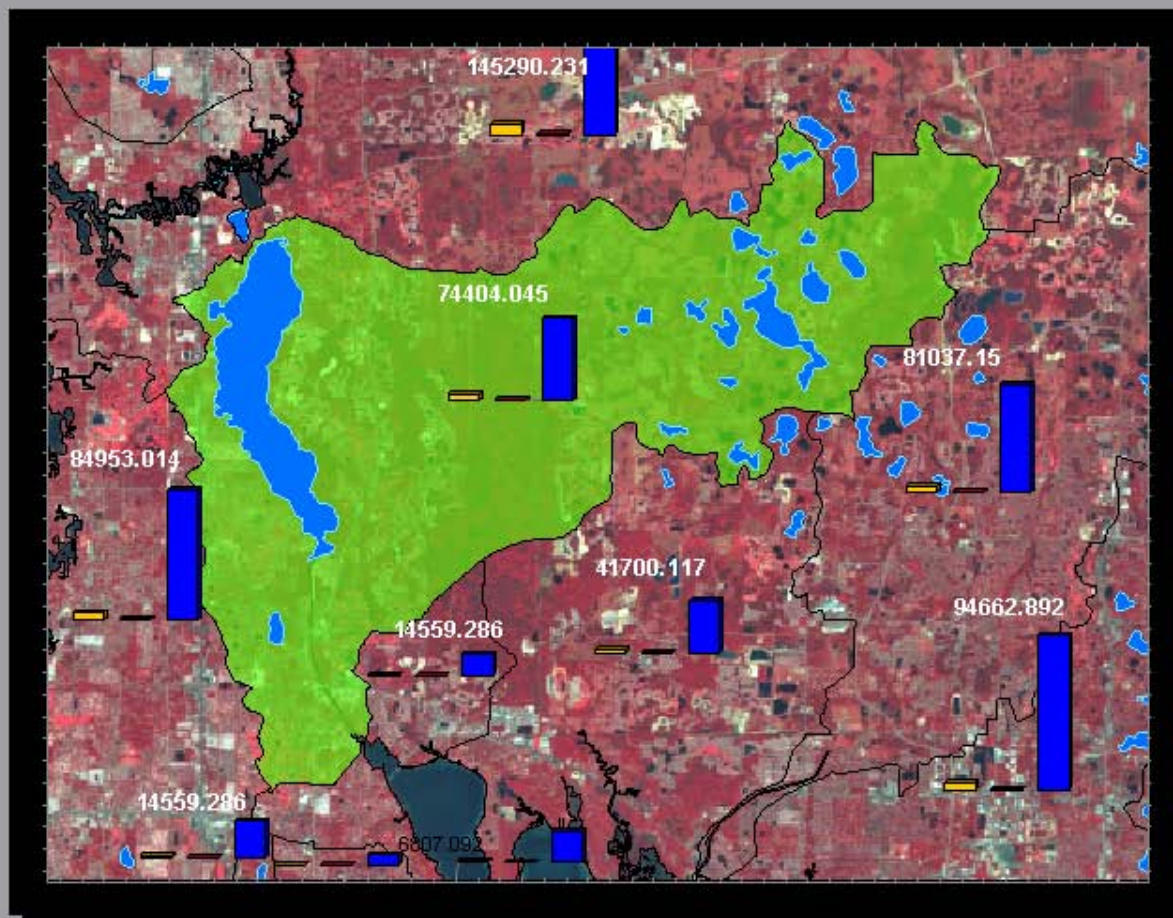
☐ Tampa Bay/Anclote River CWM☐ Brooker Creek Sub-watersheds☒ Lake Tarpon Brooker Creek☒ TBA Watersheds CHART

1,700,000

SUM_G_TN

SUM_G_TP

SUM_G_TSS

☒ TBA Watersheds☒ WATERSHEDS☒ lu99☒ CWM WATERSHEDS☒ statecounties_line☒ County☒ distbasins_poly☒ District County

Display Source Catalog

Drawing

Arial

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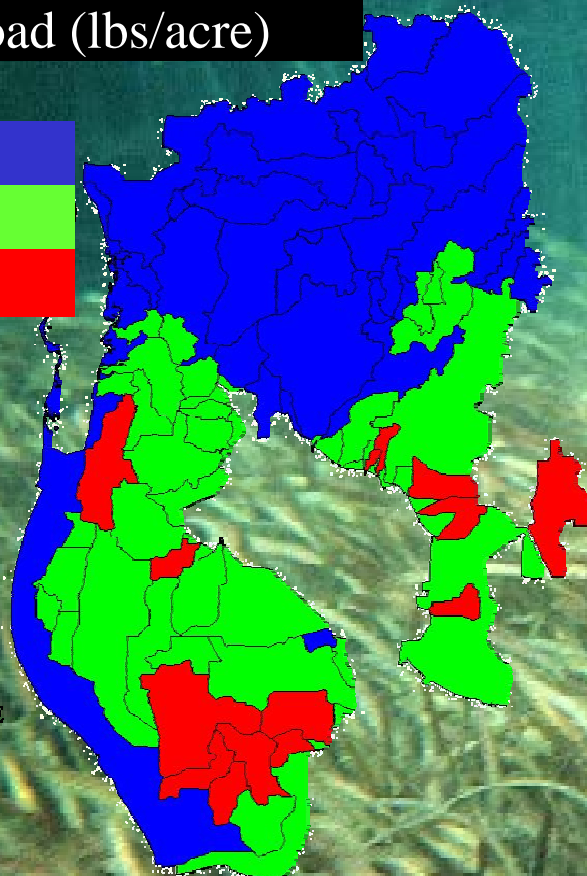
U

Tampa Bay

1995 Nitrogen Potential Load

TN Load (lbs/acre)

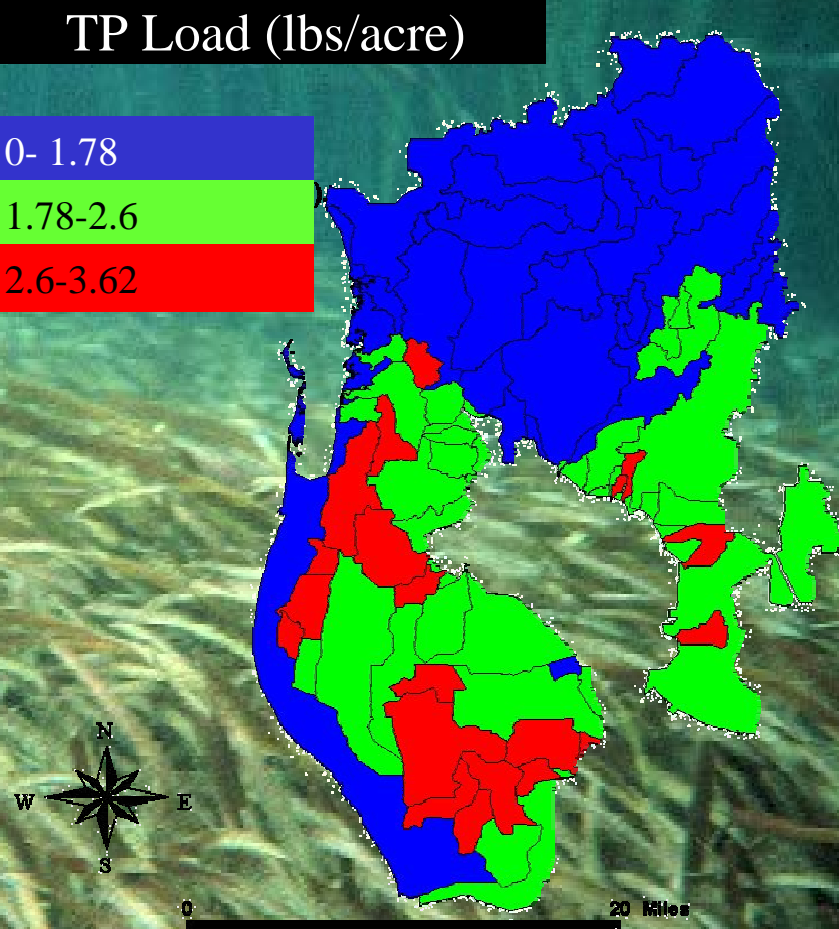
0- 9.21
9.21-12.81
12.81-16.25



1995 Phosphorous Potential Load

TP Load (lbs/acre)

0- 1.78
1.78-2.6
2.6-3.62

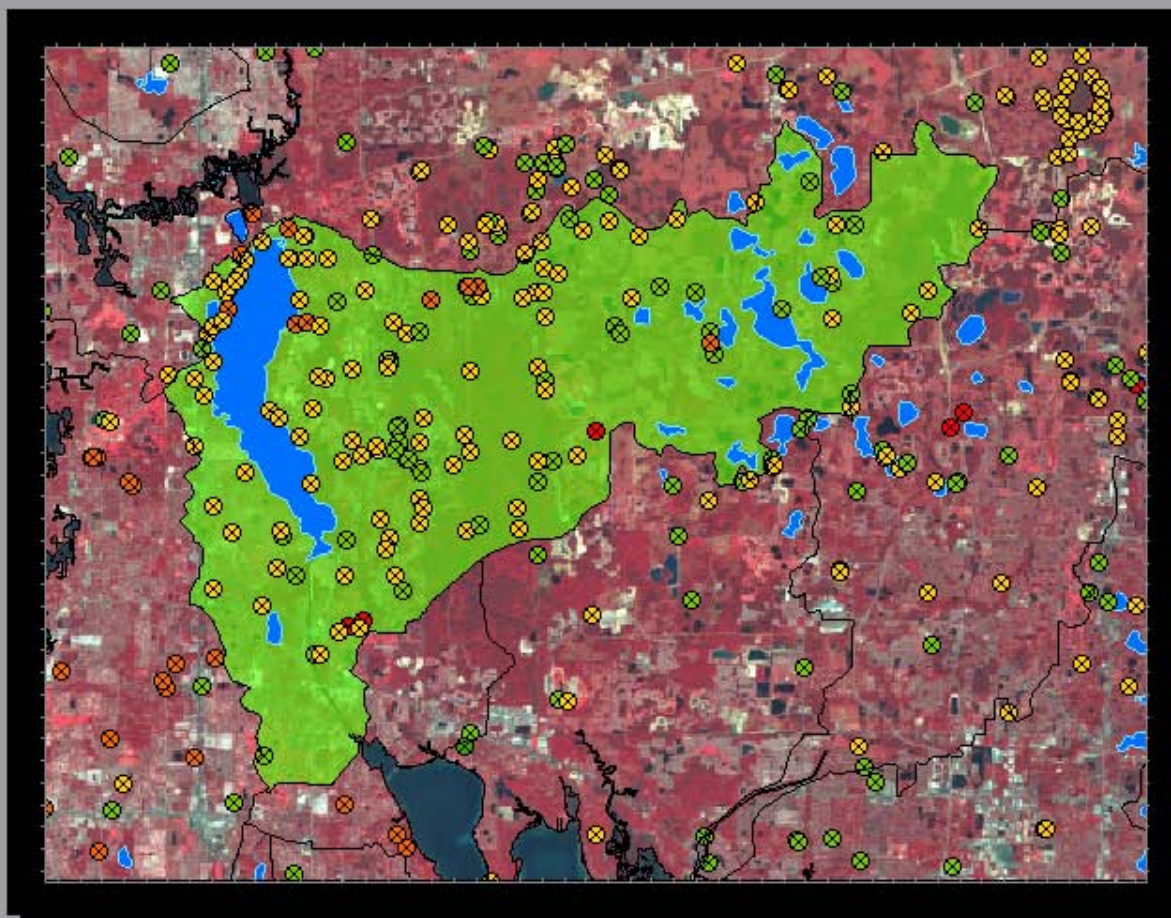




1:105,486

BASIS 4

- ☒ TBA Watersheds
 - ☐ dbasin_dbasin
- ☒ AQUIFER DATA MONITORING S
 - AQUIFER NAME
 - ☒ COMBINED
 - ☒ FLORIDAN
 - ☒ INTERMEDIATE
 - ☒ SURFICAL
 - ☒ UPPER FLORIDAN
 - ☒ UNKNOWN
- ☐ wrmdbsites
- ☐ RAINFALL DATA COLLECTION
- ☐ wrmdbops
- ☐ Water Flow Data Collection Sites
- ☐ REGIONAL OBSERVATION AND
- ☐ distbasins_line
- ☐ CWM Boundary
- ☐ waterdistricts_line
- ☐ WMD Boundary
- ☐ County Line - Full
- ☐ City



Display Source Catalog

Drawing

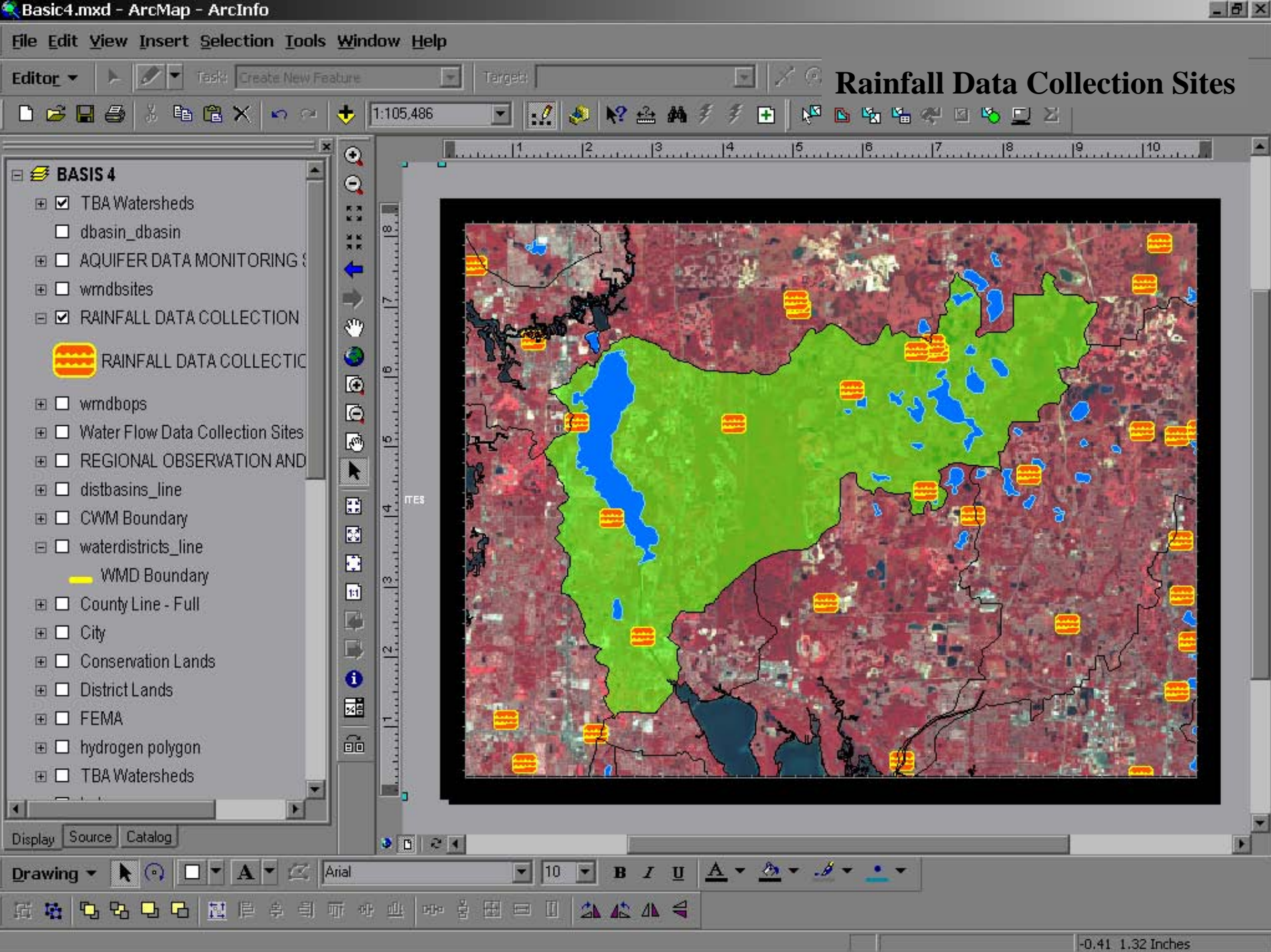
Arial

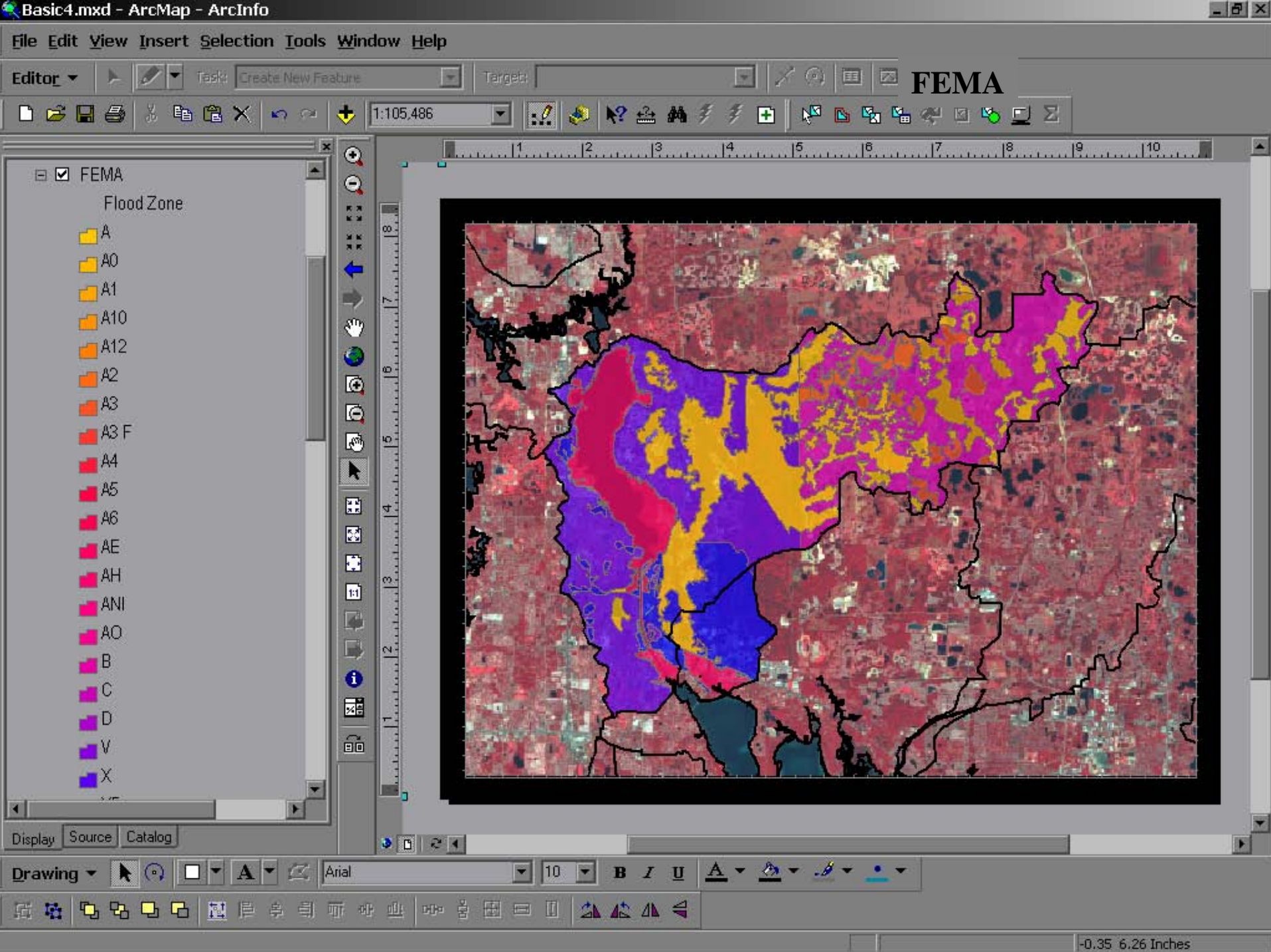
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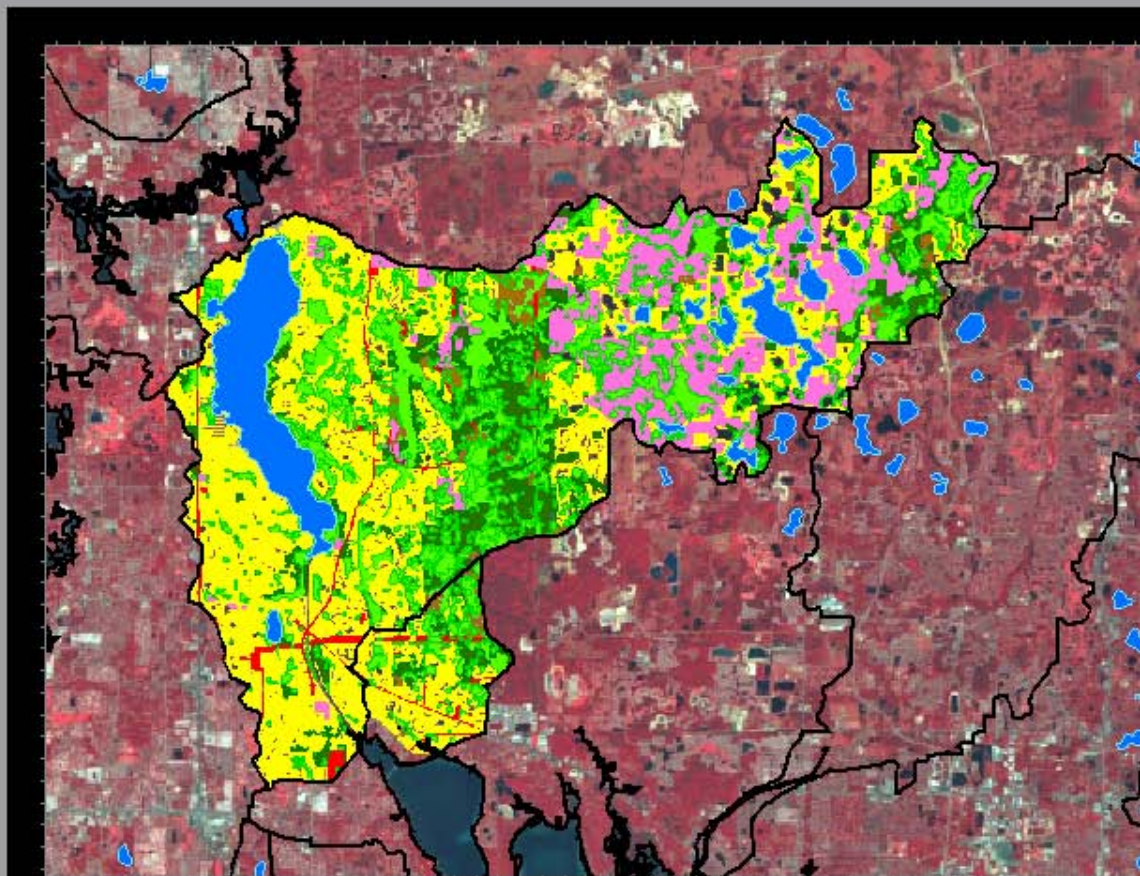
U





1:105,486

- ☐ TBA Watersheds
- ☒ Lakes
 - ☒ Lakes
- ☐ usgstopo_line
- ☒ Rivers and Streams
 - ☒ Rivers and Streams
- ☒ Brooker Creek LULC - 1999
 - ☒ Urban and Built-Up
 - ☒ Agriculture
 - ☒ Rangeland
 - ☒ Upland Forests
 - ☒ Wetlands
 - ☒ Barren Land
 - ☒ Transportation, Communication
 - ☒ Special Classifications
- ☐ Tampa Bay/Anclote River CWM
- ☐ Brooker Creek Sub-watersheds
- ☐ Lake Tarpon Brooker Creek
- ☐ TBA Watersheds CHART
- ☐ TBA Watersheds
- ☐ WATERSHEDS



Display Source Catalog

Drawing

Arial

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Editor


Task: Create New Feature

Target:

Parcel Data

1:24,592

BASIS 4

- ☒ pinellas
- ☐ pasco
- ☐ hillsborough
 - ☐ dbasin_dbasin
- ☐ AQUIFER DATA MONITORING S
- ☐ wrndbsites
- ☐ RAINFALL DATA COLLECTION
-  RAINFALL DATA COLLECTIO
- ☐ wrndbops
- ☐ Water Flow Data Collection Sites
- ☐ REGIONAL OBSERVATION AND
- ☐ distbasins_line
- ☐ CWM Boundary
- ☐ waterdistricts_line
- ☐ County Line - Full
- ☐ City
- ☐ Conservation Lands
- ☐ District Lands
- ☐ FEMA
- ☒ hydrogen polygon

Display Source Catalog

Drawing

Arial

10

B

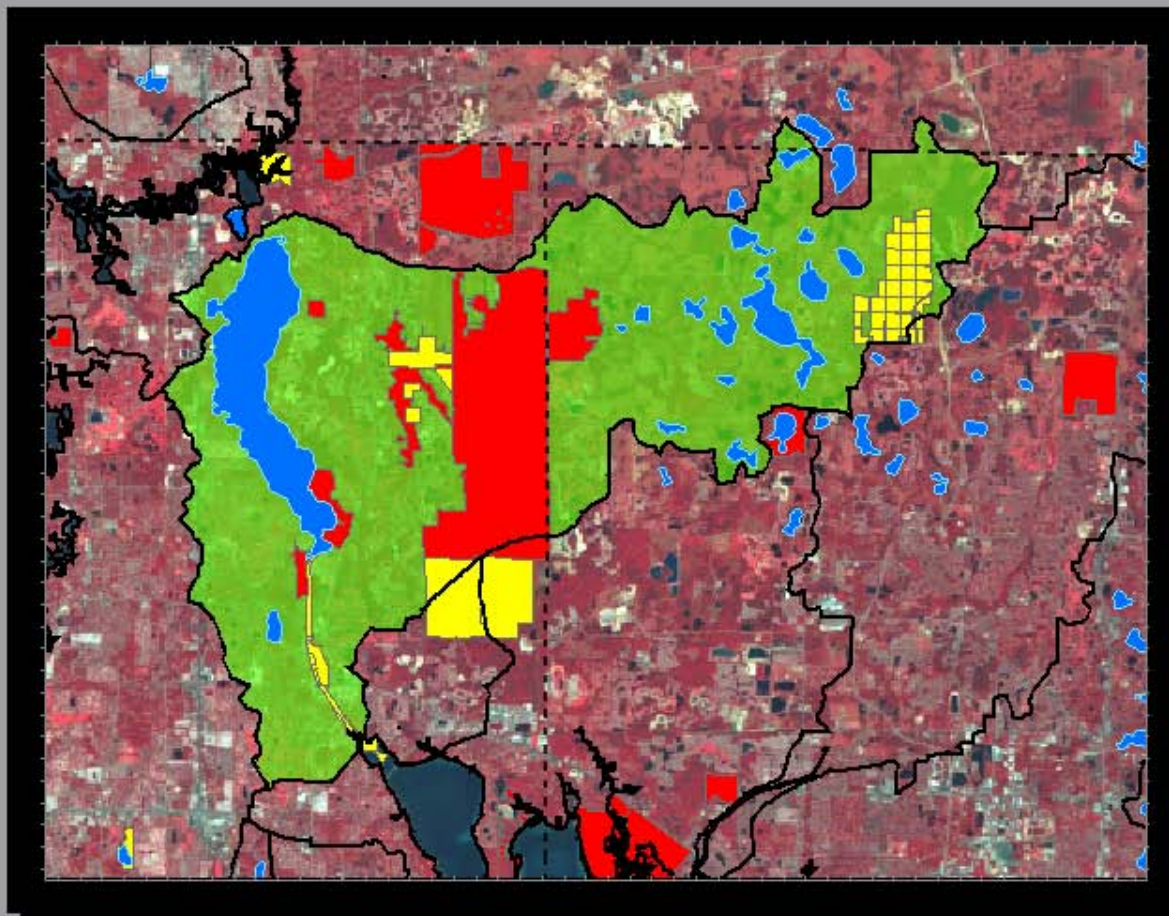
I

U

A

1:105,486

- ☐ waterdistricts_line
- ☒ Rivers and Streams
 - Rivers and Streams
- ☒ Lakes
 - Lakes
- ☒ County Line - Full
 - County Boundary
- ☐ City
- ☒ Conservation Lands
 -
- ☒ District Lands
 -
- ☐ FEMA
- ☐ hydrogen polygon
- ☐ TBA Watersheds
- ☐ usgstopo_line
- ☐ Brooker Creek LULC - 1999
- ☐ Tampa Bay/Anclote River CWM
- ☐ Brooker Creek Sub-watersheds
- ☒ Lake Tarpon Brooker Creek
- ☐ TBA Watersheds CHART
- ☐ TBA Watersheds



Editor

Task: Create New Feature

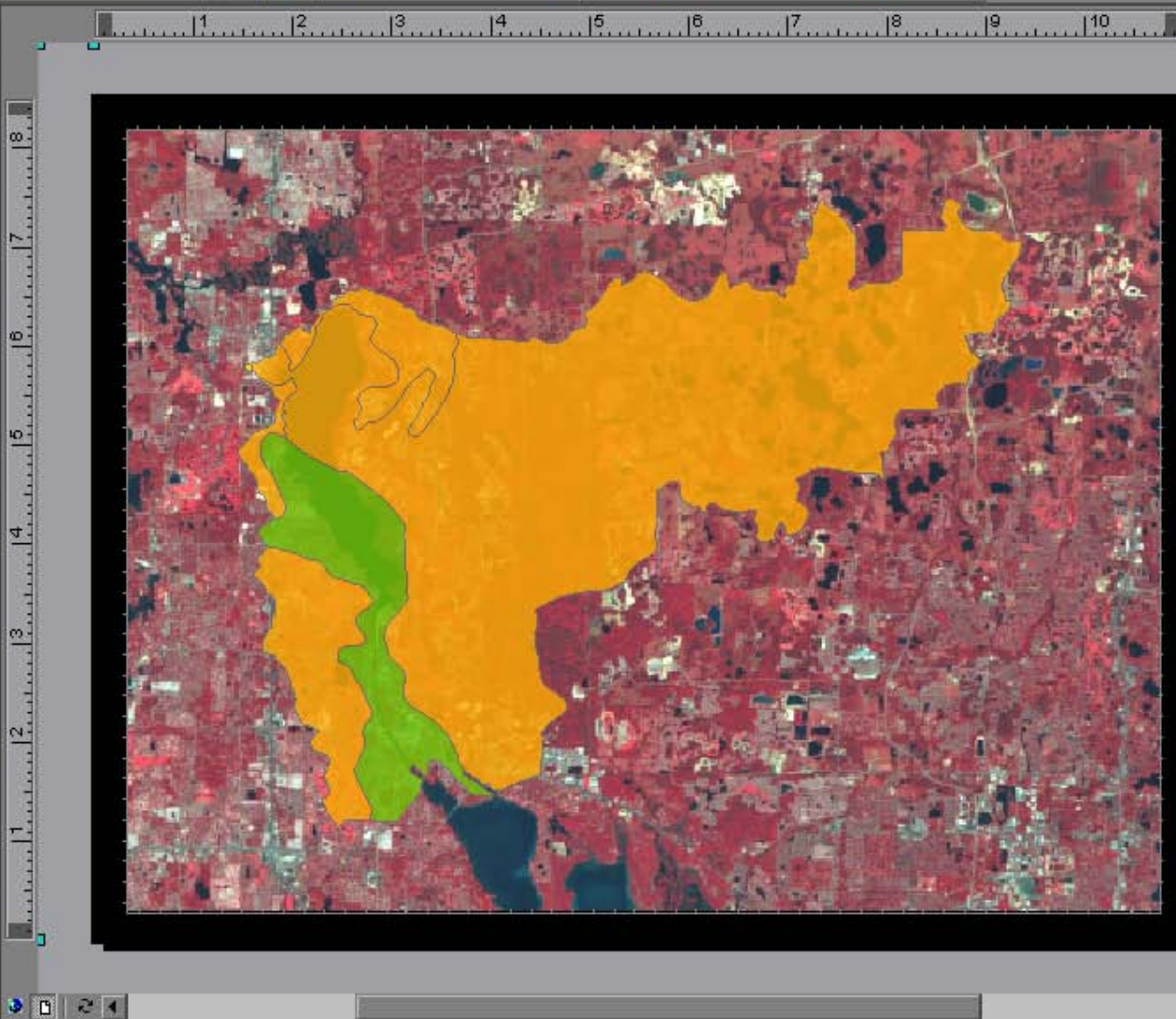
Target:

Geologic Formation



Legend

- ☐ City
- ☐ Conservation Lands
- ☐ District Lands
- ☐ FEMA
- ☒ Geological Formation
 - Description
 - ☐ Holocene (light yellow)
 - ☐ Miocene (green)
 - ☐ Miocene/Pliocene (green with gray)
 - ☐ Oligocene/Miocene (purple with black)
 - ☐ Pleistocene and Holocene (lighter yellow)
 - ☐ Tertiary Pliocene (gray)
 - ☐ Tertiary/Quaternary Pliocene/Pleistocene
- ☐ hydrogen polygon
- ☐ TBA Watersheds
- ☐ usgstopo_line
- ☐ Brooker Creek LULC - 1999
- ☐ Tampa Bay/Anclote River CWM
- ☐ Brooker Creek Sub-watersheds
- ☐ Lake Tarpon Brooker Creek



Drawing



Editor

Task: Create New Feature

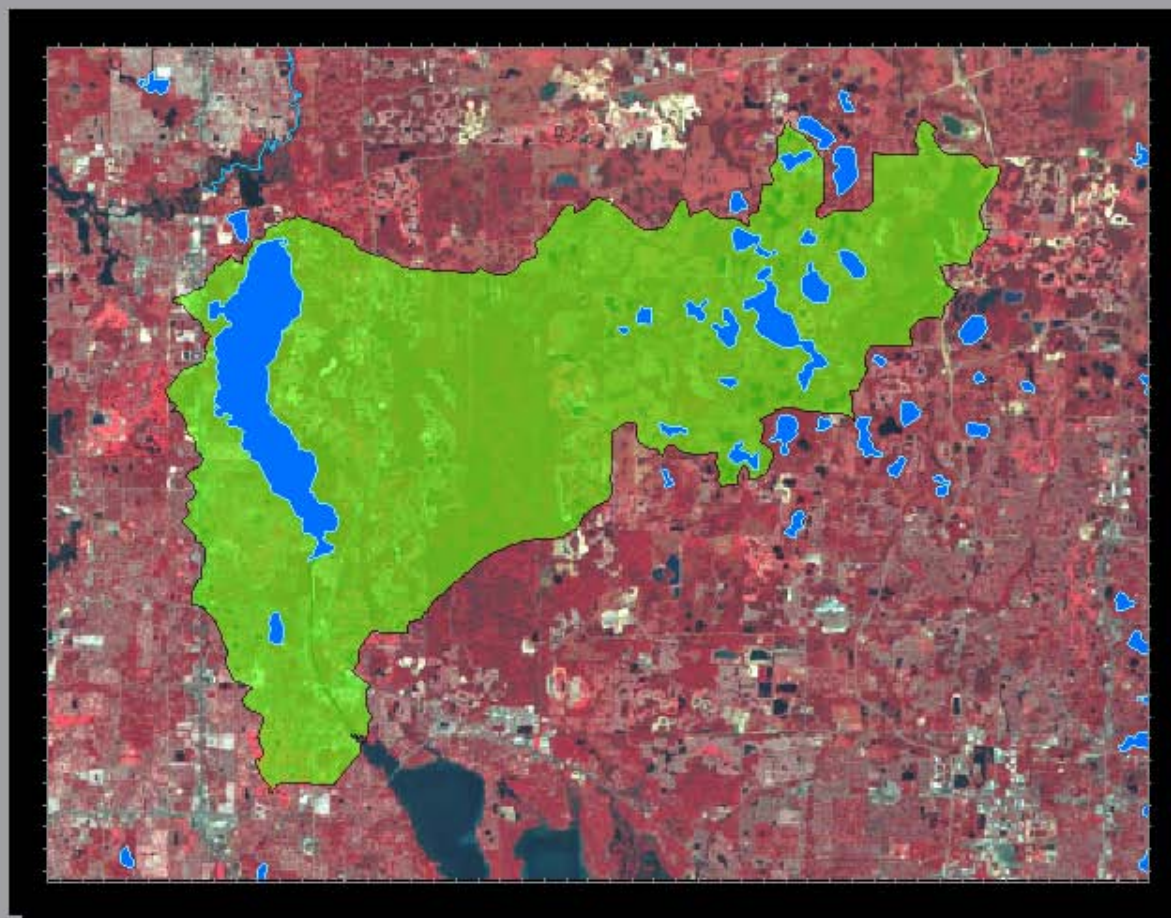
Target:

Surface Water Features



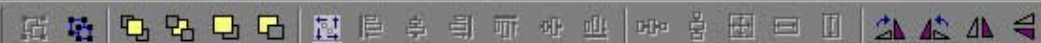
1:105,486

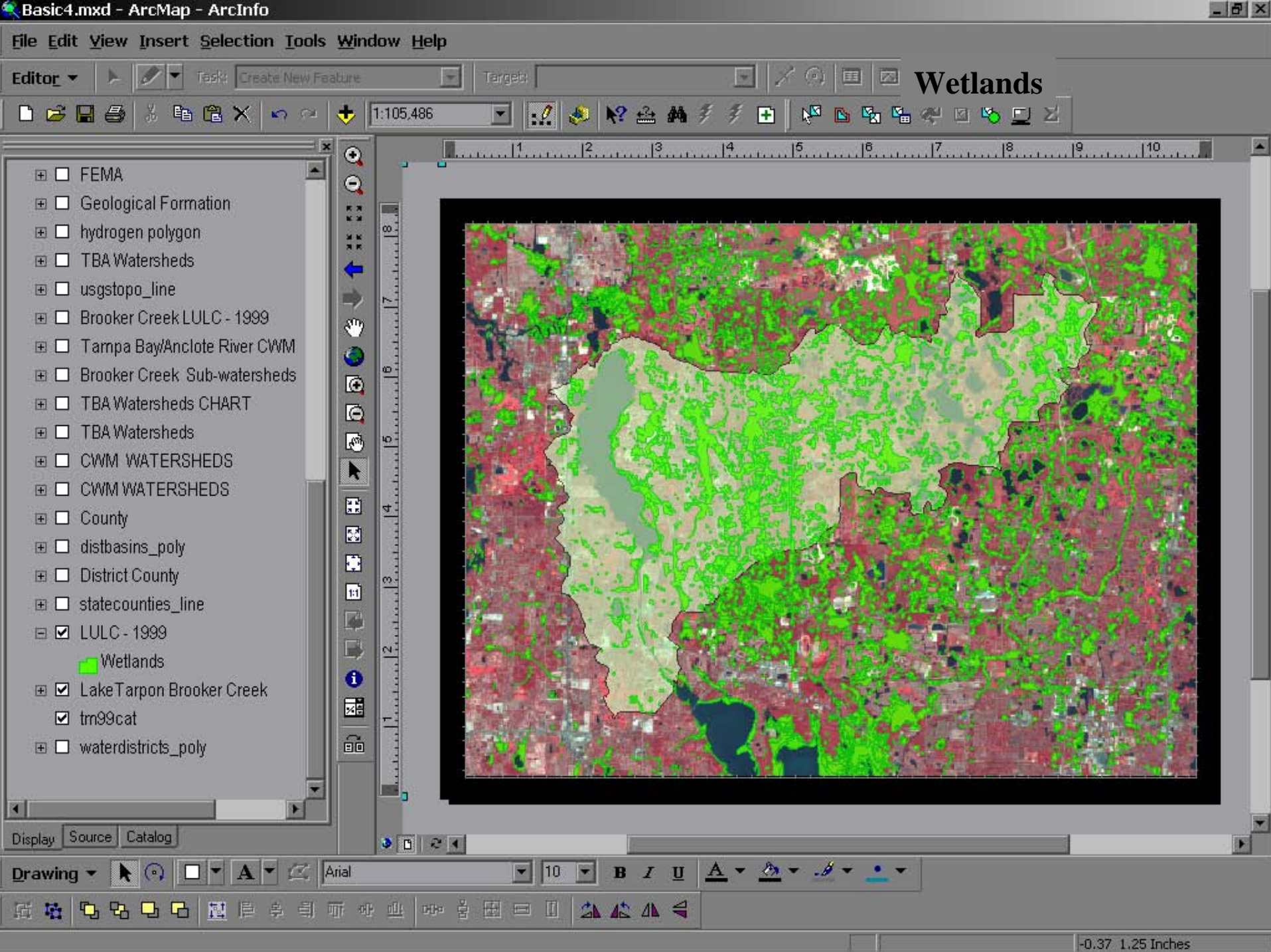
- ☐ FEMA
- ☐ Geological Formation
- ☐ hydrogen polygon
- ☐ TBA Watersheds
- ☐ usgstopo_line
- ☐ Brooker Creek LULC - 1999
- ☐ Tampa Bay/Ancote River CWM
- ☐ Brooker Creek Sub-watersheds
- ☐ TBA Watersheds CHART
- ☐ TBA Watersheds
- ☐ CWM WATERSHEDS
- ☐ CWM WATERSHEDS
- ☐ County
- ☐ distbasins_poly
- ☐ District County
- ☐ statecounties_line
- ☐ LULC - 1999
- ☒ Lake Tarpon Brooker Creek
 - ☒ tm99cat
- ☐ waterdistricts_poly



Display Source Catalog

Drawing





Comprehensive Watershed Management



A map of the Tampa Bay/Anclote River region showing various sub-watersheds. The map is color-coded: a large red area at the top, a green area in the upper center, a purple area in the center, a pink area in the lower center, and a blue area at the bottom. The map is set against a black background.

Tampa Bay/Anclote River CWM Priority Sub-Watersheds

- Anclote River
- Brooker Creek
- Clearwater Harbor/
St. Joseph's Sound
- Old Tampa Bay

TBA CWM Plan

Tampa Bay Anclote Comprehensive Watershed Management Plan



2002



Overall team effort including extensive research, shared ideas, document reviews, and designing strategies to guide policies and projects

Plan of Action



Why CWM?

1. Agency Coordination
2. Central Data Source
3. Collective Review/Analysis
4. Team Consensus
5. Data Consistency
6. Data Availability
7. Coordinated Strategy
8. Coordinated Action
9. Combined Resources

Better Resource and
Watershed Management

Better Local Government
and Agency Coordination

