

Interactive Document Distribution

Damian Maddalena
NC State University

Dave Toms
NC Division of Water Quality



*"To preserve, protect
and enhance
North Carolina's water..."*



NC STATE UNIVERSITY



“Hey son, come here.

These two gentlemen showed me a totally
sweet *MASH UP* in Reno!!!”

Current Format Challenges

- Information Volume
- Navigation
- Nonpoint Source Pollution Emphasis
- Long Update Interval
- Insufficient Local Project Support

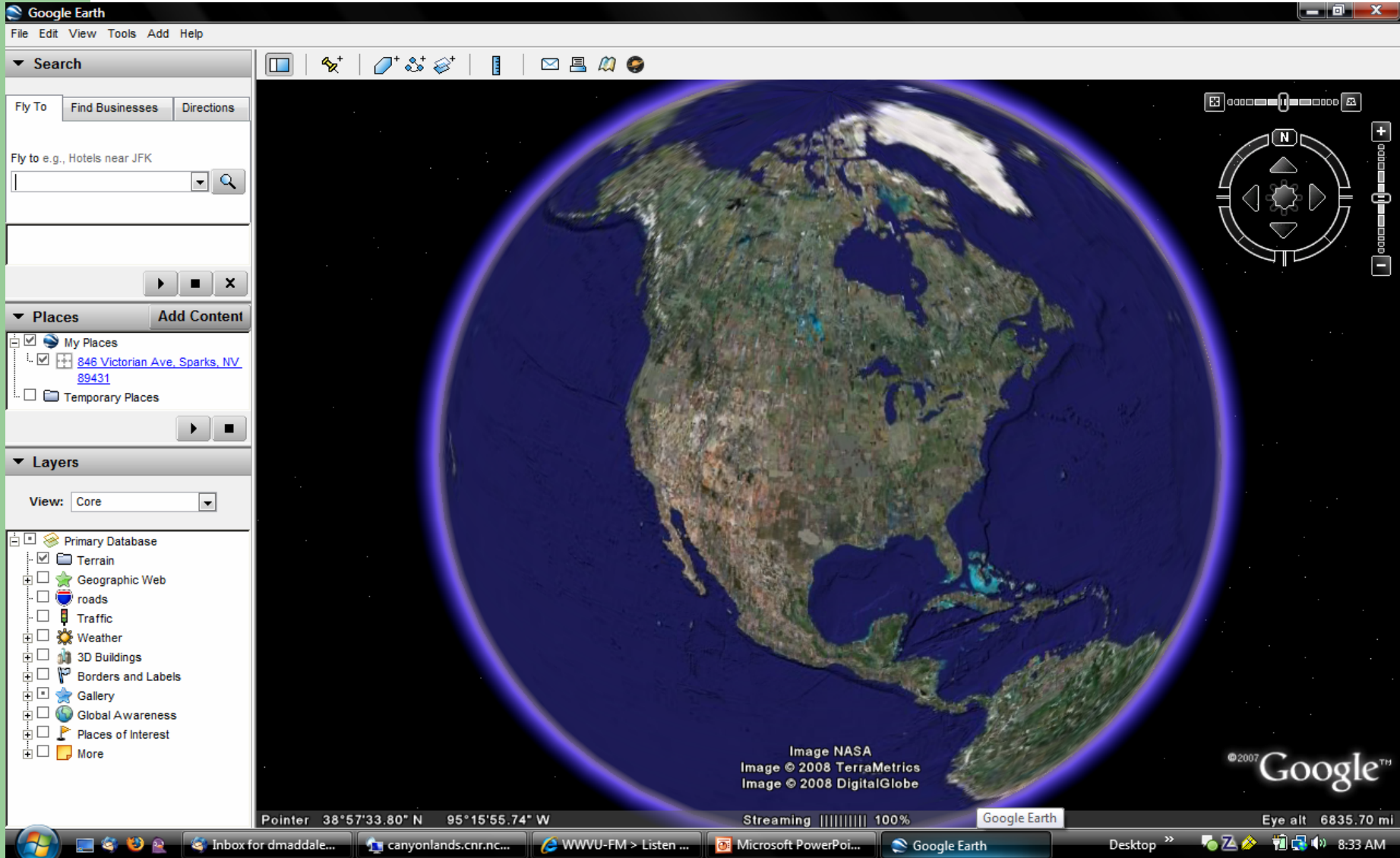
Needs

- Improved Accessibility
- Intuitive Link to Geography & Land Cover
- Search Functions
- Restoration support/tracking
- Easy updates
- Minimal maintenance

Vocabulary: MASH UP

In technology, a **mash-up** is a web application that combines data from more than one source into a single integrated tool.

The Answer: Google Earth

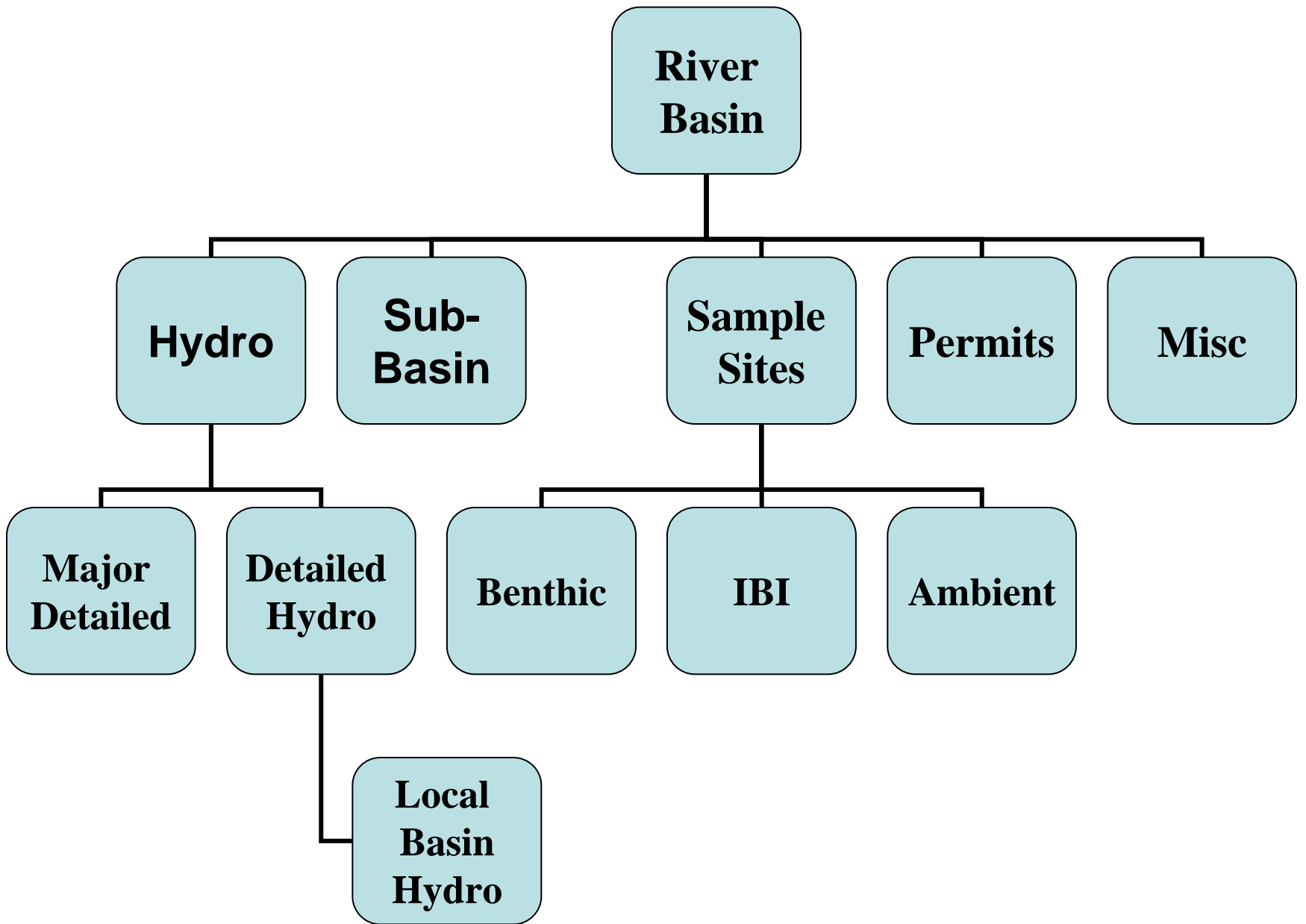


The Answer: Google Earth

- Free
- Operate with basic computer skills
- Built in search functions and geographic data
- Google maintains base layers
- Easy updates
- Documents and data easily downloaded by user

Journey to the Center of Google Earth

- Can you hack HTML?
- Written in KML (KMZ)
- KML can be accessed locally or remotely
- Series of files hosted on a remote server, linked using standard URL addresses



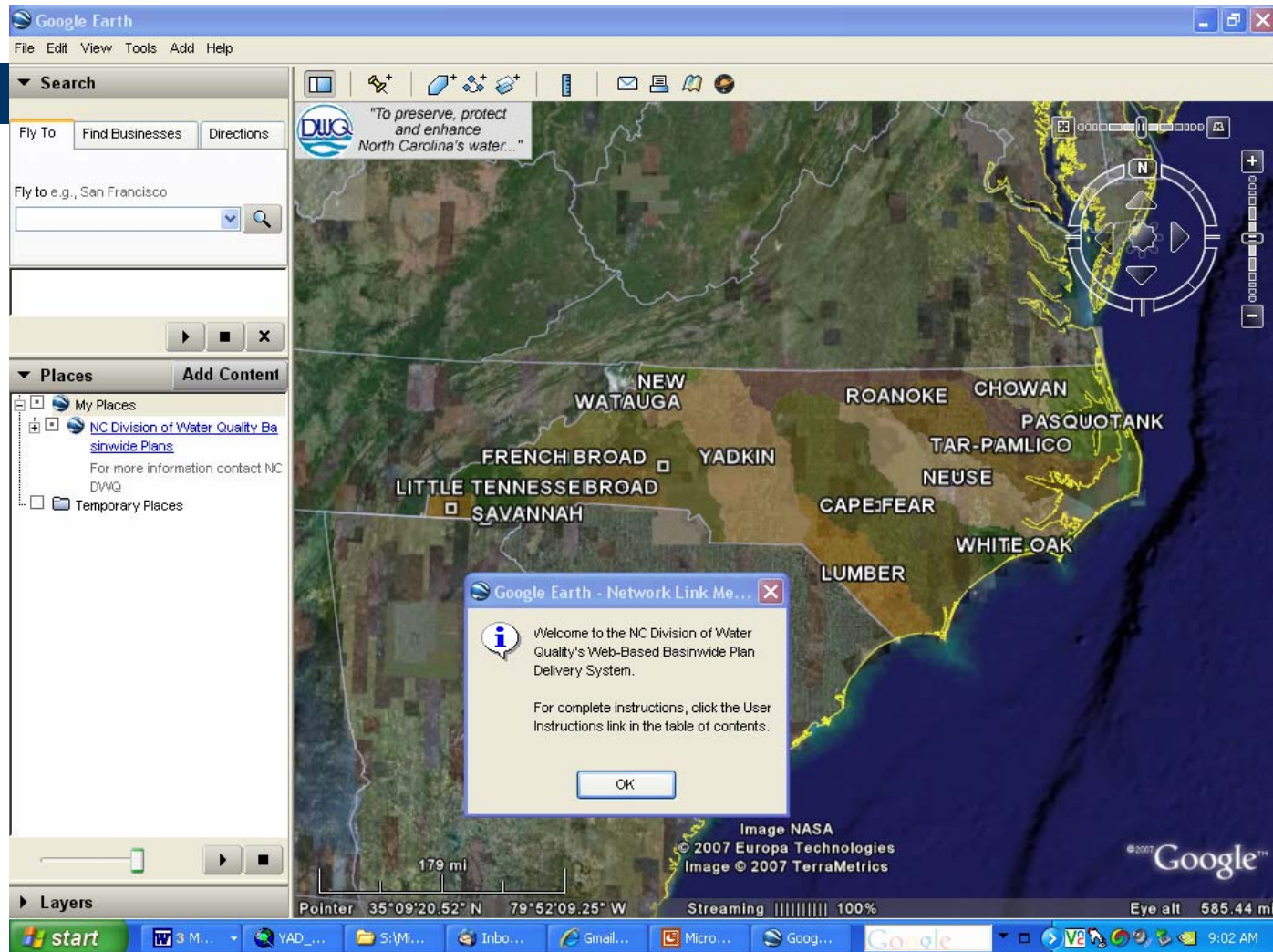
Journey to the Center of Google Earth

```
<NetworkLink>  
  <name>Sample Sites</name>  
  <Snippet>Sample Sites</Snippet>  
  <description>Sample Sites</description>  
  <visibility>1</visibility>  
  <Link>  
    href>http://web.ceo.ncsu.edu/dwq/yadkin/sample\_sites.kml</href>  
  </Link>  
</NetworkLink>
```

Construction Tools

- Information on Google's website
- ESRI Tools within ArcToolbox
- Download tools created by other users
- Consult the community
- Make your own

Opening Screen



Basinwide Issues

The screenshot displays the Google Earth interface with a sidebar on the left and an information panel on the right. The sidebar lists various layers under 'My Places', including 'NC Division of Water Quality Basinwide Plans' and 'NC Hydrologic Units'. The information panel is titled 'Yadkin River Basin' and provides details such as HUC: 030401, Acres: 4621556.672, and Square Miles: 7221.34. It also features several links to resources like 'North Carolina Division of Water Quality Supplemental Guide to Basinwide Planning', 'North Carolina Ecosystem Enhancement Program (EEP)', 'Forestry and Water Quality', 'Source Water Assessment Program (SWAP)', and 'Yadkin-PeeDee River Basin Association'. A photograph of a river is included in the panel.

Yadkin River Basin

HUC: 030401
Acres: 4621556.672
Square Miles: 7221.34

[North Carolina Division of Water Quality Supplemental Guide to Basinwide Planning](#)

General information about water quality issues in the State of North Carolina

[North Carolina Ecosystem Enhancement Program \(EEP\)](#)

An innovative program to restore, enhance, and protect North Carolina streams and wetlands

[Forestry and Water Quality](#)

A discussion of water quality programs operated by the Division of Forest Resources

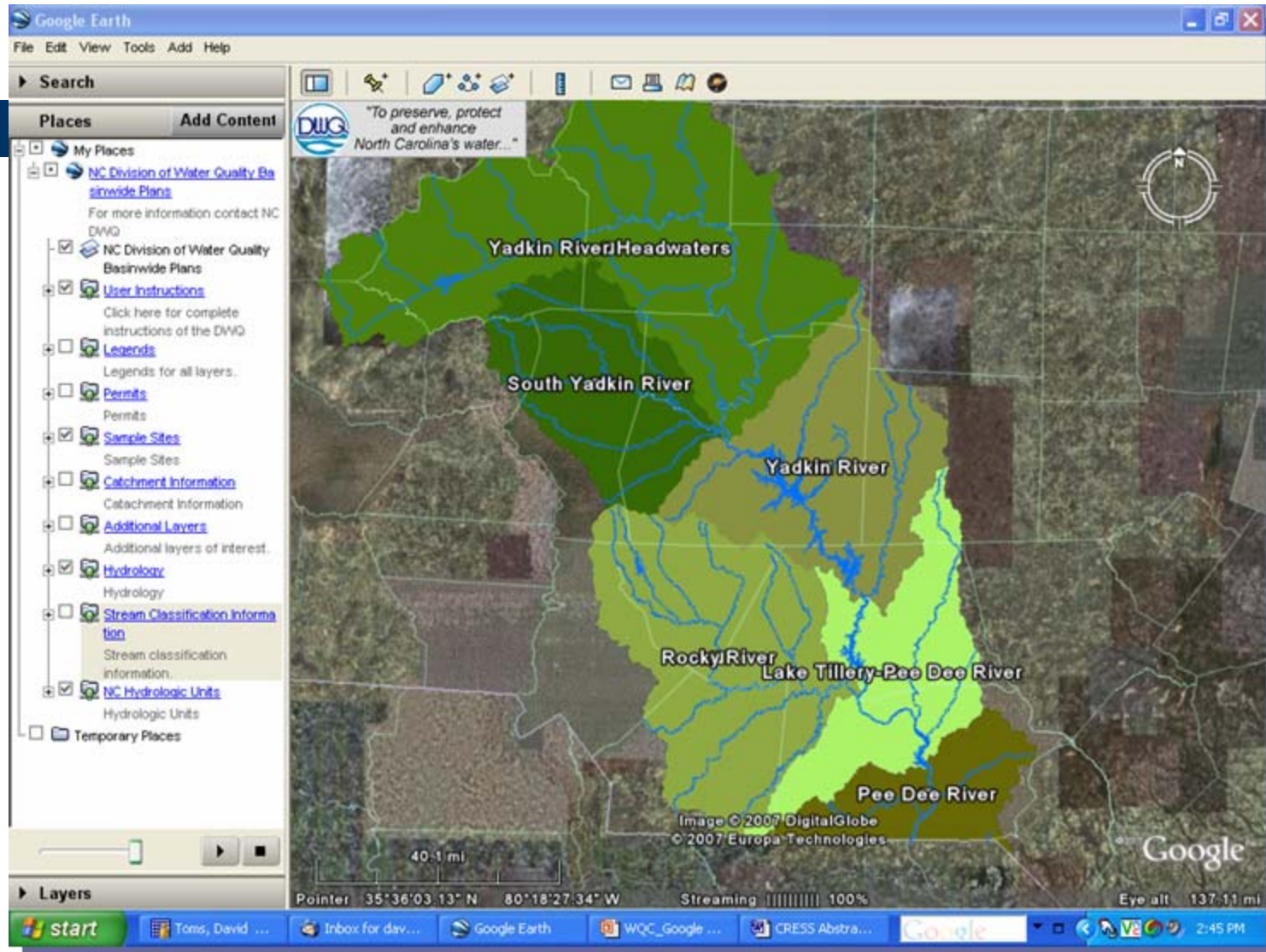
[Source Water Assessment Program \(SWAP\)](#)

A program to assess threats to public drinking water supplies

[Yadkin-PeeDee River Basin Association](#)

A coalition of NPDES dischargers who

Sub Basin Level



Sub Basin Level

Google Earth

File Edit View Tools Add Help

Search

Places Add Content

My Places

- NC Division of Water Quality Basinwide Plans
For more information contact NC DWQ
- NC Division of Water Quality Basinwide Plans
- User Instructions
Click here for complete instructions of the DWQ
- Legends
Legends for all layers.
- Permits
Permits
- Sample Sites
Sample Sites
- Catchment Information
Catchment information
- Additional Layers
Additional layers of interest.
- Hydrology
Hydrology
- Stream Classification Information
Stream classification information.
- NC Hydrologic Units
Hydrologic Units

Temporary Places

Pointer 35°36'03.13" N 80°18'27.34" W Streaming 100% Eye alt 137.11 mi

HUC: 03040105

Rocky River

North Carolina Division of Water Quality

Watershed Summary

Summary report for watershed. Send electronic comments to [Dave Toms](#), Basin Planner Planning Branch; Basinwide Planning Program Unit

Use Support Map

Impaired Streams in HUC 03040105

Conduct Your Own Watershed Survey

Useful tool for stream assesment.

Directions: [To here](#) - [From here](#)


"To preserve, protect and enhance North Carolina's water..."

Yadkin River Headwaters

Rocky River

Sub Basin Text Examples

- Sub Basin Chapters
- Use Support map & table
- Stream Survey Form
- Restoration Plans
- Data Summaries



ROCKY RIVER WATERSHED

HUC 03040105
Part of the Yadkin-Pee Dee River basin: HYDROLOGIC UNIT 030401

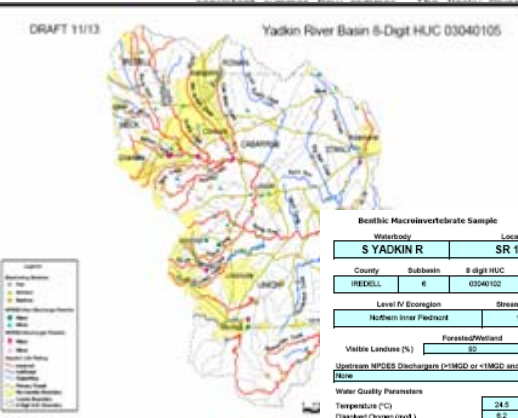
OVERVIEW

Streams in the uppermost reach of the Rocky River watershed are characterized by sandy substrates and generally...

WATERSHED AT A GLANCE

COUNTIES
Anson, Cabarrus, Iredell, Rockingham, Rowan, Stanley, Union (7)

MUNICIPALITIES
Aibemarle, Charlotte, China Grove, Concord, Cornelius, Davidson, Gold Hill, Harrisburg, Huntersville, Indian Trail, Kannapolis, Lake Park, Landis, Locust, Marshallville, Matthews, Mint



Benthic Macroinvertebrate Sample

Waterbody	Location	Date	Bioassessment
S YADKIN R	SR 1561	07/25/06	Good

County	Subbasin	8 digit HUC	Index Number	Latitude	Longitude
IREDELL	6	03040102	12-108-5.5	355311	809524

Level IV Ecoregion	Stream Classification	Drainage Area (mi ²)	Stream Width (m)	Stream Depth (m)
Northern Inland Piedmont	WS-IV	88.3	12	0.3

Forested/Planted	Urban	Agriculture	Other (describe)
92	0	0	0

Upstream NPDES Dischargers (<1MGD or <1MGD and within 1 mile)

NPDES Number	Volume (MGD)
(None)	

Water Quality Parameters

Temperature (°C)	24.9
Dissolved Oxygen (mg/L)	5.2
Specific Conductance (µS/cm)	57
pH (at 25°C)	8.4


Water Clarity: slightly turbid

Habitat Assessment Scores (max)

Channel Modification (5)	4
Instream Habitat (20)	10
Shoreline Habitat (15)	7
Pool Variety (10)	3
RIPR Habitat (16)	3
Left Bank Stability (7)	5
Right Bank Stability (7)	5
Light Penetration (10)	6
Left Riparian Score (5)	4
Right Riparian Score (5)	4
Total Habitat Score (100)	47

Substrates: Sand, Gravel, Silt

Site Photograph



Sample Date	Sample ID	ST	SPT	BI	SPT BI	Bioassessment
07/25/06	SR1561	06	28	5.5	4.5	Good

Local Detail – Permits, etc.

The image shows a Google Earth interface with a map of North Carolina. The map is overlaid with numerous colored circles representing different types of permits. A pop-up window is open over a specific location, providing detailed information about a 'Major NPDES Discharge' at 'Rocky River WWTP'.

Permits Legend:

- Animal Operations
- Nondischarge
- Major NPDES Discharges
- Minor NPDES Discharges
- General Stormwater
- Individual Operations
- Phase II Stormwater

Major NPDES Discharge Pop-up:

Rocky River WWTP

Owner: Water & Sewer Authority of Cabarrus Co.

Permit Number: NC0036269

Permit Type: Municipal Wastewater Discharge, Large

Receiving Stream: Rocky River

Directions: [To here](#) - [From here](#)

The map also shows the 'Layers' panel on the left, which includes options for 'User Instructions', 'Legends', 'Permits', 'Legend', 'Animal Operations', 'Nondischarge Permits', 'General Stormwater Permits', 'Major NPDES Discharge permits', 'Minor NPDES Discharge permits', 'Individual Stormwater Permits', and 'Phase II Stormwater Permits'. The status bar at the bottom indicates the current location as 35°27'38.20" N, 80°26'17.95" W, with a scale of 100% and a distance of 33.07 miles.

Stream Detail & Land Cover

The screenshot displays the Google Earth interface with a map of the Harrisburg-Twin Lakes-Rocky River area. The map shows a network of blue streams and green land cover. Several orange circular markers are placed on the streams. The interface includes a search bar, a places list, and a layers panel.

Search Panel:

- Fly To: Find Businesses, Directions
- Fly to e.g., Tokyo, Japan

Places Panel:

- Major Hydrologic Features (lines)
- Major Rivers in Yadkin River Basin
- Major Hydrologic Features (polygons)
- Detailed Streams
- Stream Classification Information
- NC Hydrologic Units
- Broad River Basin
- Layers

Layers Panel:

- Primary Database
- Terrain
- Geographic Web

Map Labels:

- "To preserve, protect and enhance North Carolina's water..." (DWG logo)
- Town of Harrisburg-Twin Lakes-Rocky River
- Google

Map Coordinates and Status:

- Pointer 35°20'43.89" N 80°39'31.06" W elev 596 ft
- Streaming 100%
- Eye alt 32334 ft

Taskbar:

- Inbox for ...
- canyonla...
- 2 Wind...
- 2 Firefox
- Google E...
- WWWU-F...
- Buddy List
- Microsoft...
- Desktop
- 6:17 AM

Stream Detail & Land Cover

The screenshot displays the Google Earth interface with several key components:

- Search Panel:** Includes a search bar and options for "Fly To" (Find Businesses, Directions) and "Fly to e.g., Tokyo, Japan".
- Places Panel:** Lists "Additional layers of interest" with checkboxes for:
 - Hydrology
 - Major Hydrologic Features (lines)
 - Major Hydrologic Features (polygons)
 - Detailed Streams
 - Stream Classification Information
 - NC Hydrologic Units
- Layers Panel:** Shows "View: Core" and lists "Primary Database", "Terrain", and "Geographic Web".
- Main Map:** A satellite view of a residential area with a network of blue lines representing streams. Several orange circular markers are placed at various points along the stream network.
- UI Elements:** A toolbar at the top, a compass in the top right, and a status bar at the bottom showing coordinates (35°20'37.77" N, 80°37'15.94" W), elevation (584 ft), and the time (6:16 AM).

Alternate Display Options

The image shows a screenshot of the Google Earth interface. The main window displays a 3D topographic map of a watershed area, with several regions highlighted in red, green, and yellow. The map is titled "Wilkes" and includes a scale bar indicating 5354 feet. The interface includes a search bar, a "Places" sidebar, and a "Layers" panel. The "Layers" panel is expanded to show various data layers, including "NC Division of Water Quality Basinwide Plans", "User Instructions", "Legends", "Permits", "Sample Sites", "Catchment Information", "Water Supply Watersheds", "High Quality Watersheds", "Additional Layers", "Hydrology", and "Stream Classification Information". The "High Quality Watersheds" layer is currently selected and highlighted in yellow. The "Layers" panel also includes a "Layers" button at the bottom.

Google Earth
File Edit View Tools Add Help

Search

Places **Add Content**

My Places

- NC Division of Water Quality Basinwide Plans
For more information contact NC DWQ:
 NC Division of Water Quality Basinwide Plans
- User Instructions
Click here for complete instructions of the DWQ
- Legends
Legends for all layers.
- Permits
Permits
- Sample Sites
Sample Sites
- Catchment Information
 - Water Supply Watersheds
Watersheds that supply drinking water
 - High Quality Watersheds
High Quality Watersheds
- Additional Layers
Additional layers of interest
- Hydrology
Hydrology
- Stream Classification Information
Stream classification information.

Wilkes

5354 ft

© 2007 Europa Technologies
Image © 2007 TerraMetrics
© 2007 Google

Pointer 36°15'32.03" N 81°01'34.66" W elev 1225 ft Streaming 100% Eye alt 15863 ft

Contact Information

- Dave Toms
 - North Carolina Division of Water Quality
 - Email: dave.toms@ncmail.net
- Damian Maddalena
 - NC State University, Center for Earth Observation
 - Email: dmaddalena@ncsu.edu