



# A GEOSPATIAL WETLANDS MITIGATION FORECASTING MODEL

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# SCDOT MITIGATION STRATEGY

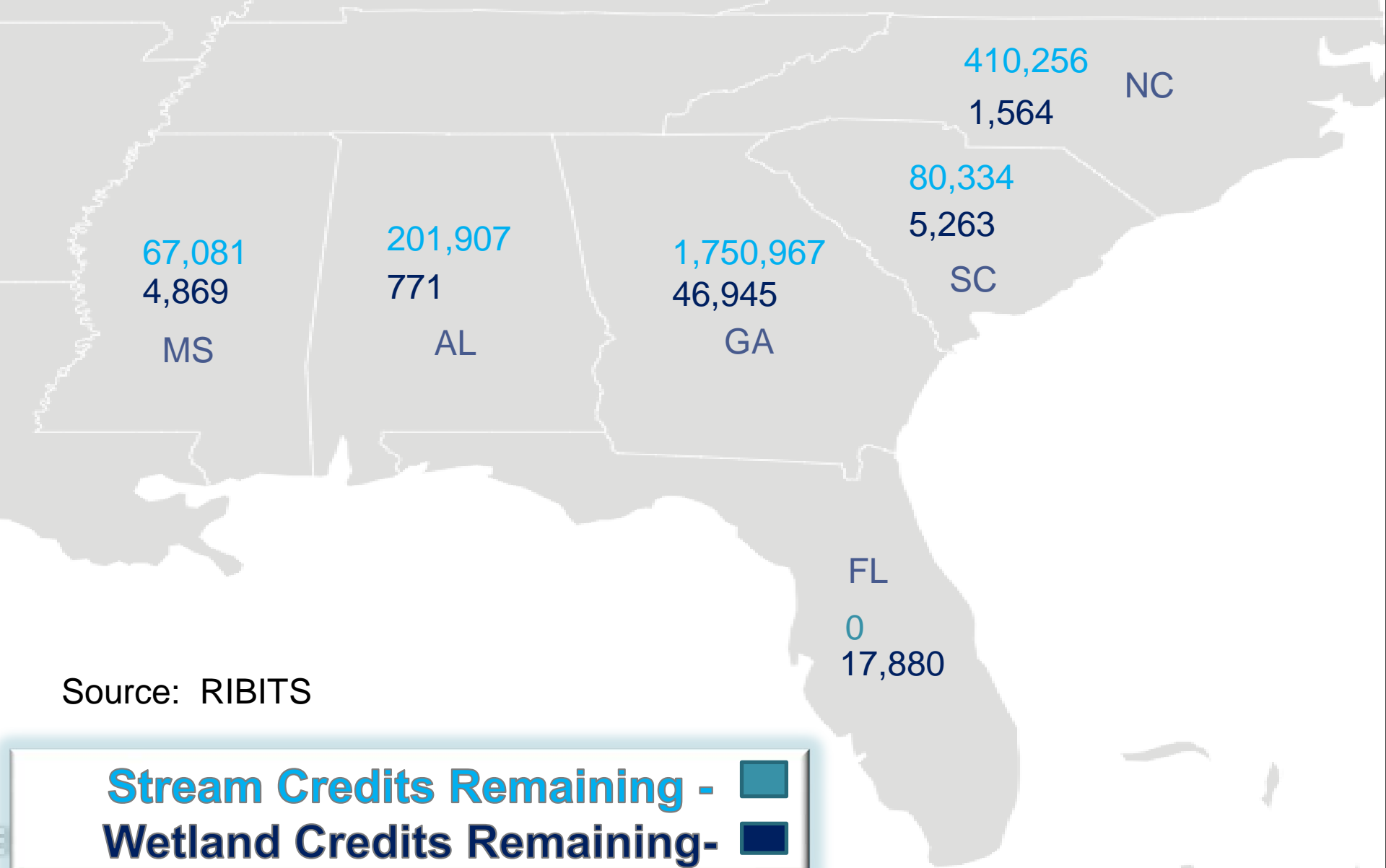
- The Challenge
- The Solution
  - Demonstration of Need
  - Available Funding
- Next Steps
  - Partnerships
  - Banking options



# SCDOT MITIGATION PROBLEM STATEMENT

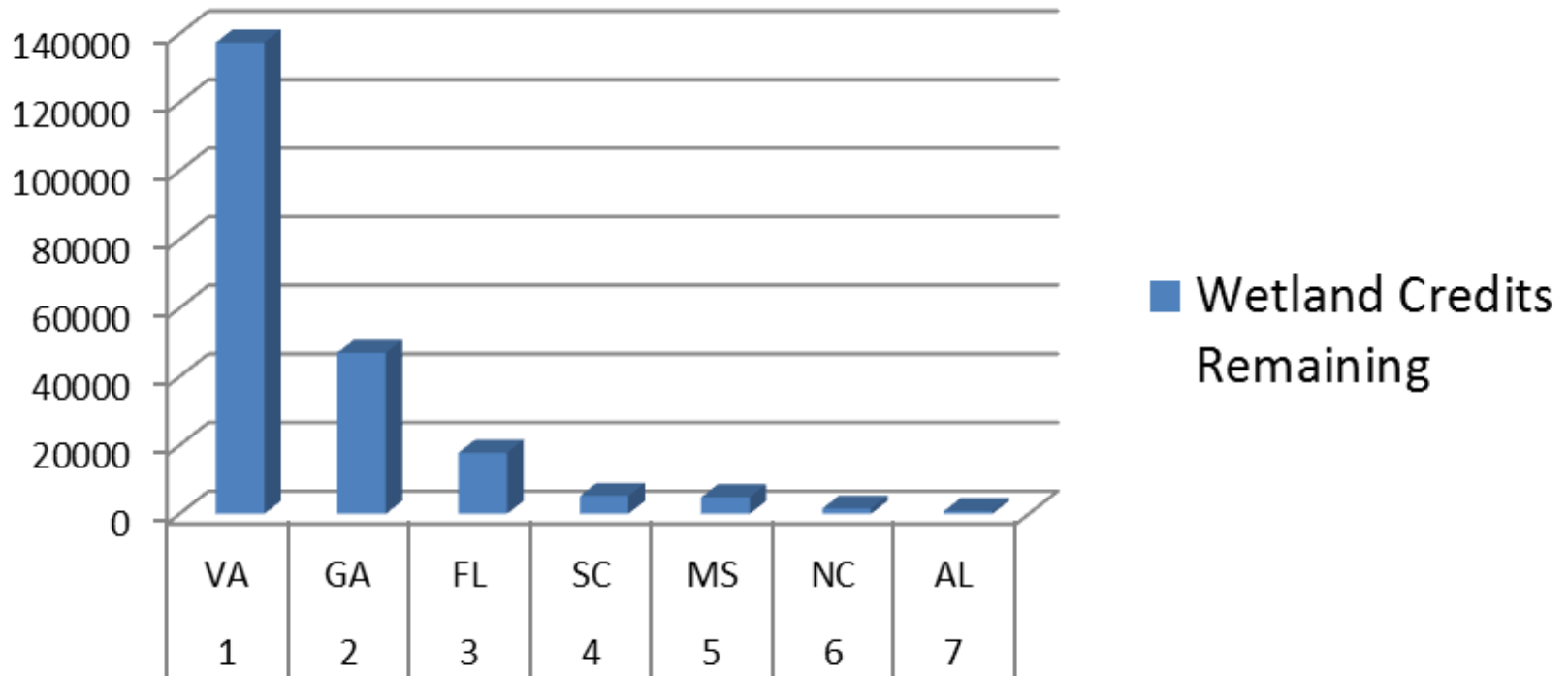
- SCDOT has transportation needs (\$billions).
- Few Banks located in our areas of need
- No Coastal Stream Mitigation Banks
  - SCDOT preliminary forecast shows high demand in Low Country and Pee Dee
- Concern due to limited stream credits even within approved banks
- PRM not Economical option for smaller projects
  - Safety sending about 30+ projects this month

# MITIGATION BANK CREDITS



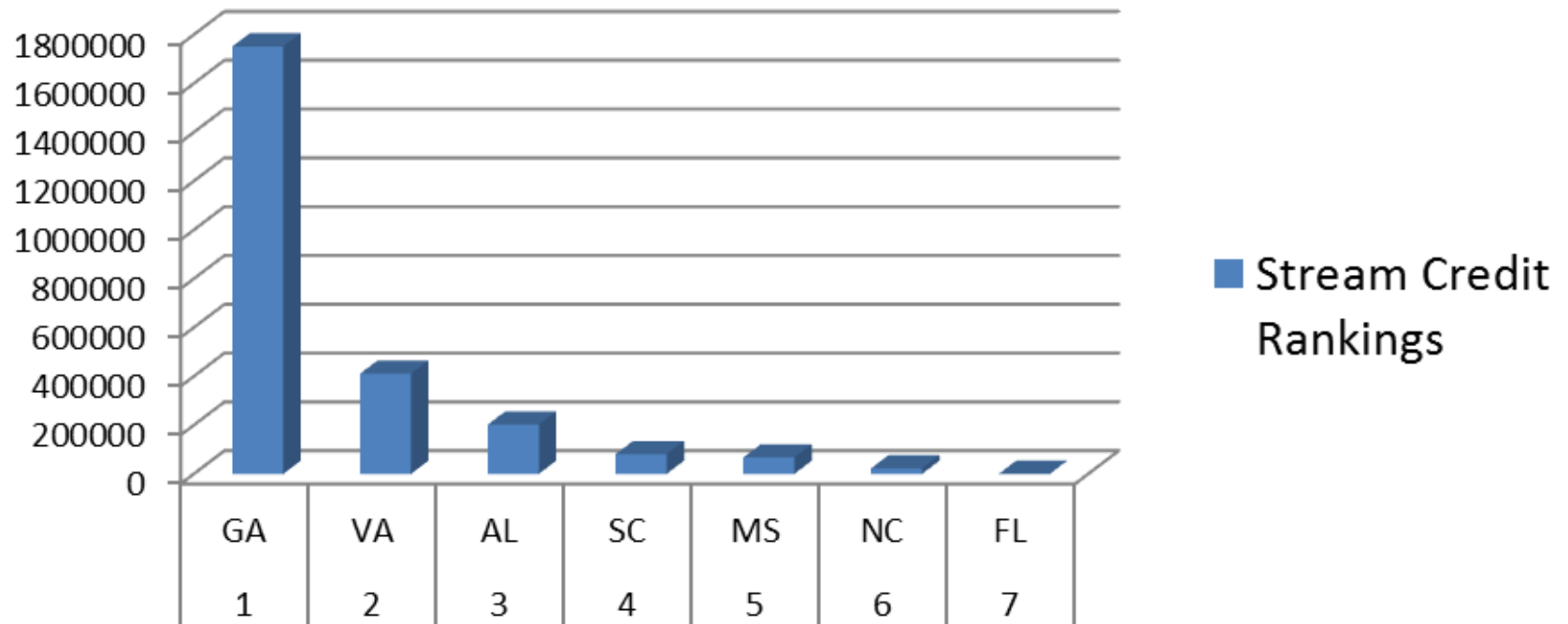
# MITIGATION CREDIT RANKING

## Wetland Credits Remaining



# MITIGATION CREDIT RANKING

## Stream Credit Rankings



# SCDOT MITIGATION SOLUTIONS:

- **Proactive vs. Reactive**
  - Review STIP, Long Range Plan, and County Projects
  - Estimate potential stream and wetland impacts
  - ID Critical Watershed and Ecoregions based on stream and wetland impacts and forecast Credit Demand
  - Can now be Proactive on mitigation strategies for those critical watersheds/ecoregions
- **USC to develop a Forecast Tool**

# PROJECT TASKS

Conducted by the GISciences Research Laboratory in the Department of Geography at USC, this project will complete four tasks in support of and with guidance from the South Carolina Dept. of Transportation:

- Assembly of a Statewide Geospatial Database
- Assessment of Existing State Wetlands Mitigation Tools/Approaches
- Development of a GIS-Based Wetlands Mitigation Forecasting Model
- Application to Selected State Watersheds

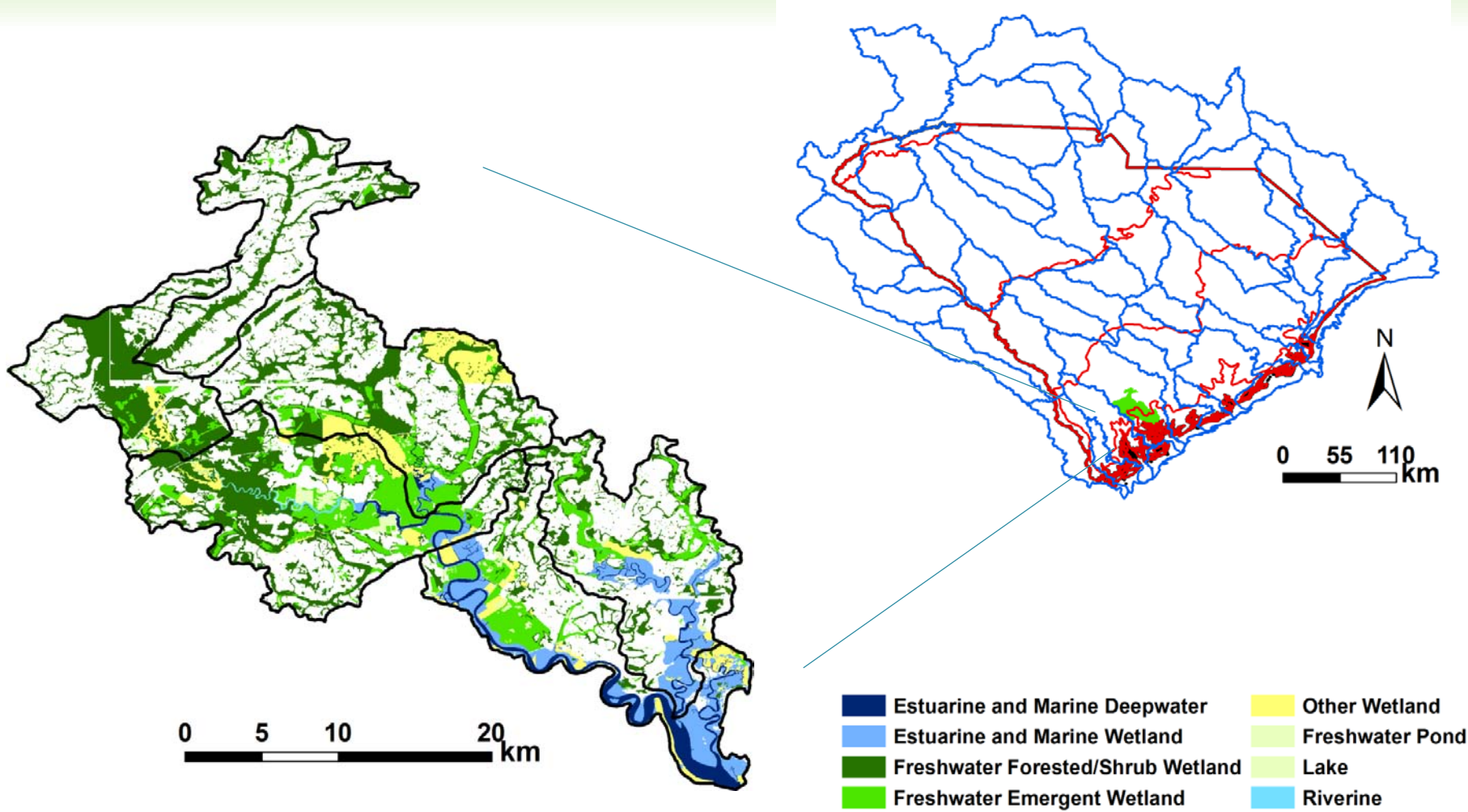


# TASK 1: STATEWIDE GEOSPATIAL DATABASE

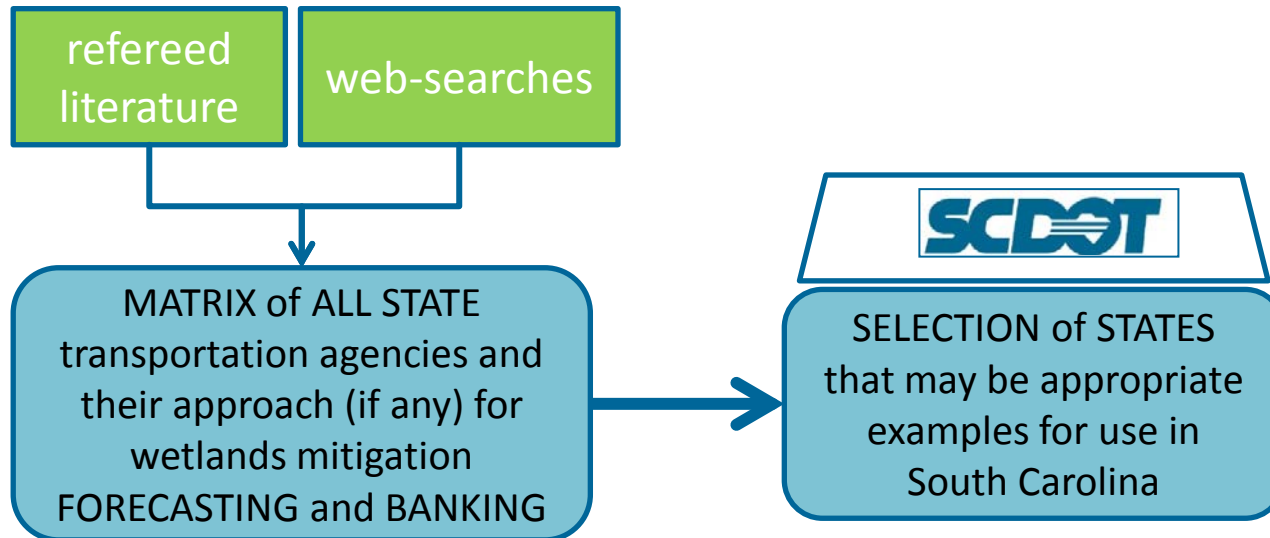
Plan for all relevant geospatial data needs. The following geospatial data will be assembled for the project:

- Wetlands – National Wetlands Inventory (NWI) and USDA Hydric Soils
- NOAA C-CAP Land Cover
- HUCS – 8-digit and 10-digit watershed boundaries
- Hydrographic Features (e.g. USGS, SCDNR)
- Level 3 Ecoregions
- County and State Boundaries
- LiDAR
- Planned transportation projects (SC-DOT) & County Programs

# WETLANDS DATABASE



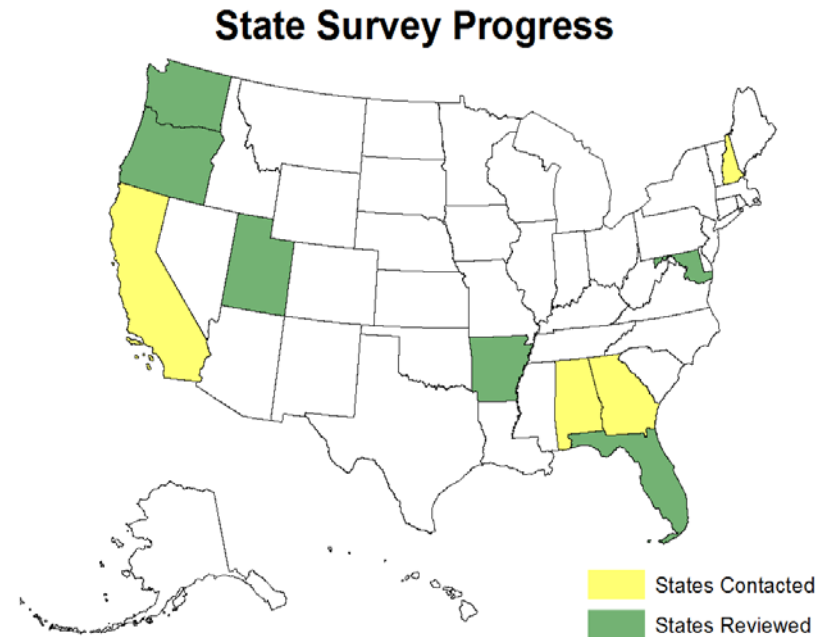
# TASK 2: ASSESSMENT OF EXISTING STATE WETLANDS MITIGATION TOOLS/APPROACHES



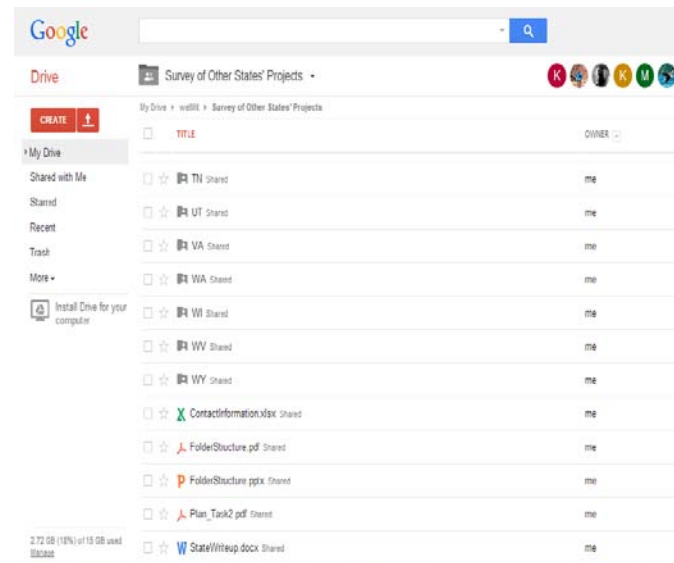
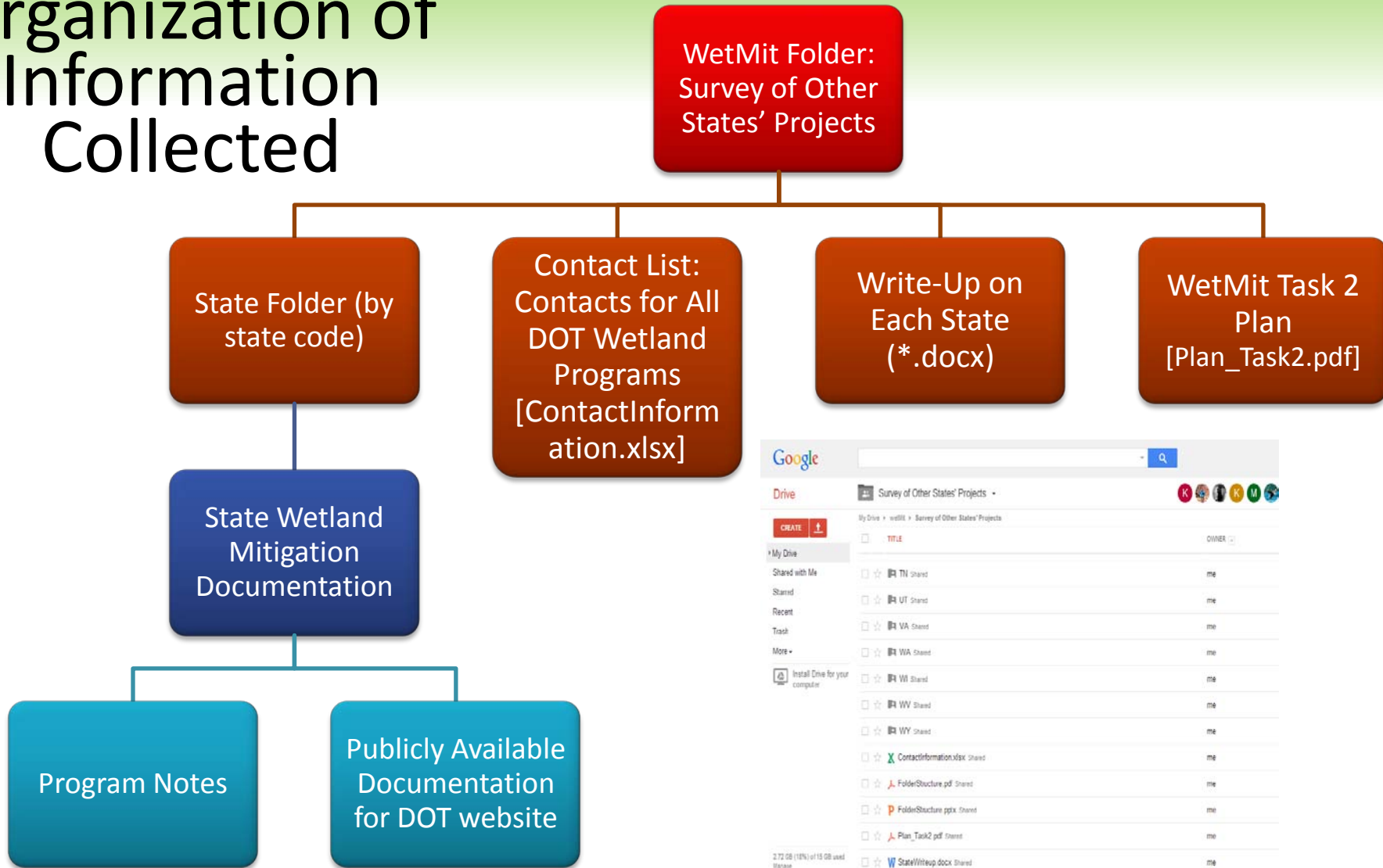
# REVIEW OF DOT WETLAND MITIGATION PROGRAMS

Review of wetland mitigation techniques used by transportation departments

- How far out do you look?
- How much wetland/ stream is affected?
- Where do you mitigate wetlands/ streams?
- Do you use GIS techniques to answer these questions?
- What other techniques are used?



# Organization of Information Collected



Using Google Drive

# PRELIMINARY FINDINGS OF SURVEY

- Forecasts are generally for 1-3 years out
- States reviewed are using a combination of techniques to answer questions
- Many states are using GIS to determine where to put mitigation sites but limited forecasting due to accuracy concerns
- Many states have stated that each road project is different so most forecasting for the amount of mitigation required is done on a case by case basis.

# TASK 3: GIS-BASED WETLANDS MITIGATION FORECASTING MODEL

- The goal of the forecasting model is to:
  - 1) estimate the **wetlands related loss** from a planned transportation project(s) and
  - 2) estimate the **offsets needed** and **where the offsets may be derived** (e.g. banking).
- The model will user friendly and easily updated (ArcGIS)

# MITIGATION IMPACT MODEL

## WETLANDS DATA

## SCDOT DATA

USFWS  
Wetlands

Soils

DOT "Project" (STIP)  
• Planned new roads  
• Planned widening

Wetlands  
Distribution/Uncertainty  
submodel

Spatial Characteristics of  
Activities/Uncertainty  
submodel

WETLANDS IMPACT MODEL

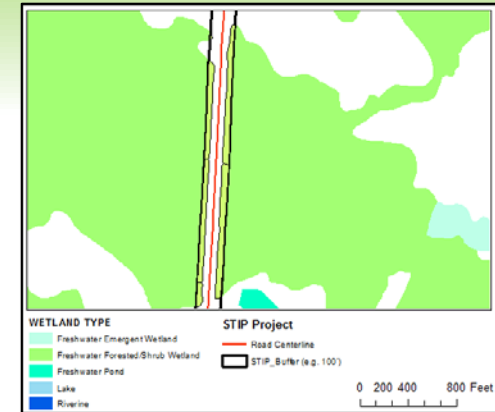
Acreage of wetlands

Hydrologic  
Units (8-digit  
HUCs)

Ecoregions

REGIONALIZED WETLAND  
IMPACT MODEL

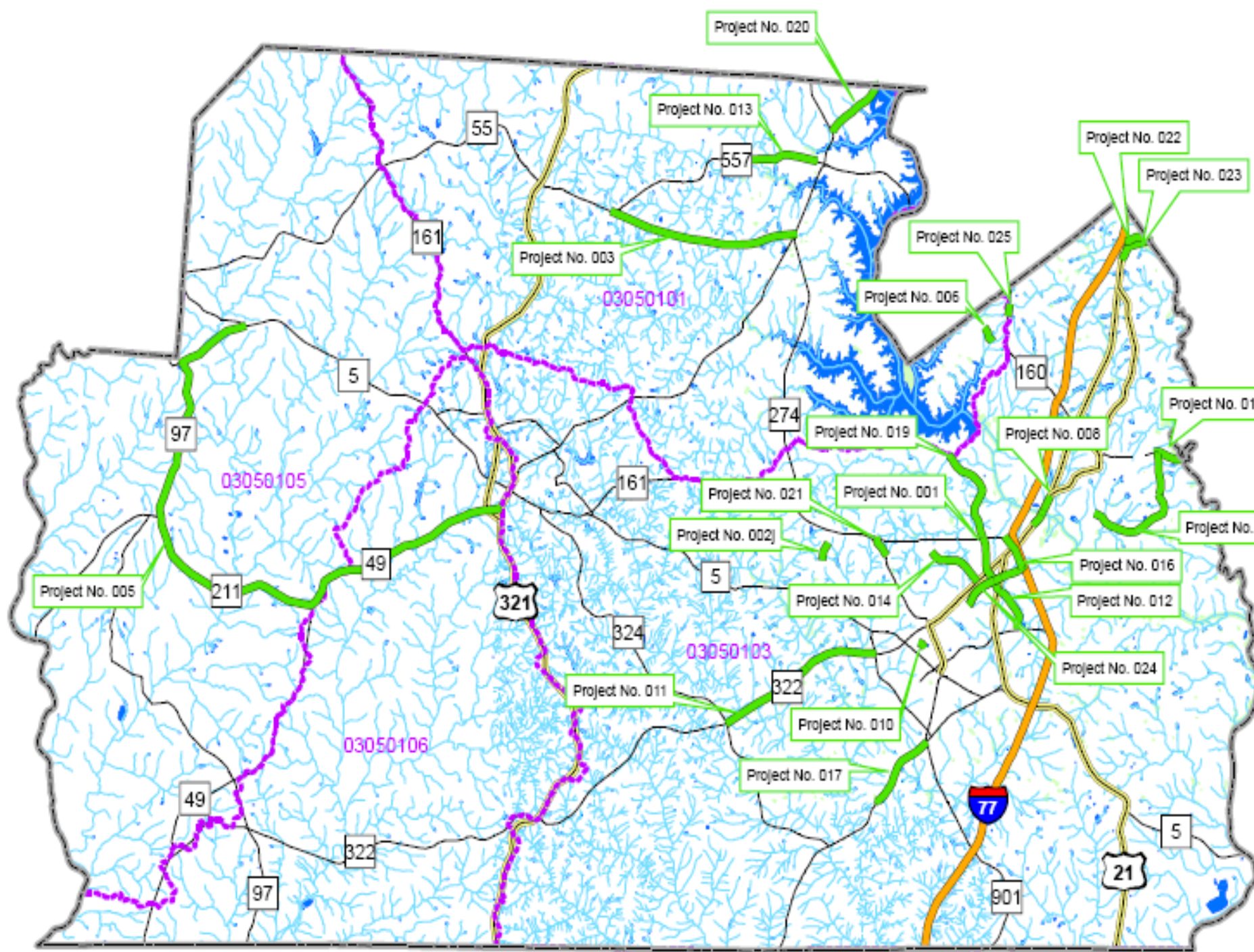
INPUT TO WETLANDS  
OFFSETS MODEL

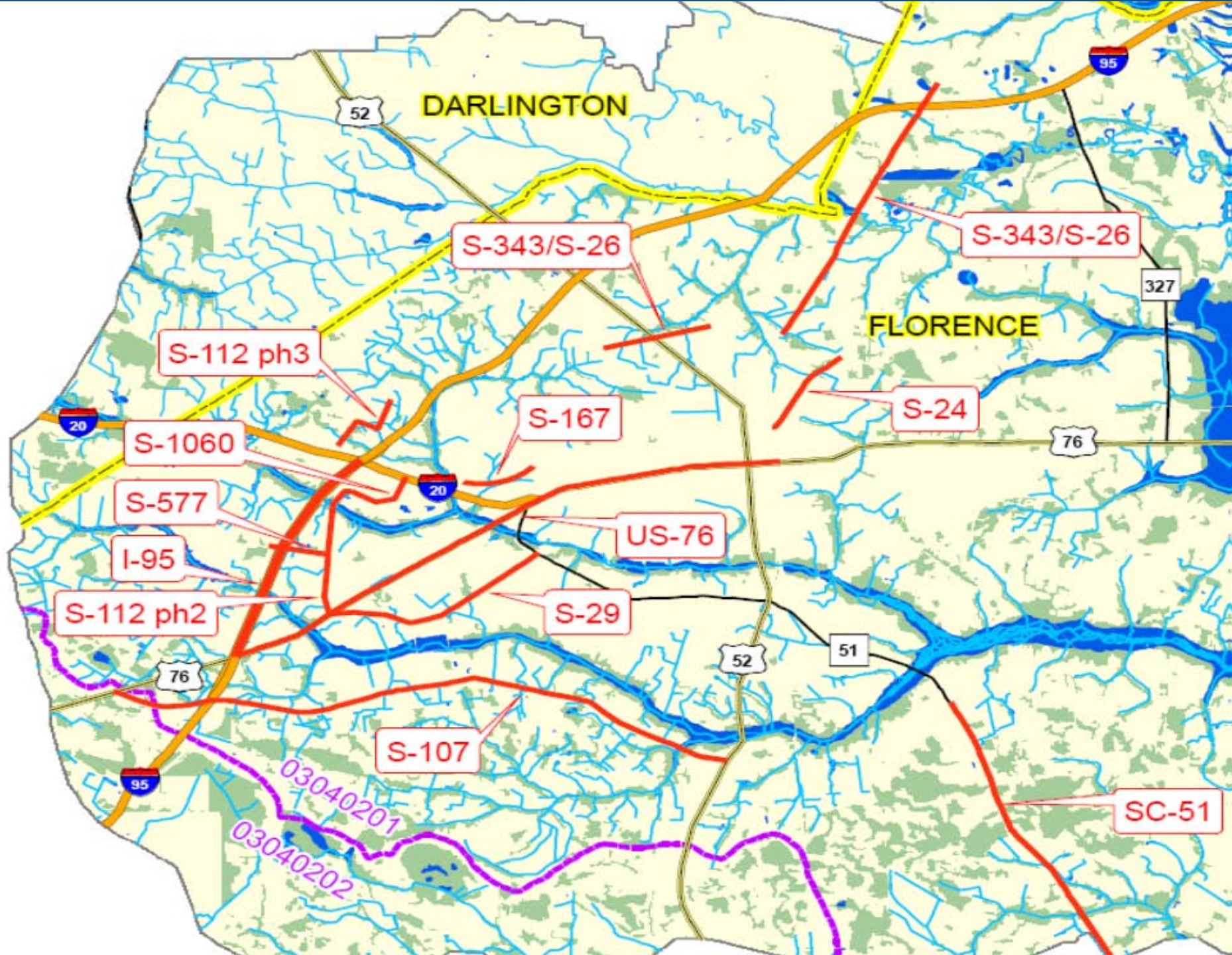




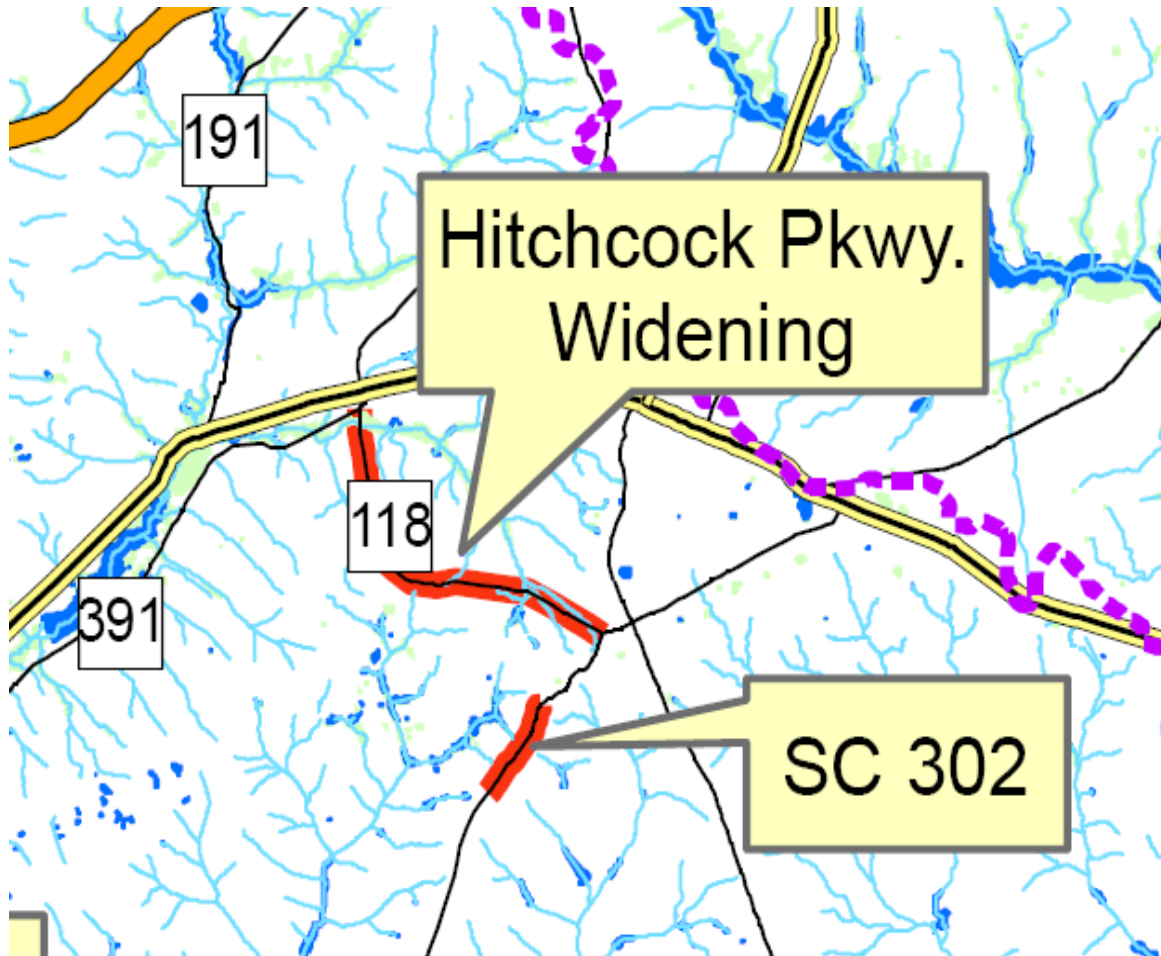
# USC FORECAST MODEL 101

- Step 1 -Projects in the STIP, COGs, MPOs, counties and other areas to be digitized – *SCDOT completed March 2014*
- Step 2 -USC to apply buffer along project corridor and jurisdictional impacts to be estimated
  - Other tools to project JD areas ???
  - Buffers are being accurately calculated on project types
- Step 3- Demonstrate Need & Develop Priority Watersheds/Ecoregions based on Forecasted Impacts.





# FOCUS ON SINGLE PROJECT



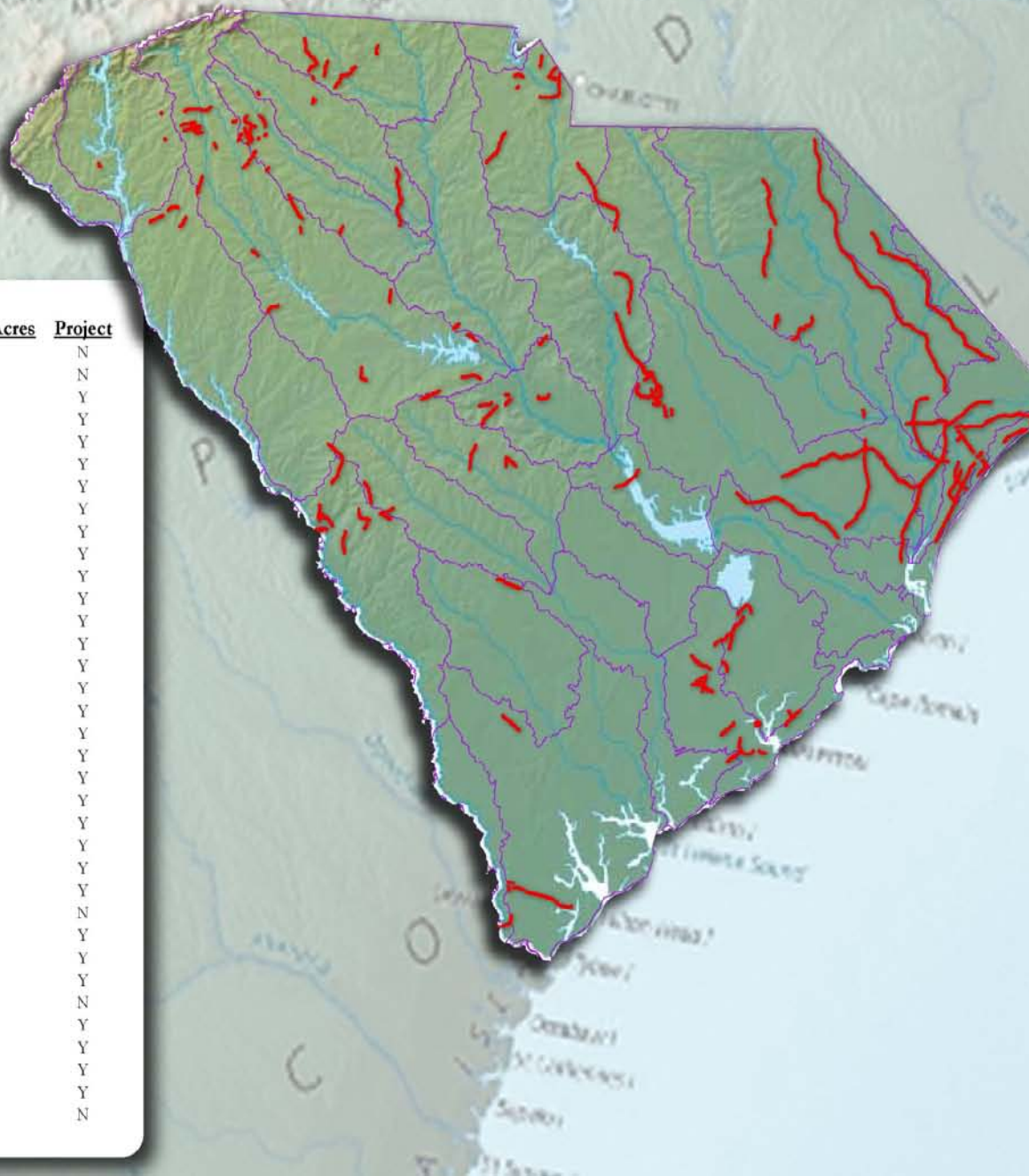
Click to show:

- 1. Impacts**
- 2. Permit**
- 3. Mitigation credits**
- 4. Mitigation options**

Watershed/Ecoregion					
	County	HUC Unit	Stream Impacts (LF)	Lake/ Pond Impacts (AC.)	Wetland Impacts (AC.)
SC-9	Chesterfield	03040201	8734.19	1.59	4.68
SC-41	Florence	03040202	675.34	0.26	4.2
US 52	Darlington	03040201	3187.24	4.66	13.8
S-577	Florence	03040214	1367.82	0	2.69
S-29	Richland	03040201	1526.77	0	0.39
S-358	Richland	03040209	1042.12	0	2.01
S-1060	Kershaw	03040201	0	0	0.54
S-112 PH2	Kershaw	03040211	786.19	1.94	6.25
S-112 PH3	Florence	03040201	1290.56	0	8.13
I-95	Darlington	03040219	2499.71	7.26	22.71
S-167	York	03040201	1012.21	0	0.69
S-24	York	03040204	589.25	0	1.45
SC-160	Lexington	03040201	1521.11	0.25	5.03
S-110	Lexington	03040206	4589.12	1.23	3.85
		03040125	0	0	1.12
US 76	Chesterfield	03040222	700.79	3.03	7.13
US-378	Florence	03040202	12041.72	16.039	82.19
S-343/S-26	Horry	03040315	2679.45	0.67	5.64
<b>Total</b>			<b>44243.59</b>	<b>36.929</b>	<b>172.5</b>

# Statewide Impacts

<u>HUCODES</u>	<u>ACRES</u>	<u>Stream Linear Feet</u>	<u>Wetland Acres</u>	<u>Waterbody Acres</u>	<u>Project</u>
03040104	4450.857	0.000	0.000	0.000	N
03040105	557.370	0.000	0.000	0.000	N
03040201	1487260.710	8994.944	218.302	9.106	Y
03040202	887286.261	217.365	0.344	0.000	Y
03040203	77928.368	480.259	3.312	0.121	Y
03040204	622902.294	19172.054	441.148	17.487	Y
03040205	1312755.857	3202.838	10.176	1.343	Y
03040206	380927.725	3037.143	195.309	3.312	Y
03040207	245480.677	529.461	0.813	0.000	Y
03050101	88547.206	0.000	0.000	0.000	Y
03050103	594085.815	2072.376	1.449	3.665	Y
03050104	804299.472	3634.525	65.876	1.261	Y
03050105	617641.858	272.370	0.000	0.080	Y
03050106	824692.341	0.000	0.043	0.000	Y
03050107	517389.675	104.141	0.361	0.216	Y
03050108	468253.875	322.270	0.000	0.000	Y
03050109	1615244.086	2416.698	4.503	1.194	Y
03050110	441181.546	992.512	13.624	0.000	Y
03050111	351220.767	564.242	58.032	27.752	Y
03050112	467339.608	121.046	0.023	0.000	Y
03050201	539601.287	2570.766	98.605	6.350	Y
03050202	572306.943	2635.518	134.169	32.885	Y
03050203	486243.100	50.925	0.574	0.000	Y
03050204	554923.824	165.406	0.002	0.000	Y
03050205	551788.371	0.000	0.000	0.000	Y
03050206	418388.566	0.000	0.000	0.000	N
03050207	654246.879	231.883	0.000	0.000	Y
03050208	1435486.111	1256.963	138.572	15.691	Y
03060101	594757.734	306.882	0.781	0.000	Y
03060102	217628.950	0.000	0.000	0.000	N
03060103	745140.540	55.858	0.000	0.000	Y
03060106	653691.632	595.298	0.001	0.000	Y
03060107	473485.636	0.000	0.000	0.000	Y
03060109	232646.763	0.000	0.846	0.000	Y
06010105	3.486	0.000	0.000	0.000	N



# FUNDING AT THE STATE LEVEL

- SCDOT has a **\$722 million budget per year...**
  - This includes \$612M Federal and \$110M State Match.
- Translation = over the next 6 years there will be ~ **\$4.3 billion** spent in SC at the State and Federal Level
- SCDOT will need permits for approx. 150 projects.
- Source: Statewide Transportation Improvement Program

# 2013 DEMONSTRATION OF NEED

- 38 General Permits issued July 2012 –July 2013
  - Approx. 333 credits (wetland)
  - Approx. 11,070 credits (stream)
- Does not Include IPs
- Coastal Stream Projects pushed to 2015
  - Approx. 20,000 credits
- Does Not Include County Projects
  - Florence County – 65,000 credits
  - Berkeley County – 13,500 credits



# PAYOUTS TO BANKS 2011-2013

Bank	Date	Cost	Credits
Grove Creek	12-21-2011	\$44,040.00	352.25
Grove Creek	12-21-2011	\$126,650.00	1,490.0
Grove Creek	2-15-2012	\$298,032.00	2,838.4
Grove Creek	3-27-2012	\$9,254.70	88.14
Grove Creek	4-11-2012	\$332,746.00	2,294.8
Grove Creek	4-11-2012	\$18,236.00	182.36
Grove Creek	5-3-2013	\$85,015.00	694.0
Grove Creek	6-11-2013	\$14,900.00	372.5
Grove Creek	6-26-2013	\$15,288.00	124.8
	Total	\$944,161.70	8,437.25
Pigeon Pond	9-26-2012	\$6,500.00	1.3
	Total	\$6,500.00	1.3
Taylor's Creek	2-26-2013	\$12,050.00	96.4
	Total	\$12,050.00	96.4
Turkey Creek	5-22-2012	\$25,896.00	199.2
	Total	\$25,896.00	199.2
Turners Branch	1-24-2011	\$91,586.05	892.79
	Total	\$91,586.05	892.79
Waccamaw Wetland	7-22-2013	\$878,700.00	121.20
	Total	\$878,700.00	121.20
	Grand Totals	<b>\$1,958,893.75</b>	<b>9,748.14</b>

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## Transportation penny tax takes effect today in Richland County

*Posted: May 01, 2013 8:03 AM EDT*  
*Updated: May 01, 2013 8:12 AM EDT*  
By Mary King - email

COLUMBIA, SC (WIS) - Today marks the first day your shopping receipt will look a little different in Richland County.

The county's new Transportation Penny tax takes effect, and county officials estimate the one percent tax increase will make the county about 50 million dollars a year to put toward improving roadways, the bus system, bike paths and greenways.

The county's one percent transportation tax increase brings the total average sales tax for retail in Richland County to eight percent. That's because the state sales tax is six percent, and Richland County already has a local option tax of one percent that was passed back in 2005.

Taxes for hotel stays in Unincorporated Richland County are now 12% because of existing state and local accommodation taxes. The transportation tax will apply to groceries changing that tax in Richland County from one to two percent. There is no state sales tax on grocery items. Taxes on other food and beverages are 10% because of the existing hospitality tax. (Taxes may be slightly different in City Limits of Irmo and Eastover.)



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### Two arrests made in Lexington Co. shooting

[WITH VIDEO](#)

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# FUNDING AT THE LOCAL LEVEL

- Richland County –
- 32 projects
- Totaling \$769M



# FUTURE OPTIONS: PARTNERING

- Discuss Partnering Options based off forecast
  - Partner with NGOs/ Banking Developers
  - Working with legal to ensure compliance
  - **Working with FHWA for advance Mitigation monies**
- Partner with Existing Banks
  - Discussion on how to set up partnerships to acquire credits and reserve for SCDOT demand.
  - Set options to Purchase (% down 3-5 year buy out)
- RFP – Full Delivery
  - If immediate need cannot be serviced by existing bank

# SUMMARY

- SCDOT hopes to remove some of the risk for Banking community
- Detailed Forecast Model – Demonstrate Credit Demand Statewide
  - Critical Watershed/ Ecoregion Identified
  - Develop mitigation strategies/ partners
  - FHWA to work with SCDOT to use project funds for mitigation

# SCDOT MITIGATION MANAGER

- Mr. Tucker Creed, P.E.
  - Pre-Construction Experience
  - Berkeley County RFP

**Phone: 803-737-0356**

**Email: CreedTS@scdot.org**

Please Call To set up an Appointment