GSWCC Trainer Recertification

March 29, 2018

GSWCC

AGENDA
Trainer Recertification
March 29, 2018

7:00-8:00	Registration – UGA Center Registration Desk
8:15	Welcome – Mahler Hall
8:30-9:15	NPDES Construction Stormwater General Permits Reissuance Updates; Michael Berry, EPD – Mahler Hall BMP Updates in the 2016 Manual for Erosion and Sediment Control: Ben Ruzowicz, GSWCC – Mahler Hall
9:15-9:45	Break with Demonstration – Hill Atrium & Area Outside Hill Atrium

	RED GROUP	ORANGE GROUP
10:00 - 11:00 Session 1	Trainer Information Room E	GEOS Room R
11:00 - 12:00 Session 2	GEOS Room R	Trainer Information Room E
12:00 – 1:00	LUNCH Hill Atrium	
1:00 – 2:00 Session 3	Organic Amendments Room YZ	Green Infrastructure Room FG
2:00 – 3:00 Session 4	Green Infrastructure Room FG	Vendor Area Mahler Hall & Hill Atrium
3:00 – 3:30	BREAK with Demo Hill Atrium & Area Outside Hill Atrium	
3:30 – 4:30 Session 5	Vendor Area Mahler Hall	Mitigation Management Room J
4:30 – 4:45	CLOSING Mahler Hall	

Insert Tab

Trainer Responsibilities

Back of Tab

Trainer Responsibilities

Trainer/Instructor Recertification Seminar
March 2018

Overview of Policies & Procedures

- Scheduling and Holding Certification and Recertification Courses
- After the Course
- Citizenship Paperwork
- Third Party or Trainer Developed Courses
- FAQ
- Trainer Audits

Scheduling a Course

The following applies to Initial Courses as well as Recertification Courses:

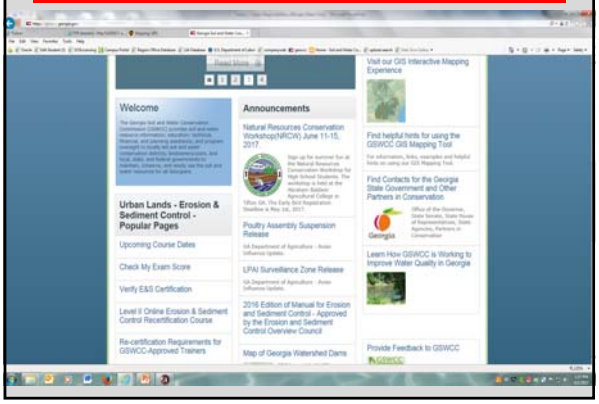
- The approved trainer must notify the GSWCC of the scheduled course at least 15 days prior to the date of the course
- Trainers are required to use the electronic form entitled "**Notification of Scheduled Education & Certification Courses for Approved Trainers**"
- The following information must be provided
  - Course Name
  - Course Date
  - Maximum # of Attendees
  - Course Location
  - Contact Information

The completed form (Excel Spreadsheet) should be filled out and submitted electronically to gaswcc.certification@gaswcc.ga.gov

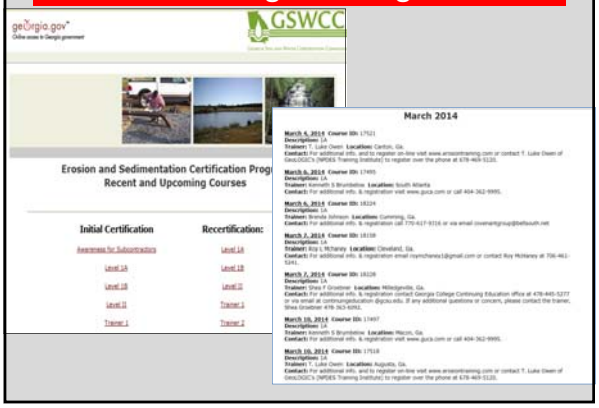
Scheduling a Course

- Courses will be posted on the GSWCC website
- It is the responsibility of the trainer to check the website within 3 days of submittal of the course notification form to verify that the course has been posted
- If the course is not posted on the website, it is not in the system and exams will not be sent

www.gaswcc.org



www.gaswcc.org



During the Course

- Use approved PowerPoint presentations
- Provide course notebooks and #2 pencils
- Follow the course agenda provided in notebook
- Use “Exam Procedures” PowerPoint to ensure that all participants correctly understand how to complete the Application and Scantron forms

During the Exam

- Trainers are prohibited from:
  - -Providing answers to or discussing exam questions
  - -Reading the exam questions aloud
  - -Altering score sheets
  - -Allowing group testing

Initial Course Reminders

LOOK over exam materials turned in by course participants!

- Is DOB correct? (did they use 2018 as the year of birth?)
- Did participant bubble in an Exam Version?
- Is name listed correctly under “first” and “last” on the Scantron form
- Is the information on the application form legible? Did participant fill in full address (many people leave out City & Zip)

Recertification Course Reminders

- Double check the Scantron Roster form before submitting to GSWCC
  - -Trainer ID
  - -Course # (found on GSWCC website)
  - -Date
  - -Student ID number must be written and bubbled in on the form.

*Regardless of whether the trainer or the students fill out the form – DOUBLE CHECK to make sure all ID numbers are correct!!

DON'T FORGET CHANGE OF ADDRESS FORMS!!

Recertification FAQ

Q: Can I combine a GSWCC Level 1A & GSWCC Level 1B recertification course, so that each level can attend the course?

A: No, individuals with a Level 1A certification need to take a Level 1A recertification course AND individuals with a Level 1B certification need to take a Level 1B recertification course

Q: May an individual sit through 4 hours of a certification course to receive recertification credit?

A: No, individuals seeking recertification credit must take a recertification course. GSWCC will not award recertification credit if an individual attends a full certification course.

Q: What recertification course does an individual with a Subcontractor certification need to take?

A: There is not a recertification course for a Subcontractor certification. Individuals with a Subcontractor certification must retake the Subcontractor Awareness seminar every 3 years.

Returning Exam Packages

- Exam Packages & Class Registration List must be sent with a tracking method such as UPS/FedEx/Certified Mail USPS
- The trainer may drop off the exam package at the GSWCC office in Athens, GA
- All Exam Packages must be postmarked or delivered within 48 hours of exam

Canceled Certification Course

- If a certification course is canceled, and the trainer has already received the exam packet, those exams must be sent back to GSWCC within 48 hours of the course being canceled
- Exams may not be held and used for another course
- If a trainer submits completed exams from a canceled course, the exams will not be scored

Canceled Recertification Course

- If a recertification course is canceled, the canceled course code cannot be used for another recertification course
- GSWCC will not accept recertification rosters from an unscheduled course

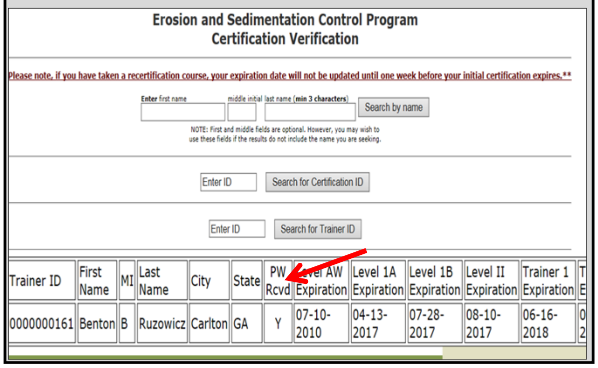
Citizenship Documentation

O.C.G.A. 50-36-1: Must verify the legal immigration status of any person 18 years or older who applies for state or local public benefits as defined in federal law under 8 U.S.C. Section 1621

As of July 2, 2013, U.S. citizens and legal residents only **HAVE TO SUBMIT DOCUMENTATION ONCE.** All Qualified Aliens will have to submit the documentation for each course they attend

Most participants in recertification courses have submitted documentation. However, trainers should double check the paperwork status on the GSWCC website

Citizenship Documentation



Erosion and Sedimentation Control Program
Certification Verification

Please note, if you have taken a recertification course, your expiration date will not be updated until one week before your initial certification expires.**

Enter first name | middle initial | last name (min 3 characters) | Search by name

NOTE: First and middle fields are optional. However, you may wish to use these fields if the results do not include the name you are seeking.

Enter ID | Search for Certification ID

Enter ID | Search for Trainer ID

Trainer ID	First Name	MI	Last Name	City	State	PW Rcvd	Level AW Expiration	Level 1A Expiration	Level 1B Expiration	Level II Expiration	Trainer 1 Expiration	T E
0000000161	Benton	B	Ruzowicz	Carlton	GA	Y	07-10-2010	04-13-2017	07-28-2017	08-10-2017	06-16-2018	0 2

Citizenship Documentation

- **All citizenship forms are available at ww.gaswcc.georgia.gov under "Documents" as well as on the the Education and Certification page**
- **Trainers should have forms available if someone forgets to bring theirs**
- **Trainers should remind the applicants of the requirements when they register for the course**
- Trainers are to collect from the applicant:
  - The checklist
  - The appropriate affidavit
    - Make sure the affidavit is notarized
  - A legible photocopy of secure and verifiable form of ID

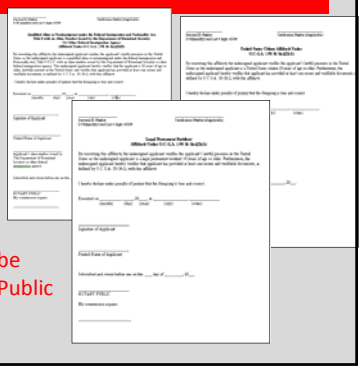
Required Documentation

(1) GSWCC Checklist for Verification of Lawful Presence Within the United States

Required Documentation

(2) Affidavit

-Legal U.S. Citizen
-Legal Permanent Resident
-Qualified Alien or Non-Immigrant under the federal Immigration & Nationality Act



The affidavit must be notarized by a Notary Public

Required Documentation

- A **legible photocopy** of at least one secure and verifiable document must accompany the affidavit that is being submitted by an applicant. A "secure and verifiable document" is defined in O.C.G.A. § 50-36-2

Secure & Verifiable Documents

- Secure & Verifiable Documents include, but are not limited to:
  - -State/Government issued Drivers License, ID Card
  - - Military ID
  - - Passport issued by US or foreign government
  - - Certificate of Citizenship or Naturalization
- The Office of the Attorney General of the State of Georgia created a catch-all in the list of Secure & Verifiable documents requiring acceptance of documents for proof of or documentation of identity if so required by federal law
- Such documents are deemed "Secure & Verifiable Documents" by the Attorney General of the State of Georgia

Third Party or Trainer Developed Courses

- GSWCC will allow a GSWCC-approved Trainer to develop a training course that may be used to satisfy continuing education requirements
- All 3rd party courses must be taught by a GSWCC-approved Trainer.
- Only the approved trainers listed on the application will be allowed to teach the course
- Applications for a 3rd party course must be completed and submitted at least 45 days prior to the commencement of the course
- All applications are processed in the order in which they are received

Third Party or Trainer Developed Courses

GSWCC

The Georgia Soil and Water Conservation Commission
Education and Certification Program

Application for Continuing Education Course Approval

Please Print or Type

Company/Organization: | Date Submitted:

Contact Person: | Phone Number: | Email:

Course Title: | Continuing Education Course Level (i.e. A, I) | Course Duration:

Brief Description of Course and Objectives:

Course Agenda – Give detailed description of each topic. Include start and stop times for each topic/speaker. All breaks must be shown. Use additional sheets if necessary.

Name of Approved Instructor(s): | Approved Instructor(s) Certification Number:

By Submitting this application I am certifying I understand that:

GSWCC has the authority to approve or deny a course for any reason.

GSWCC reserves the right to revoke course approval status at anytime.

The course is not eligible for re-certification hours until it has been approved by GSWCC.

GSWCC has 45 days to review my application and any incomplete applications will not be reviewed. Resubmitted applications are subject to 45 day review period.

If course is approved, I must follow the continuing education guidelines mandated by the GSWCC.

Signature: | Date:

Please submit application and all other required documentation to:
Georgia Soil and Water Conservation Commission
Education and Certification Program
4310 Lexington Road
Athens, GA 30605
ATT: Urban Program Manager

- Those trainers that are interested in developing a recertification course must submit an *Application for Continuing Education Course Approval*
- Available at www.gaswcc.georgia.gov

Third Party or Trainer Developed Courses

- Applications will be evaluated on the basis of subject matter presented and time devoted to the topic(s)
- Discussions relating to all aspect of erosion and sediment control and land disturbing activities may be considered for approval of credit hours

- Examples
  - Monitoring/Sampling
  - NPDES General Permits
  - BMP Installation
  - Structural & Vegetative BMPs
  - ES&PC Plans
  - Site Inspections

Third Party or Trainer Developed Courses

- The GSWCC Education & Certification Program will
  - Review the course outline and the instructor's qualifications and assign the appropriate credit hours
  - Education credit hour(s) will be assigned on a basis of 1.0 credit per hour of actual course instruction time with a maximum of 4.0 credit hours
  - Assign a course name/code that will be specific to that course

- Examples of topics that will not be considered for credit include:
  - Business Management
  - Marketing Techniques
  - Public Relations
  - Sales Presentations

Trainer Course Audits

- Periodically GSWCC will arrive unannounced to audit a course:
  - A GSWCC representative will introduce themselves and observe the trainer and the course
  - If any violations are found, a formal report will be written. A copy will be sent to the trainer and placed in his/her trainer file.

Third Party Instructor Audit

Date: _____ Course: _____

Course Location: _____

Instructor: _____ Proctor: _____

Number of Participants: _____ Evaluator: _____

1. Did the course start on time? _____
2. Did the attendees receive the appropriate course notebook?
3. Was the course notebook complete? (i.e. in binder, agenda, presentations, supporting materials)
4. Did the instructor have the required AV equipment? (i.e. laptop, LCD projector, microphone, etc.)
5. Was the room setup classroom style? (i.e. desks and chairs)
6. Did the instructor use the presentations provided by the Commission?
7. Were all agenda topics presented using the approved PowerPoint presentations?
8. Did the instructor adhere to the allotted time for each agenda topic?

Trainer Course Audits

- If the GSWCC attempts to audit a course, and the course is not being held at the specified location and the trainer did not notify the GSWCC **before the course**, the course will be canceled and the exams will not be accepted
- This applies to both open and closed courses

Replacement Cards

- Individuals must submit a written request for a replacement card along with a self addressed stamped envelope to:

  GSWCC
  4310 Lexington Rd
  Athens, GA 30605

- No charge for replacements

Questions??

GSWCC
Urban Program
4310 Lexington Rd.
Athens, GA 30605
(706) 552-4474

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Getting Started in GEOS

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GEORGIA
DEPARTMENT OF NATURAL RESOURCES
ENVIRONMENTAL PROTECTION DIVISION

Getting Started in GEOS

Presented by Jessica Jones, Licensing Technician, NE District Office, Georgia EPD

E&S Day at UGA
March 29, 2018

INTRODUCTION

- GEOS – Georgia EPD Online System
- How to get there
  - epd.georgia.gov
    - "GEOS Guidance"
- What to do before creating a submittal
  - Responsible Official (RO) vs Preparer
    - If you are a Preparer, RO must create an account in GEOS as well
- Create your account
  - "Storm Water Construction"

IMPORTANT POINTS

- 50+ Acres
- Submittal ID
- 14-day Clock
  - RO vs Preparer
- Track Submittals
- Edit Pending
  - If it was not submitted, it will not receive coverage
- Submittal receipt
  - LIAs

ADDITIONAL FUNCTIONS

- Public Portal
- Sampling Reports
- Manage Certification
  - Modify/Terminate/Reissue Coverage
- Contact EPD
- LIA Map
- Manage Consultants/Preparers
  - Delete/Add/Associate to Facilities
- Older Submittals

WHAT HAPPENS NEXT

- Partial vs Complete Submittal
- GEOS Automated Emails
- Agency Review
  - Location Map
  - ES&PC Plans when applicable
  - Fees when applicable

RESOURCES

- District Offices
  - 7 office locations
- EPD Website
  - GEOS Site
  - Instructions
  - Submittal video
  - Training


GEORGIA
Department of Natural Resources
Environmental Protection Division
Questions?

Insert Yellow Sheet

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Resources

Websites:

EPD Website
https://epd.georgia.gov/

GEOS Log In Page
https://geos.epd.georgia.gov/GA/GEOS/Public/GovEnt/Shared/Pages/Main/Login.aspx

District Offices:

Coastal District - Brunswick Office
400 Commerce Center Drive
Brunswick, GA 31523-8251
(912) 264-7284

East Central District – Augusta Office
3525 Walton Way Extension
Augusta, GA 30909-1821
(706) 667-4343

Mountain District - Cartersville Office
P.O. Box 3250
Cartersville, GA 30120-1705
(770) 387-4900

Mountain District - Atlanta Satellite
4244 International Parkway, Suite 114
Atlanta, GA 30354-3906
(404) 362-2671

Northeast District – Athens Office
745 Gaines School Road
Athens, GA 30605-3129
(706) 369-6376

West Central District - Macon Office
2640 Shurling Drive
Macon, GA 31211-3576
(478) 751-6612

Southwest District – Albany Office
2024 Newton Road
Albany, GA 31701-3576
(229) 430-4144

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Why Green Infrastructure & Why Now?

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Training that helps It all make sense

Why Green Infrastructure

WHY NOW?!

WHY "GREEN INFRASTRUCTURE"

1) POPULATION & GROWTH
2) WATERSHED SIZE
3) IMPERVIOUS SURFACES
   - Pollutant Load
   - SW Volume
   - SW Velocity
4) GEORGIA RAINFALL (compared to other states)
5) GEORGIA AQUATIC HABITAT (unique in all the wolrd)
6) A GI PERSPECTIVE
   - QUALITY OF LIFE
   - MS4 NPDES PERMITS
     - MCM #5
       - MNGWPD
         - GSWMM "The BLUE BOOK"

1

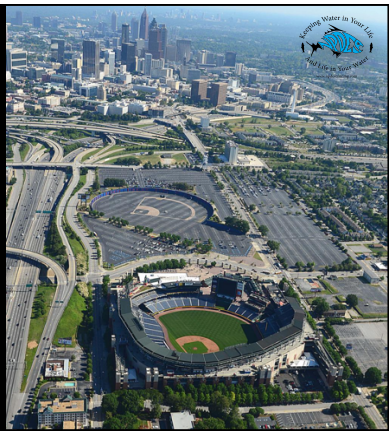
POPULATION & GROWTH

Training that helps It all make sense

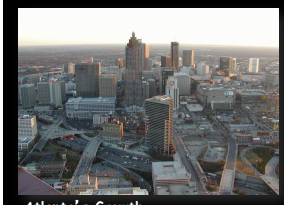
Training that helps It all make sense

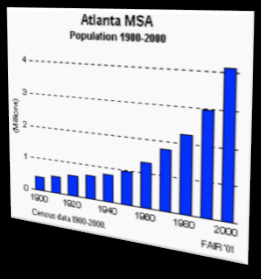
2.3 Sanford Stadiums
(92,746 Bulldogs)
DAILY

1 Metro Atlanta
MONTHLY



Metro Atlanta





Atlanta's Growth

1837 to 1959 – 1 million (122 years)
1959 to 1980 – 2 million (21 years)
1981 to 1993 – 3 million (13 years)
1993 to 2000 – 4 million (7 years)
2000 to 2006 – 5 million (6 years)

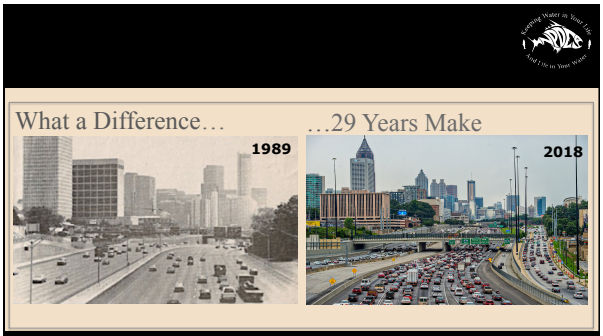
2017 Metro Atlanta ~ 6.5 Million


Atlanta
Peachtree Street
1875
STORE
HARDWARE


Atlanta
Peachtree Street
2018


What a Difference…
…13 Years Make
1967
1980
I-85/I-75
Atlanta Downtown Connector

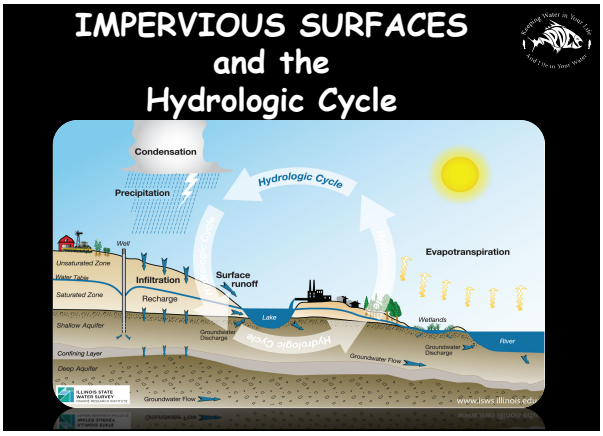
I-85/I-75
Atlanta Downtown Connector

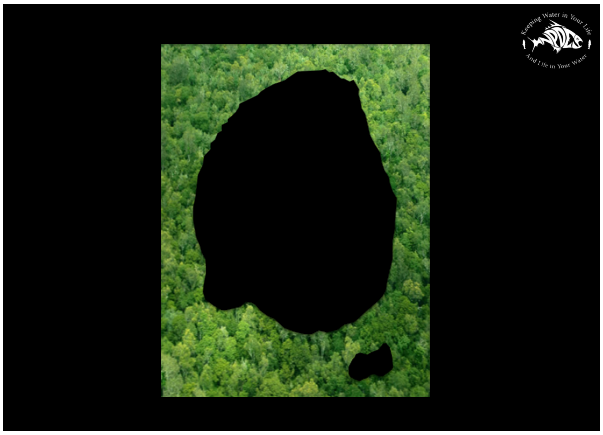


I-85/I-75
Atlanta Downtown Connector

Training that helps It all make sense

Training that helps It all make sense





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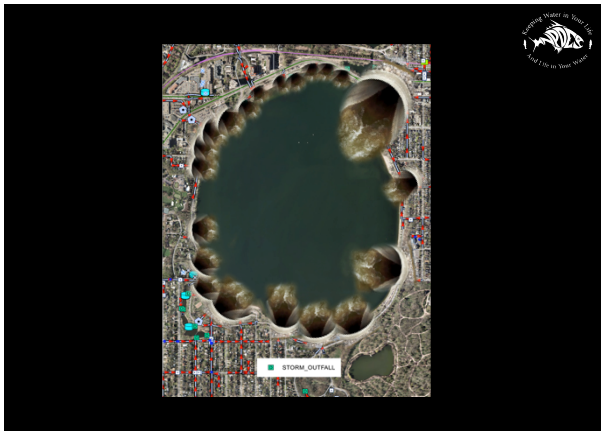

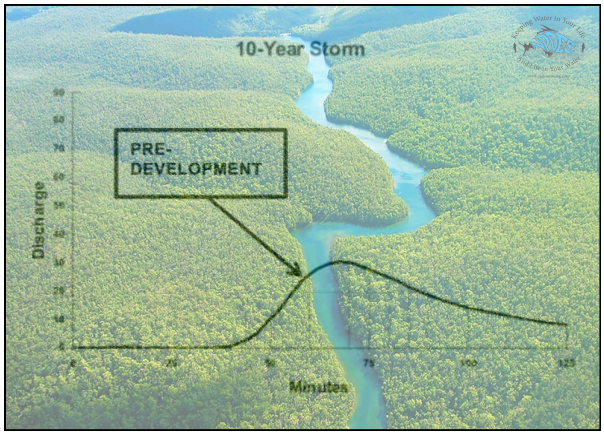

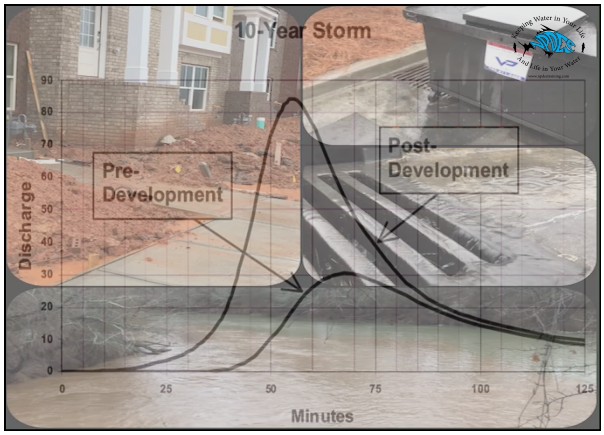

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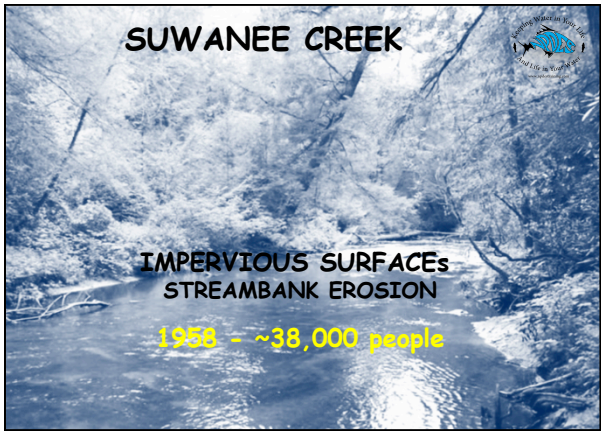
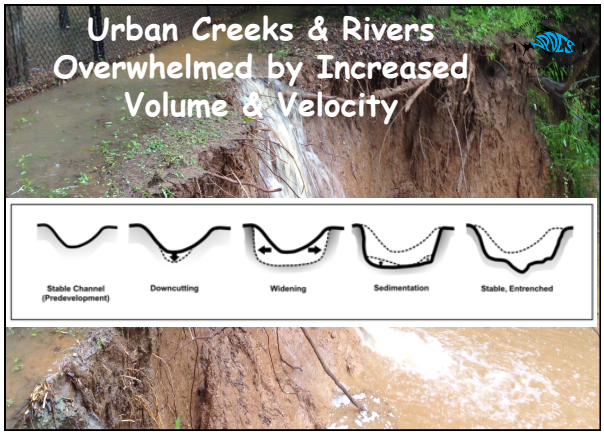
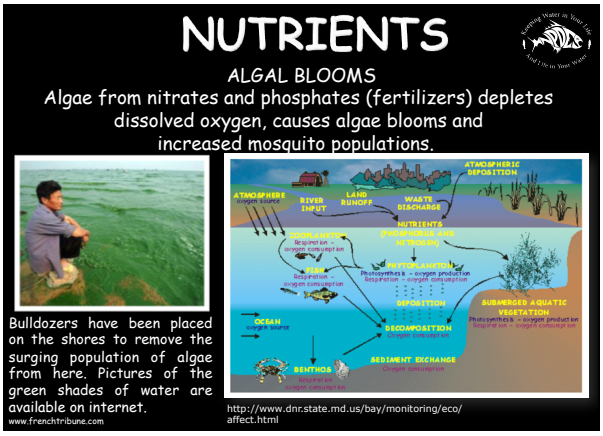
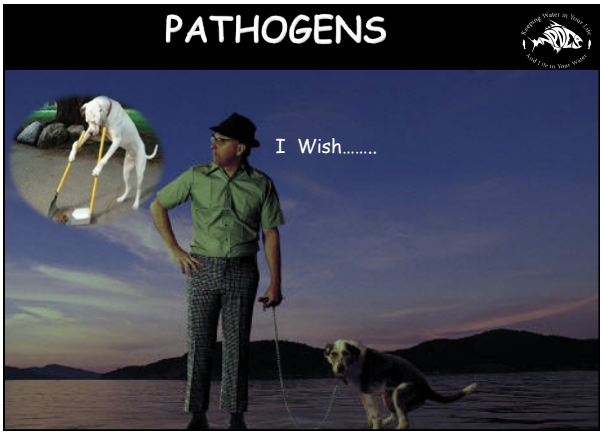


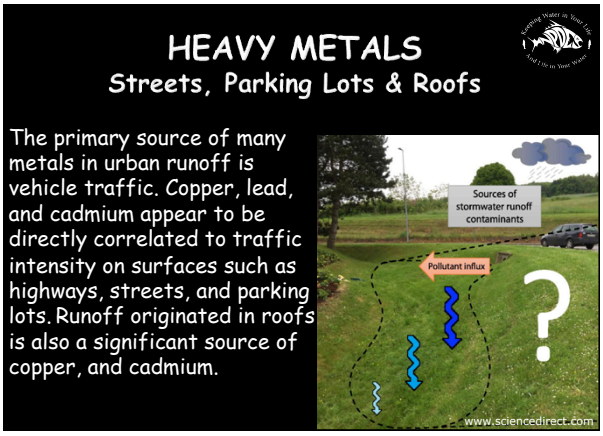


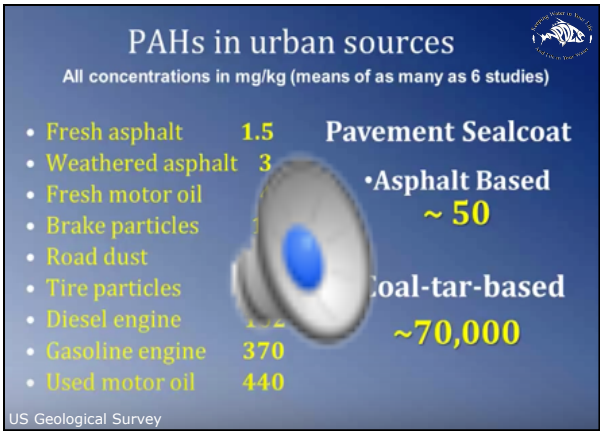

SEDIMENT
Sediment Reduces Drinking Water Storage Volume


NUTRIENTS
ALGAL BLOOMS
Algae from nitrates and phosphates (fertilizers) depletes dissolved oxygen, causes algae blooms and increased mosquito populations.
Bulldozers have been placed on the shores to remove the surging population of algae from here. Pictures of the green shades of water are available on internet.
www.frenchtribune.com
http://www.dnr.state.md.us/bay/monitoring/eco/affect.html


PATHOGENS
I Wish.....

Training that helps It all make sense





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TRASH
Solid Waste, Plastics, Etc.

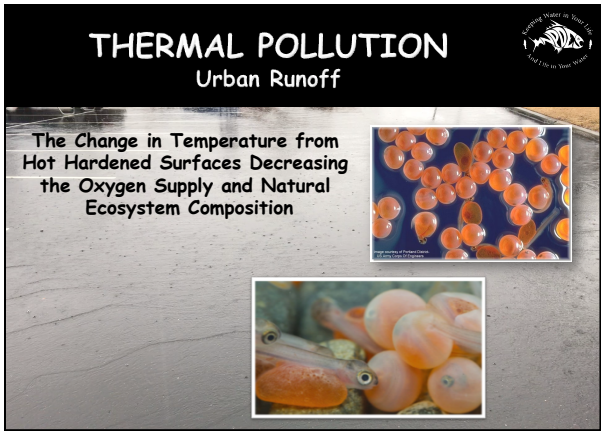
4
GEORGIA RAINFALL
(compared to other states)

STATE DIFFERENCEs in
Population Growth & Precipitation

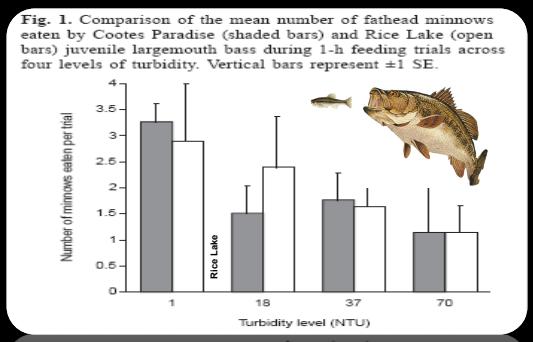
STATE	~2016 POP	PEOPLE/SQ MILE	ANNUAL PRECIPITATION
AZ	6.7 Million	56.3	13.6
CA	38.9 Million	239.1	32.2
GA	10.5 Million	168.4	50.6
IN	6.6 Million	184	40.6
MO	6.1 Million	87.1	46.9
NV	2.9 Million	26.7	14.3

The US population by 2050 is estimated to be 439 million (up from ~ 326 million today)

Training that helps It all make sense



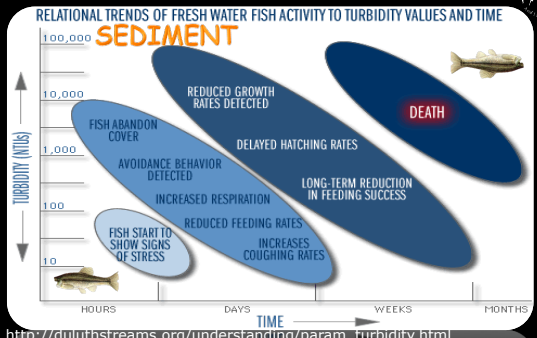
SEDIMENT & Turbidity



NC State University- Dept of Soil

Reid et al., 1999

RELATIONAL TRENDS OF FRESH WATER FISH ACTIVITY TO TURBIDITY VALUES AND TIME



http://duluthstreams.org/understanding/param_turbidity.html

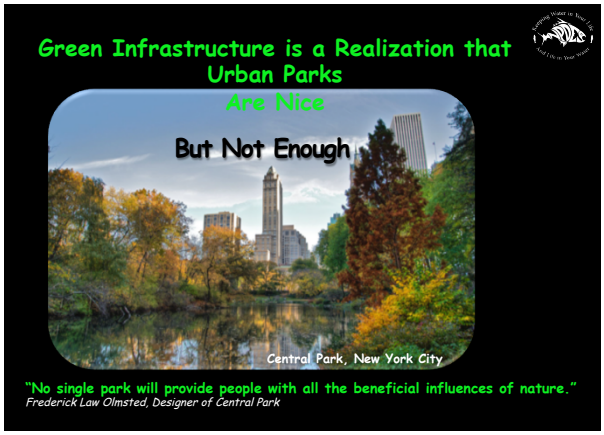
Schematic adapted from "Turbidty: A Water Quality Measure", Water Action Volunteers, Monitoring Factsheet Series, UW-Extension, Environmental Resources Center. It is a generic, un-calibrated impact assessment model based on Newcombe, C P., and J. O. T. Jensen. 1996. Channel suspended sediment and fisheries: a synthesis for quantitative assessment of risk an impact. North American Journal of Fisheries Management. 16: 693-727

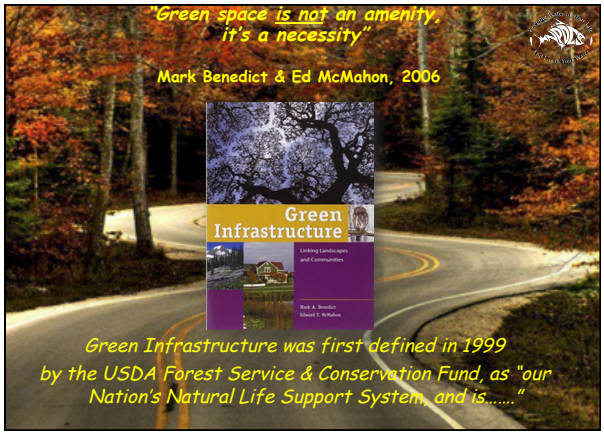
FISH REPRODUCTION

Eggs from Salmon, Steelhead, Striped Bass, American Shad and Trout are very susceptible to sediment pollution.

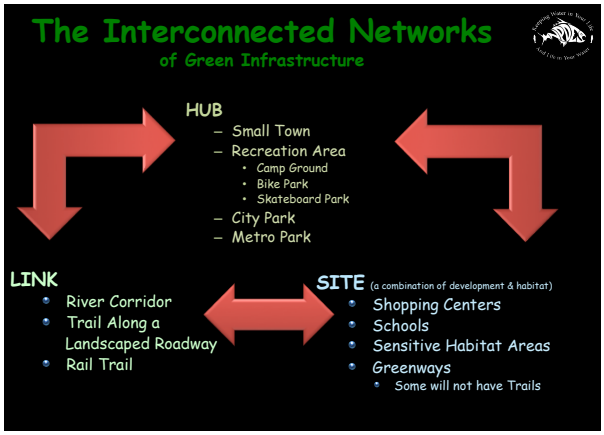
www.npdestraining.com

Training that helps It all make sense




"Green space is not an amenity, it's a necessity"
Mark Benedict & Ed McMahon, 2006
Green Infrastructure
Linking Landscapes and Communities
Mark A. Benedict
Edward T. McMahon
Green Infrastructure was first defined in 1999
by the USDA Forest Service & Conservation Fund, as "our Nation's Natural Life Support System, and is....."


Green Infrastructure is.....
Historic Fourth Ward Park – Atlanta, GA
"....nothing more than allowing mother nature to improve on mans best effort of creating aesthetically pleasing natural environments within a city (a park), so that it also links the life sustaining qualities of clean air, land, and water into our everyday urban lives".
T. Luke Owen, NPDES Training Institute


The Interconnected Networks
of Green Infrastructure
HUB
– Small Town
– Recreation Area
• Camp Ground
• Bike Park
• Skateboard Park
– City Park
– Metro Park
LINK
River Corridor
Trail Along a Landscaped Roadway
Rail Trail
SITE (a combination of development & habitat)
Shopping Centers
Schools
Sensitive Habitat Areas
Greenways
Some will not have Trails

The Interconnected Networks
of Green Infrastructure

HUB

Plaza Community Center Jasper, IL

LINK


Silver Comet Trail, Georgia

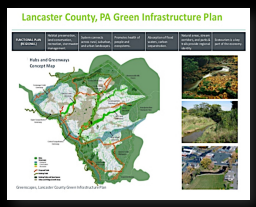
SITE


Bana Park Village Square - Tempe, AZ

The Interconnected Networks
of Green Infrastructure

Enables the area to better:

1) Carry and filter stormwater runoff
2) Remove pollutants from the air, and
3) Support diverse plant & wildlife species



Link Open Spaces Together to Function as an Ecological Whole

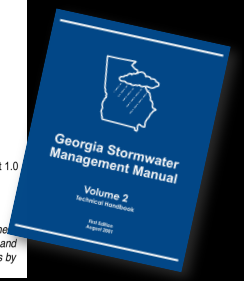
Green Infrastructure is…….

…….a form of Biomimicry, to
mimic natural life support systems
as human population grows

Training that helps It all make sense

GSWMM (Blue Book) Performance Standards

New Recommended
WQ Performance Standards



Runoff Reduction

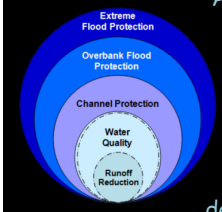
Runoff reduction practices should be sized and designed to retain the first 1.0 inch of rainfall on the site to the maximum extent practicable.

Water Quality

Stormwater management systems should be designed to *retain or treat the runoff from 85% of the storms that occur in an average year [1.2 inches], and reduce average annual post-development total suspended solids loadings by 80%.*

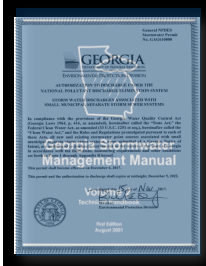
GSWMM Performance Standards

GSWMM WATER QUALITY PERFORMANCE STANDARDS



An 80% removal rate for the 1.2 inch rainfall event is the standard for addressing water quality in the GSWMM. Therefore 100 TSS removal through volume reduction of the 1.0 inch rainfall event will address the same requirement. In another method of describing total TSS removal, 80% of 1.2 inches equals (0.96) approximately equates to 100% of 1.0 inches.

Georgia MS4 NPDES Phase II General Permits

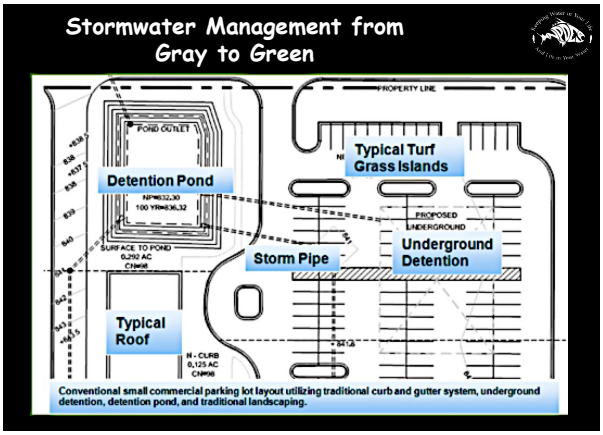


MCM #5

4.2.5.1 Stormwater Design Manual
The permittee must implement either
1 - the appropriate parts of the latest version of the Georgia Stormwater Management Manual (GSMM)
2 - an equivalent or more stringent local design manual.
For those permittees located in the 11-county coastal management program service area (Bryan, Brantley, Camden, Charlton, Chatham, Effingham, Glynn, Liberty, Long, McIntosh, and Wayne), the adopted manual must include the applicable parts of the Coastal Stormwater Supplement (CSS) to the GSMM, specifically the performance standards

All permittees must implement the GSMM and/or CSS to the maximum extent practicable. The permittee must provide documentation to EPD in the 2018 annual report to demonstrate the date of the adoption of the appropriate design manual(s).
For new permittees, the adoption of either
1 - the GSMM, or
2 - a local design manual, and/or
3 - the CSS must be completed within one year of designation.
Documentation of the design manual adoption must be provided to EPD with that year's annual report. Implementation must begin upon adoption.

Training that helps It all make sense



Training that helps It all make sense

Green Infrastructure

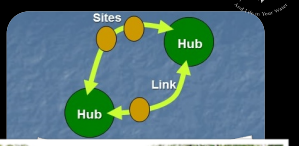
The Interconnected Networks of Green Infrastructure

People value neighborhoods based on Smart Growth principles

"A majority of consumers want single-family detached homes in a pedestrian-friendly community that has shopping within walking distance." NAR/NAHB survey

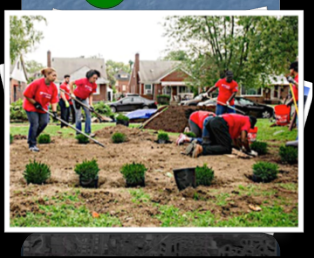
NAR – Charrettes Smart Growth

Key Concepts



In it's purest form, GI

- Provides interconnected Hubs, Links & Sites
- Shapes the urban form & provides a framework for growth
- Encourages natural systems in urban environments.
- Moves GI from "*nice*" to have to a "***must***" have
- Promotes and supports conservation action



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REALTORs GO GREEN

REALTORS® Go Green (Sept. 4, 2016) In response to **growing consumer demand for GREEN HOMES** & **BUILDING PRACTICES**, the National Association of Realtors® has introduced a new Green designation for Realtors®.

Excerpted from the APA Elements of Smart Growth

Kentlands ~ Gaithersburg, MD

NATIONAL ASSOCIATION of REALTORS®

Official Designation

green

A study conducted by the National Association of Realtors ~ "On Common Ground: Realtors & Smart Growth," ~ showed that:

57% of American voters are more likely to purchase a home near green **space**, and **50%** are willing to pay **10%** more for their home.

BENEFITS of Green Infrastructure

- Stormwater Management Improvements
- Air Quality Improvement
- Microclimate Modification
- Enriched Habitat and Biodiversity
- Localized Economic Improvement
- Recreational & Transportation Opportunities

Training that helps It all make sense

Benefits of Green Infrastructure

Urban Forest

Wildlife Habitat

Benefits of Green Infrastructure

Watershed Corridors for People and Nature

Benefits of Green Infrastructure

Enriched Habitat & Biodiversity

A variety of birds & animals indicates a healthy environment

Wildlife move along rivers and streams

Health of habitats depends on size and connectivity

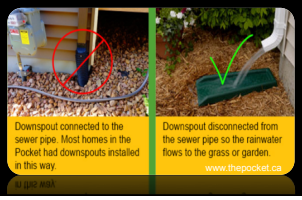
Training that helps It all make sense

Green Infrastructure
Examples

- Rain Gardens
- Stormwater Planters
- Dry wells
- Rainwater Harvesting
- Bioretention
- Infiltration Practices
- Dry Swales
- Grass Channels

Green Infrastructure
Examples

- Soil Restoration
- Site Reforestation
- Green Roofs
- Permeable Pavements
- Undisturbed Pervious Areas (Gr Space)
- Vegetated Filter Strips
- Downspout Disconnection

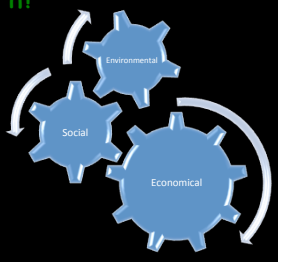


NOW WHAT?

THE GI JOURNEY
Step by Step

1) **COMMIT 100%** to **Green Infrastructure**
   Convince Yourself First!
   - **Learn** about your community's Air/Water/Land challenges and benefits of GI
   - **Grow** - Gain Membership in Active Stormwater Organizations
2) **SEEK ADVICE** from other GI Experts with your issues
   - Establish/Create your SOP & Tool Box
3) **SET UP GI Task Force** from your Stakeholders
   - Determine Your Urban Environmental Problems
   - Determine Areas to Focus GI Efforts
   - Determine your GI Goals
   - Determine GI BMPs to accomplish your goals & be flexible!
4) **Document** Your GI Success Stories & Lessons Learned
5) **Communicate** with Stakeholders Along the Way
6) **Share Your Story** with Other Municipalities

Implementing
Green Infrastructure
is worth it!



- **Triple Bottom Line**
  - Economic benefits
  - Social benefits
  - Environmental benefits
- **Leads to Sustainable Development**

MS4 STORMWATER EFFORTS MATTER!

"THEY ARE THE GATEWAY TO AMERICAs FUTURE QUALITY OF LIFE"

Training that helps It all make sense

In SUMMARY
Ten Principles of Green Infrastructure

taken from *Green Infrastructure: Linking Landscape & Communities* by Mark Benedict and Edward McMahon, 2006

1) Connectivity is key
2) Context matters
3) Grounded in science and land use theory & practice
4) Functions as a framework
5) Planned and protected before development
6) A critical public investment
7) Benefits nature and people (for generations)
8) Respects landowners and other stakeholders
9) Requires connections within and beyond the community
10) Requires long term planning & maintenance

Insert Tab

Organic Amendment Restoration

Back of Tab

Organic Amendment Restoration of Degraded Upland Landscapes in the Chestatee-Yahoola Watershed

Presenters
Dr. Justin Ellis, Director
Jacob Roberts, GIS Specialist

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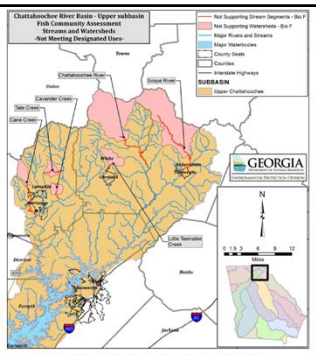

Figure 4. Fish Community Not Supporting Stream Segments and their Associated Watersheds - Upper Chattahoochee Subbasin

3 Watersheds in Chestatee Watershed Have Impaired Fish Biota Due to Sedimentation

- Chestatee River Watershed in Lumpkin County provides 28% of the annual average inflow (568 cfs) to Lake Sydney Lanier
- Home to 3 out of the 6 watersheds in the Upper Chattahoochee that **fail to support native FISH DIVERSITY** due to sedimentation.
- 14 miles of stream are impaired due to sedimentation
  - Cane Creek = 8 miles
  - Cavenders Creek = 2 miles
  - Tate Creek = 4 miles

OUR GOAL
Watershed Scale Restoration

Sediment Impacts on Fish

- During heavy rains, **turbid water clogs fish gills** increasing the release of stress hormones.
- As sediment settles, it fills all the **interstitial spaces** in the stream bed (all the openings around the cobbles and pebbles).
- Interstitial spaces is where most **fish food (benthic macroinvertebrates ie. aquatic insects**) lives underneath the rocks.

- Once this interstitial habitat has been destroyed, it **prevents fish from laying their eggs** in rock crevices or in the spaces between gravel.

Step #1 – Recognize sediment impacts

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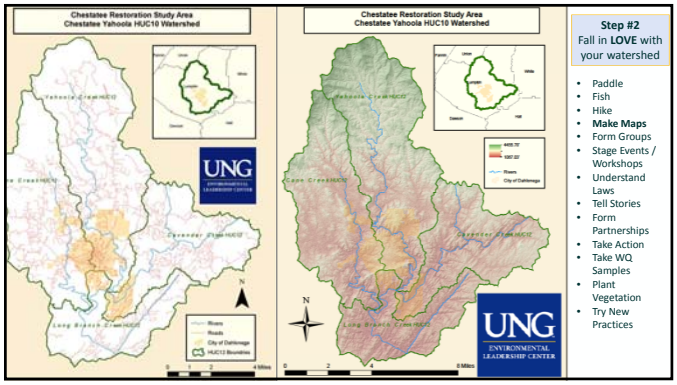

Step #2
Fall in **LOVE** with your watershed

- Paddle
- Fish
- Hike
- **Make Maps**
- Form Groups
- Stage Events / Workshops
- Understand Laws
- Tell Stories
- Form Partnerships
- Take Action
- Take WQ Samples
- Plant Vegetation
- Try New Practices

Traditional E&S BMPs at the Watershed Landscape Scale may be impractical and don't address underlying deficiencies

- Vegetation is cited as the most efficient and economic soil erosion control.
- However, for **DEGRADED LANDSCAPES** vegetative re-establishment is extremely challenging.
- Soils lack pore space, organic matter, nutrients, water holding capacity, and soil organisms that cycle nutrients back to the roots of plants.
- I.e. Soils are bare, compacted, with low pH, often red, and eroding.

Softening "Brick-like" landscapes into Green Spongy ones

For degraded landscapes additions of organic amendments (often leaf and chipped wood mulch) are the most efficient way to **stop erosion** and **kickstart secondary succession** processes.

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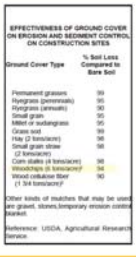
Additional Benefits of Using Organic Mulch



After vegetation, mulch is the 2nd most effective erosion control technique after compost.

Effectiveness of mulch for erosion control relative to bare soil.

Tons to the acre	C-factor
7	.08
12	.05
25	.02

Faucette, 2006

Mulch and compost provide many additional benefits other than erosion control.

- **ACTS like a SPONGE** - increasing rainfall infiltration
- **Increased vegetative productivity** due to increased nutrients, water holding capacity, and >pH (depending on feedstocks)
- **Enhanced soil ecology** which improves nutrient cycling and soil physical properties.
- Overtime, **improves soil porosity** and bulk density (due to increased activity of soil organisms).
- Increased **carbon sequestration** potential.

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2

The Revised Universal Soil Loss Equation

Step #3
Develop a **TOOL** to prioritize restoration

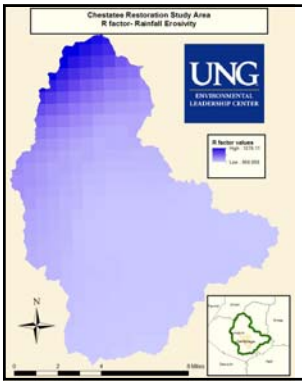
$$A = R*K*L*S*C*P$$

where A = **soil loss** (tons/acre/year)

6 factors yield a SOIL LOSS estimate
Measured in tons per acre per year

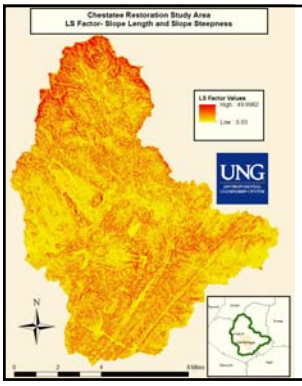
R = rainfall **erosivity** factor
K = soil **erodibility** factor
L = **slope length** factor
S = **slope gradient** factor
C = **crop/vegetation and management** factor
P = **support practice** factor (1 for watershed)
(contour farming, strip cropping, cross slope, etc.)

OUR GOAL
Demonstrate **RUSLEs** applicability for Watershed Assessment and Prioritization
GIVE to other Watersheds for ADOPTION



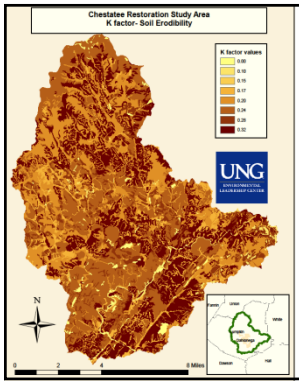
Rainfall Erosivity factor (R)

- R is defined as the average annual sum of individual storm erosion index values, EI_{30}, where E is the storm kinetic energy per unit area and I_{30} is the maximum 30 minutes rainfall intensity
- R-factor calculation is complex as it involves collection of years of storm (precipitation) intensity data
- Data used- NOAA GIS Grid Atlas Precipitation freq estimates (I_{30})
- Calculate $R = I_{30} * (331*\log_{10}(I_{30})+916)$



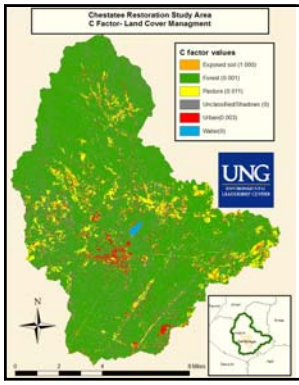
Length Slope factor (LS)

- **L- Slope Length**- ratio of soil loss to slope length
- **S- Slope Steepness**- ratio of soil loss to slope steepness
- Derived from a Digital Elevation Model (DEM)
  - Use GIS tools to get layers for Slope and Flow Accumulation
- Conditional formulas relative to standard erosion plot and slope of 22.1m at 9% slope



Soil Erodibility factor (K)

- Represents a soils susceptibility for particles to be detached by water
- Sourced from gSSURGO database
  - Field called *Kffact*
- Low K values = soils resistant to detachment (High in Clay)
- High K values = soils prone to detachment (High in Sand/Silt)



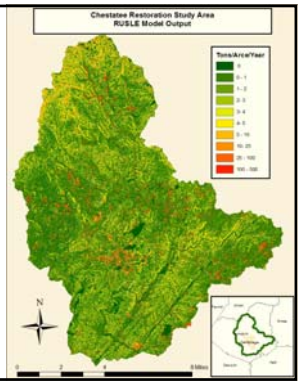
Land Cover Management factor (C)

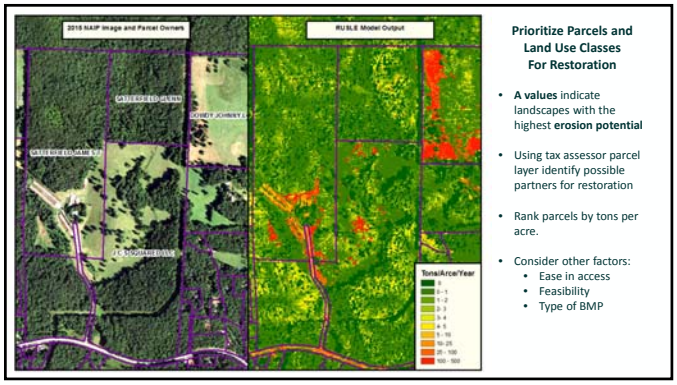
- Ratio of soil loss from a specific type of vegetation cover
- When RUSLE is done at the plot scale, precise values are associated with many different species of crops
- For the watershed scale, a few broader classes are used and the values are less precise
- We used 1m resolution imagery (4 band NAIP)
  - Supervised classification into 6 classes
- Other potential sources include LiDAR data or National Land Cover Database (30m resolution)

The Revised Universal Soil Loss Equation

$$A = R*K*L*S*C*P_{(1)}$$

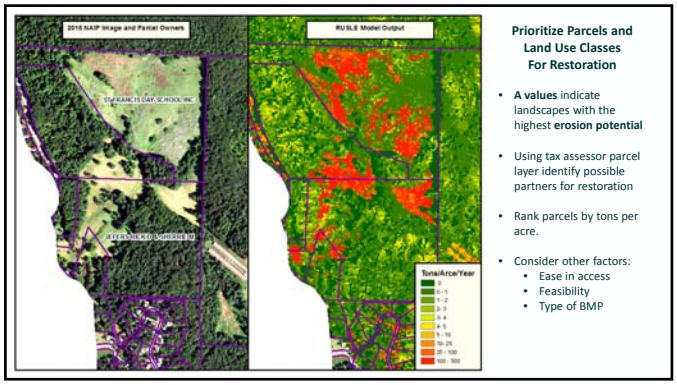
A(model output) is in Tons/Acre/Year





Prioritize Parcels and Land Use Classes For Restoration

- **A values** indicate landscapes with the highest **erosion potential**
- Using tax assessor parcel layer identify possible partners for restoration
- Rank parcels by tons per acre.
- Consider other factors:
  - Ease in access
  - Feasibility
  - Type of BMP



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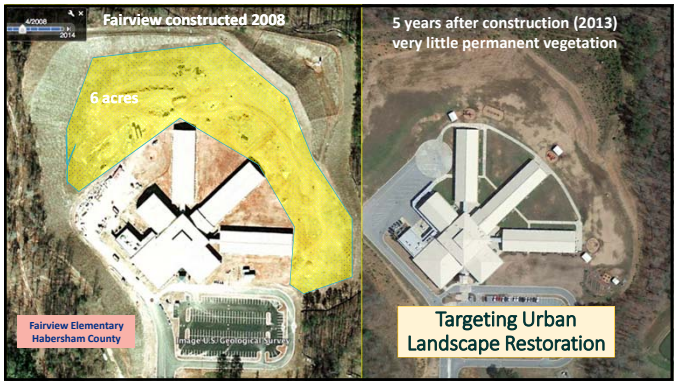



Restoration efforts began in 2013 – started with lime followed by trees


Before 2010
After 2015
Step #4
Add Organic Matter
Before 2010
After 2015


Before 2010
After 2015
Before 2010
After 2015

6

Developing Partnerships with Mulch Providers

Mulch Availability
Every county in the state of Georgia generates 100's to 1000's of tons of organic matter each and every year.

Targeting this material to priority areas has the potential to transform catchment hydrology.

Mulch Partners
Sources and partners for mulch:
- Municipal Leaf and Limb pickup
- Electric Utility right of way crews
- Tree Service companies
- DOT right of way maintenance

Straightforward Implementation

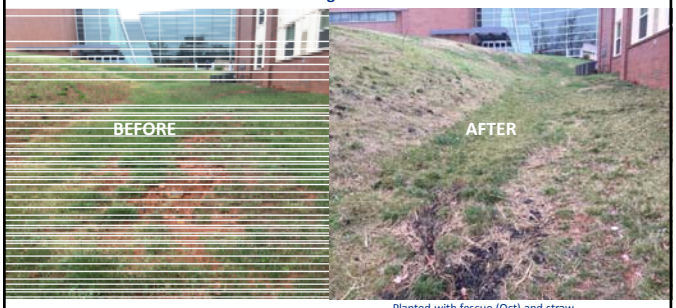

After


Stockpiled Materials to be spread in March
BEFORE


Organic amendment restoration of the Commons Residence Dorms
BEFORE
BEFORE

8

For more rapid vegetative establishment in high aesthetic areas – we utilized **aged leaf mold material**



Planted with fescue (Oct) and straw

Upland Pasture Restoration and Cattle Exclusion

Isolate cattle from sensitive areas with installation of **Temporary exclusion fencing** until full vegetative re-establishment is achieved.

Leaf mulch is an ideal organic amendment in these settings to allow more rapid decomposition and grass seed re-establishment. Wood mulch in areas that can remain untouched for 2-3 yrs.

Permanent exclusion fencing, followed by streamside plantings in the riparian buffer for bank stability.
CHALLENGE – upland watering

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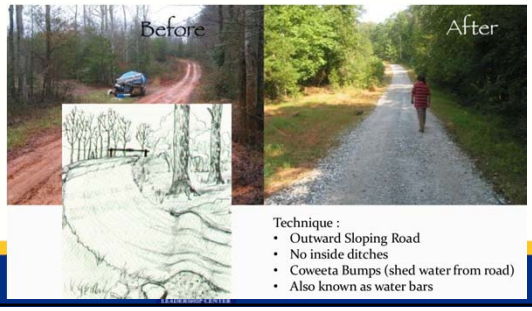
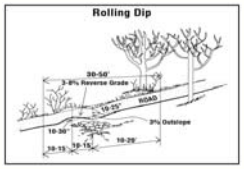
Dirt Road / Right of Way Improvement



Technique :
- Outward Sloping Road
- No inside ditches
- Coweeta Bumps (shed water from road)
- Also known as water bars

Broad-based Dips & Outward Sloped Roads



General Rule for Spacing of Dips

Road Grade, percent	Distance between dips and turnouts, feet
3	235
4	200
5	180
6	165
7	155
8	150
9	145
10	140
12	135

Source: Adapted from Georgia's Best Management Practices for Forestry

Broad-based Dips (or rolling dip)
A surface drainage diversion built into the bed of a road to intercept and divert surface water out of the road while allowing vehicles to maintain normal speeds.

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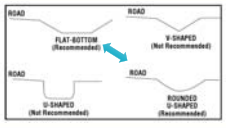
Road Side Ditches / Road Right of Ways

Ditch bottom at least **2' wide, flat, parabolic, or rounded-U** shaped, **but NOT** straight U-shaped or V-shaped.

Grade ditch and bank side slopes at **2:1 maximum slope**, i.e., 2 feet horizontal for each 1-foot vertical rise.

- Vegetated Ditches where possible
- Maintain "sheet flow" by controlling ditch shape
- Where water is concentrated - use turn-outs to to stable, mature vegetated areas.
- Avoid in-sloping roads when possible



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Sediment Loss from Utility Right of Ways

- As the RUSLE model is refined, we anticipate UTILITY Right of Ways represent a unique land class for sediment losses
- This is due to the frequent disturbance required and the steepness of slope.
- **Illegal ATV use** is an additional factor.
- We plan to work with Right of Way managers and local municipalities and law enforcement on new recommendations to address these areas.

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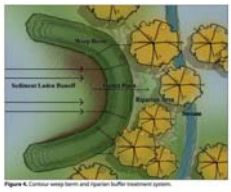
Application of New BMPs – Seep/Weep Berms



Weep berms are a type of earthen berm that slowly releases upslope runoff into a riparian area. This water is cleaner, and increased holding time of upslope water increases the productivity of riparian trees.

Slow release of water from weep berm outlet to grassed riparian zone.

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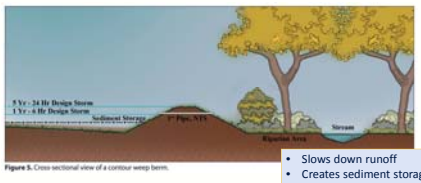
Benefits of Seep/Weep Berms



- Slows down runoff
- Creates sediment storage above a streamside area
- Reduces sediment delivery to streams
- Enhances water storage (groundwater recharge)
- Enhances streamside forests
- Captures lost upslope toposoils for reuse. It's a win, win!

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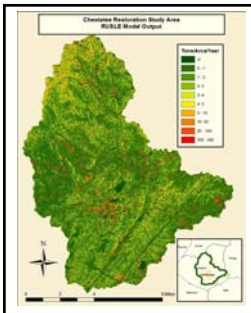

Moving Forward

- Georgia is still developing mechanisms for addressing many non-point source controls, especially in more rural counties.
- TMDLs are written but not fully implemented
- Most GA County Governments and other municipalities have GIS personnel and resources.
- RUSLE input parameters are readily available and with some guidance erosion potential priority maps can be generated at the county or sub-watershed level.

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Moving Forward

UNG ENVIRONMENTAL LEADERSHIP CENTER

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- Mobilization of mulch resources is possible in every county of the State. Prioritizing sites for restoration using RUSLE is the first step.
- Costs for spreading mulch are miniscule.
- The potential for restoration of the majority of degraded landscapes in a watershed over a period of years (decades) is significant with dramatic improvement to catchment hydrology, water quality, and ecosystems services.

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Insert Tab

Mitigation Management

Back of Tab

Mitigation Banking in Georgia

Matt Peevy

Founded **Mitigation Resource Group, LLC** in 2007.

- First consolidated holding company of bank credits in GA
- Primary investors established first stream bank in GA in 2001
- Serves as bank sponsor for 14 mitigation projects in GA
- Last bank was approved in 2015; Implemented in 2016
- Co-sponsoring mitigation proposal for Tired Creek impacts

Founded **Mitigation Management, LLC** in 2010.

- Provides credit brokerage and ecological consulting services
- Exclusive sales agent for 25 banks in GA
- Principals have had direct involvement in over 35 mitigation projects combining for more than:
  - 120 miles of stream mitigation
  - 8,500 acres of critical habitat protection

GERA

GERA is a collaboration of mitigation bankers, environmental consultants, engineers, contractors, conservation non-profits, and other professionals that are active in and committed to an ecosystem restoration marketplace in Georgia.

www.garestoration.org

What Is Mitigation Banking?

The restoration, enhancement, or preservation of a wetland, stream, or other habitat area undertaken expressly for the purpose of compensating for unavoidable resource losses in advance of development actions.

Before

After

4

Types of Permits

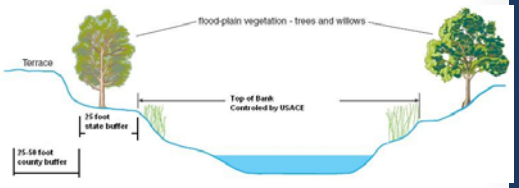
Federal:

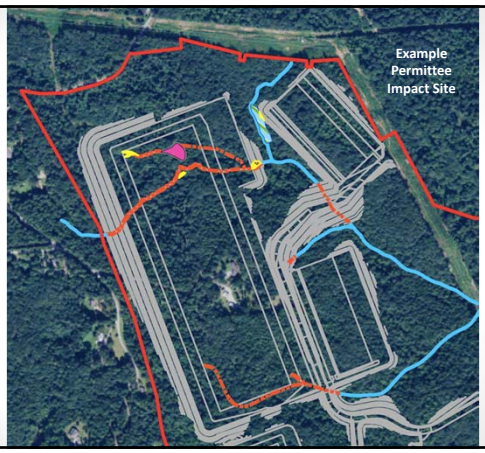
1. Nationwide – for impacts less than 300 feet of stream or .5 acres of wetlands. Typically take 45-60 days to approve.
2. Individual - for impacts greater than 300 feet of stream or .5 acres of wetlands. Typically take 6 months to a year.
3. Both permit types must prove avoidance, minimization, and mitigation (in that order).

State:

1. State Stream Buffer Variance
2. 401 Water Quality Certification (included in Nationwide permits)

Regulatory Jurisdictions





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Who needs to purchase credits?

- Residential Developers
- Georgia Department of Transportation
- Commercial and Industrial Developers
- Pipeline Companies
- Power Line Companies
- Rail Road
- Counties and Cities
- Reservoirs

Types of Mitigation Projects

1. Mitigation Banks: Credits are released to the bank sponsor based on activity and performance milestones. Credits are then sold speculatively to numerous permittees over time.
2. In-Lieu Fee (ILF): If bank credits are not available, permittees may be able to purchase credits from an ILF program. Once the ILF program has sufficient funds in a service area, it will issue an request-for-proposals for mitigation site development in that area. The funds are then released to the selected mitigation provider as its project meets activity and performance milestones and credits are released to the ILF program. Similar to a mitigation bank, except that credit revenues to the selected project sponsor are not speculative.
3. Permittee-Responsible Mitigation (PRM): If bank credits and ILF credits are not available, then permittees may be approved to implement their own mitigation project. However, often times permittees will still contract with mitigation providers to deliver the mitigation project for them. From a mitigation provider perspective, these projects are similar to ILF projects except that the client is the permittee rather than the ILF program, and there are no credit "releases" since the credits are not being transferred to third parties.

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Mitigation Banking

How Many Banks?

There are 145 public & private mitigation banks in Georgia

45,500+ acres of land protected in perpetuity

265+ miles of stream restored and preserved

21,300+ acres of wetland and upland buffer restored and preserved

Source: www.garestoration.org

Who Are Bankers?

Public Bankers:
Georgia DOT
Gwinnett County
Chatham County
City of Fairburn

Private Bankers :
Mitigation Resource Group
Timber Companies
Georgia Power
Monastery of the Holy Spirit
Elachee Nature Science Center
Piedmont College
Private Landowners

*Partial Listing

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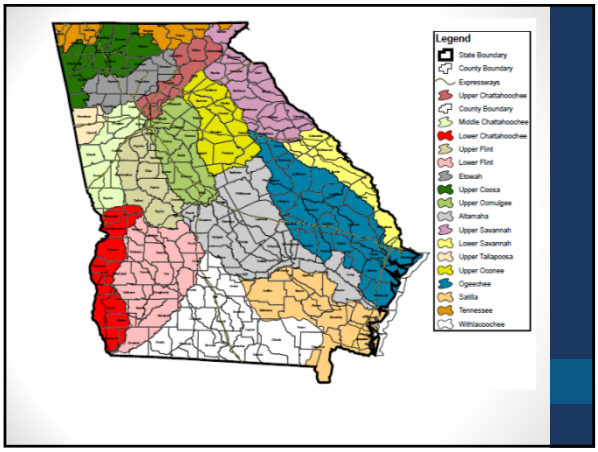
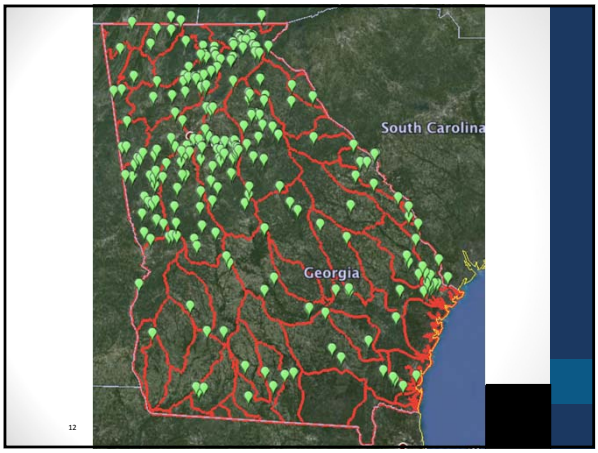
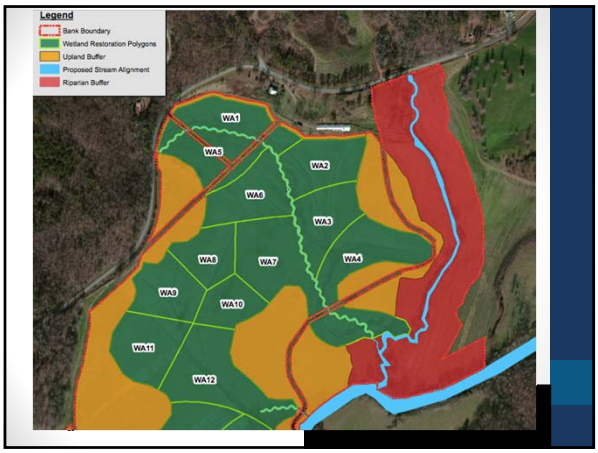






Permitting Mitigation Banks

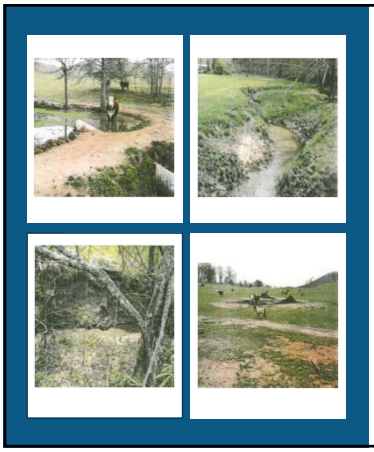
- Permitting Process:
  - IRT meeting
  - Site Visit
  - Submit Draft Banking Instrument (400-600 page document)
  - Public Notice Period, Respond to Comments
  - Submit Final Banking Instrument
  - Record Restrictive Covenants

Release Schedule Overview

Milestone	Credits Released (%)
Approval (3 - 5 Years)	10%
Implementation (12-24 Months)	10%
Monitoring (7-10 Years)	80%
Total:	100%

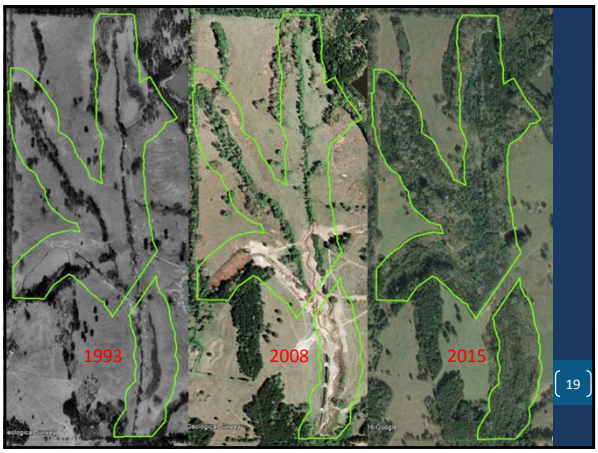
Monitoring and Maintenance

- Long Term Monitoring and Maintenance (7 years):
  - Geomorphic Measurements
  - Biological testing for fish and macro invertebrates
  - Water Quality
  - Tree Growth (301/acre with 50% survival rate)
  - Beaver, Hog, Invasive Species Control
- In order to receive future credit releases, we must demonstrate a quantifiable improvement (“ecological lift”) in our tested scores over baseline conditions.



TYPICAL BEFORE RESTORATION

FOLLOWING RESTORATION



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"Back of the Napkin" Financial Analysis

CASH IN	
Stream Credit Sales	$ 2,450,000
Wetland Credit Sales	$ 2,520,000
Land Disposition	$ 250,000
TOTAL CASH IN	**$ 5,220,000**
CASH OUT	
Land	$ (1,000,000)
Survey & Engineering	$ (120,000)
Phase I Surveys	$ (10,000)
Appraisals	$ (10,000)
Environmental Consulting	$ (100,000)
Legal	$ (25,000)
Construction of Bank	$ (500,000)
Sales Commissions (6%)	$ (298,200)
Project Mgmt Fees	$ (35,000)
Monitoring Costs	$ (175,000)
Maintenance	$ (60,000)
Long Term Stewardship	$ (100,000)
TOTAL CASH OUT	**$ (2,433,200)**
NET CASH FLOW	**$ 2,786,800**

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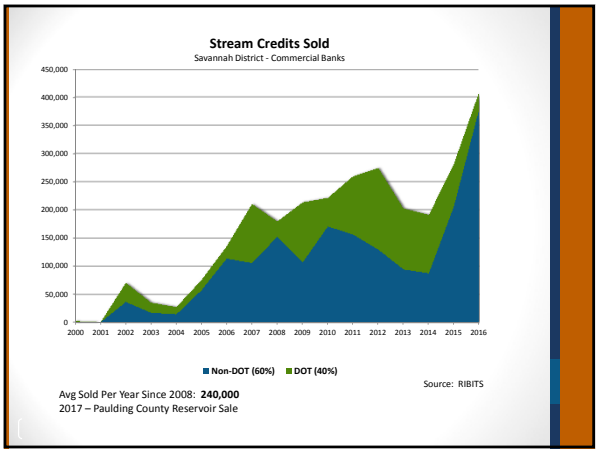
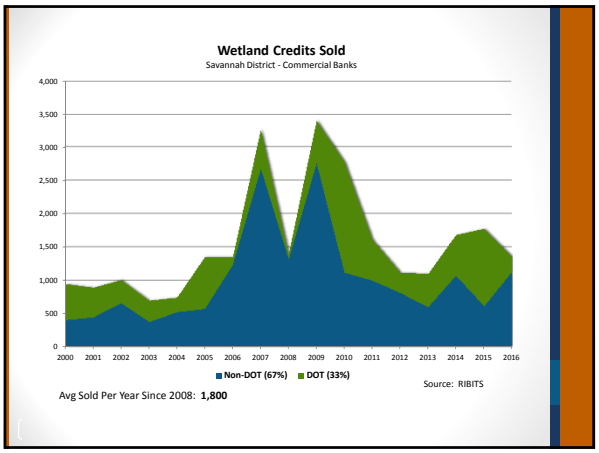
Years 1 - 8

Discounted Cash Flow Model								
Year (total)	1	2	3	4	5	6	7	8
Year (calendar)	2014	2015	2016	2017	2018	2019	2020	2021
CASH IN								
Stream Credit Sales	$ -	$ 175,000	$ 175,000	$ 175,000	$ 175,000	$ 175,000	$ 175,000	$ 175,000
Wetland Credit Sales	$ -	$ 180,000	$ 180,000	$ 180,000	$ 180,000	$ 180,000	$ 180,000	$ 180,000
Land Disposition	$ -	$ -	$ -	$ -	$ -	$ 250,000	$ -	$ -
TOTAL CASH IN	**$ -**	**$ 355,000**	**$ 355,000**	**$ 355,000**	**$ 355,000**	**$ 605,000**	**$ 355,000**	**$ 355,000**
CASH OUT								
Land	$ (1,000,000)	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Survey & Engineering	$ (60,000)	$ (60,000)	$ -	$ -	$ -	$ -	$ -	$ -
Phase I Surveys	$ (10,000)	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Appraisals	$ (10,000)	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Environmental Consulting	$ (50,000)	$ (50,000)	$ -	$ -	$ -	$ -	$ -	$ -
Legal	$ (25,000)	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Construction of Bank	$ -	$ (500,000)	$ -	$ -	$ -	$ -	$ -	$ -
Sales Commissions (6%)	$ -	$ (21,300)	$ (21,300)	$ (21,300)	$ (21,300)	$ (21,300)	$ (21,300)	$ (21,300)
Project Mgmt Fees	$ (5,000)	$ (5,000)	$ (5,000)	$ (5,000)	$ (5,000)	$ (5,000)	$ (5,000)	$ -
Monitoring Costs	$ -	$ -	$ (25,000)	$ (25,000)	$ (25,000)	$ (25,000)	$ (25,000)	$ (25,000)
Maintenance	$ -	$ -	$ (20,000)	$ -	$ -	$ (20,000)	$ -	$ -
Long Term Stewardship	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ (100,000)
TOTAL CASH OUT	**$ (1,160,000)**	**$ (636,300)**	**$ (71,300)**	**$ (51,300)**	**$ (51,300)**	**$ (71,300)**	**$ (51,300)**	**$ (146,300)**
CUMULATIVE NET CASH FLOW	**$ (1,160,000)**	**$ (1,441,300)**	**$ (1,157,600)**	**$ (853,900)**	**$ (550,200)**	**$ (16,500)**	**$ 287,200**	**$ 495,900**
CUMULATIVE IRR	**0.00%**	**0.00%**	**0.00%**	**0.00%**	**0.00%**	**0.00%**	**0.00%**	**-33.30%**

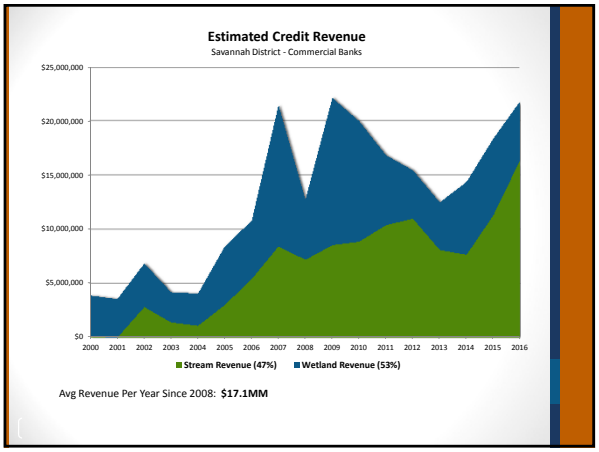
Years 9 - 15

Discounted Cash Flow Model							
Year (total)	9	10	11	12	13	14	15
Year (calendar)	2022	2023	2024	2025	2026	2027	2028
CASH IN							
Stream Credit Sales	$ 175,000	$ 175,000	$ 175,000	$ 175,000	$ 175,000	$ 175,000	$ 175,000
Wetland Credit Sales	$ 180,000	$ 180,000	$ 180,000	$ 180,000	$ 180,000	$ 180,000	$ 180,000
Land Disposition	$ -	$ -	$ -	$ -	$ -	$ -	$ -
TOTAL CASH IN	**$ 355,000**	**$ 355,000**	**$ 355,000**	**$ 355,000**	**$ 355,000**	**$ 355,000**	**$ 355,000**
CASH OUT							
Land	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Survey & Engineering	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Phase I Surveys	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Appraisals	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Environmental Consulting	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Legal	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Construction of Bank	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Sales Commissions (6%)	$ (21,300)	$ (21,300)	$ (21,300)	$ (21,300)	$ (21,300)	$ (21,300)	$ (21,300)
Project Mgmt Fees	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Monitoring Costs	$ (25,000)	$ -	$ -	$ -	$ -	$ -	$ -
Maintenance	$ (20,000)	$ -	$ -	$ -	$ -	$ -	$ -
Long Term Stewardship	$ -	$ -	$ -	$ -	$ -	$ -	$ -
TOTAL CASH OUT	**$ (66,300)**	**$ (21,300)**	**$ (21,300)**	**$ (21,300)**	**$ (21,300)**	**$ (21,300)**	**$ (21,300)**
CUMULATIVE NET CASH FLOW	**$ 784,600**	**$ 1,118,300**	**$ 1,452,000**	**$ 1,785,700**	**$ 2,119,400**	**$ 2,453,100**	**$ 2,786,800**
CUMULATIVE IRR	**-19.43%**	**-9.87%**	**-3.13%**	**1.75%**	**5.38%**	**8.15%**	**10.28%**





Avg Sold Per Year Since 2008: **1,800**



Avg Revenue Per Year Since 2008: **$17.1MM**

Wetland Credit Supply

Basin	Years	Credits	Credit Sales per Year	Remaing Credits	Years
Altamaha	13	(4,647.00)	(357.46)	6,641.00	18.58
Coosa	13	(120.60)	(9.28)	15.86	1.71
Etowah	15	(375.50)	(25.03)	307.12	12.27
Lower Chattahoochee	14	(874.44)	(62.46)	833.03	13.34
Lower Flint	0	-	-	0.00	-
Lower Savannah	19	(2,139.00)	(112.58)	1,281.00	11.38
Middle Chattahoochee	19	(873.02)	(45.95)	113.00	2.46
Ocmulgee	20	(1,070.00)	(53.50)	143.27	2.68
Oconee	15	(470.79)	(31.39)	70.80	2.26
Ogeechee	20	(4,084.00)	(204.20)	3,473.00	17.01
Satilla	13	(1,676.00)	(128.92)	4,956.00	38.44
Tidal	20	(752.09)	(37.60)	574.00	15.26
Tennessee	10	0	-	19.40	-
Upper Chattahoochee	13	(67.99)	(5.23)	201.53	38.53
*Upper Flint **	*13*	*(4,715.58)*	*(362.74)*	*3,094.00*	*8.53*
***Upper Flint ** **	***13***	***(4,715.58)***	***(43.00)***	***3,094.00***	***71.95***
Upper Savannah	13	(87.06)	(6.70)	0.67	0.10
Withlacoochee	17	(3,048.00)	(179.29)	4,495.00	25.07

***Skewed due to Magnolia Swamps Service Area Change. Basin typically only average 43 wetland credits until service area change.*

Healty Markets to invest in are typically around 5 – 7 years of supply

Stream Credit Supply

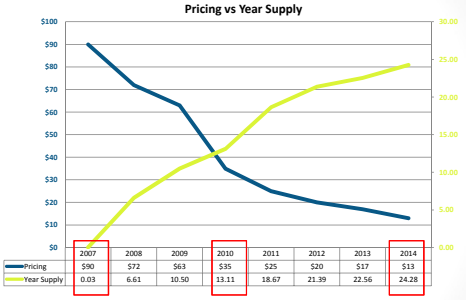
Basin	Stream Credit Sales Years	Credits	per Year	Remaing Credits	Years
Altamaha	13	(197,384.00)	(15,183.38)	698,561.00	46.01
Coosa	13	(235,923.00)	(18,147.92)	303,611.00	16.73
Etowah	13	(417,274.00)	(32,098.00)	661,703.00	20.62
Lower Chattahoochee	13	(161,373.00)	(12,413.31)	314,774.00	25.36
Lower Flint	0	-	-	0.00	-
Lower Savannah	13	(105,540.00)	(8,118.46)	86,172.00	10.61
Middle Chattahoochee	13	(398,677.00)	(30,667.46)	1,120,696.83	36.54
Ocmulgee	13	(281,307.00)	(21,639.00)	953,520.00	44.06
Oconee	13	(316,056.00)	(24,312.00)	507,927.00	20.89
Ogeechee	5	(18,446.00)	(3,689.20)	197,934.00	53.65
Satilla	0	-	-	0.00	-
Tidal	0	-	-	0.00	-
Tennessee	10	(4,917.00)	(491.70)	27,868.50	56.68
Upper Chattahoochee	13	(308,806.00)	(23,754.31)	643,772.00	27.10
Upper Flint	13	(210,695.00)	(16,207.31)	666,483.00	41.12
Upper Savannah	13	(202,491.00)	(15,576.23)	323,257.61	20.75
Withlacoochee	13	(28,891.00)	(2,222.38)	12,226.75	5.50

Healty Markets to invest in are typically around 5 – 7 years of supply

Submarket Example:

Stream Credit Inventory in Middle Chattahoochee

Pricing vs Year Supply



	2007	2008	2009	2010	2011	2012	2013	2014
Pricing	$90	$72	$63	$35	$25	$20	$17	$13
Year Supply	0.03	6.61	10.50	13.11	18.67	21.39	22.56	24.28

86% Decrease in Credit Pricing

Why is year supply of credits important?

- Appropriately priced mitigation reinforces avoidance & minimization
- Financial bank failure can lead to regulatory bank failure
- More efficient allocation of regulatory resources

MARKET CHALLENGES

Regulatory
Standard Service Areas
SOP Credit Generation
Success Guidelines
Mitigation Hierarchy Preferences (Key Personnel)

Market
Supply – Existing Banks, Future Competition, Barriers to Entry
Demand – Historical Sales, Future Estimates, Demand Drivers

Project
Bank Approval
Implementation & Maintenance
Monitoring & Performance Standards

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FUTURE OF BANKING IN GA

1. Definition of ''Waters of the United States''
2. Trump Administration Changes
    1. Infrastructure Bill
    2. Faster permits
    3. Pro Mitigation Banking?
3. SOP "No Net Loss" Fix
    1. USACE currently working on fix
4. GIS Enforcement
5. New Credit Programs
    a. USFWS – Darters, Bats, Migratory Birds, etc.
    b. NMFS – Essential Fish Habitat, others
    c. DOI currently curbing most of these programs?

Contact Information

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