



**Application for Section 319
Non Point Source Pollution Control Grant -- FY2011**

NC Division of Water Quality
North Carolina Department of Environment and Natural Resources

1. Project Title	Involving the Community to Implement the Bolin Creek Watershed Pan
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2a. Grantee Primary Contact or Project Manager¹					
Name	Christy Perrin				
Title	Program Manager				
Organization	Watershed Education for Communities and Officials, NC State University				
E-mail	christy_perrin@ncsu.edu				
Address	Campus Box 8109				
City	Raleigh	State	NC	Zip	27695
Telephone	919-515-4542	Fax Number	919-515-1824		

¹ A one-page Statement of Qualifications must be provided in Section 2d below

2b. Grantee Execution Address (where contract will be mailed for signature)					
Name	Matt Ronning				
Title	Associate Vice Chancellor, Research Admin				
Organization	North Carolina State University				
E-mail	sps@ncsu.edu				
Address	2701 Sullivan Drive, Administrative Services III, CB 7514				
City	Raleigh	State	NC	Zip	27695-7514
Telephone	919-515-2444	Fax Number	919-515-7721		
Federal Tax ID Number	56-6000756				

2c. Grantee Payment Address (where invoice payments will be mailed)					
Name	Julie Brasfield				
Title	Director, Contracts and Grants				
Organization	NC State University				
E-mail	julie_brasfield@ncsu.edu				
Address	2701 Sullivan Drive, Administrative Services III, Box 7214				
City	Raleigh	State	NC	Zip	27695-7214
Telephone	919-515-2153	Fax Number	919-515-4693		

2d. Required Statement of Qualifications (to confirm that anyone designing, installing, or monitoring the proposed project is qualified to do so. Include in the statement any past and/or ongoing 319 grant funded projects.)

Principal Investigator: Christy Perrin, M.P.A.; NCSU Dept. Agricultural & Resource Economics. Manages Watershed Education for Communities & Officials, and has managed watershed projects since 2000, including identifying and implementing stormwater retrofits. She has extensive training in public involvement, project management, and dispute resolution. Ms. Perrin coordinates all activities, designs and conducts outreach and involvement.

Christy is PI on the following EPA319 grants, and was co-PI on all others listed by Beggs:

1. Less rain down the drain: Disconnecting stormwater systems to restore Black Creek (FY09)
2. Collaborative restoration & protection of resources in Tick Creek and Rocky River (FY08)
3. Black Creek Watershed Assessment and Planning (FY06)
4. LID for Stormwater Management Guidance for North Carolina (FY06)
5. Burnt Mill Creek Watershed in Wilmington, NC: Local watershed restoration through stormwater management projects, and community involvement (FY04)
6. White Oak River Watershed: improving shellfish resources through sw management(FY02)

Co-PI: Patrick Beggs

Patrick is a project coordinator for Watershed Education for Communities and Officials, a NC Cooperative Extension program housed in NCSU Agricultural and Resource Economics. As a practitioner in the fields of alternative dispute resolution, public involvement, and education, Patrick has extensive training, which also includes identification and implementation of stormwater retrofits and conflict assessment.

Patrick was PI on the following EPA 319 grants, and co-PI or actively involved on all others listed by Perrin:

1. Implementing NCNEMO: Protecting water quality - land use ed. & capacity bldg (FY08)
2. LID & Green Building Training Curriculum for NC (FY07)
3. Transylvania County Watersheds: Connecting land use and water quality (FY06)

Carolyn Buckner, P.E., has an MS in Environmental Engineering and was employed by NCSU Dept. Biological and Agricultural Engineering before focusing on raising her children and working on environmental issues within the Town of Carrboro. She has experience organizing and working with stakeholders to plan, design, implement, and evaluate best management practices to improve the health of streams and estuaries. She has training in fluvial geomorphology and natural channel design and co-authored Hydraulic Geometry Relationships for Urban Streams throughout the Piedmont of North Carolina. Carolyn has served on the Town of Carrboro's Environmental Advisory Board and Greenways Committee, and has coordinated several educational outreach forums in the community in partnership with the Friends of Bolin Creek and the Haw River Assembly. While at NCSU, Carolyn served as the project leader for the following 319 projects:

1. Upper Neuse Urban Watersheds Project. (FY97)
2. Coastal Urban and Recreational Best Management Practice Demonstration Project. (FY96).
3. Storm Drain Stenciling and Project HERO - Help the Environment by Recycling Used Oil. (FY96).

319(h) Grant Funds Requested	\$108,284	4. Type of Funding Requested (check one)	Competitive Base	Restoration (Incremental)
				X
Match funds or in-kind Match Services	\$74,182	5. Type of Project (check one)	X	Development or implementation of a Watershed Restoration Plan
				Development or implementation of a TMDL
3. Total Project Cost	\$182,466			Innovative BMP Technology Demonstration
				Education/Technology Transfer
				Other: (please indicate)

6. Do you propose to install BMPs or other ag management measures that would be eligible for NC Agricultural Cost Share Program (ACSP) funding? If Yes, please document that the demand for ACSP funding in your county exceeds the supply, prompting your application for a 319(h) grant.

Yes	No <input checked="" type="checkbox"/>
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7. General Goal of Project (Check all that apply)	Protect and/or Maintain Water Resource Quality	Restore Water Resource Quality	Educate	
		X	X	
8. Project Start Date	1/1/2011	Project End Date		12/31/2014
9. Geographic Coverage	Statewide	Regional	Watershed	Site Specific
			X	

10. Project Location – REQUIREMENT: Important to submit as completely as possible, especially the Lat/Long coordinates and 303(d) List Assessment Unit Number.
 (NOTE: Payment of 319 Invoices will be held if all required information is not submitted in quarterly reports and the final reports, AU numbers, Lat/Long, and coordinates for all installed BMP practices)

River Basin(s)	Cape Fear River Basin	
Watershed	Bolin Creek (drains to Jordan Lake)	
Watershed size	7800 acres	
303(d) listed Stream (type yes or no, define if yes)	YES	Impaired for Biological Integrity
303(d) List (Assessment Unit)	16-41-1-15-1-(0.5)b	
HUC(s) (12 digit USGS Hydrologic Unit Codes)	03030002060100	
County(ies)	Orange	
USGS. 7.5 minute topographic quadrangle map(s) in project area	Chapel Hill, NC Quad	
Position coordinates of project location	Latitude	35° 55' 00"
	Longitude	79° 03' 30"

11. NPS Pollution Sources to be addressed (Check all that apply)

	Agriculture		Waste Disposal (includes onsite systems)
	Construction		Hydrologic Modification
	Silviculture		Marina and Recreational Boating
YES	Urban runoff/Stormwater		Groundwater Loading
	Resource Extraction		Natural Sources
	Habitat Modification (drainage/filling wetlands, streambank destabilization)		Other: (please specify)

12. NPS Pollutants to be addressed (check all that apply)

YES	Excess Nitrogen		Pesticides
YES	Excess Phosphorus		Oil and grease
YES	Sedimentation		Temperature
	Pathogens/Bacteria		pH
	Metals		Alterations
YES	Low dissolved oxygen		Other: (please specify)

13. Estimate Load Reduction, if checked for excess nitrogen, excess phosphorus and/or sedimentation ²		
# pounds of nitrogen saved	8 lbs/year	Reference: Earth Tech 2007. Bolin Creek Watershed Geomorphic Analysis and Potential Site I.d. for Stormwater structures and retrofits. Low cost/high visibility BMPs #8 & #18 removals used as proxy.
# pounds of phosphorus	.8 lbs /year	
# tons of soil saved from project implementation	.1 tons	
Load Reduction Model Used: export coefficient		Reference: Schueller 2007

² Providing a load reduction estimate is required for all BMP implementation projects, including demonstrations.

14a. Do you intend for collected data to be used by DWQ for Use Support decisions?	
NO	Explanation:
14b. Does this proposal address needs that were identified in a DWQ basin plan? If yes, please identify the specific need and the basin in which the need is outlined.	
YES	Explanation: The 2005 Plan recommends stormwater retrofits. This project will engage stakeholders in helping to identify and implement retrofits.

15. Project Abstract (short concise summary of the project – DO NOT EXPAND SPACE PROVIDED)
<p>Bolin Creek is an impaired urban watershed selected by NCDWQ and USEPA for restoration and assistance. Assessments identified several stressors: habitat degradation, riparian degradation, channel incision, low base flow, and toxicity. NCDWQ recommended stormwater retrofit projects to mitigate effects of existing development. The Bolin Creek Watershed Restoration Team (BCWRT)- Towns of Carrboro and Chapel Hill, NC DWQ, USEPA, and NCSU Dept. of Biological and Ag. Engineering- have identified and are doing stream restoration and stormwater retrofits, and drafting a 9- element watershed plan with current grants. The plan provides a strong technical basis for future restoration efforts, but BCWRT has been challenged to effectively engage the community so the plan also inspires citizens and leverages investment. Challenges include: 1) Chapel Hill & Carrboro have very engaged and often outspoken citizens. Several active advocacy-based citizens groups have formed recently, with differing perspectives on riparian management. Achieving buy in and consensus requires strong experience in and time spent on conflict management and public outreach. The staff working on behalf of BCWRT are not able to offer these services; 2) Some groups are mistrustful of the Towns due to growing pains of development and socioeconomic differences; 3) The new Jordan Lake Nutrient Strategy and pending NPDES Phase II permits require significant local staff time, and complicate the public's understanding of watershed restoration efforts; and 4) Significant local economic difficulty means limited staff capacity for non-regulatory efforts such as restoration. Local service demands are increasing and revenues are decreasing. BCWRT seeks to supplement their expertise in engineering, monitoring and restoration by inviting WECO to provide leadership in collaborative watershed management and public involvement. Successful restoration requires integrating social complexities along with the technical- most projects don't get in the ground without public involvement. BCWRT is reaching the limit of projects they can implement without actively involving the community. Watershed stakeholders are informed of Bolin Creek watershed restoration efforts, but have not yet been actively engaged in the effort yet. This project leverages current efforts and parlays those into long term success by inviting the various groups to join an "umbrella" organization to create synergy among their efforts, rather than competition. A situation assessment to be conducted in summer 2011 by WECO using current grant resources will be used to design the public involvement process portion of the watershed plan. This project will engage diverse groups in watershed visioning, sharing information, identifying watershed projects, and implementing stormwater retrofits in Carrboro and Chapel Hill. This is crucial for building trust among all parties, identifying new funding, and identifying and implementing projects that will welcomed with excitement by landowners and neighbors.</p>

NC Application for Section 319 NPS Pollution Control Grant

16a. BUDGET - 319 Funding Requested						
Budget Categories	Section 319 Grant Funds only				Total	Justification (Include detailed explanation for each budget line item)
	Year 1	Year 2	Year 3	Year 4		
Personnel/Salary	9132	15980	16779	5873	\$47,764	WECO staff to coordinate, facilitate, provide outreach, BMP id, admin
Fringe Benefits	2557	4475	4698	1645	\$13,375	28% as per NCSU
Supplies	100	400	400	100	\$1,000	BMP and outreach materials, publications,
Equipment					\$0	
Travel	100	150	150	100	\$500	To/from watershed
Contractual	3500	14500	14500	3000	\$35,500	Local consultant engineer for BMP id, design, construction; NRLI holds 1 skills building workshop (\$500)
Mailings	100	100	100	0	\$300	To stakeholders
Total Direct	\$15,489	\$35,605	\$36,627	\$10,718	\$98,439	
Indirect (max. 10% of direct costs, per 40 CFR 35.268)	1549	3561	3663	1072	\$9,845	
Annual Totals	\$17,038	\$39,166	\$40,290	\$11,790	\$108,284	
Grand Total	\$108,284					
% of Total Budget	59%					

#20

- Year 2:** July 1, 2012-June 30, 2013 (12 months) – Total MUST equal sum of quarters 3-6 in Milestone Table #20
- Year 3:** July 1, 2013-June 30, 2014 (12 months) – Total MUST equal sum of quarters 7-10 in Milestone Table #20
- Year 4:** July 1, 2014-December 31, 2014 (6 months) – Total MUST equal sum of quarters 11-12 in Milestone Table #20

16b. BUDGET - Match Funding Provided						
Budget Categories	Non-Federal Match only³				Total	Justification (Include detailed explanation for each budget line item)
	Year 1	Year 2	Year 3	Year 4		
Personnel/Salary	\$6,700.00	\$13,253.00	\$10,488.00	\$5,000.00	\$35,441	Dr. Laura Taylor, consult on financial planning; Towns of Carrboro/Chapel Hill staff
Fringe Benefits	\$729.00	\$1,148.00	\$402.00	\$0.00	\$2,279	Benefits for Dr. Taylor
Supplies					\$0	
Equipment					\$0	
Travel					\$0	
Contractual	\$0.00	\$2,000.00	\$4,100.00	\$2,000.00	\$8,100	Chapel Hill monitoring
Other					\$0	
Unrecovered direct	\$5,072.40	\$10,791.60	\$9,818.25	\$2,679.50	\$28,362	Underrecovered Facilities & admin costs from DENR/NCSU rate of 25%. NCSU salary match under-recovered at NCSU rate of 25%
Total Direct	\$7,429	\$16,401	\$14,990	\$7,000	\$74,182	
Indirect (max. 10% of direct costs, per 40 CFR 35.268)					\$0	
Annual Totals	\$12,501	\$27,193	\$24,808	\$9,680	\$74,182	
Grand Total	74,182					
% of Total Budget	41%					
Project Budget	Total 319 Fund Request + Total Match Funds Received					\$182,466

³Note: Non-Federal match must be a minimum of 40% of the total project budget

#20

Year 2: July 1, 2012-June 30, 2013 (12 months) – Total MUST equal sum of quarters 3-6 in Milestone Table #20

Year 3: July 1, 2013-June 30, 2014 (12 months) – Total MUST equal sum of quarters 7-10 in Milestone Table #20

Year 4: July 1, 2014-December 31, 2014 (6 months) – Total MUST equal sum of quarters 11-12 in Milestone Table #20

17. Budget Summary (Combined federal and match funds)							
	BMP Installation	Project Management	Education Training or Outreach	Monitoring	Technical Assistance	Other	Total
Personnel	\$16,302.80	\$11,526.40	\$40,184.80	\$6,750.00	\$8,441.00		\$83,205
Fringe	\$2,675.00	\$1,337.50	\$9,362.50		\$2,279.00		\$15,654
Supplies	\$700.00	\$0.00	\$300.00				\$1,000
Equipment							\$0
Travel		\$0.00	\$500.00				\$500
Contractual	\$35,000.00		\$500.00	\$8,100.00			\$43,600
Other			\$300.00				\$300
Operating	\$11,484.92	\$11,484.92	\$11,484.92		\$3,752.00		\$38,207
Total	\$66,163	\$24,349	\$62,632	\$14,850	\$14,472	\$0	\$182,466

18. Local and State Match (non-federal) Summary	
Total Match amount	\$74,182
Cash Match	\$10,720
In-kind Match	\$63,462
Source(s) of Cash Match	Salary and benefits for Dr. Laura Taylor to provide technical assistance on funding watershed restoration.
Source(s) of In-kind Match	Salary and benefits for Town of Carrboro and Town of Chapel Hill staff to participate in all activities. Chapel Hill contract with consultant to monitor Bolin Creek. Under-recovered F&A on request. F&A on NCSU match.

19. Project Partners (may add more, if needed)⁴			
Agency Name	Town of Carrboro		
Agency Address	301 West Main Street, Carrboro, NC 27510		
Role/contribution to Project	Coordinate with Town, manage monitoring, assist in all aspects		
Contact Person	Randy Dodd	Phone No.	
E-mail address	RDodd@ci.carrboro.nc.us		
Agency Name	Town of Chapel Hill		
Agency Address	405 Martin Luther King Jr., Blvd., Chapel Hill, NC		
Role/contribution to Project	Coordinate with Town, manage monitoring, assist in all aspects		
Contact Person	Trish D'Arconte	Phone No.	919-969-7202
E-mail address	pdarconte@townofchapelhill.org		
Agency Name	NCSU Dept. Agricultural and Resource Economic		
Agency Address	NCSU Campus Box 8109		
Role/contribution to Project	Beggs (WECO)- public involvement, outreach; Taylor- advise on watershed finance		
Contact Person	Patrick Beggs, Dr. Laura Taylor	Phone No.	919-515-4525
E-mail address	patrick_beggs@ncsu.edu; laura_taylor@ncsu.edu		
Agency Name	UNC-Chapel Hill		
Agency Address	EHS Dept., 1120 Estes Dr. Ext., CB 1650, Chapel Hill, NC 27599-1650		
Role/contribution to Project	Coordinate with UNC-CH stormwater management efforts		
Contact Person	Sharon Myers	Phone No.	919-962-9752
E-mail address	samyers@email.unc.edu		
Agency Name	Orange County		
Agency Address	131 West Margaret Lane, Hillsborough, NC 27278		
Role/contribution to Project	Coordinate with County watershed and stormwater efforts		
Contact Person	Terry Hackett	Phone No.	919-245-2588
E-mail address	thackett@orange.nc.us		
Agency Name	Orange County Water And Sewer Authority (OWASA)		
Agency Address			
Role/contribution to Project	Coordinate with OWASA efforts		
Contact Person	Ed Holland	Phone No.	(919) 968-4421
E-mail address	eholland@owasa.org		
Agency Name	Orange County Cooperative Extension		
Agency Address	P.O. Box 8181 Hillsborough, NC 27278		
Role/contribution to Project	Assist with public outreach, engage Master Gardeners in projects		
Contact Person	Carl Matyac	Phone No.	(919) 245-2051
E-mail address	919-250-1116		
Agency Name	Carolyn Buckner, Engineering Consultant		
Agency Address			
Role/contribution to Project	Coordinate with SWCD efforts		
Contact Person	Carolyn Buckner	Phone No.	(919)932-3576
E-mail address	carolyn.mojonnier.buckner@gmail.com		

20. Project Milestone Schedule		
Time Period/Date	Activities (List specific quantifiable outputs or activities that will be achieved during each quarter)	Anticipated Amount and % of Requested Funding Spent by Quarter ⁵
First Quarter Jan-Mar 2012	Publicize results of situation assessment and get feedback on public involvement plan. Convene watershed umbrella group. Provide collaborative skills workshop, develop watershed vision. Create communication structure- website, email listserve, blog and/or social network sites. Bolin Creek benthic sampling. Submit quarterly reports for every quarter	10% 10% \$ 10,828
Second Quarter Apr-June 2012	Watershed group meets- members share their work & plans, review EPA watershed plan. Group tours watershed to view areas of concern and successful projects, begins identifying potential additions to watershed plan if needed. Bolin Creek benthic results reported to stakeholders.	6% 16% \$ 6,210
Third Quarter July-Sept 2012	Watershed group meets- members review projects identified by BCWRT(e.g.EarthTech report, EEP, staff), suggest additional sites, determine criteria for selection and prioritize projects for implementation.	11.00% 27% \$ 11,911
Fourth Quarter Oct-Dec 2012	Watershed group meets. Two retrofit sites are selected for implementation, outreach to landowners and neighbors through one-on-one meetings and/or public workshops.	9.00% 36% \$ 9,746
Fifth Quarter Jan-Mar 2013	Project team revises watershed plan as needed. Create draft designs for retrofits, work with landowner/neighbors on revisions as needed. Benthic sampling conducted.	9.00% 45% \$ 9,746
Sixth Quarter Apr-Jun 2013	Watershed group meets, learns about financial planning for watershed restoration, brainstorms long-term funding mechanisms. Continue with draft designs, working on revisions, bidding for contractors conducted for any grading/infrastructure work. Benthic sampling results reported.	7.17% 52% \$ 7,764
Seventh Quarter July-Sept 2013	Construct first retrofit. Engage volunteers in helping to install plants. Create and install educational sign. Publicize outreach and involvement strategy through public workshop, and/or visits to community groups and neighborhoods.	11.00% 63% \$ 11,911
Eighth Quarter Oct-Dec 2013	Watershed group meets. Construct second retrofit. Engage volunteers in helping to install plants. Conduct outreach event to publicize successes.	11.00% 74% \$ 11,911
Ninth Quarter Jan-Mar 2014	Project team writes grant proposals if determined as needed. Create draft designs for two more retrofits, work with landowners/neighbors. Benthic sampling.	9.00% 83% \$ 9,746
Tenth Quarter Apr-June 2014	Watershed group meets. Benthic sampling results reported. Continue revising draft designs to get the two retrofits "shovel ready" for when construction funding is acquired.	6.21% 89% \$ 6,722
Eleventh Quarter ⁶ July-Sept 2014	Watershed group reviews EPA watershed plan to determine if any revisions needed based on recent data and work completed. Project team revises plan as needed.	1% 90% \$ 962
Twelfth Quarter Oct-Dec 2014	Project team finishes any grant proposals, watershed plan revisions as needed. Final EPA310 Report submitted.	10% 100% \$ 10,828

⁵ Please show anticipated dollar amount, percent of grant spent that quarter, and cumulative percent of grant spent. Unused funds will carry forward to next quarter. Invoices exceeding budgeted amount for state fiscal year (July-June) won't be reimbursed until next state fiscal year.

⁶ 10% of grant will be held until receipt of Final Project Report

Note: Sum of funds spent in quarters 1-2 MUST equal year 1 total in Budget Table #16a
Sum of funds spent in quarters 3-6 MUST equal year 2 total in Budget Table #16a
Sum of funds spent in quarters 7-10 MUST equal year 3 total in Budget Table #16a
Sum of funds spent in quarters 11-12 MUST equal year 4 total (min. 10% of 319 funds)

21. Background and goals of the project. Expand space, if necessary

Background

Bolin Creek drains a roughly 12 square mile watershed in central North Carolina. Its headwaters are in Orange County, north and west of the Town of Carrboro. Flowing south and east, Bolin Creek flows through the Towns of Carrboro and Chapel Hill. It is one of two major tributaries to Little Creek, which eventually flows to Jordan Lake, in the Cape Fear River Basin. Moving downstream, the Bolin Creek watershed transitions from rural to suburban to dense urban.

Bolin Creek is impaired for biological integrity (NCDENR-DWQ). It shows a progressive decline in watershed functional health from upstream to downstream (EEP August 2004). Assessments of the Bolin Creek watershed determined that several effects of urbanization, including habitat degradation, riparian degradation, channel incision, low base flow, and toxicity, were the primary factors stressing this watershed. Other stressors included temperature ranges and extremes, high BOD/COD, nutrients, and cross-connections or leaks from sanitary sewer lines. NCDWQ recommended stormwater retrofit projects be implemented to mitigate the effects of existing development (NCDENR-DWQ WARP June 2003).

In 2006, Bolin Creek was selected as one of only seven watersheds in the state to receive focused assistance from DENR and EPA to remove Bolin Creek from the 303(d) list. The Bolin Creek Watershed Restoration Team (BCWRT) formed in 2006 to participate in EPA's Watershed Restoration Program. The BCWRT includes Chapel Hill, Carrboro, DWQ, NCSU Dept. of Biological and Agricultural Engineering, and USEPA staff.

In 2007, the BCWRT received a Clean Water Management Trust Fund mini-grant to conduct a detailed geomorphic assessment of stream reaches to identify areas of erosion, instability, and other high risk locations. The result of this work was a geomorphic analysis and identification of 32 high priority potential stormwater management measures and stream restoration, prioritized on the severity and urgency of the problem, by ease of construction and opportunity for public involvement (Earth Tech – November 2007).

In 2008 and 2009 the Towns received 319 grants to fund the following identified projects:

- 1.completion of a comprehensive nine step watershed restoration plan for Bolin Creek;
- 2.restoration and stormwater management for a tributary to Mill Race in Chapel Hill;
- 3.restoration and stormwater management for a tributary to Tanyard Branch at Baldwin Park on the Chapel Hill/Carrboro line;
- 4.an analysis of alternatives to in-stream mitigation for the Tanyard Branch subwatershed to support success of recommended restoration in a highly urbanized area;
- 5.site and watershed monitoring to demonstrate measureable improvements from projects and improve baseline information
- 6.installation of a cistern and bioretention area at McDougle School, a public middle school, as a demonstration and education retrofit;
- 7.restoration of an intermittent stream, Dry Gulch, including streambank stabilization and stream restoration; and
- 8.continuation of runoff monitoring of the Pacifica subdivision, a Low Impact Development (LID) site adjacent to Dry Gulch being monitored by NCSU with 319 funds, for an additional 2 years.

Of these, Baldwin Park and McDougle School projects are complete; Mill Race, Tanyard Branch, Dry Gulch, monitoring, and watershed planning are in progress and all due for completion by fall 2012.

Watershed management challenges discovered

~~Watershed management challenges discussed~~

In the last few years, Town staff have encountered several challenges, many of which will require outside assistance and expertise to resolve. Some of the challenges are outlined below.

1) The Chapel Hill-Carrboro community is characterized by a very engaged and outspoken citizenry. The community's interest is both an asset and a challenge. Several active advocacy-based citizens groups have recently formed, with differing perspectives about riparian management. One of the active citizen groups, the Friends of Bolin Creek, decided to create a conservation plan for part of the Bolin Creek, and have expressed interest in coordinating with the Towns' planning efforts. Another group, Save Bolin Creek, is lobbying against a multiuse greenway along the same portion of Bolin Creek, while yet another group, Advocates for Carrboro Greenways, is advocating for greenways along the creek. Differing positions on greenway development and how to protect riparian resources has led to difficulty in proactively addressing watershed restoration. The Towns are not seen as legitimate or unbiased arbiters in this disagreement.

If the community can get behind a direction, it has a great opportunity to develop a thriving watershed restoration effort. However, achieving buy in and consensus among groups with no history of collaboration requires strong experience in conflict management and public outreach and a substantial time commitment. An "umbrella organization" that is viewed as fair and unbiased is needed to guide watershed restoration activities among the various groups. The staff working on behalf of the BCWRT are unable to organize and coordinate this "umbrella organization" and fully offer the services warranted.

2) In some groups in the community, there is a mistrust of the Towns due to factors outside of watershed restoration efforts. This mistrust is in part associated with socioeconomic factors, and in part associated with the growing pains of development. This mistrust hampers the Towns' effectiveness in conducting watershed restoration outreach and communication. The diverse nature of neighborhoods in the watershed requires targeted outreach methods that address each neighborhood's interest and preferences for participation. There are 9,000 properties in the watershed, managed by various organizations, neighborhoods, and citizens. Effective strategies for engagement will vary.

3) Watershed restoration activities are occurring in the wake of new requirements for the Jordan Lake Nutrient Strategy and pending NPDES Phase II reissued permits. These regulatory programs both require significant local staff time to pursue, and complicate and confuse the public's understanding of nonregulatory efforts.

4) Restoration work is proceeding with limited staff capacity during a time of significant local economic and financial difficulty. Local service demands are increasing while local revenues are decreasing. Watershed restoration is a new program/service falling primarily on the shoulders of local staff to lead, with no funds for professional assistance included in current 319 grants. There is no "dedicated" restoration staff to devote time and attention to restoration outreach, education, and consensus building.

The BCWRT have considered these challenges and are looking to supplement their expertise in engineering, stream and watershed monitoring and restoration, by inviting WECO staff to join them and provide leadership in collaborative adaptive watershed management and public involvement. Successful restoration requires adaptive management that integrates social complexities along with the technical. Most stormwater retrofits do not get in the ground without public involvement, and the BCWRT is reaching the limit of projects they can implement without actively involving the community

The BCWRT will complete the first 9-element watershed plan as required by USEPA under the terms of the 2008 319 grant. The Plan will be necessarily flexible to allow for stakeholders to help identify, select, and prioritize projects as part of this next phase of watershed management. The divergent views expressed by the stakeholders requires intensive engagement to find collaborative solutions- a process that requires focus, expertise, and resources beyond what is provided in current grants that end in 2011 and 2012. This new project phase will bridge the BCWRT's work to a more broadly supported and sustainable effort through 2014.

Engaging watershed stakeholders to share and learn about different interests and incorporating those into planning efforts is crucial to achieving support and active participation during implementation, as well as during long term maintenance of the projects. There is an opportunity to engage community members from “opposing” factions in seeking common ground in the watershed plan. Effectively coordinating with stakeholder groups’ current efforts and leveraging resources is also needed to achieve restoration of Bolin Creek watershed. For these reasons, the Towns have requested help from WECO to effectively communicate and coordinate with and engage watershed stakeholders in Bolin Creek watershed management efforts.

If this grant is not funded:

- Two watershed restoration plans would likely be completed- one by the Towns and one by Friends of Bolin Creek. A lack of consensus on a riparian management plan will result in confusion and continued strife in the community, and lack of support in implementing one or both plans. Elected officials and the Greenways Commission would more likely support a plan backed by multiple stakeholders, which Town staff does not have the capacity to facilitate.
- The only “champions” to the 9-element watershed plan will be the current BCWRT members. The grant provides an opportunity to include residential neighborhoods, schools, businesses, nonprofits, churches, and citizens who may be able to offer significant time and resources, and adopt restoration projects.
- Projects in targeted subwatersheds will not have as much momentum or likelihood for success, as there will not be any local “champions” to help engage landowners and neighbors.
- Measurable improvements in both targeted subwatershed and watershed scale indicators will not be observed as quickly, or with as high a degree of improvement. These could include both instream/ecological indicators as well as management indicators such as area treated, rain gardens installed, etc.
- Social measures of success, e.g. participation rates, creation of new organizations/working groups/teams will not be realized as quickly, or as robustly
- Financial measures of success, e.g., leveraging of private/local/foundation, etc. funds for restoration projects, reduced reliance on taxes and/or fees to achieve restoration goals will not be realized as quickly, or as robustly

Goals of this project

To leverage current efforts and parlay those into long term success in restoring Bolin Creek, the community should be engaged in the process as soon as possible. Involving a neutral third-party organization such as WECO is useful when watershed stakeholders need help with the time and skills required for effective coordination, communication and conflict resolution. WECO has successfully engaged watershed stakeholders to plan and implement urban watershed restoration in Burnt Mill Creek of Wilmington, and Black Creek of Cary. They will apply similar methods in Bolin Creek. This project seeks to effectively engage the watershed community in the restoration effort to meet the following goals:

- 1.A strategy for outreach and involvement is developed and implemented, with stakeholders and their interests identified and involved.
- 2.Awareness and support of the Bolin Creek restoration effort is increased.
- 3.The 9-element watershed plan incorporates community interests in its goals and strategies.
- 4.Communication and coordination is increased between municipalities, community groups, neighborhoods, and businesses.
- 5.Leveraging of resources is increased (volunteer time and materials donated, grants acquired).
- 6.Property owners participate in many retrofit and restoration projects.
- 7.Retrofit and restoration projects are properly maintained.

22. A detailed description of the project. Note: if project entails developing or implementing a Watershed Restoration Plan, see section 26. Expand space, as necessary

Recent and current efforts funded by EPA 319 grants have focused on watershed assessment, monitoring, and specific stream restoration projects. This project focuses on the missing link necessary for watershed management: the people. We seek to build the community's capacity for communication, networking, coordination, mutual leveraging of resources, and leadership that is required for successful long-term watershed restoration.

Multiple EPA resources reference, outline, and promote community involvement as one of the necessary tools to achieve watershed restoration and management. These EPA resources include:

- Handbook for Developing Watershed Plans to Restore and Protect Our Waters
- Getting in Step Outreach Series (guide to maximizing the effectiveness of public outreach campaigns to reduce nonpoint source pollution and protect water resources)
- Nonpoint Source (NPS) Outreach Toolbox
- Community Culture and the Environment: A Guide to Understanding a Sense of Place (tools and methods for understanding the human dimension of environmental protection)

Effectively involving the public requires understanding their interests and how they want to be involved. The first step is to conduct a situation assessment. This activity identifies watershed stakeholder organizations and affected individuals, seeks to understand how they see issues, identifies conflicts and barriers to their effective involvement, identifies opportunities to engage them and meet mutual interests, and determines how stakeholders would like to communicate and participate in restoration efforts. The Bolin Creek Watershed Restoration Team has acknowledged the value of a situation assessment and reworked current efforts to fund it with existing grant resources.

So the project team plans to conduct a situation assessment in summer/fall 2011 using existing grant resources.

Situation assessment tasks include:

- Draft interview questionnaire and plan
- Collect names of stakeholders using snowball technique
- Arrange stakeholder interviews
- Conduct interviews in person and by phone
- Compile and analyze data
- Write summary report with recommendations for stakeholder involvement

WECO will use the situation assessment results to develop a community outreach and involvement strategy that they will incorporate into the Watershed Plan (as a deliverable to the current grant before it ends in 2011). The strategy will outline how to engage different stakeholder groups, including public involvement formats, locations, times, methods of communication (online, in-person, mail), and skills and resources the various groups can contribute. Stakeholders will be asked how they want to participate- the resulting public participation formats will seek to meet their needs.

To kick off this new phase, the team will publicize results of the situation assessment and seek community feedback on the outreach and involvement strategy. Depending on how stakeholders prefer to receive information and participate, this may happen through electronic distribution and surveying, community workshops, or visits to targeted community group meetings.

The next step will be to design a process for engaging stakeholders in watershed planning, selecting retrofit sites, and implementation efforts. Two possible main formats are envisioned:

- 1) form a new Bolin Creek Watershed group to build consensus for specific watershed restoration efforts (Task Force, Steering Committee, Advisory Board, etc. - depending on what language appeals to stakeholders);
- 2) hold regular Bolin Creek "summits" to get community feedback as the existing Bolin Creek Team moves forward with implementing watershed restoration efforts.

The route taken will depend on whether stakeholders are interested and willing to participate as members of a new broader and more inclusive consensus-seeking group (using a consensus-seeking process), or whether they prefer to be consulted with on a more informal basis (using a consultative process). Stakeholders will be trained in collaborative decision-making skills and will engage in team-building exercises, to enhance their capacity for working together as a group.

Consensus decision making seeks to bring all interested parties together to find common ground and help them reach their goals. Consultative public involvement is a process by which input is actively sought, but the ultimate decision is made by the managing agency or group. An assessment is needed to determine which of the public involvement tools and processes is best suited for the particular situation.

Engaging the diverse stakeholder interests (local community groups, local governments, state agencies, recreational groups, others as identified in the situation assessment) in a watershed visioning process is the next step. This exercise helps stakeholders to develop a shared vision for Bolin Creek- getting them on a similar page regarding goals for the watershed. This step is important for creating a shared framework for watershed restoration. The goals of the Bolin Creek Watershed Plan will be amended as needed based on the new information - watershed plans must be dynamic documents that are updated when new data and information is discovered.

Through a series of watershed group meetings, open public summits, and field trips, watershed stakeholders will undertake a mutual education process with three objectives:

- 1) Learn about basic watershed science principles
- 2) Learn about existing efforts, resources, and opportunities in Bolin Creek watershed
- 3) Learn about each others' interests and strengths

Stakeholders' feedback on existing plans and efforts will be collected. Stakeholders will be engaged in identifying watershed improvement projects (including retrofits) in their communities, developing criteria for assessing potential watershed improvement projects, using the criteria to prioritize projects, and selecting at least two projects to implement, and two more to create designs for so they are "shovel ready" when additional funds are identified.

Finally, stakeholders will be engaged in implementing the projects they have selected. These projects will include two retrofit BMPs or stream enhancement projects. They will be involved in reviewing BMP or restoration concepts and designs, recruiting volunteers to help with installation, and planning for maintenance.

Alternate scenarios

The most crucial component of this proposal is to perform the activities that will build up the previously missing human dimension component of Bolin Creek Watershed management. The BMPs included provide stakeholders the ability to choose and implement some projects in the ground, to stoke momentum and a sense of accomplishment, resulting in a stronger buy-in and commitment. Most stakeholders are willing to spend time on planning efforts, but see projects in the ground as a "light at the end of the tunnel". However, the project can be completed with fewer BMPs or without BMPs at all at a lesser cost. These alternates include:

- A.) Current project with 2 BMPs in the ground and 2 "shovel ready" BMP designs for \$108, 284.

- B.) Current project with just 2 BMPs in the ground (removing the 2 "shovel ready" BMP designs) for ~\$99,000
- C.) Current project as described with NO BMPS for ~\$75,000

23. Monitoring/Environmental Data Collection Describe in section below how project data will be used (i.e. demonstrate effectiveness of BMPs installed, calculate load reductions, data to be used for TMDL development, data to be used for State use support purposes, etc.). If monitoring is needed to document a demonstration project or water quality improvement, a Quality Assurance Project Plan (QAPP) will be required (reviewed and approved by DWQ). For a QAPP template, visit the 319 Program website at <http://portal.ncdenr.org/web/wq/ps/nps/319program>.

Chapel Hill has implemented a macro invertebrate monitoring program, which began in March 2011. Nine of 18 sites are located in the Bolin Creek watershed. Some of these sites coincide with past or recent DWQ monitoring sites. Annual monitoring allows them to better detect a "signal" in the midst of recurrent droughts which can skew results for DWQ's intermittent monitoring.

Sites include: Bolin Creek above Village Drive; Bolin Creek above Franklin Street; Jolly Branch near CH High School; Battle Branch near Weaver Road greenway; Cole Springs Branch near Cedar Street; Mill Race Branch at Bolinwood Drive; Tanyard Branch at Carver Street; Unnamed trib to Bolin at Severin Drive; Library creek at Library Drive.

Chapel Hill has a contract to continue monitoring for the next five years, covered by Town Stormwater Management fees, and supported by the Town Council for water quality status and trends monitoring, based on Town Comprehensive Plan goals. Some of the sites were deliberately chosen as close downstream of current restoration projects, as well as a few locations where there is significant property owner interest in possible restoration projects. A few sites may be added in anticipation of potential subwatershed restoration projects that may be well served with a few years of monitoring prior to construction as well.

Carrboro has been conducting benthic sampling yearly since 2000, and will continue to monitoring four mainstem Bolin Creeksites (as well as tributaries Homehollow, Seawell School, Jolly Branch, and Morgan Creek), monitor restoration projects for measurable results, and do tributary and other monitoring to further characterize watershed health.

Chapel Hill staff now have training in the BANCS model of streambank erosion prediction, as well as monitoring suspected high-erosion sites using bank pins- these methods will be used. The BANCS model was used in predicting sediment and nutrient contributions/reductions for sites prioritized by Earth Tech for a general watershed assessment and identification of promising projects. Three of the current 319 projects (Baldwin Park, Dry Gulch, Mill Race) were identified in that assessment. Chapel Hill & Carrboro will pay for all monitoring activities.

24. Public Involvement

The main focus of this project is to engage the public in implementing current watershed management efforts through a variety of methods. WECO staff have considerable experience engaging diverse multiple stakeholders in watershed planning and management, including recruiting of landowners in retrofit projects (for example, Burnt Mill Creek watershed in Wilmington continues to yield viable partners and retrofit sites after several years). These successes were only possible after creating a broad, collaborative stakeholder organization of some kind. Laying this foundation of partnership requires up-front work to understand their interests, facilitate information-sharing and visioning, building trust and experiencing successes together. This work has not yet happened in Bolin Creek watershed.

Recent research highlights that "the design of transparent and open social learning processes is a key requirement of sustainable water management regimes. Effort has to be devoted to building trust and social capital for problem solving and collaborative governance. An increase in, and maintenance of, the flexibility and adaptive capacity of water management regimes should be a primary management goal. Entrenched perceptions and beliefs block innovation and change. Space has to be provided for creative and out-of-the-box thinking and experiments." (Pahl & Wost)

The situation assessment will provide information critical to determining an effective outreach and public participation plan, which we will create as part of the watershed plan (in 2011), and use to implement this project. We will learn how other stakeholder groups beyond the current Bolin Creek Watershed Restoration Team (BCWRT) may be most effectively involved. New partners have been added to the BCWRT in this proposal, and several other organizations have been identified for involvement, including:

- Carrboro – Planning Department; Environmental Advisory Board; Greenways Commission
- Chapel Hill –Stormwater Management Division; Stormwater Advisory Board
- NCDENR- DWQ, EEP
- UNC-Chapel Hill (Center for Educational Excellence, Center for the Environment)
- Carolina North Forest Managers
- Nonprofits (Friends of Bolin Creek, Save Bolin Creek, Haw River Assembly, Sierra Club, Advocates for Carrboro Greenways, Triangle Off Road Cyclists)
- Landowners and Neighborhood Associations (including Rogers Eubanks Neighborhood)
- Duke Energy/Progress Energy
- Chapel Hill Carrboro City Schools,
- Triangle J Council of Governments
- Developers
- NC DOT

Watershed stakeholders will be engaged in planning and implementation efforts through the new watershed task force and/or regular public meetings. Additionally, project team members will attend existing neighborhoods' and other organizations' regular meetings to provide information about the effort, learn about other efforts, and obtain feedback as needed.

Online communication forums for watershed stakeholders will be created and linked to existing websites maintained by Chapel Hill, Carrboro, and Friends of Bolin Creek. These may include a stand-alone project website, a blog, social network sites, and an email listserve. The purpose is to provide a forum for communication among partners between face to face meetings. A Bolin Creek project newsletter will be created and distributed regularly to keep stakeholders informed of progress and opportunities to participate.

25. List Project Outputs and Products (All 319 funded projects are required to submit Quarterly Progress Reports and a detailed Final Project Report, which must be submitted no later than the contract

expiration date for DWQ review and approval.) Outputs and deliverables must include anticipated measurable results from the project.

- 1) An outreach and involvement strategy that incorporates stakeholders' interests implemented
- 2) The 9-element watershed plan updated as needed to incorporate community interests in its goals and strategies, including specific stormwater retrofit projects of community interest identified
- 3) One training session to build stakeholders' capacity for collaborative decision-making
- 4) Online communication resources developed- website, email listserve, and blog
- 5) Six or more Bolin Creek Watershed Task Force meetings or public summits
- 6) A Bolin Creek project newsletter published and distributed after meetings and/or summits
- 7) Two stormwater retrofit or stream enhancement projects completed.
- 8) Two stormwater retrofit or stream enhancement projects designed (shovel ready)
- 9) A new grant proposal or other funding mechanism completed to help continue project beyond this grant, which includes funds to install at least the two identified retrofits (Potential sources include EPA, NC CWMTF, private foundation funding, or other as identified by watershed stakeholders)
- 10) A report of monitoring results from the Chapel Hill and Carrboro's monitoring efforts, highlighting any changes in the creek as a result of projects implemented so far.
- 11) A protective maintenance mechanism for retrofits developed (for example a maintenance agreement or deed restriction)

26. Projects Developing or Implementing a Watershed Restoration Plan must include EPA's 9 Key Elements for Watershed Restoration Plans. Draft Plans must be submitted to DWQ for review and approval at least *60 days before* end of the project/contract period.

NOTE: Please provide information on the following ONLY if applying for Incremental funds to develop or implement a Watershed Restoration Plan: (use additional pages as necessary)

1	An identification of the causes and sources or groups of similar sources that will need to be controlled to achieve the load reductions estimated in the watershed
2	A description of the NPS management measures that will need to be implemented to achieve load reductions as well as to achieve other watershed goals identified in the watershed based plan
3	An estimate of the load reductions expected for the management measures
4	An estimate of the amount of technical and financial assistance needed associated costs and or sources and authorities that will be relied upon, to implement the plan
5	An information/education component that will be used to enhance public understanding of the project
6	A schedule for implementing the NPS management measures identified in this plan that is reasonably expeditious
7	A description of interim, measurable milestones for determining whether NPS management measures or other control actions are being implemented
8	A set of criteria that can be used to determine whether loading reductions are being achieved overtime and substantial progress is being made towards attaining water quality standards
9	A monitoring component to evaluate the effectiveness of the implementation efforts over time measured against the criteria established under item 8.

Staff from the Towns of Chapel Hill and Carrboro are currently developing the first 9 element watershed restoration plan, with WECO writing element 5. The plan will be noted as "draft for review only" until watershed stakeholders identified during this project are engaged in reviewing and updating the plan based on their interests. At that time, it will be recognized as "final", but will still be presented as a working document. It will be very important to communicate to stakeholders that the plan is dynamic in nature, and even though much technical information has already been collected, they have the opportunity to improve the plan to better meet their interests. Consensus on changes to the plan will be sought from watershed stakeholders. We recognize that the 9-element plan is a deliverable to the current grants, however watershed management must take an adaptive approach to respond to new data and new social realities in the watershed. The project team will demonstrate adaptive management by seeking new information at the same time portions of the plan are implemented, to illustrate transparency and responsiveness to community needs.

27. References and Literature Cited

EarthTech of North Carolina, Inc. 2007. Bolin Creek Watershed: Geomorphic Analysis and Potential Site Identification for Stormwater Structures and Retrofits.

EPA Handbook for Developing Watershed Plans to Restore and Protect Our Waters

EPA Getting in Step Outreach Series

EPA Nonpoint Source (NPS) Outreach Toolbox

EPA Community Culture and the Environment: A Guide to Understanding a Sense of Place

FY 2008 EPA 319 grant: Bolin Creek Watershed Restoration Initiative (Chapel Hill)

FY 2009 EPA 319 grant: Bolin Creek Watershed Restoration Initiative (Carrboro)

NC Department of Environment and Natural Resources, Division of Water Quality, Planning Branch. 2003. Assessment Report: Biological Impairment in the Little Creek Watershed. A report of the WARP (Watershed Assessment Restoration Project).

NC Department of Environment and Natural Resources, Division of Water Quality, Planning Branch. October 2005. Cape Fear River Basinwide Water Quality Plan

Pahl-Wostl, Claudia; Sendzimir, Jan; Jeffrey, Paul; Aerts, Jeroen; Berkamp, Ger; Cross, Katherine. 2007.

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Tetra Tech. 2004. Targeting of Management Report. In: NC Ecosystem Enhancement Program, 2004. Morgan and Little Creeks Local Watershed Plan.