STUDY OF THE SCIENCE, ECONOMICS, AND PERCEPTIONS RELATED TO IMPLEMENTATION OF TRADITIONAL AND INNOVATIVE STORMWATER BEST MANAGEMENT PRACTICES IN COASTAL SOUTH CAROLINA
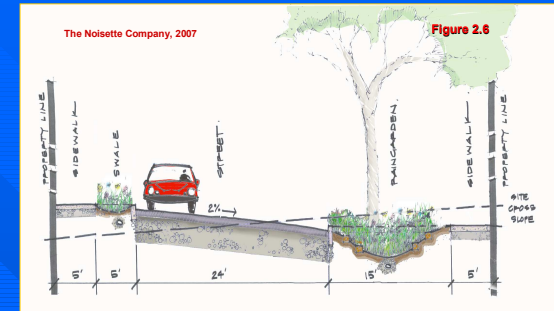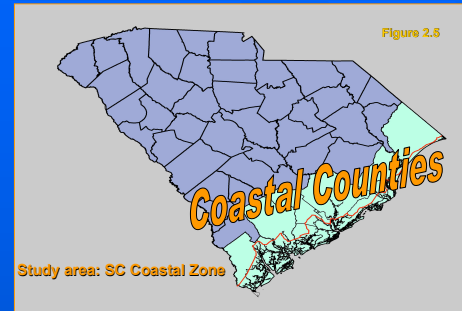
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PROMOTE PROTECT PROSPER
South Carolina Department of Health and Environmental Control

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Introduction

There are many types of innovative stormwater best management practices (BMPs) in use nationally, but few are implemented in residential areas in South Carolina. The goal of this project is to expand knowledge in the area of innovative BMP implementation in coastal SC and to understand why innovative BMPs are not more widely utilized. The main objective is to understand the obstacles that hinder implementation of innovative BMPs in coastal SC. The study proposes to address this issue by investigating the perceptions held by professionals involved in stormwater management in coastal SC. Three groups of professionals were selected to be interviewed: developers and builders, regulatory managers, and private sector professionals (e.g. engineers and stormwater BMP manufacturers).

Methods

A Survey was developed and administered by telephone or in person. The techniques used in the interviews combine the schedule-structured interview approach and the focused interview approach. In order to get a represented sample, a non-proportional quota sampling method was employed. This method specifies the minimum number of sampled units one wants in each category. A minimum of ten people from each group were surveyed. The Liekert scaling method was used to score each question and the results were statistically analyzed. In addition, the open-ended question responses were coded using an inductive coding method into generalized responses. The use of the scaling and coding methods enabled the author to conduct nonparametric statistical analysis. Lastly, a Frequency Distribution Table was created to show areas of central tendency and dispersion and a contingency table along with a Chi Square test was performed to show statistically significant relationships among the variables.

Figure 2.5

Study area: SC Coastal Zone

The Noisette Company, 2007   Figure 2.6

Pervious surfaces and vegetative buffers
John Martin, 2005

Bioretention in action!!!
NCSU-BAE, 2008

LID techniques in action: I'On, Mt. Pleasant, SC
John Martin, 2005

Recommendations:

I. Regulatory changes that emphasize water quality are needed in SC.

II. More funding is needed to aid stormwater management programs. The permitting process needs to be streamlined for innovative BMPs.

III. Public outreach and education is needed to inform both the regulated community and the general public of the importance of stormwater management, especially source controls.

IV. The regulated and regulatory communities need to improve communication channels and forge relationships that will engender cooperation in efforts to implement innovative stormwater management.

Results

Figure 2.1: I believe that alternative, LID, or innovative practices, in general, tend to be less expensive and more efficient in the long term (reasonable life cycle of practice) than traditional or conventional practices.

1 Strongly Disagree
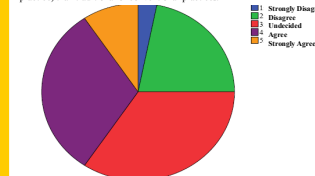2 Disagree
3 Undecided
4 Agree
5 Strongly Agree

Figure 2.2: How strongly do I agree or disagree that a lack of information and research on performance and efficiencies could influence implementation of an innovative BMP.

1 Strongly Disagree
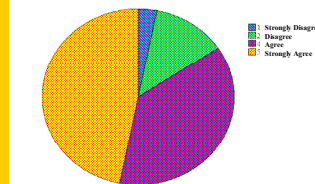2 Disagree
3 Agree
4 Strongly Agree

Figure 2.3: How strongly do I agree or disagree about the factor of engineering or consulting firms not offering many innovative options to clients as a concern that could influence implementation of an innovative BMP.

1 Strongly Disagree
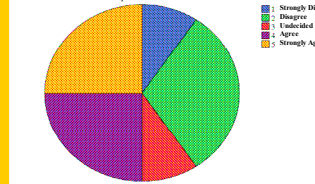2 Disagree
3 Undecided
4 Agree
5 Strongly Agree

Figure 2.4: How strongly do I feel that decision makers are not aware of alternative BMP options could be a factor that may influence implementation of an innovative BMP.
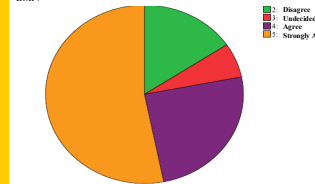

2 Disagree
3 Undecided
4 Agree
5 Strongly Agree

Table 1. Scaled (Closed ended) Questions. Choices: Strongly Agree, Agree, Undecided, Disagree, Strongly Disagree. (Mean responses rounded to the nearest hundredth decimal place).	Regulatory Group (Mean Response)	Developers & Builders Group (Mean Response)	Engineers & Other Stormwater Professionals (Mean Response)	Total Mean Response of all Respondents
How strongly do you agree or disagree that a practice must meet regulatory performance goals is a factor that could influence implementation of an innovative BMP	Agree	Agree	Agree	Agree
How strongly do you agree or disagree that a lack of information and research on performance and efficiencies could influence implementation of an innovative BMP	Undecided	Agree	Agree	Agree
Do you feel that decision makers not being aware of alternative BMP options could influence implementation of an innovative BMP	Agree	Agree	Undecided	Agree
How strongly do you agree or disagree concerns over cost, both short & long term, could be a factor that may influence implementation of an innovative BMP	Agree	Agree	Agree	Agree
How strongly do you agree or disagree about the issue of a BMPs not providing property value enhancement or adversely affecting value as a factor that could influence implementation of an innovative BMP	Undecided	Agree	Undecided	Undecided
How strongly do you agree or disagree that concerns over the ability and willingness of a responsible party to maintain a BMP is a factor that could influence implementation of an innovative BMP	Agree	Agree	Undecided	Agree
How strongly do you agree or disagree about the factor of engineering or consulting firms not offering many innovative options to clients as a concern that could influence implementation of an innovative BMP	Undecided	Undecided	Disagree	Undecided
How strongly do you agree or disagree that a decision maker may not wish to take the risk of installing a practice that is not widely used or tested in South Carolina as a factor that could influence implementation of an innovative BMP	Undecided	Agree	Agree	Undecided
I feel that it is very important that more applied research on stormwater practice and performance be conducted here in SC.	Agree	Agree	Agree	Agree
With regard to structural stormwater practices, I believe that there is a disparity between what stormwater professionals and developers expect in terms of application and performance and what is actually possible in terms of the science and design of a given BMP.	Agree	Disagree	Undecided	Undecided

Question (Open Ended) Medium responses rounded to nearest whole number.	Regulatory Group (Medium Response)	Developers & Builders Group (Medium Response)	Engineers & Other Stormwater Professionals (Medium Response)	Total Medium Response of all Respondents
I believe that alternative, LID, or innovative practices in general tend to be less expensive & more efficient in the long term (reasonable life cycle of practice) than traditional or conventional practices	Undecided	Undecided	Undecided	Undecided
Which group has the most influence in deciding what BMPs are implemented? Choices: (1) Regulatory, (2) Developers,(3) Engineers,(4) Property Owners, (5) All others. *Medium response read here	Regulators	Engineers	Regulators	Regulators
What, in your opinion is the greatest barrier in innovative or LID type BMP implementation: (1) Cost, (2) Regulatory, (3) Lack of funding & resources to implement, (4) Science & lack of research to support performance, (5) Lack of BMP options or availability of expertise needed to implement.	(3) Lack of resources and funding needed to implement stormwater mgmt programs	(1) Regulatory issues	(1) Regulatory issues	(1) Regulatory issues
What are your general perceptions of stormwater management (positive or negative) in your community or county? Generally a Positive or Negative Perception?	Positive	Positive	Positive	Positive
Is use of innovative practices generally encouraged in your community or county in SC? Yes or No answer:	Yes	No	Yes	Yes
Have you seen innovative practices being used in residential settings in coastal SC? Yes or No answer:	Yes	Yes	Yes	Yes
Is science an important factor in deciding which BMPs to use? Yes or No answer:	Yes	Yes	Yes	Yes

Q1c * Group (1=Reg, 2=Dev, 3=Stm Pro)

Table 2   CROSSTAB

			Group (1=Reg, 2=Dev, 3=Stm Pro)			Total
			1	2	3	
Q1c	1	Count	9	10	6	25
		% within Q1c	36.00%	40.00%	24.00%	100.00%
		% within Group (1=Reg, 2=Dev, 3=Stm Pro)	81.80%	90.90%	60.00%	78.10%
	2	Count	2	0	0	2
		% within Q1c	100.00%	0.00%	0.00%	100.00%
		% within Group (1=Reg, 2=Dev, 3=Stm Pro)	18.20%	0.00%	0.00%	6.20%
	3	Count	0	1	4	5
		% within Q1c	0.00%	20.00%	80.00%	100.00%
		% within Group (1=Reg, 2=Dev, 3=Stm Pro)	0.00%	9.10%	40.00%	15.60%
Total		Count	11	11	10	32
		% within Q1c	34.40%	34.40%	31.20%	100.00%
		% within Group (1=Reg, 2=Dev, 3=Stm Pro)	100.00%	100.00%	100.00%	100.00%