Spring 2009

Environmental Citizenship and Carbon Intensity; Evaluating the Carbon Masters Educational Program

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WESTERN WASHINGTON UNIVERSITY HONORS DEPARTMENT

Environmental Citizenship and Carbon Intensity

Evaluating the Carbon Masters Educational Program

Honors 490 Senior Project

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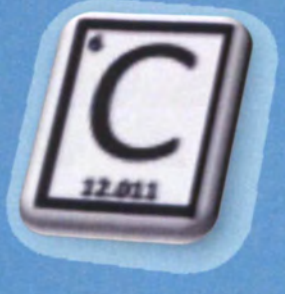
June 12th, 2009



Andrea Jean Thomas

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FACT SHEET

Title: Environmental Citizenship and Carbon Intensity: Evaluating the Carbon Masters Educational Program

Description of Project:

This document is an honors senior project investigating the impacts of a local climate change and carbon intensity reduction education program entitled "Carbon Masters" on its pilot program participants.

The Author Would Like to Especially Acknowledge:

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Dr. George Mariz – Honors Department, WWU
Carbon Masters 2009 Participants

Issue Date:

Friday, June 12th, 2009

Public Presentation:

Friday, May 29th, 2009 at 3:00pm
Communications Facility, Room 125
Western Washington University

Table of Contents

LIST OF FIGURES

Executive Summary

This honors senior project is composed of two separate, but integrated documents which, taken together, act as the foundation for a formal, systematic program evaluation model for the climate change education group Carbon Masters. The first section is comprised of a "policy analysis" proposal which outlines a policy problem, two solutions by which to address it, and a method by which to analyze the solutions for their effectiveness, efficacy, and community-building. The policy problem is defined as the fact that there are too little educational programs available to the public that offer valid, proactive, constructive and informational tools to empower ordinary citizens to deal with the complex issue of climate change. The second section of the project is comprised of a pre-experimental research design framework which attempts to analyze the Carbon Masters program as one of the solutions to the policy analysis problem. The research is not generalizable; however, the pre-experiment serves as an evaluation tool for the program. The results of the study indicate that the program has some areas to improve upon to more sufficiently address the criteria in the policy analysis. However, it can be said that this program is on the right track toward addressing both the outcomes of the logic model and the Values-Beliefs-Norms Theory; the tenant standards that serve as the backbone of the study.

SECTION 1: POLICY ANALYSIS PROPOSAL

http://whatcom.wsu.edu/carbonmasters/

1.1 The Globe Is Warming...

"Warming of the climate system is unequivocal, as is now evident from observations of increases in global average air and ocean temperatures, widespread melting of snow and ice and rising global average sea level" (IPCC, 2007). This statement, which can be found in the 4th Assessment of the Intergovernmental Panel on Climate Change (IPCC), summarizes quite succinctly that anthropogenic global warming is a real phenomenon changing the Earth's climate at an unprecedented rate. The realization and acceptance of this fact has been permeating throughout our political consciousness for quite some time. The question of how to manage the ever-increasing problem of climate change became a crucial point of interest in 1992 at the Conference on Environment and Development in Rio de Janeiro, and again in 1997 at the Kyoto conference which would establish the Kyoto Protocol (Rosenbaum, 2005). Although on the global agenda, real action in the form of effective treaties or national legislation to fight climate change has failed to produce any real results.

1.2 The Problem

In the absence of a tangible and effective climate change policy, we as a citizenry are left with very few options to actively participate in the fight against global warming. This conclusion acts as a problem in itself. The problem then, *is that there are too little educational programs available to the public that offer valid, proactive, constructive and informational tools to empower ordinary citizens to deal with the complex issue of climate change.* A secondary problem that exists alongside this issue is that, in general, there is too little individual awareness and internalization of the consequences of living a carbon-intensive lifestyle.

Narrowing the scope of this problem down to our local level, the noticeable effects of climate change can already be found from the Cascade Range to the Puget Sound interior of Washington State. Although the United States federal government has yet to develop a viable climate change policy, the Washington State Legislature recently took a more proactive stance on pushing the problem and policy streams into convergence. In 2007, the legislature passed Senate Bill 6001 which recognized that "extreme weather, a warming Pacific Northwest, reduced snow pack, and sea level rise are four major ways that climate change is disrupting Washington's economy, environment, and communities" (SB 6001, 2007). The bill aims to address these problems by requiring a reduction in statewide greenhouse gas emissions to 1990 levels by 2020 (SB 6001, 2007). The bill does not, however, outline a process to implement such a goal. Therefore, even though Washington State recognizes that action needs to be taken on this issue, the elusive policy which endeavors to offer a solution to the problem remains frozen in between the recognition and formulation stages of the policy process; unable to move toward implementation and evaluation.

This disabled system is most accurately described by John Kingdon's "three streams" policy process model. In the model, a policy stream, politics stream, and problem stream flow separate of one other until they reach a point of convergence, creating "...a window of opportunity...for significant policy development" (Clemons, McBeth, 2009). Unfortunately for the case of climate change, these streams are not yet in sync, thereby "...serving as a constraint rather than an impetus for policy development" (Clemons, McBeth, 2009). As we wait for the streams to converge, long-lived greenhouse gases

(GHGs) will continue to fuel global warming while we as a people are left helpless to sit back and watch it all happen.

Two recent Gallup polls regarding Americans' views on global warming and what they can do about it offer some insight on the scope of the problems listed above. In the first poll, conducted from March 23rd through March 25th 2007, the primary question asked participants when they thought the effects of global warming would begin to happen. Only 60% of those surveyed said that the effects of global warming have already begun, 15% said that the effects will not happen in their lifetime, and 11% said that effects from global warming will never happen (Carroll, 2007). In a second poll, conducted from March 6th through March 8th 2008, the survey asked participants: "How much do you worry about the "greenhouse effect" or global warming?" Only 37% of Americans said that they personally worried about global warming; this is only a 2% increase from 1989. The Gallup poll graphic below depicts how these results do not appear to have fluctuated over the last 20 years. The results show that even though more than half of the Americans just the year before stated that the effects of global warming have begin to happen, "the American public is more worried about a series of other environmental concerns than about global warming, and there has been no consistent upward trend on worry about global warming going back for two decades" (Newport, 2008).

1.3 Through a Market Failure Lens

At the heart of the problem and most likely the primary factor fueling the results in the Gallup polls above is that the majority of American citizens are not adequately informed about steps they can take to reduce their contribution to climate change. The problem is a result of an information failure. This information failure stems from the fact that climate

change science and policy solutions have primarily been an area for technocratic and scientific expertise. Given the scientific complexity involved in a large-systems problem like climate change, a reduction in the capacity for a holistic understanding of the issue across a broad range of individuals tends to result. Therefore, topics such as the albedo effect, latent heat transfer, aerosol interactions in the upper atmosphere, and forcing and feedback systems are left for university educated climatologists to decipher. They then pass this data along to technocrats within the bureaucracy who will form think tanks to develop "appropriate" policy solutions. The public, however, is completely left out of the process. Average citizens are left alone to piece together how their action of turning on a light switch powered by a coal-fired power plant produces the effect of melting the ice caps. Without sufficient or adequate information available to the public, citizens are left to devise their own strategies to reduce the carbon intensity of their lifestyles.

In addition to the general complexity associated with climate change science, another factor contributing to the information failure is the tradition of journalism and other news media to report on an issue from a balanced perspective. In an article entitled "Communicating on Climate Change: An Essential Resource for Journalists, Scientists, and Educators", the "Executive Summary" points out that "...scientists said they were frustrated that the accumulated advances in understanding of climate change over more than two decades of research had not led to a better-informed public" (Ward, 2008). The main reason for this is that the media reports about the climate science that is widely accepted by the IPCC and the scientific community, while also reporting about the obscure scientific findings that refute the common understanding that global warming stems from anthropogenic sources. The public perspective turns to one of confusion as they attempt to

make sense of the seeming controversy within the scientific community regarding extremely complicated processes associated with global warming. The article goes on to say that "...many of the experienced reporters agreed with the scientists' concerns, often faulting their own trade for misapplying the tradition in the coverage of climate science" (Ward, 2008).

1.4 Possible Solutions to the Problem

At present, both the information failure surrounding the issue of global warming and the general complexity of climate science act as barriers to the individual awareness of the consequences of a carbon intensive lifestyle. This in turn prevents one's personal ascription of responsibility to the issue. In terms of this analysis, ascription of responsibility can be defined as the belief that an individual's personal actions can mitigate threats directed at something they value (Stern et al., 1999). To narrow the scope of this problem down, this policy analysis will focus on a client in the City of Bellingham in Whatcom County of Washington State. The client designed to address the problem of the deficit of educational programs available to offer valid, proactive, constructive and informational tools to empower ordinary citizens to decrease the carbon intensity of their lifestyles is a program entitled Carbon Masters. The Carbon Masters directors are Joyce Jimerson and Craig MacConnell. This program is an extension project of Washington State University, partnered with both the University of Washington and Western Washington University. The program design is based on the success of the Washington State University Extension Project *Master Gardeners*, which aims to "[train] volunteers to be community educators who provide science-based information on horticulture and environmentally sound gardening practices" (WSU Extension, 2009).

The Carbon Masters program itself caters specifically to community members interested in actively engaging in the fight against climate change. The purpose of Carbon Masters is to "...[change] public behaviors that contribute to climate change and [provide] tools to adapt" (Carbon Masters, 2009). The Carbon Masters program is exceptional in the sense that it follows in line with a major characteristic of "the new environmental regulation" so strongly advocated by Daniel Fiorino. Carbon Masters promotes reflexivity, which "...create[s] incentives and procedures that induce people to continually assess their actions...and adjust them to society's goals, for example," (Fiorino, 2006) by reducing one's carbon footprint to fight against global warming.

1.5 Criteria for Evaluation

Given that there is a problem of a lack of education and awareness regarding what to do about climate change in Whatcom County, we are greeted by the challenge of developing programs which address the problem in such a way as to inspire change and produce real results. In terms of analysis, there must be a set of criteria which serve as evaluative tools in the process of determining which policy, or in this case which program, is the most suitable solution given the circumstances. In this case, there are four key criteria to evaluate program alternatives: effectiveness, efficacy, efficiency, and community. Each of these criteria are in turn characterized by the short, medium, and long term outcomes of the alternative programs as outlined in terms of the logic model.

Criterion 1: Effectiveness

The first criterion to evaluate a possible program is effectiveness. Effectiveness is defined in this situation as that which effectuates a solution to the problem at hand. I have selected effectiveness as a criterion for this analysis because it is crucial to understand

whether or not a program will be effective. It relates to efficiency in that it makes the most rational sense to invest your efforts in a program that will produce a result reflective of the goals of the program. In this case, an effective program would be one that addresses the problem listed above, while also addressing a number of outcomes as described by the logic model. The logic model is a tool developed by the University of Wisconsin Extension project entitled "Program Development and Evaluation". The logic model is a representation of what a program will do to achieve its desired outcomes. In its simplest form, it is characterized by inputs and outputs which produce certain outcomes (UW Extension, 2005). Therefore, an effective program is one that produces the short term outcomes of an increase in awareness, knowledge, aspiration, motivation, and changed attitudes. Medium term outcomes include a change in behavior and encouragement to pursue social action. The long term outcomes include an improvement in the civil condition and a new environmental condition where we as a society greatly reduce our carbon emissions (UW Extension, 2005). Please refer to Appendix A at the end of the document for a diagram of the logic model.

Another insightful method to characterize the criterion of effectiveness is based on whether or not pro-environmental personal norms, such as a less carbon-intensive lifestyle, are activated. In order to understand whether or not a person has activated pro-environmental norms, one must first understand the Value-Belief-Norm (VBN) Theory. An article in *Human Ecology Review*, entitled "A Value-Belief-Norm Theory of Support for Social Movements: The Case of Environmentalism", eloquently breaks down the psychological process involved in one's ability to activate pro-environmental personal norms. The authors summarize their theory in the following statement:

> We propose that each social movement seeking a collective good develops its positions based on certain basic human values and that each movement's ideology contains specific beliefs about consequences and responsibilities that, in conjunctions with its chosen values, activate personal norms that obligate individuals to support the movement's goals (Stern et al., 1999).

The social movement in this case is one that requires individuals to take action in the fight against global warming by educating themselves on the process of climate change, while also learning what they can do on a day to day basis to affect change. According to the VBN theory, an effective program would be one that amplifies its participants' existing altruistic and eco-centric values to provide for them a new ecological paradigm to understand reality. From here, the program would assist the individual to become aware of the consequences of global warming, allow the individual to ascribe responsibility to the issue, and finally, foster the activation of the individual's pro-environmental norms (Stern et al., 1999). In actuality, the VBN theory allows for a more detailed understanding of how the program can shape the outcomes of the logic model.

Figure 1: Values-Beliefs-Norms Theory Flow Chart (Stern et al., 1999)

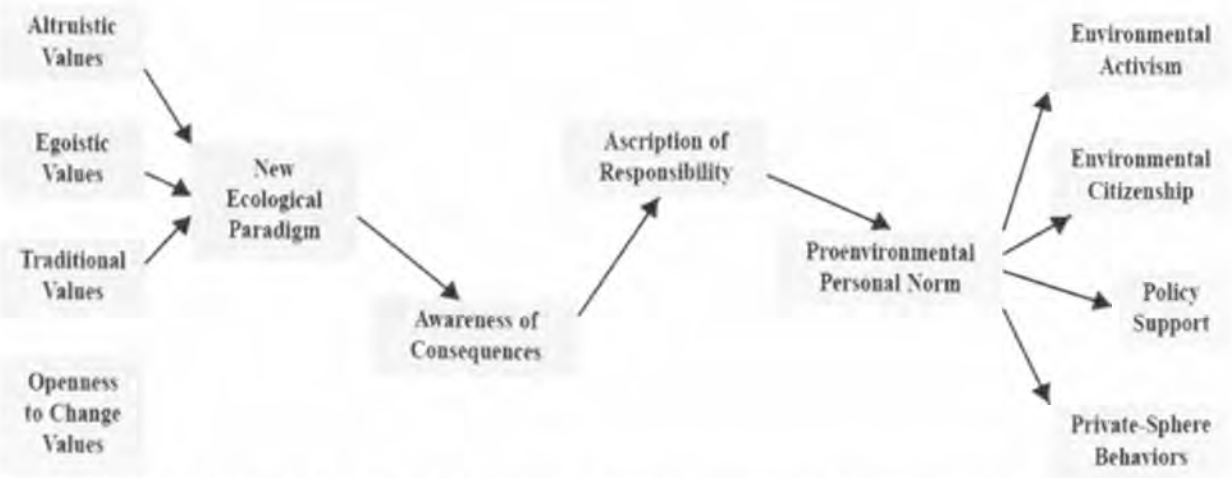


Figure 1. Schematic model of variables in the Value-Belief-Norm theory as applied to environmentalism, showing direct causal relationships between pairs of variables at adjacent causal levels.[4]

Criterion 2: Efficacy

The second criterion, which is also strongly rooted in the VBN theory, is efficacy. The definition of the word in a political sense would be that which empowers individuals so that they feel like they can actually make a difference. For example, a citizen voter would have efficacy if they believed that by casting a vote in an election, their contribution would make a difference in the outcome. I have selected efficacy as a criterion for this analysis because I believe it is extremely important that the participants of the possible programs feel empowered by the information they receive regarding global warming. This empowerment will lend to a greater feeling of confidence, which will inspire the belief within the participants that if they reduce their carbon intensity, there will be a pronounced, decreasing effect on the rate of climate change.

The logic model would characterize efficacy as that which produces the short term outcomes of an increase in aspiration and motivation, the medium term outcome of social action, and the long term outcome of improving the civic condition (UW Extension, 2005). In the VBN theory, aspiration and motivation are directly linked to the stage of "Ascription of Responsibility". This stage directly "implies a belief that action can alleviate consequences" (Stern et al., 1999). Therefore, a sense of efficacy would motivate the program participants to ascribe the responsibility of taking action against the undesirable consequences of climate change upon themselves. Efficacy acts as a conduit from the ascription of responsibility stage toward the activation of pro-environmental personal norms. An empowered individual with pro-environmental norms may be more prone to engaging in environmental activism, environmental citizenship, and engaging in private-sphere behaviors (Stern et al., 1999). To address the problem at the heart of this analysis,

the possible programs acting as solutions must include processes which cultivate a sense of efficacy.

Criterion 3: Community

The third criterion for this analysis is community, and more specifically, community-building. Community-building is defined as that which produces or increases social capital within a network of people. Preferably, the building of social capital would occur amongst the program participants and also throughout the community at large. Social capital can be defined in a number of different ways; however, I believe the most appropriate definition would be: "social capital consists of the stock of active connections among people: the trust, mutual understanding, and shared values and behaviors that bind the members of human networks and communities [to] make cooperative action possible" (Cohen, Prusak, 2001). In terms of the logic model, community would be characterized by the long term outcome of an improved civic condition. This civic condition is defined by a sufficient supply of social capital. I have selected community as a criterion for analysis because social capital is essential to ensuring efficacy and success in the long term of a program's goals. The alternative programs to offer solutions to the problem presented in this analysis should be able to actively address both private-sphere behavior changes as well as community efforts to adapt to climate change. These characteristics lend themselves toward the improvement of the alternative program's effectiveness.

Criterion 4: Efficiency

The fourth criterion for this analysis is efficiency. The term is defined here as that which maximizes net benefits. In short, the efficiency criterion is an attempt to apply a benefit-cost analysis to the alternative programs. I have selected this criterion because it is

an effective and common tool in the positivist policy analyst's toolbox (Clemons, McBeth, 2009), and also because "...efficiency – on average, across most policy issues and policy decisions – is a way to produce more humanistic policy results" (Bardach, 2009). Determining the efficiency of the programs may not be quite as important as determining the effectiveness or efficacy of the alternatives in this case. However, I do believe it is crucial to use this common tool to point out in simple, economic terms which program is the most cost effective in producing the greatest amount of benefits.

Efficiency will be determined by the costs, or the "What We Invest" section of the logic model, and also the benefits, or the number of pounds of carbon reduced per individual's carbon footprint over one year. Specifically, the inputs, or costs, that will be analyzed and monetized include: staff, volunteers, time, money, and materials. The benefits will be more difficult to measure. A reduction of 10,000 pounds of carbon per $100 spent could be an arbitrary baseline established to determine efficiency. However, I think a more accurate way to represent the quantified benefits of a reduction in carbon emissions would be to require all program participants to calculate their carbon footprint, average the totals, and determine a baseline goal for reduction in emissions. A cross comparison analysis of a similar and established program would need to be implemented to determine whether the results reflect an outcome where the benefits of the program are greater or less than the costs.

1.6 Programs for Evaluation

The problem at hand in this analysis is that *there are too little educational programs available to the public that offer valid, proactive, constructive and informational tools to empower ordinary citizens to deal with the complex issue of climate change.* There are two

potential solutions to this problem in Whatcom County. Both the Washington State University Extension Carbon Masters Program and the RE Sources for Sustainable Communities "be cool" Campaign offer the methods and tools that would be required to provide the common citizen with the information to actually do something about climate change. Both programs aim to educate individuals so that they may educate others around them about what they can do on a daily basis to fight global warming. These programs are on-the-ground, community-based efforts responding to the fact that there has been no significant legislation implemented on the state and federal level to slow climate change. The third alternative would be characterized by no action, or preservation of the status quo. The status quo at this time is characterized by policy stagnation, complex science, and little citizen involvement.

The following graphic depicts a decision-matrix displaying the program alternatives evaluated in terms of the criteria discussed in the previous section. The criteria were assigned a weight on a point scale of 1 - 4. A weight of 1 suggests that the criterion is least important in terms of making a decision as to which program is most appropriate given the program. A weight of 4 suggests that the criterion is very important. Each program was scored from a range of 0 - 4 based on their ability to meet the terms of the criteria as discussed in the previous section. A score of 0 indicates that the program did not meet the objectives of the criterion at all, while a score of 4 indicates that the program met all of the objectives outlined in the criterion. I have selected the following program alternatives because there are very few programs dedicated to outreach and education regarding climate change in Whatcom County. Both programs are new to the environmental education scene, and therefore are prime candidates for analysis.

*Figure 2: Decision Matrix for Program Alternatives**

	Criteria				
Program Alternative	**Effectiveness** Weight: 4	**Efficacy** Weight: 3	**Community** Weight: 2	**Efficiency** Weight: 1	**Weighted Totals**
WSU Extension, Carbon Masters Program	3	4	3	2	32
RE Sources Bellingham, 'be cool' Campaign	3	2	1	2	22
No Action - Maintain Status Quo	0	0	0	0	0

*Key: Weight scales range from 1-4, with 1 being least important and 4 being most important. Row scales range from 0-4, with 0 signifying that the definition of the criterion was not met at all; a score of 4 signifies that the definition of the criterion was met completely.

Carbon Masters

The Carbon Masters program is an educational project of the Washington State University Extension geared toward solving the problem outlined in this analysis. The mission of the program is to "train, equip and manage a core group of volunteers on climate change issues" (WSU Extension, 2009). Most importantly, however, is the fact that Carbon Masters reaches beyond simply educating its participants about climate change science. The program website touts that the curriculum will be focused on the following topics: "climate change science, community infrastructure, natural resources, green economy, transportation, social justice, energy, and civic engagement" (WSU Extension, 2009). Stern et al. in "A Value-Belief-Norm Theory of Support for Social Movements" state that there are three types of support for a social movement to progress. These types of support include citizenship actions, policy support and acceptance, and personal-sphere behaviors (Stern et

al., 1999). The design of the Carbon Masters program actively engages two of these three kinds of support, including citizenship actions and personal-sphere behaviors.

In terms of the criteria, the Carbon Masters program is forecasted to score relatively high across the board. For effectiveness, I gave the program a 3 because the curriculum available to its participants fosters an environment for value amplification and norm activation. Stern et al. point out in their article that a program's "intense focus on values already held by prospective constituents is one of the key steps toward committed movement activism" (Stern et al., 1999). Carbon Masters advocates altruistic, eco-centric, and other values that support the new ecological paradigm of the VBN. While these values are amplified in the participants, the program also seeks to ensure a personal awareness of the consequences and an ascription of responsibility to climate change, especially in Whatcom County. Therefore, a score of 3 is appropriate for effectiveness because the possibility for pro-environmental norms to be activated within the program participants can be expected to be quite high.

Following along the same line, this initial assessment predicts that Carbon Masters would receive a score of 4 for offering a high degree of efficacy for its participants. The diversity of information available, as well as the presence of a supportive and educational environment, correlates strongly with the potential for the empowerment of the program participants. The participants should also be empowered by the fact that they are encouraged to take their newfound knowledge and volunteer their services by becoming involved in public outreach activities such as speaking out to community businesses, schools, and other organizations about what personal behaviors we can all adopt to reduce our carbon emissions (WSU Extension, 2009).

Carbon Masters will score highly under the community criterion as well. The fact that the program's public outreach strategy "...includes interactive teaching methods, peer-to-peer connections, social marketing techniques and civic engagement" (WSU Extension, 2009) lends itself to receiving a score of 3. Interested individuals have the opportunity to participate in the program, change their personal-sphere behaviors, and then take this information to share and interact face-to-face with other members of the community. The availability of peer-to-peer interaction supports an increase in social capital within the community. The "Carbon Masters" that go out into the community will build "active connections among [the] people" in such a way as to establish "...the trust, mutual understanding, and shared values and behaviors that bind the members of human networks" (Cohen, Prusak, 2001).

The Carbon Masters program is expected to score somewhat low on the efficiency scale simply because it is too difficult to determine at this point whether the inputs, or costs, of staff, materials, and time will not exceed the benefits of a citizenry reducing their carbon emissions. I feel that it is safe to assign a score of 2, which is on the middle of the scale. Seeing as how the short term costs of any action to reduce carbon emissions will lead to long term benefits down the road, I believe this score is appropriate at this time. After the program has finished its first year of citizen engagement, a post-evaluative matrix should be constructed to re-assess each of these criteria.

RE Sources, "be cool" Campaign:

An alternative solution to the problem presented in this analysis is another Bellingham-based environmental program. RE Sources Sustainable Communities is a community-based, non-profit environmental education organization. The organization was

established in 1982 with the mission to "[promote] sustainable communities through recycling, education, advocacy, and conservation of natural resources" (RE Sources, 2009). The group sponsors a number of community-based programs including waste reduction programs, youth outreach programs, and workshops sponsored by its RE Store. Their newest program, entitled the "be cool" Campaign, launched in May of 2008. The campaign claims to "[challenge] individuals to personally combat climate change" (RE Sources, 2009).

The primary medium of education for the campaign is the "be cool" website at http://www.imcool.info/. There are three key components to the website. The first is a section entitled "Get Informed" with subheadings entitled "Global Warming 101" and "Local Impacts". The second section is a "What's Happening?" page which features a community spotlight on initiatives that are happening in Whatcom County to reduce greenhouse gas emissions. The third section consists of a network of links leading to informational pages about what you can do to reduce your own carbon footprint. These pages have buttons which say "I will do that!" in efforts of allowing individuals to make a pledge to the campaign that they will follow the tips listed on the site. The website also has a feature which allows anyone to sign up to an e-newsletter which contains updates about information and innovative techniques to reduce carbon intensity. The e-newsletter also attempts to keep track of individual's "I will do that!" pledges (RE Sources, 2009).

In terms of effectiveness, the "be cool" campaign is forecasted to score a 3. The information presented on the webpage is accurate, detailed, and diverse. The website touches on a number of the short and medium term outcomes outlined by the logic model. Increases in awareness, knowledge and motivation, changes in attitudes and behavior, and social action could be expected results of an individual spending time on the website. Pro-

environmental norms could also be activated given that the website promotes the new ecological paradigm of the VBN, and also encourages the viewer to become aware of the consequences while ascribing personal responsibility. The effectiveness of this program could however be compromised if only a small number of people are informed of the website's existence. The scoring for this criterion could require re-evaluation.

The "be cool" Campaign will score relatively low in terms of efficacy and community due to the fact that the primary medium for education in this case is a website. The campaign does sponsor a booth at summertime events in Bellingham such as the Ski to Sea event, as well as a travelling display hosted by a team of interns; however, the key to most of the information is on the website. Social capital cannot be built up or even established when individuals are acting in isolation. Empowerment can occur on a personal level, yet it is more effective when an individual of a social movement feels supported by a collective group of people. The e-newsletter attempts to provide a sense of community by discussing what is going on in Whatcom County; however, this effort does not appear to be sufficient. Therefore, in terms of efficacy, the campaign scored a 2, and in terms of community, the campaign scored a 1.

Under the criterion of efficiency, the "be cool" Campaign is predicted to score a 2. Efficiency in this case will also be difficult to measure. The "I will do that!" button provides a mechanism for tracking pledges, and possibly, the amount of carbon reduced per dollar invested in the website. The problem with this initiative is that there is no enforcement mechanism to ensure that when a person presses the "I will do that!" button that they will *actually* do that. Katie Fleming, the "be cool" Campaign director, informed me that there have been efforts to make this data transparent to its participants on the website in the

form of graphs and charts of the pledges recorded. This, however, has not yet been established due to a lack of funding. Therefore, like the Carbon Masters program, it will be difficult to assess the efficiency criterion.

No Action: Maintain Status Quo

The current status quo is the very environment that has produced the problem confronted in this analysis. As discussed earlier, our governmental systems have yet to produce and implement legislation that actively targets the reduction in greenhouse gas emissions fueling climate change. The problem and policy "streams" of Kingdon's model have failed to converge over the last decade, thereby creating a political situation defined by "no action" (Clemons, McBeth, 2009). Besides the efforts made by both the Carbon Masters and the "be cool" programs, there are very few other policies or programs that have been implemented around the country to deal with the problem of a lack of education regarding what to do about climate change. Therefore, the "no action" option scored zero in each criteria category. Doing nothing about the problem is neither effective nor efficient. Maintaining the status quo will not improve community relations, build social capital, nor empower individuals to make a difference. From this point on, the "no action" option cannot be considered a valid program alternative for the purposes of this analysis.

1.7 Analyzing the Alternatives

My methodological approach to analyzing both the Carbon Masters Program and the "Be Cool" campaign will be to include both qualitative observational data as well as quantitative pre- and post-test data. My research will be structured so that I will be able to use the criteria of effectiveness, efficacy, community, and efficiency to determine which program alternative is the most appropriate option to serve as a model solution to the

problem. Both the expected outcomes of the logic model and the characteristics of the Values-Beliefs-Norms Theory will serve as the backbone for the questions composing the survey. My qualitative data collected through participant focus groups, interviews and monitoring will bolster the quantitative data contrived through a statistical analysis of the survey responses. A supplementary benefit-cost analysis will also be conducted for each program to determine efficiency.

The most important information to be gained through analysis of either program will be through the results of the pre- and post-tests of the participants. The surveys will most likely be available via an internet website so that all participants can access the survey from a computer. The questions for the survey will be designed based on the logic model outcomes and the VBN characteristics assigned to each criteria. For example, there will be a section of the survey pertaining to effectiveness in the form of questions that seek out information regarding the participant's awareness of the consequences and ascription of responsibility to climate change. An example question pertaining to one's awareness of consequences, which could be adapted for this survey, comes from the "Values-Beliefs-Norms Theory" article by Stern et al.:

> In general, do you think that climate change, which is sometimes called the greenhouse effect, will be a very serious problem for you and your family, somewhat of a problem for you and your family or won't really be a problem for you and your family? (Stern et al., 1999).

Questions pertaining to one's ascription of responsibility can be adapted from a number of questions asked in a recent Gallup poll regarding what Americans can do to reduce the effects of global warming. An example question includes: "Do you think the effects of global warming can be controlled if most people take steps such as driving less, recycling, and

turning down their thermostat, or will more drastic measures be needed?" (Newport, 2008).

The survey should also have questions dedicated to community-building and social capital as well as efficacy and empowerment. The number of questions per section will be determinant upon the weights that I have assigned the criteria as reflected in the decision matrix in Figure 2. Therefore, the majority of the questions will pertain to effectiveness, followed by a proportional number of questions dependent on their weighted values dedicated to efficacy and community. I expect to acquire the most beneficial information relating to efficacy and community in my qualitative observational analysis. Participant interviews using open-ended questions will allow me to broaden my scope of understanding regarding the participant's internalization of the program goals. All of the data acquired through the survey and interview questions will be scored accordingly. The data will then be statistically analyzed to determine their significance in meeting the characteristics of the outlined criteria.

In addition to interviews, I plan on conducting one or two focus group sessions with the Carbon Masters. Given that the 'be cool' campaign's participants are loosely connected individuals, focus groups will not be appropriate for their program. The purpose of the Carbon Masters focus groups will be to brainstorm and develop ideas about, first, what they believe will be the innovative and realistic approaches to applying the information they have gathered through the program in a real world setting, and second, the methods and techniques which they believe will improve the Carbon Masters program as a whole. Clemons and McBeth in their book Public Policy Praxis outline focus groups as one of the postpositivist tools that comprise their "mixed-methods approach" to policy analysis. Focus

groups in particular allow for civic engagement in decision making. Clemons and McBeth point out that "Civic engagement must engage. Rather than merely presenting the information, you engage the stakeholders again and facilitate another discussion, wherein the participants may reconstruct their narratives" (Clemons, McBeth, 2009). Given that most approaches to policy analysis neglect the civic engagement aspect of the process, I believe that using the postpositivist tool of facilitated focus groups in my analysis of the Carbon Masters program will address this problem.

As the policy or program analyst in this case, I will act as a facilitator for the focus groups. I intend to use the techniques outlined in Clemons and McBeth which include: following the "rules of discourse", avoiding monologic communication, and following the format of a "futuring" exercise (Clemons, McBeth, 2009). In laymen's terms, I will encourage dialogue, stick to ground rules set by the group, record the ideas and information formulated by the group, and finally, use the results of the participant's input from the focus group in my analysis of the program. The focus groups should add to the efficacy of the group and will hopefully shed light on the ability of the program to inspire community and social capital amongst the participants. The outcomes of the sessions should also provide some insight as to the effectiveness of the program in terms of the Values-Beliefs-Norms theory.

Lastly, a benefit-cost analysis needs to be conducted to determine the efficiency of the programs. Efficiency in this case will be expressed in terms of the amount spent in dollars ($) per person per pound (lb.) of carbon reduced from each individual's carbon footprint. As mentioned earlier, the costs of the inputs first need to be monetized. These inputs include the following from the logic model: staff, volunteers, time, money, and

materials. The benefits can be quantified per person by requiring the participants to make a pledge of how many pounds of carbon they plan to reduce by the end of the program. A baseline or goal of efficiency first needs to be established before the analysis is conducted. This baseline can be arbitrarily decided, or can be based on a group consensus compiled of average pledges to reduce carbon emissions. After running the analysis for both programs, the results will be compared, and a determination can be made based on which program is more efficient in terms of money spent per pound of carbon reduced.

1.8 We Can Make a Difference

This analysis serves as a method to evaluate two possible solutions to the problem of a lack of educational programs available to the public that offer tools to empower the ordinary citizen to deal with climate change in Whatcom County. Climate change is a worldwide, complex phenomenon that will produce real consequences within our lifetimes. The problem outlined in this analysis is but one of the concerns associated with our need to mitigate the issue. The news media and scientific reports about the future of the human race in the face of global climate change are foreboding and grim. Perhaps the changes are irreversible. Perhaps the natural processes fueling the change will be impossible to decipher before it is too late. Perhaps though, it is our responsibility to preserve the quality of life for ourselves and all the other living creatures on this planet. We can only do so if we believe we can be informed and make a difference. Both the Carbon Masters program and the RE Sources 'be cool' campaign have set out to achieve this. The goal of this analysis is to shed light on the strengths and weaknesses of the programs in attempts to improve their ability to attain the goals they have stated. It is my hope that this information be used

constructively and usefully to better serve the public, while at the same time, raising awareness about what we *can* do about climate change.

Section 2: Pre-Experimental Research Design

2.1 Putting the Proposal into Action: The Pre-Experimental Research Design

The previous section described in detail a policy analysis proposal to go about the evaluation of two environmental education programs geared toward inspiring civic engagement and stimulating action to fight climate change. The proposal itself serves as a foundation for the following pre-experimental research design. In light of scarce resources, including time, the scope of the following experiment will include only the investigation of the short term outcomes outlined in the logic model of the Carbon Masters pilot program which launched on April 9th, 2009. In order for a more comprehensive evaluation to be completed, both the medium and long term outcomes of the Carbon Masters program would need to be studied. In addition, a cross-comparison study between Carbon Masters and RE Sources "be cool" campaign would need to be conducted to examine similarities, differences, and degrees of success in relation to the criteria outlined in the proposal.

The character of the data collected is primarily qualitative in nature, therefore, the potentially high degree of bias and error preclude the study results from being generalizable across the broad populous. The data, however, is not without merit. The information collected offers interesting insight into the capacity for a pilot climate change education program to address both the components of the Values-Beliefs-Norms theory, and the optimal outcomes presented in the logic model. At the end of the day, the intent of this study is to provide the client, the Carbon Masters directors, with a systemic evaluation model to assess the effectiveness, efficacy, community-building capacity, and efficiency of future Carbon Masters programs.

2.2 Objective and Hypotheses

Objective:

The objective of this study is to employ social science research methods to evaluate the WSU Extension Carbon Masters program to determine whether or not it successfully addresses the problem of too little educational programs available to the public that offer valid, proactive, constructive, and informational tools to empower ordinary citizens to deal with the complex issue of climate change. Based on the criteria of effectiveness, efficacy, and community-building, the study should illuminate whether or not the Carbon Masters program has the capacity to inspire change within its participants. Over the long-term through the extension process, the study expects to examine the program's capacity to inspire change within the community members of Bellingham and Whatcom County.

Hypotheses:

H_0: Null Hypothesis:

The WSU Carbon Masters program will have no impact on its participants. More specifically, the program will have no effect enhancing altruistic or eco-centric values, nor encourage awareness of the consequences and ascription of responsibility to climate change within the participants.

H_1: Tested Hypothesis:

The WSU Carbon Masters program will have an impact on its participants. More specifically, the program will have the effect of enhancing altruistic or eco-centric values, in particular by raising awareness of the consequences and ascription of responsibility to climate change within the participants.

2.3 Methodological Approach

The following study to evaluate the Carbon Masters educational program is based on a pre-experimental design format. Therefore, this study has not been conducted in such a way as to meet the scientific standards of an experimental design. As mentioned before, despite this shortcoming, the information accrued during the research process will be sufficient to provide resourceful feedback in the overall purpose of evaluating the program. The pre-experimental design is characterized as a one group pre-test, post-test design. In this type of design, the researcher measures only one group of subjects, in this case, the participants, on a dependent variable following the administration of an experimental stimulus, in this case, the Carbon Masters classes. Therefore, because the study lacks the comparison of a control group, the experiment could suffer from the potential inference of an outside, independent variable which could change the pre- and post-test results. Despite this possibility for error and bias, the methods used in this pre-experimental design were administered in a uniform fashion and were developed in such a way as to still provide some insight as to whether or not the criteria for a successful program, outlined in the proposal, are met by Carbon Masters.

The study methodology for this pre-experimental design originates from the study outline of the "analyzing the alternatives" section of the policy analysis proposal. The logic model outcomes as well as the characteristics of the Values-Beliefs-Norms Theory serve as the foundation for the entire study. Provided that the study is limited by resources and time, only the short term outcomes of the logic model and the awareness of consequences (AC) and ascription of responsibility (AR) phases of the VBN will be used to evaluate whether the definitions of the criteria of effectiveness, efficacy, and community are

satisfied. The criterion of efficiency will not be addressed in this study because it would require a separate research design of which a cost-benefit analysis would serve as the primary means of evaluation.

The five research methods employed in this study were tailored directly to the format of the Carbon Masters classes. The classes themselves are structured as a lecture format for two and a half hours once a week. Various professional individuals who are involved in climate change research, civic engagement, sustainability, and other environmentally conscious professions in the community act as guest lecturers every week. In addition to the classes, the Carbon Masters participants are invited on a field trip every other Saturday morning to visit and experience hands on the activities that some individuals in the community are doing to reduce their carbon footprint and become more engaged as environmental citizens. The research methods of this study attempt to extract data from every available area in the program. The research methods include: "Carbon Masters Google Group" discussion posts, "After the Class" responses, an online pre-test, a focus group session, an online focus group session, an online post-test, and lastly, participant observations.

The "Carbon Masters Google Group" is an online blog forum operated through Google Software. It was established on April 3rd, 2009 by Carbon Masters Co-Director Joyce Jimerson with the intention of sparking discussion and debate about climate change education and issues outside of the classroom. The effectiveness of the "Carbon Masters Google Group" is dependent on the interaction and involvement of the participants. The program requires some initiative on behalf of the participants to contribute posts that are thought-provoking and reflective of their interests or concerns. The benefits of the Google

Group responses are that they act as a window into the participant's different values and beliefs about climate change. It also allows for a comparison of the subject matter of the posts spanning across the duration of the class to determine whether or not participants' ideas or beliefs about a particular topic have changed. In terms of the logic model, the "Carbon Masters Google Group" should provide insight on how the participants are learning, what knowledge they are acquiring, whether their attitudes have changes, and whether or not they have gained aspiration or motivation to make changes to their own carbon footprint. In terms of the VBN, the Google Group may provide insight on awareness of consequence and ascription of responsibility.

The "After the Class" responses are the results of two group activities that were conducted at the end of class on two separate occasions. The first "After the Class" activity was conducted on the very first day of class, on April 9th, 2009, and was coordinated by the Carbon Masters directors. The activity was a "group think" which had the participants get into small groups to brainstorm and answer the question: "What have you done in your life that relates to civic engagement? What are you doing now in terms of civic engagement?" The second "After the Class" activity was conducted on April 23rd, 2009, and was designed to be directly reflective of the objectives of this study. The question asked "Why do some communities protect the environment more than others?" Both of these questions were administered in the beginning of the program, and therefore attempt to discover whether or not the participants have an initial understanding of civic environmental engagement. In this case, civic environmental engagement can be defined as the active efforts taken to work to make a difference in the environmental quality of our communities by developing the combination of knowledge, skills, values and motivation that make a difference

(Ehrlich, 2000). The informational data collected in these "After the Class" responses can be understood as a pre-focus group for the participants. Their responses for these questions will be compared to the responses acquired in the facilitated focus group, as well as the online focus group.

The pre-test, which is also the post-test, is a strategically designed questionnaire taken directly from the Values-Beliefs-Norms Theory paper by Paul C. Stern et al. The purpose of the survey is to analyze the participants' responses in terms of the VBN to acquire a better understanding for their existing set of values, beliefs, and tendencies toward being aware of the consequences and ascribing the responsibility of climate change on to their individual self. Two questions are directly transplanted into the survey from a Gallup poll survey of a similar nature entitled "Americans Assess What They Can Do to Reduce Global Warming", published on April 24th, 2007. These two questions can be located under Appendix D-1. The purpose of using these two questions in particular is that it will allow for an interesting cross comparison of results between the Carbon Masters participants and a sample of United States citizens. The survey and these Gallup poll questions in particular are designed to shed light on whether or not the Carbon Masters participants have an existing value set that can be amplified to ensure awareness of consequences and ascription of individual responsibility in regards to climate change.

The importance of the pre-test lies in its comparability to a post-test. The pre-test was distributed on April 21st, 2009 after the classes had started. External circumstances precluded the survey from being distributed prior to the beginning of classes. Therefore, the post-test will be distributed after the Carbon Masters have completed their assigned

100 hours of volunteer work involving the skills they learned in the program. The purpose of comparing the two surveys is to determine whether the independent variable, the Carbon Masters classes and experiences, have acted on the participants in such a way as to change their original values and beliefs, recorded in the pre-test, regarding carbon intensity and environmental citizenship.

A more in depth method for determining whether or not their values and beliefs, especially regarding their awareness of consequences and ascription of responsibility, have changed since the application of the independent variable, is the use of both an in-person and online focus group. The focus groups in particular allow for civic engagement in the research process. Participant contribution to discussion in this area is a much richer source of data than a survey alone can provide. The focus groups were designed using the "Focused Conversation Method". This method is a particular type of facilitation tool which allows for a more effective discussion among a large group of people. In particular, the "method works because it follows a natural, human process" (ToP, 2000). The structure of the Focused Conversation Method is to incorporate questions that are objective, reflective, interpretive, and decisional. These could be translated as the "what?", the "gut", the "so what?", and the "now what?" of a subject-based conversation. Objective questions retrieve the facts, reflective questions aim for reactions, interpretive questions try to find connections and significance, and the decisional questions outline actions or future actions to be taken. The exact questions that were asked can be found in Appendix E-2. The online focus group is the same format in a different medium of communication to reach out to those participants who could not meet in person.

The purpose of the focus groups is to examine the degree of awareness of consequences (AC) and ascription of responsibility (AR) within the participants. The focus group questions are open-ended, and therefore allow for the participants to broaden their answers and provide more insight as to the status of their learning. Provided that the focus group was conducted near the end of the program, on May 14th, 2009, the in-person focus group responses will be compared to the second "After the Class" group think activity which asked the question "Why do some communities protect the environment more than others?" This comparison will be used to determine whether there has been a change in the participants AC and AR.

Lastly, as a student researcher, I took the liberty to become a Carbon Masters participant myself in order to acquire general qualitative participant observations. I have attended every single class and every single field trip since the program started. I have conducted a few impersonal interviews and have taken general note of classroom dynamics and participant opinions regarding the program so far. The purpose of this method is to allow for an overarching understanding of how the program is functioning, as well as how the participants are reacting to the stimulus, or the classes themselves.

In terms of demographics, there are 8 male and 13 female participants currently enrolled in the 2009 Carbon Masters Program. Out of the total participants, 11 work full-time, 5 are retired, 3 are students, and the others are not listed in either category. Ages of the participants are in a range from 21 to 80. Participation is voluntary and was determined based on an application process. The participants are required to complete 100 hours of volunteer service upon the completion of the Carbon Masters classes.

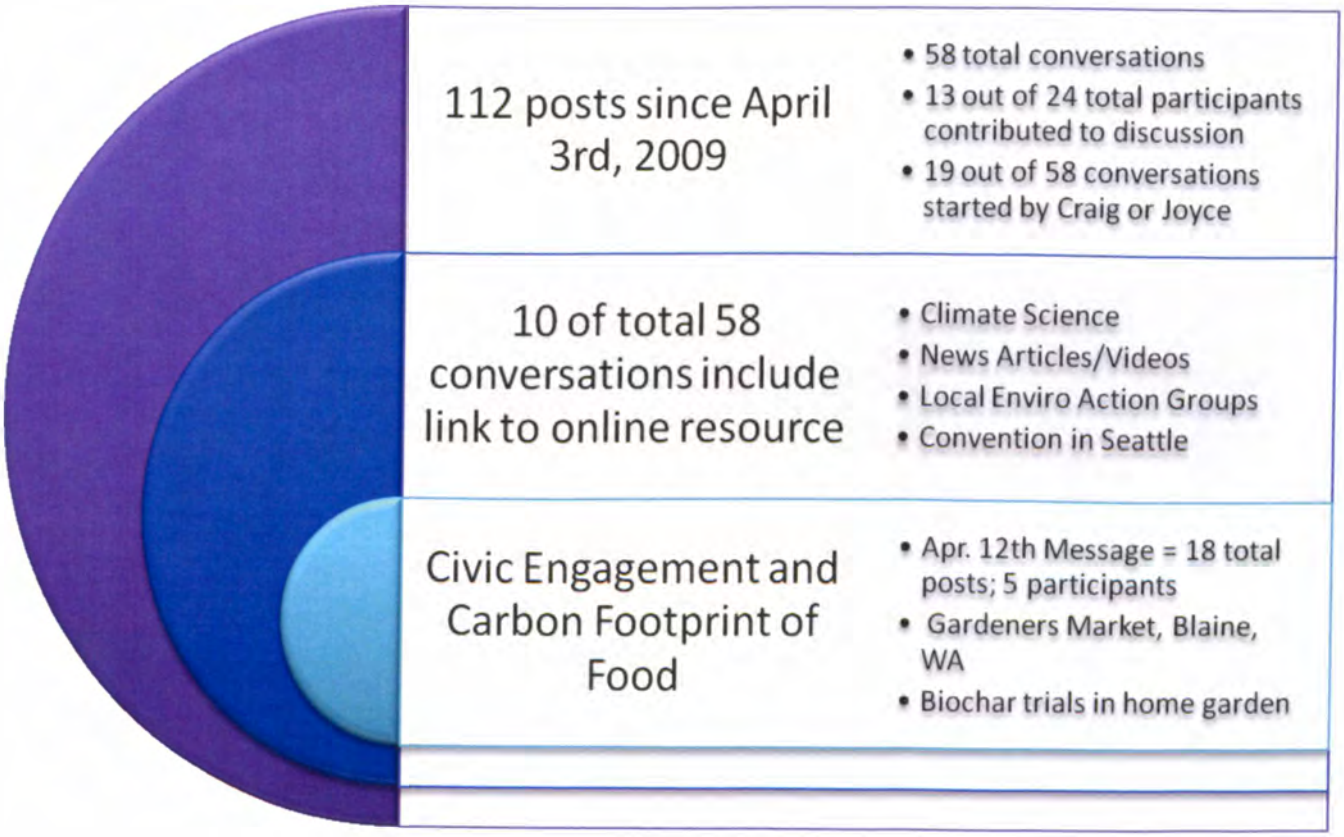
2.4 Results from Primary Analysis

The results of the data thus far are both anticipated and surprising. Each of the data sets provide interesting details as to the degree to which the program is meeting or is not meeting the goals outlined by the criteria of effectiveness, efficacy, and community-building. It is important to note that the results are qualitative in nature and are not generalizable across a wider population. Detailed information corresponding to each research method can be located in their respective appendices.

2.4.1 "Carbon Masters Google Groups" Discussion Posts

The following graphic depicts the summarized findings of the "Carbon Masters Google Groups" discussion posts:

Figure 3: Target Graphic of "Carbon Masters Google Groups" Discussion Posts



The target graphic on the previous page simplifies the information available on the "Google Groups" page down from the more broad concepts on the outside ring to more narrow and detailed concepts on the center bulls eye. As of May 18th, 2009, there have been 112 total posts; 58 of which were actual conversations between participants, and 19 of those 58 were initiated by the program directors. The fact that a little more than half of the posts involved a conversation or discussion by a little more than half of the total participants suggests that this medium of communication has been relatively successful. Almost 20% of the posts involved the sharing of a link or online resource to learn more about topics like climate change science and civic engagement. Provided that this method of communication requires self-motivation and participation, these results suggest that the program has opened up an opportunity for the participants to realize some of the short-term outcomes of the logic model including gaining new knowledge, become motivated to research more on their own, and develop new attitudes or opinions about the topics for discussion.

For example, one video post about a geo-engineering solution to climate change produced a discussion between three participants. This discussion opened up a window into three of the individuals' particular beliefs about geo-engineering. One participant said: "My reaction to large scale geo-engineering solutions to climate change is definitely revulsion". Another participant responded saying: "Hard for me to look at geo-engineering as anything but a lazy guy's experiment". These responses hint to the idea that these participants could already be ascribing personal responsibility for climate change in that they believe a *technological* solution will not solve the *behavioral* problem. Another post made a few days later expanded on the idea of an individual connection to the problem

with the following philosophical quotation about how connected we are to carbon: "...Each and every leaf that grows [in the Spring] will incorporate into its body a few dozen atoms of carbon that came from one particular exhalation you made during the previous Fall".

Despite these occasional changes in topic, the primary focus for discussion, which is also shown at the center of the target graphic, is the subject of civic engagement and the carbon footprint of food. In terms of gaining awareness and knowledge, as delineated in the logic model, this topic of discussion has allowed for the greatest amount of development. For example, one participant shared her positive experience encouraging civic engagement in her neighbors by starting a gardener's market in Blaine. Another participant responded saying that after a field trip to see a biochar plot, which involves infusing carbon in the soil for fertilization and sequestration benefits, she decided to start her own plot and work with her son in learning and developing how to grow their own food while reducing their carbon footprint.

2.4.2 "After the Class" Group Think Activities

The first of the "After the Class" Group Think activities posed the following question: "What are you doing and what have you done in terms of civic engagement?" The responses were given a score of 1, 2, or 3 based on the degree to which the response indicated involvement in an activity defined as "civic *environmental* engagement". In this case, this term can be defined as an active effort taken to work to make a difference in the environmental quality of our community by developing the combination of knowledge, skills, values and motivation to make that difference (Ehrlich, 2000). A score of "one" suggests that the activity listed is not considered civic environmental engagement, a score

of 2 suggests that the activity could not be defined as absolutely civic environmental engagement or simply civic engagement, and a score of 3 suggests that the activity satisfies the definition of civic environmental engagement. Between the four groups that submitted responses, a total of 52 responses were broken down in the following manner: 24 were given a score of 1 (44.2% of the total), 11 were given a score of 2 (21% of the total), and 17 responses were given a score of 3 (32% of the total).

These results hint to a selection bias in the participants for the very fact that over 70% of the responses involved some degree of civic engagement. Responses characterized as civic environmental engagement were almost a third of the total responses. The fact that the participants are already engaged in activities that lend themselves to be defined by both awareness of consequences and ascription of responsibility suggests that the program will only need to amplify these existing tendencies to encourage the participant's growth into true environmental citizens.

The second of the "After the Class" Group Think activities posed the following question: "Why do some communities protect the environment more than others?" The purpose of this question was to investigate a pattern among the answers in terms of a metric of beliefs. This metric is composed of four categories; category 1 is based on the belief that individuals can make a difference, category 2 is based on the belief that the community collectively can make a difference, category 3 is based on the belief that people in positions of authority (i.e. government) can make a difference, and category 4 is composed of beliefs that step beyond these bounds. Out of 21 total responses, 7 fall under category 1 (33.3% of the total), 8 fall under category 2 (38% of the total), 2 fall under category 3 (9.5% of the total), and 3 responses fall under category 4 (14% of the total). The

results from this section indicate that a majority of the participants believe that individuals or the community, composed of individual actions, can lead to more environmental protection. This again relates back to the suggestion that the participants already have a burgeoning sense of an awareness of consequences and personal ascription of responsibility to environmental problems. For graphic representations of the data listed above, please see Appendix C-1.

2.4.3 Pre-Test Results

The purpose of the pre-test results is to acquire an understanding of the participant's existing set of values in addition to gauging their tendencies toward being aware of the consequences (AC) and ascribing personal responsibility (AR) to climate change. In particular, the expectation is to see a movement from the results in the pre-test toward the re-prioritization of values and an increase in AC and AR in a post-test. Until that test is completed, the survey results will primarily serve as a tool to help restructure the Carbon Masters program in such a way as to amplify certain values or encourage AC or AR wherever they are currently lacking in the participants. The results transcribed here reflect only those questions which addressed values, AC, and AR in particular.

Altruistic values are values reflective of the unselfish concern for the welfare of others. Altruistic values are critical component of a value set that would lead one to understand the new ecological paradigm, possess AC and AR, and eventually have the capacity to be an environmental citizen.

"Graph 1, Values Part 1" in Appendix D-4 depicts the results for only the answers characterized as "altruistic values" from the participant responses to the question: "*In the following section are a series of statements some people say guide their life. Please tell me*

how important each of these is as a guiding principle in your life." The answers are on a five point scale, with responses ranging from "Extremely unimportant" to "extremely important". Generally, almost all of the altruistic values listed were considered "extremely important" as guiding principles in the participants' lives. Only one value, "unity with nature", had a predominant response of only "important". Seeing as how the responses reflected the top two most positive choices of answers, the difference in answers does not refute the fact that the majority of the participants seem to have a strong disposition toward possessing altruistic values.

"Graph 2, Values Part 2" in Appendix D-4 depicts the results for a comparison of the four different types of values the survey was testing for. These values for comparison were selected randomly and include altruistic values, traditional values, self-interested values, and openness to change values. The altruistic value responses ranked higher in importance in comparison to the other values. Traditional and openness to change values were still considered important to the participants. A curious area within the graph is over the "self-interest value" of "wealth, material possessions, and money". This value shows the greatest range in responses from "extremely unimportant" to "important". The reasons for this range are highly variable, however it does shed light on degree of importance money has on the choices we make. This fact is further reflected in the set of graphs illustrating AR.

"Graph 3: Awareness of Consequences" shows a graphic depiction of the following question: "*In general, do you think that climate change, which is sometimes called the greenhouse effect, will be a very serious problem, somewhat of a problem or won't really be a problem for the following: you and your family, the country as a whole, for other species of plants and animals.*" The answers were on a three point scale from a response of "it won't

really be a problem", "it will be somewhat of a problem", "it will be a very serious problem", or "it will be a very serious problem". The graph itself looks incomplete, but that is simply because the participants overwhelmingly thought that the problem of climate change "will be a very serious problem" for each of the different variables. It is curious to note that 41% of the responses to the question of "*will climate change be a problem for you and your family?*" said that it would only be "somewhat of a problem". This piece of information could contradict the general observation from the question results that there is a healthy awareness of consequences, especially at the individual level.

Graphs 3 and 4 for Ascription of Responsibility in Appendix D-4 display a comparison between the responses of the Carbon Masters and a national sample to two Gallup Poll questions from a published study entitled "Americans Assess What They Can Do to Reduce Global Warming" (Carroll, 2007). The first question asked: "*The following is a list of steps individuals can take to reduce global warming. Please respond for each if that is something you, personally, should or should not be doing.*" The second question asked: "*The following is a list of steps the government can take to reduce global warming. Please respond for each if that is something the government should or should not be doing.*" The total number of Carbon Masters participants that answered these questions was 17, while the total number of United States citizens that responded to these questions was 1,007. The purpose of the comparison between the Carbon Masters participants and the national survey participants is to determine whether or not the Carbon Masters represent a significantly different sample than what one would expect from a national average.

In regards to the first question, there are two areas in which the Carbon Masters responses are unique. In general, the Carbon Masters' responses reflected the national

response trend. However, in regards to the two individual steps, including "spending several thousands of dollars to make your home energy efficient" and "buying a hybrid car", the Carbon Masters responded "no", suggesting that they do not think those are steps that individuals should be taking. In short, it appears that the participants are not willing to place the burden on themselves to address the problem at hand. The reason for this appears to be primarily financial, as spending thousands or even hundreds of thousands of dollars to reduce one's carbon footprint is not an easy objective. This result relates back to the variable response under "self-interested value" heading in Graph 1 of Appendix D-3. It appears that the Carbon Masters' value of money and wealth is reflecting back on their willingness to place a monetary burden on themselves to reduce their carbon intensity.

Graph 4 depicting the responses to "what steps should government take" would appear to be in conflict with the unique responses in Graph 3. In this case, the Carbon Masters said they would be more willing than the national sample to accept the burden of an increase in surcharges on utility bills, as well as the increase in the cost of goods and services as a result of an increase in cost with additional regulations imposed on industry and utilities. Although the responses seem paradoxical, the answers really are reflecting back to the results of the "After the Class" Group Think question which asked "*Why do some communities protect the environment more than others?*" In that data set, 38% of the responses fell under the category of belief that "communities collectively can make a difference". Therefore, the participants may have responded in such a way because the direct ascription of responsibility is shifted from the individual to the community collective instead.

The post-test will not be conducted until after the Carbon Masters complete their required 100 hours of volunteer service in the form of a project that reflects the knowledge they have acquired in the classes. Therefore, a comparison between the two surveys is currently pending.

2.4.4 Focus Group Results

The results of both the in-person and online focus group so far provide the first set of data that displays some degree of feedback after the application of the independent variable; the Carbon Masters classes. The in-person focus group was attended by only three participants. So far, the online focus group has only produced one response. The turn-out has been low, but the results are very interesting. The questions that were presented to the focus group participants can be found in Appendix E-2. The rough notes of the responses taken from the in-person focus group can be found in Appendix E-3. In general, the responses from the three participants reflected an overwhelming sense of an Awareness of Consequences (AC). Each of them felt like they had a general understanding of climate change science and the implications it posed to the globe. Each of them commented to some degree about how the classes up until that point had provided an added sense of clarity to the issue of climate change science. In short, the participants suggested that the classes had actually facilitated their increased AC.

Although it appears that the participants are fully aware of the consequences of climate change, it is not certain to what degree they are aware of the consequences to themselves as individuals. This uncertainty comes in the form of a general lack of ascription of responsibility (AR) within the participants. The figure on the following page summarizes their responses pertaining to AC and AR.

Figure 4: In-Person Focus Group Responses Regarding AC & AR

Participant 1	Participant 2	Participant 3
• Wanted to learn more about carbon footprinting. • Has become more interested over time on the variety of topics in class. • "What is my role in trying to make a bigger impact beyond myself?" • "There are things I can change but I [typically] choose the route of least resistance." • Leads life by example; doesn't believe the course has given them tools yet to change others. • "I'm not sure about the burning question: 'what's my role in all of this?'"	• Would like to see a more structured payback with Carbon Masters. • "I was surprised when I found out it would take 6 worlds to support my [carbon intensity]... however I'm still resistant, for instance, to stop flying [to see family]." • The classes have brought climate change into their value system as a global citizen. • Believes we're focusing on splinters when we should be looking at the whole tree. • Interested in learning more about civic engagement.	• Curious about carbon, but more concerned about air pollution than global warming. • Tends to be pragmatic in nature (i.e. conservation vs. total behavioral overhaul). • The information has generated more questions. • "I feel we should work locally in the US to try and improve our behavior [in terms of our] use of energy." • Trying to fit personal priorities in with the information gained on carbon intensity. • Generally intrigued about new types of technological solutions to climate change problems.

In terms of ascription of responsibility, the participants appeared lost or unsure about what to do to actually affect change on an individual level. For example, participant 1 stated: "There are things I can change but I [typically] choose the route of least resistance." Participant 2 made a similar statement: "I was surprised when I found out it would take 6 worlds to support my [carbon intensity]... however I'm still resistant, for instance, to stop flying [to see family]." Participant 3 suggested that no real effort can ever really be achieved if China and India, two carbon intensive nations, make no effort to reduce their greenhouse gas emissions. Participant 1 made a strong statement supporting the fact that

she didn't believe, as of yet, that she could take action to mitigate the threat of climate change. She said: "I'm not sure about the burning question: 'what's my role in all of this?'" Participant 2 agreed somewhat to this statement by saying that the Carbon Masters program did not yet offer a structured payback after the learning portion of the extension process.

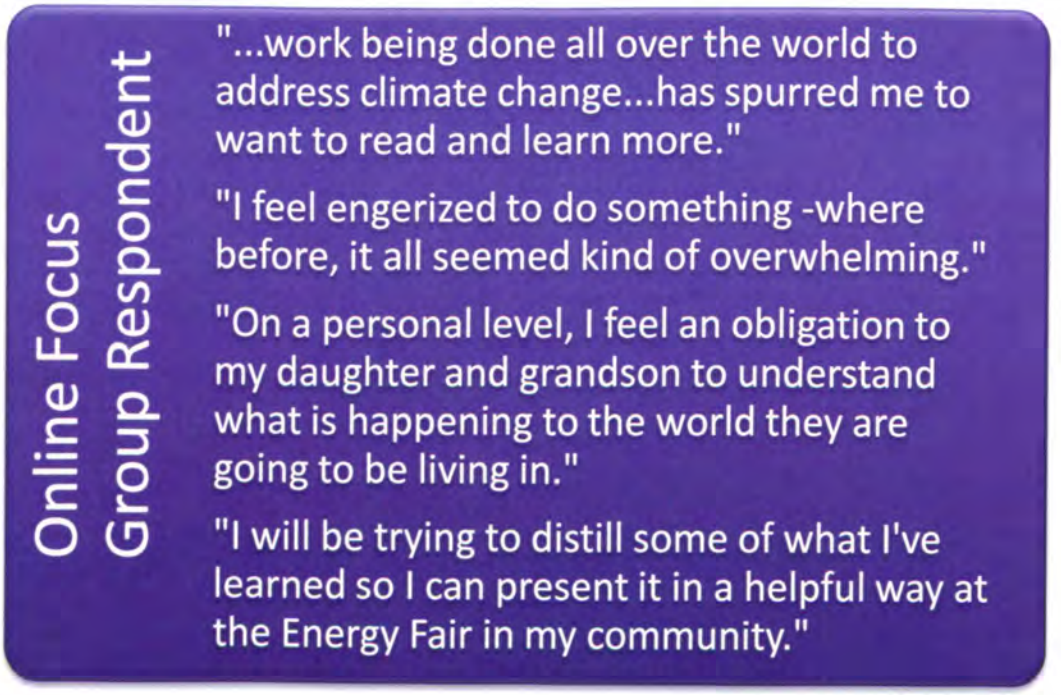
Each of these contributions to discussion supports a slight contradiction in the data up to this point. The "Google Groups", "After the Class", and pre-test results recognize that the participants are ascribing responsibility to climate change to at least some degree. It would appear curious that the focus groups indicate that, at present, the participants are lacking the tools to fully believe that they can take action to mitigate the threat of climate change. The main reason I believe there is such a gap between the AC and AR phase of the Values-Beliefs-Norms flow chart to environmental citizenship is that, according to Stern et al., an individual must first *experience* the problem at hand before moving on to ascribe responsibility to that problem (Stern et al., 1999). In the case of the Carbon Masters, experiential learning in the form of the 100 volunteer service hours in a project, which is designed to put the information of the course into perspective, has yet to occur. Therefore, the participant's question of "What's my role in all of this?" should be answered in time once the actual extension process is able to begin.

The focus groups, besides identifying a short-coming of the program design, were still able to point out the program's subtle success in encouraging some individuals to move beyond the gap between AC and AR. One participant of the in-person focus group made a particular comment that transcends the gap described above. She said the following in response to the question, "*What does carbon dioxide science mean to you?*": "I've understood

how my values and behavior affect the treatment of women around the world but I had not done that for CO_2 [until now]. [It has] brought climate change into my value system as a global citizen." The fact that she is aware of the consequences of carbon intensity, is now willing to change her values and beliefs to ascribe responsibility to the issue, and finally recognizes that she is a part of the new ecological paradigm as a "global citizen", suggests that her progression through the VBN is much farther than anticipated. This can be expected provided that the variability in maturity, as well as the diversity of values and beliefs within the participants, will determine when or if the participants have the capacity to become true environmental citizens. This evidence of norm-activation is a good indicator for the program's ability to allow for growth in light of the experiential gap between AC and AR.

The online focus group has only received one respondent as of May 28th, 2009. The following is a figure displaying key quotations signaling a progression toward AR and environmental citizenship, similar to that of participant 2 above.

Figure 5: Online Focus Group Participant Responses Signaling AR



These responses clearly indicate that the participant is both aware of consequences and believes that action on an individual level is necessary in order to mitigate climate change, which poses a threat to their close family. This particular participant's responses do not fall entirely in line with the characteristic of the in-person focus groups. The reason for this could be reliant upon the fact that the focus group only had three volunteers to share their experiences and opinions. Therefore, the results accrued in this section cannot be generalized across the entire Carbon Masters group until a greater percentage of the entire class has contributed to the focus group process.

2.4.5 Participant Observations

My observations of the participants throughout the classroom and field trip experiences have served to verify a majority of the data that has been gathered through this research design process. Provided that my assessment could be biased in nature, a future external observer, blind to the purpose of the study, could make similar generalizable statements about the dynamics of the group without internal bias. Throughout the process, I have confirmed that despite being aware of the consequences of climate change, most of the participants have asked questions or discussed amongst themselves about the remaining complexity of the issue of how to extend the information they've received in the classes and field trips to inspire community members to change their carbon-intensive behaviors. Despite this challenge, I have also witnessed dynamic and innovative thinking, an increase in motivation and excitement about starting their projects, and an overall increase in a sense of bonding and connection with fellow classmates.

Some general statements I can make about the participants in the classroom are as follows: there are a core group of individuals that consistently contribute to discussion in

class and on the "Google Groups"; there are those who are very knowledgeable and then there are those who are working to take in new and complex information; most everyone is eager to ask questions; and finally, some participants, as mentioned before, seem to be overwhelmed with the material. Overall, I can say with confidence that a large majority of the participants are reacting positively to the Carbon Masters experience.

2.6 What is the Future of Carbon Masters?

All of the results discussed in the previous section are simply an analysis of the existing conditions of the values and beliefs currently guiding the behavior of the Carbon Masters participants. The purpose of these results is to compare them with a control group and also the results of a post-test test, which will be conducted after the completion of the participant's 100 volunteer service hours. The results currently generated from these preliminary studies will aid in the final evaluation of the pilot program of the Carbon Masters program. The information itself has substantial merit in allowing for the program to grow and adapt by addressing the policy analysis problem outlined in the beginning of this paper.

Although a final assessment of the program's success will not be conducted until much further down the road, I would like to take this opportunity to review the initial decision matrix I had designed for Carbon Masters. I have developed the following table which sketches a comparison between my initial judgments of the program and that of the preliminary data from this experimental research design. The table serves as an unofficial scorecard for the program in terms of the criteria of the policy analysis proposal.

Figure 6: Unofficial Evaluation Matrix of the Carbon Masters Pilot Program

	Criteria			
WSU Extension Carbon Masters	**Effectiveness** Weight: 4	**Efficacy** Weight: 3	**Community** Weight: 2	**Weighted Totals**
Original Scores from Policy Analysis	3	4	3	30
Un-Official Revised Scores	3	2	2	22

I have re-evaluated the scores for efficacy and community in light of the data associated with this preliminary research design. The criterion of effectiveness is defined by an increase in awareness, knowledge, aspiration, motivation, and change in attitudes, as well as the activation of pro-environmental, personal norms. A majority of the evidence cited in the results section suggests that most if not all of the short-term logic model outcomes listed above are already being achieved through the program. It is too early to determine whether or not pro-environmental, personal norms have been activated among all the participants; however, the response from participant 2 from the in-person focus group is a sign that to some degree, the program may already be assisting the development of norms in some of the participants.

The score for efficacy went down two points for the time being. The simple reason is that, for now, the definition of the criterion, which requires that the participants feel empowered by the information they are receiving about climate change, has not yet been met. This is evident in the data results from participants not fully recognizing the individual impacts from climate change, as well as the personal ascription of responsibility to do something about the problem. Another reason can be cited from the participant's focus group responses in which they believed that they did not yet know what their roles as

Carbon Masters will be in the community. However, there is still a sense of burgeoning efficacy in the form of an increase in aspiration and motivation within the participants. The "Google Groups" posts, the focus group responses, and personal observation confirm that the information presented to the Carbon Masters has inspired them to do their own research and think creatively about how they can extend their knowledge to the community.

In terms of the criterion of community, or community-building, the score went down two points for the time being. The reason for this is that the criterion of community requires an increase in social capital among the Carbon Masters, and at this point, I do not believe that has been firmly established. The participants could have more opportunities to interact and actually get to know one another. From my participant observation, I have come to realize that not everyone knows everyone else in the group's name. There has only been one group "bonding" experience in the form of an after-the-class potluck. I would expect more social to be built among the Carbon Masters once they begin working on their projects with one another. Social capital in the form of linking and bridging can also be expected to grow between the Carbon Masters and the community members they interact with.

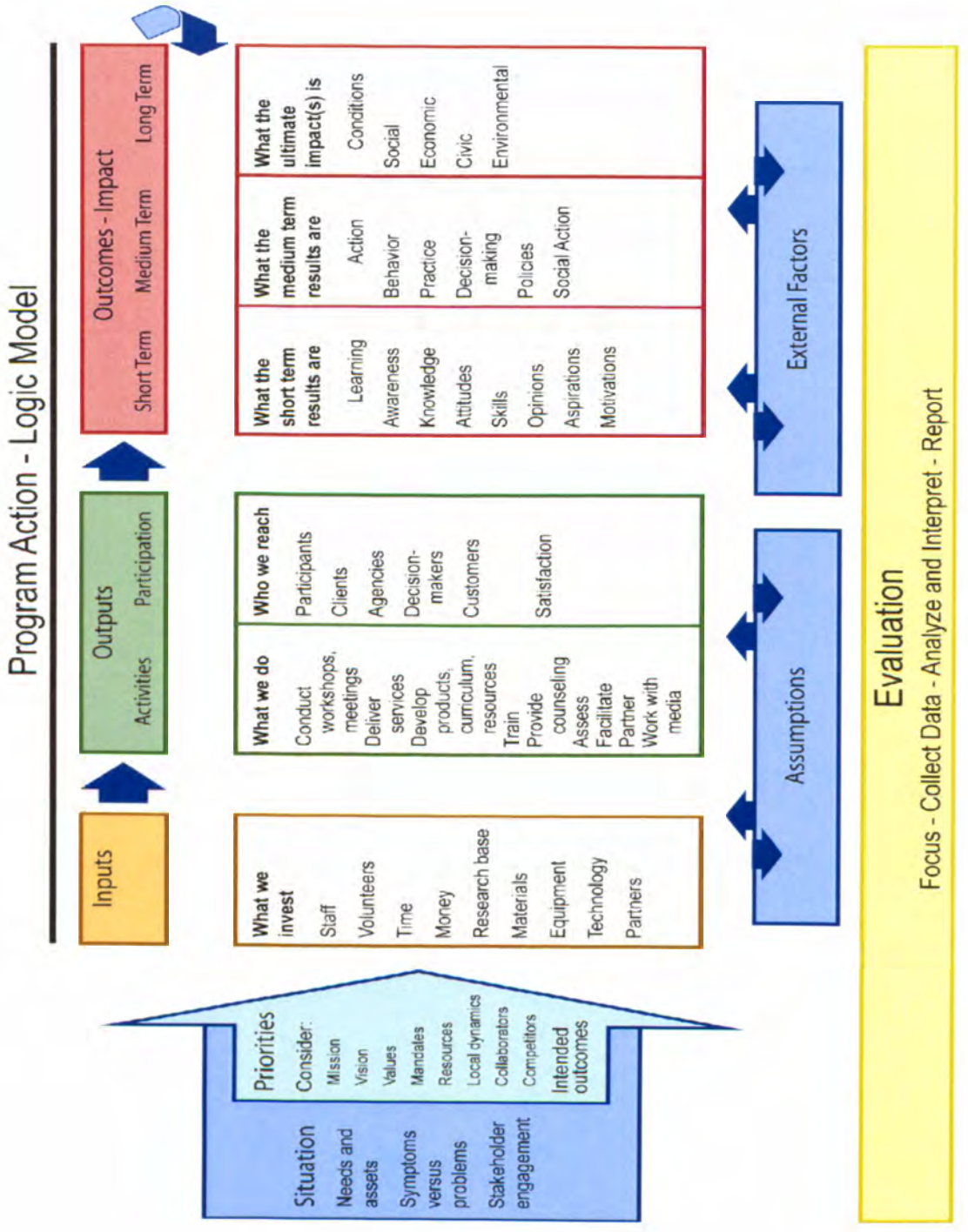
Despite these minor changes, I wholeheartedly believe that the Carbon Masters pilot program is well on its way toward acting as a solution to the policy problem discussed throughout this paper. Some suggestions I would offer the Carbon Masters directors would be: to open up more opportunities for the participants to interact in a non-formal way to build social capital, conduct more classroom activities like the "After the Class" responses and facilitate a discussion of the results afterward, to help the participants to realize what

their own values, beliefs, and norms are in an attempt to help them realize their own limitations to potential growth toward becoming environmental citizens, and finally, to design a more solid payback structure of which the Carbon Masters can rely on to assist them in their discovery of ascription of responsibility. As the program continues and the participants become involved in their projects, there may be more helpful suggestions which will allow the directors to design a more successful program down the road.

The deficit of climate change education programs to help ordinary citizens to feel empowered to deal with climate change has been reduced, at least in Whatcom County, with the introduction of the pilot program, Carbon Masters. With the guidance of this pre-experimental research design, the directors of Carbon Masters will have the opportunity to evaluate and adapt future programs in such a way as to successfully address all of the criteria outlined in the proposal, while at the same time, offering a solution to a seemingly unsolvable problem. I look forward to witnessing a change within the community as the newly equipped Carbon Masters venture out to extend their knowledge and experience on how to fight climate change to everyday citizens like you and me.

APPENDICES

Appendix A: University of Wisconsin Extension Evaluation Logic Model



Appendix B: Carbon Masters Google Groups Data

- 111 posts since April 3rd, 2009; 58 total conversations (*As of May 18, 2009)
- Out of 24 total participants, only 13 participants contributed to discussion
- 19 conversations were started by either Craig or Joyce out of 58 total conversations.
- 10 of the total 58 conversations included/focused on a link to an online resource discussing the following topics:
    - Climate Science, EPA CO_2 regulatory news, various news publications, reclamation of sewage and grey water treatment, waste to energy, alternatives to carbon-intensive concrete production, a convention in Seattle re: climate change, and various videos (i.e. "Dan Rather takes a look at Earth Day")
- April 12th: Post regarding civic engagement and carbon footprint of food:
    - 18 total responses; 5 total participants
    - One post in particular talked about a participant's efforts to start a gardeners market in Blaine, WA. Gained support from the Chamber of Commerce and City of Blaine – "We are looking at it as a way to enhance sustainability and community regardless of people's views on climate change and peak oil."
- April 19th: Biochar field trip encouraged participant to try own trials in charcoal fertilization in own garden.
- April 20th: Participant wants to start letter-writing campaign to city/county governments re: "Clean Green" waste disposal and "no idling" advocacy.
- April 23rd: Message re: wanting to start a community garden.
- April 29th: Discussion between 3 participants re: TED climate engineering video:
    - "His ideas foreshadowed what, for me, is a weakness in exclaiming the automatic acceptance of 'science' as a generator of good ideas."
    - "The fault is not in the tool but in its misguided application."
    - "My reaction to large scale geo-engineering solutions to climate change is definitely revulsion."
    - "Hard for me to look at geo-engineering as anything but a lazy-guy's experiment. Look at Denmark! Look at Sweden! Now that's progress."
- May 6th: Post re: introspective look at carbon present in our own bodies. Connection to systemic thinking – bringing perspective to individual connection to carbon.
    - "...Each and every leaf that grows will incorporate into its body a few dozen atoms of carbon that came from one particular exhalation you made during the previous Fall."
- May 8th: Agriculture and Energy: Discussion between 2 participants:
    - Direct effects outlined: "...sustainable vs. conventional methods, carbon sink vs. carbon source, social effects of methods choice, low-energy storage of foods: solar dehydration, seasonal consumption of produce..."
    - Indirect effects outlined: "...environmental and ethical issues of eating consistently higher on the food chain as opposed to lower, respect for animals as 'co-beings' and attention to their overall welfare..."
    - "I love the term co-species; it succinctly removes us from our anthropocentric pedestal."
- May 8th: Interest in taking action on solar cooker technology. Interest in sharing/spreading information about demonstration of and mobile information for solar cooking and its benefits.

Appendix C: "After the Class" Responses

Question 1: "What have you done in your life that relates to civic engagement? What are you doing now in terms of civic engagement?"

Score 1 = The activity listed may be considered civic engagement, but is not considered civic *environmental* engagement.
Score 2 = The activity listed could be in between, but without background information, cannot be characterized as an absolute.
Score 3 = The activity listed satisfies the definition of civic environmental engagement.

Group #1:

- Move-on.org: Power up America – Green Jobs – Clean Energy = **Score 1**
- Realtor Environmental Council – new committee within local association (government affairs) = **Score 3**
- Master Gardener – involved in community education = **Score 3**
- Master Composter "train to train" (garden club, Farmers Market, Home Show, NW Fair, green yard waste, SSC-Food Plus education...) = **Score 3**
- Responsible Development = **Score 1**
- Election Worker = **Score 1**
- Habitat for Humanity = **Score 1**
- Animals as natural therapy = **Score 1**
- Lobbyist = **Score 2**
- South Neighborhood Association = **Score 1**
- Grant Writers (music, canoe journey) = **Score 1**
- Water users association of Ferndale = **Score 3**
- Alternative Gifting Fair = **Score 2**
- Sierra Club Member, Defenders of Wildlife = **Score 3**
- Kulshan Land Trust = **Score 3**
- Sustainable Connections = **Score 3**
- Reducing Carbon Footprint (community education) = **Score 3**
- Running a women's hockey team = **Score 1**
- Community music = **Score 1**
- Local eating group = **Score 2**

Group #2:

- Nooksack Salmon Enhancement Association tree planting party = **Score 3**
- Birthday party at Food Bank Farm = **Score 1**
- Parent and business owner (horticulturalist) – Mother Baby Center (helping new mothers make green choices) = **Score 1**
- Teaching kids = **Score 2**
- Children's museum fundraising = **Score 1**
- Sustainable builder = **Score 1**
- Beachwatchers = **Score 3**
- Americorps = **Score 2**
- Camp director = **Score 1**
- Freemont Public Association – low income population = **Score 1**

Group #3:

- Outback farm at WWU: where our food comes from, can we grow our own? = **Score 2**
- Trash pick up = **Score 1**
- Presenting with Sustainable Connections = **Score 3**
- Tours for Master Composters = **Score 3**
- Organized Earth Day event = **Score 3**
- Promoting bicycle/walking campaign = **Score 3**
- Recycling = **Score 1**
- Sprawl prevention = **Score 2**

Group #4:

- Master Gardener = **Score 3**
- Leadership Team for health support group = **Score 1**
- BOD for foundation to combine art and nature = **Score 1**
- Neighborhood coop for food security = **Score 1**
- Ski to Sea Green Team = **Score 2**
- Whatcom Sustainable Recreation = **Score 2**
- Lifelong Learning curriculum committee (WWU) = **Score 1**
- Historic preservation of Mill = **Score 1**
- 4th Corner Exchange = **Score 2**
- Mt. Baker Events committee = **Score 1**
- Contacts state and national leaders = **Score 2**
- Presentations on permaculture = **Score 3**
- Member of Friends of the Library = **Score 1**
- Education about recycling = **Score 3**

Question 2: "Why do some communities protect the environment more than others?"

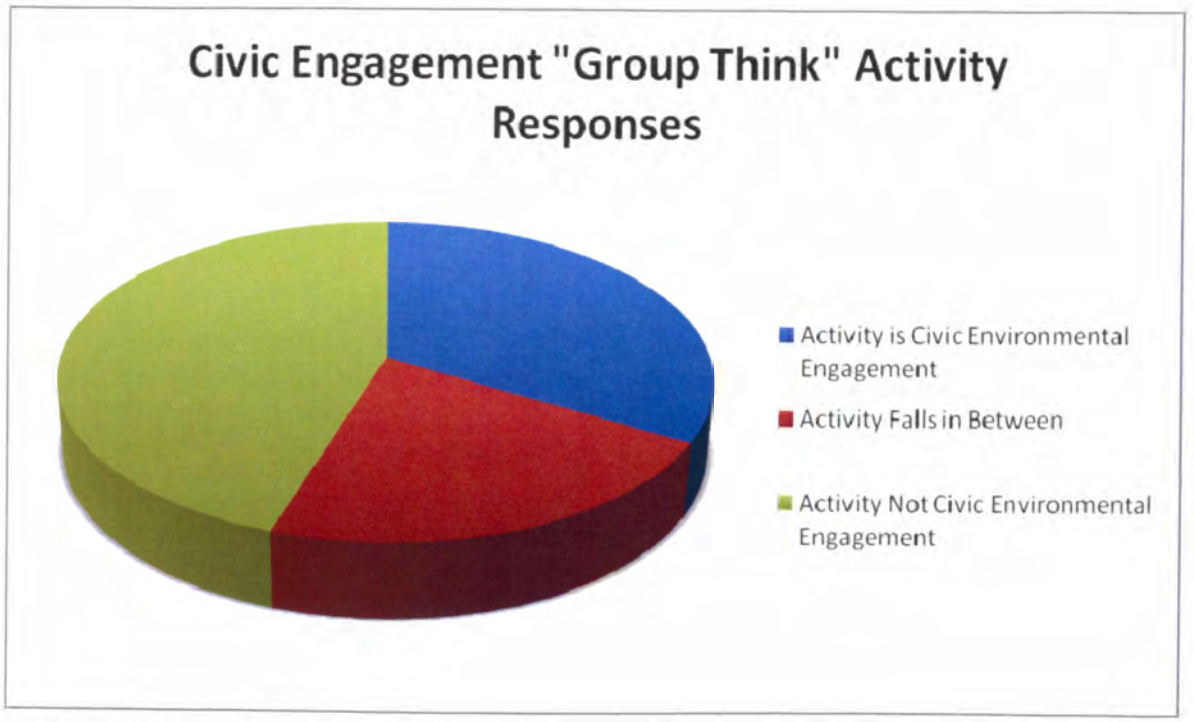
Metric of Beliefs

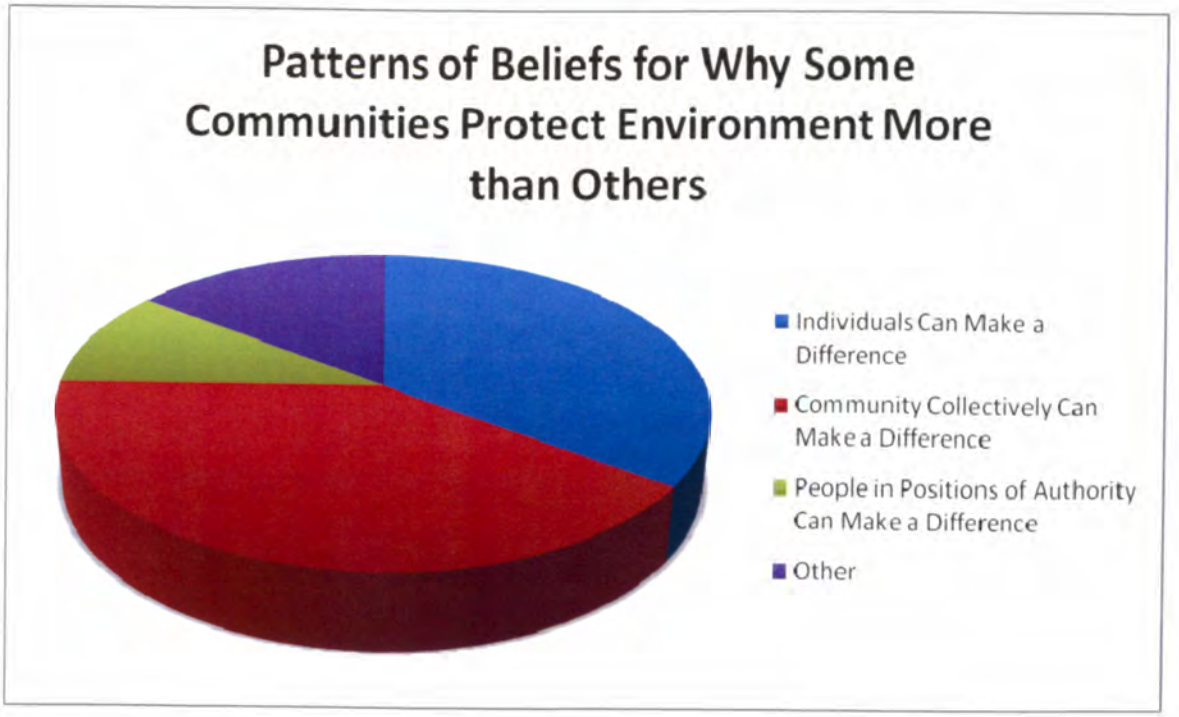
Category (1): Individuals can make a difference
Category (2): Community as a collective can make a difference
Category (3): People in positions of authority (i.e. government) can make a difference
Category (4): Other
Class Responses:

- Shared community mentality, if one feels a strong relation with their neighborhood, they will fight for a better community environment. **(2)**
- Local culture. **(2)**
- Depends on how far removed from "nature" they are. **(1)**
- Their cultures care more about future generations...or maybe some communities are less influenced by money. **(2)**
- Culture. **(2)**
- Some communities are aware on a local level of what they have to lose...it's clear what needs protecting. **(2)**
- They have more to lose by not protecting the environment than by continuing on their current path. **(1)**
- Perception of value: it depends on what the community shares on conversation or not. **(1)**
- Some communities have progressive (city/county/town) leaders who inspire sustainable values. **(3)**

- If applied only to the U.S., then it comes down to value, responsibility and integrity: is it worth more than a new car or wardrobe? **(1)**
- No clue. **(4)**
- Depends on scale of community: large hierarchical societies chew up the environment; smaller more egalitarian communities have less impact. **(2)**
- Because citizens engage and elect decision makers to value the public commons. **(3)**
- Higher level of education of the population will protect the environment. **(1)**
- Values of the community. **(2)**
- Awareness of each individual's impact, also, spiritual beliefs. **(1)**
- Because they live in a beautiful place vs. living in a concrete jungle. **(1)**
- ONE – if something, like nature, is overly abundant, it is not valued highly. TWO – upbringing, poverty, religious upbringing, changes on orientation towards the physical world and the value given it. **(4)**
- ONE – lack or abundance of educational experiences. TWO- cause some people are less selfish than others. **(1)**
- PROTECT – the need of local goods (resources) to support population. NOT PROTECT – goods come from somewhere else. **(4)**
- Culture. **(2)**

Appendix C-1: Graphs of "After the Class" Data





Appendix D: Online Pre- and Post-Test

Appendix D-1: Environmental Citizenship and Carbon Intensity Assessment Questions

Values- Stern, Dietz, et al. (1999)

5 point scale (5 means the statement is extremely important as a guiding principal)

In the following section are a series of statement some people say guide their life. Please tell me how important each of these is as a guiding principle in you life.

Altruistic:

1. Social justice, correcting injustice, caring for the weak
2. Preventing pollution, conserving natural resources
3. Equality, equal opportunity for all
4. Unity with nature, fitting into nature
5. A world of peace, free of war and conflict
6. Respecting the earth, harmony with other species
7. Protecting the environment, preserving nature

Traditional:

8. True friendship, close supportive friends
9. Loyal, faithful to my friends
10. Sense of belonging, feeling that others care about me
11. Obedient, dutiful, meeting obligations
12. Self-discipline, self-restraint, resistance to temptations
13. Family security, safety for loved ones
14. Honoring parents and elders, showing respect
15. Honest, genuine, sincere
16. Forgiving, willing to pardon others

Self-interest:

17. Social power, control over others, dominance
18. Influential, having an impact on people and events
19. Wealth, material possessions, money
20. Authority, the right to lead or command

Openness to change:

21. Curious, interested in everything, exploring
22. A varied life, filled with challenge, novelty and change
23. An exciting life, stimulating experiences

Awareness of Consequences (AC)-Stern, Dietz, et al. (1999)

Response categories: strongly agree/ somewhat agree/ somewhat disagree/strongly disagree

1. In general do you think that climate change, which is sometimes called the greenhouse effect, will be a very serious problem for you and your family, somewhat of a problem for you and your family or won't really be a problem for you and your family?
2. Do you think that climate change will be a very serious problem for the country as a whole, somewhat of a problem or won't really be a problem for the country as a whole?
3. Do you think that climate change will be a very serious problem for other species of plants and animals, somewhat of a problem or won't really be a problem for other species of plants and animals?

4. Next, I'd like you to consider the problem of loss of tropical forests. Do you think this will be a very serious problem for you and your family, somewhat of a problem or won't really be a problem for you and your family?
5. Do you think that loss of tropical forest will be a very serious problem for the county as a whole, somewhat of a problem or won't really be a problem for the country as a whole?
6. Do you think that loss of tropical forest will be a very serious problem for other species of plants and animals, somewhat of a problem or won't really be a problem for other species of plants and animals?
7. Next, I'd like you to consider the problem of toxic substances in air, water and the soil. Do you think this will be a very serious problem for you and your family, somewhat of a problem or won't really be a problem for you and your family?
8. Do you think that toxic substances in air, water, and the soil will be a very serious problem for the county as a whole, somewhat of a problem or won't really be a problem for the country as a whole?
9. Do you think that toxic substances in air, water, and the soil will be a very serious problem for other species of plants and animals, somewhat of a problem or won't really be a problem for other species of plants and animals?

Personal Normative Beliefs-Stern, Dietz, et al. (1999)

Response categories: strongly agree/ somewhat agree/ somewhat disagree/strongly disagree

1. The government should take stronger action to clean up toxic substances in the environment.
2. I feel a personal obligation to do whatever I can to prevent climate change
3. I feel a sense of personal obligation to take action to stop the disposal of toxic substances in the air, water, and soil.
4. Business and industry should reduce their emissions to help prevent climate change.
5. The government should exert pressure internationally to preserve the tropical forests.
6. The government should take strong action to reduce emission and prevent global climate change.
7. Companies that import products for the tropics have a responsibility to prevent destruction of the forests in those countries.
8. People like me should do whatever we can to prevent the loss of tropical forests.
9. The chemical industry should clean up the toxic waste products it has emitted into the environment.

Environmental Citizenship-Stern, Dietz, et al. (1999)

Response categories are: yes/no

1. Are you a member of any group whose main aim is to preserve or protect the environment?
2. In the last twelve months, have you read any newsletters, magazines or other publications written by environmental groups?
3. Signed a petition in support of protecting the environment?
4. Given money to an environmental group?
5. Written a letter or called your member of Congress or another government official to support strong environmental protection?
6. Boycotted or avoided buying the products of a company because you felt that company was harming the environment?
7. Voted for a candidate in an election at least in part because he or she was in favor of strong environmental protection?

8. Some people feel the environmental movement does a great deal of good and strongly support it, others feel the environmental movement does more harm than good and strongly oppose it. Where do you stand? Do you strongly support, somewhat support, somewhat oppose, or strongly oppose the environmental movement?

Gallup Poll Questions (Carroll, 2007)

Response categories are yes/no

1. The following is a list of steps individuals can take to reduce global warming. Please respond for each if that is something you, personally, should or should not be doing.

- Spending several thousand dollars to make your home energy efficient
- Riding mass transit such as buses and subways whenever possible
- Installing a solar panel to produce energy for your home
- Using only fluorescent light bulbs in your home
- Buying a hybrid car
- Unplugging your electronic equipment when not using it
- Supporting the construction of a nuclear energy plant near your home

2. The following is a list of steps the government can take to reduce global warming. Please respond for each if that is something the government should or should not be doing.

- Starting major research effort to develop new energy sources
- Requiring government office buildings to use renewable energy sources
- Requiring surcharge on utility bills when energy use limits exceeded
- Banning vehicles that do not average at least 30 miles per gallon
- Imposing tough restrictions on U.S. industries and utilities
- Setting land-use policies to discourage suburban sprawl

Appendix D-2: Online Pre-test Submitted to Participants

1.) In the following section are a series of statement some people say guide their life. Please tell me how important each of these is as a guiding principle in you life. Answers are on a 5 point scale: extremely unimportant, not important, neither important nor unimportant, important, or extremely important (Stern et al., 1999).

- Social justice, correcting injustice, caring for the weak
- Preventing pollution, conserving natural resources
- Equality, equal opportunity for all
- Unity with nature, fitting into nature
- A world of peace, free of war and conflict
- Respecting the earth, harmony with other species
- Protecting the environment, preserving nature
- True friendship, close supportive friends
- Loyal, faithful to my friends
- Sense of belonging, feeling that others care about me

- Obedient, dutiful, meeting obligations
- Self-discipline, self-restraint, resistance to temptations
- Family security, safety for loved ones
- Honoring parents and elders, showing respect
- Honest, genuine, sincere
- Forgiving, willing to pardon others
- Social power, control over others, dominance
- Influential, having an impact on people and events
- Wealth, material possessions, money
- Authority, the right to lead or command
- Curious, interested in everything, exploring
- A varied life, filled with challenge, novelty and change
- An exciting life, stimulating experiences

2.) In general, do you think that climate change, which is sometimes called the greenhouse effect, will be a very serious problem, somewhat of a problem or won't really be a problem? (Stern et al., 1999)

- For you and your family?
- For the country as a whole?
- For other species of plants and animals?

3.) The following is a list of steps individuals can take to reduce global warming. Please respond for each if that is something you, personally, should or should not be doing. (Carroll, 2007).

- Spending several thousand dollars to make your home energy efficient
- Riding mass transit such as buses and subways whenever possible
- Installing a solar panel to produce energy for your home
- Using only fluorescent light bulbs in your home
- Buying a hybrid car
- Unplugging your electronic equipment when not using it
- Supporting the construction of a nuclear energy plant near your home

4.) The following is a list of steps the government can take to reduce global warming. Please respond for each if that is something the government should or should not be doing. (Carroll, 2007)

- Starting major research effort to develop new energy sources
- Requiring government office buildings to use renewable energy sources
- Requiring surcharge on utility bills when energy use limits exceeded
- Banning vehicles that do not average at least 30 miles per gallon
- Imposing tough restrictions on U.S. industries and utilities
- Setting land-use policies to discourage suburban sprawl

5.) The following statements are about addressing environmental problems. Answers on a 4 point scale: strongly disagree, disagree, agree, or strongly agree.

- The government should take stronger action to clean up toxic substances in the environment.
- I feel a personal obligation to do whatever I can to prevent climate change.
- I feel a sense of personal obligation to take action to stop the disposal of toxic substances in the air, water, and soil.
- Business and industry should reduce their emissions to help prevent climate change.
- The government should exert pressure internationally to preserve the tropical forests.
- The government should take strong action to reduce emissions and prevent global climate change.
- Companies that import products for the tropics have a responsibility to prevent destruction of the forests in those countries.
- People like me should do whatever we can to prevent the loss of tropical forests.
- The chemical industry should clean up the toxic waste products it has emitted into the environment.

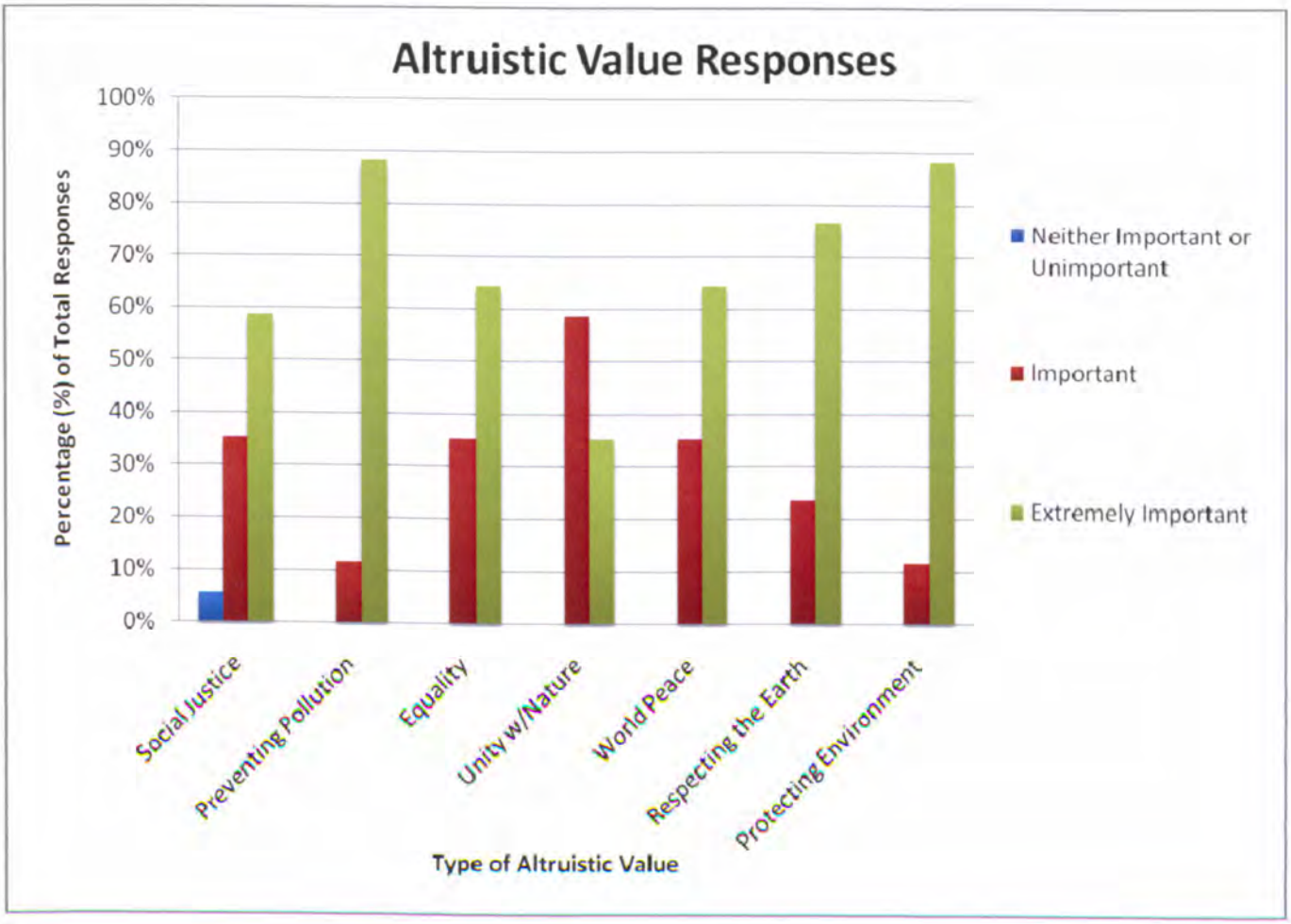
6.) Have you engaged in any of these environmental activities? Answers are either yes or no. (Stern et al., 1999)

- Are you a member of any group whose main aim is to preserve or protect the environment?
- In the last 12 months, have you ready any newsletters, magazines, or other publications written by environmental groups?
- Signed a petition in support of protecting the environment?
- Given money to an environmental group?
- Written a letter or called your member of Congress or another government official to support strong environmental protection.
- Boycotted or avoided buying the products of a company because you felt that company was harming the environment?
- Voted for a candidate in an election at least in part because he or she was in favor of strong environmental protection?

7.) Some people feel the environmental movement does a great deal of good and strongly support it. Other feel the environmental movement does more harm than good and strongly oppose it. Where do you stand? (Answers on a 4 point scale: strongly oppose, somewhat oppose, somewhat support, or strongly support)

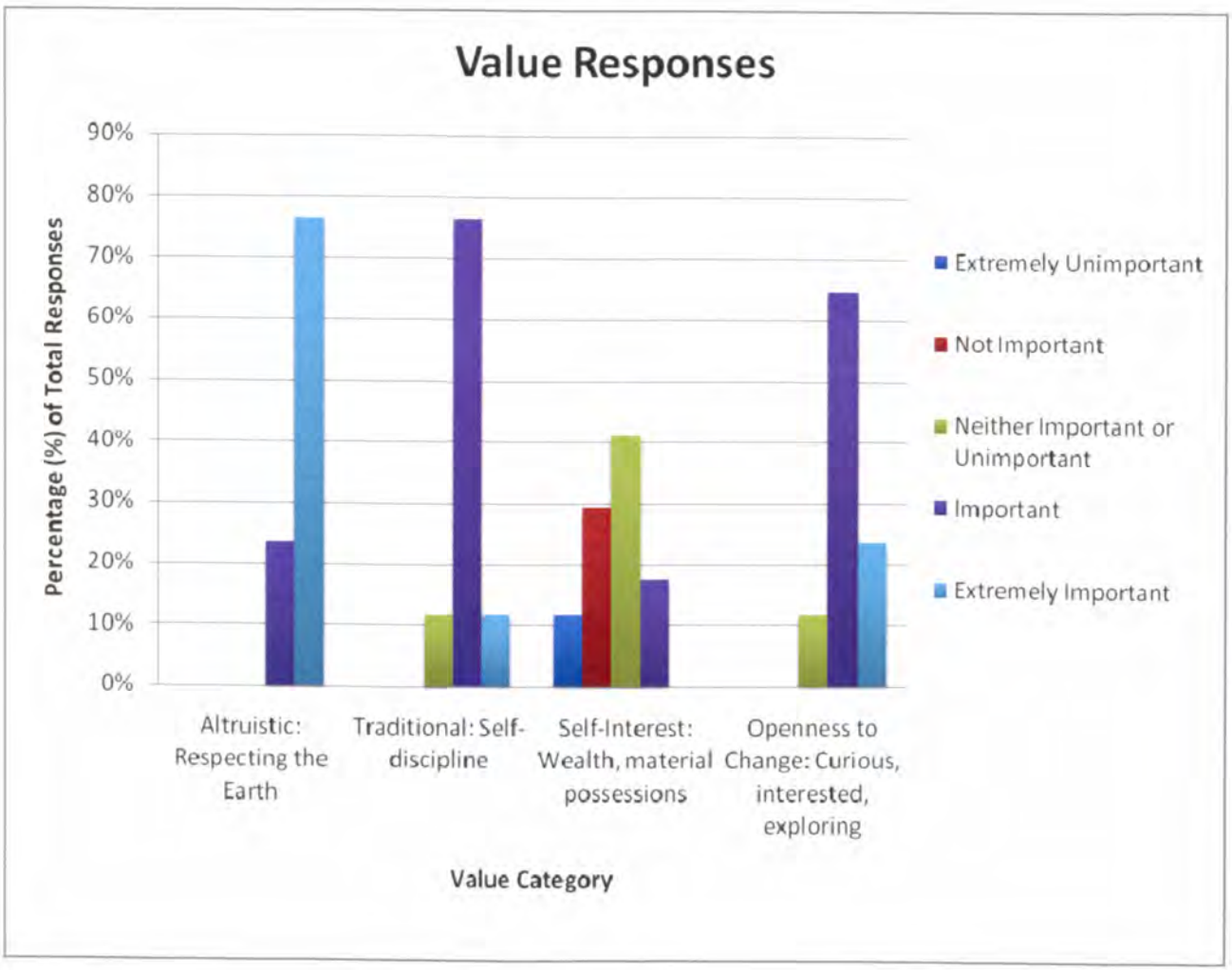
Appendix D-4: Select Responses to Online Survey (Values, AC, & AR)

Graph 1, Values Part 1:
The graph below depicts the responses to only the responses categorized as "altruistic" in response to the following question: In the following section are a series of statement some people say guide their life. Please tell me how important each of these is as a guiding principle in you life. Answers are on a 5 point scale: extremely unimportant, not important, neither important nor unimportant, important, or extremely important (Stern et al., 1999) (17 total participants).

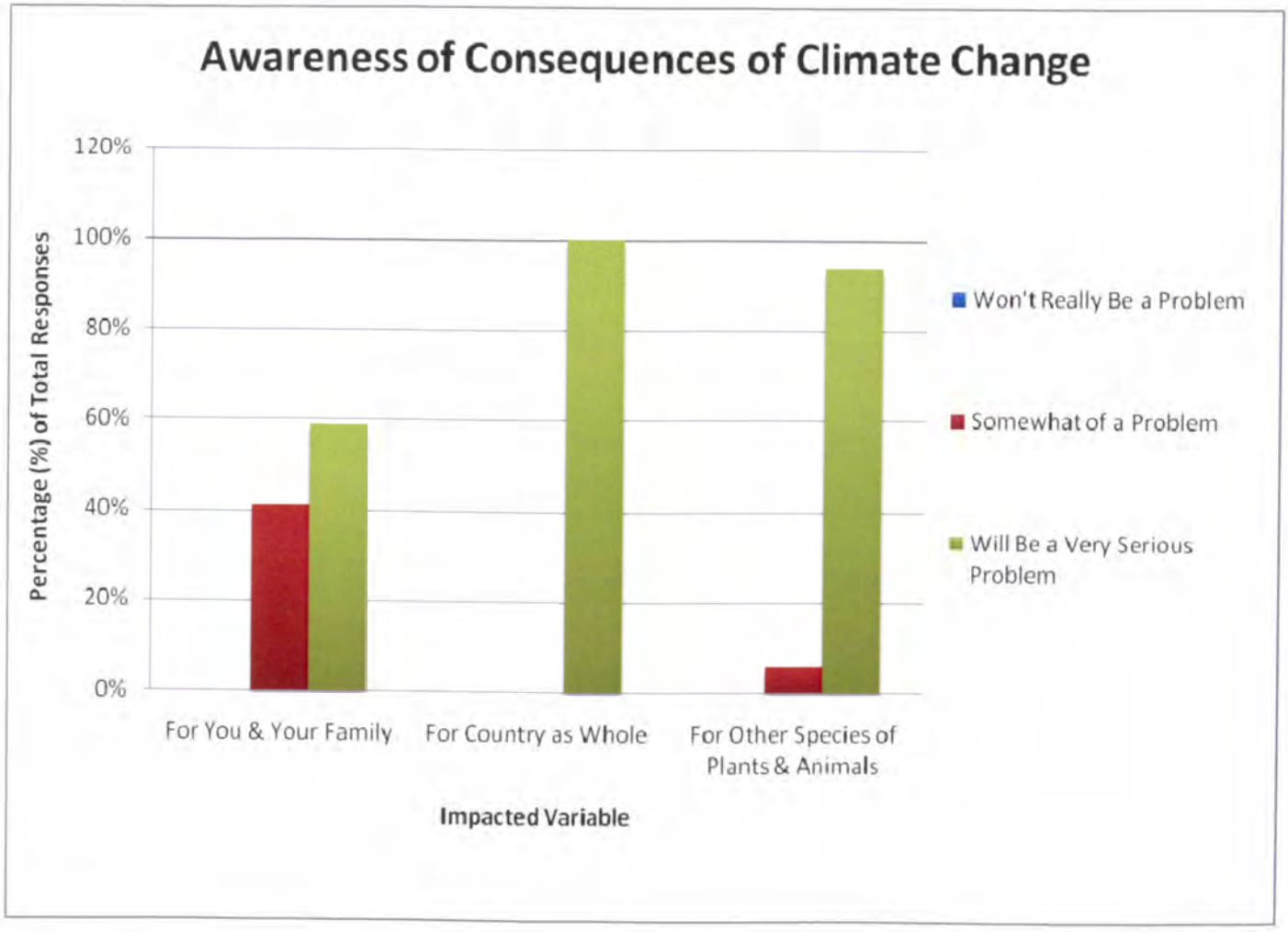


Graph 2, Values Part 2:

The graph below depicts the responses to an example from each different type of value category (including: Altruistic, Traditional, Self-Interest, and Openness to Change) from the following question: In the following section are a series of statement some people say guide their life. Please tell me how important each of these is as a guiding principle in you life. Answers are on a 5 point scale: extremely unimportant, not important, neither important nor unimportant, important, or extremely important (Stern et al., 1999) (17 total participants).

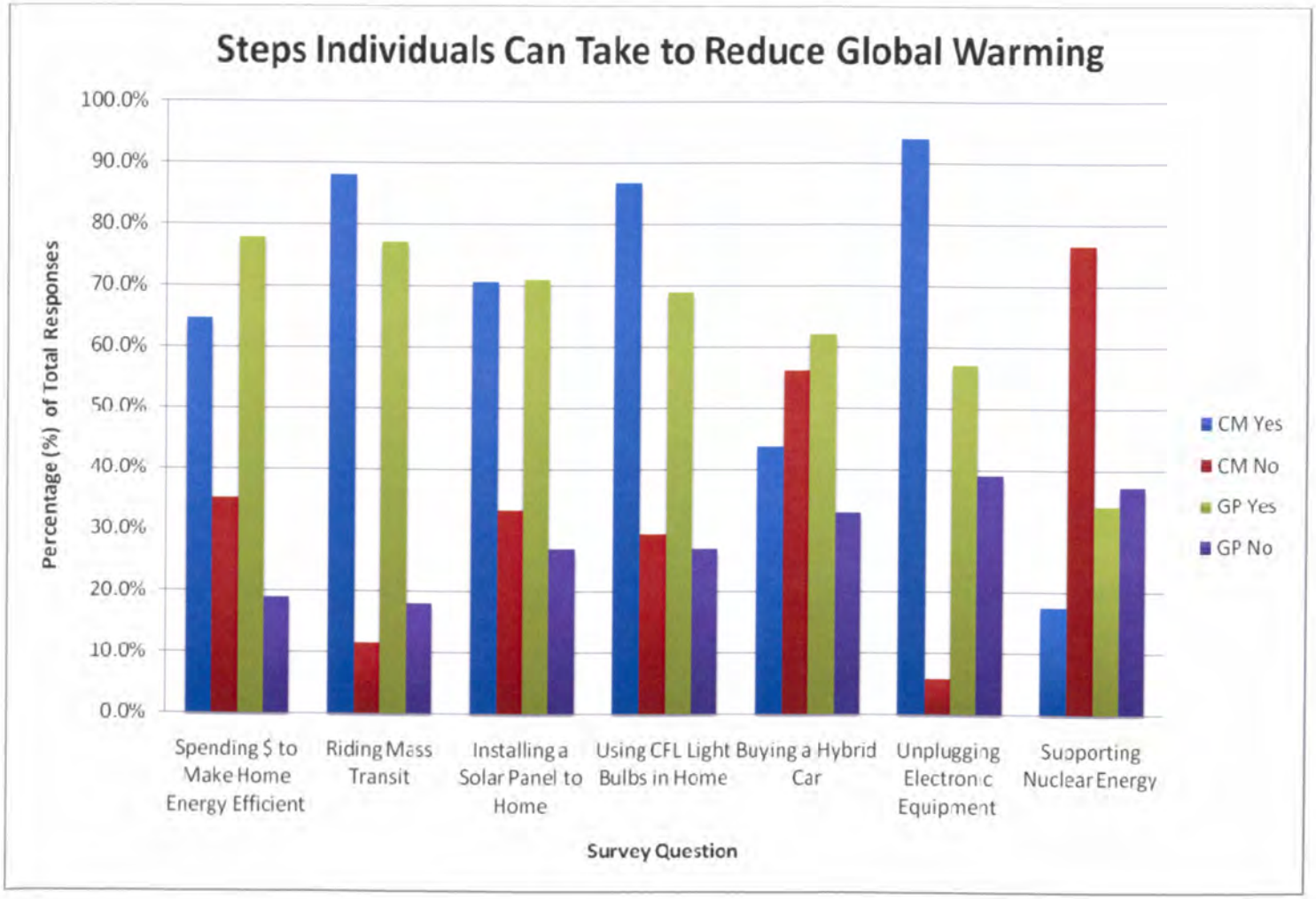


Graph 3, Awareness of Consequences:
The graph below depicts responses reflective of the VBN "Awareness of Consequences" characterization in the following question: "In general, do you think that climate change, which is sometimes called the greenhouse effect, will be a very serious problem, somewhat of a problem or won't really be a problem?" Answers on a 3 point scale: won't really be a problem, somewhat of a problem, will be a very serious problem. (Stern et al., 1999) (17 total participants).

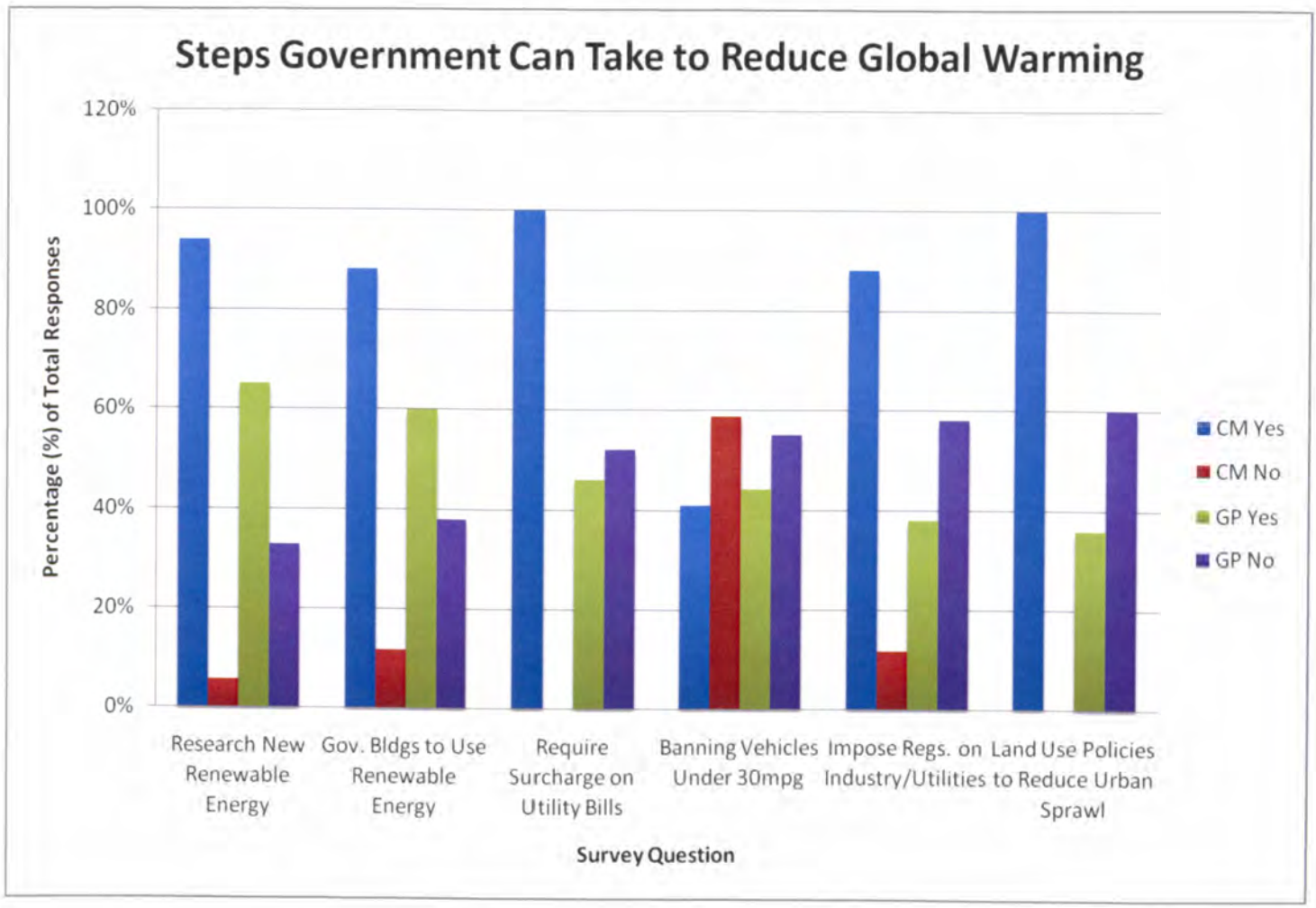


Graph 4, Ascription of Responsibility

Comparison between Carbon Masters (17 participants) survey results and Gallup Poll (1,007 respondents) survey results to the question: "The following is a list of steps individuals can take to reduce global warming. Please respond for each if that is something you, personally, should or should not be doing." (Carroll, 2007).



Graph 5:
Comparison between Carbon Masters (17 participants) survey results and Gallup Poll (1,007 respondents) survey results to the question: "The following is a list of steps individuals can take to reduce global warming. Please respond for each if that is something you, personally, should or should not be doing." (Carroll, 2007).



Appendix E: Participant Focus Groups

Appendix E-1: Facilitated Focused Conversation Agenda

- Introductions
- Topic:
  - The focus or subject of this conversation is to learn more about what the Carbon Masters program is doing well that is working and what could be changed to improve the structure of the training.
  - We will also discuss the role of a "Carbon Master" in the community and brainstorm ways in which we believe we could better extend our knowledge and resourcefulness to others.
- Objective Aim:
  - The objective of this conversation is to explore the ways in which we believe we can grow and learn to become better Carbon Masters in the field.
- Experiential Aim:
  - The experiential aim of this conversation is based in our commitment to a shared sense of purpose and a general excitement about this pilot program.
- Ground Rules Framework:
  - This conversation shall go no longer than 1 hour and 15 min.
  - The facilitator will preside over the group.
  - The role of the facilitator will be responsible for the following responsibilities: ensure adherence to the ground rules, encourage active participation by all members, keep the discussion on track, and maintain control during periods of disagreement.
  - Sample ground rules to be agreed upon by the group prior to discussion include:
    - Group participants will recognize the legitimacy of the interests and concerns of others, and expect that their interests will be respected as well.
    - Participants commit to listening carefully to each other, to being open and assertive, and to being clear in the expression of needs, goals, objectives, and expectations.
  - Conversation notes will be taken by the facilitator and provided to the members in a timely fashion.
- Open Up Conversation
  - The questions asked of this group will be objective, reflective, interpretive, and decisional in nature.
  - Participants may be asked to brainstorm individually, in small groups, and with the entire group.
- Closing
  - Facilitator will wrap up the discussion points and ensure that everyone who wanted to contribute had a chance to share their thoughts.

Lead Researcher/Facilitator: Andrea Thomas
Faculty Advisor: Dr. Troy Abel

Appendix E-2: Focus Group Questions

Objectives (3 min)

What do you want to learn (are you learning) from Carbon Masters?

- What did you expect to hear? What did you think you would see? What ONE thing do you remember hearing? Seeing?
- What do we know about our carbon intensity? What should we know?
- Which field trip or activity has stood out most to you?

Reflective (12 min)

What did you like about the Carbon Masters opportunity? What does it remind you of? What did you like in the program thus far? What did you dislike?

- When and/or where were you engaged the most? When and/or were you the most disengaged?
- What experience(s) does Carbon Masters remind you of?
- What has surprised you the most? What has intrigued you the most?

Interpretive (15 min)

What has Carbon Masters or one of its sessions meant to you personally?

- What's the significance of carbon dioxide science? What does it mean for you personally? For our group? For your family? For our community? For the Pacific Northwest? For our world?
- Which topics presented in this program do you consider to be the most important to you personally? For our group? Which topics presented in this program do you consider to be the most important to communicate to the community?
- Why is civic engagement important? What does CE mean for you personally? For our group? For your family? For our community? For the Pacific Northwest? For our world?
- What challenges will have to be overcome? What things will have to change? Which of these is the most important for you? Which of these need to be dealt with first? Why? Which one do you see yourself confronting?

Decisional (10 min)

What will you do now? What should WE do now?

- What are the first steps we need to take to deal with all this?
- How do we best respond to climate change? How do we best relate what we've learned to our family? Our neighbors? Our community? Our region?
- How will you incorporate what you have learned into your daily activities?
- What techniques or methods did you like best that should be incorporated into future Carbon Masters programs?

Appendix E-3: Rough Notes Taken from In-person Focus Group

Key:

1CM = Carbon Masters Participant 1, 2CM = Carbon Masters Participant 2, 3CM = Carbon Masters Participant 3, AT/Facilitator = Andrea Thomas

Notes Taken by: Dr. Troy Abel on 5/14/2009

Introductions.

Ground rules. Method—facilitated focused conversation. Are these the same categories as Craig's email. No.

Q: What did you want to learn? Comment—carbon masters is quite different than what I expected in a positive way. I was a corporate sustainability director and thought I might be overqualified. But its blown me away. 2nd also thought she was really informed but she is learning a lot of details. When I came to CM, I knew basic concepts but getting depth of knowledge/details. 3rd was very curious about carbon but more concerned with emissions and air pollution than global warming. My wife's asthmatic and the air to the north is bad.

AT, are you more interested in global warming b/c of CM. no, not much we can do with China and India. And is it Co2 or sunspots or both?

The methane powered example from Sweden was a very powerful case. Craig's lecture.

1st CM. wanted to learn more about carbon footprinting. The first presentation onward its making more and more sense in a quantitative. We have amazing businesses and things going on right here. What about the announcement. As a sust. Director and wanting to pursue that. Tightrope walking single bottom-line and making an impact. So the carbon focus was attractive b/c so far carbon offsetting and other methods were ambiguous.

2nd CM had called about the masters composter but was invited into CM. gone from hands on in master gardeners with a very structured payback method. CM doesn't yet have a structured payback. This is more intellectual. Filling out the application, they haven't or aren't going to structure the payback. That was the hardest part. How would I use the information in the organizations I'm connected to.

3rd. I hope they introduce the concept of conservation. The best and practical way to save millions of gallons of gasoline.

2nd CM. homework on carbon footprint was blowing me away. It started to get real. Concrete. Personalized it in the world not my neighbors, not Bellingham, but relative to the world. Tangibility.

Q: What do you like about the opportunity and what does it remind of?

1st CM. I liked getting together with other people in the community interested in similar topics. Found it appealing to work with WWU and WWU working in the community. Love the format of having lecture. Concerned about the workload but the online syllabus and leasurily review videos. Using the listserve.

3 CM. found the lectures informative and learned new things. Found one lecture that was 'wanting'. She wasn't prepared to put meat on the bones. 1 CM agreed. Everything else was wow.

2 CM had a reaction to craig's. The depth was so scientific that it wasn't necessary to get that deep to get the points across. Strong 'get real' to being presented with new information and being expected to respond without any preparation. That wasn't assigned but if it was she would have been prepared to discuss it. But I shut down. Grace's comment was classic. Is this going to involve chemistry? I like new information.

3 CM observed lots of numbers with no units. Neat to see how much energy we waste.

2 cm said it was neat but there was an expectation to be interactive. Its quite a give to simplify but not dumb it down.

3 cm. the information generated more questions however. That's a great outcome.

Q: Anything Surprised You?

We're barking up the wrong tree using methane as diesel but use for steam and you wouldn't have corrosion problem.

I like the conversations that happen b/c of the class. 2 CM surprised at my own resistance when I found it would take 6 worlds to support myself but still resistant, for instance, to stop flying. I'm surprised how resistant I am to changing. What am I going to do, stop seeing my parents in PA. I resist not flying, but its what I should do. If I'm resistant, than oh my, what about other people and how much am I willing to do. When my parents die, my footprint will drop.

1 CM. thinking about lifestyle and individual responsibility but what is my role in trying to make a bigger impact beyond myself. There are things I can change but I choose the route of least resistance. I 've been asking bigger questions b/c of the course.

Facilitator. Watch the TED video about sulfur emissions in the atmosphere.

2cm. we are looking at splinters and he's looking at the trees, the big issues. So maybe the world we be better off if I write letters, go to meetings and not composting.

1 cm. low-hanging fruit might be composting in your kitchen. 2cm. big resisters may not change so target not Doc Hastings but someone who gets it and who will get going.

Q: What has CM meant to your personally? What about CO2 science mean to you, to our group, to our community?

2cm. its given me a global perspective and personalized it as me being a global citizen that I understand for other issues like women's rights or peace. I've understood how my values and behavior effect the treatment of women around the world but I've not done that for C02. Its intensified that relationship to the world. My relation to the world. Brought climate change into my value system as a global citzen.

3cm. I feel that we should work locally, in the US to try and improve our behavior for the use of energy. When our vehicles avg 21 mpg, we are lacking! In a perfect world, we could use this as a stepping stone to have an impact locally. We could get support, if we develop something good, from the oil companies. They don't want to use all their resources. BP are businesses. Looking to diversify. They get it.

1 cm. this course is giving me the science of what I was looking for and I didn't have before. I'm not sure about the burning question about what's MY ROLE. Not a reflection on the course but I'm not answering that one yet.

Q: What topics were most important... you liked the most, for the group, for the community.

1cm. when I started, it was food systems, but I've not been impressed about how the course addresses that, we've barely dable. I was not interested in today's topic initially. But then I got into it. I loved it. I wasn't bummed I was going to miss the digester but now I want to go. If we're talking about the community, all the topics are important to community. I'm not sure how we'd take it into the community. That's one of the links I'm struggling with. If I talk about the digester, people will shut down. I may not necessarily transfer the knowledge. I was going nuts about the world affairs council. It was easy equations that could be communicated, for instance, to my extremely conservative dad.

2cm. in the very beginning we had the CE lectures and it was my favorite and I like to teach others. That would be good to incorporate into every lecture. If that could be incorporated into how we are going to engage. It feels like it was a long time ago.

3cm. impressed with the sincerity of our instructors. We have been given untruths which is pretty common. I was really excited about the cars (it's a guy thing) but learn about hybrid trucks.

2cm. that's a really good point. Impressed by the quality of the instructors. Ability, quality, and topics that I wasn't particularly interested in but I still got lit up. Classroom enthusiasm for this topic.

CE for other people in the community.

2cm relatively new to b'ham it seems that there is a strong buy local be local is the b'ham definition. But not what I meant, I meant CE in my network that stretches around the world. When I tell them in CM and it spreads it beyond b'ham. Here its preaching to the choir so its important to reach out.

1cm. you focus attention on whose doing the best first, and you work out from there. But there's so much we can do in this community. I have friends whose its their life and most people I know is

sustainability. Or, their not involved. One group is totally not involved. Theres a lot to do here. We got a long ways to go.

2cm. b'ham can be an inspiration.

Q: What will or should we do now?

3cm. what I'm trying to do is fit into my personal priorities and make it into a presentation and show it to my children and their families and whoever else will listen.

2cm. I'm going to do 2 things. I'm part of an annual conference and I've announced I will make it more green and now I can figure out how to do that. This and next year. 2nd, I write an annual letter to a lot of people and I'm going to put in there climate change information and websites.

1 cm. I'm not sure. I feel like I'm overcommitted, I lead my life by example so the course hasn't impacted me in that way.

Q: Is there a particular method or technique that you would promote?

1cm. I love this course b/c we've learned about many options. There's hope and excited about the diversity of enegy sources and it will be a combination.

3cm. I don't think we can have impact b/c of the Indians and Chinese. We can show our skies our bluer. You're not going to tell china no more cars.

1cm. I was very optimistic after the world affairs council. I was in the 3cm camp but I'm more optimistic. I'm hoping we've been through our industrialization and we can be greener and show other countries how to be greener.

Q: What specific techniques in the classroom do you like? Not like? Suggestions for formatting?

1cm. I don't' like people rushing through and then getting cutoff. They get the axe. Or someone uses an extra half-hour and that's disrespectful.

Longer class? Two yes or more weeks or more sessions and a firm commitment from the presenters to take no more than their allotted time. In the beginning, there was a desire more interaction but there needs to be a balance but there must be a method to keep us from getting off track.

3cm. To have a good meeting, you have to have discipline from the presenters and the facilitator. When you allow side comments to distract its not fair.

1cm. there trying to cram in too much information.

3cm. it's such a diverse group that people ask questions. Another half-hour would help but rules apply to everyone, even the boss.

2cm. don't be vague. If you really want our feedback, its been a consistent issue about craig taking too much time when he's not the presenter.

Appendix E-4: Online Focus Group Questions

1.) What do you want to learn (are you learning) from Carbon Masters?
2.) What did you expect to hear or see at Carbon Masters? What ONE thing do you remember hearing or seeing so far that has stood out to you?
3.) What do you know about your carbon intensity? What should the group as a whole know?
4.) What did you like about the Carbon Masters opportunity? What does it remind you of?
5.) What has surprised you the most about the program? What has intrigued you the most?
6.) What has Carbon Masters or one of its sessions meant to you personally?
7.) What is the significance of carbon dioxide science to you? To our group? To the community?
8.) Which topics presented in this program do you consider to be the most important to you personally? To the group? Which topics presented in this program do you consider to be the most important to communicate to the community?
9.) Why is civic engagement important? What does civic engagement mean for you personally?
10.) What will you do now? What should WE do now? What are the first steps we need to take to deal with all of this?
11.) What techniques or methods did you like best that should be incorporated into future Carbon Masters programs? What techniques or methods did you not like that should be changed for future Carbon Masters programs?

Appendix E-5: Online Focus Group: 1 Participant Response as of 5/29/09

1. **What did you expect, or want to learn when you enrolled in Carbon Masters? What ONE thing do you remember seeing or hearing so far that has stood out to you?**
   I wanted to understand the science of climate change better and I wanted to know what I could do (in my home, my car, my community) to reduce energy uses and green house gases. The most amazing information was making energy from cow manure -- seeing Craig's video and taking the field trip.

2. **What did you like about the Carbon Masters opportunity? What did it remind you of?**
   I felt like I was back in school learning interesting and useful information, and getting to know the backgrounds and skills of various people in the Carbon Masters group.

3. **What do you know about your carbon intensity? What should the group as a whole know?**
   My carbon intensity is pretty low, but there's a lot more I can do about making my home more energy efficient. The group as a whole should know a lot more about what's being done to address climate change and how we can use what we've learned to share with others.

4. **What has surprised you the most about the program? What has intrigued you the most?**
   I am most surprised and heartened to learn about all the work being done all over the world to address climate change, especially on the local level in our country. I am most intrigued

about what is going on in developing countries, but we only got glimpses of that in this program. It has spurred me to want to read and learn more.

5. **What has Carbon Masters or one of its sessions meant to you personally?**
   It has fulfilled my hope to learn information I can use and that I can share with others. I feel energized to do something -- where before, it all seemed kind of overwhelming,

6. **What is the significance of carbon dioxide or climate science to you? To our group? To the community?**
   A warming climate is and will change the world we live in. On a personal level, I feel an obligation to my daughter and grandson to understand what is happening to the world they are going to be living in. On a broader level, I worry about the effects of climate change on poor people all over the world.

7. **Which topics presented in this program do you consider to be the most important to you personally? To the group? Which topics presented in this program do you consider to be the most important to communicate to the community?**
   All the topics are important. I can't pick just one. I came to the conclusion that there is (finally) a broad consensus about climate change and the need to reduce green house gas emissions and our efforts should be concentrated on helping people understand what they can do to reduce those emissions.

8. **Why is civic engagement important? What does civic engagement mean for you personally?**
   I'm not sure how to define civic engagement. I do know that people who have a passion for improving their communities, correcting injustice, or somehow making things better have always been inspiring to me. I have spent my working years doing public interest legal work. It has always been important for me to feel I am working to make things better for people. I don't know where that comes from.

9. **What will you do now? What should WE do now, or what are the first steps we need to take to deal with climate change?**
   I will be trying to distill some of what I've learned so I can present it in a helpful way at the Energy Fair my community is having in August. First steps, after getting an understanding of the science and the importance of acting now, is to take information to my community about ways they can reduce energy uses in fairly simple cost-effective ways.

10. **What techniques or methods did you like best that should be incorporated into future Carbon Masters programs? What techniques or methods did you not like that should be changed for future Carbon Masters programs?**
    I liked the "homework" listings (websites, readings, videos to watch) related to each class. I liked the variety of presenters (some were more effective public speakers than others). I

particularly liked the field trips. The Google Group concept has been helpful. Change for the future -- maybe needs to be a longer course (more classes) to cover the breadth of material.

Accompanying PowerPoint Presentation

Environmental Citizenship and Carbon Intensity

Evaluating the Carbon Masters Educational Program

Andrea Thomas
Honors Senior Project
May 29th, 2009

Introduction

- Real action in the form of effective treaties or national legislation to flight climate change has failed to produce any real results.
- There are too little educational programs available to the public that offer valid, proactive, constructive and informational tools to empower ordinary citizens to deal with the complex issue of climate change.

The Client: Carbon Masters™

- WSU Extension Program
  - Program Directors: Craig MacConnell and Joyce Jimerson
- Purpose: "to train, equip and manage a core group of volunteers on climate change issues."
- Class Format:
  - Lectures from environmental professionals in the community and experiential field trips to see low-carbon activities in action.
- 23 participants

Objective

- To employ social science research methods to evaluate the WSU Extension Carbon Masters program to determine whether or not it successfully addresses the problem outlined in the policy analysis proposal.
- Criteria
  - *Effectiveness, Efficacy, and Community-Building*
  - Short Term Outcome: Carbon Masters inspires change within its participants
  - Long Term Outcome: Through extension process, inspire change within the community

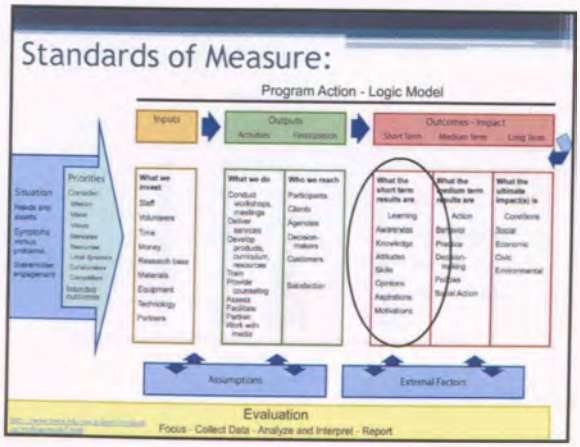
Hypotheses

- H_0: *Null Hypothesis*:
  - The WSU Carbon Masters program will have no impact on its participants. More specifically, the program will have no effect enhancing altruistic or eco-centric values, nor encourage awareness of the consequences and ascription of responsibility to climate change within the participants.
- H_1: *Tested Hypothesis*:
  - The WSU Carbon Masters program will have an impact on its participants. More specifically, the program will have the effect of enhancing altruistic or eco-centric values, in particular by raising awareness of the consequences and ascription of responsibility to climate change within the participants.

Methods

- "Google Groups" Posts
- "After the Class" Responses
- Pre- and Post-Surveys
- Focus Groups
- Participant Observations

Standards of Measure:



Values-Beliefs-Norms Theory (Stern, et al.)

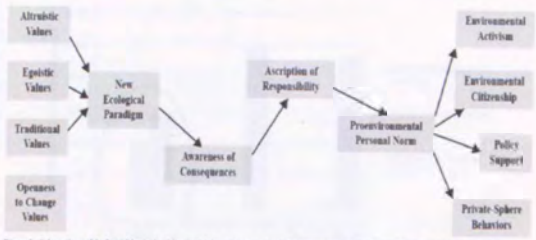
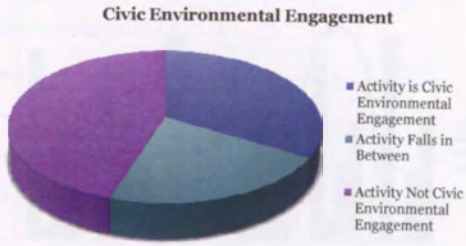


Figure 1. Schematic model of variables in the Value-Belief-Norm theory as applied to environmentalism, showing direct causal relationships between pairs of variables at adjacent causal levels.*

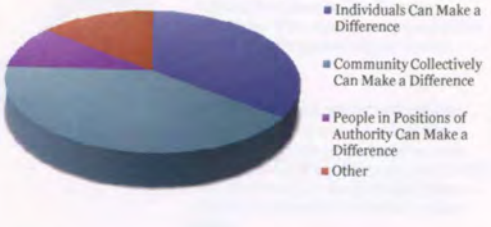
Results

- "Google Groups" Posts

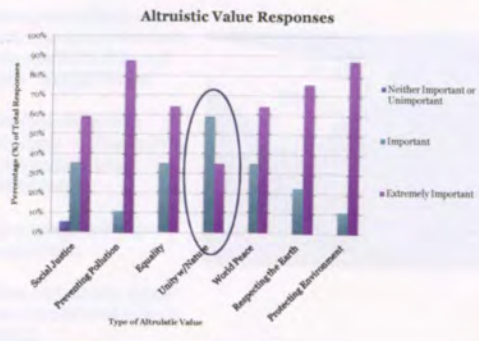
- "After the Class" Group Think Activities



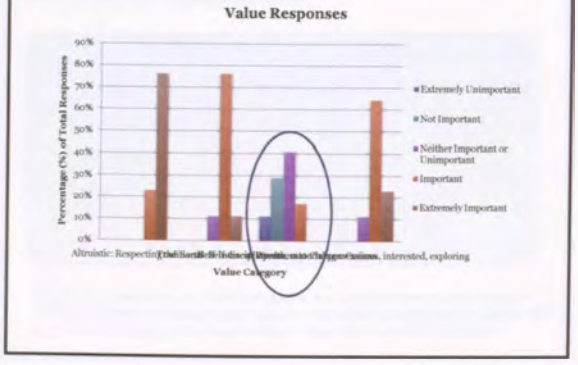
- "After the Class" Group Think Activities



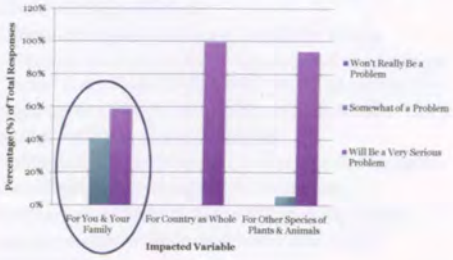
- Pre-Survey Results: Values



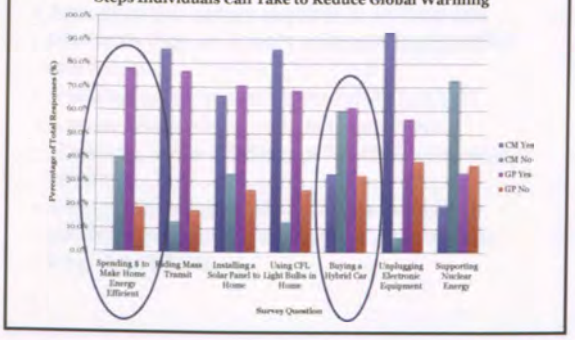
- Pre-Survey Results: Values



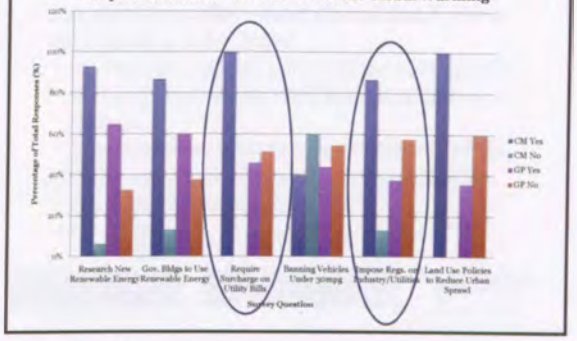
- Pre-Survey Results: Awareness of Consequences



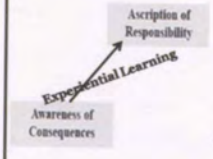
- Pre-Survey Results: Ascription of Responsibility



- Pre-Survey Results: Ascription of Responsibility



- Focus Groups



- Focus group results pose a paradox:
  - Surveys indicate existing tendencies toward possessing ascription of responsibility...
  - BUT the responses from the focus groups indicate that there is a gap between awareness of the consequences and actual ascription of responsibility to climate change
- Some evidence of norm activation:
  - "I've understood how my values and behavior affect the treatment of women around the world but I had not done that for CO_2 [until now]. [It has] brought climate change into my value system as a global citizen."

- Participant Observations

- Core group of individuals that consistently contribute to discussion in class and on the "Google Groups".
- Very knowledgeable individuals vs. those taking in new and complex information.
- Most everyone is eager to ask questions.
- Some participants appear to be overwhelmed with the material.

Unofficial Scorecard*

	Criteria			
WSU Extension Carbon Masters	Effectiveness Weight: 4	Efficacy Weight: 3	Community Weight: 2	Weighted Totals
Original Scores from Policy Analysis	3	4	3	30
Unofficial Current Scores	3	2	2	22

*Key:
Weight scales range from 1-4, with 1 being least important and 4 being most important.
Row scales range from 0-4, with 0 signifying that the definition of the criterion was not met at all; a score of 4 signifies that the definition of the criterion was met completely.

The Future of Carbon Masters

- Most, if not all, short-term outcomes of logic model already being achieved.
- Efforts to improve efficacy should be taken:
  - Payback structure needs to be designed to encourage belief in participants that they can make a difference.
- More opportunities should be created to allow for a greater building of social capital.
- Facilitated discussions and reviews of the lectures should aid in digesting the information.
- Conduct an activity to allow the participants to become aware of their own value and belief structures.

Still More To Do...

- A study of this nature requires more time and resources than an honors undergraduate project can take on.
- A control group is needed for future analysis.
- A cross-comparison study between Carbon Masters and the RE Sources "be cool" campaign is required.
- A longitudinal study of participants would be needed to determine whether the program has long-term effects.

Special Acknowledgements

- I would like to offer a most sincere thank you to the following individuals:
  - Dr. Troy Abel, Huxley College of the Environment
  - Dr. Craig MacConnell, WSU Extension Carbon Masters
  - Joyce Jimerson, WSU Extension Carbon Masters
  - Dr. George Mariz, Honors Department, WWU
  - The 2009 Carbon Masters Class

Carbon Masters™

HONORS WESTERN WASHINGTON UNIVERSITY HUXLEY COLLEGE OF THE ENVIRONMENT WASHINGTON STATE UNIVERSITY

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