The Mobile Bay Watershed Project: An Experiment in Collaborative Learning about the Social Construction of Environmental and Natural Resource Problems

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THE MOBILE BAY WATERSHED PROJECT:
AN EXPERIMENT IN COLLABORATIVE LEARNING ABOUT THE SOCIAL CONSTRUCTION OF ENVIRONMENT AND NATURAL RESOURCE PROBLEMS*

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ABSTRACT

A collaborative research project was developed for a multidisciplinary class of advanced undergraduate and graduate students enrolled in Sociology of Natural Resources and the Environment. The goals of the project were to determine the feasibility of offering an experiential learning opportunity and to explore its usefulness in enhancing students' thinking about the social constructedness of natural resource and environmental (NRE) problems. The context was the Mobile Bay watershed, which is the site of a variety of concerns such as land use, pollution, and habitat destruction. To explore these types of problems, students completed a series of assignments including a media analysis, an annotated bibliography, several peer reviews, and a poster. Evaluation found that the project was not entirely successful for teaching and learning about the role of the media in shaping and defining NRE problems, but it was very successful for teaching and learning about rural sociology more broadly.

Critiques of higher education, as well as the teaching and learning of sociology, are nothing new (Bassis 1986; Pescosolido 2008). Students seek courses that are engaging and relevant (Atkinson and Hunt 2008; Friedland 1969), whereas scholars point to the need for students to develop a sociological perspective. Students, it is argued, need to learn how to "see the social," to recognize social constructions, and to understand generalizations about social phenomena (Atkinson, Wills, and McClure 2008; Persell, Pfeiffer, and Syed 2008). They must also improve their "higher-order" thinking skills (HOTS)—the ability to conceptualize and contextualize, to evaluate claims about social "facts," to synthesize information from multiple sources, and to draw conclusions (Atkinson et al. 2008; Geertsen 2003).

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Bidwell (1995) argues that students cannot be "taught" to have a sociological perspective. Instead, it is something learned through practice and application (Sernau 1995). Content analysis of the mass media is one strategy used to develop such a perspective as it provides a means of exploring the ways in which a phenomenon is socially constructed and a means for identifying and challenging assumptions about a phenomenon (Finley 2004; Parrot and Ormondroyd 1992). Collaborative research projects, particularly those that link the substantive content of a course to a "real world" problem, have been an effective way to give students an opportunity to put theoretical concepts into practice and to practice HOTS—analysis, evaluation, and synthesis (Caulfield and Persell 2006; Johnson and Steward 1997; Longmore, Dunn, and Jarboe 1996). Research projects, by their very nature, are a form of inquiry-based learning (IBL). IBL challenges students to identify, deconstruct, and operationalize a problem, and to use appropriate resources to investigate the problem (Levine-Rasky 2009:309). Thus, it is tightly coupled with information literacy. Information literacy is the ability to determine the type and amount of information necessary to examine a problem, to access and evaluate said information, to synthesize and integrate information from multiple sources, and to incorporate information into one's knowledge base (Caravello et al. 2008; Caulfield and Persell 2006; Ross and Hurlbert 2004:85).

In "doing" sociology, students have been found to conduct a more thorough analysis and to produce higher quality work (Blank 2004; Caulfield and Persell 2006; Parsons and Drew 1996; Sernau 1995). Althauser and Darnall (2001) found this to be particularly true of peer review. The authors found that students who work in groups often conduct a higher quality peer review of another's written work, and students who produce a higher quality peer review are more likely to increase the quality of their own written work. Public poster sessions have also been found to increase the quality of student work, especially as to HOTS. The struggle to share their research helps students to reflect on their earlier conceptualization of a topic and their operationalization of a research question (Levine-Rasky 2009; Lowry 1992:315).

In this paper I detail an attempt to develop and implement a group research project that would culminate with a public poster presentation. The rational for this experiment was twofold. First, I wanted to determine the feasibility of offering an experiential learning opportunity to a combined class of advanced undergraduate and graduate students in a Sociology of Natural Resources and Environment course. Second, I wanted to explore the usefulness of such a strategy for enhancing

students' thinking and learning about the social constructedness of natural resource and environmental (NRE) problems.

While much of the pedagogical literature speaks highly of collaborative research and public presentations, these strategies are not necessarily a panacea. Many students are inclined to drop a course if they are intimidated by research projects, by public presentations, and by a presumed increase in their workload (Sernau 1995). Apprehension about working in a group is especially problematic. Resistance to collaboration may go beyond the obvious concerns—grading, "free riders"—to include task distribution; collaborator follow-through; and an array of transaction costs including negotiation of substantive content, interpersonal conflict, and project organization (Levine-Rasky 2009; Parsons and Drew 1996; Yamane 1996). Another concern about group projects is the question of whether or not student learning actually improves. For instance, in the literature on testing, studies have shown that collaborative work has a significant, positive impact on students' short-term retention of material and their ability to answer relatively straightforward concept questions (e.g., Zipp 2007). However, it is not clear that teamwork improves complex reasoning (Breedlove, Burkett, and Winfield 2004). Yet another concern is design. Parsons and Drew (1996:77) claim that "poorly designed group work may be at best ineffective and at worst damaging to the students."

Each of these concerns implies that student research and group projects will place increasing demands on an instructor, particularly in time, organization, and other forms of support. To ensure that the teams run smoothly, fairly, and effectively instructors are advised to develop a set of "ice breaking" strategies (Caulfield and Persell 2006) and to closely monitor the groups throughout the project (Renzulli 2000). To allay fear of abstract concepts, instructors are called on to provide an emotionally supportive environment and to create specialized assignments that can be used to create a common language (Macheski et al. 2008). It is recommended that the project be coordinated with librarians who possess subject area expertise, specialized knowledge of relevant and evolving collections, familiarity with ongoing changes to bibliographic databases, and experience teaching information literacy (Thomas 1992). In addition, instructors are alerted to the need for detailed instructions and organizational guides for carrying out a research project (Atkinson et al. 2008). Instructors are also directed to supply frequent, rapid, and detailed reactions to each assignment that can be applied to subsequent assignments (MacMillan and McLean 2005). Lastly, it is suggested that instructors provide guidance on poster construction as there are inherent aspects (e.g., layout, design) that are unique to visual presentations (Levine-Rasky 2009).

In the next section, I briefly describe the course, Sociology of Natural Resources and Environment, the Mobile Bay Watershed Project developed for the course, and the general context of the assignment. This background is followed by the project objectives, a description of the project, the steps taken in designing and implementing the project, and a brief discussion of the poster session and research findings. In the third section I assess the project's usefulness in meeting the objectives for student learning. The later notes not only the successes, but also the problems encountered due to course design and implementation. I conclude with a discussion of what I learned from this experiment, future considerations, its applicability in other academic settings, and several recommendations for future research.

THE MOBILE BAY WATERSHED PROJECT

The Mobile Bay Watershed Project (MBWP) is a semester-long case study in which students conduct an in-depth exploration of the print media's framing of a natural resource or environmental (NRE) problem. It was developed for the 2009 spring semester of Sociology of Natural Resources and Environment. The course surveys the sociology of NRE and focuses on the United States. Its substantive content includes discourse, framing, and the media; deep ecology and ecofeminism; production and consumption; resource dependency; environmental justice; science and power; risk and natural disasters; and management and policy.

The class is open to students from any discipline and it is an approved elective for an undergraduate minor in sustainability. It meets twice a week for 75 minutes, over a 17-week semester. The course is taught as a seminar, meaning that it is designed for advanced undergraduates and graduate students, it is presented in a discussion-based format, and it requires the completion of a research project. In lieu of exams, the group project is broken into a series of individual and group assignments (approximately 60 percent and 30 percent of the final grade respectively) that requires engagement with the assigned readings. Students are also required to lead discussion on a rotating basis, provide discussion questions for each reading, and to actively participate in discussion (approximately 10 percent of the final grade).

Objectives

The MBWP component of the course had two objectives: for students to engage in collaborative learning about NRE issues (Atkinson et al. 2008; Blank 2004; Geertsen 2003; Macheski et al. 2008; Sernau 1995) and for students to explore the

role of the media in socially constructing NRE problems (Hannigan 2006b). In particular, the goals were to give students a model for working in groups to carry out a preliminary study of the ways in which the media frames NRE problems (e.g., Faupel, Bailey, and Grifin 1991; Szasz 1995), to explore the implications and significance of this framing (e.g., Bardwell 1991; Lee and Roth 2006; Walton and Bailey 2005), and to present their results publically (Levine-Rasky 2009; Lowry 1992).

Context

The Mobile Bay watershed is one of the largest river basins in the United States (Swann et al. 2008). It is a significant natural, cultural, and economic resource that reaches across three states (Figure 1). The MBWP focuses on the region immediately surrounding the delta—Mobile and Baldwin Counties and the Mobile Bay itself. The region's land cover is a mixture of water, agriculture, wooded and non-wooded wetlands, forest, and urban development. It has one of the richest and most complex ecosystems in the U.S. in terms of ecosystem types and species density (Swann et al. 2008).

Historically, the region was dominated by agriculture and commercial fishing. Offshore oil and gas exploration began after WWII. More recently, direct access to the water, favorable weather, and widespread marketing contributed to its rise as a popular tourist destination, particularly for those interested in the beach and those interested in fishing and boating. It is estimated that 4.5 million visitors spent $2.3 billion in Mobile and Baldwin Counties in 2008 (Malone 2009). These counties have also had extensive growth in the number of permanent residents. Between 1990 and 2007 the population increased 17 percent, and it is projected to increase another 17 percent by 2025. Currently, Mobile County is a metropolitan statistical area with one primary city, Mobile. Baldwin County is a micropolitan with sprawl from Mobile, as well as two secondary cities—Daphne and Foley.

In the last 30 years, urban land development increased 50 percent (Swann et al. 2008). The bulk of this development occurred in Baldwin County. Between 2000 and 2006, the county's residential development increased 30 percent. Much of this growth is in high-density, high-rise condominiums that replaced private homes and small businesses damaged during Hurricane Ivan (Barringer and Revkin 2004). Current land use throughout the region has been linked to many problems—stormwater drainage, nonpoint source pollution, erosion—that threatens the health of the Bay. Use of the waterways has also had a negative impact. Navigational development (e.g., commercial shipping), for instance, is a

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leading cause in the loss of coastal marshes in the region (U.S. Environmental Protection Agency 2008).

FIGURE 1. THE MOBILE BAY WATERSHED. Mobile County borders Mississippi on the west side of the bay and Baldwin County is on the east side of the bay bordering Florida.
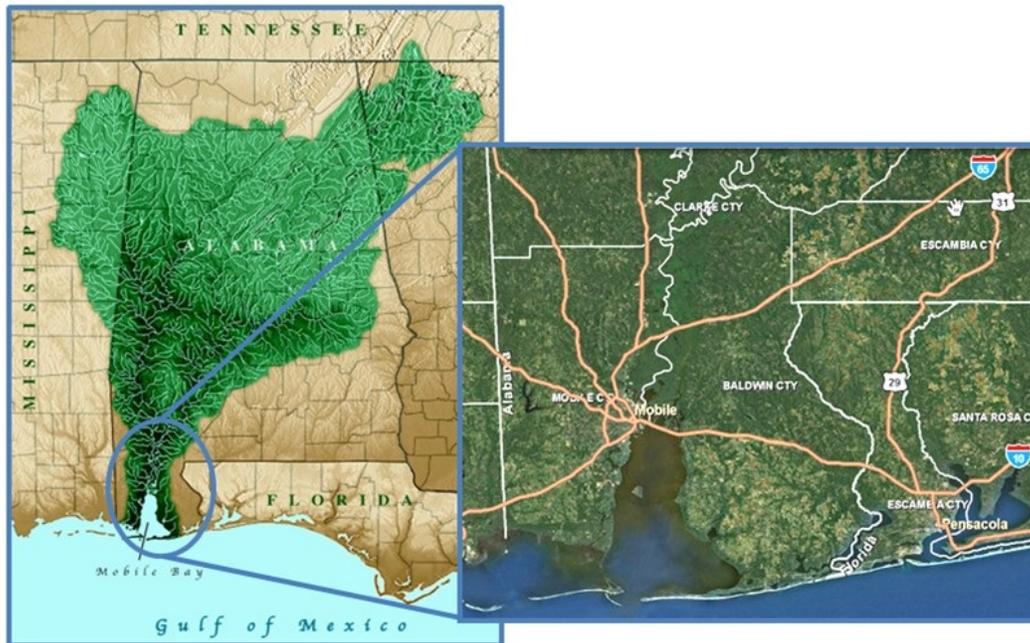
SOURCE: Mobile Bay National Estuary Program (N.d.); Mobile Bay National Estuary Program et al. (N.d.)

Assignment

The MBWP was organized into three steps: project development, data collection and analysis, and presentation of results. Students were instructed to divide themselves into groups of three (Caulfield and Persell 2006) and to choose any NRE problem in the Mobile Bay watershed. Each group submitted a five-page proposal that illustrated a basic understanding of the topic including the associated socioeconomic and biophysical issues, identified a specific researchable question, and broke the question into constituent parts for which each member would take responsibility.

In the second phase, each student was required to complete two independent assignments (Sernau 1995). For the first assignment, students collected all the print media coverage of their subtopic in local and national newspapers (e.g., Mobile Press-Register, New York Times). Students recorded and organized their data

using a spreadsheet (i.e., "evidence matrix") then used the spreadsheet to summarize the main point(s) or purpose of the article, to identify the standpoint and/or its potential biases, and to specify how each article contributes to their project and researchable question (Atkinson et al. 2008). The findings were presented in a five-page analysis and discussion paper on the ways in which the media framed their selected NRE problem. In the next assignment, students refined their subtopic and research question based on their media analysis and in consultation with their teammates, and then located a set of journal articles, government documents, and/or professional reports that represented the most current thinking on their topic. Undergraduates were required to find at least 10 documents, whereas the graduate students were required to find at least 15. Each student prepared an annotated bibliography of approximately 250 words per citation. The annotations included three items: a summary of the content and its thesis; a brief critique using assigned readings and course concepts; and a reflection on the document's usefulness to their project, the ways in which it contributes to their research question, and the ways in which it was similar or different from other sources and/or assigned readings (Caravello et al. 2008; Johnson et al. 2010).

The third component of the MBWP was the synthesis, interpretation, and presentation of the groups' findings. To assist with the content and the substantive connections across the subtopics, I provided extensive comments on each individual assignment and I provided summary comments for the group (MacMillan and McLean 2005; Yamane 1996). Each group prepared a five-page summary that introduced their NRE problem, summarized their research questions, described their methods, and synthesized the collective findings and conclusions. This summary served as the basis for constructing a 36 inch by 48 inch poster for a public presentation. The students were permitted to use any additional resources necessary (e.g., photographs, statistical data) to illustrate their points. The posters were constructed using standard presentation software and printed at the library using large-format color printers.

Peer reviews were conducted at each major step (Appendix A). Students were instructed to use the process as an organizational tool for collaboration. In other words, to reflect on their progress as a team; to reevaluate, refine, and narrow their researchable question(s); and to keep each other on task and accountable (Parsons and Drew 1996). Ten percent of the grade on each assignment was linked to the quality of the reviewer's work (Renzulli 2000). Students evaluated their group members' contribution to the project as well (Appendix B). These evaluations were not quantified, but they were considered in the final grade assessment.

Development

   The MBWP was developed in two stages: project design and project implementation. The first step in the design was the preliminary ground work. I met with several faculty members and extension agents at Auburn University who had an active program of research and outreach in the Mobile Bay watershed. Starting with the information and contacts provided, I spent a week traveling throughout Mobile and Baldwin Counties. I spoke with individuals at a local university, a county extension office, a water research institute, and an agricultural research facility. I also met with representatives of a nongovernmental organization and a local community group. As a group, they provided a wide range of supporting documentation including pamphlets, maps, peer-reviewed articles, and research reports. They also provided unpublished reports, manuscripts, and conference presentations that would have otherwise been difficult to find and/or to access. I also took a series of photographs documenting the biophysical and socioeconomic landscape (Hyatt 1992; Ihde 1995). This material served as the basis of the project design and it was made available to the students for use in their research.

   The second part of the project design phase was to consult with and to enlist the assistance of several information specialists, most of whom were librarians. I conferred with a special collections and subject area specialist who assisted in the initial brainstorming and conducted a preliminary review of the project. A member of the circulation department digitized all the material that I collected and made it available to the students electronically. Given the multidisciplinary nature of NRE concerns, being familiar with a range of databases beyond Sociological Abstracts was important for students. Thus, I sought the assistance of a specialist in information literacy who later conducted two training sessions specific to the project: 1) the use of LexisNexis and other newspaper-specific databases, and 2) the use of other digital resources for finding academic literature and government reports. An information technology specialist provided the hardware expertise necessary for students to create and to print professional quality posters. Lastly, I recruited a web master to develop an internet site that served as a repository for the project photographs, a means for advertising the course, and a publicly available space for posting students' findings.

   The last part of the design phase was course organization. I conducted an extensive literature review to identify readings that would be appropriate for the course while also specific to the MBWP. These readings included foundational pieces about the sociology of natural resources and environmental sociology (e.g., Belsky 2002; Hannigan 2006a), as well as core concepts in NRE studies such as

ecofeminism (e.g., Mellor 2000) and the treadmill of production (e.g., Schnaiberg, Pellow, and Weinberg 2002). Selected readings included substantive topics that students might choose for their research such as watershed management (e.g., Blomquist and Schlager 2005), natural disasters (e.g., Pielke Jr. 1997), wilderness (e.g., Walton and Bailey 2005), conservation (e.g., West, Igoe, and Brockington 2006), and policy (e.g., Barham 2001). Articles addressing the underlying concepts and methods that students would use in their research—environmental discourse (e.g., Bruell 1996; Cohen 2001), problem framing (e.g., Bardwell 1991; Mansfield and Haas 2006), media content analysis (e.g., Faupel et al. 1991; Freudenburg et al. 1996)—were also included.

Project implementation was the second stage in the development of the MBWP. I separated each phase of the project into numerous small steps (Table 1) and created a set of detailed guides for conducting the research and preparing the presentation. These guides included instructions for building an "evidence matrix" (Atkinson et al. 2008) using a standard spreadsheet program (La Pelle 2004). The matrix was to be formatted such that each newspaper article was assigned to a row and each column was used to record its bibliographic information, as well as the "evidence." In other words, the table was to be used to record whether the article was on topic and contributed to the project, and to record the article's standpoint and biases.

The second step was to develop the peer review process. A separate peer review guide was prepared for each major step in the project—media content analysis, annotated bibliography, summary, poster and presentation. Each peer review guide included questions that targeted not only grammar and style, but also the substantive content of each assignment (Appendix A). A group member evaluation was also constructed (Appendix B). Class time was set aside for each student to conduct at least one review of each paper written by a group member and to discuss the review with the team. Each student also reviewed another team's project summary and poster presentation.

The last step in project implementation was to create and implement an advertising strategy. A webpage was developed for this purpose, as well as a set of advertisements for standard outlets including the College and the University electronic, daily news services. During a university-wide Mobile Bay research and extension meeting, I made a presentation on the project and the poster session to approximately 30 people. Lastly, I created an e-mail list and project description for other relevant parties who expressed interest in the MBWP, or the Mobile Bay

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watershed more broadly, and for the faculty and staff overseeing the sustainability minor.

TABLE 1. TASK SEQUENCE FOR THE MOBILE BAY WATERSHED PROJECT

PHASE	WEEK	TASKS
Project Development	2	Create teams
	3	Choose tentative topics and submit one-page description
	5	Develop a five-page group research proposal and identify individual subtopics
Data Collection and Analysis	4	Attend the library training session on the use of LexisNexis and other newspaper databases
	5-8	Gather all newspaper articles, enter them into a spreadsheet (i.e., evidence matrix), create columns for analysis, then analyze and synthesize the data and prepare a content analysis paper
	8	Peer-review media content analysis paper and make corrections accordingly
	9	Attend the library training session on finding peer-reviewed literature and government reports
	9-11	Gather the minimum required number of relevant peer-reviewed journal articles and government documents and prepare an annotated bibliography
	12	Peer-review the annotated bibliographies and make appropriate corrections
Presentation of Results	14	Summarize, synthesize, and draw conclusions from the collective findings of the media content analyses and annotated bibliographies and prepare an executive summary
	15	Peer-review the executive summaries and make corrections
	16	Construct a poster for presentation and prepare a brief oral introduction
	17	Present the poster at the public poster session and peer-review the poster presentations and each group member's participation in the project

Presentation

Approximately 30 people attended the poster session and a light lunch was provided by the Department. I opened the session with a brief presentation on the overarching theme. By random chance, all three groups asked questions that spoke to the quality of life in Baldwin County. Following my introduction, each group introduced their poster. The groups chose the following topics: the impact of agricultural and residential irrigation on water quality; land use conflict among residential, commercial, and agricultural interests; and the environmental impacts of urban sprawl.

The collective findings of these research projects painted a picture of an area undergoing increasing environmental stress from rapid socioeconomic change. While some residents are acutely aware of, and very concerned about, the environmental impact of these changes, the media has paid little attention. Instead, environment is framed in terms of the land and the land is considered a resource for development. Commodization of the land is promoted by the power elites—developers, business owners, and public officials—who maintain that its development is "best" for the local economy. Citing the power elite, the print media portrays this development as a means of moving away from a traditional resource-based economy (e.g., farming) and toward something "better," a lifestyle with easy access to resource amenities (e.g., beachfront/waterfront property), as well as convenience and luxury. The elites have been particularly successful in changing local zoning rules, or occasionally ignoring them, to permit development on sensitive sites that has contributed to water pollution, excessive erosion, deforestation, and habitat destruction. Meanwhile, other stakeholder interests (e.g., loss of farmland, environmental degradation) are expressly ignored.

Following the introductions, the poster session was opened for individualized interactions. Nearly everyone who attended the session visited with each group. Several faculty members had lengthy conversations with the groups and contributed both a pointed critique and praise.

ASSESSMENT

Nine people completed the course, three graduate students in rural sociology and agricultural economics and six undergraduates from a variety of disciplines—business, history, sociology, political science, and urban planning—four of whom were working toward an undergraduate minor in sustainability. Because the final enrollment was quite small and this project was an experiment, a standardized, objective measure for project assessment was not

developed. However, there were two key ways that I assessed project effectiveness: observation and performance.

Students were observed multiple times throughout the semester including the library training sessions, peer reviews, and the poster session, during which time I noted students' comments about their work and their response to questions, as well as group-audience interactions. Following the poster session, almost a dozen visitors spoke to me privately. Observation and anecdotal remarks revealed a very high level of support for the project. Audience members expressed interest in the results of the research and in the MBWP as a pedagogical approach. The students indicated that while they were anxious about the work, had experienced many difficulties along the way, and were apprehensive about the final product, they were surprised at how it finally came together. Similar to other findings (e.g., Caulfield and Persell 2006; Levine-Rasky 2009; Lowry 1992), the students were proud of their accomplishment and excited to share their results. In fact, students who initially appeared indifferent through much of the semester came alive during their poster presentation (Macheski et al. 2008). Following the session, the students collectively stated that they learned more doing this project than they had in any other class project to that point (Sernau 1995).

Performance is believed to "authentically demonstrate" what students have learned (Finley 2004; Sanders 2001). For the MBWP, I conducted an extensive evaluation of students' in-class participation (e.g., discussion, written discussion questions, presentations), data collection (e.g., evidence matrix), and a series of seven written assignments (e.g., peer reviews, annotated bibliography, executive summary). I found that the students struggled to identify and define an NRE research question, but most could do so by the end of the course successfully. In addition, most could search for and use some resources necessary to investigate their question and to support their findings, to complete a preliminary synthesis of their data and to summarize their results, and to link some of their findings to some course concepts. In addition, nearly all students could use the peer review process to improve the mechanics and style of their writing. As further testament to the potential benefits of the MBWP, one group presented their poster at a national academic conference.

Observation and class performance suggests that designing and implementing a semester-long group research project is feasible in an NRE course with a mixture of advanced students from multiple disciplines. These preliminary results also suggest that the MBWP may be a viable strategy for improving students' higher-order thinking skills. Simultaneously, the assessment revealed a significant problem

that undermined the quality of student performance and the original intent of the project. Collectively, the students did not engage in "deep" reading, a well-known problem in higher education, even among better students (Roberts and Roberts 2008). Daily, most read only enough to participate in discussion minimally (Yamane 2006) or did not read at all, which had at least two interrelated consequences.

The first consequence was that students had difficulty distinguishing a NRE concern, or issue of interest, from a case that met the definition of a "problem" (Hannigan 2006b). In addition, they were unable to make the links between the readings that were specific to the project (i.e., exemplars of media framing and media content analysis) and their research project. Thus, the purpose and process of the data collection, as well as the need for rigor, failed to resonate. The result was that three of the nine did not attend the required library training session to learn how to use the newspaper databases. One who did not attend found approximately twelve articles, but a third of the articles had been collected and reviewed by another teammate. The second student found eight articles, but three of them were posts to a blog on a newspaper website. The third student failed to complete the assignment altogether. In addition, a fourth student, who attended the training, chose not to participate and subsequently found only four articles.[1]

Second, insufficient engagement with the literature meant that most had trouble developing the multifaceted understanding of constructionism that was necessary to recognize nuances in the data. Review of the data revealed that half of the eight students who submitted the matrix were unable to satisfactorily identify the standpoint and/or a potential bias in their articles. The incomplete matrices made it difficult for students to see similarities and differences among their data, to synthesize and analyze their data, and to draw conclusions about the role of the media in shaping and defining their chosen NRE problem. Consequently, it was difficult for students to contextualize and to discern the sociological significance of their findings in terms of the existing literature and their larger group project. It also meant that the peer review was largely reduced to a grammatical exercise. The result was that the groups lost their focus on the purpose of the content analysis, struggled to move beyond a simplistic summary of the data, and reverted to accepting the contents of the media reports as "Truth."

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[1] In a rudimentary search of the Google News archive, I found nearly 200 articles on each of the specific subtopics that were chosen. Assuming that some of the archived articles were duplicates and some were incorrectly indexed (i.e., not a newspaper article, did not cover the topic), a very conservative estimate suggests that each of the four students should have located at least 20 articles.

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Missteps

Assessment also revealed four problems in the design and implementation of the MBWP. The first problem was selling the class. Despite reports that students desire active learning and meaningful assignments, and despite my own excitement about the project, 40 percent of the students enrolled in the course dropped when they learned of the combination of reading, writing, and group work (cf., Sernau 1995).[2] I incorrectly assumed that advanced level students would see the value of such a project and this value would outweigh other concerns that they might have.

The second problem relates to the methods. While I considered the students' previous experience, I did not do so adequately. I made an erroneous assumption that graduating seniors and graduate students would have had some degree of information literacy, would have taken at least one methods course in their respective discipline, and would have written at least one term paper (Lofland 1996). Instead, I found that both the graduate students and the undergraduates had little previous knowledge of the library resources, how to develop a search term strategy, how or why to differentiate between sources (e.g., newspaper articles vs. journal articles; peer-reviewed vs. non-peer reviewed); or how to find a source once it had been identified. I found that only three of the nine had taken a methods course; only one had previously worked on a research project; and as a group, they had little experience with term papers or other long-term assignments.

Third, I failed to appreciate fully the conceptual and contextual complexity of the assignment (Geertsen 2003). To identify environmental frames, for instance, the project required a high level of abstraction (Blank 2004), and to carry out the analysis it required at least a minimal degree of familiarity and comfort with the basic logic of social science research (Lofland 1996). The combination of assigned readings and in-class discussion of the readings; library instruction; group collaboration and both individual and group meetings outside class; and detailed instructions for, and comments on, each assignment were simply not enough.

Finally, in implementing the project I failed to provide enough time for in-class group work and enough direct supervision. As a result, two of the three groups had difficulty working together (i.e., intergroup conflict, failure to attend meetings, lack of preparation). The limited in-class time also opened a space for students to resist collaboration. For instance, to encourage deeper reading, two additional assignments were added to the project (Table 1): each *group* was instructed to develop an *integrated* presentation on the central course concepts (e.g., types of

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[2] The Spring 2010 course began with 14 students, then dropped to 6 students.

discourse, rhetorical framing devices) (Hannigan 2006a) that were most relevant to their respective project (week 7) and to develop a presentation that synthesized their findings (week 10). In place of teamwork, each group split the assignments into disconnected parts and each member presented their individual portion.

DISCUSSION AND CONCLUSION

With the inclusion of the MBWP, the Sociology of Natural Resources and Environment course gave students breadth of subject matter and in-depth study of a particular NRE concern. However, incorporating a semester-long group research project into the class did necessitate some sacrifice. Due to the time dedicated to library instruction (Ross and Hurlbert 2004), in-class presentations, and peer reviews, compromises were made in the number of assigned readings and in the overall time spent reviewing the readings (cf., Caulfield and Persell 2006). If the students, and myself, had not been burdened by the project, it is possible that more comprehensive reading, and subsequently a deeper discussion of the readings, may have been possible. Yet, this collaborative, inquiry-based exercise gave students an opportunity to develop, conduct, and publicly present an in-depth case study that went beyond what would have been possible for students working alone and/or producing a traditional term paper (Ransford and Butler 1982). Thus, despite the problems that emerged, the MBWP challenged students to be "active and engaged participants in their own learning" (Caulfield and Persell 2006; Macheski et al. 2008:42; MacMillan and McLean 2005).

What I learned from the first group of students to take on this challenge was that they may not have fully comprehended the ins and outs of library research, fully understood the details of the media content analysis, or fully grasped the concept of framing, but they may have gotten something from the MBWP that was ultimately more important—skills and ways of thinking that transcend the course (Caulfield and Persell 2006; Hartmann 1990; Lofland 1996; Longmore et al. 1996). It is these types of skills and these ways of thinking that may set a foundation for lifelong learning and lead to the development of a sociological perspective (Atkinson and Hunt 2008; Bidwell 1995; Sernau 1995).

For instance, students left the course with an appreciation for rural sociology. In conducting a research project themselves, the students were exposed to the science of sociology, to one way that we "do" sociology (Raddon, Nault, and Scott 2008), and to several information-seeking skills that may be useful in future explorations of social phenomena (Caravello et al. 2008). After completing the course, students had an appreciation for the importance of formulating "good"

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questions, questions about factors that are not readily apparent, and the importance of teasing out the constituent parts of a question (Persell et al. 2008:114). In completing and presenting the project, students have seen, first-hand, the value of thorough evaluation, reflection, and reassessment and how to incorporate this information into their work (Atkinson and Hunt 2008; Hsiung 2008). Furthermore, students left the course with a tangible product. "Their project," a project for which students could claim ownership, allowed them to explore an NRE issue from initial conceptualization to the presentation of findings, which authenticated the process (Raddon et al. 2008).

This experience has taught me that developing a semester-long research project will take multiple iterations and multiple assessment techniques to "get it right" (Lofland 1996). In the future, the MBWP must address at least four interconnected issues, the first of which is how to get students to read and to read more deeply. According to Roberts and Roberts (2008), many students do not know how to read at a college level or how to read for deep comprehension. Strategies for increasing reading often focus on frequent testing (e.g., Jay 2004). Here, the focus should be on deep reading strategies such as the use of instructional guides for reading a research article (Bordt 2005) or the use of "graphic organizers" for visualizing key ideas and making conceptual connections (Roberts and Roberts 2008:132).

A second issue that must be addressed is students' understanding of the research methods and the process of synthesis and analysis. Corrective action should include specific instruction on content analysis as a research technique (e.g., purpose, standards) and specific discussion of the ways it is used in the assigned readings. Completing the matrix was a critical step in synthesis and analysis (Atkinson et al. 2008). Giving students a template (Johnson and Steward 1997), and guiding them through in-class exercises using it, may provide a more structured way to effectively cue students to the information that they need to identify and record (Macheski et al. 2008). This additional assistance may also help students make connections between the concepts in the readings and their own data.

Third, the collaborative learning process itself must be addressed. The existing literature suggests that a grade-based incentive is the most effective way to encourage students to focus on their contributions to a group project rather than each others' behavior. In these cases, the students assign grades to each other and this assessment is incorporated into their final grade (Caulfield and Persell 2006; Parsons and Drew 1996; Renzulli 2000). Another option, which would not carry the threat of a penalty, is to not only provide more in-class time to work in groups, but to focus that time on specific tasks that will help guide students through synthesis

and analysis (Yamane 1996). Yet, as Ransford and Butler (1982) indicate, care must be taken not to interact so closely with a group, and their work, that it stifles creativity.

A fourth issue to consider is how to improve assessment. One approach is to survey the students. A survey could ask students to identify course content that remains unclear (e.g., Caravello et al. 2008:14) and to provide their opinion of the overall effectiveness of the assignment (e.g., Obach 2009) including whether or not the project contributed to their understanding of specific course concepts and their ability to analyze and to synthesize the information (e.g., Levine-Rasky 2009). Another option is to use a standardized rubric. Rubrics might be used to assess information literacy, to judge the rigor in data collection (e.g., breadth of keywords and databases used), and to gauge completeness of the evidence matrix (e.g., ability to identify environmental frames). They can also be used to evaluate HOTS—students' ability to conceptualize an NRE problem, the degree to which their researchable question was answered and supported with evidence, and their creative use of, and connections to, appropriate theoretical concepts (e.g., framing) (Atkinson et al. 2008).[3]

Most of the pedagogical research in sociology focuses on undergraduates, particularly students in lower level courses (e.g., Finley 2004; Jay 2004; MacMillan and McLean 2005; Yamane 2006; Zipp 2007). What I learned is that similar challenges can be found among upper division undergraduates and graduate students alike (Lofland 1996). Thus, future pedagogical research ought to focus on how best to measure information literacy and HOTS among students in advanced courses. For example, the Standardized Assessment for Information Literacy Skills (SAILS) used at many institutions (e.g., Caravello et al. 2008), including my own, is designed for undergraduates. SAILS does not have an assessment for graduate students. NRE courses are inherently difficult as they require study of sociology *and* NRE issues. To improve content delivery in these types of courses, especially courses that have students with widely varying competencies, instructors need methods for differentiating content-specific problems (e.g., ability to differentiate between "nature" and "environment") from general weaknesses (e.g., reading comprehension, conceptualization and contextualization); and innovative ways to

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[3] Jennings, Rienzi, and Lyda (2006) designed a set of rubrics for assessing knowledge and application of social theory at the program level. Their criteria include, but are not limited to, whether or not a student can describe a theoretical concept, identify and define a problem, and accurately apply the concept to that problem. These rubrics could be adjusted to fit a specific exercise.

aid students with an insufficient background, and/or are otherwise inadequately prepared, without diluting the substantive content of the course (Johnson and Steward 1997; Raddon et al. 2008). In addition, instructors need a means for motivating students to want to tackle the complexity and ambiguity that is inherent in NRE studies, to encourage students to move from application of concepts to abstract reasoning, and ultimately to help students develop a more sophisticated understanding of NRE concerns (Blank 2004; Geertsen 2003; Lofland 1996:394; Macheski et al. 2008; Persell et al. 2008).

In reflecting on my experience with the MBWP, I have come to appreciate why large, complex group research projects are rarely assigned (Raddon et al. 2008). This type of work may be impractical for a myriad of legitimate reasons including concerns about enrollment, insufficient time, and high student-instructor ratios (Longmore et al. 1996). Without significant modification, a project of this scope will only be suitable for smaller classes, ideally 18 students or less, and for classes serving honors and upper division undergraduates and/or graduate students. More important, the problems that I identified were not unique to this course or this class (e.g., Caravello et al. 2008; Caulfield and Persell 2006; Lofland 1996; Raddon et al. 2008; Roberts and Roberts 2008). This means instructors considering similar projects must be prepared to expend a great deal of effort in design, development, and monitoring; to provide adequate training and support beyond the substantive content of a course; and to work very closely with students throughout the semester. For instructors at research intensive institutions, as well as those with heavy teaching loads, these demands may appear insurmountable.

Yet, I have also come to appreciate the value in encouraging students to engage in active learning and in "doing" sociology. Despite the problems that I have detailed, I found the MBWP to be a powerful experience and a powerful educational tool that could be easily adapted for use in any course focused on the types of social problems that are important to rural sociologists—the slow food movement, farm subsidies, broadband access, health care, and a variety of international concerns. Moreover, it need not be limited to land grant universities. The MBWP could be used in any social problems class or modified for quantitative and qualitative methods courses. It is particularly appropriate for courses taught in departments committed to information literacy, integrating theory and methods across the curriculum, and collaborative learning (Atkinson and Hunt 2008; Jennings et al. 2006; Persell et al. 2008).

APPENDIX A[4]
Peer Review of the Media Content Analysis
(Excerpt)

There are three key goals for this peer review: 1) to help improve your classmate's paper by pointing out strengths and weaknesses that may not be apparent to the author, 2) to help improve your editing skills, and 3) to help keep the group project on track and the topic area unified!!

INSTRUCTIONS: Read the paper twice, once to get an overview and a second time to provide constructive criticism for the author to use when revising his/her paper. Answer the questions below.

ORGANIZATION
1. Were the basic sections adequate (e.g., introduction, body, conclusion, references)? If not, what is missing?
2. Was the material ordered in a way that is logical, clear, and easy to follow? If not, what changes might improve the organization?

CITATIONS
1. Did the writer cite each source adequately and appropriately? If not, note any formatting that appears to be incorrect.
2. Were all the citations listed in the reference section? If not, what discrepancies did you find?

CONTENT
1. Did the writer adequately summarize the group project and researchable questions? If not, what changes would you recommend?
2. Does the research appear to be comprehensive (e.g., is there evidence that each opinion-leading and local newspaper was searched)? If not, what appears to be missing?
3. Did the writer adequately draw on the course concepts/readings in his/her analysis? If not, are there course concepts that you think the writer should consider?
4. Does the writer make a contribution of thought to the paper or merely summarize the data and the literature? If not, what changes would you recommend?

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[4] This peer review was inspired by the Mānoa Writing Program (2009). Its website (http://www.mwp.hawaii.edu/Default.htm) has a number of useful aids for students and teachers in writing intensive courses.

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APPENDIX B

Group Member Evaluation

For each member of your group, including yourself, please fill in the name of the individual you are evaluating; a rating for each category indicated; and at least one written comment assessing each member's contribution. The categories include:

1. Attendance (e.g., has the member attend each work session, has this member's non-attendance affected the work of the group)
2. Preparation (e.g., doing the research, thinking about how to conceptualize the data in terms of the course material)
3. Knowledge sharing (e.g., did the member regularly share ideas and reactions to the data and in the preparation of results that were helpful to you or the group)
    ➔ Please note: sharing problems with understanding the material can be helpful in the learning process.
4. Listening to others (e.g., did this member make an effort to listen to other's comments and/or allow others to speak without breaking in)
5. Support for others (e.g., did this member express support for other members in their efforts to express themselves; did s/he make a positive contribution to a group climate that was open and friendly)
6. Written comments (i.e., your comments should summarize the members' contribution(s) or indicate problems that were not covered elsewhere)

For each category, please mark an **X** in the box indicating whether the actions of the member you are evaluating made it easier (a high rating) or more difficult (a low rating) for you, or the group as a whole, to do your work. If you have little information about a member (e.g., s/he has been absent frequently and/or not contributing to the project), it should be reflected by assigning a low rating.

PEER ASSESSMENT

Member:					
Criteria	Excellent	Good	Average	Poor	Very poor
Attendance	☐	☐	☐	☐	☐
Preparation	☐	☐	☐	☐	☐
Knowledge sharing	☐	☐	☐	☐	☐
Listening to others	☐	☐	☐	☐	☐
Support for others	☐	☐	☐	☐	☐

Written comments:

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