

The Role of Capstone Workshops in Connecting Environmental Policy Masters Students to Employer Communities

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Background: The Curriculum of the MPA in Environmental Science and Policy Program

The Master of Public Administration in Environmental Science and Policy (MPA ESP) began in 2002 to train sophisticated public managers and policymakers who apply innovative, systems-based thinking to environmental issues. Students in the MPA in Environmental Science and Policy program complete a total of 54 credits over the course of an intensive twelve months. The program's objective is to provide students with the analytic, communication, and work skills required to be problem-solving earth systems professionals. Graduates are prepared for professional careers in the roles of analyst, manager, and translator of scientific knowledge. Exhibit 1 provides the program's current curriculum.

The program's curriculum combines in-depth understanding of the issues of environmental sustainability policy with the traditional analytic and conceptual skills of a master of public administration (MPA) program. Two fundamental insights shape this master's program: the realization that institutional, social, and economic processes interconnect to both sustain and endanger the planet and the need for professionals who can maintain the health of this interconnected system. Only by combining an understanding of earth systems issues with management strategies will it be possible to cope with the threats to planetary sustainability.

Exhibit 1: The Curriculum and Course Sequence of the MPA in Environmental Science and Policy

Summer Term—18 points	Autumn Term—18 points	Spring Term—18 points
Environmental Chemistry (2 points)	Sustainability Management	Financial Management
Risk Assessment and Environmental Toxicology (2 points)	Microeconomics and Policy Analysis	Macroeconomics and Policy Analysis
Climatology (2 points)	Quantitative Techniques and Systems Analysis in Policymaking and Management	The Workshop in Applied Earth Systems Policy Analysis (6 points)
Hydrology (2 points)	Ethics, Values, and Justice	*Environmental Data Analysis (or elective)
Principles of Ecology (2 points)	The Workshop in Applied Earth Systems Management II	*Sustainable Economic Development (or elective)
Urban Ecology (2 points)	*Political Context of Public and Private Management (or elective)	
The Workshop in Applied Earth Systems Management I		
Earth Systems and Environmental Politics, Policy, and Management		

*All courses are three points unless otherwise indicated, *Recommended but not required*

To train effective earth systems professionals, the program focuses on the practical skills necessary to understand the formulation and management of public policy. The teaching of public policy and administration is the core of the program. This set of classes focuses on specific professional and vocational skills, such as memo writing, oral briefings, group process and team building, leadership, strategic thinking, spreadsheet and other forms of financial analysis, and the use of computer programs and case studies of earth systems issues. The principal goal of the core curriculum is to provide students with the analytic, communication, and work skills required to be problem-solving earth systems professionals.

The skills and concepts include an understanding of:

- the connections between policy intent, program design, organizational capacity, and political feasibility;
- the relationship of program to organization and organization to budget;
- the design of studies that are methodologically rigorous and defensible within the constraints of available resources;
- environmental economics, politics, policy, and management;
- public and environmental ethics;
- perceptions of environmental quality and environmental values, and how to explain science to nonscientists and manage the work of scientists;
- how to manage organizational change and innovation;
- how to work in groups and deal with group conflict; and
- professional communication, including memo and report writing and the conduct of formal oral briefings.

Courses in environmental science round out the training so that our graduates will be able to inform the decision-making process and manage science experts. The policy and management challenges our graduates are being trained to address include global change issues, such as global warming, but more frequently, they focus on air, water, solid waste, and toxic waste management issues. This Environmental MPA program requires more environmental science than any other public policy master's degree of which we know. The skills and concepts involve an understanding of the scientific method, including observation, hypothesis generation, and hypothesis testing; the

chemical processes affecting environmental quality and public health; collection and analysis of field and laboratory data; and systems modeling.

This paper presents an analysis of an alumni survey of the impact of the Spring-semester capstone client workshop. The purpose of the Spring-semester workshop is threefold:

1. To develop an understanding of how policy and management analysts approach analytic projects in the “real-world” action environment and how research methodologies vary and why;
2. To learn how to understand and overcome the practical problems associated with conducting policy analysis in an action environment with a client;
3. To learn how to frame a policy or management problem and cut it down to a manageable size that permits progress to be made in a short period of time.

Workshop in Applied Earth Systems Policy Analysis

At the heart of the curriculum for the MPA in Environmental Science and Policy program is the Workshop in Applied Earth Systems Policy Analysis (Workshop), a sequence of three courses, totaling 12 credit points. The Workshop provides practical training gained by working on real problems where student analyses and reports can have an impact on actual public sector operations. The goal is to teach students how to integrate their understanding of natural science, social science, policy studies, and management in a problem-solving exercise.

In the Summer and Fall semesters, the Workshop emphasizes management issues. Students are placed into groups of twelve- or thirteen-member student teams, each led by a faculty-selected Manager and Deputy Manager, to analyze an important public policy problem. Each Workshop faculty member selects a piece of proposed but not yet enacted state, federal, or local environmental law (or a U.N. resolution or international treaty) and students develop a plan for implementing and managing the new program. In the Summer semester, the Workshop groups write reports explaining the environmental science aspects of a management problem to political decision-makers who are not scientists. During the Fall semester the Workshop group completes the operational plan for implementing the program. In the Spring semester, students form new groups to take on projects for real-world clients in government and nonprofit agencies. These teams analyze an actual environmental policy or management problem faced by their clients.

The Spring Workshop is specifically designed to give students hands-on experience integrating and using the various skills they learn during the Environmental Science and Policy MPA program. Throughout the semester, students build relationships amongst themselves, with their faculty advisors, and with the client. During this process, the client fills a number of roles: data resource, point of entry to the organization, student work evaluator, and expert, allowing students to gain maximal exposure to the client. Students approach the client for feedback on all key project questions and issues. Student outputs include mid-term and final briefings to the class and client, and a final report for the client.

While many of the Workshop clients were non-profit organizations, of course a number were also government agencies. Of the total 39 projects analyzed in this study, 16 of the clients were for government agencies, over 40%. These clients collectively represent all levels of government work, and have included local New York City departments and agencies, state-level organizations, such as the New Jersey Department of Environmental Protection, federal agencies, such as the Environmental Protection Agency, and international organizations, including various United Nations departments. These clients serve to develop students' connects to the professional environmental community, while also introducing them to the inner workings of the public sector.

The issues covered by capstone workshops vary widely in topic and client. Exhibit 2 details the projects, clients and faculty advisors for the Spring Workshops from 2004-2011.

Exhibit 2: Workshop Projects and Clients 2004-2011

Year	Project	Client	Faculty Advisor
2011	The Evolving Role a REDD+ Mechanism in National Development Plans	Coalition for Rainforest Nations	Kathleen Callahan
2011	Enhancing the Feasibility of Electric Vehicles in New York City	NYC Mayor's Office of Long-Term Planning and Sustainability	Steve Cohen
2011	Creating a Strategic Plan for the High-School for Sustainability	NYC Department of Education's Division of School Facilities, Sustainability Initiative Committee	Nancy Degnan
2011	Post-Katrina Restoration of the Port of Gulfport: Incorporating Sustainable Development Practices	Mississippi Center for Justice	Gail Suchman
2011	The Problem with Ecosystem Services: Promoting Private Investment in the Protection of Wetlands	Environmental Defense Fund	Sara Tjossem
2010	Human Impacts on Biodiversity Conservation	The Nature Conservancy	Sara Tjossem
2010	Success and Failures: Evaluating Environmental Justice Strategies in Federal Agencies	Natural Resources Defense Council, West Harlem Environmental Action	Gail Suchman
2010	Sustainable Water for Abu Dhabi	Abu Dhabi Urban Planning Council	Nancy Degnan

2010	Understanding New York City's Food Supply	NYC Mayor's Office of Long-Term Planning and Sustainability	Steve Cohen
2010	Evaluating Possibilities for an International Carbon Markets Regime	Environmental Defense Fund	Kathleen Callahan
2009	Assessing the Effectiveness of Payments for Environmental/Ecological Services	TRANSLINKS	Kathleen Callahan
2009	Retrofitting Older Apartment Buildings for Energy Efficiency: Practical Proposals for Public Housing in New York City	New York City Housing Authority	Steve Cohen
2009	Gateway's Long-Term Ecosystem Management Options under Changing Climate Conditions	The National Park Service: Gateway National Recreation Area	Tanya Heikkila
2009	Quantifying and Reducing a National Organization's Impact on Global Climate Change and Developing a Model to be Replicated	National Audubon Society	Gail Suchman
2009	Renewable Energy Payments (REPs) Policies for the United States	EarthAction & the Alliance for Renewable Energy	Sara Tjossem
2008	Act Locally: Implementing Sustainability in Local Governments	United States Environmental Protection Agency, Region II	Steve Cohen
2008	Integration of Coastal Ocean Observing Systems into Emergency Management in the New York/New Jersey Bight	Mid-Atlantic Regional Coastal Ocean Observing Regional Association	Tanya Heikkila
2008	G.R.E.A.T. Ideas: Designing a Building Retrofit Training Program	Sustainable South Bronx	Gail Suchman
2008	UN Food Programme and Climate Change in West Africa	United Nations World Food Programme - West Africa Bureau	Kathleen Callahan
2008	Reducing Carbon Emissions from Power Generation: the Potential Role of Biofuels in New Jersey	New Jersey Department of Environmental Protection	Sara Tjossem
2007	Power to the People: Promoting Micro-Investment in Distributed Generation in the European Union	Notre Europe	Sara Tjossem
2007	Bridging the Gap: Tools for Conservation and Development	Wildlife Conservation Society	Kathleen Callahan
2007	Green Building for Affordable Housing in Manhattan	The Manhattan Borough President's Office	Blaine Pope
2007	Waste-to-Energy: A Possibility for Puerto Rico	US Environmental Protection Agency, Region II	Steve Cohen
2007	Maintenance Funding Recommendations for the South Bronx Greenway	Barretto Bay Conservancy	Gail Suchman
2006	Regulating Electronic Waste in New York City	Natural Resources Defense Council	Steve Cohen
2006	Community Wind Project Development	Clean Energy Group	Tanya Heikkila
2006	The European Union Emission Trading Scheme	Notre Europe	Tanya Heikkila
2006	Workshop on Corruption and Environmental Degradation	Transparency International	Sara Tjossem
2006	Sustainable South Bronx: Greening an Industry	Sustainable South Bronx	Gail Suchman
2005	Green Retrofitting in Battery Park City	Battery Park City Authority	Tanya Heikkila
2005	Transporting NYC to a Sustainable Future	Natural Resources Defense Council	Lewis Gilbert
2005	Solid Waste Management Alternatives for The City of New York	New York City Economic Development Corporation	Steve Cohen
2005	Reducing Transaction Costs of the Clean Development Mechanism	United Nations Division of Sustainable Development in the Department of Social and Economic Affairs	Bruce Chadwick

2005	Water Quality Problems and Solutions in Jamaica Bay: Analyzing the Role of Wastewater	New York / New Jersey Clean Ocean and Shore Trust (COAST)	Tanya Heikkila
2004	An Analysis of the Brownfields Initiative In EPA Region II	EPA Region II	Steve Cohen
2004	Sustainable Development and the Clean Development Mechanism	UN Division of Sustainable Development	Bruce Chadwick
2004	Waterkeeper Alliance Mercury Project	Waterkeeper Alliance	Tanya Heikkila
2004	Congestion Pricing in New York City	Environmental Defense Fund	Tanya Heikkila

Connections to Employment Communities

The Spring Workshop helps students penetrate non-for-profit and government environmental communities that sometimes lead to permanent job placements or internships with the client or with organizations in the client’s professional network. In addition, the community formed between students and organizations during the program allows students to contribute a public service for clients whose missions the program supports. The Spring Workshop provides unique benefits to both students and clients, enabling each to grow their professional work and experience.

Spring Workshop Survey Data Results

The following details the findings of a recent survey of alumni of Columbia University’s MPA in Environmental Science and Policy program who graduated between 2003 and 2011. The online survey consisted of nine questions administered through SurveyMonkey.com. An email with the link was sent to a total of 371 alumni on July 20, 2011. Two follow up messages were emailed on July 27th and August 8th. Out of 371 who received the survey, we received **163** responses for a response rate of approximately **43.9%**. The findings from this survey are summarized below.

Direct & Indirect Employment

A total of **10** respondents answered yes when asked if the Spring Workshop lead to employment or an internship with the client (either after graduation or at a later point in the future). This represents only **6.2%** of respondents. However, from a total of 39 projects offered by the Workshop since 2004, 10 respondents represent a hiring rate of over **25%**. Looking at it this way, roughly 1 in 4 clients directly hired one of its Workshop students as full time employees or interns after the Workshop experience.

In addition, **6.8%** of respondents answered yes when asked if the Spring Workshop client helped to secure employment or an internship at another organization connected to the client's community (either after graduation or at a later point in the future). A total of 11 respondents indicated that they were assisted by their Workshop client in landing a job with *another* organization, again representing approximately 1 out of 4 Workshop clients.

Taken together, these two data points indicate the willingness of clients to both hire and aid in the job placement process for their previous Workshop students. This reflects both the students' skills and their level of professionalism during the Spring Workshop.

Furthermore, a typical comment among respondents was that while the client did not directly assist in gaining employment, the experience, including the analytic and subject matter expertise, helped alumni stand out to employers. Many also indicated that they have used the client as a reference when they applied or interviewed for jobs. Our

graduates found that they were able to utilize the client's reputation in the environmental community and the client's familiarity with the skills of our graduates to leverage the experience into professional work. Respondents commented that they consider the Workshop to be a good resume booster as Workshop clients are well-known and respected organizations that stand out on resumes. Such comments included that the "experience looked good," "added some edge to my CV," and that the experience "helped me secure many interviews working on the issue."

Professional Networking

A total of **6.8%** of respondents have worked with their Spring Workshop client in a professional capacity at another organization. Interestingly, **17.9%** of our respondents have maintained contact with their Spring Workshop client as part of their broader environmental community/network and **42.9%** of the survey's respondents stated that they would reach out to his/her Spring Workshop client when looking for a new job opportunity.

While the survey indicates that not many alumni have directly worked with their previous client since graduation, nearly 1/5th of respondents have maintained contact with their client and close to half indicated that they would contact their client for assistance with a future job search, underscoring the importance of the professional network established through the Workshop course. Respondents appear mindful of the potential opportunities that their previous client could present, even if they have not received direct employment help previously.

Professional Experience & Skills

Alumni were asked for their impression of the Workshop’s impact on specific skill sets – skills the program identified as crucial to the professional development of its students.

The results are summarized in Exhibit 3.

Exhibit 3: Assessment of Impact on Skill Sets

“What impact did the Spring Workshop have on the following skill sets?”

	No Impact	Little Impact	Moderate Impact	Strong Impact	Very Strong Impact	Rating Average	Response Count
Client relations	16.6% (27)	26.4% (43)	31.3% (51)	22.1% (36)	3.7% (6)	2.70	163
Subject matter expertise	1.2% (2)	2.5% (4)	31.5% (51)	44.4% (72)	20.4% (33)	3.80	162
Group work	0.6% (1)	6.7% (11)	20.9% (34)	42.3% (69)	29.4% (48)	3.93	163
Professional communication (memo & report writing, oral briefings)	2.5% (4)	9.2% (15)	28.8% (47)	33.1% (54)	26.4% (43)	3.72	163
answered question							163

The data shows that, overall, respondents believe that the Spring Workshop strongly enhanced these skills. The most common response for subject matter expertise, group work, and professional communication was “Strong Impact” at **44.4%**, **42.3%**, and **33.1%**, respectively. Very few respondents indicated the Workshop’s impact on these skills was either “No Impact or “Little impact.” It appears clear, based on the data, that the Workshop has met its goal of building a student’s technical and professional skills. At least the program’s alums hold this perception.

However, regarding the Workshop's impact on client relations the most common answer was "Moderate Impact" at 31.3% with "Little Impact" at 26.4%. This may be due to the fact that the level of client interaction varied by Workshop group. In some instances, the student Workshop Manager and Deputy Manager kept close client contact, while the remaining group members had less direct communications with client. These relationship decisions are often dictated by the client, which may prefer to have one or two primary contacts to direct questions and comments through, rather than working individually with all twelve members of the group. Additionally, the Workshop Managers may have determined the procedures for client contact, and may have preferred to keep primary contact to maintain oversight. In either case, there may be room for improvement in allocating adequate time and exposure for all team members. One survey respondent suggested reducing the number of students in each Workshop which would allow for more client interaction for each group member. Of course that would also reduce the resources available to conduct the project and reduce the depth and detail of the analytic project.

Value of Workshop Contributions

Alumni were then asked for their assessment of the impact of their work during the Spring Workshop and their impressions of the non -profit and environmental communities. We focused on non -profit clients due to their variability and their increased prominence in the Workshop. There had been some discussion among the faculty about the focus on government in other parts of the curriculum and the need to include more exposure to non -profits. Workshop is one place where many of our

students encountered non -profit organizations. This part of the survey enabled us to see if the Workshop could provide this element to our curriculum. The results are summarized in Exhibit 4.

Exhibit 4: Assessment of Workshop Impact

“Please indicate whether you agree with the following statements.”

	1. Strongly Disagree	2. Disagree	3. Neutral	4. Agree	5. Strongly Agree	Response Count
The skills learned and applied in Workshop are valuable to current or previous professional work.	1.2% (2)	4.3% (7)	7.4% (12)	49.4% (80)	37.7% (61)	162
The work performed during the Spring Workshop was useful to the client organization.	1.2% (2)	7.4% (12)	21.6% (35)	51.2% (83)	18.5% (30)	162
The work performed during the Spring Workshop made an important contribution to society.	2.5% (4)	11.1% (18)	38.9% (63)	37.0% (60)	10.5% (17)	162
My perception of the non-profit industry changed after completing the Spring Workshop.	6.2% (10)	31.1% (50)	45.3% (73)	13.7% (22)	3.7% (6)	161
My perception of the environmental community changed after completing the Spring Workshop.	6.2% (10)	29.0% (47)	43.2% (70)	17.9% (29)	3.7% (6)	162
answered question						162

When asked to rate the value and importance of the Workshop, most alumni recognize that the Workshop skills are valuable to their professional work (**49.4%** agreeing and **37.7%** strongly agreeing). The data shows that alumni overwhelmingly believe that the skill sets utilized during the Workshop are applicable to their professional work. In the comments sections, this was underscored with one respondent noting, “My

client...brought me on to this new firm as he thought my skills were appropriate after the Spring Workshop.” Not only do alumni feel the Spring Workshop had a strong impact on these skills, they also acknowledge that the applied Workshop skills are useful in their careers.

Another goal of the Workshop is to present students with the opportunity to make real contributions to management problems in organizations. The survey results found that alumni respondents believe their work made an impact at the client organization, and was more than a classroom exercise - **51.2%** of respondents agreed and **18.5%** strongly agreed that the work performed was useful to the client. By placing students in public sector and non-profit sector organizations, which typically have fewer resources than the private sector, students are utilized to the fullest extent. Alumni overwhelmingly perceive that their effort impacts the client organization’s work. However, there was less certainty on the significance of that work to society with **38.9%** remaining neutral, but a still noteworthy **37.0%** agreeing and **10.5%** strongly agreeing with the statement.

Interestingly, respondents’ perceptions of the non- profit industry and environmental community were mostly neutral, 45.3% and 43.2%, respectively. One potential reason for the neutrality of perception change after the Workshop is the extensive exposure to the environmental public and non -profit community throughout the Environmental Science and Policy MPA program. By the Spring semester, students are expected to have a solid understanding of the environmental community and the public and non-

profit sectors. Working within that community through the Spring Workshop perhaps served to reinforce these perceptions.

Conclusions

It is clear that the alums of Columbia's MPA in Environmental Science and Policy found the capstone Workshop to be a valuable learning and professional experience. Moreover, they found it a useful way to create links with the professional community they hoped to join after graduation.

The unique nature of the environmental public and non -profit community lends itself to the symbiotic relationship of the Spring Workshop course. Clients gain access to top-quality analysis at no cost, plus the benefits of professional networking with graduate students about to enter or return to the community of environmental professionals. Students gain exposure to the industry, professional experience, and the ability to work on a project that contributes to the mission of the program.

In the School of International and Public Affairs's two-year degree programs, students are required to complete internships as well as a capstone workshop. In the one year MPA in Environmental Science and Policy, the compressed schedule does not allow the program to require an internship. The survey indicates that many students did not have sufficient exposure to clients through the Workshop, and that is particularly problematic when coupled with the absence of an internship. The Environmental Science and Policy faculty have begun meeting to review and possibly revise the program's

curriculum and the issue of enhanced practitioner interaction is on the agenda for further discussion.

Nevertheless, the alumni survey described here demonstrates that the Spring Workshop in Applied Earth Systems Policy Analysis has been successful in its goal of connecting students directly to employers and more broadly to the environmental community as well as providing the professional skills necessary to excel in the environmental public and non-for-profit world.