

Learning Together: Sustaining a Commitment to Excellence

**Vision and Next Steps for the
The Rubenstein School of Environment and Natural Resources
Donald DeHayes, Dean
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Vision

The vision for The Rubenstein School of Environment and Natural Resources is to be the best environment and natural resources program we can become by committing ourselves to addressing the compelling issues of our time, serving as a model for adaptive evolutionary change, and dedicating our discovery and dissemination to advancing societies. We aspire to nothing less than this level of commitment and accomplishment. Our distinctive niche must be to explore and understand the human relationship with the natural world and to focus on holistic, interdisciplinary analysis of complex environmental issues and opportunities. Our challenge is to ensure that our work really matters and to strive toward solutions and alternatives as well as sophisticated analysis of problems.

As a non-departmentalized School with an integrated mission and strong reputation, we are well-positioned and structured to bring ecosystem thinking and conservation leadership to the forefront on a global scale. Environmental challenges facing our world are extraordinary and complex; as a School, we have the capacity to grapple with these issues and to imagine, model, design, and demonstrate alternative pathways that lead to ecological and economic sustainability. We must continue to find ways to engage our students in “real world” as well as classroom learning, including problem-based analysis, internships, service learning, and meaningful research experiences about issues that matter. To achieve this vision, we must challenge many deeply ingrained assumptions in ourselves and society, modify our own behavior and model alternatives, and deploy our most innovative pedagogical and scholarly resources and our deepest passions to strive toward a sustainable human community in harmony with the natural environment.

Many national and global leaders have declared the 21st century as the “century of the environment” in recognition of the vexing civilization-scale challenges associated with human alteration of critically important planetary processes, such as climate, evolution, and hydrological and biogeochemical cycles. To achieve this vision, we must engage our students, staff, and faculty in programs of the highest *quality* and meaning, insure *relevance* through teaching, research, and outreach aimed at offering and demonstrating solutions, and commit ourselves to building a tireless *community* of learners who will work together for the greatest good. Our commitment to *integrative learning and interdisciplinary problem solving and analysis* is our most distinctive and compelling feature.

The faculty of The Rubenstein School are united in our concurrence with scientific understanding that indicates that humanity is altering planetary systems in an unprecedented manner, which, if left uncorrected, will continue to compromise quality of life, economic vitality, and human health. We recognize that the work we must pursue is challenging and will require the best we have to offer. Society is searching for leadership, viable options, and solutions. We must respond, not so we can establish our reputation, but because we have something special to offer. The Rubenstein School of the future is up to the task --- prepared to give our best, teach our best, and learn together at our best --- and pleased to serve as a model for UVM, the nation, and the world.

A “Successful” School

The Rubenstein School is an academic enterprise connected to the challenges and opportunities of the world and engaged in discovery and dissemination that can advance societies. While it is comforting to view institutional metrics of quality, productivity, and efficiency as quantitative measures of “success,” it is clearly the commitment of the people of The Rubenstein School community that has driven the growth, vitality, and “true success” of the School. A key element has been the commitment on the part of the faculty and staff as well as our students to “push the envelope” on thoughtful and needed programmatic change – creating the ever-evolving School always adapting to changing environments and new natural or societal-based selection pressures. The effort put forth has been incredible. Whether it was the recasting of the School’s mission a decade ago, the revitalization of the core curriculum in the early 1990’s, the adoption of new active learning pedagogies, the extraordinary work to thoughtfully build issues of multiculturalism into the curriculum, implementing the concept of “integration” in an operational manner, or the emergence of a world class integrated environmental research enterprise, The Rubenstein School community has worked hard and diligently to advance the meaning of its work for all constituents. In so doing, the School has been deemed “successful” and earned a positive reputation nationally that elevates all of us both individually and collectively. So, how do we sustain the effort to advance our programs, the student experience, and the work of the School community?

While quality teaching, scholarship, and service are critical to any academic unit, I maintain it is the willingness of the faculty and staff to expend energy to explore new ideas, directions, and emerging opportunities that distinguishes and builds great programs. This is the essence of excellence through innovation and commitment --- a faculty and staff that understand the larger societal challenges and opportunities and are willing to invest their energy to insure programs are relevant, engaging, and well-positioned into the future. Whether this motivation is driven simply by pride or a real concern for the “state of the planet” may not be important. In the end, it is our work ethic and deep commitment that matters. I hope that as a community currently stretched by limited resources and with so much to do, we can reach back and find a way to sustain our collective commitment to excellence.

Next Steps

“Vision” statements may provide some overall direction and/or generate healthy debate, but it is ultimately our willingness to design and implement tangible “next steps” in response to changing conditions and new challenges and opportunities that really matters. The world has changed dramatically in recent years and our programs and efforts need to reflect and incorporate that change. While climate change is receiving major media attention, anthropogenic alterations are pervasive. Issues of energy availability, contaminants that cause cancer and disrupt endocrine systems, water quality and quantity, soil erosion and food supplies, human rights, poverty, injustice, and even violence and war are often deeply rooted in the interconnections among environment, people, and power. So, how do we as a School respond? What should our tangible next steps be? How do we keep our School relevant not only in the present, but into the future as well? How do we prepare ourselves and our students to address these challenges and help shape a sustainable and desirable future?

While I don't pretend to know the answers to these questions, I know we all will benefit from grappling with these questions and collectively imagining how we can get to a future in which these issues have become afterthoughts rather than societal drivers. I have a strong sense that moving from a focus on *describing problems* to a focus on *designing solutions* is both critically important and desirable. It is an enormous challenge for the academy to think in these terms. Schools like ours evolved from forestry to natural resources to environmentally focused programs. It is prudent to think about what's next in that line of evolutionary progression. Following personal engagement in considerable national and international dialogue around these issues and hearing the thoughtful and sobering commentary from our faculty about the "state of the world" at the Grafton retreat last year, I have a strong sense that we need to begin to understand the elements of a sustainable and desirable future for all societies on the planet. Defining and teaching these elements can be a platform for educational and research programs that will matter in the future. This is perhaps a daunting task, and one that will require our best and most enlightened effort.

The following represents my thoughts about possible next steps for our School. Each of these suggestions re-enforces elements of the aforementioned vision. I hope you will consider these openly and critically and, for each idea that you reject, offer your own "next step" in recognition that sitting still or simply tweaking around the edges isn't sufficient for our programs, our students, or the future viability of humanity.

1) Possible New Programs

New Major in Sustainability Science – While academic scholars debate the meaning of the word "sustainability" and question whether it is a passing fancy, much of the rest of the world is searching to develop and implement sustainable systems that bring vitality to local communities. In my view, sustainability captures some of the strengths and potential future desires of the School. It capitalizes on, and indeed requires, the type of integrated approach to which our School has committed. It also connects well with the hopeful future we should be committed to supporting, rather than the continued "gloom and doom" description of the world's problems. While the academic dimensions of sustainability may not be carefully defined, this offers us an opportunity to help shape those ideas. Indeed, courses we already offer in ecological economics, ecological design, environmental health, restoration ecology, environmental policy, planning, and more -- seem relevant to a sustainability focus. If these were combined with content related to sustainable communities, food systems, and experiential learning opportunities, it would seem we could offer an exciting and relevant learning experience that would prepare students to help create a hopeful future.

A New Master's Concentration in Global Conservation Leadership – We have been discussing creating a professional master's option as a complement to our existing thesis/project master's for some time. To some extent, we have experimented with this through the ecological planning concentration. Our external scan has clearly re-enforced that the arena of "conservation leadership" is needed and desired, especially in the non-profit world and among land trusts. In fact, we have raised over \$200,000 for this type of effort by simply putting the idea on the table. Effective leadership, i.e., leaders that can actually get something positive done, is rapidly emerging as one of the most endangered species on the planet. In addition, the conservation tool-box has changed dramatically over the past decade. The new generation of conservation leaders need to understand legal dimensions of easements, land trusts, philanthropic pursuits, ecosystem services, economics, policy development,

communities, and, in most of the world, conservation issues are totally intertwined with human health perspectives as well. There is a demand for this type of expertise in Vermont, nationally, and globally and an opportunity to partner internationally to develop a meaningful program and global student experience. We are discussing this with the Graduate College and hope to formally advance this concept in the near future.

2) Active Learning – Ideas to Engage Students and Faculty

Rethinking the Core Curriculum – The framework for the School’s integrated core curriculum was developed and implemented about 15 years ago. Since that time, a group of faculty have worked tirelessly to shape, deliver, and advance the core, and enhance the integrative, critical thinking, and interconnected dimensions of student learning. In many ways, these faculty have shouldered a disproportionately large load on behalf of all of us for the development and delivery of the integrated dimensions of the School’s mission. I want to publicly acknowledge and thank these faculty leaders for their efforts. These individuals have indeed contributed to the greater good of the School and we all own them a debt of gratitude. It is time now to more fully share this responsibility.

Much has changed since the core framework was adopted and implemented. It may be time to rethink some of the academic content, mode of delivery, and faculty participants. Topics such as ecological economics, ecosystem services, global climate change, environmental justice are all inherently integrative and prevalent in our dialogue and our work. Our students need to fully comprehend these emerging ideas and perhaps others as well. At the same time, service learning and problem-based learning are also models for integrative teaching and learning that our students seem to cherish. These could well benefit from the participation of more faculty as part of core instruction. It may be time to take a fresh look – retaining elements and pedagogies that make sense and incorporating new ones where appropriate. Frankly, we need to do this in each of the majors offered through the School as well.

Integrative Problem-based Learning – Problem-based learning offers an opportunity to apply innovative teaching tools to engage both students and faculty in integrative learning. The President’s vision nudges us all in this direction and even offers some support. Given the nature of our field, there is a plethora of interesting and important topics, such as global climate change, Vermont’s energy future, urban ecosystems, and many more, that lend themselves to problem-based analysis that cuts across multiple disciplinary courses in which students would be concurrently enrolled.

I recommend that we seriously consider requiring each student in our School to take a theme-driven, problem-based learning semester that we might offer. Perhaps it should even become incorporated into the core curriculum. We would need to offer about three per year, probably aimed at juniors. Such offerings might follow the “un-course” format we experimented with a few years ago. That is, all or most of the courses taken simultaneously would address the theme from a different academic perspective and class meeting times would be flexible so that field trips, including extended travel where appropriate, would be possible. Obviously, the faculty teaching the different courses would work together and interact regularly in course planning and delivery. If this actually replaced some existing courses or requirements, it would not necessarily increase the overall workload, especially if faculty teams rotated in and out of this responsibility every four to five years. The School’s new Office of Experiential Learning can provide support for faculty engaged in this type of

teaching. It would be feasible for a few theme specific courses to be packaged with, for example our biostatistics course and/or an environmental justice course, with the latter two perhaps contributing to more than one problem-based theme by incorporating data or examples relevant to those themes.

Partnering to Create a Study Abroad Experience – Rubenstein School faculty and students are engaged in international learning through faculty–led travel courses, research projects, partnerships, service activities, and semester abroad experiences. In the case of the latter, the School and UVM usually have relatively little to do with the content, quality, or relevance of the student semester abroad experience. In fact, students are usually on leave from UVM and actually transfer credits back to UVM (often as NR XXX courses), frequently passing the credits through some other U.S. institution. Given the plethora of international faculty activities, it appears that many of our faculty enjoy working in the context of other countries and at a global scale.

We should consider developing a semester abroad experience for our students that might include a mixture of travel courses taught by our faculty and other courses offered in another country by a partner institution. The partner institution may be able to provide student room and board, in-country logistics, and add some of their students to our courses as well. Once again, our new Office of Experiential Learning could provide assistance in working out the logistics of the overseas partnership. Because Costa Rica is a country where we have substantial involvement, already lead 2-3 travel courses per year, and have identified some institutions willing and ready to partner, we may want to consider initially developing an undergraduate-focused partnership there. However, the selection of location should be based on the combined interest of faculty and students as well as logistical ease. This could be an interesting as well as productive experience for faculty and students. There may be financial as well as academic advantages to such a partnership approach and it may benefit our faculty and students.

3) Community Responsibility and Engagement Initiatives

Global Climate Change Initiative – One year ago, The Rubenstein School established a Global Climate Change Initiative. Led by a Task Force of faculty, staff, and students, the initiative has developed and disseminated educational materials to increase awareness (including a web site), sponsored speakers and discussions, and sponsored a student-lead carbon emissions analysis of our School. This Initiative, which is more about our behavior than our teaching or research programs, is an opportunity for us to serve as a model to our students and the larger university community. Perhaps John Dewey would refer to this as “teaching by doing.”

The School emits about 1,954 metric tons of carbon each year and about 60% of that comes from work-related (including commuting) travel. More than 75% of the carbon emitted from our professional travel is attributed to air travel. On a per capita basis, the average Rubenstein School faculty member emits about 5 metric tons of carbon from air travel each year compared to 1 and 0.56 Mg from commuting and non-commuting driving, respectively. Clearly, to reduce our carbon footprint, we must reduce or offset carbon from our air travel. In a community discussion about the pros and cons of purchasing carbon offsets, three major concerns emerged: it may soothe our conscience, but not change our behavior; we don’t know how much of the purchase goes to administration and overhead compared to low carbon-emitting investments; and, the projects being subsidized are often too distant from our horizon (geographically and from a mindset perspective).

We have established an internal carbon offset program (see the link on the School's home page) for air travel within the School that addresses some of these concerns. While we need to change our behavior, we also recognize that faculty, staff, and students need to travel by air in support of their learning and professional development and the work of the School. Our hope is, however, that all within the School will recognize and think about the carbon cost as well as the time and money costs associated with each trip, use videoconferencing where possible, and minimize air travel that really isn't necessary. Our program has no overhead and the investments will be very local --- that is, right here in the School. The School is paying (from a discretionary gift account) \$12 per metric ton to offset the carbon emitted from professional air travel of faculty, staff, and students, which is creating a fund to be used to support School-based energy efficiency measures, renewable energy, and carbon sequestration initiatives. In the few months the program has been operating, the fund has provided the capacity to offset 194,000 air miles, 78 metric tons of carbon emitted, and has accumulated \$934 to be used in carbon reducing initiatives.

We need to take this program to the next level. First, we need you to take serious your responsibility to reduce or offset your professional air travel. It is an honor system and it takes only minutes to do. We also need you to build the offset in your grant budgets. This program must teach, bring visibility to the high carbon cost of air travel and promote responsibility in all of us. It has been suggested that we establish a School-wide "cap and trade" program that could simultaneously reduce our footprint, bring visibility to our efforts, and build community within the School. We need your help to design next steps and set realistic targets to reduce our carbon footprint.

Creating the Jericho Community Forest and Conservation Center – Traditionally, the Jericho Research Forest was viewed as a landholding that largely supported forest-based teaching and research. The revitalization of the forest associated with the Green Forestry Education Initiative has opened new possibilities to consider the forest holistically as the School's community forest (effectively our "town" forest) and to insure it is an active demonstration of "sustainability" in the fullest sense. It can and should serve as a peaceful and private get away for faculty, staff, and students, a model for restorative conservation and carbon sequestration projects, a natural history exploratory site, and a demonstration of the many ways that forests are interconnected with people. Student-lead projects and courses, community events, a model for watershed science and planning, demonstration of sustainable forestry practices, and the development of School-branded forest products that simultaneously create value and illustrate sustainability principles are all within our reach. We can use this accessible parcel to advance our mission, build our community, and illustrate to the world the numerous services provided by forest ecosystems.

4) Emerging Local and Global Mindsets About Research and Scholarship

The Rubenstein School faculty and staff comprise one of the most productive and meaningful research enterprises at UVM and among the environmental and natural resources programs across the nation. I have confidence in your expertise, capacity to learn, work ethic, and judgment. As a School, our collective intellectual capacity and potential for innovation will serve us well into the future. With growing national interest in exploring "coupled natural and human systems (NSF), the "science of integration" (USDA), and inter-and transdisciplinary problem-solving research focused broadly on environment, the School is well-positioned to remain an important contributor to addressing the

challenges and opportunities facing global societies and exploring the development of sustainable systems. The following represents some emerging mindsets that seem to be emerging in the evolving world of environmental exploration that are worthy of our contemplation.

In situ Projects – Exploring “Messy” Research --- For many of us, research embodies carefully designed, statistically rigorous projects where several variables are controlled or accounted for so we can draw interpretations about other variables with 95% confidence. Furthermore, we typically choose “field sites” with minimal extraneous or human disturbance so that we can better understand how pure systems work. Research that falls into these categories will no doubt continue to be important. However, increasingly “science” is being pushed to contribute to “authentic learning.” That is, understanding real systems and whole systems as fully as possible, including the multiplicative and interacting variables and the “disturbances” introduced by peopled environments. Also, we need to be able to provide projections, descriptions, and our best estimates derived from existing as well as new data. Renowned ecosystem ecologist and friend of our School, Dr. Herb Bormann, has called for scientists to comfortably and confidently step forward with their “legitimate best guesses” about how complex ecosystems function or are altered. I fully expect that a call for this type of “messy” research will increase as we struggle to explore solutions to problems and to design alternative systems that might be truly viable. The Redesigning The American Neighborhood project, which is deeply embedded in a real South Burlington community, is perhaps a good example of such a project. The new development, called South Village, being proposed off of Spear Street may represent a fertile arena for “messy,” integrated, community-based research from which much can be learned and applied.

Urban Ecosystems – As of about one year ago, about 50% of the world population and 80% of the U.S. population live in urban settings. These are complex and are highly integrated biophysical-social/cultural ecosystems that are paying increasing attention to the human environment interface. Issues such as quality of life, human health, air and water quality, green spaces, and mitigation of storm water and climate extremes are very complex as are issues of the distribution of ecosystem service benefits within communities. The Baltimore Ecosystem Study Long Term Ecological Research Project and the PLANYC – A Greener, Greater New York are just two of many examples that are rapidly expanding.

Exploring our Energy Future and Carbon Economy – Whole new economies are emerging related to alternative energy ventures, ecosystem service markets (e.g., wetland banks, biodiversity trusts, etc.) and the dynamics of carbon emissions, trading, and sequestration. The “science” of understanding and accounting for these emerging industries and quantifying carbon footprints is in its infancy. This arena will likely continue to grow rapidly and hopefully the science of measuring alternative energy benefits and carbon dynamics will rapidly catch up to the global interest and market activity. This arena is ripe for “messy” real world exploration that is built upon pulling together widely scattered, but already existing, information.

Ecology and Human Health – Environmental health has traditionally focused on human health implications of various types of contaminants (air and water pollution, pharmaceuticals, pesticides, etc.) introduced into the environment. Infectious diseases in a changing environment are also a growing societal challenges. While this type of work will likely continue to be important, the emerging arena of ecosystem health has become much broader, including

interconnections between quality of life and the natural world, relationships between natural resource depletion and habitat destruction and the vitality of human communities, and relationship between design of the built environment (including design of neighborhoods as well as buildings) and the health of our communities. Indeed, as noted by Wangari Maathai, 2004 recipient of the Nobel Peace Prize, “it is a fact of human existence ... human beings can not thrive in a place where the natural environment has been degraded.” We may wish to explore partnering with our colleagues in the health sciences and medicine to explore these relationships further.

Social Landscape - At the 2007 Tallberg Forum in Sweden, Her Majesty Queen Rania Al-Abdullah of Jordan in her keynote address applauded the scientific gains made in our understanding of ecological landscapes, but recognized that our quest for a sustainable communities and societies will require an understanding and appreciation of “social landscapes.” This includes, not just social structures, economic systems, and policy analysis, but rather multicultural understanding and a true respect and appreciation for difference. We need to better understand human attitudes, behaviors, and cultures, not so we can change the behavior of others, but so we can admire and respect each other. She called for a new type of global warming -- “one that is about a climate change within our heads and our hearts.” Our quest for creating truly sustainable systems will indeed require our best and most comprehensive effort. Failure for us as scholars to explore this dimension of our future will undermine our best efforts to design a sustainable and desirable future.

Closing Thoughts

I had the good fortune and opportunity to spend the past six months reflecting on my own academic work as well as the work and future direction of our School. The ideas put forth in this document emerged during that time and were informed by my numerous interactions with colleagues in the School, around the country, and across the globe. These may not be the best, or even good ideas. They are designed to prompt discussion and debate and to prevent complacency. I believe strongly that “restfulness” in the academic sector can be a plague to relevance and meaning. Our programs need to be dynamic and ever-evolving --- adapting to the selection pressures created by a world out of balance. Our School has been successful, not because of student credit hours or grant dollars produced, but because the community has cared enough to look forward and become better. I sincerely hope that our commitment to excellence and learning together is sustainable.