

PROPOSAL for INTERDISCIPLINARY MAJOR in GLOBAL ECOLOGY

Executive Summary

Leaders of the Catholic Church and the Society of Jesus have urged reflection and action in response to the enormity of the climate crisis, loss of biological diversity, and the degradation of ecological systems. Concern about the sustainability of Earth and the justice implications of ecological degradation was a major focus of the 35th Congregation of the Society of Jesus, the document entitled *Healing a Broken World* issued by the Society's Social Justice and Ecology Secretariat, and the 2012 Heartland-Delta Faculty Conversations that prompted the Society's newly initiated three-year International Jesuit Ecology Project in which Marquette is participating.

An interdisciplinary major in Global Ecology will position Marquette University for leadership on this crucial justice issue and allow students, faculty, and staff to tackle pressing ecological issues while also maintaining Marquette's traditions of local, engaged, and transformative learning. Foundational coursework in the natural sciences, mathematics, social sciences and humanities will earn students bachelor degrees with one of three concentrations—Scientific Discovery and Innovation, Policy and Advocacy, and Sustainability and Entrepreneurship. The thirty-five credit hour major will be capped by a seminar in which students integrate the disciplines within the context of a major ecological problem addressed from a justice perspective. Some additional course options will include topical “collaborative seminars” in which colleagues with varied expertise on a topic (e.g., Environmental Health) will team teach a new course.

Marquette is positioned to offer a unique major of this sort because of existing personnel and programmatic strengths and because of emerging opportunities to partner with local organizations (e.g., the Urban Ecology Center, Growing Power, and the Milwaukee Water Council). These organizations bring research and internship collaborations to the heart of the new major, enjoining both academics and practitioners in the same common cause of discovery, transformation, and justice.

As a Jesuit university, Marquette must do more than follow the lead of the Society of Jesus and the Church. Marquette must also be a beacon that provides a path toward realizing human dignity and ecological sustainability. By boldly staking a claim in this arena by establishing the first Interdisciplinary Major in Global Ecology, Marquette embraces a leadership role among Jesuit institutions and emboldens its students and faculty to become leaders in their own right.

Within the Milwaukee community, Marquette possesses tremendous reputational assets. For the past decade, however, Marquette has ceded its community leadership to the University of Wisconsin-Milwaukee. Marquette has looked inward as it reconstructed its campus and buffered itself against economic upheavals. Meanwhile, UWM's School of Public Health, School of Freshwater Sciences, proposed Institute for Human Nutrition, and other programs have taken center stage in community revitalization efforts. Marquette needs a flagship community engagement initiative—one that complements ongoing community initiatives. We envision the Global Ecology major as an opportunity for Marquette to align its resources and rejoin the conversation. The vast untapped pool of goodwill for Marquette will return the investment many times over by inspiring students to attend Marquette, inspiring alumni to give to Marquette, and, most importantly, inspiring members of the campus community to commit themselves to their teaching, research, and service with even greater dedication than before.

Student demand suggests that enrollments in the major will surge in its first years. To meet that demand, the University must: (1) Provide three course offsets each year to allow professors to teach the capstone seminar, collaborative interdisciplinary and intradisciplinary seminars, and special courses deemed essential to offer our students; (2) fund one half-time administrative assistant to work under the Director of the major to perform innumerable organizational tasks; and (3) grant one course release per academic year for the Director of the major. Though we are unable at this time to project a net

revenue due to the fact that Global Ecology will be an undergraduate program and may not initially expand the number of students currently admitted to Marquette, we are hopeful that the success of the well-supported Global Ecology major that we are envisioning will attract new students who want to be prepared to address the future sustainability of Earth.

As with all interdisciplinary majors, Global Ecology will rise and fall on the shoulders of its participating faculty, support from the University, and the expanding network of outside organizations that provide our students with internships and jobs. We have held extensive conversations with key stakeholders regarding student internships, sources of grant funding, and opportunities for faculty to pursue collaborative research. While we are entirely confident in the faculty commitment to the major and cautiously optimistic that the University will support it appropriately, the response that we have received from organizations like the Urban Ecology Center and companies like MillerCoors has inspired the lion's share of our confidence in the sustainability of the Global Ecology major on a long-term basis. Milwaukee is in the midst of a major renaissance in several key areas: innovations in urban agriculture have drawn national acclaim; the emergence of a water technology cluster promises growth of high tech jobs; and, the growth of an entrepreneurial sector signals new innovations in both public and private sectors. In all these areas, students and faculty involved with the major will find an eager audience for their engagement.

Program Description

Goals

Three major goals drive the Interdisciplinary Major in Global Ecology:

- An undergraduate curriculum that empowers students to pursue careers at the intersection of justice and ecology is the primary goal of this proposed major. Students will gain knowledge, skills, and inspiration from courses in the natural sciences, mathematics, social sciences, and humanities taught by enthusiastic faculty pursuing innovative teaching and research goals. Moreover, students will have an opportunity to learn and experience how to integrate the knowledge and skills gained in the various disciplines when collaborating to address from a justice perspective an ecological issue that has global ramifications. We expect that some students will pursue Global Ecology as a primary major while others will pursue it as a secondary major. Already we are finding enthusiastic students creating their own version of a Global Ecology major while dozens of others have pursued a minor in Environmental Ethics. In addition, the availability of new courses will allow other students to engage issues related to Global Ecology even if they are not pursuing a formal major or minor. We expect many non- majors to enroll in the collaborative seminars envisioned as part of the major.
- Interdisciplinary faculty research will be improved by the creation of the Global Ecology major. The collaborations that have emerged in the development of the major speak to the enormous potential for cross-college and cross-campus research engagement. Examples abound of faculty transforming their careers by explicitly engaging the questions at the heart of ecological justice. Increasingly, granting agencies like the NSF require interdisciplinary collaboration in order for a team to qualify for funding. Existing areas of excellence such as water, urban agriculture, and sustainability offer opportunities for Marquette faculty to align research productivity and improve success rates for grant applications.
- Community and alumni relations will be strengthened by the major. In recent years, Marquette students, faculty, and staff have begun partnering with diverse community organizations such as the Urban Ecology Center, 16th Street Community Health Centers, Schlitz Audubon Nature

Center, and Milwaukee Riverkeeper. While these partnerships reflect the entrepreneurial resourcefulness of the participants, the creation of a major will provide opportunities to institutionalize these relationships to the benefit of the entire campus as well as the broader community. Alumni events such as Marquette Circles create opportunities for the University to showcase its innovative faculty and programming and engage its former students. The new major will offer opportunities for corporate and alumni engagement with significant fundraising potential. Recent fundraising campaigns by Loyola University Chicago, Georgetown University, and the University of Notre Dame speak to the vast potential for new initiatives in this area.

Rationale for Instituting

Marquette's four pillars of excellence, faith, leadership, and service speak to an underlying dual premise that the University serves as an institution for enrichment and a vehicle for engaging the world. As scientific studies identify threats to the sustainability of Earth and show that already-vulnerable people are most adversely affected, the development of a strong moral compass within our students will be critical to confronting and making difficult choices in the future. Our proposed interdisciplinary major in Global Ecology integrates the knowledge and skills of pertinent disciplines and provides opportunities to reflect upon and prepare to implement appropriate solutions.

Strategically, Marquette has positioned itself as a university open to and involved with the world. We interviewed students who recently completed study-abroad programs in Australia, Chile, and South Africa where they integrated environmental studies coursework with their field experience. An administrator in the Office of International Education views a Global Ecology major as complementary to current programs and student interest. Marquette students have demonstrated considerable interest in addressing ecological issues and poverty through various projects in Latin America under the auspices of Engineers Without Borders and Applied Global Business Learning. We anticipate that student recruitment for the Global Ecology major will be substantially augmented when we can link academic opportunities on campus with robust international experiences in our study abroad programs.

Mission and Strategic Goals of the University Advanced

Marquette's new strategic plan begins: "We must reach beyond traditional academic boundaries and embrace new and collaborative methods of teaching, learning, research and service." We have designed the Global Ecology major in that spirit and to those ends. Indeed, the very process of creating the major has led to a remarkable discovery of colleagues interested in collaborating across disciplines to pursue interests in ecological sustainability. The six strategic themes of "Beyond Boundaries: Setting the Course for Marquette's Future" speak to the ways in which the Global Ecology major advances the mission and strategic goals of the University. Within these themes are the following key objectives that directly tie the success of the strategic plan to the creation of a Global Ecology major:

- Adopt new learning and research technologies to strengthen the university's commitment to Coordinate and harness Marquette's current resources for addressing issues such as community health and K-12 education.
- Offering a personally transformative education.
- Create an institutional culture that promotes scholarly collaboration across disciplines and research that addresses community and world problems.
- Engage faculty, staff and students in exploring and enhancing their understanding and practice of Jesuit spirituality and pedagogy.

- Prepare Marquette students for a world that needs their leadership by encouraging their participation in student-led and student-managed experiences.
- Gain national distinction for fostering sustainable practices among faculty, staff and students, and for cultivating a culture of environmental responsibility.

The Global Ecology major's twin pedagogical themes of collaborative seminars and experiential learning speak to the development of new learning and research technologies that offer a personally transformative education. Collaboration across disciplines and research that addresses community and world problems is at the heart of ecological justice. Faculty members are aching for opportunities to build collaborative research projects. As the letters of support indicate, there is tremendous interest in a collaborative seminar in environmental health as well as other topics and in certifying the major for Broad Field Science. For these and related reasons, the major in Global Ecology advances the strategic plan in important and exciting ways.

Curricular and Other Student Requirements

Discussion with faculty in all colleges at Marquette led to the conclusion that students should be offered a curriculum grounded in (1) a core of required courses in the natural sciences, mathematics, social sciences, and humanities that are crucial for addressing complex ecological problems and an integrating capstone seminar within which students are guided to address an ecological problem that has global ramifications from a justice perspective and (2) concentrations in (i) the sciences and technology to help prepare them for graduate studies and/or careers that are more scientifically and technologically oriented, (ii) policy and advocacy to help prepare them for graduate studies and/or careers in government and non-government organizations, and (iii) sustainability and entrepreneurship to help prepare them for graduate studies and/or careers in businesses that focus on sustainable practices in all sectors of the economy. Laboratory experiences are built into the core science courses, field experience in the sciences and technology concentration (e.g., Urban Ecology Center, Miller-Coors, and Engineers without Borders), and internships with local stakeholders (e.g., Schlitz Audubon Center, Growing Power, and the Milwaukee Water Council) in the policy and advocacy and in the sustainability and entrepreneurship concentrations. Among the courses to be offered within each concentration are collaborative seminars in which colleagues with varied expertise on a topic (e.g., environmental health, environmental forensics, sustainable business practices, organizing to promote sustainability, and perspectives on food) develop, team teach, and take turns leading a seminar. After input from faculty and department chairs offering key courses, the core was established at 23 credit hours and the concentrations at 12 credit hours each.

Educational Goals and Student Learning Outcomes

The overall educational goal of the Interdisciplinary Major in Global Ecology is to facilitate students' gaining the knowledge and skills essential to address from a justice perspective complex ecological problems that have global ramifications. Throughout their studies, students will prepare a journal of the contributions the courses, field experiences, and internships have made toward completing the Global Ecology major, identify their particular strengths, and use them when working together in the capstone seminar to address an ecological problem. Student learning outcomes include demonstrating the following:

- Basic scientific knowledge needed for a sound understanding of current and projected ecological problems.

- Mathematical skills with which to compute quantitative dimensions of ecological problems and to recognize the need for dimensions that are qualitative.
- Awareness of the economic and political contexts out of which ecological problems have arisen and the kinds of analyses and strategies that the social sciences offer for addressing problems effectively.
- Familiarity with theological and philosophical foundations and methods of reasoning from which to reflect on the justice implications of current ecological issues and projected effects.
- Understanding ways in which the various disciplines needed to address ecological issues complement one another to facilitate a more comprehensive approach to problem-solving.
- Skills in collaborative problem solving including critical thinking about structuring a multi-disciplinary approach to an ecological problem, resourcefulness in identifying requisite research and sources, perceptiveness in recognizing particular knowledge and skill strengths to contribute to addressing the problem, responsibility to others in completing and reporting on assigned tasks within specified times, careful listening to and commenting on one another's reports, and negotiating conclusions about the most just approach to resolving the ecological problem.

Furthermore, the Global Ecology major exemplifies and advances the anticipated outcomes of the University's Core of Common Studies. Pursuant to CCS outcome #1, students who graduate with this major will have had experience in applying "the perspectives, concepts and traditions of multiple disciplines...to professional, intellectual, and societal challenges" when engaging the natural sciences, social sciences, and the humanities required in the Global Ecology core and options in the three concentrations. CCS outcome #2 will be achieved by student exercise in communicating with one another, their professors, and stakeholders in the diverse modes appropriate to ecological issues. CCS #3 outcome is advanced considerably in the capstone seminar by engaging students in a collaborative process of integrating the knowledge and skills learned in pertinent multiple disciplines to address an issue with global ramifications from a justice perspective. Finally, students graduating with the major will not only be oriented through their coursework toward acting responsibly as "members of the global human family" as required in CCS #4 outcome, but also toward acting as responsible members of the planetary family of many species, ecological systems, marginal areas, and the biosphere. Throughout, this major will serve as an example of the type of interdisciplinary and transformational education that the Society of Jesus wants at its colleges and universities throughout the world.

Incorporates Jesuit Values and Educational Philosophy

The Interdisciplinary Major in Global Ecology incorporates Jesuit values of educating the whole person and forming men and women for others to serve present and future generations, especially the most materially poor and vulnerable, out of a sense of justice when addressing ecological problems that have global ramifications. This major orients students and faculty toward promoting and demonstrating justice by becoming knowledgeable and skilled in disciplines that are essential to address complex ecological problems and collaborating in developing a process for integrating these disciplines to resolve problems. Students should emerge with values and goals that transcend their own quests for personal gain and that motivate them to strive for prudent decision-making and intergenerational justice for people who are essentially interconnected with and dependent upon the flourishing of other species, ecological systems, and the biosphere. For students who believe in God, who made this complex world possible, sustains it in existence, and calls it forth to self-develop and flourish, their striving for justice as

leaders in service to others will be motivated ultimately by their desire to give glory to God by loving their neighbors in the most inclusive and altruistic sense near and far, now and into the future.

Furthermore, the Global Ecology major demonstrates the Jesuit educational philosophy of building upon student experiences to understand the multiple facets of ecological problems, guiding students in identifying options for addressing ecological problems that bring about justice in the world--especially for the most vulnerable and materially poor, and empowering students to choose actions have the greatest potential for realizing justice from local to global levels. Throughout this educational process, students are encouraged to reflect on the meaning and value of what they are learning, discerning, and acting upon in their continual search for truth and desire to serve others.

Constituency Served and Intended Student Market

The Interdisciplinary Major in Global Ecology will attract new undergraduate students who are seeking a carefully integrated education that is oriented toward gaining the knowledge, skills, and justice perspective from which to address ecological problems as they contemplate graduate studies and careers in the environmental sciences, government and non-governmental organizations, and businesses focused on economic and environmental sustainability. While the core courses assure that students engage in key disciplines essential to addressing ecological problems, the opportunity to choose a concentration will orient each student in a career direction that is conducive to her/his interests. The excitement of opportunities for field experiences and internships with local stakeholders will be especially appealing. And, the opportunity in the capstone seminar will appeal to students who want to know how to integrate the key disciplines, to develop an approach to addressing an ecological problem in collaboration with other students and to discern the best approach from a justice perspective, and to know how to implement the solution to a problem. Clearly, the capstone seminar will prepare students for graduate studies and careers that require the skill of effective collaboration to address ecological issues.

As a second major, Global Ecology will attract a wide array of students from colleges across campus that offer undergraduate programs. We anticipate that the widest array of students will be situated in the College of Arts and Sciences, seeking first majors in any one of the natural sciences (Biology, Chemistry, and Physics), social sciences, mathematics, humanities, and the various languages, and desiring a complementary major that adds a depth of perspective to their studies that is unique in Jesuit education. Students majoring in the natural sciences and Civil and Environmental Engineering will find Global Ecology appealing and essential for realizing that they cannot compartmentalize ecological issues into natural science and engineering silos but need a wider perspective from which to demonstrate their expertise and an opportunity to understand how to integrate them for effective problem solving in their careers. Education students will find in Global Ecology an excellent second major that will qualify them for certification in Broad Field Sciences. Global Ecology will also appeal to students in the College of Business Administration who are majoring in Economics, Entrepreneurship, Real Estate, and Supply Chain Management and recognize a need for relating their primary field of study to one that addresses related issues.

Courses offered as collaborative seminars may appeal to students who are not seeking the Global Ecology major. Faculty across campus have indicated their desire to teach with colleagues in other colleges and/or departments courses not currently offered and can best be approached from multiple disciplinary perspectives. For example, Nursing and Health Sciences students will be attracted to a collaborative seminar in environmental health on which professors in those colleges are working with a colleague in Dentistry. Environmental forensics will appeal to students majoring in Chemistry, Biology, and pre-Law. A seminar in environmental sustainability team taught by professors in Management, Marketing, Finance, Applied Management, and Economics will appear to a broad

spectrum of students majoring in those fields. Perspectives on food in which colleagues in Biological Sciences, Nursing, Social and Cultural Sciences, and Philosophy collaborate will draw students from those disciplines. Organizing to promote sustainability will attract students majoring in pre-Law, Political Science, Leadership and Organization, and Entrepreneurship. The remarkable colleagues we have encountered in our journey to propose this major make us confident that the possibilities for collaborative research and courses are endless.

Students desiring to seek advanced degrees in field pertinent to Global Ecology will be urged to take courses that are required for entrance into graduate programs. For example, a student who wishes to apply for a master's degree in environmental science, sustainable engineering, or environmental law will take courses specified by the respective graduate school. The Director of the Global Ecology major will play a key role in advising students toward their career objectives.

Facilities Used for Delivery

Among the campus facilities to be used for the Interdisciplinary Major in Global Ecology are classrooms, natural science laboratories, Raynor Libraries, and places where projects are underway under the leadership of the Office of Sustainability.

Required Library Resources

An initial \$3000 start-up will facilitate ordering books, journals, and media sources that faculty deem necessary. Thereafter, an annual account of \$2000 should suffice. Heather James is prepared to begin ordering requisite materials for Global Ecology.

Time Line and Scheduling for Initiating

Having submitted an earlier version of this proposal to Rev. Philip Rossi SJ who commissioned it when serving as Acting Dean of the College of Arts and Sciences, we plan to present this revision to Dean Richard Holz in mid-July. His approval of the proposal will set in motion our acquiring the other components essential to this major with the goal of entering the requisite data on CourseLeaf by August 9, 2013. If approvals at the various stages of the CourseLeaf process are obtained in time for the Global Ecology major to be listed in the 2014-15 Undergraduate Bulletin, students will be able declare it beginning in Fall 2014.

Impact on Existing Curriculum and Accreditation

The existing curriculum for students will be enhanced with the addition of the Interdisciplinary Major in Global Ecology. Courses have been identified that make distinct contributions to addressing ecological problems, yet no one course or two can address problems comprehensively as professors of courses will underscore. Bringing the most pertinent courses together under one major will provide students with an opportunity to recognize the complexities of ecological problems and, in the capstone seminar, learn how to integrate the knowledge and skills of several disciplines to resolve problems from a justice perspective. Collaborative seminars will further enhance the existing curriculum by providing faculty with an opportunity to work with one another on topics to explore with their students, thus demonstrating and experiencing the fruitfulness of interdisciplinary endeavors.

Marquette's upcoming accreditation review board should find in this new major a significant advancement in well-planned and executed interdisciplinary studies on our campus. The strength of the core courses, three career-oriented concentrations, the integrating capstone seminar, and collaborative seminars should contribute significantly to a positive outcome when the accreditation team issues its evaluation.

List of Courses to be Offered (*new)

Core Courses Required (23 credits): BIOL 2401 Ecology; CHEM 1080 Chemistry in the World; ECON 4016 Environmental and Natural Resources Economics or POSC 4193 Environmental Policy; MATH 1400 Elements of Calculus or MATH 1410 Calculus for the Biological Sciences; PHIL 3350 Philosophy of the Environment or THEO 4440 Foundations for Ecological Ethics; PHYS 1009 Earth and Environmental Physics; and *INGE xxxx Capstone Seminar (to be cross-listed with INEE 4997 Capstone Seminar for the Interdisciplinary Minor in Environmental Ethics).

Scientific Discovery and Innovation Options (12 credits): BIOL 3401 Advanced Ecology (required); BIOL 4956 Laboratory Research Project in Biological Sciences; BIOL 2001 Principles of Biological Investigation; BIOL 3407 Plant Biology; Biol 3801 Microbiology or BIOL 3802 Experimental Microbiology; CHEM 3201 Quantitative Analysis; CHEM 4956 Undergraduate Research in Chemistry; CEEN 3510 Environmental Engineering; CEEN 4515 Environmental Chemistry (for CEEN majors only); CEEN 4535 Environmental Engineering Microbiology (for CEEN majors only); MATH 4630 Mathematic Modeling and Analysis (focus on Environmental Modeling); PHYS 4046 Physical Basis of the Biological Environment; *BIOL xxxx Field Experience in Ecology or INGE xxxx Field Experience in Scientific Discovery and Innovation.

Policy and Advocacy Options (12 credits): COMM 4330 Health, Science, and Environmental Communication; ECON 4016 Environmental and Natural Resources Economics (if not taken as a core course); HIST 4951 Readings in Environmental History; HIST 4955 Land and Landscapes: Studies in Social and Environmental History; PHIL 3350 Philosophy of the Environment (if not taken as a core course); SOCS 3930 Food, Water and Society; SOCS/SOSW SOCI/SOWJ 4930 Social Perspectives on Environmental Issues; THEO 4440 Foundations for Ecological ethics (if not taken as a core course); INGE xxxx/LAW 7564 Environmental Policy and Philosophy; *INGE xxxx/LAW Organizing to Promote Sustainability or INGE xxxx/LAW Legal Obstructions to a Culture of Sustainability; and INGE xxxx/LAW Internship in Policy and Advocacy.

Sustainability and Entrepreneurship Options (12 credits): BUAD 2040/ECON 3040 Global Ecology and Business; CEEN 4715 Sustainable Engineering (for CEEN majors only); *COMM xxxx Corporate Responsibility and the Natural Environment; ECON 4016 Environmental and Natural Resources Economics (if not taken as a core course); ENTP 4931 Topics in Entrepreneurship: Sustainable Entrepreneurship; LEAD xxxx Introduction to Sustainability; MANA 3002 Business and the Environment; PUBS 6931/INGE xxxx Models of Sustainability; *INGE xxxx/MANA Sustainability Seminar; and *INGE xxxx Internship in Sustainability and Entrepreneurship.

List of Current Faculty Participating

Biological Sciences—James Maki, Rosemary Stuart, and Krassi Hristova

Chemistry—Scott Reid

Communications—Bob Griffin and Jeremy Fyke

Dentistry—Pradeep Bagavatula (Environmental Health Seminar)

Economics and Center for Global Economic Studies—Heather Kohls

Engineering—Dan Zitomer and Brooke Mayer

Health Sciences—Josh Knox (Environmental Health Seminar)

History—Peter Staudenmaier and Andrew Kahrl

Law—Alan Madry

Management—Cheryl Maranto, John Peterson, Andrew Stewart

Mathematics—Gary Krenz and Steve Merrill

Nursing—Ruth Ann Belknap and Mallory O'Brien (Environmental Health Seminar)

Philosophy—Susanne Foster

Physics—Joe Collins and John Karkheck
Political Science—McGee Young
Professional Studies—Bob Pavlik, Bob Deahl, and Sharon Crowe
Sociology—Roberta Coles and David Nowacek
Theology—Jame Schaefer

Level of Quality to be Realistically Achieved with Available Resources

The College of Arts and Sciences is capable of delivering the core courses for the Global Ecology major. Fortunately, the departments of Chemistry and Physics are offering laboratory components with Chemistry in the World and with Earth and Environmental Physics respectively which, with Biological Sciences' Ecology course, are foundational for student understanding of ecological problems. The calculus courses offered by the Department of Mathematics are also vital as underscored by participating faculty and the School of Freshwater Sciences at the University of Wisconsin-Milwaukee. Other core courses are offered with sufficient regularity for students to complete them within four years.

Though the core and concentration courses can be delivered by the respective departments at startup of the major, new resources will be requisite for coordinating their offerings, providing creative counseling for students who anticipate advancing to graduate programs, securing a professor to lead the capstone seminar, and carrying out the many administrative tasks specified in the Special Needs section below. Growth in student interest in Global Ecology will most likely require considering the need for adding additional faculty lines to various departments.

When moving into the concentrations, the need for a full University commitment to the major's interdisciplinary nature becomes more obvious. One department within the College cannot manage a major that encompasses Global Ecology's breadth and depth. Faculty from colleges across campus are enthusiastic about participating in the collaborative seminars, but they will have to balance their participation with commitments to their home departments. Faculty who teach within the major (the capstone seminar and collaborative seminars) will need to be released from teaching courses in their home departments, and new hires may be necessary in the future to offer courses that are needed to make the major viable in our increasingly complex world plagued with increasingly complex ecological problems. One course that is particularly important for Biological Sciences to develop as soon as possible is an experience in field ecology in conjunction with the nearby Urban Ecology Center. In the meantime, the Global Ecology major will rely on structured internships with the Urban Ecology Center and other stakeholders and with field experiences in ecology that students are able to take through the University of San Francisco, Duke University's Marine Laboratory, universities abroad where they are studying, and other venues that are surfacing.

Enhance the Academic Stature of the University

Marquette's academic stature will be elevated considerably when the Interdisciplinary Major in Global Ecology is established. We will be the only Catholic and Jesuit university to offer a major of this type. Our progress in conceptualizing and proposing Global Ecology's establishment here is closely followed by the main authors of *Healing a Broken World* and colleagues in Jesuit institutions world-wide who are involved in the International Jesuit Ecology Project. Marquette was the first Catholic university to establish an Interdisciplinary Minor in Environmental Ethics and will be the first to offer an Interdisciplinary Major in Global Ecology.

The establishment of Global Ecology will also help Marquette attract faculty who want to work in an atmosphere in which they can engage in collaborative research and teaching with other specialists. Eagerness to function in a setting that appreciates, encourages, and facilitates interdisciplinary endeavors is becoming an increasing attraction for astute faculty who recognize the limitations of their

disciplines and the need for collaboration with others in order to address with students increasingly complex ecological problems. Thus, Global Ecology will play a key role in recruitment and retention of faculty--if appropriately supported by the University.

Marquette's stature will also be increased by the interdisciplinary teams of Global Ecology faculty who apply for and receive National Science Foundation grants. Encouraging their efforts is vital for a high quality program that will attract and retain faculty. We also anticipate that faculty grants that involve undergraduate students will also attract students who are eager to engage in research. Enhancement of our stature among other Jesuit and Catholic universities should also be anticipated when Global Ecology is an established major. Whereas Georgetown, Loyola University Chicago, Xavier, Notre Dame and others have established centers for interdisciplinary studies and majors in various types of environmental and sustainability studies and sciences, Marquette has lagged considerably behind, much to the lament of committed faculty. The establishment of Global Ecology will place Marquette in conversation with them, while demonstrating a unique albeit belated entry into offering students a major that is needed and desired today.

We also anticipate that our stature will be improved in the community, especially with faculty at UWM's School of Freshwater Sciences with whom we have worked during the latest Capstone Seminar or the Interdisciplinary Minor in Environmental Ethics. They have expressed interest in the justice dimension from which Global Ecology is positioned that makes collaboration between our two universities appealing. Our mutual collaboration should position Marquette in better standing with donors who are willing and eager to advance the greater Milwaukee community as a hub for research, teaching, and action on freshwater concerns.

Indicators of Program Quality to be Achieved within Five Years

Within five years, the quality of the Global Ecology major will be demonstrated by the following:

- Thirty students enrolled in the major within five years of start-up.
- Established and launched internships with local stakeholders.
- Established and launched field experiences for Scientific Discovery and Innovation.
- Three collaborative seminars offered.
- One major interdisciplinary research grant funded (e.g., National Science Foundation).
- One major national conference hosted.
- Student and faculty submission of comments on current issues (e.g., Great Lakes Restoration Initiative for 2015-2019 and the Adaptive Science-Based Framework for Great Lakes Restoration).

Special Needs Associated with the GE Major

The Interdisciplinary Major in Global Ecology needs a home! Though all of the core courses are based within the College of Arts and Science, faculty from all eight colleges that comprise Marquette University have expressed enthusiasm for this major and desire to be involved in collaborating with colleagues in other colleges on research topics and team teaching collaborative seminars. To make this major possible, the timely availability of courses offered at non-conflicting times must be assured, student opportunities for creative advising must be provided, internships and field experiences must be developed and implemented, a process for coordinating the concentrations must be established,

proposals for collaborative seminars must be sought from faculty and scheduled during particular semesters, new library sources must be solicited from faculty teaching core and concentration courses and ordered, assessment must be conducted and processed, stimulating content and update meetings of faculty and students need to be held annually to maintain the major at a high quality level that meets student and faculty needs, and the plethora of duties required of departments offering majors must be executed (e.g., Undergraduate Bulletin, Majors Fair, copy for pre- registration, development and maintenance of the major's web page, etc., etc.). No one department within Arts and Sciences has the capability or resources for handling an interdisciplinary major of this type. Thus, we propose establishing the Interdisciplinary Major in Global Ecology within the College of Arts and Sciences and equipping it to meet the tasks that must be accomplished.

To meet these needs and, most likely, many more, a director and at least a half-time administrative assistant are essential. The director should be released from teaching one course during each academic year. The department that provides the capstone professor should be compensated accordingly. Funding must be provided to facilitate the development of collaborative seminars by professors who will take turns leading them and to compensate the lead professor's home department.

Use of Off Campus Site(s) to Teach Associated Program Courses

While most of the course needs for the Global Ecology major will be met on Marquette's campus, off campus sites will be crucial for completing the program. Structured internships with local, regional, and national stakeholders will be held off campus and designed with the input of students concentrating in Policy and Advocacy and in Sustainability and Entrepreneurship. Some limited field experiences may be provided through Marquette's Office for Sustainability, but in-depth experiences at the Urban Ecology Center, the Schlitz Audubon Center, the University of San Francisco's Wilderness Experience, Duke University's Marine Laboratory, and universities at which students study abroad will enhance the Scientific Discovery and Innovation concentration offerings. Applied Global Business Learning and Engineers without Borders will provide field experience for students concentrating respectively in Sustainability and Entrepreneurship and Scientific Discovery and Innovation. Other possibilities will be sought and developed by students working with faculty.

Jame Schaefer, Department of Theology
McGee Young, Department of Political Science
25 July 2013

Next steps: Assessment Plan
Market Demand Analysis
Business Analysis