

Earth Institute Certificate Program in Conservation & Environmental Sustainability  
**SPRING 2016 COURSES**

**MODULE 1**

**Digital Markets & Public Relations in Environmental Sustainability**

*Brian Kateman, President of Reducetarian Foundation and Innovation Manager at The Good Food Institute*

How can digital technology help secure a more sustainable planet? Effective mass communication is going to play a critical role in the months and years ahead. This highly hands-on course takes marketing and public relations to new levels by providing practical lessons in how best to navigate communications in strategic ways. Learn about the development of social media, where it is headed in the future, new ideas and trends and how to bring attention and traffic to enhance your work (and that of others) in protecting our planet. Discover principles of persuasion and influence and tips on what to avoid in this fast-changing Web 2.0 world. Become conversant in using social media (Facebook, Twitter, LinkedIn, YouTube), paid online advertising tools (Google Adwords), website design (Squarespace), email management, (MailChimp), and public relations; learn how each can be used for environmental change and sustainability. Case studies (including the reducetarian movement) illustrate how to put environmental issues in the mainstream and how to attract large and diverse audiences when digital media and public relations are used effectively. **\*\*Not Available via Distance Learning\*\***

**Brian Kateman** is Co-Founder and President of the Reducetarian Foundation (RF), where he oversees the day-to-day operations of the organization. A TEDx speaker and leading expert on the food system, he has appeared in hundreds of media outlets including The Huffington Post, National Geographic, Los Angeles Times, Fox News and The Daily Mail. In addition to his work for RF, Brian is Innovation Manager at The Good Food Institute, where he focuses on supporting the work of early stage companies and expanding the pipeline of startups. Brian received a Master of Arts in Conservation Biology from Columbia University and a Bachelor of Science from the Macaulay Honors College at The City University of New York.

**Mondays, Jan. 25, Feb. 1, 8, 15, 22 (5 sessions, 6:10-8:10PM)**

**Scenarios for a Sustainable World**

*Cary Krosinsky, Executive Director, Network for Sustainable Financial Markets (NSFM)*

Climate change, habitat loss, and population growth are dramatically reshaping life on Earth. Human activities are pushing the Earth toward environmental 'tipping points' that could cause sudden, irreversible changes to our planet. Learn the causes behind these issues and examine future scenarios that can help us best avoid potential global environmental tipping points. Featuring prominent speakers from corporations, investment houses, and NGOs this course addresses key questions such as:

- Can finance and investing be a part of the solution?
- How can companies be more involved to drive solutions and what are they already bringing to the table?
- What role do governments and other global bodies have to play?
- What happens if we do nothing or instead choose only incremental change as a way forward?
- What does dramatic change look like? Do we now need to consider dire choices? And what are they?

Topics include: stakeholder analysis, portfolio and asset allocation construction, differences between short and long term goals for organizations, and how current behaviors to drive solutions may be counterproductive.

**Wednesdays, Jan. 20, 27, Feb. 3, 10, 17 (5 sessions; 6:10-8:10PM)**

*Cary Krosinsky is a well-regarded author, editor, educator & advisor on sustainability issues. His books on sustainable investing are contemporary standard texts used in classrooms on this subject, including 2008's Sustainable Investing: The Art of Long Term Performance and 2011's Evolutions in Sustainable Investing, both with Nick Robins, he writes and edits on Sustainable Investing for About.com and the Journal of Environmental Investing, and is co-author of the recent A New Vision of Value report from KPMG. His teaching includes a Residential College Seminar at Yale, and MBA courses at the University of Maryland's Robert H. Smith School of Business and he is a Senior Advisor to the University of Cambridge's Investment Leaders Group representing over \$5T of assets under management. He also worked closely on the recent Value Driver Model in late 2013 for the UN Global Compact, is Executive Director of the Network for Sustainable Financial Markets, Co-Founder of the Carbon Tracker Initiative, Sustainability Advisor to RLP Wealth Advisors, Global Chairman of ET Index and is a former Senior Vice President for Trucost in North America, having helped develop the Newsweek Green Rankings.*

**Landscape Ecology: The Mannahatta Project *\*\*Course Cancelled\*\****

*Eric W. Sanderson, PhD, Senior Conservation Ecologist at the Wildlife Conservation Society*

Few places have seen as many changes in ecosystem type and distribution as Manhattan Island over the last 400 years. Landscape ecology is the study of how ecosystems are distributed in space and time - and the consequences of those distributions for living things. Some of the questions addressed in this course are: What are the consequences of these changes for the plants, animals and people of Manhattan, compared to 1609, when Henry Hudson arrived in New York and ushered European development of the island, to the island we find today? How might the ecosystems and habitats of New York City change over the next 400 years? This course illustrates fundamental concepts and techniques in landscape ecology and geographic analysis, using Manhattan Island's ecological development as a case study, drawing from materials available from the WCS's Mannahatta Project ([www.wcs.org/mannahatta](http://www.wcs.org/mannahatta)).

**Mondays, Jan. 21, 28, Feb 4, 11, 18 (5 sessions, 6:10-8:10PM)**

*Dr. Eric W. Sanderson is a Senior Conservation Ecologist at the Wildlife Conservation Society. Sanderson received his Ph.D. in ecology (emphasis in ecosystem and landscape ecology) from the University of California, Davis, in 1998, while studying with Dr. Susan Ustin. Starting at WCS in 1998, he established the "Landscape Ecology and Geographic Analysis" program to bring landscape thinking and geographic analysis tools into the conservation practices of the WCS. In 2002 Dr. Sanderson and colleagues created the Human Footprint map, the first look at human influence globally at less than 1 square mile resolution. He is also an expert on species conservation planning and has contributed to efforts to save lions, tigers, Asian bears, jaguars, tapirs, peccaries, American crocodiles, North American bison and Mongolian gazelle; and landscape planning conservation efforts in Argentina, Tanzania, Mongolia, and the Greater Yellowstone Ecosystem and the Adirondack Park, in the USA. He has edited two scientific volumes and written numerous scientific papers. His work has been featured in the New York Times, National Geographic Magazine, CNN, NPR, and The New Yorker. He is also the director of The Mannahatta Project, an effort to reconstruct the original ecology of Manhattan Island at the time of European discovery in the early seventeenth century. In 2009 he published a book, "Mannahatta: A Natural History of New York City," illustrated by Markley Boyer. From May 20 – October 12, 2009, Dr. Sanderson curated an exhibition based on the Mannahatta Project on display at the Museum of the City of New York. Sanderson's latest book is "Terra Nova: The New World After Oil, Cars and Suburbs (Abrams, 2009).*

## **MODULE 2**

### **Sustainable Agriculture**

*Jeff Potent, Adjunct Professor, School of International and Public Affairs, Columbia University*  
Climate change, habitat and biodiversity loss and eutrophication, among other concerns, have raised interest in and encouraged practices to minimize the environmental footprint and social impact of modern agriculture. Innovative approaches are emerging from all sectors of the established agricultural industry, as well as from new entrants and from a diverse array of agricultural stakeholders. While these approaches are emerging in response to a common set of issues, each is manifesting in diverse ways in response to unique perspectives, objectives and conditions. This course profiles the range of these and related approaches to sustainable agriculture. We explore emerging trends, obstacles, anticipated outcomes and the inherent contradictions and controversies surrounding the leading approaches. We engage in lively discussions on the scope of the significant challenge that lies ahead and seek to uncover cause for optimism.

**Tuesdays, Feb. 23, Mar. 1, 8, 22, 29 (5 sessions, 6:10-8:10PM)**

*Dr. Jeff Potent is an adjunct professor in EICES and the Columbia University, School of International and Public Affairs. He develops and teaches courses in corporate sustainable development, ecosystem services, systems theory and sustainable agriculture. Mr. Potent led corporate partnerships for the US Environmental Protection Agency (EPA) in Washington DC, advancing sustainable and market-based approaches to environmental protection. Previously, he served as EPA/US Department of Agriculture (USDA) liaison, facilitating collaboration among Land Grant Universities, EPA, USDA, and other agencies and academic institutions. In 2001 he established the regional component of the USDA National Integrated Water Quality Program, serving as regional coordinator and member of the program's national leadership team. Earlier in his career, Mr. Potent led an energy and environmental services engineering consulting practice, managed pollution prevention programs for a large environmental agency, and planned international telecommunications facilities for a leading telecommunications corporation.*

### **Climate and Biodiversity**

*Shahid Naeem, PhD, Director, Earth Institute Center for Environmental Research and Conservation (EICES); Professor of Ecology, Evolution and Environmental Biology, Columbia University*  
Life on Earth is often perceived as a passive player in world events, but nothing could be further from the truth. The Earth's climate, for example, has been strongly regulated by life for over 3.5 billion years, and its current change is as much a function of life on Earth as is it is of greenhouse gas emissions. This course explores the biosphere from a unique perspective, one in which climate is understood as a function of plants, animals and microorganisms. It goes beyond the conservation problems of mass extinction (e.g., the loss of polar bears and penguins) and shifting biogeography (e.g., the northern migration of species on a warmer planet) and considers how biodiversity conservation is also critical to managing and adapting to climate change.

**Wednesdays, Feb. 24, Mar. 2, 9, 23, 30 (5 sessions, 6:10-8:10PM)**

*Dr. Shahid Naeem is the Director the Earth Institute Center for Environmental Sustainability (EICES). He oversees the development of research science programs that benefit from the combined resources of the Consortium for Environmental Research and Conservation. For example, he is currently leading center partners to actively develop programs for adapting conservation to climate change, which requires basic research in partnership with institutions that study the diversity of plants and animals, and is engaged in conservation activities around the world. Naeem studies the ecological and environmental consequences of biodiversity loss. He is interested in how changes in the distribution and abundance of plants, animals and microorganisms affect ecosystem functions and, by extension, how ecosystem services are affected. His current fieldwork includes American northeastern deciduous forests, Inner Mongolian*

*grasslands in China and African agro-ecosystems. He is actively involved in bringing the science of biodiversity and ecosystem function to conservation, restoration and policy development. He is author, co-author and editor of over 100 scientific publications and co-chaired the UN Millennium Assessment's Biodiversity Synthesis Report published in 2005. Naeem is also a professor of ecology in Columbia University's Department of Evolution, Ecology and Environmental Biology. He received his Ph.D. from the University of California, Berkeley; was a postdoctoral fellow at Imperial College of London, the University of Copenhagen and the University of Michigan; and served on the faculties of the University of Washington and the University of Minnesota before coming to Columbia in 2003.*

### **Evolution: Darwin to DNA**

*Sergios Orestis Kolokotronis, PhD, Assistant Professor of Biological Sciences at Fordham University; Adjunct Assistant Professor at New York University; and a Research Associate in Evolution Genomics at the American Museum of Natural History*

Are Darwin's findings still relevant today? How could he have come up with the idea of evolution through natural selection if he did not know about DNA or how heredity works? And how did heredity work, again...? Now that we have decoded the human genome, what do we know – and still don't – about life? This course will lead students on a broad exploration of evolutionary science, seeking to answer questions such as these, among many others. We will review the history of evolutionary thought and science, genetics and heredity, the main mechanisms by which evolution acts, and the tools and findings of evolutionary research, including the evolution of humans and microbial pathogens.

**Thursdays, Feb. 25, Mar. 3, 10, 24, 31, (5 sessions, 6:10-8:10PM)**

*Dr. Sertios Orestis Kolokotronis is an Assistant Professor of Biological Sciences at Fordham University; Adjunct Assistant Professor at New York University; and a Research Associate in Evolution Genomics at the American Museum of Natural History. As the Principle Investigator of the Kolokotronis Lab at Fordham University, Dr. Kolokotronis' research group focuses on molecular evolution of biological diversity where they employ modern tools drawn from genomics and bioinformatics to investigate the temp and mode of evolution leading to adaptation of organisms to their environment. He has co-authored numerous scientific publications and served as a research assistant at the American Museum of Natural History and the New York Botanical Gardens. He received his Ph.D., MPhil, and MA in Ecology and Evolutionary Biology from Columbia University; and was a post-doctoral fellow at the American Museum of Natural History.*

### **SPRING BREAK (BERMUDA FIELD EXPERIENCE)**

#### **Coral Reef Ecology: Bermuda**

*Kaitlin Baird, Science Officer, Bermuda Institute of Ocean Sciences*

Located at the Bermuda Institute of Ocean Sciences (BIOS), this five-day field course introduces participants to the world of corals. Learn the biology and microbiology of corals, the ecology of coral communities, anthropogenic factors that impact coral reefs and coral reef restoration and sustainability. Daily snorkeling excursions enhance the learning experience.

Coral reef ecosystems around the world contain some of the highest biodiversity on our planet. Not only are coral reefs home to thousands of marine species but are important to our daily lives through tourism, fisheries, carbon sequestration and coastal protection, just to name a few. The decline of coral reefs has become a pressing concern for scientists and managers alike as environmental and human threats to these ecosystems increase. Understanding the complex ecological relationship of coral reefs is a cornerstone to understanding how they will respond in the coming decade.

Bermuda is an ideal location for an introduction to Coral Reef Ecology because it is the northern most tropical reef in the world and on the cutting edge in research on the effects of climate change on coral reefs. The course is an introduction to the coral reef as an ecosystem and some of the many organisms that inhabit and sustain the reef. Students learn about the basics of corals and their growth, reproduction and recruitment. Accompanying lectures are hands on snorkels to see up close what the coral species and reef ecosystems of Bermuda look like. Additionally demonstrations allow for students to become the scientist and learn techniques that marine biologists use to analyze corals and food chains.

Students also visit the Bermuda Aquarium and Zoo and Nonsuch Island to learn more about the various projects being studied on the islands. Students are exposed to the many threats to these ecosystems and some of the ways that conservation efforts have aided their preservation. **\*\*Not Available via Distance Learning\*\***

**Course takes place in Bermuda from March 16 - 20, 2016.** Additional course fees apply.

Related Course Links:

- Bermuda Institute of Ocean Science (BIOS)  
<http://www.bios.edu>
- Course Syllabus
- Course Schedule (tbd)

*Kaitlin Baird currently helps manage both international and local community partnerships for Ocean Academy at BIOS. Kaitlin oversees the building and maintenance of relationships with schools, professional associations and non-profit organizations locally and internationally. She currently aids in science curriculum development and workshops for Ocean Academy Explorer program, and manages the Bermuda Program, Marine Science Internship and Road Scholar programs at BIOS. Prior to her time with BIOS, Kaitlin was a coordinator and instructor for EICES, for the Summer Ecosystem Experience for Undergraduates program (SEE-U). She received her Master's in Conservation Biology in 2008 from Columbia, where she remains on certificate faculty. Kaitlin holds a B. Sc. (Hons) in Marine Biology from Roger Williams University ('06).*

### **MODULE 3**

#### **Introduction to Environmental Policy**

*J. Alan Clark, PhD, JD, Associate Professor in the Department of Biological Sciences at Fordham University*

The past two decades have seen an increasing amount of attention given to the importance of environmental policy and planning in promoting a sustainable future for the planet. This course examines contemporary domestic and international issues that require environmental policy and planning solutions. Explore policy responses to local and global environmental problems such as biodiversity loss, clean air and water, and climate change. Examine how governments of industrial and developing countries, non-governmental organizations, the scientific community, and the private sector shape environmental policy through a wide range of economic, social, and political factors. Topics include environmental law, economics, human population growth, and public health.

**Mondays, Apr. 11, 18, 25, May 2, 9 (5 sessions, 6:10-8:10PM)**

*Dr. J. Alan Clark is an Associate Professor in the Department of Biological Sciences at Fordham University. He is a lawyer by training; however he now directs the Conservation Biology Certificate program and teaches Conservation Policy and Law. His research focuses on understanding the taxonomy and behavior of Little Blue Penguins in New Zealand in addition to using molecular techniques to sex and determine ancestry in the colony with two different types or "clades" of this species. Dr. Clark earned his*

*PhD from the University of Washington, JD from the University of Michigan School of Law, MS from University of Michigan, BA and BME from Evangel College.*

### **Biomimicry: Innovation Inspired by Nature**

*Lisa Dokken, Environmental Program Manager at PCI Media Impact*

Biomimicry is the conscious emulation of nature's genius. It is an interdisciplinary approach that brings together two often disconnected worlds: nature and technology, biology and innovation, life and design. The practice of biomimicry seeks to bring the time-tested wisdom of life to the design table to inform human solutions that create conditions conducive to life. At its most practical, biomimicry is a way of seeking sustainable solutions by borrowing life's blueprints, chemical recipes, and ecosystem strategies. At its most transformative, biomimicry connects us in ways that fit, align and integrate the human species into the natural process of Earth.

**Wednesdays, Apr. 6, 13, 20, 27, May 4 (5 sessions, 6:10-8:10PM)**

*Lisa Dokken is a senior sustainability professional with broad experience in developing and managing innovative sustainable development programming across the globe, including over a decade working for the UN Development programme implementing sustainable development programming in over 30 countries. Lisa lived and consulted in Asia, North and South America for over 15 years in the built environment, conservation, policy analysis, strategy planning and advocacy. Lisa will be one of 20 professionals who will be conveyed the first Masters in Science in Biomimicry and Design from Arizona State University in the fall of 2015.*

### **Forest Management and Conservation**

*Matt Palmer, PhD, Senior Lecturer in Discipline, Department of Ecology, Evolution and Environmental Biology (E3B), Columbia University*

Forests are a vitally important habitat for much of the world's terrestrial biodiversity. They are sources of goods, such as timber and food, and provide services, such as carbon storage and water filtration. However, forests worldwide are threatened by overexploitation, conversion, climate change, and invasive species. Learn key issues in forest ecology and management through the local environment of Black Rock Forest. Participate in an all-day field trip to Black Rock Forest to study how pathogens and other invasive species affect forest structure and function. Local observations are scaled up to consider how these issues affect forest conservation on a global scale. **\*\*Not Available via Distance Learning\*\***

**Thursdays, May 5, 12 (6:10-8:10PM) & Saturday, May 7 (9AM-4:30PM; includes travel to and from Black Forest) – 3 sessions total**

*Dr. Matt Palmer is a faculty member in the department of Ecology, Evolution and Environmental Biology (E3B) at Columbia University. His research interests are based in plant community ecology, with emphases on conservation, restoration and ecosystem function. Palmer has done research on the effects of microtopography and plant interactions on centimeter-scale diversity patterns in ferns of the New Jersey Pinelands. He is currently doing research on the community dynamics and ecosystem functions of urban forests and green roofs, the population biology of rare plants and the effects of forest canopy disturbance on understory structure and function.*

## **MODULE 4**

### **Green Gotham: Ecological Restoration & Wildlife Conservation in NYC**

*Simon Bird, PhD, Advising Dean, Columbia University; Adjunct Professor, New York University*

This course provides an overview of ecological restoration and wildlife conservation initiatives in action throughout New York City. Field visits to a selection of diverse, high profile sites of environmental

significance introduce the key challenges and benefits associated with restoring native vegetation, mitigating pollution impacts, fostering environmental stewardship, enhancing wildlife habitat, and providing outdoor environmental education opportunities across the five boroughs. Students learn unique characteristics of urban ecological systems; relationships between natural resources, anthropogenic activities and human welfare; and how general and specific approaches to land and natural resource management can help improve quality of life in urban settings. Coursework provides an opportunity to further develop a sense for how scientific knowledge and ecological concepts can be applied to conservation practice. Field visits illustrate examples of complex, multi-scale projects and programs that aim to improve air quality, water quality, biodiversity, invasive species control, and recreation resources. Each trip provides a unique perspective on how different agencies and organizations collaborate towards common conservation and restoration goals. The series as a whole builds towards a broad overview of those efforts across the city. **\*\*Not Available via Distance Learning\*\***

**Saturdays, May 14, 21, June 4, 11 (4 sessions, 2.5 hours each; 12:00PM-2:30PM)**

*Dr. Simon Bird is an ecologist and conservation biologist currently working as an advising dean at Columbia and adjunct professor in Liberal Studies at NYU. His research and teaching interests focus on land use ecology, urban ecology, invertebrate biodiversity, and soil system dynamics. He has two decades of experience teaching college-level ecology, conservation biology, entomology, and environmental science, and has a diversity of field experience in urban, desert, forest, grassland, coastal, and upland ecosystems. He received his B.Sc. (hons) from the University of Leeds in Zoology and a Ph.D. in Insect Ecology from Texas A&M University. Simon hails from northern England but is now a firmly-adopted Manhattanite.*

### **Ecology of Landscapes**

Landscape ecology is a broad-based, multi- and cross-disciplinary field of study with a large and diverse audience. The landscape ecological community consists of conservation biologists, landscape architects, engineers, geographers, urban planners, ecologists, agronomists, designers, and scientists. As such, the impact of this relatively new discipline is broad and significant, particularly in regard to environmental conservation and sustainability. This course will provide an overview and introduction to basic landscape ecological concepts with a focus on application for conservation. Students will be introduced to a broad-based knowledge of landscape ecological principles, the interaction between the concepts of landscape ecology and landscape-level resource management, and the tools and methodologies used to describe and analyze landscape spatial and temporal dynamics. Case studies will focus on local urban projects and challenges throughout New York City and the Hudson River watershed. Students will have the opportunity to visit Jamaica Bay in Queens to explore examples of complex, multi-scale projects and programs that apply landscape ecological principles to the management of a key location in the city that affects air quality, water quality, biodiversity, and storm damage resilience.

**Mondays, May 16, 23, June 6, 13, 20 (5 sessions, 6:10-8:10PM)**

*Dr. Simon Bird is an ecologist and conservation biologist currently working as an advising dean at Columbia and adjunct professor in Liberal Studies at NYU. His research and teaching interests focus on land use ecology, urban ecology, invertebrate biodiversity, and soil system dynamics. He has two decades of experience teaching college-level ecology, conservation biology, entomology, and environmental science, and has a diversity of field experience in urban, desert, forest, grassland, coastal, and upland ecosystems. He received his B.Sc. (hons) from the University of Leeds in Zoology and a Ph.D. in Insect Ecology from Texas A&M University. Simon hails from northern England but is now a firmly-adopted Manhattanite.*