

**The Earth Institute Center for Environmental Sustainability
Executive Education Program
Spring Semester 2019 Course Descriptions**

SPRING BREAK

March

Coral Reef Ecology: Bermuda^{#}**

Instructor: Kaitlin Baird

Fulfills requirement: Case Study (CS) **OR** Tools (T)

Days: Wednesday – Sunday

Dates: March 20 – 24

Location: Bermuda Institute of Ocean Sciences

Course number: ENVB 0321 N

#Not available via distance learning

**** Additional program fees apply; students are responsible for airfare and transportation to and from the Bermuda Institute of Ocean Sciences.**

Course Description

The ocean can be your classroom! Join The Earth Institute Center for Environmental Sustainability (EICES) and the Bermuda Institute of Ocean Sciences (BIOS) for an exploration of the northernmost tropical coral reef in the Atlantic Ocean. Combining lectures, labs, and fieldwork, the course serves as an introduction to coral reef ecosystems. In this course you will:

- Learn about the structure and function of coral reef ecosystems
- Become familiar with the coral and fish species that inhabit Bermuda's reefs
- Explore the drivers of coral reef decline and degradation
- Gain practical knowledge about ocean conservation efforts
- SNORKEL!!!

Early commitment discount (\$50 off program fee) deadline: **January 25th**

Final commitment deadline: **February 15th**

For more information, see the course webpage.

About the Instructor

Kaitlin Baird currently directs science curriculum development, programming, and workshops for Ocean Academy programs at the Bermuda Institute of Ocean Sciences (BIOS). Kaitlin oversees the building and maintenance of relationships with schools, professional associations and non-profit organizations locally and internationally. She is actively involved in course and curriculum development for current and new international visiting groups and is currently the Bermuda Regional Coordinator in cooperation with the Marine Advanced Technology and Education Centre. Kaitlin received her Master's in Conservation Biology in 2008 from Columbia University, where she remains on certificate faculty. Kaitlin holds a BSc (Honors) in Marine Biology from Roger Williams University). She is graduate of the Duke Environmental Leadership Program and is currently enrolled in the Informal Education Certificate Program at Oregon State University.

MODULE 1

January to February

Introduction to Ecology*

Instructor: Dr. Jenna Lawrence

Fulfills requirement: Fundamental (F)

Day: Tuesday

Dates: Jan. 22, 29, Feb. 5, 12, 19 (5 sessions)

Time: 6:10 – 8:10 PM

Course number: ENVB 0301 N

***Fundamental course required to complete the 12-course Executive Education Program**

Course Description

This course examines the interaction between the living components of the earth with the environment, including the distribution and abundance of plants and animals and the impact of human activities on these distributions. Key ecological principles are illustrated with applied examples of how changes in the environment affect ecological systems, ultimately providing you with the tools to evaluate environmental issues.

About the Instructor

Dr. Jenna Lawrence received her PhD from the department of Ecology, Evolution and Environmental Biology (E3B) at Columbia University. Her research focuses on primate behavioral ecology and her current lectures and interests extend to all biodiversity in both marine and terrestrial ecosystems. At Columbia University, she also teaches sustainability management at the graduate level and a Summer Ecosystem Experiences for Undergraduates (SEE-U) course in Jordan offered by The Earth Institute Center for Environmental Sustainability (EICES).

Environmental Change, Demographic Trends, and Sustainable Development

Instructor: Dr. Susana Adamo

Fulfills requirement: Environmental Policy, Management, and Finance (EPMF)

Day: Wednesday

Dates: Jan. 23, 30, Feb. 13, 20 (4 longer sessions)

Time: 6:10 – 8:40 PM

Course number: ENVB 0452 N

Course Description

The recognition of the intrinsic complexity of coupled human-natural systems is implicit in the concept of sustainable development and in the design of the Sustainable Development Goals (SDGs). The idea of sustainable development embodies the paradigm of harmonizing socio-economic and environmental sustainability. The SDGs – as concrete targets to map progress toward this end –reflect both the diversity of and the interlinkages among the many dimensions and sectors involved. Understanding these matters requires pulling the components apart and disentangling a web of recursive links.

Demographic processes, their outcomes in terms of population size, distribution and characteristics, and their interaction with environmental processes (including environmental change) have a fundamental role in sustainable development and environmental sustainability, and they have broad policy implications. This course aims to contribute to the understanding of society-nature interactions, taking into account the implications of population-environment links in the context of climate change, consumption trends, economic development, sustainability threats, and cultural transformations.

About the Instructor

Dr. Susana B. Adamo is a research scientist at The Earth Institute Center for International Earth Science Information Network (CIESIN) and an adjunct assistant professor in the Undergraduate Program in Sustainable Development at Columbia University. She is also a member of the Scientific Advisory Committee of the Inter American Institute for Global Change Research (IAI) and co-coordinator of the Population and Environment Research Network (PERN). Her research interests spread across several fields: environmental migration and displacement in the context of climate change; social vulnerability and environmental change; dynamics of internal migration in developing countries; rural/urban demography; and all aspects of data integration related to demography and environment links, particularly with respect to global and regional georeferenced population databases. Dr. Adamo holds a BS in geography from the University of Buenos Aires, an MS in population studies from the Facultad Latinoamericana de Ciencias Sociales (FLACSO-Mexico), and a PhD in demography/sociology from the University of Texas at Austin.

Coffee from Seed to Cup: A Case Study in Sustainable Agriculture[^]

Instructor: Dr. Amanda Caudill

[^]**Sustainable Food Systems Track course**

Fulfills requirement: Food, Ecology, and Environment (FEE) **OR** Case Study (CS)

Day: Thursday

Dates: Jan. 24, 31, Feb. 7, 14, 21 (5 sessions)

Time: 6:10 – 8:10 PM

Course number: ENVB 0333 N

Course Description

Coffee is a tropical crop grown in regions of the world that host high levels of biodiversity. The way that coffee farms are managed can have a large impact on the local wildlife communities that live in and around coffee farms. Although consumers in import countries pay top dollar for their cup of coffee, many coffee farmers across the globe struggle to support themselves and their families. Can coffee farms be managed in a way that protect wildlife habit and the environment, while at the same time producing a viable, profitable crop for the farmers?

This course explores this question and others related to the complexities surrounding coffee sustainability. We will investigate the coffee industry from seed to cup and have an opportunity to connect with coffee farmers, researchers, roasters/shop owners, and consumers. We will examine coffee farms through case studies; assess coffee certifications such as shade grown, organic, Rainforest Alliance, and Smithsonian Bird Friendly; learn about socio-economics and environmental issues associated with coffee; and gain an understanding of the challenges that farmers face and the nuances involved in defining sustainable coffee.

About the Instructor

Dr. Amanda Caudill is a coffee research scientist and an alumnus of Columbia University and The Earth Institute Center for Environmental Sustainability (EICES) Executive Education program. She recently completed a postdoctoral fellowship with the Smithsonian Conservation Biology Institute. She has worked with coffee sustainability from seed to cup and has lived and worked in the coffee-growing regions of India, Costa Rica, and Mexico. She is interested in sustainable agriculture as a means to provide wildlife habitat, foster ecosystem services, and conserve biodiversity while simultaneously providing for human livelihoods. She is the owner and creator of Blue Leaf Travels – Curated Coffee and Culture Tours. Blue Leaf provides weeklong eco-tours in Costa Rica that are a balanced mix of coffee farms, monkey-filled rainforests, cultural activities, and some rest and relaxation on the beach.

MODULE 2

February to April

Module 2 courses will not meet the week of spring break, March 18th – 22nd; note individual course dates.

NEW!

Politics, Society, and a Sustainable Environment

Instructor: Dr. Fumiko Sasaki

Fulfills requirement: Environmental Policy, Management, and Finance (EPMF) **OR** Tools (T)

Day: Monday

Dates: Feb. 25, March 4, 11, 25, April 1 (5 sessions)

Time: 6:10 – 8:10 PM

Course number: ENVB 0451 N

Course Description

Environmental disruptions are not always caused by conscious human activity but often result from activities somewhat distant from those commonly identified as disrupting the environment. Such activities are part of social and political institutions, traditions, and customs. On one hand, slash-and-burn agriculture in Indonesia and burning coal to generate power in China are human activities visibly and intuitively harmful to the environment. On the other hand, dictatorship, corruption, and ethnic/tribal conflict – political activities far from being directed to harm the environment – can cause environmental disaster.

For example, dictatorship in China led to massive environmental damage after the government forcefully and arbitrarily constructed the Three Gorges Dam that devastated the ecosystem of an extensive area, which was worsened by corruption that diverted funds budgeted to reinforce the Yangtze River embankments, enlarging downstream flood damage. Similarly, corruption in China invited contamination of soil when inspectors were bribed to forgo poison usage tolerances, creating cancer villages and ecological annihilation. In Yemen, tribal/religious conflict has caused wide-spread famine due to mutual attack to farming lands. As such damage is caused by human-made environmental disruptors, by definition these disruptors are avoidable if there is a change in the human behaviors that give rise to their existence. However, in cases as those described above, it can be very difficult to reduce human-induced environmental damage because decision-makers and others in power are acting for their own benefit.

This course will employ strategic thinking to foster an alternative view—that stakeholders (e.g., decision-makers, constituents, community members, business) have the capacity to understand that minimizing damage to the environment is in fact to their ultimate benefit. This course will focus on how to resolve environmental challenges arising from socio-political mechanisms and will, in practice, employ the following two steps:

- Step 1: Understand seemingly traditional or institutional, yet changeable, socio-political mechanisms that lead to environmental deterioration; and
- Step 2: Design innovative, strategic solutions to these issues.

The five classes will be as follows:

- **Class 1:** *Mechanisms* of politics and culture that cause environmental problems, the impact of globalization on the environment, and why strategic solutions are necessary to combat environmental challenges
- **Class 2:** *Culture* against a sustainable environment: mechanisms and case studies (e.g., mass consumption and the great Pacific Garbage Patch, ivory trade and Chinese tradition)
- **Class 3:** *Corruption* against a sustainable environment: mechanisms and case studies
- **Class 4:** *Governing systems* against a sustainable environment: mechanisms and case studies (e.g., Chernobyl nuclear meltdown in the USSR, North Korean famine)
- **Class 5:** *Discrimination, ethnic, and religious conflicts* against a sustainable environment: mechanisms and case studies (e.g., water pollution in Flint, Katrina flood, famine in Yemen)

By the end of the course, students will be well-equipped to identify and analyze the socio-political institutional causes of environmental damage and craft strategic solutions to effect positive outcomes in the future with respect to environmental management.

About the Instructor

Dr. Fumiko Sasaki is a specialist in international relations focused on Asia as well as Japanese politics. At Columbia University, she teaches East Asian Security for the School of International and Public Affairs (SIPA), is an advisor for the SIPA Capstone Program, and is an Adjunct Associate Research Scholar at the Weatherhead East Asian Institute. She also teaches East Asian Security at the School of Advanced International studies (SAIS) at Johns Hopkins University. Previously, she was a visiting scholar at The New School. She has been a panelist and speaker on numerous occasions at the graduate schools of Columbia University and Johns Hopkins University. Dr. Sasaki received a PhD and MA in Asian Studies and International Relations from SAIS at Johns Hopkins University.

Dr. Sasaki is actively engaged in social activities focused on strategic and innovative solutions for human security issues. As the director of the Community E-Learning Initiative at Distance Education for Africa, she is involved in enhancing education in Africa. As an Executive Director at the Japan Institute for Social Innovation and Entrepreneurship (JSIE), she has organized various conferences and workshops that strengthen women's social participation and entrepreneurship.

Climate and Biodiversity

Instructor: Dr. Shahid Naeem

Fulfills requirement: Case Study (CS)

Day: Wednesday

Dates: Feb. 27, March 6, 13, 27, April 3 (5 sessions)

Time: 6:10 – 8:10 PM

Course number: ENVB 0423 N

Course Description

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 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.

About the Instructor

Dr. Shahid Naeem is the Director of The Earth Institute Center for Environmental Sustainability (EICES). 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. 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 (E3B). He received his PhD 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.

Introduction to Evolution*

Instructor: Dr. Sergios-Orestis Kolokotronis

Fulfills requirement: Fundamental (F)

Day: Thursday

Dates: Feb. 28, March 7, 14, 28, April 4 (5 sessions)

Time: 6:10 – 8:10 PM

Course Number: ENVB 0450 N

***Fundamental course required to complete the 12-course Executive Education Program**

Course Description

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.

About the Instructor

Dr. Sergios-Orestis Kolokotronis is an Assistant Professor of Epidemiology at the School of Public Health at SUNY Downstate Medical Center located in Brooklyn. He maintains secondary affiliations at the American Museum of Natural History, New York University, and the New York Botanical Garden. His research group focuses on molecular evolution of biological diversity by employing modern tools drawn from genomics and bioinformatics to investigate the tempo and mode of evolution leading to adaptation of organisms to their environment. Having worked on endangered species, his interests are now focused on the application of evolutionary thinking to questions in public health, such as infectious diseases and pathogen vectors, as well as polluted environments and their microbial communities. He has coauthored numerous scientific publications that can be accessed on his lab website. He received his PhD, MPhil, and MA in Ecology and Evolutionary Biology from Columbia University and was a postdoctoral fellow at the American Museum of Natural History's Sackler Institute for Comparative Genomics.

MODULE 3

April to May

Sustainable Agriculture[^]

Instructor: Jeff Potent

[^]Sustainable Food Systems Track course

Fulfills requirement: Food Systems (FS) **OR** Environmental Policy, Management and Finance (EPMF)

Day: Tuesday

Dates: April 9, 16, 23, 30, May 7 (5 sessions)

Time: 6:10 – 8:10 PM

Course number: ENVB 0381 N

Course Description

Concern about the health risks and questionable nutritional value associated with modern food systems, as well as other damaging social and environmental impacts, has raised public concerns across society in both the U.S. and abroad. Issues associated with prevailing farming, ranching, and food processing practices include: climate change; habitat and biodiversity loss; widespread use of GMO crops and pesticides; water pollution and over exploitation; unfair and dangerous labor practices; and low and unstable farmer incomes and associated financial insecurity.

Fortunately, these far-reaching and often severe consequences of business as usual are encouraging innovative and paradigm-shifting approaches in all subsectors of the established agricultural industry, as well as among new entrants and an ever-growing array of agricultural stakeholders. Agribusiness corporations, food processors, retailers, trade associations, governmental agencies and universities

are, albeit to varying degrees, working to advance best practices, reformulating products (including offering organic options), acquiring sustainable agriculture startups, and changing sourcing policies and supply chain relationships. At the local scale, family farmers, communities, and consumers, impatient with sometimes incrementalist approaches, are taking matters into their own hands by embracing regenerative and resilient farming systems, creating business networks, incentives, and markets for local farm products, and raising knowledge and awareness about this critically-needed transformation.

While these approaches are emerging in response to a common set of issues, actions are manifesting in diverse ways in response to unique perspectives, objectives, and conditions. This course will examine this exciting and hopeful array of groundbreaking approaches to sustainable agriculture, as well as the emerging trends, obstacles, anticipated outcomes, and inherent contradictions and controversies surrounding the leading approaches. We will also engage in lively discussions on the scope and scale of the significant challenges that lie ahead for the agricultural sector and seek to uncover cause for optimism.

About the Instructor

Jeff Potent develops and teaches courses in corporate sustainable development, systems theory, ecosystem services, and sustainable agriculture. He also consults and speaks publicly on corporate and agricultural sustainability and water quality. Mr. Potent formerly led corporate partnerships for the US Environmental Protection Agency (EPA), Office of Water in Washington DC, advancing sustainable and market-based approaches to environmental protection. Earlier in his career, 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. Before that, he led an energy and environmental engineering consulting practice, managed pollution prevention programs for a large environmental agency, and planned satellite and cable infrastructure for a global telecommunications corporation.

NEW!

Ecosystem Services

Instructor: Lisa Dokken

Fulfills requirement: Case Study (CS) **OR** Tools (T)

Day: Wednesday

Dates: April 10, 17, 24, May 1, 8 (5 sessions)

Time: 6:10 – 8:10 PM

Course number: ENVB 0448 N

Course Description

Have you ever considered that the food you eat is brought to you by soil that has taken millions of years to build, or that the water you drink has been purified by the wetlands next door? Or how the trees in your neighborhood filter the air we breathe? Natural ecosystems perform fundamental life-

support services upon which human civilization depends. Unless human activities are carefully planned and managed, valuable ecosystems will continue to be impaired or destroyed.

Although substantial understanding of many ecosystem services and the scientific principles underlying them already exists, there is still much to learn. What is the interconnection and interdependence of the many plant and animal communities within ecosystems? The tradeoffs among different services within an ecosystem, the role of biodiversity in maintaining services, and the effects of long-term and short-term disturbances are just some of the questions to be explored. The answers to such questions will provide information critical to the development of management strategies that will protect ecosystems and help maintain the provisions of the services upon which we depend. The choices we make today in how we use land and water resources will have enormous consequences on the future stability of earth's ecosystems and the services they provide.

About the Instructor

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 and both North and South America for over 15 years in the built environment, conservation, policy analysis, strategy planning, and advocacy. Lisa holds a master's degree in Public Policy and Administration from Columbia University and was one of the first to receive an MS in Biomimicry from Arizona State University in 2015.

Introduction to Environmental Policy*

Instructor: Bipasha Chatterjee

Fulfills requirement: Fundamental (F)

Day: Thursday

Dates: April 11, 18, 25, May 2, 9 (5 sessions)

Time: 6:10 – 8:10 PM

Course number: ENVB 0351 N

***Fundamental course required to complete the 12-course Executive Education Program**

Course Description

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. It explores policy responses to local and global environmental problems such as biodiversity loss, air and water pollution, and climate change. The course examines 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 cover the history, evolution and the application of existing environmental policies in the

world, US environmental regulation, international environmental treaties including Kyoto Protocol, new clean energy policies, and incentives for the private sector for promoting sustainable technologies.

About the Instructor

Bipasha Chatterjee is an environmental economist and a policy consultant with post-graduate degrees from the University of Cambridge, UK and from the London School of Economics, UK. She started her career with the Food and Agriculture Organization of the United Nations in Rome, Italy and went on to work as a governance reform consultant (KPMG and AEA GROUP) in the UK. She has extensive experience in working on environmental and climate change policy issues. She has led projects in the areas of climate change mitigation action, Kyoto Protocol and clean development mechanism (CDM), renewable energy-related research, and advisory work. She is currently an Executive Education Instructor for the Earth Institute Center for Environmental Sustainability (EICES) teaching courses on environmental policy and agricultural economics. She also teaches BA and MA environmental economic courses at Hunter College, City University of New York, and Roosevelt House Public Policy Institute.

MODULE 4

May to June

Principles, Tools, and Approaches for a More Resilient World

Instructor: Thomas Murtha

Fulfills requirement: Environmental Policy, Management, and Finance (EPMF)

Day: Monday (1 session) and Tuesday (3 sessions)

Dates: May 6, 14, 21, 28 (4 longer sessions)

Time: 6:10 – 8:40 PM

Course number: ENVB 0535 N

Course Description

The great acceleration of human impacts on a finite planet is straining the resilience of earth system processes that support human society. Humanity has now crossed more than four planetary boundaries affected by climate change, loss of biosphere integrity, land system change, and altered biogeochemical cycles.

This course explores creating a new story about having an ecological consciousness in the 21st Century. It is a survey course examining the squeeze on planetary boundaries and introduces essential principles, tools, approaches, and resources for providing individual citizens with the agency to address sustainability issues in their homes, workplaces, and communities. Through the course lectures, readings, videos, and discussions, we will examine how individuals and civil society can better align lifestyles and societal values to enable a more resilient and diverse world. Topics may include climate change, biodiversity loss, economic benefits from the wise management of ecosystems, sustainable capitalism, and developing new narratives for humanity in the Anthropocene Era that enable prosperity, diversity, inclusion, and good lives.

About the Instructor

Thomas Murtha has over thirty years of experience as a journalist, investment banker, institutional investment manager, director of corporate engagement at The Nature Conservancy (TNC), and as an environmental/investment activist working on issues related to the systemic risk of climate change. At the non-profit Preventable Surprises, he works with institutional investors and other nongovernmental organizations to engage publicly traded companies in North American, Europe, and Asia on the adoption of net zero emission transformation plans in accordance with the science-based targets of the UN COP21 Paris Agreement.

While at TNC, he worked with Royal Dutch Shell on approaches to replacing grey infrastructure with green living infrastructure for improved coastal resilience and landscape-scale mitigation of oil and gas development as well as scenario planning for climate change adaptation and pathways to net zero emissions. Also at TNC, Thomas worked with BHP Billiton to develop the Martu Living Deserts Project in Australia, the Valdivian Coastal Reserve in Southern Chile, and the Sustainable Rivers and Forest Initiative in Texas. At T. Rowe Price Associates in Baltimore, he was a portfolio manager for the International Stock Fund and the Global Technology Fund.

Earlier in his career, Thomas was an investment banker in Asia for Jardine Fleming, a joint venture of Hong Kong-based conglomerate Jardine Matheson and London-based bank Robert Fleming. Prior to his career in finance, Tom was a journalist for McGraw Hill Publications and Dun and Bradstreet where he covered technology and finance beats in Asia. Tom is an occasional contributor of op-ed articles to *Institutional Investor*, *Pensions and Investments*, *Responsible Investor*, *Greenbiz.com*, and the *Huffington Post*. Tom also serves on the advisory boards of the non-profits Climate and Forest Capital and the Alliance for a Viable Future.

NEW!

Food Supply Chains and Markets: Engaging Local and Regional Producers[^]

Instructor: Christopher Wayne

[^]Sustainable Food Systems Track course

Fulfills requirement: Food Economics and Sustainability (FES) **OR** Case Study (CS)

Day: Wednesday and a Saturday field trip

Dates: May 22, 29, June 5, 12 (4 evening sessions on Columbia University Morningside Campus)

Time: 6:10 – 8:10 PM

Field trip: **Saturday, June 8** from **10:00 AM – 12:00 PM** at the Greenmarket Regional Food Hub in the Bronx**

Course number: ENVB 0453 N

****Students are responsible for transportation to the field trip site.**

Course Description

Interest in and demand for locally-grown farm products continues to increase, in part driven by food movements such as the slow food and local food movements. These movements envision food systems that are equitable for both producers and consumers, engage local producers, and incorporate sustainable methods of production, in contrast to the globalized and industrialized systems that have come to define modern agricultural production. Aligned with these movements, farmers' markets, opportunities to participate in Community Supported Agriculture, and farm-to-table restaurants serve as direct-to-consumer pathways that can meet the food needs and preferences of consumers while supporting local producers.

Ensuring that markets (used broadly here as a place or space in which buyers and sellers exchange goods or services) function in a way that corresponds with local food production, however, continues to be a considerable challenge. Even with the renewed interest in local food production and local food systems, it is estimated that 97% of food produced in the United States still moves through conventional market channels such as wholesalers and distributors. New aggregation and distribution business models, coupled with technological advances, offer promising solutions that could enhance the reliability, sustainability, and profitability of local food systems. For example, food hubs can process and distribute farm products aggregated from many small producers in a manner that increases farm marketing efficiencies, reduces food miles, and opens up access to larger wholesale markets.

The course will explore agricultural direct-to-market channels that have evolved over the last 15 years and shortened food supply chains, thereby facilitating an increased reliance on local and regional producers. Students will also learn about some of the innovative aggregation, processing, and distribution models that are helping create scale-appropriate efficiencies for farmers in the United States. As part of this course, students will have the opportunity to participate in a field trip to GrowNYC's Regional Food Hub, a facility in the Bronx that aggregates and distributes locally-procured farm products.

About the Instructor

Christopher Wayne is the Director of the FARMroots program, part of GrowNYC, which provides business development technical assistance to beginning and established farm businesses to ensure their long-term viability. Mr. Wayne grew up in a farm family in Connecticut and spent two years working with agricultural producers in Costa Rica's Puntarenas province before joining GrowNYC in 2009. His current work at FARMroots covers three primary initiatives, including Beginning Farmer Development, Strategic Marketing, and Retiring Farmer Assistance. Combined, these initiatives provide one-on-one technical support to well over 100 farm businesses each year at various stages of growth and complexity. Mr. Wayne's previous work at the New Farmer Development Project saw him providing bilingual business development support to aspiring immigrant farmers from predominately Latinx and West African heritage. Mr. Wayne completed a Masters in Sustainability Management from Columbia University in May of 2016.

Forest Management and Conservation: Black Rock Forest[#]

Instructor: Dr. Matt Palmer

Fulfills requirement: Case Study (CS) **OR** Tools (T)

Day: Thursday evening and an all-day Saturday field session

Dates: May 16, 23 (2 evening sessions on Columbia University Morningside Campus)

Time: 6:10 – 8:10 PM

Field session: **Saturday, May 18** from **9:00 AM – 4:30 PM** at Black Rock Forest^{***}

Course number: ENVB 0338 N

#The two evening sessions will be offered via distance learning; however, students must attend the field session to be eligible to receive a passing grade.

****EICES will provide transportation; students need to bring a lunch.**

Course Description

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. Students will 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.

About the Instructor

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. Dr. Palmer has done research on the effects of microtopography and plant interactions on centimeter-scale diversity patterns in fens of the New Jersey Pinelands. He is currently conducting 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.