

## Wellesley College Sustainability Research



Sustainability in the research focuses on the interactions of natural systems and social systems as they relate to the environment. This research can be applied or conceptual. It is likely to address one or more of the following:

- limits and dynamics of earth systems,
- inter- and intra-generational environmental and social vulnerabilities,
- social, cultural and historical context that shape how we think about environmental problems and solutions.

The research goals of the following Wellesley College faculty members have been identified as related to the development of an improved understanding of sustainability.

### **Christopher Arumainayagam**

*Professor of Chemistry*

The goal of his research is to elucidate the fundamentals of electron-molecule interactions in the condensed phase. His studies of low-energy electron-induced chemical reactions may provide information valuable to furthering cost-efficient destruction of hazardous chemicals by high energy radiation and clarifying the role, if any, of low-energy electrons, produced by cosmic rays, in interacting with chlorofluorocarbons (CFCs) to produce Cl atoms which contribute to the destruction of ozone and the formation of the ozone hole.

### **Rebecca Bedell**

*Professor of Art*

Much of her research and scholarly writing has focused on the relationship between art and science. Her first book, *The Anatomy of Nature: Geology and American Landscape Painting, 1825-1875*, explored the ways that a number of prominent landscape artists, including Frederic Church and Thomas Moran, were engaged with the then fashionable science of geology. She also was part of the curatorial team that produced the international exhibition *Endless Forms: Charles Darwin, Natural Science, and the Visual Arts* (2009).

### **James Besancon**

*Professor of Geosciences*

His recent work has been on the development of modal analysis of complex mixtures (rocks) by x-ray diffractometry, and the analysis of soils and sediments polluted by mine waste and by naturally occurring arsenic. He also uses a field-portable x-ray fluorescence spectrometer to measure trace elements *in situ* in fine-grained rocks, especially zirconium abundances which are important in locating optimal samples for radiometric dating.

### **Dan Brabander**

*Professor of Geosciences*

His current research focus is environmental geochemistry and the quantification of biogeochemical processes in watersheds, aquifers, and in the urban environment.

Applications include bioremediation, environmental biomonitoring, fate and transport of contaminants (toxic metals) in watershed and aquifer systems, isotopic dating and mapping of contaminants within sediments and soils, and sustainable urban agriculture.

### **Kate Brogan**

*Professor of English*

Her book, *Cultural Haunting: Ghosts and Ethnicity in Recent American Fiction*, examines how ghost stories in ethnic literature reflect the way shared group histories are recalled and reshaped. She is now working on a study of how cities are depicted in American literature and art.

### **John Cameron**

*Professor of Biological Sciences*

His research focuses on the environmental physiology of cold-blooded animals. Many fish, reptiles and amphibians can withstand prolonged exposure to environmental conditions that would prove lethal to mammals. He uses physiological and molecular techniques to characterize alterations in ion channel activity and gene expression in the heart that might underlie tolerance of environmental extremes. His long-time focus has been an ion channel found in the hearts of all vertebrate that is increasingly active as oxygen levels (and ATP synthesis) are reduced—the ATP-sensitive K<sup>+</sup> channel. He is currently involved in a project aimed at characterizing alterations in gene expression that accompany acclimation to low oxygen in goldfish and zebrafish.

### **Flick Coleman**

*Professor of Chemistry*

His research interests are in computational chemistry including electronic structure calculations of small and medium sized molecules including PAHs and other environmentally problematic species. Recently he has decided to reinvent himself as a theoretician and has embarked on a research program involving quantum mechanical calculations on medium-sized molecules of chemical, biochemical and environmental interest. He has spent more than twenty years developing and disseminating applications of computers and the Internet in chemical education.

### **Beth DeSombre**

*Professor of Environmental Studies*

Her main focus is international environmental politics and law, especially problems of the global commons. She works especially on issues of the global commons, such as the oceans and atmosphere. Her recent projects address environmental, safety, and labor standards on ships, and the functioning of global environmental institutions generally.

### **Nolan Flynn**

*Professor of Chemistry*

His avenue of work is with hydrogels, which are water-loving polymers. His research group, along with many others around the world, is investigating engineered hydrogels for use in removing contaminants from water and controlling the rate of drug delivery.

## **Alden Griffith**

*Professor of Environmental Studies*

His research interests in plant ecology include invasive species, plant-plant facilitation, and the effects of climate change. Recently, he has examined issues of communication and misconceptions in climate change science, making this work available to the public at [www.fool-me-once.com](http://www.fool-me-once.com).

## **Bunny Harvey**

*Professor of Art*

Bunny Harvey is an internationally known painter whose most recent work is a series of large semi-abstract landscapes. These works are a natural continuation of a 30-year pursuit of the visual possibilities inherent in combining her interests in archaeology, the philosophy of time, cosmology and the silent world of particle physics. The landscape is a resting place where these interests collide.

## **Thomas Hodge**

*Professor of Russian*

*Hunting Nature: Ivan Turgenev and the Organic World* provides a carefully contextualized environmentalist perspective on the work of one of Russia's most important nineteenth-century writers: Ivan Sergeevich Turgenev (1818-83). Chapters are devoted to Turgenev's immersion in nineteenth-century hunting; the way his writing resembled his approach to field sport; his lifelong search for what he viewed as a "nest"; his expert use of natural symbols and signs; his projection of social and philosophical debates onto the natural world; and his anguished application of natural predation and hunting ethics to the end of his own life.

## **Kristina Jones**

*Professor of Biological Sciences*

Her primary research and teaching interests are plant ecology, particularly plant-animal interactions, conservation biology, and speciation. Overseeing the botanic gardens has meant new interests in invasive species management, wetland restoration, and greenhouse management.

## **Anastasia Karakasidou**

*Professor of Anthropology*

Professor Karakasidou has been involved in the study of chemical pollution, the vulnerable human body and cancer as a disease of modernity. She has been conducting a cross-cultural study on discourses of cancer by exploring different cultural understandings of the disease and examining its narration and imagery in three diverse settings: the United States, Greece, and China.

## **Pinar Keskin**

*Professor of Economics*

A central theme of her research is the use of various geographical and historical settings, ranging from early twentieth century United States to contemporary India, to study the determinants and consequences of water access, specifically the response of economic agents to changes in water availability. She has focused her research agenda on a number of

topics: the value of groundwater access in agricultural production, and how it differ under different climate scenarios; the role socioeconomic status and ethnic identity play in determining access to water resources; the power of well-designed policy interventions, such as gender or caste quotas, to facilitate access to public water resources; and the potential to mitigate the spread of water-borne diseases by improving access to high-quality water sources.

### **Julie Matthaei**

*Professor of Economics*

She published *Solidarity Economy: Building Alternatives for People and Planet* (Changemaker Publishing, 2008). She defines herself as a feminist, Marxist, anti-racist, ecological economist, and sees her vocation as helping students think critically and creatively about economics, and find their paths, as well as assisting the development of the economy in a progressive, liberatory, and spiritual direction.

### **Heather Mattila**

*Professor of Biological Sciences*

Her research focuses on the mechanisms that create organization in social insect colonies. Her study subject is the honey bee, one of the most important insects on the planet. Not only do honey bees add enormous value to the crops that we produce through their pollination services, but they also serve as an important model organism for understanding how genetic and environmental influences can act on individuals to produce group-level phenomena.

### **Marianne Moore**

*Professor of Biological Sciences*

Marianne specializes in aquatic ecology, and studies ecological processes at the community and population scale in lakes, streams, and coastal waters. She works with plankton communities and fish, and her current work focuses on how artificial night lighting affects the movements, behavior and predator-prey interactions of zooplankton and fish. Her additional research interests include aquatic food webs, disturbance ecology, and urban ecology.

### **Craig Murphy**

*Professor of Political Science*

His other current project focuses on world politics in the transition from the agricultural era to the industrial age and from the state and state-systems to global governance. The project is outlined in "Agriculture, Industry, Empire, and America," his part of the Social Science Research Council study, *Lessons of Empire* (New Press 2006).

### **Robert Paarlberg**

*Professor of Political Science*

His principal research interests are international agricultural and environmental policy. Most recently, his work has focused on the regulation of modern technology, including biotechnology.

## **Nikhil Rao**

*Professor of History*

His current project investigates the formation of suburbs and suburban communities in late colonial Bombay. He's also interested in the comparative study of cities, in social theory, and in ideas of economic development in 20th century south Asia.

## **Nick Rodenhouse**

*Professor of Biological Sciences*

His research focuses on population ecology, particularly the demography and ecology of migratory songbirds. He has worked for more than 20 years on research at the Hubbard Brook Research Foundation, the site of one of the longest running and most comprehensive ecosystem studies in the world.

## **Andrea Sequeira**

*Professor of Biological Sciences*

Her research draws on molecular biology and biogeographical information to explore the ecological historical forces responsible for speciation in plant feeding insects.

## **Filomina Steady**

*Professor of Africana Studies*

Her research interests include the intersection of gender, race, and socially-constructed categories and continuing effects of the legacy of colonialism through corporate globalization and international financial institutions. Her books, monographs and articles include the award-winning *The Black Woman Cross-Culturally*. Her most recent book is *Women and Collective Action in Africa*. Her current research, which is funded by the Ford Foundation, is on women and leadership in West Africa.

## **Jay Turner**

*Professor of Environmental Studies*

His work focuses on the recent history of American environmental politics and policy, with a particular interest in debates over the public lands, the role of science in environmental decision-making, and the connections between environmental politics and American politics.