



OARDC



Supplementing Your College Education- Planning a Successful Program

By: Samy Sekar

I became an environmental science major, because I wanted to learn how to combat climate change, land degradation, and pollution. The Ohio State University School of Environment and Natural Resources does an excellent job of providing a portion of that education in the classroom, but as complex as these environmental challenges are, I recognized the importance of learning how people were already addressing these issues outside of the academic setting.

When I first arrived on campus, I was immediately drawn into the campus democratic campaign for the 2008 elections. Of course, politics isn't for everyone and is a bit of a stretch from the actual application of environmental science, but it is always relevant.



Politics – local, state, federal, and international dictate the type of environmental policies that are made. Thus, being involved in politics is certainly one valuable perspective into how the outside world approaches environmental issues. For example, as a canvasser on the 2010 campaign to re-elect governor Strickland, my job was to go door to door, talking to community members about what issues they thought were important in the campaign.

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Rarely did the environment make it to the list, but “green jobs” did consistently. Whether one is going into business, a government agency, or academia, understanding politics can be extremely beneficial to communicating the potential to leverage environmental challenges to make a profit or change in society. Continue Page 2....

Successful Program Continued....

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By: Samy Sekar

Later that year I applied for a position as intern for State Representative Ted Celeste of the 24th district of Ohio. Rep. Celeste was the chairman of the alternative energy committee, and I met him at a college Democrats mixer set up for students to find internships with local political leaders. I took this internship, because alternative energy is and will continue to be a major part of our discussion about combating climate change, and my curriculum at school would not be covering energy or energy policy. I spent a little over two years interning for Rep. Celeste, and the knowledge of state government and research experience that I acquired have already been valuable in other positions I've held and even during my graduate coursework.



President Obama, Samy Sekar and Mrs. Obama

On-campus involvement in student organizations has also been an important aspect of my student career. Again, I found myself strategically thinking about the skills that I was yet to gain from school or my other extracurricular activities, and though I had worked in state government (and had a federal government internship previously), I had very little experience in the non-governmental organization (NGO) realm. So, I began volunteering for the Association for India's Development (AID), which raises money in the United States and, after a rigorous review process, funds grassroots initiatives in India

focused on issues such as community empowerment, poverty alleviation, and the environment. As treasurer of AID Columbus, I've learned about the inner-workings of a non-profit NGO and the elements of successful grassroots projects.

Another piece of the puzzle (of a holistic education) is learning how to rally students around important issues such as the environment. As a future environmental scientist or policymaker, I knew it was...Continue page 3...

Successful Program Continued....

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By: Samy Sekar

Continued from page 2...important for me to be aware of the most effective ways to engage the public in environmental discourse and activism. I've worked with several different student groups and student-led initiatives to build these skills, one of which, the Progressive Coalition, I helped found. Overall my experience in public outreach, I believe, has been invaluable in preparing me to communicate the relevance of various social issues to people's lives.

I have filled a few of my summers with internships – two with government agencies and one with a non-governmental non-profit. Personally, internships have served three main purposes: they have given me insight into various professions and helped me determine my compatibility in those fields; they have provided me with recommendations for other internships and scholarship opportunities; and they have allowed me to experience the 40-hour a week desk job, convincing me to stay in school as long as possible! While my internships have not always been exceptionally educational or hands-on, I am convinced that they do in fact function as a stepping-stone to future jobs or clarify one's path to advanced degrees.

The final component of my extracurricular education has been my research project. I have been interested in traveling to a developing country for my research for quite some time, and during my 2nd year at OSU I learned about bio-char in a climate change class. Bio-char was and still is a complicated, confounding material that needed more research, so I realized this was an opening for me to set up a research project in conjunction with an NGO in India. It was certainly overwhelming and tedious at times to acquire the land, manpower, experimental equipment, and technical resources necessary to run the experiment 10,000 miles away. However, designing and conducting an experiment requires independence, perseverance, and analytical skills that helped me determine whether I had the dedication necessary to pursue a career as a scientist.

There are several caveats and qualifications to the case that I have made above. For example, many graduate programs are designed to be highly time-consuming, making most extra-curricular activities impossible. Another disclaimer would be that all of these supplemental activities should not be attempted simultaneously, because the result is highly ineffective and disappointing. However, I do believe that a complete undergraduate or graduate experience entails finding relevant educational opportunities outside of the classroom or lab. What often restricts students from actively participating in a student organization, acquiring an internship, or being involved in research is not their lack of ability or time, but a lack of recognition that all of these experiences will help clarify and achieve their post-graduate goals. Having a career plan and job connections is not a pre-requisite to pursuing a holistic university experience, but a result of it.



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New to C-MASC

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Post Docs



Dr. Catherine Bonin

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I'm from Waukesha, WI and got my B.S. in biology and M.S. in botany from the University of Wisconsin. In 2011, I received my Ph.D. from Virginia Tech, where my work focused on agroecology and I studied how native grasses may serve as forage and biofuel. I began my postdoc at CMASC in June 2011 under Dr. Rattan Lal. As a postdoc, I am continuing my studies of biofuels and am interested in the carbon and energy balances of biofuel systems, as well as the potential to use native perennials as feedstock.



Dr. Mostafa Ibrahim

Post Doc
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I am Mostafa Ibrahim. I am originally from Egypt. I received my PhD degree in Soil Science within the Agronomy Department at Iowa State University in summer 2011. My research interest is in soil genesis and geomorphology, Pedology. Also, I am interested in GIS, clay mineralogy and soil chemistry as well as Laboratory Methodology. I joined the CMASC on August 1st, 2011 as a Postdoctoral Researcher with Dr. Rattan Lal. My duties are investigating the relationship between drainage systems, closed and open, and carbon sequestration. Also, I will write proposals to get grants for research, analyze soil samples, help both graduate and undergraduate students in their research.

Visiting Scholars

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New to C-MASC



Dr. Mingsheng Fan

Associated Professor

July 5-Oct 18 , 2011

College of Resources and Environmental Sciences
China Agricultural University
No.2 Yuanmingyuan West Road, Haidian District,
Beijing 100193, China
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Role at C-CMASC

Guest lecturer, August 5, 2011

“The Soil Quality Basis of Chinese Green Revolution”

My research interests include:

- (1) agricultural management options (e.g., carbon, nitrogen, tillage, and water) towards sustainable cropping systems,
- (2) and the feedbacks between management options, global change (e.g., climate change), and biogeochemical cycling.

I am working with Prof. Rattan Lal at CMSC, OSU through synthesizing lots of data to evaluate soil quality trend and its significance in generating past growth in productivity in China, and explore how improved soil quality can help China, also developing world meet its food needs with higher resource use efficiency and environment protection in the twenty-first century.

Visiting Scholars

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New to C-MASC



Dr. Jennifer Dungait

Rothamsted Centre for Soils
and Ecosystem Function

North Wyke Research, Okehampton, Devon, UK

June 24-July 2, 2011

Contact: jennifer.dungait@rothamsted.ac.uk

- BSc in Environmental Science (University of London (Birkbeck College))
- MSc in Crop Protection (Univ. of Bath, Long Ashton Research Station)
- PhD in Organic Chemistry (Univ. of Bristol)

Role at C-MASC

Guest lecturer, July 1, 2011

“Carbon Movement in Erosional Landscapes”

Dr. Dungait will C-MASC for 6-months in 2012.

Dr Jennifer Dungait is a biogeochemist working in the BBSRC Institute Rothamsted Research in the Sustainable Soil Function programme which addresses contemporary questions on climate change and food security. JD is a specialist in the application of compound-specific stable isotope techniques in ecological and agricultural research. Her research involves tracing soil carbon in soils at scales from the rhizosphere to the field scale using biomarker and stable isotope approaches, with the aim of distinguishing between organic molecules from specific sources (e.g. plants versus animals versus micro-organisms) in soil, and determining the flux of compounds through pools with varying mean residence times. This research underpins strategies to manage and improve soil quality, to mitigate greenhouse gas emissions and improve environmentally benign agricultural productivity. JD is a member of the BSSS Council, Chair of the BSSS South-West England Soils Discussion Group and Editorial Board member of Biology and Fertility of Soils journal. Research Themes: (i) challenging concepts of recalcitrance in soils, (ii) biomarker applications to explore soil C dynamics, and (iii) soil microbial biomass activity and decomposition.

Visiting Scholars

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Ms. Olga Vilmundardottir
University of Iceland
Contact: okv2@hi.is

Olga, a Ph.D. student from the University of Iceland, was at OSU for an academic school year from September 2010 until June 2011, joined by her husband and one year old daughter. She was enrolled as a full time student at OSU, and attended ENR 671 and ENR 871 classes. She conducted analyses of soil samples she obtained from the Skaftafell glacier in summer of 2010 with three OSU graduate students. She will complete the remainder of her Ph.D. program at the University of Iceland.

Olga received her M.Sc. in Physical Geography from the University of Iceland. She is a Ph.D. student at the University of Iceland, and is a visiting student at SENR from Autumn 2010 to Spring 2011. Her field of study is soil development in front of retreating glaciers, Iceland.



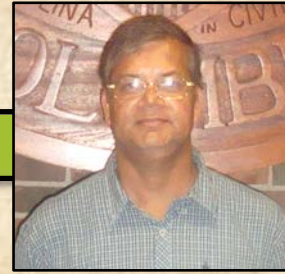
Dr. Gudrun Gisladdottir
University of Iceland
Contact: ggisla@hi.is

Prof. Gudrun Gisladdottir of the University of Iceland visited C-MASC for one week from May 25-June 1, 2011. The purpose of her visit was to:

- (i) Conduct M.Sc examination for Melissa Herman,
- (ii) Review the research progress of Olga Vilmundardottir,
- (iii) Discuss the dual degree program between OSU and University of Iceland,
- (iv) Plan the visit of President Gee to University of Iceland, and
- (v) Discuss the collaboration between C-MASC and the University of Iceland.

Visiting Scholars

Summary of Study



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DR SUBHENDU ADHIKARI

April 15, 2011- July 17, 2011

- **Study conducted at CMASC:** Carbon sequestration in fishponds, croplands and forest soils of Piketon, Ohio.
- **Writings accomplished:** In three months, I have completed two research articles on carbon sequestration in different aquaculture systems and carbon footprint of aquaculture in eastern India.
- **Field work conducted:** I surveyed fish ponds, croplands and forest land in Piketon, Ohio. Soil samples were collected from four sites of a pond, three sites of a crop land area, three sites of forest land, and four sites of a controlled pond (without any fish culture and management practices). As the same management practices are followed for the ponds, soil samples were collected from the four ponds. The averages age of the pond is 20 years and the culture practices are being done since last 10 years.
- **Lab analysis techniques learned:** Soil aggregates analysis by wet sieving method and soil C, N analysis by CN Analyzer, calculation of soil carbon sequestration, collection and calculation of gases from the ponds/wetland, calculation of carbon footprint.
- **How this experience supports your career:** In India, I will work on the potentialities of aquaculture ponds in carbon sequestration. This training program will be of immense help in this regard.
- **Future collaborations:** I am very much interested to collaborate with CMASC in future for working with carbon sequestration by fish ponds and other aquatic bodies and mitigation of global warming.



Visiting Scholars

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Summary of Study

Aweke M. Gelaw

August 2010- July 2011

August 2010 to December 2010:

- Soil samples from Ethiopia brought to C-MASC for analyzing the carbon pool in relation to the farming systems. Predominant farming systems involved rainfed agriculture, irrigated crop production, agroforestry with *Acacia faidherbia*.



January 2011 to March 2011:

- In addition to the laboratory work I attended two classes (ENR 671 and ENR 871) and also visited the North Application Experimental Watershed at Coshocton, Ohio.

From April 2011 to July 11:

- Having finished the remaining soil organic carbon and total nitrogen analyses, visited long term no-till and other experiments at OARDC research sites but took no samples here
- I conducted data compilation and statistical analysis using the SAS software
- Started writing the following two journal articles from the data I analyzed here:
 - Soil Organic Carbon and Total Nitrogen Stocks in different Land uses in Tigray, northern Ethiopia
 - Soil Aggregate- and Particle-Associated Organic Carbon and Nitrogen pools under Different Land Uses in Tigray, Northern Ethiopia

The experience I gained here while working in the laboratory, attending classes and visiting research fields will have paramount importance for my future career as a teaching and research staff at my university back home, Ethiopia. I will share these experiences with my students and colleagues. I have also developed an interest in no-till practices and hopefully start and experiment after finishing my PhD study in Norway. In the future, I will be interested to have a strong collaboration with The Ohio State University, particularly, CMASC in the field of Soils and Environment.



O-H-I-O!
From Left to Right:
A. Gelaw,
M. Fan, S. Adhikari,
and R. Lal

The C-MASC is cooperating with the Institute of Advanced Sustainability Studies (IASS), in Potsdam Germany. Both IASS and C-MASC have organized two workshops (March and May, 2011), and another is planned for October 2011. The workshop in May concluded the following:

RECOMMENDATIONS FOR POLICY MAKERS

The workshop entitled “Recarbonization of the Biosphere” was sponsored by the Institute of Advanced Sustainability Studies (IASS), and held in Potsdam, Germany from 20-23 March 2011. It was attended by about 30 participants from Germany, USA, Australia, Italy, France, China representing soil science, forestry, climatology, sociology, and political sciences along with policy makers and media representatives. Specific recommendations for the policy makers emerging from the deliberations include the following:

- I. Land-Based Carbon Sinks:** Priority ecosystems with large C stocks which must be protected and sustainably managed are: permafrost, wetlands, peatlands, tropical rainforests, tropical savannas, urban lands, degraded or desertified lands, and agricultural lands.
- II. C Sink Capacity Management:** The C sink capacity of land-based sinks are continuous, and require long-term management and protection strategy because it grows with a progressive improvement in ecosystem health.
- III. Ecosystem Services and Co-Benefits of Land-Based C Sinks:** Protecting and enhancing land-based sinks generate numerous ecosystem services. Important among these are:
 - Food security,
 - Quality and quantity of renewable fresh water resources,
 - Adaptation and mitigation to climate change, and
 - Biodiversity
- IV. A Global Instrument of Soil Protection:** The key roles in advancing food security and providing numerous co-benefits and ecosystems services of vital significance to humanity necessitate identification, nurturing and support of an organization with primary focus on sustainable management and protection of world soils.

Tokyo Scientists Visit C-MASC

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June 19-26, 2011

Dr. Rattan Lal (OSU) and Dr. Takashi Kosaki from Tokyo Metropolitan University (TMU) enjoyed their meeting and conversation on June 20, 2011. Dr. Kosaki and Dr. Kazumichi Fujii of the Forestry and Forest Products Research Institute (FFRPI) visited CMASC as a starting place of their tour, Soil Survey Tourism, spanning 1,300 miles through Coshocton, OH, Blacksburg, VA and Raleigh, NC. Their friendship started in 1982, the first year of Dr. Kosaki's career at International Institute of Tropical Agriculture (IITA) in Nigeria. They discussed their common colleagues in IITA, life in Africa, Japan as well as in Ohio. Pleasant hours fly fast. They promised to meet again at the annual meeting of Japanese Society of Soil Science and Plant Nutrition, which will be held at Tsukuba, Japan in August 2011.



Left to Right: Dr. Kazumichi Fujii (FFPRI, Tokyo), Dr. Rattan Lal (OSU), Dr. Takashi Kosaki (TMU), and Dr. Atsu Kadono (OSU).

July 14, 2011



Delegations from OSU and University of Iceland
Center: Dr. Kristín Ingólfssdóttir, Rector, University of Iceland (pointing) and Prof. Gordon Gee (OSU)

President E. Gee and his entourage comprising of faculty and officials from The Ohio State University traveled to Reykjavik, Iceland in July 2011 to discuss potential joint collaborations with University of Iceland on student and scientific exchange. The parties signed a MOU on initiating a dual degree program. This collaboration has been in the making since 2006.

Australian Visitors

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August 23-24, 2011

A group of about 20 practitioners of conservation agriculture from NSW, Australia are scheduled to visit Ohio for two half days in August (23rd in the afternoon and 24th in the morning). They are travelling to Ohio from Chicago and continuing to Kentucky by a private bus. The group consists of conservation farmers, extension agents, and scientists. Their goal is to visit farms using conservation tillage (no-till farming) and controlled traffic (precision tillage) from Colorado to Tennessee, including Illinois, Ohio and Kentucky. The program coordinator, Andrea Kotch, is a project manager of the “Soil Carbon Initiative” of the United States Studies Center of the University of Sydney.

Objective of the Visit:

1. Learn from the practical experiences of the farmers practicing conservation agriculture about its potential and challenges,
2. Understand the impact of conservation agriculture on soil carbon storage, and the net ecosystem C budget,
3. Explore the options of trading carbon credits, and
4. Exchange information and experiences with regard to soil carbon sequestration by conservation agriculture.

Expected Output:

1. Contacts and cooperation with the United States Studies Center on soil carbon sequestration.
2. Establish joint programs including scientific exchange and graduate students between the University of Sydney and OSU.
3. Cooperate on the establishment of Global Soil Forum.
4. Participation in seminar and workshops.



Forthcoming Meetings

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October 16-19, 2011



**Fundamental for Life:
Soil, Crop, & Environmental Sciences**

2011 INTERNATIONAL ANNUAL MEETINGS
October 16–19, San Antonio, Texas

American Society of Agronomy
Crop Science Society of America
Soil Science Society of America

in conjunction with the Canadian Society of Soil Science

Forthcoming Meetings

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Oct. 26-28, 2011

Carbon Sequestration and Ecosystem Services Institute for Advanced Sustainability Studies (IASS) Potsdam, Germany

The C-MASC is cooperating with the Institute of Advanced Sustainability Studies (IASS), in Potsdam Germany. Participants from Australia, Austria, Canada, China, Germany, Kenya, Netherlands, South Africa, Sweden, Thailand, United Kingdom, USA representing agricultural, biological, business, economic, forest, and soil sciences along with policy makers media representatives will attend. The focus of the workshop is on enhancing provisioning, regulating, cultural, and supporting ecosystem services depending on ecosystem carbon pools.

Renowned scientists are invited to discuss how the restoration of the ecosystem C (and especially soil C) pools may enhance ecosystem services with specific reference to agronomic production and food security, use efficiency of inputs, water quality, biodiversity etc. The focus is on enhancing ecosystem services. The results obtained will contribute to an improved understanding of short- and long-term impacts of current land use and adaptability to abrupt climate change, disposal of wastes, chemical fertilization, genetically modified organisms, conflicting interests with regard to food and energy production and enhanced soil sealing (urbanization) rates. The human dimensions issues (i.e., food security, access to land and water) and payments for enhancing ecosystem services will be deliberated. Topics to be discussed are:

- Biodiversity of Recarbonized Ecosystems
- Provisioning Ecosystem Services in a Recarbonized Biosphere
- Regulating Ecosystem Services in a Recarbonized Biosphere
- Cultural Ecosystem Services in a Recarbonized Biosphere
- Supporting Ecosystem Services in a Recarbonized Biosphere
- Ecosystem Economics in a Recarbonized Biosphere
- Land Use Management and Policy in a Recarbonized Biosphere
- Value of Ecosystem Services in a Recarbonized Biosphere



Kleist Villa
Potsdam, Germany
Home of IASS