



URBAN ADAPTATION TO CLIMATE CHANGE: RESILIENT CITIES

COLLABORATIVE FIELD COURSE IN THE USA



January 6th to 18th, 2014

Cambridge, Boston & New York

Academic Host Institutions



**School of Engineering &
Applied Sciences
(SEAS)**



**Escola Politécnica da
Universidade de São Paulo
(Poli-USP)**



HARVARD UNIVERSITY
David Rockefeller Center
for Latin American Studies

**David Rockefeller Center for
Latin American Studies
(DRCLAS)**

Field Sites & Collaborating Institutions

- ❖ Added Value & Red Hook Community;
- ❖ Beth Israel Deaconess Medical Center;
- ❖ Center for Health and the Global Environment;
- ❖ EnerNOC;
- ❖ Exuma Lab;
- ❖ Harvard Graduate School of Design;
- ❖ Harvard Innovation Lab;
- ❖ Harvard School of Public Health;
- ❖ MWRA's Deer Island Sewage Treatment Plant;
- ❖ NYC Office of Emergency Management;
- ❖ NYC Mayor's Office of Long-term Planning & Sustainability;
- ❖ NYC Metropolitan Transportation Authority;
- ❖ Regional Plan Association;
- ❖ Stephen M. Lawlor Medical Intelligence Center;
- ❖ Zofnas Program for Sustainable Infrastructure;
- ❖ 9/11 Memorial.

Support

**In addition to the support of the academic host institutions,
this collaborative course was made possible thanks to the generosity of Claudio Haddad,
Fundação Centro Tecnológico de Hidráulica, and the Lemann Family Endowment.**

<http://brazil.drclas.harvard.edu>

Dear Participants (*Caros Participantes*),

Welcome to the fifth edition of the Harvard/Poli-USP collaborative environmental engineering field course! This initiative is a joint effort of Harvard University's School of Engineering and Applied Sciences (SEAS), the Universidade de São Paulo's Escola Politécnica (Poli-USP) and the Brazil Office of Harvard's David Rockefeller Center for Latin American Studies (DRCLAS). Following last year's course in Brazil, we are excited to host our USP colleagues in Cambridge, Boston and New York City.

The January 2014 course focuses on, "Urban Adaptation to Climate Change: Resilient Cities." It has a strong urban planning component that calls on the experiences of professors from the Harvard Graduate School of Design (GSD), the Harvard School of Public Health and the Harvard Kennedy School. Core faculty includes world-class climate scientists, engineers and urban planners. Our experience will be enriched by guest lecturers from the Boston Harbor Association, Beth Israel Deaconess Medical Center (BIDMC), Massachusetts Institute of Technology (MIT), The Canary Project, the New York City Department of City Planning, the Mayor's Office of Long-Term Planning and Sustainability, the NYC Metropolitan Transportation Authority, the Regional Plan Association, the NYC Office of Emergency Management and the founders of Added Value, a non-profit organization promoting sustainable development of the Red Hook neighborhood of Brooklyn, which was severely damaged by Superstorm Sandy.

During our time in Cambridge and Boston, we will visit the Zofnass Program for Sustainable Infrastructure at the GSD, the Stephen M. Lawlor Medical Intelligence Center at BIDMC, the Harvard Innovation Lab (i-lab), the Deer Island Sewage Treatment Plant and EnerNOC, a leading provider of energy management equipment. In New York City, we will visit the 9/11 Memorial immediately after learning about the design process from its chief architect. Present and past leaders from São Paulo's Secretary of Urban Development will be with us at Harvard and in New York.

While the majority of the course's 29 students (15 from Poli-USP and 14 from Harvard) are undergraduates in engineering, the group includes three Ph.D. candidates in engineering sciences and seven students pursuing degrees or joint-degrees in urban planning. We are happy to welcome back four participants who joined last year's program in Brazil and to have a diverse group, including participants originally from Argentina, Brazil, China, Mexico, Sweden, the United States and Zimbabwe.

To all who contributed to the creation and execution of this collaborative field course, please know that we are deeply grateful. This initiative would not have been possible without the vision and support of many individuals and institutions in Brazil and the United States. We appreciate the ongoing engagement and support of the Deans of Poli-USP and SEAS. Thanks are also due to professors who are not able to join us this year but who continue to strengthen the broader Harvard-USP collaboration by hosting students and researchers in their labs. Finally, we would like to express our sincere appreciation to Claudio Haddad, the Fundação Centro Tecnológico de Hidráulica, and the Lemann Family for their support. *Muito obrigado!*

Grande abraço,



Monica Porto

Full Professor and Chair, Department of Hydraulic and Sanitary Engineering, Escola Politécnica da Universidade de São Paulo (Poli-USP)



Steven Wofsy

Abbott Lawrence Rotch Professor of Atmospheric and Environmental Science, Harvard School of Engineering and Applied Sciences (SEAS)



Jason Dyett

Director, Brazil Office Harvard University David Rockefeller Center for Latin American Studies (DRCLAS)

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ACADEMIC HOST INSTITUTIONS

HARVARD'S SCHOOL OF ENGINEERING AND APPLIED SCIENCES

Harvard University's School of Engineering and Applied Sciences (SEAS) serves as the connector and integrator of the University's teaching and research efforts in engineering, applied sciences, and technology. Its core tenets are educating broad-minded students; interdisciplinary research; integration across disciplines; and balancing theory, experimentation, and practice. SEAS offers undergraduate concentrations in Applied Mathematics, Biomedical Engineering, Computer Science, Electrical Engineering, Engineering Sciences, and Mechanical Engineering and graduate programs (S.M., M.E., and Ph.D.). Graduate students may work towards a Master's of Science (S.M.), Master's of Engineering (M.E.), and Doctor of Philosophy (Ph.D.) degree in Applied Mathematics, Applied Physics, Computational Science and Engineering, Computer Science, Bioengineering, Electrical Engineering, Environmental Science and Engineering, Mechanical Engineering (including a Materials Science track), and Secondary Field in Computational Science and Engineering (as part of the Ph.D.). Faculty number approximately seventy who have particularly close ties with the departments of Physics, Earth and Planetary Science, and Chemistry and Chemical Biology. Over the past decade, undergraduate enrollments in Applied Mathematics, Computer Science, and Engineering Sciences have ranged from 300 to over 500. For additional information, please see: www.seas.harvard.edu.

ESCOLA POLITÉCNICA DA UNIVERSIDADE DE SÃO PAULO

The University of São Paulo (USP) is the largest institution dedicated to higher education and research in Brazil, with nearly 90,000 students. It is highly acclaimed around the world, especially in Latin America, and is responsible for training a large part of Brazilian academics working in colleges, universities and research institutes. USP is a public university, free of charge and with open access for students selected by the *vestibular* (Brazilian admissions exam for universities). It is composed of 48 educational and research units, five hospitals, five museums, five specialized institutes, multiple experimental laboratories as well as scientific and cultural centers spread across seven campus locations. The primary campus in metropolitan São Paulo houses the Escola Politécnica (Poli-USP), which has fifteen departments and over 100 laboratories. Founded in 1893, the Poli was incorporated into the Universidade de São Paulo in 1934. Poli-USP has ~340 full time faculty and offers undergraduate (~4,600 students), master's, doctoral (~1,600 students) courses and degrees. For additional information, please see: www.poli.usp.br.

HARVARD'S DAVID ROCKEFELLER CENTER FOR LATIN AMERICAN STUDIES

The David Rockefeller Center for Latin American Studies (DRCLAS) is one of 11 inter-faculty initiatives at Harvard University and is overseen by the Office of the University Provost, with an administrative home in the Faculty of Arts and Sciences (FAS). DRCLAS was founded in 1994 as an initiative to promote high-quality teaching and research on Latin America and related fields at Harvard University. The mission of the DRCLAS Brazil Office in São Paulo and Brazil Studies Program in Cambridge is to enhance collaborative research among Harvard faculty and their Brazilian counterparts; encourage faculty engagement with Brazil and student participation in language programs, internships and research projects in Brazil; and provide a hospitable environment for Brazilians at Harvard and for Harvard scholars in Brazil. Since the launch of the Brazil Office in June 2006, more than four hundred Harvard faculty and students have engaged in and with the country across a range of disciplines with support or involvement of the Office. For additional information, please see: brazil.drclas.harvard.edu.

COURSE SCHEDULE – JANUARY 2014

Sunday, January 5th – Cambridge

- Morning & Afternoon** **International student arrivals** – *Harvard's David Rockefeller Center for Latin American Studies (DRCLAS) Brazil Office staff will greet USP participants at Boston Logan International Airport (BOS) arrivals area.*
- 5:00 pm** **Hotel check-in for all participants.**
(Brazilian and Harvard students will be paired in double occupancy rooms).
The Sheraton Commander Hotel
- 7:30 pm** **Welcome dinner and Presentation: Globalization and the Role of Engineering in Addressing Societal Grand Challenges.**
Venkatesh “Venky” Narayanamurti, Director of the Science, Technology and Public Policy Program, Harvard Kennedy School (HKS);
Benjamin Peirce Professor of Technology and Public Policy and a Professor of Physics at Harvard University.

Monday, January 6th – Cambridge

- 8:30 am** **Depart** hotel for School of Engineering and Applied Sciences.
- 9:00 – 10:15 am** **Welcome and Collaborative Course Introductions and Overview.**
Cherry Murray, Dean, John A. and Elizabeth S. Armstrong Professor of Engineering and Applied Sciences, SEAS, Harvard University. Each student briefly introduces herself/himself. Jason Dyett provides overview of what to expect in the next two weeks; Professors Monica Porto and Steven Wofsy briefly explain teaching and learning objectives for the course.
- 10:15 – 11:45 am** **Lecture & Discussion: Physics-Based Assessment of Hurricane and Storm Surge Risk.**
Kerry Emanuel, Cecil and Ida Green Professor of Atmospheric Science, Massachusetts Institute of Technology.
- 11:45 am – 1:00 pm** **Harvard College Campus Orientation and Walk to Hi-Lab.**
This tour will focus on general orientation to Cambridge.
Brazilian students will stop by the Harvard International Office at 12:15pm.
- 1:00 – 2:30 pm** **Group lunch with Gordon Jones, Harvard Innovation Lab.**
Short talk on what the Hi-Lab is focused on supporting at Harvard.
- 2:30 – 4:00 pm** **Lecture & Discussion: Air Quality, Greenhouse Gases, and Public Health in the Urban Setting.**
Steven Wofsy, Abbott Lawrence Rotch Professor of Atmospheric and Environmental Science, SEAS, Harvard University.
- 4:00 – 5:30 pm** **Visit to SEAS Labs** (walking tour in smaller groups).
Wofsy-Munger Group on Biosphere-Atmosphere Exchange, Martin’s Environmental Chemistry, and Vecitis’ Environmental Technology Labs.
- 5:30 pm** **Return** to hotel.

Evening **Free.** Students encouraged to get to know other members of their groups.

Tuesday, January 7th – Cambridge

8:30 am **Depart hotel** for Graduate School of Design.

9:00 – 10:30 am **Lecture & Discussion: Ecology and Sustainability.**
Gareth Doherty, Lecturer in Landscape Architecture and Urban Planning and Design, GSD, Harvard University.

10:45 am – 12:15 pm **Workshop: Water Resources and Consumption in Exuma,** Abner Calixter. **Exuma Water’s Vulnerabilities,** Lindsay Woodson. This multi-year ecological planning project is a collaboration between the Government of The Bahamas, the Bahamas National Trust, and Harvard University Graduate School of Design. The goal is to facilitate the design and management of a more sustainable future for the Exuma archipelago, and The Bahamas more generally.

12:15 – 1:00 pm **Tour of GSD Design Studio Space.**
Led by GSD students participating in the course.

1:00 pm **Lunch** at DRCLAS.
Afternoon lectures will be held at the Harvard Graduate School of Design.

2:30 – 4:00 pm **Lecture & Discussion: Sustainable Urban Development of São Paulo: Challenges, Opportunities and Long-term Planning.**
Miguel Bucalem, Full Professor, Department of Geotechnical and Structural Engineering, Escola Politécnica da Universidade de São Paulo; Former Secretary of Planning of the City of São Paulo.

4:30 – 5:30 pm **Lecture: Zofnass Program for Sustainable Infrastructure.**
The ZPSI mission is to develop and promote methods and tools that help quantify the sustainability of infrastructure, facilitate the adoption of sustainable solutions, and expand the body of knowledge regarding sustainable infrastructure.

Evening **Free.** Students encouraged to get to know other members of their groups.

Wednesday, January 8th – Cambridge

8:30 am **Depart hotel** for School of Engineering and Applied Sciences.

9:00 – 10:30 am **Lecture & Discussion: Campus Energy Master Planning: A Road Map to Carbon Neutral Institutions – United States Northeast Region.**
Shirine Boulos, Principal Architect at Ellenzweig.

10:45 am – 12:15 pm **Lecture & Discussion: Harvard’s Climate Plan.**
Heather Henriksen, Director, and Sam Houston, Coordinator, Office for Sustainability at Harvard.

12:15 – 1:30 pm **Lunch.**

- 1:45 pm **Depart** for DRCLAS.
- 2:00 – 3:30 pm **Lecture & Discussion: Mega-Cities and Mega Events.**
Judith Grant Long, Associate Professor of Urban Planning, GSD, Harvard University.
- 3:45 – 5:15 pm **Lecture, Discussion and Working Session: Natural Disasters Planning and Response.**
Monica Porto, Full Professor and Department Chair, Hydraulic and Sanitary Engineering; and José Rodolfo Scarati Martins, Assistant Professor of Civil and Environmental Engineering, Escola Politécnica da Universidade de São Paulo.
- 5:30 – 6:30 pm **Lecture & Discussion: Resilient Electric Grids.**
Maurício Salles, Assistant Professor, Department of Electric Energy and Automation Engineering, Escola Politécnica da Universidade de São Paulo.
- 7:00 – 8:00 pm **Dinner & Discussion of group research themes** for each of the 6 student Working Groups. Course faculty will provide information to help students progress in their thinking during the program.

Thursday, January 9th – Boston/New York

- 7:30 am **Breakfast and check-out.** Participants should check-out and take luggage to the bus for afternoon trip to New York.
- 8:00 am **Depart** for site visit.
- 9:00 am – 12:00 pm **Site Visit & Lecture: EnerNOC.**
EnerNOC is among the largest providers of energy management equipment and services for commercial, institutional, and industrial customers, as well as electric power grid operators and utilities.
- 1:00 – 2:00 pm **Lunch.**
- 2:15 – 7:15 pm **Travel to New York.** Group bus. Approximately five hours.
- 7:15 pm **Hotel check-in for all participants.**
Holiday Inn Express at Herald Square
- Evening** **Free.** Students from Harvard & Brazil encouraged to have joint informal activities/outings.

Friday, January 10th – New York

- 8:30 am **Depart** hotel.
- 9:00 am – 12:00 pm **Site Visit: South Ferry Station, Metropolitan Transportation Authority.**
The Metropolitan Transportation Authority (MTA) is a public benefit corporation responsible for public transportation in the U.S. states of New York and Connecticut, carrying over 11 million passengers on an average weekday systemwide, and over 800,000 vehicles on its seven toll bridges and two tunnels per weekday.

Location: To be announced.

- 12:00 – 1:30 pm** **Lunch.**
- 2:00 – 4:30 pm** **Site Visit: Regional Plan Association – RPA.**
Regional Plan Association aims to improve the New York metropolitan region’s economic health, environmental sustainability and quality of life through research, planning and advocacy.
- 5:00 pm** **Return** to hotel.
- Evening** **Free.** Students from Harvard & Brazil encouraged to have joint informal activities/outings.

Saturday, January 11th – New York

- 9:30 am – 12:00 pm** **Added Value & Red Hook Brooklyn.**
Ian Marvy, Co-founder and Executive Director, Added Value.
- 12:00 – 1:00 pm** **Lunch** in Red Hook.
- 2:30 – 5:30 pm** **Circle Line Full Island Cruise.**
- Evening** **Free.** Students from Harvard & Brazil encouraged to have joint informal activities/outings.

Sunday, January 12th – New York

- All Day** **Free.** Students from Harvard & Brazil encouraged to have joint informal activities/outings.

Monday, January 13th – New York

- 9:00 am** **Depart** hotel.
- 10:00 am – 12:15 pm** **Site Visit: New York City Office of Emergency Management – OEM.**
Established in 1996, the OEM plans and prepares for emergencies, educates the public about preparedness, coordinates emergency response and recovery, and collects and disseminates emergency information. To accomplish this mission, OEM maintains a disciplined unit of emergency management personnel, including responders, planners, watch commanders, and administrative and support staff, to identify and respond to various hazards.
- 12:15 – 1:45 pm** **Lunch.**
- 1:45 pm** **Depart** for AS/Council of the Americas for afternoon activities.
- 2:00 – 3:30 pm** **Lecture & Discussion: Urban Climate Adaptation.**
Joyce Klein Rosenthal, Assistant Professor of Urban Planning, GSD, Harvard University.
- 3:45 -5:15 pm** **Lecture & Discussion: The Canary Project: Visualizing Climate Change.**

Susannah Saylor, Director & Co-Founder, The Canary Project; Assistant Professor, Department of Transmedia Art Photography, Syracuse University.

6:30 – 8:00 pm **Dinner & Discussion of group research themes** for each of the 6 student Working Groups. Course faculty will provide information to help students progress in their thinking during the program.

Tuesday, January 14th – New York

8:00 am **Depart** hotel.

9:00 – 10:30 am **Lecture & Discussion: 9/11 Memorial at World Trade Center.**
Michael Arad, Architect of 9/11 Memorial; Partner, Handel Architects LPP.
Occupying eight of the 16 acres at the World Trade Center, the Memorial is a tribute to the past and a place of hope for the future.

11:00 am – 12:30 pm **Visit: 9/11 Memorial at World Trade Center.**
Note: Please limit the items that you bring with you. No baggage larger than 8”x17”x19” will be permitted, and bag storage is not available.

12:30 – 1:30 pm **Lunch.**

2:30 – 5:00 pm **Site Visit & Lecture: A Stronger, More Resilient New York – NYC Mayor’s Office of Long-term Planning & Sustainability.**
Daynan Crull, Program Manager, Community Resiliency and Head of External Affairs, NYC Mayor’s Office of Long-Term Planning and Sustainability.

Evening **Free.** Students are encouraged to pack for the next day’s trip to Cambridge.

Wednesday, January 15th – New York & Cambridge

7:30 am **Breakfast and check-out.** Participants should pack and take luggage to the bus for afternoon trip to Cambridge/Boston.

8:15 am **Depart** hotel for AS/Council of the Americas for morning activities.

9:15 – 10:45 am **Lecture & Discussion: The Nature of Urban Design: A New York Perspective on Resilience.** Alex Washburn, Chief Urban Designer, New York City Department of City Planning.

11:00 am – 12:30 pm **Lecture & Discussion: São Paulo: Developing Large-scale Urban Projects.** Carolina Heldt D’Almeida, Chief Advisor, Applied Research and Development Advisory Group, Secretary of Planning of the City of São Paulo.

12:30 – 2:00 pm **Lunch.**

2:00 pm **Travel to Cambridge/Boston.** Group bus. Approximately five hours.

7:00 pm **Hotel check-in for all participants.**
The Sheraton Commander

Evening **Free.** Students from Harvard & Brazil encouraged to have joint informal activities/outings.

Thursday, January 16th – Cambridge/Boston

8:30 am **Depart** hotel.

9:30 am – 12:00 pm **Site Visit: MWRA’s Deer Island Sewage Treatment Plant.** (*outdoors*).
MWRA’s Deer Island Sewage Treatment Plant is the centerpiece of MWRA’s \$3.8 billion program to protect Boston Harbor against pollution from Metropolitan Boston’s sewer systems. **Stephen Estes-Smargiassi**, Director of Planning at Massachusetts Water Resources Authority, will talk about how Deer Island was designed to adapt to SLR, how the water system will be affected, and possible impacts of SLR and larger storms on Deer Island’s coastal facilities.

12:15 – 1:45 pm **Brown Bag Lunch.**

2:00 – 3:30 pm **Lecture & Discussion: Health and the Built Environment.**
Ramon Sanchez, Program Leader, Health and the Built Environment, Center for Health and the Global Environment, HSPH; Assistant Director of the Sustainability and Environmental Management Program, Harvard Extension School.
Location: To be announced.

3:30 – 5:00 pm **Lecture & Discussion: Preparing for the Rising Tide – Climate Adaptation and Sea-Level Rise in Boston.**
Vivien Li, President, The Boston Harbor Association

6:00 – 7:30 pm **Dinner & Discussion of group research themes** for each of the 6 student Working Groups. Course faculty will provide information to help students progress in their thinking during the program.

Friday, January 17th – Boston

8:30 am **Depart** hotel for Harvard School of Public Health.

9:30 – 10:45 am **Lecture & Discussion: Cardiopulmonary Effects of Air Pollution.**
Joe Brain, Cecil K. and Philip Drinker Professor of Environmental Physiology, Department of Environmental Health, HSPH, Harvard University.

10:45– 11:30 am **Overview of Ongoing Laboratory Research Collaboration: Cardiopulmonary Effects of Air Pollution.**
John Godleski, Associate Professor in the Department of Environmental Health, HSPH; Associate Professor of Pathology, HMS, Harvard University.

11:45 am – 12:45 pm **Lunch.**

1:00 – 5:00 pm **Site Visit: Beth Israel Deaconess Medical Center (BIDMC) & Medical Intelligence Center (MIC).**
Meg Femino, Director, Emergency Management at Beth Israel Deaconess Medical Center.

Evening **Free.** Students from Harvard & Brazil encouraged to have joint informal activities/outings.

Saturday, January 18th – Cambridge/Boston

8:30 am **Depart hotel** for SEAS.

9:00 – 10:30 am **Online course evaluation.**

10:45 am – 12:45 pm **Group presentations.**

1:00 – 2:30 pm **Closing lunch.**

Late Afternoon & Evening **Departure** of international participants.

FACEBOOK

CORE COURSE FACULTY

From Harvard



Steven Wofsy
Abbott Lawrence Rotch
Professor of Atmospheric and
Environmental Science,
Harvard School of Engineering
and Applied Sciences (SEAS)



Gareth Doherty
Lecturer in Landscape
Architecture and Urban
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Harvard Graduate School of
Design (GSD)

From Poli-USP



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Full Professor and Chair,
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José Rodolfo Scarati Martins
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Maurício Salles
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Miguel Bucalem
Full Professor,
Department of Geotechnical
and Structural Engineering,
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Universidade de São Paulo;
Former Secretary of Planning of
the City of São Paulo

PARTICIPATING HARVARD FACULTY



Cherry A. Murray
Dean,
Harvard School of Engineering
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John Godleski
Associate Professor,
Department of Environmental
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Joseph D. Brain
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Professor of Environmental
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Harvard School of Public
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Joyce Klein Rosenthal
Assistant Professor of
Urban Planning,
Harvard Graduate School of
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Judith Grant Long
Associate Professor,
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Venkatesh Narayanamurti
Director of the Science,
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GUEST LECTURERS



Alex Washburn
Chief Urban Designer,
New York City Department of
City Planning



Carolina Heldt D'Almeida
Chief Advisor,
Applied Research and
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Secretary of Planning of the City
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Daynan Crull
Program Manager,
Community Resiliency and
Head of External Affairs, NYC
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Planning and Sustainability



Gordon Sinclair Jones
Director,
Harvard Innovation Lab



Heather Henriksen
Director, Office for
Sustainability at Harvard



Ian Marvy
Co-founder and Executive
Director, Added Value



Kerry A. Emanuel
Cecil & Ida Green Professor of
Atmospheric Science,
Massachusetts Institute of
Technology (MIT)



Meg Femino
Director,
Emergency Management
Beth Israel Deaconess Medical
Center (BIDMC)



Michael Arad
Designer of 9/11 Memorial;
Partner, Handel Architects LLP



Ramon Sanchez
Program Leader, Health and the
Built Environment, Center for
Health and the Global
Environment, HSPH;
Assistant Director of the
Sustainability and
Environmental Management
Program, Harvard Extension
School



Sam Houston
Coordinator, Office for
Sustainability at Harvard



Shirine Boulos
AIA, LEED AP Principal,
Ellenzweig



Susannah Sayler
Director & Co-Founder,
The Canary Project;
Assistant Professor, Department
of Transmedia Art Photography,
Syracuse University



Vivien Li
President,
The Boston Harbor Association

ORGANIZERS



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Manoel Carlos Pereira Neto
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Jill Larson
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for Environmental Sciences
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STUDENTS

From Harvard University



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From University of São Paulo



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3rd-year Undergraduate Student
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Poli-USP



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5th-year Undergraduate Student
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Emily Kraemer
B.S. in Chemistry,
Harvard College, Class of 2015



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Harry Stone
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S.B. in Environmental
Engineering,
Harvard College, Class of 2015



Gustavo Tanaka
5th-year Undergraduate Student
in Environmental Engineering,
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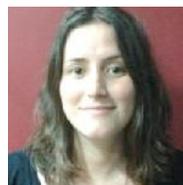
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Civil Engineering,
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Kate Donahue
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Ligia Monteiro
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Kim Smet
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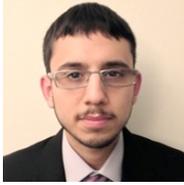
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Raphael Guiguer
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Sciences,
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Selma Shimura
6th-year Undergraduate Student
in Architecture, Urbanism and
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Sofia Viguri
Master's candidate in Urban
Planning,
GSD, Harvard University



Thiago Arapian
4th-year Undergraduate Student
in Environmental Engineering,
Poli-USP



Yanina Barrera
Ph.D. candidate in
Environmental Science and
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Tiago Corso Kruk
4th-year Undergraduate Student
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Poli-USP



Victor Silva
5th-year Undergraduate Student
in Civil Engineering,
Poli-USP

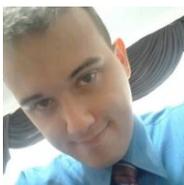
GUEST PARTICIPANTS



Abner Calixter
Master's candidate in
Sustainable International
Development, Heller School for
Social Policy and Management;
Researcher, Exuma Lab,
GSD, Harvard University



Bruno Cesar Burin
4th-year Undergraduate Student
in Chemical Engineering,
Poli-USP



Raphael Rodrigues
Ph.D. candidate in
Environmental Engineering,
Poli-USP

COURSE LOCATIONS

Harvard University

Harvard University, which celebrated its 375th anniversary in 2011, is the oldest institution of higher learning in the United States. Harvard is devoted to excellence in teaching, learning, and research, and to developing leaders in many disciplines who make a difference globally. The University, which is based in Cambridge, Allston and Boston, Massachusetts, has an enrollment of over 20,000 degree candidates, including undergraduate, graduate, and professional students. Harvard has more than 360,000 alumni around the world.

Cambridge & Boston

Cambridge is a city in Massachusetts, United States, situated across the Charles river from Boston and is home to Harvard University and the Massachusetts Institute of Technology. Radcliffe College, once one of the leading colleges for women in the United States, was also located in Cambridge before it merged with Harvard. According to the 2010 United States Census, the city's population was 105,162. It is the fifth most populous city in the state, behind Boston, Worcester, Springfield, and Lowell.

Boston is the capital of Massachusetts and largest city in the state, covering 48 square miles (124 km²). The city had an estimated population of 636,000 in 2012, making it the 21st largest city in the United States. Greater Boston as a commuting region is home to 7.6 million people, making it the sixth-largest Combined Statistical Area in the United States.

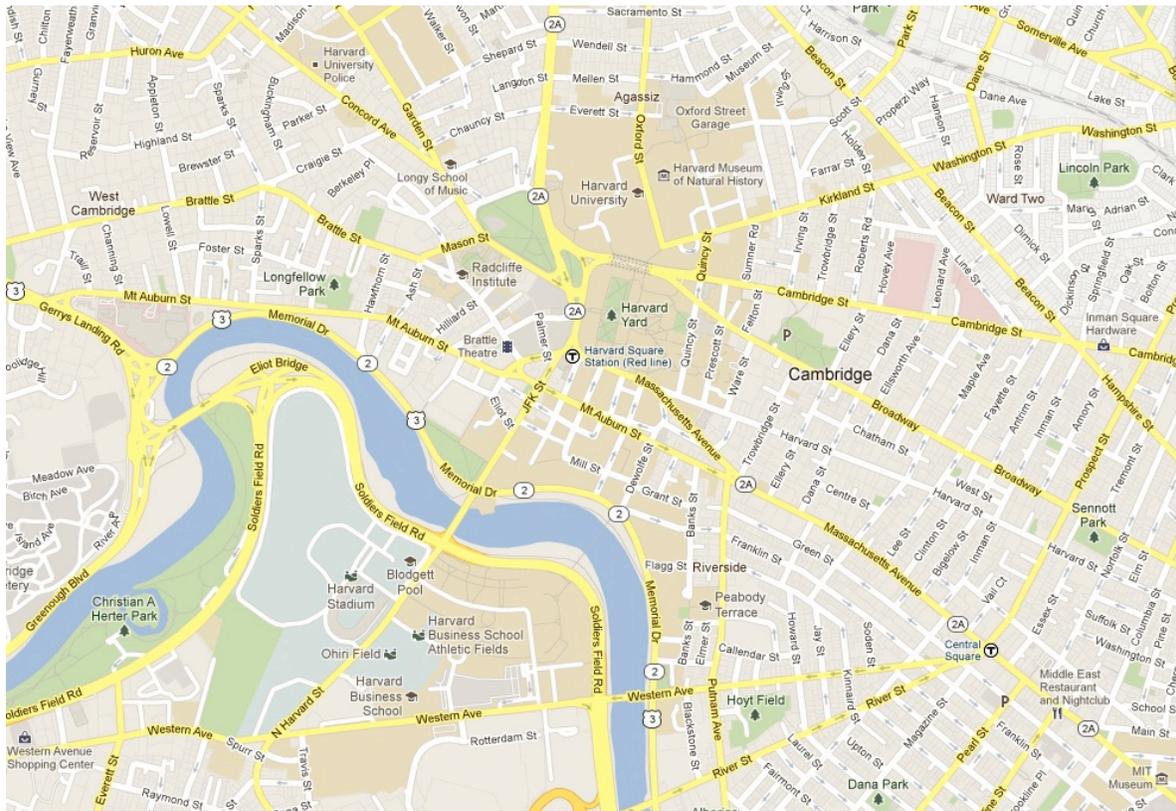
It was the scene of several key events of the American Revolution, such as the Boston Massacre, the Boston Tea Party, the Battle of Bunker Hill and the Siege of Boston. Upon independence from Great Britain, the city continued to be an important port and manufacturing hub, as well as a center for education and culture. Its rich history helps attract many tourists, with Faneuil Hall alone attracting over 20 million visitors. Boston's many "firsts" include the United States' first public school (1635), and first subway system (1897).

New York

New York is the most populous city in the United States and the center of the New York Metropolitan Area. An influential city, New York exerts a significant impact upon commerce, finance, media, art, fashion, research, technology, education, and entertainment.

The city consists of five boroughs (Bronx, Brooklyn, Manhattan, Queens, and Staten Island) and a census-estimated 2012 population of 8,336,697 distributed over a land area of just 302.64 square miles (783.8 km²), which makes New York the most densely populated major city in the United States. The New York Metropolitan Area's population remains by a significant margin the United States' largest Metropolitan Statistical Area, with approximately 19.8 million people, and is also part of the most populous Combined Statistical Area in the United States, containing an estimated 23.4 million people. As many as 800 languages are spoken in New York, making it the most linguistically diverse city in the world.

Cambridge:



SITE VISITS

An Important Note of Thanks to our Field Site Hosts:

On behalf of all its participants, the course organizers would like to thank the tremendous generosity, openness and hard work of the many institutions and individuals who have made the following field site visits possible. Unfortunately, we are certain to miss many of you in this brief note of acknowledgement. Please know that, despite our omissions in the listing below, we appreciate your contributions and recognize that you are integral to this collaborative course's existence and success.

Added Value & Red Hook Community	❖ Ian Marvy; ❖ Corbin Laedlein.
Beth Israel Deaconess Medical Center & Stephen M. Lawlor Medical Intelligence Center	❖ Meg Femino.
EnerNOC	❖ Dan Curran.
Harvard Innovation Lab	❖ Gordon Jones; ❖ Deborah G. Lyon.
MWRA's Deer Island Sewage Treatment Plant	❖ Stephen Estes-Smargiassi; ❖ Nadia Caines.
NYC Office of Emergency Management	❖ Christina Farrell; ❖ Jonathan M. Jenkins.
NYC Metropolitan Transportation Authority	❖ Projjal Dutta; ❖ Dana Coyle; ❖ Carolyn Jackson Colley.
Regional Plan Association	❖ Roberto D. Yaro; ❖ Nicholas Ronderos.
Zofnass Program for Sustainable Infrastructure	❖ Andreas Georgoulis.

ADDED VALUE

Added Value is a non-profit organization promoting the sustainable development of Red Hook by nurturing a new generation of young leaders. It works towards this goal by creating opportunities for the youth of South Brooklyn to expand their knowledge base, develop new skills and positively engage with their community through the operation of a socially responsible urban farming enterprise.

Since opening its doors Added Value has provided long-term training to more than 150 neighborhood teenagers between the ages of 14 and 19, provided hundreds of local elementary school students with educational programs and worked with thousands of volunteers to build a more just and sustainable future for all.

Together they have helped revitalize local parks, transformed vacant lands into vibrant Urban Farms, improved our access to healthy, safe and affordable food, and begun to grow an economy that supports the needs of our community. Currently, Added Value's three main initiatives are: Growing a Just Food System, Youth Empowerment, and Farm-Based Learning.

BETH ISRAEL DEACONESS MEDICAL CENTER

Beth Israel Deaconess Medical Center (BIDMC) is one of the nation's preeminent academic medical centers. We are committed to excellence in clinical care, biomedical research and education and to the health and wellness of our patients and our communities. Beth Israel Deaconess, a major teaching hospital of Harvard Medical School, is a fully integrated medical center providing adult services from cardiology to obstetrics, gastrointestinal disorders to cancer care. Each year U.S. News & World Report ranks BIDMC as a "Best Hospital" in multiple specialties. As national leaders in patient care quality, safety and transparency, we are setting standards in the way health data can be used to improve care and services. We were the first hospital in the country to achieve meaningful use of electronic medical records, meeting a key set of new federal government standards.

ENERNOC

EnerNOC is a leading provider of energy intelligence software and related solutions. EnerNOC unlocks the full value of energy management for utility and commercial, institutional, and industrial (C&I) customers by delivering a comprehensive suite of demand-side management services that reduce real-time demand for electricity, increase energy efficiency, improve energy supply transparency in competitive markets, and mitigate emissions.

EnerNOC's Utility Solutions™ offerings, which include both implementation and consulting services, are helping hundreds of utilities and grid operators worldwide meet their demand-side management objectives. EnerNOC serves thousands of commercial, institutional, and industrial customers worldwide through a suite of energy management applications including: DemandSMART™, comprehensive demand response; EfficiencySMART™, continuous energy savings; and SupplySMART™, energy price and risk management.

HARVARD INNOVATION LAB

Launched in November 2011, the Harvard Innovation Lab (i-lab) serves as a resource for students from across Harvard interested in entrepreneurship and innovation. The programming offered by the i-lab is designed to help students grow their ventures at any stage of development and covers a wide range of disciplines. The i-lab's approach differs from that of other entrepreneurship centers in its breadth, operating model, and governance. First, it accepts any student from any Harvard school with any idea, fostering cross-disciplinary, cross-university collaboration. The i-lab resources support student ventures spanning social and cultural entrepreneurship, health and sciences, technology, and consumer fields. Second, it is student centered and faculty enabled, with programming supplied by schools across Harvard to help students take their ideas as far as they can go. Third, the i-lab serves as a new model for university collaboration as it is co-governed by each of the Deans of Harvard and the Provost.

MWRA'S DEER ISLAND SEWAGE TREATMENT PLANT

MWRA's Deer Island Sewage Treatment Plant is the centerpiece of MWRA's \$3.8 billion program to protect Boston Harbor against pollution from Metropolitan Boston's sewer systems. The plant removes human, household, business and industrial pollutants from wastewater that originates in homes and

businesses in 43 greater Boston communities. In compliance with all federal and state environmental standards and subject to the precedent-setting discharge permit issued for the plant by EPA and DEP, its treated wastewater can be released to the marine environment. This discharge occurs through a 9.5-mile, 24-foot-diameter outfall tunnel that transports treated effluent into the 100-foot deep waters of Massachusetts Bay. Effluent is discharged through more than 50 individual diffuser pipes, each with eight small ports, so that rapid and thorough mixing into surrounding water is achieved and water quality standards are not compromised by the discharge. Extensive environmental monitoring ensures that the environment is properly protected.

The treatment plant is located on Deer Island, a peninsula that extends into the waters of Boston Harbor and Massachusetts Bay. Because the facility's location, the potential effects of sea-level rise were considered in the final design, including the potential for flooding within the treatment plant as well as the effectiveness of the gravity driven outfall. To counteract these potential impacts throughout the operational lifetime of the facility, the plant was constructed at an elevation 1.9 feet higher than initially planned to accommodate the projected sea level rise.

NEW YORK CITY OFFICE OF EMERGENCY MANAGEMENT

Established in 1996, the New York City Office of Emergency Management (OEM) plans and prepares for emergencies, educates the public about preparedness, coordinates emergency response and recovery, and collects and disseminates emergency information. To accomplish this mission, OEM maintains a disciplined unit of emergency management personnel, including responders, planners, watch commanders, and administrative and support staff, to identify and respond to various hazards. The agency also developed and runs the Notify NYC emergency alert program, by which citizens can sign up to receive phone and email alerts about emergencies and events happening in their neighborhoods.

OEM's new headquarters, located in Downtown Brooklyn, replaces the agency's former offices that were located on the 23rd floor of 7 World Trade Center, the 47-story building that was the last to collapse in the September 11, 2001 attacks. The new facility is home to the Emergency Operations Center (EOC). The EOC serves as a central clearinghouse where local, state, and federal agencies can gather to assess and respond to a number of emergencies. Activated for numerous events, the new EOC contains workstations for some 130 city, state, federal, and non-profit agencies. There is secure communications equipment, large video displays, and space for Geographic Information Systems. The new structure also has the distinction of being New York City's first "green" agency headquarters utilizing energy-saving and environmentally sound construction techniques. OEM qualifies for the Energy and Environmental Design (LEED) Silver certification for its new building. According to Commissioner Bruno at the unveiling ceremonies, "New York City is at the forefront of emergency management planning and this new facility will continue to move us forward."

NEW YORK CITY OFFICE OF LONG-TERM PLANNING AND SUSTAINABILITY

New York City's Office of Long-Term Planning and Sustainability (OLTPS) was created as part of the Mayor's Office by local law in 2006. The Office coordinates with all other City agencies to develop, implement, and track the progress of PlaNYC and other issues of infrastructure and the environment which cut across multiple City departments. Released in 2007 and updated in 2011, PlaNYC was an unprecedented effort to prepare the city for one million more residents, strengthen our economy, combat climate change, and enhance the quality of life for all New Yorkers. The Plan brought together over 25 City agencies to work toward the vision of a greener, greater New York. Since then, we have made significant progress towards our long-term goals.

In just four years the City has built hundreds of acres of new parkland while improving its existing parks. They have created or preserved more than 64,000 units of housing, built whole new neighborhoods with access to transit, provided New Yorkers with more transportation options, enacted the most ambitious

laws of any city in the country to make existing buildings more energy-efficient, and reduced our greenhouse gas emissions 13% below 2005 levels. Over 97% of the 127 initiatives in PlaNYC were launched within one-year of its release and almost two-thirds of its 2009 milestones were achieved or mostly achieved. The updated plan has 132 initiatives and more than 400 specific milestones for December 31, 2013.

NEW YORK CITY METROPOLITAN TRANSPORTATION AUTHORITY

The Metropolitan Transportation Authority is North America's largest transportation network, serving a population of 15.1 million people in the 5,000-square-mile area fanning out from New York City through Long Island, southeastern New York State, and Connecticut. MTA subways, buses, and railroads provide 2.62 billion trips each year to New Yorkers – the equivalent of about one in every three users of mass transit in the United States and two-thirds of the nation's rail riders. MTA bridges and tunnels carry more than 280 million vehicles a year – more than any bridge and tunnel authority in the nation. MTA mass transit helps New Yorkers avoid about 17 million metric tons of pollutants while emitting only 2 million metric tons, making it perhaps the single biggest source of greenhouse gas (GHG) avoidance in the United States. The people living in our service area lead carbon-efficient lives, making New York the most carbon-efficient state in the nation.

Public transportation is a powerful force to reduce the greenhouse gas emissions that cause climate change. Yet as New York saw during Superstorm Sandy, climate change can take a devastating toll on public transportation. That's why making the Metropolitan Transportation Authority network more resilient against extreme weather is both a short term tactic to keep service running and a long-term strategy to fight climate change. Much of New York's public transportation network is over a century old, and even routine maintenance and rehabilitation work is challenging on a subway system that never shuts down. But addressing the effects of climate change and reducing New York's carbon emissions will require significant new infusions of capital investment.

Superstorm Sandy was only the latest and largest in a series of events that underscored how vulnerable the MTA network is to extreme weather. After an August 2007 rain storm during the morning rush hour brought subway service on many lines to a halt, the MTA adapted low-lying infrastructure to fortify against future flooding. And in the years since, the MTA learned that in some weather events, the best response is to suspend service and move trains to safe locations – a practice that proved its worth during Hurricane Irene and Superstorm Sandy.

The MTA has traditionally relied on its own resources to fortify its infrastructure against extreme weather, meaning that every improvement to address climate change has come at the expense of other capital needs. But the sheer magnitude of Sandy's damage, with years of repairs to cost billions of dollars, has made clear that developing resilient infrastructure is a vital priority in the MTA's capital planning. Protecting the MTA network against future storms will carry a cost in time and resources, but Sandy showed that the cost of inaction is unacceptable. Mitigating the impact of climate change will ensure the MTA can keep New York's carbon emissions low and make New York resilient.

REGIONAL PLAN ASSOCIATION

The Regional Plan Association (RPA) is America's oldest independent urban research and advocacy organization. RPA works to improve the prosperity, infrastructure, sustainability and quality of life of the New York-New Jersey-Connecticut metropolitan region. Some of the region's most significant public works, economic development and open space projects have their roots in RPA ideas and initiatives, from the location of the George Washington Bridge to the revitalization of downtown Brooklyn, Stamford and Newark to the preservation of open space and development of parks in the Palisades, Governors Island and Gateway National Recreation Area.

RPA has pursued these goals by conducting independent research, planning, advocacy and vigorous public-engagement efforts. Every year, the most pressing challenges facing the region are debated at RPA's spring conference, the Assembly, which draws leaders and professionals from government, business, civic groups and the media.

A cornerstone of their work is the development of long-range plans and policies to guide the region's growth. Since the 1920s, RPA has produced three landmark plans for the region and is about to begin work on a fourth plan that will tackle the urgent challenges facing the region, including climate change, fiscal uncertainty and declining economic opportunity.

STEPHEN M. LAWLOR MEDICAL INTELLIGENCE CENTER

The Field Operations Division is the public face of Boston EMS. The division is made up of more than 350 extremely dedicated EMTs and Paramedics who carefully work together, 24 hours a day, 365 days a year, to deliver the finest level of pre-hospital care to the citizens and visitors of Boston. Our EMTs and Paramedics are highly skilled in all aspects of pre-hospital emergency medicine. They are trained leaders who work effectively under pressure to deliver excellent patient care to the critically ill and injured. Each and every day, they serve Boston with compassion, dignity, and professionalism.

Averaging over 300 incidents per day and more than 100,000 incidents per year, Boston EMS is one of the busiest EMS providers in the country. The Department utilizes a two-tier response model offering Basic Life Support (BLS) and Advanced Life Support (ALS). BLS ambulances are staffed with two EMTs who are exceptionally well trained to intervene in non-critical and critical incidents. They are responsible for treating, stabilizing, and transporting patients to hospitals. ALS ambulances are staffed by two Paramedics who have highly developed medical skills and the capability to deliver complex interventions and treatments in the field.

Boston EMS places an emphasis on intelligence gathering through cooperation with other public safety and public health organizations. Through greater information sharing we strive to prevent emergencies and to respond effectively when incidents occur. In 2009, Boston EMS opened the Stephen M. Lawlor Medical Intelligence Center (MIC). The MIC is a state-of-the art communications and information sharing facility which allows Boston EMS, first responder agencies, hospitals, public health departments, community health centers, long-term care facilities, State and Federal as well as public and private partners to share information and work collaboratively in response to large scale incidents.

ZOFNASS PROGRAM FOR SUSTAINABLE INFRASTRUCTURE

The Zofnass Program for Sustainable Infrastructure was founded in 2008 by a generous donation by siblings Paul and Joan Zofnass, and is housed at Harvard University's Graduate School of Design. The Zofnass Program extends its activities throughout Harvard including the School of Public Health, Kennedy School of Government, Business School, and the Center for the Environment. The Zofnass Program is supported by the industry through an Industry Advisory Board.

The Zofnass Program for Sustainable Infrastructure prides itself on the collaborative nature of its research efforts. In addition to providing the generous gift that founded the program Paul and Joan Zofnass have been integral in guiding the program's research. Though housed at the Graduate School of Design, the Zofnass Program has worked with students and faculty advisors from across Harvard. The research team includes a core group of academic faculty from across the university and student research associates from undergraduate, graduate, and doctoral programs. However, what makes the Zofnass Program truly unique is the strong support provided by the industry through the Industry Advisory Board. These collaborations with academic experts and industry specialists have been instrumental in the development of the Zofnass Rating System.

The Program aims to provide a series of resources, tools, and events that facilitate better project planning, design, and rating for sustainable infrastructure projects. The Zofnass Program hopes to serve as a clearing house for information collected from projects, both in the preliminary pilot phase and after the system is launched and utilized. We hope to continue to improve upon the system and resources as new information becomes available.

9/11 MEMORIAL

The National September 11 Memorial is a tribute of remembrance and honor to the nearly 3,000 people killed in the terror attacks of September 11, 2001 at the World Trade Center site, near Shanksville, Pa., and at the Pentagon, as well as the six people killed in the World Trade Center bombing in February 1993. The names of every person who died in the 2001 and 1993 attacks are inscribed into bronze panels edging the Memorial pools, a powerful reminder of the largest loss of life resulting from a foreign attack on American soil and the greatest single loss of rescue personnel in American history.

Architect Michael Arad and landscape architect Peter Walker created the Memorial design selected from a global design competition that included more than 5,200 entries from 63 nations. The 9/11 Memorial is located at the site of the former World Trade Center complex, and occupies approximately half of the 16-acre site. The 9/11 Memorial features two enormous waterfalls and reflecting pools, each about an acre in size, set within the footprints of the original twin towers. The Memorial Plaza is one of the most eco-friendly plazas ever constructed. More than 400 trees are planned for the plaza, surrounding the Memorial's two massive reflecting pools. Its design conveys a spirit of hope and renewal, and creates a contemplative space separate from the usual sights and sounds of a bustling metropolis.

The Memorial plaza has been created as one of the most sustainable, green plazas ever constructed. Its irrigation, storm water and pest management systems will conserve energy, water and other resources. Rainwater will be collected in storage tanks below the plaza surface. A majority of the daily and monthly irrigation requirements will be met by the harvested water. The project is pursuing the Gold certification in the U.S. Green Building Council's LEED for New Construction program. LEED is a third party certification program for green building, design and construction. The plaza is also built to meet requirements of New York State Executive Order 111 and the WTC Sustainable Design Guidelines, which both promote environment-friendly practices.

WORKING GROUPS & FINAL PRESENTATIONS

The following guide for final presentations is designed to drive the discussion and learning of students during the course. Students will be divided in the following six sub-groups:

1. Scale of Adaptation (International vs. Country/State vs. City/Community level; Government vs. Private Sector);
2. Mitigation vs. Adaptation (Can either be sufficient on its own? How to integrate?);
3. Economics of Adaptation (Costs of Policies/Technologies; Who should pay for adaptation?);
4. Timescale of Adaptation (Managing for Current Impacts vs. Future Changes);
5. Public Perception and Support for Adaptation Strategies;
6. Risk Management.

Group	Name	School	Nationality
A	Anneli Tostar	Harvard College	USA
A	Beatriz Beccari Barreto	Poli-USP	Brazil
A	Chengyan Zhang	Harvard SEAS	China
A	Gustavo Tanaka	Poli-USP	Brazil
A	Kevin Hernandez	Harvard College	USA
B	Camilla Almeida Silva	Poli-USP	Brazil
B	Emily Kraemer	Harvard College	USA
B	Gabriel S. dos Santos	Poli-USP	Brazil
B	Jacob Koch	Harvard GSD	USA
B	Joanne Nghiem	Harvard College	USA
C	Gabriel Rezende Nahas	Poli-USP	Brazil
C	Johnathan Budd	Harvard College	USA
C	Kim Smet	Harvard SEAS	Belgium
C	Larissa Arakawa Martins	Poli-USP	Brazil
C	Thiago Arapian	Poli-USP	Brazil
D	Guilherme Cesar	Poli-USP	Brazil
D	Harry Stone	Harvard College	USA
D	Ligia Monteiro	Poli-USP	Brazil
D	Lindsay Woodson	Harvard GSD	USA
D	Raphael Guiguer	Poli-USP	Brazil
E	Rafael Granja	Poli-USP	Brazil
E	(José) Rodrigo Leal	Harvard College	USA
E	Selma Shimura	Poli-USP	Brazil
E	Tiago Corso Kruk	Poli-USP	Brazil
E	Yanina Barrera	Harvard SEAS	USA
F	Kate Donahue	Harvard College	USA
F	Layla Lambiasi	Poli-USP	Brazil
F	Sofia Viguri	Harvard GSD	Mexico
F	Victor Silva	Poli-USP	Brazil

At the closing ceremony of this collaborative course, each group of students will briefly present (15-20 min per group) its conclusions addressing the following points of view:

1. Give a brief presentation of the topic: definitions and impressions;
2. Comparison between U.S. and Brazil: advantages and disadvantages in terms of available resources, technical difficulties, and legal/institutional challenges;
3. Identify what you consider to be the main points in this subject;
4. How do you view further collaboration in this topic between our institutions?

During the presentation, all group members will have to speak.

Group A:

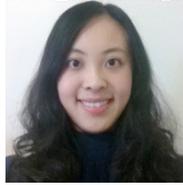
Anneli Tostar



Beatriz Barreto



Chengyan Zhang



Gustavo Tanaka



Kevin Hernandez



Group B:

Camilla Silva



Emily Kraemer



Gabriel dos Santos



Jacob Koch



Joanne Nghiem



Group C:

Gabriel Nabas



Jobnathan Budd



Kim Smet



Larissa Martins



Thiago Arapian



Group D:

Guilherme Cesar



Harry Stone



Ligja Monteiro



Lindsay Woodson



Raphael Guiguer

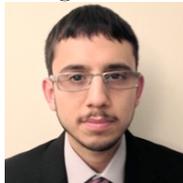


Group E:

Rafael Granja



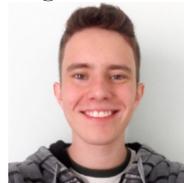
Rodrigo Leal



Selma Shimura



Tiago Kruk



Yanina Barrera



Group F:

Kate Donahue



Layla Lambiasi



Sofia Viguri



Victor Silva



PARTICIPANT BIOGRAPHIES

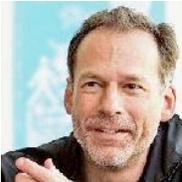
(Alphabetical by first name)



Abner Calixter

Master's candidate in Sustainable International Development, Heller School for Social Policy and Management; Researcher, Exuma Lab, GSD, Harvard University

Originally from Brazil, Abner Calixter is a Master's candidate in Sustainable International Development at the Heller School for Social Policy and Management, focusing on sustainable policies. His expertise in Urban Climate Adaptation has been further enriched through his time with the Massachusetts Institute of Technology Department of Urban Studies and Planning. At the Harvard Graduate School of Design (GSD), he has earned Executive Education Certificates in Climate Adapted Design and Master Planning for Sustainable Cities. Calixter is currently conducting research with the Sustainable Exuma Project at the GSD. At the same time, he is developing his thesis on climate change adaptation and resilience of vulnerable communities. Additionally, Calixter has ten years of experience in commercial and institutional relations, working for multinational companies on commercial management and manufacturing of environmentally friendly automotive components in South America. He also holds a Bachelor's in International Business Management from the Methodist University of Piracicaba (UNIMEP) in Brazil.



Alex Washburn

Chief Urban Designer,
New York City Department of City Planning

Alexandros E. Washburn, AIA is the Chief Urban Designer of the City of New York, Department of City Planning. An architect who has worked both in the private and public sector, he served as Environment and Public Works Advisor to US Senator Daniel Patrick Moynihan, then as President of the Pennsylvania Station Redevelopment Corporation, and then partner of W Architecture and Landscape Architecture LLC. From individual buildings to the most complex infrastructure projects, he judges success in urban design from the point of view of the pedestrian. In his daily work, he tries to achieve the “quantity of Robert Moses with the quality of Jane Jacobs.” And for this missing link – between the human-scale and the mega-project– he turns to another great New Yorker, Fredrick Law Olmsted, designer of Central Park, for inspiration. He sees the integration of urbanity and ecology as the next great wave in city-building. Washburn received his Masters of Architecture from Harvard Graduate School of Design in 1988.



Anneli Tostar

B.A. in Social Anthropology,
Harvard College, Class of 2015

Anneli Tostar is a junior at Harvard College, concentrating in Social Anthropology with a secondary in Environmental Science & Public Policy. Originally from Portland, Oregon and a dual Swedish-American

citizen, she enjoys traveling and learning from other cultures in her spare time. Anneli spent the summer after her freshman year studying abroad in Paris, France, and the following summer in Tanzania, where she volunteered with a non-profit to promote HIV/AIDS education in rural villages. She is interested in the intersection between people and their environments and plans to conduct her senior thesis on sustainable development in Brazil. Anneli hopes to pursue a career in environmental journalism and is currently a staff writer and photographer for The Harvard Crimson.



Beatriz Beccari Barreto

3rd-year Undergraduate Student in
Environmental Engineering,
Poli-USP

Beatriz Barreto is currently a third-year undergraduate student in Environmental Engineering. Since her second year, Beatriz has been engaged in researches related to recycling. This year, she is involved in a research project about recycling in the city of São Paulo. Beatriz has also a lot of interest in the area of natural disasters and energy. One of her goals is to apply this knowledge in poor communities with creative solutions. Ms. Barreto is the student representative in one at the Department of Environmental Engineering. She intends to pursue an academic career and become a university professor. In her spare time, Beatriz likes to dance, and playing rugby. She also writes for the students' newspaper and has been a member of the scout movement since she was five.



Bruno Cesar Burin

4th-year Undergraduate Student in
Chemical Engineering,
Poli-USP

Bruno Burin is a 24-years-old Brazilian studying Chemical Engineering at the Escola Politécnica da Universidade de São Paulo (Poli-USP). Always dedicated and driven by challenges with focus on targets, Bruno did an undergraduate research about “the effect of chemical composition of supports in nanostructuring of polymeric films deposited by spin coating”. He was an academic coordinator in the organization of the VIII week of Chemical Engineering at Poli-USP, helping to connect over 300 students and companies in the field of chemical engineering. He also interned at DuPont Brazil and worked with new business development in chemical and fluoroproducts, specifically with fluorine surfactants and fluorine polymers. In his spare time, Bruno likes to practice sports, such as soccer, and bicycling. He loves traveling, going to the movies and making new friends.



Camilla Almeida Silva

5th-year Undergraduate Student in Architecture,
Urbanism and Civil Engineering,
Poli/FAU-USP

Camilla Almeida Silva is currently a fifth-year undergraduate student enrolled in the undergraduate joint-degree program in Architecture, Urbanism and Civil Engineering (Poli/FAU-USP). She is mainly interested in subjects related to sustainability in the built environment, building design and civil construction. These interests were developed in her third year at college, when she joined a research project that aimed to produce a Zero Energy Home prototype, named Ekó House. This project is part of a Brazilian R&D project which intended to develop national competence in design and construction of Zero Energy Buildings adapted to different bioclimatic regions. As a member of this project, Camilla has developed various activities, participating more in those related with the production design of the house

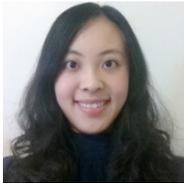
structure. Ekó House was the Brazilian house in the Solar Decathlon Europe international competition in 2012, in which Camilla participated. She has developed a research project related with the structure production of prefabricated houses. Camilla believes that reconciling research and theoretical knowledge with practical activities are essential for innovation. She plans to continue researching about constructive technologies, and working with building design. In 2010 Camilla was one of the winners of a design contest for art work in her city (Embu das Artes, SP), and was responsible for monitoring its implementation. In her free time, Camilla enjoys drawing, reading and hanging out with friends.



Carolina Heldt D'Almeida

Chief Advisor, Applied Research and
Development Advisory Group,
Secretary of Planning of the City of São Paulo

Carolina Heldt is Chief Advisor for the Applied Research and Development Advisory Body of the Secretary of Urban Development of the City of São Paulo (SMDU-PMSP). She is the primary link between SMDU-PMSP and the research community. An architect and urban planner, Heldt graduated from the School of Architecture and Urbanism of the University of São Paulo (FAU-USP). She holds a Master's Degree from the University of São Paulo's Institute of Architecture and Urbanism (IAU-USP), where she is currently pursuing a doctorate. Heldt is also a Professor of Architecture and Urbanism at São Judas Tadeu University (USJT). Her research focuses on the creation of urban space, contemporary cities, large scale public works infrastructure and large scale urban projects.



Chengyan Zhang

Ph.D. candidate in Environmental
Science and Engineering,
SEAS, Harvard University

Chengyan Zhang is a third-year Ph.D. candidate at Harvard School of Engineering and Applied Sciences. Her primary research focuses on urban water supply planning and management under uncertainty. In this course, she is particularly interested in how different sectors, namely water, energy, and transpiration, will plan and adapt to climate change. In 2010 she received her B.S. in Civil and Environmental Engineering from University of Massachusetts Amherst. Her undergraduate research focused on reducing endocrine disrupting chemicals in drinking water treatment by advanced oxidation processes. Chengyan spent the summer in 2013 working in China Development Bank on impact of climate change on Africa's water resources and its consequences on agribusiness investment. Chengyan is also passionate about consulting, as a consultant of the Harvard Graduate Volunteer Consulting Group, she helps a non-profit organization to develop and implement an expansion strategy. In her free time, Chengyan enjoys traveling, swimming, and reading.



Cherry A. Murray

Dean,
Harvard School of Engineering and Applied Sciences
(SEAS)

Cherry A. Murray, who has led some of the nation's most brilliant scientists and engineers as an executive at Bell Laboratories and the Lawrence Livermore National Laboratory, was appointed dean of Harvard University's School of Engineering and Applied Sciences (SEAS), on July 1, 2009. She also holds the John A. and Elizabeth S. Armstrong Professorship of Engineering and Applied Sciences and is a Professor of Physics. Murray served as principal associate director for science and technology at

Lawrence Livermore National Laboratory in Livermore, California from 2004-2009, and as president of the American Physical Society (APS) during 2009. Before joining Lawrence Livermore, Murray had a long and distinguished career at the famed Bell Laboratories, starting in 1978 as a staff scientist and culminating in her position as senior vice president for physical sciences and wireless research. A celebrated experimentalist, Murray is well-known for her scientific accomplishments using light scattering, an experimental technique where photons are fired at a target of interest. In 2002, Discover Magazine named her one of the “50 Most Important Women in Science.” Born in Fort Riley, Kan., and the daughter of a diplomat, Murray lived in the United States, Japan, Pakistan, South Korea, and Indonesia as a child. She received her B.S. in 1973 and her Ph.D. in physics in 1978 from the Massachusetts Institute of Technology. She has published more than 70 papers in peer-reviewed journals and holds two patents in near-field optical data storage and optical display technology.



Daynan Crull

Program Manager, Community Resiliency and
Head of External Affairs, NYC Mayor’s Office of
Long-Term Planning and Sustainability

Daynan Crull is Program Manager of Community Resiliency and Head of External Affairs at the New York City Mayor’s Office of Long-Term Planning and Sustainability (NYC-MOLTPS). Prior to joining MOLTPS, Daynan worked with the AmeriCorps VISTA program at Habitat for Humanity-NYC, which set a precedent for working with efforts to address complex economic and social issues, like affordable housing. Since then, his career experience has been a unique combination of policy, finance, non-profit development, and digital media strategy. Mr. Crull enjoys working with leader, taking an idea to action, and serving New York City. His specialties include digital communication and operations strategy, urban policy development, campaign management, and business development (non-profit, technology, and financial industries).



Emily Kraemer

B.S. in Chemistry,
Harvard College, Class of 2015

Emily Kraemer is junior at Harvard College, pursuing a concentration in chemistry and a secondary concentration in sociology. She grew up with her family of seven in beautiful West Palm Beach, Florida, where she came to treasure the environment at an early age. As ocean levels rise and South Florida’s elevation approaches sea level, Emily is eager to learn how the cities of Boston and New York are preparing for climatic changes. Emily is interested in the intersection of science with the formation, growth, and health of communities. Specifically, she has spent time studying projects in sustainable development in central Mexico, such as those combining improvements in agriculture and public health with community-based education. At Harvard, she works on research investigating the idea of degrading organic contaminants in drinking water through treatment that couples electricity and ozone. Apart from academic interests, Emily is an active member of her upperclassman house and is President of Harvard’s Student Mental Health Liaisons, peer educators who work to connect students with wellness resources on campus.



Gabriel Rezende Nahas

2nd-year Undergraduate Student in
Chemical Engineering,
Poli-USP

Gabriel Rezende Nahas is a second-year undergraduate student in Chemical Engineering. Since his freshman year he has been involved in a synthetic biology competition with a team of graduate and undergraduate students from different institutes of the USP. That gave him the opportunity to work on a molecular biology lab, to give lectures to high school students about synthetic biology and to develop a game which will be used as a teaching tool of biology in classrooms. In the last year, he has also been developing a research about mathematical modeling and bioinformatics in the department of computer science. These activities made him interested in interdisciplinary topics and working with professionals that have different backgrounds. In the future, he wants to work with sustainability and biotechnology in an environment where biologists and engineers work side by side. In his spare time he likes listening to music, running and reading.



Gabriel Sanchez dos Santos

4th-year Undergraduate Student in
Environmental Engineering,
Poli-USP

Gabriel Sanchez dos Santos is a fourth-year undergraduate student at the Escola Politécnica da Universidade de São Paulo majoring in Environmental Engineering. He is very interested in renewable energy, urban planning, and all the concepts that build smart cities. During his third-year, he was an intern at the Universidade de São Paulo's Permanent Program for the Efficient Use of Energy for nine months, where he participated in projects of energetic efficiency. In January 2013, Gabriel participated in a social exchange to Poland, where he presented workshops about Brazilian social problems. In the following years, he intends to work with urban planning, and wants to keep studying with focus in new technologies for smart cities. In his free time, Gabriel enjoys listening to music, playing soccer and tennis, hanging out with friends and playing the guitar.



Gareth Doherty

Lecturer in Landscape Architecture and
Urban Planning and Design,
Harvard Graduate School of Design (GSD)

Gareth Doherty's research and teaching focus on the intersections between landscape, ecology, urbanism, and anthropology. Dr Doherty's publications include *Ecological Urbanism*, edited with Mohsen Mostafavi (Lars Müller Publishers, 2010), which challenges urban practice to engage more fully with the arts, environment, government, public health, society, and technology—ecology in a broad sense. Doherty is a founding editor of the *New Geographies* journal and editor-in-chief of *New Geographies 3: Urbanisms of Color* (Harvard GSD and Harvard University Press, 2011). Doherty is currently working on the effective integration of anthropological methods with design and planning. Recent projects include research on the notion of informal urbanism in favelas in Rio de Janeiro, and his doctoral dissertation on concepts of the color green in Bahrain, the latter of which was supported by a Frederick Sheldon Traveling Fellowship from Harvard University. In addition to the Doctor of Design from Harvard, Doherty received his Master of Landscape Architecture and Certificate in Urban Design from the University of Pennsylvania and masters and undergraduate degrees from University College Dublin. Doherty is a registered landscape architect and has practiced in the UK and Ireland, including collaborations with Chora/Raoul Bunschoten and Donegal County Council. Doherty has previously

taught at the Architectural Association in London; Aarhus School of Architecture; Aalborg University; Berlage Institute, Rotterdam; Kingston University, London; Queensland University of Technology, Brisbane; RMIT University, Melbourne; and the University of Sheffield.



Gordon Jones
Director,
Harvard Innovation Lab

Jones has a long history of entrepreneurial activity. Having participated in the new product development of over 12 products and providing consulting services to small and large companies, he has extensive experience working with entrepreneurs, investors, partner organizations, and other key stakeholders. He currently serves as a business advisor to numerous startups, providing them with strategic and tactical marketing and sales direction. He has also been awarded two U.S. patents. Earlier in his career, Jones was an equity partner and head of marketing and sales for the privately-held Universal Pest Solutions. He has also served as the senior vice president of marketing and sales for American Biophysics Corporation, and has ten years of experience working with The Gillette Company in a variety of marketing, new product development, and business development positions. Jones also brings a deep understanding of the world of education at both the undergraduate and graduate levels and, most importantly, a proven commitment to mentoring the next generation of thought leaders. Since 2008, he has served as an Adjunct Lecturer at Bentley University, teaching marketing to MBA and undergraduate students. Since 2007, he has worked with the Admissions Office at Harvard Business School in evaluating applicants for admission to the MBA program. He graduated from Brown University (B.A.) and earned an MBA from the Stanford University Graduate School of Business.



Guilherme A. Nogueira Cesar
6th-year Undergraduate Student in Architecture,
Urbanism and Civil Engineering,
Poli/FAU-USP

Guilherme Arruda Nogueira Cesar was born in the countryside of the state of São Paulo, in Avaré, and is attending the undergraduate joint-degree program between Poli-USP and FAU-USP. He is primarily interested in natural resources and their correlation with two different scales: the macro-scale, inside urban environment, and micro-scale, considering buildings and the architectural scale, and people acts within these surroundings. Guilheme was a participant in this collaborative field course in 2013, and joining the course this year will amplify his possibilities of understanding the paradigms and differences between Brazil and United States realities. He has concluded a scientific research project about the Applicability of Parametric CADs in Practice and Teaching in Brazil, where he studied a software about Building Information Modeling (BIM) and how it correlates to Brazilian codes of practice. He has participated in a workshop with Università IUAV di Venezia in 2011 in remodeling a favela in São Paulo, which was then exposed at the Brazilian Embassy in Rome, at IUAV in Venice and at FAU-USP in Brazil. Also, he is very interested in applying for a graduation program at Harvard. Outside the classroom, his passions include playing the piano, cooking and drawing.



Gustavo Tanaka

5th-year Undergraduate Student in
Environmental Engineering,
Poli-USP

Gustavo Tanaka is a fifth-year Environmental Engineering student at Poli-USP. Gustavo has had a passion for nature and a strong interest on environmental issues since he was a child. He decided to study environmental engineering when he realized that he could work on these issues as an engineer. In his third year, Gustavo coordinated the Engineering Team at the Bandeira Científica Project, which focused on improving health and sanitation conditions in needy cities in the countryside of Brazil. The experience working in a small city in the Amazon made him aware of the lack of sanitation in Brazil and its influence in public health issues. Due to his efforts in the project, Gustavo was invited to show the intervention results in the World Student Summit for Sustainability 2012 in Nairobi, Kenya. Gustavo was also granted a scholarship from the Brazilian Government to study environmental engineering abroad; he is now finishing a one-year exchange program at the University of Guelph, Canada, where he has taken courses and has focused on work regarding groundwater contamination in bedrock aquifers. In the future, Gustavo aspires to manage environmental engineering projects – especially those related to sanitation. He believes this collaborative course will help him to grasp a better understanding of environmental engineering challenges, and allow him to decide which area to focus on for his graduate degree. In his spare time, Gustavo enjoys juggling, playing capoeira, dancing (salsa and forró), ice skating and traveling.



Harry Stone

B.S. in Environmental Engineering and Science,
Harvard College, Class of 2016

Harry Stone is a sophomore at Harvard from Dover, MA, a small town 20 miles from Boston. He is majoring in Environmental Science and Engineering and is interested in water quality issues and large-scale water systems. Harry really wants to learn more about how developing countries will have to deal with pressing water issues. Outside of class, he loves Ultimate Frisbee and is a member of Harvard's Ultimate team. Harry also enjoys hiking and can be found many weekends on the mountains that dot northern New England.



Heather Henriksen

Director,
Office for Sustainability at Harvard

Heather Henriksen is the Director of the Office for Sustainability at Harvard University. She holds a Master's in Public Administration with a focus on energy and environment from the Harvard Kennedy School (HKS). While a student at HKS, Heather was a member of the Harvard University Task Force on Greenhouse Gas (GHG) Emissions, commissioned by President Drew Faust to recommend a GHG reduction goal for the University. Heather is also a partner of Environmental Entrepreneurs (E2), a national community of business people lobbying for environmental policies which protect the environment while building economic prosperity. Heather's work with E2, since 2002, has brought her into closer partnership with the Natural Resources Defense Council. Before graduate school, Heather was Director of Corporate Marketing & Business Development at Time Warner. Prior to her nine year tenure at Time Warner she was an Assistant Director of Development at Stanford University Law School. She serves on Secretary Napolitano's Sustainability and Efficiency Task Force, Department of

Homeland Security, and on the Board of Trustees of Phillips Brooks House Association, the undergraduate social service and social action organization at Harvard College. She holds a B.A. from Tulane University.



Ian Marvy
Co-founder and Executive Director,
Added Value

Ian Marvy is the co-founder and Executive Director of Added Value, and a resident of the Red Hook, the Brooklyn neighborhood where his organization works. Prior to founding Added Value, Ian spent fifteen years organizing youth to become a positive force for social change in post-industrial cities and towns like Holyoke, Massachusetts, Camden, New Jersey, and Philadelphia, Pennsylvania. He also spent two years in New York designing service-learning programs for youth caught up in the juvenile justice system. Ian is a graduate of Hampshire College, where he majored in Political Theory and American History, receiving the Peace and World Security Scholars Fellowship and the Social Justice Scholarship.



Jacob Koch
Master's candidate in Urban Planning,
GSD, Harvard University

Jacob Koch is a candidate for a Masters in Urban Planning at the Harvard Graduate School of Design. Previously he has worked for the U.S. Veterans Administration of Greater Los Angeles as a Strategic Planner, where he led the creation of a long range strategic plan to end Veteran homelessness in Los Angeles. He worked as the Urban Development Coordinator for EMBARQ Brasil, based in Porto Alegre and Rio de Janeiro, where he led a project to insert sustainable transportation into a citywide slup-upgrading program in Rio de Janeiro, working directly with the Municipal Secretariat for Housing and the Brazilian Institute of Architects. His research on transportation in the favelas has been published by the Lincoln Institute of Land Policy and featured at the International Sustainable Transport Congress in Mexico City. He has a B.A. in Political Science from Yale University, with a focus on urban politics and policy.



Jason Dyett
Program Director, Brazil Office
of Harvard University's David Rockefeller Center for
Latin American Studies (DRCLAS)

Jason Dyett manages the activities and operations of the Brazil Office of Harvard's David Rockefeller Center for Latin American Studies (DRCLAS). He first moved to São Paulo in 1996, after two and a half years at the DRCLAS in Cambridge during the Center's launch. From 1997 to 2002, he established the Brazil office of the Economist Intelligence Unit's telecommunications research division and went on to gain experience growing technology companies backed by local and international investors. Jason rejoined DRCLAS from the Corporate Executive Board, a Washington, DC-based organization that provides executive education to public and private companies. Since the creation the DRCLAS Brazil Office in 2006, he and the Brazil-based team have worked to develop and strengthen opportunities for Harvard student and faculty engagement with Brazil in close collaboration with the Brazil Studies Program at Harvard University. He has a Master's of Business Administration (MBA) from the University of Chicago Graduate School of Business (2004) and graduated Phi Beta Kappa with a B.A. in

Political Science and Spanish from the University of Vermont (1994).



Jill Larson

Area Director for Environmental Sciences and Engineering, Harvard School of Engineering and Applied Sciences (SEAS)

Jill has a B.S. in Ceramic Engineering and worked in industry for 10 years, lastly as an engineering manager. She earned a Masters of Liberal Arts (ALM) in Business Management at the Harvard University Extension School. Jill started her career at Harvard in 2001 and joined the SEAS team in 2009. Among other responsibilities as Area Director in Environmental Sciences and Engineering, one of her functions includes working with students on community building activities.



Joanne Nghiem

S.B. in Environmental Engineering, Harvard College, Class of 2015

Joanne Nghiem is a junior at Harvard College from Sacramento, California. She is pursuing a Bachelor of Science in Environmental Engineering interested in researching alternative energy sources and pollution sources and treatment. She is starting research on direct air capture, which is a technology that removes carbon dioxide from the atmosphere. Because climate change is affected by so many sources she is very excited to learn more about its relationship with urban society. A goal of hers is to spend time abroad helping underdeveloped areas establish basic infrastructure such as access to clean water. Joanne spent the past summer interning at a non-profit environmental policy organization, Friends of the River, which fights to protect California rivers. She aspires to be a part of the world's movement to conservation and sustainability. Born and raised in Northern California, Joanne loves to go camping and backpacking, whitewater rafting, swimming, and hiking in the many state and national parks.



John Godleski

Associate Professor, Department of Environmental Health, Harvard School of Public Health (HSPH); Department of Pathology, Harvard Medical School (HMS)

Dr. Godleski's research focuses upon the pulmonary and systemic responses to inhaled ambient air particles. His studies use cardiac and pulmonary mechanical measurements as well as cell and molecular biologic approaches with inhalation exposure to concentrated ambient air particles. The overall hypothesis is being tested in his laboratory is: Ambient urban air particles are complex mixtures with intrinsic toxicity; particulate exposure results in stimulation of lung receptors, release of reactive oxygen species, and induction of pro-inflammatory mediators that lead to local and systemic effects especially on the cardiovascular system, which ultimately account for epidemiologic associations between adverse health effects and particulate air pollution.



Johnathan Budd

S.B. in Electrical Engineering and Computer Science,
Harvard College, Class of 2015

Johnathan Budd is originally from Temecula, California. He is a junior at Harvard College living in Winthrop House and studying Electrical Engineering and Computer Science. His interests lie in renewable energy, transportation, and robotics. He is passionate about working on projects that bring about positive change through technological innovation. In his free time he enjoys, running, biking, scuba diving, and working on cars.



José Rodolfo Scarati Martins

Assistant Professor of Civil and Environmental Engineering,
Escola Politécnica da Universidade de São Paulo

José Rodolfo Scarati Martins is currently an Assistant Professor at the Escola Politécnica da Universidade de São Paulo where he teaches courses on civil engineering, environmental engineering and architecture. He specializes in the areas of hydraulics, applied hydraulics, and water resources, with a particular focus on urban water drainage, water supply, mathematical modeling applied to hydraulics and flood control, including research on hydraulic transients for calibration and leak detection purposes. He is a coordinator at the Brazilian Association of Technical Standards (ABNT - Associação Brasileira de Normas Técnicas) and in 2005 was president of the Fundação Centro Tecnológico de Hidráulica (FCTH). Prof. Scarati Martins earned a bachelor's degree (1981) in Civil Engineering and a Master's degree (1989) and doctorate (2002) in Hydraulic Engineering from the Escola Politécnica da Universidade de São Paulo.



Joseph D. Brain

Cecil K. and Philip Drinker Professor of
Environmental Physiology,
Harvard School of Public Health (HSPH)

Dr. Brain's research emphasizes responses to inhaled gases, particulates, and microbes. His studies extend from the deposition of inhaled particles in the respiratory tract to their clearance by respiratory defense mechanisms. Of particular interest is the role of lung macrophages; this resident cell keeps lung surfaces clean and sterile. Moreover, the lung macrophage is also a critical regulator of inflammatory and immune responses. The context of these studies on macrophages is the prevention and pathogenesis of environmental lung disease as well as respiratory infection. He received his S.D. from Harvard University in 1966.



Joyce Klein Rosenthal

Assistant Professor of Urban Planning,
Harvard Graduate School of Design (GSD)

Joyce Klein Rosenthal is Assistant Professor of Urban Planning. She received the Ph.D. (with distinction, 2010), the M.Phil. (2007), and the M.S. (2000), all in Urban Planning, from the Graduate School of Architecture, Planning and Preservation of Columbia University, as well as the Master of Public Health in Environmental Health Sciences (2001) from Columbia Mailman School of Public Health and the B.A.

in Environmental Studies (1980) from Binghamton University (SUNY). She was also concurrently an adjunct assistant professor at Columbia Graduate School of Architecture, Planning and Preservation (2000/2006) and a lecturer in the Mailman School of Public Health (2000/2010). Rosenthal's research interests are in environmental planning, sustainable development, and the public health impacts of planning and urban design strategies, with a particular present focus on the spatial and social determinants of climate-related health outcomes, the subject of her Ph.D. dissertation. Her research also includes analyzing the development of community-based ecological infrastructure and critical assessment of urban climate policy and governance. In recent teaching at Columbia, she created urban planning and studio courses, as well as participated in a core course in public health.



Judith Grant Long

Associate Professor, Department of Urban Planning,
Harvard Graduate School of Design (GSD)

Judith Grant Long is Associate Professor of Urban Planning at the Harvard University Graduate School of Design where she is also the Director of the Master in Urban Planning Degree Program. She coordinates and teaches in the first semester core urban planning studio, teaches a two-semester sequence on methods for urban planning, and offers a seminar on planning for the Olympic Games. Dr. Long's research investigates the relationship between infrastructure and urbanism. She is a nationally-recognized expert in the planning, finance, and development of sports and tourism facilities. Her recent publications include "Full Count: Inside Public-Private Partnerships for Major League Sports Facilities", "Facility Finance: Measurement, Trends, and Analysis," and "Ballpark Design and Rent-Seeking Behavior: 1890 to 2010". She has testified before the U.S. Congressional Oversight and Government Reform Committee on infrastructure finance, and her research has been quoted in major newspapers and periodicals worldwide. Dr. Long's newest book project, "Olympic Infrastructure", examines the legacies of facilities built for the summer and winter Olympics, calling for a more affordable, green, and just games. A certified professional planner, Dr. Long has practiced extensively at the local level of government in the Toronto area, managing innovative strategies for downtown redevelopment and historic preservation. Dr. Long served as Assistant Professor of Urban Planning at Rutgers University from 2002 to 2005, and as Design Critic at the GSD during 2005-2006. She received her BA (Economics) from Huron College at the University of Western Ontario, Canada; her BAA (Urban and Regional Planning) from Ryerson Polytechnic University, Canada; her MDesS from the GSD; and her Ph.D. (Urban Planning) from the Harvard Graduate School of Arts and Sciences.



Kate Donahue

S.B. in Physics and Math,
Harvard College, Class of 2016

Kate Donahue is a sophomore at Harvard from Lexington, Massachusetts. She is concentrating in Physics and Math with a language citation in Mandarin. Outside of her classes, she enjoys being a director for Chinatown Citizenship, an organizer for Robocup (a robotics team) and a member of the Harvard Political Opinion Poll at the Institute of Politics. Additionally, she is the Events Coordinator for the Society of Physics students. Last summer, she worked at Resources for the Future, an environmental and economic think tank in DC, on research related to Hurricane Sandy. In her spare time, she enjoys reading, biking and cooking elaborate desserts.



Kerry A. Emanuel
Cecil & Ida Green Professor of Atmospheric Science,
Massachusetts Institute of Technology (MIT)

Kerry Emanuel is Cecil & Ida Green Professor of Atmospheric Science at the Massachusetts Institute of Technology (MIT). Emanuel is working on various aspects of moist convection in the atmosphere, and on tropical cyclones. He is interested in fundamental properties of moist convection, including the scaling of convective velocities and the nature of the diurnal cycle of convection over land. His group has developed a promising technique for inferring tropical cyclone activity from coarse-grain output of climate models or re-analyses. Kerry received his Ph.D. from MIT in 1978.



Kevin Hernandez
S.B. in Environmental Engineering,
Harvard College, Class of 2014

Kevin Hernandez is senior at Harvard concentrating in Environmental Engineering from Covina, CA, a suburb of Los Angeles. Outside of the classroom, he gives campus tours as a member of the Crimson Key Society and participates in an after-school tutoring program. Previously, he rowed for two years on the beautiful Charles River as a member of the Lightweight Crew Team and stays active by playing volleyball, squash and team handball. This last summer he worked in Brazil with Rede Nossa São Paulo on their sustainable cities program. Coming back as a course alum, Kevin hopes to reconnect with past participants, make new relationships, practice some Portuguese and welcome the Brazilians students coming to his home country.



Kim Smet
Ph.D. candidate in Environmental Engineering,
SEAS, Harvard University

Kim Smet is a third year Ph.D. student in Environmental Engineering in the School of Engineering and Applied Sciences at Harvard University. She was born and grew up in Zimbabwe and previously lived in Vancouver, Canada, where she studied Environmental Science with a focus on hydrology at the University of British Columbia. Upon graduation, she worked as a contaminated sites consultant to the petroleum industry in British Columbia for two years. Kim's current research is looking at ways to incorporate a higher degree of adaptability/flexibility in the design of flood risk reduction infrastructure systems, as driven by the increased degree of future uncertainty due to climate change. She is applying these concepts to case studies on the North Sea Canal in the Netherlands and the Mississippi River in the USA.



Larissa Arakawa Martins
5th-year Undergraduate Student in Architecture,
Urbanism and Civil Engineering,
Poli/FAU-USP

Larissa Martins is a fifth-year undergraduate student enrolled in the double-degree program in Architecture, Urbanism and Civil Engineering at the Escola Politécnica da Universidade de São Paulo

(Poli-USP) and USP's School of Architecture and Urbanism. Since her second year of studies, she has been working on different research projects related to bioengineering, green-infrastructure, urban storm-water management and urban green spaces. She has always been interested in technological innovations in this field and has the goal to apply the solutions and concepts she has learned so far in developing cities like São Paulo, her home-town. In addition, she has participated in a one-year exchange program in Belgium, an experience that provided her not only technological and cultural references, but also the opening of a whole new world and perspective. Furthermore, she enjoys taking part in all sorts of extracurricular activities, like theater, language courses and volunteer work and she never misses a chance to travel and participate in cultural tours.



Layla Lambiasi

4th-year Undergraduate Student in
Environmental Engineering,
Poli-USP

Layla is a fourth-year Environmental Engineering undergraduate student. Over the past year she has been involved in an undergraduate research project about soil contamination due to lubricant oil and plasticizer spills. Along the research she has been able to realize that it is her desire to focus her further studies on soil contamination and its consequences to society. Currently, she has started an internship in an engineering and consulting group, which deals with several projects concerning the remediation of sites contaminated by industrial activity and brownfields. The more she gets involved, the clearer it is for her the negative impact caused by lack of human planning in their production processes. Layla intends to start her Master's dissertation as soon as she graduate, and deepen in more complex questions about soil and subsurface water contamination, as well the aftereffects and how it could imply into changes in our way of living. In her spare time, she likes to read, going to the beach and hanging out with her friends.



Ligia Monteiro

5th-year Undergraduate Student in
Environmental Engineering,
Poli-USP

Ligia Monteiro, born and raised in São Paulo, is a fifth-year undergraduate student concentrating in Environmental Engineering at Escola Politécnica da Universidade de São Paulo (Poli-USP). She has great interest in topics related to energy, water resources, environmental planning and climate change. During her time at Poli-USP, Ligia has taken part in the Hydroterm Project, a research group which aimed to develop a Non Linear Programming Model for hydropower generation in Brazil. Ligia had great results proposing a methodology to reduce the model's processing time and presented them at the World Environmental and Water Resources Congress 2013, held in Cincinnati (Ohio). In this year, she has worked as an intern at Centro Tecnológico de Hidráulica, where she helped developing emergency action plans for dams and learned how to improve resilience in cases of dam failures. Currently, she has been working as an intern within the sanitary and water resources field at Engecorps, a company member of TYPESA Group. Ligia participated in the fourth edition of this collaborative course, in which she improved her knowledge in the energy field and had the opportunity to exchange ideas with students from different nationalities. In her free time, she likes playing the piano, learning new languages and travelling.



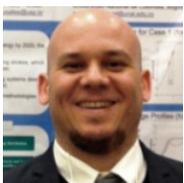
Lindsay Woodson
Master's candidate in Design Studies,
GSD, Harvard University

Cleveland, Ohio is where Lindsay calls home. As a result, a natural trajectory guided her to develop a strong affinity with post industrial landscapes, rooted in waterfront dependency. With a Bachelor's of Architecture and a minor in Geography, from Syracuse University, Lindsay was devoted to marrying her analytic strategies and design methodologies. Specifically, her path led to coastal resilience as a function of disaster management for post-industrial sites. In previous research, she focused on socio-ecologic impacts of disasters for disadvantaged populations in New Orleans. At Harvard University, Lindsay is pursuing a Master's of Design Studies, with concentration in Risk and Resilience. As it pertains to water scarcity, coastal resource management and urban theories, current research has led her to study water control infrastructure for climate change adaptation. Working as a Research Assistant for Harvard's Graduate School of Design and the Ministry of the Bahamas Exumas project, her work has led her to study coasts through notions of risk and vulnerability as well. Furthermore, her interests allow her to effectively relate political impacts of water polemics to urban form and geographies. Lindsay is excited for this course because it will allow her to bolster her studies, by adding a new layer of adaptable frameworks for coastal cities.



Manoel Carlos Pereira Neto
Program Manager, Brazil Office of
Harvard University's David Rockefeller Center for
Latin American Studies (DRCLAS)

Manoel Carlos Pereira Neto joined the Brazil Office of Harvard University's David Rockefeller Center for Latin American Studies in March 2009. Prior to that, he was selected by the U.S. Embassy in Brazil to become a Youth Ambassador in a program that targets students with leadership skills, positive attitude, proven social consciousness and academic excellence. During the program's trip to the United States, he met with public and private sector organizations and visited schools and social projects. Prior to moving to São Paulo, Manoel lived for two years in Curitiba, a city in the south Brazil, where he worked as coordinator for a web commerce company. In 2002, Manoel was awarded a Microsoft National Talents award for distinguished leadership in social entrepreneurship for volunteer work developed at his school's computer lab, when he was twelve. As a Program Manager at the Brazil Office, Manoel is responsible for programs, collaborative courses, and events. He provides support for Harvard faculty, students, and staff as well as for overall office administration. Manoel is earned a B.A. in Business from the Pontifícia Universidade Católica de São Paulo (PUC-SP).



Maurício Salles
Assistant Professor,
Department of Electric Energy and Automation Engineering,
Escola Politécnica da Universidade de São Paulo

Maurício Salles is Assistant Professor in the area of electrical machines at the Escola Politécnica da Universidade de São Paulo. From 2006 to 2008, he joined the researcher team of the Institute of Electrical Machines at the RWTH Aachen University, in Germany. He has experience with computational modelling and dynamic analysis of wind power in power systems and with Finite Element Method-based analysis of electromagnetic devices. His main interests are distributed generation, power generation, power system dynamics and stability, wind turbines, induction generator and renewable energy. He earned his bachelor's degree in Electrical Engineering from Universidade Presbiteriana

Mackenzie. In 2004, he obtained the M.Sc. degree in the area of Wind Farms and Power Systems from the Universidade Estadual de Campinas (UNICAMP), and a doctorate degree at the Universidade de São Paulo, also in the area of Wind Power Generation.



Meg Femino

Director, Emergency Management,
Beth Israel Deaconess Medical Center (BIDMC)

Meg Femino serves as Director of Emergency Management at Beth Israel Deaconess Medical Center. In this role, she is responsible for providing leadership, oversight, planning and administrative support for emergency management and disaster preparedness activities in all occupied areas of the medical center. She has led and participates on many internal and external taskforces, committees and meetings regarding emergency preparedness. As Director, she manages response operations, planning and preparedness activities, mitigation initiatives and recovery efforts. Meg has been collaborating for over 10 years in Boston as a hospital based Emergency Manager. She is robustly involved with response partners across the City of Boston and the state. She holds a certificate in Community Preparedness and Disaster Management from University of North Carolina Chapel Hill, School of Public Health and is a 2006 graduate of Harvard University's National Preparedness Leadership Initiative. Meg is also a Beth Israel Deaconess Medical Center 2009 Sloane Fellow graduate.



Michael Arad

Designer of 9/11 Memorial;
Partner, Handel Architects LLP

Michael Arad's design for the 9/11 Memorial at the World Trade Center site, titled "Reflecting Absence," was selected by the Lower Manhattan Development Corporation from among more than 5,000 entries submitted in an international competition held in 2003. Mr. Arad joined the New York firm of Handel Architects as a Partner in April 2004 where he worked on realizing the Memorial design as a member of the firm. A native of Israel, Mr. Arad was raised there, the U.K., the United States and Mexico. He came to the United States and earned a B.A. from Dartmouth College in 1994 and a Master of Architecture from the Georgia Institute of Technology in 1999. Mr. Arad became a resident of New York City following his studies. He worked for Kohn Pedersen Fox in the city before joining the Design Department of the New York City Housing Authority, where he was working during the Memorial competition. In 2006, Mr. Arad was one of six recipients of the Young Architects Award of the American Institute of Architects. In 2012, he was awarded the AIA Presidential Citation for his work on the National September 11 Memorial. In addition, he was also honored in 2012 by the Lower Manhattan Cultural Council with the Liberty Award for Artistic Leadership. Michael Arad lives in New York City with his wife, Melanie Arad Fitzpatrick, and their children.



Miguel Bucalem

Full Professor, Department of Geotechnical and Structural
Engineering, Escola Politécnica da Universidade de São Paulo;
Former Secretary of Planning of the City of São Paulo

Miguel Bucalem has a distinguished career in academia and city leadership. Following four years as Secretary for Urban Development in the City of São Paulo Government, he recently returned to the University of São Paulo (USP) to set up its new Center for Cities, called USP Cidades. This multi-

disciplinary Center focuses on generating insights for São Paulo and other Brazilian cities, with a focus on international learning and partnerships. Bucalem graduated from the Polytechnic School of the University of São Paulo (Poli-USP) in Civil Engineering in 1984. He earned his Master's in Engineering and began teaching at the USP in 1987. He went on to earn his Ph.D. from the Massachusetts Institute of Technology (MIT) in 1992, prior to becoming a Full Professor at Poli-USP. Bucalem served as Deputy Head of the Department of Geotechnical and Structural Engineering at the USP from 1998 to 2002 and as Department Chair in 2006. He coordinated graduate civil engineering programs through the doctoral degree level from 1994 to 1995. In 2007 and 2008, he served as head of the Urban Planning Advisory Department of the Secretary of Planning of the City of São Paulo. From 2009 to 2012, he served as Secretary of Urban Development. During this period, he also served (2010- 2012) as President of São Paulo Urbanism, the municipal company dedicated to urbanism and urban development. As Secretary of Urban Development, Bucalem lead more than twenty major projects and strategic initiatives for São Paulo. In his roles both as academic and municipal leader, Professor Bucalem has spoken and presented papers at a large number of international conferences on cities and urban development issues. He has published many books and articles on urban development and civil engineering issues.



Monica F. A. Porto

Full Professor and Chair, Department of Hydraulic and Sanitary Engineering,
Escola Politécnica da Universidade de São Paulo

Monica F. A. Porto is a Full Professor and current Chair of the Department of Hydraulic and Sanitary Engineering at the Escola Politécnica da Universidade de São Paulo (Poli-USP), where she has taught since 1984. She is also President of the Fundação Centro Tecnológico de Hidráulica (FCTH), and previously was president of the Brazilian Association of Water Resources (ABRH). She has been an active member of a number of major water organizations including the Global Water Partnership (GWP), the Stockholm International Water Institute (SIWI), and the International Water Resources Association (IWRA). She is a researcher of the Brazilian National Council for Scientific and Technological Development (CNPq) in urban water quality. Her areas of expertise include water quality and water management of reservoirs and rivers. Courses taught at USP include “Introduction to Environmental Engineering”, “Natural Resource Management,” and “Urban Water Systems”. Prof. Porto earned a bachelor's degree (1978), a Master's (1983), and a Ph.D. (1993) in Civil Engineering from the Universidade de São Paulo (USP), and carried out post-doctoral research in 1994 and 1995 at Colorado State University (CSU).



Patrick Ulrich

Assistant Director for Undergraduate Studies in Environmental Science & Engineering;
Lecturer on Environmental Sciences & Engineering,
Harvard School of Engineering and Applied Sciences

Patrick Ulrich is the Assistant Director for Undergraduate Studies in Environmental Sciences & Engineering at SEAS. He started in this position in June 2012, and prior to that he was a Graduate Student Researcher and Graduate Student Instructor at the University of California, Berkeley. His Ph.D. dissertation research studied the production and cycling of methylmercury in tidal wetlands in San Francisco Bay. As a graduate student, Patrick received two research fellowships, including a National Science Foundation Graduate Research Fellowship and a CALFED/Bay Delta Science Program Predoctoral Fellowship, and was awarded an Outstanding Graduate Student Instructor Award from the university for his work in a course on water chemistry. Patrick received a Ph.D. (2011) and M.S. (2006) in environmental engineering from UC Berkeley and a B.S. (2005) in physics from the Pennsylvania State University.



Rafael Granja

5th-year Undergraduate Student in
Environmental Engineering,
Poli-USP

Rafael Cesar Granja is an undergraduate student at the Escola Politécnica da Universidade de São Paulo (Poli-USP) majoring in Environmental Engineering. He is involved in a research program in the field of Water Quality and also has interest in Solid Waste Management and Sustainable Energies. In 2013 Rafael was awarded a scholarship to study in the U.S. during the year at the University of Nebraska in Lincoln, NE. There, he took graduate courses related to his field of study and worked as a Water Resources Intern at a state environmental company. He is a communicative person seeking new experiences and knowledge to improve his undergraduate experience, applying environmental techniques to help leading Brazilian's big cities to a sustainable way of development. He loves theater, singing, listening to good music, and hanging out with his family and friends.



Ramon Sanchez

Program Leader, Health and the Built Environment,
Center for Health and the Global Environment, HSPH;
Assistant Director of the Sustainability and
Environmental Management Program,
Harvard Extension School

Ramon Sanchez is a certified professional in sustainability, renewable energies, green manufacturing techniques, and technology innovation. He is assistant director of the Sustainability and Environmental Management Program at the Division of Continuing Education in Harvard University. Sanchez received an ScD in environmental health from the Harvard School of Public Health (HSPH), he previously received a MS in environmental health management from HSPH, and both an MS in manufacturing systems and technology innovation and a BS in mechanical engineering from the Monterrey Institute of Technology in Mexico. Before coming to Harvard, Sanchez was a corporate engineering manager in a company dedicated to the design and manufacture of furniture and electronic consumer goods. He oversaw seven departments in which hundreds of workers and engineers created and built products that generated approximately \$180 million a year in revenues. Sanchez has fifteen records of invention and four patents in the United States and Europe. From 2000 to 2003 he worked as a forward products lead engineer at Delphi Automotive Systems, a former division of General Motors, dedicated to the design and manufacturing of electronic components and automotive systems. As an automotive designer, he was a member of a research group that won the National Technology Award in Mexico in 2002. That same year, Ramon got the Best Teacher Award of Monterrey Institute of Technology for developing the first lean manufacturing and innovation engineering classes in Mexico. Sanchez's main research interests are corporate sustainability, green manufacturing, energy management in buildings, carbon accounting, life-cycle assessment for industrial operations, carbon capture from thermoelectric power plants, health and environmental effects of renewable energies, and the development of renewable fuels with micro-algae species.



Raphael Guiguer

5th-year Undergraduate Student in Civil Engineering,
Poli-USP

Raphael Chercezian Guiguer is a fifth-year undergraduate student in Civil Engineering at the Escola Politécnica da Universidade de São Paulo (Poli-USP). He is interested in entrepreneurship and in management, particularly the organizational skills required to optimize resources in infrastructure projects. During his exchange at the Politecnico di Torino, in Italy, he focused his studies in project

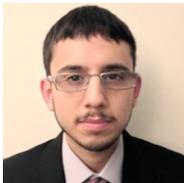
management and building technology. For the future, he wants to merge logistics with building technology to enhance productivity. He has just started a company and in his free time, he is an all-around adventurer: mountain biking, mountaineering, paddling and swimming are some of the sports he enjoys practicing.



Raphael Rodrigues

Ph.D. candidate in Environmental Engineering,
Poli-USP

Raphael Rodrigues graduated in Environmental Engineering from Poli-USP in 2010. Since then, he has worked as environmental consultant for assessment of contaminated sites in São Paulo metropolitan area and as technical auditor in São Paulo's Environmental Company (CETESB). Now he is a Ph.D. candidate at Poli-USP, working in a research related to synthesis of modified membranes and their use for water and wastewater treatment. Thanks to the partnership between Poli-USP and Harvard University, Raphael was able to get a one-year fellowship from CAPES to work at Vecitis' Lab of Environmental Technology at SEAS to collect new data for his research. In his free time, Raphael likes to watch movies, play video games, web surfing, swimming, cycling, and spending his time with friends and family.



(José) Rodrigo Leal

B.S. in Earth and Planetary Sciences,
Harvard College, Class of 2016

Rodrigo Leal is a sophomore at Harvard College and is originally from Brownsville, Texas. Rodrigo is currently studying Earth and Planetary Sciences, as well as Latin American Studies. He is very interested in the effects of natural disasters on human populations and plans to explore these topics in the context of Latin America. His other academic interests include urban studies, climate change, and human geography. Rodrigo is extremely excited to have the opportunity to explore the intersection of these academic areas through this course. This past summer, Rodrigo had the privilege of working with the Anderson Group on climate change research related to carbon dioxide and methane fluxes from the Arctic. At Harvard, Rodrigo is a proud member of Harvard Radio Broadcasting and Harvard's Fuerza Latina. Currently, Rodrigo is studying Portuguese and hopes to one day have the opportunity to study and do research in Brazil.



Sam Houston

Coordinator,
Office for Sustainability at Harvard

Sam Houston joined OFS in July 2011 after graduating from Harvard with a B.A. in Environmental Science and Public Policy. As an undergraduate, Sam worked for the Resource Efficiency Program as a house representative for two years and a captain for one year. Sam also served as chair of the Adams House Committee. In this role, she planned house events—from weekly social gatherings to a Harry Potter –themed formal—and institutionalized green practices as the norm for such events. Her more formative experience with environment and sustainability issues includes field work in Florida and the New England region developing ways to sustainably achieve the growth of existing urban areas.



Selma Shimura

6th-year Undergraduate Student in Architecture,
Urbanism and Civil Engineering,
Poli/FAU-USP

Selma Shimura, born and raised in São Paulo, is a sixth-year undergraduate student in the joint-degree program between Poli-USP and FAU-USP, majoring in Architecture, Urbanism and Civil Engineering, where her interest in rethinking problems of large urban centers began. She has taken part in a two-year scientific research project at FAU-USP about low quality and irregular housing communities in São Paulo. After a more general analysis about sanitation and electricity distribution and other urban improvements, the research took as case study at the Jaguaré Favela, in São Paulo, was awarded in the contest Soluções para Cidades in 2012. Prior to that, Selma participated in a Workshop on International Social Housing, a partnership between FAU-USP and Accademia de Mendrisio (Switzerland). In her spare time, she enjoys traveling to new places, watching movies, cycling and practicing yoga.



Shirine Boulos

AIA, LEED AP Principal,
Ellenzweig

Shirine Boulos Anderson joined Ellenzweig in 1998. She has devoted more than 30 years of practice to developing creative alternatives for physical space and advocating a holistic approach to sustainable design and energy conservation. As a Principal of the firm she has lead the effort to sign the American Institute of Architects 2030 Commitment, with the goal of designing carbon neutral buildings by the year 2030. Ellenzweig is an architectural firm located in Cambridge, Massachusetts. It was founded in 1965 and has provided master planning, programming, feasibility study, in-house laboratory planning, and architectural design services to academic, institutional, and corporate clients. Its projects include technically complex buildings for science research and teaching, medical and health science education, and infrastructure - energy and chilled water plants, parking complexes, and transit facilities.



Sofia Viguri

Master's candidate in Urban Planning,
GSD, Harvard University

Sofia Viguri is a Master in Urban Planning candidate at the Graduate School of Design. Before coming to Harvard, Sofia worked as a team leader and policy analyst at the Mario Molina Center, an environmental NGO based in Mexico City that provides consultancy services to the Mexico City Government, the Ministry of the Environment and Natural Resources (SEMARNAT), as well as Federal housing institutions. In that position, she was responsible for bridging technical and economic research findings with public policy on issues related to climate change, air quality, water and waste management. Relevant achievements include the coordination of a Handbook for the Methodological Assessment of Local Climate Change Plans, as well as the drafting of proposals on urban policy to be included in the 2013-2018 Federal Climate Action Plan. Prior to that position, Sofia worked as a policy analyst in the Sustainable Development Program at the Center for Dialogue and Analysis on North America at Tecnológico de Monterrey, the university where she earned her Bachelor's Degree in International Relations. Additionally, Sofia is passionate about Brazilian culture, having studied Portuguese and Samba for over year; she is extremely eager to find venues to foster bilateral collaboration in environmental and climate change policy issues, considering Brazil and Mexico are both mega diverse countries with incalculable natural wealth for our planet and generations to come.



Steven Wofsy

Abbott Lawrence Rotch Professor of Atmospheric and Environmental Science,
Harvard School of Engineering and Applied Sciences (SEAS)

Steven Wofsy was born in New York City in 1946 and is currently Abbott Lawrence Rotch Professor of Atmospheric and Environmental Chemistry at Harvard University, Division of Engineering and Applied Science and Department of Earth and Planetary Sciences. He studied chemical physics at University of Chicago (BS, 1966) and Harvard (Ph.D. 1971), shifting to atmospheric chemistry in 1971. His work has focused on changes in the composition of the stratosphere and troposphere, at first in theory and modeling and later in field and laboratory studies. His current research emphasizes the effects of terrestrial ecosystems on the global carbon cycle, and the impacts of climate change and land use on ecosystems and atmospheric composition. Several projects focus on quantitative measurements of ecosystem carbon fluxes, for time scales spanning instantaneous to decadal and spatial scales from meters to thousands of kilometers, combining physical, chemical and biological methods. His awards include AGU's McIlwane prize and NASA's Distinguished Public Service Medal.



Susannah Sayler

Director & Co-Founder, The Canary Project;
Assistant Professor,
Department of Transmedia Art Photography,
Syracuse University

Susannah Sayler is an artist and co-founder of The Canary Project. For her current body of work, A History of the Future, Sayler photographed landscapes throughout the world where scientists are studying the impacts of climate change. In exhibition, the photography is frequently combined with other elements, such as archival objects and images, research, video and/or mixed media installation. The project has been exhibited widely in group and solo shows at Exit Art (NYC), Denver Museum of Contemporary Art - Creative Acts that Matter Program (Denver), Everson Museum of Art (Syracuse, NY), ARTECH (Spain), Wave Hill (NYC), Harvard Graduate School of Design (Cambridge, MA), Cleveland Museum of Natural History and others. She has upcoming exhibits at Human Resources (L.A.) and The Nevada Museum of Art (Reno). In 2006, Sayler and her collaborator Edward Morris co-founded The Canary Project, which has produced projects involving more than 30 artists, scientists, writers, designers, and educators – all efforts to deepen public understanding of climate change. In 2008-09, Sayler was a Loeb Fellow at Harvard's Graduate School of Design.



Thiago Arapian

4th-year Undergraduate Student in
Environmental Engineering,
Poli-USP

Thiago Arapian, a São Paulo native, is currently in his fourth-year of study at the Escola Politécnica da Universidade de São Paulo, majoring in Environmental Engineering. He is interested in learning how technology can improve sustainable growth. He spent one year in Italy at Università Degli Studi di Padova to study environmental engineering and economics. Prior to that, Thiago was intern in a civil engineering company where he had the opportunity to improve methods of construction and saving water with some changes in the standard projects. In his future, Thiago believes that creating a consulting company in this area will help to spread new ideas and new technologies around the world. In his free time he likes to practice tennis, judo and jiu-jitsu, reading and playing the piano.



Tiago Corso Kruk

4th-year Undergraduate Student in Civil Engineering,
Poli-USP

Tiago Corso Kruk is a fourth-year undergraduate student in Civil Engineering at Escola Politécnica da Universidade de São Paulo (Poli-USP). He has been interested in the urban environment and transportation issues since he started his university studies. During high school, he was always interested in Mathematics, and won a bronze medal in the Brazilian Olympiad of Mathematics for public schools (OBMEP). Due to his achievement in the Olympiad, he was invited to join a group study of applied mathematics during the first year at Poli-USP. In 2012, went to Texas Tech University for a semester abroad, attending regular classes of civil engineering. At the moment, he has been mentored in a research project about the effects of freight transportation in São Paulo, which is linked to MIT's Megacity Logistics Lab. He also enjoys programming, travelling to the countryside and hiking. Even so, he loves to live in a megacity and he wishes his professional work can improve the lives of people in our cities.



Venkatesh “Venky” Narayanamurti

Director of the Science, Technology and Public Policy
Program, Belfer Center for Science and International
Affairs, Harvard Kennedy School (HKS);
Benjamin Peirce Professor of Technology and Public
Policy and a Professor of Physics at Harvard University

Venkatesh Narayanamurti is the Director of the Science, Technology and Public Policy Program at the Belfer Center for Science and International Affairs at the Harvard Kennedy School (HKS). He is also the Benjamin Peirce Professor of Technology and Public Policy and a Professor of Physics at Harvard. For ten years he was the John L. Armstrong Professor and Dean of the School of Engineering and Applied Sciences and Dean of Physical Sciences at Harvard. Previously he served as the Richard A. Auhll Professor and Dean of Engineering at the University of California at Santa Barbara. Prior to that he was Vice President of Research at Sandia National Laboratories and Director of Solid State Electronics Research at Bell Labs. He is an elected member of the American Academy of Arts and Sciences, the National Academy of Engineering and the Royal Swedish Academy of Engineering Sciences, and a Fellow of the American Physical Society, the American Association for the Advancement of Science, the IEEE, and the Indian Academy of Sciences. He has served on numerous advisory boards of the federal government, research universities and industry. He is the author of more than 200 scientific papers in different areas of condensed matter and applied physics. He lectures widely on solid state, computer, and communication technologies, and on the management of science, technology and public policy. He obtained his Ph.D. in Physics from Cornell University and has an Honorary Doctorate from Tohoku University.



Victor Silva

5th-year Undergraduate Student in Civil Engineering,
Poli-USP

Victor D'Afonseca e Silva is currently a fifth-year undergraduate student at the Escola Politécnica da Universidade de São Paulo (Poli-USP) majoring in Civil Engineering. He works for a large company in the construction business, developing projects in the fields of Research, Development, and Innovation, using the method of Design Thinking. His current line of research is related to the study of the performance of buildings, like the concepts of thermal performance, acoustic performance, energy efficiency and durability of buildings. Still in the area of Innovation and Development, he worked for

two years at EMBRAER, an aerospace company where he helped plan and participated in the development of a patent related to new models of comfort and efficiency for medium-sized aircrafts. Victor believes the future of the construction industry is in the smart building design, with superior performance and high energy efficiency, thus contributing to shaping lean resilient cities. He actively participates in social projects, and enjoys doing sports and playing music with his band in his spare time.



Vivien Li
President,
The Boston Harbor Association

Vivien Li is the president of The Boston Harbor Association, a harbor advocacy group in Boston, Massachusetts. TBHA's goal is "to promote a clean, alive, and accessible Boston Harbor" through environmental protection programs and harbor activities, as well as providing public access to the harbor through the HarborWalk. Vivien has more than 20 years of experience with the TBHA. Prior to joining The Boston Harbor Association, Vivien worked at the Office of Governor Michael Dukakis and was a Special Assistant to the Public Health Commissioner at the Massachusetts Department of Public Health. Li earned a B.A. in Environmental Management from Barnard College and a Master's Degree in Public Affairs/Urban and Regional Planning from Princeton University.



Yanina Barrera
Ph.D. candidate in Environmental
Science and Engineering,
SEAS, Harvard University

Yanina Barrera is obtaining her Ph.D. in Environmental Science and Engineering under the guidance of Professor Steve Wofsy at Harvard University. She was born in Buenos Aires, Argentina, and raised in Southern California. Prior to the commencement of her doctorate program, Yanina obtained her B.S. in Chemical Engineering and worked as an environmental consultant mostly in air quality management for 5 years. Her primary academic interest is to conduct pertinent research in air pollution, clean energy technology, and climate change. Yanina's current career interest is to bridge the gap between engineering and policy, and to push for more stringent environmental policies in Latin American countries. In her spare time, Yanina enjoys outdoor activities (surfing, snowboarding, hiking, etc.) as well as salsa and hip-hop dancing.

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