Appendix

Yale Climate Change and Health Initiative Annual Report, August 1, 2016 to July 31, 2017

Appendix II.A.2

Climate Change
Leader in Residence

Version 7, 03/27/2017

Kristie Ebi Itinerary, Yale Climate Change and Health Initiative Leader in Residence, April 3-6, 2017

Time	Location	Event and participants	Point
Monday, April 3			
5:15 PM	Bradley International Airport	**Arrival at Bradley International Airport in Hartford Flight Delta DL1444 from Seattle, WA**	Bethany
5:15 PM	Hy's Limo	**Pick up at BDL in Baggage Claim (Conf#347654)**	800.255.5466
	Hy's Limo	**Transport to Omni Hotel in New Haven**	Bethany
	Omni Hotel	**Check in to the Omni (Stay from 4/3-4/6/2017)**	203-772-6664
Tuesday, April 4			
8:15 am	Omni Hotel	**Pick-up and travel to Claire's Corner Copia**	Rob
8:30 am – 9:30 am	Claire's Corner Copia	**Breakfast with Robert Dubrow**	Rob
9:30 am – 10:00 am	Dean's Office	**Sten Vermund**	Kelly Edwards
10:00 am – 11:30 am	LEPH 424	**Meeting with students**	Rob
11:30 – noon	LEPH 434	**Break and preparation for talk**	Rob

Noon – 1:00 pm	Winslow Auditorium	**Talk "Lessons learned on health adaptation to climate change in low and middle income countries"**	Rob
1:00 pm – 2:00 pm	LEPH 105 & Gathering space	**Lunch**	Bethany
2:00 pm – 2:45 pm		**Break and travel to Kroon Hall**	Rob
2:45 pm – 3:15 pm	Kroon Hall Room 215	**Michelle Bell**	Rob
3:15 pm – 4:00 pm	Kroon Hall Room 321	**Break and preparation for talk**	
4:00 pm – 5:00 pm	Kroon Hall Main Auditorium	**Talk: "Health co-benefits of climate change mitigation policies and technologies"**	Rob Karen Seto Melanie Quigley
6:00 pm – 8:00 pm	To be determined	**Dinner** with faculty Robert Dubrow, Martin Klein, Vasilis Vasiliou, Yawei Zhang	Rob

Wednesday, April 5			
9:30 am	Omni Hotel	**Pick-up and travel to YSPH**	Rob
10:00 am – 10:30 am	LEPH 301	**Xi Chen**	Bethany
10:30 am – 11:00 am	LEPH 434	**Debbie Humphries**	Bethany
11:00 am – 11:30 am	LEPH 405	**Kaveh Khoshnood**	Bethany
11:45 am – 1:15 pm	Union League Cafe	**Lunch with Gary Yohe (**gyohe@wesleyan.edu**) and wife**	Bethany
1:15 pm – 1:30 pm		**Travel to Kroon Hall**	Gary
1:30 pm – 2:30 pm	Kroon Hall 102	**Karen Seto**	
2:30 pm – 3:30 pm	Kroon Hall 220	**Robert Mendelsohn**	
3:30 pm – 4:00 pm		**Break and travel to Branford College**	Rob
4:00 pm – 5:00 pm	Branford College Branford House	**College Tea** Informal conversation and Q&A with mostly undergraduate students: "Climate Justice and Health Equity"	Rob Betsy Bradley Joan Dempsey
6:00 pm – 8:00 pm	Thali Too	**Dinner with Climate Change and Health Initiative Student Associates**	Alyssa Parpia

Thursday, April 6			
8:45 am	Omni Hotel	**Pick-up and travel to Nursing School**	Patricia Ryan-Krause
9:30 am – 11:30 am	West Campus	**Nursing School (detailed itinerary below)**	Patricia Ryan-Krause
11:30 am – Noon	West Campus	**Travel from Nursing School to YSPH**	Patricia Ryan-Krause
Noon – 1:00 pm	LEPH 429	**Lunch and Summary with Robert Dubrow**	Rob
1:00 pm – 1:30 pm	LEPH 434	**Break**	
1:30 pm – 2:00 pm	LEPH 319B	**Albert Ko**	Carolyn
2:00 pm	YSPH	**Leave for drop-off at New Haven train station**	Bethany
3:13 pm	New Haven train station	**Train departs**	

Itinerary for Dr. Ebi's visit to School of Nursing on April 6th

Time	Participants	Location
9:00	Pat Ryan-Krause will pick up Dr. Ebi at Omni Hotel	New Haven
9:30	Students: Lynmarie Knight Aviela Lerner, Frances Ogudebe (see below)	School of Nursing West Haven Goodrich Room # 21102
10:00	Faculty: Mark Lazenby Dir of Urban Farm: Justin Freiberg	School of Nursing West Haven Goodrich Room # 21102
10:30	Faculty: Heather Reynolds	School of Nursing West Haven Goodrich Room # 21102
11:00	Faculty: Jane Dixon Pat Jackson Allen	School of Nursing West Haven Goodrich Room # 21102
11:30	Pat Ryan-Krause will drop Dr. Ebi at School of Public Health	New Haven

Aviela Lerner

I am a second year masters student finishing my FNP this year. I came to YSN directly from my undergraduate education at Emory University where I majored in Anthropology and Minored in Global Health. I wrote my thesis on Burmese Refugees and the challenges that they face when seeking healthcare in the United States. I am still very interested and dedicated to working with Refugee health. At YSN I am in the Global Health Concentration and I am able to pursue this goal. I recently accepted a fellowship position at the Institute for Family Health in the Bronx, NY where I will work as an FNP in a community health center with an underserved population.

Frances Ogudebe

Born on the Niger in the West African city of Onitsha-Ado in Anambra State, Nigeria, I began my career-based education in a college of business administration and obtained a Bachelor of Science degree in accountancy from University of Nigeria. I became a banker on graduation, and for the next several years created and operated fiscal programs that ranged from international banking to special revolving business loans and grants to the motivated, innovative, poor seeking better livelihood through small-to-mid-sized ventures in commerce. This was before I came to Yale to begin training for entry and committed service in healthcare. Somehow philanthropy and volunteer activities steadily grew in importance for me during my years as a banker. It was during one of those activities that an unexpected, gruesome, event redefined my professional trajectory and guided me to step away from the affluent world of finance so that I can serve the weak and the ill in the more modest but highly fulfilling world of nursing. I am fulfilled knowing that by utilizing my training and expertise, I am able to give back and serve others. When you get a big hug or a smile, you know you are making a difference in the lives of others. This is why I became a nurse. I am proud to be a Yale nurse. Married and a mother of three young children, I am now in my final year of study as a psychiatric and mental health

Lynmarie Knight

Lynmarie Knight is a graduating FNP student at Yale School of Nursing and a HRSA Nurse Corps scholar. Prior to nursing school, Lynmarie lived and worked in rural West Virginia for six years where she led a project to create the first-ever county water resources management plan in the state. Lynmarie's experiences in Appalachia helped her understand how vital good health is for our capacity to care for each other and our natural world, and this set her on the path to becoming a primary care provider. Lynmarie remains interested in the intersection of environmental and human health and is

YALE Climate Change and Health Initiative

Climate Change Leader in Residence

Kristie L. Ebi, PhD, MPH, MS

Professor of Global Health and Environmental ... Occupational Health Sciences
Director of the Center for Health & the Global Environment
University of Washington

Lessons learned on health adaptation to climate change in low and middle income countries

Tuesday, April 4, 2017
60 College Street
Yale School of Public Health
Winslow Auditorium, First Floor

12:00 pm to 1:00 pm

(lunch to follow)

Dr. Ebi conducts research on the impacts of climate change on extreme events, thermal stress, foodborne safety and security, water-borne diseases, and vector-borne diseases. She also focuses on understanding sources of vulnerability and designing adaptation policies and measures to reduce the risks of climate change. She has done this work in Central America, Europe, Africa, Asia, and the Pacific, in collaboration with WHO, UNDP, USAID, and others. Dr. Ebi was Executive Director of the Intergovernmental Panel on Climate Change (IPCC) Working Group II Technical Support Unit during 2009 – 2012, and was a coordinating lead author or lead author for assessments of the health effects of climate change for two US national assessments, the IPCC Fourth Assessment Report, the Millennium Ecosystem Assessment, and the International Assessment of Agricultural Science and Technology for Development.

Yale SCHOOL OF PUBLIC HEALTH

Yale SCHOOL OF FORESTRY & ENVIRONMENTAL STUDIES

Health Co-Benefits of Climate Change Mitigation Policies and Technologies

KRISTIE L. EBI, PHD, MPH, MS

Rohm & Haas Endowed Professor in Public Health Sciences, Departments of Global Health and Environmental and Occupational Health Sciences, Director of the Center for Health & the Global Environment, University of Washington

TUESDAY, APRIL 4

4:00 PM – 5:00 PM

Kroon Hall, Burke Auditorium

195 Prospect Street, New Haven, CT

Co-sponsor: Yale Climate Change and Health Initiative

BRANFORD COLLEGE TEA

with

Dr. Kristie Ebi

Climate Justice and Health Equity

Kristie L. Ebi, PhD, MPH, MS is Professor of Global Health and Environmental and Occupational Health Sciences and Director of the Center for Health & the Global Environment at the University of Washington. She conducts research on the impacts of climate change on extreme events, thermal stress, foodborne safety and security, water-borne diseases, and vector-borne diseases. She also focuses on understanding sources of vulnerability and designing adaptation policies and measures to reduce the risks of climate change in a multi-stressor environment. She has done this work in Central America, Europe, Africa, Asia, and the Pacific, in collaboration with WHO, UNDP, USAID, and others. Dr. Ebi was Executive Director of the Intergovernmental Panel on Climate Change (IPCC) Working Group II Technical Support Unit during 2009 – 2012, and was a coordinating lead author or lead author for assessments of the health effects of climate change for two US national assessments, the IPCC Fourth Assessment Report, the Millennium Ecosystem Assessment, and the International Assessment of Agricultural Science and Technology for Development. Dr. Ebi recently led one of the first conferences on the health co-benefits of climate change mitigation policies and technologies. Her work directly addresses climate justice and health equity.

Wednesday, April 5th at 4:00 pm
Branford House, 80 High Street

Appendix II.B.1

Climate Change and Health Pre-Doctoral Fellowships

SAPPHO ZOE GILBERT, MPH

703.966.9978

sgilbert@jhu.edu

EDUCATION

Dartmouth College, The Dartmouth Institute for Health Policy and Clinical Practice, Hanover, NH 2014
Master of Public Health

Research Report (Capstone Award Recipient): "Selective Serotonin Reuptake Inhibitors versus Placebo for Irritable Bowel Syndrome Relief: A Systematic Review"

Massachusetts Institute of Technology, Cambridge, MA 2013
Bachelor of Science in Biology; Minor in Political Science

Final Paper in Experimental Biology Project Lab: "TNF-α Induces Increased Death via Necrosis and Accumulation of Pro-Survival CCL5 in L929 Cells"

PROFESSIONAL EXPERIENCE

Project Director, Berman Institute of Bioethics Oct. 2015-present
Johns Hopkins University, Baltimore, MD

- Oversee Hopkins' efforts on PHASES, a multi-university, NIAID-funded study exploring the responsible inclusion of pregnant women in biomedical HIV research in the U.S., South Africa, Malawi, and Botswana
- Assist a Wellcome Trust grant on pregnant women's health needs for Zika and other public health emergencies

Lombard Fellow, Dartmouth College Richard D. Lombard '53 Public Service Fellowship May 2015–May 2016
The John Sloan Dickey Center for International Understanding, Dartmouth College, Hanover, NH
Embrace Life Council, Iqaluit, Pond Inlet, Rankin Inlet; Nunavut, Canada

- With local partners, conducted need-based service through research (community-based participatory action approach) on 3 Inuit communities' mental health care, resilience, and mental wellness practices
- Analysis aimed to inform effectual public/mental health changes to address the tragically high suicide rate

Volunteer, Public Health Specialist Jan.–May 2015
Project HOPE, Sarajevo, Bosnia and Herzegovina

- Researched and implemented best practices for UNICEF grants in the areas of community mental health (following May 2014 disaster floods), school nutrition, and early child development and care
- Generated a user-friendly, evidence-based toolkit for creating Centers for Healthy & Active Aging

Data Analysis Intern, Patient Experience Aug. 2014–Jan. 2015
The George Washington University Hospital, Washington, DC

- Digitized streamlined executions of hospital-wide quality improvement initiatives with senior leadership
- Built and launched survey tools for patients in preventive care education and volunteer rounding

Navigator, Vermont Health Connect Jan.–Jun. 2014
Good Neighbor Health Clinic, Inc., White River Jct., VT

- Assisted individual Vermonters, families, and small employers to enroll in qualified health plans
- Researched key state & federal health reforms and bolstered community outreach with area agencies

Health Assistant, EMT-Basic & Certified Medication Technician Jun.–Aug. 2011 & 2012
Johns Hopkins University, Center for Talented Youth Camp, Chestertown, MD

- Worked closely with the site nurse and director as part of the administrative team and health office
- Treated injuries and illnesses (10-13 year old campers), dispensed students' medications, conferred with parents, and acted as a liaison with nearby medical professionals

Research Intern Sept.–Dec. 2010
Trilogy Advisors, LLC, Washington, DC

- Prepared memoranda for Woodrow Wilson International Center's Southeast Europe Project
- Created lecture notes for State Department courses and maintained international client portfolios

Student Researcher May–Aug. 2010
Brigham and Women's Hospital/Children's Hospital Boston, Boston, MA
Harvard Medical School Summer Research Program in Newborn Medicine, Christou & Kourembanas Labs

- Investigated effect of a variable nucleotide repeat polymorphism in the human heme oxygenase-1 (HO-1) gene on the gene's inducibility in response to hypoxia and lipopolysaccharide
- Shadowed doctors in both hospitals' Neonatal Intensive Care Units and various pediatric clinics

PUBLICATIONS & PRESENTATIONS

Krubiner CB, Faden RR, Cadigan RJ, **Gilbert SZ**, Henry LM, Little MO, Mastroianni AC, Namey EE, Sullivan KA, Lyerly AD. "Advancing HIV research with pregnant women: navigating challenges & opportunities." AIDS 30(15), 2261-5, (2016).

SZ Gilbert. "*Athens' 'Nephos': A Heating Oil Tax Hike, Particulate Matter, and Public Health."* Athens Journal of Health, 2(1), 39-60 (2015).

SZ Gilbert, LJ Martin, RT Raines. *"Inhibition of the 26S Proteasome by a Non-Hydrolyzable Ubiquitin Linkage,"* National Conference for Undergraduate Research (2010).

OP Soldin, BE Goughenour, **SZ Gilbert,** HJ Landy, SJ Soldin. "*Thyroid Hormone Levels Associated with Active and Passive Cigarette Smoking",* Thyroid, 19(8), 817-823 (2009).

OP Soldin, C Marian, C Loffredo, **SZ Gilbert,** H Ressom, P Shields. *"Hormonal Changes in Women of Reproductive Age Associated with Tobacco Smoke Exposure and Genetic Polymorphisms",* Future Research on Endocrine Disruption, NIEHS, NIH (2007).

Premature neonatal blood gas data analyses published in:

SJ Soldin, C. Brugnara, EC Wong. Pediatric Reference Intervals, 6th Edition, AACC Press (2007).

Acknowledgement in the following papers:

TP Vrahopoulos and A Grous. *"Periodontal treatment in two Siblings with Papillon-Lefevre Syndrome: 12-year Follow-up and Review of the Literature,"* Periodontology, 5(3), 169-177 (2008).

E Bazopoulou-Kyrkanidou, TP Vrahopoulos, G Eliades, H Vastardis, K Tosios, K Vrotsos. *"Periodontitis associated with Hajdu-Cheney Syndrome (HCS): A case report"*, Periodontology, 78, 1831-1838 (2007).

HONORS & AWARDS

Model Arctic Council, Best Position Paper, *Life With&Without Water in Nunavut: a Hydro-Humanitarian Crisis*	2016
Project HOPE, Volunteer of the Month (February 2015)	2015
The Dartmouth Institute, Top Capstone Award, *SSRI vs. Placebo*: *a Meta-Analysis/Research Report*	2014
Dartmouth Global Health Day, Poster Competition, 2nd Place	2014
National Next Generation "Greeks Give Back" Competition, Semifinalist	2012
Hellenic Medical Society of NY's Leonidas Lantzounis Research Grant, Honorable Mention	2010
Emerging Leaders Institute, MIT Alpha Phi (Zeta Phi chapter) representative	2010
National Raytheon Scholar (30 students nationwide, sole Virginian)	2009
National Merit Finalist	2008
Intel Science Talent Search Finalist (top 40 in the Nation, sole Virginian)	2008
Intel International Science & Engineering Fair, Third Place in Medicine and Health	2008
National Coca-Cola Scholar (top 50 in the Nation out of 80,000 applicants, sole Virginian)	2008
National Micron Science & Technology Scholar (one of two Virginian recipients)	2008
American Hellenic Educational Progressive Association (AHEPA), Endowment Scholar	2008
Siemens Math, Science & Technology Competition, Semifinalist (top 300 in the nation)	2007

EXTRACURRICULAR ACTIVITIES

MIT Educational Counselor	2013–Present
Hellenic Bioscientific Association, American Chapter	2009–Present
Geisel School of Medicine Indian Health Service Trip *(White Earth Reservation, Minnesota)*	Spring 2014
The Dartmouth Institute, Student Activity Council *(Co-Social Chair)*	2013–2014
Geisel School of Medicine Student Government (*Institute Representative*)	2013–2014
Geisel School of Medicine, Martin Luther King Jr. Celebration 2014 *(Committee Member)*	2013–2014
MIT Hellenic Students' Association *(Vice President 2012-3, General Board Member 2009-10)*	2008–2013
MIT Alpha Phi Sorority (*House Manager 2009–10)*	2008–2012
MIT Emergency Medical Services, Volunteer Emergency Medical Technician *(EMT-Basic)*	2008–2010
MIT Freshman Class Council *(Social Chair)*	2008–2009

SPECIAL SKILLS & INTERESTS

- **Languages**: English (native), Greek (fluent), Spanish (conversational)
- **Programming & Software**: STATA, EndNote, RevMan, HTML, XML, MATLAB, Microsoft Office Suite
- **Laboratory**: Cell and tissue culture, molecular cloning, PCR, rtPCR, all blotting, ELISA, antibody testing
- **Certifications**: Lean Six Sigma (Green Belt), American Red Cross Disaster Responder, Vermont Health Connect Navigator, First Aid/CPR, Certified Medication Technician (2011-3), EMT-Basic (MA, 2009-11)
- **Personal interests**: global, mental, & women's health, creative writing, computer refurbishing, soccer

Appendix II.B.2

Graduate Course on Climate Change and Health

SYLLABUS: CDE 547a, CLIMATE CHANGE AND PUBLIC HEALTH
INSTRUCTOR: DR. ROBERT DUBROW
Fall 2016

1. Prerequisites:

- (CDE 508a, Principles of Epidemiology I or HLTH 240, Epidemiology & Public Health or equivalent) AND (BIS 505a, Introduction to Statistical Thinking I or equivalent)

OR

- Permission of Instructor

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2. Course description: This course takes an interdisciplinary approach to examining relationships between climate change and public health. After placing climate change in the context of the Anthropocene, planetary boundaries, and planetary health and exploring the fundamentals of climate change science, the course covers impacts of climate change on public health, including heat waves, occupational heat stress, tropospheric ozone, wildfires, aeroallergens, vector-borne, foodborne, and waterborne diseases, water scarcity, food insecurity, migration, violent conflict, natural disasters, and health co-benefits of climate change mitigation. The course integrates climate justice issues and adaptation strategies into the discussion of specific topics. The course is reading-intensive, and makes ample use of case studies. There is a focus on critical reading of the literature and identifying research gaps and needs. This course should be of interest to students across Yale School of Public Health and the University.

3. Course learning objectives: Successful completion of this course will enable students to:

a. Situate climate change in the context of the Anthropocene, planetary boundaries, and planetary health.
b. Describe how the climate has changed.
c. At an introductory level, explain the physics of climate change and the role of greenhouse gases in climate change.
d. At an introductory level, explain climate models and describe how the climate is predicted to change in the future.
e. Describe ecosystem impacts of climate change.
f. Describe health impacts of climate change.
g. Explain how adaptation strategies can reduce adverse health impacts of climate change.
h. Describe health co-benefits of climate change mitigation.
i. Explain which population groups are most vulnerable to health impacts of climate change.
j. Describe the main research approaches to studying relationships between climate change and health.
k. Evaluate and interpret research articles about relationships between climate change and health.
l. Perform an in-depth, critical examination of a climate change and health topic.

4. Meeting time and place: Wednesday, 8:00 am to 9:50 am, LEPH 103

5. Course website: The Canvas course website can be accessed through http://canvas.yale.edu. Course readings, announcements, assignments, and other information are posted on the website.

6. Office hours: The instructor's office hours are Thursday, 2:00 pm to 4:00 pm in LEPH 429. Please sign up to attend office hours using the Canvas Calendar.

7. Contacting the instructor: The best way to contact him is by e-mail (robert.dubrow@yale.edu).

8. Course requirements:

a. **Class attendance and participation**: Attendance and participation are expected. Class sessions will be interactive, with student input expected. To enhance high-quality participation and to motivate students to read the readings, students will often be asked to come to the next class prepared to answer a particular question or set of questions, (not knowing in advance which students will be selected to answer the question(s)).

b. **Readings**: **The course is reading intensive**. Furthermore, due to the inherent interdisciplinary nature of climate change and health, students should be prepared to find readings that assume expertise in a discipline outside of their comfort zone to be challenging. The readings for each class are posted on the course website. For class sessions to be productive, it is necessary that students do the readings in advance of each session.

c. **Short writing assignments**: There will be two short (2-4 pages, double-spaced) writing assignments, such as an op-ed, article critique, policy brief, or answer(s) to a question or a set of questions.

d. **Case study**: Case studies will involve both a class presentation and a paper. At the beginning of the semester, the instructor will decide whether the case studies will be individual or group projects, based on the class size. Case studies could focus on climate change and health issues faced by a specific geographic area (e.g., a small island nation, Dhaka, Miami), on a specific extreme event (e.g., California drought, 2015 South Carolina floods, Superstorm Sandy), on a specific disease or exposure (e.g., harmful algal blooms, asthma, *Vibrio*, ground-level ozone, wildfires), on a specific health-related issue in climate change mitigation (e.g., the role of nuclear power, reproductive health as a mitigation strategy, health co-benefits of ending hydraulic fracturing), on a specific health-related adaptation issue (e.g., adaptation policies to address flooding of low-lying coastal areas, reducing urban heat island effects, enhancing food security in the context of climate change), or on a specific methodology used in climate change and health research (e.g., attribution, a specific type of modeling). Topics not fitting into one of these categories are also possible.

   Students will propose a case study topic early in the semester and will receive feedback from the instructor. Students will have wide latitude in choosing a topic and format, but each case study must be approved by the instructor. The case study should consist of a multi-faceted critical examination of the topic from an interdisciplinary perspective (e.g., climate science, epidemiology, ecology, policy) and should identify policy controversies and/or research gaps and include policy and/or research recommendations.

   Alternatively, the case study could take the form of a systematic review, a policy white paper that argues for a particular policy or set of policies in depth, or a research proposal. The case study should utilize multiple sources, with all sources cited using the U.S. National Library of Medicine style. Depending on the topic, sources could be from the peer-reviewed literature, gray literature, reputable newspapers and magazines (print or online), or key informant interviews (e.g., by email, phone, or Skype). The length of the paper should be 15-20 pages (not including reference list), double-spaced, using Times New Roman 12-point font with 1 inch margins.

A 1-2 page overview/outline of the proposed topic and format will be due October 7, a high-quality first draft of the paper will be due on November 18, and the final paper will be due on December 21. Class presentations will be scheduled throughout the semester starting with Class 7, to the extent possible matching the case study topic with the topic slated for a particular class. The instructor will decide on the length of the presentation based on the class size. Early in the semester, the instructor will provide further details about the case study.

e. **Final exam**: The purpose of this exam is to assess the basic knowledge about climate change and public health that you have accrued over the course of the semester. If you conscientiously read the readings and attended class you should do fine on this exam.

9. Grades: The grade for the course will be calculated as follows:

Class attendance and participation	15%
Short writing assignments	20%
Case study presentation	10%
First draft of case study paper	15%
Final case study paper	25%
Final exam	15%

Your numerical course grade will translate into your transcript grade as follows:

≥90	Honors
80 – 89.99	High Pass
65 – 79.99	Pass
<65	Fail

Policy on late submission of assignments: The assignment will be graded down by 10 points for each day late.

10. Classroom etiquette: Please turn off cell phones and pagers and do not surf the internet, text, or read email during class.

11. Academic integrity: Academic integrity is a core institutional value at Yale. It means truth in presentation, diligence and precision in citing works and ideas you have used, and acknowledging collaborations with others. Violations of academic integrity include cheating on exams, problem sets and all other forms of assessment; falsification or fabrication of data; plagiarism, that is, the failure in a paper or other written exercise to acknowledge ideas, research, or language taken from others; and multiple submission of the same work without obtaining explicit written permission from both instructors before the material is submitted. Students found guilty of violations of academic integrity are subject to written reprimand, probation (noted on a student's transcript), suspension (noted on a student's transcript) or dismissal (noted on a student's transcript).

Students will sign the following statement at the end of each writing assignment and at the end of the case study: ***I certify that this is my own original work and that I have not committed plagiarism.*** Students will sign the following statement at the end of the final exam: ***I have not given, received, or witnessed inappropriate exchange of information on this exam.***

12. Class schedule and readings (note that some readings may change):

Class 1 (August 31): Course introduction; the Anthropocene and planetary boundaries

- Steffen W, Crutzen PJ, McNeill JR. The Anthropocene: are humans now overwhelming the great forces of nature. AMBIO 2007;36:614-621.
- Steffen W, Broadgate W, Deutsch L. The trajectory of the Anthropocene: the Great Acceleration. The Anthropocene Review 2015;2:81-98.
- Rockstrom J, Steffen W, Noone K, Persson A, Chapin FS, Lambin E, Lenton TM, Scheffer M, Folke C, Schellnhuber HJ, Nykvist B, de Wit CA, Hughes T, van der Leeuw S, Rodhe H, Sorlin S, Snyder PK, Costanza R, Svedin U, Falkenmark M, Karlberg L, Corell RW, Fabry VJ, Hansen J, Walker B, Liverman D, Richardson K, Crutzen P, Foley J. Planetary boundaries: exploring the safe operating space for humanity. Ecol Soc 2009;14:32.
- Steffen W, Richardson K, Rockstrom J, Cornell SE, Fetzer I, Bennett EM, Biggs R, Carpenter SR, de Vries W, de Wit CA, Folke C, Gerten D, Heinke J, Mace GM, Persson LM, Ramanathan V, Reyers B, Sorlin S. Planetary boundaries: guiding human development on a changing planet. Science 2015;347:1259855.

Class 2 (September 7): **Planetary health**

- Whitmee S, Haines A, Beyrer C, Boltz F, Capon AG, de Souza Dias BF, Ezeh A, Frumkin H, Gong P, Head P, Horton R, Mace GM, Marten R, Myers SS, Nishtar S, Osofsky SA, Pattanayak SK, Pongsiri MJ, Romanelli C, Soucat A, Vega J, Yach D. Safeguarding human health in the Anthropocene epoch: report of The Rockefeller Foundation-Lancet Commission on planetary health. Lancet 2015;386:1973-2028.

Class 3 (September 14): Fundamentals of climate change (1)

- Walsh J, Wuebbles D, Hayhoe K, Kossin J, Kunkel K, Stephens G, Thorne P, Vose R, Wehner M, Willis J, Anderson D, Kharin V, Knutson T, Landerer F, Lenton T, Kennedy J, Somerville R, 2014: Appendix 3: Climate Science Supplement. *Climate Change Impacts in the United States: The Third National Climate Assessment*, JM Melillo, TC Richmond, GW Yohe, Eds., U.S. Global Change Research Program, 735-789.
- **Optional**: Dessler A. Introduction to Modern Climate Change, second edition. Cambridge University Press, Cambridge, 2016, Chapters 1-5:1-89. (This textbook is available from Amazon [from $55.25] or from Cambridge University Press [$54.99]. In addition, there are three copies on reserve in the Medical Library.)
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Class 4 (September 21): Fundamentals of climate change (2)

- Walsh J, Wuebbles D, Hayhoe K, Kossin J, Kunkel K, Stephens G, Thorne P, Vose R, Wehner M, Willis J, Anderson D, Kharin V, Knutson T, Landerer F, Lenton T, Kennedy J, Somerville R, 2014: Appendix 4: Frequently Asked Questions. *Climate Change Impacts in the United States: The Third National Climate Assessment*, JM Melillo, TC Richmond, GW Yohe, Eds., U.S. Global Change Research Program, 790-820.
- Walsh J, Wuebbles D, Hayhoe K, Kossin J, Kunkel K, Stephens G, Thorne P, Vose R, Wehner M, Willis J, Anderson D, Kharin V, Knutson T, Landerer F, Lenton T, Kennedy J, Somerville R, 2014: Appendix 5: Scenarios and Models. *Climate Change Impacts in the United States: The Third National Climate Assessment*, JM Melillo, TC Richmond, GW Yohe, Eds., U.S. Global Change Research Program, 821-825.
- **Optional**: Dessler A. Introduction to Modern Climate Change, second edition. Cambridge University Press, Cambridge, 2016, Chapters 6-9:90-161. (This textbook is

available from Amazon [from $55.25] or from Cambridge University Press [$54.99]. In addition, there are three copies on reserve in the Medical Library.)

Class 5 (September 28): Overview of climate change and public health

- Smith, KR, Woodward A, Campbell-Lendrum D, Chadee DD, Honda Y, Liu Q, Olwoch JM, Revich B, Sauerborn R. Chapter 11. Human health: impacts, adaptation, and co-benefits. In: Climate Change 2014: Impacts, Adaptation, and Vulnerability. Part A: Global and Sectoral Aspects. Contribution of Working Group II to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change [Field CB, Barros VR, Dokken DJ, Mach KJ, Mastrandrea MD, Bilir TE, Chatterjee M, Ebi KL, Estrada YO, Genova RC, Girma B, Kissel ES, Levy AN, MacCracken S, Mastrandrea PR, and White LL, eds]. Cambridge University Press, Cambridge, United Kingdom and New York, 2014:709-754.

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Class 6 (October 5): Heat extremes

- Morrison SF. Regulation of body temperature. In: Bron WF, Boulpaep EL, eds. Medical Physiology. Elsevier, Philadelphia, 2017:1193-1203.
- Kovats RS, Hajat S. Heat stress and public health: a critical review. Annu Rev Public Health 2008;29:41-55.
- Hajat S, Kosatky T. Heat-related mortality: a review and exploration of heterogeneity. J Epidemiol Community Health 2010;64:753-760.
- Roelofs C, Wegman D. Workers: the climate canaries. Am J Public Health 2014;104:1799-1801.
- Correa-Rotter R, Wesseling C, Johnson RJ. CKD of unknown origin in Central America: the case for a Mesoamerican nephropathy. Am J Kidney Dis 2014;63:506-520.
- Knowlton K, Rotkin-Ellman M, King G, Margolis HG, Smith D, Solomon G, Trent R, English P. The 2006 California heat wave: impacts on hospitalizations and emergency department visits. Environ Health Perspect. 2009;117:61-67.
- **Optional**: Jones B, O'Neill BC, McDaniel L, McGinnis S, Mearns LO, Tebaldi C. Future population exposure to US heat extremes. Nat Clim Change 2015;5:652-655.

October 12: NO CLASS

October 19: October recess

Class 7 (October 26): Tropospheric ozone; wildfires; aeroallergens

- Kinney PL, Ito K, Weinberger KR, Sheffield PE. Chapter 5. Respiratory and allergic disorders. In: Levy BS, Patz JA, eds. Climate Change and Public Health. Oxford University Press, New York, 2015:105-127.
- Sheffield PE, Knowlton K, Carr JL, Kinney PL. Modeling of regional climate change effects on ground-level ozone and childhood asthma. Am J Prev Med. 2011;41(3):251-257.
- Beggs PJ. Adaptation to., impacts of climate change on aeroallergens and allergic respiratory diseases. Int J Environ Res Public Health 2010;7:3006-3021.
- Johnston FH, Purdie S, Jalaludin B, Martin KL, Henderson SB, Morgan GG. Air pollution events from forest fires and emergency department attendances in Sydney, Australia 1996-2007: a case-crossover analysis. Environ Health 2014;13:105.
- **Optional**: Liu JC, Pereira G, Uhl SA, Bravo MA, Bell ML. A systematic review of the physical health impacts from non-occupational exposure to wildfire smoke. Environ Res 2015;136:120-132.

- **Optional**: Ziska L, Knowlton K, Rogers C, Dalan D, Tierney N, Elder MA, Filley W, Shropshire J, Ford LB, Hedberg C, Fleetwood P, Hovanky KT, Kavanaugh T, Fulford G, Vrtis RF, Patz JA, Portnoy J, Coates F, Bielory L, Frenz D. Recent warming by latitude associated with increased length of ragweed pollen season in central North America. Proc Natl Acad Sci USA 2011;108:4248-4251.

Class 8 (November 2): Vector-borne and zoonotic diseases

- Beard CB, Garofalo JF, Gage KL. Chapter 8. Climate and its impacts on vector-borne and zoonotic diseases. In: Luber G, Lemery J, eds. Global Climate Change and Human Health. Jossey-Bass, San Francisco, 2015:221-266.
- **Optional**: Campbell-Lendrum D, Manga L, Bagayoko M, Sommerfeld J. Climate change and vector-borne diseases: what are the implications for public health research and policy? Philos Trans R Soc Lond B Biol Sci 2015;370:20130552.
- **Optional**: Ostfeld RS, Brunner JL. Climate change and Ixodes tick-borne diseases of humans. Philos Trans R Soc Lond B Biol Sci 2015;370:20140051.

Class 9 (November 9): Waterborne and foodborne diseases

- Rose JB, Wu F. Chapter 7. Waterborne and foodborne diseases. In: Levy BS, Patz JA, eds. Climate Change and Public Health. Oxford University Press, New York, 2015:157-172.
- **Optional:** Backer LC. Chapter 6. Effects of climate change on noninfectious waterborne threats. In: Luber G, Lemery J, eds. Global Climate Change and Human Health. Jossey-Bass, San Francisco,2015:171-193.
- **Optional:** Vezzulli L, Grande C, Reid PC, Helaouet P, Edwards M, Hofle MG, Brettar I, Colwell RR, Pruzzo C. Climate influence on Vibrio and associated human diseases during the past half-century in the coastal North Atlantic. Proc Natl Acad Sci USA 2016;113:E5062-71.

Class 10 (November 16): Water scarcity and food insecurity

- Schewe J, Heinke J, Gerten D, Haddeland I, Arnell NW, Clark DB, Dankers R, Eisner S, Fekete BM, Colon-Gonzalez FJ, Gosling SN, Kim H, Liu X, Masaki Y, Portmann FT, Satoh Y, Stacke T, Tang Q, Wada Y, Wisser D, Albrecht T, Frieler K, Piontek F, Warszawski L, Kabat P. Multimodel assessment of water scarcity under climate change. Proc Natl Acad Sci USA 2014;111:3245-3250.
- Dangour AD, Green R, Sutherland J, Watson L, Wheeler TR. Chapter 8. Health impacts related to food and nutrition insecurity. In: Levy BS, Patz JA, eds. Climate Change and Public Health. Oxford University Press, New York, 2015:173-193.
- **Optional:** Springmann M, Mason-D'Croz D, Robinson S, Garnett T, Godfray HCJ, Gollin D, Raynor M, Ballon P, Scarborough P. Global and regional health effects of future food production under climate change: a modelling study. Lancet 2016;387:1937-1946.
- **Optional:** Lake IR, Hooper L, Abdelhamid A, Bentham G, Boxall AB, Draper A, Fairweather-Tait S, Hulme M, Hunter PR, Nichols G, Waldron KW. Climate change and food security: health impacts in developed countries. Environ Health Perspect 2012;120:1520-1526.

Class 11 (November 30): Violent conflict, population displacement

- Kelley CP, Mohtadi S, Cane MA, Seager R, Kushnir Y. Climate change in the Fertile Crescent and implications of the recent Syrian drought. Proc Natl Acad Sci USA 2015;112:3241-3246.

- Hsiang SM, Burke M, Miguel E. Quantifying the influence of climate on human conflict. Science 2013;341:1235367.
- **Optional:** McMichael C, Barnett J, McMichael AJ. An ill wind? Climate change, migration, and health. Environ Health Perspect 2012;120:646-654.
- **Optional:** Scheffran J, Brzoska M, Kominek J, Link PM, Schilling J. Climate change and violent conflict. Science 2012;336:869-871.
- **Optional:** Leaning J, Guha-Sapir D. Natural disasters, armed conflict, and public health. N Engl J Med 2013;369:1836-1842.

Class 12 (December 7): Health co-benefits of climate change mitigation: energy

- Smith K R, Balakrishnan K, Butler C, Chafe Z, Fairlie I, Kinney P, Kjellstrom T, Mauzerall DL, McKone T, McMichael A, Schneider M. Chapter 4. Energy and Health. In: Global Energy Assessment – Toward a Sustainable Future, Cambridge University Press, Cambridge and the International Institute for Applied Systems Analysis, Laxenburg, Austria, 2012:255-324 (**Executive Summary and sections 4.1-4.4 [pages 260-280]**).
- **Optional:** Wilkinson P, Smith KR, Davies M, Adair H, Armstrong BG, Barrett M, Bruce N, Haines A, Hamilton I, Oreszczyn T, Ridley I, Tonne C, Chalabi Z. Public health benefits of strategies to reduce greenhouse-gas emissions: household energy. Lancet 2009;374:1917-1929.
- **Optional:** Markandya A, Armstrong BG, Hales S, Chiabai A, Criqui P, Mima S, Tonne C, Wilkinson P. Public health benefits of strategies to reduce greenhouse-gas emissions: low-carbon electricity generation. Lancet 2009;374:2006-2015.

Class 13 (December 14 [reading week]): Health co-benefits of climate change mitigation: transport, agriculture, methodological issues

- Remais JV, Hess JJ, Ebi KL, Markandya A, Balbus JM, Wilkinson P, Haines A, Chalabi Z. Estimating the health effects of greenhouse gas mitigation strategies: addressing parametric, model, and valuation challenges. Environ Health Perspect 2014;122:447-455.
- **Optional:** Woodcock J, Edwards P, Tonne C, Armstrong BG, Ashiru O, Banister D, Beevers S, Chalabi Z, Chowdhury Z, Cohen A, Franco OH, Haines A, Hickman R, Lindsay G, Mittal I, Mohan D, Tiwari G, Woodward A, Roberts I. Public health benefits of strategies to reduce greenhouse-gas emissions: urban land transport. Lancet 2009;374:1930-1943.
- **Optional:** Friel S, Dangour AD, Garnett T, Lock K, Chalabi Z, Roberts I, Butler A, Butler CD, Waage J, McMichael AJ, Haines A. Public health benefits of strategies to reduce greenhouse-gas emissions: food and agriculture. Lancet 2009;374:2016-2025.

Final Exam (December 19) (LEPH 115)

Appendix II.B.3

Climate Change and Health
Case Study

EHS 510a, Principles of Environmental Health
Assignment: Case Study: The Role of Nuclear Power in Climate Change Mitigation in Connecticut
Case study website: http://workshop1.cases.som.yale.edu/future-nuclear-connecticut
Due date: Tuesday, December 6, 8:30 am
Assignments should be submitted electronically through Canvas.

Introduction

Bryan Garcia, the President and CEO of the Connecticut Green Bank, had a big decision to make. Garcia is a member of the Governor's Council on Climate Change (GC3), a group charged with creating a comprehensive climate strategy for the State of Connecticut. As of September 2016, Garcia remained undecided about a key element of that strategy – nuclear power plants. There were strong proponents and opponents of nuclear energy on the GC3 and Garcia was weighing each side's arguments before announcing his own position.

Connecticut had a long history of considering climate change in state policy. As part of this tradition, Connecticut's governor Dannel Malloy established the GC3 on Earth Day 2015 to examine the effectiveness of existing policies designed to reduce greenhouse gas emissions and identify new strategies. Connecticut's government had already set a target of reducing greenhouse gas emissions by 80% from 2001 levels by 2050. The GC3 had been tasked to develop interim statewide greenhouse gas reduction targets for years between 2020 and 2050 and identify short- and long-term statewide strategies to achieve the necessary reductions. The governor chose the 15 members of the GC3 from state agencies, quasi-state agencies, business, and nonprofits.

The GC3 recommendations would have to take into account Connecticut's changing energy profile. Between 1996 and 2015, natural gas largely replaced the dirtier fossil fuels coal and oil for electricity generation to provide almost half of the state's electricity and one-third of the its energy (including for transportation and home heating). But the one constant had been the state's nuclear power, which supplied more than one-fifth of Connecticut's energy needs. The nuclear power all came from a massive plant situated near New London, CT called Millstone. The facility included two reactors that produced almost half of the electricity generated in Connecticut and supplied about 15% of the power required for the New England regional grid. The operating licenses for the two reactors were set to expire in 2035 and 2045, making the issue extremely salient for the GC3.

The GC3 remained divided as to what to do about Millstone. On the one hand, nuclear reactors do not emit greenhouse gases while in operation, therefore continuing to use nuclear energy—or even increasing its use—would greatly facilitate meeting the 2050 greenhouse gas emissions reduction target. Since natural gas use generates substantial greenhouse gases in its own right, the state needs to

drastically phase down natural gas by 2050, putting further pressure on keeping or expanding nuclear.

On the other hand, there are ongoing health and safety, environment, and security concerns about nuclear power, as well as questions of short- and long-term financial viability. For these reasons, one of the other two nuclear plants in New England had already announced its early closure in 2019.

With compelling arguments on both sides of the nuclear issue, Garcia had his work cut out for him. Garcia noted about natural gas, "If you're extending the infrastructure, you're building something into the system that will be around for a long time." To provide insight into the long term consequences of their actions, the GC3's data and metrics working group was building models that would both project Connecticut's energy needs and the corresponding greenhouse gas emissions. Time to make a decision was getting short. The governor expected the GC3 to unveil its strategy, including a recommendation about Millstone, by early 2017.

Assignment: group papers and group debates

The assignment is to argue for one of the following potential GC3 recommendations (i.e., propositions) and implicitly against the other recommendation:

1. **Pro:** Nuclear power has a central role to play in climate change mitigation in Connecticut; the Millstone nuclear power station should operate until 2050 and beyond, with expansion to add two additional reactors.
2. **Con:** Nuclear power has no role to play in climate change mitigation in Connecticut and therefore the Millstone nuclear power station should be retired as quickly as possible – when the current licenses for each of the two reactors expire if not before.

Although the GC3 is likely to make a more nuanced recommendation, it will be instructive to argue the two extreme positions head to head. **The arguments should be Connecticut-specific, taking into account the information about the Connecticut energy situation presented on the case study website**. Of course, more general arguments about the pros or cons of nuclear power may be incorporated into your arguments, but the focus should be Connecticut.

The class will be randomly divided into groups of five students. Each group will be randomly assigned to argue for one of the recommendations in a paper 1000 to 1200 words in length (see Group Assignment Chart below). Furthermore, groups should be prepared to argue their side in debates that will take place during class on Tuesday, December 6. The debates will have the format specified below. Each student in your group will fill one of the roles specified in this format (i.e., one student in your group will give the first half of your opening statement, a second student will give the second half of your opening statement, a third will give the first half of your rebuttal, a fourth will give the second half of your rebuttal, and the fifth will give the closing statement, so that each group member will have a distinct role

to play). Please include in your written assignment which role each of the team members prepared for. (Note: Group 22 only has four students, so one member will have to take on two roles)

Written Assignment Expectations

The case study website (http://workshop1.cases.som.yale.edu/future-nuclear-connecticut) provides an overview of the relevant issues and links to numerous additional resources to allow exploring issues in more depth. To develop your arguments, we expect that groups will use (and cite) at least 10 primary sources of information. We expect much of the material to be obtained from the case study website resources, and outside sources are encouraged as well. General website overview text is not considered a source (i.e., you need to refer to the primary document). Please be sure to provide complete and accurate citation of sources. The paper is due on Tuesday, December 6, at 8:30 am. Please turn in one paper per group.

In-Class Debate Format

Full class vote on pro vs. con	5 minutes
Pro opening statement (divided between 2 students-3 min each)	6 minutes
Con opening statement (divided between 2 students-3 min each)	6 minutes
Pro rebuttal (divided between 2 students-3 min each)	6 minutes
Con rebuttal (divided between 2 students-3 min each)	6 minutes
Time for audience to prepare questions (each group will be expected to offer at least one question or comment)	5 minutes
Comments and questions from audience to the debaters (any group member participating in debate can address comments)	25 minutes
Pro closing statement (1 student)	3 minutes
Con closing statement (1 student)	3 minutes
Full class vote on pro vs. con	5 minutes

The class will be divided into three rooms (LEPH 101, LEPH 115, and Winslow Auditorium). The groups that will debate (a total of 6 groups; 2 per room) will be randomly selected at the beginning of class on Tuesday, December 6. The groups not selected will serve as the audience and will participate during the voting and the comment/question periods. PLEASE BE ON TIME so we can make the most of this interactive case study!

Appendix II.B.5

Practicum in Climate Change, Sustainability, and Public Health

Interested in working for course credit on an exciting practical project that links sustainability and health?

How:
Apply for this new Spring Term course opportunity, **EPH 555b, Practicum in Climate Change, Sustainability, and Public Health** (instructor: Robert Dubrow), taught at the School of Public Health and open to graduate and professional students and undergraduates from across the University.

Course description:
In this course, interdisciplinary student teams (3-4 students each) carry out applied research or practice projects in the area of climate change, sustainability, and public health. Each team works with a sponsoring organization (e.g., unit within Yale, local health department, community organization).

Climate Change, Sustainability, and Public Health Leadership Training Workshop:
The course requires participation in this weekend Fall Term workshop**,** a partnership between the Climate Change and Health Initiative, the Global Health Leadership Institute, and the Office of Sustainability. The workshop will provide training on leadership, strategic problem solving, and policy/applied research implementation. This training will be valuable for project implementation during the Spring Term course.

Timeline:

- Wednesday, September 28 — Information Session from 5-6pm in LEPH 103, 60 College St.
- Friday, October 7 — Application deadline
- Thursday, October 13 — Applicants notified
- Friday and Saturday, November 4-5 — Leadership Training Workshop *(required)*
- Week of January 16 — Start of Class—day and time TBD

Course syllabus: You can find the course syllabus here.

Dr. Dubrow has arranged four projects:

Project	**Organization**
Reducing automobile use for short workday trips by Yale employees	Yale Office of Sustainability
Developing a healthy, sustainable, and tasty pizza for Yale events	Being Well at Yale
Bacterial contamination in Long Island Sound: improving beach closure policy and assessing the effects of climate change	East Shore District Health Department (East Haven, Branford, North Branford)
Carbon footprint impact of reduction in unnecessary medical testing in a hospital clinic	Yale-New Haven Hospital, Department of Anesthesiology, Pre-operative Admission Testing Clinic

Alternatively, you may form your own team of 3-4 students and propose a project. These proposals should be no more than two pages, should use a format similar to that used for the four projects listed above, and should list the team members.

Note to MPH students: This course is one of the options available to fulfill the practice requirement for the MPH degree.

Questions and additional information: Contact Dr. Robert Dubrow

Application for Enrollment in EPH 555b, Practicum in Climate Change, Sustainability, and Public Health

Basic Information

Name:

Email:

School/Department and Year of Graduation:

Background and Interests

What are your academic experience and interests? (200 words maximum)

Why do you want to enroll in this course? What can you contribute to your team? (200 words maximum)

Project preferences

Please rank the projects in which you would like to participate (do not rank a project that does not interest you).

Project	Rank
Reducing automobile use for short workday trips by Yale employees	
Developing a healthy, sustainable, and tasty pizza for Yale events	
Bacterial contamination in Long Island Sound: improving beach closure policy and assessing the effects of climate change	
Carbon footprint impact of reduction in unnecessary medical testing in a hospital clinic	

Alternatively, if you have assembled your own team and project proposal, please attach the proposal with team members listed.

Resume: Please attach your resume.

Please send your completed application to Dr. Robert Dubrow by Friday, October 7, 2016.

Climate Change, Sustainability, and Public Health Leadership Development Workshop, Friday, November 4 to Saturday, November 5, 2016

Sponsors:

- **Yale Climate Change and Health Initiative**
- **Yale Global Health Leadership Institute**
- **Yale Office of Sustainability**

Workshop Faculty Leader: Robert Dubrow, Professor of Epidemiology

Workshop Facilitator: Heather Fosburgh, Program Manager, Yale Global Health Leadership Institute

Friday, November 4 (5:00 pm to 9:00 pm)

Location:	**Branford College Common Room, 74 High Street, New Haven**
Preceptors attending:	Amber Garrard, Michael Pascucilla, Jodi Sherman, Alex Cinotti, Dennis Johnson
5:00 pm	Gathering and hors d'oeuvres
5:30 pm	Introductions
6:00 pm	Keynote address by Elizabeth H. Bradley, PhD, Brady-Johnson Professor of Grand Strategy and Director, Global Health Leadership Institute: *Never Doubt what a Small Group of Committed People Can Accomplish*
7:00 pm	Dinner
8:00 pm	Dessert; Amber Garrard, Senior Manager, Yale Office of Sustainability: *Yale Sustainability Plan 2025: Building a More Sustainable World*
9:00 pm	End of Friday session

Saturday, November 5 (8:30 am to 6:00 pm)

Location:	**Laboratory of Epidemiology and Public Health (LEPH), 60 College Street, New Haven, First Floor**
8:30 am	**Gathering space:** Gathering and continental breakfast
9:00 am	**LEPH 115:** Heather Fosburgh, Program Manager, Global Health Leadership Institute: *The 8 Steps of Strategic Problem Solving*
10:30 am	Break
10:45 am	**Various rooms:** Student Team Work Session 1 (includes preceptors Amber Garrard, Brianne Mullen, Lisa Kimmel, Michael Pascucilla, Jodi Sherman, and Jill Zafar) Step 1 -- Further define the problem Step 2 -- Envision the future Step 3 -- Set a SMART objective
12:15 pm	Lunch

1:00 pm	**Various rooms:** Student Team Work Session 2 (includes preceptors Amber Garrard, Brianne Mullen, Michael Pascucilla)
	Step 4 – Conduct a root cause analysis
	Step 5 -- Develop and compare possible strategies for selection
	Step 6 – Create an implementation plan
2:30 pm	Break
2:45 pm	**Various rooms:** Student Team Work Session 3 (includes preceptors Amber Garrard, Brianne Mullen, Michael Pascucilla)
	Step 7 – Create an evaluation plan
	Plan team presentations
4:15 pm	Break
4:30 pm	**LEPH 115:** Student team presentations
	Feedback from Robert Dubrow, Heather Fosburgh, preceptors Amber Garrard, Brianne Mullen, Rafael Perez-Escamilla, Julie Carrion, Michael Pascucilla, and Jill Zafar, and other students
6:00 pm	End of workshop

Thanks to Michael Skonieczny, Executive Director, Global Health Leadership Institute; Emma Ryan, Research Assistant, Climate Change and Health Initiative; and Susan Obert, Operations Manager, Branford College; and Maureen O'Donnell-Young, General Manager, Branford & Saybrook Colleges; and Martin Klein, Executive Director, Climate Change and Health Initiative, for their help in planning the workshop.

Climate Change, Sustainability, and Public Health Leadership Development Workshop, Friday, November 4 to Saturday, November 5, 2016

Attendees

Workshop Faculty Leader: Robert Dubrow, Professor of Epidemiology

Workshop Facilitator: Heather Fosburgh, Program Manager, Yale Global Health Leadership Institute

Keynote Speaker: Elizabeth Bradley, Brady-Johnson Professor of Grand Strategy and Director, Global Health Leadership Institute

Project 1: Reducing automobile use for short workday trips by Yale employees

Organization: Yale Office of Sustainability

Preceptors

- Amber Garrard, Senior Manager
- Brianne Mullen, Urban Sustainability Program Associate

Students

- Allie Forman, Yale College, Chemistry, 2019
- George Gemelas, Yale College, Ethics, Politics, and Economics, 2018
- Elsie Moore, School of Public Health, Social and Behavioral Sciences, 2018
- Tori Shephard, Yale College, Environmental Studies, 2017
- Rose Sulentic, School of Public Health, Environmental Health Sciences, 2018

Project 2: Bacterial contamination in Long Island Sound: improving beach closure policy and assessing the effects of climate change

Organization: East Shore District Health Department

Preceptors

Primary:

- Michael Pascucilla, Director of Health
- Alex Cinotti, Assistant Director

Secondary:

- Dennis Johnson, Director of Health, Guilford Health Dept.
- Trent Joseph, Director of Health, Madison Health Dept.

Students

- Rona Chen, School of Public Health, Epidemiology of Microbial Disease, 2018
- Aine Lehane, School of Public Health, Epidemiology of Microbial Disease, 2018
- Brandon Marks, Yale College, Global Affairs, 2018
- Daryn Ramsden, School of Public Health, Advanced Professional MPH, 2017

Project 3: Carbon footprint impact of reduction in unnecessary medical testing in a hospital clinic

Organization: Yale-New Haven Hospital, Department of Anesthesiology, Pre-operative Admission Testing (PAT) Clinic

Preceptors

- Jodi Sherman, Assistant Professor and Environmental Compliance Officer
- Jill Zafar, Assistant Professor and PAT Clinic Director

Students

- Lyndsay Gavin, School of Public Health, Environmental Health Sciences, 2017
- Charlotte Lawrence, Yale College, Global Affairs, 2018
- Somya Mishra, School of Public Health, Advanced Professional MPH, 2017
- Erin Wang, Yale College, Molecular Biophysics and Biochemistry, 2018

Project 4: Developing a healthy, sustainable, and tasty pizza for Yale events

Organization: Being Well at Yale

Preceptors

- Lisa T. Kimmel, Senior Wellness Manager
- Rafael Pérez-Escamilla, Professor of Epidemiology
- Julie Carrion, General Hospitality Manager

Students

- Justin Abbasi, Yale College, Ecology and Evolutionary Biology, 2018
- Nicole Collins, School of Public Health, Social and Behavioral Sciences, 2017
- Angela Lee, School of Public Health, Epidemiology of Microbial Disease, 2018
- Anna Lifland, Yale College, Environmental Health Studies with concentration in Food and Agriculture, 2018

SYLLABUS: EPH 555b, PRACTICUM IN CLIMATE CHANGE, SUSTAINABILITY, AND PUBLIC HEALTH
INSTRUCTOR: DR. ROBERT DUBROW
Spring 2017

1. Prerequisite: participation in the Fall 2016 Climate Change, Sustainability, and Public Health Leadership Development Workshop

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2. Course Description: This course is one of the options available to students to fulfill the practice requirement for the MPH degree. In this course, interdisciplinary student teams carry out applied research or practice projects in the area of climate change, sustainability, and public health. Each team works with a sponsoring organization (e.g., unit within Yale, local health department, state agency, community organization, other non-governmental organization). As a prerequisite for enrollment, this unique Spring Term course requires participation in the Fall Term Climate Change, Sustainability, and Public Health Leadership Development Workshop, a partnership between the Climate Change and Health Initiative, the Global Health Leadership Institute, and the Office of Sustainability. In September, students apply to join a team, and in November the selected students participate in this weekend workshop that provides training on leadership, strategic problem solving, and policy/applied research implementation. Teams use these skills to further conceptualize and plan their projects. These established student teams then implement their projects in this Spring Term course, which affords the opportunity to apply concepts and competencies learned in the workshop and in the classroom to this important area of climate change, sustainability, and public health. This course should be of interest to students across Yale School of Public Health and the University.

3. Course Learning Objectives: Successful completion of this course will enable students to:

- Apply knowledge and skills learned in their M.P.H. course work to an important public health problem.
- Within a defined timeframe, work as part of an interdisciplinary collaborative team to design, implement, and evaluate a concrete public health project that complies with established YSPH criteria for the M.P.H. practicum experience.
- Present an in-depth review of a specific practical problem in climate change, sustainability, and public health.
- Utilize team building, negotiation, and conflict management skills.
- Demonstrate effective oral and written communication skills.
- Demonstrate specific competencies selected from the YSPH core curriculum and student area of concentration that are pertinent to the practicum project.
- Demonstrate attainment of general cross cutting competencies in the areas of communication, diversity and culture, leadership, and professionalism.

4. Meeting Place and Time: Wednesday, 6:00 pm to 7:50 pm, LEPH 101

5. Course Website: The Canvas course website can be accessed through http://canvas.yale.edu. Course announcements and other information are posted on the website.

6. Office Hours: The instructor' office hours are Monday, 2:00 pm to 4:00 pm in LEPH 429. Please sign up for his office hours using the Canvas Calendar.

7. Contacting the instructor: The best way to contact him is by e-mail (robert.dubrow@yale.edu).

8. Course Requirements:

a. **Project implementation**: The major time commitment for this course is implementation of the team project, with an expectation of about 8 hours per week. Projects are identified in advance by the instructor in consultation with potential sponsoring organizations. Types of projects include, but are not limited to, developing policy recommendations and writing a "white paper" or policy brief; researching and writing a technical report; analyzing and interpreting data (either pre-existing data or limited data collected during the project, such as focus group data); conducting strategic planning; developing and conducting a workshop; or developing educational, communications and/or outreach strategies and/or materials. The course aims for four teams, each consisting of three or four students.

   Students apply for admission to the course, including ranking of their project preferences, in September of the Fall Term. In October, the selected students are assigned to a project and, after making a commitment to enroll in the course in the Spring Term, participate in the Climate Change, Sustainability, and Public Health Leadership Development Workshop, a weekend event that helps teams further conceptualize and plan their projects and therefore "hit the ground running" when the course begins in the Spring Term. Each team is advised by a preceptor(s) from the sponsoring organization, as well as by the course instructor. The expectation is that preceptors will have an in-person meeting or phone conference with the team at least every other week, as well as email communication as needed.

b. **Team project protocol and work plan, including Gantt Chart (interim products/tasks, timeline, and persons responsible)**: This is an ungraded requirement essential for project implementation. The protocol and work plan will be working documents that will serve as guides to project progress throughout the semester. Interim products are essential products (e.g., IRB approval, questionnaire, data abstraction form) needed to enable timely completion of each project and will be determined early in the semester by each team in consultation with preceptors and the instructor.

c. **Class attendance and participation**: Weekly class sessions will consist of team meetings as well as meetings of the entire class to assess progress, discuss and propose solutions to problems that arise in project implementation, share experiences and best practices among teams, and provide opportunity for instructor and cross-team feedback.

d. **Team oral and written progress reports**: These will cover progress to date. The oral report will take place the week before Spring break (Wednesday, March 8). The written report will be due the day before Spring break (Friday, March 10).

e. **Team final oral presentation and written report**: The final oral presentation should present the background and significance, methods, results, discussion and conclusions of the project. The final written report should include an executive summary and sections on background and significance, methods, results, discussion, conclusions, and references, as well as an appendix with supporting documents (e.g., questionnaire, intervention guide). The final oral presentation will talk place during reading week (Wednesday, May 3). The final written report will be due Wednesday, May 10.

f. **Individual self-reflection**: Each student will write a short paper (2-4 pages, double-spaced) consisting of a critical evaluation (strengths and weaknesses) of his or her contributions to the project and how working on the project has addressed selected MPH core competencies. The due date is Wednesday, May 10.

g. **Peer evaluations**: At the end of the semester each student will anonymously evaluate the performance of his or her team members.

9. Grades: The grade for the course will be calculated as follows:

Attendance and participation (including peer evaluation)	10%
Oral progress report	10%
Written progress report	10%
Final oral presentation	10%
Final written report	50%
Individual self-reflection	10%

Your numerical course grade will translate into your transcript grade as follows:

≥90	Honors
80 – 89.99	High Pass
65 – 79.99	Pass
<65	Fail

Policy on late submission of assignments: The assignment will be graded down by 10 points for each day late.

10. Classroom etiquette: During class, please turn off cell phones and pagers and please do not surf the internet, text, or read your email.

11. Academic integrity: Academic integrity is a core institutional value at Yale. It means truth in presentation, diligence and precision in citing works and ideas you have used, and acknowledging collaborations with others. Violations of academic integrity include cheating on exams, problem sets and all other forms of assessment; falsification or fabrication of data; plagiarism, that is, the failure in a dissertation, essay or other written exercise to acknowledge ideas, research, or language taken from others; and multiple submission of the same work without obtaining explicit written permission from both instructors before the material is submitted. Students found guilty of violations of academic integrity are subject to written reprimand, probation (noted on a student's transcript), suspension (noted on a student's transcript) or dismissal (noted on a student's transcript). Students will sign the following statement at the end of each written assignment: ***I certify that this is my own original work and that I have not committed plagiarism.***

12. Class schedule:

- **Classes 1-7 (January 18, January 25, February 1, February 8, February 15, February 22, March 1)**: Team meetings as well as meetings of the entire class to assess progress, discuss and propose solutions to problems that arise in project implementation, share experiences and best practices among teams, and provide opportunity for instructor and cross-team feedback.
- **Class 8 (March 8)**: Oral progress reports.
- **Classes 9-13 (March 29, April 5, April 12, April 19, April 26)**: Team meetings as well as meetings of the entire class to assess progress, discuss and propose solutions to problems that arise in project implementation, share experiences and best practices among teams, and provide opportunity for instructor and cross-team feedback.
- **Class 14 (May 3) (reading week)**: Final oral presentations.

Appendix II.B.6

CCHI Student Associates

YALE Climate Change and Health Initiative

Become a Yale Climate Change and Health Initiative Student Associate

The Yale Climate Change and Health Initiative

The Yale Climate Change and Health Initiative (CCHI) utilizes Yale's multidisciplinary expertise and global reach to train future leaders, provide a comprehensive educational program, and catalyze innovative research, all to address one of the greatest public health challenges of the 21st century: climate change. Based at the Yale School of Public Health, and with partners across the University, CCHI offers courses on climate change and health, a speaker series, a climate change leader in residence program, summer internships, leadership training workshops, and pilot research support for faculty. Approximately 30 faculty representing multiple disciplines are affiliated with the initiative.

Expectations

Student associate positions will be offered to a small, highly select group of students. As such the expectations of the associates, while limited, must be taken seriously. Associates attend two Associates Lunches per semester, which they organize, to discuss issues related to climate change and health across disciplines. They attend talks and other events sponsored by CCHI, as well as special CCHI-associate-only discussion sessions with CCHI speakers. Through their coursework, interests, and foci, associates exemplify the attributes of the next generation of climate change and health leaders and serve as ambassadors for the program.

CCHI Student Associates

Student associates are committed to actively engage in issues related to climate change and health. They come from professional and graduate schools, as well as Yale College. They have professional and/or academic experience in areas related to climate change or are highly motivated to learn. They are eager to work and learn in a cross-

disciplinary environment. They are self-motivated and take the responsibilities of the program seriously. They will be future leaders.

Benefits

Associates gain broad exposure to issues related to climate change and health, are eligible for mentorship by CCHI affiliated faculty, and join a community of like-minded faculty and students. Associates are connected via an email list and become part of the nucleus of the CCHI community when they graduate.

Next Step

Please send your completed application (also attached) to Alyssa Parpia (alyssa.parpia@yale.edu), Yale Climate Change and Health Pre-Doctoral Fellow, by **Wednesday, September 21, 2016**.

To learn more about the CCHI, visit our website at http://publichealth.yale.edu/climate/

The Yale Climate Change and Health Initiative
Student Associates Program Application

Basic Information

Name:

Email:

School and Year of Graduation:

Background and Interests

What are your academic and/or research interests? (50 words maximum)

Please describe any previous professional and academic work relevant to climate change and health, or more broadly in the area of climate change. How will being a CCHI Associate contribute to your academic growth and professional goals? (200 words maximum)

Why do you want to be an associate? What about the program appeals to you? What can you contribute to the group? (200 words maximum)

List a suggestion (or a few) for topics or speakers you would be interested in learning about or hearing from during the speaker series.

Please send your completed application (attached) to Alyssa Parpia (alyssa.parpia@yale.edu), Yale Climate Change and Health Pre-Doctoral Fellow, by Wednesday, September 21, 2016.

Appendix II.C.1

Speaker Series on
Climate Change and Health

Jan Semenza

Yale School of Public Health visit

Sunday, October 30 to Monday, October 31, 2016

Day/Time	Location	Activity
Sunday		
8:51 pm	Bradley International Airport (Delta Flight 514)	Arrival and pick-up by Albert Ko
Monday		
8:00 am to 9:30 am	Claire's Corner Copia	Breakfast with Robert Dubrow, Daniel Weinberger, Virginia, Pitzer, Jeff Townsend
10:00 to 10:30 am	LEPH 434	Kaveh Khoshnood, Alark Saxena, Tshering Dukpa, Robert Dubrow
10:30 am to 11:00 am	LEPH 434	Lawrence Mcdermott
11:00 am to 11:30 am	LEPH 718	Virginia Pitzer
11:30 am to noon	LEPH 434	Preparation for lecture
12:00 pm to 1:00 pm	Winslow Auditorium	Lecture: Climate change and other drivers of infectious disease threat events in Europe
1:00 pm to 1:30 pm	LEPH 105	Lunch
1:30 pm to 2:30 pm	LEPH 126	Meeting with CCHI Student Associates and Health and Environment at Yale students
2:30 pm	60 College St.	Departure to Newark International Airport: Hy's Limo

YALE Climate Change and Health Initiative

Department of Epidemiology of Microbial Diseases

Jan C. Semenza, PhD

Head, Scientific Assessment Section
European Centre for Disease Prevention and Control
Stockholm, Sweden

Monday, October 31, 2016
60 College Street - Yale School of Public Health
Winslow Auditorium, First Floor

12:00 pm to 1:00 pm
(lunch to follow)

Dr. Semenza was an Epidemic Intelligence Service Officer at the U.S. Centers for Disease Control and Prevention (CDC) in 1995, when a record-breaking heat wave claimed the lives of more than 700 individuals in Chicago. He led the CDC response to this environmental calamity and elucidated the underlying environmental, societal, and behavioral causes of heat-related mortality. He also worked internationally on a number of infectious disease issues in Uzbekistan, Sudan, Egypt, Denmark, Brazil, and Haiti. Currently he is studying environmental and climatic drivers of infectious disease transmission in Europe. He is particularly interested in environmental and climatic precursors of disease that can be used to anticipate, or even forecast, an upsurge of infectious disease. These epidemic precursors can be monitored through early-warning systems and help us adapt to the challenges of global climate change.

Yale SCHOOL OF PUBLIC HEALTH

Sabrina McCormick
Yale School of Public Health visit
Friday, March 3, 2017

Time	Location	Activity
8:15 am	Omni Hotel	Picked up by Paul Sabin
8:15 am to 9:30 am	Place of choice	Breakfast with Paul Sabin
9:30 am	60 College Street	Arrive at School of Public Health
9:30 am to 10:30 am	LEPH 429	Robert Dubrow
10:30 am to 11:00 am	LEPH 434	Miraj Desai
11:00 am to 11:30 am	LEPH 405	Kaveh Khoshnood
11:30 am to noon	LEPH 434	Preparation for lecture
12:00 pm to 1:00 pm	Winslow Auditorium	Lecture: Climate Change in the Court System: A New Role for Public Health
1:00 pm to 1:30 pm	LEPH 105; LEPH 108	Lunch
1:30 pm to 2:30 pm	LEPH 126	Meeting with Climate Change and Health Initiative Student Associates and Health and Environment at Yale students
2:30 pm to 3:30 pm		Break and travel to Kroon Hall
3:30 pm to 4:30 pm	Kroon Hall – Room 139	Daniel Esty
5:13 pm	New Haven train station	Departure for Washington, DC

YALE Climate Change and Health Initiative

Climate change in the court system: A new role for public health

Sabrina McCormick, PhD

Associate Professor, Department of Environmental and Occupational Health, George Washington University
Milken Institute School of Public Health

Friday, March 3, 2017
60 College Street - Yale School of Public Health
Winslow Auditorium, First Floor

12:00 pm to 1:00 pm
(lunch to follow)

Dr. McCormick is a sociologist and filmmaker who investigates how to motivate climate change mitigation and adaptation. She is the Principal Investigator of a study on climate change litigation funded by the National Science Foundation. This research assesses how and why such lawsuits are launched, have changed over time, and are decided, with the ultimate goal of identifying characteristics of cases that may lead to success or failure. Her recent research, funded by the Environmental Protection Agency, investigates how and why six U.S. cities act on climate change. This research informs how cities across the country can more quickly mitigate climate change and can speed the development of resilience through co-benefits. Dr. McCormick has worked in the Brazilian Amazon and currently has a research project to understand how the political economy of renewable energy development in that region is affecting sustainability for the rainforest and local populations. Dr. McCormick was Producer on The Years of Living Dangerously, an eight-part Showtime series about climate change that earned the Emmy Award for Best Documentary in 2014.

Yale SCHOOL OF PUBLIC HEALTH

Appendix II.C.2

Climate Change and Health Pilot Research Grants

Final Report: Pilot Project in Climate Change and Health Research

Consequences of climate change for risk of enteric infections: investigating links between hydrology and water-borne disease

Principle Investigators: Virginia Pitzer, Daniel Weinberger, William Boos

The goal of this pilot project was to develop a methodological framework for quantifying the impacts of climate change on enteric disease risk. This is an essential first step in being able to predict the impacts of climate change on the risk of infectious diseases, including water-borne diseases in general and specifically typhoid and paratyphoid fever.

We began by reviewing the mechanisms by which climatic drivers such as rainfall, temperature, and humidity can impact the incidence of infectious diseases in general, and the data that can be used to probe these mechanisms. We then provided an overview of the methodological approaches that have been used to link variation in climatic variables to infectious diseases incidence with the ultimate goal of predicting the impacts of climate change, and discuss the challenges and limitations of the various approaches. The resulting manuscript (Metcalf CJE, et al.) is currently in press at *Proceedings of the Royal Society B: Biological Sciences*.

We then decided to focus our efforts on enteric (typhoid and paratyphoid) fever, for which we identified major gaps in the literature when it came to understanding seasonal patterns of disease and the impact of climatic variables. We conducted two complementary systematic reviews to identify (1) studies describing seasonal patterns of typhoid and paratyphoid fever incidence and how they vary by latitude and geographic region, and (2) studies that examined the relationship between enteric fever incidence and climatic variables. We found that typhoid and paratyphoid fever exhibited more pronounced seasonal patterns in settings further from the equator, and that rainfall preceded the peak in enteric fever incidence in the subtropics, whereas variation in temperature was weakly associated with enteric fever incidence in equatorial regions (Saad NJ et al, *in prep*). Furthermore, we identified distinct associations with climate in Asia versus Africa; enteric fever generally peaked during the wet season in humid subtropical and tropical regions of Asia, whereas peaks occurred during the dry season in subtropical desert regions of the Middle East and North Africa; a variety of patterns were observed in tropical regions of Africa (Lynch VD et al, *in prep*). However, few studies have attempted to quantify the relationship between enteric fever and climatic variables, and the methods used have varied widely.

Lastly, we are using a combination of time series regression and mechanistic modeling approaches to quantify the relationship between rainfall and the incidence of typhoid and paratyphoid fever, while accounting for feedbacks in transmission and the potential influence of additional climatic variables, including temperature, humidity, evaporation, and soil conditions. We are estimating both the increased risk of typhoid and paratyphoid fever and proportion attributable to rainfall using time series regression. We found that lagged rainfall, up to eight weeks prior, was strongly associated with typhoid and paratyphoid fever incidence and that it prolongs the peak occurrence of typhoid and paratyphoid fever. We estimated that the attributable risk of rainfall on typhoid and paratyphoid fever cases ranged from 10 to 20% annually throughout our study period. Moreover, we complemented this analysis by quantifying the influence of rainfall on typhoid and paratyphoid fever transmission using mechanistic modelling (Saad NJ et al, *in prep*).

Completion of the project has been delayed due to difficulties in obtaining data on all the necessary climatic variables from the Nepalese Meteorology Department. However, the data is currently in hand, and we are proceeding with the analysis of rainfall in the absence of this additional information. We expect to have a manuscript ready for submission by the end of August.

The pilot project funding has stimulated interdisciplinary collaboration between climate scientists and public health researchers that would not have otherwise happened. While we had originally planned to use these analyses to generate the preliminary data necessary for a full grant proposal, we have decided to hold off on pursuing this given the current political climate. Furthermore, co-investigator William Boos from the Department of Geophysics has relocated to the University of California-Berkeley as of July 1, 2017. We will reevaluate the potential funding opportunities and feasibility of continuing our collaboration in the coming years.

Manuscripts in press or in preparation:

Metcalf CJE, Walter KS, Wesolowski A, Buckee CO, Shevliakova E, Tatem AJ, **Boos WR, Weinberger DM, Pitzer VE** (2017). Identifying climatic drivers of infectious disease dynamics: recent advances and challenges ahead. *Proc Biol Sci*. (*in press*)

Saad NJ, Lynch VD, Antillón M, Yang C, Crump JA, **Pitzer VE**. Seasonal dynamics of typhoid and paratyphoid fever. (*in prep*)

Lynch VD, **Saad NJ**, **Pitzer VE**. Influence of climatic factors on enteric fever: a systematic review. (*in prep*)

Saad NJ, **Weinberger DM**, Karkey A, **Baker S**, **Boos WR**, **Pitzer VE**. The impact of rainfall on enteric fever: a time series and mechanistic modelling approach. (*in prep*)

Yale SCHOOL OF PUBLIC HEALTH

YALE Climate Change and Health Initiative

Request for Proposals 2017

$25,000 Pilot Project in Climate Change and Health Research

The Yale Climate Change and Health Initiative seeks proposals for innovative pilot research projects focused on climate change and health. Potential research areas include, but are not limited to, health effects of heat waves; occupational heat stress; cardiovascular and respiratory health effects of climate change; interactions between climate change and air pollution; relationships between climate change and infectious or other environmentally-transmitted diseases; climate change and food insecurity; mental health effects of natural disasters; climate refugee health; social justice in relation to climate change and health; interplay between climate change and human exposure to chemical contaminants; health co-benefits of climate change mitigation; and adaptation strategies to minimize adverse health effects of climate change.

We encourage applications from co-Principal Investigators (similar to the NIH multiple Principle Investigator mechanism) across disciplines, **especially collaborations between Yale School of Public Health faculty and faculty from other parts of the University**.

We will consider applications to support preliminary, formative, or feasibility studies that will inform the development of a larger project that can compete successfully for external government or foundation funding. Applicants may propose to collect new data or to analyze data from completed externally-funded projects. Applicants may propose to supplement a project that is currently funded by another source only if the proposed project is clearly distinct from the funded project. Priority for pilot project funding will be based on the scientific merit of the research plan; the likelihood that the project will lead to an externally-funded study; the likelihood that the project will be completed within one year; and the extent to which the project is interdisciplinary. **Applicants may request up to $25,000**. With the exception of Associate Research Scientists, the award will not support faculty salaries. Funds are available for one award.

Application process: Applicants should submit a Letter of Intent (LOI) with 1) project title; 2) Principal Investigator name(s), department(s), and position(s); 3) names and affiliations of any collaborators; and 4) a summary of the project (**maximum of one page**), including its significance and innovation, the feasibility of completing the project in one year, and how the project will lead to an external grant application. Please submit the LOI as a PDF document to Robert Dubrow (robert.dubrow@yale.edu) by **Monday, February 13, 2017**. After review, applicants will be notified if they have been selected to submit a full application. Detailed application instructions will be provided to applicants who submit a successful LOI.

Eligibility: All full-time Yale faculty are eligible to apply.

For further information, please contact Dr. Robert Dubrow (robert.dubrow@yale.edu).

Title: *"Effects of extreme climate events on environmental reservoirs and dispersion of Legionella"*

Principal Investigator:
Dan Weinberger, PhD. Assistant Professor of Epidemiology, Yale School of Public Health
Co-Investigators:
Pete Raymond, PhD, Professor of Ecosystem Ecology, Yale School of Forestry
Josh Warren, PhD, Assistant Professor of Biostatistics, Yale School of Public Health
Matt Cartter, MD, MPH. State Epidemiologist, Connecticut Department of Public Health
Kelsie Cassell, BS, MPH Student and Research Assistant, Yale School of Public Health

Abstract

Legionella pneumophila is a poorly understood but increasingly common cause of community acquired pneumonia in the US. The bacterium has been studied separately in the hydrological and epidemiological sciences, but we propose a unique collaboration between these fields to further our understanding of *Legionella*. More specifically, we will clarify the role of climate change—particularly warming temperatures and high intensity storm events—on the spread of *Legionella* and resulting clustering of non-outbreak "sporadic" disease. Expertise will come from an interdisciplinary team of researchers from epidemiology and biostatistics at Yale School of Public Health, biogeochemists at Yale School of Forestry, and public health practitioners from the Connecticut Emerging Infections Program/Department of Public Health. Our study would use a mix of quantitative analyses of existing public health data and testing of environmental water and aerosol samples to evaluate hypotheses about the observed long-terms trends and spatial variations in the incidence of legionellosis. Outcomes will include identification of drivers for environmental *Legionella* "hot spots", estimation of the time *Legionella* remains suspended in water and aerosols after intense storm events, and elucidation of threshold climatic events that significantly increase rates of disease. These data and models will then be used to generate forecasts of legionellosis under different climate change scenarios. The proposed studies will provide important information regarding the climatic drivers of an emerging infection of public health significance.

SPECIFIC AIMS

The CDC has reported increases in legionellosis incidence across the United States since 2000, with the greatest increase in coastal states in New England and the Mid-Atlantic (1). It is generally believed that legionellosis is grossly underdiagnosed, further complicating the estimates of disease burden (2). Disease occurs after exposure to aerosols contaminated with the bacterium *Legionella pneumomphila* (3). While nosocomial and travel-related outbreaks receive frequent attention, most cases are never traced to any specific exposure. Therefore, understanding the environmental drivers of these "sporadic" cases of legionellosis is a major priority.

Legionella are pervasive in the aquatic environment. Meteorological factors, such as humidity and precipitation, are linked to short-term epidemics and seasonality, although the mechanism by which these factors influence disease is not fully understood (4–6). During preliminary analyses of sporadic legionellosis in Connecticut, we found a distinct spatial clustering around a few key river systems, suggesting there is an important environmental driver of community-acquired cases that has not yet been identified. River systems and watersheds are sensitive to changes in climate and severe weather events in a manner that might increase exposure and disease. For example, flooding of river systems places strain on sewage treatment plants, generating combined sewer overflow which alters the bacterial communities of the river ecosystem (7). Likewise, increased water velocity that occur after large storms can disrupt bacterial biofilms and generate bioaerosols containing *Legionella* (8). A changing climate can increase *Legionella* in the environment through the warming of surface water as well as increases in the frequency of intense precipitation events (9). We hypothesize that the spatial pattern and long-term increases in cases are related to the increasing frequency and intensity of destructive storm events and that the mechanism is related to increased concentrations of bacteria in suspension that become dispersed in natural bodies of water following storms.

Aim 1: To quantify the relationship between changes in climate and increases of non-outbreak cases of legionellosis in the United States. The CDC's Emerging Infection Program collects data on human cases of legionellosis at ten sites around the United States, including demographic information and location of residence. We will use spatial models in a Bayesian regression framework to evaluate spatial and temporal variations in incidence associated with climatologically-relevant variables (e.g., humidity, temperature, rainfall, wind-speed, stream flow, flooding). This analysis will build on our previous work in Connecticut while allowing for a more thorough assessment of the role of climate on sporadic disease. Ultimately, this model will be used to generate predictive state-level forecasts of legionellosis incidence under various climate change scenarios.

Aim 2: To determine the influence of weather and climate on the density of *Legionella* bacteria along a high-risk stream and river system in central Connecticut. We will test samples from an ongoing study by Peter Raymond's group at Yale FES. They have been "storm chasing" and archiving water and biofilm samples year-round over the past two years from different points along the Connecticut River, including the Farmington River, as part of an NSF funded study on river chemistry responses to large storms. We will test existing water samples and also pilot test the use of aerosol sampling to detect the bacteria after storm events. The temporal resolution will allow us to determine the relationship between changes in stream flow patterns following large climatic events and the density of bacteria in the environment. This will allow for a biological understanding of the clustering of sporadic cases around certain river systems and the increase in cases after precipitation events. Furthermore, samples are collected at varying points along the river to determine if there are risk differences along riverways associated with urban infrastructure.

SIGNIFICANCE

Legionella is an overlooked and poorly-understood cause of community- acquired pneumonia

Observational cohort studies have found that "sporadic" cases of legionellosis (those not associated with an outbreak) are often underdiagnosed and that the true burden of legionellosis is as high as 7% of all community acquired pneumonia (CAP) cases. This burden is likely much higher during summer/early fall months (10–12). Estimates have also placed *Legionella* the third or fourth most common cause of CAP among immunocompromised individuals (3,12,13).

Legionella has an environmental reservoir, but the relevance for "sporadic" disease is still unknown. A rise in sporadic cases among all regions of the US, particularly along the East Coast, has caused increasing concern among public health officials. Identifying the causes of legionellosis cases has become a new priority area for the CDC's Emerging Infections Program (EIP). There are a number of hypotheses about the spatial pattern of cases and the recent increase. Some studies have postulated that rainwater and drinking water could contribute to cases (14–16). However, our previous analysis of spatial data from Connecticut suggest that river systems and watersheds are more likely the unifying mechanism that links intense precipitation events and sporadic disease (**Figure 1)**.

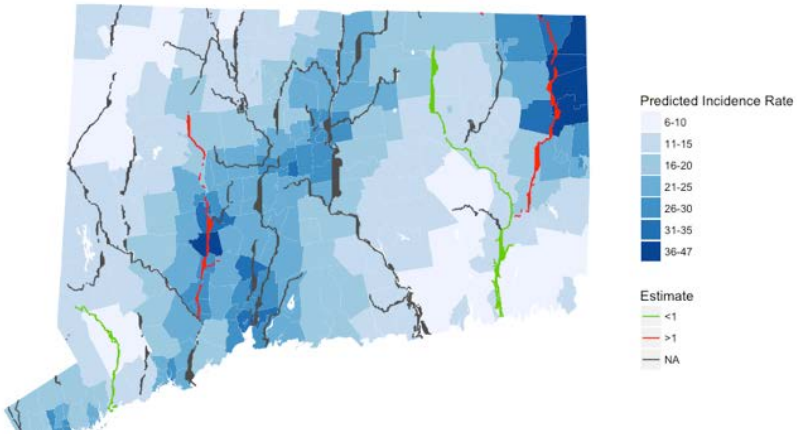


Figure 1. Spatial distribution of legionellosis incidence in Connecticut, by ZIP code, in relation to major rivers. Rivers are colored based on their relation to disease in proximal ZIP codes, with red indicating a positive association with increased disease and green a negative.

Legionella could flourish with a changing climate. The mechanistic link between climate, water systems, and disease is still elusive. *Legionella* grow optimally in warm water, between 30°C and 37°C. We believe longer warm seasons, with earlier springs and later falls (17) will provide a longer window of optimal growth of *Legionella* in the environment. Stream flow patterns and seasonality are also predicted to be exacerbated due to climate change. Stretches of low flow periods allow the accumulation of bacterial biofilms and high flow periods (caused by intense precipitation events) disperse the accumulations along the riverway. Due to evidence correlating sporadic disease and precipitation, the recent severe flooding (18) and increasing intensity and frequency of precipitation events along the East Coast of the US (19) is of concern for legionellosis.

We hypothesize that climate influences the growth and dispersion of *Legionella* and subsequent human disease through 1) warming water temperatures, which enhance conditions for bacterial growth, 2) storm events, which create high river flow rates, increasing stream velocity and stream power which disrupts biofilms and disperses aerosols, and 3) increasing humidity, which retains bioaerosols in the air. Moreover, we hypothesize that there will be a spatially-dependent association between these factors and disease in humans. We will test these hypotheses using a unique combination of environmental sampling and statistical modeling of environmental data and case data. The results from this one-year pilot study will allow for more accurate forecasting of the effects of climate change (and particularly the increasing frequency of major storm

events) on the incidence of legionellosis. Our findings will form the basis for a major federal grant application.

INNOVATION

Aim 1 is innovative because it will provide a comprehensive evaluation of the association between sporadic legionellosis cases and climatic factors, providing a framework to generate credible forecasts of legionellosis under different climate change scenarios. Our study would combine both spatial and temporal models, with special attention to major storm events. This will be done using data obtained from NOAA, USGS, and Google Earth Engine, providing fine scale approximations of regional climatic factors.

Aim 2 is innovative due to our use of a rare combination of water and aerosol samples collected before and after large storm events to directly estimate the impact of climatic events on density and dispersion of *Legionella*. A significant knowledge gap is the mechanism behind how heavy precipitation events and high humidity increase dispersion of the bacteria. The unique partnership with Dr. Raymond at FES will allow for testing of his lab's previously-collected samples from river systems after high-intensity precipitation events, thereby matching the exact temporal resolution that we are interested in. We will also continue to take water samples and pilot test the use of aerosol sampling across a range of urban and forested hydrological systems, before and after storm events. The capacity to leverage multiyear and multisite aquatic samples will provide a needed bridge between the hydrological sciences and epidemiology.

APPROACH*:*

Summary of Approach: Our analyses will consider both proximal causes of disease (e.g., increases in water velocity leading to dispersion in the water) and more distal causes (e.g., long term changes in climate). We will use a combination of statistical modeling of existing epidemiological and climate data and testing of available environmental samples to evaluate the link between climate and legionellosis.

Preliminary results: Our preliminary analyses of sporadic legionellosis data in Connecticut (**Figure 1**) revealed striking spatial patterns in incidence that contributed to the hypotheses put forth in this proposal. Humidity, stream flow, and precipitation were correlated with increases in sporadic disease during the 16-year study period, and spatial analysis confirmed that residence near three 4-5th order river systems and watersheds was associated with increased incidence.

Data sources: Non-outbreak legionellosis case data will be obtained from the CDC's ten Emerging Infections Program sites, which represent a range of regions in the U.S. Meteorological and hydrological data will come from NOAA, USGS and Google Earth Engine (which compiles from satellite sources such as NOAA). Climate change scenario data by region are also available via Google Earth Engine (through NASA and NCEP/NCAR). We will also test previously-collected environmental samples for the presence of bacteria (from Pete Raymond), and we will pilot test environmental sampling of aerosolized bacteria.

Approach for Aim 1: In this aim, the goal is to quantify the relationship between climatic events and spikes in cases of sporadic legionellosis among 10 sites for which data is collected by CDC's Emerging Infections Program (EIP). We would build on our preliminary analysis of the effects of precipitation, humidity and stream flow on the incidence of legionellosis. Specifically, our time series analysis will predict legionellosis in each site by ZIP code and week as an outcome of multiple weather patterns and proximity to river systems, with the goal of identifying "threshold" levels of precipitation, stream flow, or humidity that significantly increase risk of sporadic disease. The effects of climatic events on localized areas over time, notably hurricanes and floods, will be determined through the use of spatiotemporal models that have location-specific intercepts and that explicitly model whether a ZIP code has cases (zero-inflated Poisson). These relationships will be explored using spatial models in a Bayesian framework

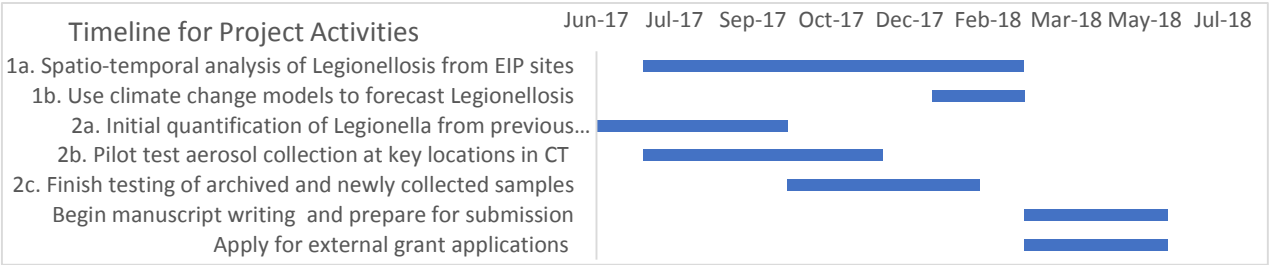
(CAR) models (1a). Finally, these statistical models will be used to generate out-of-sample forecasts for the rates of disease under different climate change scenarios by inputting climate change projections of different meteorological variables into the model (1b). Uncertainty in the climate change projections will be propagated through the model predictions to ensure that forecasts have appropriate levels of forecasting uncertainty.

Approach for Aim 2: Our preliminary analysis identified a few key river systems associated with unexplained increases in legionellosis rates which would be explored further in Aim 2. We will quantify the presence of *Legionella pneumophila* from previously collected water samples from Dr. Raymond's ongoing research, using quantitative Real-Time PCR to estimate bacterial density in the water. The Raymond lab has archived over 1000 samples, targeting storm events from over 40 watersheds of different sizes and land cover across the CT River watershed. These samples represent 1000's of technician hours. This sample design will allow us to test if land cover (e.g., relation to cities, treatment plants, dams) and recent storm events of different sizes over different seasons alter the presence and density of *Legionella* (2a). The initial water sample results will also provide needed information for the best placement of multisite aerosol samplers for pilot testing. We anticipate that aerosol sampling will be performed at increments between a river and a nearby roadway and at different locations along the river so that samples will encompass urban and forested environments (2b). Similar to water samples, aerosol samples before and after storm events will be tested, as well as during low-incidence periods (winter) for reference.

Expected outcomes and milestones. These analyses will result in at least 1 publication in a peer-reviewed journal. The publication would detail the results from the analysis of climate change and storm events (Aim 1), with emphasis on how different climate change scenarios could disparately affect regions of the U.S. The results from the pilot testing of water and aerosol samples would lead to an external grant focusing on the intersection of storm events and *Legionella's* dispersion in the environment, specifically exploring a mechanistic explanation for the correlations we report in our preliminary analysis (Aim 2). Assessments for threshold levels of risk after different climatic events will be put forth as well as new directions for source assessment of sporadic cases.

This comprehensive study, with both environmental sampling and epidemiological data, will bridge a significant knowledge gap in the understanding of sporadic legionellosis and would provide predictions for the critical question of how climate change will affect the disease.

Plan for securing future funding. The results of the proposed project will serve as preliminary data for a major federal grant application focused on the mechanistic drivers of legionellosis. Depending on the results, the grant application would go to either the NIH (R01 from NIAID) or the NSF. The study team has experience securing funding from both sources: Dr. Weinberger has successfully competed for R01 funding, and Dr. Raymond has previously secured major grant funding from NSF. Additionally, funding opportunities might arise through the CDC's Emerging Infection Program for which the investigators would be eligible to apply.



Budget Justification

Salary:
The $25,000 budget would support a research assistant, Kelsie Cassell, to test previously collected water samples, actively collect and analyze aerosol samples, and perform analyses, manuscript preparation and grant writing throughout the year. The remainder of the research assistant salary would be provided through Emerging Infections Program and faculty funds. Laboratory supplies and environmental collection supplies would be provided by the investigators.

References:

1. CDC. Legionellosis --- United States, 2000--2009 [Internet]. MMWR. 2011 [cited 2017 Mar 10]. Available from: https://www.cdc.gov/mmwr/preview/mmwrhtml/mm6032a3.htm
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Appendix III.B

Sustainability Committee

YSPH Sustainability Committee Agenda, Thursday, September 8, 2016
1:00 - 2:00 pm, LEPH 424

Committee membership: Robert Dubrow (co-Chair), Heidi Richard (co-Chair), Peter Krause, Brian Weiss, Frank Grosso, Liz Eocaci-Tucker, Katie Owers, (MPH 1st and 2nd Year students and student employee to be identified)

Invited: Pauline Fagan, Director of Finance, YSPH Office of Finance and Administration

1. Welcome Back, introductions (3 mins)

2. Recap 2015-2016 (5 mins)
    a. Carbon Charge Pilot Update
    b. Cool Effect Update
    c. Healthy Meeting Toolkit Update

3. The Year Ahead
    a. International Coastal Clean-up Day, September 17th (3 mins)
    b. Climate Change and Health Initiative, Departmental Paper Reduction Competition (40 mins)
    c. Celebrate Sustainability Week, October 3-7 (5 mins)
    d. YSPH Sustainability 2017 Action Plan (4 mins)

YSPH Sustainability Committee Agenda, Thursday, October 27, 2016
11:00 am - 12:00 pm, LEPH 105 – note new location

Committee membership: Robert Dubrow (co-Chair), Heidi Richard (co-Chair), Peter Krause, Brian Weiss, Frank Grosso, Liz Eocaci-Tucker, Katie Owers, Lindsay Gavin, Arsalan Ahmed

Invited: Pauline Fagan, Director of Finance, YSPH Office of Finance and Administration

1. YSPH Paper Reduction Competition – 6-month planning

2. YSPH Sustainability 2017 Action Plan – Please review the Yale plan and consider priority areas for YSPH to discuss at the meeting.

YSPH Sustainability Committee Agenda, Thursday, November 17, 2016
11:00 am - 12:00 pm, LEPH 424 – note former location

Committee membership: Robert Dubrow (co-Chair), Heidi Richard (co-Chair), Peter Krause, Brian Weiss, Frank Grosso, Liz Eocaci-Tucker, Katie Owers, Lindsay Gavin, Arsalan Ahmed

Invited: Pauline Fagan, Director of Finance, YSPH Office of Finance and Administration

1. YSPH Paper Reduction Competition – Update; 6-month planning

2. YSPH Sustainability 2017 Action Plan – Please review the Yale plan and consider priority areas for YSPH to discuss at the meeting. (brainstorming will be continued from the last meeting)

YSPH Sustainability Committee Agenda, Thursday, December 15, 2016
11:00 am - 12:00 pm, LEPH 126 – note new location

Committee membership: Robert Dubrow (co-Chair), Heidi Richard (co-Chair), Peter Krause, Brian Weiss, Frank Grosso, Liz Eocaci-Tucker, Katie Owers, Lindsay Gavin, Arsalan Ahmed

Invited: Pauline Fagan, Director of Finance, YSPH Office of Finance and Administration

1. YSPH Paper Reduction Competition – update, November data

2. YSPH Sustainability 2017 Action Plan – Please review the Yale plan and provide your ideas for priority areas for the YSPH action plan.

3. Spring Meetings

YSPH Sustainability Committee Agenda, February 10, 2017
11:00 am - 12:00 pm, LEPH 424

Committee membership: Robert Dubrow (co-Chair), Heidi Richard (co-Chair), Peter Krause, Brian Weiss, Frank Grosso, Liz Eocaci-Tucker, Katie Owers, Lindsay Gavin, Arsalan Ahmed

Invited: Pauline Fagan, Director of Finance, YSPH Office of Finance and Administration

1. YSPH Sustainability 2017 Action Plan – Please review the Yale plan and be prepared to provide your ideas for two of the categories, **Health & Well-Being** and **Materials** for the YSPH action plan.

2. YSPH Paper Reduction Competition Update

3. Declutter-Destress-Donate Bin, February 28 - March 10

YSPH Sustainability Committee Agenda, March 10, 2017
11:00 am - 12:00 pm, LEPH 424

Committee membership: Robert Dubrow (co-Chair), Heidi Richard (co-Chair), Peter Krause, Brian Weiss, Frank Grosso, Liz Eocaci-Tucker, Katie Owers, Lindsay Gavin, Arsalan Ahmed

Invited: Pauline Fagan, Director of Finance, YSPH Office of Finance and Administration

1. YSPH Sustainability 2017 Action Plan –
    a. Please review the Yale plan and consider ideas for **Climate Action, Stewardship, Materials or Technology** priority areas for the YSPH action plan.
    b. SMART goals
    c. Timeline: Earth Day stakeholder engagement; June completion

2. Office of Sustainability RFP for Student Projects (with academic merit)


Yale Sustainability Plan - funding oppc (not sure if this email link will work)

3. YSPH Paper Reduction Competition – update, February/aggregate data

YSPH Sustainability Committee Agenda, April 7, 2017

10:30 am - 11:30 am, LEPH 424

Committee membership: Robert Dubrow (co-Chair), Heidi Richard (co-Chair), Peter Krause, Brian Weiss, Frank Grosso, Liz Eocaci-Tucker, Katie Owers, Lindsay Gavin, Arsalan Ahmed

Invited: Pauline Fagan, Director of Finance, YSPH Office of Finance and Administration

1. YSPH Sustainability 2017 Action Plan –
    a. Review the draft YSPH action plan, to be distributed in advance
    b. Assign SMART goals: timeline, metrics, accountability
    c. Earth Day stakeholder engagement; event? combine with Paper Competition Award?

2. YSPH Paper Reduction Competition –
    a. Final results
    b. Award “ceremony”? (see above)

YSPH Sustainability Committee Agenda, May 5, 2017

11:00 am - 12:00 pm, LEPH 105

Committee membership: Robert Dubrow (co-Chair), Heidi Richard (co-Chair), Peter Krause, Brian Weiss, Frank Grosso, Liz Eocaci-Tucker, Katie Owers, Lindsay Gavin, Arsalan Ahmed

Invited: Pauline Fagan, Director of Finance, YSPH Office of Finance and Administration

1. YSPH Sustainability 2017 Action Plan –
    a. Review edits and comments received on the **draft Action Plan** in Google docs
    b. Assign SMART goals: timeline, metrics, accountability

2. YSPH Paper Reduction Competition – Final results

3. Next meeting?

Yale School of Public Health Sustainability Action Plan 2017-2025

Overview

This document begins with an overview of Yale University's sustainability action plan and its relevant goals for 2025. It is followed by a description of the Yale School of Public Health (YSPH), its position on sustainability, an overview of its successes-to-date, and finally, its school-specific 2025 Action Plan (Timeline to be added*)*

Sustainability at Yale University

Yale University is dedicated to an integrated, comprehensive approach to policy and operations that balances ecosystem health with human health and economic viability in order to demonstrate that sustainability is both feasible and affordable. To accomplish this goal, the University integrates sustainable practices into the fabric of the institutional decision-making at all levels. Each unit on campus has a unique cultural context. Successful implementation of sustainability tactics will rely on efforts to refine tools and tactics to suit this diversity of disciplines and perspectives

Yale 2025 Sustainability Strategic Plan

The Yale Sustainability Plan 2025 contains 9 ambitions encompassing 38 goals. The nine ambitions are listed below.

1. Leadership: Demonstrate local and global leadership in sustainability teaching, research, service, and operations.
2. Empowerment: Foster a diverse and inclusive sustainability movement.
3. Health and Well-Being: Enhance health, well-being, and ecosystem vitality.
4. Climate Action: Take urgent action to mitigate climate change and proactively adapt to its impacts.
5. Stewardship: Plan and preserve resilient and sustainable infrastructure and landscapes.
6. Built Environment: Design, build, and maintain resilient and sustainable buildings.
7. Mobility: Promote and support human and ecosystem health through sustainable transportation.
8. Materials: Ensure sustainable consumption and disposal patterns.
9. Technology: Explore innovative technological platforms to address sustainability challenges.

About the Yale School of Public Health

The Yale School of Public Health (YSPH) strives to lead in protecting and improving the health of the public. Its mission describes a focus on interdisciplinary scholarship, innovative research, policy analysis and education with the aim of serving local, national and international communities with knowledge and expertise.

Public Health and Sustainability

Public health and sustainability are inextricably linked. The tenets of sustainability at Yale encompass ecosystem health, human health, and economic viability. Human health is directly impacted by our natural and built environments. Air pollution may cause respiratory diseases, access to nutritious food and physical activity may alleviate the burden of some chronic diseases, and climate change will affect human ecosystems, such as causing vector-borne diseases to be more widespread. YSPH faculty, staff and students also conduct innovative research on health care policy and cost effectiveness. The economic landscape of the current health-care situation in the

U.S. and around the globe will likely face greater challenges stemming from environmental impacts of human activity if actions to mitigate or adapt do not take place.

As global environmental crises worsen and demand on resources including food and energy increase, it is critical that public health research and education remain at the forefront. YSPH aims to support a culture of sustainability through its academic and research priorities and through the way we conduct our work every day.

Reasons for Creating a School-Specific Sustainability Action Plan

A school specific action plan was created as part of Yale's initiative to establish and implement directed sustainability plans for each of the professional schools. These plans intend to support university-wide goals while reflecting the physical constructs and constraints of each School as well as the intersection of each discipline with sustainability.

YSPH Sustainability Successes-To-Date

Leadership

- Engagement since 2007
- 2012 Strategic Plan developed by YSPH Green Team/Sustainability Committee
- 2015 Action Plan
- 2015 Revitalization of YSPH Sustainability Committee (faculty/staff/student collaboration)
- Monthly sustainability article in YSPH Insider e-newsletter
- Annual Celebrate Sustainability events/campaigns
- Sustainability web page creation in 2012
- Green prizes for BYOs at school-wide social events
- Promotion of Green certifications for workplace, lab and events
- Community impact: Common Ground HS Urban Farm Workday, New Haven Land Trust Community Garden Clean-up, Community Carbon Fund fundraiser, Community Service Days at New Haven Farms and Massaro Farms, SWAP surplus donations to area schools and charities
- Partnership with SAYPH (YSPH student organization)
- Staff Lunch and Learn

Empowerment

- Common Ground High School Urban Farm Workday
- New Haven Land Trust Community Garden Clean-up
- New Haven Farms Community Service Day
- 2015-2016 "Turn-Off" campaign to reduce energy usage
- 2016-2017 Paper Reduction Competition with $5000 prize for sustainability action
- signage/sticker campaign to promote recycling and energy conservation

Health and Well-Being

- Water filtration dispensers have replaced most bottled water units
- Conversion to water pitchers to replace bottled water at school-wide events; replicated by some departments
- Eliminated soda and pizza from Dean's Office-hosted events
- Use and promotion of local (and preferably environmentally responsible) catering vendors
- Replaced traditional junk food vending machines with healthier food and drink vending machines

- Healthy Meeting Toolkit developed by students and implemented by Committee in 2016

Climate Action

- Conducted night-time energy survey and audit in May of 2014
- LEPH pilot building in 2015-2016 Carbon Charge Pilot Project

Stewardship

- Picnic tables installed to promote outdoor use
- Urban Meadow requested

Built Environment

- LEED Certification was obtained for the 6th and 7th floors
    - The 7th floor received the CT Green Building Award
- LEED Requirements for new labs have been met
- A/V upgrades in conference rooms and classrooms to facilitate paperless meetings
- Plumbing and electrical upgrades requested in four high-traffic restrooms and common rooms
- Picnic tables installed to promote outdoor use
- Light sensors and timers and HVAC adjusted to conserve evening/weekend energy use

Mobility

- Additional bike racks installed to promote bike-to-school/work
- Promotion of Commuter Benefits Program, ZipCar, Zagster and Yale Shuttle programs

Materials

- Implemented PaperCut for paper waste minimization and monitoring
- Administrative offices' conversion to flash drives, file share software, and YSPH intranet to replace volumes of paper documents distributed annually
- YSPH flash drive giveaways to all faculty and staff
- Compost pilot completed, now being used on 5 floors
- Lab Recycling Program implemented on 3 floors
- Furniture re-use, repurpose practice through self-storage, TR&S and Eli Surplus Exchange
- Green Purchasing promotion
- Introduction of "pen pails," improving pen recycling
- Implementation of a central toner/printer cartridge recycling site
- Travel mug sale/education campaign to replace paper cups
- Student plastic cup giveaway and campaign to promote green events
- Reusable clamshell sales and giveaways to reduce cart container waste
- Office Supply Swaps held annually or semi-annually

Technology

- A/V upgrades in conference rooms and classrooms to facilitate paperless meetings
- Established policy to avoid Personal Printer purchases and usage
- Implemented PaperCut in 2015 for paper waste minimization and monitoring
- Yielded an overall paper reduction of 29% following a 6-month long paper reduction competition.

Sustainability Action Plan Items for the Yale School of Public Health

1- Leadership

2017 **2018** **2019** **2020** **2021** **2022** **2023** **2024** **2025** **Timeline TBA** **Continuous** *** = annually**

OBJECTIVE 1.1: Enrich and enhance teaching, research, learning, and service that explore and contribute to sustainability solutions.

- **2018** Leverage CEPH curriculum reform for multidisciplinary, case-based, and practice learning opportunities on sustainability related topics (Timeline: January 2018, Mark S/ curriculum-reform committee).
- **Timeline TBA** Increase the number of practicum-based opportunities for course-credit related to a sustainability initiatives. (Timeline: ? , Education/ Curriculum reform committee)
- **Timeline TBA** Offer a *student-initiated* directed studies for-credit, focused on sustainability (Timeline: ?, Vasilis Vasiliou or EHS)
- **Timeline TBA** Integrate a sustainability topic into existing departmental seminars. (Timeline?, Sustainability Committee)
- **2018** **2019** Implement a joint F&ES-YSPH practicum placement geared towards sustainability (Timeline: Likely in Fall 2018, FES/ Career services)
- **2017** * Conduct a campus-wide inventory of current sustainability-related courses that YSPH students can take. Ensure that courses are available online. (Timeline: Summer 2017*, CCHI, Robert Dubrow and FES)
- **2017** **2018** Explore related course development and cross-listing with F&ES, Architecture, Law, and the Divinity Schools (Timeline: 2017-2018 to begin discussions, Education Committee/ Frank Grosso)
- **2017** Identify health co-benefits of sustainability practices and integrate into operations, curriculum, and research through a combination of student proposals and sustainability initiatives (Summer 2017, YSPH Sustainability Committee)
- **2017*** Offer materials and giveaways that promote a sustainable culture at Student, Staff and Faculty Orientations (Fall 2017*, Student Affairs, Faculty Affairs, HR, and Sustainability Committee)
- **2017*** Continue hosting Community Days of Service at various environmental sites. (Timeline: Spring*, Alumni Affairs office/ Deans office)

OBJECTIVE 1.2: Act as a convening voice and leader for dialogues about local, national, and global sustainability challenges.

- **Continuous** Create an online database of articles and projects that feature successful health and sustainability initiatives and health impacts assessments from around the world (Monthly occurrence, managed by website and newsletter uploader)
- **2017** **Continuous** Support evidence-based climate change and health education efforts (Summer 2017* and on-going, partnership between Communications team, Faculty, and student groups)

2- Empowerment

2017 **2018** **2019** **2020** **2021** **2022** **2023** **2024** **2025** **Timeline TBA** **Continuous** * = annually

OBJECTIVE 2.1: Engage and empower members of the Yale community around themes of sustainability.

- **2018** Develop a YSPH sustainability 'Vision Statement' leveraging the UN Sustainable Development Goals and the YSPH tagline, *Innovation Through Collaboration* (Timeline: 2018, Sustainability Committee)
- **2018** Partner with YSPH student organizations in sustainability decision-making (Timeline: Spring 2018, Sustainability Committee and SAYPH)
- **2017** **2018** Engage the entire YSPH community in sustainability development through Town Hall, social events, and departmental or Diversity & Inclusion seminar series (Timeline: 2017/2018, Sustainability Committee + Dean's office, SAYPH)
- **Timeline TBA** **Continuous** Update and expand educational and marketing info through signage, website, messaging (Timeline: potential summer project, Sustainability Committee)
- **2018** **2019** Recommend including one sustainability practice goal on staff Performance Evaluations (Timeline: 2018 spring/ summer, Office of Finance and Administration)

OBJECTIVE 2.2: Support diversity and inclusion in local efforts through education and collaboration.

- **2018** **2019** Foster partnerships with New Haven sustainability projects in context of New Haven Vision 2025 (Timeline: 2018-2019 initiate, person responsible TBA)
- Conduct education on climate change awareness around New Haven/CT (Timeline: Spring 2018, Sustainability Committee and *Science in the News* series)

3- Health and Well-Being

2017 **2018** **2019** **2020** **2021** **2022** **2023** **2024** **2025** **Timeline TBA** **Continuous** *** = annually**

OBJECTIVE 3.1: Encourage decision-making and behaviors that lead to a healthy, vibrant campus and surrounding community.

- **Timeline TBA** Partner with Student Wellness and Being Well at Yale on wellness activities and benefits to integrate healthy behaviors. Provide outlets for *stress* relief incorporating the natural environment (Timeline TBA , Student Wellness and YSPH)
- **Timeline TBA** Conduct a mental health assessment addressing concerns of students, staff, faculty and administration (Timeline: TBA, student project)
- **Timeline TBA** Conduct a lead test of the water in LEPH and 47 College Place (Timeline: 2018-2019, Office of Finance and Administration, YSM Facilities)
- **Timeline TBA** Meet a higher "Well-Building" standard (Timeline: TBA, responsibility TBD)
- **2018 to 2020** Provide brighter, well-lit public spaces for the YSPH community (Timeline: 2018-2020, YSPH Administration)
- **2018** Provide additional outdoor patio furniture to improve YSPH community mental health and make better use of existing unused outdoor spaces. Ideas include more tables with umbrellas, use of balcony spaces, and adding more flower pots (Timeline: Spring 2018, YSPH administration)

OBJECTIVE 3.2: Promote resilient food systems through on-campus food service and community-wide efforts.

- **Timeline TBA** Provide nutritional information for food carts located near Yale School of Medicine (Timeline: TBD, Responsible: TBD)
- **2019 to 2021** Develop a partnership with Procurement services and/or implement a student project to create a *Green Food Cart Certification Program* (Timeline: 2019-2021, procurement and student-led initiative)
- **2017 Continuous** Encourage and empower students and staff to eliminate using single-use food containers and utensils (Timeline: 2017-2018, student project already underway)
- **2018*** Provide students with a list of healthy food vendors available within a 10-minute walk at Orientation (Timeline: setting criteria for what's healthy by Summer 2018, have a list ready for Fall 2018, student-led project and Orientation-planning committee)
- **Timeline TBA** Upgrade the student kitchen at 47 College Place with sustainable servingware (Timeline: TBD , Responsible: TBD)
- **Timeline TBA** Implement composting at 47 College Place (Timeline: TBD , Responsible: TBD)
- **Timeline TBA** Signage in student lounge on preparing waste for recycling (Timeline: TBD , Responsible: TBD)
- **Continuous** Emphasize the Healthy Meeting Toolkit and endeavour to provide affordable, healthy food for all school-related events (Timeline: continuous and ongoing , Responsible: Sustainability committee)

4- Climate Action

2017 2018 2019 2020 2021 2022 2023 2024 2025 Timeline TBA Continuous * = annually

OBJECTIVE 4.1: Achieve carbon neutrality for Yale University by or before 2050.

- **2020** Establish policies that promote tele- and video-conferencing instead of air travel (Timeline: 2020, Dean's Office/Leadership Team)

- **2020** Consider carbon offset initiatives (Timeline: 2020, Sustainability Committee)
- Determine a carbon offset policy for large school events requiring travel (Timeline: 2020, Sustainability Committee and relevant events planning committees)

OBJECTIVE 4.2: Develop, test, and share climate change mitigation and adaptation strategies in support of overall regional resilience.

- **to** Create a new emergency-preparedness class developed by EHS (Timeline: Initiate talks in 2017 pending a curriculum review, implement in 2019, EHS Chair and Administration)

OBJECTIVE 4.3: Incorporate the risks and opportunities associated with climate change and possible governmental responses to climate change in the evaluation of investment opportunities.

- Encourage the publication of white papers and free speech regarding hot issues in climate change (Timeline: Continuing, relevant subject matter experts)

5- Stewardship

2017 2018 2019 2020 2021 2022 2023 2024 2025 Timeline TBA Continuous * = annually

OBJECTIVE 5.1: Develop transformative approaches to urban growth and campus planning that address financial, environmental, and social imperatives.

- Work with Forestry and Environmental Sciences to integrate positive health outcomes in the Land Use Plan (Timeline: TBD, Responsible: TBD)

OBJECTIVE 5.2: Develop innovative approaches to land and water management that enhance human health, biodiversity, and environmental vitality.

- Encourage implementation of a tobacco-free YSPH policy (Timeline: November 2017, Dean's Office and Sustainability Committee)
- Leverage YSPH air quality research in future policy implementation; identify projects or events for the collaborative goal of improving asthma rates in New Haven (Timeline: TBD, Responsible: TBD)
- Monitor air quality at corner of Frontage Rd. and College Street and address effects on air intake at 47 College Place, LEPH Exposure Assessment course (Timeline: Spring 2018, Nicole Deziel)
- Promote native tree plantings on and off campus in partnership with URI (Urban Resources Initiative) and local neighborhoods (Timeline: Ongoing and continuous, Sustainability Committee)
- Develop and implement a plan to make YSPH landscaping more sustainable (Timeline: 2019/2020, YSPH business office)
- Work with city to maintain traffic barrier plantings on South Frontage Road bridge (Timeline: ?, Responsible: ?)

6- Built Environment

2017 2018 2019 2020 2021 2022 2023 2024 2025 Timeline TBA Continuous * = annually

OBJECTIVE 6.1: Develop transformative approaches to project design, construction, and maintenance that address financial, environmental, and social imperatives.

- Invest in 'living walls,' and other indoor native plant installments in YSPH underground spaces (Timeline: 2018, Dean's Office and administration)

OBJECTIVE 6.2: Develop effective approaches to maintenance, operation, and occupancy of buildings that both ensure optimal performance and are responsive to environmental, social, and financial imperatives.

- **2020** Install and maintain motion-detection and LED lights in YSPH buildings to become more energy-efficient as part of a partnership with YSM Facilities (Timeline: 2020, YSM/ YSPH facilities management)
- Provide signage encouraging turning lights off when not in use (Timeline: Ongoing, Sustainability Committee)
- Focus on providing students with more aboveground study spaces (Timeline: 2018/2019, Student Affairs and the Business Office)
- Install and maintain low-flow toilets and faucet sensors in YSPH Yale-owned buildings (Timeline: 2020, YSM/ YSPH facilities management)
- Install hand dryers at 47 CLP and 60 College (Timeline: 2020, YSM/ YSPH facilities management.)
- Install and maintain water-bottle refill (hydration) stations (Timeline: Winter 2018, joint student & sustainability committee)
- Provide occupancy training for the YSPH community and incoming members. Consider use of Office of Sustainability guides regarding sustainability guidelines (Timeline: 2023, Business office YSPH)
- Leverage number of off-campus sites to elicit University support with recycling, green cleaning in non-Yale buildings (Ongoing, Sustainability Committee).
- Strengthen Lab Recycling Program and promote Green Lab Certification (Timeline: Ongoing and 2018; Brian Weiss)

7- Mobility

2017 **2018** **2019** **2020** **2021** **2022** **2023** **2024** **2025** **Timeline TBA** **Continuous** *** = annually**

OBJECTIVE 7.1: Enhance and support systems for alternative and active transportation.

- No goals at this time.

OBJECTIVE 7.2: Advance transportation choices that improve human health and environmental vitality.

- **2017** **Continuous** Promote sustainable commuting by offering educational materials (health co-benefits, air quality) and a 'Sustainable Commuter of the Month' award/spotlight (Timeline: Begin discussions in 2017 through Sustainability Committee meetings, Sustainability Committee)
- **Continuous** Promote and increase participation in the *Commuter Benefits Program*, and use of Yale-sponsored mobility initiatives including ZipCar, Zagster and Yale Shuttle services (Timeline: ongoing promotion, Sustainability Committee)
- **2018** Install a shuttle shelter at the curb of 60 College (Timeline: 2018 to begin talks, Dean's Office, Financial Office and Yale facilities)

8- Materials

2017 2018 2019 2020 2021 2022 2023 2024 2025 Timeline TBA Continuous * = annually

OBJECTIVE 8.1: Advance sustainability purchasing standards that promote sustainability and resilience.

- No goals at this time.

OBJECTIVE 8.2: Promote material flow systems that employ use and disposal patterns to inform purchasing decisions.

- **Continuous** Encourage WB Mason delivery bins as an alternative to paper packaging (Timeline: ongoing, Sustainability Committee)
- **2017** **2018** Establish purchasing day of week to minimize deliveries to buildings (Timeline: 2017-2018, Michelle Mata and WB Mason)

OBJECTIVE 8.3: Cultivate sustainable purchasing and disposal decisions.

- **Continuous** Update and expand recycling educational and marketing info through signage, website, messaging (Timeline: ongoing, Office of Sustainability and Sustainability Committee
- **Timeline TBA** Expand composting and TerraCycle opportunities school-wide in Yale-managed buildings (Timeline?, student projects and sustainability committee)
- **2017** Stress the importance of reusable water bottle and food container use; eliminate bottled water and single-use plastic cups at YSPH events (Timeline 2017, student projects and sustainability committee)
- **Continuous** Continue the "Supply Swaps" program, which then donates remaining used goods to local schools and charities. Enhance this program with permanent pick up/ drop off bins in LEPH (Timeline: ongoing, Sustainability Committee)
- **Continuous** Continue the promotion of the Eli Surplus Exchange; much of our furniture and equipment comes from or goes to ESE (Timeline: ongoing, Sustainability Committee)

9- Technology

2017 2018 2019 2020 2021 2022 2023 2024 2025 Timeline TBA Continuous * = annually

OBJECTIVE 9.1: Develop and implement multidisciplinary technological solutions that foster sustainability and connectivity through local, regional, and global networks.

- **2025** Post sustainability opportunities and notices on relevant social media sites including CareerBoard (Timeline: 2025, VP of Social Life SAYPH)

- **2018** **Continuous** Create Distance Learning opportunities for a variety of academic programs (Timeline: 2018 start then ongoing, Marty Klein)

OBJECTIVE 9.2: Lead the technology industry by creating replicable sustainability standards related to energy, materials, human well-being, and transportation.

- **Continuous** Eliminate personal printers from offices, encouraging the use of shared printers in YSPH (Timeline: ongoing; Sustainability Committee/ Business office)
- **Continuous** Encourage powering down lab equipment and computers when not in use (Timeline: ongoing; Brian Weiss and Sustainability Committee)
- **2019** Develop teleworking policies for YSPH staff (Timeline: 2019, YSPH HR and staff)

Thank you *for taking the time to support YSPH efforts to promote a healthier public and planet!*

https://docs.google.com/spreadsheets/d/1YsEne4Idr7h-8gn5n8KxP-I5UjiN0qtn_ymsNFjZ-9c/edit?usp=sharing

From: Goodall, Melissa
Subject: Yale Sustainability Plan - funding opportunity for students - applications due 3 April 2017
Date: Thursday, February 23, 2017 10:50:26 AM
Attachments: image003.png
image004.png
image005.png
image006.png
image007.png
image013.png
image014.png
image015.png
image016.png
image017.png
image018.png

The Yale University Office of Sustainability in partnership with the Yale Institute for Biospheric Studies announces a new grant program to fund innovation and hands-on scholarship addressing information needs and solutions in support of the objectives described in Yale University's ambitious Yale Sustainability Plan 2025. A pool of funding is available to support actionable research by individual or teams of undergraduate, graduate, professional, and doctoral students who have innovative ideas for sustainability projects.

Those interested in receiving funding should review the Yale Sustainability Plan 2025. Proposals for funding should clearly state which ambitions, objectives, and goals of the Sustainability Plan the project will support. Priorities for this year's funding cycle are

- **Climate adaptation**
- **Energy conservation**
- **Land and water stewardship**
- **Stormwater management**
- **Sustainable building standards**
- **Carbon Charge Program**
- **Biodiversity planning**

However, all projects related to the Yale Sustainability Plan 2025 will be considered.

Proposal structure and submission:

To apply for funding, fill out the application form and provide a proposal of the planned work. The proposal should not exceed 5 single-spaced pages (excluding references). The proposal should explain (1) what specific ambition, objective or goal the project will address and why it is important; (2) the methods that will be used, (3) how the information could be deployed as part of Yale's sustainability efforts, and (4) an itemized budget.

Multidisciplinary proposals are especially encouraged, and each project should include strategies for measuring success, reporting, and communications. Each applicant must have the support of a faculty advisor (indicated by a Memorandum of Understanding [MOU]) that spells out the advisor's engagement and obligations to be signed by faculty.

Requests over $25,000 will not be considered.

Application Deadline: 3 April 2017. Send the application form and proposal in a single PDF file to yibs@yale.edu

Melissa Goodall
Associate Director
YALE Office of Sustainability

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Find us online: sustainability.yale.edu

Yale Sustainability Plan 2025 Funding Opportunity

Key Milestones:

Application Deadline: 3 April 2017

Award Notification: 21 April 2017

Name : Sheridan Finnie

Academic Department : Yale School of Public Health

Academic Advisor to this project: Dr. Robert

Project Name: Minimal Disposal Practices for Catered Events

Start date: (estimated) 5/2017

End date: (estimated) 5/2018

Yale Sustainability Ambitions

Please select all that apply to your project.

- [x] Leadership: *Demonstrate local and global leadership in sustainability teaching, research, service, and operations.*
- [ ] Empowerment: *Foster a diverse and inclusive sustainability movement.*
- [x] Health & Well-being: *Enhance health, well-being, and ecosystem vitality.*
- [ ] Climate Action: *Take urgent action to mitigate climate change and proactively adapt to its impacts.*
- [ ] Stewardship: *Plan and preserve resilient and sustainable infrastructure and landscapes.*
- [ ] Built Environment: *Design, build, and maintain resilient and sustainable buildings.*
- [ ] Mobility: *Promote and support human and ecosystem health through sustainable transportation.*
- [x] Materials: *Ensure sustainable consumption and disposal patterns.*
- [ ] Technology: *Explore innovative technological platforms to address sustainability challenges.*

Keywords

Please select all that apply.

- [ ] Academic integration
- [x] Attitudes and Behavior
- [ ] Building efficiency
- [x] Community-building
- [ ] Energy
- [x] Community
- [ ] Global priorities
- [ ] Offsets
- Inter-university collaboration
- [ ] Others:
- [ ]
- [x] Outreach and communications
- [ ] Recycling
- [ ] Renewable energy
- [ ] Social networking
- [x] Student engagement
- [ ] Sustainability planning
- [x] Food
- [ ] Transportation
- [x] Waste management

Project Scope

Please select all that apply to show the reach of the proposed project.

- [x] Part of campus
- [x] On campus
- [x] Surrounding community
- [ ] Region
- [ ] World
- [ ] Other:

Project Overview

The proposal should not exceed 5 single-spaced pages (excluding references and these cover pages). The proposal should explain (1) what specific ambition, objective or goal the project will address and why it is important; (2) the methods that will be used, (3) how the information could be deployed as part of Yale's sustainability efforts, and (4) an itemized budget.

Multidisciplinary proposals are especially encouraged, and each project should include strategies for measuring success, reporting, and communications. Each applicant must have the support of a faculty advisor (indicated by a Memorandum of Understanding [MOU]) that spells out the advisor's engagement and obligations to be signed by faculty.

Specific Aims

A team of students and faculty at Yale School of Public Health (YSPH) seeks to address the Yale Sustainability Plan 2025 ambition 'health and well-being' to promote the health, well-being, and ecosystem vitality of ourselves and our Yale and New Haven community. Specifically, we aim to address sustainable catering through reusable 'materials' to disrupt current unsustainable food and catering disposable item practices, providing Yale's transition to sustainable consumption and minimalist disposal patterns.[1]

Our specific aims are:

(1) **To create structures within the YSPH to promote an internal cultural shift** towards reducing non-sustainable disposable item use and transitioning to reusable items instead. Hypothesis 1: A transferable model for minimizing food and beverage packaging, container, and utensil wasted can be developed and adopted by YSPH, facilitating the transition that will be applicable to the wider Yale community.

(2) **To substantially reduce YSPH's use of disposable food and beverage items**, such as paper or plastic plates and cups. We will propose policy-based structural reform through our Office of the Dean (collaborating on this proposal) and through educational efforts within the school. Hypothesis 2: We will reduce disposable food and beverage waste at YSPH by 40% in a 6-month span of time.

(3) **To work with local restaurants and catering partners to evaluate current practices and collaboratively create a scalable, cost-efficient model** for best practices related to sustainable catering. This model will be transferable to various restaurant settings in the Yale and the New Haven communities. This will be a combination of education as well as economic incentives to join a sustainable food providers list, from which catering will be preferentially solicited by participating members of the YSPH (first) and broader Yale/New Haven communities (second). Ultimately, we seek to aid other campus entities in undergoing programmatic and individual behavior change to meet targeted sustainability objectives. Hypothesis 3: With guidance, education, and economic incentives of saving money on packaging, container, and utensil materials, food service workers and restaurateurs will adopt practices of lower intensity food packaging.

Background and Significance

Health and wellbeing of ourselves, communities, and ecosystems are intrinsically connected in a web of overlapping, interacting relationships. At the YSPH, we are expressly committed, as articulated in our mission statement to "provide leadership to protect and improve the health of the public."[2] Through this funding opportunity we seek to collaborate with a diverse set of partners to both further our mission to promote public health and support target objectives of the ambitious, but inspiring, Yale Sustainability Plan 2025. We believe that this project will support the goals of establishing 'sustainable catering' and objective 8.3 'cultivate sustainable purchasing and disposal decisions.'[1] Through leadership in promoting the necessary imminent transition to sustainable practices we also target the ambition 'leadership' through this project.

In a single day, the average person produces ≈4.3 pounds (1.95 kilos) of waste; at least 55% ends up in a landfill.[3] It is our responsibility, as members of the Yale community, recognizable in both academic and general settings as innovators and trend-setters, to lead the transition to more sustainable materials practices. Approximately 72% of current landfill or incinerated waste consists of materials that could be repurposed through changing waste and recycling behaviors.[4] Packaging and containers accounts for 23% of overall solid waste. Using the free Environmental Protection Agency's Food and Packaging Waste Prevention Tool we will measure and track the amount and type of wastes disposed to properly target our intervention and establish meaningful benchmarks[4,5] We must be leaders in advocating for the importance of action in the face of time-sensitive

environmental degradation if not sufficiently, and quickly, addressed. Furthermore, given the current political climate that is hostile to ecological preservation ("job killing regulations"), it is increasingly important that progressive and enterprising non-governmental entities step up to meet the historic imperative towards innovative solutions in support of sustainable global resource utilization.

Aim 1, to initiate and maintain an internal culture shift, will be supported through formative research including focus groups and individual interviews to establish community wide motivation and beliefs toward behavior change. Partnerships with community restaurants and community entities will also be fostered through in-depth, baseline qualitative interviewing to establish existing norms and barriers to organizational change. We discuss the specific strategies in more depth below.

Our team at YSPH will build on existing structures designed by the YSPH Sustainability Committee. One such aid will be the YSPH Healthy Event Toolkit (see Appendix A) that provides tips and steps for running a healthy and environmentally sound event with food.[6] We will improve the toolkit implementation strategy by hosting training workshops to demonstrate how an organization might utilize the toolkit in a real-world setting. We will maintain close collaboration with the Sustainability Committee throughout the development and implementation of this project to achieve maximal efficiency and communication

Using techniques borrowed from the field of implementation science we will emphasize establishing school-wide readiness for change, initially assessing 'change commitment,' individuals' collective determination or desire to implement transition to sustainable item patterns, and 'change efficacy', collective belief in capability to achieve the transition.[7] In both arms of the project, we will develop structures for assessing change in attitudes, beliefs, and practices regarding disposable items and materials including a Sustainability Index Score, adapted from the existing composite Environmental Performance Index (EPI), presented below.[8]

Throughout the project development process, we will maintain monthly reporting to the Sustainability Office to coordinate our efforts and ensure that the project remains applicable to the Yale community at large. We will aim to communicate both successes and challenges to promote transparency in our interactions and foster an environment of reception to outside resources and input. One member of our team will be made responsible for this reporting and upkeep of best communication practices.

We seek to establish an internal cultural shift, using the model of systems redesign, to initiate behavior change both discretely at YSPH and in the wider New Haven community.[7] These actions support the Yale Sustainability Plan 2025 objectives and describe a plan for implementation throughout the campus community that will benefit not only our collective health outcomes, but also the health of the complicated ecosystem in which we live.

Approach

We will initiate a two-pronged approach to improve sustainability at YSPH and in the New Haven community at large.

I. Structural and cultural mind shift in staff, faculty, students at YSPH.
II. Partnership with local restaurants to improve sustainability efforts in catering relationship with Yale partners.

I. Cultural Shift at YSPH

1. Formative research, conduct focus groups with groups of students, staff, faculty to understand A) current challenges and barriers to changing disposable item habits, both within and outside of academic setting B) current perspectives and beliefs regarding sustainable practices at YSPH.
2. Develop and distribute YSPH branded reusable items to school community include students, staff, faculty.

3. Redesign student center in LEPH, the school of public health, to include a sink and storage facility for student reusable items.
4. Conduct trainings with departments, mandating faculty and staff attendance, to educate regarding sustainable event planning practices and individual behavior impact.
5. Work with the Office of the Dean to establish YSPH policies towards minimizing food packaging in all catered events.

The first step in promoting the internal cultural shift, and assessing readiness to change will include conducting several focus groups, across YSPH to learn about challenges and barriers to reusable item use. Using the model of systems redesign we will simultaneously design and distribute a branded set of YSPH reusable items, meant to be used at school events to eliminate the use of disposable materials.[7] We will hold a school-wide competition for designing the set of bowl, plate, utensils, and cup that will be distributed to each member of the YSPH community. Our hope is to promote a new normal in practices related to disposable item use and motivate individuals to support their peers in choosing reusable, branded items, over disposable materials.

After conducting initial, formative research, we will hold a series of training sessions, or create a mandatory training module to be included in beginning of year training requirements, as well as in our new student orientation, related to best practices in disposable item use. These modules will be accessible to students, faculty, and staff with the intention of each department holding its own unique training workshop, which our team will facilitate.

Additionally, we will redesign the student center in LEPH to expand the current student mailboxes to include a place to store one's branded, reusable cutlery and flatware. Using funding from this grant, we will add an industrial sink (see budget for pricing) to the student center to provide an accessible location for students to wash their items after use. We believe that this will motivate continued use of reusable items as lack of washing and storage facilities have been barriers in past initiatives such as clam-shell promotion.

This project will also consider the merits of a 'pay as you throw' system of incentivizing waste reduction and mindfulness in disposal behaviors through initial questioning in our baseline research. The Office of the Dean will play a role as a "bully pulpit" helping the community retain motivation towards sustainable policies and actions.

Metrics used for Measuring Success

We will create a 'sustainability improvement index' adapting existing metrics, primarily the Environmental Performance Index (EPI), and integrating expert advice, into the composite index comprising different outcome oriented indicators of environmental sustainability. The 19 element, state assessment index will be adapted to include more event and scale specific items such as vegetarian and use of disposable food related items.[8] We will validate the metric in the preliminary phase of the project before initiating the intervention. We will use this index to rate the 'sustainability factor' of different events at YSPH. We will assess the internal validity of the index with help from experts in study design at YSPH. Before the intervention begins in fall of 2017, we will use the sustainability index to assess a representative sample of different events held regularly at YSPH. This sample will include events across the six departments, some faculty-led and some student-led, and run through the Climate Change and Health Initiative and/or the Office of the Dean (Drs. Dubrow and Vermund, respectively). After establishing this baseline level of sustainability practices we will initiate a year long competition between departments, including the central office, students, and staff in which each entity competes for the highest average rating of sustainability in scored events. The index will emphasize items such as cost efficiency, use of disposable materials, and vegetarian as these outcomes are related to both improved individual and environmental health. We incentivize this competition with a $5,000 prize, required to be spent on sustainability initiatives, to the actor who achieves the highest improvement in the sustainability index. We will conduct post intervention focus groups and ratings, through a representative sampling of events, to

determine both attitude change and improvement in sustainability practices throughout YSPH.

II. Catering and Restaurant Partnership

1. Conduct in depth qualitative interviews with restaurant owners and managers to understand baseline challenges and obstacles to behavior change.
2. Data analysis borrowing techniques from qualitative interviewing grounded theory methods. Will reference qualitative methods experts at YSPH for help in data coding and analysis process.
3. Create training modules for dissemination at participating restaurants and food providers, pertaining to best practices involving catering and sustainability.
4. Leverage capacity as consumer to prioritize partnerships and purchasing from vendors who have undergone sustainability initiatives and favor sustainable practices.

We will conduct in depth qualitative interviews with common catering partners in the Yale Community. There is a community standard of working with Yale actors to improve capabilities and promote responsive engagement and best practices in Yale-community relations. We believe this project will build on the existing legacy of community partnerships, an engrained practice at YSPH and in the wider campus community. Using validated data analysis techniques, we will code the data from these interviews and create a final report that will be distributed to the restaurants as well as the Sustainability Office at Yale, From there, we will work with actors across campus, such as teams at the Forestry & Environmental Sciences school, who are working on similar initiatives to streamline our efforts and promote collaboration. We will develop a similar rating scale of restaurant practices sustainability to evaluate pre and post intervention practices related to disposable item use. Restaurants will be made aware that YSPH favors purchasing food and other services from vendor who prioritize sustainable practices.
We will emphasize transparency and open communication in this process of partnering with community partners to maximize our programmatic effectiveness and partner buy-in.

Timeline

May 2017

- Establish community catering partners to engage in the project.
- Gather team members at YSPH, prioritizing representation from students and faculty.
- Conduct initial research in designing Sustainability Improvement Index.
- Market design competition for YSPH branded cutlery and flatware.
- Create initial plans for student center remodeling, coordinate with Deans office.

June-August 2017

- Finalize scale and validate outcomes for Sustainability Improvement Index.
- Design and validate catering partner sustainability rating scale.
- Order and obtain YSPH branded cutlery and flatware.
- Distribute branded items to students during orientation and departments faculty and staff.
- Conduct remodeling, inclusion of washing and storage station, of LEPH student center.

September 2017

- Recruitment for YSPH specific focus groups (incentive of $25 for participating). Staff, student, faculty, specific groups.
- Begin advertising campaign for Sustainability Improvement Index competition.
- Recruit local restaurants and caterers to participate in interviews.
- Begin conducting focus groups and qualitative interviews.

October-November 2017

- Finish focus groups and interviewing, code and analyze data.

- Rate representative sample of YSPH events using sustainability index.
- Hold staff, faculty, and student training sessions.
- Create initial draft of training modules for sustainable restaurant education.

December 2017 -February 2018

- Continue to promote sustainable practices and track use of index in event planning.
- Hold spring semester 're-training' and morale boosting event to maintain motivation and build excitement.
- Begin second round of recruitment for YSPH focus groups.

March-May 2018

- Conduct 2nd round of focus groups and interviews.
- Rate representative sample of YSPH events using sustainability index.
    - Calculate improvement index and establish winner of competition.
- Work with restaurants to establish improvement in sustainability practices.

*Ongoing communication with the Office of Sustainability throughout year long grant period.

Budget

1. $25.00 incentive gift cards for students, faculty, staff, and restaurant participating in focus groups and interviews (5 focus groups, 10 members each. 10 restaurant interviews = 60 individuals)
   25.00 x 60 = $1,500
2. 9.25" Dining plates with logo, customized design. $7.20 per plate, 500 plates for YSPH faculty, staff, and students.
   Cost estimates from discountmugs.com **$3,600**
3. Ceramic mug with customized design/logo. $3.50 per mug, 500 mugs for YSPH faculty, staff, and students.
   Cost estimates from discountmugs.com
   $1,750
4. Dining bowls with logo, customized design. $10.00 per ceramic bowl, 500 bowls for YSPH faulty, staff, and students.
   $5,000
5. Engraved cutlery, 3 piece utensil set with logo. $1.90 per set, 500 sets for YSPH faculty, staff, students.
   Cost estimates from discountmugs.com
   $950.00
6. Self-contained, no plumbing required sink. 1, 2, or 3 basin compartments (Ozark River Portable Sink brand).
   Information and product from *http://theportablesink.com/index.php/products-by-name/elite-series-professional/elite-ls-1.html* **$2,000**
7. Storage option in student center for storing reusable dishware, shelving and mailbox enlargement.
   Information from *https://www.containerstore.com/s/kitchen/dinnerware-serving-storage/12*
   $1,500
8. Installation and workers fees associated with installation.
   $2,000
9. Hiring of computer science experts to create and pilot online training materials.
   $1,500
10. Competition prize to department/entity with highest improvement in Sustainability Index scores.
    Provided by YSPH

Total budget:
$19,800

References

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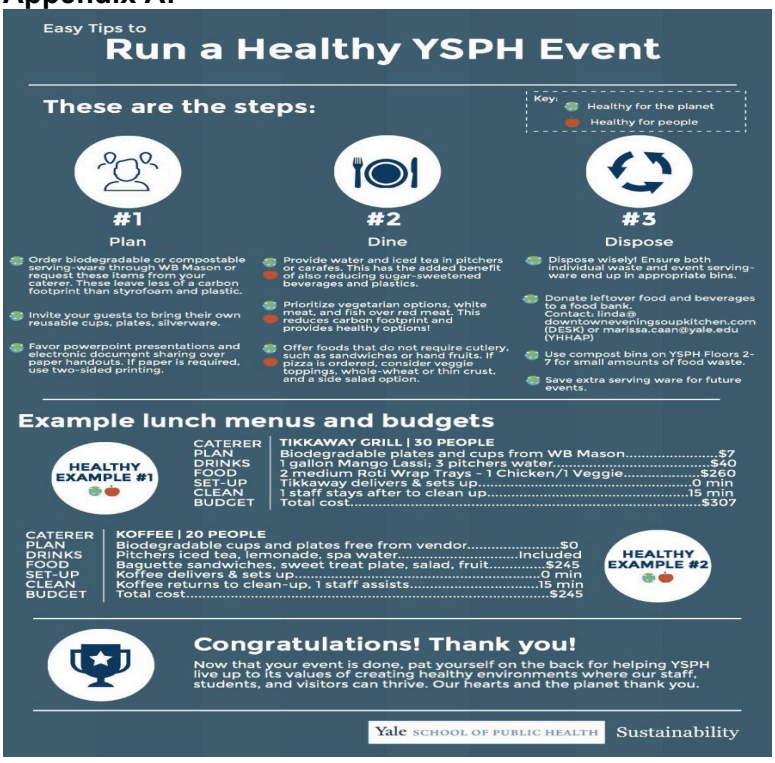
Appendix A:



Yale SCHOOL OF PUBLIC HEALTH

PO Box 208034
New Haven CT 06520-8034
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courier
60 College Street
New Haven CT 06510

April 3, 2017

Sheridan Finnie
MPH Student
Yale School of Public Health

Dear Sheridan,

This letter constitutes a Memorandum of Understanding concerning my engagement and obligations for your project "'Minimal Disposal Practices for Catered Events."

I will enthusiastically serve as the faculty advisor for this important project. As co-chair of the Yale School of Public Health (YSPH) Sustainability Committee, I can attest that in order to make meaningful progress on sustainable catering we need the kind of organized effort you are proposing. I will be available for weekly meetings, as well as email communication at any time, with you and your team about substantive, methodological, logistical issues, or any other issues related to the project, and will refer you to appropriate faculty experts when I do not have the needed expertise.

Furthermore, the YSPH Sustainability Committee will coordinate closely with you and your team to ensure the success of this project.

Sincerely,

Robert Dubrow

Robert Dubrow, M.D., Ph.D.
Professor of Epidemiology

Minimal Disposal Practices for Catered Events

Sheridan Finnie

Amendment:

1. Please offer more insights into the type of kitchenware you will source. As a part of this, please explain whether branded materials are necessary, or if it might be possible to source easily-identifiable materials that might cost less?

We plan to source kitchenware from local, charitable thrift stores and other markets for disadvantaged, up-cycled, low input goods (i.e. Freecycle, Craigslist). Your question has prompted us to decide that branded materials are no longer necessary due to the added environmental impact and cost implications of purchasing new durable goods. In keeping with our overall goals of improved sustainability and decreased consumption, we will set an example for responsible re-use of durable items. If we are not able to acquire enough suitable plates, cups, mugs, and utensils from local thrift stores and need to purchase new products, we will favor Made in the USA products to support the domestic economy and lesson our project's carbon footprint in shipping due to import and transportation. We will develop a low cost YSPH sticker that we will produce and adhere to each item, to facilitate identification of what will likely be a heterogeneous combination of plates, mugs, utensils, etc. We will integrate these steps into our overall marketing campaign to ensure transparency in process, thereby maximizing school wide buy-in and sense of ownership upon project implementation. Beyond adhering to the overall ethos of prioritizing reuse and responsible consumption, this decision to source durable, non-branded kitchenware will also reduce the overall cost of our project.

2. Please offer thoughts on how to prevent users from taking the kitchenware. In particular, we are concerned that branded materials might be appealing to some as a memento.

To address the very real possibility of users taking the kitchenware, regardless of branding, we suggest a 2-leveled strategy.

I. In the basement of 60 College Street, by the kitchenware storage racks, we will place polite signage asking people to respect this student-led initiative and a limited budget, and not take home their kitchenware. This location specific signage will be accompanied by an emphasis in the overall project marketing strategy, utilized in spreading awareness of our initiative, encouraging users to reduce waste and not take home their cups, mugs, plates, etc. In addition, we will include motivating language on some of the signs highlighting the health co-benefits for people and the environment that waste reduction includes.

II. We will include change in numbers of kitchenware from beginning to end of year as one metric in our overall sustainability index that will be used in the departmental competition motivating departments to compete for 'most sustainable' events. As most of the items on the index will emphasize issues such as durable item use, amount of waste, etc., it is fitting to include a metric specifically aimed at reuse and sustainability in provided kitchenware use. We hope that by integrating an element of friendly competition into the previously stated marketing campaign we will enhance the external motivation to not take the kitchenware.

3. It would be helpful to have a clear idea of how you would intend to work with the Office of Sustainability – including frequency and nature of interactions.

It is our hope to work closely with the Office of Sustainability over the course of this project. We request that a staff member at the Office of Sustainability be assigned to serve as a liaison with our team for the duration of the project. We, our student team and faculty advisor, would meet formally once a month with this liaison, and communicate otherwise as needed. This relationship would serve to keep O of S aware of project notable developments, challenges, and successes that occur. Additionally, the liaison would facilitate our staying up to date on any campus wide initiatives or updates that would be relevant to both our specific project and general sustainability efforts.

We would also hope to leverage the skills of the student employees at O of S, specifically in partnering with them on specific tasks, such as our marketing campaign and graphic design projects. This task sharing would not only optimize our resources and budget, but would also foster cross campus partnerships in building relationships among students across various graduate and professional schools.

In addition to this collaboration with the Office of Sustainability we would also partner with the Yale School of Medicine Facilities Department, YSPH Office of Finance & Administration, YSPH Office of Student Affairs, YSPH Sustainability Committee, and YSPH Dean's Office throughout the course of our project. We hope that by building a broad base of close collaboration we will maximize our efficiency in project implementation and individual level investment in our aims.

4. If possible, please suggest how you think this project might be scaled up or replicated.

We are hopeful, that if successful, this project will be integrated throughout the YSPH community. To address continuity in our specific community, we will create a long-term student team of interested individuals, emphasizing the importance of recruiting first years who are willing to take leadership roles and commit to the permanence of the project. This team will coordinate closely with the existing YSPH Sustainability Committee to eliminate redundancy and maximize our efficiency. In this way, we will develop a body of students who are excited to motivate their peers and encourage the cultural shift we hope to see take place.

Additionally, as we go through the process of developing and implementing our proposed project we will appoint a designated student team member as the historian of sorts, responsible for documenting the process, and its challenges. From this documentation, we will compile a 1-2 page action guide that would be useful to the other graduate/professional schools hoping to transition away from disposable item use in catered events. In this way, we will address scaling and replication within our Yale Community. Furthermore, members of the student team, as well as members of the YSPH Sustainability Committee, will be available to partner with members of other professional schools and serve as consultants in going through the transition process.

5. Job Description for Student Employee
10 hrs per week from August 16th, 2017-May, 2017:

General purpose: student will be responsible for coordinating all aspects related to the development and implementation of 'Minimal Disposal Practices for Catered Events' sustainability project.
Specific Duties:

- Facilitate weekly meetings of student sustainability team.
- Maintain monthly communication with O of S staff member; compile monthly reporting to O of S.
- Facilitate and coordinate ongoing communications with Facilities Department and other collaborators as needed.
- Conduct weekly check of sink and storage rack for cleanliness.
- Coordinate logistics of project implementation, specifically related to acquisition of goods and ordering of necessary items.
- Develop Sustainability Index, with expert input, and pilot index before implementation for YSPH sustainable event competition.
- Organize focus groups for YSPH pre-intervention and coordinate qualitative data coding and analysis.
- Organize interviews with local caterers and coordinate qualitative data coding and analysis
- Coordinate baseline event evaluation of YSPH events using Sustainability Index and manage ongoing assessments.
- Manage ongoing problem evaluation and response efforts.

Minimal Disposal Practices for Catered Events

Revised Budget:

1. $25.00 incentive gift cards for students, faculty, staff, and restaurant participating in focus groups and interviews (5 focus groups, 10 members each. 10 restaurant interviews = 60 individuals)

   25.00 x 60 = $1,500
2. Durable, non-descript dining plates sourced from Craigslist, local thrift stores, etc. $3.00 per plate, 500 plates for YSPH faculty, staff, and students.
   Cost estimates from Craigslist.com listings

   $1,500
3. Durable, non-descript ceramic mugs sourced from Craigslist, local thrift stores, etc. $1.50 per mug, 500 mugs for YSPH faculty, staff, and students.
   Cost estimates from Craigslist.com listings

   $750
4. Durable, non-descript ceramic bowls sourced from Craigslist, local thrift stores, etc. $3.00 per ceramic bowl, 500 bowls for YSPH faulty, staff, and students.
   Cost estimates from Craigslist.com listings

   $1,500
5. Non-descript 3 piece utensil set sourced from Craigslist, local thrift stores, etc. $1.00 per set, 500 sets for YSPH faculty, staff, students.
   Cost estimates from Craigslist.com listings

   $500
6. Customizable, waterproof stickers with YSPH logo (2,000 count), 4" x 2" sticker labels.
   Cost estimates from https://www.stickermule.com/products/rectangle-roll-labels

   $372

7. Self-contained, no plumbing required sink. 1, 2, or 3 basin compartments (Ozark River Portable Sink brand).
   Information and product from *http://theportablesink.com/index.php/products-by-name/elite-series-professional/elite-ls-1.html*

   $2000

8. Storage option in student center for storing reusable dishware, shelving and mailbox enlargement.
   Information from *https://www.containerstore.com/s/kitchen/dinnerware-serving-storage/12*

   $1,500

9. Installation and workers fees associated with installation.

   $2,000

10. Hiring of computer science experts to create and pilot online training materials.

    $1,500

11. Student employee wages for activities associated with leading and coordinating project development and implementation.
    Please see amendment for job description and specific duties

    10 hrs/wk @ $14.00/hr for 30 wks = **$4,200**

12. Competition prize to department/entity with highest improvement in Sustainability Index scores.

    Provided by YSPH

Total budget:
$17,322

Appendix III.D

Greenhouse Gas Reduction Program for Students and Partnership with Cool Effect

Climate justice: Greenhouse gas emissions reduction in developing countries

Learning objective: Completion of this one-hour workshop will enable students to evaluate strengths and weaknesses of greenhouse gas emissions reduction projects in developing countries from a climate justice perspective at an introductory level.

Workshop description

We will consider from a climate justice perspective the main types of emissions reduction projects that can be supported by individuals through purchase of carbon credits. We will then apply this perspective to a range of specific projects listed on the website of Cool Effect,[1] which aims to identify some of the best emissions reduction projects in the world and to make it simple for supporters to donate. These projects include a wind power project in Costa Rica; cook stove projects in Malawi, Uganda, and Peru; biogas projects in Vietnam and India; and a tropical forest protection project in Peru.

Finally, each student will cast a vote for the project he or she deems to be most worthy from a climate justice perspective, and Yale School of Public Health will donate funds to these projects in proportion to the results of the voting.

Background and rationale

The 2015 Lancet Commission on Health and Climate Change concluded that addressing climate change could be the greatest global health opportunity of the 21st century, both because we still have time to avert the most catastrophic public health effects of climate change and because climate change mitigation results in tremendous health co-benefits independent of reductions in greenhouse gas emissions (such as reduced morbidity and mortality from particulate matter air pollution).

The historic United Nations COP 21 Paris Agreement aims to hold the increase in the global average temperature to below 2° C above preindustrial levels and, furthermore, to pursue efforts to limit the temperature increase to 1.5° C. The Agreement recognizes that deep reductions in global greenhouse gas emissions will be required, as well as the urgent need for developed countries to provide financial support for climate change mitigation and adaptation efforts to developing countries.

Reductions in greenhouse gas emissions, no matter their geographic location, benefit the entire world, developed and developing countries alike. Thus, financial aid for emissions reduction from developed to developing countries serves the world's common good but is also self-serving. Given the historic inequities between the developed and developing world, we might favor projects that provide benefits to local communities over and above emissions reductions (often called co-benefits). These could be health, economic, social, environmental, or other co-benefits.

While most of the financial support for these projects must come from governments, individuals in developed countries also can play an important role by supporting worthy greenhouse gas emission reduction projects through purchase of "carbon credits." However, as described above, some projects appear to be more worthy than others when viewed through a climate justice lens. Since social justice and public health are intimately linked, as public health professionals we need to think about how to evaluate these projects. This guided session will equip students to think critically about how such projects can be evaluated.

[1]The co-founders of Cool Effect fund the Yale Climate Change and Health Initiative.

YALE Climate Change and Health Initiative

Yale Center for Business and the Environment

Help contribute **$15,000** to **greenhouse gas emissions reduction** projects in developing countries!

Come learn about some amazing projects, evaluate their impact on climate justice, and vote on which projects to fund.

Projects will come from the portfolio of Cool Effect, a leader in identifying and supporting effective greenhouse gas reduction projects.

These workshops will be led by the faculty director of the Yale Climate Change and Health Initiative, Prof. Robert Dubrow.

Two sessions available – attend the one that works best for you!

Friday, April 7, 2017
Noon to 1:00 pm
Yale School of Public Health
(60 College St. Winslow Auditorium, 1st floor)
Lunch to follow

Register here

Tuesday, April 25, 2017
5:30 to 7:00 pm
Yale School of Forestry & Environmental Studies
(Kroon Hall, 195 Prospect St., Room G-01)
Includes dinner

Register here

The co-founders of Cool Effect fund the Yale Climate Change and Health Initiative.

YALE Climate Change and Health Initiative

Yale Center for Business and the Environment

Climate Justice Workshop

Yo. r vote will help contribute **$15,000** to **greenhouse gas emissions reduction** projects in developing countries!

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Yale School of Forestry & Environmental Studies
(Kroon Hall, 195 Prospect St., Room G-01)
Includes dinner

Register here

The co-founders of Cool Effect fund the Yale Climate Change and Health Initiative.

Appendix III.E

Paper Competition

YSPH PAPER REDUCTION COMPETITION

WIN $5000

TO FUND A SUSTAINABILITY PROJECT

20% Paper Reduction

YSPH is committed to improving sustainability.

Our goal is to reduce paper consumption by 20%.

From October to March, YSPH departments, students, and administration will go head-to head to become top paper-reducers.

ADMIN | BIS | CDE | HPM

THE WINNER WILL GET **$5000** FOR A SUSTAINABILITY PROJECT

EHS | EMD | MPH STUDENTS | MS & PhD STUDENTS

WHAT CAN YOU DO?

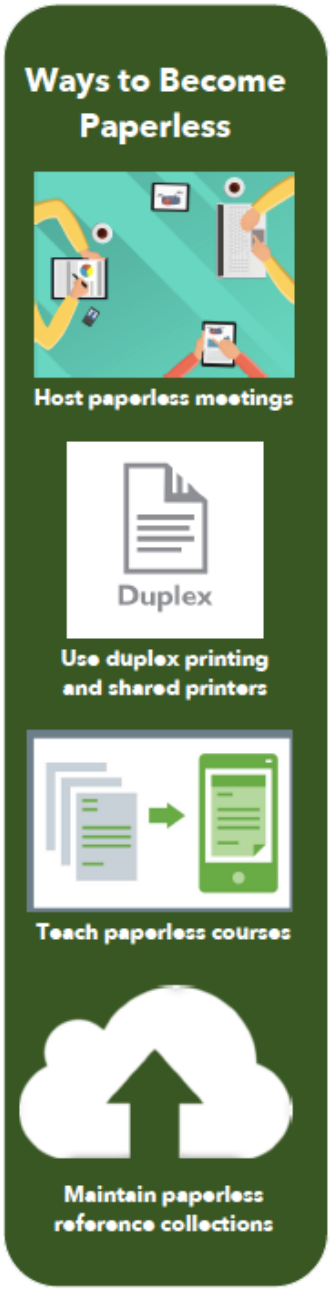
- Host paperless meetings
- Use duplex printing and shared printers
- Teach paperless courses
- Maintain paperless reference collections

4th

DID YOU KNOW?

Paper production is the 4th largest cause of CO_2 emissions in the US.

Learn more →



We need you.

The YSPH Paper Competition is underway. Beginning the week of October 3rd, the YSPH Sustainability Committee will launch a paper use reduction competition to reach our sustainability goal of a **20% reduction**.

Why reduce paper consumption?

The pulp and paper industry is the 4th largest emitter of greenhouse gases among U.S. manufacturing industries, based on data collected by the Green Press Initiative. The industry is therefore a major contributor to climate change and its devastating effects on human health and the environment. The current demand for and waste of paper is simply unsustainable.

Who is competing?

There will be eight groups competing:

- Administration
- Dept. of Biostatistics
- Dept. of Chronic Disease Epidemiology
- Dept. of Environmental Health Sciences
- Dept. of Epidemiology of Microbial Diseases
- Dept. of Health Policy and Management
- MPH Students

- MS & PhD Students

How does a group win $5000?

A $5,000 prize will be awarded to the group with the greatest reduction in paper consumption. The prize funds should be used to support a sustainability effort (e.g., a student employee to help a department make all of its events sustainable, installation of LED lighting, a sustainability-related research project).

WANT TO START NOW?

GET A PRINT-CONSCIOUS EMAIL SIGNATURE

How will paper reduction be measured?

Paper usage from October- March of 2016/2017 will be compared to baseline usage from the prior year (October-March 2015/2016).

How can I get involved?

To get started on a paper reduction campaign, you can start by monitoring your paper usage or click any of the tools below. We'll link you to the best resources available.

I want to get linked to a shared printer

I want to use digital referencing tools

I want to share paperless documents

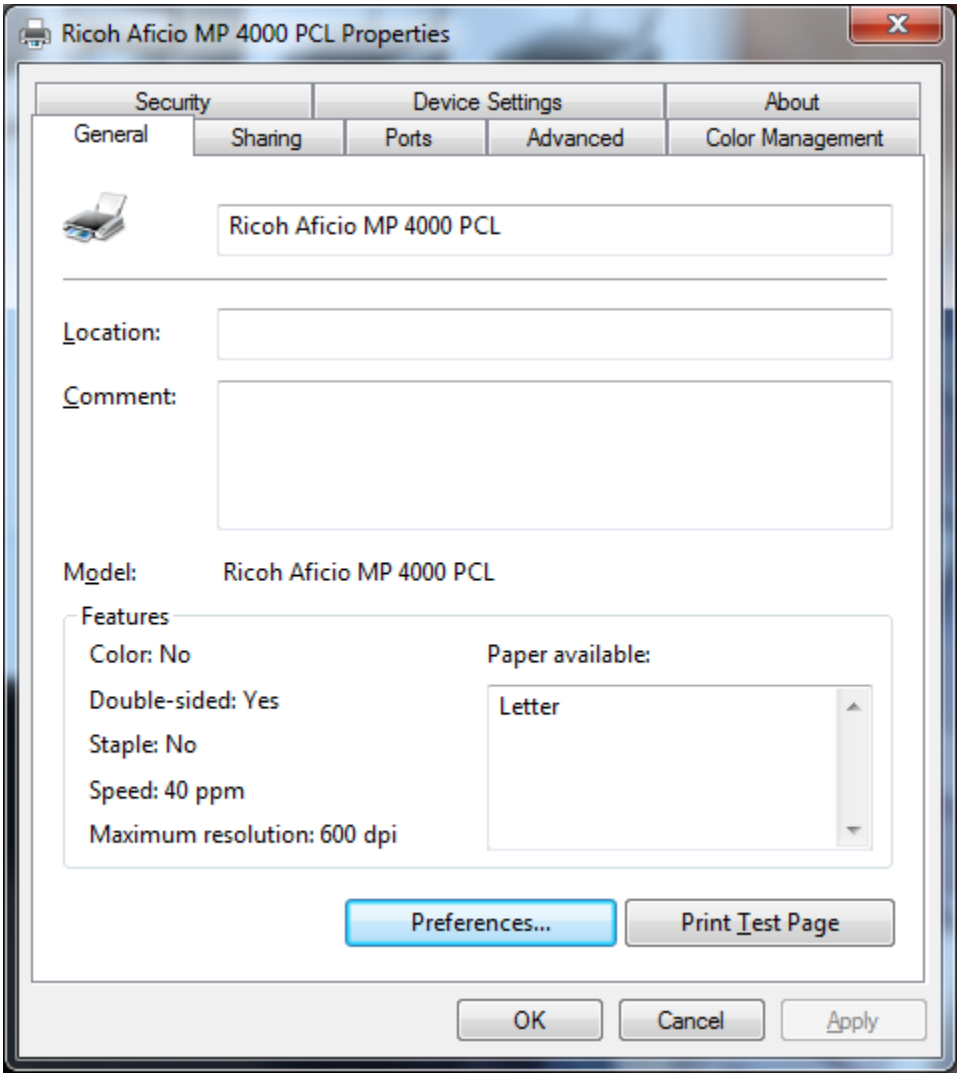
I want to print duplex

I want a free paper reduction consultation (15 min)

By Arsalan Ahmed, Heidi Richard, and Robert Dubrow for the YSPH Sustainability Committee

A. Set Printer Preferences to automatically print Double Sided

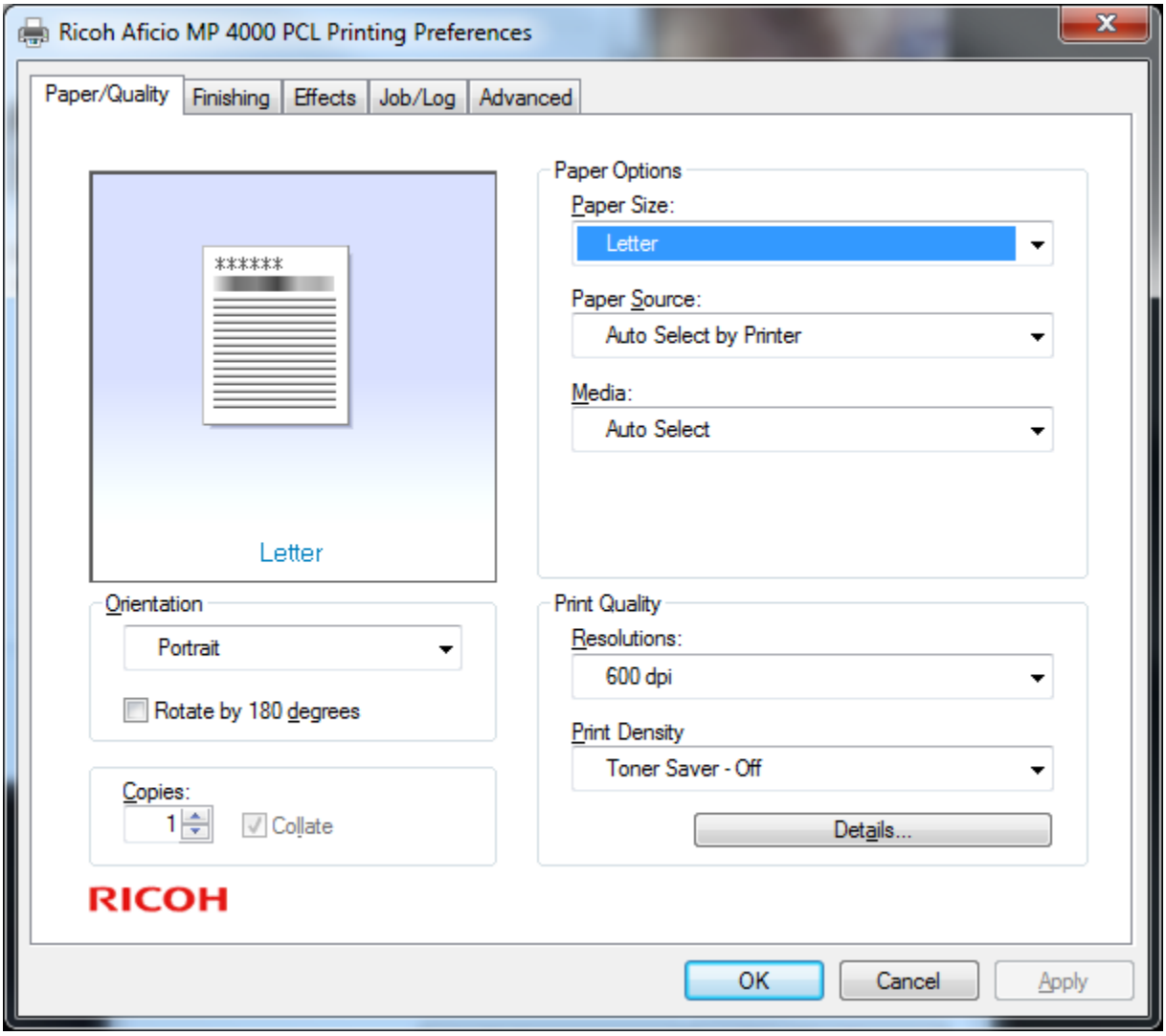
Click “Start” > Device and Printers > Right click on the Printer and click “Printer properties” You should see this Window:



Click on “Preferences”

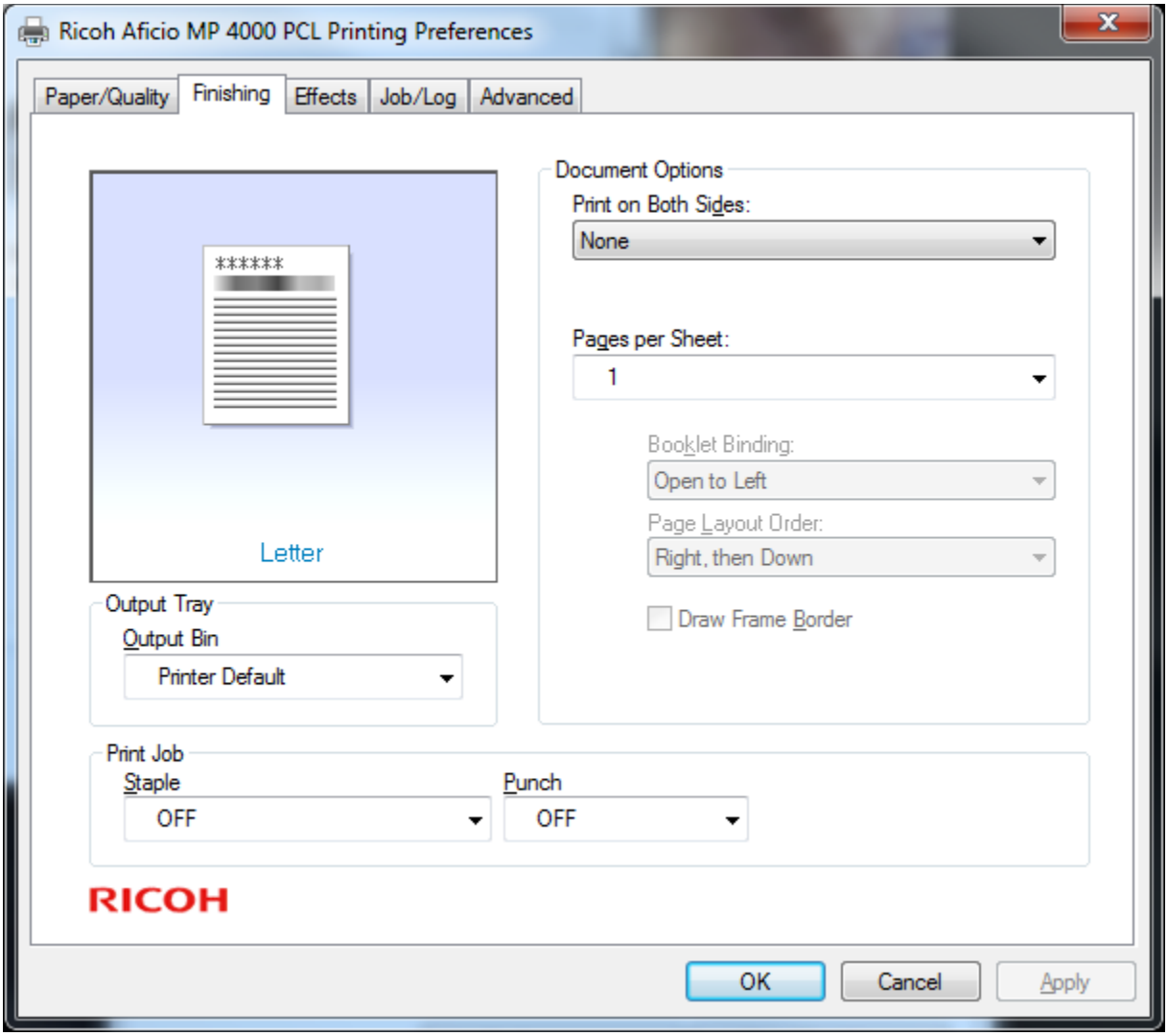
(You may be able to go directly to Printer Preferences when you right click)

You should now see this window:



Click on the “Finishing” tab

You should now see a Window like this:

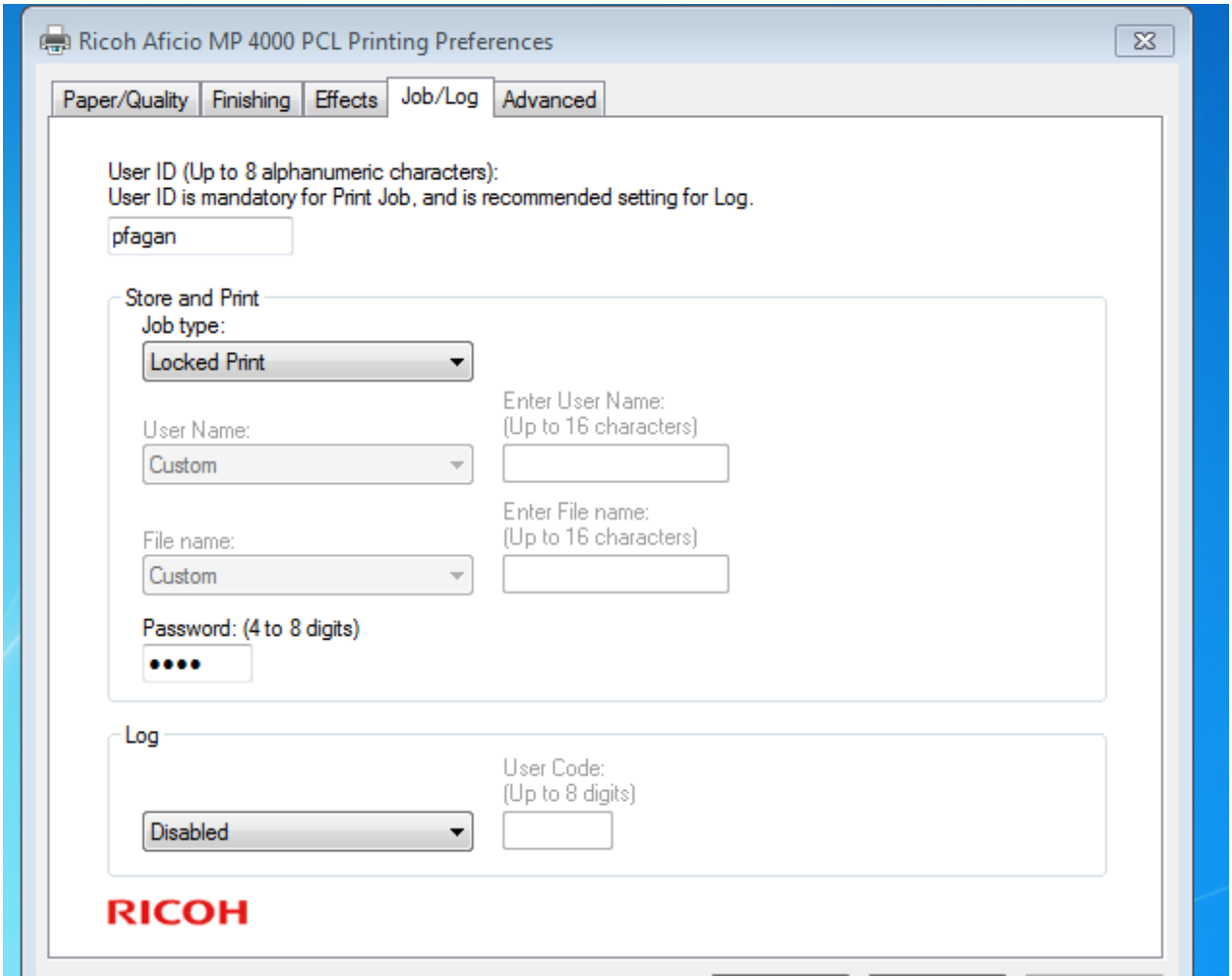


Click the drop down where it says “Print on Both Sides” and choose the desired setting, Hit “Apply” and “OK”

You should now automatically print on both sides.

B. Set Printer Preference to lock your jobs (i.e., the files won't print until you go to printer);

Click on Job/Log



Ensure your netid is in the **User ID** box. If not, type it in.

Under "**Store and Print**" click drop down and select **Locked Print** (if you want it password protected); **Hold Print** (if you do not).

If you selected **Lock Print**, you must enter a P**assword** in the Password field. If you selected **Hold Print**, you do not.

Hit **Apply** and **Ok**.

To print the File:

Go to the Ricoh machine, select "Printer" along the left side of machine. On the screen, select "Print Jobs"; Highlight the one with your Netid by touching the screen; press "Print" on the screen (if it's password protected, it will prompt you to input your password; then select "Ok"); then select "Yes" to print.

Appendix IV.A

Faculty Search Ad

Yale SCHOOL OF PUBLIC HEALTH

Tenure-Track Assistant, Associate, or Full Professor in Climate Change and Health
New Haven, Connecticut

The Yale School of Public Health (YSPH) is seeking candidates for a faculty position in the field of climate change and health at the level of Assistant, Associate, or Full Professor. The successful candidate will serve as a core faculty member of the Yale Climate Change and Health Initiative, and will help shape this new initiative, which YSPH plans to build into a center. The initiative currently includes 28 Affiliated Faculty from across Yale.

YSPH is searching broadly for a scholar who 1) is well-grounded in a relevant discipline (including, but not limited to, epidemiology, environmental risk assessment, health policy, health economics, social and behavioral sciences, medicine, demography, mathematical modeling, or biostatistics); 2) applies his or her discipline to the study of climate change and health and related topics; and 3) has demonstrated capacity to bring together and work with investigators from other disciplines on research projects related to climate change and health.

The successful candidate will have the opportunity work to with an outstanding mathematical modeling group at YSPH, as well with faculty across Yale, including at the School of Forestry & Environmental Studies; the School of Engineering and Applied Science; the Departments of Geology and Geophysics, Economics, and Ecology & Evolutionary Biology; the Yale Institute for Biospheric Studies; and the Yale Program on Climate Change Communication.

Candidates should have a doctoral degree and a strong record of research accomplishments. The successful candidate will be expected to develop an independent research program, mentor MPH and PhD students, and teach at least one course at the masters/doctoral level.

Review of applications will begin immediately and will continue until a successful candidate is identified. Applicants are asked to submit a cover letter, curriculum vitae, statement of research and teaching interests, copies of up to five recent publications, and contact information for three referees. Please apply online at:

https://apply.interfolio.com/43928

The successful candidate's department within YSPH will be determined based on his or her discipline and specific interests. For additional information and inquiries, please contact climatechange.search@yale.edu.

Yale University is an Affirmative Action/Equal Opportunity Employer and welcomes applications from women, members of minority groups, persons with disabilities and protected veterans.