

COURSE INFORMATION:

Time: Wednesday, 6-9 PM
Location: 035 Robertson Hall

CONTACT INFORMATION:

Instructor: Professor Deborah Balk
Assistant: Ms. Renee Weist

Email: dbalk@princeton.edu

Email: weist@princeton.edu

Office/phone: 322 Bendheim (used on *Wednesday only*)
Office hours: Wednesday, 4-5:30 or by appointment

Course Description:

This course will examine two hallmark demographic and socioeconomic characteristics of the 21st century: urbanization and migration. It will place those changes in the context of climate-change adaptation and mitigation, and consider policy and programs that address these issues. The course will focus on changes in a developing-country context. Students will learn to examine theory and evidence (data and methods) that is used at the local, national and international level to understand populations at risk in the short and long-run, internal and international migration flows, city-growth and urban dynamism in the context of short and long-term climate-change related hazards (e.g., increased storms and associated flooding, sea-level rise, drought, changes in disease vectors, and so on).

Class sessions will consist of several parts: a lecture that provides an overview of several key issues, student presentations (with the exception of the first class), and in-class exercises/group work. There will be discussion throughout, particularly after the student presentations. There is a moderate amount of reading each work: Students are expected to come to class prepared to discuss the readings and make connections between them.

Assignments & Grading:

Students' grades will be comprised of these three elements each described below:

Written work: 60%
Presentation: 20%
Class Participation: 20%

Written work:

Students will write three short papers, due at the start of class. Students may choose which of 6 classes (excluding the first one) to submit papers, except that all students must either submit a paper or present in week 2. They may not submit a paper for the week in which they will be making a class presentation. Please submit as a hard-copy in class.

Reaction/Review papers (3-4 pages) must consist of two unequal parts: (1) A brief review of the reading for the week, to include **all the required reading** and **at least one of the supplemental readings**. The review must make linkages between the various kinds of documents (policy papers, methodological papers, frameworks, and case studies). (2) A critique that addresses, for at least one of the papers, a significant shortcoming in methods or data that the student identifies, or elaborate on one which is identified by the authors. Students must draw out the implication of this shortcoming in the empirical record or for policy, and must include at least one suggestions for how to remedy this shortcoming (be creative!). **At least two of your papers must be of this type.**

Opinion/policy paper. In this paper (2 pages), you may state an opinion or articulate the elements of a policy that you would create. You will base this on the week's readings – be sure to cite evidence from the readings, but your goal is to be persuasive in arguing for policy or in articulating a particular point of view. **You may write one of these in-lieu of a reaction/review paper (though you may write three reaction papers, if you wish.)**

Presentation:

Student presentations will consist of a 15 minute in-depth analysis of one of the *'ed supplemental reading for the week. Students are expected to present: (1) the aim(s) of the paper; (2) main results and conclusions; (3) the conceptual framework/methods and data or used for the analysis; (4) how that framework/methods & data or model were innovative and/or lacking; (5) connections to the required paper(s) for that week or previous ones; (6) areas for improvement in the empirical record to support policy analysis (as identified in the reading as well as the students own suggestions). Students may also which draw connections to readings from earlier weeks. Finally, (7) students should end with **ONE** provocative opinion **OR** a question for class discussion. Students will sign-up for in-class presentations on the first day of class. Please email to Professor Balk by 5:30 on the day of your presentation.

NB: For items 3 & 4 above, because the readings vary in approach (case studies, methodological, empirical studies; conceptual frameworks); students must adapt the presentation to the type of paper they are presenting. Remarks that combine frameworks with method & data, when possible, are encouraged.

Class participation:

Students are expected to contribute to each class. Up to one-third of the class time may be used in discussion, which will be based on thoughtful and critical assessment of the readings.

Week-by-week

29 MARCH: CLIMATE CHANGE OVERVIEW AND CONNECTIONS TO URBANIZATION AND MIGRATION

Topics: We will start with an overview of climate issues, and the work of the Intergovernmental Panel on Climate Change (IPCC). Then we will place climate-change in context of key demographic changes in the 21st century (urbanization, aging, and migration). Two foundational studies on the role of urbanization and human settlements in climate change emissions scenarios and at risk of seaward hazards, respectively, will be discussed. We will learn why these studies were innovative and examine the new methods and data they used to answer policy questions about the role of population change in climate change.

Required Reading:

1. Intergovernmental Panel on Climate Change (IPCC), 2014. *Climate Change 2014 Synthesis Report Summary for Policymakers*. Available [on-line](#).
2. Revi, A., D.E. Satterthwaite, F. Aragón-Durand, J. Corfee-Morlot, R.B.R. Kiunsi, M. Pelling, D.C. Roberts, and W. Solecki, 2014: Urban areas. 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, C.B., et al (eds.)]. Cambridge University Press, Cambridge, United Kingdom and New York, NY, USA, pp. 535-612. Available [on-line](#). [Skim]
3. O'Neill, B.C., M. Dalton, R. Fuchs, L. Jiang, S. Pachauri, and K. Zigova, (2010) Global demographic trends and future carbon emissions, *Proceedings of the National Academy of Sciences of the United States of America*, 107(41):17521-17526 Available [on-line](#).
4. McGranahan, G., D. Balk and B. Anderson, 2007. "The Rising Tide: Assessing the Risks of Climate Change and Human Settlements in Low Elevation Coastal Zones," *Environment and Urbanization*. 19(1):17-37. Available [on-line](#).

Supplemental readings:

5. Smith, K., 2011. "We are seven billion". *Nature Climate Change* 1: 331-335 [On-line](#) w/subscription.
6. IPCC, 2014: Summary for Policymakers video highlights [here](#).
7. Stern, N. *Why Are We Waiting? The Logic, Urgency, and Promise of Tackling Climate Change*, Cambridge, MA: MIT Press, Part 1 (Chapters 1-2). (On reserves.)

5 APRIL: URBANIZATION I

Topics: Understanding the urban future and implications for climate change. What do we really know about urbanization today? How do we measure urban trends? How does this differ from understanding city-growth and why does this matter for climate change (both mitigation and adaptation), particularly in developing countries? In depth examples will be drawn from the water and public health sectors.

NB: Written essays for this week should also refer to one of the papers from Week 1.

Required Reading:

1. Montgomery M. R., 2008. "The Urban Transformation of the Developing World," *Science* 319: 761-4. Available [on-line](#).
2. McDonald, R.I., P. Green, D. Balk, B. Fekete, C. Revenga, M. Todd, and M. Montgomery, 2011. "Urban growth, climate change, and freshwater availability," *Proceedings of the National Academy of Sciences*, 3(21): 1-6. Available [on-line](#).
3. Reiner, R. C., D. L. Smith, and P. W. Gething. 2015 "Climate change, urbanization and disease: summer in the city..." *Trans Royal Society of Tropical Medicine and Hygiene*. 109(3): 171-172. Available [on-line](#).
4. **(Ch 1, 15-16)** Satterthwaite, D., S. Huq, M. Pelling, H. Reid and P. Romero Lankao, *Adapting to Climate Change in Urban Areas The possibilities and constraints in low- and middle-income nations*. Available [on-line](#) (with subscription and on reserves). London: Taylor & Francis, 2009.
 - a. Note: an earlier, much longer version is available at IIED Human Settlements Discussion Paper Series Theme: Climate Change and Cities- 1 London: International Institute for the Environment and Development. Available [on-line](#).

Supplemental readings:

5. *NOAA Indore Research Team, 2011. Climate Change and Urbanization: Building Resilience in the Water Sector – A case study from Indore, India. ISET and Pacific Institute (2011), *Climate Change and Urbanisation: Building Resilience in the Urban Water Sector, a Case Study of Indore, India*, ISET: Boulder, CO and Pacific Institute: Oakland, CA. Available [on-line](#).
6. *EU State of European Cities 2016. *Cities Leading the way to a Better Future*. European Union and UN Habitat. Available [on-line](#). [Ch 1 only]
7. *Dorelien, A., D. Balk and M. Todd 2013. “What is Urban? Comparing a Satellite View with Demographic & Health Surveys,” *Population and Development Review* 39(3): 413-439. Available [on-line](#).
8. Buettner, T. 2015 in “Urban Estimates and Projections at the United Nations: The Strengths, Weaknesses, and Underpinnings of the World Urbanization Prospects,” *Spatial Demography* 3(2): 91-108. Available [on-line](#).
9. Balk, D. and M. Montgomery, 2015. “Spatializing Demography for the Urban Future” *Spatial Demography* 3(2): 59-62. Available [on-line](#).

12 APRIL: URBANIZATION 2

Topics: Conceptual and policy frameworks for urban contributions to climate mitigation will be discussed, building on the readings from the previous classes. What role do cities play in *causing* climate change, or increased emissions? Are cities more efficient? What sectors dominate urban life and economic activity that may make it difficult to tease apart emissions from cities and emissions from industrial livelihoods? Which actors or environments can help shape urban sustainability or and create policies for cities in terms of climate-change mitigation and adaptation? And, how can progress towards such policy goals be monitored and evaluated?

Required Reading:

1. Dodman, D. 2009. “Blaming Cities for Climate Change: An analysis of Greenhouse Gas Emissions,” *Environment & Urbanization* 21(1): 185-201. Available [on-line](#).
2. World Bank, 2010. *Cities and Climate Change: An Urgent Agenda*. December 2010, Vol. 10. Available [on-line](#).

Supplemental readings:

3. *Solecki, W., K. C. Seto, et al., 2015. “A conceptual framework for an urban area typology to integrate climate change mitigation and adaptation,” *Urban Climate* Volume 14 (1): 116-137. [On-line](#) w/subscription.
4. *Jabeen, H., C. Johnson, and A. Allen, 2010. “Built-in resilience: learning from grassroots coping strategies for climate variability,” *Environment and Urbanization* 22(2): 415-431. Available [on-line](#).
5. *Peter Erickson and Kevin Tempest. 2014. S, Advancing climate ambition: How city-scale actions can contribute to global climate goals Stockholm Environment Institute – U.S. Center, SEI-Working paper No, 2014-06, Available [on-line](#).
6. *Asian Development Bank. *Key Indicators for Asia and the Pacific 2012: Green Urbanization in Asia, special chapter*. Mandaluyong City, Philippines: Asian Development Bank, 2012. Available [on-line](#).

19 APRIL: MIGRATION 1

Topics: We will connect urbanization with migration, and understand the conceptual linkages and empirical record (or lack thereof) between migration and environmental factors at large, including climate-related factors. (Internal migration will be placed in the context of international, with emphasis being given to the former.) We will begin our critical review what types of data have been used in studies on migration and climate-related hazard. The livelihoods of urban migrants will be considered, particularly as this impacts climate adaptation, and we will consider whether migrants themselves may contribute to environmental change, and if so, how?

Required Reading:

1. Emphasis on ch 4-5 Tacoli, C., G. McGranahan and D. Satterthwaite, 2015, "Urbanisation, rural-urban migration, and urban poverty," IIED Working paper. Available [on-line](#).
2. McLeman, R. 2013. "Developments in modelling of climate change-related migration," *Climatic Change* 117 (3): 599-611. Available [on-line](#).
3. *The Foresight Report: Migration and Global Environmental Change* (2011) Final Project Report: Executive Summary. The Government Office for Science, London. Available [on-line](#), and chapter 5 from item 4 below.

Supplemental readings:

4. **The Foresight Report: Migration and Global Environmental Change* (2011) Final Project Report: Executive Summary. The Government Office for Science, London. Available [on-line](#). [NB: This is a 235 page report! Select a section of interest and skim the rest.]
5. *Seto, Karen C. 2011. "Exploring the dynamics of migration to mega-delta cities in Asia and Africa: Contemporary drivers and future scenario". *Global Environmental Change*, Volume 21. 2011; 94-107. Available [on-line](#).
6. Hunter, L.M., J. K. Luna, and R. M. Norton. 2015. "Environmental Dimensions of Migration." *Annual Review of Sociology*. 41: 377-397. [On-line](#) w/subscription.

26 APRIL: MIGRATION 2

Topics: A continuation of the last week's topic, this week will focus on estimates of climate-change or hazard-induced migration both in global studies and in case studies. We will also review evidence for climate-change refugees and examine various migration measurements, particularly on the spatial and temporal scales required for demonstrating associations (or causal pathways) with climate change.

Required Reading:

1. UNHCR Advisory Group on Climate Change and Human Mobility. 2015. "Human Mobility in the Context of Climate Change." UNFCCC COP-21 Paris. November, 2015. Available [on-line](#).
2. Raphael J Nawrotzki, Lori M Hunter, Daniel M Runfola, and Fernando Riosmena (2015), "Climate change as a migration driver from rural and urban Mexico," *Environmental Research Letters* 10 (2015): 114023. Available [on-line](#).
3. Francois Gemenne and Julia Blocher, 2017. How can migration serve adaptation to climate change? Challenges to fleshing out a policy ideal. *The Geographical Journal*, 2017, Available [on-line](#).

Supplemental readings:

4. *Bell, M. et al. 2015 “Internal Migration and Development: Comparing Migration Intensities Around the World” *Population and Development Review* 44(1): 33-58. Available [on-line](#) with subscription.
5. *de Sherbinin, A. et al. 2012. “Migration and risk: net migration in marginal ecosystems and hazardous areas”. *Environmental Research Letters*, 7 (4): 1-14 Available [on-line](#).

3 MAY: PREPARING FOR CLIMATE CHANGE IN CITIES AND THE URBANIZING DEVELOPING WORLD

Topics: What do policy analysts and policy makers need to prepare the urbanizing world of developing countries for future climate variability, vulnerability and change? We will examine some of the institutional contexts that make the developing world particularly vulnerable, and consider aspects of equity and inequality over time and place. We will also consider several applications (health planning, local government) and a translational paper on cities at large -- so that we can discuss what data and information is best suited for particular audiences.

Required Reading:

1. ICLEI 2015. *Climate Change: Implications for Cities* Key Findings from the Intergovernmental Panel on Climate Change, Fifth Assessment Report, University of Cambridge and ICLEI, Local Governments for Sustainability. Available [on-line](#).
2. Roberts, D. 2008. “Thinking globally, acting locally — institutionalizing climate change at the local government level in Durban, South Africa” *Environment and Urbanization* 20(2): 521-537. Available [on-line](#).
3. Chang, A. D. O. Fuller, O. Carrasquillo, and J. C. Beier. 2014. “Social Justice, Climate Change, and Dengue,” *Health and Human Rights Journal* (16):1. Available [on-line](#).
4. Rosenzweig, C, W. D. Solecki, S. A. Hammer, S. Mehrotra, Eds (2011). *Climate Change and Cities: First Assessment Report of the Urban Climate Change Research Network (ARC3)*, Cambridge, UK: Cambridge University Press. Available [on-line](#). [To be replaced with ARC3.2, if it is released in time.] SKIM! Pay particular attention to the boxes with case-study findings, or peruse chapter for a sector of interest.

Supplemental readings:

5. *Fankhauser, S. and T. McDermott. 2011. “Understanding the adaptation deficit. Why are poor countries more vulnerable to climate events than the rich countries?” *Global Environmental Change*, Vol 27. 2011; 9-18. Available [on-line](#).
6. *Fiack, Duran and Sheldon Kamieniecki, 2015. “Stakeholder engagement in climate change policymaking in American cities,” *Journal of Environmental Studies*. 7(1): 124-140. Available [on-line](#).
7. *Kernaghan, Sam and Jo Da Silva, 2014. “Initiating and sustaining action: Experiences building resilience to climate change in Asian cities,” *Urban Climate* 7 (2014) 47-63. Available [on-line](#).
8. *Vanessa Castan Broto and Harriet Bulkeley, 2013. “A survey of urban climate change experiments in 100 cities,” *Global Environmental Change* 23(2013): 92-102. Available [on-line](#).
9. *Bahadur, AV, T Tanner, 2014. “Climates and climate policies: Analysing the politics of building urban climate change resilience,” *Urban Climate* 7 (2014) 20-32. Available [on-line](#).

NB: Topics and readings are more or less fixed, but minor changes (reordering or substitutions) may occur!