

Prof. Lynnette Widder

**SUMA PS5030: Hungry City Workshop**

Mondays, 4:10-6:00

TA: Debasmita Sarkar (ds3510)

Fulfills Graduation Requirement:

- Physical Dimensions of Sustainability Management
- Integrative Courses

The city has historically served to gather and leverage what the hinterland has produced: it was in cities that craft guilds added value to raw materials, crops and piecework were monetized, knowledge was assembled and disseminated. Within sustainability studies, cities are often cited for the efficiency of their transportation, housing and supply or refuse infrastructures, but the importance of their relationship to their hinterlands in a globalized world is often obscure. Nothing – whether a living creature or a settlement – can have a metabolic rate of zero. This course will look to the knowledge base of urban metabolism to ask questions about how cities supply and off-load their metabolic processes, and how that metabolism shapes and is shaped by each city's specific spatial and cultural characteristics. Our work presumes that each individual resource flow can tell a different story about a city's working, and that by studying that flow, we can find subtle, location-specific ways to talk about its metabolism.

We will test this hypothesis by engaging a case-study city. This Fall, we will again look at Los Angeles. The first half of the semester will be spent understanding the premises of urban metabolism, and how they apply historically and currently to Los Angeles' relationship with its hinterland. We will also use a course textbook, Sustainable Urban Metabolism, in concert with other readings and in-class diagramming exercises, to develop a flexible methodology through which to track and study the interaction of resource flows and urban culture. In the second half of the semester, class time will also be devoted to developing and discussing the students' individual term research projects, in which they identify and examine a resource flow through which to explain best their cities of origin. Together, we will engage the problem of finding appropriate metrics and proxies that can quantify the city/hinterland interaction in a way that supports the development of alternate infrastructure and sustainable practices, from the bottom up and the top down.

Work in this course will involve considerable amounts of reading, writing and in-class discussion. You will complete shorter collaborative assignments based upon the readings. To support your work on these assignments and on your term projects, we will also spend time on developing skills for the visual communication of analytic and quantitative information. By the end of the semester, each student will present a final briefing, supported by a formal research document for submission, on the city of her or his origin. Lectures and in-class exercises will provide you with the specialized knowledge you will need to complete your work, but you will be asked to learn actively through interpolation, research and visual representation.

Because nothing makes clearer the implications of urban resource flows than confrontation with the spaces allocated to them, there are two elective field trips associated with this course. On October 12th at 8:30 AM, we will visit Dead Horse Bay in Brooklyn, the site of a 19th century horse rendering complex and the land fill to which all rubble from the building of major New York City highways in 1953 was sent. Our guide will be Howard Warren, who has studied the site and its artifacts for several decades. On October 19th we will visit the Hunts Point Terminal Produce Market, which supplies more than 2/3 of the fresh fruits and vegetables sold in the tristate area.

**By the end of this course, you should be able to:**

- Define the primary concepts of urban metabolism;
- Understand the significance of each resource flow in understanding the particularities of a city;
- Understand the interplay between metrics and quantification in evaluating urban systems and supporting sustainable practices;
- Be conversant with the DPSIR methodology for describing urban metabolism and its application to a sustainability agenda;
- Use creatively tools of urban analysis;
- Use visual communication methods to define and address problems, and to convey complex proposals.

**Required Course Work and Evaluation:**

- Class attendance and active participation. I expect evidence of solid preparation and willingness to invest your own expertise into group work. You may email me or make an appointment to discuss concerns and clarifications. If you cannot attend any given class session, you must inform the professor or TA via email no later than noon on the day of class. Individual, 5% of grade.

**Part I: Principles of Urban Metabolism**

- Verbal Reading Responses: In Weeks 1-5, key readings will be assigned; reading guides to frame central questions will be provided. After the first post, these should take the format of response and provocation. You will be evaluated on your preparation of the readings, your participation on the forum and in-class contributions. Individual, 20% of grade
- Methodology Presentation: We will use one class as a roundtable to discuss readings on methodology. Each student will individually present a reading on that day. Individual, 10% of grade

**Part II: Los Angeles Case Study**

- Reading Response/Diagramming: In weeks 6-10, when the class transitions to the Los Angeles case study, you will be assigned to a working group. In the working group, you will support one another in the larger research project and prepare a weekly analysis of one of the readings assigned. You will be asked to depict your findings in visual form. The purpose is to cultivate your ability to represent urban flows visually. Collaborative, 20% of grade
- Term research project and presentation: Using our analyses of Los Angeles as your template, you will define a proxy resource flow and create a research database for the city in which you grew up. You will unearth information on its history, its infrastructure, its changing relationship to its hinterland and its current resource and waste flows. You will present this information using visual communication

techniques and lead the class in discussion of your findings. In addition, to your in-class presentation, you will submit a final research paper ca. 15-20 pages in length. Individual, 45% of grade

### **Final Project Grading:**

The work submitted should be graphically clear and free of careless errors. Building upon your shorter analytical exercises and your reading responses, your term research project should evidence:

- research (15% of grade) – show knowledge of subject literature; explain historical development of city and current urban infrastructure management trends
- analysis (20%) – draw meaningful conclusions from your research, strategize what information is vital and how to make it adequate to your evolving thesis
- synthesis/mission statement (20%) – based on research and analysis, identify an hypothesis about the city's resource inputs and outputs; develop back-up on the historical, political, logistical, etc. givens that support or challenge your hypothesis
- in-class preparation and presentation (25%) – verbal and visual presentation including original diagrams; prepare readings for your colleagues prior to your presentation; lead discussion
- creativity/integrative thinking (20%) – qualitative evaluation of the framing and resolution of the problems you identify

Students will make intermediate submissions of their term project throughout the semester. Returned submissions will include both comments and letter grades so that students can improve their performance over the semester. However, final work may not be redone and resubmitted for a new grade. Requests for extensions will only be granted if made in advance and warranted by extenuating circumstances (sickness, personal or family matters, etc). Failure to submit an assignment will result in an F for that portion of the grade. Plagiarism is an academic offense that will result in automatic failure for the course.

### **Course Format and Assignments:**

This course will be run as a hybrid lecture/seminar. We will also have invited guest speakers whose research addresses specific aspects of our case study city, Los Angeles, and the field of urban metabolism. Separate assignment sheets will be distributed.

In the final portion of the semester, you will be called upon to design a portion of the class time for your peers. A separate assignment sheet will provide a rubric and detailed schedule for your presentations.

Your TA will prepare and lead out-of-class tutorials and hold office hours. These will be scheduled in the first week of class to ensure optimal timing.

As graduate students from a broad spectrum of disciplines, group discussions offer you the chance to leverage your colleagues' expertise in a creative, open way. This is an academic setting – there are neither clients nor finite “deliverables.” Use your presentations to show what you know but also to ask pertinent questions and to spur discussion.

**Required Books:**

Please be sure that you have a paper or digital copy of all readings for reference during class.

- 1) Paolo Ferrao and John Fernandez, *Sustainable Urban Metabolism* (Boston, Ma.: MIT Press, 2013) ISBN: 978-0-262-01936-1 (on order at Bookculture, 112th Street between Broadway and Amsterdam)
- 2) Kazys Varnelis, ed., *The Infrastructural City: Networked Ecologies in Los Angeles* (Barcelona: Actar, 2013) [\*pdf will be available on Canvas, courtesy of editor\*]

**Recommended Books:**

Although out of print, Mike Davis' *Ecology of Fear* is very strongly recommended for purchase for the L.A. case study portion of class. All other readings will be made available to you on Canvas.

Christopher Kennedy, *The Evolution of Great World Cities: Urban Wealth and Economic Growth* (University of Toronto Press, 2011). Written from the point of view of urban metabolism, this book uses historical case studies to describe the relationship between available resources, resource flows and urban wealth, and the appropriate metrics for evaluating this relationship.

**Additional Resources:**

- 1) Online photo collection of Los Angeles' evolving landscapes and cityscapes: <http://pstp-edison.com/>
- 2) UCLA Center for Sustainable Communities LA urban metabolism website; the second link listed is their methodology report: <http://sustainablecommunities.environment.ucla.edu/2011/07/energy-baselines-the-urban-metabolism-of-los-angeles-county/>  
<http://sustainablecommunities.environment.ucla.edu/wp-content/uploads/2012/10/Methodology-to-Develop-Regional-Energy-Baselines-10-qud.pdf>
- 3) Stephanie Pincetl, Paul Bunje, Tisha Holmes, 'An Expanded Urban Metabolism Method: Toward a systems approach to assessing urban energy processes and causes', in: *Landscape and Urban Planning* 107 (2012) (digital resource on Canvas)
- 4) <http://mfadiagrams.blogspot.com> This website offers a series of diagrams of material flow analysis and metabolism scenarios.
- 5) <http://projects.urbmet.org> MIT digital "toys" for simulating urban metabolic analysis

**Schedule:**

Part I: Principles of Urban Metabolism

**Week 1: September 11th**

Lecture: Why Not Net Zero? Principles of Urban Metabolism and the Expanding Hinterland

Reading: Edward Soja, 'Putting Cities First: Remapping the Origins of Urbanism', in Gary Bridge and Sophie Watson, *A Companion to the City* (Oxford, UK: Blackwell, 2000) p. 26-34 [*Available on Canvas*]

**Week 2: September 18th**

Lecture: Spatializing resource flows

Readings: Ferrao and Fernandez, *Sustainable Urban Metabolism* Chapters 1, 2 and 5: methodology and terms [*required book*]

Assignment: Begin research for Hungry City Workshop research project; meet with Professor and TA between Week 2 and Week 4 submission date

### **Week 3: September 25th**

Lecture: Reading Cities: flows, maps, scale and diagrams

Readings: Ferrao and Fernandez, *Sustainable Urban Metabolism* (required book), Chapters 3 and 4: research areas and toolbox

*Available on Canvas:*

Haberl, Fischer-Kowolski, Krausmann, Martinez-Alier, Winiwarter, 'A Socio-metabolic Transition towards Sustainability? Challenges for Another Great Transformation', in *Sustainable Development* 19, 1-14 (2011)

### **Week 4: October 2nd**

Guest Lecture: Paul Hoekman, Co-founder metabolismofcities.org; web designer and industrial ecologist, Cape Town, South Africa

Discussion: Administering an MFA using online software: an introduction to OMAT

Readings: Ferrao and Fernandez, *Sustainable Urban Metabolism* (required book), Chapters 6, 7  
Metabolism of Cities - <https://metabolismofcities.org>

This website will be used to administer MFA data. However, this community-driven portal has a lot of other urban metabolism resources available as well. Please explore the website in preparation to this session.

Assignment: Initial Proposal for research project: overview of city's history, configuration and challenges; suggested potential proxy resources with sketch of DPSIR analysis for each; initial bibliography and research/data acquisition plan

### **Week 5: October 9th**

Discussion/

Lab: Student-led methodologies workshop for urban metabolism

Readings: *Each student or student pair will present one reading [available on Canvas]*

Agudelo-Vera et al, 'The Urban Harvest Approach as an Aid for Sustainable Urban Resource Planning'; Cast'an Broto et al, 'Interdisciplinary Perspectives on Urban Metabolism'; Keirstead et al, 'Using Activity-Based Modeling to Simulate Urban Resource Demands at High Spatial and Temporal Resolutions'; Hodson et al, 'Reshaping Urban Infrastructure Material Flow Analysis and Transitions Analysis in an Urban Context'; Bristow and Kennedy, 'Urban Metabolism and the Energy Stored in Cities'; Baynes and Bai, 'Reconstructing the Energy history of a City: Melbourne's Population, Urban Development, Energy Supply and Use from 1973 to 2005'

New York City Department of Sanitation and Business Integrity Commission, 'Private Carting Study'; Orzana and Barera, 'Culture meets Flows: The Cultural Dimension of Urban Metabolism'; Pincetl et al, 'An Expanded Urban Metabolism Method: Toward a systems approach to assessing urban energy processes and causes'

Assignment: Ongoing research for Hungry City Workshop presentation: finalize proxy resource flow; annotated bibliography; update on image and data collection

**October 12th, 8:30-1:30 Field Trip to Dead Horse Bay, Brooklyn**

**October 19th , 8:30-12:00 Field Trip to Baldor Market, Bronx** (ID, signed liability waiver, appropriate footwear and clothing required)

Part II: Los Angeles

**Week 6: October 16th**

Lecture: Nature/Not Nature: The Resource Costs of Environment

Reading: 'Maneaters of the Sierra Madre' in *Ecology of Fear* by Mike Davis

'Introduction' in *The Infrastructural City*, ed. Kazys Varnelis (pdf)

'Los Angeles Against the Mountains' in, *The Control of Nature*, by John McPhee

Assignment: Formation of working groups for final project peer support and reading responses; ongoing research

**Week 7: October 23rd**

Lecture: Supply and waste streams: The Resource Costs of Consumption

Readings : 'Los Angeles River Watershed' and 'Distribution', *The Infrastructural City*, ed. Kazys Varnelis (pdf)

*Sustainability and Waste Management in Los Angeles* by Susan Thorneloe and Keith Weitz; Mike Davis, *City of Quartz* p. 196-219; Aldous Huxley, 'Hyperion to A Satyr (1956)

Assignment: Ongoing research for Hungry City Workshop presentation; develop outline and storyboard

**Week 8: October 30th**

Lab: In-class student presentation overview and critique via peer review

Mid-term project critique

**Week 9: November 6th University Holiday**

**Week 10: November 13th**

Guest lecture: Jessie Braden, Director and Founder, Spatial Analysis and Visualization Initiative (SAVI), Pratt Institute

Readings: additional readings on GIS tba

'Owens Lake' *The Infrastructural City*, ed. Kazys Varnelis

*Ecology of Fear* by Mike Davis 'How Eden Lost its Garden'

'The Imperial Valley of California: Sustainability, Water, Agriculture and Urban Growth' by Stephanie Pincetl and Basil Katz, in: *The Sustainable Paradox: Urban Political Economy in the United States and Europe*, ed. Rob Krueger and David Gibbs, p. 266-294; *Filmic Landscape Mapping* by Fred Trunniger p. 225-247

Assignment: Submit storyboard for final project with developed graphics and representation strategies [Optional Evening Session to be scheduled]

Screening: Excerpts from *Los* and *Centro Valley* by James Benning

**Week 11: November 20th**

Lecture: Energy Only?: The Resource Costs of Topography

Readings: 'Oil', 'Traffic', 'Telecommunications' in *The Infrastructural City*, ed. Kazys Varnelis; 'The Case for Letting Malibu Burn' by Mike Davis (1995)

*Los Angeles: The Architecture of Four Ecologies* by Reyner Banham, Chapter 4 'The Transportation Palimpsest'; *Thirsty City* by Austin Troy (2015, *Places* journal; 'Unraveling Petroleum: How Policy Drives California's Demand for Oil' by Juan Matute (2013 report)

Assignment: Ongoing work on Hungry City Workshop presentation

### **Week 12: November 27th**

Lecture: Built Environment: The Resource Costs of Habitation

Readings: 'Gravel' and 'Property' *The Infrastructural City*, ed. Kazys Varnelis (pdf)

*Los Angeles: The Architecture of Four Ecologies* by Reynor Banham, Introduction and Chapters 2, 5, 8 and 11 The Four Ecologies; Pincetl et al, 'Enabling Future Sustainability Transitions: An Urban Metabolism Approach to Los Angeles'

Assignment: Submission of draft presentation to professor and to working group colleagues for comments

Part III: Hungry City Workshop

**Week 13: December 4th** (This presentation date may be moved to the prior or subsequent weekend to all adequate time for all presentations, subject to student availability)

Presentations: Student presentations and commentary

Readings: As specified by students

### **Closing Panel**

#### **Week 14: December 11th**

Presentations: Closing discussion of comparative themes and topics (guest discussants tba)