Excavating Innovation | building a global lexicon of drylands design

Instructor: Hadley Arnold (hadleyar@usc.edu and hadley.arnold@aridlands.org)
Mondays 10 am-11:50 AM, Harris 102
2 Units

Nabatean sluice. Petra, Jordan. Photo by Hadley Arnold, 2015.

> "'Is there no speech,' they ask her, 'no words you can give us that help us break through your dossier of failures? …No song, no literature, no poem full of vitamins, no history connected to experience that you can pass along to help us start strong?'"
>
> --Toni Morrison – Nobel Lecture. NobelPrize.org. Nobel Media AB 2019. Mon. 12 Aug 2019.
> https://www.nobelprize.org/prizes/literature/1993/morrison/lecture/

COURSE DESCRIPTION
AR698a is a 2-unit advanced design research seminar that precedes AR698b, a 6-unit advanced design research studio in the spring. Together, the seminar and the studio form a full-year exploration of the architecture of water supply in drylands.

AR698a is grounded in a commitment to an expanded lexicon of drylands design as a strengthened basis for adapting to a post-carbon future. What coupled human-natural systems have shaped drylands cultures, and with what social, spatial, and environmental consequences? And with what possible future applications?

Through critical readings, independent inquiry, selected case studies, small-team collaborations, and mentorship from the instructor, students will research and curate a visually rich lexicon [or stub of a lexicon] that defines, diagrams, and interprets drylands water systems as instruments of adaptation throughout history.

The intent is to build a shared resource that informs contemporary applications, including application to contemporary sites in the spring thesis studio.

The human need for water has ordered landscapes, given rise to culture, and shaped architecture + urban form throughout history. Focusing on case study sites in South Asia, the Middle East/North Africa, and arid parts of Southern Europe and the Americas, this seminar will ask how public water systems have evolved to support ritual, hygiene, gender roles, public health, technological innovations, social space, local economies, and political power. The course selectively excavates history to reveal relevance to contemporary design challenges, asking, in all cases, how are ancient environments still contemporary?

Looking ahead to the spring:

Discrete elements of water systems recovered from ancient, archeological, and pre-industrial sites might be seen as what Ferdinand de Sausure termed '*paroles*'—speech, words, utterances.

As students transition from fall seminar to spring studio, the challenge will be to construct and test frameworks in which those discrete pieces of the lexicon combine meaningfully as '*langue*': the rules, syntax, grammar of expressive, intentional design language.

Which systems intrigue you? Why—what are the outcomes you hope to produce? When are those strategies and outcomes scalable? Replicable?

With what operations, transformations, rules might some of these pre-carbon systems be modified, combined, and grafted fruitfully into a contemporary post-carbon context?

By late October, the class will have produced a collective lexicon (or 'stub') in a shared format. Students will have identified hardwares (constructed systems), softwares (governance systems), and potential contexts of particular interest.

Through the end of the fall term, students will generate a set of questions and conditions for testing their interests in the spring studio: an area of interest within the seminar focus area; a potential test case [site/program/population/condition]; problem definition and analysis; selection of potential application of historical infrastructures; and a work plan.

In the spring, students will apply their research in new ways to global sites of their choosing. Ultimately the class will return to the collective working hypothesis and eleven individual, curated responses: could an expanded drylands design vocabulary drawn from history accelerate or expand our capacity as evolutionary architects for the future?

LEARNING OBJECTIVES

Responsible Scholarship: Ability to properly cite sources (text and image), demonstrating fullest scholarly integrity and adherence to academic standards: See:
https://dornsife.usc.edu/assets/sites/903/docs/Trojan_Integrity_-_Guide_to_Avoiding_Plagiarism.pdf

Critical Reading: Ability to critically read texts and form insights that are relevant to contemporary issues and debates.

Critical Research: Ability to work with various archival, mapping and data resources and critically interpret their value, potential for bias, objectives/aims and application for the developing argument.

Case Study Evaluation: Ability to examine, comprehend and critique the fundamental principles present in relevant precedents and to make informed choices about the incorporation of such principles into landscape architecture projects.

Communication: Ability to communicate a stance through short, succinct and well-structured logics – in writing and speaking formats.

COURSE SCHEDULE (Subject to Change!) and RESOURCES

Part I: Week 1-5

Week 1: Aug 26: Intro/overview
Read:
IPCC Exec Summary: https://www.ipcc.ch/sr15/chapter/spm/
Toni Morrison Nobel speech: https://www.nobelprize.org/prizes/literature/1993/morrison/lecture/

Week 2: Make-up Class for Labor Day: Wednesday, Aug. 28:
Context: What's the Problem? Changing Hydrologic Sphere, Limited Design Vocabulary
Bring reading notes:
IPCC Exec Summary: https://www.ipcc.ch/sr15/chapter/spm/
Toni Morrison Nobel speech: https://www.nobelprize.org/prizes/literature/1993/morrison/lecture/

[Week 2: Sept 2: Labor Day—No class.]

Week 3: Sept 9: Context: What's the Problem, continued:
Defining Terms: Drilling into IPCC Executive Summary
Where's water? Limited Vocabulary, Limited Vision
Bring to class:
IPCC reading notes and 50 most useful words learned at USC Landscape Architecture

Week 4: Sept 16: What's the Opportunity, continued?
Defining terms. Water Security = Quantity + quality + access
How do we build water security?
What's a taxonomy?

Week 5: Sept 23: Methods: Surveying the Territory of Existing Tools ("comparables")
What's out there already?
Survey and Critical Review of Lexicon Case Studies/Precedents:
Literature, Databases, Digital Atlases, Taxonomies
Design of Data: What works? What doesn't? Why?
Content: first batch from "known" vocabulary (USC MLA terms); begin to research/add new contemporary terms: UN and US EPA best practices.
Format: review/critique and generate collective design guidelines: print/digital? drawing standards; type; codification; expected content

September 25th: AIA/ACSA 2020 Intersections Symposium: Design for Climate Action:

http://www.acsa-arch.org/programs-events/conferences/intersections-symposium/2020-intersections-symposium. Submission deadline; tbd.

Part 1: Water/Climate Overview Resources:

Required:
International Science/Policy Frameworks:
IPCC AR 5_Summary Report for Policy Makers
IPCC Special Report_2018
UN Sustainable Development Goals, SDG 6 in particular

National Science/Policy Framework:
US EPA Recommended Best Practices: Green infrastructure (stormwater collection, capture, treatment)

Recommended: National Outlook:
National Climate Assessment (NCA), is issued, by law, every four years to Congress and the US President.
US Federal agencies are required, by law, to operate within its recommendations.
See esp: Chapters on overview, impacts on the American Southwest, water, and impacts on urban centers

Recommended: Local/Regional Outlook in Global Context:
Arid Lands Institute videos, "Thinking Water: A Briefing for Designers" (2012)

Intro/overview
Hadley Arnold, ALI, intro:
https://aridlands.org/discover/video/thinking-water-briefing-designers-hadley-and-peter-arnold-drylands-design-challenge

Water, Energy, and Design of Built Environment
Paul Bunje, UCLA:
https://aridlands.org/discover/video/thinking-water-briefing-designers-paul-bunje-water-energy-and-design-built

Urban Assets: Myths, Facts, Opportunities
Stephanie Pincetl, Ph D, UCLA:
https://aridlands.org/discover/video/thinking-water-briefing-designers-stephanie-pincetl-phd-urban-assets-myths-facts-an-0

Thinking Upstream:
Terri Hogue, PhD, UC Boulder:
https://aridlands.org/discover/video/thinking-water-terri-hogue-thinking-upstream-glen-macdonald-stephanie-pincetl-urbanag

Western Water and Global Citizenship
Glen MacDonald, PhD, UCLA:
https://aridlands.org/discover/video/thinking-water-briefing-designers-glen-macdonald-phd-western-water-and-global

Recommended/Local Regional Science Policy Frameworks:
Climate Change in the LA Region, by Alex Hall, PhD, UCLA:
https://www.ioes.ucla.edu/project/climate-change-in-the-los-angeles-region/

Required/Local/Personal:
Water Footpring: Point of Use, Embodied Water, and Water/Energty/Carbon nexus.

Required/What do I know about water?

Inventory of drylands design terms familiar to you as of September 2019.
Inventory of US EPA and UN Development Program recommended BMPs.

Part II. Making a Case for a Richer Drylands Design Lexicon

Week 6: Sept 30: Methods: Trial Balloon: Assembling/Shaping Data
Inventory/catalog "known" water techniques/stragtegies/BMPs.
Pin Up: Draft lexicon pages; draft content 'template'.

Have you researched possible case studies and precedents from taxonomies in architecture and other disciplines? Analyzed them? Attempted to draw/diagram

Week 7: Oct 7: No Class; Work independently as a lab:
Do we have a working taxonomy?
Do we have a working template for populating entries onto the taxonomy?
Have standard guidelines been clearly communicated/debated/revised by the team?
To identify/document each piece of historical 'hardware' has a standard been created?
Each water technology is to be defined, drawn, diagrammed, and annotated in a precise and uniform visual and textual language, identifying its historical, cultural, and hydrogeological roles and context.

Collectively play with EPA and UN DP best practices as a set of cards—layout on taxonomy, test expanded framework.

Resources on the Architecture/Design of Taxonomies:
Required: Edward Tufte, Envisioning Information (1990, Graphics Press).
Recommend: Independent research into case studies, role models, inspiring precedents.

Part III. Hearths: Case Studies in Global Drylands Desgin History

Week 8: Oct 14: MIDTERM: Revised and Updated Draft Lexicon due
Preliminary Presentation (as "cards")

Priority: Beyond BMPs: Let's dig in. (At last).

Hardware: what are the physical infrastructures employed in global hearths over history?

Hearths: Teams assigned to geographic/chronological cross-sections.
--Andean Americas
--Meso/North America
--Ganges/Indus Valley
--Mesopotamia and Middle East
--Wei/Huang River Valleys
--Nile and North Africa
--Early Modern Europe

Week 9: Oct 21: Hearths: Preliminary Presentation (as "cards")
Hardwares, by Hearth
Factual definition/identification, date, construction method, analysis of purpose, scale, materials.

To Consider:
Software: What metrics are used to assess/evaluate/guage/index operating systems---social, economic, power structures---of case studies?
What are the measures of performance?
Political power?
Bodily senses?
Social cohesion?
Equity and inclusion?
Typological connections?
Geographical transmissions? Continuities and Discontinuities.
Do you have the expertise on your team required?
What other disciplines need to engage?

Week 10: Oct 28: Hearths: Pin-Up:
What have you got? How are your representation techniques working? What do you see?
Draft thesis proposal due.
Pin-up.

Week 10, continues: Thursday October 31: 1:1 meetings.
Where is this going? What are your interests?
Portfolio + hearth research + revised preliminary thesis proposal.
20 minutes each, 9am-2pm. Sign up.

Week 11: Nov 4: Hearths, continued: Reflection
Evidence of revisions, continued research, outside consultation.
Collective final output proposal: digital? Print? Exhibition?
Pin-up.

Week 12: Nov 11: Hearths, continued: Drilling Down
Revised and Updated Lexicon stub (print and digital) due;
Thesis Statements presented in class:
Preliminary area of interest + research questions identified.
Possible historic case study sites and/or possible test sites identified.
Feedback from classmates.

Week 13: Nov 18: Workshopping the Lexicon; testing individual thesis proposals.

Week 14: Nov 25: Lexicon Review + Thesis Proposal discussion: Outside critics.

Week 15: Dec 2: Final [Collective] Lexicon and Independent Research (individual thesis) statements due

[Dec 9: No class. Finals week].

Week 16: Dec 16: Exhibition + Publication
Installation of final flat work and upload of digital catalog to ALI website.

GRADING
Participation in Class Discussions (25%)
Reading and Field Notes: 25%

Lexicon: 25%%
Independent Research (Thesis) Statement: 25%%

Following academic standards for avoiding plagiarism is fundamental to passing this course and each of its assignments. Please see detailed resource list below for maintaining academic integrity.

ASSIGNMENTS

1. Participate in Class Discussions:
Teasing out vision as it relates to teasing out voice—discussion, conversation, exchange, trust---is at the heart of this course. Show up ready to collaborate, debate, question, formulte, coach and be coached , give and receive. To participate in class is to participate in, invest in your own growth.

Think of Toni Morrison's Nobel parable: "Finally", she says, "I trust you now. I trust you with the bird that is not in your hands because you have truly caught it. Look. How lovely it is, this thing we have done – together." (Toni Morrison, Nobel Lecture, 1993).

2. Reading and Field Notes
For assigned readings, students are responsible for generating written responses. Recap the author's argument and evidence cited. Likewise, students consulting experts or making field visits should also document their process, observations, and critical response. Pose questions where you do not understand or do not agree, and bring those questions to class. List words, phrases, concepts that are unfamiliar; look up and write out definitions, synonyms, and etymology. Most importantly, ask: what does this reading have to do with the landscape architecture I aspire to practice? Where do I see a problem or opportunity that drives my work? What if…..? Draw, diagram,. doodle, speculate. Reading responses may be typed or handwritten, but either way: they must be in legible, intelligible writing, submitted electronically before or at the start of class. A clean scan of notebook/sketchbook is acceptable and encouraged.

2. Lexicon
The sites we explore in class and in readings and others you identify over the course of the term form part of a global-historical lexicon of dry lands design, largely obscured by envelopment and erasures by 20th-century engineering paradigms.

Each site, device or technology serves, or has served, as a low-carbon, gravity-fed strategy for adapting to water scarcity, mitigating hydrologic variability, and constructing intentional social relationships around resource management.

Working in teams of two, each team will focus on a geographic/cultural hearth—a birthplace of drylands innovation. The Lexicon will itemize specific pieces of water-related design and construction: systems designed to capture, store, cleanse, distribute, or dispel water in arid or semi-arid environments, and shape the societies that built them.

Format: Each piece will be drawn and curated according to graphic standards generated by and with the class, in consultation with multiple design professionals reviewing the work.

Content: Each piece will be understood in terms of its relationship to water (source, quantity, quality), its materiality and construction methods, and its engagement of people, natural systems, and public space. Each team will generate and propose a set of metrics for indexing their case studies; performance metrics may be hybridized and standardized across the class.

Scholarship: Each piece will have a short written description that places the piece in historical, social, and ecological context, and will be accompanied by an annotated bibliography (books,
books, journal articles, websites, documentaries, etc). All text and image sources will be properly attributed.

Students will format each entry's bibliography in alignment with Chicago Manual of Style, 17th edition: see https://www.chicagomanualofstyle.org/tools_citationguide/citation-guide-1.html.

Teams will key each entry to a standard (possibly interactive) global map.

Craftsmanship: Design and editorial standards will meet exhibitable and publishable quality.

We will generate collective design and editorial standards together as the project evolves.

3. Independent Research (Thesis) Statement
Each student will craft an illustrated, researched, critically positioned statement of intent for independent design research in the spring. Statements will serve as a blueprint for 8 weeks of design work Jan 15-March 15, and must address the following:

Title: Conveys a critical concept memorably
[five words]

Abstract: Summarizes in a few short sentences your hypothesis. This includes your area of interest, the central burning question you hope to address, your choice of possible applications for testing your ideas, and the means by which you define, test, and evaluate. Lastly, what are the potential larger implications of your project? [fifty words]

Proposal: [approx. 500 words, to include]]:

Area of Interest:
Topically, culturally and geographically, situate your work; locate us in your inquiry. Within the general scope of climate mitigation and adaptation within drylands: what piece or pieces of design from the hearth you researched (or from others?), intrigues you and why? What specific contemporary social and environmental water challenge are you interested in addressing?

Problem/opportunity definition:
What exactly is the bio/physical/social challenge you are inspired to address? What evidence do you have that the problem is real, measurable? Why have you chosen a particular set of geographic or cultural conditions to work into? Where else does this condition exist on earth? Affecting how many?

Critical case studies, ancient and modern:
What are comparable examples of design solutions addressing the challenge you are addressing? In what ways do they succeed? Under what circumstances? In what ways do they fall short? Under what circumstances? In what ways do the case studies drawn from history have applicability to contemporary challenges or sites, and at what scale? In what ways do case studies drawn from other regions or cultures have covalence or alignment with the problem you are hoping to address (ie, what is the relevance?).

Methods of Investigation, Analysis, And Evaluation
What form of research, site observation and analysis do you propose? Tools, techniques, data sets, analytic methods? By what measures will your proposal succeed or fail? By what means will you analyze your results—data? Analytic modelling? Field work? Community participation/feedback? Expert review from peers, mentors, outside experts?

Global contemporary context
If your proposed intervention were to succeed in one location or application, could it be applied to others? When, where, and under what circumstances? What are the potential impacts or implications? Who benefits?

POLICIES

Environmental Integrity (Sustainability)
The USC School of Architecture has adopted the 2010 Initiative for Sustainability. Solutions to design problems must engage the environment in a way that dramatically reduces or eliminates the need for fossil fuel.

Academic Integrity
Plagiarism – presenting someone else's ideas as your own, either verbatim or recast in your own words – is a serious academic offense with serious consequences; importantly, plagiarism is intent-neutral. In other words: plagiarism—using the ideas of others without credit--undermines and offends the academic enterprise, whether you intended to deceive or simply were not careful. Be both: honest and careful.

USC tutorials on how to avoid plagiarism are here:
https://usclibraries.usc.edu/tutorials/avoiding-plagiarism/story_html5.html

The USC summary of how to avoid plagiarism is here:
https://libguides.usc.edu/c.php?g=234929&p=1559180

and specific advice for students are here: https://libraries.usc.edu/tutorials

Please familiarize yourself with the discussion of plagiarism in *SCampus* in Part B, Section 11, "Behavior Violating University Standards" https://policy.usc.edu/scampus-part-b/

Other forms of academic dishonesty are equally unacceptable. See additional information in *SCampus* and university policies on scientific misconduct, http://policy.usc.edu/scientific-misconduct.

SCampus, the Student Guidebook, contains the Student Conduct Code in Section 11.00, while the recommended sanctions are located in Appendix A: http://www.usc.edu/dept/publications/SCAMPUS/gov/.

Students will be referred to the Office of Student Judicial Affairs and Community Standards for further review, should there be any suspicion of academic dishonesty. The Review process can be found at:
http://www.usc.edu/student-affairs/SJACS/.

Attendance
The School of Architecture's general attendance policy is to allow a student to miss the equivalent of one week of class sessions (three classes if the course meets three times/week, etc.) without directly affecting the student's grade and ability to complete the course. If additional absences are required for a personal illness/family emergency, pre- approved academic reason/religious observance, the situation should be discussed and evaluated with the faculty member and appropriate Chair on a case-by-case basis. For each absence over that allowed number, the student's letter grade will be lowered 1/3 of a letter grade (e.g., A to A–).

Any student not in class within the first 10 minutes is considered tardy, and any student absent (in any form including sleep, technological distraction, or by leaving mid class for a long break) for more than 1/3 of the class time can be considered fully absent. If arriving late, a student must be respectful of a class in session and do everything possible to minimize the disruption caused by a late arrival. It is always the student's

responsibility to seek means (if possible) to make up work missed due to absences, not the instructor's, although such recourse is not always an option due to the nature of the material covered.

Being absent on the day a project, quiz, paper or exam is due can lead to an "F" for that project, quiz, paper or exam or portfolio (unless the faculty concedes the reason is due to an excusable absence for personal illness/family emergency/religious observance). A mid term or final review is to be treated the same as a final exam as outlined and expected by the University.

Students with Disabilities
Any student requesting academic accommodations based on a disability is required to register with Disability Services and Programs (DSP) each semester. A letter of verification for approved accommodations can be obtained from DSP. Please be sure the letter is delivered to me (or to TA) as early in the semester as possible. DSP is located in STU 301 and is open 8:30 A.M.–5:00 P.M., Monday through Friday. The phone number for DSP is (213) 740-0776.

Religious Holidays
USC recognizes the diversity of our community and the potential for conflicts involving academic activities and personal religious observation. The University provides a guide to such observances for reference and suggests that any concerns about lack of attendance or inability to participate fully in the course activity be fully aired at the start of the term. As a general principle, students should be excused from class for these events if properly documented and if provisions can be made to accommodate the absence and make up the lost work. Constraints on participation that conflict with adequate participation in the course and cannot be resolved to the satisfaction of the faculty and the student need to be identified prior to the add/drop date for registration. After the add/drop date the University and the School of Architecture shall be the sole arbiter of what constitutes appropriate attendance and participation in a given course.

SUPPORT SYSTEMS:

Student Counseling Services (SCS) - (213) 740-7711 – 24/7 on call
Free and confidential mental health treatment for students, including short-term psychotherapy, group counseling, stress fitness workshops, and crisis intervention. https://engemannshc.usc.edu/counseling/

National Suicide Prevention Lifeline - 1-800-273-8255
Provides free and confidential emotional support to people in suicidal crisis or emotional distress 24 hours a day, 7 days a week. http://www.suicidepreventionlifeline.org

Relationship and Sexual Violence Prevention Services (RSVP) - (213) 740-4900 - 24/7 on call
Free and confidential therapy services, workshops, and training for situations related to gender-based harm. https://engemannshc.usc.edu/rsvp/

Sexual Assault Resource Center
For more information about how to get help or help a survivor, rights, reporting options, and additional resources, visit the website: http://sarc.usc.edu/

Office of Equity and Diversity (OED)/Title IX Compliance – (213) 740-5086
Works with faculty, staff, visitors, applicants, and students around issues of protected class. https://equity.usc.edu/

Bias Assessment Response and Support
Incidents of bias, hate crimes and micro-aggressions need to be reported allowing for appropriate investigation and response. https://studentaffairs.usc.edu/bias-assessment-response-support/

The Office of Disability Services and Programs
Provides certification for students with disabilities and helps arrange relevant accommodations.
http://dsp.usc.edu

Student Support and Advocacy – (213) 821-4710
Assists students and families in resolving complex issues adversely affecting their success as a student EX: personal, financial, and academic. https://studentaffairs.usc.edu/ssa/

Diversity at USC
Information on events, programs and training, the Diversity Task Force (including representatives for each school), chronology, participation, and various resources for students. https://diversity.usc.edu/

USC Emergency Information
Provides safety and other updates, including ways in which instruction will be continued if an officially declared emergency makes travel to campus infeasible, http://emergency.usc.edu