Landscape Representation III: Landform and Ecological Process
Landscape Architecture 2241, Fall 2012
Gund Hall 111 (War Room), Thursday 8:30 am -11:30 pm

Instructors:
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Teaching Assistants:
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Course Description:
Landscape Representation III seeks to examine the fundamental relationship between landform and the dynamic landscape processes it supports and engenders. Through in-depth study of the methods in which these processes are understood, conveyed, and graphically communicated, the course builds upon topics covered in Landscape Representation I and II by focusing on a diverse body of representational models, both past and present, that position landscape architecture as an expanded field involving science, art, architecture, urban design, and philosophy. To accompany precedent study, the course engages in advanced exploration of digital media, with an emphasis on responsive, performative, and indexical methodologies as well as fluid transitions between documentation and speculation, 2D and 3D, static and dynamic, and digital and analog media.

Course topics are organized thematically and range from mapping ecological systems to illustrating time-based processes, from manipulating and extracting topographical datasets to generating intelligent terrain models, from synthesizing geological, ecological, and hydrological processes to depicting the flows, flux, and ephemera of floral and faunal communities. Through simulation, conjecture, and graphic extraction, these physical and temporal landscape processes will be examined at multiple scales, with particular attention paid to the complexities of large-scale sites in order to complement core coursework in the MLA third term.

Weekly lectures and lab exercises will provide the foundation for the group’s collective exploration, research, and discussion. Through a series of working labs, students will be exposed to an expanded set of digital and analog techniques for analyzing and expressing landform and process as a means of advancing both technical and conceptual ability. This format aims to establish fluency in conceptual, organizational, and formal expression as well as to provide a point of departure for an in-depth awareness of landscape precedents and representational techniques.
course STRUCTURE:

The course will be broken into three units that explore the relationships between landform and ecological processes. Lectures and lab sessions will be geared toward developing an understanding of terrain as a fluid medium that shapes ecological systems from the geological scale to the human scale. From hydrology and geology to floral, faunal, and urban networks, processes will be studied through a range of projections and media that emphasize spatial and temporal dynamism. Each week, the class will commence with a topical lecture presenting iconographic precedent drawings within the landscape architecture canon as well as from affiliated fields, with examples ranging from scientific drawings to early landscape art to contemporary practice.

The second half of each class will focus on specific representational techniques for complex, large-scale sites, with an emphasis on developing fluid workflows between data manipulation and mapping in GIS, modeling in Rhino and Grasshopper, animation in 3D Studio Max and After Effects, and graphics and layout in the Adobe Suite. The labs are not meant to be prescriptive, rather, each week TAs will present a range of methodologies, both digital and analog—students are expected to expand upon these techniques, both in the term assignments and in their time at the GSD.

Unit 1_Landform Processes (4 weeks) will view landform through the lens of the ecological and human processes that it influences and is influenced by. Lectures and labs will examine a variety of 2D and 3D projections and surface analogs that frame topography as a performative surface and a fluid medium that is constantly in flux.

Unit 2_Ecological Processes (5 weeks) will examine drawings that express ecological processes, whether by documenting existing and historic conditions or speculating upon projected or designed outcomes. Processes including hydrology, planting, migration patterns, and other flows, networks, and systems will be viewed over a range of physical and temporal scales with a focus on their relationships to landform and to each other.

Unit 3_Temporal Processes (4 weeks) will look at temporal processes over macro and micro timespans: geological, ecological seasonal, and diurnal. Time as a critical driver of landscapes, urban systems, and ecology will be expressed through both static media (notated, layered drawings) and dynamic media (animations).

course REQUIREMENTS:

Assignments:
The three course assignments correspond to the three units described above, and work cumulatively to explore the complexities of large-scale landscapes through abstract and concrete representational techniques, 2D and 3D projection, and static and dynamic media. The assignments are focused on eight eco-regions across the continental United States in order to gain experience working with real conditions and data sets; these existing terrains will in turn be the jumping-off points for manipulation and speculative projection. For each assignment, students should upload requested deliverables to the course isite by 11:59 pm on the Wednesday deadlines. Specific details on submission requirements will be provided at the beginning of each unit.

Assignment 1_Topographic Manipulation Process Diagram (due Wednesday, October 10th)
Assignment 2_Phenomena Mappings (due Wednesday, November 7th)
Assignment 3_Temporal Notation + Animation (due at Final Pinup)

Final Pinup: The last class meeting will be a pinup, scheduled during final exam period (date/time TBD) with all instructors and invited jurors, during which the three assignments produced during the semester will be reviewed. Based on comments received during the semester and in desk crits scheduled the week of 11/19, students should revise Assignments 1 and 2 to express a coherent narrative that illustrates process as well as an individual representational agenda.

Representation Blog:
To foster discussion on topics of interest and importance to the class, students should upload images to the Representation Blog on the course isite. Blog entries need not be restricted to built landscape projects, rather, students may draw from a range of contemporary and historic precedents spanning scientific visualization, landscape, architecture, graphic design, infographics, media, blogs, etc. At least two (2) times over the semester, upload images, credits, and a description/thoughts by the Tuesday before Thursday's class.

Grading:
Class Attendance/Participation (including representation blog): 30%
Assignment 1: 15%
Assignment 2: 15%
Assignment 3/Final Submission: 40%
<table>
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| **_1.1 week 2_** | LANDFORM PROCESSES 1 |
| 09/13 | Lecture: Surface as Performative Terrain |
| | Lab: Automating Terrain: Data Mining and Generative Tools (AH + ML) |
| | (ArcGIS, Rhino, Grasshopper, RhinoTerrain, ArcScene, Google Earth/Sketchup) |
| | Readings: |

| **_1.2 week 3_** | LANDFORM PROCESSES 2 |
| 09/20 | Lecture – Landform Systems: Constructed Realities vs. Speculative Realms |
| | Lab – Introduction to Parametric Modeling: Manipulating Terrain [AH + CM] |
| | (Rhino, Grasshopper, Paneling Tools) |
| | Readings: |

| **_1.3 week 4_** | LANDFORM PROCESSES 3 |
| 09/27 | Lecture – Dynamic Terrain: Topography as Fluid Medium |
| | Lab – Describing Topography: Spatial vs. Notational Representation (AH + XW) |
| | (Rhino, Grasshopper, Illustrator) |
| | Readings: |

| **_1.4 week 5_** | LANDFORM PROCESSES 4 / ECOLOGICAL PROCESSES 1 |
| 10/04 | Lecture – Mapping Land: Performance and Process |
| | Lab – Landform Dynamics 1 [AH + ML] |
| | (Rhino, Grasshopper, ArcGIS, Ecotect) |
| | Readings: |

| 10/02 | Studio 1211 Indexing Topographies Workshop |
| 10/09 | Studio 1211 Phase 4 (Workshop) Review |

**10/10, W ASSIGNMENT #1 DUE: TOPOGRAPHIC MANIPULATION PROCESS DIAGRAM**
_2.2 week 6  ECOLOGICAL PROCESSES 2
Lab – Landform Dynamics 2 [AH + BC + CM]
[Aquaveo, 3dsmax particle systems, Rhino]

Readings:

_2.3 week 7  ECOLOGICAL PROCESSES 3
10/18 Lecture – Representing Biotic Ephemera: Floral and Faunal Networks
Lab – Illustrating Dynamic Living Communities [AH + XW]
[ArcGIS, Rhino, Grasshopper, Kangaroo, Illustrator]

Readings:

10/23 Studio 1211 Phase 5 Review

_2.4 week 8  ECOLOGICAL PROCESSES 4
10/25 Lecture – Representing Human Forces and Flows: Altered Landscapes
Lab – Mapping Human Systems: Networks & Impacts [AH + MKS]
[Adobe Illustrator, Rhino, Grasshopper, Kangaroo]

Readings:

_2.5 week 9  ECOLOGICAL PROCESSES 5
11/01 Lecture – Illustrating Ecological Networks and Systems: Patches, Edges, and Corridors
Lab – Ecological Performance: Suitability Mapping [AH + ML]
[Adobe Illustrator, ArcGIS, Rhino, Grasshopper]

Readings:

11/06 Studio 1211 Phase 6 Review

11/07, W ASSIGNMENT #2 DUE: FOUR PHENOMENA MAPPINGS
[series of 4 mappings of ecological processes and phenomena: geological/hydrological, floral/faunal, human systems, ecological suitability]
_3.1 week 10  TEMPORAL PROCESSES 1
11/08 Lecture – The Animated Landscape: Static vs. Dynamic Media
Lab – Introduction to Animation: From Static to Dynamic Landscape Simulations [BC + CM]
(After Effects, 3ds max)

Readings:
• Treib, Marc. “Photographic Landscapes: Time Stilled, Place Transposed” in Representing Landscape

11/08 Studio 1211 Indexing Topographies Workshop
11/13 Studio 1211 Phase 7 (Workshop) Review

_3.2 week 11  TEMPORAL PROCESSES 2
11/15 Lecture – Notation: Revealing Sensory, Textural, and Temporal Information
Lab – Intermediate Animation: Workflows and Analog Media [BC + MKS]
(Illustrator, Photoshop, After Effects, 3ds max)

Readings:

_3.3 week 12  TEMPORAL + COMPOSITE PROCESSES 3
11/19-20 Individual Desk Crits (no lecture or lab)
11/20 Studio 1211 3B Interim Review
11/21-25 Thanksgiving Recess – no classes

_3.4 week 13  TEMPORAL + COMPOSITE PROCESSES 4
11/29 Lecture – Representational Horizons: Landscape and New Media
Lab – Composite Workflows, Temporal and Static Interactions [BC + XW/MKS]
(After Effects, 3ds max)

Readings:
• Girot, Christophe. “Vision in Motion: Representing Landscape in Time” in The Landscape Urbanism Reader,

11/27 Studio 1211 Phase 8 Review
12/05 Studio 1211 Final Review

ASSIGNMENT #3 DUE [GSD2241 FINAL PINUP]
12/14-19 [1-2 minute animation, revised topography process diagram and phenomena mappings]
computing REQUIREMENTS:

We will be using several software platforms and covering a number of digital representation topics in the weekly labs. In order to cover all course material, it is critical that you have your personal computer configured to the below requirements by the time class meets on September 13th, as labs will require you to bring your personal laptop to each class. Students are responsible for installing and purchasing software on their own. Generally, with the exception of the Adobe Creative Suite and Adobe After Effects (which are installed on lab machines), the software we will be using in the course is available either on the GSD Software server (goliath.design.harvard.edu\Software) or is free online. For installation instructions, please refer to the GSD Readme files on Goliath or the software download instructions on product websites listed below.

_computer and OS requirements:
- Laptop computer (PC, or Mac capable of running Windows) with at least 2GB ram (4GB+ preferred)
- Windows XP or later
- Mouse (ArcGIS and Rhino are severely hindered without an external mouse with scroll wheel)

_software: graphics and layout:
- Adobe Creative Suite 6 (Photoshop, Illustrator, InDesign). Adobe Creative Suite 6 Standard is available from Harvard Technology Services for $199. Note: CS6 Standard does not include Adobe AfterEffects. We will reserve the computer lab for the days when labs include AfterEffects
- Adobe Acrobat Pro [or equivalent PDF printer such as CutePDF]

_software: Rhino and plugins:
- Rhinoceros 4 SR 9 [available on goliath.design.harvard.edu\Software\Rhino]
  1. You MUST make sure to have the latest service release [SR 9] installed, or RhinoTerrain and Grasshopper will not run.
  2. Rhino does not run on wireless unless you have VPN access. To work around this issue, you must start Rhino BEFORE CLASS while connected to a wall jack. It will continue to run when you disconnect your Ethernet cable.
- RhinoTerrain [available on Goliath but only works on GSD-licensed versions of Rhino, 15-day free trial available from http://www.rhinoterrain.com/]
- Grasshopper: generative/parametric process-driven modeler for Rhino [available for free from www.grasshopper3d.com/]
- Kangaroo: a Live Physics engine for interactive simulation, optimization and form-finding directly within Grasshopper [available for free at http://www.food4rhino.com/project/kangaroo] Installation Instructions: In Grasshopper, choose File > Special Folders > Components folder. Save the gha file there. Right-click the file > Properties > make sure that it is not ‘blocked’ Restart Rhino and Grasshopper
- Autodesk Ecotect: evaluative environmental performance software. [available at goliath.design.harvard.edu\Software\Ecotect 2011]

_software: animation:
- Adobe After Effects [Note: Adobe Creative Suite 6 Standard does not include Adobe AfterEffects. We will reserve the computer lab for the days when labs include AfterEffects]
- Autodesk 3D Studio Max [available on goliath.design.harvard.edu\Software\3D StudioMax 32-bit or 64-bit]

_software: GIS, mapping, and data extraction:
- ArcGIS 10 [available on goliath.design.harvard.edu\Software\ArcGIS]
- Google Earth [available for free at http://www.google.com/earth/download/ge/]
- Google Sketchup Pro [available on goliath.design.harvard.edu\Software\Sketchup]

_other programs [OPTIONAL, covered in advanced demos]:
- Community Viz Scenario 360: A plugin for ArcGIS that analyzes multiple data layers and outputs a suitability map. [a small number of licenses are on the lab machines, free 30-day trial available at http://placeways.com/communityviz/]
- Paneling Tools: A Rhino plugin that panelizes and creates geometric patterns on NURBS surfaces [available for free from http://wiki.mcneel.com/labs/panelingtools]
- PointSet Reconstruction: A free Rhino plugin that performs similarly to RhinoTerrain [available for free from http://wiki.mcneel.com/labs/pointsetreconstruction]
- SectionTools: A Rhino plugin that creates intelligent, dynamic sections. [available for free from http://wiki.mcneel.com/labs/sectiontools]
- For more Rhino tools and plugins, see http://www.rhino3d.com/resources/ or www.food4rhino.com
course REFERENCES: [on shared reserve as marked: * GSD2141 ** GSD2241]

_representation: graphic techniques

_representation: theory

_representation: diagramming, mapping, and displaying information

**Corner, James with Alex S. MacLean. Taking Measures Across the American Landscape. New Haven: Yale University Press, 1996.


