

LA 3001

Ecological Restoration Studio

Brendan Harmon

baharmon@lsu.edu

Fall 2017. Design 217.

Monday, Wednesday, & Friday 1:30am–5:20pm.

Course Description

In this studio you will plan and design the restoration of the Golden Meadows coastal wetland. You will conduct research and develop designs across spatial and temporal scales. First you will map and model landscape patterns and processes at regional to site scales using geographic information systems (GIS) and digital illustration. Then you will develop a masterplan for the region based on shifting ecological baselines and suitability analysis. Finally you will design the wetland park and reserve with a phased planting plan that will evolve over time. This course will introduce you to the basics of cartography, geospatial analysis and modeling, digital fabrication, and rapid ideation. You will use both analog and digital media including freehand drawing, GIS, 3D modeling, and computer numerical controlled (CNC) milling. Generally on Tuesdays there will be a workshop or seminar and on Thursdays there will be desk critiques, pinups, or reviews. There will also be a site visit and a couple of workshops on special topics on Saturdays.

Course Schedule

1	Design charrette	
2	Field trip	
3	Precedent studies	
4	Cartography	Site visit: Golden Meadows
5	Topography	
6	Hydrology	
7	Ecosystems	Review: Maps
8	Ecological baselines	Workshop: Digital fabrication
9	Suitability analysis	
10	Trail planning	
11	Masterplanning	Review: Masterplan
12	Site design	
13	Trail design	Workshop: Drawing
14	Planting design	
15	Phased planting design	Final review: Site design

Projects

You will work in small teams and submit a digital collection of your design work at the final review.

Mapping Your team will use GIS to map, analyze, and simulate the physical patterns and processes that shape the Bayou La Fourche watershed. At the review your team will present maps of infrastructure, topography, hydrology, and ecosystems representing each of these systems at a range of scales.

Masterplanning Your team will develop a GIS-based masterplan for the region using map overlay, suitability, and least cost path analysis. At the review your team will present an illustrative masterplan, concept diagrams, and a physical model of the landscape.

Site design Your team will develop a site design addressing program, trails, and planting for the restored wetland. At the final review your team will present a site plan, a series of phased planting plans, sections, and a perspective.

Sessions

Design charrette A design charrette for the Louisiana Governor's Mansion.

Field trip We will visit Washington DC and New York City. In Washington DC we will explore traces of the L'Enfant plan and tour the city's museums and monuments. In New York City we will visit design firms including MVVA, SCAPE, and Robert A.M. Stern Architects and tour projects like the Brooklyn Bridge Park and the High Line. We will also learn about US Army Corps of Engineers' coastal resilience projects and tour their projects on the New Jersey shore.

Precedent studies In groups you will study one of the following projects:

Louisiana Coastal Masterplan | <http://coastal.la.gov/2017-coastal-master-plan/>
 Netherlands National Coastal Strategy | <http://rijksoverheid.minienm.nl/nvk/NationalCoastalStrategy.pdf>
 The Sand Engine | <http://www.dezandmotor.nl/en/>
 Delta Works | <http://www.deltawerken.com/>
 MOSE | <https://www.mosevenezia.eu/>
 Oystertexture | <http://www.scapestudio.com/projects/oyster-tecture/>
 New Meadowlands | <http://newmeadowlands.org/>
 Fresh Kills | <http://freshkillspark.org/>

Cartography An introduction to GIS and mapping. You will learn how to acquire geospatial data and elegantly map it. You will produce a series of infrastructural maps of the study region.

Desimini, Jill, Charles Waldheim, and Mohsen Mostafavi. 2016. *Cartographic Grounds: Projecting the Landscape Imaginary*. Princeton Architectural Press.

Acciavatti, A. 2015. *Ganges Water Machine: Designing New India's Ancient River*. ORO Editions.

Topography You will acquire elevation data, model topography as digital elevation models in GIS and meshes in Rhino, and analyze topographic parameters such as contours, slope, hillshading, and landforms. You will also visualize topography and sunlight in 3D using Rhino. You will produce a series of topographic maps and perspective renderings of the study region.

Hydrology You will model watersheds and water accumulation and simulate water flow, sediment flux, and flooding. You will produce a series of hydrological maps of the study region.

Ecosystems You will derive high resolution landcover from orthophotography using image classification, analyze habitat fragmentation, and map ecosystem diversity. You will produce a series of ecosystem maps of the study region.

Ecological baselines

Willis, Katherine J, Miguel B Araújo, Keith D Bennett, Blanca Figueroa-Rangel, Cynthia A Froyd, and Norman Myers. 2007. "How can a knowledge of the past help to conserve the future? Biodiversity conservation and the relevance of long-term ecological studies." *Philosophical Transactions of the Royal Society of London B* 362:175–86. doi:[10.1098/rstb.2006.1977](https://doi.org/10.1098/rstb.2006.1977).

"Pleistocene Park: Does re-wilding North America represent sound conservation for the 21st century?" 2006. *Biological Conservation* 132 (2): 232–238. doi:[10.1016/j.biocon.2006.04.003](https://doi.org/10.1016/j.biocon.2006.04.003).

Donlan, Josh. 2005. "Re-wilding North America." *Nature* 436 (7053): 913–914.

Willis, K. J., L. Gillson, and T.M. Brncic. 2004. "How 'virgin' is virgin rainforest." *Science* 304:402–403. doi:[10.1126/science.1093991](https://doi.org/10.1126/science.1093991).

Suitability analysis

McHarg, Ian L. 1992. *Design with Nature*. New York: Wiley.

Trail planning

Masterplanning

Site design

Trail design

Planting design

Kingsbury, Noel, and Piet Oudolf. 2013. *Planting: A New Perspective*. Portland: Timber Press.

Phased planting design

Supplies

Alcohol-based markers | *Chartpak or Copic*
Felt-tip markers | *Tombow Dual Brush Pens or Pentel Sign Pen*
Trace | *White or Canary*
Polymer enriched sand | *Kinetic Sand, 11 lbs*
Medium density fiberboard

Software

GRASS GIS | <https://grass.osgeo.org/>
QGIS | <https://www.qgis.org/>
ArcGIS | <http://www.esri.com/arcgis/about-arcgis/>
Rhinceros | <https://www.rhino3d.com/>
RhinoTerrain | <http://www.rhinoterrain.com/>
RhinoCAM | <https://mecsoft.com/rhinocam-software/>
Adobe Creative Cloud | <http://www.adobe.com/creativecloud.html>

Resources

Intro to GRASS GIS | <https://ncsu-geoforall-lab.github.io/grass-intro-workshop/>
Hydrology in GRASS GIS | https://grasswiki.osgeo.org/wiki/Hydrological_Sciences

Readings

Desimini, Jill, Charles Waldheim, and Mohsen Mostafavi. 2016. *Cartographic Grounds: Projecting the Landscape Imaginary*. Princeton Architectural Press.

Acciavatti, A. 2015. *Ganges Water Machine: Designing New India's Ancient River*. ORO Editions.

Kingsbury, Noel, and Piet Oudolf. 2013. *Planting: A New Perspective*. Portland: Timber Press.

Willis, Katherine J, Miguel B Araújo, Keith D Bennett, Blanca Figueroa-Rangel, Cynthia A Froyd, and Norman Myers. 2007. "How can a knowledge of the past help to conserve the future? Biodiversity conservation and the relevance of long-term ecological studies." *Philosophical Transactions of the Royal Society of London B* 362:175–86. doi:[10.1098/rstb.2006.1977](https://doi.org/10.1098/rstb.2006.1977).

"Pleistocene Park: Does re-wilding North America represent sound conservation for the 21st century?" 2006. *Biological Conservation* 132 (2): 232–238. doi:[10.1016/j.biocon.2006.04.003](https://doi.org/10.1016/j.biocon.2006.04.003).

Donlan, Josh. 2005. "Re-wilding North America." *Nature* 436 (7053): 913–914.

Willis, K. J., L. Gillson, and T.M. Brncic. 2004. "How 'virgin' is virgin rainforest." *Science* 304:402–403. doi:[10.1126/science.1093991](https://doi.org/10.1126/science.1093991).

McHarg, Ian L. 1992. *Design with Nature*. New York: Wiley.

Policies

Time Commitment Expectations LSU's general policy states that for each credit hour, you (the student) should plan to spend at least two hours working on course related activities outside of class. Since this course is for three credit hours, you should expect to spend a minimum of six hours outside of class each week working on assignments for this course. For more information see: <http://catalog.lsu.edu/content.php?catoid=12&navoid=822>.

LSU student code of conduct The LSU student code of conduct explains student rights, excused absences, and what is expected of student behavior. Students are expected to understand this code: <http://students.lsu.edu/saa/students/code>.

Disability Code The University is committed to making reasonable efforts to assist individuals with disabilities in their efforts to avail themselves of services and programs offered by the University. To this end, Louisiana State University will provide reasonable accommodations for persons with documented qualifying disabilities. If you have a disability and feel you need accommodations in this course, you must present a letter to me from Disability Services in 115 Johnston Hall, indicating the existence of a disability and the suggested accommodations.

Academic Integrity According to section 10.1 of the LSU Code of Student Conduct, "A student may be charged with Academic Misconduct" for a variety of offenses, including the following: unauthorized copying, collusion, or collaboration; "falsifying" data or citations; "assisting someone in the commission or attempted commission of an offense"; and plagiarism, which is defined in section 10.1.H as a "lack of appropriate citation, or the unacknowledged inclusion of someone else's words, structure, ideas, or data; failure to identify a source, or the submission of essentially the same work for two assignments without permission of the instructor(s)."

Plagiarism and Citation Method Plagiarism is the "lack of appropriate citation, or the unacknowledged inclusion of someone else's words, structure, ideas, or data; failure to identify a source, or the submission of essentially the same work for two assignments without permission of the instructor(s)" (Sec. 10.1.H of the LSU Code of Student Conduct). As a student at LSU, it is your responsibility to refrain from plagiarizing the academic property of another and to utilize appropriate citation method for all coursework. In this class, it is recommended that you use Chicago Style author-date citations. Ignorance of the citation method is not an excuse for academic misconduct.