Yale University
School of Architecture
Fall 2022, 1111a Fall Advanced Studio | Mondays/Thursdays, 2:00-6:00pm

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Designing a Green New Deal: The Spatial Politics of Our Response to Climate Change

v4: Resource Frontiers, Energy Transitions, and Reciprocal Landscapes



Image: Yixin (April) Wei for “Field Notes Toward an Internationalist Green New Deal”

Studio Context

In the fall of 2019, this studio focused on how the abstract, national-scale ambitions of the Green New Deal (GND) might be translated into real projects in real communities across the United States. Our work centered on two key questions: (1) which regions must be “won” in order to achieve the stated aims of the GND’s jobs, justice, and decarbonization agenda?; and (2) from that subset of regions, which ones

belong at the front of the line for investments in climate action, either because they're sites of historic disinvestment and/or because they represent a chance to grow the political coalition of the GND through material investments in people and place? Through the same seminar-studio hybrid model we will use this fall, that effort identified three key regions for investment and focus: the Midwest, the Mississippi Delta, and Appalachia. Their work culminated in a public exhibition of ideas, merging spatial histories of the New Deal with more speculative futures for these regions through the GND—leading to coverage in *Gizmodo*. The full exhibition is now available online.

In the fall of 2020, this studio continued expanding on previous efforts--working in the Midwest, Mississippi Delta, and Appalachia. Their work focused squarely on the carceral, fossil fuel, and agricultural systems of each region, their connection to the program put forward by Green New Dealers, and developed a series of climate fictions at the regional scale to try and imagine the kind of world where prisons did not exist, but low-carbon leisure (among other things) did. They moved through a similar process as the 2019 and your studio did/will: (1) they developed a regional atlas to better understand these three industries in each region, (2) they proposed a series of sites or areas to focus their post-mid-review work on, and (3) they developed a series of tools and fictions aimed at either building or imagining the kind of post-carbon, post-prison, post-industrialized agriculture world you will now delve into this fall.

In the fall of 2021, this studio picked up where its predecessors left off in the Mississippi Delta and Central Appalachia (though not in the Midwest). It focused on the historic and contemporary formations of the plantation-to-prison and coalfield-to-prison pipeline in each region, with students producing three key deliverables: a field guide intended to describe the political ecology of each system in their respective regions; a how to manual outlining a path toward dismantling its various components; and a set of climate fictions aimed at creating a series of post-carceral and post-carbon imaginaries in each region, co-produced with movement leaders in each. I framed their brief thusly: "So, while you may at times be asked to simply illustrate the often-abstract, non-spatial demands of, say, the climate justice movement, by giving form and aesthetic and spatial dimensions to their work, by landing their ideas in real sites through real projects, and by elucidating the various state instruments (legal, regulatory, financial) imbricated in the fossil fuel, carceral, and agriculture industries of each region, you will be, in some ways, attempting to make their visions for the future seem more pragmatic, more tangible, and more desirable than they might otherwise." In the Delta, students focused on Angola Farm, Parchman Farm, and LaFourche Correctional. In Appalachia, they focused on USP McCreary, Big Sandy, and Letcher. Their work culminated in a physical exhibition and website and continues to be used regularly by partners at the Gulf Coast Center for Law and Policy (the southern hub of the Movement for Black Lives) and several partners in Appalachia.

In some ways, your studio will once again pick up where previous efforts left off—you'll be back in Appalachia (expanded to include Northern Virginia, more on that shortly!) and the Delta. But you'll also take on a new geography–the rare earth frontiers of Greenland, sites where the raw materials at the core of the energy transition are being mined, processed, and distributed through a global supply matrix to build, among other things, the batteries, data centers, wind turbines, solar PVs, and other key elements of a post-carbon society. One key to a just transition is building a more robust understanding of how thresholds of waste come to be defined, articulated, and regulated both at these sites and between them. This entails seeing industrial processes like mining, manufacturing, deployment, and post-consumer discard as part of a singular interrelated matrix. Through this lens, mining in Greenland is

connected in a variety of nonlinear ways to semiconductor fabrication in Taiwan, to Amazon Data Center buildout in Northern Virginia, to e-waste disposal in Zimbabwe, and so on. Seeing these sites as moving together and bound up in one another is key to unlocking pathways toward a just transition. Through support from the Internet Society Foundation, we will visit both Greenland and Northern Virginia (in two groups) to meet those at the forefront of rare earth extraction and production and to see how radically it's transforming the landscapes and built environment of the energy transition. Rather than producing a set of beautiful buildings or object-oriented images, this studio will focus on making the reciprocal relationships between these sites of extraction (Greenland) and deposition or disposal (the Delta and Appalachia) legible and actionable for those at the frontlines of the struggle for climate justice.

Your challenge will be to make these pernicious forces legible, to situate your work in both the realm of the built environment and the broader public imagination, and to then develop credible, compelling stories from/for the future, informed by the various movements for justice organizing around each industry in each region. **The central aim of this studio is to continue forging new alliances with these movement leaders through the tools at designers and planners' disposal.** So, while you may at times be asked to simply illustrate the often-abstract, non-spatial demands of, say, the climate justice movement, by giving form and aesthetic and spatial dimensions to their work, by landing their ideas in real sites through real projects, and by elucidating the various state instruments (legal, regulatory, financial) imbricated in the fossil fuel, carceral, and agriculture industries of each region, you will be, in some ways, attempting to make their visions for the future seem more pragmatic, more tangible, and more desirable than they might otherwise.

The model for the course will be roughly as follows: (1) seminars involving close reading and discussion, long before any plans or ideas are developed, to help situate our work in the broader social, historical, and political context of planning and design; (2) production of regional field guides to spatialize and narrate those various forces over time; (3) developing climate fictions (illustrated stories for/from the future) that help readers see and understand the kind of world in which the projects you'll propose are possible; and (4) curating a pop-up exhibit (location TBD, likely at the Boston Public Library) of your work for guests to peruse.

Some of the interventions themselves, however far from the foreground of design culture, will not necessarily be novel—prisons, pipelines, and industrial-scale mining operations have all been decommissioned and repurposed before. What will set this work apart is the *rationale* you develop for how you intervene and where; how you think through these investments as ways to restructure power and for whom; how you think about aligning your work with movements; and how you think about communicating your ideas to an audience beyond planning and design.

Background on the Green New Deal

Americans are living through the early days of the climate crisis—through Hurricane Maria and its impact on the Puerto Rican diaspora, through Hurricanes Sandy and Harvey and the drowning of America's coastal cities, through this spring's record flooding in the Heartland and its devastating effects on farming communities and Indian Country, through the wildfires in Paradise and last year's second Big Burn, and through this summer's roiling heat that can no longer be viewed as a wave but as the beginning of our planet's big, long sweat. Yet the conspiratorial neglect of climate change by Republicans and its trivialization by Democrats at the federal level has left the nation in a perpetual state of triage—trying earnestly, if hopelessly, to recover from these disasters with limited funds and authority while an endless queue of worsening floods, storms, droughts, and wildfires approach. The climate crisis is here and there is no plan to address it.

The absence of federal climate action has given some urbanists leeway to trumpet claims that cities and metropolitan regions are now leading on the issue. At its most basic level, this is true—without any real federal investment in climate change, cities and regions have had to become leaders, regardless of the insufficiency of the measures taken. It is easy to lead on climate when the bar for doing so is on the floor. Mayors simply must step over it.

Much of the work mayors and urbanists now point to as evidence of their ability to lead on climate can be traced back to the Rockefeller Foundation and its recent focus on resilience—first, its jointly administered "Rebuild by Design" (RBD) competition in New York after Sandy with the U.S. Department of Housing and Urban Development that began in 2012, and then through the many derivatives modeled after RBD, including the recently canceled "100 Resilient Cities" (100RC) initiative aimed at accelerating investments in climate adaptation across the world's most vulnerable communities. These programs focused on metropolitan regions and cities, addressing specific challenges to resiliency, overseen by city government. But leaving the challenge of climate adaptation in the hands of a massive private foundation and a handful of city officials—all of whom are constrained by short-term thinking and limits on the scale and scope of their action—has proven ineffective at best and disastrous at worst. Nearly a decade after Sandy, none of those local, resilience-focused projects have a clear path to implementation. All that most of the communities have to show for their efforts are a few glossy renderings—fictions of a world never built. It shouldn't be surprising when technocrats like Andrew Yang proclaim that the only option left is to give each individual American a "Freedom Dividend" which they could use to adapt to the changing climate by moving inland or out of flood zones. Without strong, federal leadership, this—and planetary geoengineering—might become our best available option.

This is not to say that cities and mayors have no place in whatever national action that might be taken on climate. Quite the opposite, as any national-scale plan will require coordination by local officials in cooperation with municipalities across the country under federal oversight. But whatever action we take on climate, most people will not experience or comprehend the scale, scope, and pace of transformation by turning on a light powered by wind instead of coal or natural gas. Rather, they will experience it through the building energy retrofits that result in new, electric appliances and green roofs of public and market-rate housing. It will be recognized through massive investments in public transportation, including electrified Bus Rapid Transit systems and High Speed Rail between cities. It will be recognized through the cleanup of every single toxic or polluted parcel of land in this country, an effort that could form the backbone of a federal jobs guarantee that puts millions of people to work in communities long

abandoned by the government. These, and many other major spatial propositions, are at the core of the **Green New Deal**.

On February 7th, 2019, Representative Alexandria Ocasio-Cortez (NY-14) and Senator Ed Markey (MA) introduced H.R. 109, a non-binding resolution "Recognizing the duty of the Federal Government to create a **Green New Deal**." In it, they provide a framework for a "10-year national mobilization" that calls on Congress to pass legislation that builds resiliency against climate change-related disasters, repairs and upgrades the infrastructure of the U.S. (including universal access to clean water), establishes a zero-emission energy standard, develops an energy-efficient and distributed 'smart' grid, upgrades every existing building to and requires that all new construction in the U.S. achieve maximum energy and water efficiency (among other standards), reinvigorates federal industrial policy to guide the growth of a 'clean manufacturing' sector, works collaboratively with farmers and ranchers to lower agriculture-driven GHG emissions, overhauls the U.S. transportation system through the development of inter- and intra-city public transit, invests in conservation lands and other 'low-tech' carbon sequestration solutions that also enhance biodiversity, remediates or repurposes hazardous waste and abandoned sites, and focuses on several other technology-driven emissions reducing investments.

In their press conference announcing the resolution, Ocasio-Cortez remarked that the public should view the **Green New Deal** legislation as a "Request for Proposals…we've defined the scope and where we want to go. Now, let's assess where we are, how we get there, and collaborate on real projects." Since then, a new body of policy development and economic research, headquartered at New Consensus, has emerged. But the work accomplished to date on the Green New Deal has been focused on abstract, national-scale economic and political strategies. None of it has dealt directly with the unprecedented scale, scope, and pace of landscape transformation that it implies.

In the four+ years since this announcement, several more concrete proposals have been developed concerning the implementation of the Green New Deal (nearly all of them connect to either this studio sequence or the McHarg Center). This includes work led by Daniel Aldana Cohen around public housing, Akira Drake Rodriguez around public schools, Johanna Bozuwa around public utilities, Yonah Freemark around transportation, Olufemi Taiwo around debt cancellation and global climate justice, and Thea Riofrancos around clean energy supply chains.

Most recently, the fight for some form of a Green New Deal has emerged in a pair of interventions enacted through the Biden Administration: the evocation of the Defense Production Act to accelerate critical mineral extraction in the U.S., a move intended to begin building domestic mining and manufacturing capacity for renewable energy technologies; and the recent passage of the Inflation Reduction Act (IRA), the so-called "biggest climate bill in history" that invests some $369 billion in the energy transition (though it should be noted that those investments include zero-carbon technology like renewables and nuclear alongside massive new subsidies oil and gas production and unproven carbon dioxide removal). IRA also represents a significant reduction in the administration's initial climate bill, the Build Back Better Act–which itself was a major reduction in the President's campaign platform.

A national climate plan like the **Green New Deal** will be understood by most people through the buildings, landscapes, infrastructures, and public works agenda it inspires. Given the scope of these efforts, it's clear that designers will play a central role in project managing the nation's response to climate change both at the scale of the national plan and the built works through which Americans will experience this transition.

Pedagogic Structure and Goals

A studio built on the seminar model, this course will require close reading and discussion of critical texts related to: the Green New Deal, the New Deal, political economy, prison abolition, fossil fuel abolition, and food systems and land justice, among others. We will focus on building a shared understanding of the realities of the climate crisis and energy transition through 5 seminars (front-loaded early in the semester) that explore: (1) Legacies of the New Deal and their Relation to the Green New Deal, (2) Reciprocal Landscapes and Supply Chains linking Southern Greenland and Northern Virginia, (3) the Coalfield-to-Prison and Plantation-to-Prison pipelines in Appalachia and the Mississippi Delta, (4) the role that Rare Earth Elements and Critical Minerals Will Play in the Coming Energy Transition, and (5) the use of World-building and Storytelling in Design and the Broader Climate Movement.

In response to feedback from previous versions of this studio, the critical topics that will be necessary to develop your projects and complete your assignments are stacked early in the semester—this bloc is essentially over before travel week. The remaining seminars cover topics you'll need to develop your projects and are spread evenly through much of the rest of the semester. Also, there are 5 fewer seminars than last fall, in order to ensure you have more time to work (and that we try to minimize burnout this fall).

These seminars will often include guest lectures from primary authors on our reading list and will shape the general progression of this fall's studio work: moving us from histories of power and theories of change in the built environment to a set of concrete design and policy proposals that can carry this work beyond the aesthetic or faux-ecological focus of so much studio work and into a set of projects focused on liberation and justice through a shared understanding of how the political economy shapes our work.

Like the previous iteration of this studio, you will be asked to move through geographic scales as you go: beginning at the regional level through the development of the field guide project to the site or territorial scale in which you attempt to translate movement demands into a concrete, materialist suite of interventions.

Our method will follow that of policy development and applied research teams in government, industry, think-tanks, and campaigns—to read and engage deeply with new material and stakeholders, to think and discuss the ideas critically and collegially as a group, to draw or design or otherwise apply these ideas to our work, and to repeat. We will engage with some of the most complex, wicked problems the world has to offer. You won't be expected to solve any of them. But you will—or rather, we will—be challenged to sit with those problems, to struggle with them, and to use that struggle to imagine a new, better world designed through the Green New Deal.

Students will each be expected to schedule a 1:1 exit interview with Billy in early January to debrief on the semester.

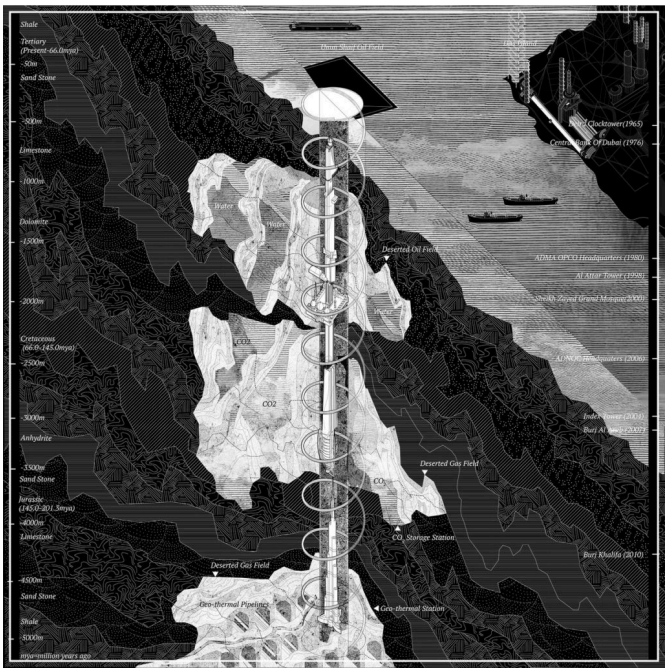
Deliverables

I. Field Guide to the Energy Transition

To frame the studio's focus on the relationships between rare earth and critical mineral extraction and clean energy technology and infrastructure deployment, you will work both individually and in groups to develop a "Field Guide to the Energy Transition." This field guide will serve multiple purposes: (1) to precisely describe, map, illustrate, and others contextualize the supply matrix of the global energy transition, including the key sites of extraction (real and speculative), manufacturing (e.g. solar PVs, wind turbines, batteries), and deployment (e.g. wind farms in the Texas Panhandle); (2) to identify at least one "key" rare earth or critical element and its associated technology/ies at the core of the transition; (3) and to downscale this global analysis to the regions at the core of this studio (Greenland's rare earth frontier and Northern Virginia's data center complex; Appalachia's USP Big Sandy, Letcher, and McCreary; and the Delta's Parchman, Angola, and LaFourche prisons). You might think of this as equal parts field guide and operating manual–the kind of booklet a reader could encounter that gives them the necessary global and historical context shaping the energy transition before quickly getting into the weeds of specific rare earth elements, critical minerals, core technologies, and regions at the core of this studio. **These field guides will be the focus of your mid-review.** A few notes to consider as you begin this work:

- **You will each need to select a particular critical mineral or rare element to focus on for this assignment**. The intent here is to connect these minerals (their deposit sites/mines, the logistical network involved in processing and manufacturing digital and clean energy technology with them, and their eventual sites of mass deployment). You running list of CM/REEs to choose from includes but is not limited to:
    - Scandium
    - Yttrium
    - Lanthanum
    - Cerium
    - Praseodymium
    - Neodymium
    - Samarium
    - Europium
    - Dyspromium
    - Holmium
    - Lithium
    - Graphite
    - Antimony
    - Cobalt
    - Nickel
    - Aluminum
    - Arsenic
    - Bismith
    - Cesium
    - Fluorspar
    - Vanadium
    - Berrylium

    - Chromium
    - Niobium
    - Tantalum
- **Some questions that your field guide should help readers answer:**
    - How much of each kind of rare earth or critical mineral is necessary for the buildout of a post-carbon US? (e.g. how much copper or lithium or cobalt do we need?)
    - How much earth/material is required to get enough of a given rare earth or critical mineral for a particular technology? (e.g. what volume of material must be extracted to get enough antimony to build a utility-scale solar installation)?
    - What are the kinds of waste material involved in the extraction, processing, and deployment of your particular mineral/technology? (e.g. where does the excavated material that isn't lithium go afterwards? where do retired solar PVs or permanent magnets go once decommissioned?)
    - How much of a particular mineral/material would be required for the various decarbonization scenarios on the table (full renewables, renewables + alternative base load power (e.g. hydro and advanced nuclear), an all of the above blend of renewables, new base power, and legacy base power (gas and coal))?
    - Where are the active/speculative mining, processing/manufacturing, deployment, and disposal sites for a given mineral/technology?
- **Once you've selected your mineral/element, you must also select an active or speculative mining site where it is being extracted to detail.** You can do this in a variety of ways–plans, sections, and other conventional design drawings analyzing the scale and operations of the mine; physical models (photographed for the guide, showcased in the exhibition) showing the impacts of mining on/around the site; and/or producing something weird and cool that I'm not smart enough to imagine!
    - This could look something like Rania and Al-Hadi's work (or nothing like it!):



- **The field guides will form the basis for your semester of work–namely in the decisions you make about which rare earth/critical minerals and their associated technologies that you elect to focus on.** Each has its own set of extraction, manufacturing, logistical, and implementation-related operations that will need to be described, analyzed, illustrated, and geographically designated. You will be expected to produce a print-ready version of this guide *and* develop a digital repository (e.g. a website, but not something as simple as uploading your PDF to Issuu). Content decisions should be near-final for the mid-review (organizational and representational revisions will be the post-review focus on this assignment).
- **Field Guides require a fair amount of writing, often in the form of a framing essay for the entire guide and a series of smaller texts introducing new sections and their accompanying images**. The former should help us understand how the political ecology of rare earth and critical mineral extraction works, how this field guide is intended to be used (e.g. to understand the landscapes of extraction and deployment at the frontlines of the climate crisis), and how readers might link the kinds of sites and non-sites we'll focus on throughout the studio. Concision is your friend in all of these textual components.
- **Your field guides should also fold in research from the previous year's studio on the plantation-to-prison and coalfield-to-prison pipelines in the Delta and Appalachia**. This should be relatively simple (some re-writing and re-mapping/drawing to fit your chosen style). It's important because these sites will be key to the second half of your semester and need to be linked to your rare earth/critical mineral research (you'll need this when you go to develop potential futures for each site).
- **For the mining, processing/manufacturing, and deployment sites (as well as the logistical networks linking them), you will be expected to catalog and describe their physical characteristics**. This includes active, speculative, and decommissioned mining sites (both in general on the whole, and in far greater detail for chosen cases in Greenland and Virginia); major manufacturing hubs in the global supply matrix of clean energy technology; and the major renewable and carbon-free electricity-generating installations (operating, planned, and speculative) around the U.S.
- **You will also be expected to illustrate and describe the global flow of materials between these sites of extraction, processing, and deployment**. These can be abstract/illustrative or precise (or both).
- **On the question of political economy, you'll be expected to map, describe, and otherwise make legible the various forms of direct and indirect subsidies that make each industry possible.** These can be direct financial support (government grants and loans), indirect support (tax incentives), and regulatory subsidies (variances/zoning changes, infrastructure buildouts to support a facility, etc.). These flows of capital, resources, and physical assets should give you a broader understanding of how the energy transition's political ecology was formed and continues to operate–and how it might be remade in more just ways.
- **If you are anything like me, you like to have some quasi-productive distractions when wading into the oft-grotesque worlds of the fossil fuel, carceral, and industrial agriculture systems.** So here are a few resources to peruse when you're looking to take a break that might end up being helpful:
    - 2021 Studio Website: https://dgnd3.cargo.site/

- Andrea Roberts, “The Texas Freedom Colonies Project,” available at: http://www.thetexasfreedomcoloniesproject.com/p/atlas-study.html
- Richard Weller, “An Atlas for the End of the World,” available at: https://atlas-for-the-end-of-the-world.com/
- McHarg Center, “Field Notes Toward an Internationalist Green New Deal,” available at: https://internationalistgreennewdeal.org/
- McHarg Center, “An Atlas for the Green New Deal,” available at: https://mcharg.upenn.edu/2100-project-atlas-green-new-deal

- For a primer on rare earth and critical minerals, please review the following:
  - The Biden Administration’s invocation of the Defense Production Act to accelerate critical mineral extraction, stockpiling, and supply chain resilience: https://www.nytimes.com/2022/03/31/business/economy/biden-minerals-defense-production-act.html
  - The supply matrix of several rare earth elements and their associated technologies can be found here: https://internationalistgreennewdeal.org/topic/supply-matrix

II. Scenario Development

Nothing is settled or certain about the shape of our collective futures. In the context of this studio, that means no one really knows the magnitude of mining, manufacturing, and deployment will be necessary to transition off of fossil fuels. Will the energy transition be market-based and aligned with the goals of ecomodernism (e.g. near-infinite growth, with carbon-free technology essentially substituted into life as we now know it)? Will it be centrally planned and aligned with the aims of ecosocialism (e.g. limited growth in the Global North, collective ownership of the electricity and industrial sectors at the core of the transition, with how and where we live restructured)? Will it descend into a form of ecofascism (e.g. hardened national borders and autocratic rule)?

Though this assignment’s deliverables (a visual and narrative “preferred scenario” alongside “possible scenarios”) are relatively simple, your studio-wide decision-making process here will be more complex. I have no idea what kind of ideological orientations you all will bring to the studio, and our task here will be to reach consensus on a set of probable and a singular preferred scenario for building out the energy transition.

For the mid-review, you will simply need a working narrative and 3-5 accompanying images for each proposed scenario. By the final review, you will need to produce a trailer of sorts–this could be a compilation of altered news clips (real or fake), a set of images and animations with your own voiceover, or some other assemblage of material that can quickly pull guests into the world you’ve imagined.

Y**ou will need a working version of this assignment ready to discuss at your mid-review.** For this, you may choose from existing sources and simply adapt to your liking. I recommend limiting yourself to the following:

- Intergovernmental Panel on Climate Change, Sixth Assessment Report, Summary for Policymakers, available: https://www.ipcc.ch/report/ar6/wg2/downloads/report/IPCC_AR6_WGII_SummaryForPolicymakers.pdf

- Princeton University, Net-Zero America, Summary report, available: https://netzeroamerica.princeton.edu/img/Princeton%20NZA%20FINAL%20REPORT%20SUMMARY%20(29Oct2021).pdf

III. Stories from/for the Future

Images and stories have a way of prefiguring the future. It is why people like Jeff Bezos, Peter Thiel, and Elon Musk invest to heavily in a particular kind of techno-utopian, ecomodernist imagery and storytelling rooted in "solutions" to unsolvable crises (e.g. Blue Origin). For the bulk of your post-mid-review work, you will be asked to develop a series of climate fictions--ideas and arguments for a particular kind of future in the storytelling device of your choice. This might come in the form of a zine or graphic novel, a choose-your-own adventure graphic novella, a children's book, a cookbook, a set of fictional dispatches from the future (e.g. World War Z (book not film)), or another format you choose to pursue. They must be rooted in a particular site but expansive enough in scope and scale to help readers grasp the broader world-building that would have to accompany something as transformative a just energy transition aligning with the goals of Green New Dealers and prison abolitionists in Virginia, Appalachia, and the Delta. These will be the focus of your final review. A few notes to consider as you begin this work:

- **You will need to make some early decisions about program (even if that program is flexible or, in the case of making a choose-your-own adventure type novella, the range of programs) in order to move forward with image creation, storyboarding, character development, and so on.** For instance, if you elect to convert the prisons built atop AMLs of Appalachia into rural electric co-ops or to imagine a kind of mining/process future in the vein of "fully automated luxury communism", you'll want to make that choice as early as possible in order to execute the rest of this assignment well.
- **A rule of thumb in speculative/climate fiction is that the ideological project tends to remain in the background.** The same is true of the built environment transformations you'll propose. These aren't stories about architecture or landscape architecture or city planning per se, but about the world in which these kinds of alternative forms of practice would be possible. That will require you to think differently about the kinds of images you make, the kinds of narratives you construct, and the kinds of audiences you intend to reach.
- **You will need to become comfortable making less familiar images and objects.** Plans, sections, and axons might play a small role in your final deliverables, but the bulk of your work will be in visual and narrative storytelling. This work will be exhibited, so you'll also want to think about immersive experiences (via projection), objects (e.g. samples of antimony or theodynium), and other gallery-based formats of exploration.
- **You should draw on whatever forms of fiction have been compelling to you** (spoiler: you are going to hear me reference "The Expanse" often in this studio)**.** These might be books, films, television shows, websites and exhibitions, and other formats I haven't considered. All of these are on the table for you this fall.

IV. The Pop-Up Exhibit

This show will feature your semester's work and include gallery tours, time at your assigned sections, and a series of group or panel discussions. The volume of materials you assemble for your assignments will be the focus of the show, but you will be expected to complete a few additional elements in order to create this physical show:

- I simply do not believe there's much value in the conventional model of juried studio reviews–ones where, too often, conversations become more about the ideologies or work of the jurors and not of the students (not to mention everyone wearing all black, pointing at the wall to talk about themselves, and otherwise reinforcing the master-pupil dynamic at the core of most design education). For this studio, we'll present a pop-up exhibition–one that will require you to curate a gallery tour and to program a series of panel discussions that let us talk about the deeper themes and meaning of the work without focusing primarily on formal or aesthetic choices you've made in your drawings.
- Furniture, custom or kit-made, where you think visitors may want to rest or sit to view a particular installation (e.g. your trailer video, a light box, or other complex objects).
- Though not required, you may also consider building a custom wall or other installation to project your trailer film onto (and remember that you will want to hide as much of the project and speaker wiring as possible).
- You will likely want to produce a set of "hero" images too that can anchor different sections or "rooms" in the exhibit.
- **Any other objects, ephemera (e.g. posters, future archive materials, etc.), and other elements as you see fit to help immerse people in the worlds you're proposing.** The 2019 studio included a range of these objects in their exhibition (including coal deposits, sketchbooks from hikers, etc.). Last year's studio brought in vials of coal, rare earth elements, reproductions of the Angolite (the prisoner-run newspaper in Angola), and a number of other physical objects used in either the plantation or coalfield prisons.

V. Seminar Slack Chats

Before each seminar day, we will have a slack chat happy hour to help tee up the conversation for the in-class meeting. **For each of these seminar slack chats, a small group of students will join me for an hour in a dedicated (tbd) channel in our studio slack where we can foreground critical themes, questions, and takeaways for the upcoming seminar**.

Your responsibility in these chats will be twofold: to respond to a set of questions/prompts from me, and to bring a question or prompt yourself that your classmates and I can respond to. You can drop in external links, images, or anything else that helps push our discussion along.

For an idea of how this might work re: format (not content), see the slack chat series at 538: https://fivethirtyeight.com/tag/slack-chat/.

Other Course Notes

If some of this sounds patronizing, I apologize. But I want to make sure we have clear expectations around how to treat and relate to one another in class this fall. A few notes to help us with that:

- Everyone must be masked at all times in the studio together. No one knows–or needs to know–someone else's health status, or that of those in their family or friend groups who might be at higher risk of a severe case of COVID-19.
- Everyone must use their classmates' preferred name and pronouns at all times. Mistakes happen and that's ok. But malicious or habitual misgendering or deadnaming will not be tolerated in class.
- If you are not feeling well, do not come to the studio. You don't need a doctor's note and you don't need to disclose anything you aren't comfortable with. If you need an extension due to a prolonged absence, I am more than happy to work that out with you.
- If and when things become overwhelming in the studio or your general academic life, please let me know so we can dial things back accordingly. I have tried to make this studio as humane as design education allows, but I'm sure there will be moments where I've simply asked you to do too much. Tell me and we can fix it before it becomes a crisis.
- In this studio, we are all peers and colleagues. I have no interest in the kind of master-pupil relationship that's often reproduced in design academia.
- I love writing letters of recommendation and providing a reference for former students. Please never hesitate to ask if you need one.
- I am planning to spend most Monday and Thursday evenings in New Haven. If you need or want additional desk crit time after class on those days or early in the morning on the following days, please let me know.

Schedule

Week 1:	Th 08/25	Studio Introduction | *Grant Partners and Past Students Join*	
Week 2:	M 08/29	**Seminar I**	New Deal Legacies + The Green New Deal
	Th 09/01	**Seminar II**	Greenland, Northern VA, and Reciprocal Landscapes
Week 3:	M 09/05	**Labor Day**	
	Th 09/08	**Seminar III**	Field Guides, Ideology, and Design Politics
Week 4:	M 09/12	**Seminar IV**	Rare Earth Elements, Critical Minerals, and The Energy Transition
	Th 09/15	Workday	Desk Crits + Pin-Up | Field Guides We Love Day
Week 5:	M 09/19	Workday	Desk Crits | Field Guide + Travel Prep
	Th 09/22	**Seminar V**	Prisons, Plantations, and Abandoned Mine Lands in Appalachia and the Mississippi Delta
Week 6:	M 09/26	**Travel**	Greenland and Northern Virginia
	Th 09/29	**Travel**	Debrief in New Haven (or Philly)
Week 7	M 10/03	Workday	Desk Crits | Field Guide Production
	Th 10/06	Workday	Desk Crits | Field Guide Production
Week 8	M 10/10	Workday	**Pin-Up** | *Draft Field Guide + Storyboards Due*
	Th 10/13	Workday	Desk Crits (mostly production)
Week 9	M 10/17	Workday	Desk Crits | *All Materials in Box by Midnight Wednesday*
	Th 10/20	**Mid-Review**	TBD
Week 10	M 10/24	Workday	Debrief + Field Guide Wrap-Up/To-Dos
	Th 10/27	**Seminar VI**	Climate Fiction and Worlding the Energy Transition
Week 11	M 10/31	Workday	Desk Crits
	Th 11/03	Workday	Desk Crits
Week 12	M 11/07	Workday	**Pin-Up** | *Cli-Fi Storyboards*
	Th 11/10	Workday	Desk Crits
Week 13	M 11/14	Workday	Desk Crits | *Exhibition Object List + Design Workshop*
	Th 11/17	**¾ Review**	**¾ Review** | *Cli-Fi and Scenarios Only*
Week 14	M 11/21	Workday	Debrief + Desk Crits | *Remote*
	W 11/23	Workday	Desk Crits | *Final Review Responsibilities Assigned*
Week 15	M 11/28	Workday	Desk Crits | *Production Time*
	Th 12/01	No class	*Production Time (Desk Crits by Appointment)*
Week 16	M 12/5	No class	*Production Time (Desk Crits by Appointment)*
	F 12/9	**Final Review**	**TBD**

Workplan

08.25 | Studio Introduction

Agenda:

Today, we will meet the broader project team involved in the Greenland and Virginia sites at the core of this studio (along with other project partners whose work will take on a more prominent role in the spring seminar after this studio). We'll cover the basics of the larger grant, the sites each collaborator is focused on, and their goals for the studio. We'll also meet a former student who went through a previous version of this studio (sans rare earth frontiers) to get a better sense of how the semester will flow for you. The goal here is to give you an overview of the semester's structure, deliverables, and basic content we'll need to cover.

Readings:

1. None, but review the datasets after class in our box folder.

Shared Questions:

A. What is a working definition for the political ecology of the energy transition? How does this relate to architecture and urbanization?
B. What did previous iterations of this studio accomplish? How does your studio relate to theirs?
C. How might we begin to link the material conditions of resource frontiers like Greenland with those of deployment like Northern Virginia?

Tip:

- You will likely want some sort of running Box note or google doc to keep notes from our class discussions. Once you set this up, you should rotate note-taking responsibilities.

Assignments: None

Guests: Zane Griffin Talley Cooper, Lauren Bridges, Ann Chen, Ingrid Burrington, and AL McCullough

08.29 | New Deal Legacies and the Green New Deal

Agenda:

Today, we will discuss the legacies of the New Deal, focusing on both its mass-transformation of the built and natural environment as well as its alignment with Dixiecrats and the Jim Crow South; and the evolution of the Green New Deal as a program and organizing call over the last 5 years. The goal is to give you an overview of how much is possible (and quickly) through a national mobilization of resources like the Green New Deal demands and to caution against replicating the New Deal's investment in reproducing existing power structures as you move through the semester's work.

Readings:

2. Brent Cebul, Lily Geismer, and Mason Williams. *Shaped by the State: Toward a new Political History of the Twentieth Century*, Chicago: University of Chicago Press (2018). **Chapter Three.**
3. Phoebe Cutler. *The Public Landscape of the New Deal* New Haven: Yale University Press (1985). **Chapter One.**
4. Brent Cebul, "Creative Competition: Georgia Power, the Tennessee Valley Authority, and the Creation of a Rural Consumer Economy, 1934-1955," *Journal of American History*, 105(1): 45-70.; available at: https://academic.oup.com/jah/article-abstract/105/1/45/5000189
5. House Resolution 109, "Recognizing the duty of the Federal Government to create a Green New Deal," available at: https://www.congress.gov/bill/116th-congress/house-resolution/109.
6. Kate Aronoff, "With a Green New Deal, Here's What the World Could Look Like for the Next Generation," *The Intercept*, available at: https://theintercept.com/2018/12/05/green-new-deal-proposal-impacts/.
7. Jasper Bernes, "Between the Devil and the Green New Deal, *Commune Mag*, Winter 2020, available at: https://communemag.com/between-the-devil-and-the-green-new-deal/
8. Thea Riofrancos, "Plan, Mood, Battlefield: Reflections on the Green New Deal," *Viewpoint Magazine*, 16 May 2019, available at: https://viewpointmag.com/2019/05/16/plan-mood-battlefield-reflections-on-the-green-new-deal/.

Shared Questions:

A. How did the New Deal's political strategy reshape the built and natural environment (during and beyond the New Deal era)?
B. What can we learn about statecraft from this era? How does it make us think differently about producing a Green New Deal?
C. How has the Green New Deal evolved over the last 5 years?
D. How can we think about using national-scale investments to restructure local power?

Assignments: This isn't a "formal" assignment, but a kind of "exercise" for us to go through together–you should read through H.R. 109 and "markup" the bill, noting what stands out to you (in ways good and bad), and denoting what is missing. Sample markups can be found here and here.

Guests: Brent Cebul

09.01 | Greenland, Northern Virginia, and Reciprocal Landscapes of the Energy Transition

Agenda:

Today, we will focus on the relationship between sites of extraction, production, and deployment–conceptually, through frameworks like "reciprocal landscapes" and materials, through place-based inquiries in Greenland and Virginia. The idea here is to give you a primer of the minerals/elements that comprise the resource frontier, their broader political economy and ecology, and their end-uses (e.g. solar PVs, permanent batteries, etc.).

Readings:

9. Jane Hutton, *Reciprocal Landscapes: Stories of Material Movements*, London: Routledge (2020). **Introduction.**
10. Andrew Needham, *Power Lines: Phoenix and the Making of the Modern Southwest*, Princeton: Princeton University Press (2014). **Chapter Five**.
11. Max Liboiron and Josh Lepawsky, *Discard Studies: Wasting, Systems, and Power*, Cambridge: The MIT Press (2022). **Chapters One and Five**.
12. Bert de Jonghe, *Inventing Greenland: Designing an Arctic Nation*, **Chapters One and Four**.
13. Thomas Mullaney et al., *Your Computer Is On Fire*, Cambridge: The MIT Press (2021). **Chapter One.**
14. Mel Hogan and Asta Vondreau, "The Nature of Data Centers," *Culture Machine*, 2019. available at: https://culturemachine.net/wp-content/uploads/2019/04/HOGAN-AND-VONDERAU.pdf

Shared Questions:

A. How might concepts like reciprocal landscapes be applied to our set of sites/non-sites? To the physical and social construction of the energy transition?
B. What are the key sites, processes, and technologies at the core of the energy transition? Between Greenland and Virginia?
C. What are the key architectural, landscape, and urbanism challenges at these various nodes between extraction, processing, shipping, manufacturing, and deployment?

Assignments:

Seminar Slack Chat | Students: Calvin, Sosa, Katherine, Grace, Signe

Guests:

Jane Mah Hutton and Zane Griffin Talley Cooper

09.08 | Field Guides, Ideology, and Design Politics

Agenda:

Today, we will have something like a half-seminar on atlas-making and design politics as they relate to your field guides. The intent here is to better understand how the images you make and stories you tell reproduce or contest different forms of power as they manifest in the built environment.

Readings:

15. Judith Schalansky, *An Atlas of Remote Islands: Fifty Islands I Have Never Set Foot On and Never Will*, New York: Penguin Books (2010). **Preface, Indian Ocean (skim).**
16. Amanda Shendruk, "Welcome to Leeside," *Quartz*, 1 September 2020, available at: https://qz.com/1891446/welcome-to-leeside-the-uss-first-climate-haven/ **(PDF in Box, but focus on the website)**.
17. Jane Hutton, *Reciprocal Landscapes: Stories of Material Movements*, London: Routledge (2020). **Epilogue.**
18. Shannon Mattern, "How to Map Nothing," *Places Journal*, available at: https://placesjournal.org/article/how-to-map-nothing/.
19. Andreas Malm, *How to Blow Up a Pipeline*, Verso: New York (2021). **Chapter One.**

Shared Questions:

A. How are otherwise "objective" atlases, drawings, and stories framed and contextualized in these readings?
B. What kinds of "invisible" relationships are made legible in these works? How? Why does it matter?

Assignments:

Seminar Slack Chat | Students: Ryan, Brandon, Sarah, Katie, Calvin

Guests:

TBD

09.12 | Rare Earth Elements, Critical Minerals, and the Energy Transition

Agenda:

Today, we will focus on the cultural and environmental histories of the Midwest. The goal is to give you an overview of the region as it is understood today, the forces that shaped it to this point, and how it relates to the aims of the Green New Deal.

Readings:

20. Thea Riofrancos, "The Security-Sustainability Nexus: Lithium Onshoring in the Global North," *Global Environmental Politics*, issue/volume TBD, available at: https://direct.mit.edu/glep/article/doi/10.1162/glep_a_00668/111308/The-Security-Sustainability-Nexus-Lithium.
21. Julie Klinger, *Rare Earth Frontiers: From Terrestrial Subsoils to Lunar Landscapes*, New York: Cornell University Press (2018). **Introduction, Chapter One**
22. Field Notes Toward an Internationalist Green New Deal, sections on Supply Matrix (https://internationalistgreennewdeal.org/topic/supply-matrix) and Rare Earth Elements (https://internationalistgreennewdeal.org/topic/rare-earth-elements).
23. Holly Jean Buck, *Ending Fossil Fuels: Why Net-Zero is Not Enough*, New York: Verso Books (2021). **Introduction and Thirteen**.
24. Adlinger Center at Princeton University, "Net-Zero America" Report, Summary available at: https://netzeroamerica.princeton.edu/img/Princeton%20NZA%20FINAL%20REPORT%20SUMMARY%20(29Oct2021).pdf
25. Climate and Community Project, "Biden's Defense Production Act Order and Four Key Ways to Ensure Supply Chain Justice," 6 April 2022, available at: https://www.climateandcommunity.org/dpa-supply-chain-justice

Shared Questions:

A. How are the pressures of rapid urbanization and decarbonization via ecomodernism driving extraction across a range of rare earth and critical mineral frontiers? Who is driving (and pushing against) these growth machine processes?
B. What role do architects and designers have in contributing to/resisting these kinds of extractive urban development processes?
C. How might scenario planning and/or backcasting allow us to imagine (and win) alternative and just post-carbon futures?

Assignments:

Seminar Slack Chat | Students: Kai, Ana, Signe, Brandon, Ryan, Grace

Guests:

Thea Riofrancos + Julie Klinger

09.15 | Pin-Up and Desk Crits: Field Guides We Love Day

Agenda:

Today, we are mostly at our desks and working (desk crits). But! We shall begin with a quick (and hopefully fun exercise): everyone must bring both a physical copy of and a 3-slide maximum presentation describing at least one of their favorite field guides (it can be one you loved as a child, one you've used endlessly as an adult, or one that you just think rules for other reasons). Things we'll want to pay attention to as we discuss them are: intended audience (general or specialized), structure and organization of the books, visual identity, and a potential use case for someone who encounters it.

Readings:

26. None, though I will schlep some of my favorite field guides to New Haven for you to peruse.

Shared Questions:

A. What makes a good field guide?
B. Why are these ones memorable to you?
C. What might we take from these and apply to your assignment?

Assignments:

None

Guests:

N/A

09.19 | Desk Crits

Agenda:

Today is a workday dedicated to developing your regional field guides. I will be available for desk crits from 12-6.

Readings:

27. None

Shared Questions:

N/A

Assignments:

N/A

Guests:

None

09.22 | Prisons, Plantations, and Abandoned Mine Lands in Appalachia and the Delta

Agenda:

Today, we will focus on the cultural and environmental histories of Appalachia and the Mississippi Delta–namely their histories of industrial-scale extraction and exploitation (e.g. convict-leasing in the Delta, coalfield prisons in Appalachia). The goal is to give you an overview of the regions as understood today, the forces that shaped it to this point, and how it relates to the aims of the Green New Deal. Note that these regions/sites will feature in your climate fiction assignment (and may in your field guides too).

Readings:

28. Brett Story, "The Prison in 12 Landscapes," film available in course folder and more information at: https://www.prisonlandscapes.com/.
29. Brett Story, *Prison Land: Mapping Carceral Power Across Neoliberal America*, Minneapolis: University of Minnesota Press (2019). **Chapter 3**.
30. Vann Newkirk, "The Great Land Robbery," *The Atlantic*, September 2019, available at: https://www.theatlantic.com/magazine/archive/2019/09/this-land-was-our-land/594742/
31. Priscilla McCutcheon, "'Returning Home to Our Rightful Place': The Nation of Islam and Muhammad Farms," *Geoforum*, 49: 61-70.
32. Clyde Woods, *Development Arrested: The Blues and Plantation Power in Mississippi*, New York: Verso Books (1998). **Chapter Six.**
33. Richard Mizelle, *Backwater Blues: The Mississippi Flood of 1927 in the African American Imagination*, Minneapolis: University of Minnesota Press (2014). **Chapter One.**
34. 2021 Studio Field Guides (in box) to Appalachia and the Delta.

Shared Questions:

D. How has our understanding of Appalachia and the Delta, as a place and a culture, changed as a result of these readings?
E. How do they fit within the broader jobs, justice, and decarbonization aims of the Green New Deal?
F. What are the critical built and natural environment challenges/assets in the regions?

Assignments:

Seminar Slack Chat | Students: Sarah, Sosa, Ana

Guests:

Brett Story and TBD

09.26 | Desk Crits

Agenda:

Today is a workday dedicated to developing your regional field guides. I will be available for desk crits from 12-6.

Readings:

35. None

Shared Questions:

N/A

Assignments:

N/A

Guests:

None

09.29 | Desk Crits

Agenda:

Today is a workday dedicated to developing your regional field guides. I will be available for desk crits from 12-6.

Readings:

36.

Shared Questions:

N/A

Assignments:

N/A

Guests:

N/A

10.03 | Desk Crits

Agenda:

Today is a workday dedicated to developing your regional field guides. I will be available for desk crits from 12-6.

Readings:

37. None

Shared Questions:

N/A

Assignments:

N/A

Guests:

TBD

10.06 | Desk Crits

Agenda:

Today is a workday dedicated to developing your regional field guides. I will be available for desk crits from 12-6.

Readings:

38. x

Shared Questions:

A. x

Assignments:

None

Guests:

TBD (Claire's studio exchange)

10.10 | Desk Crits

Agenda:

Today is a workday dedicated to developing your regional field guides. I will be available for desk crits from 12-6.

Readings:

39. None

Shared Questions:

N/A

Assignments:

N/A

Guests:

TBD

10.13 | Desk Crits

Agenda:

Today is a workday dedicated to developing your regional field guides. I will be available for desk crits from 12-6.

Readings:

40. None

Shared Questions:

N/A

Assignments:

Manifesto Drafts Due by Noon

Guests:

TBD

10.17 | Desk Crits

Agenda:

Today is a workday dedicated to developing your regional field guides. I will be available for desk crits from 12-6.

Readings:

41. None

Shared Questions:

N/A

Assignments:

N/A

Guests:

TBD

10.20 | Mid-Review

Agenda:

Today is our Mid-Review! Don't worry, you'll be fabulous. All materials should be uploaded in Box by midnight on Wednesday and ready to present at our kick-off time (TBD).

Readings:

42. None

Shared Questions:

N/A

Assignments:

None

Guests:

TBD

10.24 | Debrief + Desk Crits

Agenda:

Today, we will collectively debrief after the mid-review and work through some of the outstanding comments/revisions to your field guide–including make a decision about who will “edit” this volume on behalf of the class.

Readings:

43. None

Shared Questions:

A. N/A

Assignments:

None

Guests:

None

10.27 | Climate Fiction and Worlding the Energy Transition

Agenda:

Today, we'll discuss some methods for creating "usable speculation" that allows us to imagine alternative futures free from the blinders of capitalist realism (often referred to as pragmatism in design practice). We have a few items to read/watch, but you'll also have to bring a work of speculative fiction that you love to class, prepared to present and discuss.

Readings:

44. McSweeney's Quarterly Concern, "2040 A.D.," 58. **Preface, Introduction, The Good Plan.**
45. Anthony Dunne and Fionna Raby, *Speculative Everything: Design, Fiction, and Social Dreaming*, Cambridge: The MIT Press (2013). **Chapters 1 and 9.**
46. Holly Jean Buck, *After Geoengineering: Climate Tragedy, Repair, and Restoration*, Verso: New York (2019). **Introduction.**
47. Julian Brave Noisecat, "Indigenous Peoples and the Apocalypse," KQED Public Lecture, November 4, 2021, available at: https://www.youtube.com/watch?v=LRCrIaOthSs.
48. Brandi Summers, "Untimely Futures," *Places Journal*, November 2021, available at: https://placesjournal.org/article/black-homelessness-in-oakland/

Shared Questions:

A. How do these readings help us think about larger systems and specific sites (within and beyond the energy sector)?
B. What can we take from these readings regarding power structures and investment-led climate policy?

Assignments:

Seminar Slack Chat | Students: Kai, Katie, Ana

Guests:

Julian Brave Noisecat

10.31 | Desk Crits

Agenda:

Today is a workday dedicated to developing your regional field guides. I will be available for desk crits from 12-6.

Readings:

49. None

Shared Questions:

N/A

Assignments:

N/A

Guests:

TBD

11.03 | Desk Crits

Agenda:

TK

Readings:

50. None

Shared Questions:

A. None

Assignments:

Seminar Slack Chat

Guests:

None

11.07 | Pin-Up

Agenda:

TK

Readings:

51. None.

Shared Questions:

N/A

Assignments:

N/A

Guests:

TBD

11.10 | Desk Crits

Agenda:

Today, we will do desk crits with each group to see how your work is progressing. To use this time as efficiently as possible, please come prepared with key questions or issues you have about pulling this project together.

Readings:

52. None.

Shared Questions:

N/A

Assignments:

N/A

Guests:

TBD

11.14 | Desk Crits

Agenda:

Today, we will do desk crits with each group to see how your work is progressing. To use this time as efficiently as possible, please come prepared with key questions or issues you have about pulling this project together.

Readings:

53. None

Shared Questions:

N/A

Assignments:

N/A

Guests:

TBD

11.17 | ¾ Review

Agenda:

Today, we will do desk crits with each group to see how your work is progressing. To use this time as efficiently as possible, please come prepared with key questions or issues you have about pulling this project together.

Readings:

54. None

Shared Questions:

N/A

Assignments:

N/A

Guests:

TBD

11.21 | Desk Crits

Agenda:

Today, we will do desk crits with each group to see how your work is progressing. To use this time as efficiently as possible, please come prepared with key questions or issues you have about pulling this project together.

Readings:

55. None.

Shared Questions:

N/A

Assignments:

N/A

Guests:

TBD

11.23 | Desk Crits

Agenda:

¾ review text

Readings:

56. None.

Shared Questions:

N/A

Assignments:

N/A

Guests:

TBD

11.28 | Desk Crits

Agenda:

Today, we will do desk crits with each group to see how your work is progressing. To use this time as efficiently as possible, please come prepared with key questions or issues you have about pulling this project together.

Readings:

57. None.

Shared Questions:

N/A

Assignments:

N/A

Guests:

TBD

12.09 | Final Review

Agenda:

This is our final review!

Readings:

58. None

Shared Questions:

N/A

Assignments:

N/A

Guests:

TBD