

SYLLABUS

ARC 485 - CLIMATE CHANGE ADAPTATION AND TRANSITIONS IN FLOODPLAINS Spring 2026

Professor Guy Nordenson

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Wednesdays 1.30 – 4.20pm

Room TBD

Description

A direct consequence of climate change has been the increased severity and frequency of floods, particularly in low lying floodplains at the coasts and along rivers. These have led to proposals and projects for adaptation, transformation and transitions that vary with circumstances. Historically there have been differences between places where long-established floodplain communities have evolved and adapted their way of life and structures and those where colonial and other settlements have led to more rapid and often highly engineered flood control. Examples abound throughout the world. In the US the “management” of the Mississippi watershed is a prime example, including both the communities along the river and those in the Gulf delta itself. Coastal floods due to hurricanes and other events have also impacted Tohoku, Japan, New Orleans, and Venice and led to the construction of flood “control” infrastructures throughout the 19th and 20th centuries.

Most of these structures have served their purpose over the past two centuries, though in many cases with unplanned environmental and social consequences. However, the subsidence of deltas, the rise in sea levels and the increased frequency of cloudbursts, due to climate change, as well as expanded settlements in floodplains, have greatly increased the impacts of floods. Tsunamis, though not impacted by climate changes have also devastated coastal communities already stressed by climate change effects.

For the most part the response of governments has been to treat great floods as disasters and rebuild back as before. But the cumulative cost both economic and social has led to other proposals for either greater traditional flood control or more novel or radical measures. These include a reliance on nature-based measures to absorb or dampen the storm effects and even “managed retreat” or relocation from places at risk. The choices present complex challenges to policymakers, planners, architects, and engineers. Adaptation and transition cannot succeed without an appropriate policy framework, local, regional and beyond, that both provides a scientific basis for change and the necessary support. This requires new ways of envisioning change and transformation by design.

This seminar is organized in four parts. Following two introductory sessions that will present background and theory we will focus on three topics: “managed retreat”; nature-based and engineered adaptations in place; and the transitions and loss/damage reparations that these scenarios entail. We will also focus on two US regions – the Mississippi River and Delta and the New York region – as well as three international locations in Tohoku (Japan), Hô An, Vietnam and Venice. Note also there is no class on 25 March (TBC).

Course Process and Requirements

The course is a discussion-based seminar. Students will be expected to read the assigned texts prior to the class meeting and be prepared for in-depth discussion. Digital PDFs of text selections are provided via Canvas. Each 'module' includes additional and optional readings marked 'ar_' and a list of references for each topic is provided in the syllabus to allow for further study. Others are available on line through the Library or direct to the web links given. Some of the readings will be in books on reserve in the SPIA or School of Architecture libraries, or purchased new or second hand online, or at Labyrinth Books.

The central part of the course is divided into the three topical parts: *Managed Retreat; Adaptation Planning and Design*; and *Transition and Loss/Damage Reparations*. Each part will consist of three classes one each on the Mississippi, the NY region, and the international locations. Students will be responsible for actively contributing to discussions of selected readings in the seminars. Each week, students will write a short one-page brief (approximately 150 words) on a specific aspect of each week's reading that is of specific interest to them, and submit this to the professor digitally as a PDF two days before the class (with their name and the class date in the filename). These will be incorporated into the class discussion.

For each part of the course, students will be divided in multi-disciplinary groups (1 to 3) and each group will be asked to investigate a particular location. The groups will be expected to deliver a 30 to 45-minute digital slide/visual presentation of the research and lead a discussion, on the dates noted. In each group, individual students will stake out different aspects of each topic or location, in discussion with the instructor and the group (on a Zoom meeting at least a week before the class). The groups will also alternate locations so each group will engage with all three different locations across the three parts. Finally, each student will write a 2,000 to 2,500 (max)-word final paper on a topic to be chosen together with the instructor and related one of the regions and topics of the course. This will be due on 7 May and should be submitted as a PDF.

Students will be responsible for actively contributing to discussions of selected readings in the seminars, for the assigned presentations, and for a final individual paper. Grading is based 40% on the final paper, and 30% each for the presentations and group discussions. Unexcused absences will result in reductions in a student's final grade.

Key Readings

Barry, John M. *Rising Tide: The Great Mississippi Flood of 1927 and How it Changed America*.

Simon and Schuster, 2007. **Reserve**

Kousky, Carolyn, Billy Fleming, and Alan M Berger, eds. *A Blueprint for Coastal Adaptation: Uniting Design, Economics, and Policy*. Island Press, 2021. **Reserve**

Nordenson, Guy, Catherine Seavitt and Adam Yarinsky *On the Water | Palisade Bay*.

Hatje Cantz, 2010. **Reserve**

Nordenson, Catherine Seavitt, Guy Nordenson, and Julia Chapman. *Structures of Coastal Resilience*.

Island Press, 2018. **Reserve and Labyrinth**

Lewis, Paul, Guy Nordenson and Catherine Seavitt. *Four Corridors: Design Initiative for RPA's Fourth Regional Plan*. Hatje Cantz, 2021. **Reserve**

O'Neill, Brian, Maarten van Aalst et al. "Key Risks Across Sectors and Regions" in: *Climate Change 2022: Impacts, Adaptation and Vulnerability. Contribution of Working Group II to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change* H-O Pörtner, DC Roberts et al eds.

Cambridge University Press. pp 2411–2538. <https://doi:10.1017/9781009325844.025>

Saikku, Mikko. *This Delta, this Land: An Environmental History of the Yazoo-Mississippi Floodplain*.

University of Georgia Press, 2005. **Reserve**

SYLLABUS

PART 1: INTRODUCTIONS

1 Climate Change Impacts and Resilience

28 Jan

Basic background information and seminar introduction. Organize student teams. Climate change consequences to floodplains – coastal storms, sea level rise and cloudbursts. Storm increases are variable and traditional engineered flood control or insurance programs are failing. This differs from other natural hazards (eg tsunamis) and complicates adaptation. Designs and policies must be able to adjust to unforeseen rates of change and discontinuities. Introduce concepts of ecological and engineering resilience.

- Reading Berrang-Ford, Lea, AR Siders, et al. "A systematic global stocktake of evidence on human adaptation to climate change." *Nature Climate Change* 11 no 11 2021: 989-1000. <https://doi.org/10.1038/s41558-021-01170-y>
- Holling, Crawford S. "Resilience and stability of ecological systems." in *Annual Review of Ecology and Systematics*. 1973: 1-23.
www.zoology.ubc.ca/bdg/pdfs_bdg/2013/Holling%201973.pdf
- Mach, Katharine J, Maria Carmen Lemos, et al. "Actionable knowledge and the art of engagement." *Current Opinion in Environmental Sustainability* 42 (2020): 30-37.
<https://doi.org/10.1016/j.cosust.2020.01.002>
- Singer, Peter. Ch 9 "Climate Change" and Ch 10 "The Environment" in *Practical Ethics*. Cambridge University Press, 2011: 216-255. **Canvas**

2 Resilience, Transformation, Transition and the Commons

4 Feb

Pelling's framework for adaptation. "Leaving place, restoring home" as paradigm of relocation. Examples. Review of major examples of relocation. The tragedy of the commons and Elinor Ostrom's work on common pool resources as model for transitions beyond conventional property rights.

- Reading Bower, Erica, and Sanjula Weerasinghe. "Leaving Place, Restoring Home." *Platform on Disaster Displacement*, 2021
<https://disasterdisplacement.org/portfolio-item/leaving-place-restoring-home>
- Hardin, Garrett. "The tragedy of the commons". *Science* 162, no 3859 1968: 1243-1248. <https://www.jstor.org/stable/1724745>
- Pelling, Mark. "Framework and theory" and "The resilience-transition-transformation framework" in *Adaptation to Climate Change: From Resilience to Transformation*. Routledge, 2010: 3-51. **Canvas**
- McKean, Margaret A "Common Property: What Is It, What Is It Good for, and What Makes It Work?" in Gibson McKean, and Ostrom, eds. *People and Forests: Communities, Institutions, and Governance*. MIT Press, 2000: 27-55. **Canvas**

PART 2: MANAGED RETREAT

3 Hurricane Sandy and Oakwood Beach, Staten Island NY

11 Feb (Group 1)

The example of Oakwood Beach NY. Context of Hurricane Sandy (2012) and the challenge of incomplete relocation. What are the alternatives? Possible visit (optional) on the weekend.

- Reading
- Flavelle, Christopher "U.S. Flood Strategy Shifts to 'Unavoidable' Relocation of Entire Neighborhoods" *NY Times* 26 August 2020 <https://nyti.ms/3b05TY5>
- Georgetown Climate Center. "Oakwood Beach Buyout Committee and Program" Chap XVII in *Managing the Retreat from Rising Seas* 2020. **Canvas**
- McDonnell, Simon, et al "A Managed-Participatory Approach to Community Resilience: The Case of the New York Rising Community Reconstruction Program." *The American Review of Public Administration* 49.3 2019: 309-324. <https://doi.org/10.1177/0275074018804663>
- Staten Island Community Reconstruction Plan https://stormrecovery.ny.gov/sites/default/files/crp/community/documents/statenisland_nyrcr_plan_20mb.pdf.

4 Mississippi River – Isle de Jean Charles LA and Valmeyer IL

18 Feb (Group 2)

Relocations of Isle de Jean Charles community. The background to the forced displacement of the Choctaw tribe from Mississippi to Oklahoma and Louisiana and loss of the island to SLR. Community organization and relocation for both Isle de Jean Charles and Valmeyer IL. Review Nicholas Pinter research on Valmeyer IL and other managed retreat cases.

- Reading
- Barry, John M *Rising Tide: The Great Mississippi Flood of 1927 and How it Changed America* Simon & Schuster 2007: 169-395. **Reserve**
- Moss, Richard H, PM Reed, Antonia Hadjimichael, and Julie Rozenberg. "Planned relocation: Pluralistic and integrated science and governance." *Science* 372, no 6548 2021: 1276-1279. <https://www.science.org/toc/science/372/6548>
- Pinter, Nicholas, and James C Rees. "Assessing managed flood retreat and community relocation in the Midwest USA." *Natural Hazards* 107, no 1 2021: 497-518. <https://doi.org/10.1007/s11069-021-04592-1>
- Simms, Jessica RZ, Helen L Waller, Chris Brunet, and Pamela Jenkins. "The long goodbye on a disappearing, ancestral island: a just retreat from Isle de Jean Charles." *Journal of Environmental Studies and Sciences* 11, no. 3 2021: 316-328. <https://doi.org/10.1007/s13412-021-00682-5>
- Film
- Morrison, Bill and Bill Frisell (music). *The Great Flood Brooklyn*. Icarus Films, 2013. **Canvas Video Reserves**

5 The 2011 Tōhoku Earthquake and Tsunami and Rebuilding of Rikuzentakata

25 Feb (Group 3)

The 11 March 2011 tsunami and the rebuilding in the Tohoku region. Nature vs infrastructure. History markers and change.

- Reading
- Morino Project <https://morinoproject.com/english>
- Normile, Dennis. "One Year After the Devastation, Tohoku Designs its Renewal." *Science* 09 Mar 2012: Vol. 335, Issue 6073 2012: 1164-1166.
<https://doi.org/10.1126/science.335.6073.1164>
- Suppasri, Anawat, et al. "Improvement of Tsunami Countermeasures Based on Lessons from The 2011 Great East Japan Earthquake and Tsunami — Situation After Five Years" *Coastal Engineering Journal* 58, no. 4 2016: 1640011-1.
<https://doi.org/10.1142/S0578563416400118>
- Rots, Aike "Trees of Tension: Re-making Nature in Post-disaster Tohoku" *Japan Forum* 2019: 1-24 <https://doi.org/10.1080/09555803.2019.1628087>
- Miyamoto, Ken'ichi "Japanese Environmental Policy: Lessons from Experience and Remaining Problems": 222-253 and Muscolino, Micah "Fisheries Build Up the Nation: Maritime Environmental Encounters between Japan and China": 56-71 in Miller, Ian Jared, Julia Adeney Thomas, and Brett L Walker. *Japan at Nature's Edge: The Environmental Context of a Global Power*. University of Hawai'i Press, 2013 **Canvas**
- Totman, Conrad D "The Negative Regimen: Forest Regulation": 83-115 and "Land-Use Patterns and Afforestation" in *The Green Archipelago: Forestry in Preindustrial Japan*. University of California Press, 1989:149-169. **Canvas**

PART 3: PLANNING AND DESIGN: ADAPTATION AND MALADAPTATION

6 Vietnam

4 Mar (Group 1)

Climate adaptation challenges Vietnam include in particular the management of forests given the lasting influence of French forestry practices and US defoliation and destruction. But there are also unique cases of ancient towns like Hội An which embody evolved forms of adaptation to frequent coastal flooding.

- Reading
- McElwee, Pamela, Tuyen Nghiem, Hue Le, and Huong Vu. "Flood vulnerability among rural households in the Red River Delta of Vietnam: implications for future climate change risk and adaptation." *Natural Hazards* 86, no. 1 (2017): 465-492 <https://doi.org/10.1007/s11069-016-2701-6>
- Nguyen, Thuy Linh, Chisato Asahi, Thi An Tran, and Ngoc Hanh Le. "Indicator-based approach for flood vulnerability assessment in ancient heritage city of Hoi An, Central Region of Vietnam." *Natural Hazards* 114, no. 2 (2022): 2357-2385.
<https://doi.org/10.1007/s11069-022-05475-9>
- Rozenberg, Julie, and Stephane Hallegatte. "Modeling the impacts of climate change on future Vietnamese households: a micro-simulation approach." *World Bank Policy Research Working Paper* 7766 (2016).
<https://doi.org/10.1596/1813-9450-7766>
- Film
- UN Habitat. "Urban Adaption to Climate Change in Hoi An, Vietnam"
<https://youtu.be/BHhJ6HJ8ReA>

7 Lower Manhattan NY

18 Mar (Group 2)

The Princeton based research project “On the Water | Palisade Bay” instigated the 2010 MoMA “Rising Currents” workshop and exhibition which in turn frame much of the rebuilding strategies and designs after the 2012 Hurricane Sandy. This framework for the combining of science, policy and design and both nature-based and engineered infrastructure over a dozen years provides a useful history of both successes and failures as applied to a key economic district such as Lower Manhattan.

- Reading Bergdoll, Barry G ed *Rising Currents: Projects for New York's Waterfront*
The Museum of Modern Art, 2011. **Reserve**
also <https://www.moma.org/calendar/exhibitions/1028>
Nordenson, Guy, Catherine Seavitt and Adam Yarinsky *On the Water | Palisade Bay*.
Hatje Cantz, 2010. **Reserve**
Nordenson, Catherine Seavitt, Guy Nordenson, and Julia Chapman. *Structures of*
Island Press, 2018. **Reserve and Labyrinth**
Rebuild by Design, “The Big U”
<https://rebuildbydesign.org/work/funded-projects/the-big-u/>
The East Side Coastal Resiliency (ESCR) Project, NYC
<https://www.nyc.gov/site/escr/index.page>

8 Mississippi – New Orleans LA Flood Protection

1 Apr (Group 3)

Following the 2005 Hurricane Katrina the US Army Corps rebuilt the flood protection systems based on a storm return period of 100 years. Was this the right approach? What are the lessons learned, and policy and design constraints that make change difficult.

- Reading Barry, John M *Rising Tide: The Great Mississippi Flood of 1927 and How it Changed*
America Simon & Schuster 2007: 169-395. **Reserve**
Costley, Drew “15 Years After Katrina, a Fight Against ‘the Jim Crow of Climate
Change’” <https://link.medium.com/IOPLldvb9>
Day, John W, et al "Restoration of the Mississippi Delta: Lessons from Hurricanes
Katrina and Rita." *Science* 315.5819. 2007 pp1679-1684
<https://doi.org/10.1126/science.1137030>
Nordenson, Guy, and Catherine Seavitt. "Structures of Coastal Resilience: Designs
for climate change." *Social Research: An International Quarterly* 82, no 3
2015: 655-671. <https://www.jstor.org/stable/pdf/44282126.pdf>
US Army Corps of Engineers New Orleans District “Hurricane & Storm Damage Risk
Reduction System” <https://www.mvn.usace.army.mil/Missions/HSDRRS/>
- Film Lee, Spike. *When the Levees Broke: A Requiem in Four Acts*. 40 Acres and a Mule
Filmworks, 2006. **Canvas Video Reserves (TBC)**

PART 4: TRANSITIONS AND REPARATIONS FOR LOSS AND DAMAGE

9 Mississippi Yazoo Delta and Mayersville MS

8 Apr (Group 1)

- Reading Hale, Benjamin, Adam Pérou Hermans, and Alexander Lee. "Climate adaptation, moral reparation, and the baseline problem." Ch 4 in *Successful Adaptation to Climate Change*, pp. 67-80. Routledge, 2013: 67-90. **Canvas**
- Saikku, Mikko. Ch 4 "The Creation of a Cotton Kingdom" in *This Delta, This Land: An Environmental History of the Yazoo-Mississippi Floodplain*. University of Georgia Press, 2005.
<https://www-jstor-org.ezproxy.princeton.edu/stable/j.ctt46n5z6.10>
- Mastran, Shelley S and Mark Robbins. *Your Town: Mississippi Delta*. National Endowment for the Arts, 2002 **Canvas**

10 Venice

15 Apr (Group 2)

- Reading Ferrarin, Christian, Piero Lionello, Mirko Orlic et al. "Venice as a paradigm of coastal flooding under multiple compound drivers." *Scientific Reports* 12, no 1 2022: 5754. <https://doi.org/10.1038/s41598-022-09652-5>
- Mel, Riccardo A. "Exploring the partial use of the MOSE system as effective adaptation to rising flood frequency of Venice." *Natural Hazards and Earth System Sciences* 21, no 8 (2021):3629–3644
<https://doi.org/10.5194/nhess-21-3629-2021>
- Project Mose <https://www.mosevenezia.eu/project/?lang=en>
- Rose, Emma. "A sinking world: A model framework for climate change adaptation measures in coastal cities." *Vanderbilt Journal of Transnational Law* 53 2020: 383-388. **Canvas**

11 Jamaica Bay NY

22 Apr (Group 3)

- Reading Nordenson, Guy, Andrew MacMillan et al *Jamaica Bay Tree Ring: And Afforestation Handbook*. New York, 2020
https://issuu.com/joonma1/docs/201011_treering_issuu
- Jones, Rennie, Paul Lewis, Ning Lin, Reza Marsooli, Guy Nordenson and Catherine Seavitt *Jamaica Head of Bay Resilience*, 2018 https://cee.princeton.edu/sites/cee/files/head-bay-coastal-resilience-jamaica-bay_2018-12-5.pdf

12 Conclusions

29 Apr

General Reference Texts (on Canvas and/or Reserve as noted)

- Adger, W Neil, Irene Lorenzoni, and Karen L O'Brien, eds. *Adapting to Climate Change: Thresholds, Values, Governance*. Cambridge University Press, 2009.
- Batten, Bruce L, and Philip C Brown. *Environment and Society in the Japanese Islands: From Prehistory to the Present*. Oregon State University Press, 2015.
- Gibson Margaret A, McKean, Clark C and Elinor Ostrom, eds. *People and Forests: Communities, Institutions, and Governance*. MIT Press, 2000.
- Hannah, Susan, Carl Folke and Karl-Göran Mäler, eds. *Rights to Nature: Ecological, Economic, Cultural, and Political Principles of Institutions for the Environment*. Island Press, 1996.
- Harvey, David, and Jim Perry, eds. *The Future of Heritage as Climates Change: Loss, Adaptation and Creativity*. Routledge, 2015.
- Holling, Crawford S and Lance H Gunderson. *Panarchy: Understanding Transformations in Human and Natural Systems*. Island Press, 2002.
- Kolbert, Elizabeth. *Field Notes from a Catastrophe: Man, Nature, and Climate Change* Bloomsbury Publishing, 2010: 7-90. **Canvas**
- Lemann, Nicholas. *The Promised Land: The Great Black Migration and How it Changed America*. Alfred A Knopf, 1991. **Reserve**
- Lewis, Paul, Guy Nordenson and Catherine Seavitt. *Four Corridors: Design Initiative for RPA's Fourth Regional Plan*. Hatje Cantz, 2021. **Reserve**
- Levin, Simon A. *Fragile Dominion: Complexity and the Commons*. Perseus, 1999.
- Luetlich, Richard et al "Reducing Coastal Risk on the East and Gulf Coast" Report of the Committee on U.S. Army Corps of Engineers Water Resources Science, Engineering, and Planning: Coastal Risk Reduction, Ocean Studies Board, National Research Council, National Academies Press 2014 www.nap.edu/catalog/18811/reducing-coastal-risk-on-the-east-and-gulf-coasts
- McElwee, Pamela D. *Forests Are Gold: Trees, People, and Environmental Rule in Vietnam*. University of Washington Press, 2016.
- Pelling, Mark. *Adaptation to Climate Change: From Resilience to Transformation*. Routledge, 2010.
- and Sophie Blackburn, eds. *Megacities and the Coast: Risk, Resilience and Transformation*. Routledge, 2014.
- Ostrom, Elinor. *Governing the Commons: The Evolution of Institutions for Collective Action*. Cambridge University Press, 1990.
- Singer, Peter. Ch 9 "Climate Change" and Ch 10 "The Environment" in *Practical Ethics*. Cambridge University Press, 2011: 216-255. **Canvas**
- Thompson, Allen, and Jeremy Bendik-Keymer, eds. *Ethical Adaptation to Climate Change: Human Virtues of the Future*. MIT Press, 2012.
- Totman, Conrad D. *The Green Archipelago: Forestry in Preindustrial Japan*. University of California Press, 1989.
- White, Gilbert F. *Human Adjustment to Floods: a Geographical Approach to the Flood Problem in the United States*. No. 29. University of Chicago, 1945.
- [https://hazards.colorado.edu/uploads/basicpage/Human Adj Floods.pdf](https://hazards.colorado.edu/uploads/basicpage/Human_Adj_Floods.pdf)
- Woodward, C Vann. *The Strange Career of Jim Crow*. Oxford University Press, third edition, 2002.

Reference Texts by Class

INTRODUCTION

1 Climate Change and Resilience

Climigration, *Lead with Listening: A Guidebook for Community Conversations on Climate Migration* available at <https://www.climigration.org/guidebook>

Emanuel, Kerry. "Atlantic tropical cyclones downscaled from climate reanalyses show increasing activity over past 150 years." *Nature Communications* 12, no. 1 (2021): 1-8. **Canvas**

- . "Hurricanes and Climate Change" at Society of Catholic Scientists June 2022
<https://www.youtube.com/watch?v=XQF4mccVizk>

Levin, Simon A. "Six Fundamental Questions" in *A Fragile Dominion: Complexity and the Commons*. Perseus, 1999: 39-55. **Canvas**

Mayo, Talea L, and Ning Lin. "Climate change impacts to the coastal flood hazard in the northeastern United States." *Weather and Climate Extremes* 36, 2022: 100453.

<https://doi.org/10.1016/j.wace.2022.100453>

National Flood Insurance Program <https://www.fema.gov/national-flood-insurance-program>

O'Neill, Brian C, Michael Oppenheimer, et al "IPCC reasons for concern regarding climate change risks." *Nature Climate Change* 7, no 1 (2017): 28-37. **Canvas**

Wing, Oliver EJ, Nicholas Pinter, Paul D Bates, and Carolyn Kousky. "New insights into US flood vulnerability revealed from flood insurance big data." *Nature Communications* 11, no. 1 (2020): 1-10. **Canvas**

2 Resilience, Transformation, Transition and the Commons

Adger, W. Neil, Suraje Dessai, Marisa Goulden, et al. "Are there social limits to adaptation to climate change?" *Climatic Change* 93, no 3-4 2009: 335-354. <https://doi.org/10.1007/s10584-008-9520-z>

Attfield, Robin. "Rehabilitating Nature and Making Nature Habitable," in *Environmental Restoration: Ethics, Theory and Practice*, ed. William Throop. Humanity Books, 2000: 113-126. **Canvas**

Bratton, Susan P. "Alternative Models of Ecosystem Restoration." *Environmental Restoration: Ethics, Theory, and Practice* W Throop ed. Humanity Books, 2000: 53-68. **Canvas**

Burger, Joanna et al "Common-Pool Resources and Commons Institutions" in Burger, Elinor Ostrom et al, eds. *Protecting the Commons: a Framework for Resource Management in the Americas*. Island Press, 2001: 1-15. **Canvas**

Cutter, Susan L, Bryan J Boruff, and W Lynn Shirley. "Social Vulnerability to Environmental Hazards." *Social Science Quarterly* 84.2 2003: 242-261. <https://doi.org/10.1111/1540-6237.8402002>

Hannah, Susan, and Svein Jentoft "Human Use of the Natural Environment: An Overview of Social and Economic Dimensions" in Hannah, Carl Folke and Karl-Göran Mäler, eds. *Rights to Nature: Ecological, Economic, Cultural, and Political Principles of Institutions for the Environment*. Island Press, 1996: 35-55. **Canvas**

Ostrom, Elinor and Edella Schlager "The Formation of Property Rights" in Hannah, Folke and Mäler, eds. *Rights to Nature*. Island Press, 1996: 127-156. **Canvas**

Walker, Brian, et al "Resilience, Adaptability and Transformability in Social-Ecological systems." *Ecology and Society* 9.2 2004: 5. <http://www.ecologyandsociety.org/vol9/iss2/art5/>

MANAGED RETREAT

General

- Carey, John "Core Concept: Managed Retreat Increasingly Seen as Necessary in Response to Climate Change's Fury" *PNAS* vol 117 no 241 16 June 2020.
- Flavelle, Christopher "U.S. Flood Strategy Shifts to 'Unavoidable' Relocation of Entire Neighborhoods" *NY Times* 26 August 2020 <https://nyti.ms/3b05TY5>
- , articles on managed relocation, <https://www.nytimes.com/by/christopher-flavelle>
- Georgetown Climate Center "Managed Retreat Toolkit"
<https://www.georgetownclimate.org/articles/building-resources-for-managed-retreat.html>
- Hale, Benjamin et al "Climate Adaptation, Moral Reparation, and the Baseline Problem" in Susanne Moser and Maxwell Boykoff ed *Successful Adaptation to Climate Change* Routledge, 2013: 67-80. **Canvas**
- Kousky, Carolyn. "Managing shoreline retreat: a US perspective." *Climatic Change* 124, no 1 (2014): 9-20.
- Lester, Charles, Gary Griggs, et al. "Shoreline Retreat in California: Taking a Step Back." *Journal of Coastal Research* 38, No 6 2022: 1207-1230. **Canvas**
- Mach, Katharine J, and AR Siders. "Reframing strategic, managed retreat for transformative climate adaptation." *Science* 372, No 6548 (2021): 1294-1299.
- Siders, AR "Managed retreat in the United States." *One Earth* 1, no 2 (2019): 216-225. **Canvas**
- . "Social justice implications of US managed retreat buyout programs." *Climatic Change* 152, No 2 (2019): 239-257.
- , and Idowu Ajibade. "Introduction: Managed Retreat and Environmental Justice in a Changing Climate." *Journal of Environmental Studies and Sciences* 2021: 1-7.

3 Oakwood Beach NY

- McDonnell, Simon, et al "A Managed-Participatory Approach to Community Resilience: The Case of the New York Rising Community Reconstruction Program." *The American Review of Public Administration* 49.3 (2019): 309-324. available at <https://doi.org/10.1177/0275074018804663>
- Rebuild by Design: Living Breakwaters: <https://stormrecovery.ny.gov/learn-more-about-living-breakwaters-project> and <http://www.rebuildbydesign.org/>
- NY Rising Community Reconstruction Program (NY Rising)
<https://stormrecovery.ny.gov/community-reconstruction-program>
- Staten Island Community Reconstruction Plan
https://stormrecovery.ny.gov/sites/default/files/crp/community/documents/statenisland_nyrcr_plan_20mb.pdf

4 Mississippi - Isle de Jean Charles LA and Valmeyer IL

- Cheramie, Kristi D "The Scale of Nature: Modeling the Mississippi River" in *Places*, March 2011
<https://placesjournal.org/article/the-scale-of-nature-modeling-the-mississippi-river/>
- Zeitlin, Benh. *Beasts of the Southern Wild*. Cinereach et al and Fox, 2012. **Canvas**

5 Rikunzentakata, Tohoku Japan

- Muscolino, Micah "Fisheries Build Up the Nation: Maritime Environmental Encounters between Japan and China" and in Miller, Ian Jared, Julia Adeney Thomas, and Brett L Walker. *Japan at Nature's Edge: The Environmental Context of a Global Power*. University of Hawai'i Press, 2013: 56-71. **Canvas**
- Miyamoto, Ken'ichi "Japanese Environmental Policy: Lessons from Experience and Remaining Problems" in Miller, Ian Jared, Julia Adeney Thomas, and Brett L Walker. *Japan at Nature's Edge: The Environmental Context of a Global Power*. University of Hawai'i Press, 2013: 222-253. **Canvas**
- Totman, Conrad D "The Negative Regimen: Forest Regulation": 83-115 and "Land-Use Patterns and Afforestation": 149-169 in *The Green Archipelago: Forestry in Preindustrial Japan*. University of California Press, 1989. **Canvas**

PLANNING AND DESIGN: ADAPTATION AND MALADAPTATION

6 Vietnam

Hallegatte, Stephane, Adrien Vogt-Schilb, Mook Bangalore, and Julie Rozenberg. *Unbreakable: building the resilience of the poor in the face of natural disasters*. World Bank Publications, 2016. **Canvas**

McElwee, Pamela D. *Forests Are Gold: Trees, People, and Environmental Rule in Vietnam*. University of Washington Press, 2016. **Reserve**

McElwee, Pamela, Van Hai Thi Nguyen, et al. "Using REDD+ policy to facilitate climate adaptation at the local level: synergies and challenges in Vietnam." *Forests* 8, no. 1 (2016): 11. **Canvas**

Rentschler, Jun, Paolo Avner, Mattia Marconcini, Rui Su, Emanuele Strano, and Stephane Hallegatte. "Rapid Urban Growth in Flood Zones." 2022. **Canvas**

7 Lower Manhattan/East Side (Big U)

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