# IDS 2935 Living with Rising Seas

### Quest 2

## I. Course Information

Spring 2022

Meeting Day/Time: T5-6, R5

Location: T- Leigh 0104, R - Matherly 0012

Primary General Education Designation: Physical Sciences

Secondary General Education Designation (if seeking): Diversity (D)

Writing Designation (if seeking): No writing designation

A minimum grade of C is required for general education credit.

### Instructor

Dr. Katy Serafin – kserafin@ufl.edu

Office location: 3140 Turlington Hall

Office hours: TBA and by appointment (please email to schedule) (in person or zoom)

### Course Description

Coastlines, home to much of the world's population, economy, and important ecosystems, are changing in critical ways due to rising seas. This course examines the complex relationship between humans and coastlines by asking the pressing question, "How will humanity adapt to sea level rise?" Students will connect the science of sea level rise and coastal change to impacts on infrastructure, ecosystems, and society. Students will explore multiple facets of sea level rise through place-based learning, investigating cross-disciplinary topics such as the physical drivers and consequences of sea level rise, mitigation techniques, and adaptation, using examples from our home state of Florida. Students will examine how social inequities within the United States exacerbate the disproportionate impacts of sea level rise, and how existing policies and adaptation strategies may perpetuate inequity. Students will consider the transformative shifts that will be necessary in current decision-making to develop resilient, sustainable, and equitable coastal futures. Students will explore these themes through in-class discussions and activities, experiential learning, and reflections on theirs and others' relationship with the coast.

### Course Delivery

The class will meet two times per week in a primarily classroom setting. Each week will include lectures, readings, activities, and discussions. Tuesday's class is a double period and will usually include a lecture to provide background information on subject material and a hands-on, follow up individual or group activity to reinforce concepts learned during the lecture. Thursday's class focuses on student-lead discussions on key literature topics which strengthens the learning from the previous class session. In-class activities will include quantitative and geospatial data analysis, role play scenarios, and

investigations into local coastal adaptation plans. Place-based learning is emphasized, and Florida examples will be provided whenever relevant to the subject material.

## General Education Objectives

This course is a Physical Science (P) and Diversity (D) subject area course in the UF General Education Program.

Physical Science (P)

Physical science courses provide instruction in the basic concepts, theories and terms of the scientific method in the context of the physical sciences. Courses focus on major scientific developments and their impacts on society, science and the environment, and the relevant processes that govern physical systems. Students will formulate empirically-testable hypotheses derived from the study of physical processes, apply logical reasoning skills through scientific criticism and argument, and apply techniques of discovery and critical thinking to evaluate outcomes of experiments.

Diversity (D)

In Diversity courses, students examine the historical processes and contemporary experiences characterizing social and cultural differences within the United States. Students engage with diversity as a dynamic concept related to human differences and their intersections, such as (but not limited to) race, gender identity, class, ethnicity, religion, age, sexual orientation, and (dis)abilities. Students critically analyze and evaluate how social inequities are constructed and affect the opportunities and constraints across the US population. Students analyze and reflect on the ways in which cultures and beliefs mediate their own and other people's understandings of themselves and an increasingly diverse U.S. society.

## Required & Recommended Course Materials (to purchase/rent)

Materials and Supplies Fees: n/a

Required:

Rush, Elizabeth, 2019, *Rising: Dispatches from the New American Shore*, Edition 1, Milkweed Editions, Minneapolis, Minnesota.

All other readings will be provided in class or as .pdf format on canvas.

Recommended:

Hine et al., 2016, Sea Level Rise in Florida: Science, Impacts, and Policy. University of Florida Press

# II. Coursework & Schedule

### 1. List of Graded Work

| Assignment | Description | Requirements | Points (Percent) |
|---|---|---|---|
| Learning Check-Point Quizzes | Most weeks students will complete a 5 question, multiple choice quiz on Canvas that will test their understanding of the readings and lecture material (10 points each). | 12 weekly quizzes, lowest score dropped<br><br>Due by 11:59pm on Friday | 110<br>(11%) |
| Class Participation and Discussions | All students are expected to participate in class discussions according to the course guidelines. A rubric for class participation can be found below. | Students are expected to attend/participate in every class. | 84<br>(8.4%) |
| Discussion Preparation | Thursday's class will focus on discussion of weekly reading material. Students will submit 3-4 key takeaways or main points and 1-2 questions from the required literature they have reviewed at least one hour prior to Thursday's class. | 3-4 main points/key takeaways<br>1-2 questions<br><br>Due one hour prior to Thursday's class | 26<br>(2.6%) |
| Leading Discussions | Students will participate fully in discussions and will lead specific discussions in groups by presenting a short summary of the discussion topic (<15 minutes) and introducing discussion questions based on the provided readings for the class to explore. Students will be assigned dates and specific discussion topics to lead once the number of students in the class is finalized. | Develop a power point presentation and discussion focused questions<br><br>Each student will co-lead 1-2 discussions | 80<br>(8%) |
| In-class Activities | Most weeks have an activity to complete. Students are welcome to work with a partner/group or individually. Activities will introduce hands-on learning concepts and usually focus on place-based material (20 points each). In-Class activity responses must be turned in by Friday.<br><br>**All members of a group will receive the same score for graded group activities and projects unless otherwise noted in the activity. | 11 weekly in-class activities, lowest score dropped<br><br>Due Friday by noon | 200<br>(20%) |

| | | | |
|---|---|---|---|
| Guided Reflections | During the semester, students will reflect on their own experiences and uses of the coastline. Students will also read excerpts from the book "Rising: Dispatches from the New American Shore" to reflect on others' personal narratives about sea level rise impacts on their homes and families. Students will write four reflections during the term (not including their final reflection) following prompts from the instructor (25 pts each). | 4 total<br><br>Due dates on Canvas | 100<br>(10%) |
| Midterm | During week 8, students will have a short answer, open book midterm focused on the physical processes that drive sea level and landscape change across different environments (weeks 1-7). | Short-answer, open book | 100<br>(10%) |
| Final Project | While this course will describe a few examples of sea level rise impacts on coastlines and people, students will use the final project as an opportunity to explore sea level rise impacts on society more thoroughly through a research topic of their own interest.<br><br>At the beginning of the semester, students will choose a topic that they are interested in researching during the term. Topic suggestions will be provided by the instructor and may include, human health, national security, cultural sites, species migration, etc. More details will be provided on our Canvas page.<br><br>Stages of project development will be graded and returned to the student to ensure progress. The final project output documenting their research topic is due Finals week. Students will submit their final reflection with their project. | 1) Topic Choice (due week 3; 10 pts; 1%)<br>2) Project Outline (due week 7; 30 pts; 3%)<br>3) Draft (due week 12; 50 pts; 5%)<br>4) Peer Review of 2 classmate's drafts (due week 13, 25 pts each, 50 pts, 5%)<br>5) Final Project (due week 15; 140 pts; 14%)<br>6) Reflection (due week 16; 20 pts; 2%)<br>a. 200-300 words | 300<br>(30%) |
| Total | | | 1000 pts |

## 2. Weekly Course Schedule (add/remove rows as needed)

* Students should note that the syllabus is a guideline and that there may be changes to the class schedule. Please refer to our Canvas page for official weekly readings, assignments, and due dates.

| Week/ Date | Theme | Activity | Topic/Assignment (Question/Subject) | Assigned Work Due |
|---|---|---|---|---|
| Week 1 | **The Science of Sea Level Rise** | Topic | *Introduction to the course* | |
| | | Readings/Works | | |
| | | Assignment | Reflection #1: Your relationship with the coast | Wednesday |
| Week 2 | | Topic | *How do we know sea level is rising?*<br>We will explore how observations from tide gauges and satellite altimetry illustrate present-day sea level rise. | |
| | | Readings/Works | Syllabus<br><br>Rush, Elizabeth, 2019, *Rising: Dispatches from the New American Shore*. The Password, pg 1-15<br><br>Nicholls, R. J., & Cazenave, A. (2010). Sea-level rise and its impact on coastal zones. *science*, *328*(5985), 1517-1520.<br><br>Dusto, A. ( 2014), Reading between the tides: 200 years of measuring global sea level<br><br>How to Read a Scientific Article, Adapted from Drs. Purugganan and Hewitt; Cain Project in Engineering and Professional Communication (optional)<br><br>Church, J. A., & White, N. J. (2011). Sea-level rise from the late 19th to the early 21st century. Surveys in Geophysics, 32(4-5), 585-602. (optional)<br><br>Sea Level Rise, Chapter 19, Florida's Climate: Changes, Variations, and Impacts, pg 558 – 559 (optional) | |

| Week/ Date | Theme | Activity | Topic/Assignment (Question/Subject) | Assigned Work Due |
|---|---|---|---|---|
| | | | | |
| | | Assignment | In-Class Activity<br>Key Takeaways/Discussion Questions | Friday<br>Thursday |
| | | | | |
| Week 3 | | Topic | *Why is sea level rising?*<br>We will explore the main drivers of global and regional sea level change including thermal expansion, ice sheet and glacier loss, and oceanographic and geological processes. | |
| | | Readings/Works | Sea Level Rise, Chapter 19, Florida's Climate: Changes, Variations, and Impacts, pg 559 – 561<br><br>Frederikse, T., Landerer, F., Caron, L., Adhikari, S., Parkes, D., Humphrey, V. W., ... & Wu, Y. H. (2020). The causes of sea-level rise since 1900. *Nature*, 584(7821), 393-397.<br><br>Kopp, R. E., Hay, C. C., Little, C. M., & Mitrovica, J. X. (2015). Geographic variability of sea-level change. Current Climate Change Reports, 1(3), 192-204. | |
| | | Assignment | Key Takeaways/Discussion Questions<br>In-Class Activity<br>Quiz 1 | Thursday<br>Friday<br>Friday |
| | | | | |
| Week 4 | | Topic | *How has sea level changed in the past?*<br>We will explore past climate-driven global fluctuations of sea level in the past and how past sea level is inferred through geological and biological proxies. | |

| Week/ Date | Theme | Activity | Topic/Assignment (Question/Subject) | Assigned Work Due |
|---|---|---|---|---|
| | | Readings/Works | Rush, Elizabeth, 2019, *Rising: Dispatches from the New American Shore*. Persimmons, pg 19-41<br><br>Sea Level Rise, Chapter 19, Florida's Climate: Changes, Variations, and Impacts, pg 562-569<br><br>Dutton, A., Carlson, A. E., Long, A., Milne, G. A., Clark, P. U., DeConto, R., ... & Raymo, M. E. (2015). Sea-level rise due to polar ice-sheet mass loss during past warm periods. *science*, *349*(6244), aaa4019.<br><br>Fairbanks, R. G. (1989). A 17,000-year glacio-eustatic sea level record: influence of glacial melting rates on the Younger Dryas event and deep-ocean circulation. Nature, 342(6250), 637-642.<br><br>Kemp, A. C., Horton, B. P., Donnelly, J. P., Mann, M. E., Vermeer, M., & Rahmstorf, S. (2011). Climate related sea-level variations over the past two millennia. Proceedings of the National Academy of Sciences, 108(27), 11017-11022. (optional) | |
| | | Assignment | Topic Choice<br>Key Takeaways/Discussion Questions<br>In-Class Activity<br>Quiz 2 | Tuesday<br>Thursday<br>Friday<br>Friday |
| | | | | |
| Week 5 | | Topic | *How will sea level change in the future?*<br>We will explore future sea level rise projections, including the range of sea level rise due to the uncertainty in mechanisms driving change. We will compare global sea level change to sea level change in our home state of Florida. | |

| Week/ Date | Theme | Activity | Topic/Assignment (Question/Subject) | Assigned Work Due |
|---|---|---|---|---|
| | | Readings/Works | Sweet, W. V., Kopp, R. E., Weaver, C. P., Obeysekera, J., Horton, R. M., Thieler, E. R., & Zervas, C. (2017). Global and regional sea level rise scenarios for the United States. Chapters 3 – 5. (optional)<br><br>DeConto, R. M., & Pollard, D. (2016). Contribution of Antarctica to past and future sea-level rise. Nature, 531(7596), pg 591-597. **Don't worry about reading the methods**<br><br>Clark, P. U., et al. (2016). Consequences of twenty-first-century policy for multi-millennial climate and sea-level change. Nature Climate Change, 6(4), pg 360-369.<br><br>Sea Level Rise, Chapter 19, Florida's Climate: Changes, Variations, and Impacts, pg 570-575 | |
| | | Assignment | Key Takeaways/Discussion Questions<br>In-Class Activity<br>Quiz 3 | Thursday<br>Friday<br>Friday |
| | | | | |
| Week 6 | **Assessing Vulnerability and Risk** | Topic | *Sea level rise impacts on the environment: Beaches, barriers, and islands*<br>We will explore how beaches, barriers and islands respond to sea level change. Topics discussed include coastal morphology, coastal erosion, and barrier island roll over, as well as vulnerable species at risk of habitat loss. | |
| | | Readings/Works | Leatherman, S. P. (1983). Barrier dynamics and landward migration with Holocene sea-level rise. *Nature*, *301*(5899), 415-417.<br><br>Vousdoukas, M. I., Ranasinghe, R., Mentaschi, L., Plomaritis, T. A., Athanasiou, P., Luijendijk, A., & Feyen, L. (2020). Sandy coastlines under threat of erosion. Nature climate change, 10(3), 260-263.<br><br>Cooper, J. A. G., Masselink, G., Coco, G., Short, A. D., Castelle, B., Rogers, K., ... & Jackson, D. W. T. (2020). Sandy beaches can survive sea-level rise. Nature | |

| Week/ Date | Theme | Activity | Topic/Assignment (Question/Subject) | Assigned Work Due |
|---|---|---|---|---|
| | | | Climate Change, 10(11), 993-995.<br><br>Vousdoukas, M. I., Ranasinghe, R., Mentaschi, L., Plomaritis, T. A., Athanasiou, P., Luijendijk, A., & Feyen, L. (2020). Reply to: Sandy beaches can survive sea-level rise. Nature Climate Change, 10(11), 996-997 (optional) | |
| | | Assignment | Key Takeaways/Discussion Questions<br>In-Class Activity<br>Quiz 4 | Thursday<br>Friday<br>Friday |
| | | | | |
| Week 7 | | Topic | *Sea level rise impacts on the environment: Marshes, Mangroves, and Wetlands*<br>We will explore how marshes, mangroves, and coral reefs respond to sea level change. Topics discussed will include intertidal zones, sedimentation, habitat migration, and coastal squeeze. | |
| | | Readings/Works | Rush, Elizabeth, 2019, *Rising: Dispatches from the New American Shore*. Milkweed Editions. The Marsh at the End of the World, pg 47-66<br><br>Kirwan, M. L., Temmerman, S., Skeehan, E. E., Guntenspergen, G. R., & Fagherazzi, S. (2016). Overestimation of marsh vulnerability to sea level rise. *Nature Climate Change*, *6*(3), 253-260.<br><br>Webb, A. P., & Kench, P. S. (2010). The dynamic response of reef islands to sea-level rise: Evidence from multi-decadal analysis of island change in the Central Pacific. Global and Planetary Change,72(3), 234-246.<br><br>Gray, W., 2013. The Potential Effects of Sea Level Rise on Florida's Coastal Ecosystems, Florida Sea Grant College Program, UF/IFAS Extension. (optional) | |
| | | Assignment | Final Project Outline | Tuesday |

| Week/ Date | Theme | Activity | Topic/Assignment (Question/Subject) | Assigned Work Due |
|---|---|---|---|---|
| | | | Key Takeaways/Discussion Questions<br>In-Class Activity<br>Quiz 5 | Thursday<br>Friday<br>Friday |
| | | | | |
| Week 8 | | Topic | *Sea level rise impacts on society: humans and the coast; chronic erosion, sunny-day flooding, saltwater intrusion*<br>We will define risk and explore how humans have inhabited and utilized the coast over time and the consequences of development along a dynamic coastline. We will begin discussing how increases to sea level have increased the frequency of erosion and flooding and what this means for infrastructure along the coast. We will explore the consequences of rising seas on public and private infrastructure as well as the economy, including tourism. | |
| | | Readings/Works | Rush, Elizabeth, 2019, *Rising: Dispatches from the New American Shore*. Pulse, pg 71-97<br><br>Gillis, J. Flooding of Coast, Caused by Global Warming, Has Already Begun. The New York Times<br><br>Ted Talk "John Englander, Sea Level Rise: Fact and Fiction"<br><br>Ray, R. D., & Foster, G. (2016). Future nuisance flooding at Boston caused by astronomical tides alone. *Earth's Future*, *4*(12), 578-587.<br>Alvarez, L. and Robles, F. (2016), Intensified by Climate Change, King Tides Change Way of Life in Florida. The New York Times | |

| Week/ Date | Theme | Activity | Topic/Assignment (Question/Subject) | Assigned Work Due |
|---|---|---|---|---|
| | | | Urbina, I., (2016), Perils of Climate Change Could Swamp Coastal Real Estate. The New York Times | |
| | | Assignment | ** Visit Florida Museum of Natural History, "South Florida People & Environments" exhibit by this week!** [This experience is subject to change for Spring 2021 due to the COVID-19 pandemic.]<br>Reflection #2: With your visit to the Florida Museum of Natural History in mind, reflect on the sustainability of different coastal practices. How do different coastal inhabitants and cultures use the coast in ways that compare and contrast to present-day usage?<br><br>Midterm Exam | Tuesday<br><br>Thursday |
| | | | | |
| Week 9 | | Topic | *Sea level rise impacts on society: human vulnerability*<br>We will explore human vulnerability to sea level rise by evaluating who is exposed to flooding. We will use the Social Vulnerability Index to consider the disproportionate impacts of sea level rise through an equity lens with a focus on income and race. | |
| | | Readings/Works | Rush, Elizabeth, 2019, *Rising: Dispatches from the New American Shore*. On Vulnerability, pg 133-135<br><br>Rush, Elizabeth, 2019, *Rising: Dispatches from the New American Shore*. Risk, pg 137-161<br><br>Cutter, S. L., Boruff, B. J., & Shirley, W. L. (2003). Social vulnerability to environmental hazards. *Social science quarterly*, *84*(2), 242-261. | |

| Week/ Date | Theme | Activity | Topic/Assignment (Question/Subject) | Assigned Work Due |
|---|---|---|---|---|
| | | | Hobbs, S. and Dennis, R., 2020, *Flooding intensifies Charleston region's racial and wealth inequities*. The Post and Courier. | |
| | | Assignment | Key Takeaways/Discussion Questions<br>In-Class Activity<br>Quiz 6 | Thursday<br>Friday<br>Friday |
| | | | | |
| Week 10 | | | *SPRING BREAK* | |
| Week 11 | | Topic | *Adaptation and mitigation: Hard and Soft solutions*<br>We will explore the contemporary terms "accommodate" and "protect" as strategies for combating sea level rise in coastal areas. We will discuss seawalls, beach nourishment, raising infrastructure, and natural solutions. | |
| | | Readings/Works | Rush, Elizabeth, 2019, *Rising: Dispatches from the New American Shore*. On Restoration, pg 206-210<br><br>Sutton-Grier, A. E., Wowk, K., & Bamford, H. (2015). Future of our coasts: The potential for natural and hybrid infrastructure to enhance the resilience of our coastal communities, economies and ecosystems. *Environmental Science & Policy*, *51*, 137-148.<br><br>Guannel, G., Arkema, K., Ruggiero, P., & Verutes, G. (2016). The power of three: coral reefs, seagrasses and mangroves protect coastal regions and increase their resilience. *PloS one*, *11*(7). | |

| Week/ Date | Theme | Activity | Topic/Assignment (Question/Subject) | Assigned Work Due |
|---|---|---|---|---|
| | | | Ted Talk, "Kotchakorn Voraakhom: How To Transform Sinking Cities Into Landscapes That Fight Floods" | |
| | | Assignments | Key Takeaways/Discussion Questions<br>In-Class Activity<br>Quiz 7 | Thursday<br>Friday<br>Friday |
| | | | | |
| Week 12 | **Choices for Living with the Sea**<br>**Planning for an Equitable and Sustainable future** | Topic | *Adaptation and mitigation: Managed retreat/Migration*<br>We will explore the contemporary term "retreat" as a strategy for combating sea level rise in coastal areas. We will focus on examples of recent cases of managed retreat such as in Isle de Jean Charles, LA. We will discuss how sea level rise may exacerbate spatial inequality and highlight locations in Florida such as Miami and the Florida Keys. | |
| | | Readings/Works | Rush, Elizabeth, 2019, *Rising: Dispatches from the New American Shore*. On Reckoning, pg 93-97<br><br>Rush, Elizabeth, 2019, *Rising: Dispatches from the New American Shore*. On Opportunity, pg 162-165<br><br>Rush, Elizabeth, 2019, *Rising: Dispatches from the New American Shore*. Goodbye Cloud Reflections in the Bay, pg 167-180<br><br>Siders, A.R. (2019). Social justice implications of US managed retreat. *Climatic Change*, 152, 239-257.<br><br>Baurick, T., 2019 Retreating from rising sea, state completes purchase of Isle De Jean Charles relocation site, The Times-Picayune | |

| Week/ Date | Theme | Activity | Topic/Assignment (Question/Subject) | Assigned Work Due |
|---|---|---|---|---|
| | | | Sack, K. & Schwartz., J. 2018. Left to Louisiana's Tides, a Village Fights for Time. The New York Times | |
| | | Assignment | Final Project Draft<br>Key Takeaways/Discussion Questions<br>In-Class Activity<br>Quiz 9<br>Reflection #3: Reflection on managed retreat | Thursday<br>Friday<br>Friday<br>Friday |
| | | | | |
| Week 13 | | Topic | *Adaptation and mitigation: Assessing costs and benefits*<br>We will explore the costs and benefits of different adaptation and mitigation techniques. We will consider cost-benefit analysis, positive and negative feedbacks, and longevity of projects in an uncertain future. We will explore how traditional risk assessments and cost-benefit analysis often leave out social vulnerability. | |
| | | Readings/Works | Rush, Elizabeth, 2019, *Rising: Dispatches from the New American Shore*. Looking Backward and Forward in Time, pg 213-251<br><br>Narayan, S., Beck, M. W., Reguero, B. G., Losada, I. J., Van Wesenbeeck, B., Pontee, N., ... & Burks-Copes, K. A. (2016). The effectiveness, costs and coastal protection benefits of natural and nature-based defences. *PloS one*, *11*(5).<br><br>Hinkel, J., Lincke, D., Vafeidis, A. T., Perrette, M., Nicholls, R. J., Tol, R. S., ... & Levermann, A. (2014). Coastal flood damage and adaptation costs under 21st century sea-level rise. *Proceedings of the National Academy of Sciences*, *111*(9), 3292-3297.<br><br>Martinich, J., Neumann, J., Ludwig, J. & Jantarasami, L. (2013). Risk of sea level rise to disadvantaged communities in the United States. *Mitigation and Adaptation Strategies for Global Change*, 18, 169-185. | |

| Week/ Date | Theme | Activity | Topic/Assignment (Question/Subject) | Assigned Work Due |
|---|---|---|---|---|
| | | | Flavelle,C., 2020. A climate plan in Texas focuses on minorities. Not everyone likes it. The New York Times | |
| | | Assignment | Final Project Draft Peer Review<br>Key Takeaways/Discussion Questions<br>In-Class Activity<br>Quiz 10 | Tuesday<br>Thursday<br>Friday<br>Friday |
| | | | | |
| Week 14 | | | | |
| | **Planning for an Equitable and Sustainable future** | Topic | *Decision-making and sea level rise*<br>We will explore the question, "who decides how to prepare for sea level rise?" with a role playing scenario. Topics discussed include the difficulty in making decisions, including what sea level rise scenario to choose to plan for, what stakeholders are at the table, etc. Students will participate in a role play exercise (adapted from the "Sea Level Rise Adaptation Strategy Role Play Game" by Dr. Dawn Jourdan and Briana Ozor) to show the complexities involved with merging science with decisions. | |
| | | Readings/Works | Rush, Elizabeth, 2019, *Rising: Dispatches from the New American Shore*, Gratitude, pg 42-45<br><br>Kopp, R. E., Gilmore, E. A., Little, C. M., Lorenzo-Trueba, J., Ramenzoni, V. C., & Sweet, W. V. (2019). Usable Science for Managing the Risks of Sea-Level Rise. *Earth's Future*. | |

| Week/ Date | Theme | Activity | Topic/Assignment (Question/Subject) | Assigned Work Due |
|---|---|---|---|---|
| | | | von Winterfeldt, D. (2013). Bridging the gap between science and decision making. *Proceedings of the National Academy of Sciences*, *110*(Supplement 3), 14055-14061. | |
| | | Assignment | Peer Review due<br>Key Takeaways/Discussion Questions<br>In-Class Role Play Activity<br>Quiz 11 | Tuesday<br>Thursday<br>Friday<br>Friday |
| Week 15 | | Topic | *Planning for a sustainable and equitable future*<br>We will explore how the most vulnerable populations are being considered in current climate planning if at all? We will use examples such as Boston Climate Ready and Adapting to Rising Tides in San Francisco to understand how social vulnerability is implemented across different planning efforts and explore how these themes may be considered in planning across Florida. | |
| | | Readings/Works | Rush, Elizabeth, 2019, *Rising: Dispatches from the New American Shore*, Afterward pg 253-264<br><br>Bick et al., in review, Rising seas, rising inequity? Communities at risk in the San Francisco Bay Area and implications for adaptation policy.<br><br>Hard, R.D., Milligan, R.A., and Heynen, N. (2017) Racial coastal formation: The environmental injustice of colorblind adaptation planning for sea level rise. *Geoforum*. 87, 62-72. | |
| | | Assignment | Reflection #4: Reflection on decision-making activity<br>Key Takeaways/Discussion Questions<br>In-Class Activity | Tuesday<br>Thursday<br>Friday |

| Week/ Date | Theme | Activity | Topic/Assignment (Question/Subject) | Assigned Work Due |
|---|---|---|---|---|
| | | | Quiz 12 | |
| | | | | |
| Week 16 | | Topic | *The future of the Florida coast, final reflections and questions*<br>We will recap the course and discuss open questions in the field of sea level rise, coastal science, adaptation, and resilience. | |
| | | Assignment | Final project due | Wednesday |
| | | | | |
| Finals Week | | Final | Final Reflection Due | |
| | | | | |

# III. Grading

## 3. Statement on Attendance and Participation

### Attendance and Participation:

Requirements for class attendance and make-up exams, assignments, and other work in this course are consistent with university policies that can be found at: https://catalog.ufl.edu/UGRD/academic-regulations/attendance-policies/

- Attendance: will be taken during each class meeting and recorded. Attendance and participation are critical to successful completion of this course. Students are allowed one "personal day" for the semester, after which each absence that does not meet university criteria for "excused" will result in a one-point deduction from their final grade.
- Participation: Consistent informed, thoughtful, and considerate class participation is expected and will be evaluated using the rubric below. I will inform you of your participation grade to date when mid-term exams are returned.
- Note: If you have personal issues that prohibit you from joining freely in class discussion, e.g., shyness, language barriers, etc., see the instructor as soon as possible to discuss alternative modes of participation.

### Participation Grading Rubric:

| | High Quality | Average | Needs Improvement |
|---|---|---|---|
| Informed: Shows evidence of having done the assigned work. | 2 | 1.25 | 0.5 |
| Thoughtful: Shows evidence of having understood and considered issues raised. | 2 | 1.25 | 0.5 |
| Considerate: Takes the perspective others into account. | 2 | 1.25 | 0.5 |

## 4. Grading Scale

For information on how UF assigns grade points, visit: https://catalog.ufl.edu/UGRD/academic-regulations/grades-grading-policies/

| | | | | |
|---|---|---|---|---|
| A | 93.5 – 100% of possible points | | C | 73.5 – 76.5% |
| A- | 89.5 – 93.5% | | C- | 79.5 – 73.5% |
| B+ | 86.5 – 89.5% | | D+ | 66.5 – 69.5% |
| B | 83.5 – 86.5% | | D | 63.5 – 66.5% |
| B- | 79.5 – 83.5% | | D- | 59.5 – 63.5% |
| C+ | 76.5 – 79.5% | | E | <59.5 |

# IV. Quest Learning Experiences

## 5. Details of Experiential Learning Component

Students are expected to visit the Florida Museum of Natural History's "South Florida People & Environments" exhibit on their own time before Week 8 (while there they also might want to check out "Northwest Florida: Waterways & Wildlife!") This exhibit documents how the Calusa, the indigenous nation of south Florida, adapted to living along the coast. Students will use this experience to compare and contrast how past cultures used coastlines with contemporary coastal uses. We will discuss this trip in class Week 8 before the midterm.

During the term, students will read excerpts from the text *Rising: Dispatches from the New American Shore* that are complementary to weekly course material. This text provides narratives of coastal change through a diverse set of perspectives. In class, students will use a variety of real data sets for quantitative analysis of physical processes and consider real adaptation plans for communities within Florida and across the United States.

## 6. Details of Self-Reflection Component

Over the course, students will reflect on their perceptions of sea level rise and how it impacts their daily lives, as well as the lives of others around them. Through guided prompts, students are encouraged to think about their relationship with the coastline and how sea level rise may alter that relationship. The experiential learning components, visiting the Florida Museum of Natural History to view past cultural use of SE Florida, as well as reading the text *Rising: Dispatches from the New American Shore* will engage students in viewing ties to the coastlines across different cultures and socio-economic backgrounds in ways that may be different than their own.

# V. General Education and Quest Objectives & SLOs

## 7. This Course's Objectives—Gen Ed Primary Area and Quest

### Physical Sciences + Quest 2 + Course Objectives

| **Physical Sciences Objectives ➔** | **Quest 2 Objectives ➔** | **This Course's Objectives ➔** (This course will….) | **Objectives will be Accomplished By:** (This course will accomplish the objective in the box at left by…) |
|---|---|---|---|
| Physical science courses provide instruction in the basic concepts, theories and terms of the scientific method in the context of the physical sciences. | Address in relevant ways the history, key themes, principles, terminologies, theories, or methodologies of the various social or biophysical science disciplines that enable us to address pressing questions and challenges about human society and/or the state of our planet. | • This course will explore the drivers of long-term sea level change, how sea level rise is measured, and how sea level will continue to change in the future.<br>• This course will identify how sea level rise drives environmental change, altering landscapes, habitats, and ecosystems. | … examining rates of global and regional sea level rise from observed satellite, tide gauge, and geologic proxy datasets.<br>… evaluating the mechanisms for coastal landscape evolution and evidence for recent coastal changes. |
| Courses focus on major scientific developments and their impacts on society, science and the environment, | Present different social and/or biophysical science methods and theories and consider how their biases and influences shape | • This course will explore the uncertainty in the future rate and magnitude of sea | … examining a range of mechanisms driving sea level change and the uncertainty in |

| Physical Sciences Objectives ➔ | Quest 2 Objectives ➔ | This Course's Objectives ➔ (This course will….) | Objectives will be Accomplished By: (This course will accomplish the objective in the box at left by…) |
|---|---|---|---|
| and the relevant processes that govern physical systems. | pressing questions about the human condition and/or the state of our planet. | level rise.<br>• This course will explore how sea level rise-driven physical changes to coastal systems impact society. | future projections.<br>… evaluating the risk sea level rise poses to habitats, infrastructure, the economy, and the social well-being of coastal communities. |
| Students will formulate empirically-testable hypotheses derived from the study of physical processes, apply logical reasoning skills through scientific criticism and argument, and apply techniques of discovery and critical thinking to evaluate outcomes of experiments. | Enable students to analyze and evaluate (in writing and other forms of communication appropriate to the social and/or biophysical sciences) qualitative or quantitative data relevant to pressing questions concerning human society and/or the state of our planet. | • This course will explore the benefits and consequences of sea level rise mitigation and adaptation options.<br>• This course will demonstrate the complexities of decision making in an uncertain future | …determining the range of solutions available for sustainable coastal futures using case studies along the Florida coast.<br>… evaluating adaptation plans from real world communities. |
| | Analyze critically the role social and/or the biophysical sciences play in the lives of individuals and societies and the role they might play in students' undergraduate degree programs. | • This course will examine sea level rise from a variety of perspectives, including that of the student and of scientists, engineers, land use managers, local governments, and residents | …reflecting on others' relationship with the coast across varying cultures and socioeconomic backgrounds. |
| | Explore or directly reference social and/or biophysical science resources outside the classroom and explain how engagement with | • This course will engage students in historical and contemporary issues surrounding coastal change | …encouraging a visit to the local natural history museum and using real world case studies in |

| Physical Sciences Objectives ➔ | Quest 2 Objectives ➔ | This Course's Objectives ➔ (This course will….) | Objectives will be Accomplished By: (This course will accomplish the objective in the box at left by…) |
|---|---|---|---|
| | those resources complements classroom work. | | the classroom, like local adaptation plans. |

## 8. This Course's Student Learning Outcomes (SLOs)—Gen Ed Primary Area and Quest

## Physical Sciences + Quest 2 + Course SLOs

| | Physical Sciences SLOs ➔ Students will be able to… | Quest 2 SLOs ➔ Students will be able to… | This Course's SLOs ➔ Students will be able to… | Assessment Student competencies will be assessed through… |
|---|---|---|---|---|
| Content | **Identify, describe, and explain** the basic concepts, theories and terminology of natural science and the scientific method; the major scientific discoveries and the impacts on society and the environment; and the relevant processes that govern biological and physical systems. | **Identify, describe, and explain** the cross-disciplinary dimensions of a pressing societal issue or challenge as represented by the social sciences and/or biophysical sciences incorporated into the course. | **Identify, describe, and explain** how sea level rise is observed in present-day and past records, the processes that drive long-term sea level change, and regional projections of sea level change for Florida.<br><br>**Compare and contrast** how sea level rise impacts a variety of landscapes and the techniques humans use to mitigate these changes along developed coastlines. | Learning Check Point Quizzes, In-Class Activities, Midterm Exam, Class Discussions and Participation |

| | **Physical Sciences SLOs ➔**<br>Students will be able to… | **Quest 2 SLOs ➔**<br>**Students will be able to…** | **This Course's SLOs ➔**<br>**Students will be able to…** | **Assessment**<br>**Student competencies will be assessed through…** |
|---|---|---|---|---|
| **Critical Thinking** | **Formulate empirically-testable hypotheses** derived from the study of physical processes or living things; apply logical reasoning skills effectively through scientific criticism and argument; and apply techniques of discovery and critical thinking effectively to solve scientific problems and to evaluate outcomes. | **Critically analyze** quantitative or qualitative data appropriate for informing an approach, policy, or praxis that addresses some dimension of an important societal issue or challenge. | **Evaluate and apply** science-based principles needed to inform management and policy outcomes designed to manage, adapt, or mitigate impacts from sea level rise. | In-Class Role Play, In-Class Activities, Midterm Exam, Final Project, Class Discussions and Participation |
| **Communication** | Communicate scientific knowledge, thoughts, and reasoning clearly and effectively. | **Develop and present**, in terms accessible to an educated public, clear and effective responses to proposed approaches, policies, or practices that address important societal issues or challenges. | **Develop** a research project related to how sea level rise will impact a topic of their interest.<br><br>**Present** final project results in a tone for a specific stakeholder of interest.<br><br>**Present** technical, scientific papers distilled to key points and main message. | Class Discussions and Participation, Final Project and Presentation |
| **Connection** | N/A | **Connect course content** with critical reflection on their intellectual, personal, and professional development at UF and beyond. | **Reflect on** how they utilize the coastline, how sea level rise may alter those uses, and how their perspective compares to others' with different cultural backgrounds. | Guided Reflections, Experiential Learning Activities |

## 9. Secondary Objectives and SLOs (Optional)

## Diversity Objectives (for D co-designation)

| Diversity Objectives ➔ | This Course's Objectives➔ **(This course will….)** | Objectives will be Accomplished By: (This course will accomplish the objective in the box at left by…) |
|---|---|---|
| Students engage with diversity as a dynamic concept related to human differences and their intersections, such as (but not limited to) race, gender identity, class, ethnicity, religion, age, sexual orientation, and (dis)abilities. | • This course will explore the social vulnerability of coastal communities | … by considering the demographics of coastal areas. |
| Students critically analyze and evaluate how social inequities are constructed and affect the opportunities and constraints across the US population. | • This course will explore how sea level rise-driven physical changes to coastal systems have the potential to impact society disproportionately<br>• This course will explore how inequitable relationships to sea level rise are constructed | …evaluating the risk sea level rise poses to socially vulnerable communities.<br>…acknowledging disproportionate impacts of present-day policies and long term planning goals. |
| Students analyze and reflect on the ways in which cultures and beliefs mediate their own and other people's understandings of themselves and an increasingly diverse U.S. society. | • This course will explore the ways that different group's relationships with the coast reflect their diverse backgrounds and cultural heritage | …evaluating sea level rise-induced change through a variety of perspectives. |

## Diversity Student Learning Outcomes (for D co-designation)

| | **Diversity SLOs ➔**<br>Students will be able to… | **Course SLOs ➔**<br>**Students will be able to…** | **Assessment**<br>**Student competencies will be assessed through…** |
|---|---|---|---|
| **Content** | Identify, describe, and explain the historical processes and contemporary experiences characterizing diversity as a dynamic concept related to human differences and their intersections, such as (but not limited to) race, gender identity, class, ethnicity, religion, age, sexual orientation, and disability. | **Identify, describe, and explain** the Social Vulnerability Index and how it can be used to highlight existing spatial inequalities and how this landscape may change<br><br>**Describe** the relationship with the coastline across different cultures, and what this means for response to sea level rise. | In-Class Discussions, In Class Activities, Guided Reflection |
| **Critical Thinking** | Analyze and evaluate how social inequities are constructed and affect the opportunities and constraints of different groups in the United States. Analyze and reflect on the ways in which cultures and beliefs mediate understandings of an increasingly diverse U.S. society. | **Analyze and evaluate** how social vulnerability and equity are addressed in sea level rise adaptation planning. | In-Class Discussions, In Class Activities, Guided Reflections, Final Project |

# VI. Required Policies

## 10. Students Requiring Accommodation

Students with disabilities who experience learning barriers and would like to request academic accommodations should connect with the disability Resource Center by visiting https://disability.ufl.edu/students/get-started/. It is important for students to share their accommodation letter with their instructor and discuss their access needs, as early as possible in the semester.

## 11. UF Evaluations Process

Students are expected to provide professional and respectful feedback on the quality of instruction in this course by completing course evaluations online via GatorEvals. Guidance on how to give feedback in a professional and respectful manner is available at https://gatorevals.aa.ufl.edu/students/. Students will be notified when the evaluation period opens, and can complete evaluations through the email they receive from GatorEvals, in their Canvas course menu under GatorEvals, or via https://ufl.bluera.com/ufl/. Summaries of course evaluation results are available to students at https://gatorevals.aa.ufl.edu/public-results/.

## 12. University Honesty Policy

UF students are bound by The Honor Pledge which states, "We, the members of the University of Florida community, pledge to hold ourselves and our peers to the highest standards of honor and integrity by abiding by the Honor Code. On all work submitted for credit by students at the University of Florida, the following pledge is either required or implied: "On my honor, I have neither given nor received unauthorized aid in doing this assignment." The Honor Code (https://www.dso.ufl.edu/sccr/process/student-conduct-honor-code/) specifies a number of behaviors that are in violation of this code and the possible sanctions. Furthermore, you are obligated to report any condition that facilitates academic misconduct to appropriate personnel. If you have any questions or concerns, please consult with the instructor or TAs in this class.

## 13. Counseling and Wellness Center

Contact information for the Counseling and Wellness Center: https://counseling.ufl.edu/, 392-1575; and the University Police Department: 392-1111 or 9-1-1 for emergencies.

## 14. The Writing Studio

The writing studio is committed to helping University of Florida students meet their academic and professional goals by becoming better writers. Visit the writing studio online at http://writing.ufl.edu/writing-studio/ or in 2215 Turlington Hall for one-on-one consultations and workshops.