

# **GEO 3930: SEA LEVEL VARIABILITY AND CHANGE**

**SPRING 2020**

**T| Period 8-9 (3:00 PM – 4:55 PM)**

**R| Period 9 (4:00 PM – 4:55 PM)**

**3012 Turlington Hall**

**Instructor:** Dr. Katy Serafin

**Office:** TBA Turlington

**Phone:** TBA

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**Office Hours:** TBA

## **COURSE DESCRIPTION:**

This course explores why sea level varies in space and time. Students will learn how sea level is measured, why there are differences between global and regional sea level, and how tides, storms, and the loss of glaciers and ice sheets alter the elevation of the sea. Understanding the drivers of sea level change over minutes to millennia helps coastal communities threatened by flooding events predict and mitigate future impacts.

## **COURSE GOALS**

1. Develop fundamental geospatial skills and concepts needed to assess processes that produce sea level change
2. Understand how sea levels have changed in the past and how they continue to change
3. Understand the complexity of sea level science and the uncertainty in planning for the future
4. Appreciate how natural and physical sciences are used to address real-world problems
5. Develop oral and written science communication skills

## **COURSE LEARNING OUTCOMES**

By the end of this course, students will be able to:

- Explain the term “sea level” and describe techniques for measuring sea level
- Identify where to find and download tide gauge data from across the world
- Analyze trends in tide gauge data to assess how sea level is changing
- Differentiate the mechanisms that produce changes in sea level over the short-term and the long-term
- Interpret the drivers of sea level change on a regional and global basis
- Compare current changes of sea level to past sea level variation
- Identify and discuss future projections of sea level and the related uncertainty
- Communicate findings in written and oral formats

## **REQUIRED TEXTS**

There is no required textbook for this course. Students will be assigned readings on a weekly basis and these will be made available on Canvas or in hard copy from the instructor

## **GENERAL COURSE POLICIES**

### **Late Work**

Late work will only be accepted in exceptional circumstances, but you must contact me immediately if you need an exception. The earlier you contact me to request a late submission the better. Requests will be considered on a case by case basis.

### **Attendance**

If you must miss a class for any reason please contact me by email or phone prior to the absence. Excused

absences are consistent with university policies in the undergraduate catalog (<https://catalog.ufl.edu/UGRD/academic-regulations/attendance-policies/>) and require appropriate documentation. You will be responsible for obtaining any handouts and/or materials that were distributed during your absence.

### **Grade Disputes**

Should a student wish to dispute any grade received in this class (other than simple addition errors), the dispute must be in writing and be submitted to the instructor within a week of receiving the grade. The dispute should set out very clearly, the grade that the student believes the assignment should have received as well as why they believe that they should have received such a grade.

### **Cell Phones**

Cell phones must be turned to silent or, for emergencies only, be set to “vibrate” during class. In the event of an emergency (and in order to keep from disturbing others), you must leave the classroom to accept an emergency call. You may not answer a call or text in the classroom. Disregard for these guidelines may result in disciplinary action, which could include the student being excused from class and marked absent for that day.

### **EVALUATION OF STUDENT PERFORMANCE:**

In-Class Quizzes	20%
Assignments and Discussions	30%
Participation	10%
Final Project	40%

### **GRADE DISTRIBUTION**

#### 1. In-Class Quizzes (20 points)

Students will receive short, approximately bi-weekly, in-class quizzes. Quizzes will occur on Thursdays and will be based on course readings, class activities, and lecture material from the previous two weeks. Each quiz is worth 4 points, and the final grade will be determined using the best 5 grades out of the 6 quizzes, with the lowest grade being dropped.

#### 2. Assignments and Discussions (30 points)

In-class activities and/or homework will be assigned on a weekly basis. Most activities are intended to be completed in class. Students are expected to participate in discussions either online or in the classroom. Students can expect to lead class discussions based on a course topic. Students will be provided a scientific article and will provide a brief overview of the reading and encourage discussion through open-ended questions. Students are encouraged to be creative and may use power-point, activities, or other means of generating class discussion. Students will be assigned a date and a specific discussion topic to lead following the drop/add date once the number of students in the class is finalized. During discussions keep the following in mind:

- Listen actively and attentively
- Do not interrupt one another
- Critique ideas, not people
- Do not monopolize the discussion

#### 3. Participation (10 points)

Attendance and participation in class activities is required. Students will earn 0.4 points for each class session attended from beginning to end and in which the student actively participates in a professional manner, for a total of 10 points. The grade is determined by tardiness, absenteeism, participation in group activities, prior preparation, and associated classroom activities.

#### 4. Final Project (40 points)

Students will collect tide gauge data from different locations around the world and assess how sea level is changing regionally in an oral presentation and written paper. This project is composed of multiple parts, where students will first download and plot sea level observations from two selected tide gauges, then analyze and interpret the data. Results will be summarized in both an in-class presentation and a written paper. Stages of project development will be graded and returned to the student to ensure progress.

#### Required Products:

- Location selection (due week 4, 5 points)
  - Students will select and submit two tide gauges for their final project. Students must choose gauges at two different sites located on different continents or oceans with a length of at least 50 years.
- Data Download and Format (due week 8, 5 points)
  - Students will submit a downloaded and formatted data file and one figure of a sea level time series for one of their two selected locations. Acceptable data formats include .csv, .xlsx, .txt, .mat.
- Project Outline (due week 10, 5 points)
  - Students will provide an outline of their final paper. An outline will help to arrange and develop ideas to guide student final presentations and papers. The outline should consider the following sections:
    - Introduction
    - Study Area (Where are your tide gauges located?)
    - Methods (Where is your data from and how are you analyzing it?)
    - Results and Discussion (How is sea level changing at your locations? What are the drivers of sea level change?)
- In-Class Presentation (due week 12, 10 points)
  - In class presentations will focus on the interpretation of the tide gauge data. Students should consider the following in their presentations, guided by their outlines:
    - Geographic location of tide gauges
    - Summary of key findings including facts, inferences, and conclusions
    - Outstanding questions or ideas for future research
- Final Paper (due Finals week, 15 points)
  - Final paper will be based off previous project outline and in class presentations
  - Students should include a final section on future sea level trends, projections and potential impacts
  - Be sure to cite all sources!

#### Grading Scale (& GPA equivalent):

<b>A</b> 100-93 (4.0)	<b>A-</b> 92-90 (3.67)	<b>B+</b> 89-87 (3.33)	<b>B</b> 86-83 (3.0)	<b>B-</b> 82-80 (2.67)	<b>C+</b> 79-77 (2.33)	<b>C</b> 76-73 (2.0)	<b>C-</b> 72-70 (1.67)	<b>D+</b> 69-67 (1.33)	<b>D</b> 63-66 (1.0)	<b>D-</b> 62-60 (0.67)	<b>E</b> 59- (0)
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**Note:** A grade of C- is not a qualifying grade for major, minor, Gen Ed, or College Basic distribution credit. For further information on UF's Grading Policy, see:

<https://catalog.ufl.edu/UGRD/academic-regulations/grades-grading-policies/#hgrades>

<http://www.isis.ufl.edu/minusgrades.html>

## COURSE SCHEDULE

Students should note that the syllabus is a guideline and that there may be changes to the class schedule.

Due dates below are tentative and can be changed at the discretion of the instructor.

Week	Date	Course Material	Assignments
1	7 Jan 9 Jan	Course Logistics and Introduction Measuring Sea Levels	Syllabus Activity
<i>Tides</i>			
2	14 Jan 16 Jan	Datums and Sea Level Statistics Tidal Forces	In Class Quiz 1
3	21 Jan 23 Jan	Tidal Forces; Tidal Analysis and Prediction Tidal Dynamics	
<i>Meteorological and Other Effects</i>			
4	28 Jan 30 Jan	Storm Surge and Meteotsunamis Waves (wind + tsunami)	Project Locations due Jan 28 In Class Quiz 2
<i>Variations in Mean Sea Level</i>			
5	4 Feb 6 Feb	Seasonal and Interannual (e.g., ENSO) Seasonal and Interannual (e.g., ENSO)	
6	11 Feb 13 Feb	Eustatic (global) and Isostatic (local) Eustatic (global) and Isostatic (local)	In Class Quiz 3
7	18 Feb 20 Feb	<i>NO CLASS; WORK ON DATA DOWNLOAD AND PROJECT OUTLINE</i>	
8	25 Feb 27 Feb	Project Check in and Troubleshooting Sea Level Drivers Review	Mid-Course assessment Project Data Download due Feb 27
	3 Mar 5 Mar	<i>SPRING BREAK</i>	
<i>Past and Future Sea Levels</i>			
9	10 Mar 12 Mar	Measuring Past Sea Levels Past Sea Levels	In Class Quiz 4
10	17 Mar 19 Mar	Modeling Future Sea Levels Global and Regional Sea Level Projections	Project Outline due Mar 17
11	24 Mar 26 Mar	Global and Regional Sea Level Projections Extreme Sea Levels and Future Flood Risk	In Class Quiz 5
12	31 Mar 2 Apr	Presentations Extreme Sea Levels and Future Flood Risk	Project Presentations Mar 31
<i>Theme: Impacts</i>			
13	7 Apr 9 Apr	Impacts of Changing Sea Levels Impacts of Changing Sea Levels	

14	14 Apr	Responding to Sea Level Rise Impacts	In Class Quiz 6
	16 Apr	Responding to Sea Level Rise Impacts	
15	21 Apr	Implications for Florida; Course Wrap Up	
	23 Apr	<i>READING DAY</i>	
	28 Apr	<i>EXAM WEEK</i>	Final paper due Apr 28 by midnight

### ACADEMIC HONESTY

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://sccr.dso.ufl.edu/policies/student-honor-code-student-conduct-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 in this class.

### STUDENTS REQUIRING ACCOMODATIONS

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.

### COURSE EVALUATION

Student feedback is greatly appreciated and taken seriously. Students are expected to provide professional and respectful feedback on the quality of instruction of 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 menus under GatorEvals, or via <http://ufl.bluera.com/ufl/>. Summaries of course evaluation results are available to students at <https://gatorevals.aa.ufl.edu/public-results/>.

### COUNSELING AND MENTAL HEALTH RESOURCES

Students facing difficulties completing the course or who are in need of counseling or urgent help should call the on-campus Counseling and Wellness Center (352-392-1575; <https://counseling.ufl.edu/>).

### ADDITIONAL CAMPUS RESOURCES

#### Academic Resources

*E-learning technical support*, 352-392-4357 (select option 2) or email to [Learning-support@ufl.edu](mailto:Learning-support@ufl.edu).  
<https://lss.at.ufl.edu/help.shtml>

*Career Resource Center*, Reitz Union, 352-392-1601. Career assistance and counseling.  
<http://www.crc.ufl.edu>

*Library Support*, <http://cms.uflib.ufl.edu/ask> Various ways to receive assistance with respect to using the libraries or finding resources.

*Teaching Center*, Broward Hall, 352-392-2010 or 352-392-6420. General study skills and tutoring. <http://teachingcenter.ufl.edu/>

*Writing Studio*, 2215 Turlington Hall, 352-846-1138. Help brainstorming, formatting, and writing papers. <http://writing.ufl.edu/writing-studio/>

*Student Complaints*, <https://registrar.ufl.edu/writtencomplaints>

### **Health and Wellness Resources**

*U Matter, We Care*: If you or a friend is in distress, please contact [umatter@ufl.edu](mailto:umatter@ufl.edu) or 352-392-1575 so that a team member can reach out to the student.

*Sexual Assault Recovery Services (SARS)*, Student Health Care Center, 352-392-1161. More information on resources to help students with sexual violence issues at [www.umatter.ufl.edu/sexual\\_violence](http://www.umatter.ufl.edu/sexual_violence)

*Sexual Harassment*, Information on UF policies, awareness, reporting, and counseling at [www.hr.ufl.edu/managerresources/policies-2/sexual-harassment/](http://www.hr.ufl.edu/managerresources/policies-2/sexual-harassment/)

*University Police Department*, 352-392-1111 (or 9-1-1 for emergencies). <http://www.police.ufl.edu/>