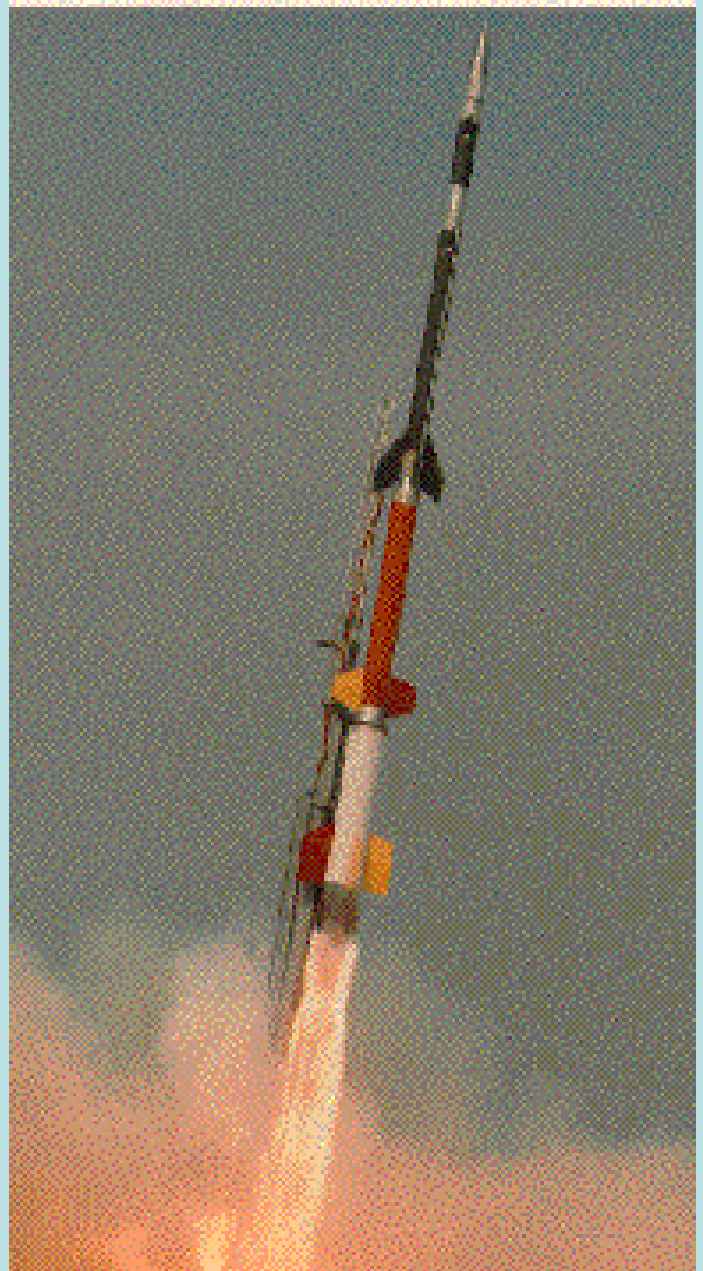
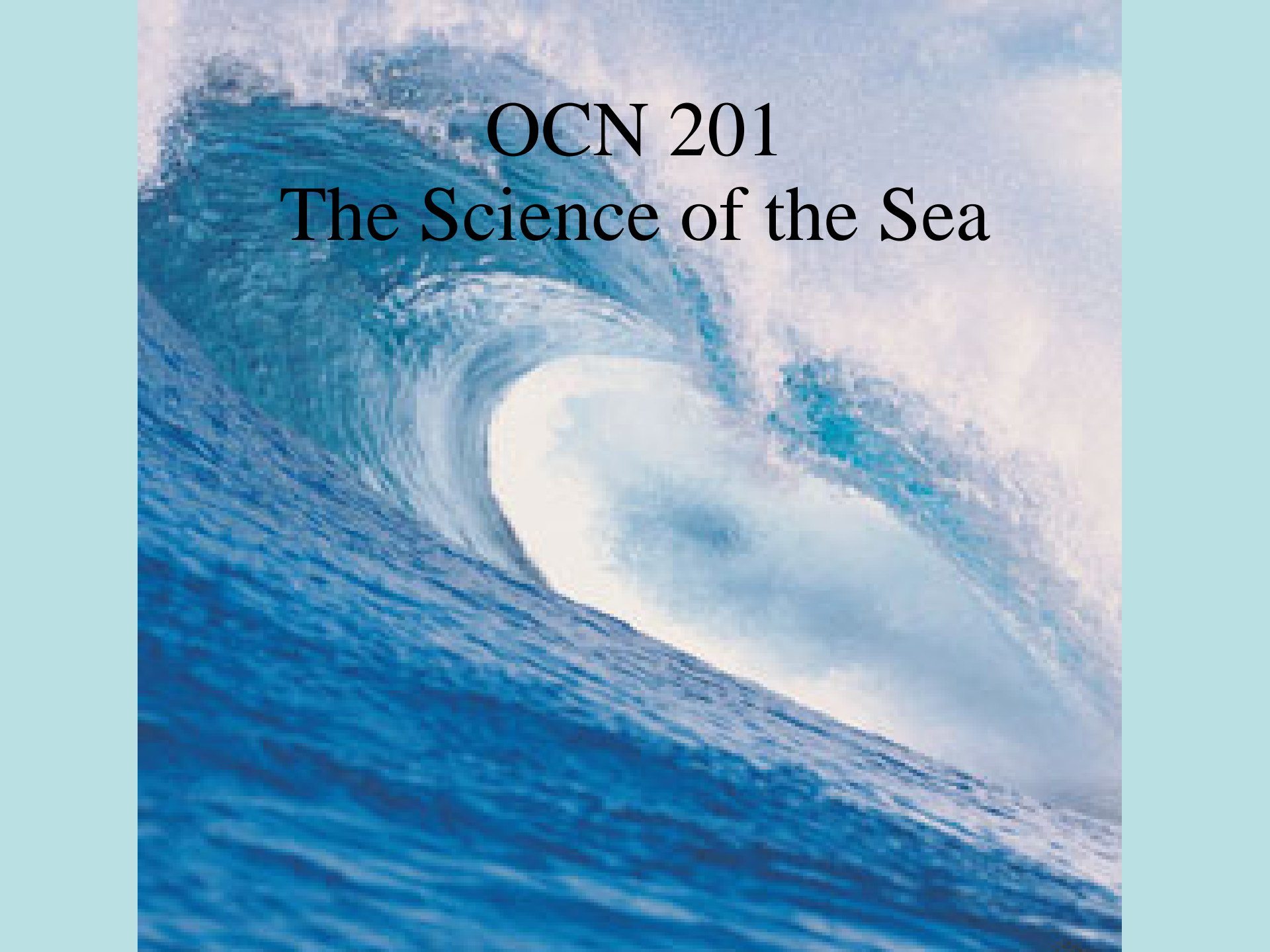


# Rocket Science 653



# Basket Weaving 101



An aerial photograph of a large oceanic eddy, also known as a 'whirlpool' or 'cyclone', in the open sea. The eddy is a circular feature with a white, turbulent center, surrounded by concentric rings of blue and white water. The surrounding ocean is a deep blue with visible wave patterns. The text 'OCN 201' and 'The Science of the Sea' is overlaid on the top half of the image.

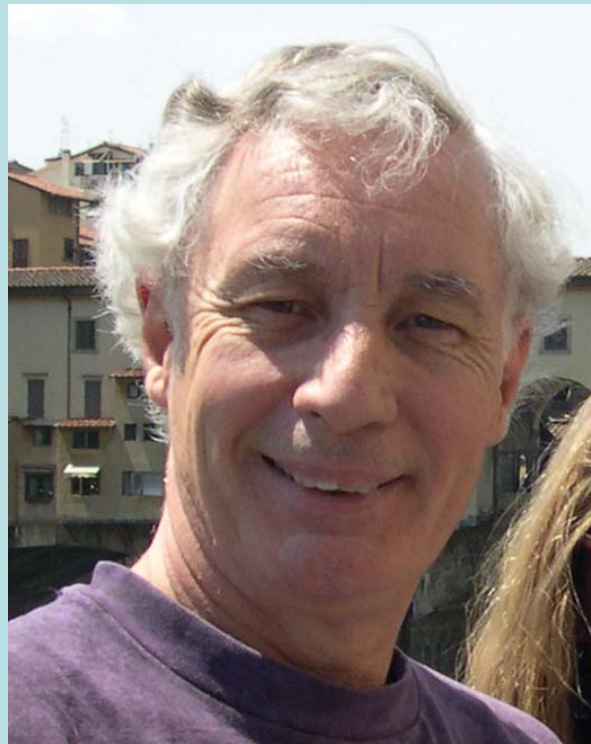
**OCN 201**  
**The Science of the Sea**



# Instructors



Mike Mottl  
Geology



Chris Measures  
Chemistry and  
Physics  
(Course Coordinator)



Grieg Steward  
Biology

# Teaching Assistants



Sharina Repollo



Michelle Jungbluth  
Head TA

Shayle Matsuda



Rebecca Simpson



Gerianne Terlouw

Paula Moehlenkamp



# Why are you in College?

*(I hope this isn't the only reason,  
but it's a good one!)*



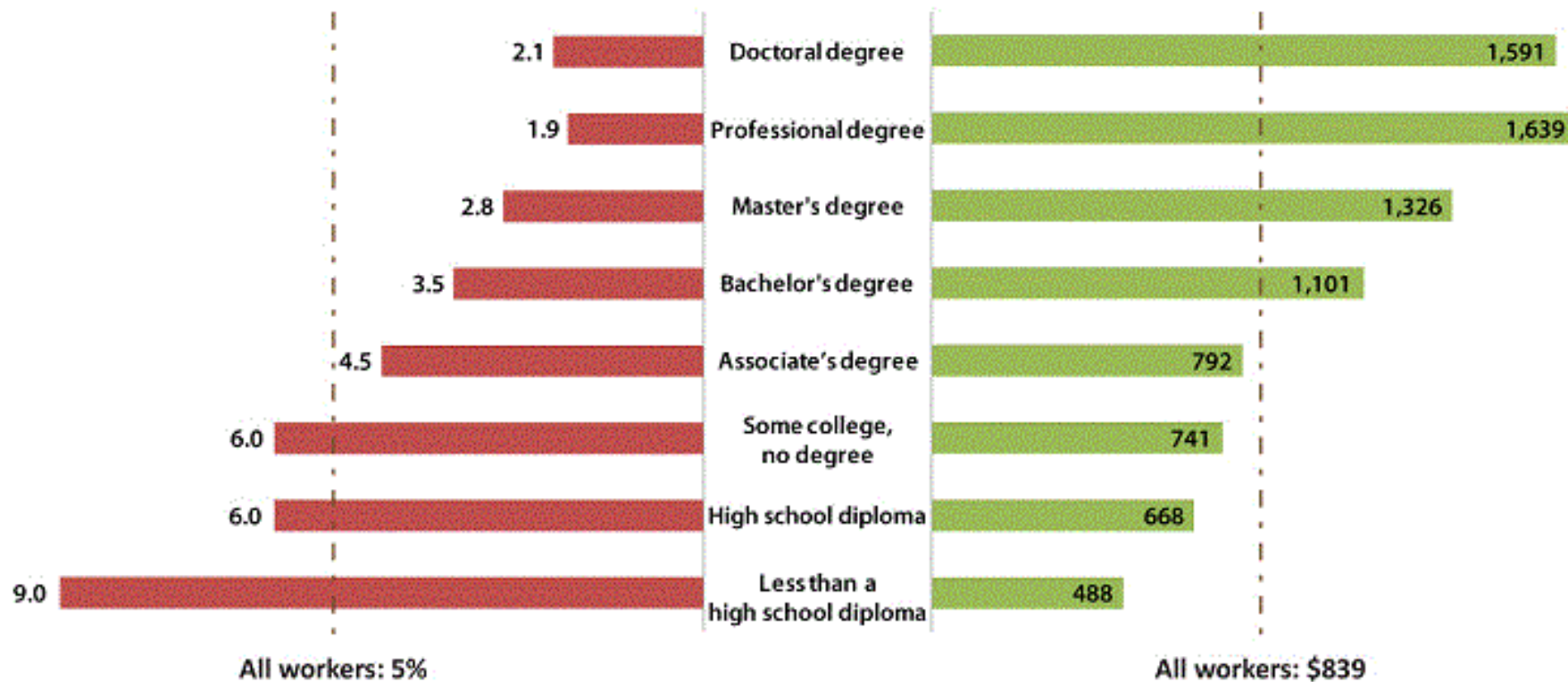
Unemployment rates and median compensation levels for all workers over 25 years of age (US Bureau of Labor Statistics)

<b>Unemployment rate in 2014 (Percent)</b>	<b>Education attained</b>	<b>Median annual earnings in 2014 (Dollars)</b>
2.1	Doctoral degree	\$82,732
1.9	Professional degree	\$85,228
2.8	Master's degree	\$68,952
3.5	Bachelor's degree	\$57,252
4.5	Associate degree	\$41,184
6.0	Some college, no degree	\$38,532
6.0	High-school graduate	\$34,746
9.0	Not a high-school graduate	\$25,376

# Earnings and unemployment rates by educational attainment

Unemployment rate in 2014 (%)

Median weekly earnings in 2014 (\$)



Note: Data are for persons age 25 and over. Earnings are for full-time wage and salary workers.  
Source: Current Population Survey, U.S. Bureau of Labor Statistics, U.S. Department of Labor



# Why are you here taking OCN 201?

To satisfy a Core requirement:

a legitimate reason, but not a good one!



To increase your lifelong ENJOYMENT of the ocean.

The more you know about a subject, the more you can enjoy it

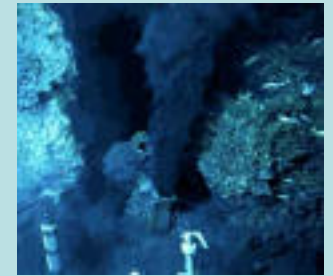
This is an OCEAN APPRECIATION course!

To learn how SCIENCE works.

How does science approach questions about the world?

What can science tell us about the world?

What CAN'T it tell us, i.e. what are its limitations?



To learn about the SINGLE BIGGEST THING on the surface of the Earth.

The oceans affect everything on Earth, directly or indirectly,  
including human affairs.

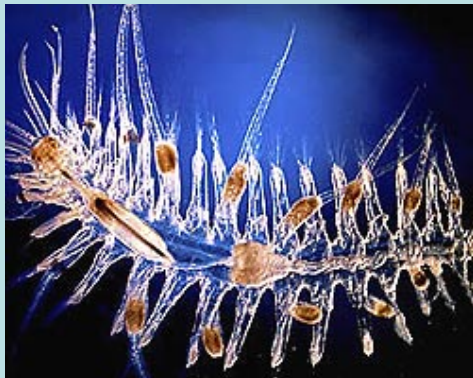
# What is Oceanography?

- A branch of Earth Sciences (geology, atmospheric sciences, etc.)
- Very hard to separate one part from another.
- How do processes of biology, geology, chemistry, and physics interact?

We will cover subjects as diverse as the origin of the Universe and Polynesian Navigation.

We will learn about processes as far apart as the center of the Earth and the upper reaches of the atmosphere.

We will learn about biology of the oceans from microscopic organisms to whales.

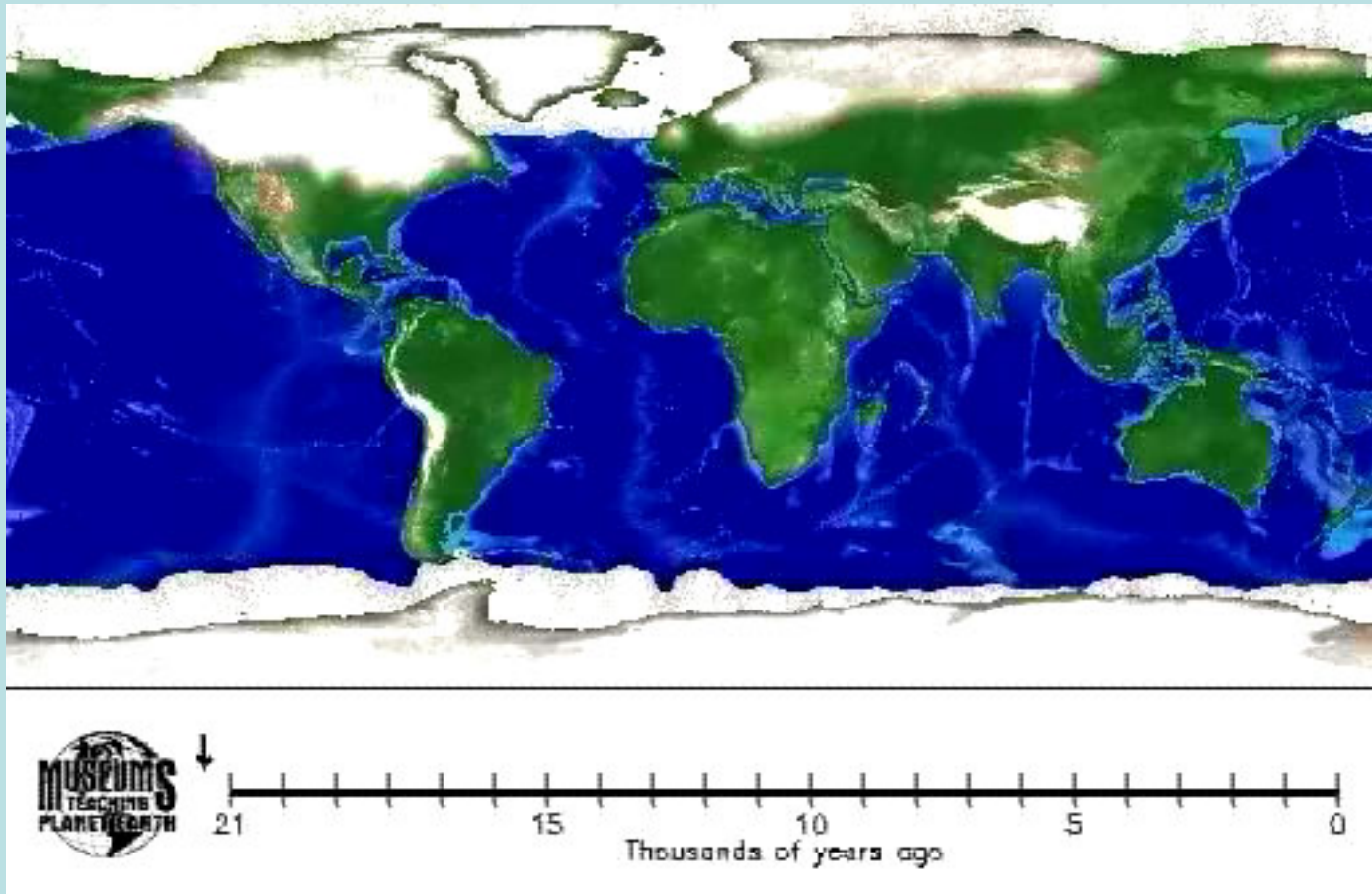


## Goal of Earth Sciences:

To understand how the planet operates today.

How did it operate in the past?

How will it operate in the future?



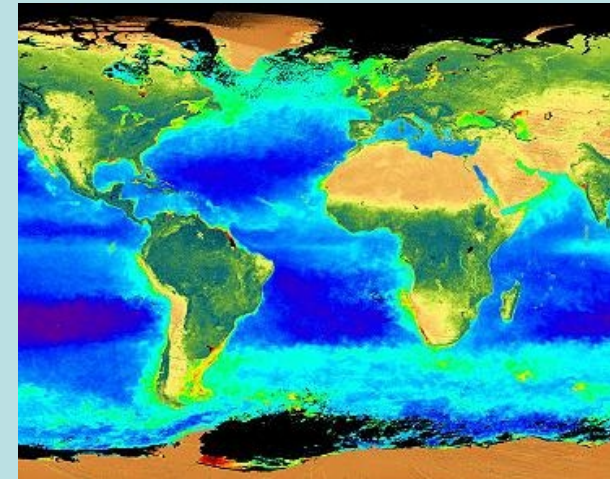
# *Study of our planet is very young.*



Geology is ~200 years old,  
and Biology ~300 years.

**Oceanography** is only ~70 years old!

Not much is known, lots to discover:  
makes the field exciting.



Some of what we teach may turn out not to be true.

Science always challenges existing theories;  
that's how they get improved!



**Warning:**

*Scientific theories may challenge religious beliefs.*

*It is not the goal of science to challenge religion*, but religions run a risk when they make assertions about natural phenomena.

For example, the age of the Earth can be measured.

It is *not* 6,000 years old, as claimed by some based on biblical texts.

Scientific knowledge and theories underpin our entire modern economic system.

Massive improvements in standard of living and life expectancy since the 1600s all result from the development of modern scientific theories and their application to our lives.

Google “ocn 201” to find our web home page:

OCN 201- Science of the Sea, University of Hawai'i - Internet Explorer provided by Dell

http://www.soest.hawaii.edu/oceanography/courses\_html/OCN201/

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OCN 201- Science of the Sea, University of Hawai'i

# OCN 201 Science of the Sea

[Course Information](#)

[Course Schedule](#)

[Lab Information](#)

[Lab Schedule](#)

[Field Trips](#)

[Galleries](#)

[Glossaries](#)

## Announcements


Welcome to OCN 201!!

[iClicker Information](#)

[Register your iClicker](#)



*Maiko swimming in Hanauma Bay in shallow water.*



*Jason being deployed*

Done

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[http://www.soest.hawaii.edu/oceanography/courses\\_html/OCN201/](http://www.soest.hawaii.edu/oceanography/courses_html/OCN201/)

# OCN 201 Course Information

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## Oceanography 201: Science of the Sea Fall 2015 - Course information

Instructors	
Michael Mottl	Course Coordinator; Geological Oceanography
Glenn Carter	Chemical and Physical Oceanography
Grieg Steward	Biological Oceanography

### Teaching Assistants

Jenny Murphy (Head TA)

Fabio De Leo

Jason Friedman

Olivia Nigro

Arisa Okazaki

Email questions can be directed to: [ta@soest.hawaii.edu](mailto:ta@soest.hawaii.edu)

### TEACHING ASSISTANTS (TAs):

The TAs are available to discuss course material and answer questions during [office hours](#). You are encouraged to utilize the TA services, as they are an excellent resource and an important link between you and the professor. They hold scheduled office hours in MSB 113. The hours are posted on the class website.

### GRADING AND EXAMS:

Your grade will be based on three (3) 50-minute in-class exams, class participation and a field trip. The breakdown for course points is as follows:

Exam 1 (Geology Section) :	75
Exam 2 (Chemistry and Physics Section):	75
Exam 3 (Biology Section):	75
Field-trip:	25
Class participation	25

**Total Course Points: 275**

Exams will consist of true/false, multiple choice, and short essay questions. Although the last exam will be given during the regular final exam period, it is not a comprehensive final and is equally weighted with the other course exams.

**NO ABSENCES ARE ALLOWED FROM ANY EXAM**, except under circumstances totally beyond your control. Except for these medical emergencies, excuses must be submitted and approved **BEFORE** the day of the exam. Athletes who will miss an exam due to scheduled games, etc. should inform the TAs 2 weeks prior to the exam.

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# OCN 201 Schedule Fall 2015

MWF: 10:30 am Physical Science 217

MWF: 12:30 pm Spalding 155

**Instructors:** Professor Mottl , Course Coordinator (Geology)  
Professor Carter (Chemistry & Physics) , Professor Steward (Biology)

\*\*If you print the slides, you can choose to print multiple slides per page.

Click file, select "print" and a new window will appear. Next to "Page Scaling" use the drop down menu to select "Multiple pages per sheet".

Date	Week	Lecture and reading assignment	Instructor	Links
Jan 10	1	Introduction	Mottl	
Jan 12		The scientific method and the origin of the universe– Ch 1	Mottl	<a href="#">Deep-space Timeline</a> (PBS)
Jan 14		History of Oceanography – Ch 2	Mottl	<a href="#">Polynesian Voyaging Society</a>
Jan 17	2	<b>Holiday - Martin Luther King Day</b>		
Jan 19		Origin of Earth and oceans – Ch 1	Mottl	
Jan 21		Earth structure – Ch 3	Mottl	<a href="#">Earth's Early Ocean</a> (UCAR)
Jan 24	3	Ocean floor physiography – Ch 4	Mottl	<a href="#">Oceanic Features</a> (COAST)
Jan 26		Continental drift – Ch 3	Mottl	<a href="#">The PaleoMap Project</a> (C.R. Scotese)
Jan 28		Seafloor spreading – Ch 3	Mottl	
Jan 31	4	Plate tectonics I – Ch 3	Mottl	
Feb 02		Plate tectonics II – Ch 3	Mottl	<a href="#">This Dynamic Earth</a> (USGS)
Feb 04		Mantle plumes and Hawaiian volcanoes	Mottl	<a href="#">Hotspots</a> (USGS)
Feb 07	5	Nova video – Hawaii Born of Fire	Mottl	
Feb 09		Deep-Sea sediments – Ch 5	Mottl	
Feb 11		Shelf sediments	Mottl	
Feb 14	6	Coastal processes incl. beach erosion– Ch 12	Mottl	<a href="#">Coastal Erosion</a> (EPA)
Feb 16		Physical resources from the sea – Ch 19	Mottl	
Feb 18		<b>EXAM #1</b>	Team	
Feb 21	7	<b>Holiday - President's Day</b>		
Feb 23		<a href="#">Salinity</a> -* Ch 2 <a href="#">reading</a>	Carter	<a href="#">Water</a> (UH)
Feb 25		How biology and physics move ocean chemicals- <a href="#">reading</a>	Carter	
Feb 28	8	Thermohaline Circulation – Ch 9	Carter	<a href="#">Thermohaline circulation</a> (UEA, UK)
Mar 02		<a href="#">Atmospheric Circulation</a> – Ch 8	Carter	<a href="#">Atmospheric circulation</a> (EIU, USA)
Mar 04		<a href="#">Surface Circulation</a> – Ch 9	Carter	<a href="#">The Major Ocean Currents</a> (UCAR)
Mar 07	9	<a href="#">El Niño</a> – Ch 9 slides	Carter	
Mar 09		Light and Sound in the Sea – Ch 7	Carter	
Mar 11		<a href="#">Waves I</a> – Ch 10	Carter	
Mar 14	10	Waves II and Surf – Ch 10 & 11	Carter	<a href="#">The Physics of Waves</a> (Zona Land)
Mar 16		<a href="#">Tides</a> – Ch 11	Carter	<a href="#">The Physics of Tides</a> (IIT)
Mar 18		<a href="#">Hydrothermal Vents</a> - <a href="#">reading</a>	Carter	<a href="#">Hydrothermal vents</a> (NOAA)
Mar 21-25		<b>Spring Break</b>		



## **Class is organized into two lecture sections:**

Section 1 M W F 10:30 -11:20 Physical Scis. 217

Section 2 M W F 12:30 - 1:20 Art Auditorium

## **6 lab sections**

09:00 - 11:50 am Marine Science Building 203

or

1:30 - 4:20 pm Marine Science Building 203

## **General Education: Diversification requirements:**

OCN 201 counts as a physical science requirement (DP).

OCN 201L counts as laboratory class (DY).

All the instructors are active researchers in the field of Oceanography: you are learning from the experts in the field!

All the TAs in the class are graduate students in Oceanography or Marine Biology.

All are highly motivated and knowledgeable.

Text book is *required*:

Garrison, *An Invitation to Marine Science*, 7th edition

Used copies of 6th edition or earlier are OK too.

# Exams

Class is taught in three sections:

Geology

Chemistry and Physics

Biology

There is an exam at the end of each section which covers *only* the material taught in that section.

# Grading

Each exam is worth 75 points = 225

+ 25 points for class attendance + 25 points for field trip = **275.**

Tests are a mixture of:

True/false, multiple choice = 60 points

Essay questions = 15 points

The “Final” (third) exam is worth the same as the other two.





Final grades are on the same curve that has been used  
for more than 25 years.

*(Your parents might have taken this class!)*

We have added plus/minus grading but the distribution  
is the same: there is no grade inflation in this class!

A+/A/A-	12.5%
B+/B/B-	25%
C+/C/C-	50%
D/F	12.5%

We will calculate letter grade boundaries  
for each exam to show you how you are doing.

**BUT -- the only letter grade that counts is the final one.**

You **must** take each exam or have a **PRE-APPROVED** excuse.

For those with excuses a make-up exam must be taken within  
**ONE WEEK** of the original exam.

*The make-up exam is all essay, i.e., it is harder!*



## Field trip

Everyone in the lecture class **MUST** take a **self-guided field-trip**.  
You will receive 25 points for the completed worksheet.

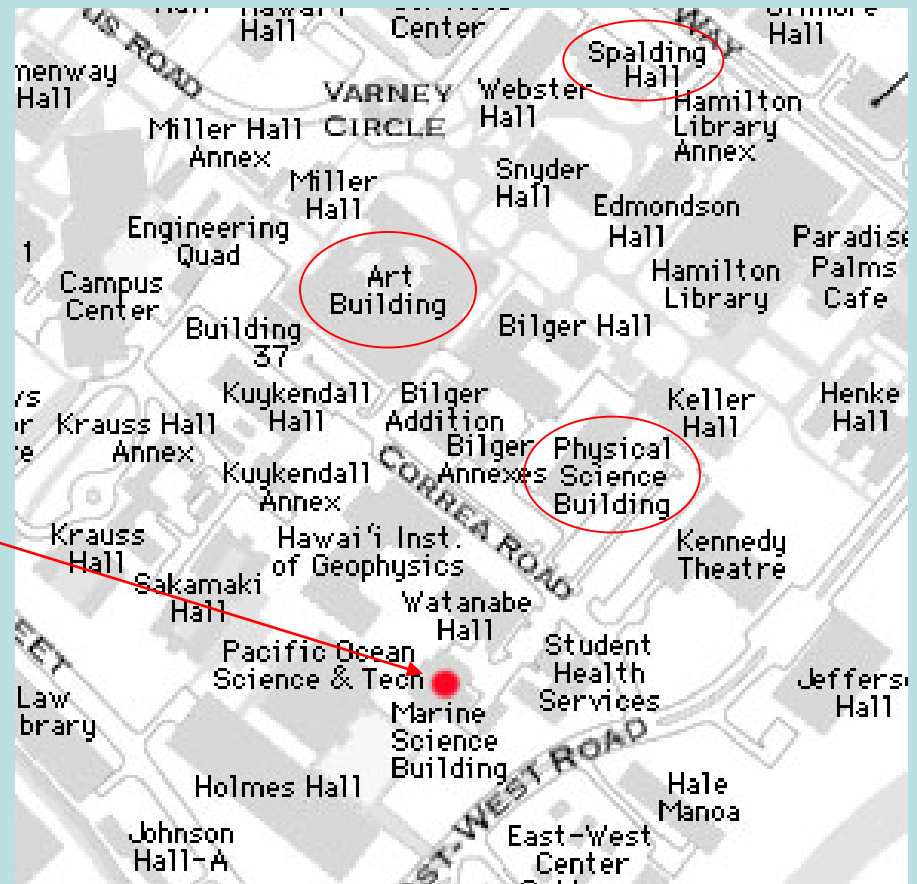
Those taking lab class **must** take a **second** guided field trip.





Office hours are held in Marine Science Building 113 in the glass-walled office on the outside of the building.

Labs are held in MSB 203: take the elevator to the 2nd floor and turn left.





Remember---

This is *Oceanography*:  
It's meant to be fun!

We do this for a living,  
because we enjoy it.

We hope you will  
enjoy it too!

