

Introductory Oceanography Lab

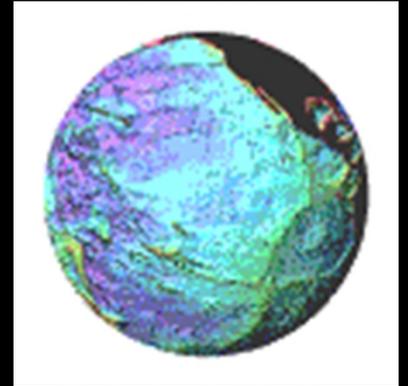


Oceanography 101L – Intro Ocean Laboratory

Fall 2022 Semester - MiraCosta College

Instructor: Ray Rector

First Day Agenda



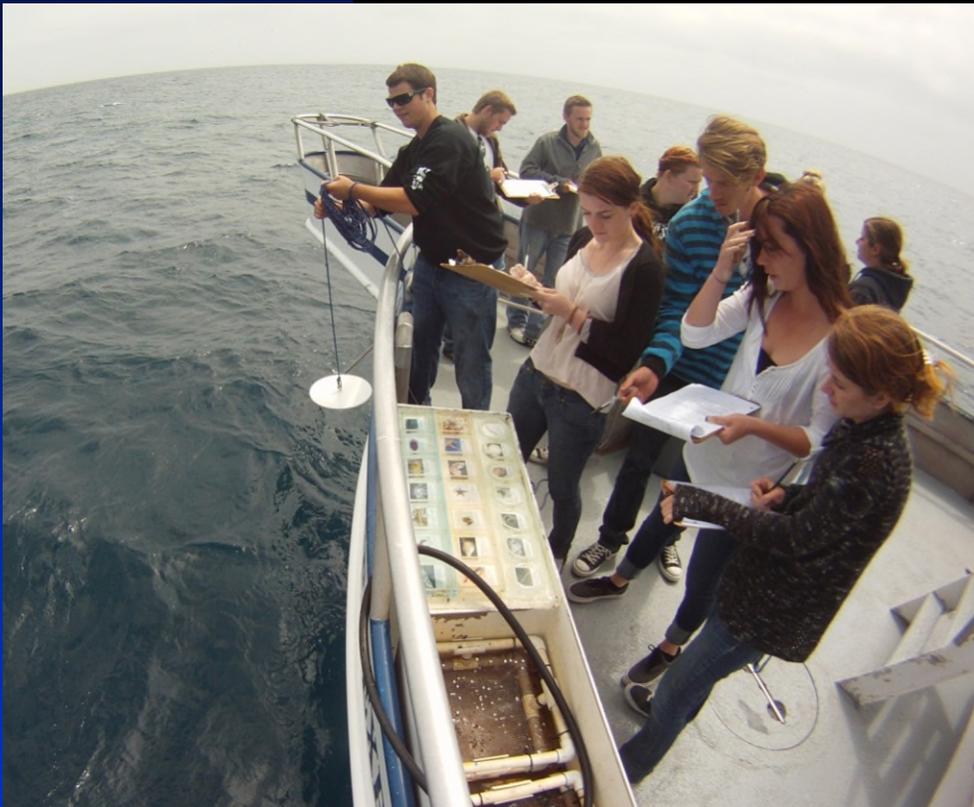
- Course Description
- Review of Course Syllabus
- Safety Instruction
- Instructor Background
- Student Introductions
- Using the Scientific Method in Lab
- Units of Measurement
- Unit Conversion Activity
- Geo-time and Ocean History Activity

Course Description

- Hands-on, Inquiry-based Lab and Field Activities that Examine the Features and Processes of the Ocean and Marine Life
- Topics Include:
 - ★ Navigation – Maps, Charts and GPS
 - ★ Seafloor Physiology and Plate Tectonics
 - ★ Marine Sediments
 - ★ Seawater Properties
 - ★ Waves, Tides and Currents
 - ★ Shoreline Processes / Beaches
 - ★ Marine Life and Habitats
 - ★ Environmental Concerns

Course Format

- Laboratory and Field Studies
- Course Activities Include:
 - ★ Student-centered
 - ★ Hands-on activities
 - ★ Class discussions
 - ★ Instructor pre-lab lectures
 - ★ Demonstrations
 - ★ Online interactive exercises
 - ★ Shore and boat field trips
 - ★ Extra credit activities



Course Syllabus

- Basic Logistics
- Course Objectives
- Important Enrollment Dates
- Instructor's Attendance Policy
- Classroom Do's and Don'ts
- Grading
- Field Trips
- Extra Credit
- Ocean Lab Canvas Course Site
- Professor's Classroom Website
- Schedule of Study

www.seascisurf.com MiraCosta OCEA 101L Tu Link

Lab Schedule and Worksheets on the Lab's Canvas site

Laboratory Safety Issues



Laboratory Safety Rules

- 1) No food or drinks allowed in lab at any time. Drinks to be stored outside of lab.
- 2) Everyone must wear closed-toed shoes while in lab – no exceptions. Any student who shows up without closed-toed shoes on will not get credit for that days laboratory work.
- 3) Any/all lab accidents, injuries, or unsafe medical/health conditions/events – however minor – must be reported to the lab instructor immediately.
- 4) Only authorized lab experiments or procedures can be preformed. All authorized experiments or procedures must be performed as described and/or demonstrated by the laboratory instructor.
- 5) Personal belongings need to be stored in a place that will not impede students' movement in and around the lab, nor clutter lab table space.
- 6) Horseplay, running, or other potentially unsafe activities while in lab is strictly forbidden.
- 7) When the fire alarm goes off, everyone must leave the lab room immediately - in a calm orderly fashion - to the designated outside emergency assembly area. Know where the assembly area is located.

Wise Suggestions for my Students of Oceanography

- 50% Motivation – 50% Perspiration
- SHOW UP for ALL laboratory meetings
- DO the Pre-lab assignment BEFORE the corresponding laboratory meeting
- ASK lots of questions
- BE PROACTIVE in lab and field activities and discussions – Help each other
- STUDY instructor's posted online lecture notes and presentations
- GO on the voluntary weekend field trips
- HAVE FUN learning about the Ocean

- Instructor's Academic Background
- Instructor's Connection with Ocean
- Instructor's Role in Classroom
- Instructor's Teaching Philosophy

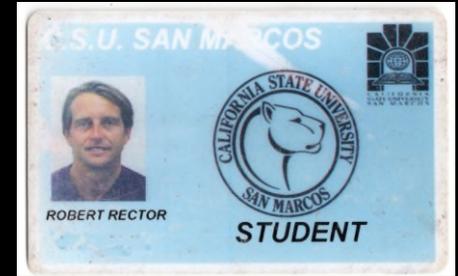
Who am I?



EARTH SCIENCE EDUCATION

California Single Subject Teaching Credential – Geosciences - California State University, San Marcos, CA

- 35 graduate-level semester units completed; GPA = 3.9
- Cross-Cultural Language and Academic Development
- Additional emphasis of technology in the classroom



Earth Science Doctoral Program – Volcanism and Tectonics University of California Riverside, Riverside, CA.

- 38 graduate-level semester units completed; GPA = 3.9
- Graduate Division Fellowship
- Mineralogical Society of America scholarship



Master of Science Degree – Igneous Petrology San Diego State University, San Diego, CA

- 35 graduate-level semester units completed; GPA=3.9
- Achievement Rewards for College Scientists Scholarship

Bachelor of Science Degree - Magna Cum Laude - Geology San Diego State University, San Diego, CA

- 172 semester units completed; GPA = 3.8
- Outstanding Senior Research Award--College of Sciences
- Outstanding Research Award—Department Of Geology



Engineering Undergraduate Program California State University, Northridge, CA

- Marine Engineering emphasis

TEACHING EARTH SCIENCE

Cuyamaca College, El Cajon, CA

- ❖ Oceanography Lecture

2013 - 2016

University of San Diego, San Diego, CA

- ❖ Earth Science Laboratory

2007 - Present

MiraCosta College, Oceanside, CA

- ❖ Oceanography Lecture and Laboratory
- ❖ Online Geology

2004 - Present

San Diego Miramar College, San Diego, CA

- ❖ Geology Laboratory
- ❖ Online Oceanography Lecture

2003 - Present

San Diego Mesa College, San Diego, CA

- ❖ Online Geology Lecture
- ❖ Geology Laboratory

2002 - Present

University of California Riverside, Riverside, CA

- ❖ General geology, Historical geology, Mineralogy, Optical mineralogy, Igneous petrology, and Metamorphic petrology

1994-1997

San Diego State University, San Diego, CA

- ❖ General geology laboratory
- ❖ Advanced field geology course in Baja, Mexico.

1991-1993

Professor's Interests



Travel to Cool Places, Adventure, Hanging Out, and Partying with Fun and Interesting Friends



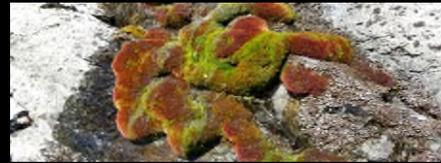
Outdoor Sports



Summer 2018 Adventure – Lake Tahoe



LAKE ALOHA	5
DICKS PASS	13
RICHARDSON LAKE	25
BARKER PASS	32
TAHOE CITY	48



*Keep
Tahoe*



Blue!



Last Summer's Adventure – Grand Cayman Island



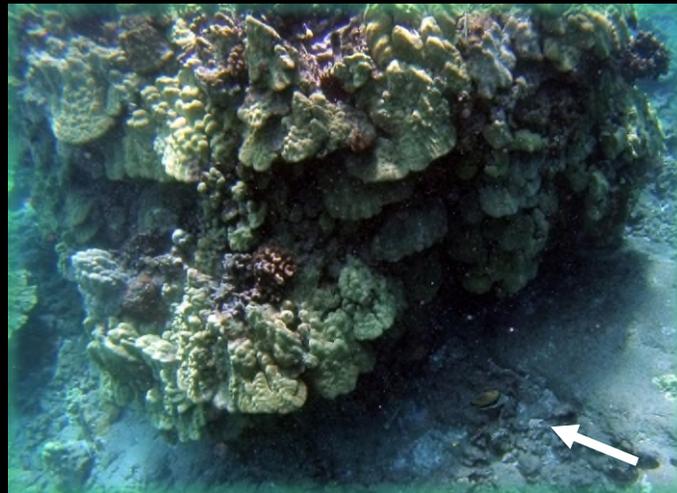
Aloha from Grand Cayman!



Winter 2020 Adventure – The Big Island



*Aloha from
Hawaii!*





Personal Introductions

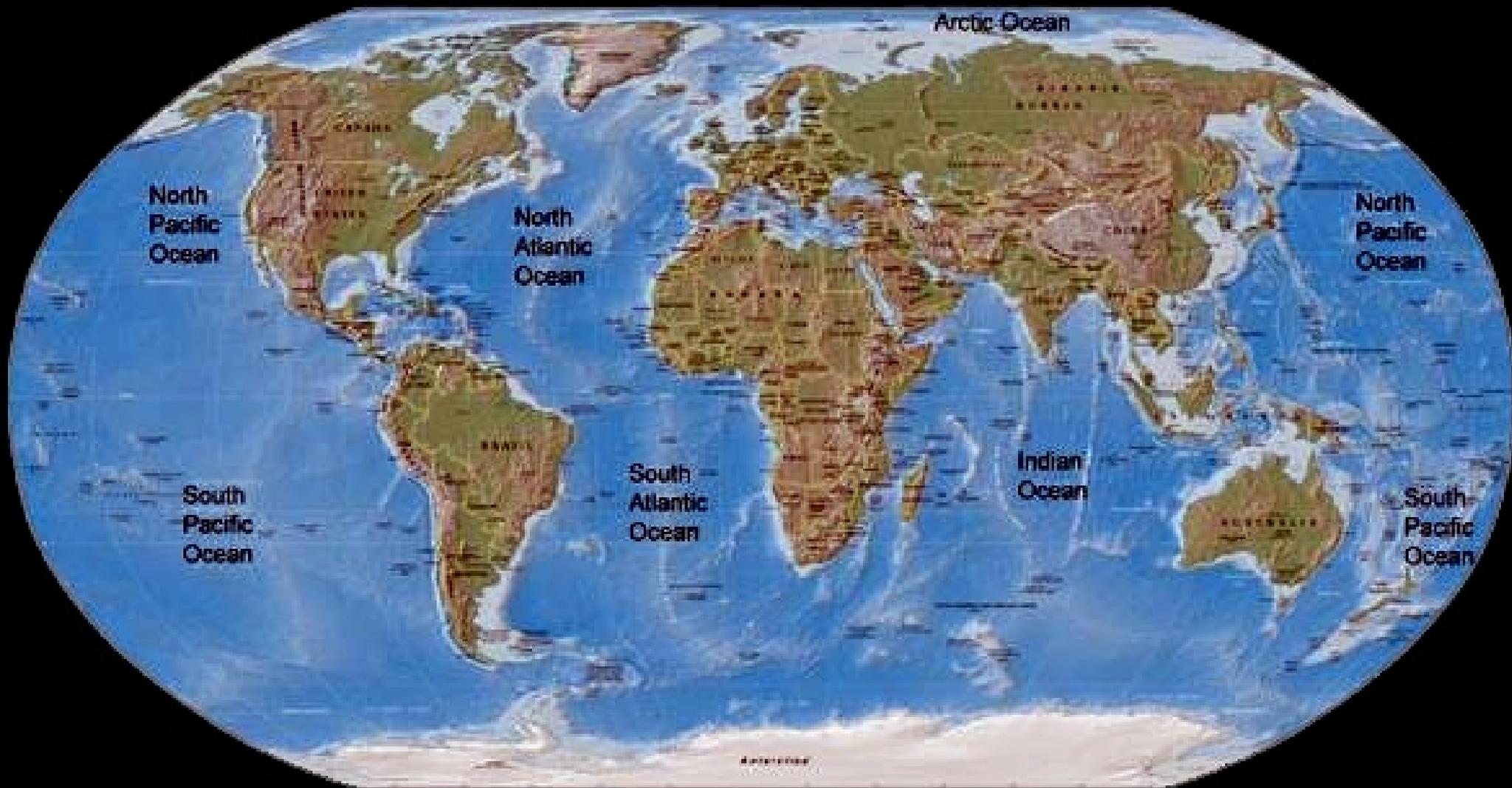
WHO ARE YOU?

- Your Name?
- Academic Focus?
- Personal Interests?
- Your Connection with the Ocean?



Wishing Everyone a Great Fall Semester!

OUR PLANET IS A WATER WORLD: *PLANET OCEAN?*



- ❖ The Ocean covers about 71% of Earth's surface
- ❖ About 98% of Earth's surface water is ocean

Our Awesome Water Planet



Everything is *connected* to everything else

Everything *affects* everything else

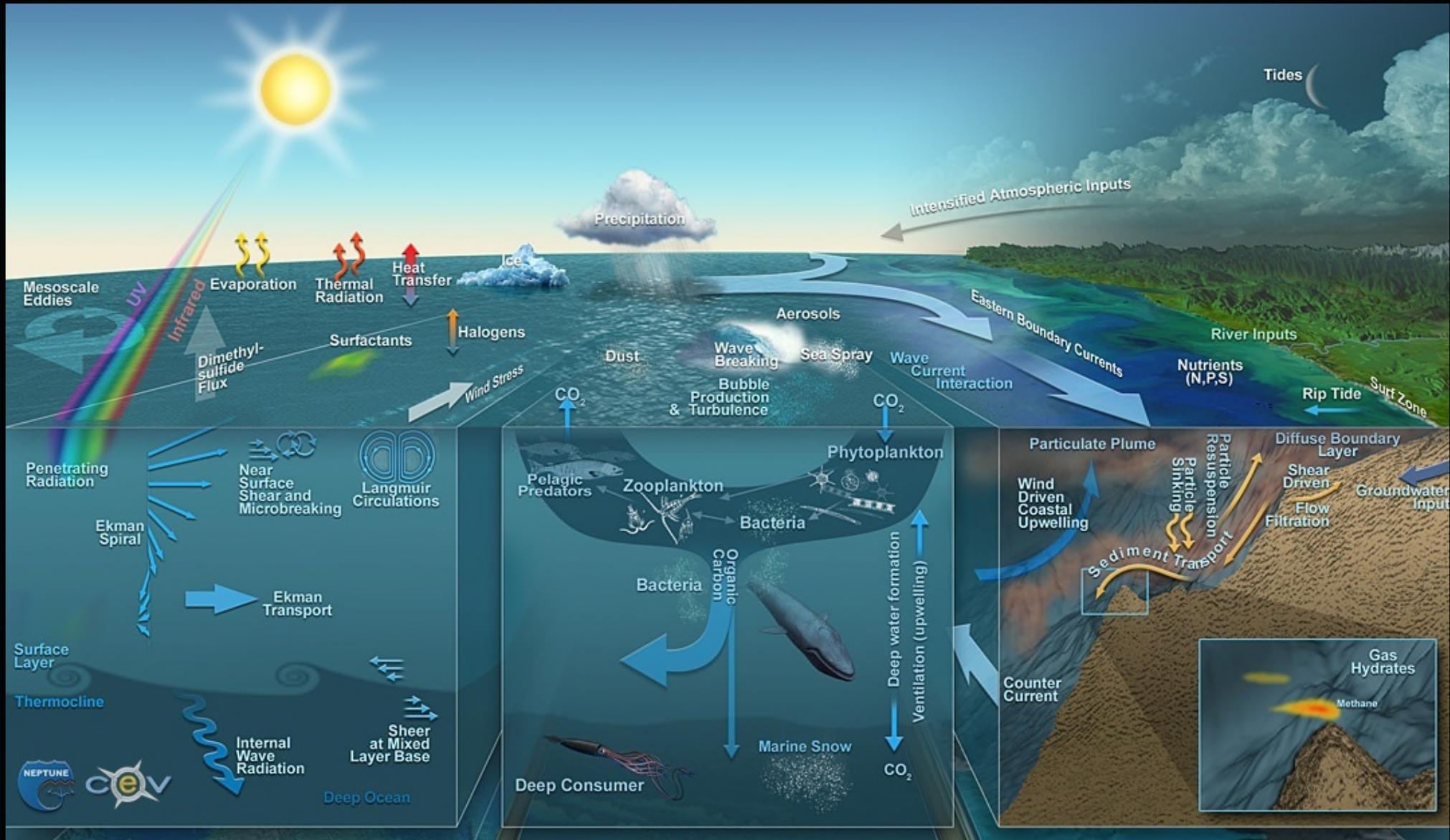
How is the Ocean Connected with Everything Else?

Ocean is Key Part of Earth's Dynamics



How Does The Whole Thing Work?

The Ocean is a Complicated System!



There is an intimate relationship between the living and nonliving world on earth – essential to life in the ocean

What Part Do Humans Play?

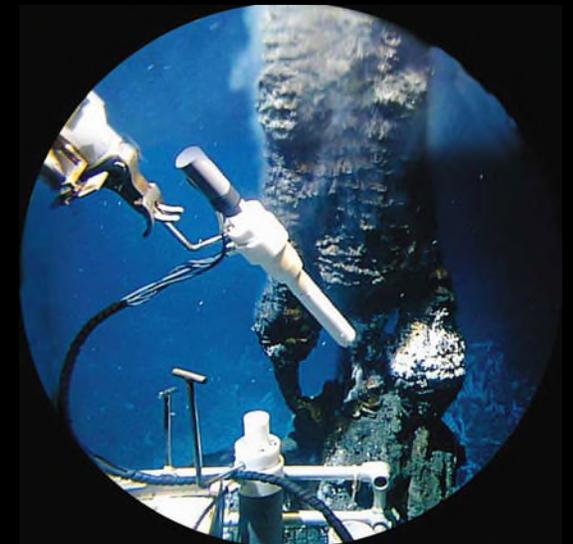
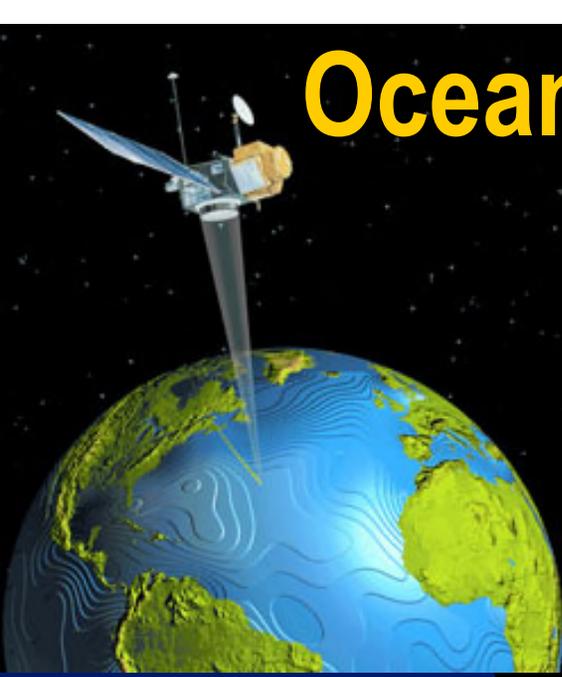


How Do We Affect the Earth?

Oceanography – A Multi-Field Science

✓ The scientific study of the ocean, seafloor, coasts, sea life, and climate:

- ✓ Waves and Currents
- ✓ Seawater properties
- ✓ Seafloor and shore features
- ✓ Marine life
- ✓ An interdisciplinary science



FIELDS OF OCEANOGRAPHY

An Interdisciplinary Science

Oceanography integrates many different types of science.

- **Marine geology** - the study of Earth's crust and composition
- **Chemical oceanography** - the study of the gases and solids dissolved in the ocean
- **Physical oceanography** - study of ocean's water column and water-air interactions: temperature, pressure, waves, currents, weather, climate
- **Marine biology** – the study of the nature and distribution of marine organisms and their associated marine habitats
- **Marine engineering** - the design and construction of structures used in or on the ocean: ships, machines, instruments, edifices, etc.
- **Environmental oceanography** - the study of human's impact on marine ecosystems

Are there any others?

The Scientific Method – The Backbone of Science

