

- ECODIM-2014
- How to proceed
- Enrolment
- Course Organization**
- Organizers
- Teaching Team
- Study Plan
- Preparation
- Skills
- Participants
- Lecture Notes
- Exercises / Tutorials
- Research
- Mini Symposium
- Papers & Books
- Helpful Links
- My best Photos
- Forum
- E-mail Course Coach
- Varia



- Course tools**
- Course editor
 - Group management
 - Rights management
 - Archive tool
 - Assessment tool
 - Statistics

- Tutored groups**
- Regular Student
 - Guest
 - Instructor / Staff / Tutor

- My learning groups**
- Regular Student
 - Guest
 - Instructor / Staff / Tutor

- General**
- Calendar
 - Detailed view
 - Notes
 - Set bookmark
- 1 course participants present

Course Organization

- Pick-up** International participants (students and instructors), and Chilean participants from other regions, will be met at the airport or bus station in Concepción in accordance to the arrival information that was provided by Mónica Sorondo (in case of delays or emergencies please contact Mónica via the cell phone number 09-6821550)
- Housing and Meals** Available for all lecturers and students from Sunday evening, January 5 to Saturday morning, January 25 at the [Cabañas El Mirador](#), Daniel Vera 1440, Camino a Pingueral (phone and fax: ++56 41 2683036; cell phone 09-6608 5155). Rooming lists will be posted by Mónica Sorondo. Breakfast and Dinner will be served for all at Cabañas El Mirador, lunch at a nearby restaurant. There are a couple of places near the Station (Tia Maigo and Don Mino) for lunch. Internet access with password 0123456789
- First Get-together** Sunday, January 5 at 19.30 at Cabañas El Mirador. Pizza and drinks will be available.
- Course Program** The course starts Monday morning, January 6 at 08.30 in the Estación de Biología Marina at Dichato (phone ++ 56 41 2683033)
- Course Contents** Lectures and Evening Sessions will take place in the Main Lecture room at the Estación de Biología Marina. Microscopy, Computer Exercises and Laboratory work in specially equipped labs, unless stated otherwise in the program.
- Language** The entire course will be taught in English. Students will have to make their presentations in English and write the contents of the project proposal and the poster in English.
- Symposium** The course Symposium on "The Microbial Tree of Life and Beyond: The Legacy of Carl Woese (1928-2012)" (special program) will take place on Friday, January 10, at the Auditorium Claudio Gay, Faculty of Natural and Oceanographic Sciences, at the main campus of the University in Concepción. A bus transport to Concepción and back will be organized by the course (departure in Dichato at 07.00 a.m.). The symposium is open to non-course participants as well.



Life on Earth depends on oceans for a number of reasons

- The hydrologic cycle is largely driven by evaporation over the ocean, by freezing of water and thawing of ice and by regional and global ocean currents.
- Rivers supply chemicals from continental erosion, which partially determine the nutritional status in delta areas and along continental shelves.
- In upwelling regions, nutrients are recycled most effectively from the depth of the ocean.
- Nutrients feed marine organisms, which drive food webs from which we all profit.
- Bacteria, Archaea, Protists and Viruses are the major players of marine microbial ecosystems.
- Microbial phototrophs produce a large portion of the oxygen in the atmosphere.
- Other microbes use oxygen to degrade the huge amount of primary productivity that is not channeled into higher food webs.
- Although much of the carbon fixed by photosynthesis is degraded during sedimentation, some gets buried in sediments where it eventually can be transformed and stored as future hydrocarbon deposits.
- Sediments also store biominerals, which can become proxies that archive environmental conditions at the time of their formation.

• The role of the oceans

Overview video by Partnership for Observation of the Global Oceans (POGO), for more information visit <http://www.ocean-partners.org>
http://www.youtube.com/watch?v=dOmArd95-BQ&feature=player_embedded#at=225

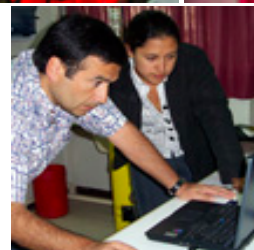
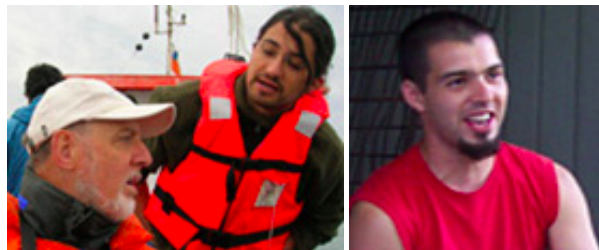
• EARTH

A YouTube video making us aware of what we miss if we don't care http://www.youtube.com/watch?v=thuVixRd_w&feature=related



Many questions remain and during the course we will address some of them

- Why is the Humboldt current ecosystem of interest to researchers from all over the world?
- What can we learn from upwelling processes?
- How are microorganisms driving geochemical cycling of nutrient-type compounds?
- Why and how are nutrient cycles of N, S and C compounds coupled?
- What limits primary productivity, what makes microorganisms bloom?
- How do we assess the diversity of microorganisms in oxygen transition zones?
- What does microbial diversity actually mean and why is it important?
- What resources for biomedical applications are hidden in marine organisms?
- How can modern "...omic" technologies be applied to unravel physiological potentials in complex ecosystems?
- How could ocean geo-engineering help us to scavenge excess CO₂ from the atmosphere?



• Bio-Diversity

A video by the Census of Marine Life about why we need to monitor biodiversity in the oceans and how it can be done using existing technologies on a global scale. For more information visit <http://www.coml.org>.

<http://www.youtube.com/watch?v=kXXzvGJCVAc&feature=related>

- **Microbes in the Ocean**

Marine microbes play an important role in all marine environments. AIMS is investigating the functions they provide in tropical marine ecosystems, what benefits and insights they might offer and what role they play in helping reefs to adapt to threats such as climate change.

<http://www.youtube.com/watch?v=1TmHlcMDIOQ>

- **How Desmids (freshwater green algae) divide**

Time lapse video microscopy by Jeremy Pickett-Heaps of the University of Melbourne.

http://www.youtube.com/watch?v=MrTw5D73xrU&feature=player_embedded

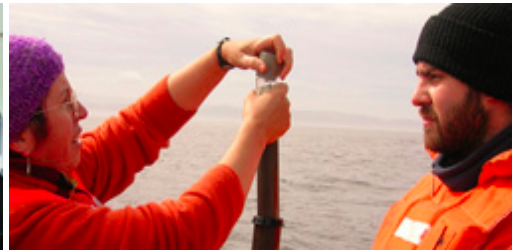
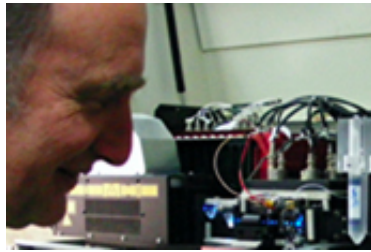


How ECODIM courses are structured

- We intend to develop an understanding of the relations between microbial diversity, metabolism and physico-chemical processes that regulate ocean biogeochemical cycles and trophic structures.
 - For three weeks you will be able to focus on marine microbiology and associated geochemistry, participate in interesting presentations, have time for discussions, work in small research groups and summarize the results in presentation sessions.
 - You will spend a day on a research vessel and learn about sampling procedures and cutting-edge techniques, including molecular biology, microscopy, flow cytometry, bioinformatics, biogeochemistry, sedimentology and many more in the laboratory on land.
 - We will build on what you already know about certain physical concepts and ask you to recall the chemical principles which you learned earlier in your studies.
 - We will show you some of the biomolecular, physical and IT tools available today for the characterization of diverse communities of bacteria, archaea and eukaryotic microbes.
 - We will try to enrich and isolate microorganisms with specific metabolic activities.
-
- During the course you will be guided by expert instructors from different fields through a small research project whose results will be summarized in a presentation and a poster.
 - Mornings, you will hear lectures addressing a broad spectrum of topics.
 - A full day is devoted to listening to and discussing with experts the newest research results and developments during a Mini Symposium..
 - At the beginning you will introduce the other course participants to the type of research that you are performing at your home institution and
 - during week 2 you will prepare an innovative research proposal based on the scientific literature and present it to the course.
 - The presentation of the research results at the end of week 3 will illustrate how successfully we worked as a group and how well we can understand what we discovered.
-
- All logistic course details as well as the information gathered during the course (research data, reading material, lecture slides, exercises, protocols, etc.) will become available on this specially designed learning platform for which you received a login and a personal password. Please consult the file "Course organization" for more details about the course.



Although we will emphasize the **biogeochemistry community diversity and molecular and microbial ecology of today's oceans**, we will often make reference to changes that occurred in oceans in the past. These changes are archived in sediments, i.e. we will show you how paleo-oceanography uses **geologic records** to reconstruct past environmental changes and events, we will experience how modern day sediments might change over time into rocks and we will discuss how microbes contribute to these processes.



The Learning Process

- We will employ classical lectures and exercises in addition to your own presentation of literature searches to particular topics.
- During the practical work you will be exposed to a number of marine ecosystems and learn how to ask research questions and choose approaches to find answers.
- Field Sampling will take place on a day during week one on the R/V Kay Kay. For details consult the "Study Plan" and be prepared with appropriate clothing and sea sickness medication, if necessary.
- The internet-accessible learning site on OLAT also allows you to share information that you consider interesting and which can supplement the course contents.
- If you "subscribe" to folders on this learning site, you will be informed by mail each time a new document was uploaded into a particular folder.
- Use the PRINT icon at the top right to download "html:// pages" to the hard disc of your computer as pdf.

Our Expectations

- We are expecting you to fully immerse yourself in the course topics and make optimal use of the contents offered.
- We want you to ask questions during all phases of the course and via the discussion forum and to try to offer answers to questions posed by others.

Preparation

- Please consult the chapter summaries, which we uploaded from the textbook **"Invitation to Oceanography"**, 6th Edition, 2013 by Paul R. Pinet. ISBN-13: 9781449648022 for repetition of terms and concepts in oceanography.

The Study Plan

- informs you about the daily lecture topics, the exercises, the research time and other course activities.
- The plan will develop as the course progresses

Lecture notes

- All instructors will be asked to upload their lecture notes, handouts, tutorials, exercises and links to valuable internet pages (power point slides, papers, texts etc.) into corresponding folders. You are welcome to use this material for your own work during the course and "at home" later. You must ask an author's permission and give proper reference to the copy right owner(s), however, if you would like to use the material otherwise.



Research Results

- Research work is performed in groups. It is essential that each group member takes responsibility for the proper recording of data in the field and in the lab and make them available to everybody else. Please keep a well organized note book.



Enrolment

- in OLAT is mandatory before you can access most of the folders and files. Please enrol as a **"Regular Student"** if you take the course for credit. There is a special sign-up window for **Instructors, Staff and Tutors**, who are personally involved in the course. **Speakers and Guests** are welcome to follow the course; they need to enrol in the appropriate sign-up window in order to have access to course folders. Access rights (login and password) were sent to you before the course.

Proposal Presentations

- will take place on Friday, January 17. Sign up for a slot by Wednesday, January, 15 and upload the paper(s), which are the basis for your proposal into the appropriate folder. Please label the paper(s) as suggested in the folder "Scientific Papers".

Posters

- summarizing the group research results will be finalized on Friday morning, January 24, and discussed from power point presentations in the afternoon of the same day.



Exercises / Modeling

- Some exercises require the use of mathematical and statistical tools. Although we will have a number of desktop computers with internet connections available, it is recommended that you take your own laptop computer and a memory drive with you. You should have Microsoft Office (e.g. Excel (xls or.xlsx), Word (doc or.docx) and Power Point (ppt or.pptx) installed and know about the possibility to store documents in older versions of the software (not everybody already has the newest version).
- Phreeqc**: We would like to use this software package to calculate a number of geochemical conditions. Please download it as a stand-alone version onto your computer from http://wwwbr.cr.usgs.gov/projects/GWC_coupled/phreeqc/
- Thermodyn**: is a thermodynamic learning spread sheet that runs with Excel. It is freely available to you and we will use it during weeks 2 and 3. Please download it from the folder "Exercises" onto the hard disc of your own computer and check before class that you can open it in your version of Excel.

Helpful Links

Search on YouTube for short movies on "Ocean AND Microbes" or any of the microorganisms like "Diatoms", "Dinoflagellates", "Thioploca" etc. A few examples of "Helpful Links" are given.



*Eighth Latin American Microbiology Postgraduate Course on "Ecology and Diversity of marine Microorganisms", (ECODIM-VIII),
offered by the Austral Summer Institute, University of Concepción & the Pontificia Universidad Católica de Chile,
January 6 - 26, 2014 at Dichato, Chile*
