

# INSTITUTO AUSTRAL DE VERANO #1: TOPICOS ESPECIALES EN OCEANOGRAFIA QUIMICA

enero 8-31, 2001. Estacion Costera de Dichato, Departamento de Oceanografia, Universidad de Concepcion.  
Programa de Cooperacion UDEC - Institucion Oceanografica de Woods Hole - Fundacion Andes.



Diagenesis de Sedimentos Dr. Fred Sayles<sup>1</sup> Dr. Kathleen Ruttenberg<sup>1</sup>

Geoquimica Organica Dr. Lihini Aluwihare<sup>2</sup> Dr. Silvio Pantoja



Biogeoquimica de Metales Traza Dr. James Moffett<sup>1</sup> Dr. David Hutchins<sup>4</sup>

Biogeoquimica de Contaminantes Organicos Dr. John Farrington<sup>1</sup> Dr. Chris Reddy<sup>1</sup>



FUNDACION ANDES

1. Woods Hole Oceanographic Institution
2. Scripps Institution of Oceanography
3. Universidad de Concepción
4. Universidad de Delaware

*Se solicitan postulaciones de estudiantes de Pre-grado Avanzado y de Post-grado en Ciencias Oceanograficas y Quimicas, de Post-doctorados, Academicos y Profesionales que tengan interes en las areas de Oceanografia Quimica/Quimica Marina. El Instituto se desarrollara en clases, grupos de discusion, y actividades practicas, conducidas en el idioma Ingles. Conocimiento del idioma es indispensable.*

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*Se requiere nacionalidad Chilena, aunque casos especiales seran examinados por el comite de seleccion. El plazo de postulacion vence Noviembre 20, 2000. Gastos de viaje y mantencion seran provistos por el Instituto.*

**Austral Summer Institute – 1.**  
**Specific Topics in Chemical Oceanography**  
**January 8 - 31, 2001**

**University of Concepción (UDEC) – Woods Hole Oceanographic  
Institution (WHOI) sponsored by the Fundación Andes (FA)**

The Austral Summer Institute UDEC- WHOI encourages all advanced under graduate- and graduate degree students, in the areas of marine science and chemistry, to apply for the first event on Specific Topics of Chemical Oceanography, to be held at the coastal station of the university, in Dichato. Furthermore professors, post-doctorates and professionals interested in chemical oceanography and marine chemistry are encouraged to apply.

The Austral Summer Institute is part of the joint project between Woods Hole Oceanographic Institution and the University of Concepción and is funded by the Fundación Andes, aiming to reinforce the formation of the graduate degree in oceanography. The purpose is to promote and improve the higher education and advanced research in oceanography in the southeastern region of the Pacific Ocean. The selection of applicants will be highly competitive, based on their potential as future scientists and on their academic and scientific achievements accomplished to date.

Send applications in English, including a copy of the attached form, a recent copy of your CV indicating your education and work experience (if applicable), and a short letter stating your intentions, indicating your scientific interests, and how you will benefit from your participation in the institute. Chilean nationality is required, though special cases will be considered by the Admission's Committee. The expenses of food, lodging and transportation will be covered by funds of the program proportioned by the Fundación Andes. Deadline for handing in the applications is November 20<sup>th</sup>, 2000.

The institute will consist of classes, discussion sessions and practical activities, mainly carried out in English. The participants and topics are as follows:

<b>Participants</b>	<b>Themes</b>	<b>Date of the series</b>
Dr. Fred Sayles <sup>i</sup> , Kathleen Ruttenberg <sup>i</sup>	Sediment Diagenesis	January 8-19, 2001
Dr. Lihini Aluwihare <sup>ii</sup> , Dr. Silvio Pantoja <sup>iii</sup>	Organic Geochemistry	January 15-26, 2001
Dr. Jim Moffett <sup>iv</sup> , Dr. David Hutchins <sup>4</sup>	Biogeochemistry of Trace Metals	January 15-26, 2001
Dr. John Farrington <sup>v</sup> , Dr. Chris Reddy <sup>vi</sup>	Biogeochemistry of Organic Contaminants	January 22-31, 2001

### **Participants – Students**

Sediment Diagenesis: January 8-19, 2001

<b>NAME</b>	<b>Position</b>	<b>Residence</b>
1. Sandra Botté	Graduate student	Argentina
2. Marcela Cornejo	Undergraduate student	Valparaiso
3. Pablo Figueroa	Undergraduate student	Viña del Mar
4. Fidelina González	New Faculty	Concepción
5. Dafne Guzmán	Graduate student	Valparaiso
6. Bibiana Jara	Graduate student	Concepción
7. Sergio Mayor	Graduate student	Dichato
8. Tatiana Matus	Undergraduate student	Valdivia
9. Juan Placencia	Graduate student	Concepción
10. Eduardo Quiroga	Graduate student	Concepción
11. Julio Salcedo	Undergraduate student	Viña del Mar
12. Nelson Silva	Experienced Faculty	Valparaiso
13. Mariela Yévenes	Graduate student	Concepción

Organic Geochemistry: January 15 - 26, 2001

<b>NAME</b>	<b>Position</b>	<b>Residence</b>
1. Camila Fernández	Graduate student	Francia/Concepción
2. Pablo Figueroa	Undergraduate student	Viña de Mar
3. Sergio Gándara	Professional	Concepción
4. Rodrigo González	Graduate student	Concepción
5. Dafne Guzmán	Graduate student	Valparaiso
6. Verónica Molina	Graduate student	Concepción

7. Juan Placencia	Graduate student	Concepción
8. Julio Sepulveda	Undergraduate student	Concepción
9. Rodrigo Castro	Graduate student	Concepción
10. Fidelina Gonzalez	New Faculty	Concepción
11. Sergio Mayor	Graduate student	Dichato

Biogeochemistry of trace metals: January 15-26, 2001

<b>NEME</b>	<b>Position</b>	<b>Residence</b>
1. Santiago Andrade	Graduate Student	Argentina
2. Sandra Botté	Graduate Student	Argentina
3. Maribel Castro	Graduate Student	Concepción
4. Marcela Cornejo	Undergraduate Student	Valparaiso
5. Bibiana Jara	Graduate Student	Concepción
6. Michelle Manley	Undergraduate Student	Iquique
7. Cristina Marabolí	Undergraduate Student	Viña del Mar
8. Tatiana Matus	Undergraduate Student	Valdivia
9. Julio Salcedo	Undergraduate Student	Viña del Mar
10. Mariela Yévenes	Graduate Student	Concepción

Biogeochemistry of organic contaminants: January 22-31, 2001

<b>NAME</b>	<b>Position</b>	<b>Residence</b>
1. Santiago Andrade	Graduate student	Argentina
2. Sandra Botté	Graduate student	Argentina
3. Maribel Castro	Graduate student	Concepción
4. Oscar Espinoza	Undergraduate student	Concepción
5. Diego Fernandez	Undergraduate student	Antofagasta
6. Pablo Figueroa	Undergraduate student	Vina del Mar
7. Sergio Gándara	Professional	Concepción
8. Bibiana Jara	Graduate student	Concepción
9. Sandra Madariaga	Graduate student	Puerto Montt
10. Michelle Manley	Undergraduate student	Iquique
11. Cristina Maraboli	Undergraduate student	Viña del Mar
12. Tatiana Matus	Undergraduate student	Valdivia
13. Juan Placencia	Graduate student	Concepción
14. Julio Salcedo	Undergraduate student	Viña del Mar
15. Mariela Yévenes	Graduate student	Concepción

**PARTICIPANTS-LECTURERS**

Participants	Topic	Dates
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Dr. Fred Sayles, Dr. William Martin, Ms. Joanne Goudreau	Sediment diagenesis	January 8-19,2001
Dr. Lihini Aluwihare, Dr. Silvio Pantoja	Organic Geochemistry	January 15-26, 2001
Dr. Jim Moffett, Dr. David Hutchins	Biogeochemistry of Trace Metals	January 15-26, 2001
Dr. John Farrington, Dr. Chris Reddy	Biogeochemistry of Organic Contaminants	January 22-31, 2001

1 Woods Hole Oceanographic Institution

2 Scripps Institution of Oceanography

3 University of Concepción

4 University of Delaware

## ABRIDGED CLASS CONTENTS

### SEDIMENT DIAGENESIS

### HIERARCHY OF OXIDANTS

Organic matter composition, sources, degradation, preservation

Mineral authigenesis

### Laboratory Activities

Core collection & sectioning

Pore water extraction and analysis

Core incubations, overlying water sampling

Laboratory profiling of sediment cores

Whole core squeezer (compared to centrifuge-collected pore water)

## **ORGANIC GEOCHEMISTRY**

Organic Molecules. Proteins, sugars, carbohydrates, amino acids, lipids, lignins

Techniques for determination of chemical structure

Stable carbon and nitrogen

Radioactive carbon

Uncharacterized material

Dissolved organic matter

Review of selected paper on dissolved organic matter

Suspended Particulate organic matter

Reaction kinetics

Sinking Particulate organic matter

Review of selected paper on particulate organic matter

## **BIOGEOCHEMISTRY OF TRACE METALS**

Distribution of trace metals, inputs, chemical processes, biological processes, speciation and bioavailability, environmental issues: copper, analytical methods, problems specific to Chile.

Phytoplankton trace metal requirements, introduction to iron limitation, source of iron to phytoplankton, the three open-ocean HNLC areas, the glacial/interglacial iron hypothesis, iron ND THE GLOBAL CARBON CYCLE. Iron limitation in the North and South American upwelling systems, Fe effects on major nutrient drawdown ration. Biological requirements and limitation by trace metals other than iron.

## **BIOGEOCHEMISTRY OF ORGANIC CONTAMINANTS**

Definitions of marine contamination. Major contaminants and their effect on marine ecosystems. Utilization of coastal areas and risk management of habitat destruction, change in sedimentation rates and mobilization of contaminants in the marine environment. Biochemistry as a tool for identification, modelling, monitoring and prediction of source and pathways of organic contaminants. Oil spills and their effects on marine life and ecosystems.

## **OVERALL CONCLUSIONS**

The Austral Summer Institute-1 on Special Topics in Chemical Oceanography, achieved the objective of exposing Chilean students and faculty to the expertise of lecturers from leading US research institutions, in collaboration with scientists at the University of Concepción. Graduate students, post doctoral fellows and faculty, interacted with scientists at WHOI, Scripps, and University of Delaware, and were trained in theoretical and practical aspects of chemical oceanography, some of them not still well-developed in Chile. This exchange promoted the enhancement of graduate education in the ocean sciences in Chile as well as spurring joint US. Chilean research endeavours.

Of particular interest to ASI-1 was the participation of students with a background in the traditional areas of chemistry. This is a consequential aspect that in time may translate into a multi-sided perspective in the fields of chemistry, marine chemistry, and chemical oceanography, widening and strengthening research questions. We can envision a new cohort of Chilean oceanographers enriching their work with the new concepts, and dedicating themselves to the further development of this area of research.

The Summer Institute also provided a forum to explore joint research opportunities involving US and Chilean scientists with a shared interest on

the study of the South eastern Pacific Ocean and the Exclusive Economic Zone of Chile scientists is an excellent presage of the potential of the Summer Institute.

Dr. Silvio Pantoja  
Department of Oceanography  
University of Concepción  
Coordinator ASI - 1

<sup>1</sup> Woods Hole Oceanographic Institution

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<sup>ii</sup> *Scripps Institution of Oceanography*

<sup>iii</sup> *University of Concepción*

*iv*

<sup>4</sup> *University of Delaware*

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