



International Graduate Course on “Antarctic Flora & Climate Change: Advances and Perspectives from Ecophysiology” Punta Arenas, Región de Magallanes, Chile: October 23-30, 2014

Organizers

Iván Gómez (UACH)
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Luis Corcuera (UdeC)
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Sponsors:

Anillos, INACH, UdeC, UFRO, UACH, IEB, Conicyt, PIA, Ivens, Ambimet

PROGRAM

Thursday, October 23

Welcome Message, Brief Introduction and Description of the Course.

9:00-9:15 Iván Gómez (Ring 1101) Brief Description of the Course

9:15-9:30 León A. Bravo (Ring 1102) General Rules/Program

UNIT 1. INTRODUCTION TO CLIMATE CHANGE

9:30-10:40 **Lecture 1.** Climate change: Global Trends and possible causes (Ryan Fogt).

10:40-11:00 Coffee Break

11:00-12:10 **Lecture 2.** Regional warming in Antarctica, causes and effects!! (Ryan Fogt)

12:10-12:30 Literature Assignment

12:30-14:30 Lunch

UNIT 2. CLIMATE & ENVIRONMENTAL EVOLUTION IN ANTARCTICA

14:30-15:40 **Lecture 3.** Climatic Evolution in Antarctica (Juan Carlos Aravena)

15:40-16:00 Coffee Break

16:00-17:10 **Lecture 4.** The Evolution of the Antarctic Flora (Marcelo Leppe)

17:10-17:40 Organizing groups and proposal activities (Bravo L.A.)

19:00 Inaugural Ceremony and welcome cocktail

José Retamales (INACH) Welcome Message

Friday, October 24

9:00-10:10 **Lecture 5.** Structure and composition of marine Antarctic macroalgae (Ivan Gómez)

10:10-11:10 **Lecture 6.** General Background to Antarctic terrestrial systems and their connections with lower latitudes (Peter Convey).

11:10-11:30 Coffee Break

11:30-12:40 **Lecture 7.** Seaweed ecophysiology and perspectives under climate change scenarios (Kai Bischof)

12:40-14:30 Lunch

UNIT 3. ADAPTATIONS OF PLANTS AND ALGAE TO ANTARCTIC ENVIRONMENTS.

Low temperature

14:30-15:40 **Lecture 8.** How to study low temperature (Chilling & Freezing) resistance in plants from cold environments (Ángela Sierra).

15:40-16:00 Coffee Break

16:00-17:10 **Lecture 9.** Freezing tolerance in Antarctic Vascular Plants/Physiological mechanisms (Bravo L.A.).

17:10-18:20 **Lecture 10.** Algal physiological adaptations to polar Environments (Kai Bischof)

18:20-19:00 Help with Literature Review.

Saturday, October 25

9:00-10:10 **Lecture 11.** Effect of low temperature on photosynthesis and carbon assimilation (Danielle Way)

Nutrients

10:10-11:10 **Lecture 12.** Heterogeneity of soil nutrient in Antarctica, Is this a limitation for plant growth? (Cecilia Perez)

11:10-11:30 Coffee Break

11:30-12:40 **Lecture 13.** The importance of biological nutrient cycling for ecosystem development after glacier retreat (Cecilia Perez).

12:40-14:30 Lunch

Visible and UV-B Radiation

14:30-15:40 **Lecture 14.** Solar radiation in aquatic media: limitations and effects in algae (Pirjo Huovinen).

15:40-16:00 Coffee Break

16:00-17:10 **Lecture 15.** Photoprotection mechanisms against excess solar radiation in algae (Iván Gómez).

17:10-18:20 **Lecture 16.** Photoinhibition & photoprotection mechanisms in Antarctic mosses and lichens (Mercedes Vivas).

18:20-19:00 Help with Literature Review.

Sunday, October 26

9:00-10:10 **seminar 1-2.**

10:10-11:10 **seminar 3-4.**

11:10-11:30 **Coffee Break**

UNIT 4. EFFECTS OF CLIMATE CHANGE

11:30-12:40 **Lecture 17.** The impacts of climate change on circumpolar biodiversity (Peter Convey)

12:40: 13:50 **Lecture 18.** The arrival of alien species in Antarctica: climate change or human impact? (Peter Convey).

Sunday Afternoon FREE to Study

Monday, October 27

9:00-10:10 **Lecture 19.** Evolutionary trait limitations in Subantarctic plants may limit plant responses to warming. The example of Macquarie Island (Dana Bergstrom)

10:10-11:10 **Lecture 20.** Consequences of the increase in temperature in cold environments (Lohengrin Cavieres).

11:10-11:30 **Coffee Break**

11:30-12:40 **Lecture 21.** The impact of warming on photosynthesis and respiration (Danielle Way)

12:40-14:30 Lunch

14:30-15:40 **seminars 5-6.**

15:40-16:00 Coffee Break

16:00-17:10 **seminars 7-8.**

17:10-18:20 Students proposals guidance

Tuesday, October 28

9:00-12:30 Field Trip, plant and algal Collection: Fuerte Bulnes

Activity 1. Measuring environmental conditions (Lohengrin Cavieres).

Lunch 13:00-14:00

14:30-17:00 Algae Collection: Magellan Strait (Punta Santa Ana), (Andres Mansilla/Iván Gómez).

Activity 2. Measuring Sub-aquatic light (Iván Gómez/Pirjo Huovinen).

Wednesday, October 29

Laboratory Demonstrations

Activity 3. Measuring ice nucleation and freezing points of algal and plant tissue (Angela Sierra)

Activity 4. Fluorescence measurements in macroalgae (Ivan Gómez/Pirjo Huovinen)

Activity 5. Effect of temperature in photosynthesis at thylakoid and carbon uptake level (Patricia Saéz, León A. Bravo)

Actividad 6. Measuring absorbance and fluorescence heterogeneity by imaging fluorescence. (Examples using plant leaves and algae).

Lunch 13:00-14:00

Proposal Defenses

14:30-15:10 Group 1

15:10-15:50 Group 2

15:50-16:20 Coffee Break

16:20-17:00 Group 3

17:00-17:40 Group 4

Thursday, October 30

9:00-10:00 Certifications