

Climate Change Ecology (0455.3082)

Syllabus

| Week/ Lecture N# | Topics and tasks |
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| 1 11.03.20 | Introduction to Global Change Ecology – The Climate System; Evolution of the Earth’s Climate; Natural Drivers of Change; Natural Drivers of Change; Major Features of Present Climate; Stable States of the climate system; Human-Driven Change: Effects of rising CO2 on ecosystems |
| 2 18.03.20 | Species Range Shifts Under Climate Change - First Sign of Change: Coral Bleaching; Ocean Acidification; First Changes on Land; Mounting Evidence of Range Shifts; Patterns of range shifts and extinctions; Freshwater Changes; Pests and Pathogens range change. |
| 3 25.03.20 27.03.20 | Phenology: Changes in Timing of Biological Events Due to Climate Change Phenology in Freshwater Systems; Tropical Forest Phenology; Marine Ecosystems; Mechanisms : Temperature and Photoperiod; Life Cycles of Insect Herbivores; Timing Mismatches Between Species Field trip N#1 (Friday, 27.03.20) Visit to Matta LTER research station and Yatir Forest climate change experiments |
| 4 01.04.20 | Ecosystem Changes under Global Change - Changes in different biomes under climate change; Food web changes in terrestrial, marine and freshwater ecosystems, Ecosystem Feedbacks to Climate System |
| 5 22.04.20 | Past Terrestrial and Marine Response to Climate Change - The Record of the Ice Ages; Ice Racing in North America and Europe; Out of Land: The Southern Temperate Response; North Meets South; Rapid Change: The Younger Dryas; Milankovitch Forcing in the Biological Record; Ocean Chemical Changes, Effects of Ocean Circulation; Lessons of Past Change <i>Students paper presentation*</i> |
| 6 06-05-20 | Extinctions and Climate Change The Five Major Mass Extinctions; Causes of Extinction Events; Climate as the Common Factor in Major Extinctions; Does Climate Change Always Cause Extinction? The Past 100 Million Years; The Past 2 Million Years: Extinction at the Dawn of the Ice Ages and the Pleistocene; The Missing Ice Age Extinctions. |

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| 08.05.20 | <p><i>Students paper presentation*</i></p> <p>Field trip N#2 (Friday, 08-05-20) Visit to Israel Oceanographic Research Station and the Kinneret Limnological Laboratory</p> |
| 7 13.05.20 | <p>Experimentation and Modeling Species and Ecosystem Response Field Experiments; Whole-Vegetation Experiments; Results of Field CO2 Experiments; Arctic Experiments; Modeling Species and Ecosystem Response; Dynamic Global Vegetation Models; Modeling Aquatic Systems</p> <p><i>Student paper presentation*</i></p> |
| 8 20.05.20 | <p>Adaptation of Conservation Strategies under Climate Change - Early Concepts of Protected Areas and Climate Change; Protected Area Planning; Planning for Persistence; Resistance and Resilience; Protected Area Management; Marine Protected Areas</p> |
| 9 27.05.20 | <p>Connectivity and Landscape Management under Climate Change Area -Demanding Species; Migratory Species under Global Change; Species Range Shifts; Managing Connectivity in Human-Dominated Landscapes; Regional Coordination Monitoring</p> <p><i>Student paper presentation*</i></p> |
| 10 03.06.20 | <p>Mitigation: Reducing Greenhouse Gas Emissions Sinks, and Solutions; Climate Policy; Stabilizing Atmospheric Greenhouse Gas Concentrations; Practical Steps for the Next 50 Years; Energy Efficiency; Renewable Energy Sources</p> |
| 11 10.06.20 | <p>Extinction Risk from Climate Change Solutions Wedges Beyond 50 Years; Land use Requirements of Alternate Energy; Carbon Sequestration; Geoengineering</p> <p><i>Guest lecturer</i></p> |
| 12 17.06.20 | <p>Israel and Global Climate Change Desert and Mediterranean ecosystems under climate change. The eastern Mediterranean and Red Sea under climate change.</p> <p><i>Guest lecturer</i></p> |
| 13 24.06.20 | <p>Food Security and Global Changes Food production under climate change; Agriculture and Land-use management under climate change. Soil health under climate change</p> |

