



GÖTEBORGS UNIVERSITET

## Late Holocene climate variability, 5 hp

Course period: 1 week, October 2015	Last day for application: 2015-09-30
Course leader / Address for applications: Hans Linderholm / hans.linderholm@gvc.gu.se	
Course description: In this course, you will learn about “natural” climate change and variability prior to the industrial revolution to set the current warming in a longer perspective. Focus will be on the Arctic and northern high-latitude regions. Issues to be addressed are for example the heterogeneity of different anomalous periods (e.g. the Medieval Climate Anomaly and the Little Ice Age) and climate forcing on different timescales. Different climate proxies used to reconstruct past climates as well as climate models will be discussed. The course will be loosely based on chapter 5 in the latest IPCC report (2013), with a special focus on the last 2000 years. Each day of the course will have a special theme, where a lecture is given during the morning (which will be open to other than the PhD students) by invited lecturers. In the afternoon there will be discussion seminars based on Ch.5 in the IPCC and papers that the lecturer have selected for the students to read beforehand. Each student will present a review of at least one paper during the course. A reflection of regional climate change during the last 2000 years is also required.	
Responsible department and other participation departments/organisations:	
Teachers: Hans Linderholm (Course leader and main contact) Other teachers to be announced	
Examiner: Hans Linderholm	



GÖTEBORGS UNIVERSITET  
Faculty of Science; Department of Earth Sciences

## **Late Holocene climate variability, 5 hp**

*Third cycle education*

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### **1. Confirmation**

The syllabus was confirmed by the Head of the Department of Earth Sciences 2014-02-05

Disciplinary domain: Science

Department in charge: Department of Earth Sciences

Main field of study: Climatology

### **2. Position in the educational system**

Elective course; third-cycle education.

### **3. Entry requirements**

Admitted to third cycle education.

### **4. Course content**

The course will be loosely based on chapter 5 in the latest IPCC report (2013), with a special focus on the last 2000 years. Each day of the course will have a special theme, e.g. the fidelity of paleoclimate reconstructions, paleoclimate modelling and regional climate change. A lecture is given during the morning (which will be open to other than the PhD students) by invited lecturers. In the afternoon there will be discussion seminars based on Ch.5 in the IPCC and papers that the lecturer have selected for the students to read beforehand. In addition to presenting papers at the seminars, the students are to hand in a written reflection of climate change in the last 2000 years.

### **5. Outcomes**

After completion of the course the Ph.D. student is expected to be able to

#### **1. Knowledge and understanding**

- Describe natural climate variability (pre Anthropocene)
- Describe spatiotemporal climate change in the Arctic – northern high latitudes of the last 2000 years
- Describe forcing of climate on different time scales
- Explain climate proxies and models



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### 2. Skills and abilities

- To be able to assess the benefits and limitations of climate proxies and models
- To review, summarise, present and discuss scientific literature

### 3. Judgement and approach

- To critically evaluate available reconstructions of past climate change.

### 6. Required reading

The reading list is supplied separate to the syllabus. (Where necessary also state other types of course material.)

### 7. Assessment

To pass the course, the students are to present a review of at least one paper at the afternoon seminars, as well as written reflection of Arctic-High-latitude climate change in the last 2000 years.

### 8. Grading scale

The grading scale comprises Fail, (U), Pass (G)

### 9. Course Evaluation

The course evaluation is carried out together with the Ph.D. students at the end of the course, and is followed by an individual, anonymous survey. The results and possible changes in the course will be shared with the students who participated in the evaluation and to those who are beginning the course.

### 10. Language of instruction

The language of instruction is English.