



GÖTEBORGS UNIVERSITET

## NORDQUA field trip: Deglacial history and geomorphic development of the area between Vänern and Vättern, 3 credits

Course period: September 21-October 5	Last day for application: 2015-08-17
Course leader/Address for applications: Mark D. Johnson/markj@gvc.gu.se	
Course description (Advertisement for Ph.D. students): <p>The course is built around the second excursion of the restarted NORDQUA (Nordic Quaternary Union) involving Quaternary scientists from the Nordic countries. The excursion (September 21-24) will take us to south-central <b>SWEDEN</b> along the trend of the Younger Dryas end moraines and to the site of the drainage of the Baltic Ice Lake. This landscape is characterized by butte-like remnants of a Paleozoic sedimentary cover resting upon the flat to etched subcambrian peneplain, and we will review briefly the billion-year history of the evolution of this landscape. But we will concentrate on the late-glacial story and investigate among other themes: the regional deglacial stratigraphy; the push-moraine genesis of the middle Swedish end moraines; the new LiDAR-revealed evidence for drainage of the Baltic Ice Lake; drumlin localities on Kinnekulle; De Geer moraine genesis; Holocene sand-dune activity and the dynamic behavior of the Vättern Lobe. Many of these localities are well-known and famous, but extensive recent work in the Skara-Billingen area and in the Vättern basin have revealed new information about this dramatic area.</p>	
Responsible department and other participating departments/organisations: Department of Earth Sciences	
Teachers: Mark D. Johnson (Course leader and main contact) Presenters: Svante Björck, Mats Olvmo, Tore Påsse, Colby Smith, Sarah Greenwood, Helena Alexandersson	
Examiner: Rodney Stevens (Department of Earth Sciences)	



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Faculty of Science  
Department of Earth Sciences

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*Third cycle education*

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### **1. Confirmation**

The syllabus was confirmed by the Head of the Department of Earth Sciences 2015-06-26.  
The course plan is valid from 2015-06-26.

Disciplinary domain: Science  
Department in charge: Department of Earth Sciences

### **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 consist of an excursion of four days to highlight the deglacial history and geomorphology of the land between Vänern and Vättern. The emphasis is to have a direct field experience of the evidence for deglaciation and geomorphic development, and to introduce the students to current knowledge and current outstanding questions. Particularly we will look at the development of the bedrock landscape, the stratigraphic and geomorphic record of the Younger Dryas event, the evidence for a dynamic ice lobe in the Vättern basin, and the current status of understanding of the drainage site of the Baltic Ice Lake.

### **5. Outcomes**

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

#### **5.1. Knowledge and understanding**



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- Describe the long-term geomorphic development of SW Sweden
- Describe the evidence for the Younger Dryas event.
- Describe the current understanding of the timing and character of the Baltic Ice Lake drainage event(s).
- Describe the evidence for the dynamic Vättern lobe

### 5.2. Skills and abilities

- To review, summarise, present and discuss scientific literature.
- To network with other scientists within the field.

### 5.3. Judgement and approach

- In order to understand deglaciation in general and potential coming deglaciations, it is important to investigate the record of a deglaciation for which we have best evidence. Additionally it is important to understand the long-term and short-term development of Nordic landscapes when addressing societal problems of landuse, groundwater, construction and natural heritage issues.

## 6. Required reading

The reading list is supplied separate to the syllabus. Recent articles in the fields. These are provided to the students in good time before the course, and their contents will be processed through lectures and seminars during the course.

## 7. Assessment

To pass the course, the students need to attend the excursion, participate in field and evening discussions and hand in a report answering one of the scientific questions posed in the thesis.

## 8. Grading scale

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

## 9. Course evaluation

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.