



# SLUkurs

## Syllabus

**PNSo164 Ecological stability in times of rapid environmental change,  
3.0 credits**

## Syllabus approved

2018-05-15

## Subjects

Biology/Environmental Assessment

## Education cycle

Third cycle

## Grading scale

Pass / Failed

The requirements for attaining different grades are described in the course assessment criteria which are contained in a supplement to the course syllabus. Current information on assessment criteria shall be made available at the start of the course.

## Language

English

## Prior knowledge

The course is open for PhD students. Post doc researchers are welcome only if there is place.

Students should have an undergraduate degree in environmental science or related subject, ideally at an advanced level. Some sections of the course will address deeper aspects of ecological theory, and thus previous courses in basic ecology would be

very beneficial, though parts of the course will also be suitable for students with a more limited ecological background who are nevertheless interested in the topic of ecological stability.

### **Objective, including learning outcomes**

After the course, students should be able to:

Discuss and evaluate different definitions of ecological stability

Relate these concepts to ecosystem management and conservation

Apply the key theoretical underpinnings of ecological stability research in developing their own research topics

Developing own hypotheses on ecological stability and to discuss approaches to test them

Identify methods for quantifying ecological stability that are appropriate for their own research topic

Evaluate the value of ecological stability in bioassessment, particularly in relation to their own research topic, and discuss advantages and possible difficulties of these approaches

### **Content**

Human actions challenge nature in many ways. Ecosystems absorb and respond to multiple types of environmental change, encompassing stochastic to periodic fluctuations as well as pulse and press disturbances. Ecological responses are ineluctably complex, demanding measures that describe them. Collectively, these measures encapsulate the overall ‘stability’ of the system. Many international bodies, including the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services, broadly aspire to maintain or enhance ecological stability. Ecological ‘stability’ is the core concept describing potential responses to such changes, a concept of central importance for understanding present-day and predicting future ecosystem dynamics. This knowledge is a pre-condition for ecosystem management and environmental policy in the face of rapid environmental change. The scientific approach to stability, however, has been characterised by a multitude of stability measures used, with at times blurred and often non-exclusive definitions. Disturbances and stability are multidimensional. Our understanding of them is not. We have a remarkably poor understanding of the impacts on stability.

During the course we will guide course participants through the theoretical concepts and dimensions of stability across different spatial and time scales to aid discussions and hypothesis development to be able prepare you to develop your

own research with the future aim to integrate results with policies and actions. The course has two parts: The first week is to prepare for the course by reading a suggested list of publications and preparing a short presentation of your own research project and thoughts of how it links to the course theme. The second week is five full day sessions, each including lectures, discussions and other exercises together with course participants and teachers.

### **Requirements for examination**

The course is graded as pass/fail

To receive full 3 ECTS credits for the course, participants should:

Read the literature provided before the course. The literature consists of publications connected to the lectures.

Actively participate in the workshop discussions.

Attend all sessions. While it is permissible to miss sessions, the points awarded will be down weighted according to the number of sessions missed. Note that if there are more than 16 students interested in taking the course, priority will be given to students able to attend all sessions.

Give an oral presentation that explains how their own research might be extended by incorporating some of the concepts or methodologies covered in the course. Thus, for students whose projects already focus on some aspects of ecosystem stability/resilience, their presentation should explain how new concepts and/or methodological approaches could extend the scope of their research.

### **Additional information**

This course is organized by the Research School Focus on Soil and Waters and the August T. Larsson Guest Professor program by the NJ Faculty at SLU.

Course homepage:

<https://www.slu.se/en/departments/aquatic-sciences-assessment/education/post-graduate-education/phd-courses/ecological-stability-in-times-of-rapid-environmental-change/>

### **Responsible department**

Department of Aquatic Sciences and Assessment