

Training event on curricula

Preventive methods for coastal environmental protection
Environmental Mathematic Modelling for wave dynamics
Coastal processes and environmental management
in the framework of SESREMO project

Tallinn 01–14 November 2014

The training was organised as a sequence of sample lectures from all three curricula in question. Each lecture was followed by an extensive discussion of its content, the match of the curricula with the existing lecture courses in the target universities, requirements for potential students, possibilities of extension or modification of the material and level of presentation within the curricula under development in the target universities, and overall role of the new curricula for the education, research and development use in the target countries.

A part of the training was organised in cooperation with the department of geophysics of Klaipėda University. This decision first of all reflects the climatological conditions in Estonia in late autumn and winter. Namely, extensive parts of the nearshore of Estonia often have sea ice already in mid-November. The possible presence of coastal ice would have considerably limited the options for the field work foreseen in the curricula "Environmental Mathematic Modelling for wave dynamics" and "Coastal processes and environmental management." Also, most of beaches in Estonia belong to a relatively rare type of almost equilibrium, geometrically sheltered beaches while beaches in the vicinity of Klaipėda are much more representative for the majority of beaches in the target countries.

The set of sample lectures of the curricula "Environmental Mathematic Modelling for wave dynamics" and "Coastal processes and environmental management" was selected to form a coherent introductory lecture course on wave dynamics and coastal processes foreseen in the study plan of MSc students specialising on Earth sciences in Klaipėda University. This choice made it possible to simulate the atmosphere, timing and presentation level of a standard lecture course in a manner maximally close to university teaching practice and at the same time to avoid frontal lectures targeted to the trainees.

The theoretical material was linked to practical demonstrations:

- full day of field work dedicated to naturally developing sandy beaches in different locations of the Curonian Spit (UNESCO World Heritage) and examples of sustainable management of the coastal zone (groins, stabilisation of sand masses, handling of the problem of cormorants);
- half-day visit to a beach near Klaipėda (with sighting of a recently discovered ship wreck from 19th century in an area suffering from intense erosion) and to Palanga Beach that has been subject of considerable anthropogenic interventions. The presence of a long jetty in Palanga made it possible to explain in practice many nontrivial and partially counter-intuitive aspects of wave dynamics in the nearshore.

The sample lectures were backed up by classes that detailed the theoretical material for MSc students and then focused on the ways of practical use of this material. These classes were open to the trainees and provided an important option for receiving feedback from regular students. Klaipėda University accepted that the participating MSc students dedicate themselves fully to this two-week training event.

On top of that, Klaipėda University organised a short course on basics of scientific communication during the SESREMO training. This course was also open to SESREMO trainees, and this possibility was actively used.

The described format made it possible to considerably widen the target audience and to reach extensive media coverage. Additionally to students from Lithuania, several PhD and MSc students from the Wave Engineering Laboratory (Tallinn University of Technology) and one young scientist (PhD in civil and environmental engineering) from the Latvian Institute of Aquatic Ecology (Riga) decided to participate in this event.

The event was extensively covered by the media service of Klaipėda University, both in web-based information stream and in the printed university newspaper. The newspaper of the City of Klaipėda published a longer overview of the event and an interview with T. Soomere. The Lithuanian TV channel TV3 broadcasted comments of T. Soomere and the local organiser (Prof. L. Kelpšaitė) about changes in coastal processes in the vicinity of Klaipėda Harbour that led to unexpected beaching of an 19th century ship wreck.

The trainees received the following printed teaching material:

- copies of a short overview of the basics of the curriculum *Preventive methods for coastal environmental protection* prepared by T. Soomere, N.C. Delpeche-Ellmann, T. Torsvik and B. Viikmäe;
- copies of lecture notes on the curriculum *Environmental Mathematic Modelling for wave dynamics* prepared by T. Soomere;
- copies of lecture notes on the curriculum *Coastal processes and environmental management* prepared by T. Soomere;
- printouts of slides of all sample lectures.

The trainees also received the following electronic material:

- pdf-files of the printouts of all sample lectures;
- full set of original slides of the sample lecture "Tsunami from the viewpoint of linear wave theory."

Appendix 1. The schedule of the training

Saturday, 01 November: Opening of the event; sample lectures and discussion on the curriculum *Preventive methods for coastal environmental protection* (Tallinn, Institute of Cybernetics).

Sunday, 02 November: Transfer to Klaipeda

Monday, 02 November – Thursday, 13 November: Training event in Klaipeda, sample lectures on the curricula *Environmental Mathematic Modelling for wave dynamics* and *Coastal processes and environmental management*. Each lecture (except for Lecture 4) was designed for four standard academic lecture hours.

Lecture 1: From Newton's laws to wave equations

Lecture 2: Fundamentals of linear theory of surface waves

Lecture 3: Wave properties in the nearshore

Lecture 4: Tsunami from the viewpoint of linear wave theory

Lecture 5: Coastal flooding as a wave problem

Lecture 6: Ocean waves: properties and measurements

Lecture 7: Wave climate

Lecture 8: Simulated sediment transport along sedimentary coasts of the Baltic Sea

Friday, 14 November: Transfer to Tallinn; discussions on the curriculum *Preventive methods for coastal environmental protection* (Tallinn, Institute of Cybernetics); closing of the event.

Appendix 2. The list of SESREMO participants

1. Mr. Andrey Zavadsky
2. Mr. Teodor Vrecica
3. DSc Tahir Aghayev
4. Dr. Ramiz Huseynov
5. Ms. Makpal Nogaibayeva
6. Prof. Dr. Zaure Rakisheva
7. Mr. Bakhtiyar Igembayev
8. Mr. Bakhitbek Saktaganov
9. Dr. Sholpan Yespenbetova
10. Ms. Saule Demessinova

The participating universities

Al-Farabi Kazakh National University (KZ)
L.N. Gumilev Eurasian National University (KZ)
Korkyt Ata Kyzylorda State University (KZ)
Sumgait State University (AZ)
Tel-Aviv University (IL)

Teaching staff

Tallinn University of Technology:
Prof. Tarmo Soomere
Dr. Irina Didenkulova
Dr. Tomas Torsvik
Cand. Sci. (Dr.) Artem Rodin
Klaipėda University:
Prof. Loreta Kelpšaitė
Mr. Edvardas Valaitis (PhD student)
Ms. Toma Mingelaite (PhD student)