



# Implementation of competence- based approach to the study programmes in Geography and Earth sciences

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# Study programmes

University of Latvia is only HEI in Latvia providing academic studies in geography and geology

Academic study programmes in geography and geology in all 3 levels:

- Bachelor's
- Master's
- Doctoral

All assessed three times; in 2017 accredited until 24.04.2023.

All programmes are **academic** ensuring the succession of all levels of specialisation and research in areas of the Earth sciences, as important in the labour market and for science in Latvia and the EU.

# Organisational scheme (since 2009)

## Faculty of Geography and Earth Sciences (FGES)

Department of  
Geography

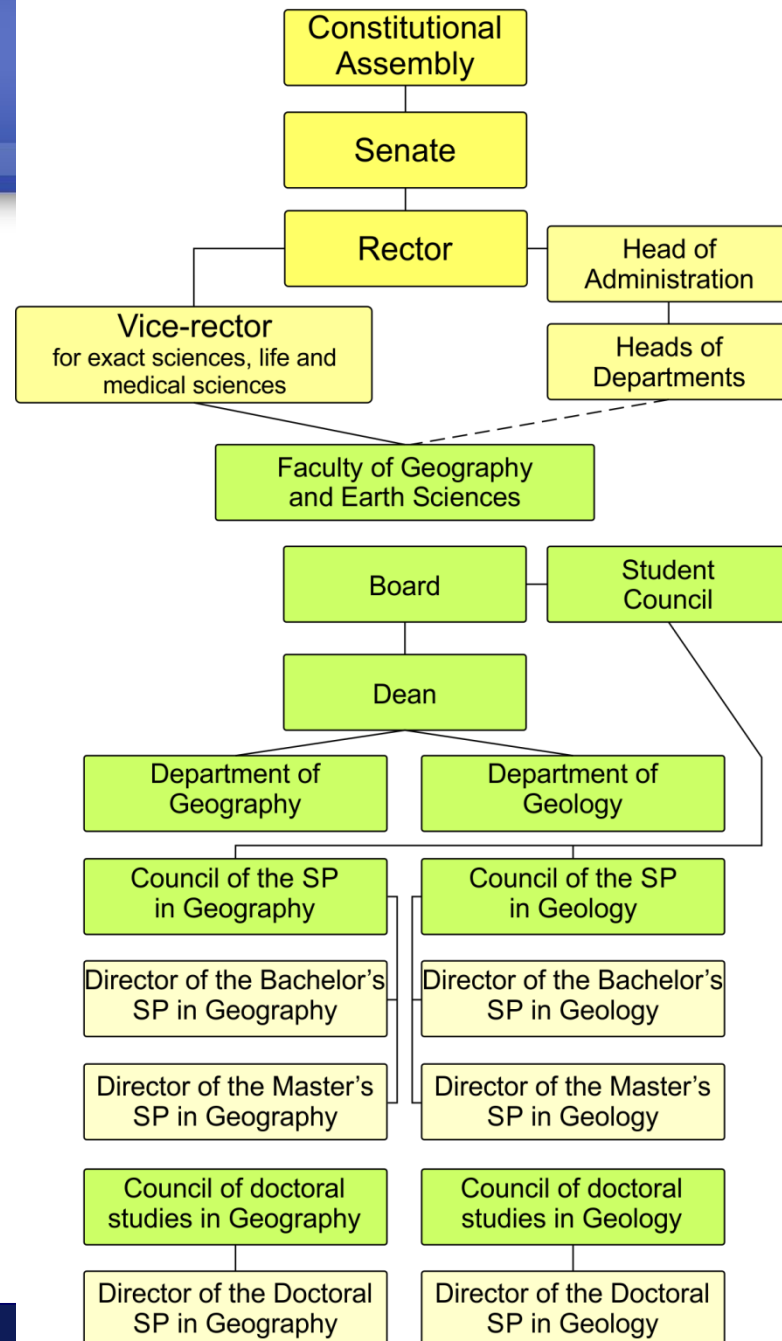
3 chairs  
4 laboratories  
Map browser

Department of  
Geology

2 chairs  
4 laboratories  
Centre of Research  
and modelling of  
geological processes

Department of  
Environmental  
Science

## University of Latvia



Significantly  
improved  
during last  
few years

New facilities

Large library and  
databases

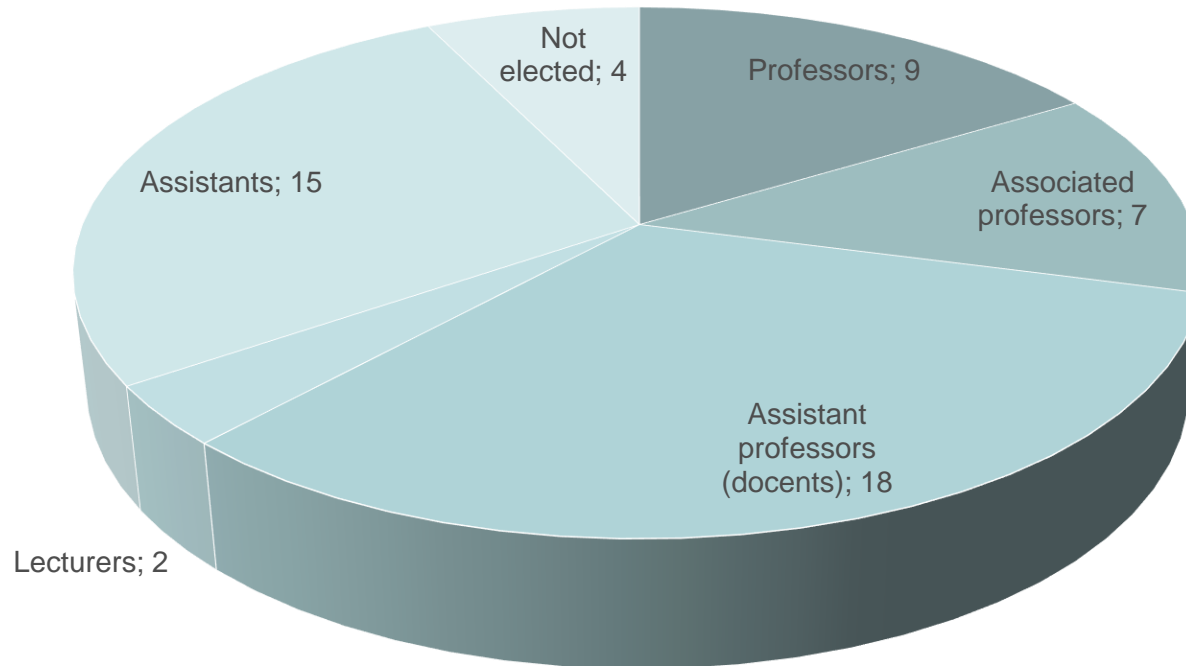
E-studies (Moodle)

Improved laboratory  
equipment, new labs



Academic Center for Natural Sciences was the most modern university building in the Baltic States (until January 2019, when a new building of Science was opened)

# Qualification of staff

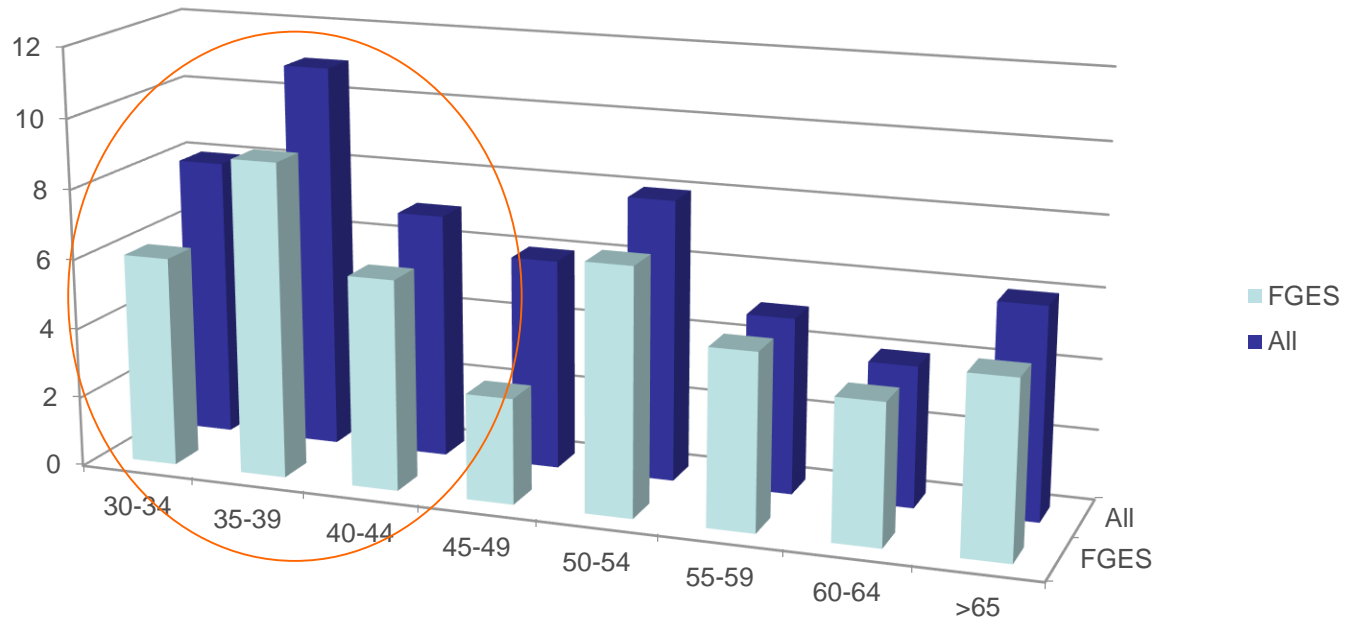


47 of 55 members of teaching staff has doctoral degree:

21 in Geography, 13 in Geology, 4 in Chemistry, 3 in Biology etc.  
45 persons are member of FGES, 39 has doctoral degree



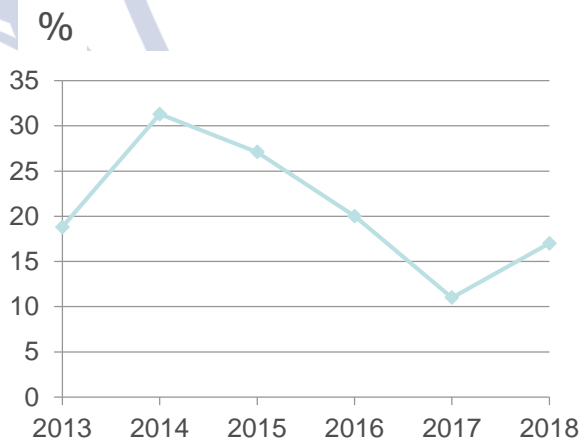
# Age structure of staff



Mean age of all staff members is 47.01 year  
(47.5 years for members of FGES) is optimal

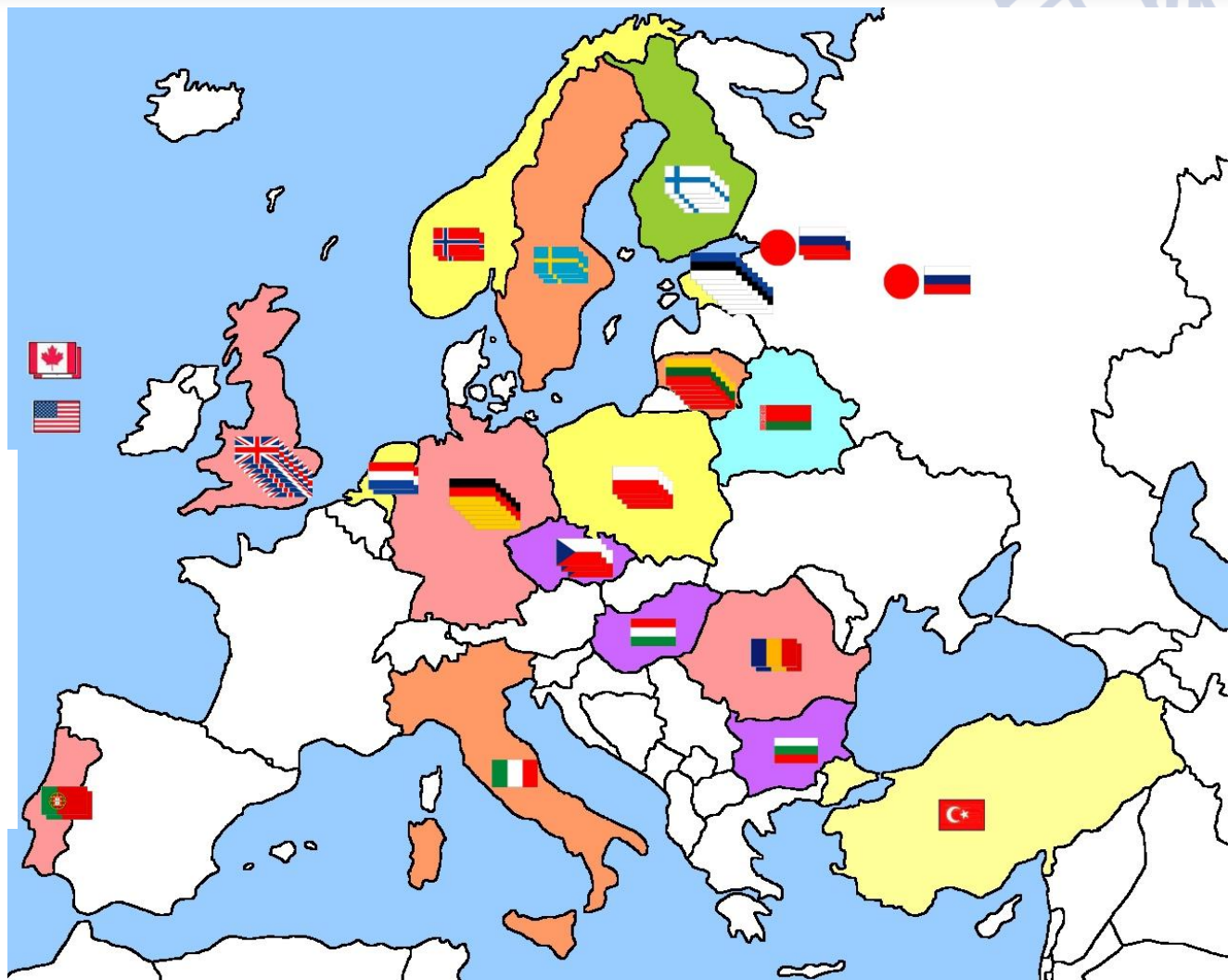
## Geography of visiting staff (20 countries)

Number of flags corresponds to the number of staff visits



Proportion of visiting staff

Data for 2013-2018

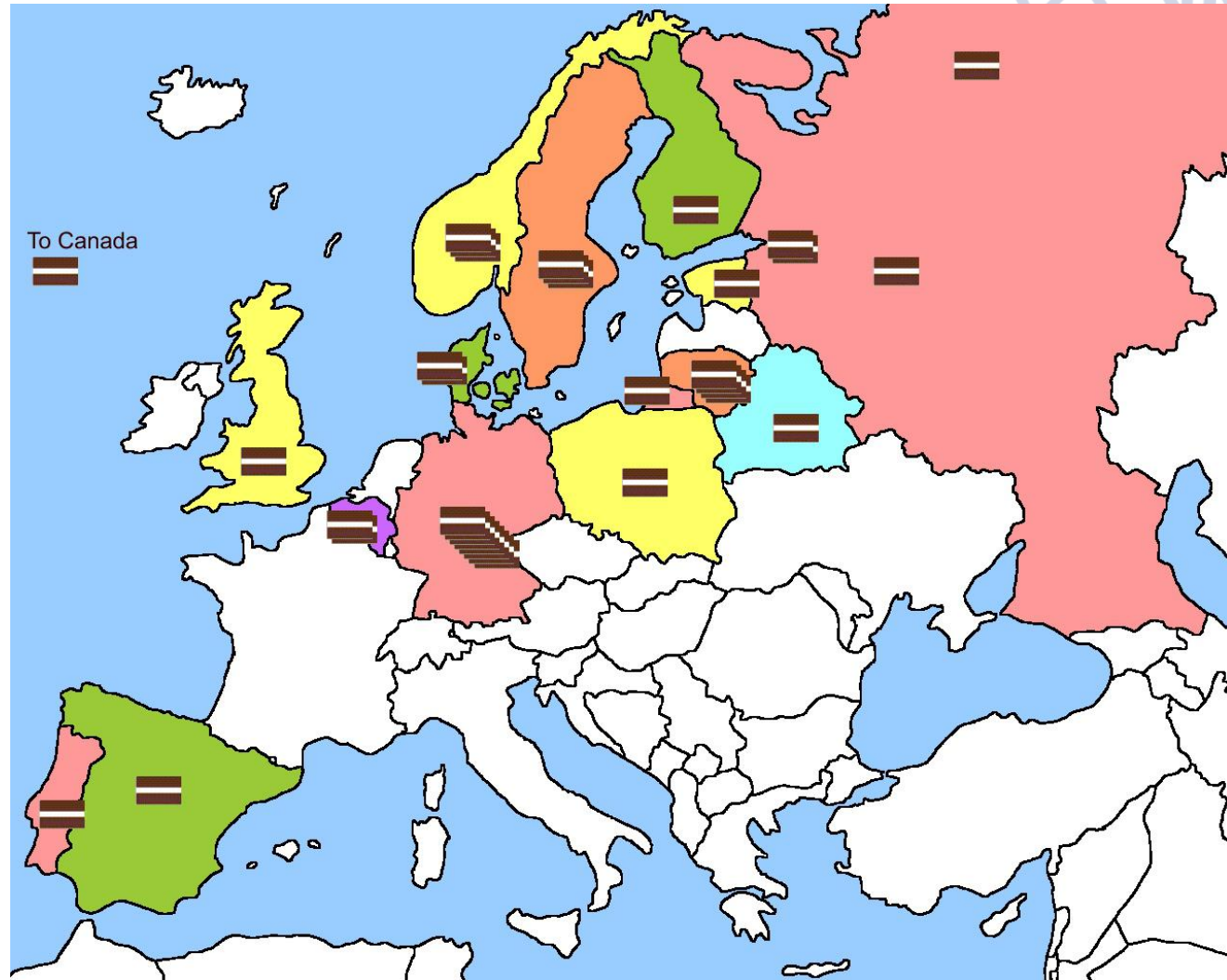




## Geography of our visits (16 countries)

Number of flags  
corresponds to the  
number of staff visits

Data for 2013-2018





# Main research areas

## Geography:

- Climatology, hydrology and meteorology
- Biogeography
- Economic geography
- Human geography
- Landscape geography
- Soil science

## Geology:

- Quaternary studies, glacial geology and geomorphology
- Sedimentology and Paleozoic-Mesozoic stratigraphy
- Applied geology
- Geoarchaeology
- Vertebrate palaeontology

## **The main international research grants and research programmes (6 years):**

- Horizon 2020: 2 projects
- 7<sup>th</sup> Framework Programme for Research and Technological Development (EU FP7): 2 projects
- European Commission (EC): 3 projects
- European Social Fund (ESF): 1 project
- European Regional Development Fund (ERDF): 1 project
- Copernicus: 1 project
- COST Action: 3 projects
- International Geological Correlations Programme (IUGS IGCP): 1 project

**22 projects in total**

## **Other projects**

- Funded by Latvian Council of Science (LCS): 7 projects
- Funded by Nature Conservation Agency: 4 projects

**18 projects in total**

## Number of publications (2013-2018):

Articles in the peer-reviewed journals – 128

Book chapters and articles in books – 60

Publications in other international sources – 62

Publications in Latvian sources – 39 (including 7 monographs)

In total: **289**, 48.2 per year (46.3 in previous period); 1.07 per capita/per year

## Contributions to the conferences and symposia (published abstracts) – 366

Q1 and Q2 journals in Geosciences (impact factors for 2017 and number of papers):

*Climate of the Past* 3.638 - 1; *International Journal of Climatology* 3.609 - 1; *Theoretical and Applied Climatology* 2.433 - 2; *International Journal of Biometeorology* 2.309 - 2; *Climate Research* 1.69 - 1

*Boreas* 1.553 - 2; *Holocene* 2.135 - 2; *Quaternary International* 2.067 - 8; *Quaternary Research* 1.317 - 1; *Quaternary Science Reviews* 2.795 - 2

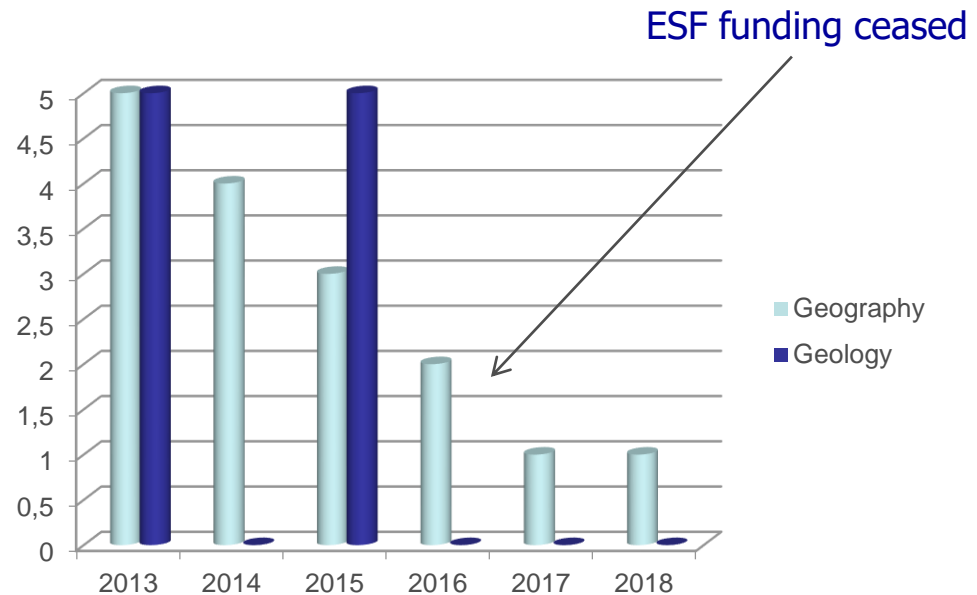
*Acta Palaeontologica Polonica* 1.749 - 2; *Bulletin of Geosciences* 1.7 - 1; *Paleobiodiversity and Paleoenvironments* 0.718 - 1; *Estonian Journal of Earth Sciences* 0.852 - 5; *Estuarine Coastal and Shelf Science* 1.034 - 4

*Hydrogeology Journal* 2.028 - 1; *Journal of Geochemical Exploration* 2.147 - 1; *Hydrological Sciences Journal* 1.061 - 1

Number of graduates of doctoral programmes during the period of 2013-2018:  
19 in Geography  
17 in Geology

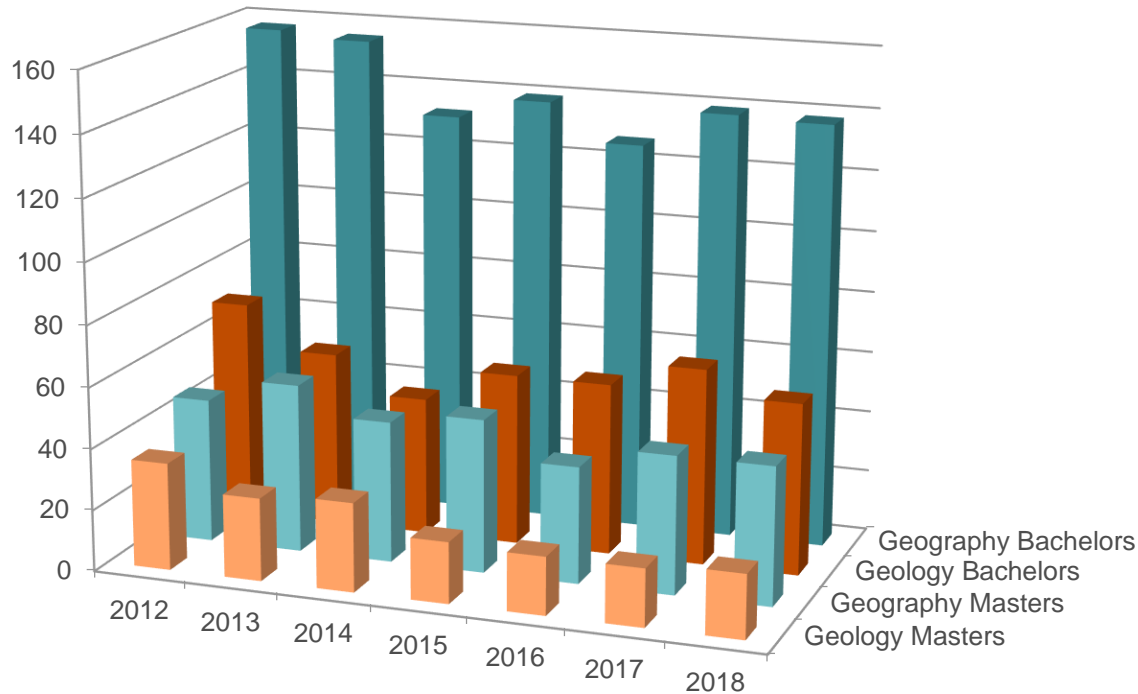
Number of defended doctoral theses during the period of 2013-2018:  
16 in Geography  
10 in Geology

Number of defended  
theses per year



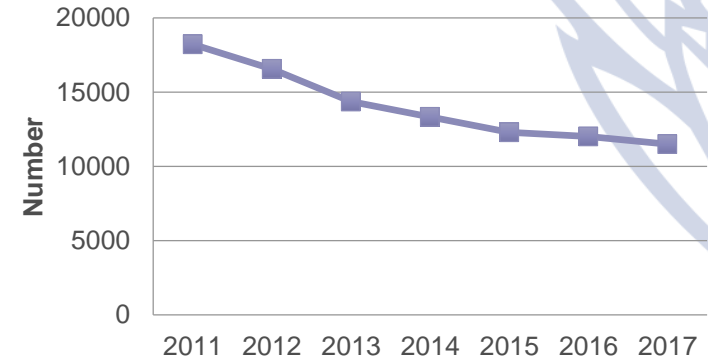


# Number of students



Number of students in the Bachelor and Master study programmes in Geography and Geology

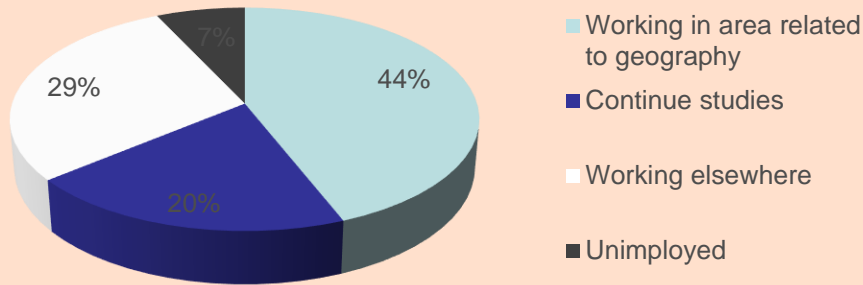
## Graduates



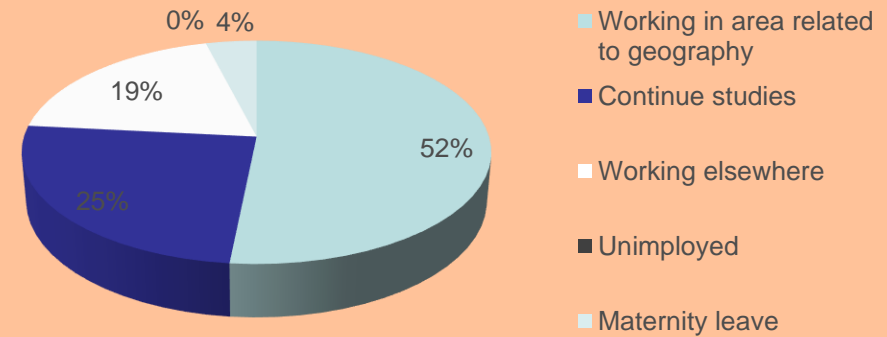
Number of general school graduates in Latvia decreases (data of CSB of Latvia)

# Labour market and employment (data for 2017)

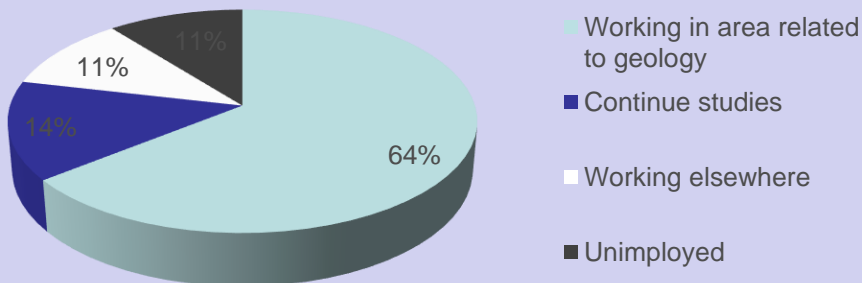
**BSP in Geography** 709 surveyed



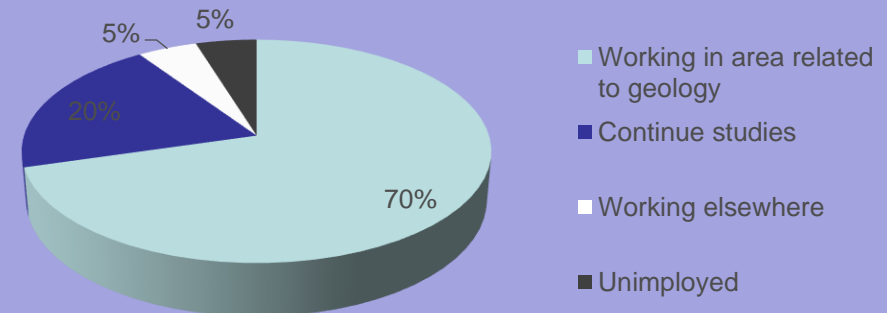
**MSP in Geography** 31 surveyed



**BSP in Geology** 28 surveyed



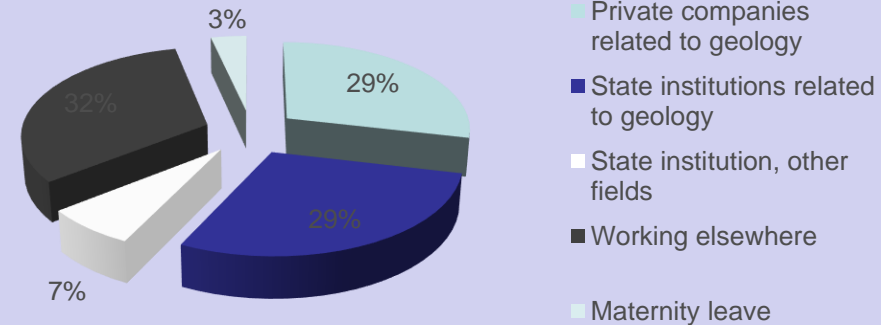
**MSP in Geology** 21 surveyed



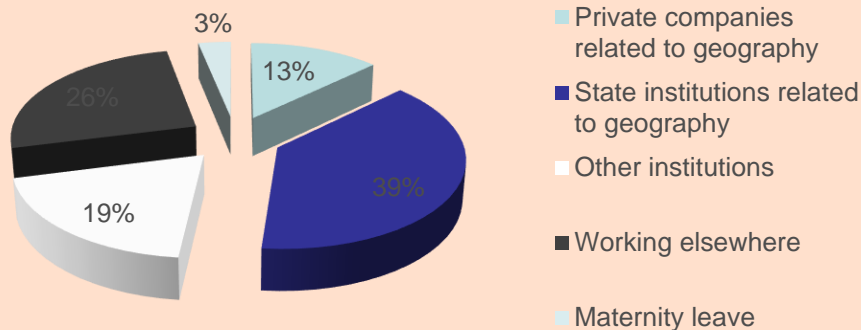
Where graduates find their jobs:  
 bachelors – mainly **industry** (private companies);  
 masters – mainly **state institutions**.

Ministry of Environmental Protection and Regional Development  
 Latvian Environmental, Geology and Meteorology Centre  
 State Environmental Service  
 State Regional Development Agencies  
 HEI: Daugavpils University, Riga Technical University, Latvian  
 Agricultural University (*also Aachen, London, Sidney etc.*)  
 Private companies as Metrum, Cemex, Latvijas Gāze,  
 Geokonsultants, Geolite (about 70 geological companies)

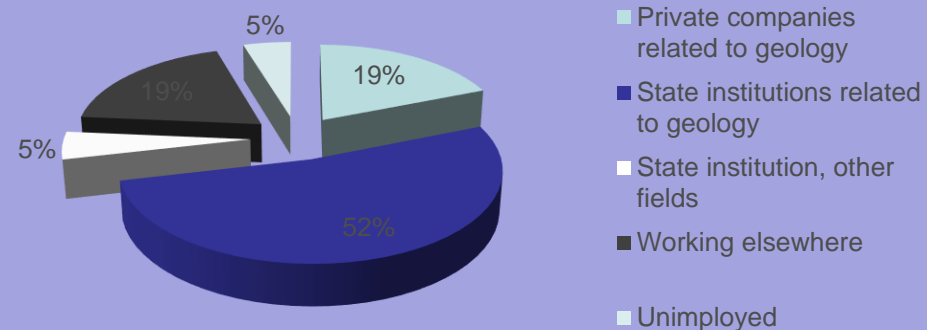
## BSP in Geology



## MSP in Geography



## MSP in Geology



Gradual change of paradigm: from teacher-centered (see what I can do and copy) to student-centered learning (partnership between teacher and student):



survey outcomes on students' satisfaction with the quality of courses  
(each semester, in LUIS)

survey outcomes on students' and graduates' satisfaction with the  
quality of studies (each year)



monitoring of the quality of study programmes (permanent)



Teacher formulates learning outcomes (**knowledge, skills, competence**) for each course (e.g., for the SP in Geology we used the document «*General Characteristics of a «European Core Curriculum» in Earth Sciences*» for our own convenience):

- Learning outcomes are available via curricula and e-courses;
- Description of learning outcomes gradually was invented several years ago;
- Since 2018 this is compulsory for all active e-courses in FGES.

Student knows and can adapt for acquiring these learning outcomes:

- The assessment includes several intermediate tests (usually smallest number of tests is the number of credit points minus 1);
- Each outcome should be tested (usually assessed by mark or yes/no).

## Example of learning outcomes Course «Evolution of the Earth»

### Knowledge

1. Demonstrating knowledge and understanding of the essential features, processes, materials, history and the development of the Earth and life in time and space;
2. Awareness of major geological paradigms, the extent of geological time and plate tectonics;
3. Knowledge and understanding of the complex nature of interactions within the geosphere.

### Skills

4. Ability to undertake literature searches, and to use data bases and other sources of information;
5. Ability to receive and respond to a variety of information sources (eg textual, numerical, verbal, graphical);
6. Ability to create simple geological models.

### Competence

7. Knowledge of the common terminology and nomenclature and the use of bibliography in Geosciences;
8. Ability to organise their own work independently;
9. Showing basic ability to communicate effectively in written and verbal form, critical thinking, ability to formulate and test hypotheses, ability to work effectively as an individual and as a member of a team.

## Criteria for Evaluation Learning Outcomes

Evaluation	Learning outcomes								
	1.	2.	3.	4.	5.	6.	7.	8.	9.
<b>1st seminar</b>	+			+			+	+	+
<b>1st test (each computer)</b>		+					+		
<b>2nd test (class-room computer)</b>			+				+		
<b>2nd seminar</b>	+			+			+	+	+
<b>practical works (two)</b>	+	+			+	+	+	+	+
<b>final exam (test)</b>	+	+	+	+			+		+

## Priority Axes (SAM 8.2.2) "To Strengthen Academic Staff of Higher Education Institutions in the Areas of Strategic Specialization"

### “Academic Staff Renewal and Continuing Professional Development at the University of Latvia”

**The aim of the Project** – to promote the employment of foreign academic staff in the study direction **Geography and Earth Science** thus contributing to the internationalization, export and international competitiveness of the University of Latvia.

**Project results** – 30% of the foreign academic staff who have received ESF funding continue to work as academic staff at the University of Latvia.

**Project time period** - from 4th quarter of 2018 to 3rd quarter of 2022, with minimum project participation set at 6 months.