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# University Campus and Laboratory Development

Prof. dr. sc. Nevenka Ožanić  
Faculty of Civil Engineering

Training, SC, PMC and QAC meetings / 18th September 2019

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University of Nis



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**Strengthening of master curricula in water resources  
management for the Western Balkans HEIs and stakeholders**

Project number: 597888-EPP-1-2018-1-RS-EPPKA2-CBHE-JP



# CROATIA



Strengthening of master curricula in water resources management  
for the Western Balkans HEIs and stakeholders

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# CROATIA





Rijeka, with its 120.000 inhabitants, is the third largest Croatian city, center of Primorsko Goranska County and the largest Croatian port situated on the Kvarner Bay.





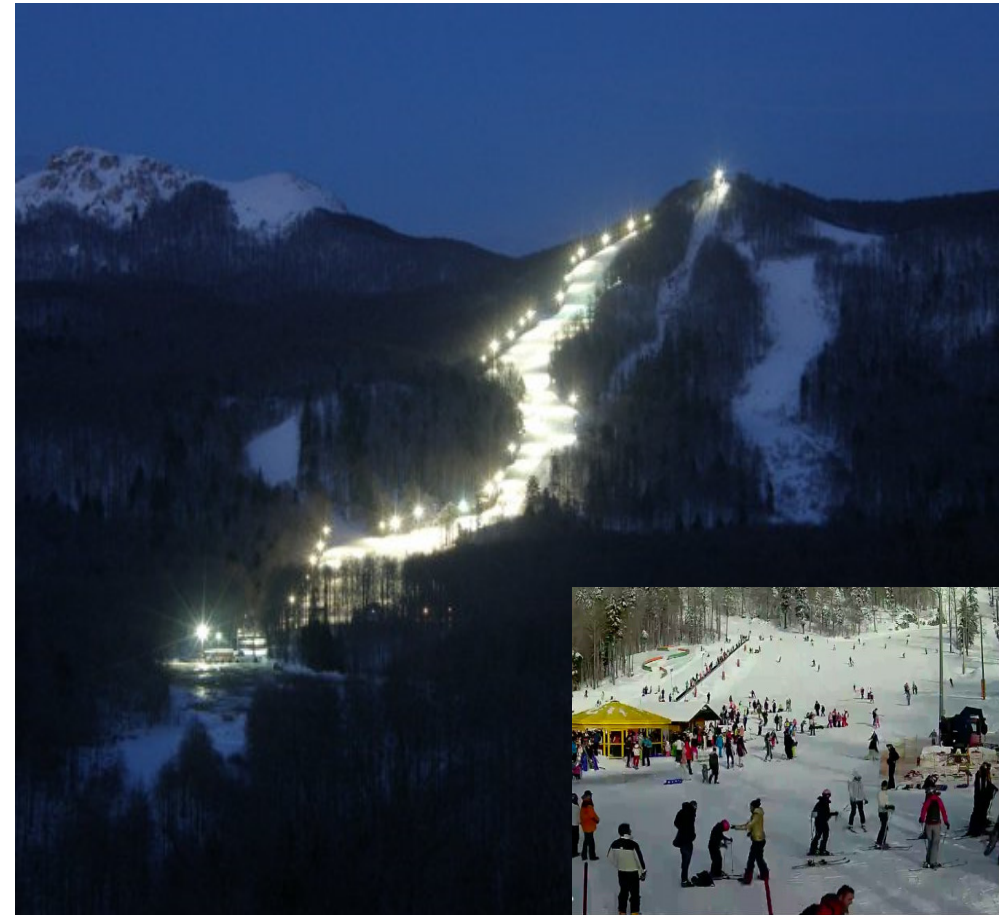
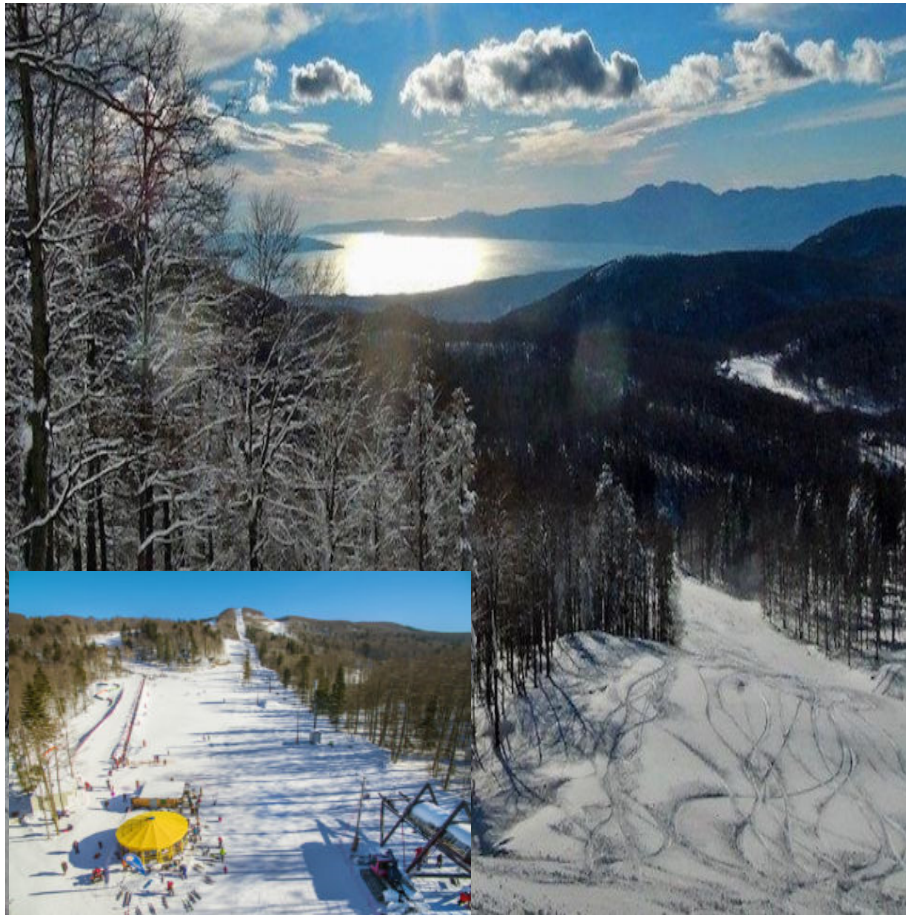
Industry and port traffic declined in 20th century and Rijeka is turning to tourism. Rijeka is a city where you can enjoy on the beautiful beaches and the clear sea and visit cultural sights.....



.....and within half an hour you can arrive on the mountain Učka and see Istria peninsula.....



...or in the winter, when you can see the sea from the ski resort Platak.





Really?

## Some Interesting Things about Rijeka:

- The Croatian anthem was written in Rijeka;
- The newspaper „Novi list” is the oldest daily newspaper in Croatia;
- Topredo was invented in Rijeka;
- The first international football match was played in Rijeka;
- In Rijeka was one of the first European disco club;
- Rijeka had the first chocolate factory in this part of Europe.

Šta da?

ŠTA DA?



## University of Rijeka – General Info



3rd Croatian university per size – Founded in 1973.

Consists of 11 faculties, 4 university departments, 1 academy, library and student centre

Number of students: ~ 16 000; No. of teaching personnel: ~ 1000

No. of non-teaching personnel: ~ 500

## University of Rijeka – General Info



Level of study	Number of students
undergraduate	8 052
vocational	1 886
graduate	3 232
specialist graduate vocational	179
integrated	2 529
postgraduate doctoral	574
postgraduate specialist	243
<b>TOTAL</b>	<b>16 843</b>

## University of Rijeka – General Info

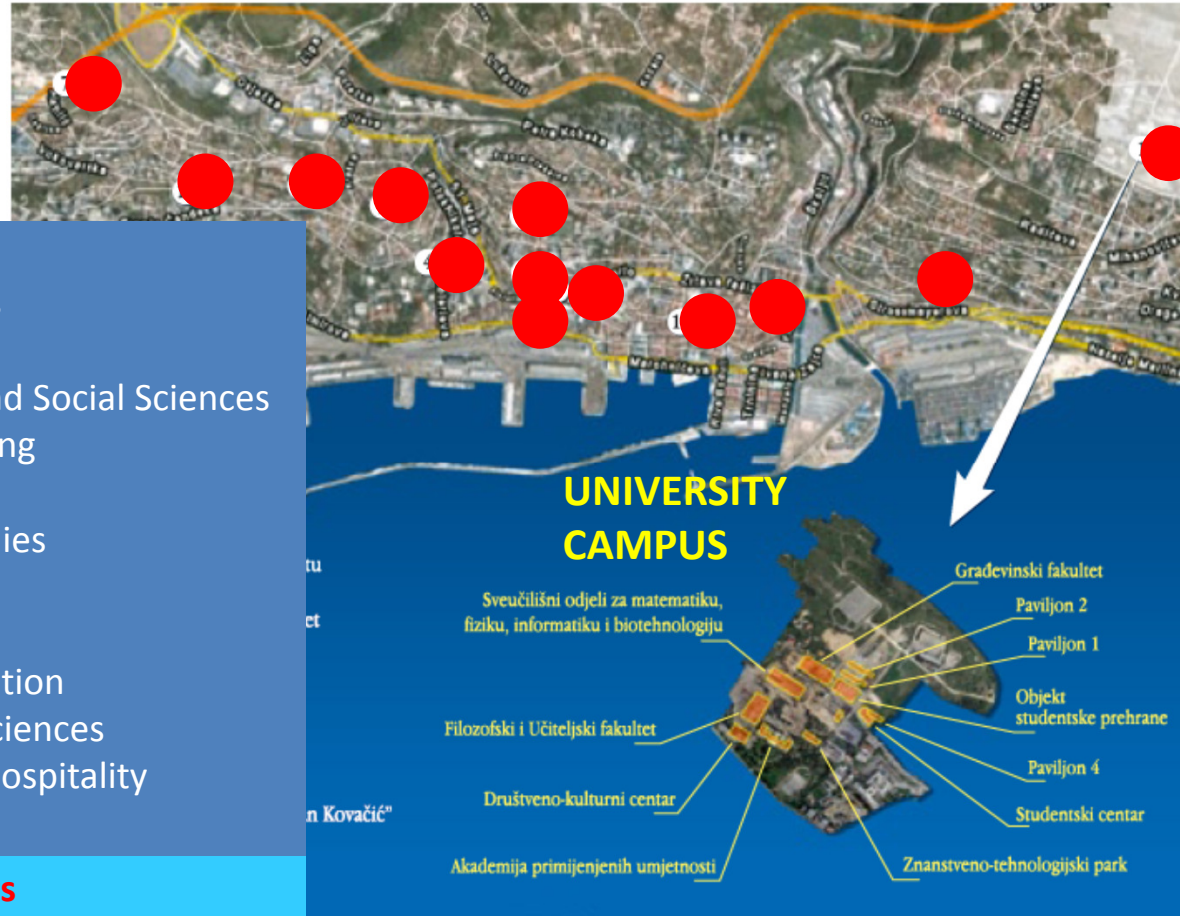
First Croatian University that came up with its Strategy – focus on excellence, quality assurance, LLL, active collaboration with the local community & economy, active inclusion into EHEA & ERA

- Aim – to harmonize with EU universities in accordance with Bologna Process requirements and goals
- Implementation of Bologna Process started in 2005 - 3 cycles (undergraduate/graduate/doctoral) and ECTS system
- Transformance from predominately teaching to research university





# UNITS OF THE UNIVERSITY OF RIJEKA



## 11 Faculties:

- Academy of Applied Arts
- Faculty of Economics
- Faculty of Humanities and Social Sciences
- Faculty of Civil Engineering
- Faculty of Medicine
- Faculty of Maritime Studies
- Faculty of Law
- Faculty of Engineering
- Faculty of Teacher Education
- Faculty of Health Care Sciences
- Faculty of Tourism and Hospitality Management Opatija

## 4 University Departments

- University Department of Biotechnology
- University Department of Physics
- University Department of Informatics
- University Department of Mathematics

# UNITS OF UNIVERSITY OF RIJEKA



- Faculty of Tourism and Hospitality Management Opatija





# UNIVERSITY CAMPUS

**Area of the University Campus within the area of Trsat, the north-east part of the City of Rijeka - former barracks**

- total area 43.21 ha
- University Campus 23.40 ha
- Clinical Hospital Centre 8.40 ha
- infrastructure 6.83 ha
- living area 3.49 ha
- Green area 1.09 ha

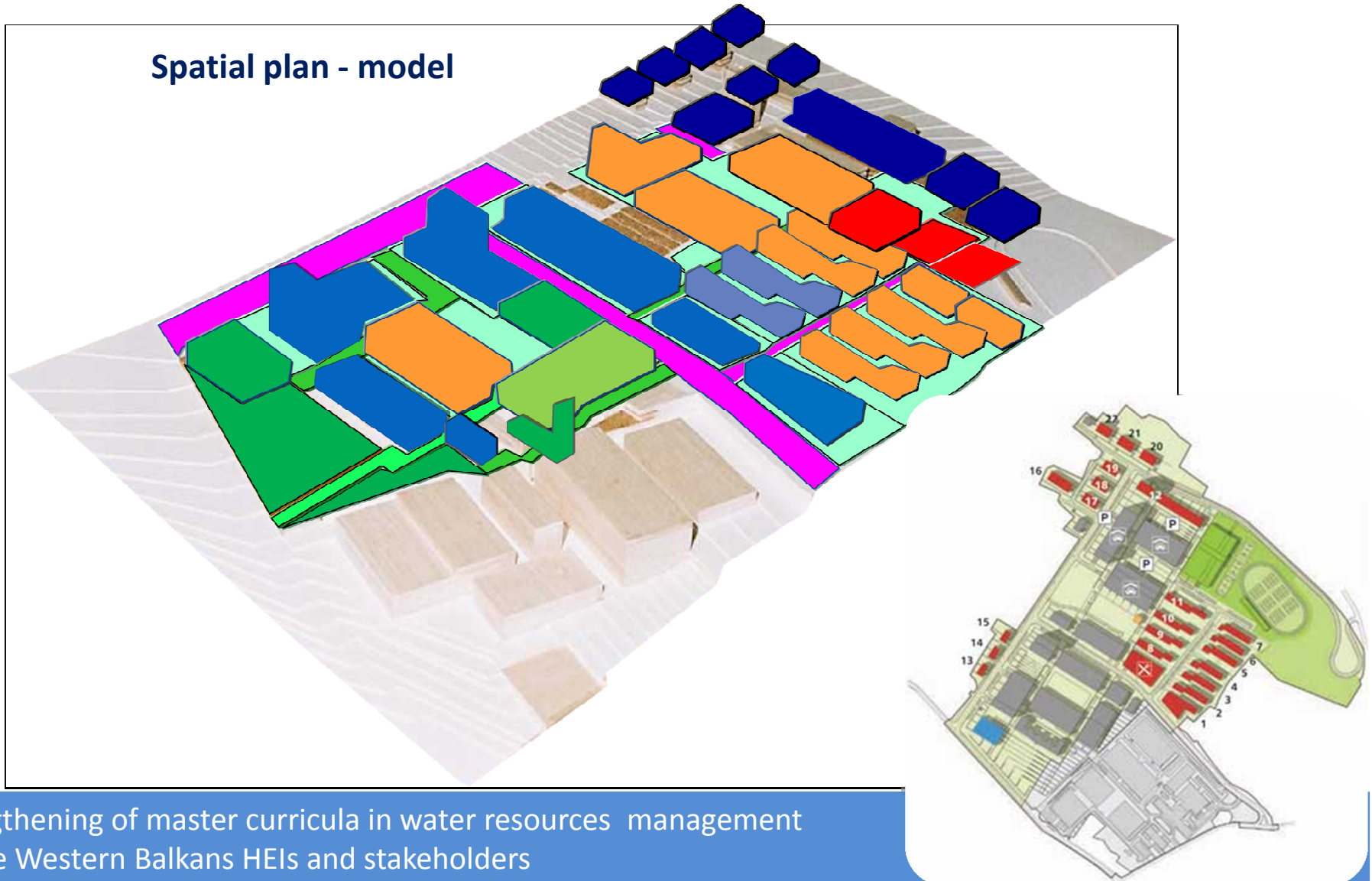
**2004. - Long Term Loan Agreement in the amount of 490 million HRK / 64,45 mEUR.**





# UNIVERSITY CAMPUS

Spatial plan - model



Strengthening of master curricula in water resources management for the Western Balkans HEIs and stakeholders

# UNIVERSITY CAMPUS



**FACULTY OF CIVIL  
ENGINEERING**

**Today's situation at UC**



**Student Accomodation at UC**

Strengthening of master curricula in water resources management  
for the Western Balkans HEIs and stakeholders

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# UNIVERSITY OF RIJEKA FACULTY OF CIVIL ENGINEERING



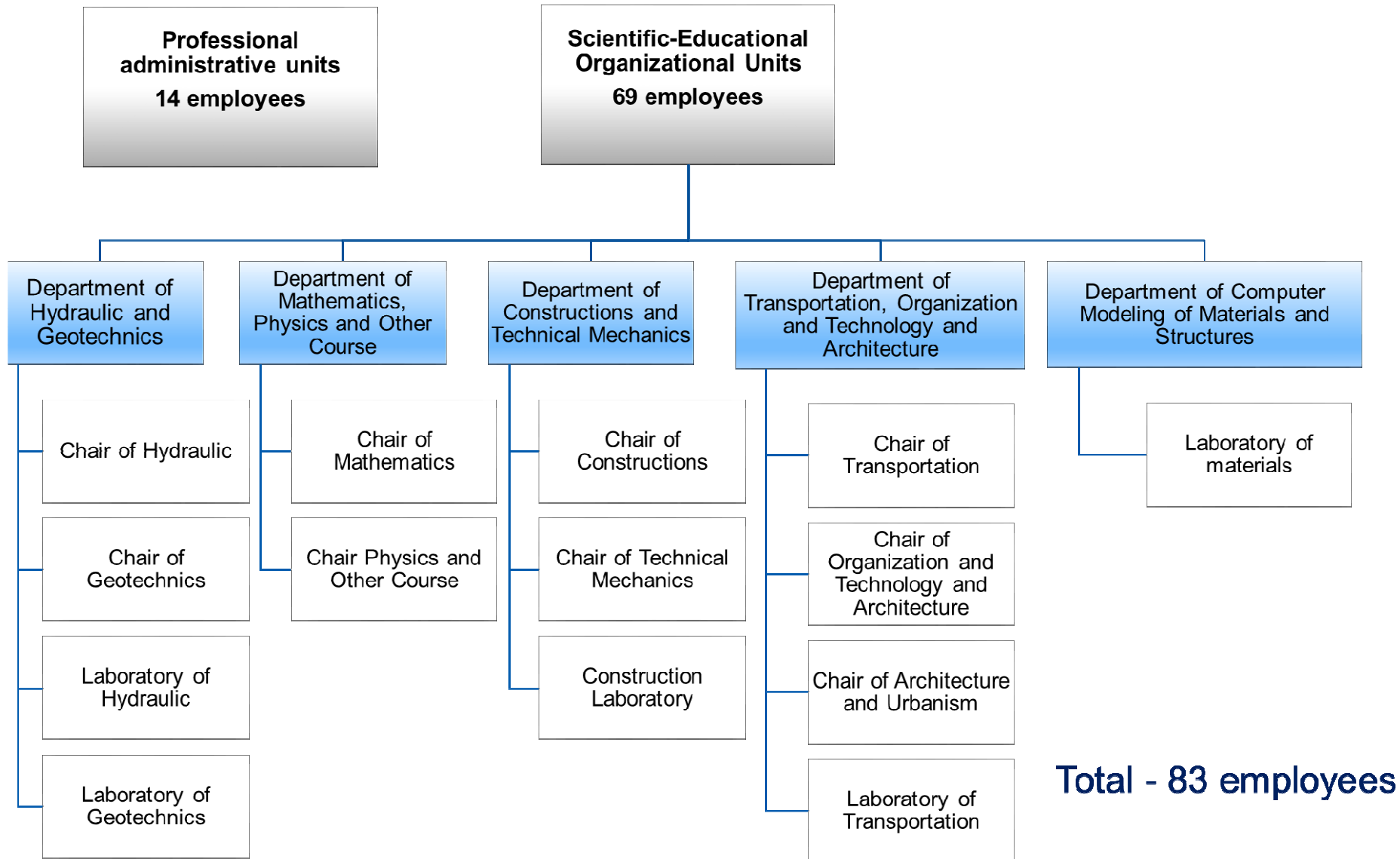
Founded 1969



Strengthening of master curricula in water resources management  
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# ORGANIZATION AND EMPLOYEES



**Total - 83 employees**



## FCE - STUDY PROGRAMS

- The Faculty of Civil Engineering began as the College of Civil Engineering in 1969.
- In 1971 programme in Civil Engineering was started within the Faculty of Engineering in Rijeka.
- Since 1976 Faculty of Civil Engineering is independent
- At the faculty, we carry out all three levels of the **UNIVERSITY PROGRAMMES** and two levels of **VOCATIONAL PROGRAMMES**



# LABORATORY TEACHING



## Laboratory of Geotechnics



Strengthening of master curricula in water resources management for the Western Balkans HEIs and stakeholders



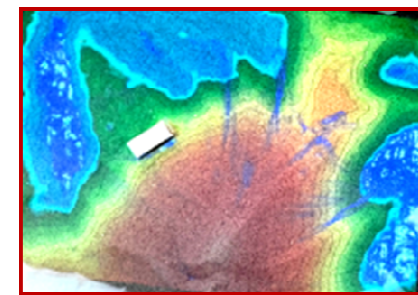
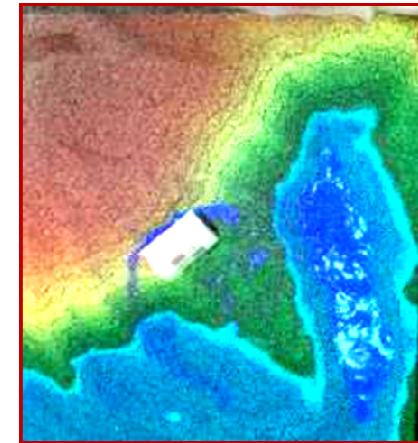
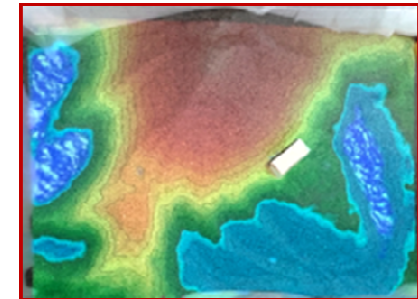
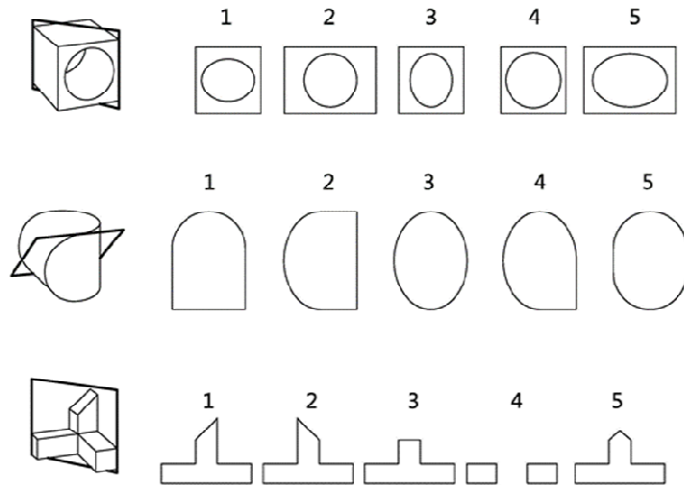
## FIELD TEACHING



**Holcim Hrvatska Koromačno**



**MMSU Rijeka**



Online Mental Cutting Test  
(MCT)

Modelling in Rhino i ACAD

Demonstration in SANDBOX





## Lifelong Learning Program Teacher Competence in Higher Education: Learning and Teaching

### Mentoring Workshop for Mentors at the PhD Level





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of the European Union



## ACTIVE SCIENTIFIC PROJECTS



University Scientific Projects



Croatian Science Foundation Projects



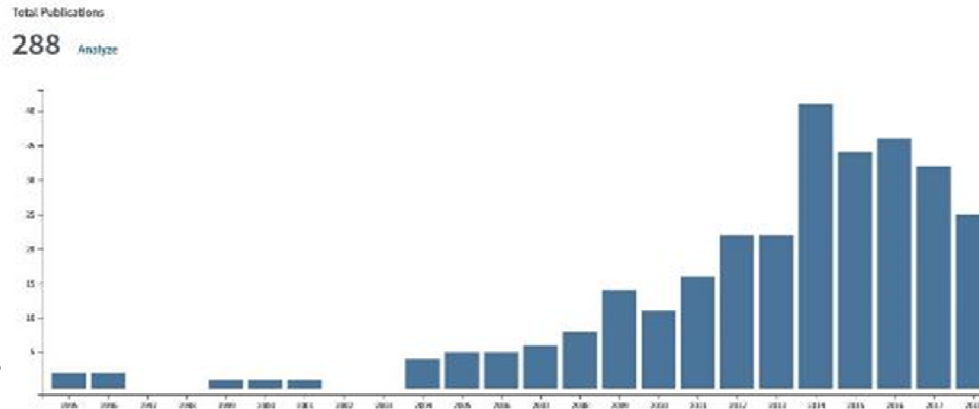
EU and Other Scientific Projects

Strengthening of master curricula in water resources management  
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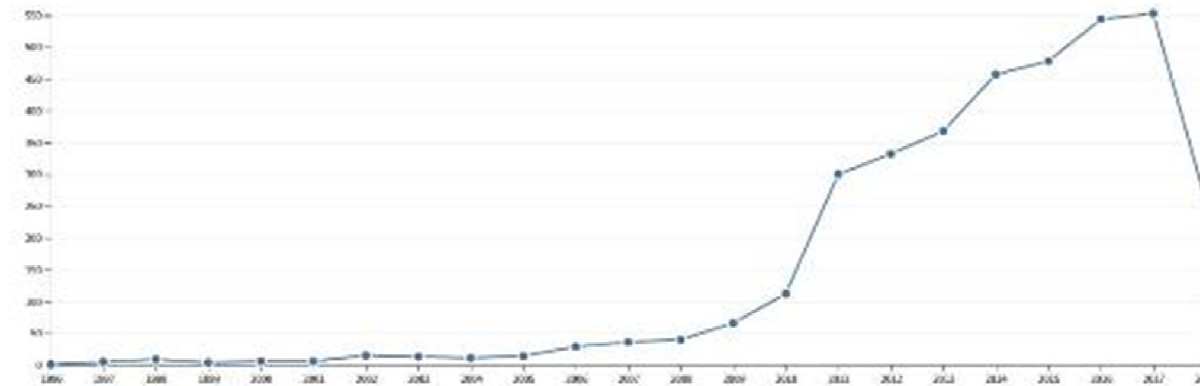
# PUBLICATION PRODUCTION

number of published papers  
by base WoSCC



WEB OF SCIENCE

Sum of Times Cited per Year



number of citations by base  
WoS CC

## COOPERATION WITH THE COMMUNITY AND ECONOMY

The Faculty conducts business cooperation with the units of local government and administration and with economic entities

- more than 60 agreements and business and technical cooperation contracts have been signed;
- it is possible to produce graduate thesis and final papers through cooperation with local government units and administration and with economic entities;
- held guest lectures by experts from the economy for students and teaching staff;
- organized field work, professional practice, expert visits to construction sites



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.ni.ac.rs



# COOPERATION WITH THE COMMUNITY AND ECONOMY



**Project Strengthening the Capacity to Use ESI Funds in Primorsko-goranska County**  
On 19th June 2018, at the Faculty of Civil Engineering in Rijeka, an education was organized under the title Environmental Impact Study, attended by about 30 participants from the entire Primorsko-goranska County



## PROFESSIONAL WORK



***Project for rehabilitation of diving tank  
(former barracks in Pula)***

- making studies, plans, conceptual solutions, opinions and expertise;
- project design and control;
- judicial expertise;
- computer modeling and simulation;
- laboratory and field tests



***Restoration of the terrace above  
the entrance to the Croatian  
National Theater in Rijeka***







## PROFESSIONAL WORK



***Detailed design of ROCK SANATION ABOVE  
THE OMIŠALJ CITY***



***Construction Pit of the  
Future Hospital in Rijeka***



## PROFESSIONAL WORK



***Measurements within the IPA project on wind turbines on Pometeno hill***



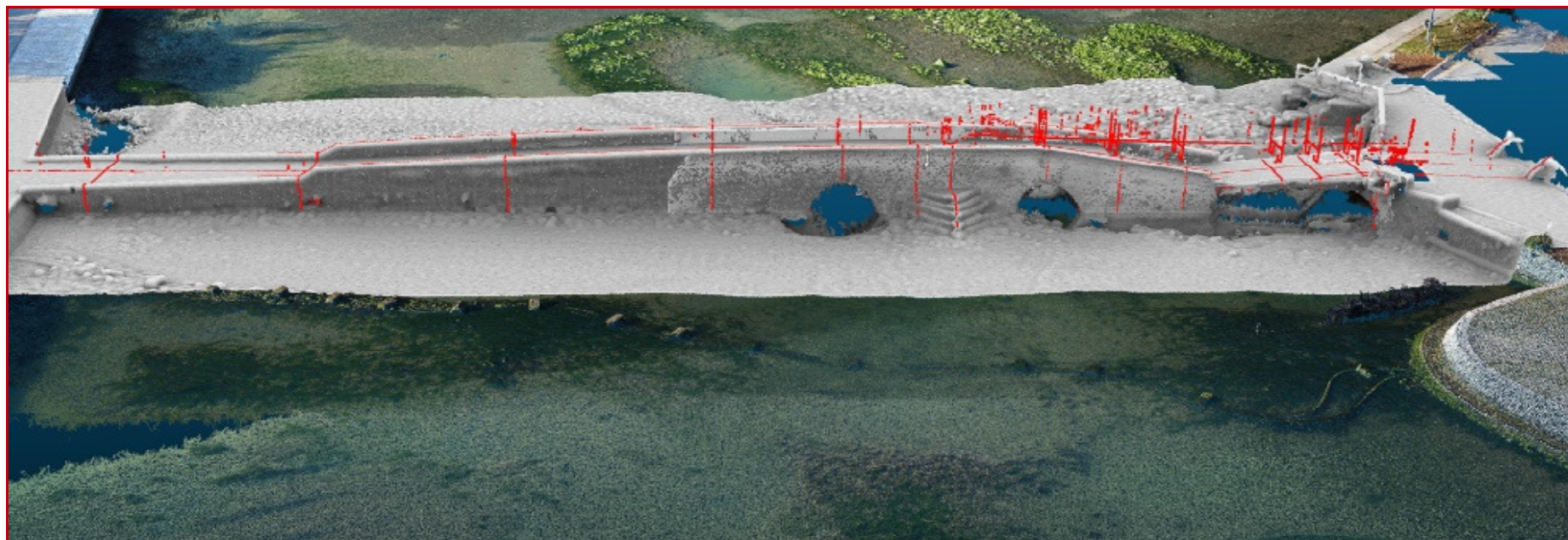
***Hydraulic measurements in the Zvir spring***



***Hydraulic measurements in the Pazinčica basin***



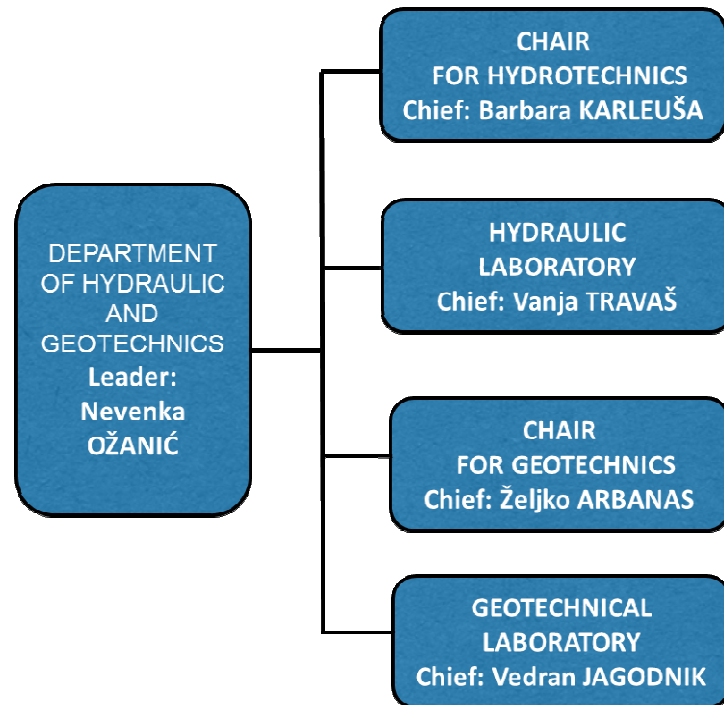
## PROFESSIONAL WORK



### *Lower Bridge in Nin-3D Scene*

# DEPARTMENT OF HYDRAULIC AND GEOTECHNICS

## ORGANIZATION AND EMPLOYEES



# THE MOST IMPORTANT FACULTY PROJECTS

- 1. RISK IDENTIFICATION AND LANDUSE PLANNING FOR DISASTER MITIGATION OF LANDSLIDES AND FLOODS IN CROATIA**
- 2. RESEARCH INFRASTRUCTURE FOR CAMPUS-BASED LABORATORIES AT THE UNIVERSITY OF RIJEKA**





## RISK IDENTIFICATION AND LAND – USE PLANNING FOR DISASTER MITIGATION OF LANDSLIDES AND FLOODS IN CROATIA

- **International bilateral Croatian Japanese project**
- **Leaders: prof. Nevenka OŽANIĆ and prof. Hideaki MARUI**
- **Duration: 2008.-2013.**
- **Value: 5 million US\$**

### **Included institutions in Croatia:**

- **University of Rijeka – Faculty of Civil Engineering - Department of Hydraulic and Geotechnics**
- **University of Zagreb**
- **University of Split**
- **Croatian Geological Survey**
- **Croatian Waters**
- **Croatian Hydrological and Meteorological Survey**
- **Local authorities**

### **Included institutions in Japan:**

- **Kyoto University, Disaster Prevention Research Institute (DPRI)**
- **Niigata University**
- **International Consortium on Landslides (ICL)**

### **Financed and supported by:**

- **JST (Japan Agency for Science and Technology)**
- **JICA (Japan International Cooperation Agency),**
- **Ministry of Science, Education and Sport Croatia**

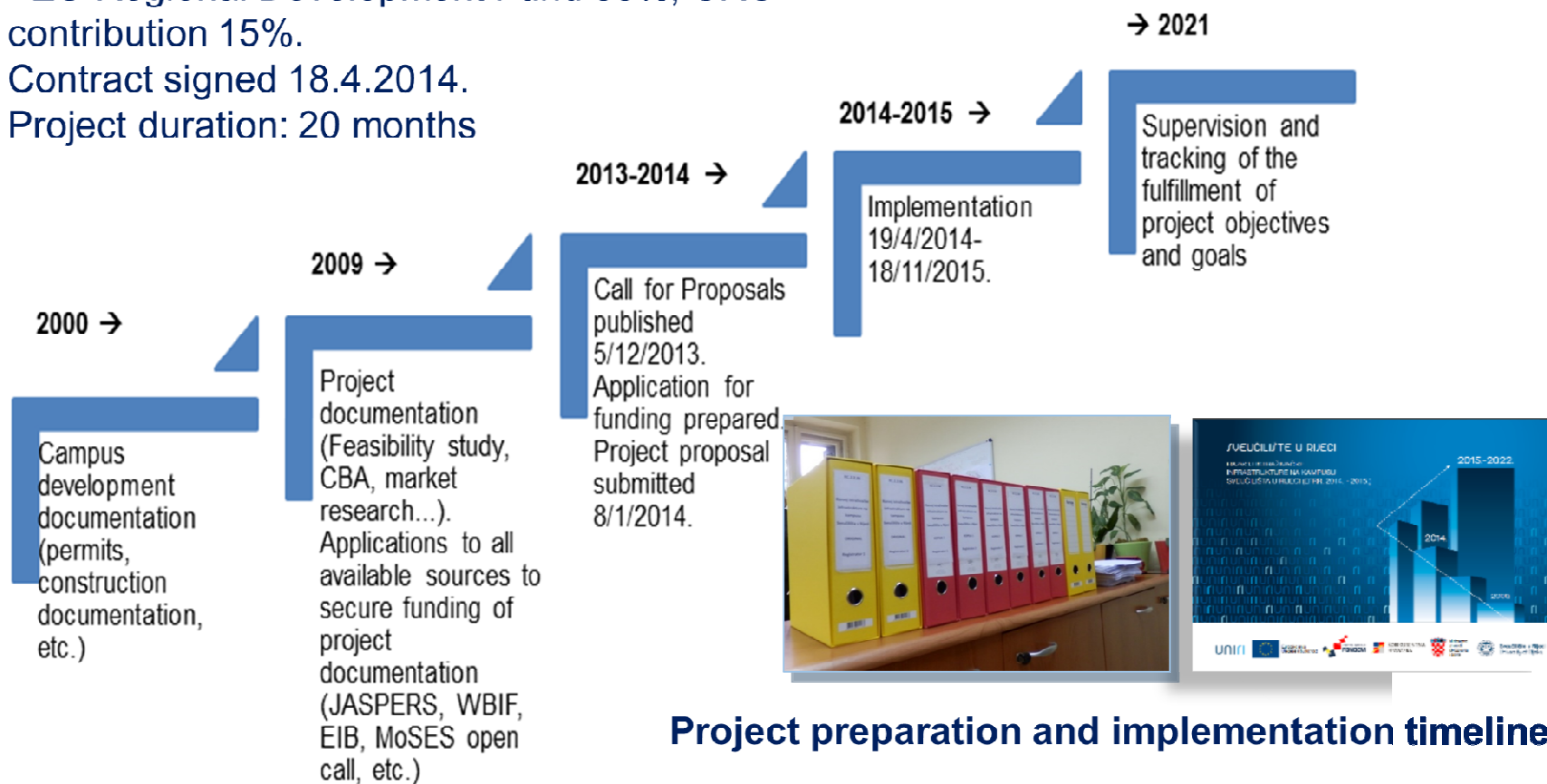
## BENEFITS FROM THE PROJECT

- Collaboration with Japanese scientists
- Training in Japan and Croatia
- Installed obtained scientific equipment in pilot areas and laboratories
- Publishing scientific papers
- Scientific equipment - start of laboratory equipment at FCER
- In the Republic of Croatia there were about 20 young researchers, and 8 + 2 in Rijeka
- Possibility of applying for scientific projects - continuation of cooperation
- Visibility of the University of Rijeka / Faculty of Civil Engineering in Rijeka



## RESEARCH INFRASTRUCTURE FOR CAMPUS-BASED LABORATORIES AT THE UNIVERSITY OF RIJEKA

- o Funded from EU funds 2007-2013 – 23 mill EUR  
- EU Regional Development Fund 85%, CRO  
contribution 15%.
- o Contract signed 18.4.2014.
- o Project duration: 20 months

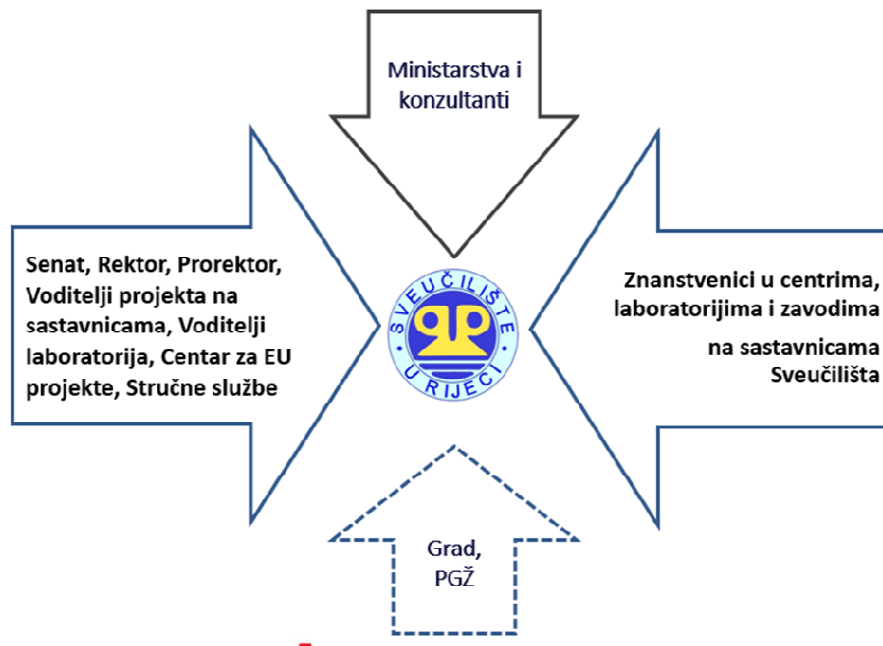


**Project preparation and implementation timeline**

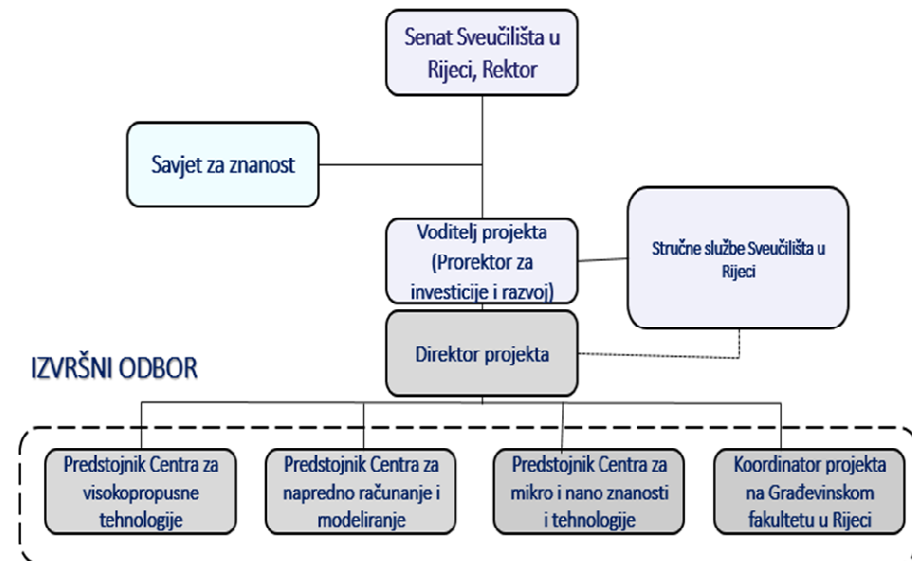


## PROJECT T I M

**Coordination of information between participants at all levels, over 150 involved participants**



## ORGANIZATIONAL STRUCTURE OF THE IMPLEMENTATION OF THE PROJECT





## **THE PROJECT'S OBJECTIVES:**

- To increase the competitiveness of the Croatian economy through the implementation of research for the promotion of interdisciplinary research, the creation of interdisciplinary study programs, the transfer of knowledge through technological innovations and the advancement of social practices;
- To develop the knowledge and skills in an area that has been identified as a globally priority at the EU level and on the national level;
- To increase the collaboration of the academic and industrial sectors;
- To develop of new products and services to the Croatian economy;
- To increase the collaboration with the government institutions;
- To increase the level of scientific output in this area;
- To increase the number of University students;
- To enhance synergic effects with other research institutions, especially abroad;
- To develop a new graduate and post-graduate educational curricula;
- To introduce of new scientific instrumentation and methods to the Croatian S&T sectors.

## RESEARCH INFRASTRUCTURE FOR CAMPUS-BASED LABORATORIES AT THE UNIVERSITY OF RIJEKA

CENTRE	Value of the equipment	VAT	Total value (KN)
Centre for high throughput technology	37.725.618	9.431.404	<b>47.157.022</b>
Centre for micro and nano sciences and technologies	24.371.009	6.092.751	<b>30.463.760</b>
Centre for advanced computing and modelling	38.404.466	9.601.116	<b>48.005.582</b>
FCER	43.559.547	10.889.888	<b>54.449.435</b>
<i>Total value of the equipment and adaptation of space:</i>			<i>180.075.799</i>
<b>External audit of the project</b>			<b>106.249,91</b>
<b>Total value of the project:</b>			<b>180.182.048,91</b>





## **RESULTS OF THE PROJECT**

- Implementation of the project increase the level of research activities at the University, creating the environment for increasing both research and learning outcomes at University's faculties and departments, with an emphasis on collaboration and development of multidisciplinary scientific fields.
- The project have an impact and benefit for different groups of project stakeholders including: university in general, University centers and faculties, scientists – researchers, students, business partner, public sector... according to feasibility study.
- Timely preparation is crucial to develop an institution and solve its most pressing needs.

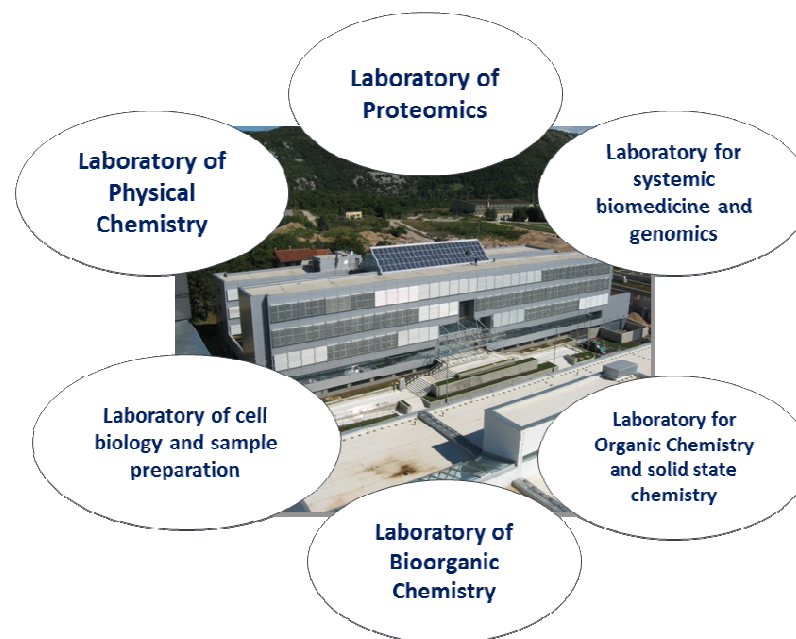
## **EFFECTS AND BENEFIT FOR VARIOUS GROUPS PROJECT STAKEHOLDERS**

- University of Rijeka in general
- University centers and FCER
- Scientists - researchers
- Students
- Centers of excellence
- Economic partners
- Local community

## THE EQUIPMENT FOR THE CENTRE FOR HIGH THROUGHPUT TECHNOLOGY – 6.3 mEUR

The laboratories of the Centre for High Throughput Technology that are equipped from the project are:

- Laboratory of Proteomics
- Laboratory for systemic biomedicine and genomic
- Laboratory of Physical Chemistry
- Laboratory of cell biology and sample preparation
- Laboratory for Organic Chemistry and solid state chemistry
- Laboratory of Bioorganic Chemistry

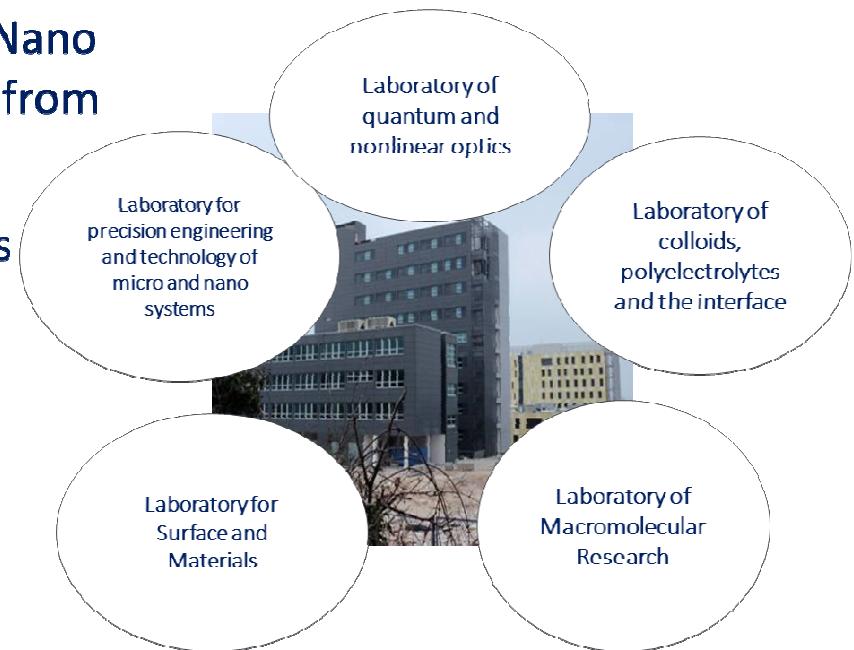


## RESEARCH INFRASTRUCTURE FOR CAMPUS-BASED LABORATORIES AT THE UNIVERSITY OF RIJEKA

### THE EQUIPMENT FOR THE CENTRE FOR MICRO AND NANO SCIENCES AND TECHNOLOGIES – 4 mEUR

The laboratories of the Centre for Micro and Nano Sciences and Technologies that are equipped from the project are:

- Laboratory of quantum and nonlinear optics
- Laboratory for precision engineering and technology of micro and nano systems
- Laboratory of colloids, polyelectrolytes and the interface
- Laboratory for Surface and Materials
- Laboratory of Macromolecular Research





## RESEARCH INFRASTRUCTURE FOR CAMPUS-BASED LABORATORIES AT THE UNIVERSITY OF RIJEKA

### THE EQUIPMENT FOR CENTRE FOR ADVANCED COMPUTING AND MODELLING – 6.4 mEUR

The laboratories of the Centre for Advanced Computing and Modelling that are equipped from the project are:

- Laboratory of Computer and Network Technology
- Laboratory for e-Science, e-learning and e-business
- Laboratory for Signal Processing and Communication Technology
- Laboratory for AI technology and modeling

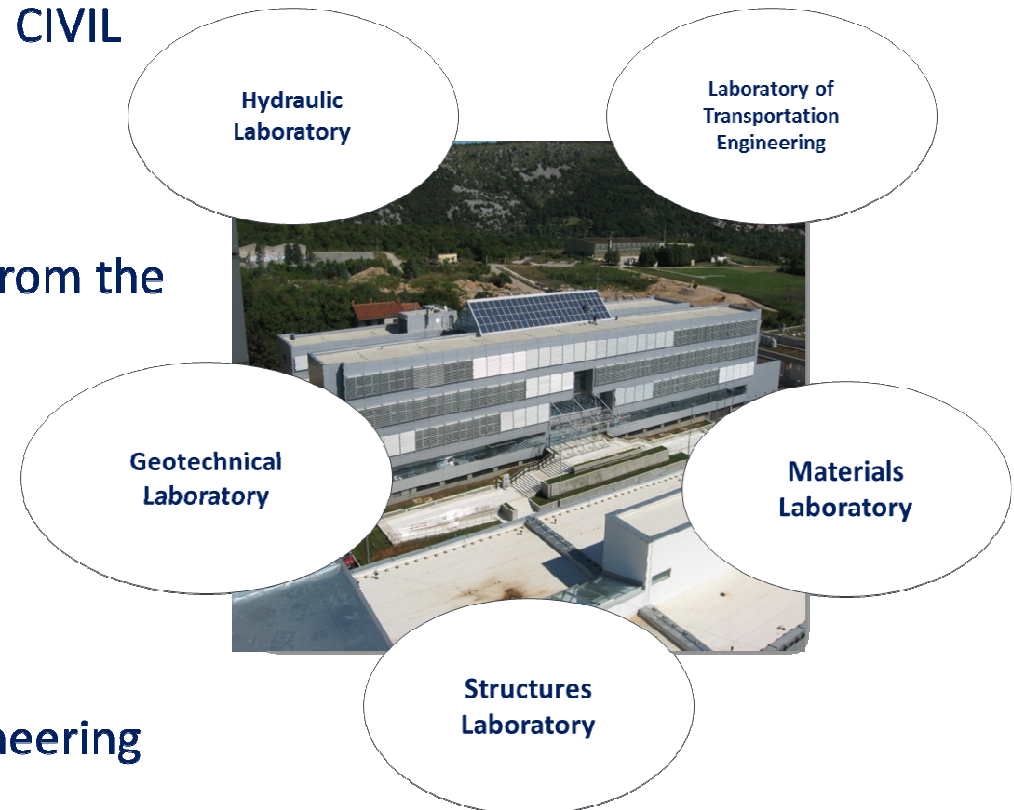


## RESEARCH INFRASTRUCTURE FOR CAMPUS-BASED LABORATORIES AT THE UNIVERSITY OF RIJEKA

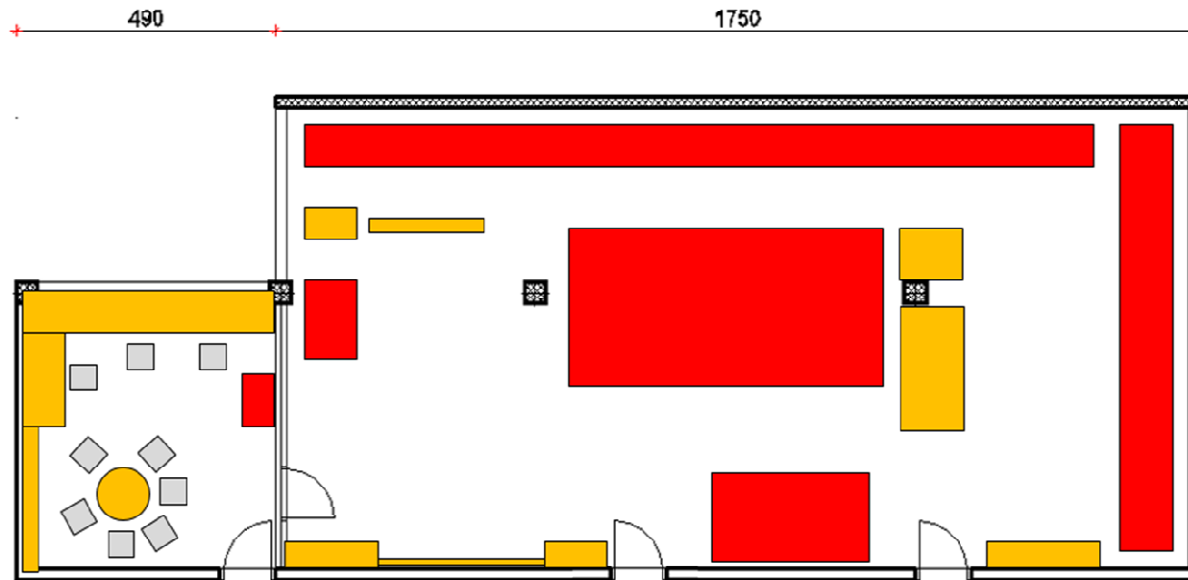
### THE EQUIPMENT FOR THE FACULTY OF CIVIL ENGINEERING - 7.3 mEUR

The laboratories of the Faculty of Civil Engineering Rijeka that are equipped from the project are:

- Hydraulic Laboratory
- Geotechnical Laboratory
- Materials Laboratory
- Structures Laboratory
- Laboratory of Transportation Engineering



## HYDRAULIC LABORATORY



**Large spin off potential and contribution to the construction sector, the services will include:**

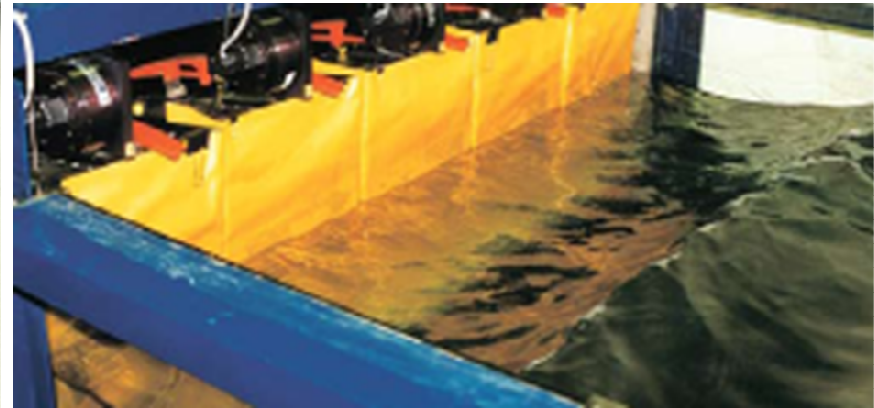
- Services specific to the field of civil engineering and basic technical sciences especially in karst areas, the sea area (geotechnics, hydraulic, construction, roads, materials), research on innovative building materials ...
- Use of complex 3D models for research and construction engineering in collaboration with the Centers of excellence at the University of Rieka.



## HYDRAULIC LABORATORY

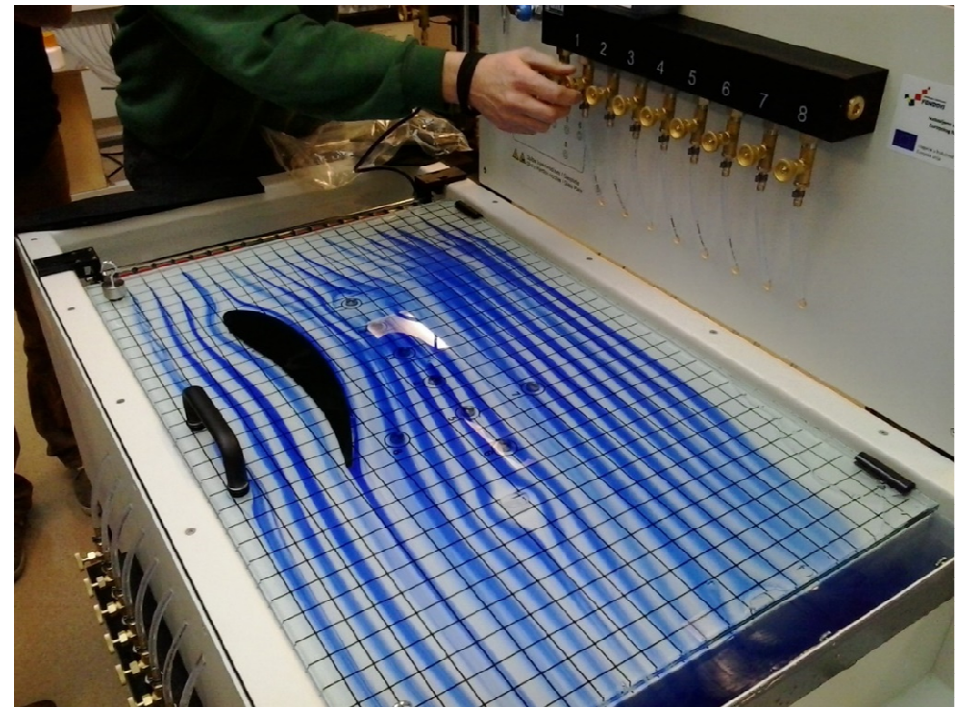
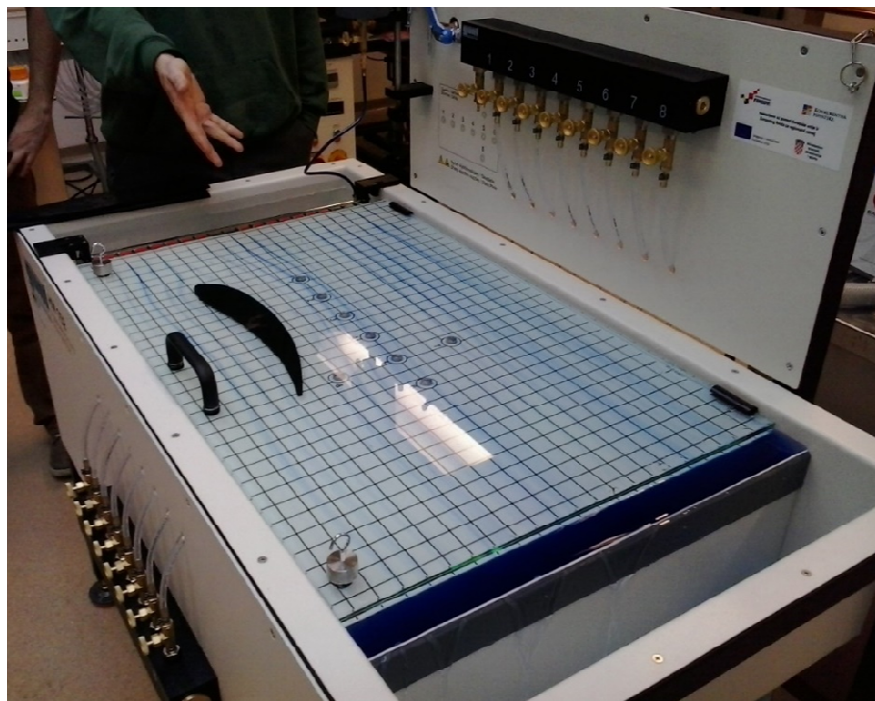


*Experimental basin  
with wave generator*



## HYDRAULIC LABORATORY

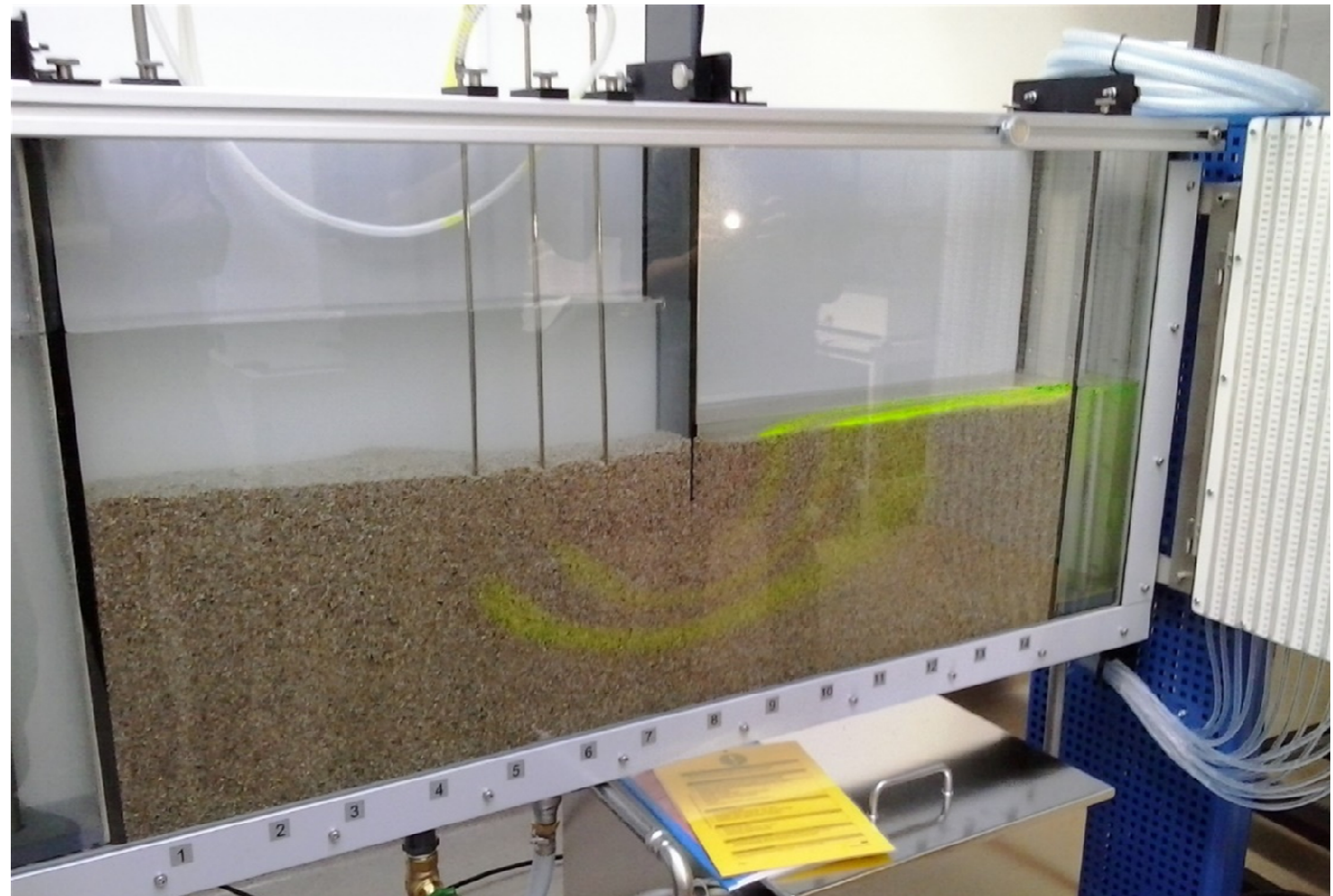
### Modelling the laminar flow





## HYDRAULIC LABORATORY

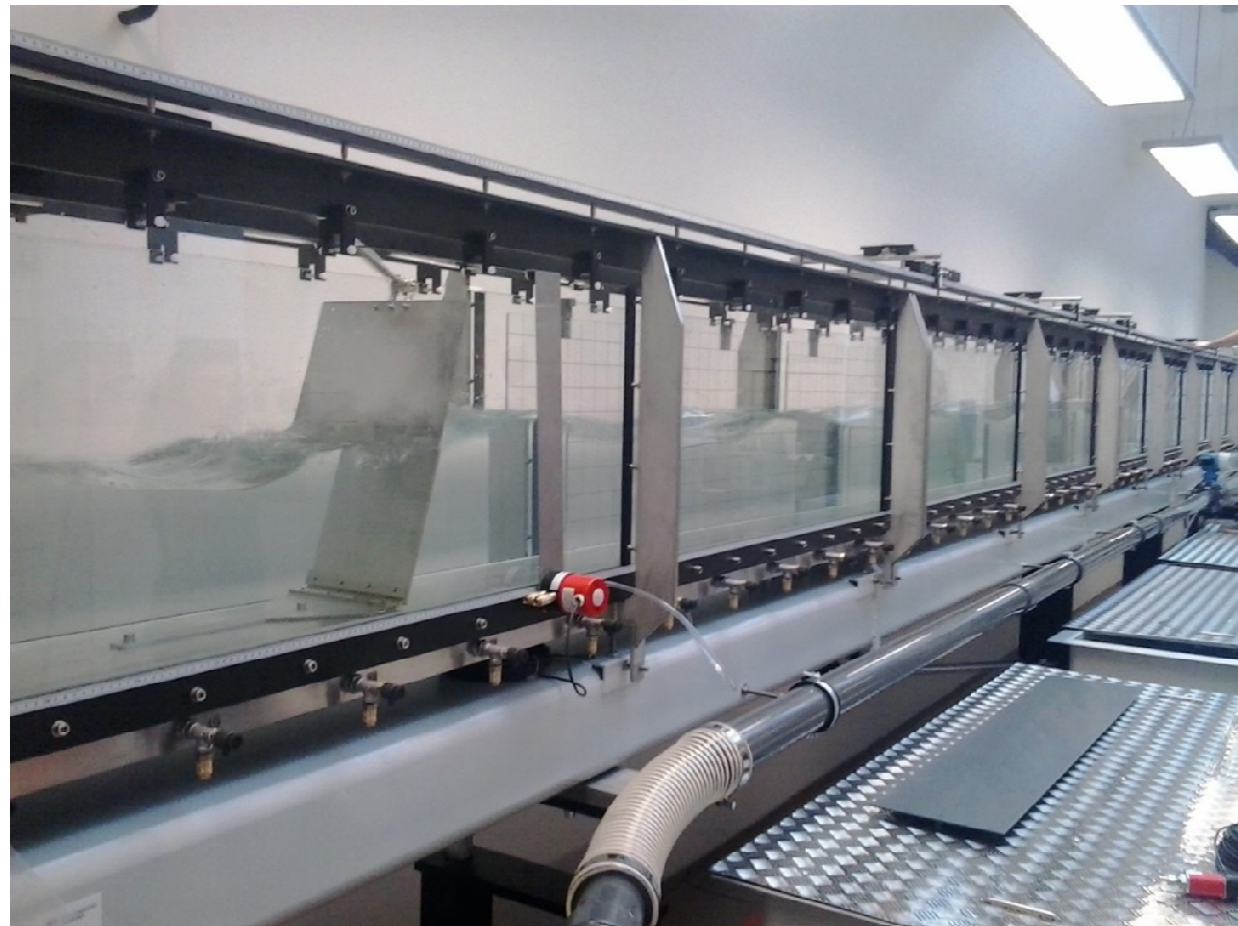
Modelling  
the flow of  
fluid through  
a porous  
medium





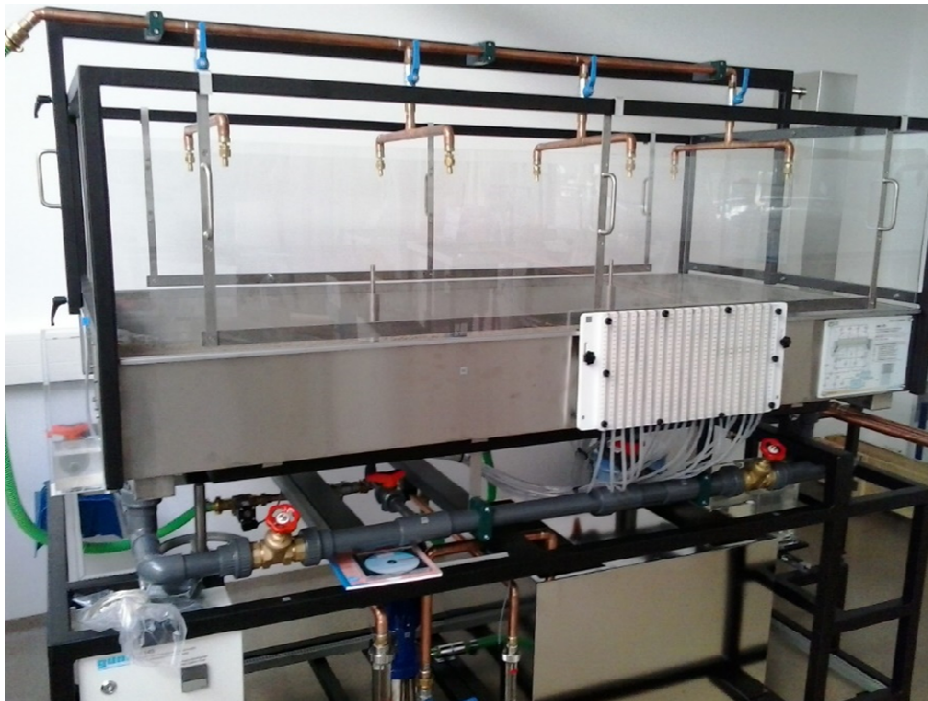
## HYDRAULIC LABORATORY

Hydraulic bench



## HYDRAULIC LABORATORY

Chamber for modelling the rain impact on runoff, erosion ...





## HYDRAULIC LABORATORY

### Wind tunnel



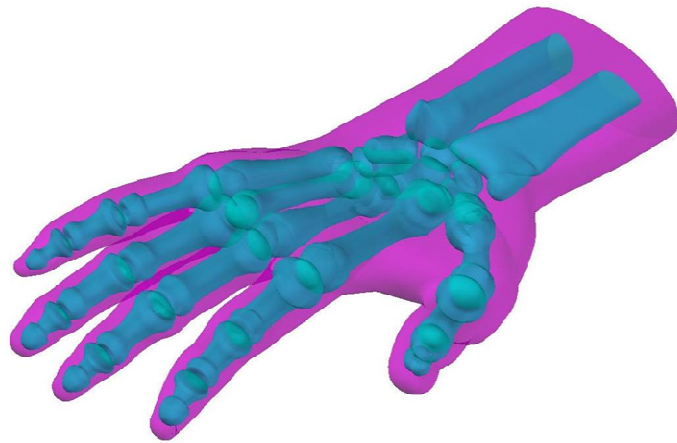
### 3D printer



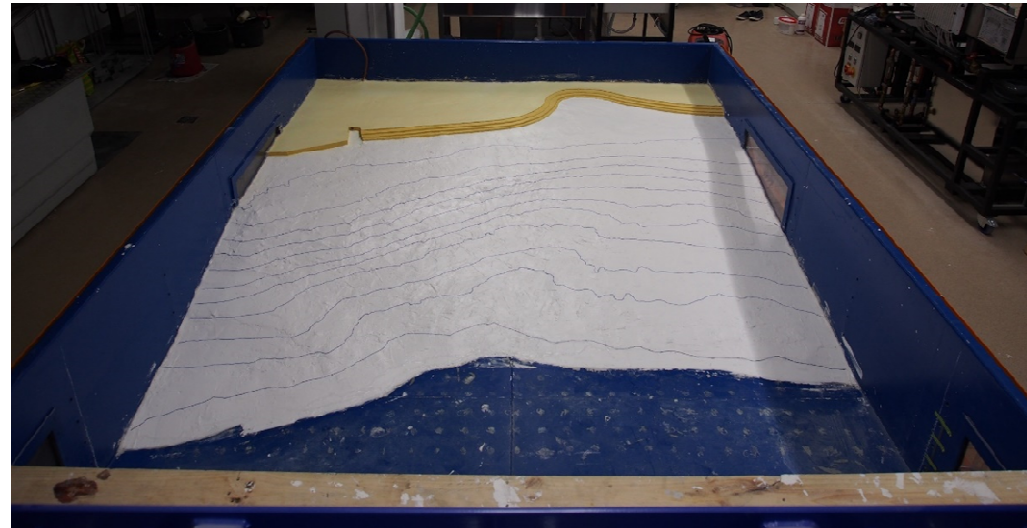


## HYDRAULIC LABORATORY

Using 3D printer for  
teaching purposes (needs  
of Anatomy Department,  
Anesthesia Chair,  
Resuscitation and Intensive  
Care, etc.)

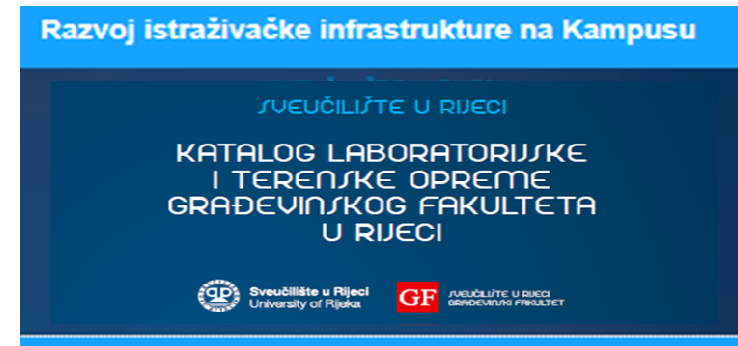


## HYDRAULIC LABORATORY - Protection from water and water protection modeling





- The University of Rijeka has published a catalog of obtained scientific equipment purchased through the RESEARCH INFRASTRUCTURE FOR CAMPUS-BASED LABORATORIES AT THE UNIVERSITY OF RIJEKA project in Croatian and English at: <https://www.uniri.hr/>
- A more comprehensive catalog of laboratory and field equipment of the Faculty of Civil Engineering in Rijeka is available at: <http://www.gradri.uniri.hr/hr/>







Sveučilišna  
bolnica

**Thank you for your attention!**  
Prof. dr. sc. Nevenka Ožanić

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