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Funded by European Union Civil Protection
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Vulnerability assessment of embankments and bridges exposed to flooding hazards

Deliverable D7.13

oVERFLOw final conferece: a report

Project Information

Grant Agreement No.	874421
Project Acronym	oVERFLOw
Project Full Title	Vulnerability assessment of embankments and bridges exposed to flooding hazards
Starting Date	1 December 2019
Duration	32 months
Call Identifier	UCPM-2019-PP-AG
Topic	UCPM-2019-PP-PREV-AG: Prevention in civil protection and marine pollution
Project Website	www.projectoverflow.eu
Project Coordinator	Prof. Meho Sasa Kovacevic
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Partner Information

Sveuciliste u Zagrebu Gradevinski Fakultet	Croatia
Infra Plan Konzalting	Croatia
GEKOM - geofizikalno i ekološko modeliranje d.o.o.	Croatia
VEILIGHEIDSREGIO ZUID-HOLLAND ZUID	Netherlands
INGEO BV	Netherlands
ZAVOD ZA GRADBENISTVO SLOVENIJE	Slovenia
Uprava Republike Slovenije za zaščito in reševanje	Slovenia

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Executive Summary

This deliverable gives an insight into the final conference of the oVERFLOw project, which was co-funded by EU through the UCPM-2019-PP-PREV-AG: Prevention in civil protection and marine pollution.

The project started on December 1st 2019 and ended on July 31st 2022.

Preparation activities

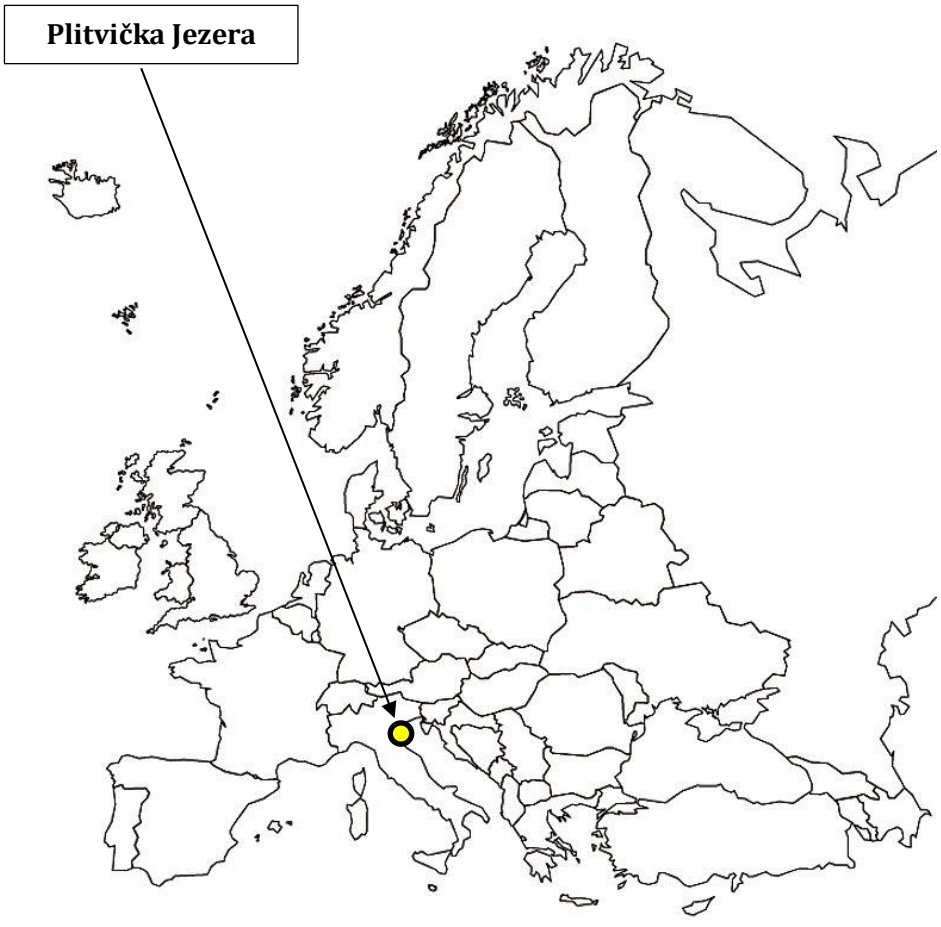
The preparations for the final conference of the oVERFLOw project started during the 4th consortium meeting held in Delft, the Netherlands, in November 2021 (M24).

As defined by the workplan, milestone MS25 included establishment of the 'Organizing committee for the final conference and workshop'.

Following persons were selected as the organizing committee:

- Prof. Meho Sasa Kovacevic, FCEZG – conference chairman
- Assoc. prof. Mario Bacic, FCEZG – conference co-chairman
- Assoc. prof. Lovorka Libric, FCEZG
- Dr. Irina Stipanovic, IPK
- Dr. Kenneth Gavin, InGEO
- Dr. Andrej Anzlin, ZAG
- Chi Brouwer, VRZHZ

During the several on-line meetings, it was decided that the conference will be held in Plitvička jezera, Croatia. Selected dates were July 14th & 15th 2022.



oVERFLOw

- FINAL CONFERENCE –

When? July 14th 2022

Where? Plitvička jezera, Croatia

Ethno Houses Plitvica Selo

Project oVERFLOw (Vulnerability assessment of embankments and bridges exposed to flooding hazards) is co-funded by the European Union through the Civil Protection Mechanism (Grant Agreement Number 874421).

Project deals with the **critical infrastructure** – flood protection embankments and bridges. Aim of the project is to enhance the methodology for the vulnerability assessment of embankments and bridges to floods.

case study 1:
Karlovac (Croatia)

case study 2:
Oostmolendijk (Netherlands)

www.projectoverflow.eu

TECHNICAL INFORMATION

Program:	UCPM-2019-PP-AG, EU CPM
Project duration:	01.12.2019. – 31.07.2022.
Project Cost:	€ 586,192.00
EU contribution:	€ 498,260.00

CONSORTIUM

Faculty of Civil Eng., University Of Zagreb, Croatia

Infra plan Konzalting, Croatia

GEKOM d.o.o., Croatia

Veiligheidsregio Zuid - Holland Zuid, Netherlands

INGEO BV, the Netherlands

Zavod za Gradbenistvo, Slovenia

Adm. for Civil Protection and Disaster Relief, Slovenia

KEY OUTCOMES

- **GIS on-line IMS platform** with operational GIS layers that contain **inventory of critical infrastructure** in pilot areas;
- **Risk assessment tool** applied in pilot areas;
- **For CPAs:** a set of guidelines on how to implement the results in existing procedures and in emergency plans;
- **For IMs:** development of strategies for adaptation measures based on a specific vulnerability of embankments and bridges.

FINAL CONFERENCE AGENDA

10:00 – 10:10 Welcome and Introduction

10:10 – 10:30 In-situ investigations of flood protection embank.
assoc. prof. M. Bacic and prof. M. S. Kovacevic (FCEZG)

10:30– 10:50 Vulnerability assess. of flood protection embankments
prof. K. Gavin (InGEO) and assoc. prof. M. Bacic (FCEZG)

10:50 – 11:20 Discussion on the embankments & future steps

11:20 – 12:00 In-situ investigations & vulnerability assess. of bridges
dr. Mirko Kosic and dr. Andrej Anzlin (ZAG)

12:00 – 12:30 Discussion on the bridges & future steps

12:30 – 13:30 Lunch break

13:30 – 14:10 Demonstration of a risk forecasting tool
dr. Irina Stipanovic and Sandra Skaric Palic (IPK)

14:10 – 14:40 Guidelines for Civil Protection Agencies
Chi Brouwer (VRZHZ)

14:40 – 15:30 Discussion and Conclusions

For participation, register by July 1st 2022 on:

Registration - oVERFLOw final conference

Contact:

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assoc.prof. Mario Bacic, mbacic@grad.hr

assoc.prof. Lovorka Libric, llibric@grad.hr

The invitations were sent to technical practitioners and end-users from emergency and civil protection authorities and infrastructure managers, since they are highlighted as the main targeted audience.

Conference

The conference venue is Ethno Houses Plitvica Selo, Plitvička jezera, Croatia.

In total, 27 participants were present, both physically and on-line. The representatives of **academia, research institutes, SMEs, civil protection agencies, infrastructure managers, city authorities and media** (newspaper 'Protection') were present on the conference.

The Agenda included following:

Day 1 (Thursday, July 14th 2022)

10:00 – 10:10 Welcome and Introduction

10:10 – 10:30 In-situ investigations of flood protection embankments
assoc. prof. Mario Bacic and prof. Meho Sasa Kovacevic (FCEZG)

10:30– 10:50 Vulnerability assessment of flood protection embankments
prof. Kenneth Gavin (InGEO) and assoc. prof. Mario Bacic (FCEZG)

10:50 – 11:20 Discussion on the embankments, implementation in the practice, future steps

11:20 – 12:00 In-situ investigations and vulnerability assessment of bridges
dr. Mirko Kosic and dr. Andrej Anzlin (ZAG)

12:00 – 12:30 Discussion on bridges, implementation in the current practice, future steps

12:30 – 13:30 *Lunch break*

13:30 – 14:10 Demonstration of a risk forecasting tool
dr. Irina Stipanovic and Sandra Skaric Palic (IPK)

14:10 – 14:40 Guidelines for Civil Protection Agencies
Chi Brouwer (VRZHZ)

14:40 – 15:30 Discussion and Conclusions

Day 2 (Friday, July 15th 2022)

09:00 – 10:00 Discussion on future initiatives regarding the UCPM calls

10:00 – 14:00 Visit to the Plitvička jezera

Assoc. prof. Mario Bacic, from FCEZG, had an **introduction presentation**. He stressed-out importance of the oVERFLOw outputs and results for the main target groups – Civil Protection Agencies (CPAs) and Infrastructure Managers (IMs). The ominpresent COVID-19 pandemic started about the same time as the oVERFLOw project and hindered implementation of project activities, mainly due to travelling restrictions. In addition, two earthquakes of high magnitude which hit Croatia in month 4 and month 13 of project, had an impact on the project implementation. However, it is noticeable that, despite the mentioned obstacles, all foreseen activities were realized, including realization of 26 foreseen milestones and submission of 40 foreseen deliverables.

A presentation on the **in-situ investigations of flood protection embankments and riverbanks** followed. Assoc. prof. Mario Bacic and prof. Meho Sasa Kovacevic, FCEZG, showed the benefit of using non-destructive, rapid, yet reliable methods for investigation of earthen structures, such as embankments and riverbanks. Series of investigations conducted on the case study areas were shown.

Prof. Kenneth Gavin from InGEO presented the developed methodology for generating **fragility curves for assessing the integrity of riverbanks or embankments**. These curves explicitly account for both material and loading uncertainty and can be used to interpret how likely a failure is given a flood event. The methodology is applied to the Dutch case study site at Oostmolendijk on the outskirts of Dordrecht and on riverbanks in the city of Karlovac in Croatia.

Dr. Mirko Kosic and dr. Andrej Anzlin, from ZAG, demonstrated the work done on assessing the **vulnerability of case study brides** in the city of Karlovac. First part of presentation was on the performed investigation works and monitoring of the bridges, followed by the part of study which considers different flooding scenarios, including hydrodynamic loads, debris and scour. Several failure mechanisms were identified in relation to the considered flooding scenarios.

Dr. Irina Stipanovic and Sandra Skaric Palic (IPK) presented **risk forecasting tool** which provides valuable information for infrastructure managers and civil protection agency, namely it predicts the consequences of different flood scenarios in the affected area. Results of the implementation of the risk forecasting tool model are presented for two case studies. In both cases the benefits of the integration of newly developed methodology into the existing tools and procedures were shown, thus revealing the information about the areas with the highest potential risk enabling prioritization of the investments and evacuation planning.

Final presentation was from Chi Brouwer (VRZHZ) who provided an insight into the guidelines for Civil Protection Agencies. She discussed the **implementation of the developed risk forecasting tool** into the existing CPA protocols, as well the benefit of having the operational GIS layer of vulnerable critical infrastructure. A discussion on the necessity of closer collaboration of CPAs and IMs followed.

conference venue

conference participants

assoc.prof. Mario Bacic (FCEZG)

prof. Kenneth Gavin (InGEO)

dr. Mirko Kosic (ZAG)

Sandra Skaric Palic (IPK)

Chi Brouwer & Anja de Rooij (VRZHZ)

promo material