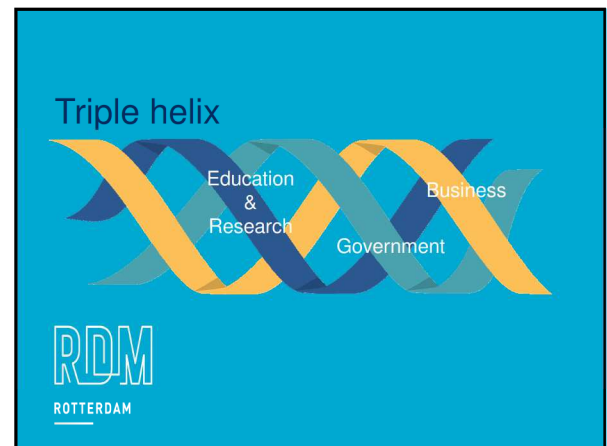
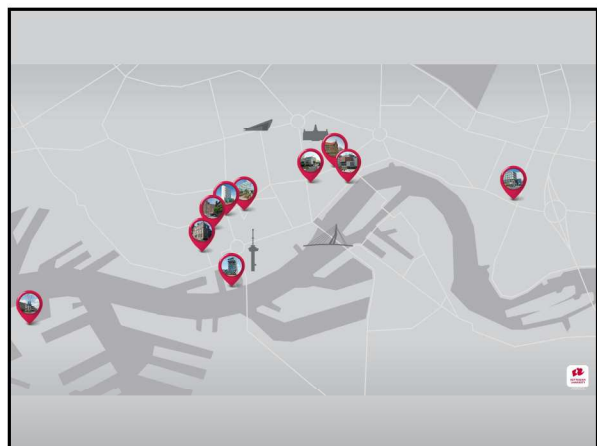
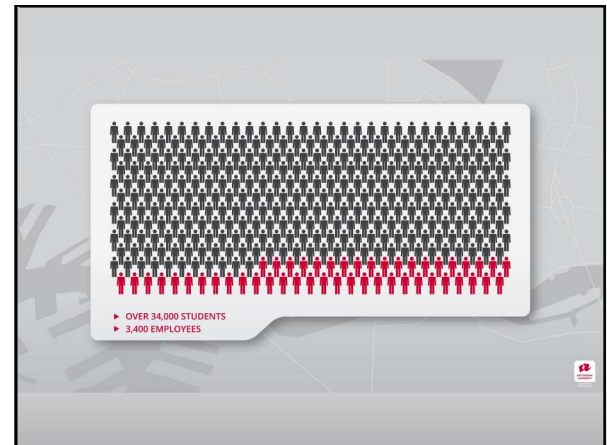




Rick Heikoop


- Senior lecturer Urban Water Management at Rotterdam University of Applied Sciences
- Researcher at RDM Centre of Expertise
- Co-founder of Wetskills: since 2010 we organized 31 water challenges in 19 different countries with 600+ participants. Focus on innovative solutions
- Co-founder of Climate cafe, 20 International water challenges. Focus on measurements and solutions.

Egypt Pyramids Canada Niagara falls Wetskills Taiwan Borobudur Indonesia



Innovation showcase

RDM Rotterdam is the innovation showcase of the Rotterdam port area, where applied science is visualized in an attractive way.




Focus on Wicked problems!

Community of Practice:


Domain. A shared domain of interest. Membership implied commitment to the domain and *willingness to collaborate* with the partners

Community. Members of a specific domain interact in shared activities, *help each other*, and *share information* with each other. They *build relationships* that enable them to learn from each other.

Practitioners. They develop a shared *repertoire of resources over time*. Communities develop their practice through a variety of methods, including: discussing developments, visiting other members, *mapping knowledge* and *identifying gaps of knowledge*

Wenger E. (2001). Communities of Practice. International Encyclopedia of the Social & Behavioral Sciences, 2339-2342.

Wicked problems



2017 Cebu City edition very succesful, but

Mandaue 2018 will be better!!




UNIVERSITY

Practical feasible solutions + video



The scope

Butuanon 'worst river in the Philippines'



► The 23-kilometer river is nestled between the Cities of Mandaue and Cebu.

Overall Assignment: Present at the River Summit your Innovative solutions to improve the river

Mandaue to save Butuanon river



Mandaue to save Butuanon River
 September 13, 2017

At least 42 establishments in Mandaue City do target their waste water into Butuanon River, contributing greatly to the river's pollution each day.

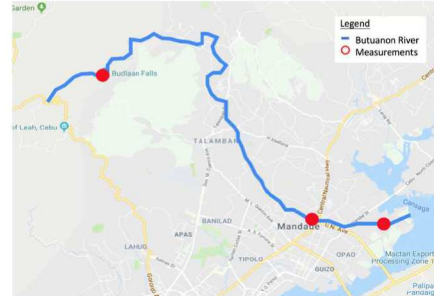
In order to save the Butuanon River, the Mandaue City Government in partnership with the different government agencies will introduce the river to be used in the upcoming 2018 International River Summit (IRS).

The City declared Mandaue as the Butuanon River Mouth and River 22 as Butuanon River City. Mandaue made 2018 as the Butuanon River Year as the City was chosen as the host for the IRS 2018 year.

- Analyze the pollution: by measuring different parameters;
- Suggest and Present one practical innovative solution or intervention;
- Feasibility, can it easily be implemented



3 locations along Butuanon river: how do the indicators at 3 locations differ?

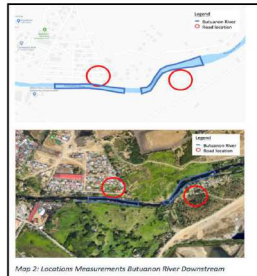


Map 1: Overview of locations



Downstream: team 1 and 2

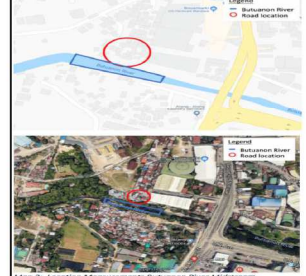
Team 1	
Team 2	



Map 2: Location Measurements Butuanon River Downstream

Midstream Team 3 and 4

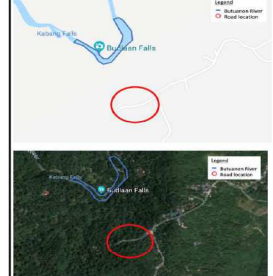
Team 3	
Team 4	



Map 3: Location Measurements Butuanon River Midstream

Upstream Team 5 & 6

Team 5	
Team 6	



Map 4: Location Measurements Butuanon River Upstream 1

Assignment 1: Group paper (practice to write a paper) for the jury

- Introduction**
- There is a clear problem statement
 - There is an objective of the study
 - There is a main research question
 - There are 1 or 2 sub questions
- Methods**
- There is clear description of the method(s) used,
- Results**
- The qualitative information that is found is structured,
 - If you did a measurement / experiment / sampling / interviews, include and discuss the quantitative data that you collected in your paper
- Conclusion and discussion**
- The conclusions and recommendations
 - The strong and weak points of your answer
 - Concrete directions for follow-up research are defined
 - The innovative aspect of the solution is discussed

Assignment 2: Poster and pitch

Bamboo-Mussels

In cooperation with **Wasslab**, from University of Applied Sciences of Rotterdam and students from University of Applied Sciences 'Technische Hogeschool van Delft', the water quality of the Oosterschelde has been investigated. According to the results of the measurements taken, an innovation is proposed to reduce the water quality to necessary.

ADVANTAGES:

- Natural and sustainable material
- Mussels are really suitable in the water
- Structures are easy to transport and install

Assignment 3: Storytelling video Perception of residents & stakeholders

Each team will make at least 5 different videos in the location using a Storymaker app

Digital Storytelling Apps

Assignments

- Flow velocity
- Maximum Flood heights
- Picture gallery
- River width use Smart measure app
- Urban Water Quality

- Users of the river (ask permission)
- Residents along the river (ask permission)
- Nature or animals of the river
- Pollution of the river water
- Pollution sources
- Houses / communities along the river
- Business establishments along the river
- Economic activities along the river
- Plastic waste along the river
- Cattle along the river
- Characteristics of the river embankment

Assignment 9

Riverine Plastic Waste Pollution

Assignment 10: Web-based mapping, Climatescan

The mouth of the kinalumsan
Problem area (Problem gebied)

Rotterdam University logo.

Assignment 11: Ecology of the river

Category	Score	Score
Ecology	10	10
Water quality	10	10
Water quantity	10	10
Water temperature	10	10
Water turbidity	10	10
Water oxygen	10	10
Water pH	10	10
Water conductivity	10	10
Water hardness	10	10
Water salinity	10	10
Water color	10	10
Water odor	10	10
Water taste	10	10
Water smell	10	10
Water sight	10	10
Water touch	10	10
Water sound	10	10
Water feel	10	10
Water think	10	10
Water taste	10	10
Water smell	10	10
Water sight	10	10
Water touch	10	10
Water sound	10	10
Water feel	10	10
Water think	10	10

Rotterdam University logo.

Assignment 12. Turbidity with Secchi Disk

Assignment 13. Turbidity with Hydrocolor app



Assignment 14: Quick Scan Android devices




Figure 1: DDK results in Google Earth from Business Mapping in Iloilo City



Finals

- Poster & Pitch at River Summit
- Each team must *visualize the problem* and an *innovative solution* on a poster which will be displayed at the Summit on a standing banner.
- Each team will pitch the solution in a 2 minutes pitch to the jury and the general public.
- Storytelling video



Butuanon River Scan 2018



- 2019 Challenge?
- 2020 Challenge?
- 2021 Challenge?

Organizing Partners:
 Rotterdam University of Applied Sciences
 University of San Carlos
 Hanzon University of Applied Sciences
 City of Mandaue

November 11-24 2018



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