Deliverable 4.5

Report on Network-wide training event 2: Big data for water quality management

Grant Agreement nº: 956623

Project full title: Inventive forecasting tools for adapting water quality management to a new climate

Project acronym: inventWater

Type of deliverable: report

Planned date of deliverable: 30 June 2022

Actual submission date: 30 June 2022

Target Audience: Public

Authors: Rafael Marcé (ICRA), Daniel Mercado-Bettín (ICRA)

This project has received funding from the European Union`s Horizon 2020 research and innovation programme under the Marie Skłodowska-Curie grant agreement No 956623

Content

This project has received funding from the European Union`s Horizon 2020 research and innovation programme under the Marie Skłodowska-Curie grant agreement No 956623

Introduction

During the Second Training Event the ESRs had the opportunity to meet in-person for the first time, learn about each other and share the first results and ideas of their research project. The meeting was to introduce the ESRs to the wide range of techniques now available to the water sector for acquiring and processing data. The activities ranged from hands-on deployments of in-situ sensors to methods for online data acquisition. To achieve this and following the Grant Agreement a list of activities and goals were developed:

- Deploying automated in-situ sensors in water bodies (8h - 0.5 ECTS). In addition to presentations from experts, the ESRs made a simple temperature sensor and deployed these to collect new data, increasing their understanding of how sensors work.
- Introduction to the use of Unpiloted Aerial Vehicles (4h - 0 ECTS). A recent innovation in water body monitoring is the use of drones for sample and data collection. Experts provided a presentation and demonstration of this technology.
- The application of Earth observation data for lake and catchment studies (8h - 0.5 ECTS). ESRs learned how to source, download and pre-process free and open satellite data using GUI- and API-based approaches, as well as received training in the selection and application of relevant biophysical data algorithms and satellite data visualisation.
- An introduction to ISIMIP (4h - 0.5 ECTS). Details of available simulation output and how to access it.
- Cloud computing (8h - 0.5 ECTS). ESRs were trained to use two of the key current-generation, geospatial and climate data platforms: the Google Earth Engine and the Copernicus Climate Data Store.
- An introduction to Machine Learning techniques was initially planned in the GA, but the company in charge of leading the session canceled at the last moment, we contact several other people to lead this session, but the timing was too tight for them to take the lead. We will complete this part of the training in an online event (e.g. webinar).

This project has received funding from the European Union`s Horizon 2020 research and innovation programme under the Marie Skłodowska-Curie grant agreement No 956623

Location of the meeting

The meeting was hold in Dundalk (Ireland) at the Dundalk Institute of Technology following the grant agreement and giving the improvement of the COVID circumstances. The meeting was organised by Eleanor Jennings and Ian Jones as beneficiaries of the project, with the support of the coordination team. See some pictures from the meeting in the different sessions. More details in the blog post (https://inventwater.eu/our-first-in-person-training-on-modeling-water-quality/).

Figure 1. First picture of the whole group

This project has received funding from the European Union`s Horizon 2020 research and innovation programme under the Marie Skłodowska-Curie grant agreement No 956623

Figure 2. Building and deploying sensors

Figure 3. Using earth observation data

This project has received funding from the European Union`s Horizon 2020 research and innovation programme under the Marie Skłodowska-Curie grant agreement No 956623

Figure 4. Introduction to the use of Unpiloted Aerial Vehicles

This project has received funding from the European Union`s Horizon 2020 research and innovation programme under the Marie Skłodowska-Curie grant agreement No 956623

List of attendees

Name	Institution	Role
Anandita Agarwal	AU (Denmark)	ESR
Ammanuel Bekele	RUB (Germany)	
Maud Siebers	US (UK)	
Sabin Taranu (attended online)*	VUB (Belgium)	
Ilaria Micella	WU (The Netherlands)	
Keerthana Suresh	IIASA (Austria)	
Ricardo Marroquin	DkIT (Ireland)	
Angela Pedregal	ICRA (Spain)	
Lipa Nkwalalw	UFZ (Germany)	
Faluku Nakulopa	UFZ (Germany	
Mahtab Yaghouti	US (UK)	
Adrian Rinaldo (attended online)*	UCC (Ireland)	
Daniela Henry	ICRA (Spain)	
Annika Schlemm	VUB (Belgium)	
Floran Clopin	WU (The Netherlands)	
Ann van Griensven (attended online)	VUB (Belgium)	Supervisor
Carolien Kroeze (attended online)	WU (The Netherlands)	
Dennis Trolle	AU (Denmark)	
Don Pierson	UU (Norway)	
Eleanor Jennings	DkIT (Ireland)	
Elvira de Eyto	MI (Ireland)	
Ian Jones	US (UK)	
Ilona Bärlund	UFZ (Germany	
Katja Frieler	PIK (Germany)	
Jeroen de Klein (attended online)	WU (The Netherlands)	
Maria Jose Farre	ICRA (Spain)	
Martina Floerke	RUB (Germany)	
Peter Hunter	US (UK)	
Philip McGinnity (attended online)	UCC (Ireland)	
Rafael Marcé	ICRA (Spain)	
Lisette Senerpont Domis (attended online)	NIOO (The Netherlands)	
Maryna Strokal (attended online)	WU (The Netherlands)	
Ting tang	IIASA (Austria)	
Tom Shatwell (attended online)	UFZ (Germany	

This project has received funding from the European Union`s Horizon 2020 research and innovation programme under the Marie Skłodowska-Curie grant agreement No 956623

WADA Yoshihide (attended online)	IIASA (Austria)	
Wim Thiery	VUB (Belgium)	
Valerie McCarthy	DkIT (Ireland)	
Heather Lally	Atlantic Technological University (ATU)	Expert on drones
Daniel Mercado-Bettín	ICRA (Spain)	Project Manager

*Two of the ESRs attended online because of unpredicted circumstances. One had a health issue and the other one had a family emergency.

Agenda of the Second Training Event

Following the initial plan, a five-day meeting was planned and successfully implemented. The first day was assumed as a traveling day to respect the family time of the network and because the training will continue after the 5-day-meeting, fulfilling the GA. In the following table are the activities and sessions per day.

This project has received funding from the European Union`s Horizon 2020 research and innovation programme under the Marie Skłodowska-Curie grant agreement No 956623

Muirhevna Building, M111/M112/M113	6/13/2022	6/14/2022	6/15/2022	6/16/2022	6/17/2022
	Monday	Tuesday	Wednesday	Thursday	Friday
8.30-9.00		Welcome and logistics	Introduction to day	**STARTING 8.30** Introduction to ISIMIP (Katja Friedler and Martin Park, PIK)	Introduction to day
9.00-10.00		Introduction to use of sensor to measure environmental data (Don Pierson, UU)	Poster presentations by ESRs (10 minutes each) foyer Muirhevna	**STARTING 8.30** Introduction to ISIMIP (Katja Friedler and Martin Park, PIK) M111/M112/M114	Introduction to geoprocessing using the Google Earth Engine (VUB) MEETING ROOM AT CROWNE PLAZA HOTEL
10.00-11.00		Making sensors/programming loggers (hands on session) (Don Pierson, UU)	Poster presentations by ESRs (10 minutes each) foyer Muirhevna	**STARTING 8.30** Introduction to ISIMIP (Katja Friedler and Martin Park, PIK) M111/M112/M115	Introduction to geoprocessing using the Google Earth Engine (VUB) MEETING ROOM AT CROWNE PLAZA HOTEL
11.00-11.30		Coffee/tea (foyer Muirhevna)	Coffee/tea (foyer Muirhevna) and GROUP PHOTO	Coffee/tea (foyer Muirhevna)	Coffee/tea (foyer Muirhevna)
11.30-12.00		Making sensors/programming loggers (hands on session) (Don Pierson, UU)	Group meetings with supervisors/ESRs	Guest lecture on using drones to monitor water bodies (Dr Heather Lally, GMIT)	Introduction to geoprocessing using the Google Earth Engine (VUB) MEETING ROOM AT CROWNE PLAZA HOTEL
12.00-13.00	TRAVEL DAY	Finalising short sensor deployment DkIT grounds (hands on session)	Group meetings with supervisors/ESRs	Guest lecture on using drones to monitor water bodies (Dr Heather Lally, GMIT)	Introduction to geoprocessing using the Google Earth Engine (VUB) MEETING ROOM AT CROWNE PLAZA HOTEL
13.00-14.00		Lunch (DkIT canteen)	Lunch (DkIT canteen)	Lunch (DkIT canteen)	Lunch (foyer Muirhevna)
14.00-15.00		Earth observation (Peter Hunter, US)	Introduction to Linux, netcdf and cdo (VUB) MEETING ROOM AT CROWNE PLAZA HOTEL	Sensor download and data collation (Don Pierson, UU)	Introduction to geoprocessing using the Google Earth Engine (VUB) MEETING ROOM AT CROWNE PLAZA HOTEL
15.00-16.00 (coffee/tea available)		Earth observation (Peter Hunter, US)	Introduction to Linux, netcdf and cdo (VUB) MEETING ROOM AT CROWNE PLAZA HOTEL	Sensor download and data collation (Don Pierson, UU)	Wrap-up
16.00-17.00		Earth observation (Peter Hunter, US)	Supervisory board MEETING ROOM AT CROWNE PLAZA HOTEL	Sensor download and data collation (Don Pierson, UU)	
End ca. 17.30		Wrap up/informal meetings	Supervisory board MEETING ROOM AT CROWNE PLAZA HOTEL	Wrap up/informal meetings	
Evening	Informal arrangements for dinner	Walk by sea at Blackrock then dinner: bus at 6.30 from front of Crowne Plaza Hotel	Informal arrangements for dinner	Dinner Carlingford Brewing Company - bus at 7.00 from front of Crowne Plaza Hotel	

This project has received funding from the European Union`s Horizon 2020 research and innovation programme under the Marie Skłodowska-Curie grant agreement No 956623