An Ecosystem of Citizen Observatories for Environmental Monitoring

WeObserve D.3.2.1 WeObserve distance learning programme 1

Work package	WP3: Accelerate: Stimulate uptake of the citizen observatories knowledge base
Task	Task 3.2: Deliver the WeObserve Citizen Observatory distance learning programme 1
Deliverable Lead	**UNIVDUN**
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Partners

Revision and history chart

Version	Date	Main author	Summary of changes
0.1	20/10/2019	Saskia Coulson	Draft outline and content
0.2	04/11/19	Mel Woods	Additional Information and Edits
1.0	06/11/2019	Saskia Coulson	Final version prepared and submitted

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Glossary of terms

Term	Description

List of abbreviations and acronyms

Abbreviation	Meaning
MOOC	Massive Open Online Course
FL	FutureLearn

Executive Summary

WeObserve has developed a distance learning programme to facilitate the scaling of citizen observation communities and education. This course will introduce a powerful learning dimension to the CO ecosystem, and support the WeObserve project in accelerating and stimulating the uptake of the CO knowledge base.

This report provides an overview of the research and activity that developed the online learning course and the structure of the course itself. Within the course, learners will discover methods, protocols and guides for co-created citizen science experiments, and practical scientific skills necessary for partaking in, and starting their own citizen science projects.

As at the time of writing the report, the course expected to go live, this document does not provide an analysis of the course. The primary purpose of this document is to demonstrate how the course evolved and the collaborative working between the WeObserve partners, and is a summary of activity and the outline of the first iteration of the WeObserve online course.

1 Introduction

1.1 Purpose and scope – Aims and objectives of this report

This report aims to give an overview of the first iteration of the WeObserve distance learning programme, or Massive Open Online Course (MOOC). This course entitled, Citizen Science Projects: How to Make a Difference will run on the FutureLearn[1] platform in November 2019.

Objectives of this deliverable are:

- Indicate the research, both internal and external, underpinning the development of this course
- Demonstrate the process of collaborative working amongst the WeObserve partners led by WP3
- Indicate the approaches for the promotion and the development of the course trailer.

1.2 Structure of this Report

This report has been structured in order to give a concise review of the development work and online learning course to date.

Section 1: Development Process. This section gives details on background and research conducted into the online learning course and the ways in which the consortium worked together to develop the online course and the research that was conducted to develop it.
Section 2: Citizen Science Projects: How to make a difference. This section outlines the MOOC structure and activities that will be on the FutureLearn platform.
Section 3: Next steps. This section proposes the next phase in the development of the WeObserve MOOC.

Annex.

2   Development Process

A Task Force for the MOOC was established by WP3 to include representation from all consortium partners, it included members that were both experienced educators, and those who were keen to be take part in MOOC development. WP3 also sought opportunities to engage with external stakeholders for MOOC development in order to validate requirements internal and external to the project.

2.1   Stakeholder Consultation

Task Force members from WeObserve were brought together at an initial workshop at the European Citizen Science Association conference (June 2018), these members make up the core online course development team. Discussions from this meeting [Annex 1] key action points were agreed:

TABLE 1. ACTION POINTS FROM INITIAL TASK FORCE MEETING AT ECSA

Suggested Action Points	Achieved through	Actioned by
Organise a working group with attendees.	Regular Task Force meetings.	WP3
Organise meeting in Venice during COWM November 2018 to discuss: learning objectives, MOOC content, delivery team task list and working schedule.	Workshop with all partners during GA in Venice prior to COWM conference.	ALL
Establish a shared workspace and protocols for collaborative course development.	Established shared platforms, Trello, GDrive, Dashboard and Development plan.	WP3
Research conducted for capturing needs and expectations for an online course in citizen science.	Online Learning Survey.	WP3

The EuroGEOSS expert community were involved in a consultation exercise during the EuroGEOSS conference in Geneva, 12 September 2018. An interactive station gathered insights from the EuroGEOSS community on the WeObserve MOOC [Annex 3]. The subsequent objectives included:

- Defining prospective target groups of the MOOC
- Discussing needs of these groups and some of the challenges encountered when working with them
- Ideate possible goals of a MOOC and how to measure success and impact in achieving these goals

Key audiences in distance learning were targeted to assess the needs and expectations of the learning programme, an online survey was conducted via Google Forms platform [Annex 3]. This survey was led by WP3 with input from the wider WeObserve partners.
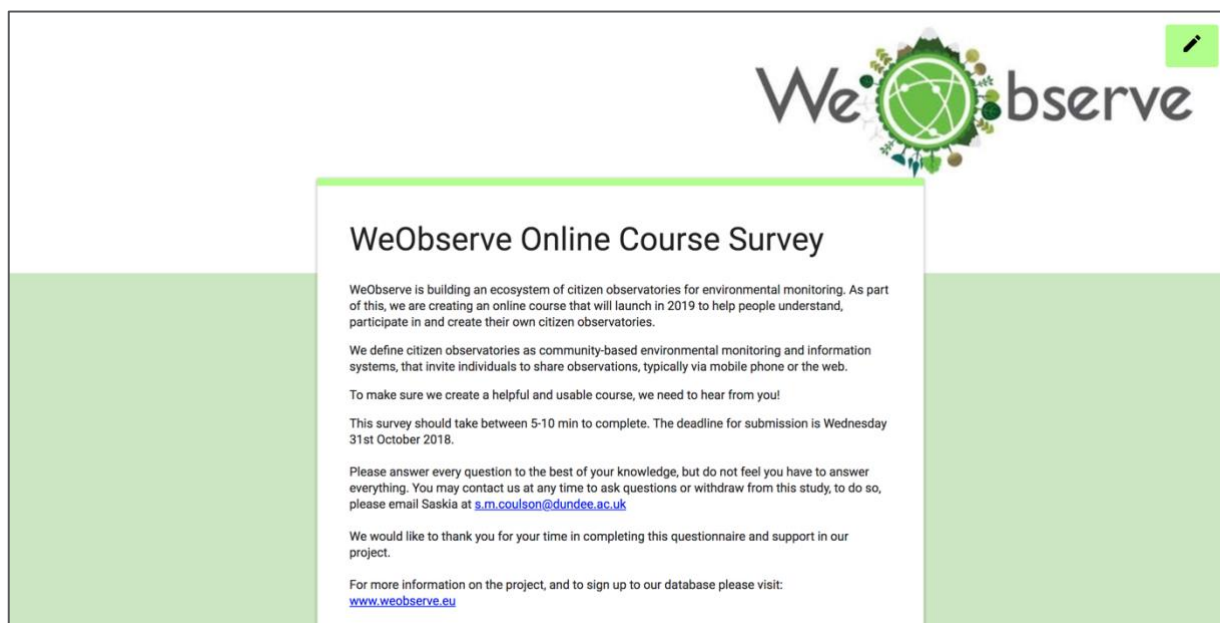
FIGURE 1. SCREEN GRAB OF THE WEOBSERVE ONLINE COURSE SURVEY.

2.2 Online Learning Survey Outcomes

The Online Learning Survey was open for public responses to be submitted between October 1st – November 15th, 2018. During this time, it was advertised through various e-mail lists (e.g. ECSA List Serve, CitSci List Serve and Ideas for Change List Serve) and on social media platforms via WeObserve, partners and networks.[2]

Total number of respondents was n=79 and the geographical spread ranged from Europe and North and South American (Austria, n=1; Belgium, n=1; Bulgaria, n=1, Columbia, n=1; Czech Republic, n=1; UK, n=20; France, n=2; Greece, n=3; Hungary, n=2; Ireland, n=1; Italy, n=3; Kosova, n=6; Netherlands, n=5; Norway, n=2; Portugal, n=3; Romania, n=1; Spain, n=8; Switzerland, n=1; USA, n=11).

[2] Peak response times followed certain circulation activities: ECSA List Serve, Ideas for Change List Serve. And tweets from FabLab Barcelona, Mara Balestrini (Ideas for Change), #MozFest (after the delivery of a workshop during MozFest 2018 for T3.1).

FIGURE 2. RESPONDENTS GEOGRAPHICAL SPREAD

Findings of this survey were presented to the WeObserve consortium during the Year 1 Plenary in Venice, 26 November 2018. Minutes of this presentation and discussion were documented by the WeObserve project manager [Annex 4].
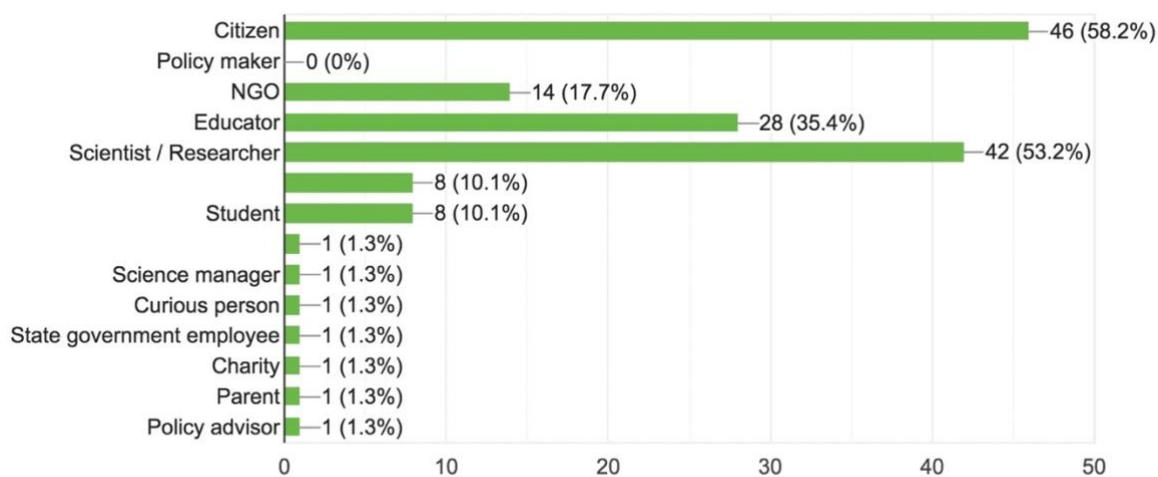
FIGURE 3. TYPE OF RESPONDENTS TO THE ONLINE LEARNING SURVEY (SELF-SELECTED)
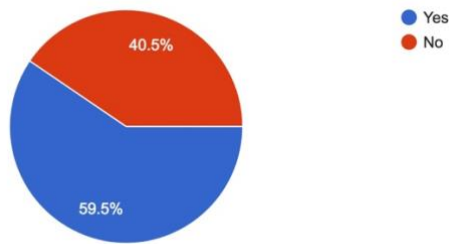
FIGURE 4. HAVE YOU EVER PARTICIPATED IN A CITIZEN SCIENCE / CITIZEN OBSERVATORY PROJECT BEFORE (CHOOSE ONE). N=79
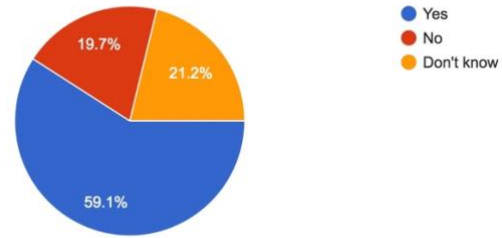
FIGURE 5. DID YOU FACE ANY CHALLENGES WHEN YOU PARTICIPATED IN THE CITIZEN SCIENCE / CITIZEN OBSERVATORY PROJECT? N=66
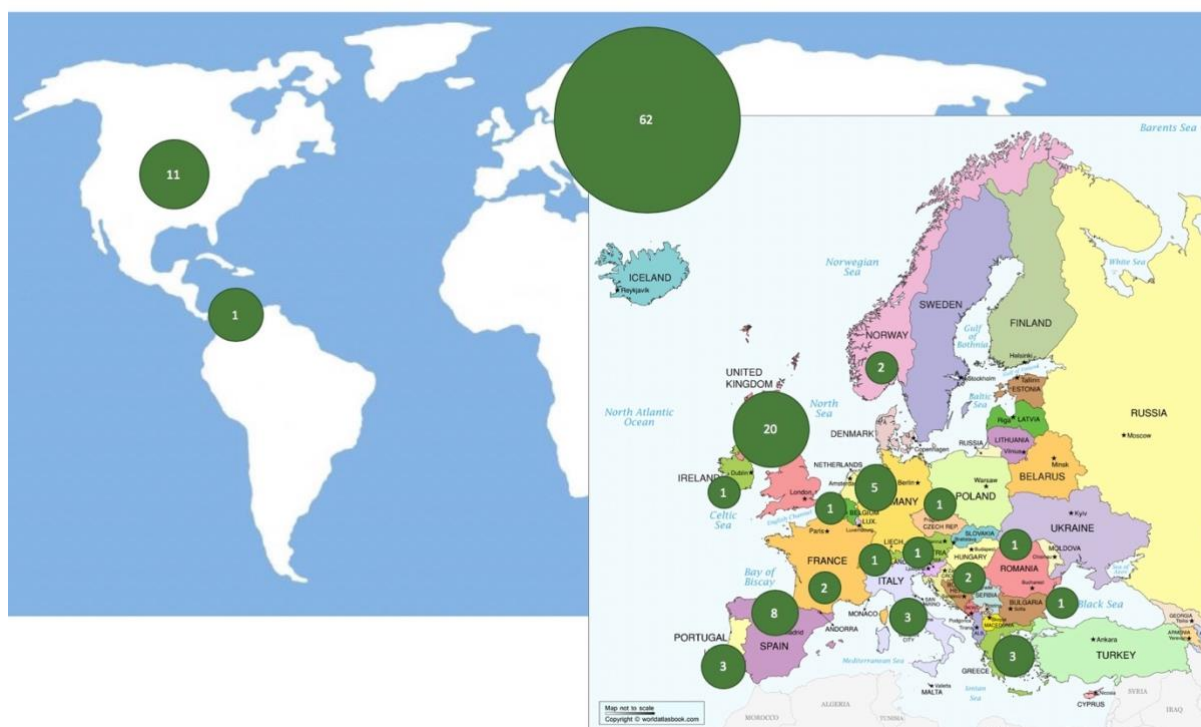
This survey posed questions to respondents regarding previous experiences with citizen science and with distance learning. Initial questions asked if they had participated in a citizen science project or citizen observatory before [Figure 4] and if they had faced any challenges when participating in a citizen science or citizen observatory [Figure 5]. Following on, the survey asked what kinds of challenges they faced. Some of the most prevalent challenges given by respondents were:

- Keeping motivated in the project (43.8%)
- Understanding how to use the data collected (41.7%)
- Know how to communicate the data (35.4%)
- Discovering ways to develop a project (35. 4%)
- Understanding how to use the technology (31.1%)

In addition, there was a field where respondents could offer their own challenges, here the answers included;

- 'getting data back from the project'
- 'not understanding the "bigger picture"'
- 'accessibility to technology'
- 'no problems at all'

The survey also elicited information about whether there was a demand for the course [Figure 6] and how much time potential learners would be able to allocate to a potential online learning course [Figure 7].
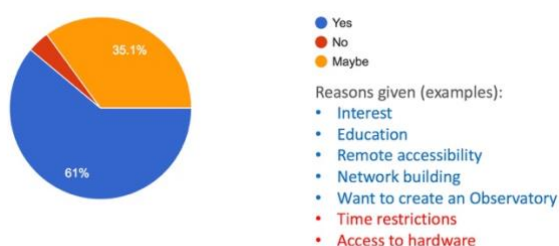
FIGURE 6. IF THERE WAS AN OPEN AND FREE ONLINE LEARNING PROGRAM ON CITIZEN OBSERVATORIES WOULD YOU JOIN? N=77
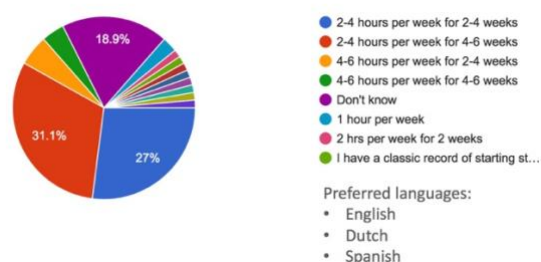
FIGURE 7. IF YES, HOW MUCH TIME WOULD YOU HAVE TO COMMIT TO AN ONLINE LEARNING PROGRAM? N=74

The working session at the WeObserve plenary was an opportunity for **all partners** (not just those involved in initial Task Force meetings) to discuss the findings of the Online Learning Survey. The intention was to use the survey as a jumping off point and to discuss prospective online course topics from challenges outlined by survey respondents. It was decided that in order to achieve this, further correlation between types of survey respondents as outlined in Figure 3, challenges and reasoning for participating in the online course was required. This was conducted and reported back to the consortium in January 2019.

The discussion also focused on key areas of the online learning provision in regards to; *audience*, *learner motivation*, and *main learning outcomes*.

Audience – this discussion considered who the main audience was for the online learning program, and the main respondents to the survey; scientists, educators and citizens. There had been previous discussions during Task Force meetings on whether the online learning course should target policy makers, as that was a key group for many of the COs involved, notably Scent and LandSense. However, as none of the respondents of the survey identified as policy makers this was reconsidered. In addition, FutureLearn, the platform which the online course would be provided is in most cases open to a very broad audience. There is an option to create a closed course, for invitees only. However, with the aims of the MOOC to accelerate the uptake of citizen science, it was agreed it was not aligned to the aims of the project.

Learner motivation – this discussion focused on whether the course was awareness raising or action oriented. It was discussed that the online learning course could signpost learners to places and projects they can contribute as a way to manage expectations and also disseminate CO outputs, i.e. examples of best practice. It would also be a way for learners to find out more about the WeObserve consortium and the resources that have come out of the project, i.e. cookbook.

Main learning outcomes – was primarily focused on how the course would be able to serve learning outcomes by signposting and linking participants to existing resources and tools, depending on their interest. It would also provide guidance for people who wish to set up their own CO.

The working session was also a crucial time for the WeObserve consortium partners to learn about the FutureLearn platform, namely, how courses were structured, the types of activities that make up to the course and how each activity can be created and how it works on the platform. In addition, several guidance documents were prepared and uploaded onto the shared project hard drive as reference documents for the partners, e.g. a summary document of the Steps that are used on FutureLearn and best practice on how to create them [Annex 5].

3 Citizen Science Projects: How to make a difference

The research and the discussions were combined to form an outline of the MOOC. The course, entitled 'Citizen Science Projects: How to make a difference' has been designed for people who are interested in citizen science and citizen observatories, and wish to learn about how to design a citizen science project. It is intended to be open to people from all walks of life who only need an open mind and interest in the environment.

Many people would like to understand the environment and help make positive change. The course will teach learners how to work together to do this. The course introduces the variety of citizen science and citizen observatory projects happening around the world right now, much of the learning comes from partners first hand experiences through the CO's but also covers examples from other significant projects. The aim of the course is to support learners in building their knowledge on this subject and feel empowered to start up their own citizen science initiatives.

This course will also train learners in leading their own citizen science projects, we will demonstrate some of the basics in participating and in project start-up, and introduce best practices for community building, question forming and data collecting. The course creates opportunities to collaborate by gathering and sharing simple environmental datasets and presents unique case studies of initiatives.

More than just an introduction to citizen science, this course was also created to help learners to see the value of building their own citizen science projects. They will find out how they can use the information they collect to lobby for change, or how they can change their own actions to make a difference where they live.

Subjects that will be covered by the course:

- **An Introduction to Citizen Science and Citizen Observatories:** existing definitions and example projects.
- **Understanding the issue or problem:** exploring environmental issues and deciding on a research focus.
- **Forming a team:** identifying the skills, expertise and networks.
- **Creating a community:** finding the people who are brought together by a shared concern and positively nurturing the sharing of ideas and experiences.
- **Choosing a question:** collectively honing in on the research focus and deciding on a research question.
- **Deciding what data to collect:** using the research question(s) to select what information will be gathered.

- **Developing protocols for data collection:** deciding on the methods and procedures for collecting the data.
- **Training for data collection:** inductions into gathering information with the diverse tools available.
- **Capturing or generating the data:** collecting the information, keeping motivated and engaged.
- **Managing the data:** using platforms and other systems to organise the data.
- **Understanding the data:** looking at the data to know what it represents.
- **Analysing the data:** interpreting the data, being able to spot trends and anomalies.
- **Visualising the data:** illustrating data sets through traditional and creative methods.
- **Disseminating results:** using the findings from the data to communicate with others about the environmental concern.
- **Inform decision making:** using the findings to make decisions about daily life activities
- **Change-making / planning action:** using the findings to lobby for change, or plan an intervention or action to inform others about the environmental concern.

Learning Outcomes of the course:

- Investigate what citizen science and citizen observatories are.
- Explore what projects are available, what they do and how to get involved.
- Engage with the general process of a citizen science project, the tools used and where to find them.
- Model the steps to create your own citizen science project.
- Collect and discuss simple environmental datasets.
- Evaluate the potential of citizen science in bringing about change.

3.1 Course Outline

TABLE 2. CITIZEN SCIENCE PROJECTS: HOW TO MAKE A DIFFERENCE – COURSE OUTLINE

Step #	Step Title	Type of Step	Brief Description
Week 1			
1.1	Welcome to the course	Video	Introduction to the course.
1.2	Introducing WeObserve (and you!)	Video	Introduction to the COs and the Educators.
1.3	Opportunities for citizen science	Discussion	Learners sharing the types of opportunities they know of.
1.4	Have you taken part in citizen science?	Poll	Poll with follow up discussion.
1.5	Glossary	Article	Terms that are frequently used in Citizen Science.
1.6	How to 'do' citizen science – the process	Article	Outline what makes a 'good' citizen scientist.

Step #	Step Title	Type of Step	Brief Description
1.7	Types of observatories and campaigns	Article	Description of different types of citizen science projects and existing observatories.
1.8	How we did it: Understanding the Issue	Video	Hear from the COs about how they understood the environmental issue they were facing.
1.9	Mapping Activity	Article	Mapping the problem of flooding.
1.10	A collaborative experiment: introducing study groups	Article	[Study groups] Groups form and discuss an environmental issue of their choosing.
1.11	Share what you discovered	Discussion	Study groups feedback on their discussions.
1.12	Action Spotlight: Community-based environmental monitoring	Video	Hear from the COs about how communities played a leading role in the citizen science process.
1.13	Empathy Timeline	Article	[Study groups] Groups use the empathy timeline to examine their environmental issues.
1.14	How to choose a question	Article	A look into how to choose what issue to focus on and how to frame the question to guide the campaign.
1.15	How we did it: Choosing a question	Video	Hear from the COs about how they decided on their research questions.
1.16	Campaign design and best practices	Article	Details on how to design a campaign, and best practices / advice from the COs.
1.17	How we did it: Forming Teams	Video	Hear from the COs about how they created teams for their projects and campaigns.
1.18	How to create a community	Article	Building interesting in an issue or project.
1.19	Test your knowledge	Quiz	Short questions based on material from Week 1.
1.20	Week 1 Summary	Discussion	Review activities and discuss.

Week 2

Step #	Step Title	Type of Step	Brief Description
2.1	Welcome to Week 2	Video	Introduction to the week activities.
2.2	Action Spotlight: Land use and land cover	Video	Hear from the COs about how they monitored land use and land cover.
2.3	How do you know what data you need?	Article	Revisit the question, decide the most appropriate kinds of data to gather evidence on the issues, and how to collect and store it.
2.4	Challenges in data collection	Article	Calibration, targeting measurements

Step #	Step Title	Type of Step	Brief Description
2.5	Community-level indicators	Video	Introduction to Community-Level Indicators and how it has been used in citizen science
2.6	Data collection in your life	Discussion	[Study groups] Groups think about the ways they already collect data.
2.7	Tools & Kits to help with data collection	Video	Hear from the COs about the tools and kits they use in their projects
2.8	Measurement protocols – your options	Article	Examples of typical protocols and factors in collecting data
2.9	Setting up to collect data	Article	Examples of ways to collect data
2.10	How we did it: Training for data collections	Video	Hear from COs about how they educated citizens in collecting data.
2.11	Technology and data collection	Article	Introduction to FabLabs, makerspaces and apps that help with data collection.
2.12	DIY data collection	Article	Options for DIY/low-cost sensors, open hardware, other tools.
2.13	How we did it: Crowdsourcing data	Video	Hear from the COs on how the crowd sourced data
2.14	Sensing strategy: a data collection plan	Discussion	[Study groups] Group explore how they would use tools to collect data on environmental issues.
2.15	Test your knowledge	Quiz	Short questions based on material from Week 2.
2.16	Week 2 Summary	Discussion	Review activities and discuss.

Week 3

Step #	Step Title	Type of Step	Brief Description
3.1	Welcome to Week 3	Video	Introduction to the activities for Week 3
3.2	Action Spotlight: Biodiversity	Video	Hear from the COs about how they explored biodiversity.
3.3	Data quality	Article	Discussion on how to know when the data is good quality.
3.4	Keeping data collectors engaged	Discussion	How to keep citizen motivated whilst collecting data.
3.5	How to understand and interpret data	Article	Discussion and examples of how to interpret data.
3.6	Options for data analysis: tools & tips	Article	Platforms that can help with data analysis.
3.7	How we did it: Analysing data	Video	Hear from COs on how they managed, understood and analysed data
3.8	Analysing data activity	Discussion	Hands on activity with soil sensor data.
3.9	Types of visualisation: What types for what data?	Article	Discussion on what methods to use and when.

Step #	Step Title	Type of Step	Brief Description
3.10	How we did it: Visualising data	Video	Showcase of visualisation from citizen observatory related projects
3.11	Test your knowledge	Quiz	Short questions based on material from Week 3.
3.12	Week 3 summary	Discussion	Review activities and discuss.

Week 4

Step #	Step Title	Type of Step	Brief Description
4.1	Welcome to Week 4	Video	Introduction to the activities for Week 4
4.2	Action Spotlight: Soil & Moisture	Video	Hear about how the COs explore soil & moisture
4.3	How results are shared	Article	Discussion on how citizens can share their findings to as many as possible.
4.4	How we did it: Sharing data	Video	Hear from the COs about how they shared they data from their projects.
4.5	Opening access to data	Article	Open source movement, open data sources, benefits and challenges.
4.6	Social/policy impact of citizen science & observatories SDGs	Video	Examples of how COs have impacted policy and social change, SDGs
4.7	What would you do to create change?	Article	[Study Groups] Groups use a Future Newspaper activity to devise a change they would like to happen.
4.8	COs and Service Innovation	Article	Examples of how COs are linked to service innovation.
4.9	Activism: Call to Action	Article	Examples of different types of activist projects: protest, arts activism, online community building, petitioning.
4.10	Examining impact and change	Video	What has happened as a result of the COs activities, example of the CoPs.
4.11	Test your knowledge	Quiz	Short questions based on material from Week 4.
4.12	Week 4 Summary	Article	Review activities and discuss.
4.13	Congratulations	Video	Final congratulations and goodbye.

3.2   Collaborative Working and Course Development

To ensure that all WeObserve partners had an active role in developing the MOOC, a shared MOOC dashboard was designed to establish working guidelines so that each partner could lead and contribute to the various steps that were required of the course. WP3 initiated the course, proposing an outline structure of article type and heading for content. Once the outline was in place and had been approved, each partner self-nominated their organisation against each step

[Figure 8] as a leader and/or contributor. These organisations would write content and gather other materials, e.g. photographs and illustrations, needed for the activity. WP3 also contributed to content as well as providing management, support, and a timeline [Figure 9] in the creation and also editing to fit the style and guidance needs of the FL platform. In addition to the shared drive, a Trello Board [Figure 10] was established to manage the workflow and progress of the course development.

* required		Activity title*	Step number*	Step title*	Step type*	Details	Writer/Creator	Org	Link to draft	Link to script	Status
Week 1							Mel Woods, Saskia Coulson	UOD	https://docs.google.com/document/d/1E-LQbwPNWnUcyxYe7lrcuqmREzO1TJKcAXmC3-OiTug/edit?usp=sharing	https://docs.google.com/document/d/1N_kJ2LMCPnUc_wQ6-Riyzs3C-j1S3v-2hCBUaeutGzs/edit?usp=sharing	Ready for edits
	Week 1 title / learning objectives / big question	Welcome to Week 1	1.1	Welcome to the course	Video	Video welcome, what we'll cover, topic list/los, people you'll meet etc.					
	In this week we will cover the following steps of the generalised CO process 'Understanding the issue of problem (e.g. environmental, ecological, etc.), Forming a team, Governance, Creating a community, Choosing a question		1.2	Introducing WeObserve (and you!)	Video	Video, discussion. Intro observatories & WeObserve. Learner intro. What observatories do - campaigns.	Inian Moorthy (LandSense), Mel Woods (GROW), Uta Wehn (GT2.0), Valantis Tsiakos (Scent)	IIASA, UOD, IHE, ICCS	https://docs.google.com/document/d/1IzOTSpCZjnDkzulbNNIFPsW0m0ZqT8pYmCXIjCIeef0/edit?usp=sharing	https://docs.google.com/document/d/1qT8_u9jUmKZabouWVvLsBGdIQab6g1RURYiils1QlOQ/edit?usp=sharing	Ready for edits
		Getting started with citizen science	1.3	Opportunities for citizen science	Discuss	Focus areas of these/other observatories/cs projects i.e. flooding, soil moisture, land use, noise. What/where/how.. Set up the 'how to' format. Q: What opportunities around you?	Laura Underwood, Saskia Coulson	UOD	https://docs.google.com/document/d/1VFBN3gzE9rKJeInjjakmehvt_H6Fen502bSGrDp1mJw/edit?usp=sharing		Ready for edits
			1.4	Have you taken part in citizen science?	Poll	If so, how? Comment.	Laura Underwood, Saskia Coulson	UOD	https://docs.google.com/document/d/1kxd0EQZVCN8YK5VYRel3zs5ONjEmL_KO-e7Cw2vepWl/edit?usp=sharing		Ready for edits

FIGURE 8: MOOC DASHBOARD COURSE OUTLINE SHOWING WRITER/CREATOR OF 4 STEPS IN WEEK 1

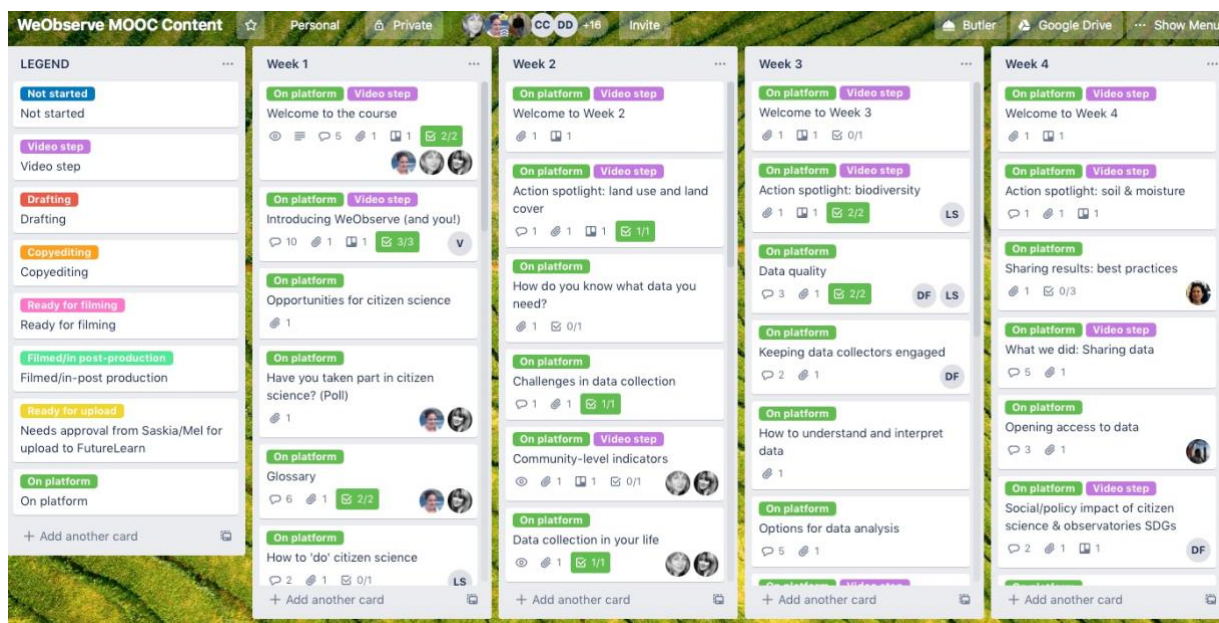FIGURE 9: MOOC DASHBOARD TIMELINE VIEW SHOWING MAJOR DEVELOPMENT LIFECYCLE

FIGURE 10: MOOC TRELLO DASHBOARD WITH OVERVIEW OF WEEK 1 – 4 WITH INITIAL STEPS

3.3 Trailer and Promotion

To recruit as many learners from across the world to sign-up to the course as possible the WeObserve team is employing a promotion strategy via email and various social media channels.

A course trailer was developed, the brief was a call to action, to drive home a message to people that have a stake in what is happening in the environmental issues around the world. The message was that Citizen Science provided a way for people to better understand and to act before the crisis goes beyond the tipping point. The trailer had to link to practices of diverse citizen observatories examining various climate emergencies across Europe and Africa. It draws on experiences, knowledge and examples of best practice to demonstrate how one can develop a citizen observatory from the ground up.

Call to action:
The trailer is a message to those who feel powerless in the face of the climate emergency, or those who want to do something more. The message is that there are ways to get involved, monitor environments and have the information to lobby for real change or take action.

Footage to capture:
[Creative / artistic shots including]
- Visually creative and interesting video sequence that inspires the viewer to take action on the climate emergency
- Finding networks and like-minded people
- Going to or discovering active groups collecting data on environmental challenges which have relevance in their own lives
- Them sharing the information with others, maybe going to an event together
- [Science shots]
- Shots that show the technology, sensors, smart phones, web platforms, apps that visualise the data

Trailer Types:

Narrative - Action focused on 'someone like me' experiencing the call to action to get involved. We discussed a single actor, possibly watching environmental issues on TV. Getting mail drop etc

Rapid Slideshow - Strong narrative and message / VO with jump cuts between fast paced images (see 1854 example).

Emotion - Emotional 'generational' call to action to save the world for our futures (see WWF website and "Seven" from FridaysforFuture)

References and Links:
- WWF - Demand action on the climate emergency video here
- 1854 Media Blog - Power of photography video here (this video is more about the use of still images combined with the rhythm of the speaker's voice, it could be an route we could go down if we want to use a lot of stills from the various COs as they are more abundant than video clips)
- Extinction Rebellion - This is an emergency video here
- Fridays for Future - Seven video here

The final trailer and link to the programme page on FutureLearn is available here: https://www.futurelearn.com/courses/weobserve-the-earth

FIGURE 11. MOOC TRAILER SCREENSHOTS

The MOOC dashboard has a dissemination tracker for ICCS and partners to record where they have promoted the course. Using the WeObserve existing network the consortium partners are promoting the course through their networks and associated organisations, e.g. ECSA and

CitSci list servs. WeObserve dissemination partners ICCS are also promoting the course through social media channels, e.g. Facebook, Twitter and Instagram.

Pre-course learner statistics:

At the time of this report, the course is open for registration. The FutureLearn platform has several statics support tools to demonstrate the geographic spread of learners [Figure 12] and the age range [Figure 13].
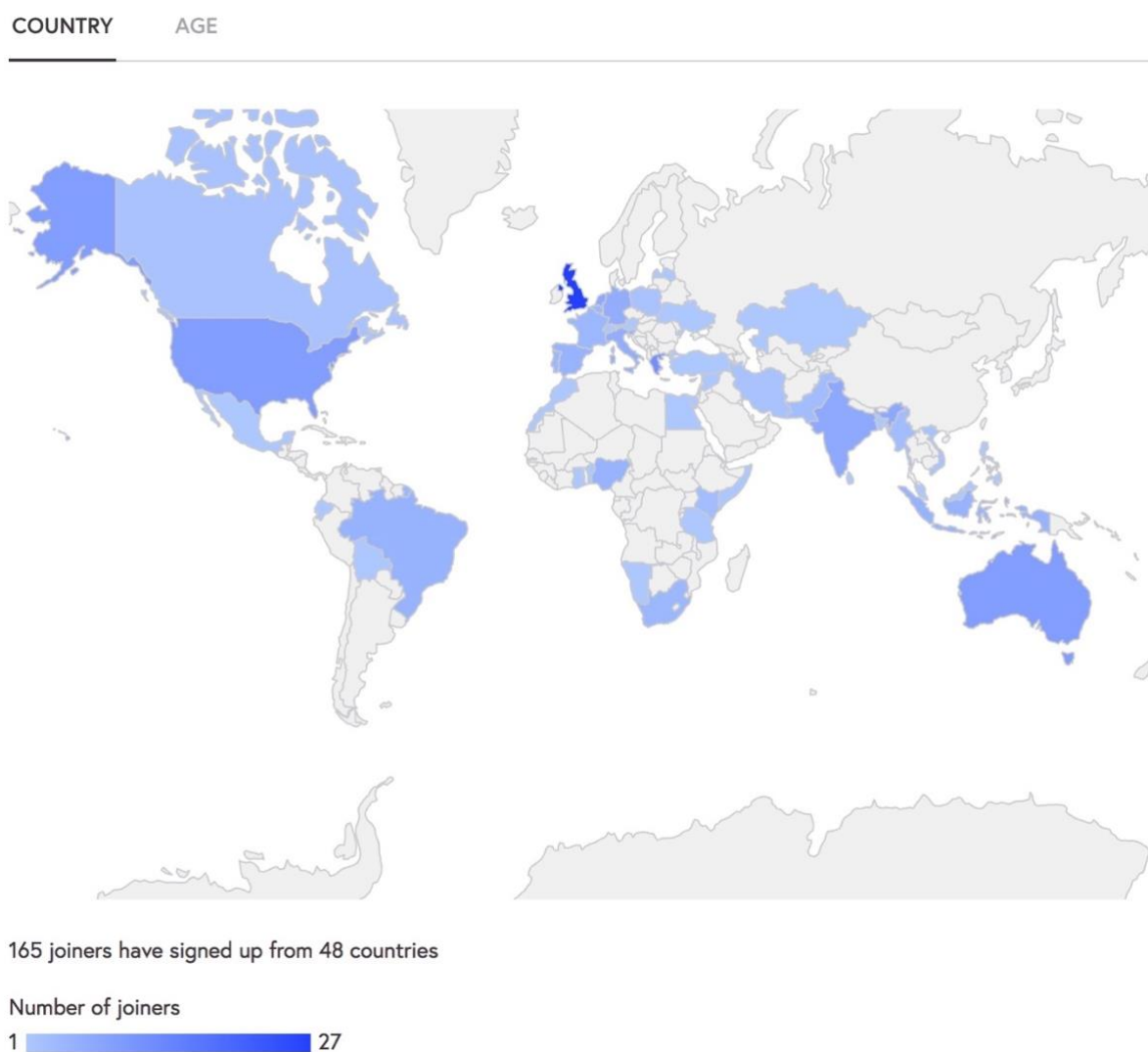

FIGURE 12. GEOGRAPHIC RANGE OF LEARNERS SIGNED UP TO THE COURSE ON 29 OCT. 19
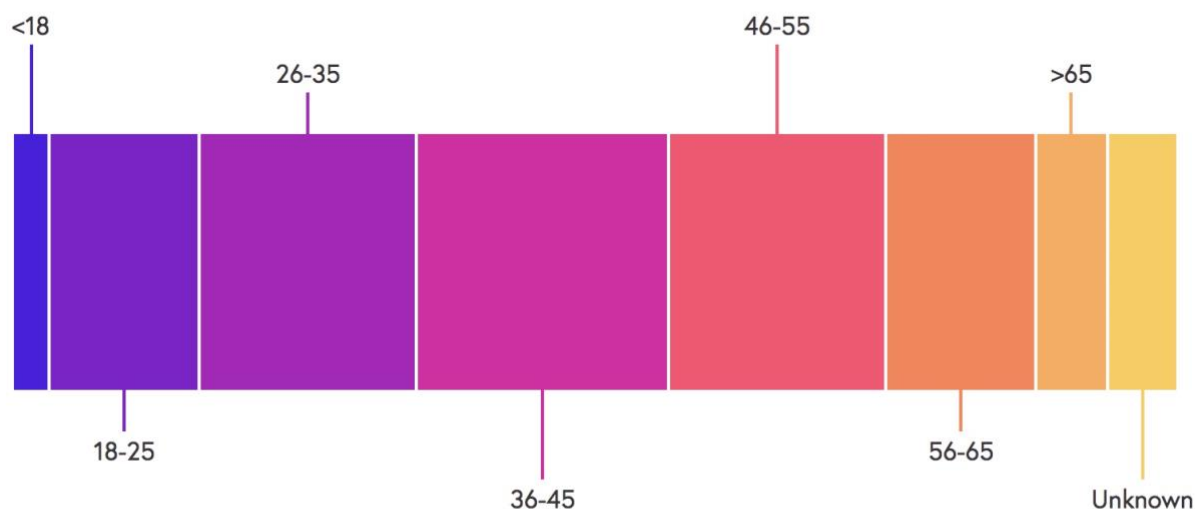
FIGURE 13. AGE RANGE AND NUMBER OF LEARNERS SIGNED UP TO COURSE ON 29 OCT. 2019

4   Next Steps

The first iteration of the WeObserve course, Citizen Science Projects: How to Make a Difference will run from Monday 18 November 2019. The course will last for four weeks, and be available on the platform for an additional two weeks.

After the competition of the course, a review of the MOOC will be conducted by a member of University of Dundee as a WP3 task. This member of staff was not heavily involved in the development of the course but has a wealth of experience in delivery online citizen science courses on the FL platform. This review will be present to the WeObserve consortium and allow for the discussions on areas of improvement and planning for the next iteration of the course in Autumn 2020.

Annex 1: WeObserve MOOC Task Force Meeting 1 – ECSA, 5 June 2018

Date	Tuesday, June 5th 2018
Time	13:00 - 14:30
Location	Grande Salle, Plaine de Plainpalais

Attendees	Linda See (IIASA); Gerid Hager (IIASA); Uta Wehn (IHE Delft); Joeri Naus (IHE Delft); Valantis Tsiakos (ICCS); Margaret Gold (ECSA); Ester Prat (CREAF) Andy Cobley (UNIVDUN); Raquel Ajates Gonzalez (UNIVDUN); Saskia Coulson (UNIDUN)

Agenda	
13:15	Welcome & introductions
13:20	Overview of materials: FutureLearn Platform and WO MOOC Info PDFs
13:40	Brainstorming Activity "What gaps might the MOOC address in the citizen observatory landscape?"
14:00	Discussion on WO MOOC possibilities & resources
14:20	Actions & key MOOC team members identified
14:25	Close

Minutes	Overview of Materials
	• Discussion of key features in the FutureLearn platform and lessons from GROW Observatory and Data Science MOOCs
	• Existing toolkits which could be incorporated into the MOOC
	• MOOC to possibly feature each CO and participants
	MOOC possibilities & resources
	• Need for scoping, specifically target audience and focus of MOOC
	• Interviewing local authorities or citizens who have engaged with the COs
	• GroundTruth 2.0 - across 6 countries
	• GROW - growers and Community Champions in GROW Places
	• LandSense - Local authorities who have an interest in citizen science (e.g. French National Mapping Agency)
	• Scent - local authorities aggregate data in Greece and Romania
	• AAWA input as local authority perspective

- Margaret Gold will be starting interviews in 2 -3 months and could include questions that could feed into the MOOC.

Timeline
- Action plan and timeline for WeObserve, when is video needed, when is a template needed etc.
- MOOC should be delivered in the late autumn of 2019, so that the peak development time does not conflict with summer holidays.

MOOC team members
- Contacts and contributors from each organisation:
  - IIASA - Gerid Hager & Linda See
  - IHE Delft - Uta Wehn
  - ICCS - Valantis Tsiakos
  - ECSA - Margaret Gold
  - UNIDUNDEE - Saskia Coulson
  - CREAF - Ester Prat
  - AAWA - ?

Resources
- Further discussion on allocation of budget and film making needs once the MOOC content is clarified.

Actions & next steps
- Organise a working group with attendees (SC / ALL)
- Organise meeting in Venice during COWM November 2018 to discuss: learning objectives, MOOC content, delivery team task list and working schedule (SC / ALL)
- Set-up Trello board (SC)
- Set-up live Google Drive folder for protocols and working documents (SC)
- CO Proforma for capturing information (SC / ALL)
- Interview questions for COs participants (SC / ALL)
- Share FL multimedia requirements with MG so that her videos can be used in the MOOC. (SC)

Annex 2: WeObserve Workshop at EuroGEOSS – Online Learning Station, 12 September 2018

Aims and objectives

The aim of this interactive station was to gather insights from the EuroGEOSS community on the WeObserve MOOC. The subsequent objectives included:

- Defining prospective target groups of the MOOC
- Discussing needs of these groups and some of the challenges encountered when working with them
- Ideate possible goals of a MOOC and how to measure success and impact in achieving these goals

Interactive Stations Overview

- Rotation 1: 16:30 - 16:45
- Rotation 2: 16:45 - 17:00
- Rotation 3: 17:00 - 17:15

No.	Lead(s)	Title
1	Uta	Cop 1: Co-designing citizen observatories and engaging citizens
2	Deborah	CoP2: Impact and value of citizen observatories for governance
3	Maria Krommyda (ICCS)	CoP3: Interoperability and standards for citizen observatories
4	Steffen	Citizen Science for the SDGs
5	Saskia	WeObserve Online Learning
6	Margaret	WeObserve CO Cookbook

Materials

Post-it notes and pens were provided to capture the discussions from each rotation.

Structure of the MOOC Session

Using a visioning board framework (Pichler 2011), themes were already provided to encourage the participants to discuss certain aspects of the citizen observatories and the potential of an online course within those areas. These headings included; target groups, needs, challenges and goals.

The post-its were left in place at the end of each rotation, these were accumulated over the three sessions.

SC facilitated led the discussions by asking questions about the participants experience and for their input into a online course.

Questions included, but were not limited to:

- What are the types / background of stakeholders (or groups) who participate in citizen observation activities?
- What are some of the needs that these groups have when participating in a citizen observatory?
- What are some of the challenges faced by the citizen observatory when working with these groups?
- What would be some of the goals when working with these groups on an online course?
- How could success and impact of these goals be measured in a tangible way?

Participants

There was only one EuroGEOSS delegate at the station for every rotation of delivery. However, this provided for an opportunity to have an in-depth discussion with each.

Participants came from diverse backgrounds, including:

- EC Representative (CO Portfolio Manager)
- Researcher working in water disaster management
- Educator who specialised in training data collection skills

Findings

EuroGEOSS online learning station activity transcribed

Target Groups	Needs	Challenges	Goals
• Students • Citizens • Potential CO Organising groups • Public Administrators • Private companies	• Empowerment • Inspiration • Lessons learned from previous projects • The barriers to engagement and how to address them • Networking & engaging with other COs • Concrete results and success stories • Data • Where's the product?	• Education • Easy measurement protocols • Motivation • Incentive • Communicating tangible and intangible needs • Holistic / unexpected needs • Objective / subjective data • Different levels of interpretation • When does data collection happen?	• Disseminate knowledge • Exams at end • Number of participants / completions • Building a community • Sustainable community participation beyond project

This station supported the development of initial ideas for a WO MOOC from the EuroGEOSS community. Salient points were discussed and unpacked which included:

- Key target stakeholders or groups who could be possible participants of the MOOC
- The needs of these target groups when participating as part of a CO, including:
    - Gaining empowerment through the monitoring process
    - Being inspired, which can come from previous projects, seeing the outcomes or the lessons learned and having concrete results
    - Knowing the barriers or the challenges that may be faced during a CO project, and also knowing the strategies and methods to address them
    - Building a networks of COs so that they may learn from each other
    - In the case of a industry participant, being able to demonstrate the product or the commercial value in CO activity.
- Some of the challenges which are encountered when delivering a CO, including:
    - Educating participants in collecting data and having easily understood protocols for the methods and tools used
    - Keeping participants motivated and the use of incentives in this
    - Communicating the tangible and intangible needs and benefits with participants
    - The difference between objective and subjective data and how participants capture and understand both
    - Knowing when each stage should take place, i.e. when data collection happens
- How the needs and challenges in CO activity could be tended to by an online course, what the goals for this would be and how can these goals be monitored and success measured, including:
    - Dissemination of knowledge - using exams to test the knowledge of participants
    - The number of participants attending the online course - including both the number which sign up and the number who complete the course
    - Building an online community
    - Sustainable community participation beyond the online activities - monitored at a local level

These discussions helped to define key stakeholders, the needs and challenges for both those participating and those delivering CO activities. There were also discussions on how this could translate into tangible activities for the online course. However, the latter was the most challenging part of each discussion, most likely due to time restrictions (15 min) not allowing for the development of ideation in this area.

The insights from this workshop activity will help to inform the WO MOOC, and also a survey which will be disseminated by WO in support of the development of our online learning programme.

Annex 3: WeObserve Online Course Survey

WeObserve is building an ecosystem of citizen observatories for environmental monitoring. As part of this, we are creating an online course that will launch in 2019 to help people understand, participate in and create their own citizen observatories.

We define citizen observatories as community-based environmental monitoring and information systems, that invite individuals to share observations, typically via mobile phone or the web.

To make sure we create a helpful and usable course, we need to hear from you!
This survey should take between 5-10 min to complete. The deadline for submission is Wednesday 31st October 2018.

Please answer every question to the best of your knowledge, but do not feel you have to answer everything. You may contact us at any time to ask questions or withdraw from this study, to do so, please email Saskia at s.m.coulson@dundee.ac.uk

We would like to thank you for your time in completing this questionnaire and support in our project.

For more information on the project, and to sign up to our database please visit: www.weobserve.eu

The data collected in this survey will be used to create an online course on citizen observatories. We will never sell your data, nor share it with third parties, and we promise to keep your details safe and secure. You can withdraw or request that your data be deleted at any time. Please indicate your consent with this below.

- o Agree

Are you (choose one)
- o Male
- o Female
- o Prefer not to say

What is your age range (choose one)
- o 18 years old or under
- o 18 – 25 years old
- o 26 – 35 years old
- o 36 – 45 years old
- o 46 – 55 years old
- o 56 – 65 years old
- o 66 years old or over
- o Prefer not to say

Which country do you live in?
[Short answer text]

Please state which of the following describes you (select all that apply)
- o Citizen
- o Policy maker
- o NGO
- o Educator
- o Scientist / Researcher
- o Industry / Business member / Technologist
- o Student
- o Other [text answer]

Have you ever participated in a citizen science / citizen observatory project before (choose one)
- o Yes
- o No

If yes, please state which one and include a URL if possible
[Short answer text]

Did you face any challenges when you participated in citizen science / citizen observatory project?
- o Yes
- o No
- o Don't know

If yes, what were some of the challenges you faced while you were part of the project? Please select all that apply
- o Understanding what citizen science and/or citizen observation are
- o Finding out how to join the project
- o Understanding how to use the technology
- o Understanding the ways to collect data
- o Understanding the measurement protocols
- o Understanding how to use the data you collected to make decisions in your daily life
- o Knowing how to use the data to communicate to others
- o Knowing how to use the data to communicate concerns to government officials
- o Keeping motivated during the project
- o Discovering the ways to develop you own citizen science observatory project
- o Other [text answer]

How did you overcome these challenges?
[Long answer text]

Have you ever participated in an online course? (MOOC, webinar, video tutorials, etc)

- o Yes
- o No
- o Don't know

If yes, please state which one and include a URL if possible
[Short answer text]

If there was an open and free online learning program or citizen observatories would you join?
- o Yes
- o No
- o Maybe

Please state why you choose your answer for the above.
[Long answer text]

If yes, how much time would you have to commit to an online learning program
- o 2-4 hours per week for 2-4 weeks
- o 2-4 hours per week for 4-6 weeks
- o 4-6 hours per week for 2-4 weeks
- o 4-6 hours per week for 4-6 weeks
- o Don't know
- o Other [text answer]

Please state your preferred language for an online course
[Short answer text]

If you joined an online course would like to interact with peers across the world?
- o Yes
- o No
- o Maybe

If yes, how would you like to interact with your peers?
- o Through discussion forums on the learning platform
- o Through group work
- o Through webinars
- o Through online community forums
- o Through creating and/or sharing images / video / other media
- o Other [text answer]

Do you have an existing subscripting to social media platforms, online community or team working tools? (select all that apply)
- o Facebook
- o Twitter
- o Instagram
- o YouTube
- o Reddit
- o Slack

o Trello
o Other [text answer]

Annex 4: WeObserve Year 1 Plenary – Distance Learning Programme Working Session Notes

Working Session 2: Distance learning action plan

Bitesize BBC approach

Online survey:
1. n. 79 respondents
2. Peak responses times linked to ECSA list serve email, Ideas for Change email and tweets from FabLab Barcelona, Mara Balestrini (Ideas for Change), and #MozFest during festival – online course promotion strategy will need to look further afield than WO partners to increase participation.
3. Include map on geographical distribution. Most answers came from the EU and particularly the UK.
4. Many respondents were citizens, followed by scientists and researchers. Not many policy makers answered the survey
5. 59.5% had participated in a CS project before (66 responses)
6. Challenges face in Citizen Science projects, as selected by respondents
    - Keeping motivated in the project
    - Understanding how to use the data collected
    - Knowing how to communicate the data
    - Discovering ways to develop a project
    - Understanding measurement protocols
    - Understanding how to use the technology
7. Challenges faced, as defined by respondents (examples included)
    - Getting data back from the project
    - Not understanding the 'bigger picture'
    - Accessibility to technology
    - No problems at all
8. Reasons given for wanting to join a MOOC on citizen observatories include:
    - Interest
    - Education
    - Remote accessibility
    - Network building
    - Want to create an Observatory
9. Reasons given for not wanting to join a MOOC on citizen observatories included:
    - Time restrictions
    - Access to hardware
10. 70.5% had taken part in online learning activities
11. Preferred languages: English, Dutch and Spanish
12. Most respondents suggested 2-4 h/w for 2-4 weeks

Types of steps for MOOC on FutureLearn platform
1. Article - (500-800 words, reading time 5-10mins)
2. Video & Audio - can also be in youtube, not just in FL, high production value
3. Discussion - learners can comment, set a topic and provide an open-ended question
4. Quiz & Test - summative assessment, learners can purchase a statement of participation (this money goes to FL)
5. Exercise (in pilot phase)- externally hosted content, interactive html4 exercise

Uta: Can we have access to MOOC user data?
FL has a clear policy on what data is accessible and how to use it.
Link to survey results, what can we learn from the survey? What do people actually want to learn, i.e. potential topics for the MOOC?

> Plan would be to derive main topics from challenges outlined by survey respondents
ACTION: Dundee to examine correlation between types of survey respondents and challenges / reasons for participating in a MOOC.

Also: Experience of gaps from within current COs to inform MOOC topics.

Discussion points:

1. Audience
   - Scientists, educators, citizens (main respondents to survey)
   - Are there other audiences we want to reach?
   - Policy makers did not answer the survey – Did we really reach policy audience with the survey, are they interested?
   - E.g. special educator's week in the MOOC, targeted at educators on how to augment classroom work with citizen science
   - Various stakeholders who want to start their own CO
   - Should it include intermediate organisations? NGOs, scientists
   - Link back to the KPIs
   - FL open to everyone everywhere, so very broad audience. Basic content needs to cater to that, additional resources and materials can be very audience specific (e.g. for scientists, educators etc.)
   - Serves "Accessibility" aspect of WeObserve
   - Need to be mindful of language challenge (implications - which languages, budget, lead time)
   - Intro in COs
   - Can we use resources from within sister projects to create content for 2nd MOOC, and to be able to cover the anticipated variety of topics?
   - Balance content with different audience interests and worldviews, e.g. tech interested vs. more topically focused interests (e.g. growing food)
   - Link between MOOC and other platforms for further discussion (Medium, twitter etc)
   - Need to flesh out more from survey results: links between different audiences and challenges/audience needs for content

2. Learner motivation
   - Awareness raising and/or action oriented
   - Points citizen to places/ projects they can contribute - while manage expectations
   - Disseminating outputs, apps. Etc - case studies of best practice
   - Sign post public deliverables for people who want to learn more, e.g. toolkits, cookbook, other CS projects, etc.
   - Need for a hook, challenges, that draw people in and through the course, how and why is the MOOC, and what it makes possible important to participants?
   - Example for a good question [fashion revolution: Who made my clothes?](#)
   - FL - learner archetypes, e.g. "advancers", "explorers", "fixers", "hobbyists" etc.

3. Main learning outcomes
   - Need to clarify: MOOC for awareness raising and/or action orientation?
   - MOOC may be able to serve both learning outcomes by signposting and linking participants to other existing resources and tools, depending on their interests
   - Providing guidance for people who wish to set up their own CO (different scales)

4. Topics
   Tbd

5. Case studies, best practice examples, exercises
   - Need to include an overview of observatories in the MOOC, use MOOC to disseminate outputs and results of the observatories
   - Call for action for sister COs: identify what you'd like to showcase (exercises, tools or case study) from within your CO - opportunity to promote COs, e.g. with a mixture of best practice and lessons learnt from failures/challenges

6. Title
   Tbd

7. Course length and time
   Tbd

MOOC promotion start (incl. teaser trailer, basic course description, learning outcomes etc.): ideally in Feb 2019

Annex 5: Step Types – Guidelines for writing content for the FutureLearn Plaform

Getting familiar with FutureLearn

The best way to understand how MOOCs are put together, and how they work on the FutureLearn platform, is to sign up for a course yourself. Even if you just skim through the material, this will help to get you familiar with the types of steps, visual style and tone of voice.

You can select a course from here:
https://www.futurelearn.com/courses

Or, try one of the GROW courses:
https://www.futurelearn.com/courses/grow-from-soil-to-sky

FutureLearn Course Structure
Each week of a FutureLearn course is made up of Activities, which are made up of Steps. Weeks may have a maximum of 20 "Steps" per week, usually grouped into 4-5 activities.

We can add related links and downloads (PDFs) to steps if required for further information.

Types of steps
Steps can be:
- Article
- Video
- Audio
- Discussion
- Poll
- Quiz
- Test
- Exercise
- Peer Review Activity
- Tutor Marked Assessment

Article
- Article steps are any plain text, max. 750 words with reading time of 5-10 minutes. These might be case studies, literary extracts, instructions from educators or short essays.
- Articles can include images (photographs, diagrams, slides etc) and should have at least one image to open the step.

- All images, article step or otherwise, will need to be provided with alternative text descriptions so that people who are using screen readers can understand what is depicted.

Video
- Videos do not all have to be "talking heads". We can also use slide-based presentations with voiceover, animation, interview/discussion etc.
- Videos should be 5 minutes or less (600-750 word script).
- Videos should always be accompanied by at least a few lines of text to extract the key points. Assume that not all learners will watch all videos in their entirety.

Audio
- Audio should be 5 minutes or less (600-750 word script).
- Please be sure to minimise background noise when recording audio clips.

Discussion
- Learners can add their comments to any FutureLearn step. Discussion steps differ in that educators actively encourage learners to respond to specific questions.
- Each week must have at least two discussion steps.
- Keep the discussion topic short, eg. three sentences: background, issue, question.
- Set a topic that requires the learner to demonstrate understanding of the immediate previous steps, preferably also drawing on personal experience.
- End with an open-ended question that elicits a range of answers (not a yes/no response).
- You can also invite learners to debate a point and give evidence to support their argument.
- If you would like learners to share a video, image or link, we can use a Padlet board to enable this type of discussion/sharing.

Poll
- Survey learners with a single-question poll (up to 6 possible responses) and then show them the results of the poll.

Quiz/Test
- Quizzes give learners an opportunity to check their understanding. It is a good idea to include at least one per week, usually towards the end of the week.
- Tests can be used as summative assessment at the end of a course.
- Each quiz or test question must be accompanied by explanatory text from the educator for both correct and incorrect responses. Please also provide a hint step that learners can refer to if they are unsure (i.e. "You may find Step 1.6: Introduction to Citizen Observatories helpful.")
- Include 5-10 questions for each quiz/test

Here are some best practices from FutureLearn about quizzes and tests.

Exercise

- We can include more in-depth interactive exercises which are hosted off-platform if permitted by FutureLearn and provided these have accessible fallbacks for learners who have visual, auditory and//or motor impairments. These could be, for example:
  - 3D models
  - Simulations
  - Interactive maps
  - Timelines

Peer Review
- Learners can be asked to submit a written activity which one of their peers will review. Learners will be asked to review a peer's assignment only when they have submitted themselves.

Here are some best practices from FutureLearn about peer review steps.

Tutor Marked Assessment
- It is possible to create a longer-form assignment (essay etc.) which is graded by the subject experts. This is more common in credit-bearing courses and programmes of courses.

Approach to learning
- One of the key elements of FutureLearn courses is that they are designed to be social. Even if a learning step is not a discussion, it will often still have a prompt to encourage conversation.
- Try to make learning as active as possible – give learners small tasks and reflective prompts and avoid long written steps and videos, which are passive in nature.
- Courses must have a clear narrative structure – each week, activity and step should build on previous learning.
- Learners need opportunities to check their understanding of concepts (reflective discussions, quizzes, tests).

Writing tips
- Use a conversational, friendly tone that is much less formal than an academic paper or textbook would be. Speak directly to the learner using "you" and "we".
- Some learners will not speak English natively, so use active voice and clear, accessible vocabulary.
- Please use British grammar and spelling conventions
- Spell out all acronyms. Avoid jargon and colloquialisms.
- Write in a gender-neutral way (they/them/their rather than he/she)
- Please incorporate hyperlinks into your text rather than using 'click here' or showing a URL inline. (Ex: Please visit [our website](http://www.growobservatory.org) to sign up for our monthly newsletter.)
- Wherever possible, use headings, subheadings and lists to make your written content easy to skim

Image and video tips

- It is a good idea to open each article, audio or discussion step with an image to create some visual interest.
- If you have images, graphs or diagrams that you would like to use in your step, please identify the source of the image and the copyright owner, and indicate whether or not copyright clearance has been provided. We must indicate copyright on every image, so if you are using one of your own images, please indicate this.
- If you do not have images to use, please indicate what you would like to illustrate and we can source stock images.
- Images must be high-resolution (300 dpi) and in landscape orientation
- Choose images fit for a global audience (people of different genders, ethnicities etc.)
- All graphs, charts and other visuals that appear in images and videos also need to be accompanied by detailed text that explains them. These should be provided in PDF form for download. This is used as a text alternative for visually impaired learners.

An Ecosystem of Citizen Observatories for Environmental Monitoring