



Developing metrics and instruments to evaluate citizen science impacts on the environment and society

EC Horizon-2020 Grant Agreement number 824711

Call: H2020-SwafS-2018-2020 (Science with and for Society)

Topic: SwafS-15-2018-2019

Type of action: RIA

Deliverable D2.1: Report about identified research results ready for review

Delivery year: 2019



This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 824711.



Document Information

Project number	824711		Acronym	MICS
Full project title	Developing metrics and instruments to evaluate citizen science impacts on the environment and society			
Project URL	mics.tools			
EU project officer	Colombe Warin			
Deliverable	Number	D2.1	Title	Report about identified research results ready for review
Work package	Number	2	Title	Methods for measuring citizen-science impact
Date of delivery	Contractual	Month 04 (April 2019)		Actual Month 04 (April 2019)
Dissemination level	Public			
Lead partner	Geonardo			
Responsible author	Balázs Kozák		Email	balazs.kozak@geonardo.com
	Partner	Geonardo		
Abstract (for dissemination)	This report introduces identified reference projects and results for review to support the development of methods for measuring citizen-science impact. The projects provide an insight into the use of citizen science in a wide range of contexts and explore impact-related concepts, methods, tools, implementation frameworks of citizen science, nature-based solutions and river restoration concepts from which indicators can be derived to evaluate the operationalisation of citizen-science concepts in the pilot.			
Keywords	citizen science projects, impact assessment methodologies, nature-based solutions, river restoration			
Version Log				
Version as date	Author	Partner	Change or comments (optional)	
2019_02_01	Balazs Kozak	Geonardo	Creation of the document, first structure	
2019_04_04	Balazs Kozak, Maria Beatriz Rosell	Geonardo	Additional content	
2019_04_04	Mohammad Gharesifard	IHE Delft	Feedback on the structure of deliverable	
2019_04_08	Uta Wehn	IHE Delft	Feedback on structure of deliverable	
2019_04_10	Balazs Kozak	Geonardo	Additional content	
2019_04_24	Mohammad Gharesifard	IHE Delft	Internal review & content from the WeSenseIt and Ground Truth 2.0 projects	



2019_04_25	Balazs Kozak	Geonardo	Additional content
2019_04_29	Balazs Kozak	Geonardo	Additional content
2019_04_29	Stephen Parkinson and Luigi Ceccaroni	Earthwatch	Final review

To cite this document:

Kozak, B., Wehn, U., Gharesifard, M., Rosell, M. B. (2019). D2.1: Report about identified research results ready for review. *Deliverable report of project H2020 MICS (grant agreement No 824711)*.

*The information in this document is public.
It can be freely accessed and reused for any purpose and without restrictions.*



Table of contents

1	Executive summary	5
2	Introduction	6
3	Methodology of the collection of research results	8
4	Introduction of the identified reference projects	9
5	Exploration of the relevant project in terms of methods, tools and implementation of the concept of citizen science	21
6	Final considerations	31
7	List of abbreviations	32
8	References	33
9	ANNEX I. – List of identified reference projects and relevant online available resources	38
10	ANNEX II. – List of shortlisted projects	42



1 Executive summary

The MICS project develops approaches and tools to evaluate citizen-science impacts. These approaches and tools can help to plan and implement projects in ways that lead to more powerful outcomes. This deliverable identifies existing state-of-the-art research results in the context of the MICS project. Desk research has been carried out to identify appropriate reference projects in the wider context of impact assessment of citizen science, and with relation to nature-based solutions or river restoration. For the purpose of this deliverable, hundreds of environmental and citizen-science-related projects were identified and screened for specific impact assessment tools, methods or indicators. This resulted in a shortlist of 24 reference projects that has undergone deeper exploration. The findings on methodologies, tools, indicators and impact assessment and evaluation of citizen-science-related project feed into the rest of the MICS project. In particular, they will inform the upcoming tasks to extract lessons learnt (T2.2) and establish a sound methodology and indicators for the impact assessment of citizen science projects (T2.3) related to nature-based solutions.



2 Introduction

The MICS project develops approaches and tools to evaluate citizen-science impacts. These approaches and tools can help to plan and implement projects in ways that lead to more powerful outcomes. The test and validation of these tools focus on the area of nature-based solutions (NBSs), defined by the International Union for Conservation of Nature (IUCN) as “actions to protect, sustainably manage, and restore natural or modified ecosystems, that address societal challenges effectively and adaptively, simultaneously providing human well-being and biodiversity benefits”.

The MICS project specifically aims to:

- provide comprehensive, participatory and inclusive metrics and instruments to evaluate citizen science impacts;
- implement an impact-assessment knowledge-base through toolboxes for methods application, information visualisation, and delivery to decision makers, citizens and researchers;
- improve the effectiveness of nature-based solutions through test-site development and citizen-science tool validation;
- generate new approaches that strengthen the role of citizen science in supporting research and development;
- foster a citizen-science approach to increase the extent to which scientific evidence is taken up by policy makers through recommendations and guidelines.

The result is an integrated platform where these metrics and instruments are available for use by anyone involved in a citizen-science project wanting to understand its impact, whether at the planning stage or several years after the project’s conclusion. This platform is validated by pilot testing in four test and validation sites across Europe. These sites explore the applicability of MICS impact-assessment tools in regions with differing needs, contexts, and approaches to nature-based solutions, and with various levels of citizen-science application. For example, in Western Europe, river restoration is increasingly carried out within an ecosystem-based management framework at river or catchment scale; in Southern Europe, river restoration tends to be issue-specific with some ecosystem relevance; in Central and Eastern Europe, river restoration is about ecosystem protection and related to existing infrastructure. The four test and validation sites selected are in the UK, Italy, Hungary and Romania.

Purpose and scope of this report

This report is a deliverable of Task 2.1 ‘Identifying and exploring reference projects’, that is the basis for further activities in Work Package 2 – ‘Methods for measuring citizen-science impact’. This deliverable identifies and explores projects, that contain valuable information



(methods, tools and implementation of the concept of citizen science) to develop a sound methodology for the impact assessment of citizen science projects related to nature-based solution in further tasks of WP2. Special attention is given to projects from which indicators can be derived to evaluate the operationalisation of citizen-science concepts in the pilot. The Task 2.1 contributes to the creation of the conceptual framework in WP2; specifications for a toolbox of metrics and instruments will be elaborated to adapt and develop new and existing tools and technologies to measure the impact of citizen-science. This toolbox will be validated at four test and validation sites in Europe in the UK, Italy, Hungary and Romania.

The scope of D2.1 covers citizen-science--related impact assessment methods from previous projects. Existing repositories and EU project deliverables are screened to obtain the relevant information in a systematic way, which later on will be maintained through a continual monitoring process.

The following tasks and deliverables will capitalize on the Deliverable 2.1:

- Task 2.2. Lessons extracted from reference projects
- Task 2.3. Establishment of a methodology and indicators for the citizen-science impact assessment of the pilot in each target region
- D2.2. Report detailing impact-assessment methods adapted to citizen science: relevant, identified methods will be adapted to citizen science, and benchmarks will be determined using previous NBS projects.
- D2.3. Impact-assessment methodology for citizen-science research ready to be used in the toolbox: novel impact-assessment methods ready to be applied to a diverse range of citizen-science challenges in the context of NBSs.



3 Methodology of the collection of research results

One of the first steps in the MICS project is to create an overview of the reference projects in which existing impact assessment methodologies and practices are identified, and that can be used for further tasks in WP2 and beyond. The primary method for collecting information for the repository was desk research and partners' contribution to identify the relevant projects. The sources for the search for relevant findings were the identified projects during the MICS proposal stage, the European Commission report on citizen science EU-wide inventory and analysis of selected practices (Bio Innovation Service, 2018), the WeObserve project landscape report (Gold, 2018), and partners' knowledge about additional citizen-science, nature-based solution and river restoration projects. These projects were considered in the screening phase.

The aspects used during the screening process were:

- the context of citizen science, nature-based solutions or river restoration projects;
- existence of a project website;
- available information in English on the project website;
- the following keywords: citizen science, nature-based solutions, citizen observatories, project impact, impact assessment, evaluation/assessment/monitoring methodologies and frameworks.

The screening phase was followed by an in-depth investigation of the short-listed projects based on the documentation found on their website including project reports, peer-reviewed publications, deliverables, policy-briefs and descriptions. The results are presented in sections 4 and 5.



4 Introduction of the identified reference projects

This chapter presents the identified reference projects in the wider context of citizen science impact assessment. A thorough screening of the 503 projects listed in the Joint Research Centre's and the European Commission's 'inventory of citizen science activities for environmental policies' (European Commission, 2018) was carried out and in the first phase 130 projects were shortlisted (see Annex II) for further investigation based on their relation to citizen science, nature-based solutions, or impact assessment. Altogether, 24 projects have been identified as reference projects. The general project descriptions are extracted from the CORDIS website [<https://cordis.europa.eu/projects/en>] and from the project websites (see Annex I).

Eleven identified reference projects give insights for citizen science impact assessment in a range of citizen-science--related activities, that can inform further activities of the MICS project.

The **beAWARE** H2020 project enhances decision support and management services in extreme weather climate events. It proposes an integrated solution to support forecasting, early warnings, transmission and routing of the emergency data, aggregated analysis of multimodal data and the coordination between the first responders (civilians) and the authorities. It intends to rely on platforms, theories and methodologies that are already used for disaster forecasting and management and add the elements that are necessary to make them work efficiently under the same objective. The overall context for beAWARE lies in the domain of situational awareness and command and control. The first phase concerns the forecast of the extreme condition and the relevant preparations. Once a disaster occurs, an initial assessment needs to be conducted as soon as possible to determine the scope, geographical distribution, and scale of the incident. Situational awareness means being able to accurately determine what has happened, what is happening now, and what will come next, all in order to plan and coordinate the most effective response possible with the resources available. This observation phase will lead to an orientation phase suggesting both an individual (Civilians Mobile Application, First Responder Mobile Application) as well as collective "cognition" orientation to data that is sensed and communicated. Once orientation to the data (or the lack of it) occurs then a decision is made, ultimately resulting is the final step, which is "act".

The **CAPTOR** H2020 project combines the concepts of citizen science, collaborative learning and environmental grassroots activism to leverage the collective intelligence of existing networks of local communities, allowing them to understand reasons and consequences of air pollution; to stimulate debate; to address authorities with scientific valuable, robust data from citizens' network of monitoring stations; and to transform this discussion into solutions. Three pilots are driven by grassroot activists and local communities where citizens will engage in the project on different levels to address their concerns.



CAPTOR's purpose is to foster bottom-up collaboration of local communities, citizens, NGOs, and scientists to raise awareness and find solutions to the air pollution problem. More specifically, CAPTOR objectives are:

- To engage a network of local communities in three European regions for monitoring tropospheric ozone pollution
- To engage these local communities in a collaborative learning process about air pollution, supporting a bottom-up process of defining and designing measures for action.
- To empower citizens and engage them in promoting active participation in decision making to drive solutions.
- To learn and to assess the effectiveness, replicability and creative power of the approach.

CITI-SENSE FP7 project developed "citizens' observatories" to empower citizens to contribute to and participate in environmental governance, to enable them to support and influence community and societal priorities and associated decision making. Furthermore, CITI-SENSE developed, tested, demonstrated and validated a community-based environmental monitoring and information system using innovative and novel Earth Observation applications.

To achieve this, the project: (i) raised environmental awareness in citizens, (ii) raised user participation in societal environmental decisions and (iii) provided feedback on the impact that citizens had in decisions. It addresses effective participation by citizens in environmental stewardship, based on broad stakeholder and user involvement in support of both community and policy priorities. The project intended to learn from citizen experience and perception and to enable citizenship co-participation in community decision making and co-operative planning. The concept of CITI-SENSE rested on three pillars: technological platforms for distributed monitoring; information and communication technologies; and societal involvement.

Three pilot case studies were carried out: combined environmental exposure and health associated with air quality; noise and development of public spaces, and indoor air at schools. The case studies were designed in collaboration with citizens' groups and decision makers. They were based on distributed data collection using innovative static, portable and personal devices (low-cost reliable microsensor packs) that communicate with a data repository through mobile phones or other devices.

The **UK Environmental Observation Framework** (UKEOF) was launched in April 2008, following acknowledgment of the long standing issues surrounding monitoring, observation and surveillance at the September 2006 Environmental Research Funders Forum workshop on environmental monitoring. UKEOF has produced a Citizen Science Guide [<http://www.ukeof.org.uk/documents/guide-to-citizen-science>] and formed a Citizen Science Working Group to provide a forum where member organisations can share good



practice and discuss future needs and plans for working with volunteers to provide high quality, environmental observation data [<http://www.ukeof.org.uk/our-work/citizen-science>; <http://www.ukeof.org.uk/resources/citizen-science-resources>]. As part of the Citizen Science Working Group, members provide updates about their organisation's initiatives to inform the wider community of areas of work or planned events. The group advised on two commissioned contracts:

- to undertake a study to investigate people's motivations for citizen science - Understanding Motivations for Citizen Science (2015-2016) [<http://www.ukeof.org.uk/resources/citizen-science-resources/MotivationsforCSREPORTFINALMay2016.pdf>];
- to undertake a study towards a methodology for evaluating opportunities, costs and benefits of citizen science - Understanding Opportunities, Cost and Benefits of Citizen Science (2015-2016) [<http://www.ukeof.org.uk/resources/citizen-science-resources/Costbenefitcitizenscience.pdf>].

COBWEB, the Citizen OBservatory WEB, was an FP7 project aimed at developing an "observatory framework" that would make it easier for citizens to collect environmental data suitable for use in research, decision making and policy formation. To ensure that the quality of data collected is usable COBWEB has a flexible design which allows the creators of citizen science surveys to use a variety of quality control measures depending upon the nature of the data being collected. The infrastructure developed explored the possibilities of crowd sourcing techniques around the concept of "people as sensors", particularly the use of mobile devices for data collection and geographic information. COBWEB increased the value and interoperability of crowdsourcing technology to policy makers by enabling the fusion of citizen-sourced data with reference data from a range of sources including data published by public authorities.

DITOs, 'Doing-It-Together Science' H2020 project represents a step change in European public engagement with science and innovation moving from a model in which scientific research, innovation, and problem-solving is mainly driven by scientific/professional institutions to one based on active public participation and capacity building with various levels and strategies of engagement in the scientific process. The project is aimed at elevating public engagement with science across Europe from passive engagement with the process of developing science to an active one. Citizen Science and Do It Yourself (DIY) scientific efforts demonstrate that this is possible, and to ensure that the European Research Area will become leader in 'deep' public engagement that is afforded by these advances. The project supports and builds upon DIY, grassroots, and frugal innovation initiatives, so that in the short and medium term it sustains localised capacity building and in the long term the effects of these grassroots efforts channel to policy makers at different levels, from external advice to societal inputs, regarding appropriate research and innovation policies.



The project **hackAIR** H2020 project aimed at improving air quality data in Europe through participatory sensing technology and citizen engagement. hackAIR helps to fill current gaps in areas where the distance between sensors may be significant; improve access to data from different sources and provide up-to-date air quality information.

The overall objective of hackAIR was to provide an open technology platform that citizens and interested parties can use to access, collect and improve air quality information in Europe. hackAIR enables communities of citizens to easily engage their members in generating and publishing information relevant to outdoor air pollution, leveraging the power of citizen science, online social networks, mobile and open hardware technologies, and engagement strategies. The platform allows them to map their neighbourhood's air by taking pictures of the sky, provide measurements themselves through open hardware sensors and see how air quality changes over time. Individual citizens will be able to use the information to avoid polluting behaviour, reduce their exposure to air pollution and participate in the public discourse on improved air quality. Scientists and policy makers can use the resulting air quality data to gain insights on air quality patterns and inform public policy. The usability and effectiveness of the hackAIR platform, and its social and environmental impact will be assessed.

The **iSCAPE** H2020 project works on integrating and advancing the control of air quality and carbon emissions in European cities in the context of climate change through the development of sustainable and passive air pollution remediation strategies, policy interventions and behavioural change initiatives. It tackles the problem of reducing air pollution impacts, focusing on the use of Passive Control Systems" in urban spaces, on policy intervention and behavioural changes of citizens lifestyle. Projections and real-world physical interventions will be applied on the urban tissue in the selected cities assessed for future climate change scenarios and representative of different cultural & lifestyles in Europe. Through the approach of Living Labs the team will deploy a network of air quality and meteorological sensors (both stationary and mobile) and evaluate through analysis and a suite of up-to-date numerical modelling the benefits expected from the interventions on a neighbourhood and city-wide scale for several aspects ranging from quantification of pollutant concentration to exposure. iSCAPE encapsulates the concept of "smart cities" by promoting the use of low-cost sensors, engaging citizens in the use of alternative solution processes to environmental problems. iSCAPE will support sustainable urban development by promoting the sharing of results with policy-makers and planners using local test-cases, and providing scientific evidence ready-to-use solutions potentially leading to real-time operational interventions.

To improve the coordination between existing Citizens Observatories (COs) and related regional, European and international activities, **WeObserve** H2020 project aims to tackle three key challenges that COs face: awareness, acceptability and sustainability. The



WeObserve mission is to create a sustainable ecosystem of COs that can systematically address these identified challenges and help to move citizen science into the mainstream.

The specific WeObserve objectives can be summarised as follows:

- develop communities of practice around key topics to assess the current CO knowledge base and strengthen it to tackle future environmental challenges using CO-driven science;
- extend the geographical coverage of the CO knowledge base to new communities and support the implementation of best practices and standards across multiple sectors;
- demonstrate the added value of COs in environmental monitoring mechanisms within regional and global initiatives such as GEOSS, Copernicus and the UN Sustainable Development Goals;
- promote the uptake of information from CO-powered activities across various sectors and foster new opportunities and innovation in the business of in-situ earth observation.

WeSenseIt is an EU-FP7 project (funded from 2012 to 2016) with the aim of designing, developing and implementing citizen observatories of water in three distinct case study locations, namely Doncaster (UK), Delfland (the Netherlands) and the Alto Adriatico region (Italy). The citizen observatories of water envisaged by the WeSenseIt project entailed the involvement of citizens, rather than scientists only, in the observation of the earth on specific water-related events and issues, primarily floods but also droughts and water quality. In WeSenseIt, citizen involvement spanned from data collection and provision, feedback and knowledge exchanges to actual involvement in decision making. This project is specifically interesting in terms of its approach for capturing impact of citizen observatories on governance processes.

Ground Truth 2.0 is a Horizon 2020 project that is setting up and validating six citizen observatories in real conditions, in four European and two African demonstration cases. The project is demonstrating that such observatories are technologically feasible, can be implemented sustainably and that they have many societal and economic benefits. The ultimate objective is the global market uptake of the concept and the enabling technologies.

The thematic focus of Ground Truth 2.0 is on flora and fauna, as well as water availability and water quality, for land and natural resources management. The project uses mobile apps and social media analytics to collect explicitly and implicitly-sensed citizen data. As such, citizens are enabled to share data about the environment and to take on a new, crucial role in environmental monitoring, decision making, cooperative planning and environmental stewardship.



Ground Truth 2.0 recognises the importance of real-life interaction between people and technology to set up a successful system. Its innovative approach combines the social dimensions of citizen observatories with enabling technologies, so that the implementation of the respective citizen observatories is tailored to their envisaged societal and economic impacts.

In addition to the first 11 project, the following 13 projects provide a wider outlook in the context of citizen science related to nature-based solutions, river restoration and impact assessment. Useful concepts, evaluation frameworks, tools for assessment and set of indicators are identified in these projects.

CLEVER Cities is an H2020 funded project, that applies a city centric approach, starting by key urban regeneration challenges and employing strong local partner clusters, to foster sustainable and socially inclusive urban regeneration locally, in Europe and globally. The project will co-create, - implement, and -manage locally tailored NBS to deliver tangible social, environmental and economic improvements for urban regeneration. The involved partners are committed to make the interventions in front-runner cities (FR) cases for successful NBS and prepare robust replication roadmaps in fellow cities (FE), that also have NBS experience and expertise to offer. The long-term sustainability of actions is ensured in FR and FE by initiating urban innovation partnerships that will use SMART city principles to engage residents, establish new governance procedures, generate innovative financing and investment strategies. CLEVER Cities will employ partners' large global networks to generate rapid and durable uptake of NBS by capacitating businesses and a CLEVER Solutions Basket with innovative technological, business, financing and governance solutions, in Europe and globally. The influential and committed FR will serve as role model for FE and global cities in East Asia and South America. All cities will actively engage in replication, thus, help to meet EU and UN sustainability goals and profile the EU as global leader in green innovation. CLEVER Cities materialises in strong local clusters around FR with partners, which can both support local co-creation as well as transversal activities with specific knowledge and expertise. This makes it a distinct, exciting project that will generate lasting results in cities and deliver a CLEVER Cities package with solutions, guidance and open-sourced data EU NBS reference framework.

The aim of **EKLIPSE** H2020 project is to establish an innovative, light, self-sustainable EU support mechanism for evidence-based policy on biodiversity and ecosystems services open to all relevant knowledge holders and users, and to hand over this mechanism to the wider knowledge community by the end of the project. The mechanism will build on existing science-policy-society interfaces and be further refined via iterative evaluation and learning throughout the project. The mechanism will provide trustworthy evidence for policy and society upon request and will make the knowledge community more able to provide synthesized and timely evidence by providing a platform for mutual learning and engagement. All relevant knowledge holders and users will be actively encouraged and



supported by the project team through their individual strengths and interests, thus ensuring targeted contributions. Many partner institutions have already expressed their interest in the “Network of Networks” of potential contributors to the EU mechanism’s activities. EKLIPSE will directly support the further development of this network and ensure the involvement of relevant stakeholders in the following key areas: (a) jointly developing and setting up a business plan for the mechanism after the end of the project (WP1), (b) conducting joint evidence assessments using established and innovative methods to support policy and societal needs (WP3), (c) jointly identifying research needs and emerging issues (WP4), actively building the Network of Networks and (d) encouraging societal engagement (WP6). This will be supported by an interim governance structure, a strong communication component, including a Science-Policy-Society Forum, and an independent formative evaluation to ensure learning (WP2).

MAES is a specific action of the European Commission aims to provide a knowledge base on ecosystems and their services in Europe. It underpins the achievement of all 6 targets of the biodiversity strategy and is also relevant to a number of other EU sectoral policies such as agriculture, maritime affairs and fisheries, and cohesion.

A coherent analytical framework as well as common typologies of ecosystems for mapping and a typology of ecosystem services for accounting have been to be applied by the EU and its Member States in order to ensure consistent approaches to map and assess the state of ecosystems and their services in their national territory

The **NAIAD** H2020 project aims to operationalise the insurance value of ecosystems to reduce the human and economic cost of risks associated with water (floods and drought) by developing and testing - with key insurers and municipalities - the concepts, tools, applications and instruments (business models) necessary for its mainstreaming. Eight demonstration sites (DEMOS) throughout Europe will showcase and ensure the applicability and transferability of the developed tools and methods across all of Europe. The assumption is that Natural Assurance Schemes can reduce risk, especially to drought and flooding, and this risk reduction can be assessed and incorporated within insurance schemes.

Trans-disciplinarity and stakeholder engagement are at the core of NAIAD for two reasons: first, because the conceptual and assessment methodologies combine physical, social and cultural and economic aspects, integrated into tools and methods but second, and most importantly “road tested” and validated with the stakeholders and end users themselves at the DEMOS.

NAIAD will contribute to providing a robust framework for assessing insurance value for ecosystem services by (i) enabling full operationalisation through improved understanding of ecosystem functionality and its insurance value at a broad range of scales in both urban and rural context; (ii) making explicit the links between ecosystem values and social risk



perception; and (iii) the application of developed methods and tools in water management by relevant stakeholders, especially businesses, public authorities and utilities.

Based on a detailed mapping of urban challenges and relevant nature-based solutions (NBS), **Nature4Cities** Horizon 2020 project aims at developing complementary and interactive modules to engage urban stakeholders in a collective-learning process about re-naturing cities, develop and circulate new business, financial and governance models for NBS projects, as well as provide tools for the impacts assessment, valorisation and follow-up of NBS projects. The different modules are:

- A database of generic NBS and associated environmental, economic and social performances
- An observatory of NBS projects best practices / case studies
- A set of innovative business, financial and governance models for the deployment of NBS in a range of different contexts, together with a tool to help urban stakeholders identify eligible models regarding their NBS project contexts
- An NBS project impact assessment toolbox providing capabilities for environmental, economic and social impacts evaluation at different stages in the project development cycle from opportunity/feasibility studies to design steps and project follow-up). This toolbox will build on a range of tools, from generic indicator-based assessment for early project stages, down to detailed modelling of NBS behaviours.

These modules will furthermore be integrated in an NBS dissemination and assessment self-learning platform [N4C Platform] to assist NBS project developers along the entire life cycle of their projects from opportunity studies and project definition down to performance monitoring. Nature4Cities indicators, methodologies, tools and platform will be field tested in real working environments and on real nature-based solution projects and developments in selected cities in Europe, which will be partners of the project and engage their technical urban and environmental planning teams.

To unlock the potential of nature-based solution for sustainable urban development (e.g. the potential to respond to climate change, enhance biodiversity and improve environmental quality while contributing to economic regeneration and social well-being), **NATURVATION** will complete the following objectives to take a transdisciplinary, internationally comparative approach to:

- Advance assessment approaches to capture the multiple impacts & values of NBS to deliver a robust evidence base for decision-making;
- Enable innovation to identify the most promising governance, business/finance and participation models and how to overcome the systemic conditions that currently limit their use to support systemic integration;
- Generate momentum to realise the potential of NBS through co-design, co-development & co-implementation of new partnerships, knowledge,



recommendations, processes and tools required to build capacity, enable replication and foster cultural change.

The transdisciplinary approach working with ‘urban-regional innovation partnerships’ in six different cities and a Task Force of highly respected international organisations working in this arena integrates science, social science and humanities and practical expertise and experience to achieve a step-change in the use of NBS for urban sustainability.

OPERAs (OPERATIONAL POTENTIAL OF ECOSYSTEMS RESEARCH APPLICATIONS) aimed to improve understanding of how ES/NC contribute to human well-being in different social-ecological systems in inland and coastal zones, in rural and urban areas, related to different ecosystems including forests and fresh water resources. The OPERAs research established whether, how and under what conditions the ES/NC concepts can move beyond the academic domain towards practical implementation in support of sustainable ecosystem management. OPERAs used a systematic review of existing ES/NC practice to identify knowledge gaps and requirements for new policy options and instruments. New insights, and improved or novel tools and instruments, were tested in practice in exemplar case studies in a range of socio-ecological systems across locales, sectors, scales and time. Throughout this iterative process, available resources and tools were collected in a ‘Resource Hub’, a web-based portal that was co-developed by scientists and practitioners representing different interests and perspectives on the development, communication and implementation of the ES/NC concepts. The Resource Hub provided the main interface between OPERAs and a ‘Community of Excellence’ (CoE) for continued practice that benefits from OPERAs outcomes.

In the Horizon 2020 funded **proGInreg** project, three front-runner cities (Dortmund (DE); Turin (IT); Zagreb (HR)) will create Living Labs in urban areas which face the challenge of post-industrial regeneration. These areas suffer from social and economic disadvantages, inequality and related crime and security problems. They lack quality greenspaces, have a negative impact on human health and wellbeing and are more vulnerable to the effects of climate change. Going beyond the current state-of-the-art with Green Infrastructure as a one-off state intervention, the proGInreg Living Labs will develop NBS which are citizen owned and co-developed by state, market and civil society stakeholders. Innovation will take place on the technical level through the NBS deployments, on the social level through co-designing, co-creating and co-implementing NBS with local communities and on the economic level through combining NBS with market-ready business models. Four follower cities in Eastern and Southern Europe (Cascais PT, Cluj-Napoca RO, Piraeus GR, Zenica BA) will be co-steering the research process to assure replicability and adaptability to their local context resulting in urban plans for NBS deployment. The NBS to be tested i.a. include: regenerating industrial soils biotic compounds, creating community-based urban agriculture and aquaponics and making renatured river corridors accessible for local residents.



Scientific assessment and monitoring results from the Living Labs will be made available on the EU NBS platforms OPPLA and THINKNATURE and will contribute to the European reference framework for NBS. Global impact will be achieved by a training programme for cooperative planning, implementation and management of NBS. It will be provided by partners from the cities, SMEs and universities involved. Training events will be organised in cooperation with the partner ICLEI. Massive Open Online Courses (MOOCs) will be distributed via EdX, the most renowned MOOCs platform worldwide.

The overall aim of **REFORM** project was to provide a framework for improving the success of hydromorphological restoration measures to reach, in a cost-effective manner, target ecological status or potential of rivers. Success is defined as being hydromorphologically sustainable, ecologically effective, and exploiting the full potential within the socio-economic setting. Cost-effective implies an optimisation of both ecosystem health and the goods and services that natural, modified and restored rivers, floodplains and connected groundwater provide. The restoration framework addresses the relevance of dynamic processes at various spatial and temporal scales, the need for setting end-points, analysis of risks and benefits, integration with other societal demands (e.g. flood protection and water supply), and resilience to climate change. The REFORM consortium developed protocols and procedures to monitor the biological response to hydromorphological change with greater precision, to support the design of programmes of restoration and mitigation measures for the WFD, in particular for the 2nd round of RBMPs, and to integrate restoration better with socio-economic activities.

The specific objectives of REFORM were:

- To select Water Framework Directive compliant hydromorphological and biological indicators for cost effective monitoring that characterise the consequences of physical degradation and restoration in rivers and their services.
- To evaluate and improve practical tools and guidelines for the design restoration and mitigation measures.
- To review existing data and information on hydromorphological river degradation and restoration.
- To develop a process-based, multi-scaled hydromorphological framework on European rivers and floodplains and connected groundwaters.
- To understand how hydromorphological pressures interact with other pressures that may constrain successful restoration.
- To assess the significance of scaling effects on the effectiveness of different adaptation, mitigation and restoration measures to improve ecological status or potential of rivers, floodplains and connected groundwaters.
- To develop instruments to analyse risk and assess benefits of successful river restoration, including resilience to climate change and relations to other socioeconomic activities.



- To increase awareness and appreciation for the need, potential and benefits of river restoration.

The Urban GreenUP H2020 project aims at obtaining a tailored methodology

- To support the co-development of Renaturing Urban Plans focused on climate change mitigation and adaptation and efficient water management, and
- To assist in the implementation of NBS in an effective way. NBS classification and parametrization will be addressed and some resources to support decision making will be established as part of the project activities.

A large scale and fully replicable demonstration action of NBS accompanied by innovative business models will provide evidences about the benefits of NBS contributing to the creation of new market opportunities for European companies, and fostering citizen insight and awareness about environmental problems.

Three European cities will assume the demos as front-runners (Valladolid, Liverpool and Izmir), other set of two European cities will act as followers to strengthen the replication potential of the results (Ludwigsburg and Mantova) and finally three non-European cities (Medellín, Chengdu and Quy Nhon) will allow to identify the market opportunities for European companies out of Europe and fostering the European leadership in NBS implementation at global level.

URBAN GreenUp also aims to: fostering the creation of a global market and EU international cooperation; deploy a wide Exploitation and Market deployment procedure for NBS solutions & deploy an Impact-based Communication and Dissemination strategy.

MoRRI's main objective is “to provide scientific evidence, data, analysis and policy intelligence to support directly Directorate General for Research and Innovation (DG-RTD) research funding activities and policy-making activities in relation with Responsible Research and Innovation (RRI)”.

RRI is a concept that is recently gaining momentum but it still lacks agreement on its definition, content and details. Hence, part of this study is to determine the scope and the benefits or RRI for Europe by:

- Operationalising the concept;
- Developing a sound conceptual framework and associated methodology, while at the same time;
- Testing the potential of this methodology to allow monitoring the current state and short-term evolution of Responsible Research and Innovation and its socio-economic and democratic impacts.

IRIS is the catalogue of generally accepted performance metrics that leading impact investors use to measure social, environmental, and financial success. It is intended for



users to find the most appropriate metrics for specific field of work, metrics tailored to specific sectors, or metrics used by companies irrespective of their social or environmental goals and the sector and regions in which they work. This means that IRIS is a useful resource for impact investors working around the world, in different sectors, and with a variety of social and environmental impact objectives.

OpenUP addressed key aspects and challenges of the currently transforming science landscape in terms of quality assurance of scientific publications, communication of scientific outputs, and impact assessment with a focus on Open Science developments. It mapped out and promoted new solutions that better suit the needs of researchers, innovators, the public and funding bodies. Its main objectives were to:

- identify and determine ground-breaking mechanisms, processes and tools for peer-review for all types of research results (publications, data, software);
- explore, identify and classify innovative dissemination mechanisms with an outreach aim towards businesses and industry, education, and society as a whole;
- analyse a set of novel indicators that assess the impact of research results and correlate them of channels of dissemination.

It followed a user-centred, evidence-based approach, engaging all stakeholders (researchers, publishers, funders, institutions, industry, public) in an open dialogue through a series of workshops, conferences and training, and validating all interim results via a set of seven pilots involving communities from four research disciplines: life sciences, social sciences, arts & humanities, energy.



5 Exploration of the relevant project in terms of methods, tools and implementation of the concept of citizen science

The reference projects that were introduced in section 4 were selected based on the methods/indicators that they used or developed for impact assessment. These projects were therefore further explored to identify specific methods tools or indicators for impact assessment of citizen science projects. This section provides the summary of the findings of this in-depth review.

beAWARE projects offers the following results to consider:

- An evaluation methodology used for the evaluation of the pilots (flood, fire and heat-wave) during the implementation of the beAWARE project.
- An evaluation methodology based on the user perspective and will mainly focus on the impact of the beAWARE solution.
- The result of the literature review of the evaluation, common methodologies and the pillars of the evaluation.
- A specific evaluation plan is elaborated based on a literature review and the general principle of evaluation methodologies.
- An analysis of beAWARE evaluation is provided according to the common methodologies that are followed and the proposed evaluation approach with focus on three main pillars:
 - the impact of the system, which has to be evaluated by comparing the management of an emergency before and after the implementation of the beAWARE system and a series of particular key performance indicators (KPIs);
 - the user interface and the user experience (UI/UX) based on empirical and heuristic evaluation methodologies;
 - the quality of the system, its definition and a list of elements which will be used in assessing it.

CAPTOR project (Battistelli F., 2017; Schäfer, T., Kieslinger, B., 2017; Schäfer, T., Kieslinger, B., Hochgerner, J., 2017) possesses the following useful aspects:

- Uses a methodology to evaluate process and outcomes in an integrated matrix.
- Puts special emphasis on assessing its socio-ecological impact and its contribution to raising collective awareness on air pollution.
- Provides detailed description of the individual evaluation instruments together with a timeline to indicate the data collection phases.



CITI-SENSE-project was found useful due to the following finding:

- Development, extension, adjustment of the CITI-SENSE methodologies in the CITI-SENSE Citizens' Observatories (COs)
- Creation and application of an evaluation framework for the project and for the applied tools to monitor (main 13 products and services)

The following assessment methods have been developed and used:

- Usability Evaluation Form towards both internal and external users
- Key Performance Indicators (KPIs) used by the internal methodology developers and users
- User-evaluation framework of the empowerment potential of the tools based on
 - Social acceptability (and political acceptability)
 - Practical acceptability
 - Facilitating and/or hindering factors
- User evaluation framework of overall project outcomes
- In terms of outcomes, the evaluation framework for the CITI-SENSE-project and the tools are expected to monitor the:
 - Gain of knowledge at the level of individual participants and/or the community
 - Change in attitudes and/or behaviours on an individual level
 - Change in attitudes and/or behaviours on community level
 - Attainment of social and personal benefits
 - Increase in social capital
 - Attainment of voice in decision-making
 - Influence on natural resource management practices or policies
 - Increase in the amount of civic participation and in the effectiveness
- Recommendations for similar projects in the future

UK Environmental Observation Framework's reports are found appropriate due to:

- Generating new knowledge on mapping the motivation of citizen scientists, stakeholders
- Providing an overview on existing evaluation models and monitoring based on referenced literature
- Revealing evaluation modes (surveys, training activities, other evaluation and monitoring modes)
- Creating an improved framework for evaluation: stage-by-stage inclusion of evaluation
- Presenting relevant key findings and recommendations
- Identifying four economic methodologies the most suitable to evaluate CS approaches for environmental monitoring:
 - Return On Investment (ROI)



- Cost-Benefit Analysis (CBA)
- Cost-Effectiveness Analysis (CEA)
- Multi-Criteria Analysis (MCA)
- Creating a framework to use all four approaches and implement via freely-available tools as no single method is suitable in all circumstances
- The tool for evaluation of the use of citizen science consist of
 - Initial screening questions to assess the feasibility of using citizen science
 - A decision framework to help users decide which of the four evaluation approaches is most suitable
 - A facility to enter costs and benefits. These can either be calculated or estimated values, or qualitative assessments (for the multi-criteria analysis)
 - A presentation of the results from the four different evaluation approaches.
- Presenting recommendations on the economic evaluation

COBWEB's potential contribution lay in the:

- Conceptual model of the process of evidence-based policy-making (to improve evaluation and targeting processes) in the UK is applied being a suitable framework to explore the relationship between crowdsourced data and approaches to policy-making.
- Empowerment of everyday people with the ability to collect environmental information using mobile devices. The collected information is suitable for use in research, decision making and policy formation.

DITOs was found suitable because it:

- Has a specific work package focusing on determining the relevance and fulfilment of project objectives and to understand impact and effectiveness of the project measures.
- Includes evaluation terms of reference and templates contains the overall terms of reference and key performance indicators identified for DITOs, with templates and guidelines for recording and documenting activities and gathering public feedback.
- Bears criteria for evaluation and the tools used to monitor and gather data about DITOs activities, terms of reference outlines expectations and evaluation methodologies:
 - approach as a whole;
 - evaluation baseline;
 - summative evaluation;
 - formative evaluation and considerations;
 - ethnographic evaluation and considerations.



hackAIR offers for the analysis:

- A developed hackAIR evaluation framework that has three different tracks:
 - hackAIR's evaluation framework contains the evaluation activities for assessing the usability, user experience (UX), effectiveness and acceptance of hackAIR solution (platform, mobile application and sensors) with end-users and pilot coordinators.
 - Comprises of a set of evaluation activities to investigate the social and environmental impact for the involved communities by using the hackAIR solution.
 - Three different types of experiments are chosen to measure behaviour change, namely before and after the participation in hackAIR workshops, during the usage of the gamification features on the platform, and when consulting the tips of the day.
- Project impact assessment results conducted through self-assessment exercises with project partners of the hackAIR consortium. The methodology relied on the identification of mostly social impacts, and was developed upon the insights of the IA4SI evaluation tools.
- An overview of the different tracks, evaluation tools and indicators.

iSCAPE project:

- Has methodology for the assessment of the socioeconomic impacts of the iSCAPE project. The methodology has identified a selection of quali-quantitative approaches able to map, describe and - to a certain extent - quantify the impact generated by the project. It builds on literature review of studies and researches and from a consultation process with the partners managing the interventions in the cities and the Living Labs. The methodological framework is designed as modular in order to adapt to the specificities of each of the project pilot.
- Gives insights into effects and significance of various behavioural interventions implemented in various parts of the world and their role in reducing air pollution and to the different methods are available to quantify the effectiveness of behavioural interventions.
- Applies living lab approach with provided monitoring kit.

WeObserve project:

- Created an overview on CO frameworks for Assessing and Analysing Citizen Observatories and for Measuring Success and Impact
- Develops analytical and evaluative methodologies iteratively throughout the project
- Will reveal the impact and value of citizen observatories for governance in CoPs



WeSenseIt project:

- WeSenseIt deliverable D6.10 (Report on the governance context for the citizen observatories of water) provides a conceptual framework for analysing citizen participation in water governance. For the purposes of WeSenseIt, the democracy cube by Fung (2006) was adjusted and built upon so as to have a means to analyse the distinct participation mechanisms of the three case studies according to a common classification scheme. This adapted version of the participation cube distinguishes between three dimensions of public decision mechanisms:
 1. The scope of participation (who participates: from government representatives to the general public (citizens))
 2. The mode of communication and decision (how participants interact and what role they play)
 3. The extent of authority (participation for personal benefit only (individual education), up to direct authority)
- In deliverable D6.3 the WeSenseIt project builds on the analysis of the governance context presented in D6.10 and reports on the impacts of citizen observatories and the extent to which these are manifested as changes in governance processes in terms of citizen participation in local flood risk management processes and as 'yield' for the public good in terms of 'good governance' and strengthened community resilience. More specifically, the report examines how citizen participation – in terms of the role of citizens and their authority in decision making - has changed over the years as a result of the knowledge exchanges mediated by the WeSenseIt citizen observatories.

Ground Truth 2.0 project:

- Ground Truth 2.0 methodology for Validation and Impact Assessment is presented in the deliverable D1.10 of the project. This methodology was later adopted to conduct a baseline analysis for impact assessment in the six demonstration cases of the project (i.e. Deliverable D1.11).
- The Ground Truth 2.0 methodology for impact assessment follows the logic model and recognizes between outputs, outcomes and impacts of citizen observatories as a specific type of Citizen Science initiatives.
- The impact assessment conceptualization in this project consists of analysing the social, economic, institutional and environmental changes triggered by the observatories. Such changes can be expected or unexpected, desirable or adverse, can vary in space and time, and be cumulative versus counterbalancing.
- Ground Truth2.0 methodology for impact assessment includes several dimensions, aspects and indicators for measuring social, economic, institutional and environmental impacts of citizen observatories.



The following selected projects hold potential in terms of evaluation and assessment methods, tools, indicators and implementation of nature-based solutions, river restoration and ecosystem services.

CLEVER Cities

- Impact Assessment Framework with a system of KPIs monitoring and evaluating the performance of the effectiveness of the nature-based Solutions (NBS) and the effectiveness the specific regeneration interventions in the CLEVER Action Labs in key social and economic aspects:
 - Human health and well-being
 - Sustainable economic prosperity
 - Social cohesion and environmental justice
 - Citizen safety
- Creating factsheets including a list of priority indicators recommended for measuring impact within the project, and considerations when selecting and applying the indicators in practice.
- The indicators in each thematic area are prioritised on a three-tiered scale:
 - Based on the ease of methods for data collection
 - Availability of data from existing sources
 - Their relevance across cities given the context and objectives of CLEVER Cities
- Definition of the principles for co-designing an evaluation framework
- Process of impact assessment during the project lifetime:
 - Definition of challenges and NBS Intervention
 - Creating the Co-design and Evaluation framework
 - Creating the Baseline
 - Monitoring and Evaluation Plan that includes the pregreening and post operam evaluation to compare both scenarios (before and after interventions)
- Local Monitoring Teams were defined to ensure operability of the monitoring process
- Deployment of sensors and applying the different tools and metrics to obtain the variable to monitor the KPIs, collection of data of the monitoring process to be storage in the CLEVER Cities platform

EKLIPSE

- Fundamental evaluation framework with a list of criteria for assessing the performance of nature-based solution in dealing with 10 challenges related to climate resilience in urban areas.
- For each challenge area a small number of representative examples of indicators are defined, and a range of methods for assessing each indicator.



- NBS application guide for measuring how NBS projects perform according to the identified indicators in delivering multiple environmental, economic and societal benefits.
- Recommendations to improve assessment of the effectiveness of NBS projects including a roadmap for the assessment of NBS impacts (identification of knowledge gaps to the criteria presented in the impact evaluation framework).

MAES

- Defines ecosystem condition, describes in a conceptual model the link between pressures, ecosystem condition and ecosystem services, and provides a hierarchical structure and classification of pressure and ecosystem condition indicators.
- Development of an indicator framework for ecosystem conditions while integrating other indicator frameworks and deriving indicators from different EU directives.
- Proposals for measuring and assessing ecosystem condition per ecosystem type (terrestrial, freshwater and marine) based on a core set of key indicators.

NAIAD

- Introduces a general methodological framework for the economic assessment of NBS/NAS based on three pillars:
 - Building a resilience approach to risk management through nature-based solutions
 - The operationalisation and testing of scientific methods using a source-to-sea in DEMOs
 - The uptake of nature -based solutions that are cost-effective and provide environmental, social and economic benefits
- Presenting the generic life cycle costing concept methodology and its relation with the bankability of infrastructure projects

NATURE4CITIES

- Development of an analysis and classification framework of the NBS.
- Developing a system of integrated multiscale and multi-thematic urban performance indicators for the assessment of urban challenges and NBS. Urban challenge framework covers NBS impacts on Climate Issues, Water Management, Air Quality, Green Space Management and Biodiversity, Urban Regeneration, Resource Efficiency, Public Health and Well-being, Environmental Justice and Social Cohesion, Urban Planning and Governance, People Security and Green Economy.

NATURVATION

- Taking stock of urban NBS solutions and impact assessment methods for NBS.



- Value and Benefit Assessment Methods Database for Urban Nature-based Solutions: A database about where, when, and under which circumstances, integrated multi-functional and systemic impacts of nature-based solutions can be assessed based on a review of assessment methods (i.e. frameworks, models and tools) currently used to assess the ecological, economic and social benefits of urban NBS.
- Take a stock of social and cultural values and impacts of nature-based solutions and natural areas.
- Comprehensive evidence-based assessment of the different types of NBS in the urban context (i.e. ecosystem services provided by urban green and blue infrastructure).
- In this review, we synthesize scientific literature reporting on NBS that are particularly relevant in urban contexts;
- Financial and Economic Value database to reveal monetary values of nature-based solutions together with respective sources and methods i.e. revealed preference and stated preference methods, and include values elicited by means of contingent valuation and choice modelling, as well as hedonic pricing and benefit transfer methods.

OPERAs

- Taking stock of economic valuation and innovative methods to account for socio-cultural values
- Summarizing socio-cultural Valuation and Valuation Methods
- Eleven tools focused on measuring, assessing and monitoring ES have been developed or enhanced
- Development of an integrated ecosystem service assessment model
- Identification of effectiveness and efficiency indicator
- Integration of effectiveness, efficiency and evidence indicator into the OPERAs blueprint
- A hierarchical analysis framework of four overarching comparison criteria developed for the identification of effectiveness and efficiency indicators

proGInreg

- Elaborated a monitoring and assessment plan for the project serving as a guide for the future assessment of benefits.
- Owns detailed protocols of measurements per each selected NBS implementation.
- Developed specific indicators in compliance with EKLIPSE as a result of benefit assessment analysis.



REFORM

- Assessing the societal benefits of river restoration using the ecosystem services approach

URBAN GreenUP

- Defined a renaturing city methodology
- Worked out a set of key performance indicators to assess the methodology the renaturing city methodology
- City diagnosis and monitoring procedures for different NBSs

The following identified projects hold the potential for the future analysis of impact assessment framework in terms of evaluation and assessment methods, tools, indicators and implementation of the nature-based solutions, river restoration and ecosystem services.

MoRRI

- Developing a sound conceptual framework and associated methodology for RRI.
- A rich set of RRI indicators collected through the MoRRI studies.
- Systematised and structured assessment of the capacity, coverage and applicability of the available indicators and data sources in measuring and capturing core RRI aspects at various dimensions and levels of aggregation.
- Suggestions for assisting further monitoring activities and how to embrace the concept, keep RRI mainstream in the routines and procedures.

IRIS

- IRIS catalogue and the guidelines of generally accepted qualitative and quantitative performance metrics that leading impact investors use to measure multiple dimensions social, environmental, and financial performance
- Directory of impact measurement toolkits
- Directory of IRIS-aligned impact measurement tools and platforms
- IRIS measures the performance of an organization

OpenUP

- Developed frameworks that define methods, roles and processes, benefits and opportunities for uptake of open peer review, innovative research dissemination and impact measurement methods.



- Built an interactive knowledge-base, the OpenUP Hub that hosts information, toolkits, guidelines and other resources on peer review, research dissemination and alternative metrics.
- Validated the proposed mechanisms through pilots involving researchers from four scientific communities- Life Sciences, Social Sciences, Arts & Humanities and Energy.
- Produced a set of concrete, practical, validated policy recommendations and actions to be used by EU, national and institutional policymakers, publishers, libraries, research funders, community-based initiatives and alternative metrics providers.



6 Final considerations

The upcoming tasks and deliverables of Work Package 2 (Methods for measuring citizen-science impact) will build upon the research results of the 24 reference projects of D2.1. A wide range of projects with diverse impact assessment methods and thematic focus have been identified. These projects range from practical measurement of urban air quality with the help of citizen science to impact assessment of nature-based solution interventions in urban environment and assessment framework of open science or ecosystem services. The diversity of the selected projects and their impact assessment approaches provides a good basis for developing the MICS methodology for measuring the impact of citizen science in the context to nature-based solution e.g. river restoration projects. After development, this methodology is going to be tested in a number of validation sites in different geographic locations within the EU.



7 List of abbreviations

CO	citizens observatory
D	deliverable
DIY	Do It Yourself
ES	ecosystem service
H2020	European Union's Horizon 2020 research and innovation programme
NBS	nature-based solutions
NC	Natural capital
RBMP	River basin management plan
RRI	Responsible Research and Innovation
UKEOF	UK Environmental Observation Framework
WP	work package



8 References

- Adnan, M., Passani, A. (2017), iSCAPE project – D1.3 Report on Behavioural Interventions
- Almassy, D., Pinter, L., Rocha, S., Naumann, S., Davis, M., Abhold, K., Bulkeley, H. (2018) Urban Nature Atlas: A Database of Nature-Based Solutions Across 100 European Cities
- Altamirano, M.A., de Rijke, H. (2018): NAIAD project – D4.2 Costs of infrastructures: elements of method for their estimation
- Arpaci, A., Aspuru, I., Bartonova, A., Castell, N., Cole-Hunter, T., Cowie, C., ... Verheyden, W. (2016), CITI-SENSE project - D 5.5 Empowerment potential evaluation
- Baldacchini, C. (2019): Monitoring and Assessment Plan, Deliverable No. 4.1, proGReg. Horizon 2020 Grant Agreement No 776528, European Commission,
- Baldacchini, C. (2019): Protocols of Measurements, Deliverable No.4.3, proGReg. Horizon 2020 Grant Agreement No 776528, European Commission, 37.
- Baneborg, A. J., Garcés, C. C., Norbiato, D., Vourvachis, I., Meliadis, M., Fernandez, R. (2017), beAWARE project - D2.2 Evaluation Methodology
- Banelytė, V., Stančiauskas, V., Nakrošis, V. (2018), OpenUP project – D7.3 - Policy report on open peer review, impact measurement and novel dissemination practices
- Bartonova, A., Castell, N., Wegner Eide, A., Fredriksen, M. F., Gan, D., Grossberndt, S., ... Verheyden W. (2016), CITI-SENSE project - D 4.4 CITI-SENSE Citizens' Observatories: Methodologies Assessment
- Bartonova, A., Fredriksen, M., Knezevic, Z., Tamin, A., Kobernus, M., Liu, H.-Y., Santiago, L., Schneider, P. (2016), CITI-SENSE project - D 6.4 Final report on methodology
- Battistelli F., A. Minutolo, A. Scialoja, G. Zampetti, T. Schäfer, B. Kieslinger Maria García González, Sibylle Egger (2017), CAPTOR project - D4.4 Engagement and empowerment report for citizen science.
- Bio Innovation Service (2018) Citizen science for environmental policy: development of an EU-wide inventory and analysis of selected practices. Final report for the European Commission, DG Environment under the contract 070203/2017/768879/ETU/ENV.A.3, in collaboration with Fundacion Ibercivis and The Natural History Museum, November 2018.
- Blaney, R.J.P., Philippe, A.C.V., Pocock, M.J.O., Jones, G.D. (2016), Citizen Science and Environmental Monitoring: Towards a Methodology for Evaluating Opportunities, Costs and Benefits
- Bockarjova, M., Wouter Botzen, W.J. (2017), NATURVATION project – D1.3 Review of Economic Valuation of Nature Based Solutions in Urban Areas



Bullock, C., Joyce, D., Collier, M., Scholte, S., Zanten, B., Verburg, P., ... Walz, A. (2015), OPERAs project - Socio-cultural Valuation and Valuation Methods

Chapman C. (Welsh Government) (2015), COBWEB project - D2.2 Value adding to crowdsourced data for decision making

da Rocha, S. M., Almassy, D., Pinter, L. (2017), NATURVATION project – D1.3 Social and cultural values and impacts of nature-based solutions and natural areas, Part IV

Damas, O., Kraus, F., Musy, M. (2018), NATURE4CITIES project - D1.1 NBS multi-scalar and multi-thematic typology and associated database

Davis, M; Mederake, L; McFarland, K; McGlade, K; Skodra, J; Moebus, S (2018). CLEVER Cities project - D1.1.4 Defining key concepts and associated indicators to measure NBS impact on urban regeneration within CLEVER Cities

Dicks, LV., Haddaway, N., Hernández-Morcillo, M., Mattsson, B., Randall, N., Failler, P., ... Wittmer, H. (2017). Knowledge synthesis for environmental decisions: an evaluation of existing methods, and guidance for their selection, use and development – a report from the EKLIPSE project: D3.1. Report and visualisation of strengths and weaknesses of existing approaches and methodologies to jointly provide evidence, identification of potential gaps in existing approaches, and how to address these gaps

DITOs Consortium (2016). Doing It Together science: Terms of reference and evaluation templates. UCL, London.

European Commission (2018). An inventory of citizen science activities for environmental policies. Directorate-General for Environment of the European Commission; Bio Innovation Service; Joint Research Centre (JRC) [Dataset] PID: <http://data.europa.eu/89h/jrc-citsci-10004>

Fung, A. (2006). Varieties of participation in complex governance. Public administration review, 66(s1), 66-75. doi:<http://dx.doi.org/10.1111/j.1540-6210.2006.00667.x>

Garcia Perez, I., Cantergiani, C., Boelman, V., Davies, H., Murphy-Evans, N. (2018), CLEVER Cities project - D4.1 CLEVER Monitoring and Evaluation Framework

Geoghegan, H., Dyke, A., Pateman, R., West, S., Everett, G. (2016), Understanding Motivations for Citizen Science

Gold, M. (2018), WeObserve project - D2.1 EU Citizen Observatories Landscape Report - Frameworks for mapping existing CO initiatives and their relevant communities and interactions. [<https://www.weobserve.eu/wp-content/uploads/2019/02/D2.1-776740-WeObserve-EU-Citizen-Observatories-Landscape-Report-Frameworks.pdf>]

Görögh, E., Schmidt, B., Banelyte, V., Stanciauskas, V., Woutersen-Windhower, S. (2017), OpenUP project - D3.1 Practices, evaluation and mapping: Methods, tools and user needs



Graveline, N., Joyce, J., Calatrava, J., Douai, A., Arfaoui, N., Moncoulon, D., ... Zdravko K. (2017): "DELIVERABLE 4.1: General Framework for the economic assessment of Nature Based Solutions and their insurance value". EU Horizon 2020 NAIAD Project, Grant Agreement N°730497

Green4Cities and NATURE4CITIES consortium (2017), NATURE4CITIES project - D2.1 System of integrated multi-scale and multi-thematic performance indicators for the assessment of urban challenges and NBS

Hanson, H., Veerkamp, C., Nordin, A., Lazarova, T., Hedlund, K., Olsson, P., Schipper, A. (2017), NATURVATION project – D1.3 Assessment of biophysical and ecological services provided by urban nature-based solutions: a review, Part II

Ingwall-King, L., Ivory, S. (2015), OPERAs project - Report on Information tools for ES/NC data capture, storage, presentation and use/Trialling new and enhanced data capture, indicator-based and information tools within Exemplars

Ingwall-King, L., Ivory, S., Brunner, S., Cojocar, G., Hadzhiyska, D., Morel, V., ... Tinch, R. (2016), OPERAs project - Report on new and enhanced Ecosystem Services Tools

Kettunen, M., ten Brink, P. (2015), OPERAs project – D3.3 Assessing ES/NC policy invn for green economy: wireframe for a toolkit for practitioners

Koetse, M., Agarwala, M., Bullock, C., ten Brink, P. (eds) (2015), OPERAs project – D3.2 Monetary and Social Valuation: State of the Art

Kraker, P., Bachleitner, R., Banelytė, V., Hasani-Mavriqi, I., Luzi, D., Ruggieri, R., ... Walker, M. (2017), OpenUP project - D4.1: Practices evaluation and mapping: Methods, tools and user needs

Maes, J., Teller, A., Erhard, M., Grizzetti, B., Barredo, JI., Paracchini, ML., ... Werner, B. (2018) Mapping and Assessment of Ecosystems and their Services: An analytical framework for ecosystem condition. Publications office of the European Union, Luxembourg. [http://ec.europa.eu/environment/nature/knowledge/ecosystem_assessment/pdf/5th%20MAES%20report.pdf]

McCorry, G., Veeckman, C., Claeys, L. (2017), hackAIR project - D 7.2 Evaluation and impact assessment framework

MoRRI consortium (2018), MoRRI project – D13 Final report – Summarising insights from the MoRRI project

MoRRI consortium (2018), MoRRI project - D4.3 The evolution of Responsible Research and Innovation in Europe: The MoRRI indicators report

MoRRI consortium (2018), MoRRI project - D4.3 The evolution of Responsible Research and Innovation in Europe: The MoRRI indicators report (ANNEX)



MoRRI consortium (2018), MoRRI project – D13 Final report – Summarising insights from the MoRRI project

Nurmi, V., Votsis, A., Prampolini, A., Passani, A., Mägdefrau, N. (2017), iSCAPE project – D5.6 Report on iSCAPE socio-economic impact assessment methodology

Ortuño, J., Feroso, J. (2017), URBAN GreenUP project – D5.1 Technical KPIs definition

Ravn, T., Nielsen, M. W., Mejlgaard, N. (2015), MoRRI project – D3.2 Metrics and indicators of Responsible Research and Innovation – Progress report

Ravn, T., Nielsen, M. W., Mejlgaard, N., Lindner, R. (2015), MoRRI project – D3.1 Synthesis report on existing indicators across RRI dimensions

Raymond, C.M., Berry, P., Breil, M., Nita, M.R., Kabisch, N., de Bel, M., ... Calfapietra, C. (2017) An Impact Evaluation Framework to Support Planning and Evaluation of Nature-based Solutions Projects. Report prepared by the EKLIPSE Expert Working Group on Nature-based Solutions to Promote Climate Resilience in Urban Areas. Centre for Ecology & Hydrology, Wallingford, United Kingdom

Rounsevell, M., Delbaere, B., Mahoney, P., Harrison, P., Brown, C., Metzger, M., ... Saarikoski, H. & the wider Oppla Team (2014), OPERAs project - Enabling decision-making in services offered by nature

Schäfer, T., Kieslinger, B. (2017), CAPTOR project – D5.1 Impact Assessment Plan.

Schäfer, T., Kieslinger, B., Hochgerner, J. (2017), CAPTOR project – D5.2 Interim Impact Assessment Report

Schmidt, S., Mupepele, A-C., Lee, H., Paterson, J., Seppelt, R., Lautenbach, S., ... Volk, M. (2014), OPERAs project - D2.2 Report on standardized metrics/indicators for monitoring the efficiency of ES/NC based measures

Stilgoe, J. (2018), MoRRI project – D8 MoRRI Policy Brief

URBAN GreenUP consortium (2018), URBAN GreenUP project – D5.3: City Diagnosis and Monitoring Procedures

Veeckman C., Temmerman L. (2018), hackAIR project - D7.7 Pilot implementation and final evaluation report

Vermaat, J. E. , J. Wagtendonk, A., Brouwer, R., Sheremet, O., Ansink, E., Brockhoff, T. ... Hering, D. (2015), REFORM project - D4.4 Assessing the societal benefits of river restoration using the ecosystem services approach

Wehn de Montalvo, U., Evers, J., Rusca, M., Faedo, G., & Onencan, A. (2013). Wesenselt project deliverable reports; Deliverable 6.10: Report on the governance context for the citizen observatories of water. Delft, the Netherlands: WeSenselt Consortium.



- Wehn, U., Anema, K., & Gharesifard, M. (2016). Wesenselt project deliverable reports; Deliverable 6.3: Report on social innovation and impact of citizen observatory-based knowledge exchange and participation. Delft, the Netherlands: WeSenseIt Consortium.
- Wehn, U., Gharesifard, M., Anema, K., Alfonso, L., & Mazzoleni, M. (2018). Ground Truth 2.0 project deliverable 1.11: Initial validation and socio-economic impacts report (initial submission). Delft, the Netherlands: Ground Truth 2.0 project.
- Wehn, U., Pfeiffer, E., Gharesifard, M., Anema, K., & Remmers, M. (2017). Ground Truth 2.0 project deliverable 1.10: Methodology for validation and impact assessment. Delft, the Netherlands: Ground Truth 2.0 project.
- Wehn, U., & Evers, J. (2015). The social innovation potential of ICT-enabled citizen observatories to increase eParticipation in local flood risk management. *Technology in Society*, 42, 187-198. doi:<http://dx.doi.org/10.1016/j.techsoc.2015.05.002>
- Wehn, U., McCarthy, S., Lanfranchi, V., & Tapsell, S. M. (2015a). Citizen observatories as facilitators of change in water governance? Experiences from three European cases. *Environmental Engineering and Management Journal*, 14 (9), 2073-2086.
- Wehn, U., Rusca, M., Evers, J., & Lanfranchi, V. (2015b). Participation in flood risk management and the potential of citizen observatories: A governance analysis. *Environmental Science & Policy*, 48(0), 225-236. doi:<http://dx.doi.org/10.1016/j.envsci.2014.12.017>
- Wehn, U., et.al. (2019). Co-designing local knowledge co-production for sustainability: the Ground Truth 2.0 methodology, Manuscript in preparation.
- Woolley, R., Rafols, I. (2016), MoRRI project – D6 Development of metrics and indicators for RRI benefits



9 ANNEX I. – List of identified reference projects and relevant online available resources

Name of the project	Link to publicly available reports, policy briefs and publications
beAWARE - Enhancing decision support and management services in extreme weather climate events	https://beaware-project.eu/wp-content/uploads/2017/09/D2.2_beAWARE.pdf
CAPTOR - Collective Awareness Platform for Tropospheric Ozone Pollution	https://www.captor-project.eu/wp-content/uploads/2018/02/D4.4_final.pdf
	https://www.captor-project.eu/wp-content/uploads/2017/12/CAPTOR-D5.1_FINAL-rev.pdf
	https://www.captor-project.eu/wp-content/uploads/2018/02/D5.2_final.pdf
CITI-SENSE - Development of sensor-based Citizens' Observatory Community for improving quality of life in cities	https://co.citi-sense.eu/Portals/1/Deliverables/D4.4_FINAL.pdf?ver=2016-12-23-093244-480
	https://co.citi-sense.eu/Portals/1/Deliverables/D5.5_FINAL.pdf?ver=2016-12-23-093008-683
	https://co.citi-sense.eu/Portals/1/Deliverables/D6_4_FINAL_complete.pdf?ver=2016-11-02-150526-630
	https://co.citi-sense.eu/CitizensObservatoriesToolbox.aspx
UK Environmental Observation Framework, Citizen Science Resources	http://www.ukeof.org.uk/resources/citizen-science-resources/Costbenefitcitizenscience.pdf/view
	http://www.ukeof.org.uk/resources/citizen-science-resources/UKEOF_CSSspreadsheetToolFinal_all.xlsx/view
	http://www.ukeof.org.uk/resources/citizen-science-resources/MotivationsforCSREPORTFINALMay2016.pdf/at_download/file
COBWEB - Citizen Observatory Web	https://cobwebproject.eu/sites/default/files/COBWEB%20D2.2%20Value%20adding%20crowdsourced%20data%20decision%20making%20v1.pdf
DITOs - 'Doing-It-Together Science'	http://www.togetherscience.eu/content/4-about/3-deliverables/6-doing-it-together-science-d5-1-terms-of-reference-and-evaluation-templates/ditos-d5.1-20161129.pdf
hackAIR - Collective awareness platform for outdoor air pollution	http://www.hackair.eu/wp-content/uploads/2019/01/d7.7_final_evaluation_report.pdf
	http://www.hackair.eu/wp-content/uploads/2018/02/d7.2-evaluation_and_impact_assessment_framework.pdf
iSCAPE - Improving the Smart Control of Air Pollution in Europe	https://www.iscapeproject.eu/wp-content/uploads/2018/10/Resubmitted-D1.3-Report-on-Behavioural-Interventions.pdf
	https://www.iscapeproject.eu/wp-content/uploads/2018/03/D5.6-Report-on-iSCAPE-socio-economic-assessment-methodology.pdf
WeObserve - An Ecosystem of Citizen Observatories for Environmental Monitoring	https://www.weobserve.eu/wp-content/uploads/2019/02/D2.1-776740-WeObserve-EU-Citizen-Observatories-Landscape-Report-Frameworks.pdf
WeSenseIt - Citizen Observatory of Water	http://staffwww.dcs.shef.ac.uk/people/F.Ciravegna/wsi-site/wesenseit.eu/the-project/deliverables/index.html
Ground Truth 2.0 - Environmental knowledge discovery of human sensed data	https://gt20.eu/knowledge-base/
CLEVER Cities - Co-designing Locally tailored Ecological solutions for Value added, socially inclusivE Regeneration in Cities	http://clevercities.eu/fileadmin/user_upload/Resources/D1.1_Theme_4_impact_indicators_ECOLOGIC_12.2018.pdf
	http://clevercities.eu/fileadmin/user_upload/Resources/181130_D.4.1_Monitoring_Framework_TEC.docx.pdf
EKLIPSE - Establishing a European Knowledge and	http://www.eclipse-mechanism.eu/apps/Eklipse_data/website/EKLIPSE_Report1-NBS_FINAL_Complete-



Name of the project	Link to publicly available reports, policy briefs and publications
Learning Mechanism to Improve the Policy-Science-Society Interface on Biodiversity and Ecosystem Services	08022017_LowRes_4Web.pdf http://www.eklipse-mechanism.eu/apps/Ekclipse_data/website/EKLIPSE_D3-1-Report_FINAL_WithCovers_V6.pdf
MAES - Mapping and Assessment of Ecosystems and their Services	http://catalogue.biodiversity.europa.eu/uploads/document/file/1673/5th_MAES_report.pdf
NAIAD - NAture Insurance value: Assessment and Demonstration	http://naiad2020.eu/wp-content/uploads/2018/11/D4.2_REV_FINAL.pdf http://naiad2020.eu/wp-content/uploads/2018/11/4.1-2.pdf
NATURE4CITIES - Nature Based Solutions for re-naturing cities: knowledge diffusion and decision support platform through new collaborative models	https://docs.wixstatic.com/ugd/55d29d_3b17947e40034c168796bfc9a9117109.pdf https://docs.wixstatic.com/ugd/55d29d_8813db2df690497e80740537b6a8a844.pdf
NATURVATION - Nature Based Urban Innovation	https://naturvation.eu/sites/default/files/result/files/urban_nature_atlas_a_database_of_nature-based_solutions_across_100_european_cities.pdf https://naturvation.eu/sites/default/files/result/files/naturvation_social_and_cultural_values_and_impacts_of_nature-based_solutions_and_natural_areas.pdf https://naturvation.eu/sites/default/files/result/files/naturvation_assessment_of_biophysical_and_ecological_services_provided_by_urban_nature-based_solutions.pdf https://naturvation.eu/sites/default/files/result/files/naturvation_review_of_economic_valuation_of_nature_based_solutions_in_urban_areas.pdf https://naturvation.eu/sites/default/files/atlas/Urban_Nature_Atlas-Methodology_approach.pdf https://naturvation.eu/sites/default/files/result/files/value_and_benefit_assessment_methods_database_for_urban_nature.xlsx
OPERAs - Operational Potential of Ecosystem Research Applications	http://www.operas-project.eu/sites/default/files/resources/d2.2-report-standardized-metrics-and-indicators-monitoring-efficiency-es-nc-based-measuresfinale-2.pdf http://www.operas-project.eu/sites/default/files/resources/d6.3-oppla-policy-brief.pdf http://www.operas-project.eu/sites/default/files/resources/ms3.7-assessing-esns-policy-integration-green-economy-wireframe-toolkit-practitioners..pdf



Name of the project	Link to publicly available reports, policy briefs and publications
	http://www.operas-project.eu/sites/default/files/resources/d-3.2-monetary-and-social-valuation-state-art.pdf
	http://www.operas-project.eu/sites/default/files/resources/deliverable-44-and-46report-new-and-enhanced-ecosystem-services-tools-1.pdf
	http://www.operas-project.eu/sites/default/files/resources/d3-5socialvaluationbullocketal20151203-update.docx
	http://www.operas-project.eu/sites/default/files/resources/ms4.15-updated-report-testing-information-tools-esnc.doc
proGReg - productive Green Infrastructure for post-industrial urban regeneration	http://www.progireg.eu/fileadmin/user_upload/Deliverables/D4.1_proGReg_CNR_2019_03_29.pdf
	http://www.progireg.eu/fileadmin/user_upload/Deliverables/D4.3_proGReg_CNR_2019-03-29.pdf
REFORM - REstoring rivers FOR effective catchment Management	https://reformrivers.eu/system/files/4.2%20Evaluating%20HyMo%20restoration%20from%20existing%20data%20FINAL.pdf
	https://reformrivers.eu/system/files/4.4%20Assessing%20social%20benefits%20of%20river%20restoration.pdf
URBAN GreenUP - New Strategy for Re-Naturing Cities through Nature-Based Solutions	https://www.urbangreenup.eu/ImagePub.aspx?id=1893106
	http://www.urbangreenup.eu/ImagePub.aspx?id=1912498
MoRRI – Monitoring the Evolution and Benefits of Responsible Research and Innovation	http://www.technopolis-group.com/wp-content/uploads/2018/04/MoRRI-policy-brief_FINAL.pdf
	http://www.technopolis-group.com/wp-content/uploads/2018/05/Final_report_MoRRI.pdf
	http://www.technopolis-group.com/wp-content/uploads/2018/02/D4.3_Revised_20022018_clean.pdf
	http://www.technopolis-group.com/wp-content/uploads/2018/02/Appendix_D4.3_20022018_clean.pdf
	http://www.technopolis-group.com/wp-content/uploads/2017/09/D5.3.pdf
	http://www.technopolis-group.com/wp-content/uploads/2017/09/D6.pdf
	http://www.technopolis-group.com/wp-content/uploads/2016/12/2171_D3.1.pdf
	http://www.technopolis-group.com/wp-content/uploads/2016/12/2171_D3.2.pdf http://www.technopolis-group.com/wp-content/uploads/2016/12/2171-D2_1-Public_engagement.pdf
IRIS - Impact Reporting and Investment Standards Initiative	https://iris.thegiin.org/files/iris-4.0-taxonomy.xlsx
OpenUP - OPENing UP new methods, indicators and tools for peer review, impact measurement and dissemination of research results	http://openup-h2020.eu/wp-content/uploads/2017/01/OpenUP_D3.1_Peer-review-landscape-report-1.pdf
	http://openup-h2020.eu/wp-content/uploads/2017/01/OpenUP_D4.1_Practices-evaluation-and-mapping-Methods-tools-and-user-needs.pdf
	http://openup-h2020.eu/wp-content/uploads/2018/11/OpenUP_D7.3_-policy-report.pdf



10 ANNEX II. – List of shortlisted projects

Geographic scope	Name of the project	Website (link)
Africa	Afri-Alliance	http://afrialliance.org/
Global	Aircasting	http://aircasting.org/
Perú	Amazo'N'oil	https://www.zooniverse.org/projects/marcartro/amazonoil/about/team
United Kingdom	Ancient Tree Inventory	https://www.woodlandtrust.org.uk/visiting-woods/ancient-tree-hunt/
Global	ARIES	http://aries.integratedmodelling.org/
United Kingdom	Bat Conservation Trust	https://nbmp.bats.org.uk/
EU (European Union)	beAWARE	https://beaware-project.eu/
Belgium	Belgian Coccinellidae - Ladybird beetles in Belgium	https://www.gbif.org/dataset/42319b8f-9b9d-448d-969f-656792a69176
EU (European Union)	Benchmarking Nature-Based Solution and Smart City Assessment Schemes Against the Sustainable Development Goal Indicator Framework	https://www.frontiersin.org/articles/10.3389/fenvs.2018.00069/full
EU (European Union)	BeWATER	http://www.bewaterproject.eu/
United Kingdom	Big Farmland Bird Count 2017	https://www.gwct.org.uk/farming/big-farmland-bird-count/
EU (European Union)	BigPicnic	https://www.bigpicnic.net/
United Kingdom	Butterflies for the New Millennium (BNM)	https://butterfly-conservation.org/our-work/recording-and-monitoring/butterflies-for-the-new-millennium
EU (European Union)	CAPTOR	https://www.captor-project.eu/en/
EU (European Union)	CASI	http://www.futuresdiamond.com/casi2020/
EU (European Union)	Citclops	http://www.citclops.eu/
EU (European Union)	CITI-SENSE	http://www.citi-sense.eu/
Italy	Citizen Hydrology	www.cithyd.com



Geographic scope	Name of the project	Website (link)
United Kingdom	UK Environmental Observation Framework, Citizen Science Resources	http://www.ukeof.org.uk/resources/citizen-science-resources
EU (European Union)	COST Action CA 15202 - Citizen Science to promote creativity, scientific literacy, and innovation throughout Europe	https://www.cost.eu/actions/CA15212/#tabs Name:overview
EU (European Union)	CITYkeys	http://www.citykeys-project.eu/
EU (European Union)	ClairCity	http://www.claircity.eu
EU (European Union)	CLEVER Cities	http://clevercities.eu/
United Kingdom	East End Quality of Life Initiative, Sheffield City Council	http://www.sheffieldeastend.org.uk/AQmonitoring.htm
EU (European Union)	COBWEB	https://cobwebproject.eu
United Kingdom	Community Air Quality (Mapping for Change)	http://mappingforchange.org.uk/projects/citizen-science-used-to-map-community-air-quality/
EU (European Union)	Crowd4Roads	http://www.c4rs.eu
Belgium	CurieuzeNeuzen	http://www.curieuzeneuzen.eu/en/
EU (European Union)	CSEOL	https://www.cseol.eu/about/
Italy	CSMON-LIFE (Citizen Science MONitoring)	http://www.csmon-life.eu/
EU (European Union)	DITOs	http://www.togetherscience.eu
EU (European Union)	D-NOSES	http://dnoses.eu/
United Kingdom	Dragonflywatch	http://www.british-dragonflies.org.uk/content/recording-dragonflies-and-damselflies-britain
global	ebird	http://ebird.org/content/ebird
EU (European Union)	EdiCitNet	https://cordis.europa.eu/project/rcn/216082/factsheet/de
EU (European Union)	Eclipse	http://www.eclipse-mechanism.eu/
EU (European Union)	Engage2020	http://engage2020.eu
Asia	Enhancing coastal safety in Indonesia	https://www.un-ihe.org/news/enhancing-coastal-safety-indonesia



Geographic scope	Name of the project	Website (link)
EU (European Union)	EUropean Biodiversity Observation Network	http://www.eubon.eu
EU (European Union)	Evolution Megalab	http://www.evolutionmegalab.org/en_GB/
EU (European Union)	FoodSmartphone	http://www.foodsmartphone.eu
EU (European Union)	Forest112	http://forest112.com
Global	FreshWaterWatch	https://freshwaterwatch.thewaterhub.org/
Global	GLOBE Program	https://www.globe.gov/about/overview
Global	Globe at night	https://www.globeatnight.org/
EU (European Union)	Ground Truth 2.0	www.gt20.eu
EU (European Union)	GROW	https://growobservatory.org
EU (European Union)	GROWGREEN	http://growgreenproject.eu/
EU (European Union)	hackAIR	http://hackair.eu/
United States	Humanitarian OpenStreetMap	https://www.hotosm.org
Global	Inaturalist	https://www.inaturalist.org/
EU (European Union)	I-REACT	http://www.i-react.eu
United Kingdom	iRecord	https://www.brc.ac.uk/irecord/
EU (European Union)	iSCAPE	https://www.iscapeproject.eu
United Kingdom	Isle of Wight Local Records Centre - IOW Natural History & Archaeological Society Marine Invertebrate Records 1853- 2011	http://www.wildonwight.co.uk/lrc/
Netherlands	iSpex	http://ispex.nl/en/
Global	iSpot	www.ispotnature.org
United Kingdom	Jam and Justice	https://jamandjustice-rjc.org/
Netherlands	KWP Water projects	https://www.kwrwater.nl/en/projecten/citizen-science-and-hardness/



Geographic scope	Name of the project	Website (link)
EU (European Union)	Landsense	https://landsense.eu
EU (European Union)	MAES	https://biodiversity.europa.eu/maes
EU (European Union)	Marine Litter Watch	https://www.eea.europa.eu/themes/water/europes-seas-and-coasts/thematic-assessments/marine-litterwatch
EU (European Union)	MARSOL	http://www.marsol.eu/
Global	MedMIS	http://www.iucn-medmis.org/
EU (European Union)	MONOCLE	http://www.monocle-h2020.eu/Citizen_science
Spain	MosquitoAlert	http://www.mosquitoalert.com/
United Kingdom	MSc Thesis	https://www.uea.ac.uk/documents/541248/10785337/DiazRedondo+Maria.pdf/f73bf6b0-57f2-4cf8-be22-bcd887dcf41d
EU (European Union)	MyNatura2000	http://digitalearthlab.jrc.ec.europa.eu/csp/topics/mynatura2000-%E2%80%93-share-your-nature-experience
United Kingdom	mySoil	http://www.bgs.ac.uk/mySoil/
Africa	NaBWIG - Nature based water infrastructures in Ethiopia and Kenya for #GlobalGoals	https://www.nwo.nl/en/research-and-results/research-projects/i/85/30085.html
EU (European Union)	NAIAD	http://naiad2020.eu/
United Kingdom	National Moth Recording Scheme	http://www.mothscount.org/text/27/national_moth_recording_scheme.html
EU (European Union)	Nature4cities	https://www.nature4cities.eu/
EU (European Union)	Nature-based Solutions - City Case Studies	https://oppla.eu
United Kingdom	Nature-based Solutions Initiative	http://www.naturebasedsolutionsinitiative.org/evidence-overview/
United Kingdom	Nature's Calendar	http://www.naturescalendar.org.uk/
Germany	Naturgucker / Enjoynature	http://n.enjoynature.net/13/natur_13.dll/EXEC
EU (European Union)	NATURVATION	https://naturvation.eu/
Austria	NBI goes Citizen Science Wissen schaffende Bürgerinnen und Bürger	http://kfl.univie.ac.at/de/forschung/laufende-projekte/nbi-goes-citizen-science/



Geographic scope	Name of the project	Website (link)
Netherlands	NETLAKE - Networking Lake Observatories in Europe	https://nioo.knaw.nl/en/netlake-citizen-science
EU (European Union)	Oasis Innovation Hub for Catastrophe and Climate Extremes Risk Assessment	https://h2020insurance.oasishub.co/
Spain	Observadores del Mar	www.observadoresdelmar.es
EU (European Union)	OdourCollect	odourcollect.scientize.eu
United Kingdom	OPAL	https://www.opalexplornature.org/
EU (European Union)	OpenAIRE2020	https://www.openaire.eu/citizen-science-activities-in-openaire
EU (European Union)	Operas	http://www.operas-project.eu
Portugal	Os pardais de Darwin: medindo evolução nos pátios da escola	https://cibio.up.pt/citizen-science-darwin-sparrows
Ireland	People for Bees	https://iwt.ie/people-for-bees/
EU (European Union)	PERARES	http://www.livingknowledge.org/projects/perares/
EU (European Union)	PERSEUS	http://www.perseus-net.eu/site/content.php
EU (European Union)	PHUSICOS	https://phusicos.eu/
Sweden	Phytophthora	http://phytophthora.se/en/citizen-science-2/
EU (European Union)	Pollentagebuch	https://pollentagebuch.at/Phd/de/start
EU (European Union)	POWER	https://www.power-h2020.eu
EU (European Union)	proGireg	http://www.progireg.eu/
EU (European Union)	PROSO	http://www.proso-project.eu
Austria	Ragweed Finder	https://www.ragweedfinder.at/
Scotland	Rainfall Observers	https://envscot-csportal.org.uk/rainfallobs/
EU (European Union)	RECONNECT	http://www.reconnect.eu/
EU (European Union)	RESTORE	https://www.therrc.co.uk/life-restore-project



Geographic scope	Name of the project	Website (link)
Union)		
EU (European Union)	RRI TOOLS	https://www.rri-tools.eu/
United Kingdom	Saving Scotland's Red Squirrels project	http://www.scottishsquirrels.org.uk/support-us/get-involved/
EU (European Union)	SCENT	https://scent-project.eu/
EU (European Union)	SeaChange	http://www.seachangeproject.eu
Ireland	See it? Say it!	http://www.epa.ie/enforcement/report/seeit/
Spain	Smart Citizen	https://smartcitizen.me/
Netherlands	Smart emission portal	http://smartemission.ruhosting.nl/
EU (European Union)	STARS4ALL	http://www.stars4all.eu
United Kingdom	Survey hazel dormice	https://ptes.org/campaigns/dormice/#ndmp
EU (European Union)	TD1202 - Mapping and the citizen sensor	https://www.cost.eu/actions/TD1202/#tabs Name:overview
Global	Tea Bag Index	http://www.teatime4science.org/
United Kingdom	The Big Seaweed Search	http://www.nhm.ac.uk/nature-online/british-natural-history/seaweeds-survey/index.html
Netherlands	The Clean Water Experiment	https://www.kwrwater.nl/en/projecten/the-clean-water-experiment/
EU (European Union)	Tracking Invasive Alien Species in Europe	http://digitalearthlab.irc.ec.europa.eu/csp/topics/tracking-invasive-alien-species-europe
Netherlands	Trektellen Trekvogels tellen Count migratory birds	http://www.trektellen.org/
Italy	TRUST	http://ec.europa.eu/environment/life/project/Projects/index.cfm?fuseaction=search.dspPage&n_proj_id=3252
EU (European Union)	URBAN NATURE LABS	https://www.unalab.eu/
EU (European Union)	URBAN GreenUP	https://www.urbangreenup.eu/
EU (European Union)	URBiNAT	https://urbinat.eu/
EU (European Union)	Waste4Think	http://waste4think.eu/es/



Geographic scope	Name of the project	Website (link)
EU (European Union)	WaterCog	https://northsearegion.eu/watercog/
Netherlands	Waterlab	https://www.un-ihe.org/news/valorisation-delta-technology
EU (European Union)	WeObserve	https://www.weobserve.eu/
EU (European Union)	WeSenseIt	http://www.wesenseit.com/
United Kingdom	Wildlife Information Centre	http://www.wildlifeinformation.co.uk/about.php
Africa	Women&Water	https://www.un-ihe.org/news/coca-cola-grant-women-and-water-change-communities-project
Global	IRIS	https://iris.thegiin.org/metrics
EU (European Union)	MoRRI	https://morri.netlify.com/
EU (European Union)	SUPER MoRRI	https://www.super-morri.eu
EU (European Union)	OPENUP	http://openup-h2020.eu/