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TITLE: Recommendations to Heads of EPAs following the European Commission's Best Practices in Citizen Science for Environmental Monitoring (Staff Working Document SWD (2020) 149 final)

AGENDA ITEM: Session 5: EPA Network activities

PAPER: 5

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OBJECTIVE OF THE PAPER: Make recommendations to promote citizen science within EPAs as a follow-up of the key messages from the European Commission's Staff Working Document on Best Practices in Citizen Science for Environmental Monitoring (SWD (2020) 149 final).

Introduction

Citizen science can be defined as the non-professional involvement of volunteers in the scientific process, commonly in data collection, but also in other phases such as quality assurance, data analysis and interpretation, problem definition and the dissemination of results. Citizen science can play an important role by filling data gaps where conventional data sources may not be sufficient, providing complementary temporal and spatial data that supports official monitoring systems and helps to validate and fine-tune national level monitoring and forecast systems. Importantly, citizen science is also a powerful tool for public engagement and empowerment in policy making and for raising awareness about environmental issues and policies. The volume of environmental knowledge generated by citizen science initiatives across the EU offers a unique opportunity to help deliver on the European Green Deal and other EU (and global) priorities, and to involve the public in EU policy-making. However, and despite its value, there is still insufficient awareness and understanding at policy level which is still hindering the potential of citizen science in support of policy making processes.

In recent years, several steps have been taken in order to raise awareness and exploit the potential of citizen science for environmental protection policies and implementation. Outstanding examples are the creation of the Interest Group on Citizen Science in 2014 within the European Network of Heads of Environmental Protection Agencies (EPA Network) or the recent EEA-Eionet Strategy 2021-2030 which includes a specific reference to citizen science as one of the areas where EEA and the Eionet should focus on to deliver on its objective of “Making full use of the potential of data, technology and digitalisation”.

In this context, in 2020, the European Commission published the Staff Working Document “Best Practices in Citizen Science for Environmental Monitoring”¹. The document was collaboratively produced with various stakeholders, including the Interest Group on Citizen Science. The document provides an analysis of challenges, opportunities and examples of good practices leading to a series of recommendations for promoting wider use of citizen science in environmental monitoring and reporting, including actions for the various actors in the field.

Over the last months, and as informed in previous EPA Network meetings, the Interest Group of Citizen Science has analysed these recommendations from the perspective of EPAs. Based on this work, the Interest Group on Citizen science provides **eight key recommendations for the Heads of EPAs to strengthen the uptake of citizen science, with a focus on both the work of the individual EPAs and as a group within the EPA Network.**

Recommendations for the individual EPAs

The Interest Group on Citizen Science (IGCS) recommends a series of actions to be implemented by the EPAs in a stepwise approach, i.e. each of the recommendations represent one step forward to a higher degree of maturity in integrating citizen science in EPA activities. Each recommendation is accompanied by a series of more detailed actions as well as some reference examples by EPAs in Europe or beyond.

¹ https://ec.europa.eu/environment/legal/reporting/pdf/best_practices_citizen_science_environmental_monitoring.pdf

Recommendations to individual EPAs

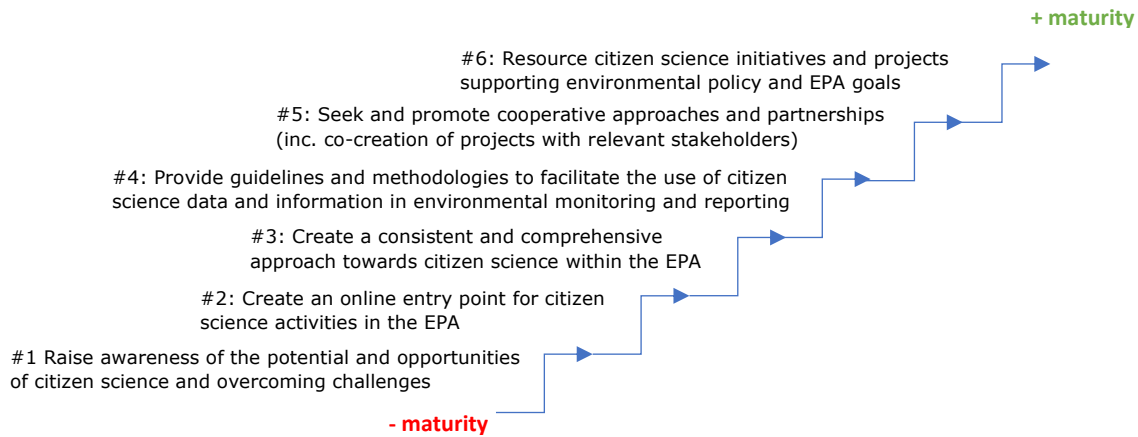


Figure 1. Recommendations to individual EPAs to increase their maturity in integrating citizen science in their activities

Recommendation 1: Raise awareness of the potential and opportunities of citizen science within the EPA and overcoming challenges

The first recommendation focuses on raising awareness about citizen science within the EPA and its stakeholders, promoting the nomination of institutional champions, understanding the existing landscape of activities and providing capacity building where necessary.

The IGCS proposes the following actions:

- 1.1 Create awareness about citizen science activities within EPA and relevant stakeholders by **pooling information and communicating about existing activities**. The objective is to ensure that EPA colleagues and their partners become aware of the multiple benefits but also the associated challenges of building upon citizen science approaches.
- 1.2 **Nominate (and give resources to) institutional “champions”**, network of facilitators or a working group of active practitioners, within the EPA to compile and disseminate best practices, tools and information related to citizen science initiatives and their impact. These institutional champions should also connect with the IGCS, in order to share experiences and knowledge across EPAs.
- 1.3 Carry out **stocktaking of existing projects** to understand the breadth of citizen science activities and experience within the EPA constituencies.
- 1.4 Promote and team up with relevant associations, organisations and communities to provide **capacity building activities**, including organising trainings or webinars. Training may in some cases need to be very specific and detailed, depending on the actual topic (e.g. biodiversity monitoring).

Some European EPAs have already taken steps to raise awareness of the potential and opportunities of citizen science within their institutions, including setting up internal teams or providing capacity building activities:

The **Irish EPA's Strategic Plan** required in 2017 the establishment of "a rolling programme of citizen science projects that are delivered in conjunction with national and international partners and that highlight the key priorities of clean air, clean water and sustainable behaviour". This strategic action coincided with the establishment of a **Citizen Science Cross-Office Team (CSCOT)** within the EPA to coordinate and foster citizen science projects that support this strategic outcome, with members representing different teams and topic areas across the agency. Partnerships have been nurtured with different stakeholders (National Biodiversity Data Centre (NBDC), An Taisce's Environmental Education Unit (EEU)). The Irish EPA partnership with the NBDC also provides a series of onsite and online workshops and training courses that are linked to these specific citizen science monitoring schemes: <https://biodiversityireland.ie/training-resources/>.

The **Finnish Environment Institute (SYKE)** has created an internal citizen science network to connect researchers working on citizen science and to share lessons between them. The network has a designated leader, and shares information via internal email-list and by managing a discussion group on the EPA Yammer platform.

Recommendation 2: Create and maintain an online entry point for citizen science activities in the EPA

Another step towards a higher degree of maturity in the uptake of citizen science in the EPA entails creating an entry point (e.g.: web portal, information access point) that facilitates access to information on citizen science initiatives carried out by the EPA or in which the EPA is involved. This can be complemented by a supporting open data infrastructure to share citizen science data with the wider audiences, including the public and policy-makers.

Proposed actions:

2.1 Create a **citizen science entry point** such as a web portal to pool information on citizen science initiatives where EPA is involved, facilitating a contact point for citizen science initiatives at EPA. Content should be maintained up-to-date. Through this portal, the public and policy making community can find projects they are interested in, facilitating engagement and collaboration, and giving visibility to projects/citizen science contributions.

2.2 Provide a **supporting infrastructure or platform** based on open data and open science principles that allows the public and policy communities to access and use citizen science data, and to provide feedback. The platform should also ensure

Some examples of citizen science portals and platforms set up by EPAs or in which EPAs are involved are:

- **Ireland**
 - o Citizen Science portal:
<https://www.epa.ie/take-action/in-the-community/citizen-science/>
- **Netherlands:**
 - o Data portal:
<https://sensors.rivm.nl/dataportaal/>
 - o Knowledge portal:
<https://www.samenmetenaanluchtkwaliteit.nl/international>
- **Belgium (Flanders):**
 - o Data portal:
<https://samenvoorzuiverelucht.eu/dataportaal/>
 - o Knowledge portal:
<https://samenvoorzuiverelucht.eu> :
- **Finland:**
 - o Knowledge portal:
<https://www.syke.fi/kansalaistiede>
 - o Thematic knowledge portals on water and sea (<https://www.jarviwiki.fi>), Invasive Alien Species (<https://vieraslajit.fi/>) and biodiversity (<https://laji.fi/en>)
- **Italy:**
 - o Italian Biodiversity Network (NNB):
<https://www.nnb.isprambiente.it/it>
- **European Environment Agency:**
 - o MapMyTree:
<https://forest.eea.europa.eu/3-billion-trees/introduction>
 - o Marine Litter Watch:
<https://marinelitterwatch.discomap.eea.europa.eu/>

that the citizen science data can be re-used beyond a single project life. Guidelines ensuring good data management need to be established. The data infrastructure should consider both access to data but also that methodologies can be transferable.

2.3. These entry points and platforms could eventually be linked to established **pan-European citizen science platforms** such as ECSA's EU-Citizen.Science² to facilitate exchange.

Recommendation 3: Create a consistent and comprehensive approach towards citizen science within the EPA

As a third step, the IGCS recommends EPAs to move towards a more consistent and comprehensive approach when using citizen science. This would involve actually embedding citizen science in the EPA mandate, mainstreaming citizen science across the EPA activities and ultimately creating a vision for citizen science within the EPA.

Proposed actions:

- 3.1 Identify in which areas or programmes **citizen science can make a meaningful contribution to the goals of the EPA**. This can be done e.g.: via a knowledge audit, a process that can help understand which information an EPA has and what is still needed. This process should therefore facilitate an alignment of citizen science activities with the EPA strategic goals.
- 3.2 Create a **citizen science-related position, lead contact or cross office team** at the EPA to help mainstreaming the knowledge about citizen science across EPA activities. This position should also be linked to getting expertise in citizen science project management.
- 3.3 Co-create a vision together with the relevant stakeholders across the different topic areas within the EPA. The vision could be eventually implemented through a **citizen science plan or strategy for the EPA**, including possibly some monitoring indicators (e.g.: on impact).
- 3.4 **Align EPA activities in citizen science with national strategies** related to open data and open science and innovation

Some EPAs as well as other national and at regional public authorities in Europe and beyond have prepared strategies or documents to facilitate policy uptake in the context of Citizen Science. Relevant examples are:

- **US Environmental Protection Agency (US EPA)** has published several strategic documents on citizen science, including "A vision for citizen science at EPA" and a "Handbook for citizen science quality assurance and documentation" (<https://www.epa.gov/citizen-science>)
- **UK Environmental Observation Framework (UKEOF)**, in the context of its Citizen Science Working Group, has provided a series of briefing notes and guides with policy relevance such as "Understanding Opportunities, Costs and Benefits of Citizen Science" and "Understanding Motivations for Citizen Science" (<https://www.ukeof.org.uk/our-work/citizen-science>)
- In Australia, the governments of **New South Wales** (<https://www.environment.nsw.gov.au/-/media/OEH/Corporate-Site/Documents/Research/Citizen-science/oe-citizen-science-strategy-2016-2018-150859.pdf>) and **Queensland** (<https://www.chiefscientist.qld.gov.au/strategy-policies/queensland-citizen-science-strategy>) each have a strategy on Citizen Science.

² <https://eu-citizen.science/>

agendas, which would make citizen science more impactful.

Recommendation 4: Provide guidelines and methodologies to facilitate the use of citizen science data and information in the context of environmental monitoring and reporting

The recommendation #4 proposes EPAs to prepare and provide guidelines and methodologies that help citizen science initiative to ensure their data is fit-for-purpose and can thus contribute to environmental monitoring and reporting.

Proposed actions:

- 4.1 Provide **standard approaches** such as best practices, data collection guidelines, QA/QC methodologies, applications and toolkits to support EPA-affiliated citizen science projects to provide data fit for purpose.
- 4.2 **Share methodological approaches within the EPA.** Internal communication tools within EPA such as webinars are needed. Improved internal communication also facilitate cross-fertilisation and feedback, opening up new ways in which the EPA can use this data.
- 4.3 Engage relevant stakeholders in a **co-development process** of the abovementioned guidelines and methodologies.
- 4.4. Remove existing obstacles, or promote their removal, so the **reporting systems** used by the EPAs can accept and process data originated not only from official monitoring networks but also from alternative data sources such as citizen science.

*In 2019, the US Environmental Protection Agency produced a "**Handbook for Citizen Science Quality Assurance and Documentation**", with a series of examples and templates (<https://www.epa.gov/citizen-science/quality-assurance-handbook-and-guidance-documents-citizen-science-projects>), in order to convey common expectations for quality assurance and best practices on data management to level the playing field for organisations that train and use volunteers in the collection of environmental data.*

*In 2020, the UK Environmental Observation Framework produced a guidance note (<https://www.ukeof.org.uk/resources/citizen-science-resources/cswq-data-guidance-booklet-web.pdf>) to provide advice to practitioners on the **development of data management plans** to support the value of datasets from citizen science projects to help them to have higher impact and re-use.*

*In 2021, EEA launched the **MapMyTree** counter (<https://forest.eea.europa.eu/3-billion-trees/introduction>) which allows associations and, soon individual citizens, to submit their observations to the **EEA reporting system Reportnet**.*

Recommendation 5: Seek and promote cooperative approaches and partnerships (inc. co-creation of projects with relevant stakeholders)

To strengthen citizen science, EPAs can seek and nurture partnerships with stakeholders, and co-create citizen science projects and activities.

Proposed actions:

- 5.1 **Partner with NGOs, associations and other organisations** to keep abreast with the pace of evolution in citizen science landscape and help shape a good set of skills. This will also strengthen

the knowledge brokering role of EPAs, fostering EPA legitimacy and learning. It may also support behaviour change and empower local communities.

- **5.2 Launch a series of pilot projects** to test the approaches that help foster learning and behaviour change or help fill knowledge gaps in those areas which are still poorly covered by traditional observation networks. When initiating an activity, a co-creation exercise could be undertaken, involving EPA colleagues, member of the public/civil society, associations and other organisations, etc.

*The Irish EPA project on Citizen Science "**Clean Air Together**" (<https://www.cleanairtogether.ie/>) is a clear example of a successful joint initiative between the EPA and the Environmental Education Unit of An Taisce (the National Trust for Ireland), an independent charity in Ireland. Clean Air Together is a citizen science project where people voluntarily sign up to measure levels of Nitrogen Dioxide (NO₂) pollution in their local area. In March 2022, they announced the results of the Autumn 2021 campaign in Dublin which involved 1000 citizen scientists and clearly showed the impact of traffic on NO₂ air pollution levels. The results will be used by EPA to support air quality modelling in Dublin and by local authorities to support air quality management. The project will be continued with another campaign in Cork city in late 2022.*

*The Finnish Environment Institute (SYKE) project **Ihan pihalla!** (we're outside!) worked with teachers and students to study local environments. The project also developed a water backpack (vesireppu - <https://www.vesireppu.com/in-english>) that helps children in primary education to study and learn about their local waters. The backpack includes for example tools for measuring transparency, oxygen levels and blue green algae levels. In 2020, the charity foundation Rotary organization took up the responsibility for producing and disseminating the backpacks to schools, as well as helping schools to finance the backpack.*

*As a programme of the more than two decades old Hungarian Biodiversity Monitoring System, Herman Otto Institute Nonprofit Ltd. together with the Ministry of Agriculture and volunteer organizers coordinates since 2009 the **WildWatcher** (<https://www.vadonleso.hu>) citizen science initiative. Vadonleső (in Hungarian) collects distribution data on widespread protected and community interest species, which are used for country reporting, habitat protection and land use management.*

Recommendation 6: Resource citizen science initiatives and projects supporting environmental policy and EPA goals

The final recommendation for EPAs is focused on promoting a sustained resourcing of citizen science activities. Monitoring schemes and data infrastructure need funding models for long term sustainability, and the investment could eventually be linked to impact indicators (although this is still under research). It is important to explore different options for resourcing, including co-funding instrument with external stakeholders.

Proposed actions:

- **6.1 Search for options to provide resourcing or seed funding** to initiatives or projects either initiated by the EPA or in which EPA is just a supporting partner.

- 6.2 In addition to seed money, consider **additional options and instruments** for covering the upscaling of the citizen science activities. This can entail exploring for example co-funding instruments and building on partnerships to exploit synergies and join up resources.

EPA Ireland is implementing a series of citizen science initiatives in partnership with **the National Biodiversity Data Centre (NBDC)** through funding support for projects covering on "Dragonfly Ireland" (<https://biodiversityireland.ie/surveys/dragonfly-ireland/>) and "Explore your Shore" (<https://exploreyourshore.ie/>) Furthermore, the EPA is also supporting the **GLOBE Programme** in air quality measurement campaigns at schools in Ireland (<https://www.globe.gov/web/ireland/home/overview-of-air-quality-campaign>). Both partnerships are being funded through grants from the EPA as part of the EPA citizen science strategy.

In the Netherlands, an agreement "**Dutch Schone Lucht Akkoord (Clean Air Agreement)**" (<https://www.schoneluchtakkoord.nl/>) has been signed between the Ministry of Infrastructures and Water Management and the local and regional authorities that facilitates funding for coordinated activities that contribute to improve air quality in the Netherlands. Some citizen science activities are benefitting from this agreement, such as SamenMeten (see above) or those carried out together with Globe Netherlands involving schools and young people. More here: <https://www.schoneluchtakkoord.nl/thema/participatie-citizen-science/>.

Recommendations for EPA Network as a whole

This note also includes two recommendations to the EPA Network *as a whole*. The recommendations aim to increase the visibility of the IGCS as a reference group in citizen science and strengthen its role as an incubator and multiplier of citizen science initiatives and monitoring schemes across Europe.

Recommendation 7: Promote the role of the Interest Group as a reference stakeholder group in citizen science for environmental protection and monitoring

Since 2014 the IGCS has conveyed expertise and knowledge on citizen science from a number of EPAs in Europe. The IGCS meets on a regular basis to share practices and to build citizen science networks. The group is thus very well positioned to become a reference stakeholder group in Europe in the context of citizen science for environmental protection, both to provide examples and share good practices across EPAs and to engage and collaborate with other actors at European level on citizen science.

The IGCS recommends the EPA Network the following actions:

- **7.1 Ensure that citizen science entry points and other EPA staff interested in citizen science belong to IGCS** and attend meetings.
- **7.2 Improve coverage of membership** across Europe.
- **7.3 Increase the presence of group members in relevant citizen science events and networks**, and facilitate the engagement with key external stakeholders.
- **7.4 Promote the cooperation between IGCS and other relevant groups in the context of**

*The IGCS can benefit from stronger collaboration with the **Eionet Groups on Communication and Data technologies and digitalization** (<https://forum.eionet.europa.eu/interest-groups?startswith=eionet>). These groups, dealing with communication practices and with cross-thematic work related to data management and data analysis respectively, are very relevant to increase the impact of the activities of the group and raise awareness about the potential of citizen science in the environmental protection context.*

Eionet (European Environment Information and Observation Network) or **ENCA** (European Network of Heads of Nature Conservation Agencies), to exploit the full potential of citizen science in the different interfaces between national and European scale.

Recommendation 8: Team up to support the creation, extension and/or upscaling of citizen science initiatives in priority areas such as those under the European Green Deal

The EPA Network and its IGCS have a potential to become a forum for incubating as well as replicating and scaling-up initiatives already existing at national or regional level to other countries or regions. IGCS can help nurture new initiatives and upscale existing ones, from local, regional or national level to a pan-European scale. Potential activities could be focused on contributing to areas underpinning the European Green Deal ambitions. To facilitate this role, the IGCS recommends the EPA Network the following actions:

- 8.1 Share opportunities for co-funding, **teaming up in proposals** to incubate regional initiatives or upscale local or national ones.
- 8.2 Provide capacity building and other support to **facilitate replication of successful initiatives by other EPAs**.
- 8.3 Use the EPA Network Plenary Meetings to formally **engage EPAs at their highest level** to support and/or join new initiatives.

*IGCS members have collaborated in the past in the joint initiative **CleanAir@School** in which citizens monitored air quality around schools across Europe in 2018 and 2019 using comparable methods (<https://discomap.eea.europa.eu/cleanair/>). This successful experience, on which some EPAs are building for national follow-up activities, proved the value of the group to launch coordinated citizen science initiatives at European level.*

*Another example of a successful replication of activities is EPA Ireland's **Clean Air Together (CAT) project**, mentioned above. This project was inspired by the Curieuze Neuzen project, run in Antwerp in 2016 and in Flanders in 2018 (with the involvement of the Flemish EPA).*

Annex – Mapping of SWD recommendations vs EPA Network recommendations

The table below presents an illustrative mapping between the recommendations put forward by the Commission in the Staff Working Document SWD(2020) 149 final “Best Practices in Citizen Science for Environmental Monitoring” and those present in this note. The mapping does not imply that all the actions included in the European Commission’s recommendations are translated into the recommendations in this note or vice versa, but it rather reflects points of convergence.

Recommendations from the Commission Staff Working Document “Best Practices in Citizen Science for Environmental Monitoring”	Recommendations to the Heads of EPAs included in this note
#1: Pool information on citizen science initiatives, tools and resources to enhance visibility and exchange	#2: Create and maintain an online entry point for citizen science activities in the EPA
#2: Support the creation, extension and/or upscaling of pan-European citizen science initiatives in priority areas under the Green Deal	#8: Team up to support the creation, extension and/or upscaling of citizen science initiatives in priority areas such as those under the European Green Deal
#3: Promote suitable reporting mechanisms, guidelines and methodologies to facilitate the use of citizen science data and information in environmental reporting	#4: Provide guidelines and methodologies to facilitate the use of citizen science data and information in the context of environmental monitoring and reporting
#4: Give visibility and recognition to citizen science outcomes	#2: Create and maintain an online entry point for citizen science activities in the EPA
#5: Raise awareness of citizen science for environmental monitoring and promote it within public institutions	#1: Raise awareness of the potential and opportunities of citizen science within the EPA and overcoming challenges #3: Create a consistent and comprehensive approach towards citizen science within the EPA
#6: Promote the adoption, effective use and transparency of data management and sharing principles, methodologies and QA/QC in citizen science initiatives	#4: Provide guidelines and methodologies to facilitate the use of citizen science data and information in the context of environmental monitoring and reporting
#7: Support the creation of citizen science capacities, reach out to the next generation of citizen scientists and promote the uptake of innovative technologies and approaches	#1: Raise awareness of the potential and opportunities of citizen science within the EPA and overcoming challenges

<p>#8: Seek and promote cooperative approaches and strategic partnerships, enhancing engagement, the societal impact of citizen science initiatives and uptake in environmental monitoring and policy-making</p>	<p>#5: Seek and promote cooperative approaches and partnerships (inc. co-creation of projects with relevant stakeholders)</p> <p>#6: Resource citizen science initiatives and projects supporting environmental policy and EPA goals</p>
<p>#9: Improve EU/national/regional coordination among citizen science initiatives</p>	<p>#7: Strengthen the Interest Group as a reference stakeholder group to discuss citizen science in the context of environmental protection</p> <p>#8: Team up to support the creation, extension and/or upscaling of citizen science initiatives in priority areas such as those under the European Green Deal</p>