

Citizen Science

20 Projects to promote the city



Ajuntament
de Barcelona

Citizen Science

20 Projects to promote the city

Published by:
Culture Institute, Barcelona City Council

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Editorial Coordination
Barcelona Lab's Citizen Science Office with the support of RecerCaixa for the "Citizen Science: Research and Education" project

Design and Layout
Tactica Grafica, sl

Printed by
Galera

Photography
Courtesy of the projects that have taken part in this edition
D.L.
xxxxxxx

Thank you to all of the Citizen Science projects that have taken part in this edition

For more information see the following websites:

www.barcelonacultura.bcn.cat
www.barcelonalab.cat
www.bcn.cat/publicacions



Ajuntament de Barcelona

Citizen Science

**Knowledge created
by the people for
the people**

Welcome to Citizen Science, scientific research that is only possible with the cooperation of hundreds of people like you.

Citizens play a key and essential part in the data gathering for this research and the city becomes one enormous laboratory. The aim? To create knowledge by the people for the people. For example: analyse Barcelona's biodiversity based of geolocalised photographs; create a real-time observatory of the condition of the seabed with the participation of volunteers, or control the tiger mosquito thanks to a mobile app that citizens use to upload information about the presence of this invasive species.

The Department of Creativity and Innovation's commitment to this type of research began in 2012, when BarcelonaLab, the collaborative platform that promotes innovation and creativity, created the Citizen Science Office. This office implemented the first experiments and pilot projects at the Science Festival and DAU Barcelona together with different research groups and institutions. It also helps many other groups to share experiences and improve strategies that encourage citizen participation in scientific research. Recently, the research groups that founded the Office have received financing from RecerCaixa, a prestigious research programme of the "laCaixa" Banking Foundation and the Association of Catalan Public Universities. Barcelona's Culture Institute has also received the support of the FECYT to promote the Office.

In this booklet you will find twenty or so of the citizen science projects that are currently in progress in the city of Barcelona, some of which are promoted by the Office. To submit projects to the Office just follow the Decalogue of Good Practices that you will find in this publication. The Office's mission and that of this booklet is to disseminate and cover all of the city's citizen science, by involving scientist citizens and also raising awareness of this new scientific discipline and encouraging the creation of new projects.

For some, citizen science may appear to be simply another experiment or a trend, but its international success endorses it. Various research projects on astronomy or molecular biology have obtained surprising results thanks to citizen science and have been published in journals such as Nature and Science. The new science, which stems from citizens and not only from universities or research centres, is here to stay and is in fact a necessity. The parameters have changed. Now, science and citizens unite to create knowledge and, with this knowledge, facilitate governance and decision making.

Decalogue of BCNLab's Citizen Science Office.

Citizen science is understood to be scientific research carried out, partially or completely, by amateur or non-professional scientists.

Any group wishing to belong to the Office must assent to the following points and be accepted by members of the Office:

1. Projects that will be accepted must involve the creation of new knowledge with the active participation of citizens in at least one stage of the research process. Valid projects under this framework must consider citizens a vital part for the realisation of the proposed research. In return and with the purpose of providing a seal of quality to the Office's projects, these will be posted on the website and included in the Office's catalogue, with a photo, a brief description and a link to the project's website.

2. The projects undertaken must comply with one of these four levels of citizen participation:

Level 1. Crowdsourcing. Citizens gather or process data.

Level 2. Distributed intelligence. Citizens interpret data.

Level 3. Participatory science. Citizens participate in the definition of problems, challenges, objectives and in the collection of data.

Level 4. Collaborative science. Citizens design, together with scientists, the research to be carried out. This research must have a direct impact on the immediate environment of the citizens and could motivate very specific actions in the city.

3. The field of action must be in some way limited to within the Metropolitan Area of Barcelona.

4. Participating research groups must share and promote the following resources with the citizen science community:

a. Volunteer census. Each group must inform its volunteer scientists that the project is part of the Citizen Science Office and invite them to register on the census of volunteer scientists on the Office's website. The census may be used to communicate the respective projects.

b. Visibility of the Office. On each project website the group will have the right and the obligation to include the Citizen Science Office's logo. Therefore each project can benefit from the seal of quality that belonging to the Office portrays and which at the same time contributes to disseminating its existence.

c. Data resulting from the experiments. Access plans and protocols must be established that are practical and capable of creating a common repository of open and accessible data.

d. Programming codes. The programming codes must be accurately documented (establishing plans and protocols) in order to create a common repository.

5. All citizens participating in experiments and field work must be notified of the results of their research, preferably before anyone else. The Office will help to disseminate these results.

6. The projects must combine strict research with communication actions integrated in the activity and do so organically. The aim is to bring the results and process of the research closer to

non-expert citizens. Responsible Research and Innovation (RRI) standards, promoted by the European Union, will be adhered to.

7. In so far as possible, the projects must obey a policy of open data and open code and must follow Creative Commons licenses.

8. On the basis of a sustainable scientific activity, participating groups are committed to searching for common experimental platforms, be they common tools (software and widgets) or experiments designed on the same basis.

9. Participating groups undertake to notify the other groups about the status of their projects and their interests on a bimonthly basis. The Office must notify, facilitate and share opportunities for new experiments with all of the participating groups. The aim is to create an environment of trust that is collaborative and non-competitive. Meetings will be held every six months with all of the members of the Office to promote networking and participatory governance.

10. Multidisciplinary practices will be encouraged so that citizens can experiment with as many disciplines as possible, at least two, at the same time endeavouring that the research has a social and social-environmental impact and is capable of providing guidelines for public policies at a local and national level.

Citizen Science: Research and education

Promoting Institution:

OpenSystems, Universitat de Barcelona

Collaborating/financing institutions:

Freshwater Ecology and Management Research Group, Universitat de Barcelona

Seawatchers, Institute of Marine Sciences-CSIC

Movement Ecology Lab, Centre for Advanced Studies of Blanes-CSIC
Point of Information on Aerobiology (PIA), Universitat Autònoma de Barcelona

RecerCaixa

Citizen Science Office of BCNLab
Department of Creativity and Innovation, Barcelona Institute of Culture



Thanks to a RecerCaixa grant, we propose the practice of citizen science as an innovative mechanism for learning about science, technology and mathematics. Citizen science, which is booming in the English-speaking world, engages the public in tasks of scientific research. It seeks to share the method, data collection and results with a broad spectrum of the population thanks to new technologies and smartphones. The project aims to improve the basic scientific training of the population, the sustainable management of resources and spaces and, ultimately, the acquisition of responsible habits and attitudes towards our everyday environment. Five research groups from Catalonia belonging to very diverse scientific areas, which already practice citizen science but wish to increase its impact by sharing resources and experiences, collaborate in this project. The initiative also has the support of the Department of Creativity and Innovation of Barcelona City Council. ●

Project website:
www.ub.edu/opensystems/ca/site/project/19

Contact email:
opensystems@ub.edu



Bee-Path, experiments on human Mobility



Promoting Institution:

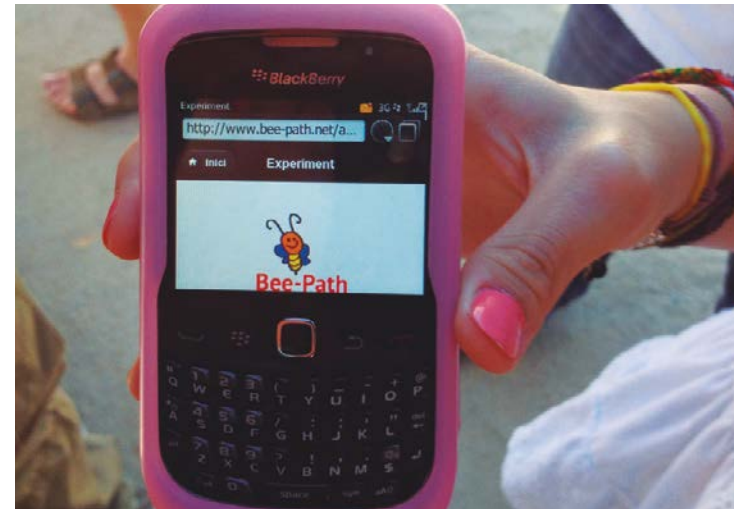
OpenSystems and Complexity Lab
Barcelona, Universitat de Barcelona;
Movement Ecology Lab (CEAB-CSIC and CREAM)

Collaborating/financing institutions:

Citizen Science Office of BCNLab
The Culture Institute of Barcelona (ICUB), Barcelona City Council
The Spanish Foundation for Science and Technology (FECYT)
RecerCaixa
Secretariat for Universities and Research, Generalitat de Catalunya

Bee-Path is a tool for studying human mobility by recording it on a mobile device application. The application is activated in specific contexts. It offers an automated analysis of the user's type of mobility and proposes mathematical models to explain the observed phenomena, capable of predicting mobility in certain contexts. Bee-Path is the result of the work of a multidisciplinary team that includes physicists, biologists and artists.

Bee-Path is carried out with the direct, voluntary and conscious participation of citizens. The participants donate their data to make the research possible. Direct communication is maintained with users and makes the research results available to them. It also offers the open code and data of the experiments to those who wish to make use of the resources generated. ●



Project website:
www.bee-path.net
Contact email:
opensystems@ub.edu

AtrapaelTigre.com

Promoting Institution:

Centre for Advanced Studies of Blanes
of the Spanish National Research
Council (CEAB-CSIC)
Sciences of the Spanish National
Research Council (ICM-CSIC)

Collaborating/financing institutions:

Centre for Research on Ecology and
Forestry Applications (CREAF)
Universidad de Murcia
The Spanish Foundation for Science and
Technology (FECYT)
RecerCaixa
"laCaixa" Foundation
Bloom
And many others. See the website for
the full list

AtrapaelTigre.com offers the opportunity to participate in the monitoring and research of the Asian tiger mosquito through the App, Tigatrapp. The tiger mosquito is an urban and vector-borne invasive species. Citizens can participate by providing possible sightings of adult tiger mosquitoes and potential breeding sites in public spaces. Data is published in real time on a website map. The project also aims to develop methodologies to validate and integrate citizens' data with that from active surveillance in order to advance in the study of the spread of this species in Spain. In addition, we are working to integrate citizens' information within existing monitoring and control programs. In 2014, the participation of citizens allowed Asian tiger mosquitoes to be detected for the first time in Andalusia and in the Catalan Pre-Pyrenees region. •



Project website:
atrapaeltigre.com
Contact email:
info@atrapaeltigre.com



Seawatchers

Promoting Institution:

Institute of Marine Sciences (CSIC)

Collaborating/financing institutions:

The Spanish Foundation for Science
and Technology (FECYT)
RecerCaixa
Others: see web

Seawatchers is focused on establishing the current health status of the ocean and promotes initiatives to reverse the current degradation trend of the Mediterranean Sea. The project's ambition is to convey the huge potential of observations and take advantage of the knowledge of the diverse groups of citizens that interact with the sea. The project is based on a platform open to everybody and dedicated to the large-scale and long-term observation of key processes related to on-going research, such as climate change, the arrival of invasive species, jellyfish blooms or the accumulation of plastics. The permanent dialogue between scientists and citizens based on the validation of observations aims to generate new joint results and is available to everyone on the website. The online platform offers resources to facilitate the observations made by citizens (identification guides, workshops, etc ...) and allows results to be tracked (real time maps). •



Project website:
www.observadoresdelmar.cat
Contact email:
observadoresdelmar@icm.csic.es



RIU.net

Promoting Institution:

Freshwater Ecology and Management (F.E.M) Research Group, Universitat de Barcelona

Collaborating/financing institutions:

The Spanish Foundation for Science and Technology (FECYT)
RecerCaixa
The Culture Institute of Barcelona City Council

RIU.net is an interactive education tool that enables the ecological quality of river ecosystems to be evaluated. In addition, it provides experts and the general public with scientific data.

Using a mobile phone, RIU.net provides users with a diagnostic protocol for determining the health of a river which at the same time teaches them about rivers, the types that exist, the problems that humans cause and, particularly, which organisms live in them, how they are grouped and classified, the level of pollution they are able to tolerate, etc.

The data gathered will allow future scientific studies with diverse aims to be developed. For instance, discovering in more detail the distribution of aquatic invertebrates or identifying which parts of a drainage basin are in a better ecological condition. Moreover, if there is an isolated pollution problem, the app could be very useful as it enables a non-expert user to quickly and autonomously evaluate the effects. ●



Web del projecte:
www.riu.net
Contacte:
pfortuno@ub.edu



Flora urbana i al·lèrgies, cooperes?

Promoting Institution:

Point of Information on Aerobiology-Universitat Autònoma de Barcelona (PIA-UAB)

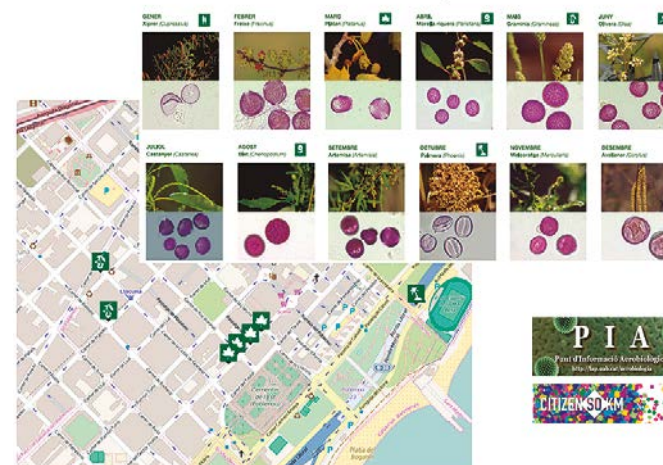
Collaborating/financing institutions:

CitizenSQKm
RecerCaixa

PIA-UAB focuses on the study of airborne pollen and spores and their allergens, offering a public information service on the biological air quality to medical specialists, citizens who have allergies and the general public through its own web portal on PIA. "Flora urbana i al·lèrgia, cooperes?" is a project in which citizens are the focal point of the research. They have the opportunity to collaborate providing data through a mobile app. Two specific activities are proposed: a) citizens inform about the ornamental plants they find in their surroundings that can cause allergies and their phenological stage, and b) citizens suffering from allergies send daily information about how they feel and their symptoms. This project complements the work at PIA-UAB, helping to better understand the relationship between environment and allergies and to improve quality of life. ●



FLORA URBANA I AL·LÈRGIA, COOPERES?



Project website:
lap.uab.cat/aerobiologia
www.citizensqkm.net
Contact email:
Jordina.belmonte@uab.cat
Concepcion.delinares@uab.cat



Urban Bees: OpenBeeResearch

Promoting Institution:

OpenSystems, Universitat de Barcelona

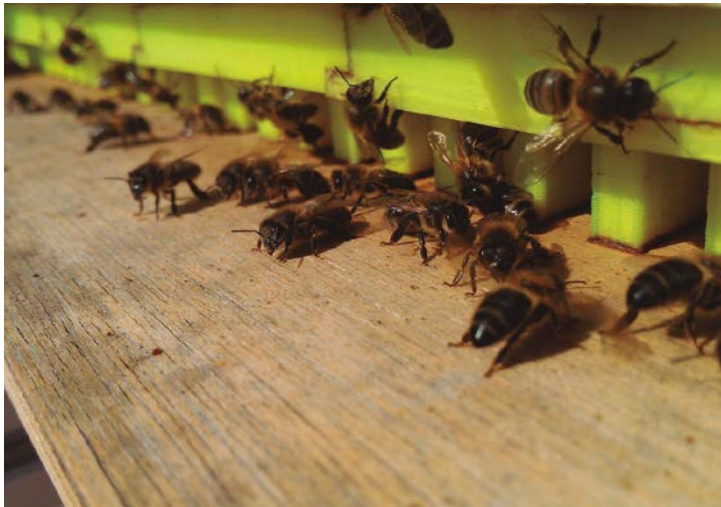
Collaborating/financing institutions:

Citizen Science Office of BCNLab
Culture Institute of Barcelona (ICUB) -
Barcelona City Council
Museu de Ciències Naturals de
Barcelona
Mel-lis
FP7 European Project Societize

Humanity's fascination for bees is nothing new. Bees' sensitivity to the smallest environmental changes, their ability to produce a variety of valuable products and the complexity of a colony's organisation, similar to the organisation of human society, has led us to think about, reflect upon and develop research on bees in a different way. This project allows us to provide a framework in which a variety of different disciplines and actors can meet and take part in a satisfactory and synergistic work to better know how a bee colony behaves in an urban context. "OpenBeeResearch" aims to unite scientific experts, artists, and different actors from civil society (e.g. beekeepers, environmentalist, gardeners, architects and policy makers at city level) in collective work, creative activities and research, where bees and beehives are the main characters and the city is the scenario. •



Project website:
openbeeresearch.org
Contact email:
opensystems@ub.edu



Games for understanding human behaviour

Promoting Institution:

OpenSystems, Universitat de Barcelona

Collaborating/financing institutions:

Board Games Festival DAU Barcelona
Institute for Biocomputation and
Physics of Complex Systems,
Universidad de Zaragoza
Complex Systems Interdisciplinary
Group, Universidad Carlos III de Madrid
Citizen Science Office of BCNLab
Universitat Rovira i Virgili
The Spanish Foundation for Science and
Technology (FECYT)

The aim of the project is to investigate the rational behaviour of each individual in relation to his or her own benefit and to the collective benefit, as well as the decision making mechanisms. To do so, collective experiments designed as games using digital platforms are developed that can be used at public events such as the DAU Gaming Festival Barcelona. Once the game is over, the players receive a personalized diagnosis of their behaviour.

Since 2012, participants have been able to play different games, presented in a fun way, such as for example "Mr. Banks, the stock market game" or "Doctor Brain, the mad psychoanalyst". The games also represent experiments that can have a big scientific impact, as shown by a paper recently published in Nature Communications based on the results of the 2012 experiment. •



Project website:
www.ub.edu/opensystems/ca/site/project/3
Contact email:
opensystems@ub.edu

The OBSEA Citizen Science Project

Promoting Institution:

Universitat Politècnica de Catalunya (UPC)
Mediterranean Centre for Marine and Environmental Research (CMIMA-CSIC)

Multiparametric seafloor observatories connected to shore for real-time data transmission represent a frontier in marine technology with important societal implications for environmental monitoring and conservation. Here, we present a Citizen Science project with the OBSEA video-observatory of Vilanova i la Gertrú at 20 m depth. A biodiversity survey is conducted by citizens (students and divers), helping to classify and count fish using different digital products (time-lapse images and footages). The objective is to track fish assemblage changes in relation to meteorology, the day-night cycles of species and seasonal behaviour. Accordingly, a protocol for web-based species identification is implemented, supervised by scientists, in order to evaluate the different performances for each group that participates in the project. 🌟

Project website:
www.obsea.es («Citizen Science»)
Contact email:
joaquin.del.rio@upc.edu
jaguzzi@cmima.csic.es



BioBlitzBcn: Citizen Science and Biodiversity

Promoting Institution:

Museu de Ciències Naturals de Barcelona

Collaborating/financing institutions:

Urban Habitat, Barcelona City Council
The Barcelona Natural Science Museum
Friends Association

A BioBlitz is an exhaustive search of species in a given area during a limited time. The research is carried out with the help of students from schools, volunteer groups and other participants, and is assessed by biologists. BioBlitz initiatives emerged from the need to inventory and monitor biodiversity, a task that requires a significant amount of fieldwork and the participation of many people. During the activity, naturalists, scientists and volunteers work together with the general public and school groups to create a snapshot of biodiversity. Barcelona organizes a BioBlitz each year and since 2010, 2 083 people have participated with over 1 500 species identified. Outdoor events like BioBlitz can help make society more aware and committed to nature through a structured activity that invites exploration and discovery. 🌟

Project website:
bioblitzbcn.museuencienies.cat
Contact email:
bioblitzbcn@museuencienies.cat



iNaturalist, a platform for nature lovers

Promoting Institution:

Centre for Research on Ecology and Forestry Applications (CREAF)

Collaborating/financing institutions :

The Spanish Foundation for Science and Technology (FECYT)

For the last two years, CREAf has been working on the adaptation and improvement of the citizen science platform "iNaturalist". iNaturalist, which also has an application for mobile devices, is a tool that allows citizens to register and manage their observations in nature, and also to be in contact with other naturalists from around the world. The initiative provides data to global biodiversity databases. CREAf has translated the platform into Catalan -among other languages-, and is now working with various groups to introduce and test iNaturalist in different case studies. Among these groups is a school from Barcelona that will carry out an "Urban Biodiversity" project, and also a research group interested in the biodiversity of Barcelona and its surroundings, monitoring the mortality of trees. •

Project website:
inaturalist.org
Contact email:
bernat.claramunt@uab.cat

Benvinguts!
iNaturalist.org et convida a utilitzar aquest portal d'informació sobre biodiversitat on podràs compartir el que observes en la natura, aprendre de la natura i intercanviar informació amb altres naturalistes.

Informa-te'n més »
Afegeix observacions

Registres recents

- Small Cranberry**
Persona: tiggex
Data: June 8, 2008
Data afegida: 12 març, 2015
Mostra »
- Zaedyus pichiy**
Persona: gullie
Data: November 17, 2009
Data afegida: 12 març, 2015
Mostra »

SacaLaLengua, the oral microbiome project

Promoting Institution:

Centre for Genomic Regulation

Collaborating/financing institutions:

"laCaixa" Foundation
Severo Ochoa
Illumina
Eppendorf

The project SacaLaLengua aims to study the variety of microorganisms that live in our mouths, specifically bacteria and fungi. One objective of the project is to define whether this diversity is related to factors connected to the environment and/or our lifestyle. From the start, the project has involved 40 schools and colleges located throughout Spain. A total of 2 000 high school students are participating by providing saliva samples and personal data. In the first phase of the project, everyone is welcome to formulate hypotheses to be examined in the future: these hypotheses are proposed via the project website. Once the samples have been sequenced (by 15 September, 2015) all the data will be publicly released for "citizen" bioinformatics and statistical analysis. In other words, resources will be made available to everyone. Individuals will be encouraged to contribute to the analysis by learning basic tools of bioinformatics. •



Project website:
www.sacalalengua.org
Contact email:
sacalalengua@crgeu

FLOOD_UP

Promoting Institution:

University of Barcelona
Center for Research, Innovation and
Knowledge Transfer in Terrestrial
Ecology (CREAF)

Collaborating/financing institutions:

The Spanish Foundation for Science and
Technology (FECYT)
Technical University of Madrid
Ebro Observatory-URL-CSIC
ISAC-CNR (Italy)
DRIHM (FP7 UE)
Distributed Research Infrastructure for
Hydro-Meteorology)
HyMeX Project

The FLOOD_UP project aims to improve the population's knowledge and awareness about floods and heavy rains and the science behind them. In this project citizens can participate with pictures of floods, their effects, high water marks or other related topics, such as places at risk of flooding. The photos and associated information will be collected through a mobile application. Contributions will be shown on a map via an online platform. This platform also includes other contents about floods: their research and their relationship with the environment.



Project website:
www.floodup.ub.edu
Contact email:
floodup2@gmail.com



Km2 Poblenu

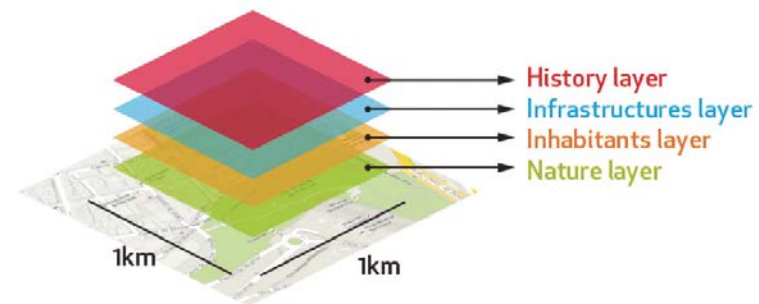
Promoting Institution:

Itinerarium

Collaborating/financing institutions:

IGOPnet (UAB)
Centre for Research in environmental
epidemiology (CREAL)
OpenSystems (UB)
Point of Information on Aerobiology
(UAB)
Associació de Veïns del Poblenu
Escola Les Acàcies
Escola Vila Olímpica
Institut Poblenu
Institut Salvador Espriu
Others, visit our website for a full list

km2 Poblenu is an educational, journalistic, scientific and public management initiative. It is a map in which participants make a census of what is in the Sant Martí district of Barcelona. Public, private, local, educational and research organizations participate in it, designing paths to invite citizens to share information and knowledge. One of the paths for participating is a collaborative scientific experiment to find the best way to get from home to work or school. It takes into account several intangible variables such as air and noise pollution; mobility and physical activity; the presence of allergenic plants and green spaces; the historical or cultural value of the buildings; the presence of shops or human activity. Participants collect data to determine their best way home, but also to provide research for various scientific projects.



Project website:
blog.citizensqkm.net
Contact email:
km2poblenu@gmail.com



Cicada.cat

Promoting Institution:

Research Group in Animal Biology,
University of Girona

Collaborating/financing institutions:

ornitho.cat (Catalan Institute of
Ornithology)

The initiative cicada.cat is a project aimed at generating knowledge about cicadas (Cicadidae); those noisy insects typical of Mediterranean warm summer days, and disseminating it in an attractive way. The associated website, started in June 2014, is the most visible example of the project. cicada.cat's main goal is to increase interest in the observation and conservation of cicadas in Catalonia. To this aim, it provides tools for the recognition of species, shows distribution maps and striking information on their biology and ecology, and also responds to inquiries. Moreover, cicada.cat encourages citizen participation through the collaborative platform ornitho.cat. Citizens upload cicada observations, which may be accompanied by photographs, videos or other information in Google Maps. In the first two months of activity of the platform, data has been received from many observers, greatly expanding knowledge on the distribution of this group of insects and even discovering a species never before mentioned in Catalonia. ●



Project website:
www.cicada.cat
Contact email:
cicada.cat@gmail.com



Ornitho.cat

Promoting Institution:

Catalan Ornithological Institute

Ornitho gathers observations of wildlife, mainly birds, but also includes other groups such as bats, butterflies, dragonflies and others. More than 2 500 users input more than half a million observations each year and it is estimated that 30 000 different users visit the website and use the data. Users can search the database and filter data by date, location, species and generate distribution maps plus many other customized outputs. ●

Project website:
www.ornitho.cat
Contact email:
abeljulien@gmail.com



Virtual Biodiversity

Promoting Institution:

Non-profit association "Fotografía y Biodiversidad"

The project objective is to build a biodiversity database with the collaboration of citizens through georeferenced photography. Citizens take pictures of all the flora and fauna they see, and they upload it to the platform. There, specialists in several areas identify the images, organizing them in a Taxonomic Bank. Periodically "testing BV" are organised, field activities free and open to everyone, where a group of people gather to take photos of the highest number of species in an area. Despite being a project without boundaries, local actions are the ones that fill the image galleries each day. For example, the project's participation in the Bioblitz-2014 photographed 235 taxa. It is currently on the verge of reaching a total of 120 000 images of Barcelona and surroundings. 🌱

Project website:
www.biodiversidadvirtual.org
Contact email:
contacto@biodiversidadvirtual.org



BeWater: Society adapting to global change

Promoting Institution:

Center for Research, Innovation and Knowledge Transfer in Terrestrial Ecology CREAM

Collaborating/financing institutions:

Cyprus Institute
ECOLOGIC Institute
Europe for Business
EFI
INRGREF
IZVRS
JRC
Prospex
GWP-Med
Anbessa
Corporation Blue
Deep Blue Consultants
EU, Seventh Framework Programme

BeWater promotes dialogue and collaboration between science and society for sustainable water management and adaptation to the impacts of global change in the Mediterranean.

In four Case Study of River Basins (Rmel, Tunisia; Tordera, Catalonia; Vipava, Slovenia and Pedieos, Cyprus), methodologies integrating physical, ecological, social and political perspectives are used to develop innovative governance strategies with local communities.

BeWater establishes a specific, long-lasting, bidirectional interaction relationship between scientists and local societies throughout the different phases of the project: diagnosis, development of management options, impact assessment and results evaluation. In all these phases, citizens actively engage and contribute with their knowledge to the development of the project.

The final outcome of BeWater will be adaptation plans to the global change in the management of water, created together by scientists and citizens. 🌱



Project website:
www.bewaterproject.eu
Contact email:
a.sanchez@creaf.uab.cat

