Fresh Water Quality and Riparian Vegetation Monitoring by Citizen Science Activities.

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www.osservatoriocitizenscience.org

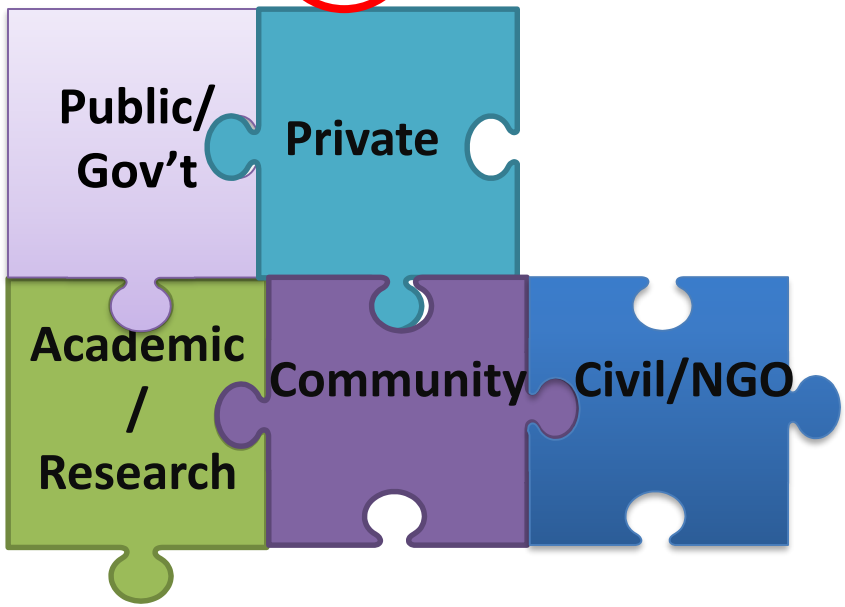
Citizen Science Osservatorio

Fondazione Flaminia Centro per l'Innovazione

FreshWaterWatch

CITIZEN SCIENCE - CROWDSOURCING DATA MANAGEMENT OPPORTUNITIES

- ***The opportunities***
  - *Meeting global goals*
  - *Creating new partnerships*
  - *Addressing local priorities*
  - *Creating informed communities supporting policy and resource management*



MAIN AIM OF CITIZEN SCIENCE

Conservation and restoration of local territory

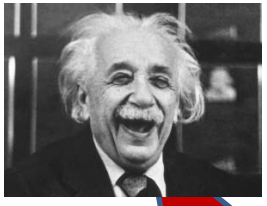
Science: large number of data for warning monitoring

Society: more knowledge increases the correct perception of the environment and increase sustainable behavior.

Moreover: Opportunity to carry out long-term monitoring

DEFINING CITIZEN SCIENCE

Active integration process self sustaining



CHALLENGES OF THE CROWDSOURCING DATA MANAGEMENT

- ***The challenges***
  - ***Quality control, scale and prevention***
  - ***Combining multiple information streams***
  - ***Continuity and engagement***

FRESH WATER QUALITY MONITORING

www.osservatoriocitizenscience.org

EARTHWATCH INSTITUTE

FreshWaterWatch

FONDAZIONE FLAMINIA
CENTRO PER L'INNOVAZIONE

Discovery

To know your surrounding, to take part in solution processes

Collection

Collect scientific data useful for research and monitoring aims

Discussion

Starting from training, an ongoing relationship with experts

PARCHI DEL DUCATO

PARCO DELTA DEL PO
EMILIA-ROMAGNA

comune di SAN LAZZARO DI SAVENA

APS Amici dei Parchi di Monteveglio e dell'Emilia

CEAS R.A21
multiCentro CEAS
Educazione Ambiente Sostenibilità
Ravenna - Agenda21

GLOBAL COMMUNITY

FreshWaterWatch

FWW PROJECT
FRESH WATER QUALITY MONITORING

1. TRAINING (safety, robust methods, consistency)

2. FIELD DATA COLLECTION

3. EXTERNAL and AUTOMATED QUALITY CONTROL

4. FEEDBACK and CONTINUOUS LEARNING

REGISTERED USER (ONLY)

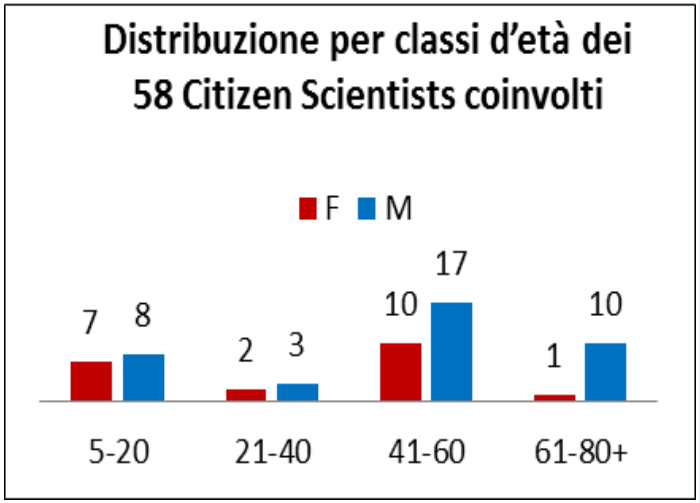
1-TRAINING

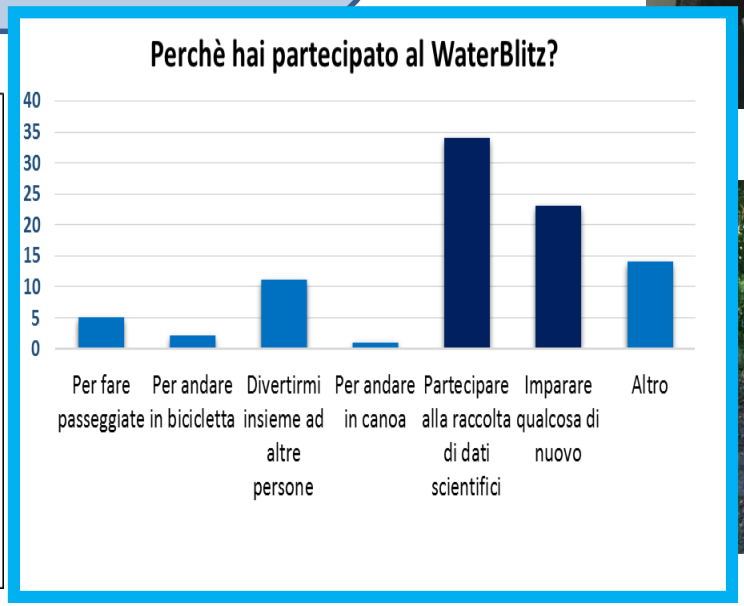
NOT ONLY TRAINING, BUT MEETING AND KNOWLEDGE AS WELL

Questionnaires:

PARTICIPANTS CHARACTERIZATION

ENVIRONMENT PERCEPTION BEFORE AND AFTER

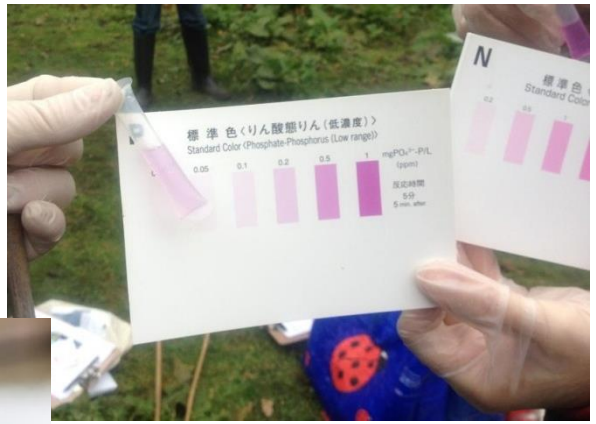


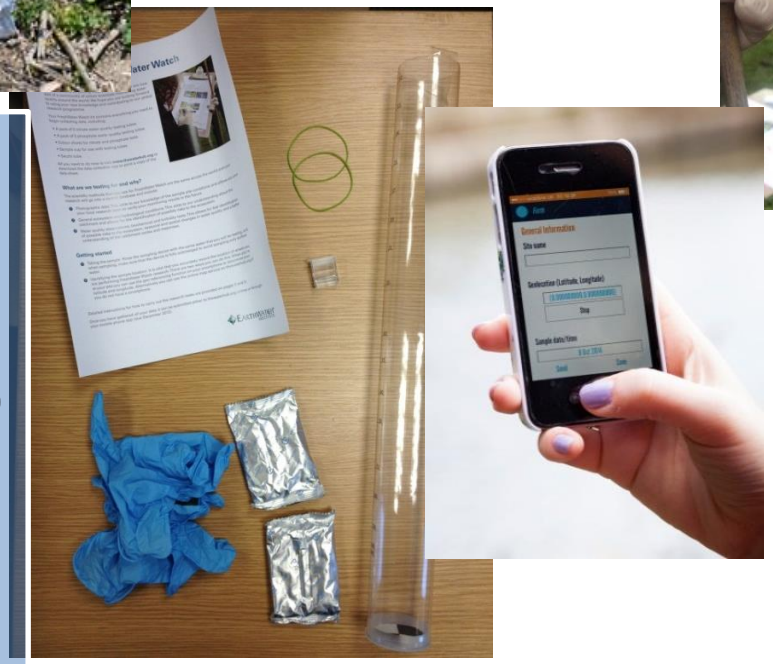


2-FIELD DATA COLLECTION

Ecosystem condition/land use:

- Bank Vegetation
- Wildlife presence
- Pollution sources





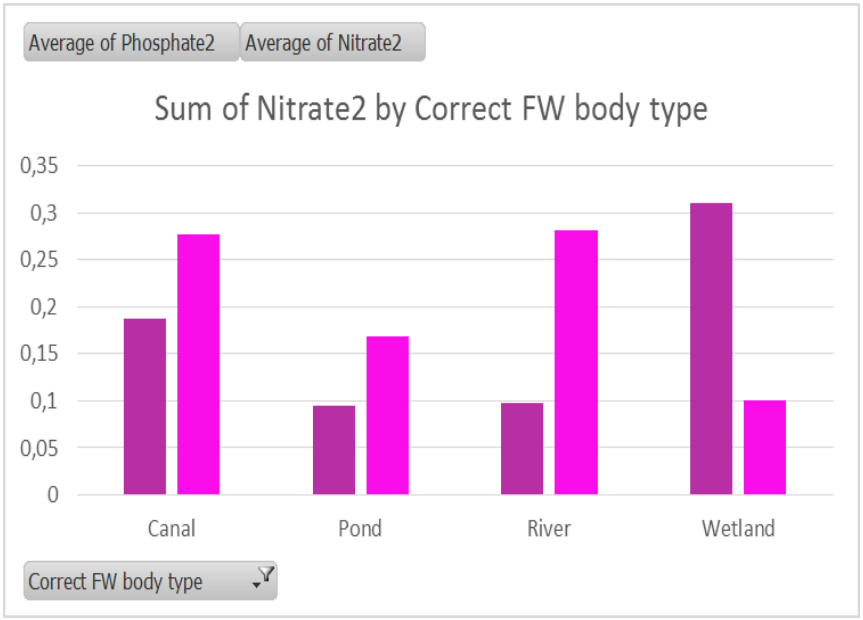
NUTRIENTS

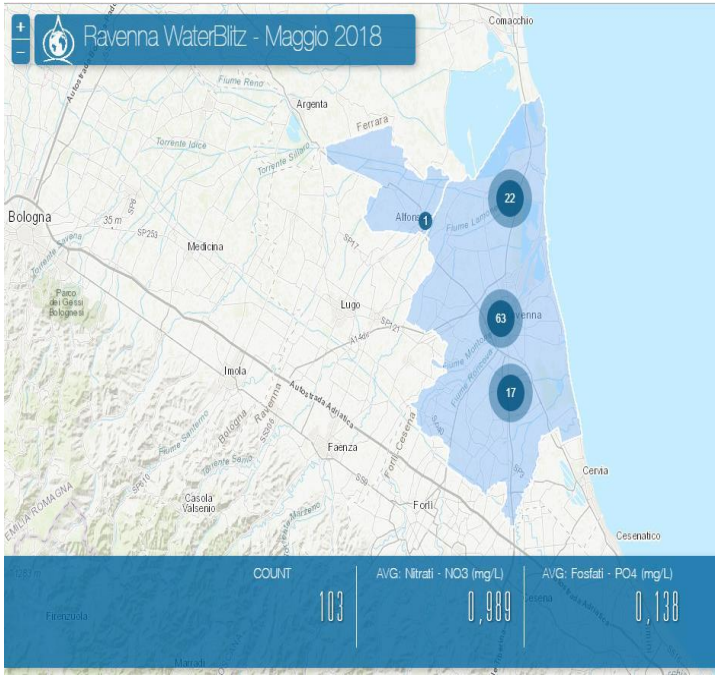
- Nitrate (NO3)
- Phosphate (PO4)
- Turbidity
- Algal Blooms

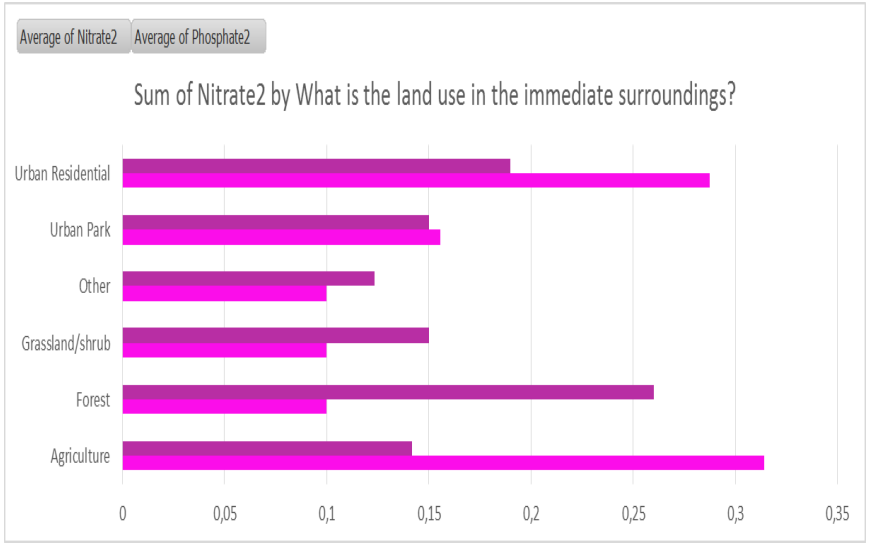
Water conditions

- Water Level/speed
- Water color
- Litter

3-DATA ANALYSIS AND FEEDBACK







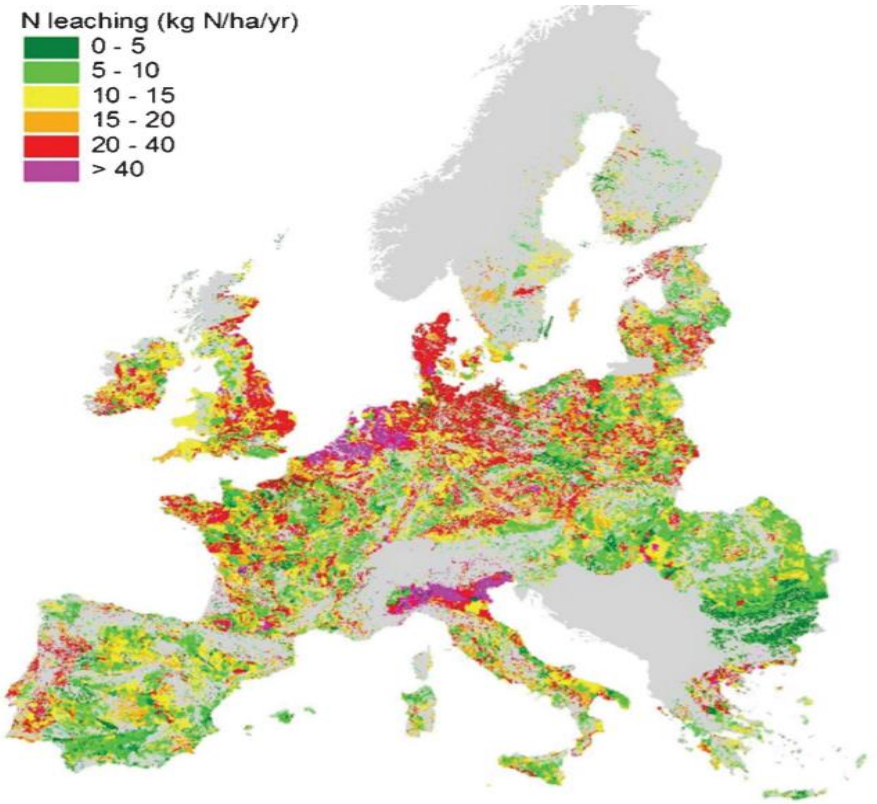
basso	NITRATI < 0,5 mg/l FOSFATI < 0,05 mg/l
medio	NITRATI tra 0,5 e 2 mg/l FOSFATI tra 0,05 e 0,1 mg/l
alto	NITRATI > 2 mg/l FOSFATI > 0,1 mg/l

WHY NITRATE AND PHOSPHATE?

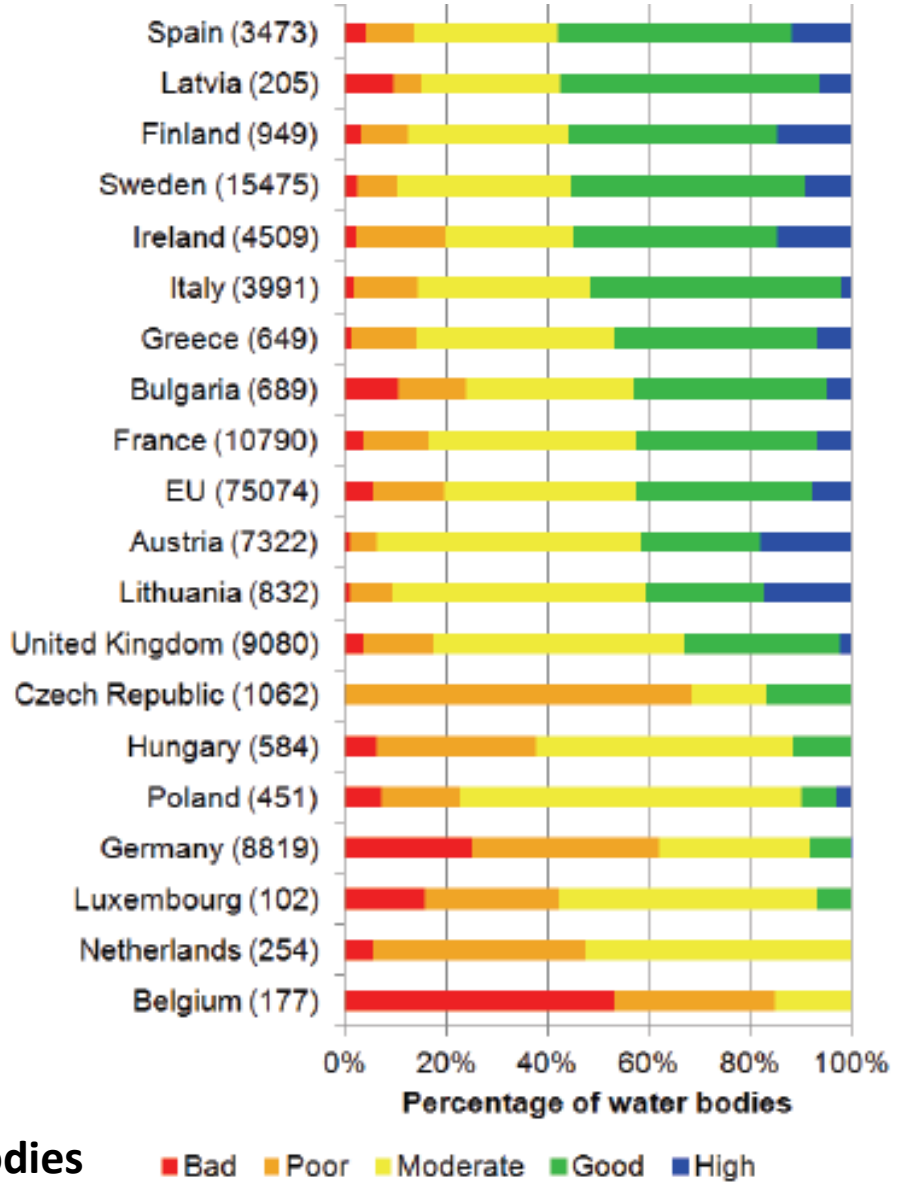
SALUTE PUBBLICA

EUROFIZZAZION

MEETING GLOBAL GOALS: WFD 2000/60



Getting Europe 's waters cleaner
Getting the citizens involved.

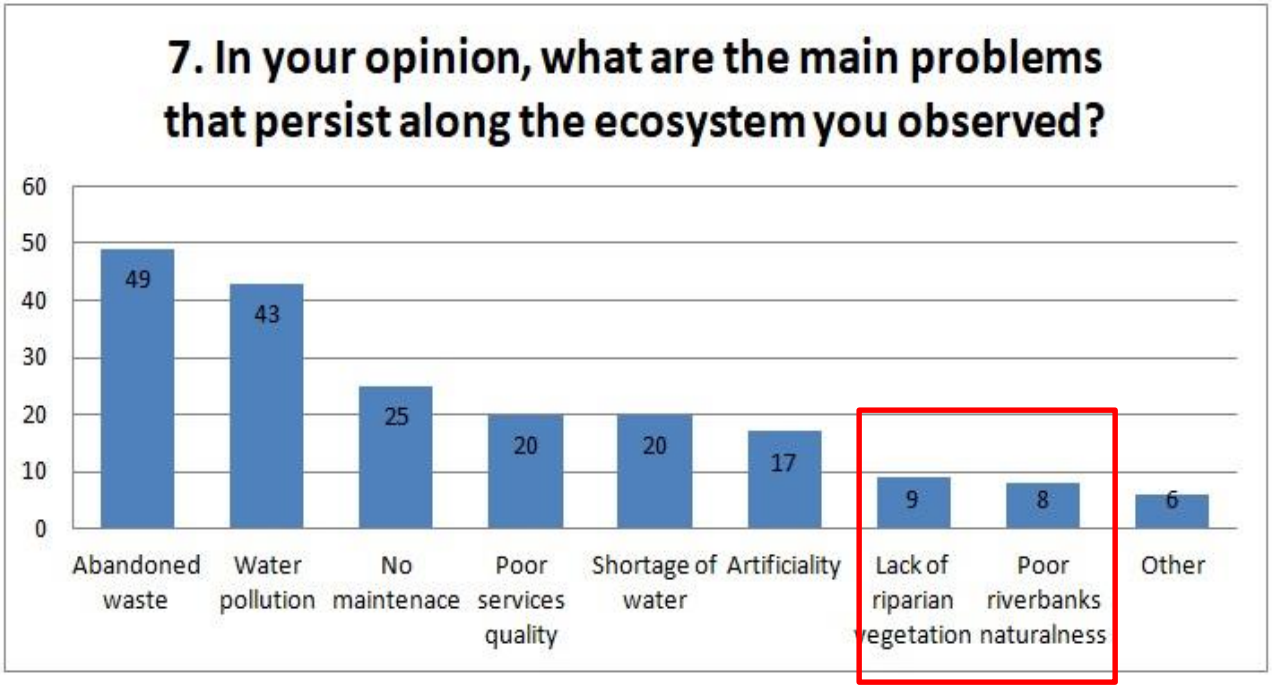


Ecological status of waterbodies

SOCIETY PERCEPTION

From previous experiences of Citizen Science (CS) in Italy, citizens' observations make it clear that absence of riparian vegetation and poor bank naturalness are not feel as a problem. Citizens ignore the importance of riparian vegetation and often they perceive natural vegetation near the river as dangerous and dirty.

Di Grazia 2018



walking paths

Cycle paths

OBJECTIVES

1 - Disseminate knowledge and awareness about Riparian Vegetation value in human society.

2 - From the scientific point of view, this monitoring can be integrated with remote sensing surveys by the identification of target species: not only hygrophylous but also invasive, nitrophilous, mesophilous species.

3 - Improve our knowledge on the "*riparian land drying*" process that riparian vegetation are suffering all over the world

SMARTPHONE APPLICATION CONTENTS

- **MINITORING SITE** is about 10x10 m but it is possible to change it

- **GEOGRAPHIC AREAS**:
- Plain from 0 to 150m
- Hill from 150 to 800m

App developed using Survey123 for Arcgis standard XLS forms

- **STRUCTURE**:
- trees, shrubs, herbaceous or mix

The APP was developped by Cristian di Stefano (ISPRA)

- **THREE LAYERS**:
  - Trees;
  - Shurbs from 1 to 3 m;
  - Herbaceous lower than 1 m.

- **VEGETATION COVER**

SMARTPHONE APPLICATION CONTENTS

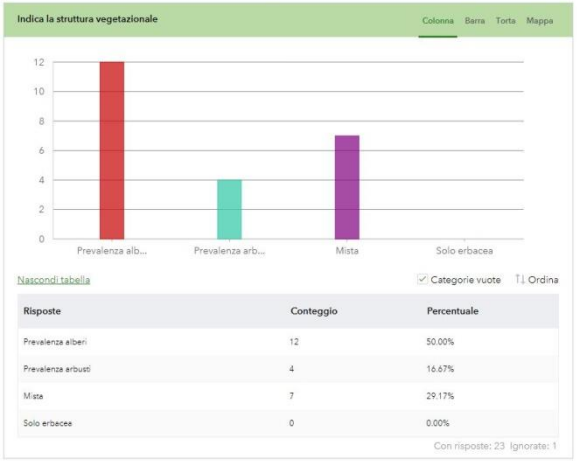
- **EACH LAYER**:
average tree height, coverage;

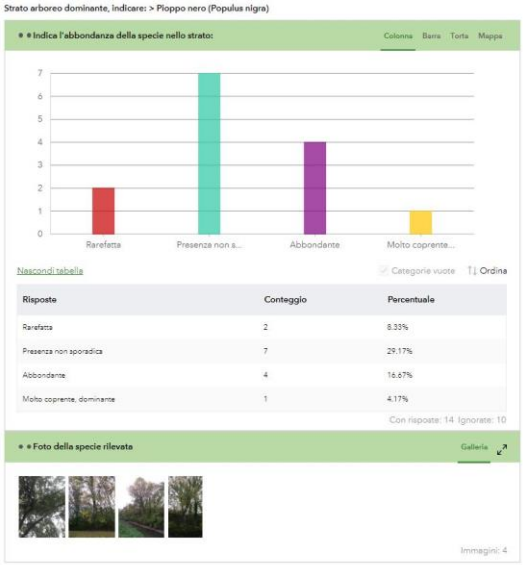
- **SPECIES TARGET EASY TO IDENTIFY** and 4 class of coverage

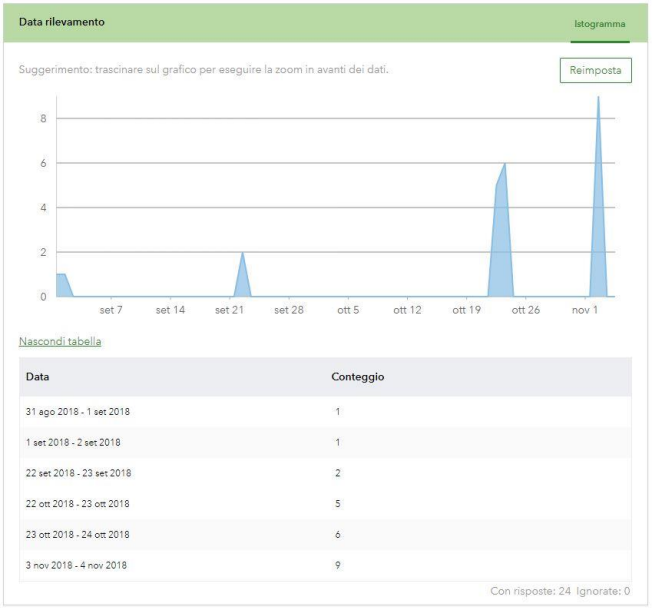
  - hygrophilous, (*Populus nigra*, *Populus alba*, *Salix alba*, *Alnus glutinosa*;
  - invasive species (*Robinia pseudoacacia, Ailanthus altissima, Amorpha fruticosa*, *Rubus* sp.);
  - good indicators (ex. Nitrophilus or mesophilus): *Urtica sp., Fraxinus ornus, Quercus sp.*

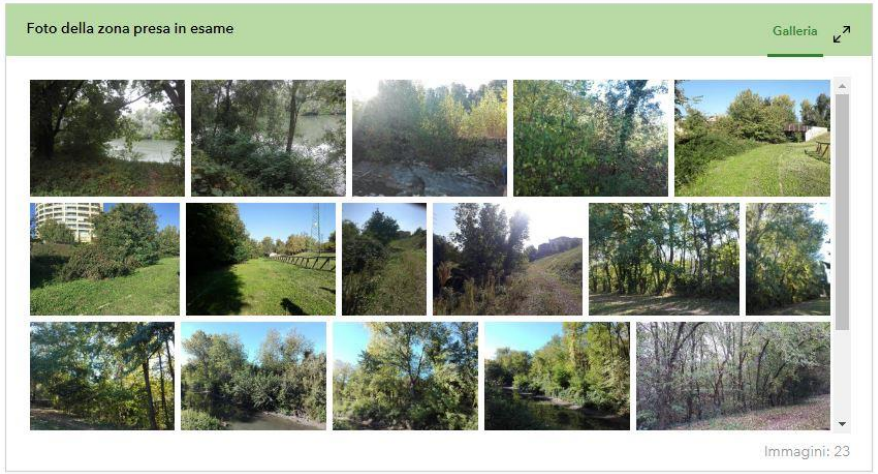
  - **Confidence**: yes, not (if not why?)

DATA ANALYSIS OUTPUT









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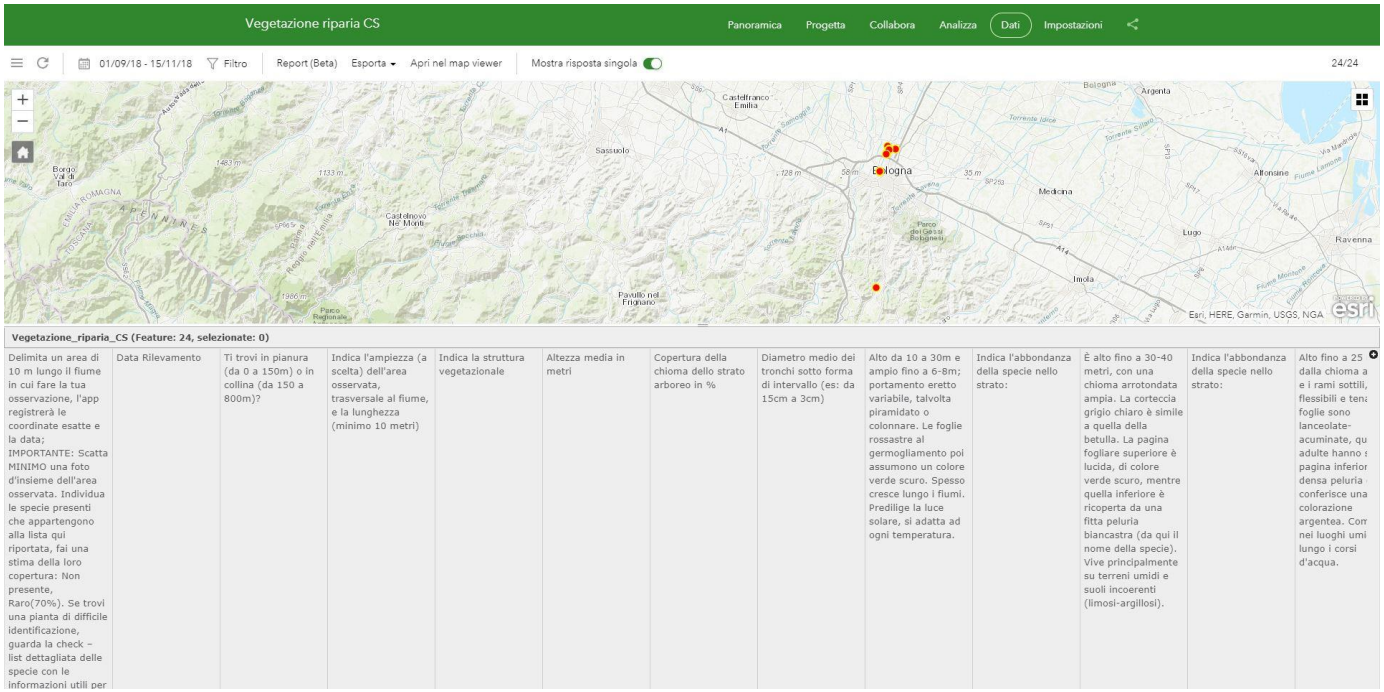
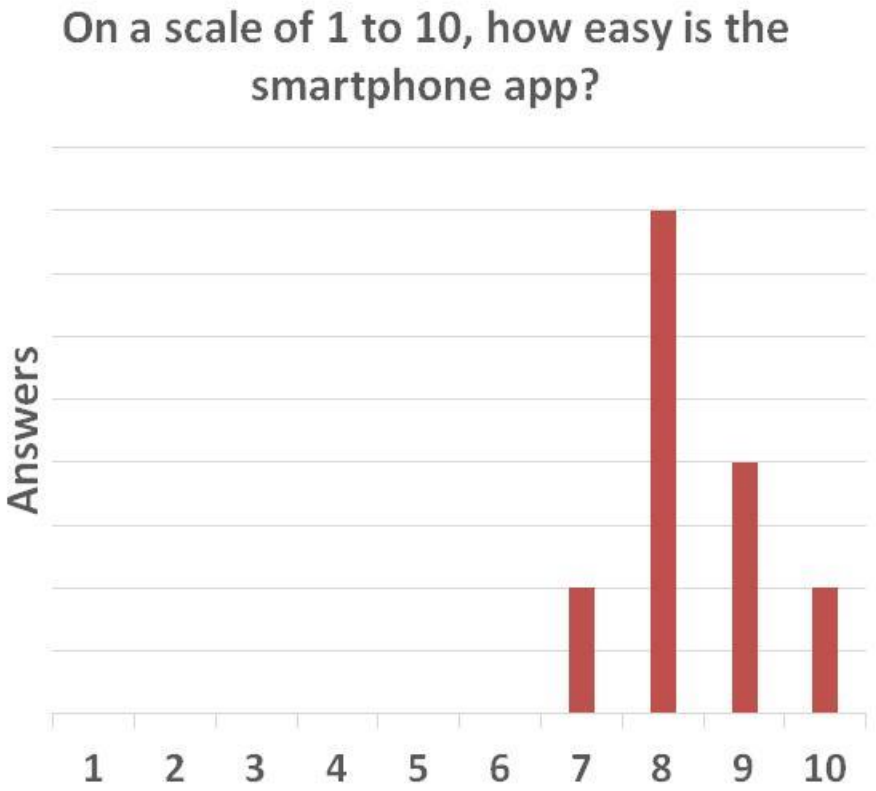


After the testing phase, collected data will be available on the National Network on Biodiversity managed by ISPRA (www.nnb.isprambiente.it).

Data will be downloadable in various formats (CSV, Shapefile, geodatabase, kml, …)

FROM QUESTIONNAIRES



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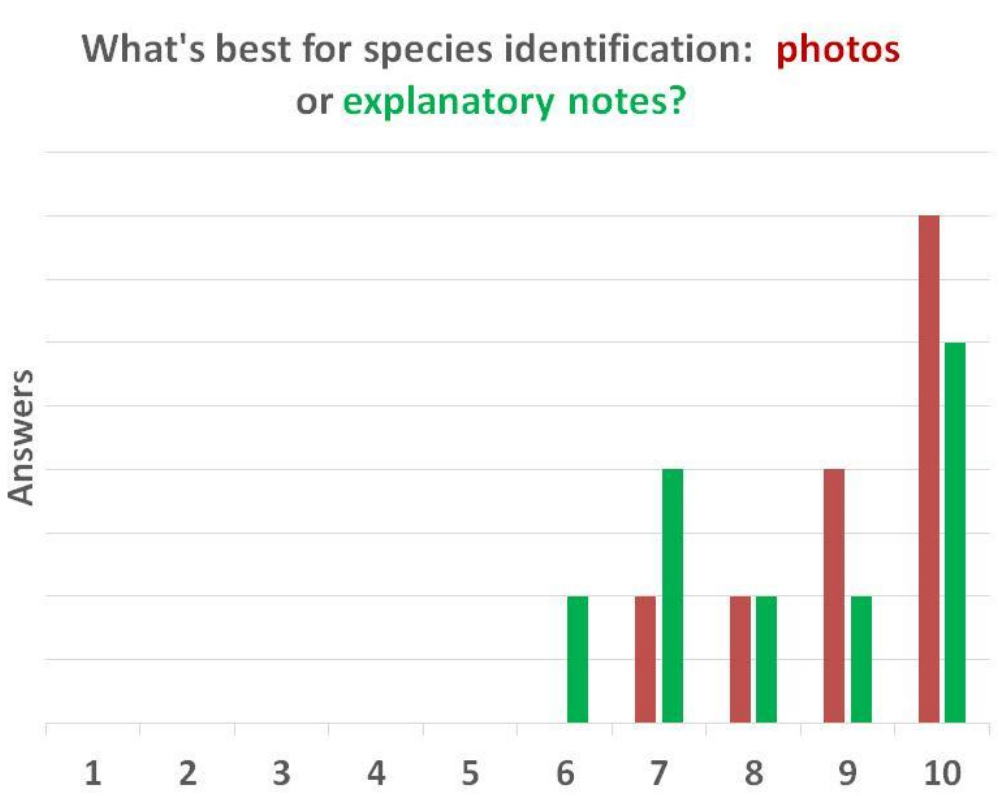


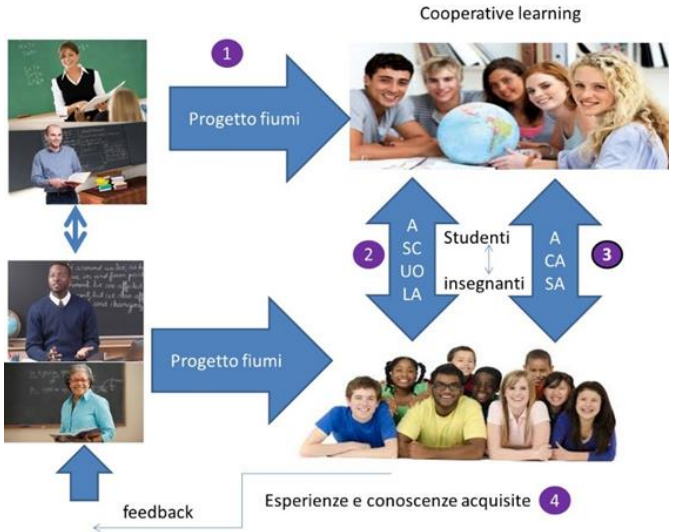
Conclusions

Though there are still improvements to be made, the Citizens' response was positive and they fill able to use it independently after a short training

Are you willing to do this kind of activity during recreational activities such as a walk?
The answer was an enthusiastic YES!

The big challenge is that this CS activity can play a role in the riparian vegetation monitoring program on a European scale.

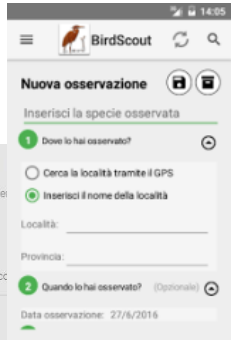
SCHOOL EDUCATION



	Ecological category (Condition)	River category	
		Sandy Type	Rocky Type
	Unmodified (NATURAL condition)	> 6.9	> 7.9
	Largely natural/few modifications (GOOD condition)	5.8 to 6.9	6.8 to 7.9
	Moderately modified (FAIR condition)	4.9 to 5.8	6.1 to 6.8
	Largely modified (POOR condition)	4.3 to 4.9	5.1 to 6.1
	Seriously/critically modified (VERY POOR condition)	< 4.3	< 5.1

NEW OPPORTUNITIES

- Water quality suitability for bathing
- Macrolitter
- Microlitter
- Macroinvertebrate Mini SASS
- Biodiversity: alien species …



CITTADINI CONSAPEVOLI E PREPARATI

La democrazia non può basarsi sull'ignoranza dei problemi, perché uno dei suoi grandi obiettivi è proprio quello di rendere i cittadini responsabili e consapevoli, in modo che possano esercitare i loro diritti utilizzando meglio la loro capacità di capire (*Piero Angela*).

GRAZIE