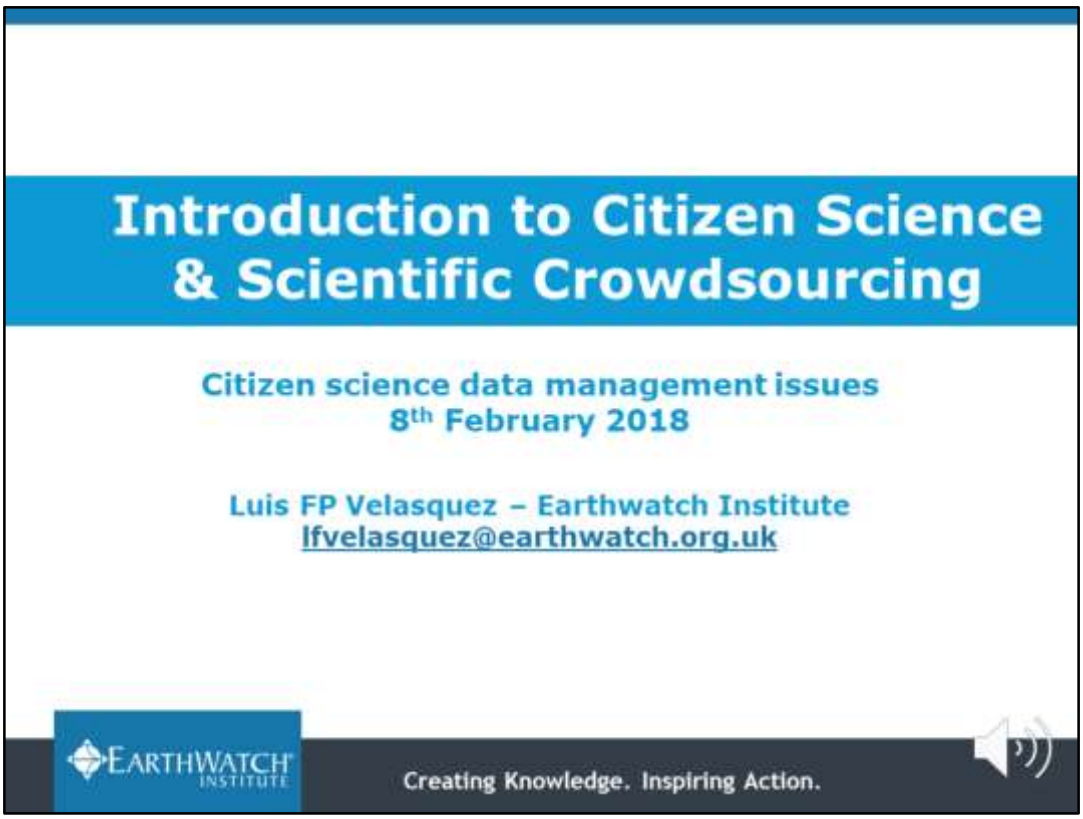
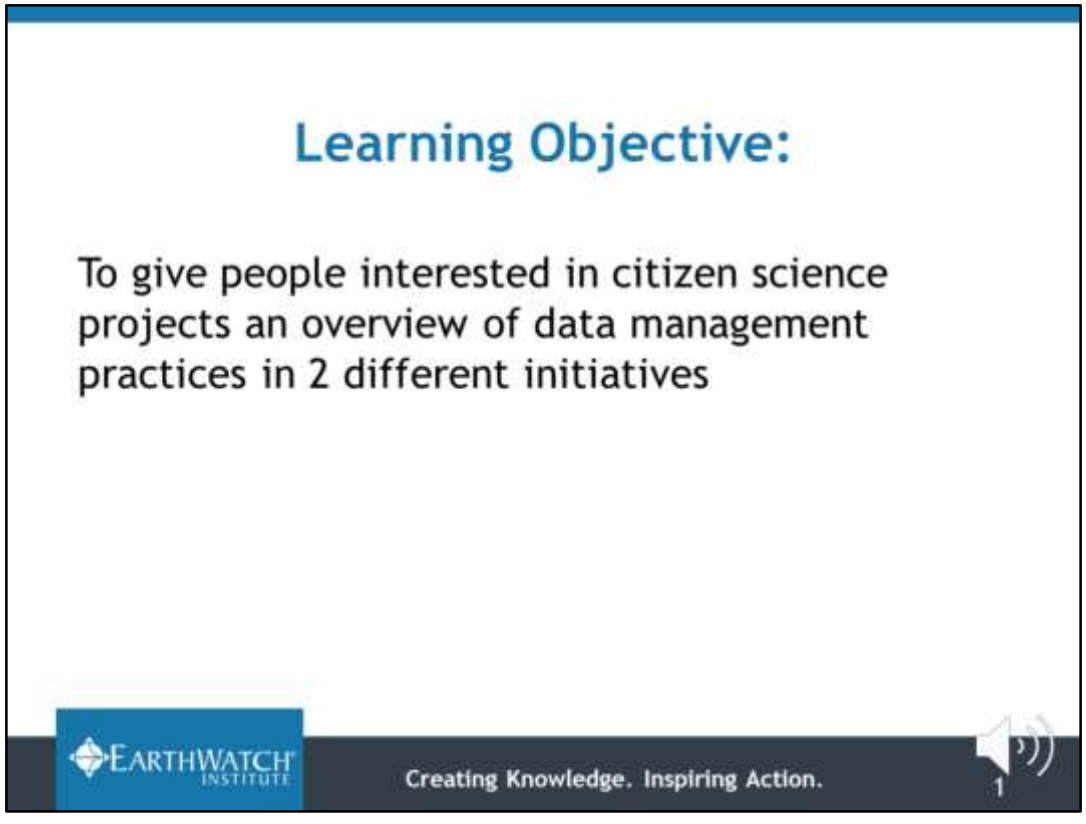


Welcome to the last presentation of this set of data management. During this presentation I will be going through my experiences in two different citizen science projects, and I will be highlighting how data management plans have helped the final output of both projects, as well as reviewing some of the issues we encountered.



To give people interested in citizen science projects an overview of data management practices in 2 different initiatives.

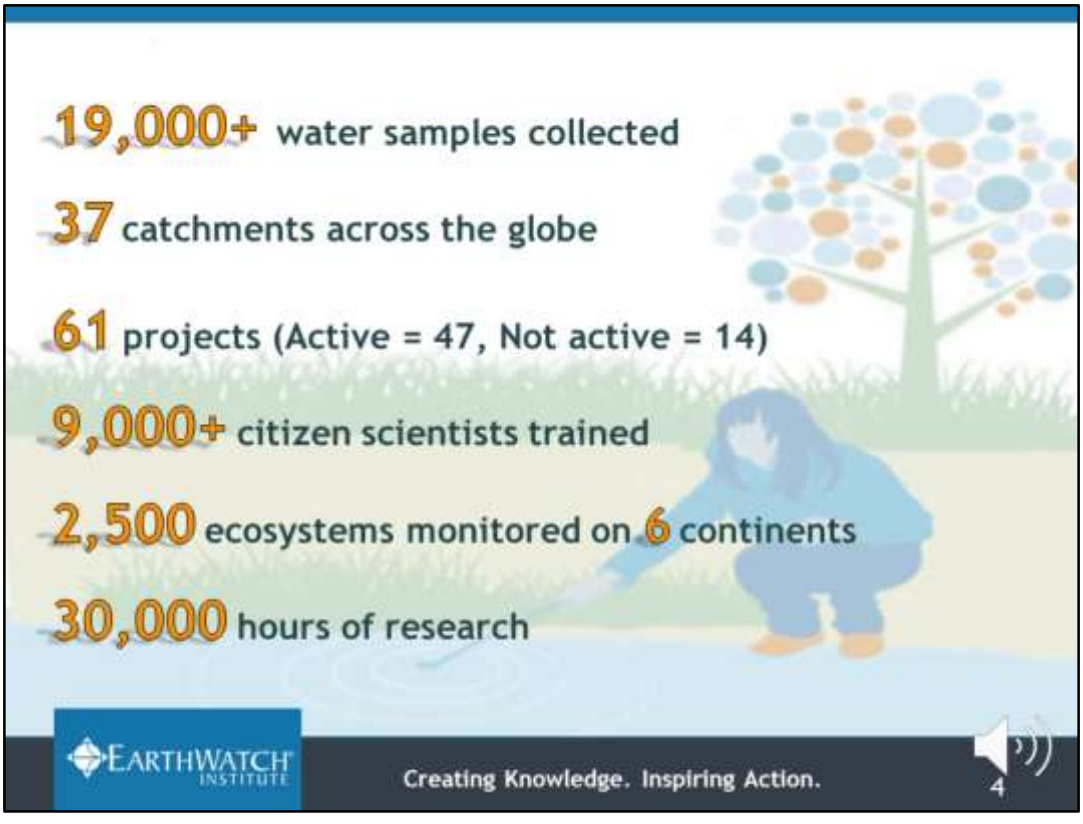
FreshWater Watch is a global citizen science project investigating the health of the world's fresh water on a scale never seen before.

1.FreshWater Watch is an Earthwatch project, beginning in 2012 in the HSBC Water Programme
2.Has been carried out in more than 35 cities worldwide using a common core methodology and training protocol
3.Partners with local organisations to support local investigations or engagement activities

FreshWater Watch has two levels which work together to investigate the health of the world's freshwater ecosystems

Global Level
FreshWater Watch has global data questions which are consistent in every location around the world. **Research Questions**
What are the causes of the loss of freshwater quality?
Why are freshwater ecosystems degrading?
Research Purpose
To better manage and protect the world's freshwater.
The Role of the FreshWater Watcher
To uncover the causes of the loss of freshwater quality and ecosystem degradation. As well as being part of a global community providing environmental information on a scale never seen before.

LEVEL TWO: Local Data
These collaborations seek to address specific local water challenges as well as gather data for global FreshWater Watch research. These local priorities have global implications such as investigating the benefits of restoration activities (Singapore), investigating sources of litter pollution in the Great Lakes (Buffalo, Chicago and Montreal).



FWW in numbers

19,000+ water samples collected

37 catchments across the globe

61 projects (Active = 47, Not active = 14)

9,000+ citizen scientists trained

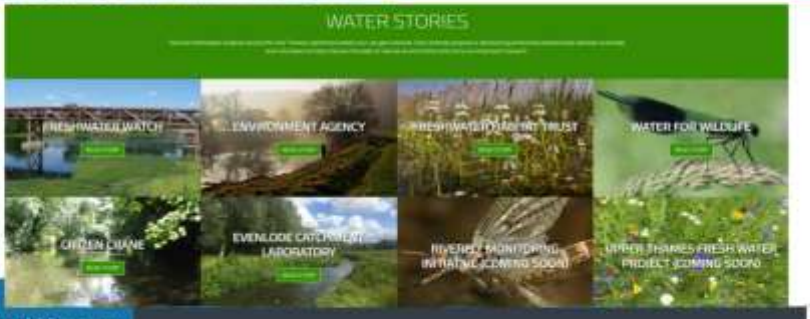
2,500 ecosystems monitored on 6 continents

30,000 hours of research

With regards to the data management life cycle stages, the strengths within the FreshWater Watch project are:
Collect – Clear definition of variables to be recorded as part of the global methodology defined in the design stage of the project. Clear understanding of the technological needs
app design and in house technical development including database and web design
Assure – same global methodology which facilitate the QA, in addition the QC has been documented and it is carry out periodically
Discover – Where is the data going to go so that it can be shared.? Data availability through web site – Hong Kong Open data initiative
Analyse – Strengthen by the design of the database- being in house -in addition the strength of the core methodology and QA/QC procedures has lead to significant scientific output and the creation of new knowledge through citizen science.

The main issues we have found within the data management plan life cycle stages are:
Plan –
Who is responsible for creating the metadata? Issues with person in charge of the metadata
Describe –
What format will the data and metadata be in?
What metadata standard will be used?
Initial metadata was done by individual PI and it was based in the methodology – There was not a relation to international metadata standards this has been and iterative process and we are currently reviewing the best metadata standard

Freshwater Links



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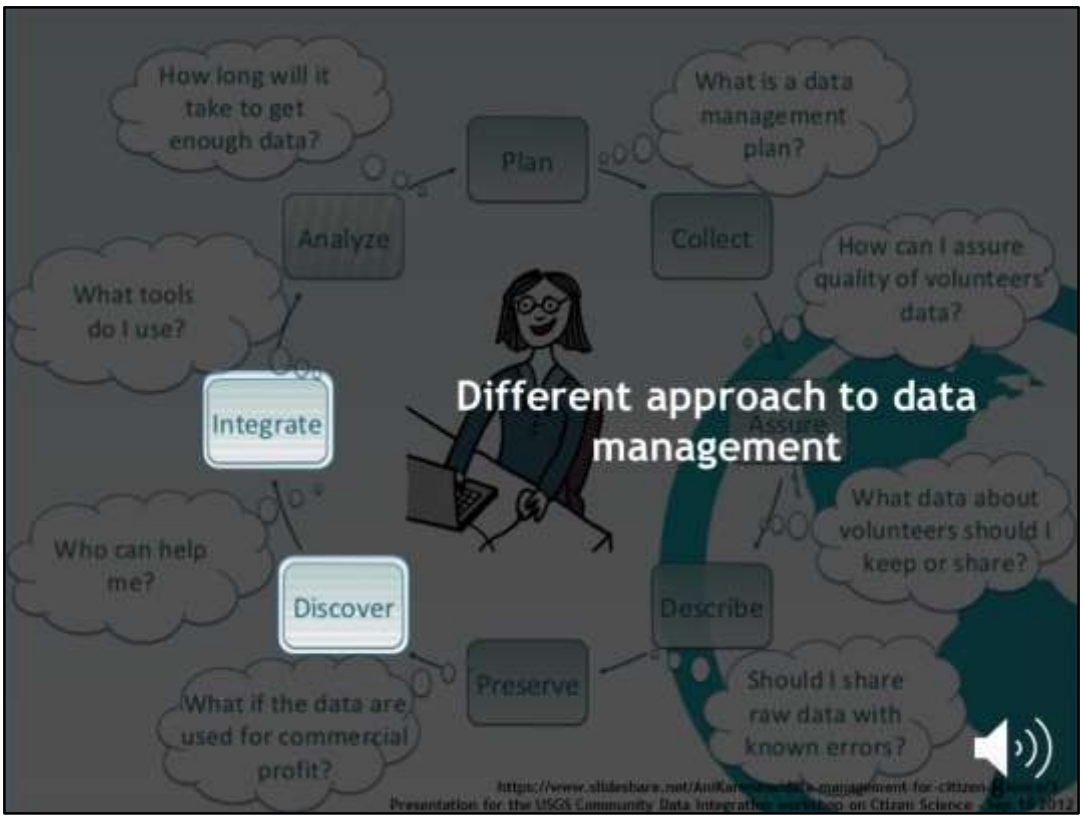

Different approach to data management plan as this is based on
Integrate
Is there the possibility of data integration?
Will the project data need additional datasets?
and Discover using the two principle defined by the DataONE methodology
1.Finding Existing data: at this point you will be asking yourself is there any data that can be used in conjunction with the project data?
2.Making the project data available

The Freshwater Links philosophy is that ***'The whole is greater than the sum of its parts'***. By connecting the growing number of citizen science projects and partners together, Freshwater Links will empower the community by:

- Nurturing citizen scientist interests by acting as an 'incubator' for new initiatives
- Fostering partnerships and data sharing between the citizen science research community and its stakeholders
- Encouraging and supporting open data, as well as developing the tools and applications needed to achieve this successfully
- Improving local understanding of freshwater/ water management issues through a suite of learning resources

In addition to allow user access to data collected by citizen science initiatives, the website also offers tutorials and learning materials with the intention of improving understanding and increase public engagement with the environment and water management

Freshwater Links is the first of its kind to consolidate the efforts of volunteer, citizen scientists and the activities of the Environment Agency. This has made significant strides towards the principal of open data for all..

Other Lessons Learned

- The research question must be scientifically and locally valid.
- Apps, platforms & methods are always evolving
- Build in quality assurance and control.
- It is easy to underestimate the time needed for maintaining engagement.
- Aspire to transfer actionable knowledge.

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Take Home Message

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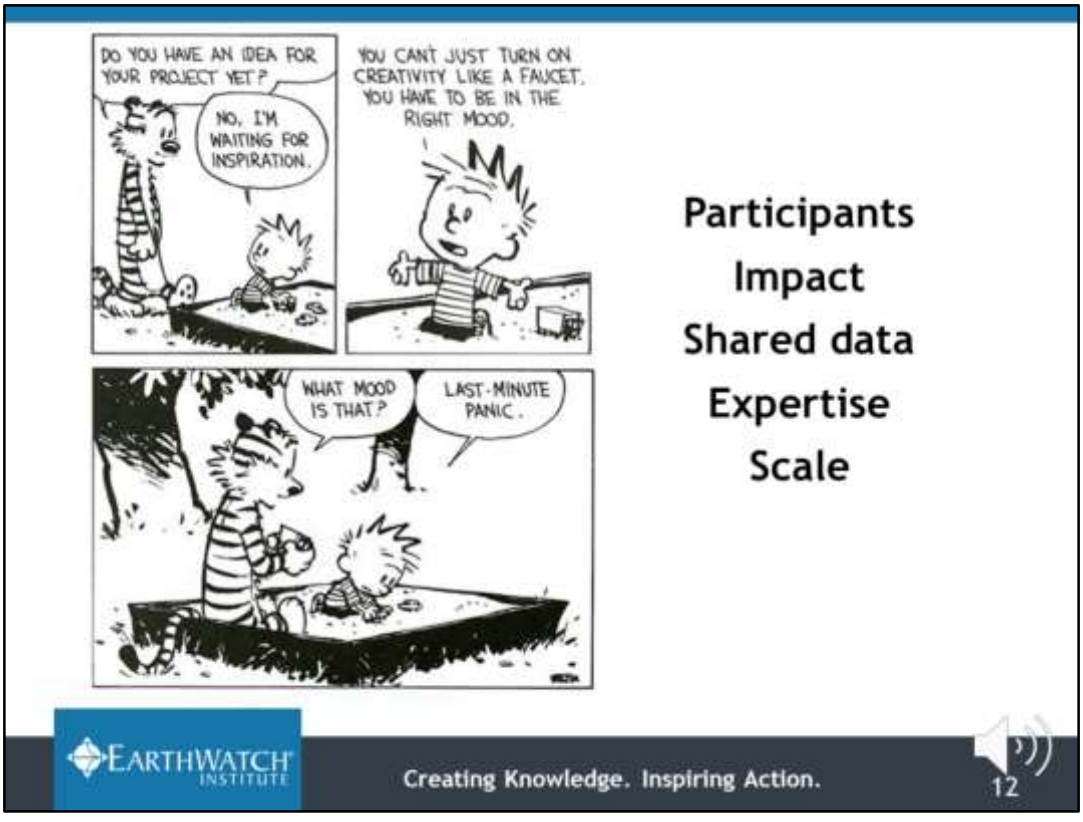

The development of detailed data management plans will allow Cit-Sci projects to work in the improvement of what we are seeing, possible benefits of developing data management plans are:

Participants - sharing participants to enable them to progress from one project to another - mobilise the community more effectively
Impact – a bigger presence achieved through collaboration and dissemination
Shared data - data not in silos and easily combined to generate greater insights
Expertise - technical, scientific and engagement skills pooled and shared
Scale - increased likelihood for projects to expand and grow as a result of the above