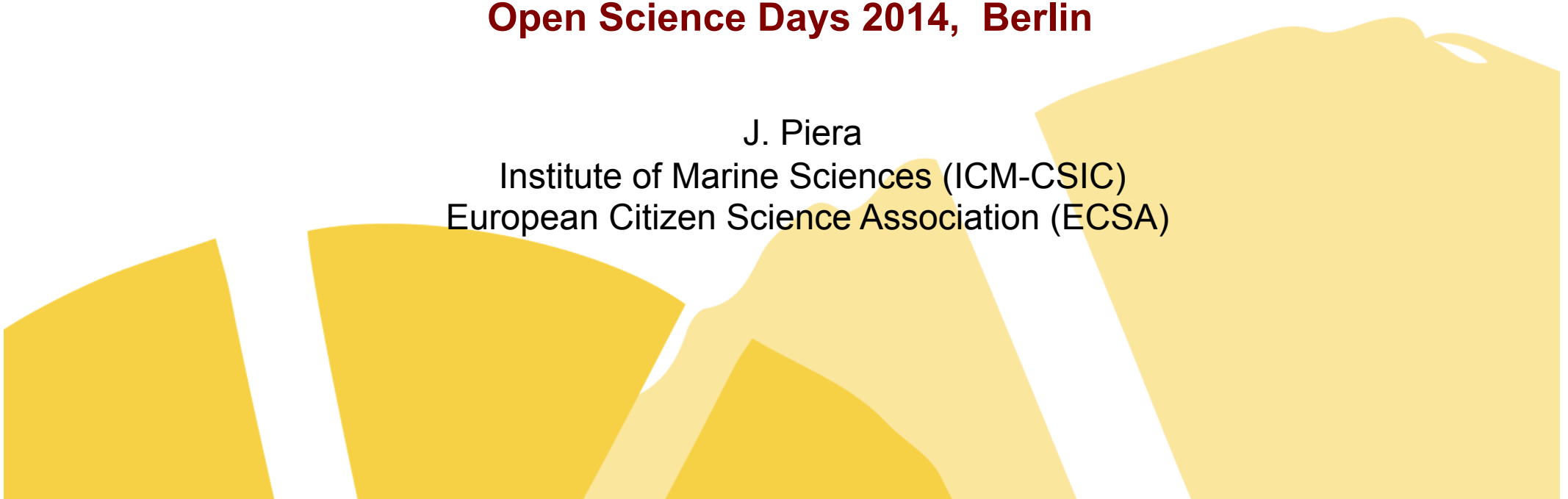
Institute of Marine Sciences

EUROPEAN CITIZEN SCIENCE ASSOCIATION

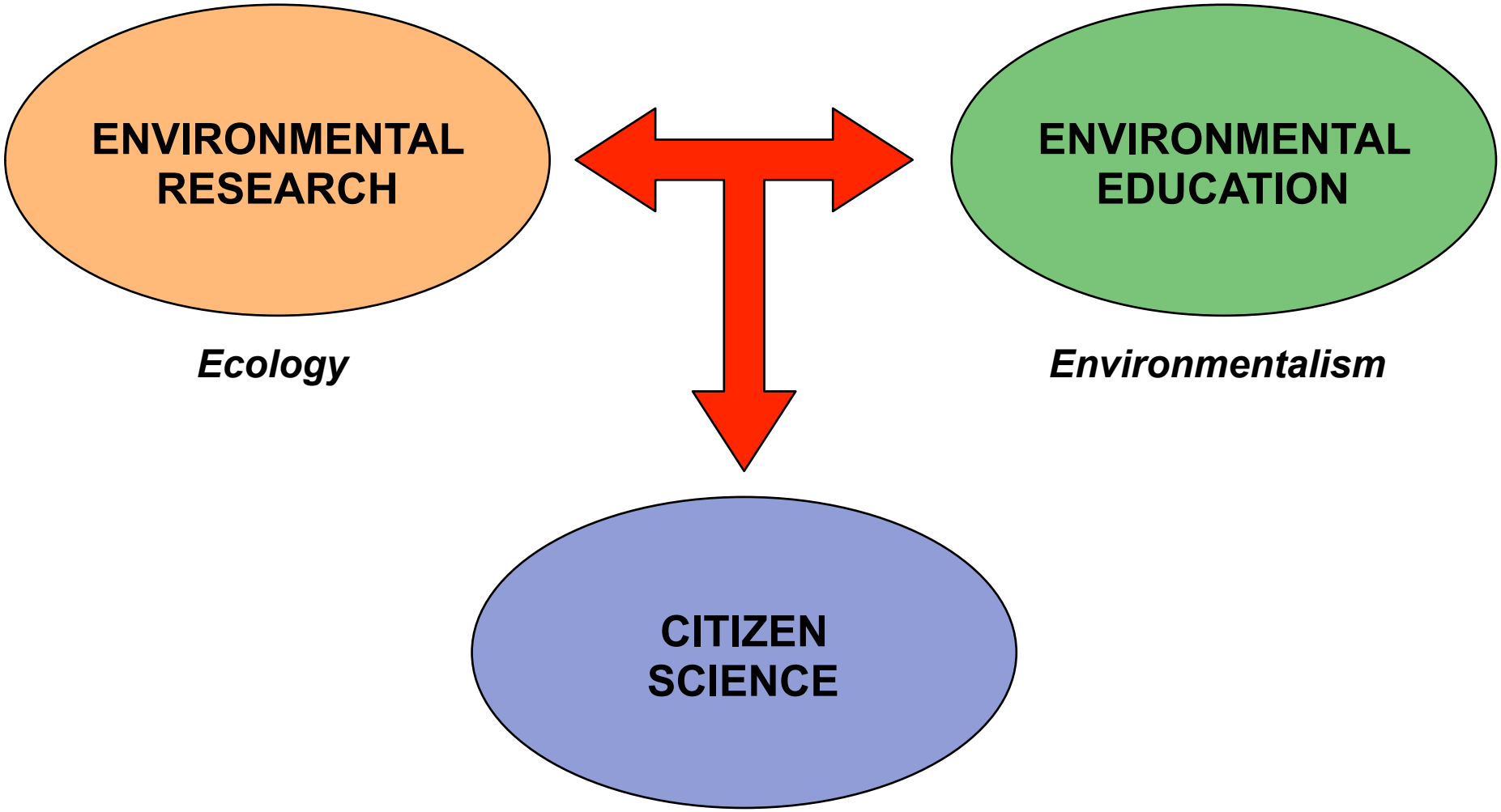
Citizen Science in Environmental R&E (Research and Education)

Open Science Days 2014, Berlin

J. Piera
Institute of Marine Sciences (ICM-CSIC)
European Citizen Science Association (ECSA)



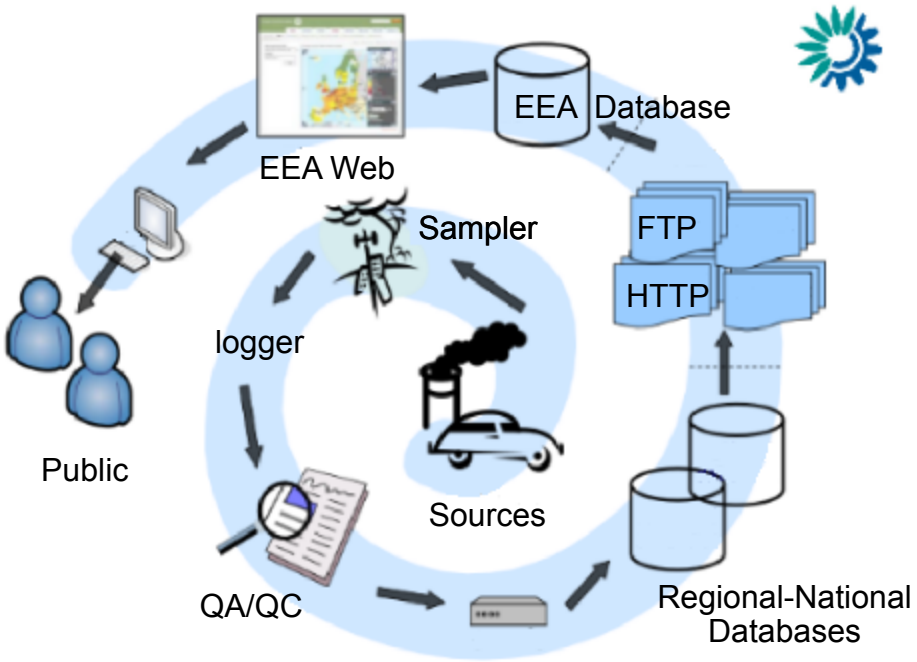
Convergence Between Environmental Research and Education



Citizen Science Project
CITCLOPS

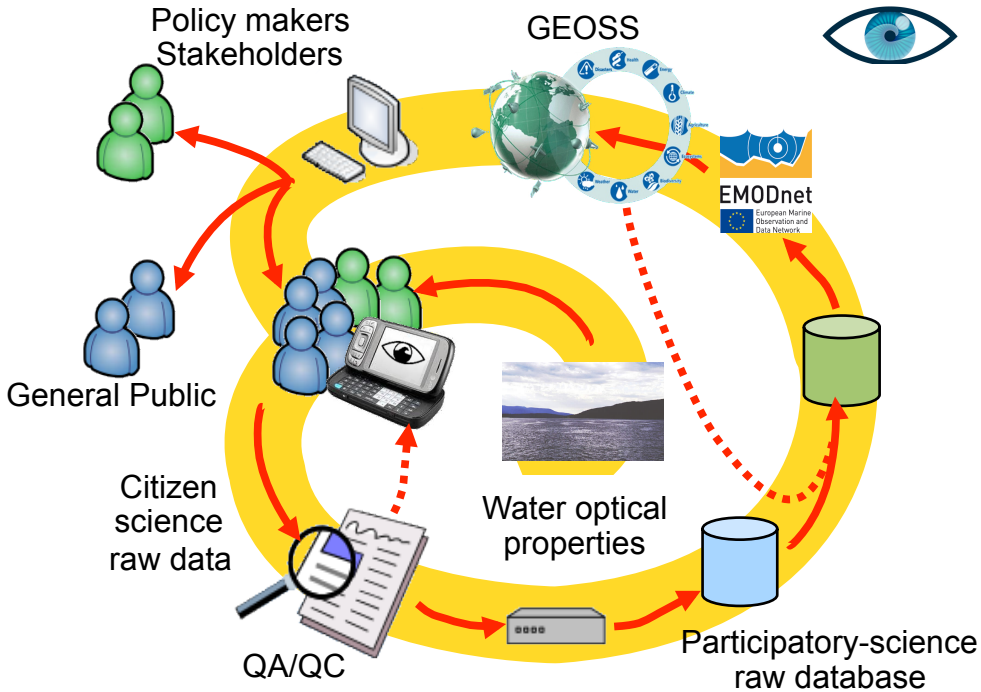
Citizens' Observatory for Coast and Ocean Optical Monitoring

Conventional monitoring chain
(spiral information process)



Pollution monitoring
(Environmental European Agency)

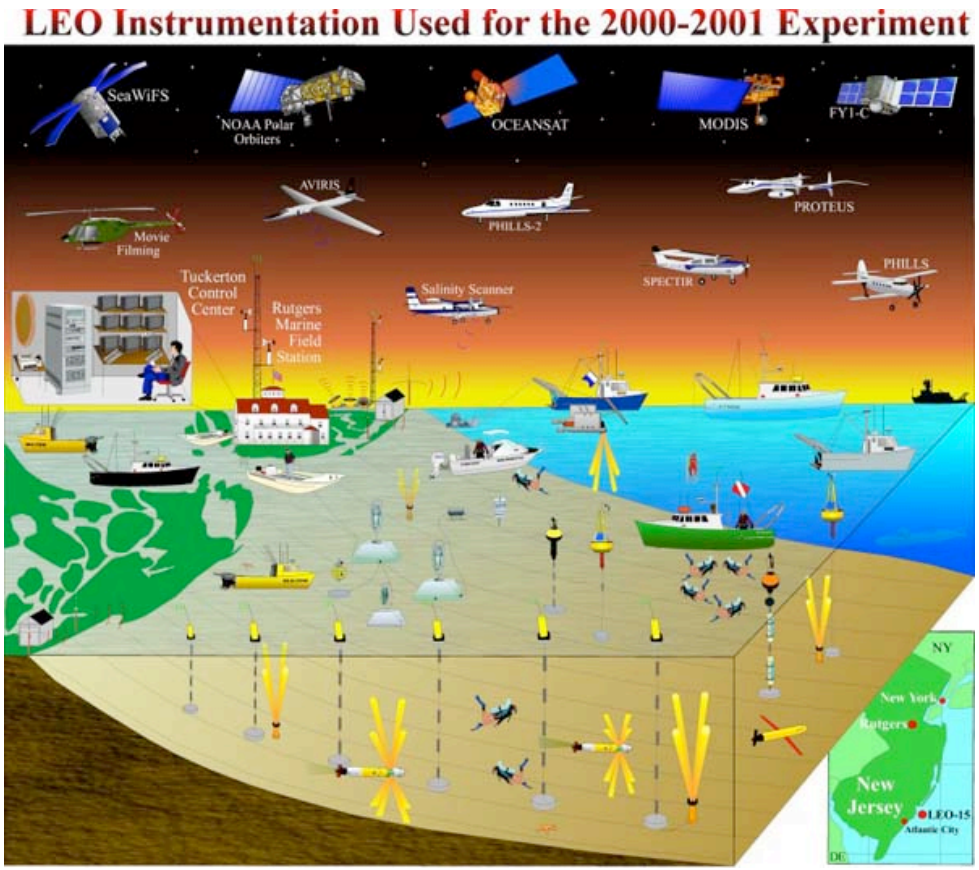
Citizen Science monitoring chain
(*closing the loop*)



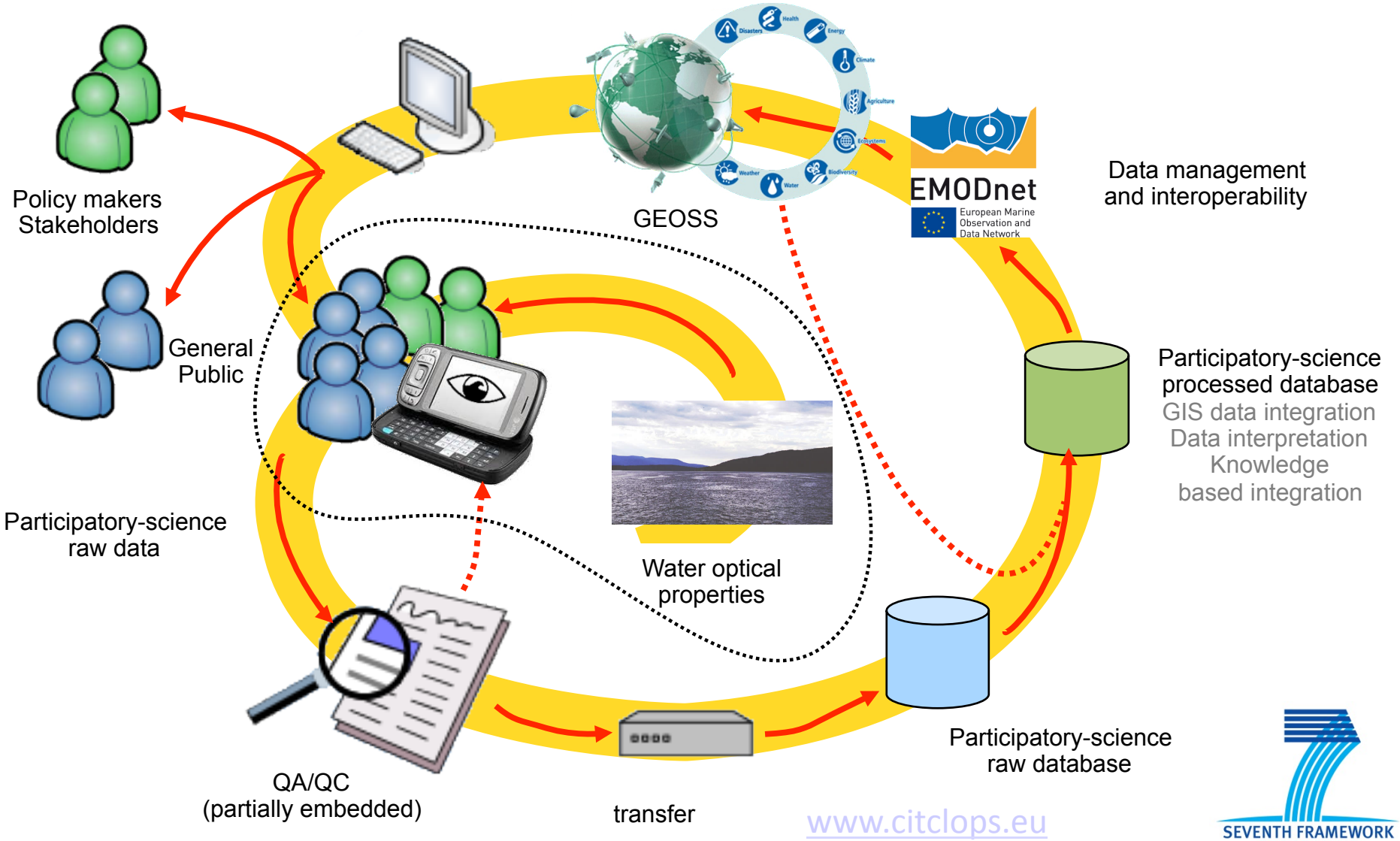
www.citclops.eu

Citizens Science in Marine Research

A new type of marine sensor networks



Citclops. Data acquisition



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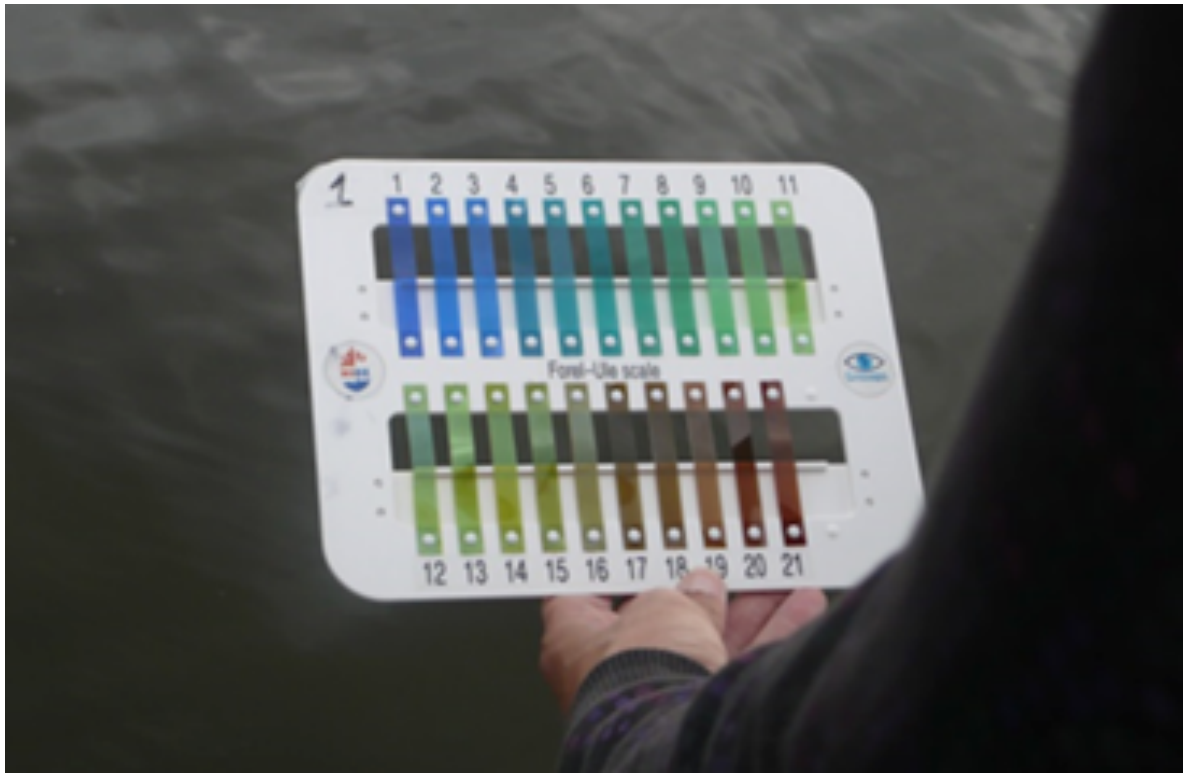
SEVENTH FRAMEWORK PROGRAMME

First approach
Measuring optical properties with the simplest devices

Water transparency: Secchi disc

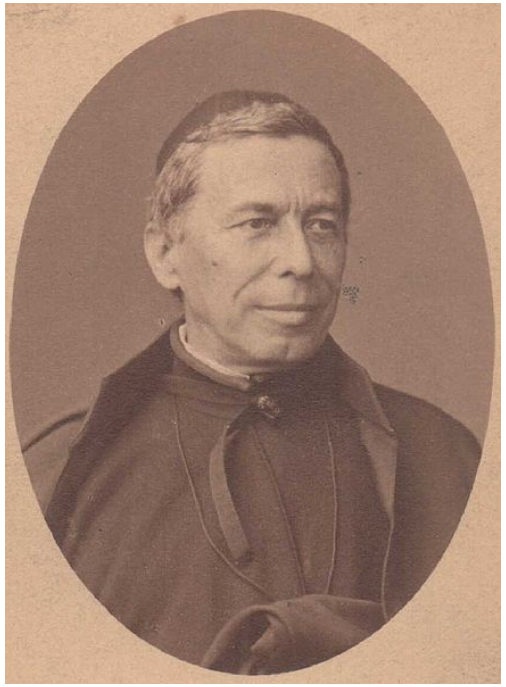


Water colour: Forel-Ule scale

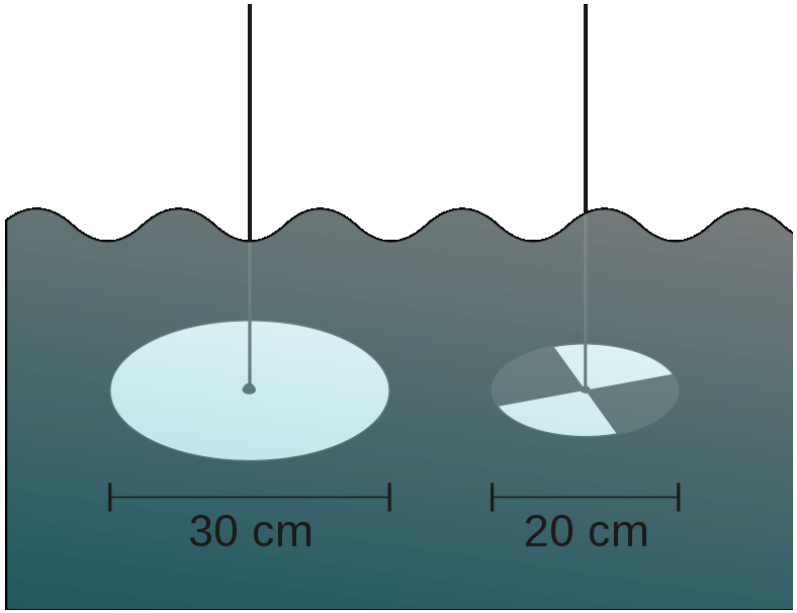
Citizen Science. Historical review

Measuring water transparency

Secchi disc



Pietro Angelo Secchi
Italy(1818 – 1878)

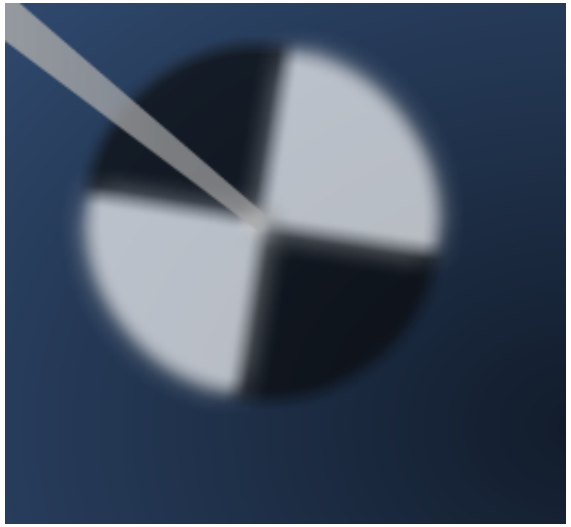


George Chandler Whipple
United States (1866–1924)

Citizen Science Historical Review

Secchi depth

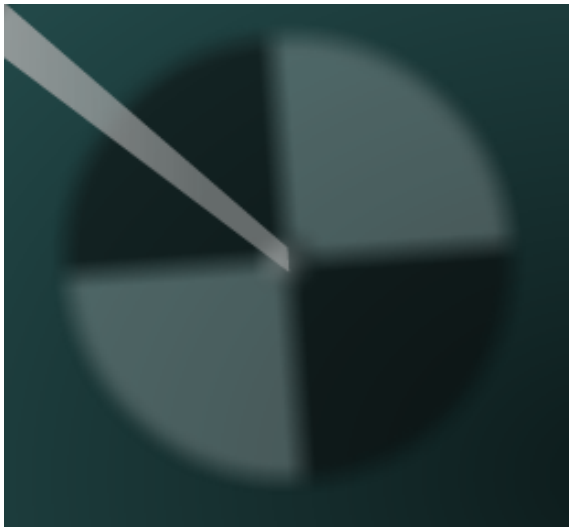
2.37 m



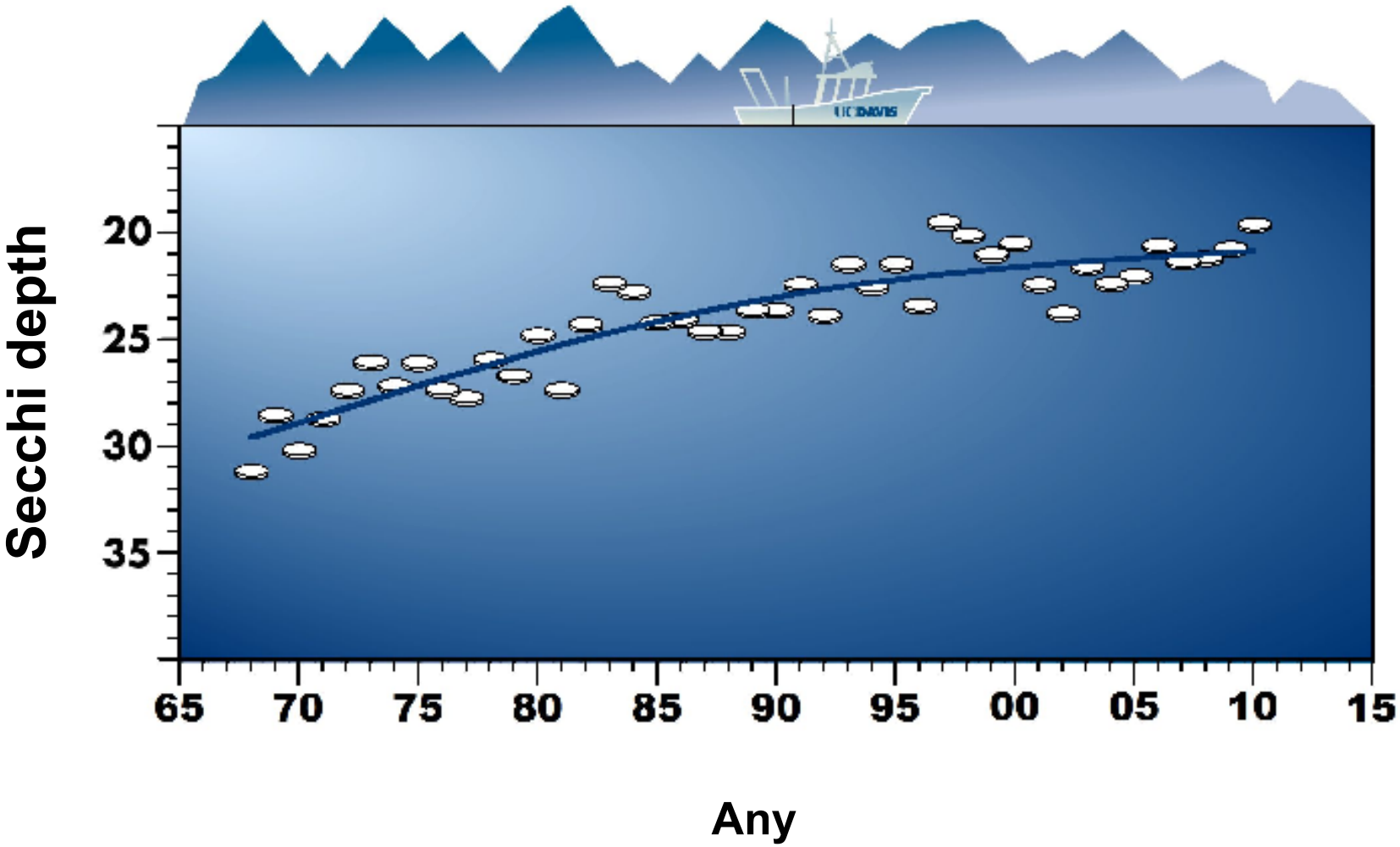
3.14 m

8.83 m

4.92 m



Long time series of Secchi depth
Lake Tahoe (50 years)



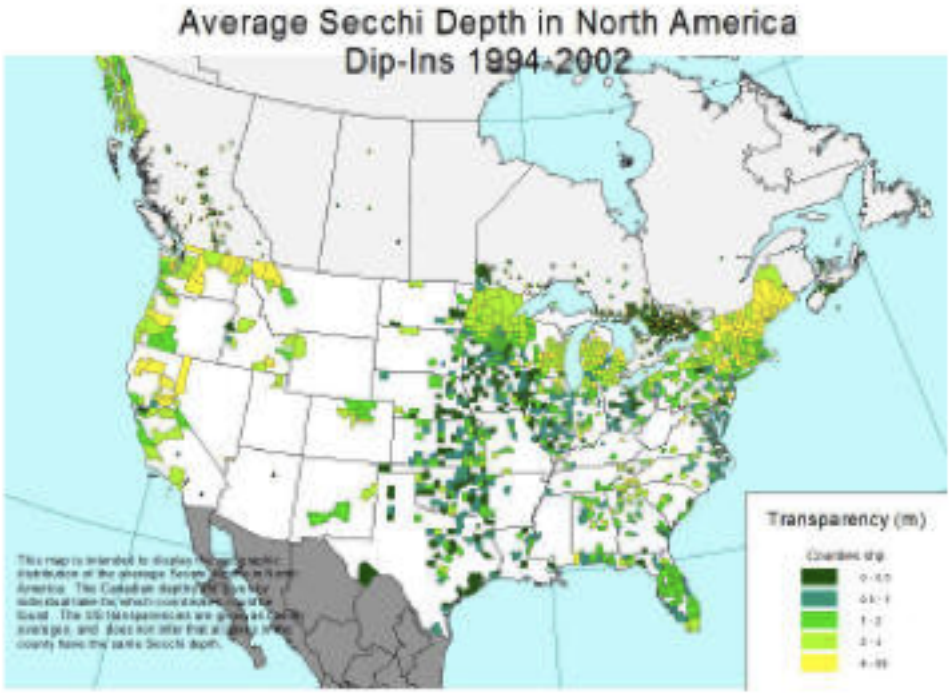
Large scale Citizen Science volunteer program
Secchi Dip-In

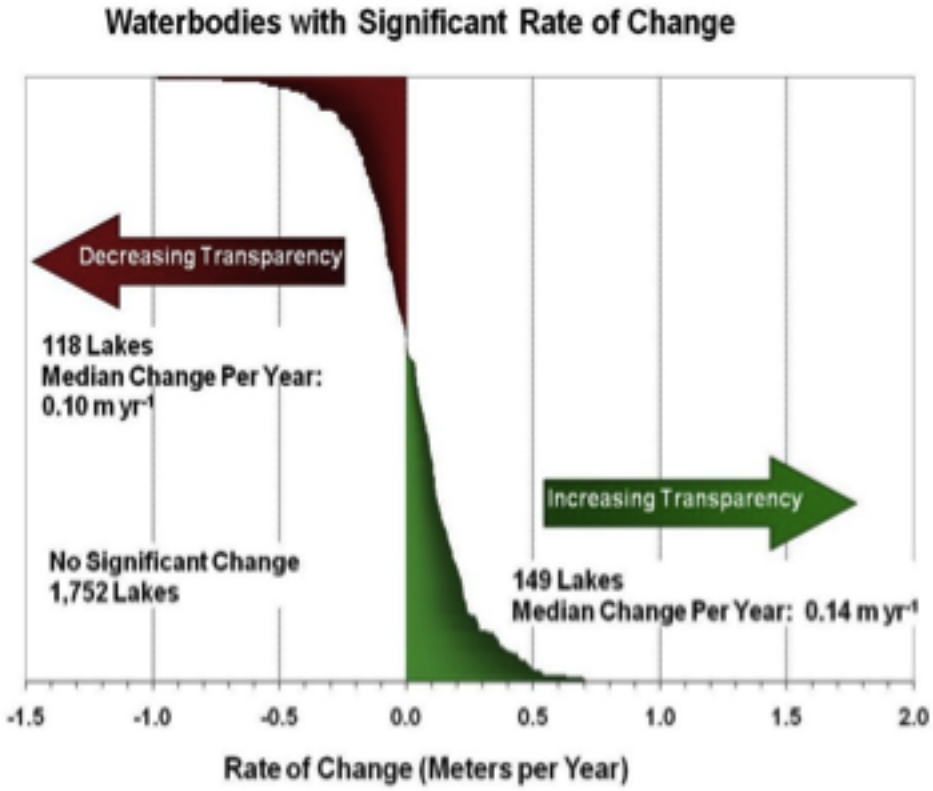
http://www.secchidipin.org/

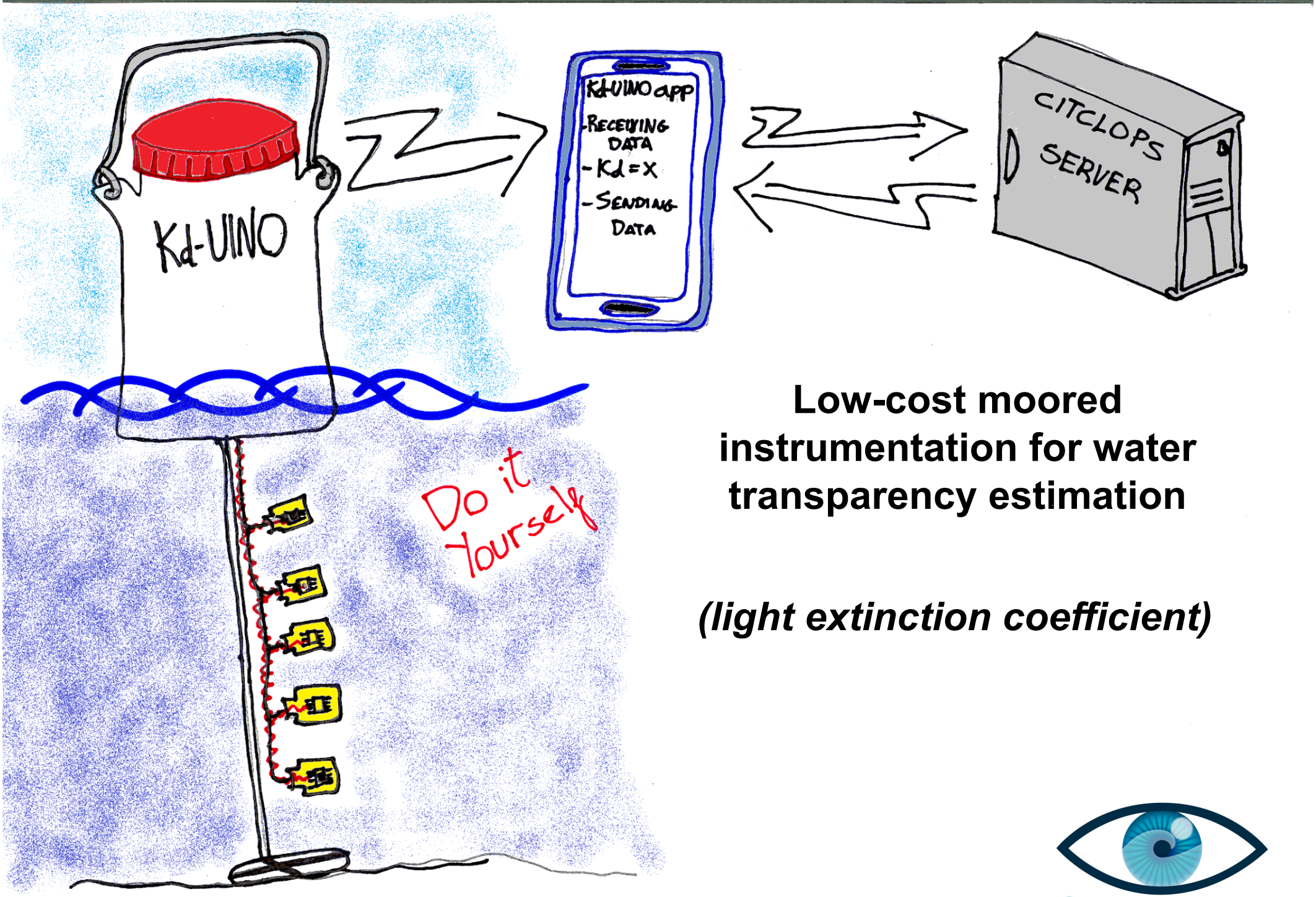
The Dip-In database has been combined with one from the University of Florida, resulting in information on more than 13,000 waterbodies.

Secchi Dip-in

Some rsults







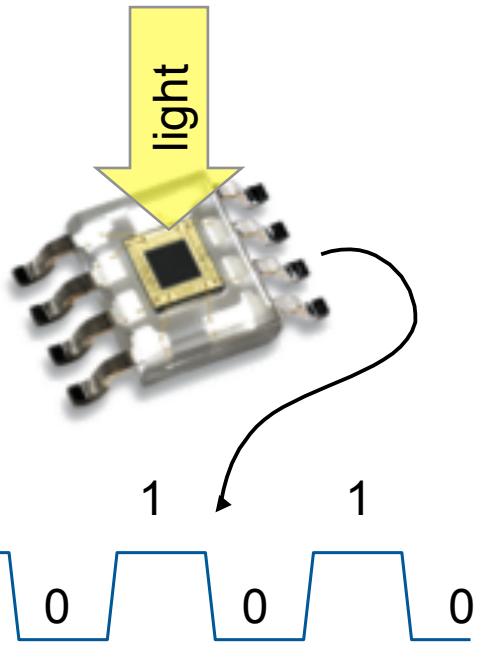
Low-cost moored instrumentation for water transparency estimation

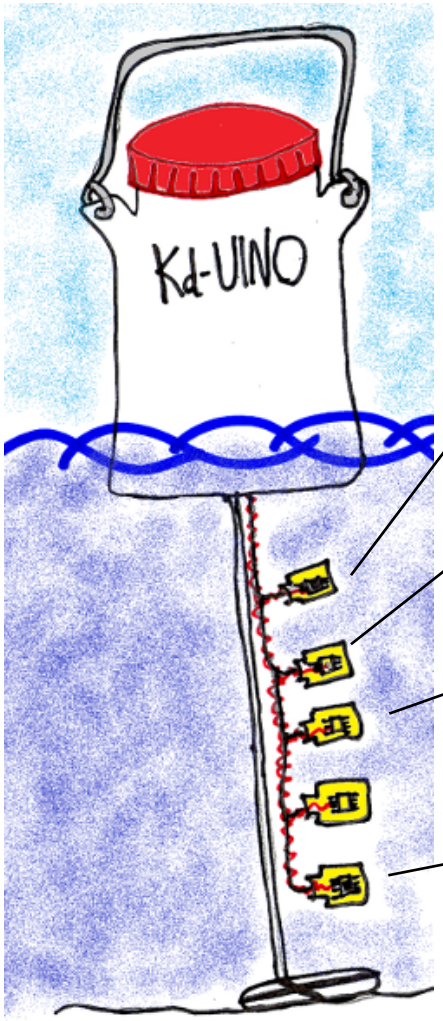
(light extinction coefficient)

CITCLOPS

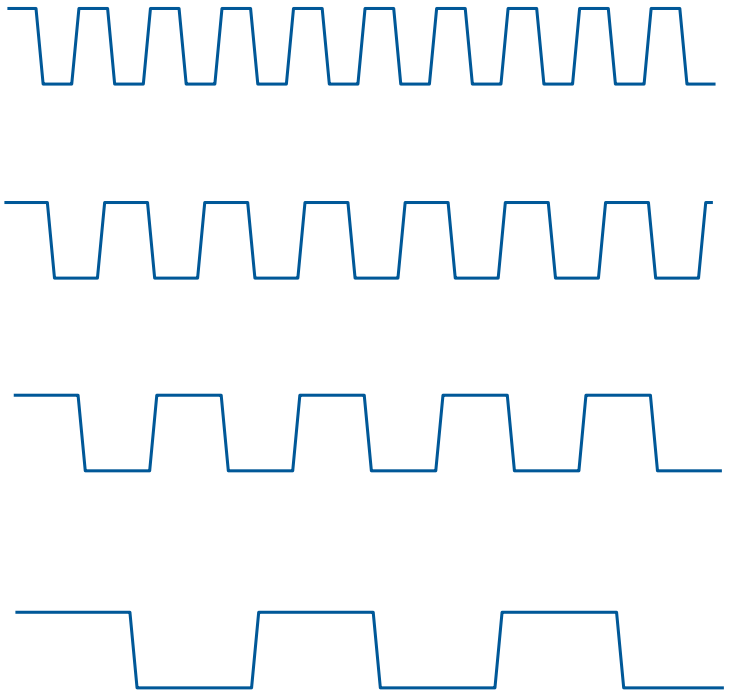
KdUINO may provide continuous measurements of water transparency

Low cost
Light sensors

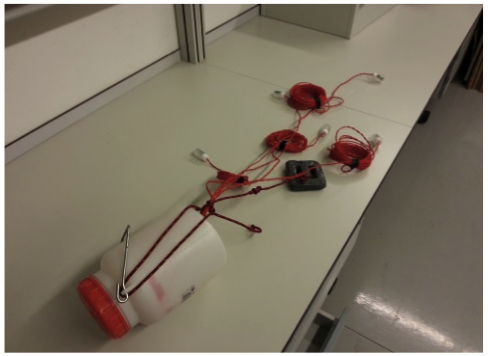


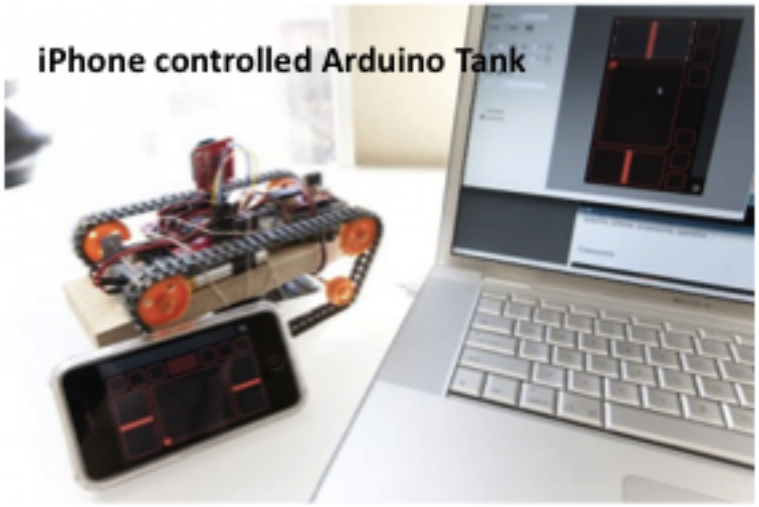


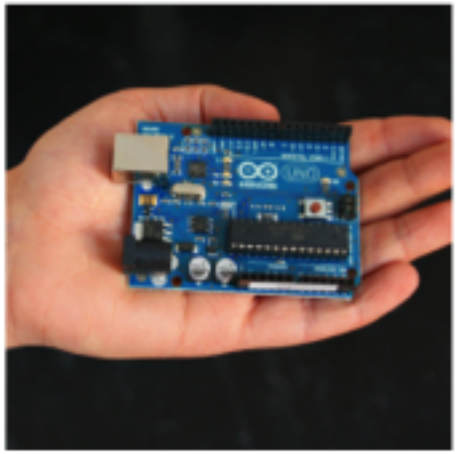
KdUINO
Measurement principles

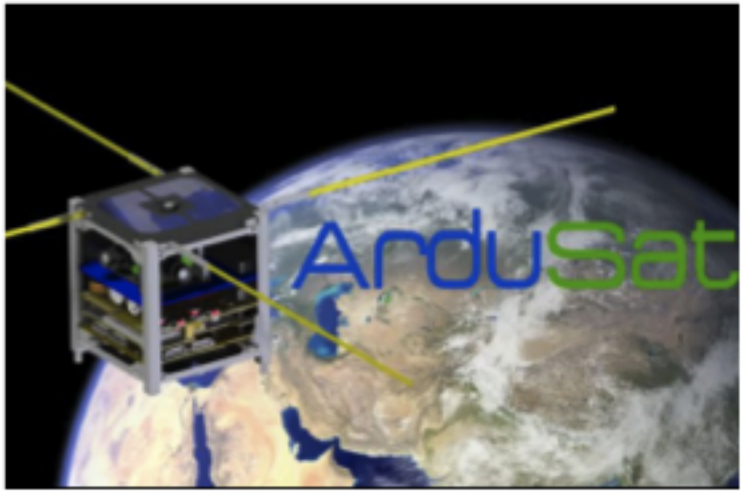


Buoy development using low cost open hardware (Arduino)

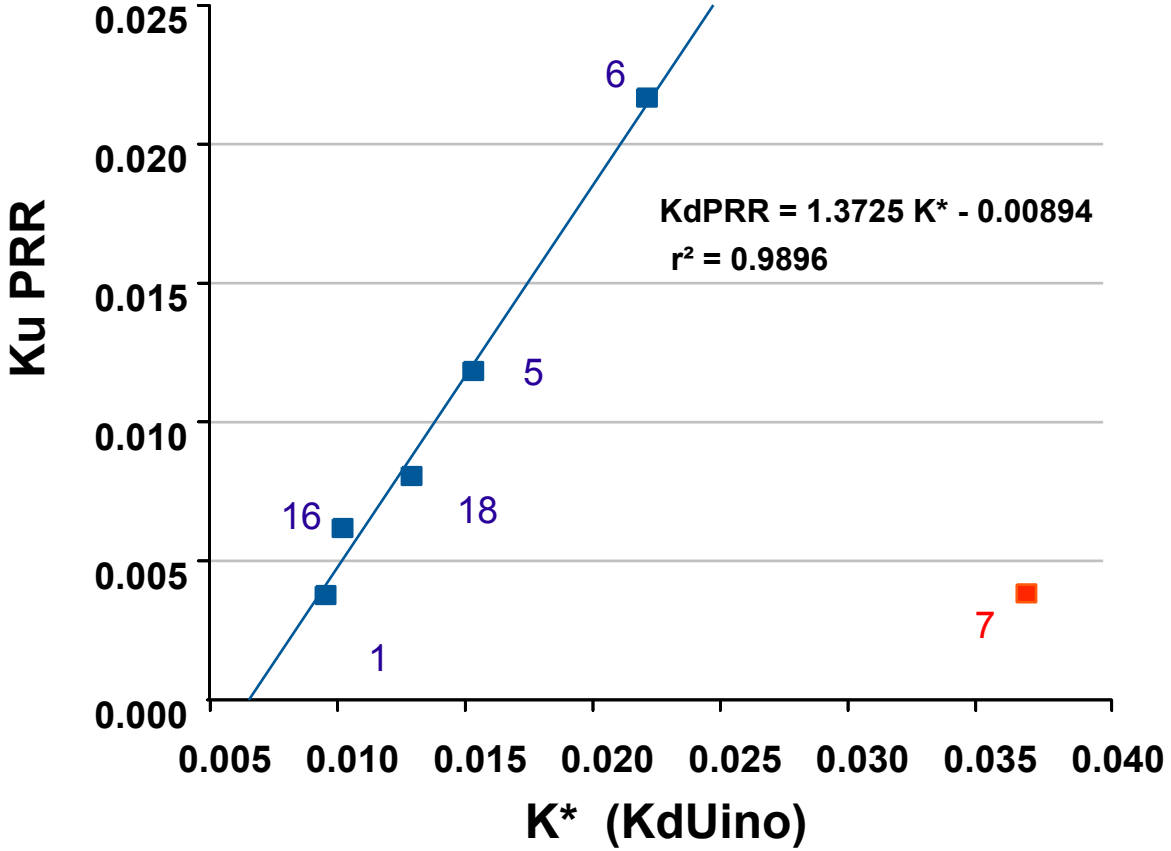








KdUino validation. Preliminary results

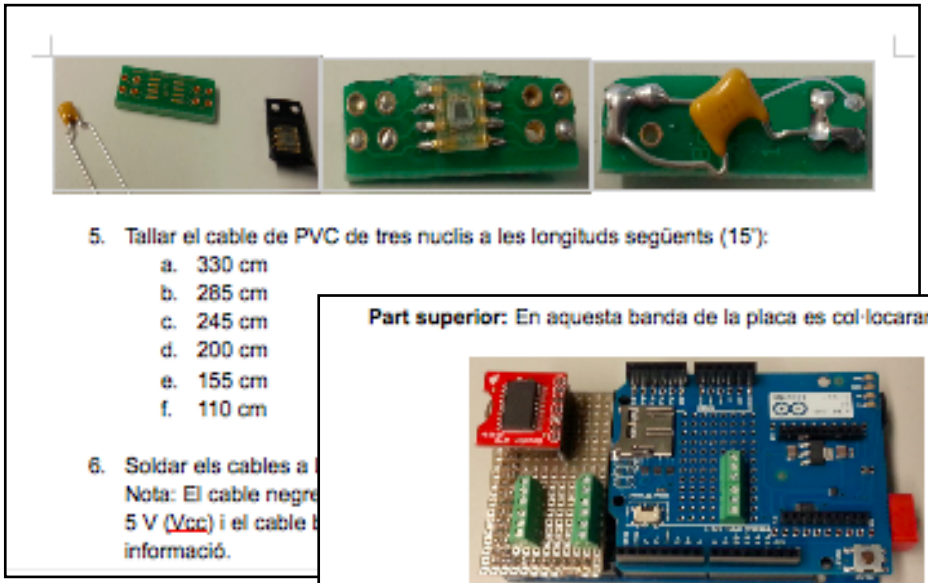


Citizen engagement
Previous demonstration (Week of Science)

Design for everybody:
Creating a reference manual in a project web

Bills of materials

Set by step process

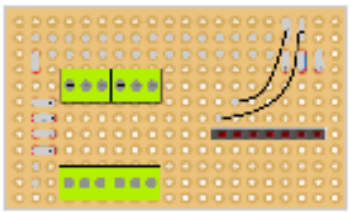


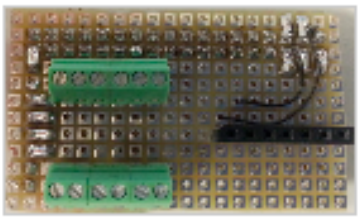
5. Tallar el cable de PVC de tres nuclis a les longituds següents (15'):
   a. 330 cm
   b. 285 cm
   c. 245 cm
   d. 200 cm
   e. 155 cm
   f. 110 cm

6. Soldar els cables a
   Nota: El cable negre
   5 V (Vcc) i el cable
   informació.

Part superior: En aquesta banda de la placa es col·locaran els connector dels

sensors i el chip de capturador del temps real (Real Time Clock).





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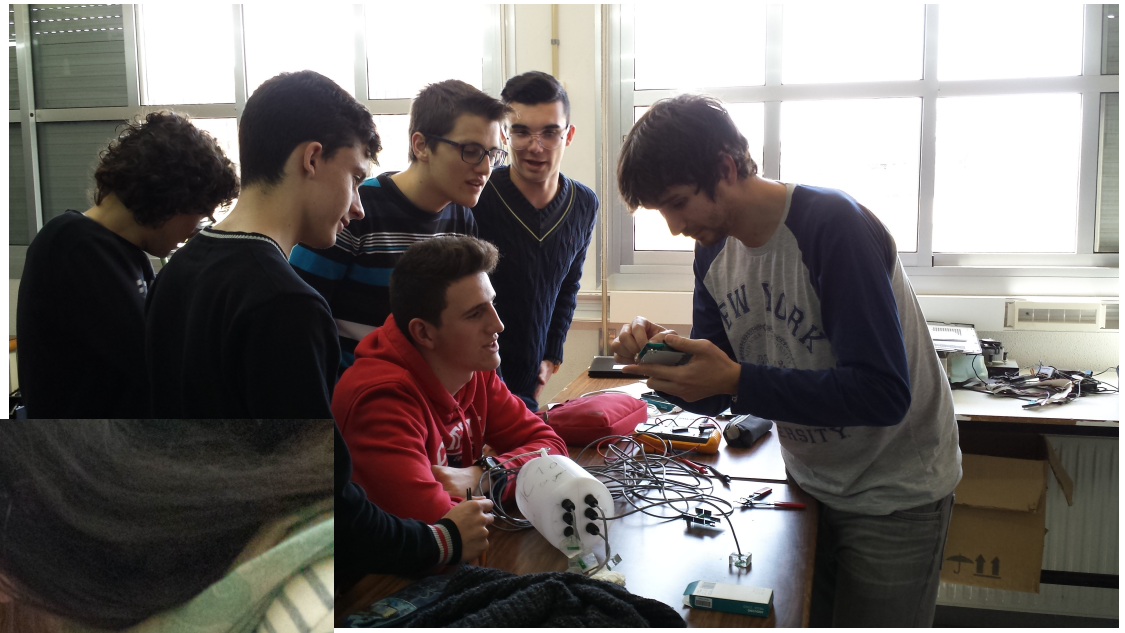
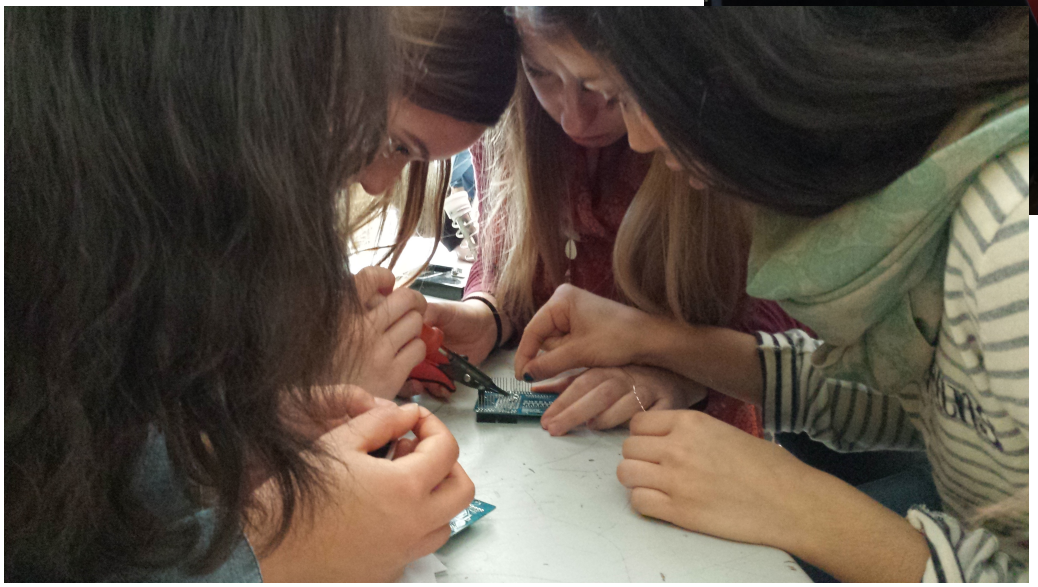
Citclops KdUINO at Schools

Citclops

The students construct their own buoy





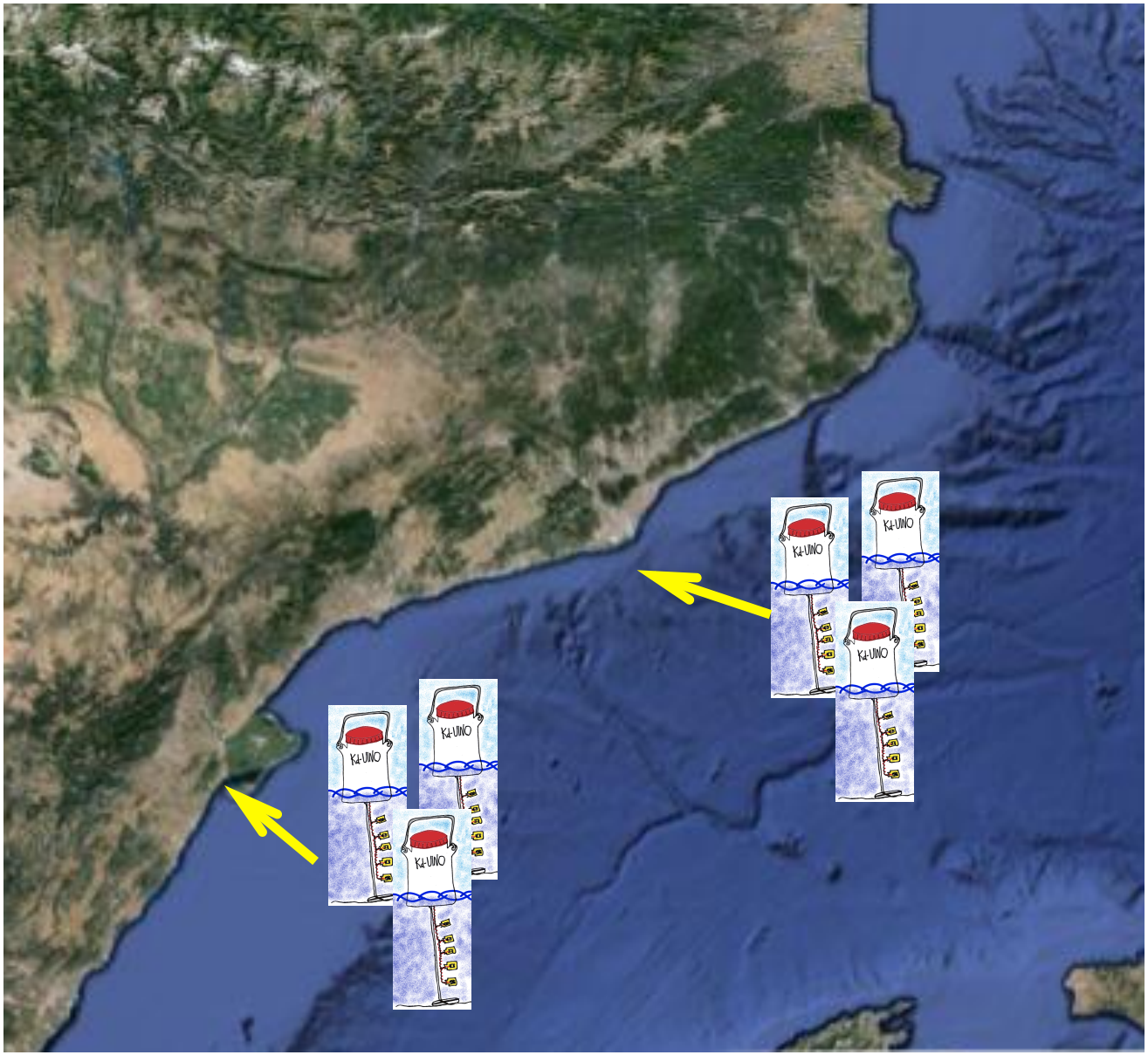
CITCLOPS

Citizen engagement: naming the buoys

Constructors became device curators

CITCLOPS

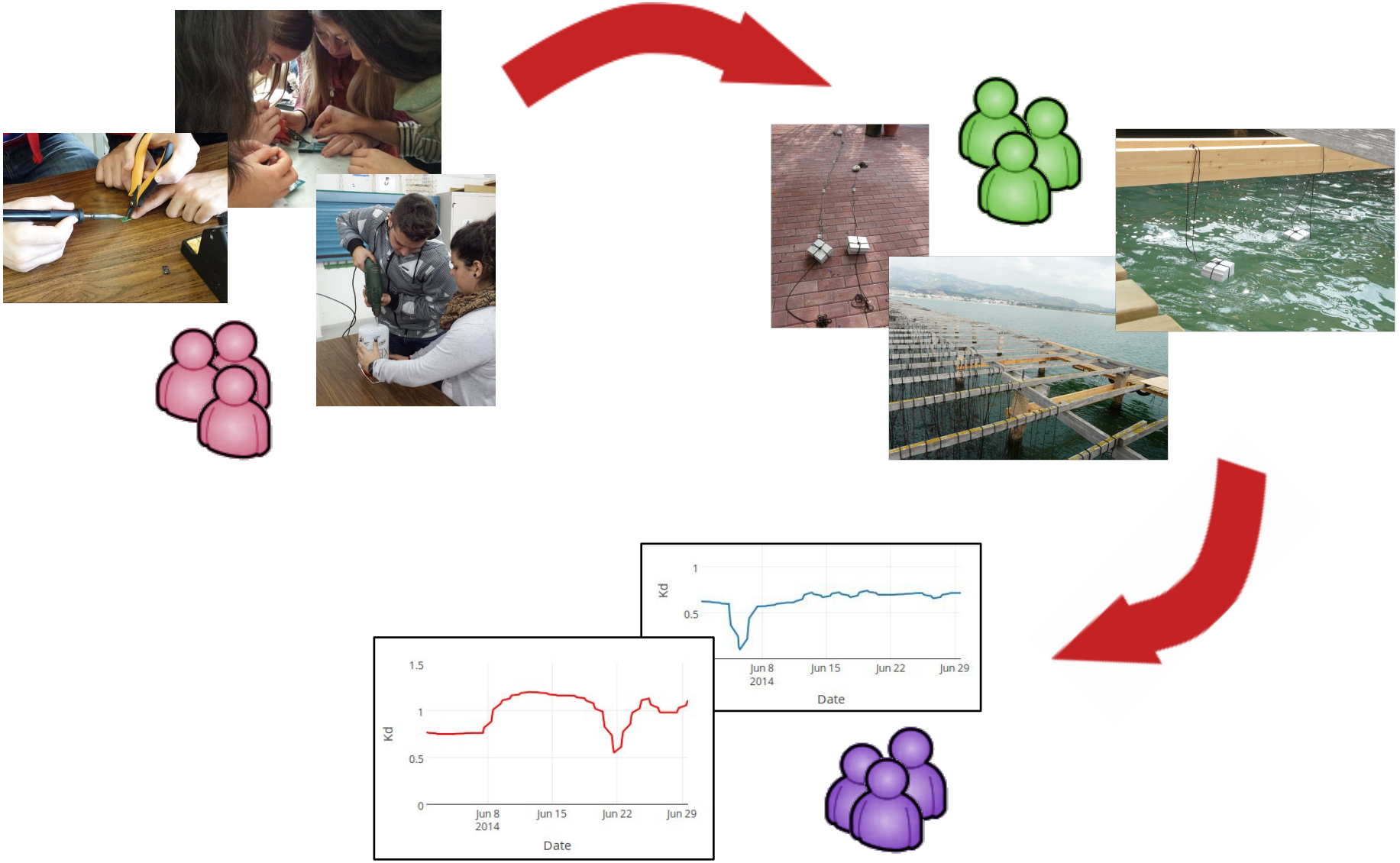
Some tests



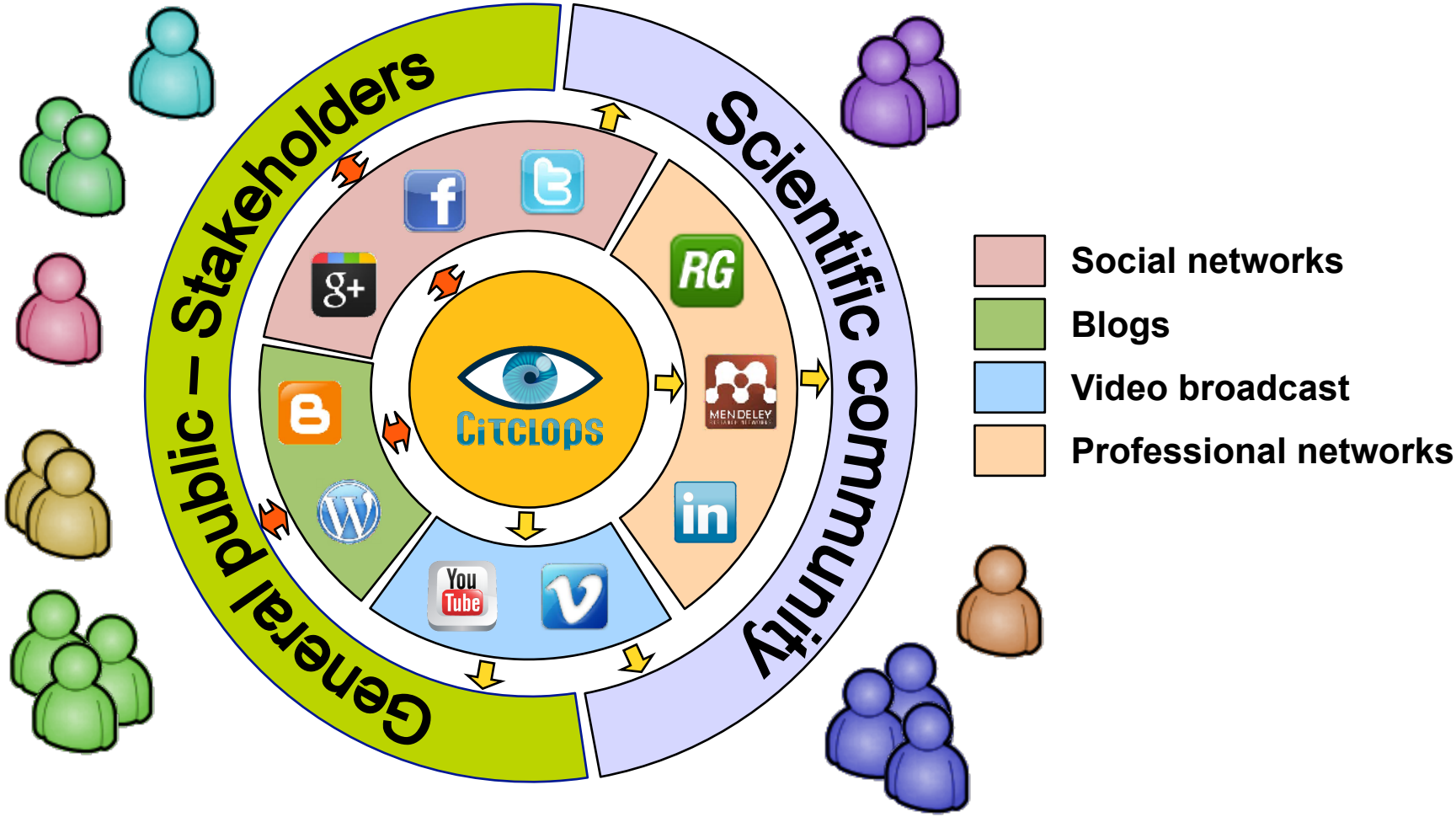
Week of science
Demonstration
measuring in real time

School projects
Buoy construction
Buoy measurements

Collaborative Citizen Science



Social media channels integrating (& engaging) collectives

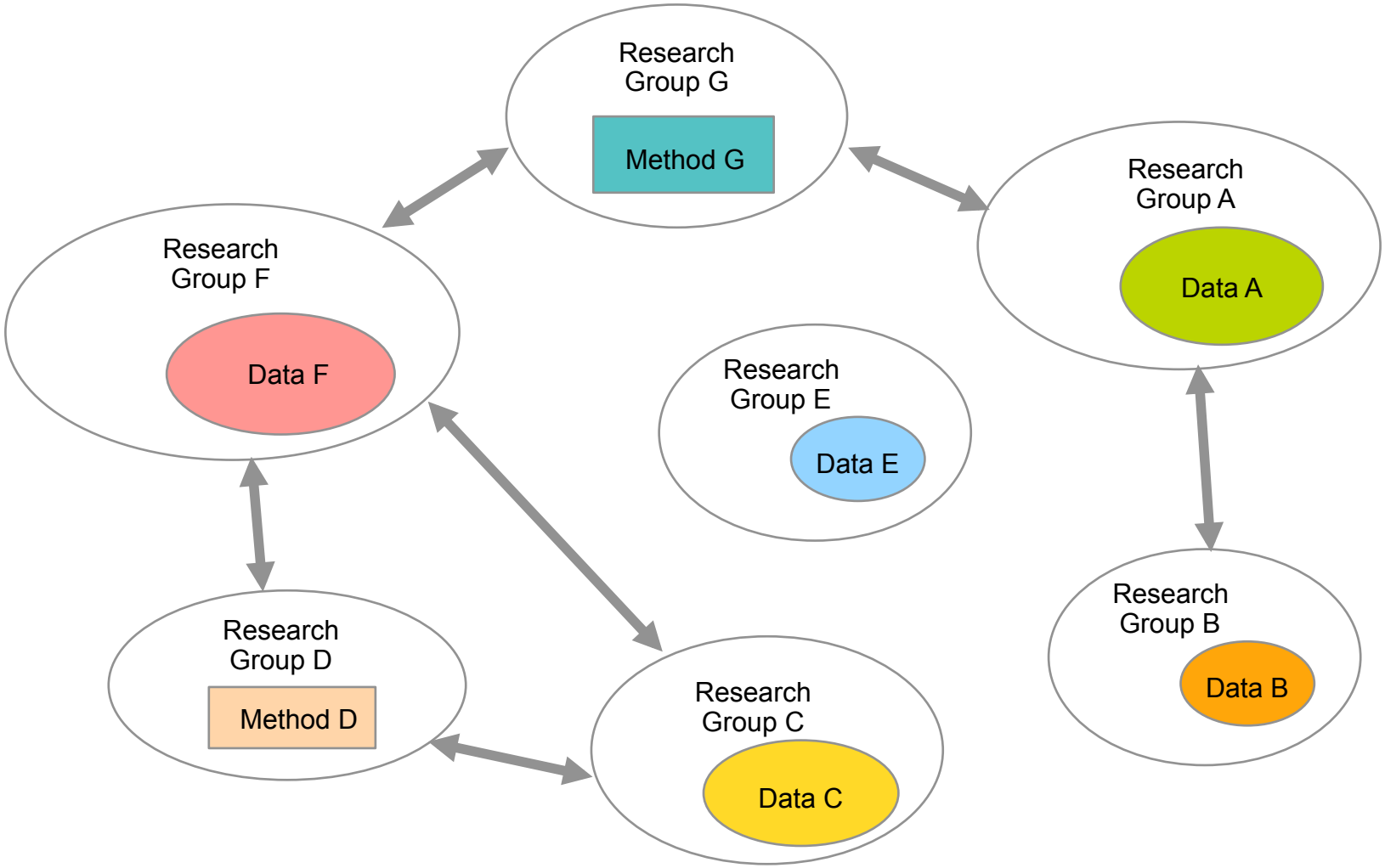


Some reflexions on Open Data in Environmental Research …

Who is using my data ?

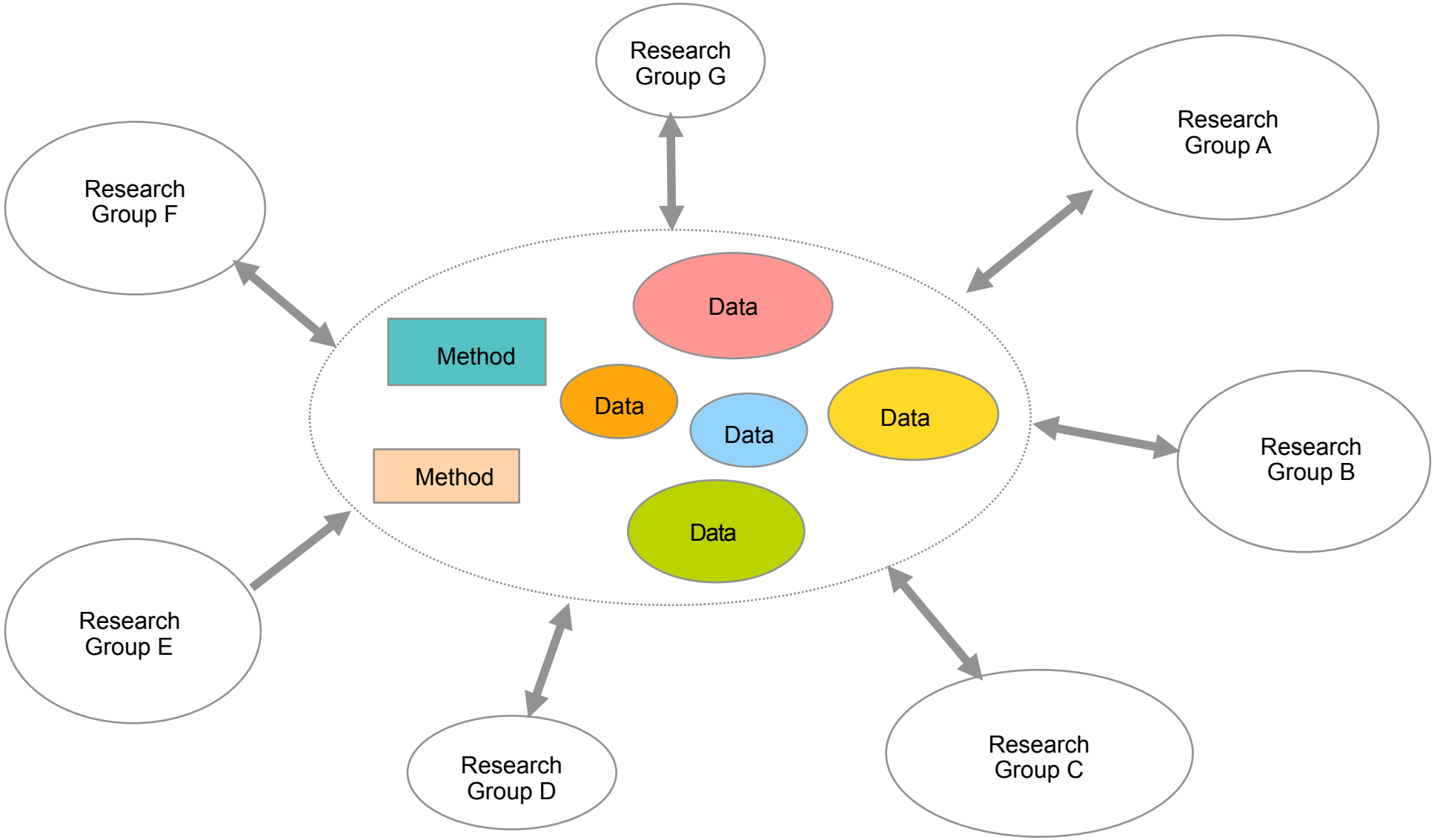
Conventional “Integrated” Experimental Research

Data and knowledge exchange based on “local” agreements between different research groups



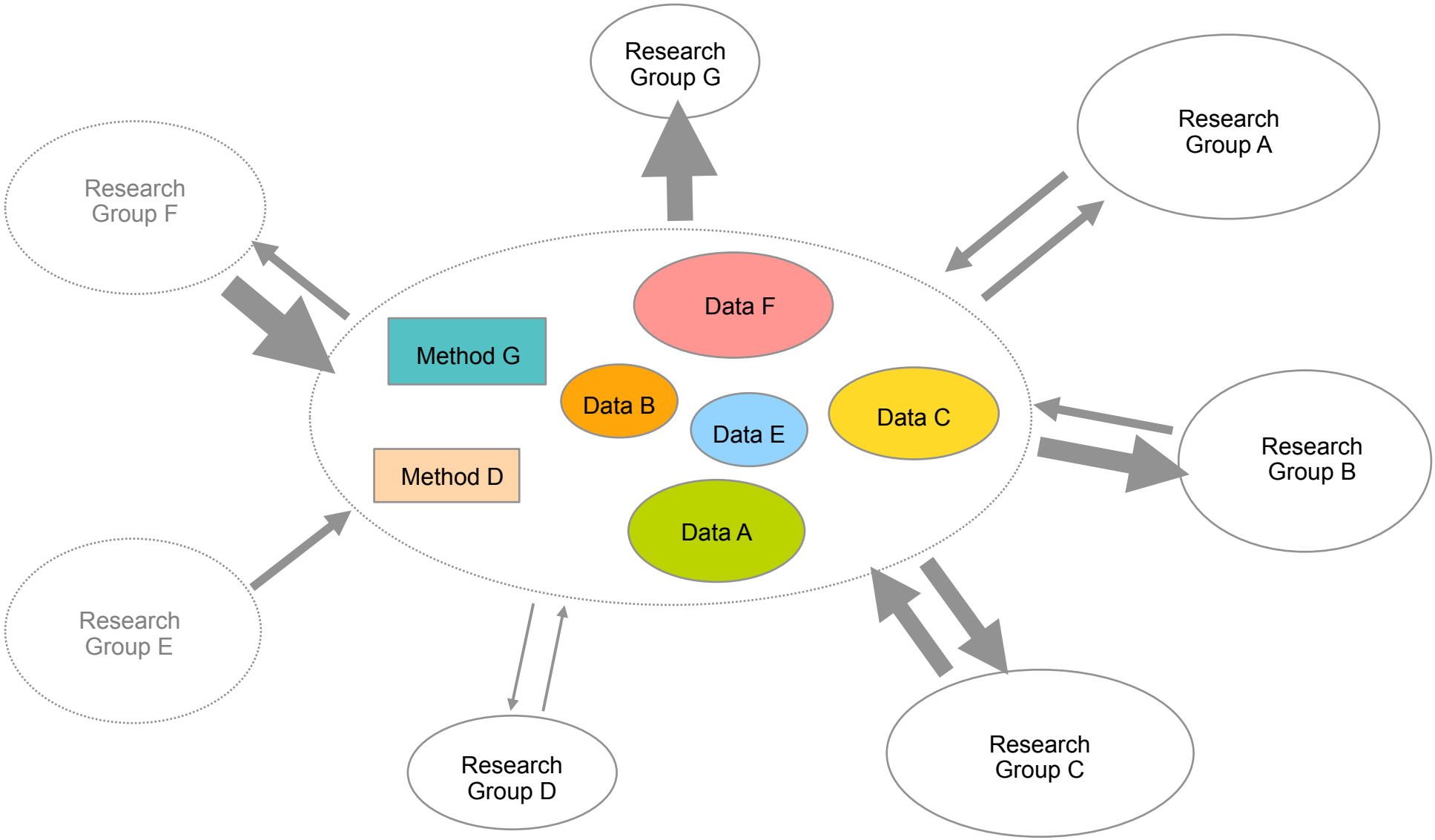
Integrated Experimental Research with Open Science. New paradigm

Data and knowledge “properties” are lost



Integrated Experimental Research with Open Science. New paradigm

Data and knowledge “properties” are lost
Contributions from different research entities will not be equal



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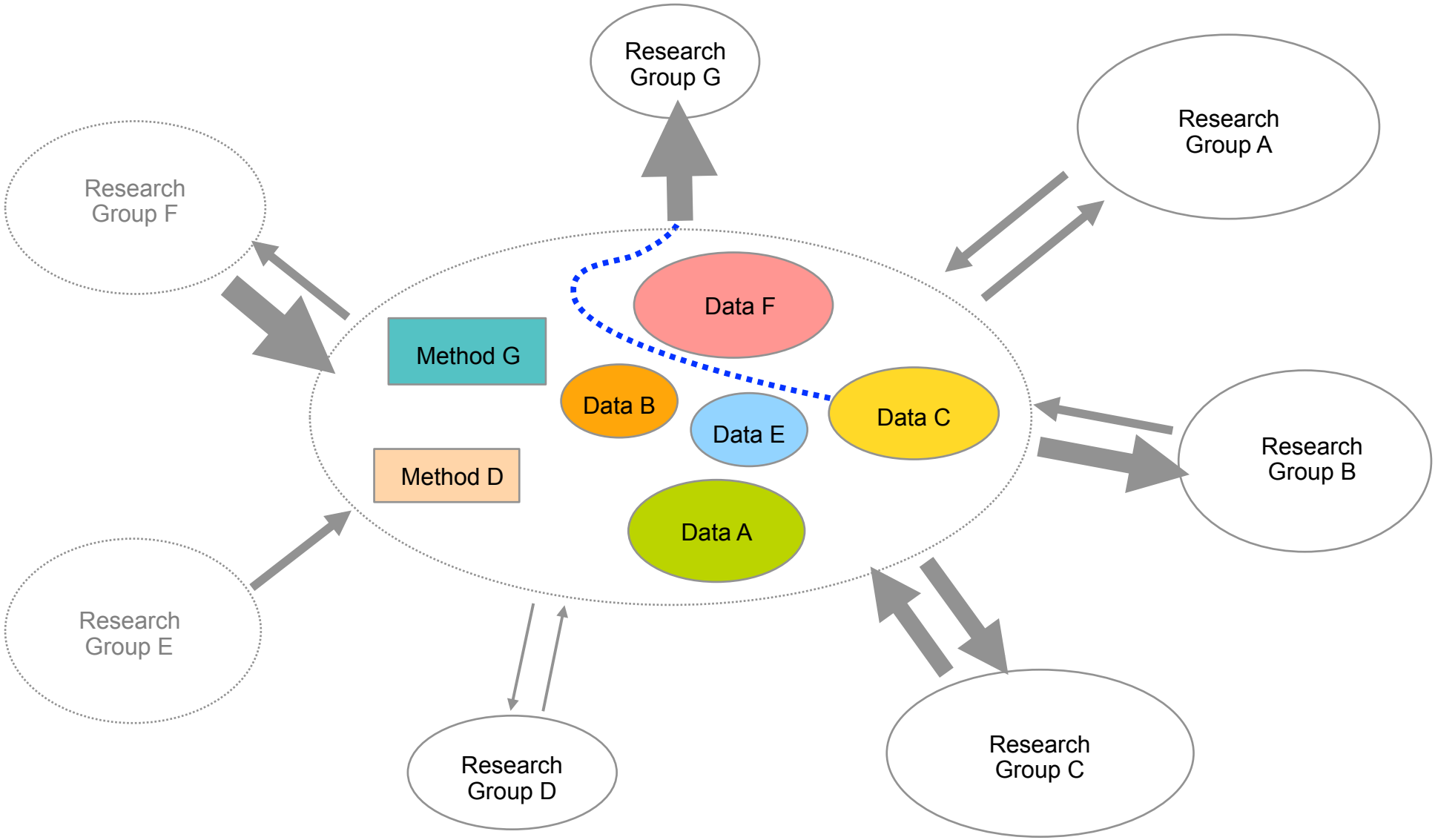

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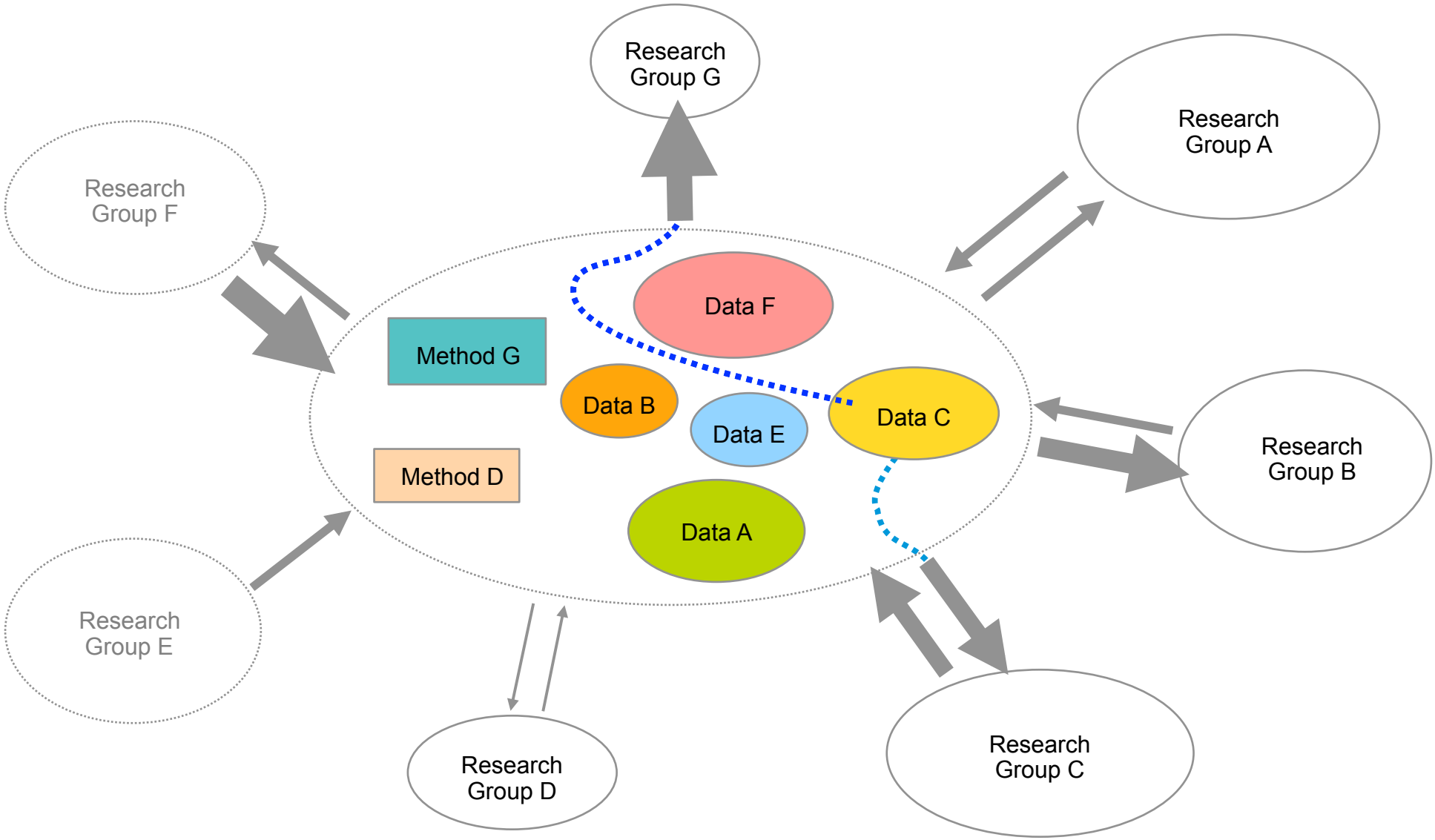

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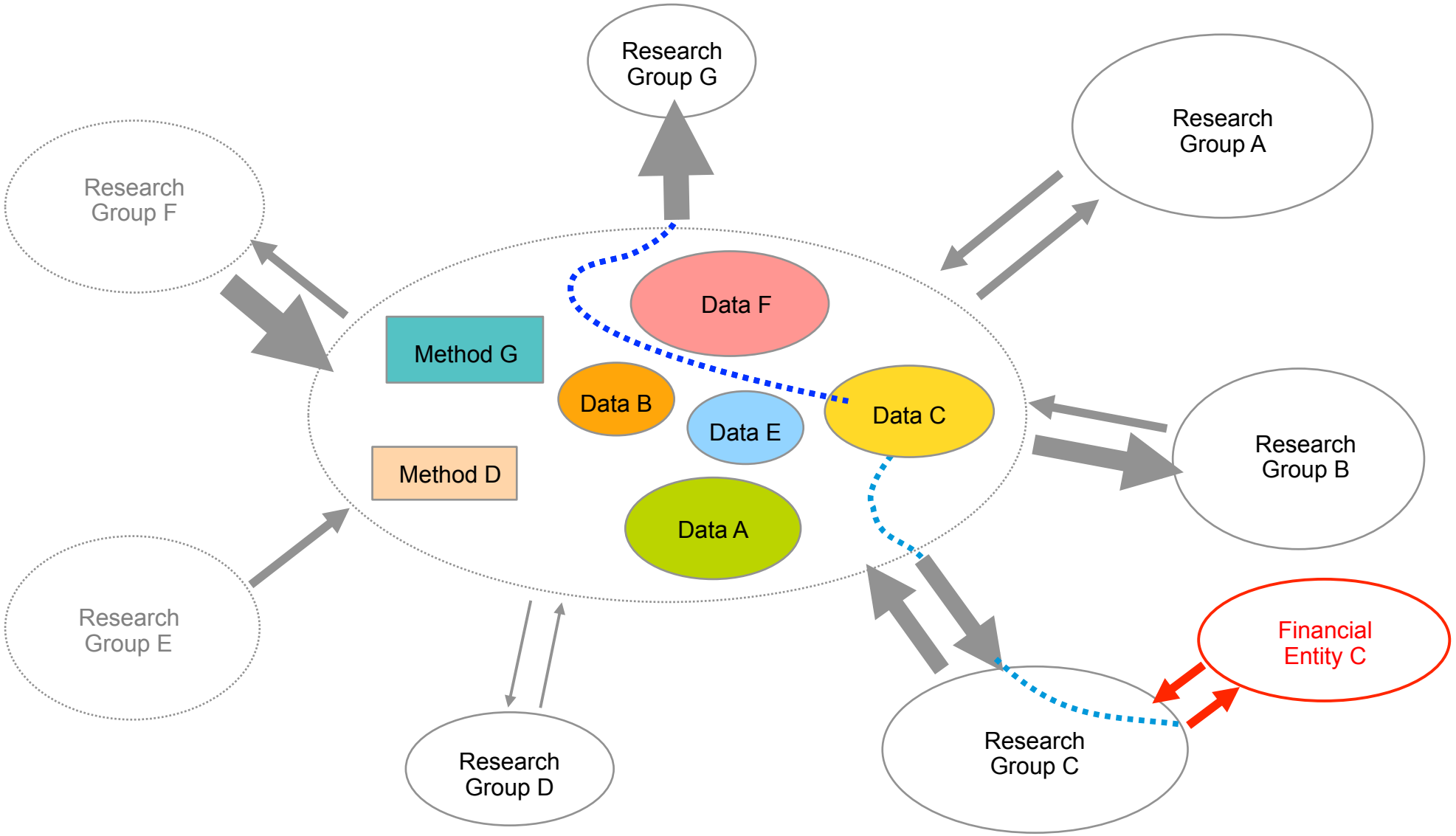
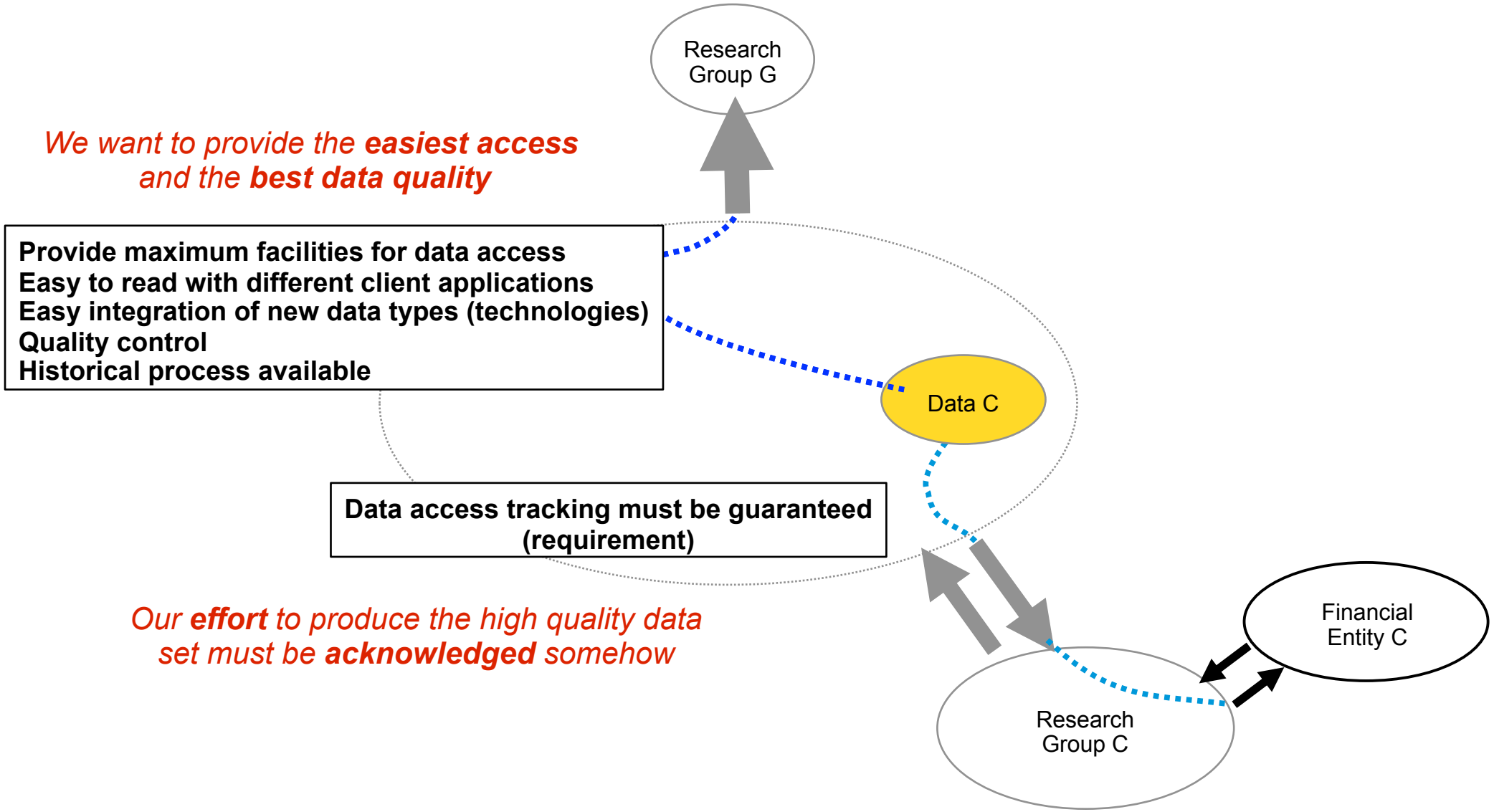


Citizen Science Web Portal. Conceptual requirements
What we want as a "data producers" ?



Web Portal. Conceptual requirements
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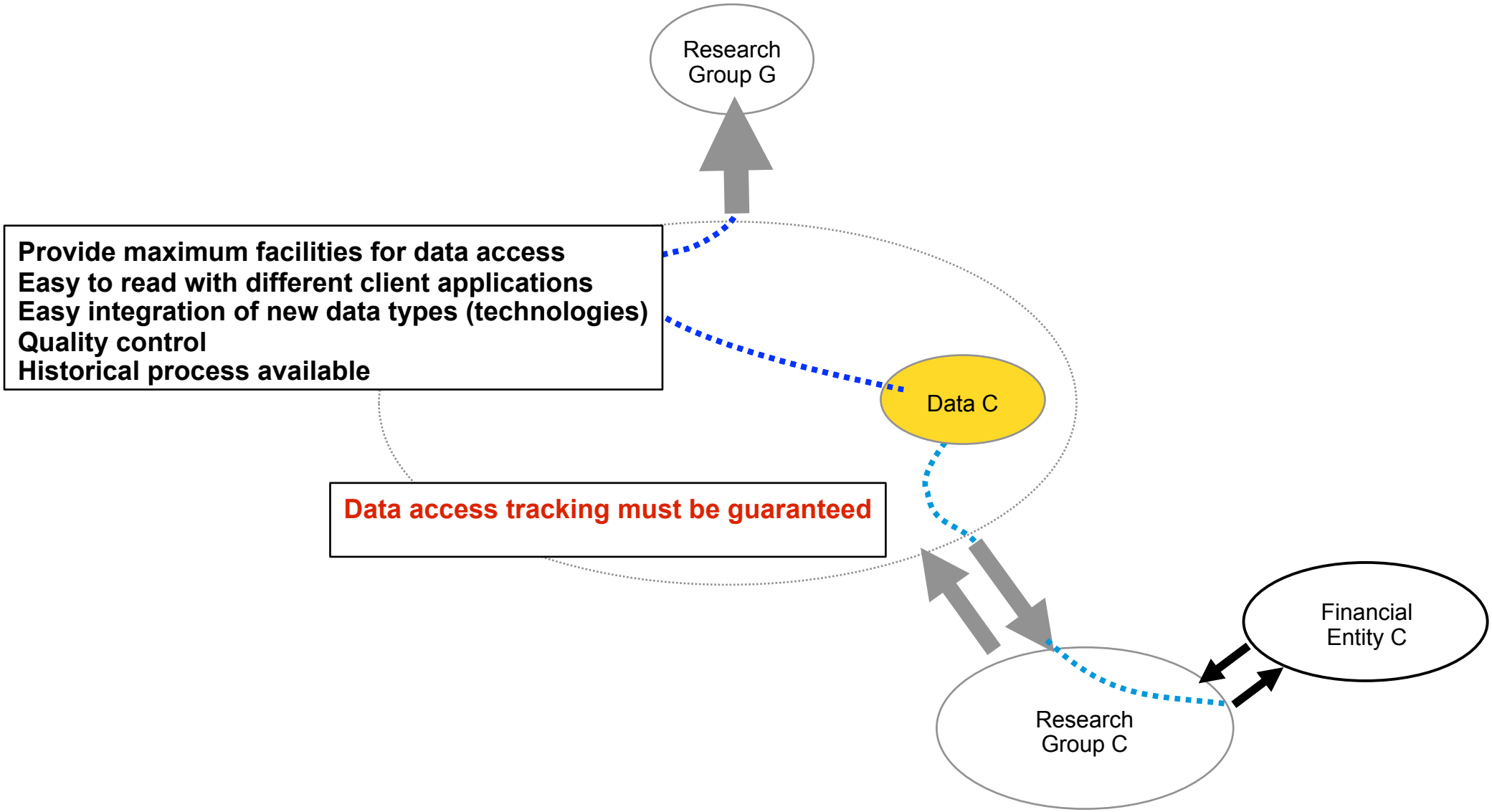
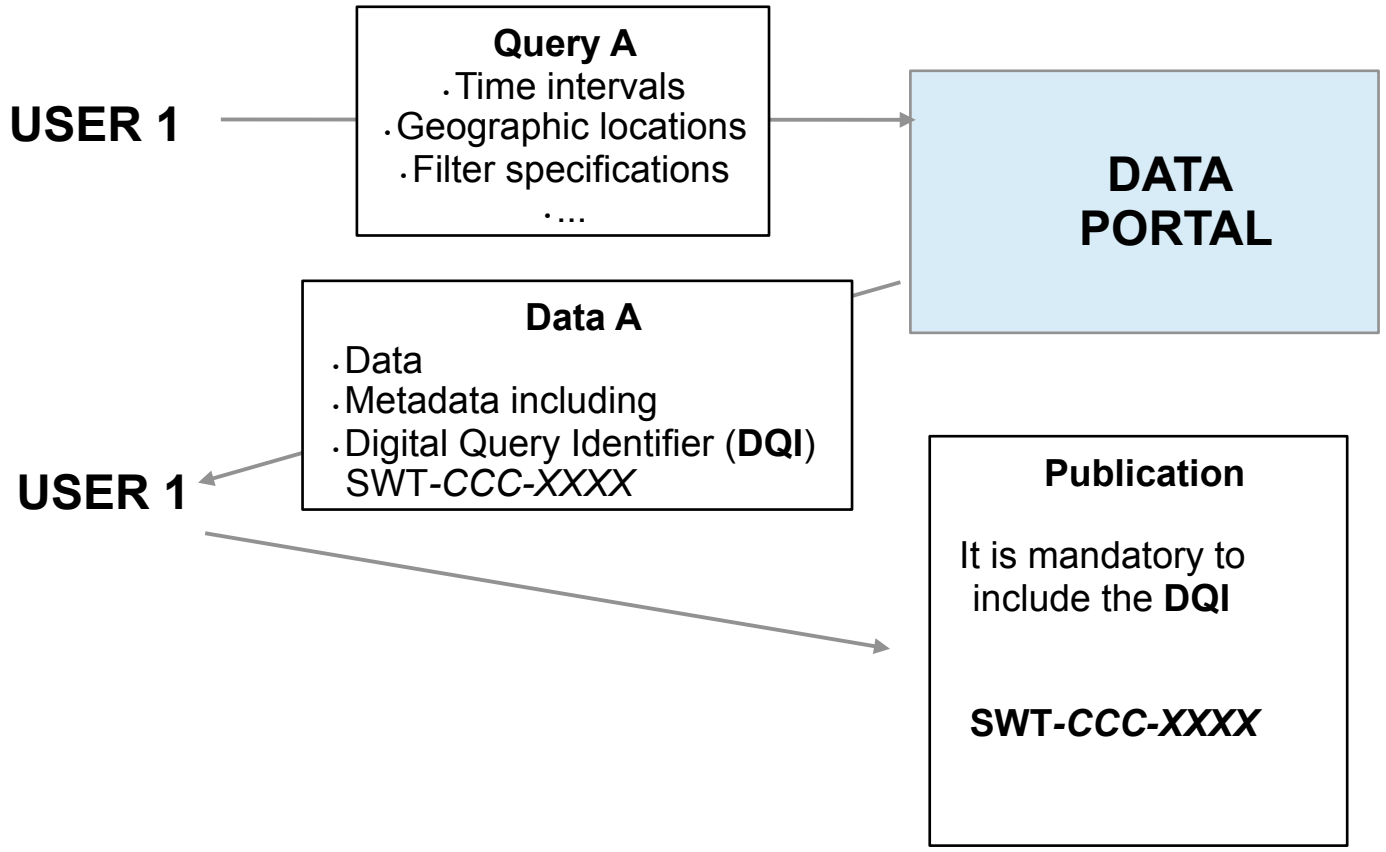


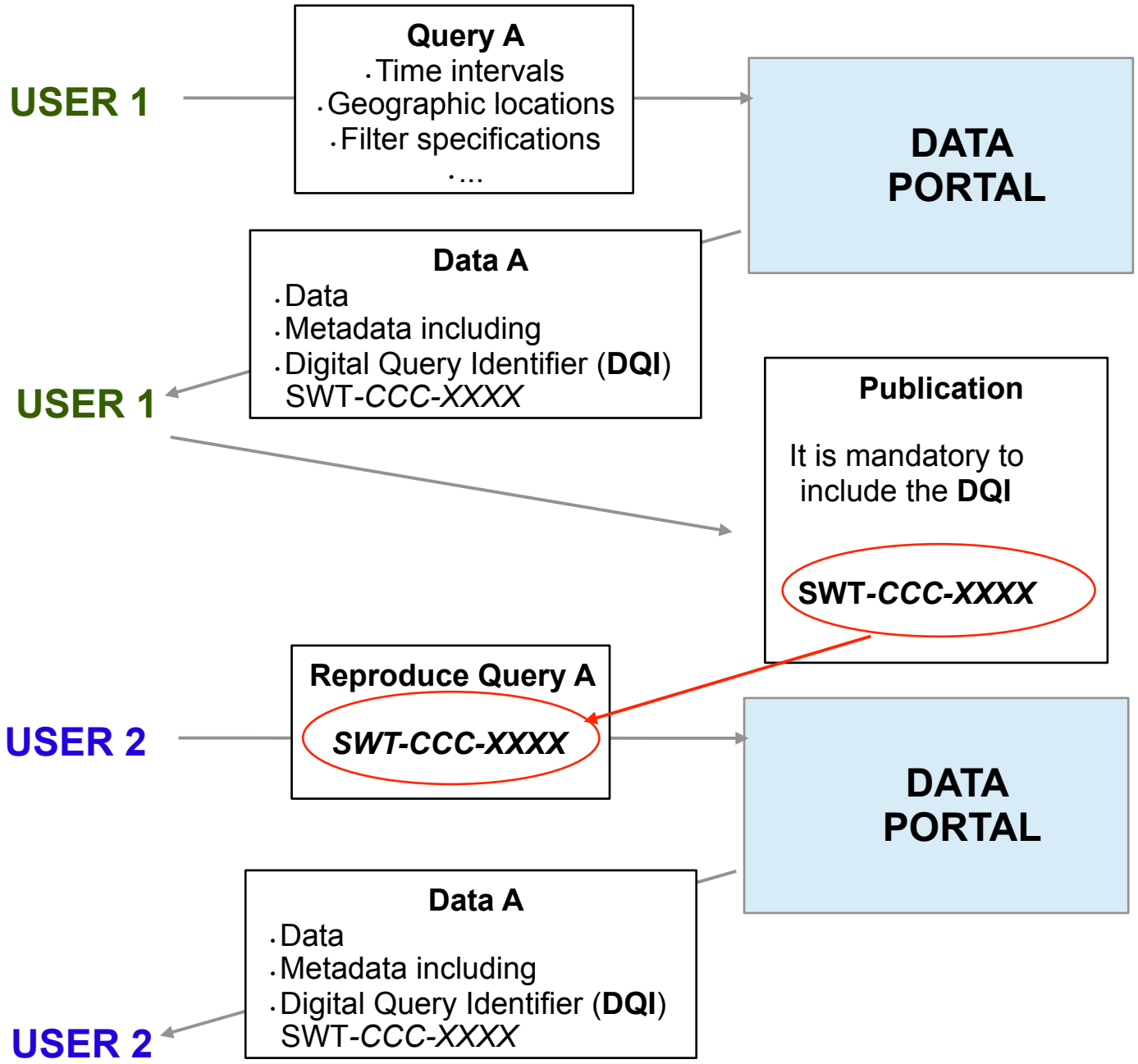
Data access tracking

We propose to develop a data access tracking system based on a **Digital Query Identifier (DQI)**



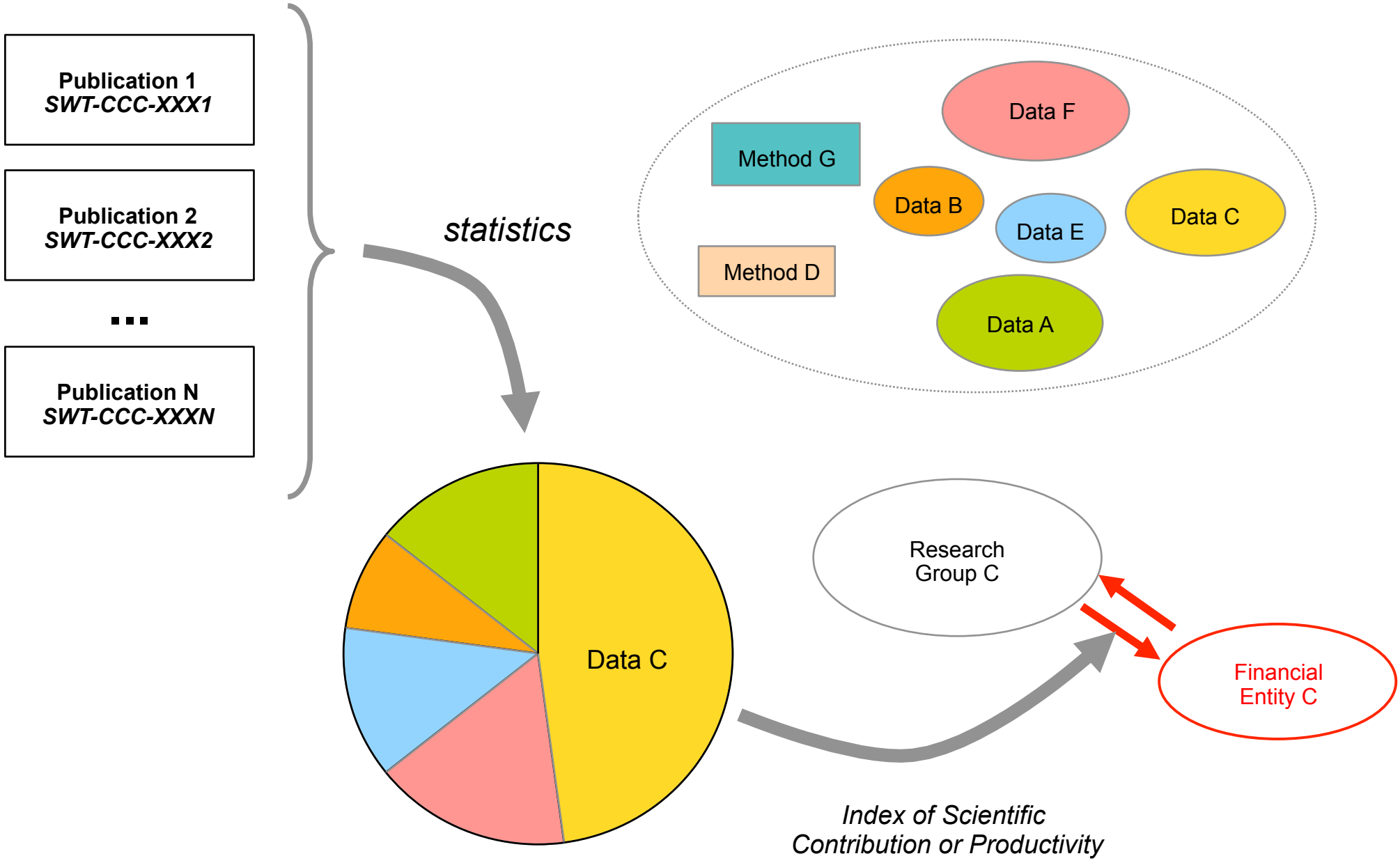
Advantages of Data access tracking (I)

Reproducible query (research)



Advantages of Data access tracking (II)

Data Citation Statistics



Thank you

Questions?