Citclops: water monitoring and participatory science

Luigi Ceccaroni (BDigital) and Jaume Piera (CSIC)

EU BON's Citizen Science Stakeholder Round Table
How can EU BON support citizen science?

Berlin, November 27th 2014

Citclops

Citizens' observatory for coast and ocean optical monitoring

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1. **Objectives**

- To **enable citizens' participation** in collecting environmental data
  -water's color, transparency and fluorescence-
  in coastal and oceanic areas through:
  - the use of existing devices, such as smart phones, as sensors;
  - the development of novel low-cost sensors and systems for monitoring

  and:
    1. new applications for mobile devices
    2. friendlier and more flexible user interfaces
    3. social-networking capabilities to connect citizens and citizens' associations to decision makers

1. **Objectives**

- To provide recommendations in sectors such as fisheries, health, tourism and spatial planning, interpreting collected data through **artificial intelligence techniques**

- To deliver interpreted information to **three kinds of users**:
  - citizens (individuals and associations)
  - decision makers (e.g., local administrations)
  - researchers

2. **Optical properties and marine-environment status**

- Optical properties as proxies of:
  - sewage impact
  - dissolved organic matter
  - sediment load
  - gross biological activity
- And more generally:
  - marine-environment status
  - anthropogenic pressures on resources
  - non-anthropogenic causes of harmful conditions

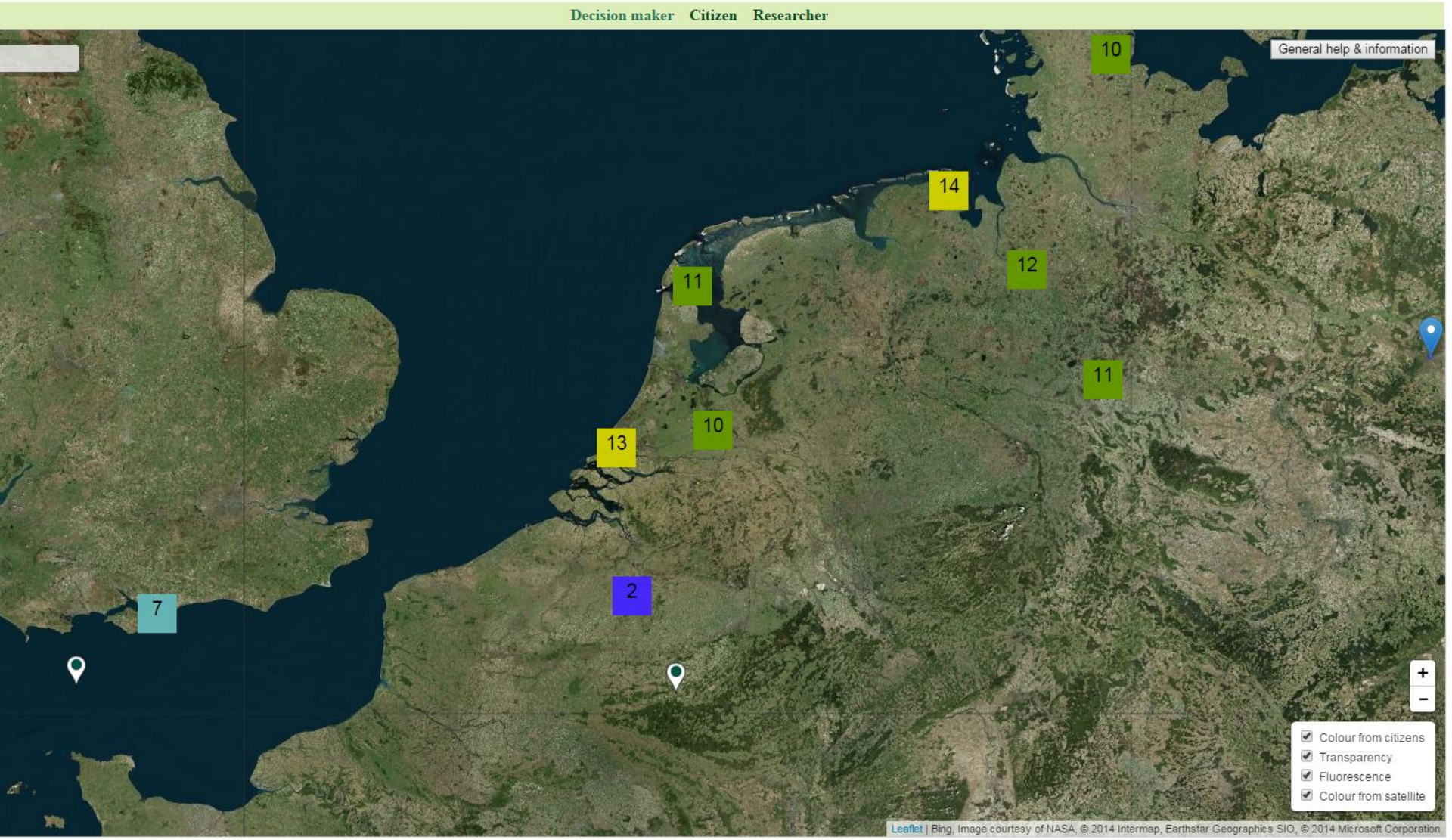
3. **Optical monitoring – but better**

- Use of optical monitoring to reinterpret seascapes
- Combination and interpretation of data collected by:
    - distributed communities of citizens sharing technological solutions (Citclops's citizen science)
    - publicly available data
        - satellites
        - data requested by EU directives
        - weather
        - other projects
- to re-design current monitoring (new sensors, apps)
- to complement governmental environmental observation systems

4. **Potential applications**

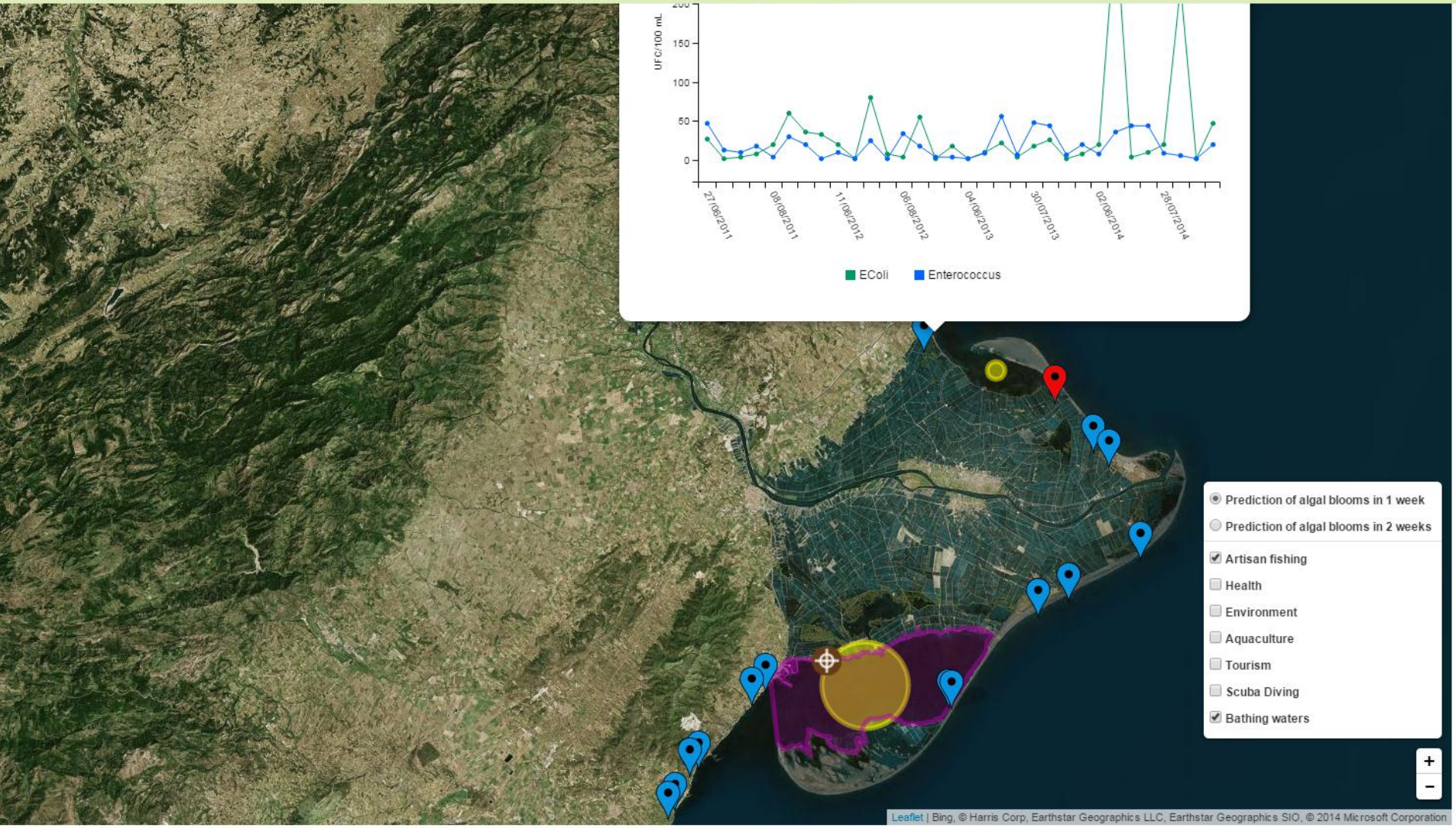
- To provide sea farmers with bulletins and early warnings about HABs
- To maximize citizens' experience in activities in which water quality has a role
- To provide everybody with powerful, user-friendly tools of environment interpretation
- To improve governmental environmental observation systems
- To implement community participatory governance methods aided by social media streams
- To improve decision making

5. **Examples and use cases**



5. **Examples and use cases**

Decision maker Citizen Researcher



5. **Examples and use cases**

- Collaboration started with the Barcelona Foundation for Ocean Sailing (FNOB)
- First step (2012): A Citclops camera installed on this ship
- Second step (2013): Creation of a common educational program
- Third step (2014): Citclops app used in the Barcelona World Race

6. **EU BON and Citclops**

- How can EU BON support Citclops's activities about citizen-science?
  - EU BON may act as data portal to find Citclops's data.
  - EU BON may provide tools to visualize and interpret Citclops's data in new ways.
  - EU BON may provide tool to assess the quality of Citclops's data.
  - EU BON may link Citclops's data to broader information pools such as different remote sensing data or modeling information.
  - EU BON may support Citclops by validating the process used for data collection, considering INSPIRE and other data standards.

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"I envision new methods for exploring ecosystems. Inexpensive, sensor-rich networks will record natural events. Data streams will be transformed into a highly patterned history of places via advanced mobile devices, inviting us to become interpreters in a living observatory"

Glorianna Davenport
MIT Media Lab
2012

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