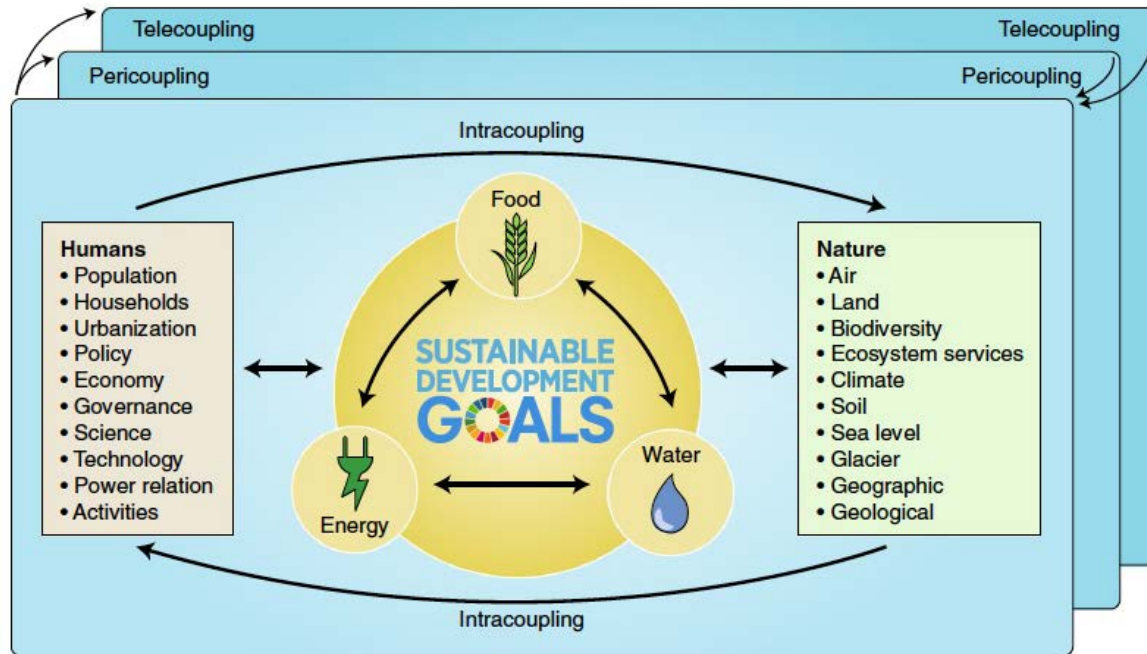


Big data e Citizen Science per la gestione delle risorse idriche e rischi idrogeologici

Fernando Nardi
Roma, 5 dicembre 2018

The Nexus: increasing (need of) resources and risks



Liu, J. at al. (2018). Nexus approaches to global sustainable development.
Nature Sustainability, 1(9), 466.

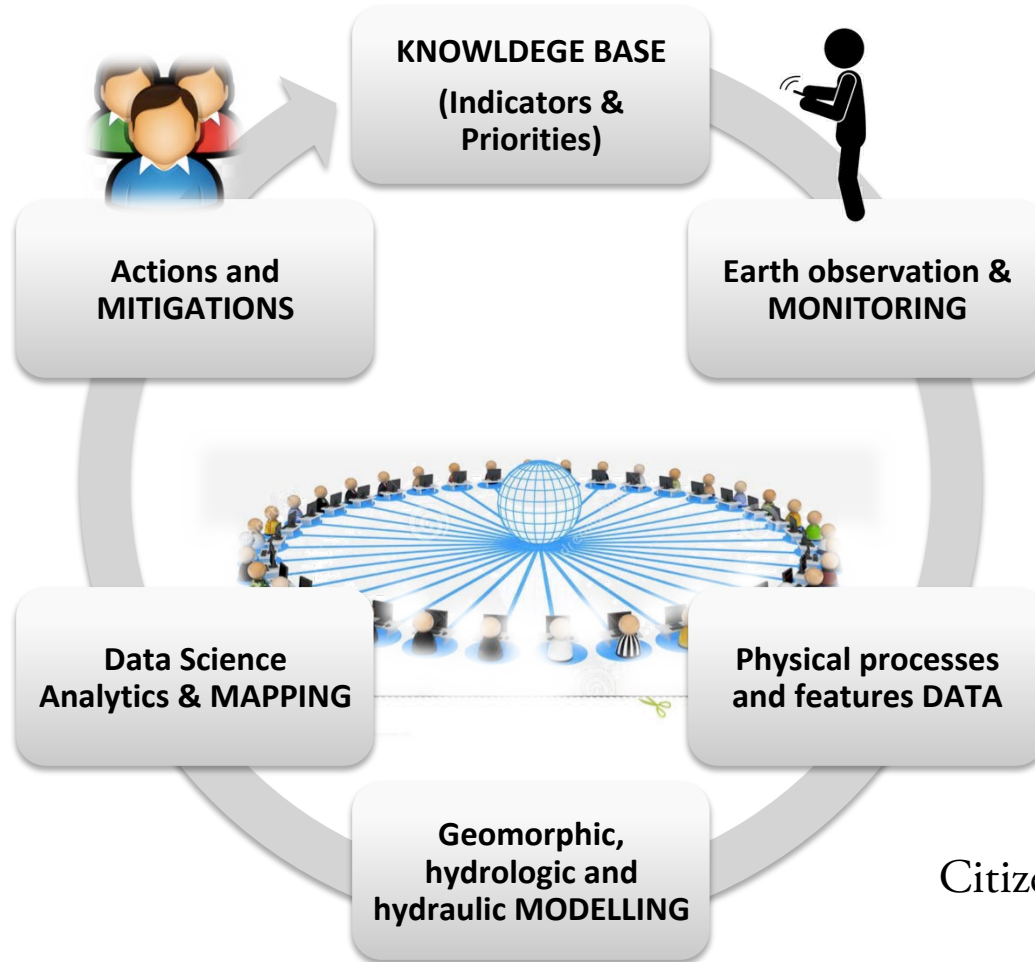
Understanding for acting (decision making)

based on the quantification of the inter-linkages and coupling mechanisms

Open/Big Data and Citizen Science for managing the Water, Food, Energy and Environment Nexus



Understanding for managing water resources and risks

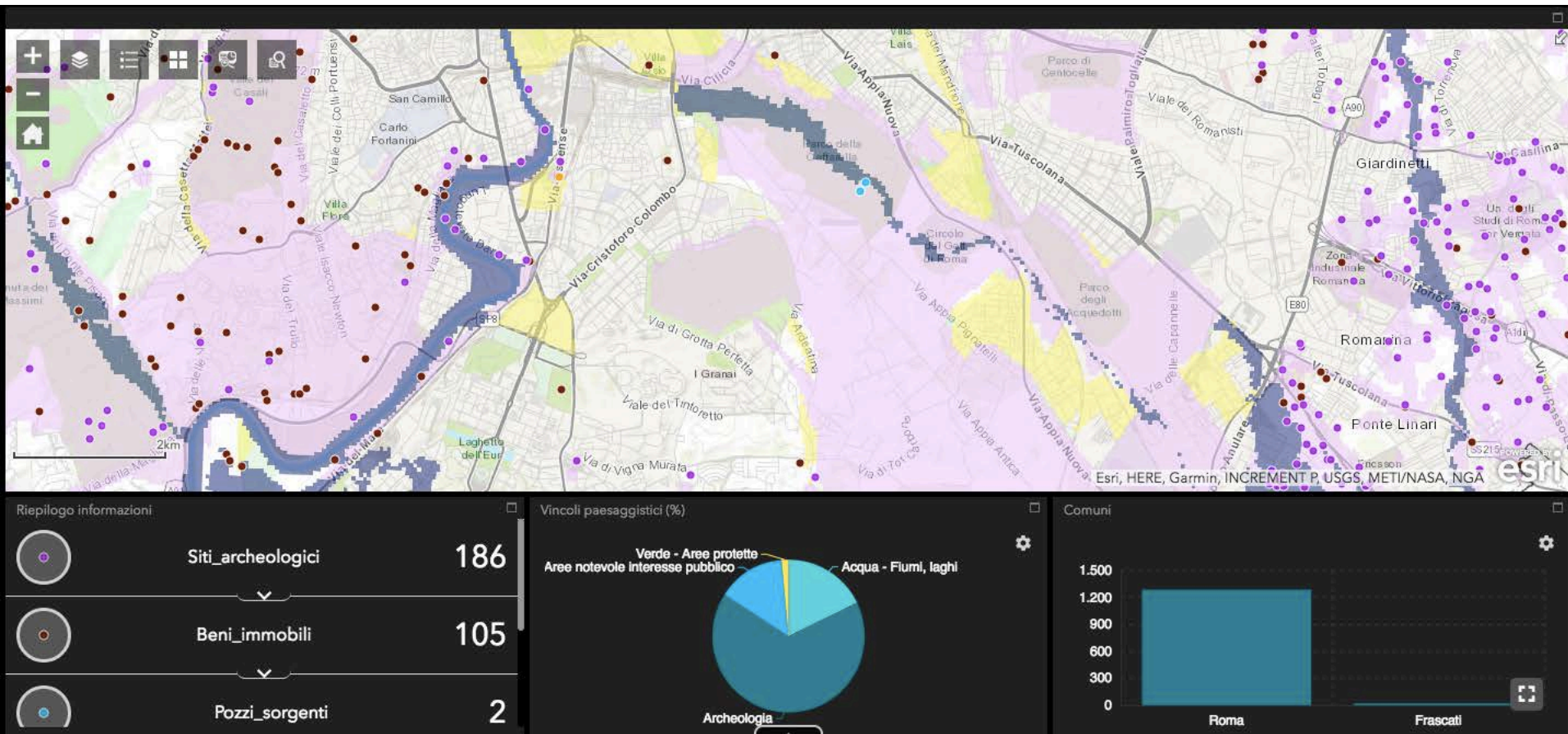


Understanding for acting
(decision making)
based on the quantification
of the inter-linkages and
coupling mechanisms

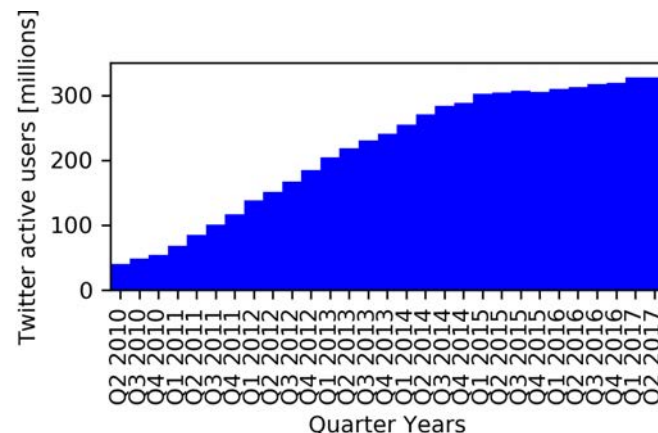
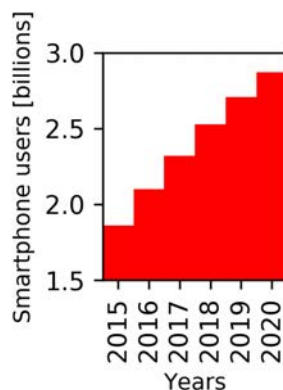
**Communication
& Outreach**

Citizens awareness <-> Vulnerable buildings

Dashboard & Infographics for Decision Making



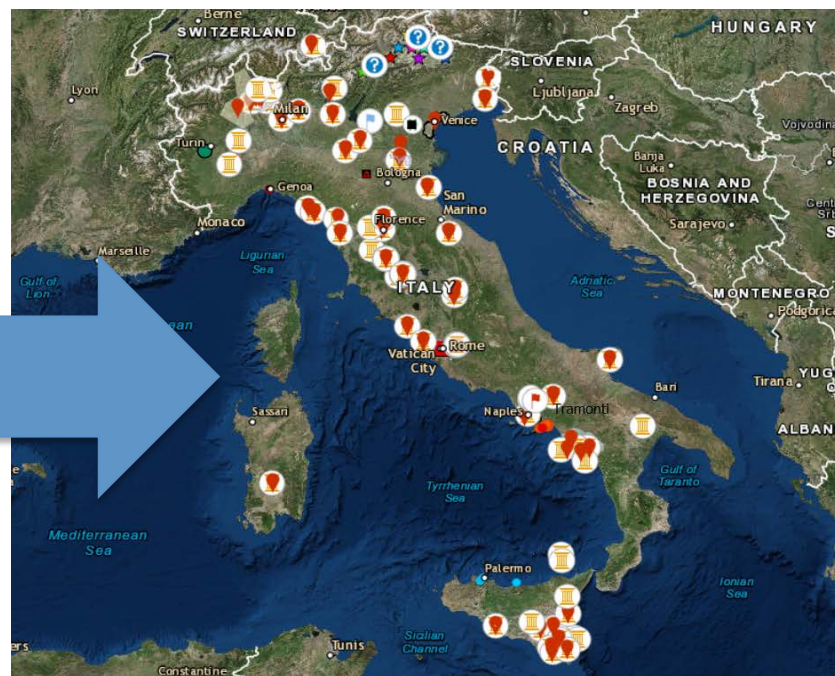
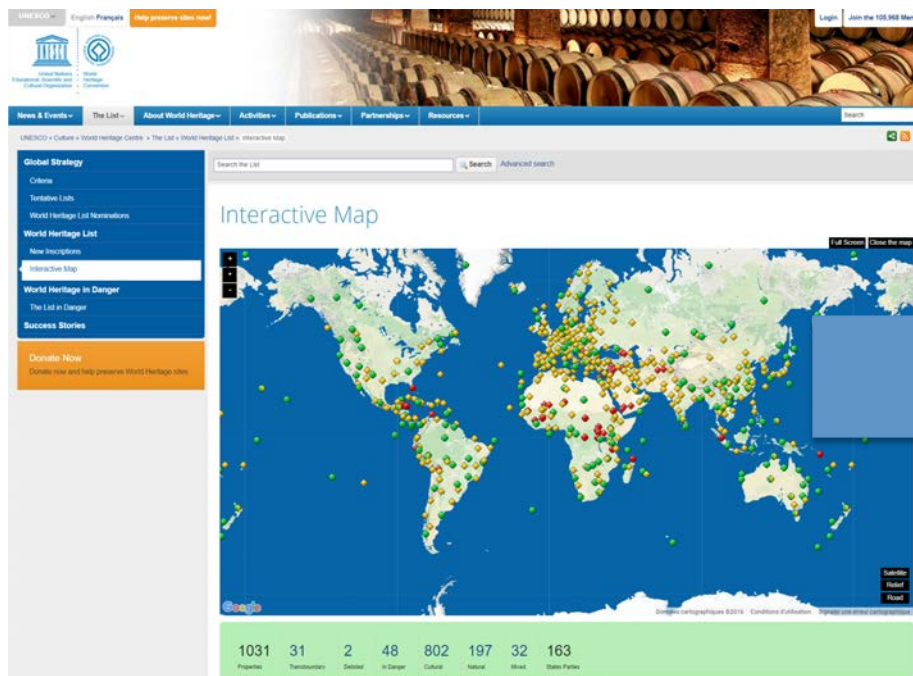
Big Data and Citizens



Statista (2017)

From Benedict XVI (2005) to Pope Francis (2013): citizens become “human sensors”, produce and receive information

Crowdmapping experiment Cultural and environmental heritage map of Italy



<http://whc.unesco.org/en/interactive-map/>

Story Map Case Study: Heritage at Risk: endangered resources and natural disasters

A story map by Francisco Peña

Historic Center of Rome

Heritage at Risk

Heritage assets are at risk as a result of neglect, decay or inappropriate development. Natural disasters and climate change are considered major threats to World Heritage property and it's important to establish mechanisms for the optimal conservation.

On the local level, the General Urban Plan of Rome regulates the entire territory of the city and represents an innovative and flexible tool for the protection, promotion and presentation of the World Heritage property. Specifically, it extends the classification of "historic city" to the whole World Heritage property and to the surrounding areas of the town. Here the regulations take into account the integrity of the urban fabric and the features of the building typologies, allowing different practices and quality controls. It selects, defines and regulates the areas of strategic planning (e.g. the Tiber, the Forums, the city walls), as well as those for potential development. It also outlines fundraising mechanisms for conservation, promotion and presentation of the site.

Roma Capitale has developed a strategic plan containing actions and major interventions aimed at protecting and promoting the values of the property.

Heritage at Risk

Invaded by rats?

Yes. In summer 2015, the fountain was overrun by rats and underwent the most extensive restoration since it was completed in 1962. The fountain was re-open in October the same year.

Weathering

Wind, air, water and elastic temperature changes can cause potential damage to the monument.

Heritage at Risk

Ward to swim? Let's go the Fountain!

Only if you want to pay an important fee, and the the Australian tourist in 2014.

Heritage at Risk

Fred! "The Bird" Fountain?

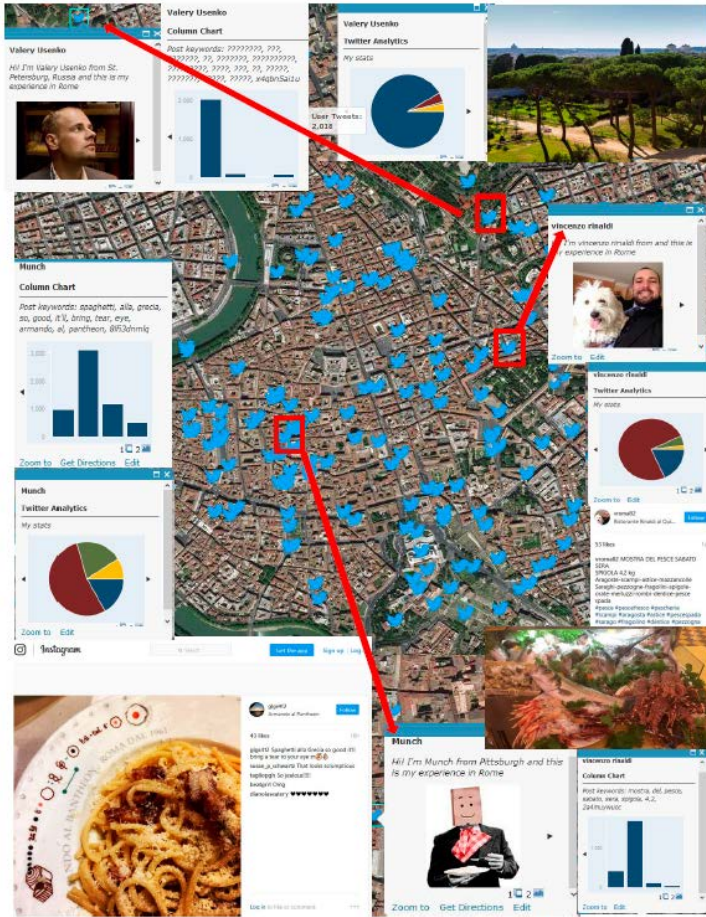
In October 2005, the fountain ran red due to a vandalism attack.

Santa Maria Maggiore

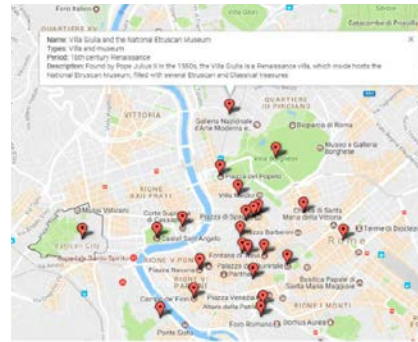
Violent protests, hooligan brawls, terrorism threats, pollution and lack of maintenance represent a serious risk to Rome cultural heritage.

Other markers on the map include: Fiume Tevere, Vaticano, Palazzo della Cancelleria, Altare della Patria, Piazza Spagna, Piazza, and Complesso di San Giovanni.

Mapping Social Open Data in GIS Environment



Perugia/@43.0949969,12.3101129,12:

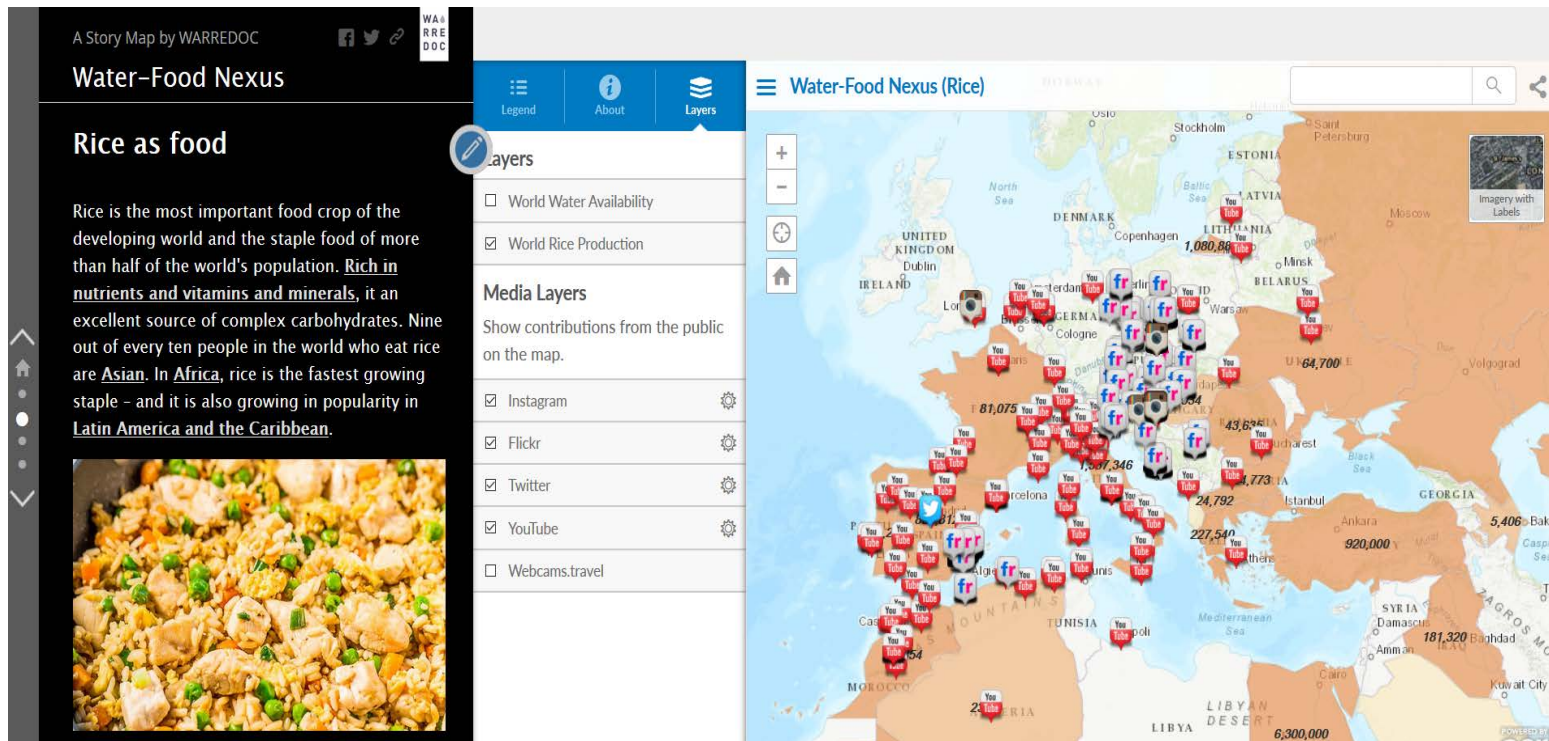


- BIRD IQ
- ARCGIS ONLINE
- GOOGLE TABLES
- GOOGLE MAPS



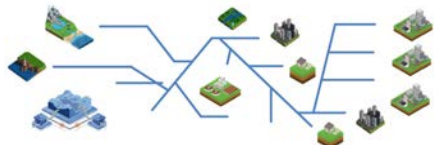
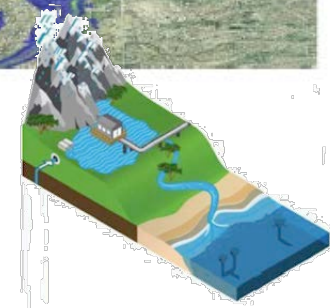
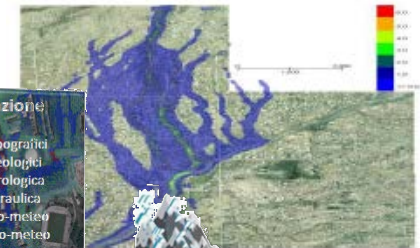
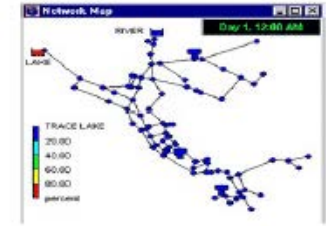
Digital mapping products

Human experience: Integrate the user experience into your map by adding social media content (using keywords and hashtags) to obtain meaningful insights on human behavior



Solutions-oriented research & training

- Dashboard and Infographics using advanced GIS and web-based interfaces
- Modelling and Mapping water systems using "human sensors" (from drones and satellites to smart phone apps)
- Communication and outreach activities – from elementary school to professional tailored-training



Analisi Geospaziali
 GEO-location
 GEO-processing
 GEO-intelligence
 GEO-statistics
 GEO-mapping
 GEO-zoning

Modellazione
 Modelli topografici
 Modelli geologici
 Modelli idrologici
 Modelli idraulici
 Modelli idro-meteorologici
 Modelli agro-meteorologici
 Modelli inquinanti

Modelli dati
 Dati/Reti idrografiche
 Dati/Reti idriche
 Dati/Reti ambientali
 Dati/Reti Infrastrutture
 Risorse idriche/ambiente
 Rischi idro/ambiente
 Uso / Vincoli

Research and outreach: Communicating and developing science

[#Watermanifesto by WaterOpenDay.org](#)

22 MARCH 2017 | WORLD WATER DAY
#WaterManifesto #WaterOpenDay
Social Media Campaign   



[CandHy \(Citizen AND Hydrology\) Working Group](#)

by the International Association of Hydrological Sciences (IAHS)

<https://iahs.info/Commissions--W-Groups/Working-Groups/Candhy.do>



Water & SME Working/Mirror Group:

- Water & Resources
- Water & Risks
- Water & Cultural Heritage



Next events

- December 6th, Italian Embassy in Washington DC, 13th US-Italy Joint Commission Meeting on Science and Technology Cooperation Earth Sciences and Cultural Heritage
- December 10-14, 2018 – American Geophysical Union Conference in Washington D.C., USA
- March, 11-13, 2019 – [MOXXI-CANDHY Conference in New York, USA](#)
- April, 2019 – Open/Big Data for the Water, Food, Energy & Environment Nexus - National Workshop (Rome) June, 2019 – Release of the White Paper
- June 28, 2019 – Watershed Summit, Denver, USA
- July 8-18, 2019 - 27th IUGG General Assembly, Montreal (Canada)

MOXXI-CANDHY Conf. by IAHS, WMO, CUAHSI

Source: ESA

MEASUREMENTS AND OBSERVATIONS IN THE 21° CENTURY

MOXXI 2019 Topical Conference

Citizen and Hydrology (CandHy) Kickoff Meeting

11-13 March 2019

New York University, New York , NY, USA



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