CD-03 A Proposed GEO Foundational Task

Assessing the benefits from Earth Observations and their Socio-Economic Values; Francoise Pearlman, IEEE; Jay Pearlman, IEEE and Adjunct Professor University of Colorado; Richard Bernknopf, IEEE and Research Professor Economics University of New Mexico.

Acknowledgements:

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GEO Value

I Overview:

The GEOValue community of practice is focused on understanding benefits from Earth observations, other geospatial and associated environmental information for complex socioeconomic decisions. Geospatial information contributes to decisions by decision-makers and individuals. More effective use of information is essential as issues become increasingly complex and consequences for future economic and social development increase.

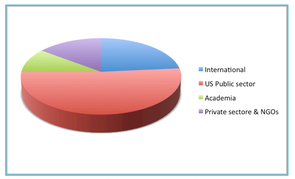
Geospatial data has evolved from a scarce and expensive resource to an abundant resource and archive, primarily provided by governmental organizations often sourced at no or minimum charge. In a recent workshop (October 28/29, 2014), the consequences of the changing technology, data, and policy landscape were examined.

We continue by defining use cases that assess value by tracing the information flow end-to-end from geospatial data acquisition system to decisions by end users. The goal is to demonstrate and compare approaches to valuation of geospatial information and forge a path forward for research. This workshop "from data to decisions" will take place March 10/11, 2016 at the OECD Paris, France.

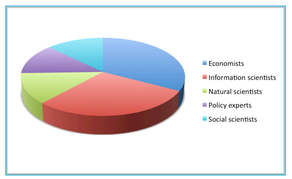
II October 28/29, 2014 Workshop:

68 Participants

- ❖International (Australia, Europe, Canada, OECD, World Bank)
- ❖US Agencies (OSTP ,IDA, NASA, NOAA, NSF, USGS)
- ❖Private Sector and NGOs
- ❖Academia



❖Disciplines (Economics, information science, natural sciences, social sciences, policy analysis)



Agenda:

Day 1: The supply of information
- Looking at the future (technology and decision-making)
- Impact of increased access to information
- Leveraging citizens

Day 2: Information users
- Social Impact of information abundance
- Emerging approaches to economic impact assessment
- Path forward

III Key Questions:

Linking Science to decision-making

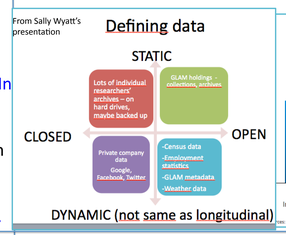
Suzette Kimball, USGS

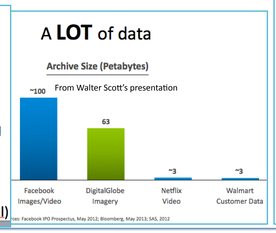
How do we know we are being effective?

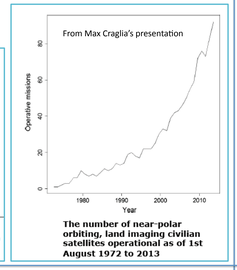
- ❖How can "data democracy" enhance the breadth and depth of users of geospatial information?
- ❖How can citizen science and crowd sourcing strengthen the understanding and appreciation of science?
- ❖How can methods for assessing geospatial information be applied more routinely and effectively?
- ❖What methodology issues do we need to address?
- ❖What information is most important for assessing the impacts of geospatial information?

IV An Abundance of Data:

According to SINTEF (a Scandinavia think tank), 90% of all data in the world were collected in the last 2 years.







V Leveraging the Crowd:

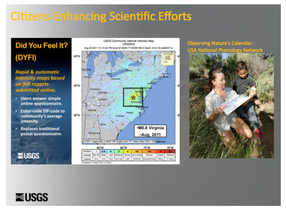
Crowd-sourcing and citizen science are new and collaborative modes of information production and consumption not just about more data.

From presentation by Max Craglia and Lea Shanley

Typology of Citizen-Generated Content Projects

Type of project	Objective	Methodology
Citizen Science (CS)	Scientific knowledge/ public policy	Scientifically designed
Education CS	Awareness raising/educat.	Scientifically designed
Community CS	Community building/ Monitoring	Community-led, scientifically designed
Crowdsourcing	Resource sharing (money, time, tasks, computing)	Varied

Citizens as Sensor: "did you feel it?"



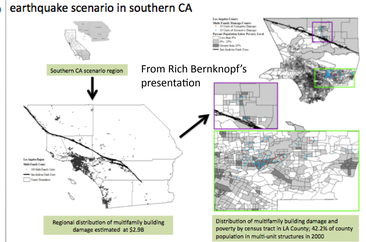
- People are critical as "data stewards"
- Data are deeply social, always inscribed in the instrument used to create them

VI Geospatial, environmental and socioeconomic integration

•How do we move beyond the abundance of geospatial data to an integrated approach?

Example – A southern California earthquake scenario is coupled with housing and income status to aid in minimizing building damage and sustaining economic growth. Simulation showed a significant risk concentration in census tracts with large numbers of residents of lower socioeconomic status. Example Los Angeles County study evaluated the economic benefits of a voluntary hazard mitigation program combined with regulated mitigation based on socioeconomic status.

Pattern of expected damage to multifamily buildings in a M=7.8 earthquake scenario in southern CA



Map of the USGS ShakeOut scenario in southern CA and multifamily building damage (Jones et al 2008) and census tracts with high levels of poverty in LA County (source: Bernknopf and Amos 2014)

VII Linking Science and decision-making

•For decision makers, value is subjective in many ways. The difference between value and perceived value is very important. The key is to focus on the local electorate (tell stories showing the impact);

•Science and technology can present options to a decision maker and politician, though the decision itself is based on the official's values – including all the contributing economic, social, scientific, and political factors;

•Data becomes more valuable as it is better understood and used to make decisions;

•The demand for geospatial information is to reduce decision uncertainty;

•The value and impact of data depend on the skills and capacity of people to analyze and apply it throughout the economy and society;

•Continue to foster public engagement. Be mindful to protect confidentiality and privacy, and be sensitive to the cultural context.

VIII 2016 GEO Work Programme task CD-03 – Assessing the benefits from EOs and their socioeconomic value

The primary focus of the task will be on developing methodologies, creating use cases/assessments, developing examples that can be broadly understood and useful for training.

The work will build upon prior developments carried out by JRC in support of INSPIRE, the efforts supporting NASA Earth Science applications, the USGS Science and Decisions Center economic analyses and case studies.

Key Deliverables

- ❖Define case studies for baseline analysis
- ❖Hold an international workshop at OECD in March 2016
- ❖Ensure presence at major international events such as AGU in the US and EGU in Europe
- ❖Publish themes and discussions in Earthzine and other web journals
- ❖Maintain the community web site
- ❖Develop and coordinate the LinkedIn virtual community

IX Path Forward

Practical steps

- ❖Integrate geospatial use cases with existing material (Environmental Valuation Reference Inventory - EVRI) and expand the range of case studies for the community.
- ❖Identify use cases related to ongoing projects. Connect with decision makers and managers interested in participating in these studies.
- ❖Develop one of more short courses addressing approaches to assess the value of information

AGU San Francisco December 18, 2015 "Valuing trade-offs in natural resources using geospatial information; PA51C Posters 8:00 – 12;20; Oral 13:40 – 15:40

The session will address the development and monitoring of environmental indices and related methods of impact/benefit assessments. The session will include for example "stacking" indicators, updating a drought indicator and identification, design, and measurement of a set of indicators overlaid on a unit of a natural resource.

"From data to decisions: Valuing the Societal Benefit of Geospatial Information", a workshop hosted by OECD in Paris, and organized in collaboration with OECD, NASA and USGS, March 10/11, 2016; a one day short course will be offered on March 9 at L'Ecole des Mines.

Present case studies and define and describe use cases that trace the information flow end-to-end from earth observations acquisition systems to decisions by end users. Case studies will be identified as examples for a range of applications.

X GEOValue Community of Practice

GEO Value

- ❖Reach out to multi-disciplinary community during Public Affairs session at AGU
- ❖Publish presentations and workshop proceedings on GEOValue community website http://www.socioeconomicbenefits.org
- ❖Publish position papers in peer reviewed open publications
- ❖Invite workshop participants to LinkedIN group https://www.linkedin.com Socioeconomic Benefits Community Group
- ❖Initiate practical steps from section IX above