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EARTH OBSERVATION SYMPOSIUM (B1)
Towards Implementation of GEOSS (6)

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MAPPING CAPACITY BUILDING ACTIVITIES FOR THE USE OF SPACE-BORNE EARTH OBSERVATION DATA: THE CEOS WGCAPD INVENTORY PROJECT

Abstract

Space-borne Earth observation (EO) data can be used for a variety of socioeconomic benefits and development needs. Activities aimed at raising awareness about and building capacity for utilizing this space-derived EO data are being carried out across the globe by various organizations. However, these organizations do not always coordinate with each other on their capacity building activities. This leads to less than efficient use of precious and increasingly scarce resources. While there are a number of complex reasons (political, financial, etc.) why organizations may not coordinate with each other to carry out capacity building, one easily identifiable reason for lack of coordination is that many organizations are simply not aware of the activities being implemented in this field. Individual organizations may have published materials about their own projects, but there is no central repository that an interested party could search to ascertain exactly what global, regional, or even national capacity building activities are taking place.

Recognizing this need, the Committee on Earth Observation Satellites (CEOS) and its Working Group on Capacity Building and Data Democracy (WGCapD) commenced a project in early 2013 to fill this gap. The Capacity Building Inventory project aims to compile all current capacity building efforts on the use of space-derived Earth observation (EO) data for societal benefits into an easily updateable and user-friendly format. The final product will be a fully interactive world map with all inventoried projects and activities sortable by region, country, Societal Benefit Area or Data Democracy area addressed. This map will likely be hosted on the WGCapD website and be updated on an annual basis.

Once available, the project and its map will serve as a comprehensive resource of ongoing capacity building efforts, helping those actors involved better coordinate their existing activities and inform future planning, ultimately bolstering international cooperation in the area of space-borne EO. This IAC submission will present on the project concept, design, and current status.

I. INTRODUCTION

Space-borne Earth observation (EO) data can be used for a variety of socioeconomic benefits and development needs. Activities aimed at raising awareness about and building capacity for utilizing this space-derived EO data are being carried out across the globe by various organizations. Some organizations execute their activities on their own while others choose to participate in bilateral or multilateral cooperation to carry out their activities. However, there still remains the opportunity to create additional efficiencies and coordination among the institutions that are carrying out capacity building by raising awareness of the activities that have been completed, are currently in progress, or are planned in the near future. Although some organizations may have published materials about their own projects, there is no central repository that an interested party could search to ascertain exactly what global, regional, or even national capacity building activities are taking place using space-borne EO data.

Recognizing this opportunity and need, the Committee on Earth Observation Satellites (CEOS) Working Group on Capacity Building and Data Democracy (WGCapD) commenced a project in mid-2013 to fill this gap. The Capacity Building Inventory project aims to compile all current capacity building efforts on the use of space-derived EO data for societal benefits into an easily updateable and user-friendly format. The final product will be a fully interactive world map with all inventoried projects and activities sortable by region, country, Societal Benefit Area, or Data Democracy area addressed. This map would be updated on a continual basis.

Once available, the project and its map will serve as a comprehensive resource of ongoing capacity building efforts, helping those actors involved better coordinate their existing activities and inform future planning. The ultimate goal is to bolster international cooperation in the area of space-borne EO capacity building. This IAC paper will present on the project concept, design, and current status.

I. BACKGROUND INFORMATION

In order to understand why CEOS is embarking on this project, it may be helpful to describe the objectives of CEOS and explain the mission of the WGCapD..

CEOS, established in 1984 in response to a recommendation from a Panel of Experts on Remote Sensing from Space that was set up under the G7 Economic Summit of Industrialized Nations to organize global EO coordination efforts, provides a framework for international coordination of space-based EO missions. CEOS has 30 Member space agencies and 23 Associate organizations. The objectives of CEOS are to:

- Optimize benefits of space-borne Earth observations (EO) through cooperation of its Members in mission planning and in development of compatible data products, formats, services, applications and policies;
- To serve as a focal point for international coordination of space-related EO activities; and,
- To exchange policy and technical information to encourage complementarity and compatibility of observation and data exchange systems.

In 2013, CEOS is focusing coordination efforts on the following priority areas: "climate monitoring and research, carbon observations, including observations to sustainable management of the world's forests, food security, disaster risk management, capacity building, and data availability and access."[1] Within the capacity building and data availability and access priorities, CEOS is making great efforts to advocate the concept of Data Democracy, which is defined as ensuring timely access to key datasets and associated tools for the worldwide development of capacity in the use of EO from space.

In order to promote Data Democracy within and outside of CEOS, CEOS maintains the WGCapD, which was reconstituted in 2011 to focus on Data Democracy. The idea of Data Democracy was introduced in 2008 during the CEOS Chairmanship of the South African Council for Scientific and Industrial Research (CSIR) and further advanced under the subsequent chairmanships of Thailand's GEO-Informatics and Space Technology Development Agency (GISTDA) in 2009 and Brazil's National Institute for Space Research (INPE) in 2010. The objective of the Data Democracy Initiative, as noted in the 2010 CEOS Rio Plenary Statement, is the "provision of timely access to key data sets free of charge to build capacity worldwide,…enhanced data dissemination capabilities, sharing of software tools, increased training, and technology transfer to end users."

While the majority of WGCapD members are CEOS Agencies, the Working Group has also partnered with

[1] CEOS 2013 Work Plan, ceos.org/images/CEOS_2013_Work_Plan_FINAL.pdf

many other institutions, such as Secure World Foundation (SWF), the Regional Centre for Mapping of Resources for Development (RCMRD), the Centro Regional de Enseñanza de Ciencia y Tecnología del Espacio para América Latina y el Caribe (CRECTEALC), the World Bank, and the Group on Earth Observations (GEO), in an effort to amplify the capacity building efforts of all parties involved.

In the first meeting of the WGCapD, coordinating numerous capacity building activities that were occurring around the world proved to be a very daunting challenge. The WG took on an initiative to better understand the entire picture of capacity building activities across the world and use that understanding to inform WG projects. Eventually, the idea to create a database of capacity building projects was born and the Capacity Building Inventory project commenced in mid-2013.

II. PROJECT CONCEPT

The WGCapD recognized that the first step in effectively coordinating capacity building activities was understanding the current landscape. This could be done by answering the following main questions:

- Who is involved in capacity building and Data Democracy initiatives?
- What types of activities are they conducting?
- Who is participating in and benefitting from these activities?

In answering these questions, the international community could identify areas of duplicate efforts, opportunities for collaboration and cooperation, and potential unmet needs that could be incorporated into future activities.

Within the WGCapD, a small team consisting of NOAA and SWF staff took on the task of background research, looking for previous studies or compilations that the WG could draw on to inform and help shape the current initiative. In this research, the team came across a few documents in CEOS and a few documents on the GEO website. These documents were mainly in the form of reports that were filled with very good information on capacity building activities, but were not widely referenced within the CEOS community.

The team took special interest in a 1997 report that the European Organisation for the Exploitation of Meteorological Satellites (EUMETSAT) led during their tenure as the Chair of the Working Group on Education, Training, and Capacity Building (WGEdu), the precursor to the WGCapD. This report focused on collecting much of the same information that the WGCapD was seeking. Although the report was filled with a wealth of capacity building information, reports are often hard to read through and leave much to be desired in the area of helping someone visualize the global picture. The team wanted to collect much of the same information as the 1997 report but was looking for a dynamic way to display and update it.

The ability to effectively coordinate across multiple agencies and organizations requires that all parties have access to the same information. Moreover, with so many activities and initiatives taking place globally, this information needs to be accessible in a format that someone can easily understand and digest without intense time requirements up front. Of course, if there is to be substantive coordination, more time intensive research will be required, but as a starting point, the team sought out a simple yet informative way to present the information.

In this search for how to display information in a concise yet informative manner, the team came across the idea of using an interactive map to show where projects and activities are occurring around the world. Early examples that the WG identified were maps produced by InterAction and the United States Agency for International Development (USAID) to represent Food Security Aid and USAID funded development projects, respectively. Examples of these maps can be seen below.

Figure 1. Food Security Aid Map produced by InterAction, http://foodsecurity.ngoaidmap.org/

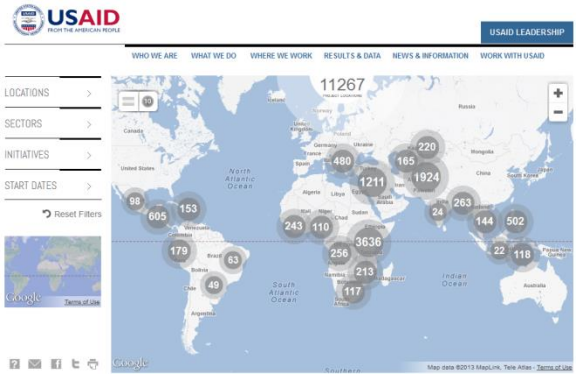

Figure 2. USAID Interactive Projects Map, http://map.usaid.gov/

Upon further research and study, it became clear that many organizations are creating interactive maps to better monitor results, improve coordination, and enhance transparency and social accountability among other goals. The team decided that this would be the ideal approach for the capacity building inventory and took this idea back to the wider WGCapD.

After the broader WGCapD refined and approved the idea, the Vice Chair of the WGCapD made a presentation at the March 2013 CEOS Strategic Implementation Team Meeting seeking concurrence from CEOS SIT to move forward with the inventory, which was granted. With support from the CEOS SIT, the WGCapD set out to implement the project.

III. PROJECT IMPLEMENTATION

Once the WG had determined the format of the project and had support from the broader CEOS community to pursue this initiative, the WG began brainstorming the best way to gather the information that would populate the map. Online surveys are basic tools that are used in the modern age to gather information. It was quickly decided to use a survey tool to gather the capacity building information.

With so many available survey tools on the market, but with little funding to purchase the tools, the WGCapD first settled on a free Google Form. Since the success of the project depends almost entirely on the quality and quantity of the information that is received, the WG aimed to make the simplest, most straightforward survey possible while still meeting the requirements needed to make the map informative. Over four months, the questions were iterated and rephrased to ensure the answers would provide the necessary data to complete the inventory. The final survey focused on the following areas:

- Point of Contact
- Name and Description of Project
- Status of Project
- Data Democracy Area(s) of the Project
- Societal Benefit Area of Project
- Location
- Beneficiaries
- Co-Sponsors and Collaborators
- Website
- Supporting Materials

Although no survey can meet the requirements of each specific case, the effort was made to incorporate and take into account every piece of feedback that the WG provided. Feedback was also sought and received from a few outside organizations. In order to accommodate those who already have the information in spreadsheet or other forms with little time to reenter the information into the survey, the inventory team provided a way for the user to submit files that the WG could then use to extract the necessary information.

In meeting the needs of individual users, it was made clear that the survey needed to be dynamic and allow for multiple activities under one project without the respondent having to enter in the same information multiple times. To meet this requirement, the WG moved to a paid site called QuestionForm to host the survey. QuestionForm was able to provide all the tools necessary to build a dynamic and user-friendly survey. CEOS, as a best efforts organization, must rely on the contributions and commitments of individual agencies to fund and execute projects. SWF, as WGCapD partner, solely funded the development of the survey, highlighting the importance of partnerships within CEOS and WGCapD. A snapshot of the survey is included in Figure 3.

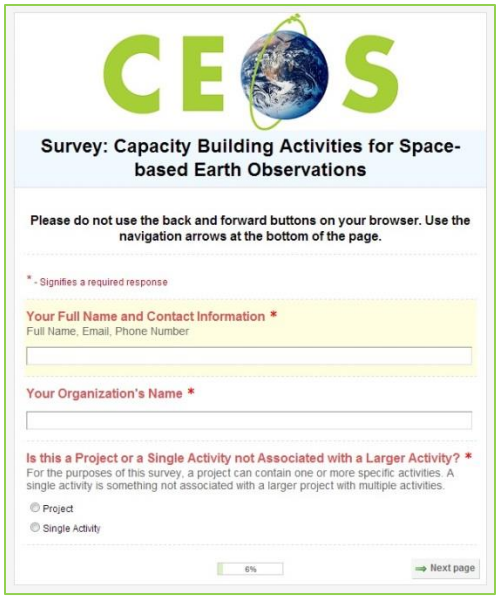

Figure 3. Capacity Building Survey for Inventory

In parallel with the development of the survey, the WG also began to socialize the project to CEOS Members, Associates, and partners to promote the inventory and gather a list of contacts for filling out the survey. Each organization that responded identified a point of contact, which was used to compile a contact list for survey distribution. The list is not quite comprehensive of all the organizations that work in this field, but the WGCapD is working to gather more contacts for distribution of the survey.

While the team developed the survey and contact list, the team was also brainstorming a way to build an interactive map for this project. They looked at various examples and contacted a number of institutions about the development of an interactive map tool. Quick information gathering by the U.S. Geological Survey revealed that development of an interactive map like the examples from USAID and InterAction would cost in the range of US$15,000, which appeared at first glance to be an insurmountable obstacle for successful completion of the project.

At this critical juncture, the WG was informed about a similar initiative being carried out in a project funded by the European Commission through the 7th Framework Programme called the GEO Network for Capacity Building (GEONetCab). This project was actually coming to a close, but one of their main outputs was a capacity building portal that functioned much like the end product that the WG had in mind. See Figure 4.

Figure 4. GEONetCab Catalog – Capacity Building for Earth Observation, http://geonetcab.mdweb-project.org/search/main.jsf

The WG began coordinating with the GEONetCab project to understand the possible synergies between the two projects and identified how the two efforts could build on each other rather than compete for resources and information. The GEONetCab project was being carried on in a new project called the Earth Observation for Economic Empowerment (EOPOWER) project. The purpose of the project is "to create conditions for sustainable economic development through the increased use of Earth observation products and services for environmental applications."[2] One of the activities of the project will be "Enhancement of the resource facility on capacity building in the GEO web portal."[3] The partnership is ideal as the WGCapD, through its CEOS Members, Associates, and partners, can gather the necessary information to populate the map and EOPOWER can concentrate on providing the interface in which the users access the information, as well as helping to promote the portal itself. This partnership also provided the perfect chance to demonstrate the ultimate goal of the entire project, that coordination among various capacity building efforts can create more effective and less costly tools and services.

IV. CURRENT STATUS

The survey was released on August 27, 2013, with a deadline of September 30. Throughout the next month, there will be various reminders and follow-up

[2] EOPOWER Website, http://www.eopower.eu/?q=node/18
[3] EOPOWER Website, http://www.eopower.eu/?q=node/18

directly with individuals to ensure that the process proceeds as smoothly as possible.

Following the survey response deadline, there will be a time where the WG, in coordination with EOPOWER, will review the submissions, *i.e.* quality control, and prepare the data for the Capacity Building Portal. This step will likely require a large number of hours since the details of how this cooperation will happen are still being worked out.

The WG is also currently working on outreach activities to start advertising the map at major meetings and fora. Side events will likely be requested at events such as the GEO Ministerial and Plenary in January 2014 in Geneva. Other opportunities like the IAC are being prepared for as well.

V. NEXT STEPS AND CHALLENGES

A big barrier to overcome to make this online tool a success is that a large number of organizations will need to respond to the survey and begin to use the interactive map. Without the buy-in of all stakeholders, the Inventory project will likely fall short of the goals originally laid out by the WGCapD.

Furthermore, in order to increase the user-friendliness and sustainability of the project, improvements will be made to the map in the coming months. Some of these improvements could eventually include log in accounts so that stakeholders could directly enter information on the website and have it populate the map automatically. The map could also link to other databases that contain similar information, reducing the need to reenter information specifically for this map. In the future, there could even be a way for end users to request certain items or training by dropping a "pin" on the map requesting a certain type of training.

The uses of the map and the possibilities are limited only by the time people can devote, the imagination of people populating and using the data, and the funds available to maintain, sustain, and improve the website.

VI. CONCLUSION

The WGCapD is excited about this opportunity and is working hard to produce a resource that can help coordinate existing capacity building activities and inform future planning, ultimately bolstering international cooperation in the area of space-based EO. There are still some major obstacles to overcome, but the WG is hopeful that there will be a pilot that is available for use in early 2014, and then a complete website launch by mid-2014. The WGCapD looks forward to reporting the successes of the project at the next IAC.