[DC-07-020] Geospatial Organizations and Programs, Internationally-based or with a Non-US Focus

Abstract

Geographic information systems (GIS) are in use in virtually every country in the world, by government agencies, industries, community entities, and academic institutions. In response, organizations and programs have been established to support diverse goals, many of which focus on the data used by GIS and the networking desires of the user base. This overview describes organizations and programs that are based outside of the United States and/or have an international mandate. Most of these groups pursue multiple goals and missions but here the compilation is organized into some of the key ones that focus primarily on data and data infrastructure, those that enable collaboration and coordination, and those that are educationally-focused.

Keywords: global, humanitarian mapping, international, OpenStreetMap, OSM, SDI, spatial data infrastructure

Author & citation

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Explanation

1. Overview
2. Focus on Data and Data Infrastructure
3. Focus on Collaboration and Coordination
4. Focus on Curricula, Capacity Building, and Education

1. Overview

Geographic information systems (GIS) are in use in virtually every country in the world, by government agencies, industries, community entities, and academic institutions. In response, organizations and programs have been established to support diverse goals, many of which focus on the data used by GIS and the networking desires of the user base. This non-exhaustive overview highlights organizations and programs that are based outside of the United States and/or have an international mandate.

2. Focus on Data and Data Infrastructure

By having control over the production, dissemination, and curation pipeline of their own

spatial data sets, governments and quasi-governmental or multi-lateral organizations maintain the authoritative nature of the data and data infrastructure. Over time, the infrastructure necessary to support these efforts has become more mature and robust. These organizations often also advance collaboration, coordination, and technical capacity building as part of their missions, but the main character tends toward official engagement due to including a focus on spatial data infrastructure which is generally led by public sector or elected officials. Participation in such organizations may require governmental appointments.

For example, the European Commission has supported the establishment of INSPIRE (https://inspire.ec.europa.eu/), a framework of spatial infrastructure directives and standards that enable the effective sharing of geospatial data sets by European governments and agencies. By designing and adopting a common strategy for describing and distributing geospatial data, countries can respond in concert with each other to environmental situations that most frequently affect multiple countries. Ensuring that data sets such as digital twins can be combined and used effectively across national and administrative borders allows policies to be instituted that would require multiple country cooperation and collaboration to enforce.

Within its Statistics Division, the United Nations supports an initiative on Global Geospatial Information Management (UN-GGIM, https://ggim.un.org/). This initiative was formally established in 2011 with the aim to facilitate the development of geospatial information necessary to address sustainable development and related challenges, world-wide. Representatives of the UN's Member States accomplish work through a set of Regional Committees, Functional Groups, Thematic Groups, and an Academic Network. One key achievement has been the development of the UN Integrated Geospatial Information Framework (UN-IGIF, https://ggim.un.org/IGIF/), a guide for pursuing optimized management and exchange of geospatial information. The UN-GGIM is promoting the integration of statistical and spatial data within its member states.

A regional example is the PanAmerican Institute for Geography and History, PAIGH, https://www.ipgh.org, a specialized organization of the Organization of American States (OAS), a multilateral institution that operates throughout the Western Hemisphere. Established in 1926, members are nations who are part of the OAS system, alongside observer organizations from other countries, and private partners who participate in technical projects. Representatives are typically appointed by the official national cartographic agencies, with a support structure organized in a National Section for each member state. The PanAmerican community also has four disciplinary commissions, including cartography and geography, where data sharing, standards sharing, peace-promoting, technical assistance, and joint knowledge production for the UN SDGs make up the scientific agenda. Each project must have more than one country and more than one discipline participating. An example is the Global Integrated Map of the Americas, representing the first digital harmonization of a set of fundamental geospatial layers from all official cartographies created and used by national mapping institutes in the hemisphere.

GEO is a partnership of more than 100 national governments and 100 Participating Organizations that envisions a future where decisions and actions for the benefit of humankind are informed by coordinated, comprehensive and sustained Earth observations (https://www.earthobservations.org). This global network connects government institutions,

academic and research institutions, data providers, businesses, engineers, scientists and experts, and offers a framework in the form of a Strategic Plan to collaborate around the Global Earth Observation System of Systems (GEOSS) to better integrate observing systems and share data by connecting existing infrastructures using common standards.

OGC, The Open Geospatial Consortium (https://www.ogc.org/), is a worldwide community improving access to location information representing government agencies, but also businesses, research organizations, and universities. The community creates free, publicly available geospatial standards that enable new technologies and manages a collaborative research & development process to address challenges experienced by members.

Beyond public data infrastructure, existence or availability of complete “unofficial” global spatial data infrastructure is rare, but the notable exception is OpenStreetMap. OSMF, (the OpenStreetMap Foundation, https://wiki.osmfoundation.org/wiki/Main_Page) supports, but does not control, the open mapping community creating and using the world’s largest volunteer crowdsourced spatial platform. OSMF is dedicated to encouraging the growth, development and distribution of free geospatial data and to providing geospatial data for anyone to use and share, including OSM data and the ecosystem of technologies deployed to create, manage, validate, and use them. Many other organizations intersect with the OpenStreetMap “community of communities” including from the humanitarian sector (e.g. HOT-OSM), the academic sector (e.g. YouthMappers), and the private sector (e.g. Overture Maps Foundation).

3. Focus on Collaboration and Coordination

Professional societies and interest groups help coordinate outcomes such as setting research or programmatic agendas and coordinating efforts to pursue those. Often they are member-based organizations, with members being individuals, universities or other institutions. Some are effective at setting standards, promoting ethical frameworks, generating other guidelines, or mobilizing specialized applied GIS that are relevant and appropriate for their audience and goals.

The **International Cartographic Association** (ICA, https://icaci.org/ was first founded in 1959 in Switzerland and continues to exist as a Swiss-registered non-profit organization. The evolution of cartography into the digital realms has necessarily shifted to include geographic information science along with traditional maps and mapping, so that the current aim of ICA is “to ensure that cartography and GIScience are employed to maximum effect and full potential for the benefit of society and science through promotion and representation of the disciplines and professions of cartography and GIScience internationally” (ICA, 2022). Membership in ICA can be at the national level under the auspices of an officially recognized society, agency, or department. Other affiliate members include organizations, institutions, and companies. Membership allows individuals to participate in one or more of the 28 Commissions or 5 Working Groups through which research and development is advanced. In alternating years, the ICA manages a large International Cartographic Conference which is hosted in a member country.

Since its establishment in the early 20th century, the I**nternational Society for Photogrammetry** - which later added **Remote Sensing** to its name - has served to develop and foster coordinated activities that advance photogrammetry, remote sensing,

and its applications. **ISPRS** (http://isprs.org) members are individual countries, associations that represent global regions, or other associations or entities with aligned professional missions. The ISPRS organizes its activities across five Commissions (Sensor Systems, Photogrammetry, Remote Sensing, Spatial Information Science, and Education & Outreach), each of which conducts scientific and technical activities through its working groups. ISPRS maintains multiple journals including its ISPRS Journal of Photogrammetry and Remote Sensing, the ISPRS Open Journal of Photogrammetry and Remote Sensing, and the ISPRS International Journal of Geo-Information. ISPRS holds a Congress every four years in one of its member countries.

The **Open Source Geospatial Foundation** (**OSGeo**, https://osgeo.org) is a non-profit organization that fosters global adoption of open geospatial technology. Its most significant achievement has been the development of a global community with OS as its common thread. Its Geo For All initiative enables collaboration and builds awareness by having research and education “labs” become affiliated, and its annual FOSS4G conference is a popular event to enable networking and coordination.

Production and use of open source data is a key element of **Humanitarian OpenStreetMap Team** (HOT, https://www.hotosm.org/. HOT serves as a connection between the OSM community and a global set of humanitarian organizations, as its establishment in 2005 was inspired and fueled by disasters such as the Indian Ocean tsunami (2004) and the Haiti earthquake (2010) that highlighted the tremendous absence of geospatial data. HOT helps coordinate the spatial data creation and validation used by the world’s humanitarian community to support disasters and other emergency needs. Their Tasking Manager platform organizes the requirements for data production for specific projects and in specific locales. The data produced is made readily available both for on-the-ground agencies or organizations to integrate into disaster responses and also for forward-looking planning activities. Currently their impact areas include disasters and climate resilience, sustainable cities and communities, public health, displacement and safe migration, and issues related to gender equality.

Since the late 1990s, the geospatial academic community in Europe has organized its collaborative efforts through **AGILE, the Association of Geographic Information Laboratories in Europe**, a member-based organization whose goals are to facilitate research-oriented exchanges and support networking. AGILE initiatives and activities have included topics related to the use of OSM data and development of the European-based GIS&T Body of Knowledge. The products from its annual conferences currently include peer-reviewed publications in an issue of Springer Lecture Notes in Geoinformation and Cartography as well as short papers distributed through their website, https://agile-online.org/. Regular membership is limited to universities and research centers, and AGILE also maintains formal relationships with other entities through Memoranda of Understanding. Leadership of AGILE is managed through an elected Council along with a small amount of administrative support.

Also in Europe, the **European Umbrella Organisation for Geographic Information (EUROGI**, https://eurogi.org/) is a not-for-profit entity, registered in the Netherlands, that seeks to contribute to a sustainable and prosperous Europe through location-based innovations and policies that enable its digital society. Its 21 members are organizations, companies, and other stakeholders involved with spatial data and its infrastructure. Their initiatives and activities around topics such as location data analytics and GIS utility

infrastructures are advanced through professional networking events and affiliations with other policy-making groups.

EIS-Africa (https://www.eis.africa/), established in 2000 in South Africa, is a pan-African agency that helps coordinate and support programs and projects that advance development goals through effective access and use of geospatial data, research, and technology. Its biennial conference, AfricaGIS, serves to bring together key stakeholders from agencies, governments, and the private sector.

Several gender identity based collaboratives and societies promoting women's participation and application of GIS for women's issues abound, including ones that aim specifically to connect women in international contexts. Examples include GeoChicas which began in Latin America around OSM and promotes closing the spatial digital data gender gap (https://wiki.openstreetmap.org/wiki/LatAm/Groups/GeoChicas), African Women in GIS (https://africanwomeningis.org/), and the UK-based Women in Geospatial (https://womeningeospatial.org/).

4. Focus on Curricula, Capacity Building, and Education

Many international organizations offer opportunities for professional development as part of their programming but relatively few have that as their primary mission.

The longest-running internationally-coordinated program for professional education in GIScience and its technologies is UNIGIS (https://unigis.net), first established as a global network of higher education institutions in 1990. Since that time, over 4,000 students have pursued Certificates, Diplomas, and Masters degrees through the program, coordinated across 9 universities and numerous learning centers in 17 different countries. Its instruction, delivered online and available in several different languages, is optimized for learners worldwide through its flexible and modular design. About 400 students enroll annually.

With more than 345 university chapters in over 72 countries as of 2023, YouthMappers (www.youthmappers.org) has emerged since 2014 as a student-centered movement to create and use spatial data, building not just maps, but also mappers. Much of the work contributes to the United Nations Sustainable Development Goals. The YouthMappers Academy, the Validation Hub, a suite of Leadership and Research Fellowships, and internships support curricula, capacity building, and informal education experiences through mapping.

The International Society for Digital Earth (ISDE) was founded in Beijing China in 2006 (http://www.digitalearth-isde.org). ISDE is an international organization principally promoting academic exchange, science and technology innovation, education, and international collaboration towards Digital Earth. It consists of a main Bureau or secretariat and council members from around the globe, including a Youth Councilor. ISDE convenes international symposia, summits, and other meetings, with lectures, communications, discussions and, as appropriate, tutorials, exhibitions, technical visits and social events.