**BIOECONOMY ECOSYSTEM - Connecting Spatial Data with bio-ecosystem challenges**

In February 2018 The Nordic Mapping Working Group discussed in a meeting in Helsinki how the potential and relevance of spatial data (SD) could be clarified to decision makers and stakeholders. This is an important issue, at the moment, as in each of the Nordic countries there are ongoing large SD development programs aiming to broaden both knowledge and utilization of SD in society.

Therefore, it is essential

* to recognize the main stakeholders and their needs to make sure that spatial data and related services provided by NMAs meet those needs in the future
* to clarify the potential of spatial data to stakeholders in order to harmonize the data in the best possible way
* to make sure spatial data is used to its full potential.

As data volumes grow rapidly, spatial data services should be integrated in the ecosystem processes as far as possible. When this takes place, large benefits for data users can be realized.

The data itself is already free of charge or the tendency is towards free data. Due to this we can no longer rely on financing from the data users. The financing needs to be centralized, eg. government budget money. To justify budget funding the benefits of spatial data in large business areas (business ecosystems) have to be clarified to decision makers and politicians.

Business ecosystem is defined in many ways, here is one: A business ecosystem is the network of organizations — including suppliers, distributors, customers, competitors, government agencies, and so on — involved in the delivery of a specific product or service through both competition and cooperation. The idea is that each entity in the ecosystem affects and is affected by the others, creating a constantly evolving relationship in which each entity must be flexible and adaptable in order to survive, as in a biological ecosystem (<https://www.investopedia.com/terms/b/business-ecosystem.asp> ).

**Spatial data can help us see forest of the trees**

Bio-economy can be seen as one of the major business ecosystems on a national level, especially in Nordic countries (<http://www.bioeconomy.fi>). Bio-economic ecosystems can be divided into four subsystems: forestry, agriculture, energy and fishery. Each of these are present in, but of different importance for, each of the Nordic countries. For example, forestry is very important in Finland and fishery in Norway. In Finland there is very strong ongoing development regarding new forestry data and digitalization of forestry processes. These processes need to be based on nation-wide harmonized spatial data instead of separately acquired and maintained datasets.

We recognized water as a connecting factor between all of the four subsystems. All the subsystems affect the quality of water and are also dependent on water. In fact, any measures taken in different countries affect shared water resources like the Baltic Sea. Bio-ecosystem also plays a key role in common megatrends, such as climate change, flooding, increasing demand for food supply, clean food, sustainable energy etc. In short spatial data can help us reach several Agenda 2030 (Sustainable development goals, SDG) goals set by the United Nations.

**Towards a data driven future**

Consequently we decided to use bio-economic ecosystems and its subsystems as examples how spatial data can be used as a key asset to solve their challenges. Spatial data includes wide range of datatypes e.g. elevation data, transport network data, aerial imagery and maps. The attached presentation illustrates some of the bio-economy challenges and types of spatial data that can be applied to solve these challenges.

The goal of this discussion is to emphasize that the spatial data is most important when it is used as a part of different business ecosystems, such as bio-economy, national security, transportation, etc. In fact, these ecosystems are dependent on spatial data. When the ecosystems are developed further, it should be ensured that the respective spatial data meets the user needs. It is important that the same data can be utilized in many purposes. This increases the impact of investments allocated in collection, quality assurance, harmonization and distribution of spatial data.

For data users it is essential to use harmonized data. When the spatial data used in different sub-ecosystems and in their different tasks (challenges) is based on a common data model, the results derived from data analysis are more coherent. It would be even more useful if the modelling and analysis could be based on similar data in neighboring countries. When private companies develop their services on data harmonized across borders, they have larger potential markets, too.

The modelling (content and quality) of data and the integration of services should be done together with the key users. The R&D-sector, universities as well as private companies should be integrated in this work respectively.

When stakeholders fully understand the relevance of harmonized spatial data, financing is easier to secure.

**NMAs must take action**

It is equally important for NMAs to understand the changing role of spatial data. Traditionally spatial data has been used to make topographic maps as well as other products and services. When the data is used in processes of various ecosystems, it must be fit for purpose without further processing. NMAs need to take responsibility of data modelling, quality assurance and consistent delivery, because this is the NMAs core expertise. Commercial providers such as Google only deliver generic products or products aimed at niche markets, not taking into account harmonization and interoperability aspects necessary for functioning ecosystems.

**LMWG recommends following decisions to be taken:**

- DGs endorse the ecosystem-based presentation as a good practice to promote the role of spatial data in society generally

- DGs endorse the plan to have a Nordic seminar on the topic “**BIOECONOMY ECOSYSTEM “** hosted by LMWG, preliminary date set out to, August 22.