

INSPIRE-GMES Joint Workshop on Land Cover **Minutes**

MONDAY, JUNE 29TH

Introduction: Presentation of related initiatives and activities

At the beginning of the first workshop organised between INSPIRE and GMES, held in Madrid, the days 29th, 30th of June and 1st of July, there were lectures about the European land cover/land use vision, the GMES Land Monitoring Core Services, the INSPIRE data specifications, the EEA activities and the European LUCAS project.

The first statement made was to work together in a collaborative, harmonized and interoperable information system based on the bottom-up approach. In this field, there is still a lot of work to do, and every alternative is open. It is time now to work together.

There was a talk about the importance of implementing a common land cover/land use data model as it will contribute to monitor one of the most important global issues nowadays: the climate change. The INSPIRE Directive is one of the main keys to get a unique data model that interoperate with different data.

There is also a need to harmonize the different activities carried out at national, European and global levels, continuing with the time-series of land cover/land use mapping and monitoring the LULCC dynamics. A decentralized production could be a good way of working as well as the bottom-up approach.

There was a question about if GMES was ready to change their specifications according to INSPIRE. The answer was that GMES takes into account the INSPIRE data specifications in order to define the type of information they want to collect and to define the activities to carry out. To the question about the GMES data specifications, the answer was that there are high resolution classes but there are not yet an agreement in common data between Member States. The point is to start the implementation of the bottom-up approach.

There was another question to the LUCAS project about if they were working with the bottom-up approach and what were the limitations of their data. It was answered that their data have enough precision to CORINE statistics, but it will be discussed again in October.

It is obvious the necessity for knowing exactly the European and Member States' requirements.

Harmonization/standardisation: state of play

The main lectures of the second part of the day referred to the need to standardise the land cover data models, using the tools provided by ISO and CEN. It was explained the Land Cover Classification System (LCCS) as well as the Parametric Object Oriented Data Model (OODM).

Differences between both models, LCCS and OODM, were observed in aspects like “how to draw the lines or how an object is divided”. It was said that the OODM does not support vertical and temporal movement and in order to achieve it, you need a lot of constraints. Spain explained that in OODM, as in the SIOSE project, geometrically you draw polygons as homogeneous as you can and save all the information that is inside the polygon. In UML notation, an instance is an object (e.g. a tree) with its attribute (e.g. the tree’s height). In LCCS the notation corresponds to abstract definition of cover units. Moreover, in LCCS, land use is inside the land cover classification system. Land cover is a basic object based on its physiognomic aspect. This object is inside a polygon which has a specific land use.

There was a question about if there was not yet an establishment about scale or the geometric resolution and whether there was a separation between use and cover.

There was another question about the definition of basic units and if automatic classification is an option in LCCS. They have already finished their Himalaya map. There was also a comment clarifying that the meta-language wasn’t a cover classification itself.

There was a remark about the difficulty for non-experts to see the differences between different approaches. However it is clear the necessity to reach an agreement and achieve standardization, and both processes should not be in contradiction.

It was also expressed that the CLC covers the European needs but not the national needs.

There were other observations about all the work to do in LU/LC. Land Use can be sometimes obtained from the land cover or from photo-interpretation but sometimes this is not possible. There is a lot of work to do in this point. Furthermore, it was said that both LCCS and CLC are standards because they have been used several times: LCCS in Africa and CLC in Europe. But CLC has mixed classes which are difficult to classify and LCCS has a good semantic for food production but if you want to use it in land cover, it has several lacks. We should clarify ideas and standardize models.

There was an enriching discussion about the differences between the concepts of classifying and describing covers, an important item since it solve in a way or another how to put together different databases. An important key in this Workshop is to work together to find the best step to go on in the harmonization/interoperability between existing databases.

There was another question of why an OODM is used in Spain. It is because there was a need to interoperate different nomenclatures. But it is important to answer to the question of what kind of model, classification or OODM is better for Europe and the Member States which meet their requirements. We are here to cooperate.

TUESDAY, JUNE 30TH

Global initiatives, perspectives and requirements

In the first part of the second day of the workshop, there was a lecture about the existing activities related to land cover at global level and the global requirements for land cover information.

There was a question if at the moment it is possible to define a parameter of an LC/LU class in a specific dataset (e.g.: 10%). The answer was that in classifications systems it is only possible to determinate intervals (e.g.: 10-30%).

There was an observation about if it was late or not to interoperate global/local datasets and if now there was any consensus in global datasets to interoperate between them. One possible solution was a global/local monitoring with data of the same source, with consensus in specifications (e.g.: mapping unit).

European requirements

The land cover/land use and environmental laws, policies, etc., the agricultural needs and the spatial planning requirements were the main topics of this section.

There was a comment about the importance of establishing policy needs and implementation rules for LC/LU for Europe and Member States.

Another remark was related to the importance of spatial and temporal resolution. They have to be different depending on the issue, with the consequent problem of defining frequency and scale, a strong requirement.

According to INSPIRE, data must be collected only once, so there is a need of harmonization and generalization of procedures. Are there funds to collect the information in a cooperative way? A point to consider is that Member States should collaborate with the European institutions.

Sub-National, national, and x-border perspectives

There were lectures about the land cover information system in Italy, the Norwegian and the Swedish view on land cover data, the Spanish National Reference Centres and the water, soil and climate change information needs in Spain and finally, the land cover information from the regional perspective of Navarra (Spain).

There was a remark about the use of automatic algorithms to generate automatically maps by generalization and the predictable problems between models. Every country should decide how to obtain their information (if using automatic classification, photo-interpretation, etc.) The definition of the territory should be done with the bottom-up approach and the definition of the model should meet the user requirements. However

there is not only one model which defines all the requirements. They encouraged people to participate in the INSPIRE process.

It was asked if the bottom-up/top-down approach is really possible. The answer was that some of the oral presentations had proved that it is possible and that it has been tested in real projects, like in the SIOSE project. The difficulty is to establish semantic and geographical generalization to the bottom-up approach.

Wrap-up of requirements and discussion on strategies

It is necessary to ensure sustainable and timely pan-EU land cover information and to find a common methodology in order to go from the global to the local level and vice versa.

In SPIRE there is no problem with the bottom-up/ top-down approach because the process is not defined and we can work in it.

Furthermore, it can be used the EU Seventh Framework Programme (7PM) which is opened nowadays as there are funding that can be used.

Good practices in modelling

Lectures were about the INSPIRE directive, an example of the hydrography theme and how to model the semantics of geospatial concepts.

About the semantic modelling, there were some comments. One was that ontologies would have to be applied not only for classifications but also for OODM and for that reason they need to be improved. Another doubt was if there were different semantic rules depending on the language since definitions are not systematic. The answer was that this has not been tried in other languages but there will be necessary to study each case.

To the question of whether a network has been implemented, the answer was there are differences between physical data and network but there is not an obligation.

A catalogue or attributes are clearly needed. They are easily defined by experts. But is the definition of the data included in data specifications? Should be better to wait for the national institutions to do so? All this information must be fulfilled.

To the question about how to define an attribute as, for example, water could be ice in winter, how do you define the attribute: as water or ice? Perhaps it is possible to talk about persistency, for instance.

There will be a future framework, as consistent as possible in which it is necessary to work, but is it necessary to hold on until Annex I is reviewed in order to implement it? It seems there is no time to wait, this is an ongoing process and while it is finalising the Annex II, INSPIRE is preparing to start Annex III.

Connecting national, European and global approaches:

The land cover information of Spain, Austria, UK, Germany and Finland were presented.

The European Union would support Member States initiatives, but which kind of initiatives we are talking about? It will be useful to clarify if it refers to money or another kind of initiatives. The answer was that it is in terms of contents and not of money. There was another doubt because in the Workshop there were discussions about “vertical” items (top-down, bottom-up) but what about “horizontal” items, for example, borders between countries? Horizontal work may be supported by European teams?

It was clear that a top-down approach, co-production, generalization and standardization of data is necessary.

The Steering Committee apologized for not being able to present all possible proposal since there were not enough time for all of them and they proposed to the Member States/ Institutions to contact IGN in order to put their presentations together with all the information of the Workshop.

At the question if in certain terms, attributes/values were quantitative / qualitative, the answer was than in OODM there are both qualitative and quantitative parameters. A dataset can have lots of attributes.

There were also observations about the importance of the updating frequency of LC/LC data.

WENSDAY, JULY 1ST

Recommendations & Conclusions

A summary of the outcomes of each session was presented by the members of the Steering Committee.

There was a question in order to know how many Member States were attending the Workshop and that were producing large scale national LC/LU data. It was said that the Member States involved would receive a questionnaire to know their requirements. It was said that it is completely necessary to define national/European/global necessities, including reference images, maximum geometric errors, scale and so on. Spain, for example, can give their images to EU.

It was mentioned that inside an object/polygon there is a lot of information which can be obtained from satellite data. It should be done more research on this. Automatic classification is possible and automatic methods can be automated in order to obtain this information. However, local knowledge must be used in order to obtain better results.

From the last Steering Committee a lesson has been learned: we should not repeat the same mistakes which have occurred in the past. It is important to study the best type of production: centralised or decentralised and use those topics which were very useful in the past, like the use of the same satellite provider to produce the data. Satellite data is an important issue as well as the land cover changes. We do not need more classes. The point is to avoid the same mistakes of the past and to be ready to improve the process taking into account national/European requirements.

The GMES next step is to implement a common data model and to cooperate with Member States. It is important to define the role of the Member States, even in the EIONET network. The contribution of the Member States in GMES should be stronger in the coming years. Inside INSPIRE, Member States participate in the guidelines. Maybe an open dialogue can be placed in EIONET or in some specific group of discussion. The most important point is the coordination between Member States, the development of the INSPIRE specifications (land cover and land use data specifications) and building up human capital (experts or people trained on data specifications) because there is a lack in LU/LC uses cases.

One comment was about not to spend more money in other projects but to focus in coming up with a data model. For that reason it is important to support economically only one team of experts and decide who is going to coordinate it. It is also essential to define the priorities, a work infrastructure, how the working groups will collaborate and to establish a partnership between Member States in order to obtain a good European land cover information.

It must be clear how the money is going to be spent, who will put that money, what amount of money we are talking about and what Member States want to work in a partnership and in which conditions. The comment from the INSPIRE/JRC was that all contributions are welcome and because there is not enough money, the

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stakeholders/institutions who want to collaborate should give support by reference material, expertise and reference data.

There was a proposal to separate the thematic groups of LC and LU but to work at the same time, putting all the reference material available to get to possible solutions.

There was another remark about the importance of informing participants regularly, with papers, actions taken, etc. to keep all the persons informed.

As a general conclusion, it was said that:

- Land Cover is not only a simple dataset.
- The production of the LU/LC dataset from the Member States needs to be harmonized and coordinated at European level and also between them.
- Now that a lot of Member States are producing land cover data is the moment to collect and share all the experience acquired.
- Therefore, now it is the time of Member States to work hard in close connection at European level in order to collect the requirements of every country.
- Thank you all for assisting and participating at the Workshop.