



Use of the ISO 19100 Quality standards at the NMCA's

Results from questionnaire taken in 2021

EuroGeographics Quality Knowledge
Exchange Network



Reference:

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Executive Summary

EuroGeographics mission is to maintain a network which helps each member to improve their capabilities and role; to facilitate access to our members' data, services and expertise; and to provide a strong voice for our members. As part of its organization, EuroGeographics has a number of Knowledge Exchange Networks that are designed to identify and spread knowledge and best practice. This report, into the use of the ISO 19100 series of standards, is the output from one of these groups the Quality Knowledge Exchange Network (QKEN).

This was the fourth time the questionnaire was sent to the member nations. In 2004 and 2011 the survey was restricted to those member organizations that were involved directly with the QKEN. Over the past few years the EuroGeographics membership has grown significantly and in 2017 the questionnaire was sent for the first time to all members. In 2021 all the members were invited to fill in the questionnaire. The QKEN received 17 valuable answers for this survey.

This report will give an overview of the results of the 2021 survey and will compare the results of this survey with the ones from 2017.

In general, the use of the ISO standards has increased again although there are areas where the usage has appeared to decrease. This may be down to the Covid 19 pandemic or to different users filling in the questionnaire.

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Background

At a plenary meeting of the QKEN in 2020 it was decided that it would be beneficial to re-run the questionnaire on the use of ISO 19100 standards within Europe to see whether their use had increased or not. Part of the work of the QKEN is to spread best practice and it is widely acknowledged that the standards represent best practice.

At this early stage, it was known that any comparison with previous surveys would be difficult as the ISO standards had undergone a major revamp with the introduction of ISO19157 and the withdrawal of ISO19113, 19114 and others. The questionnaire was therefore developed in such a way that comparisons could be drawn.

The questionnaire was sent to all member organizations of EuroGeographics.

The ISO 19100 Geographic information family of standards

One of the main objectives of this family of standards is to enable digital geographic data to be shared and made available. The quality part makes it possible for the user to determine whether or not the geographic data is of sufficient quality for their application.

EN ISO 19157 Data quality

This standard establishes the principles for describing the quality of geographic data. It

- defines components for describing data quality
- specifies components and content structure of a register for data quality measures
- describes general procedures for evaluating the quality of geographic data
- establishes principles for reporting data quality

ISO 19157:2013 also defines a set of data quality measures for use in evaluating and reporting data quality. It is applicable to data producers providing quality information to describe and assess how well a data set conforms to its product specification and to data users attempting to determine whether or not specific geographic data are of sufficient quality for their particular application

This standard includes the components from the standards ISO 19113 Quality principles (except the quality overview elements that now are defined in the Metadata standard), ISO 19114 Quality evaluation procedures and ISO 19138 Quality measures.

ISO 19113 Quality principles

This standard is now replaced by ISO 19157, but is still used. It establishes the guidelines to describe the quality of the geographic data and specifies components for reporting quality information. It is also applicable to data users attempting to determine whether or not specific geographic data is of sufficient quality for their particular application.

ISO 19114 Quality evaluation procedures

This standard is now replaced by ISO 19157, but is still used. It provides a framework of procedures for determining and evaluating the quality for geographic data, consistent with the data quality principles defined in ISO 19113. It also establishes a framework for evaluating and reporting data quality results, either as part of data quality metadata only, or as an evaluation report.

ISO 19138 Quality measures

This Technical Specification is now included in ISO 19157, but is still used as reference. It defines a set of data quality measures for the data quality sub-elements identified in ISO 19113 Quality principles. Multiple measures are defined for each data quality sub-element, and the choice of which to use will depend on the type of data and its intended purpose.

EN ISO 19115 Metadata - Part 1: Fundamentals

This standard defines the schema required for describing geographic information and services by means of metadata. It provides information about the identification, the extent, the quality, the spatial and temporal aspects, the content, the spatial reference, the portrayal, distribution, and other properties of digital geographic data and services.

It includes the definitions of the quality overview elements from ISO 19113 and the metadata part from ISO 19119:2005.

ISO 19115 Metadata

This standard is now replaced by ISO 19115-1, but is still used. It defines a procedure for the description of datasets so that users will be able to determine whether the data will be of use to them. It facilitates the organization and management of geographic data and provides information about an organization's databases to others. It includes the model for reporting the data quality described in ISO 19113.

EN ISO 19115-2 Metadata - Part 2: Extensions for imagery and gridded data

This standard extends the existing ISO 19115 Metadata standard by defining the metadata required to describe imagery, gridded and coverage data.

EN ISO 19119:2005 Services

This International Standard provides a framework for developers to create software that enables users to access and process geographic data. It defines a metadata model to support service discovery through a service catalogue. In the 2016 version of the standard this part is moved to ISO 19115-1 Metadata.

EN ISO 19131 Data product specifications

This International Standard describes the requirements to specify the geographic data products based upon the concepts of other ISO 19100 International Standards. It also provides help in the creation of data product specifications, so that they are easily understood and fit for their intended purpose.

ISO/TS 19158 Quality assurance of data supply

This International Standard provides a framework for quality assurance specific to geographic information. It is based upon the quality principles and quality evaluation procedures of geographic information identified in ISO 19157 and the general quality management principles defined in ISO 9000.

Guidelines for Implementing the ISO 19100 Geographic Information Quality Standards in National Mapping and Cadastral Agencies

These guidelines describe why it is important to implement the ISO 19100 data quality standards for geographic information datasets in the National Mapping and Cadastral Agencies (NMCAs). It gives practical suggestions on how to read and understand the standards and how to carry out the actual implementation process.

Results from the 2021 questionnaire

Introduction

This questionnaire was sent to all members of EuroGeographics. A total of 17 member organizations from 14 member nations answered the questionnaire. Belgium, Czech Republic, France, Germany, Great Britain, Greece, Hungary, Iceland, Ireland, Latvia, Slovenia, Spain, Sweden, Switzerland are the member nations that participated to this survey.

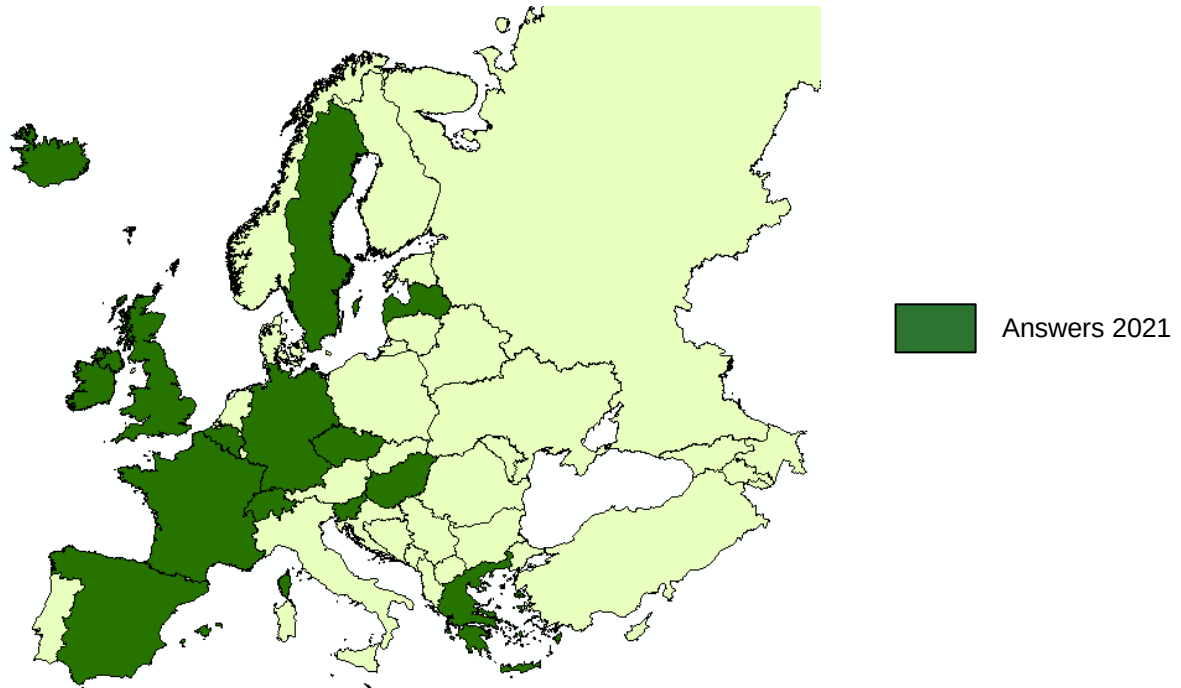


Figure 1 *Nations with members answering the questionnaire 2021*

When the answer 'no' included a comment that they use Inspire, NATO STANAG-s or another version of the standard, the 'no' has been changed into a 'yes'. That is because both INSPIRE and NATO STANAG-s use the ISO standards and there was no intention to look for what versions are used.

Is your NMCA using the section on Quality Principles in ISO 19157? (Formerly ISO 19113)

Result

Most of the member organizations are using the quality principles, described in ISO 19157.



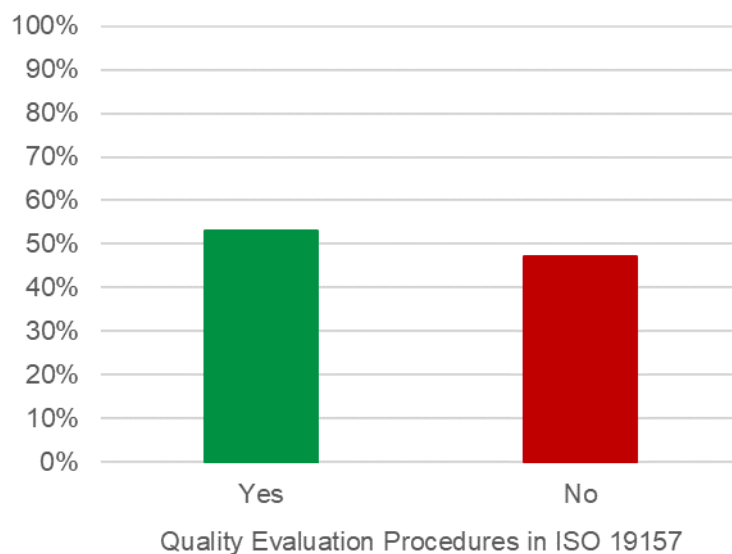
Comments on the question included:

- It differs from data set to data set, but mostly some principles are used
- Using vocabulary: elements, scope and measures in some specifications
- From the Unit of Cartography, we are starting to introduce ISO 19157 in our organization. We're yet in a very early stage.
- Especially for INSPIRE
- We have our own specification based on the esri pro suite
- We have been using it to help develop quality checking

Is your NMCA using the section on Quality Evaluation Procedures in ISO 19157? (Formerly ISO 19114)

Result

Almost 53% of the members use some of the quality evaluation procedures from ISO 19157.



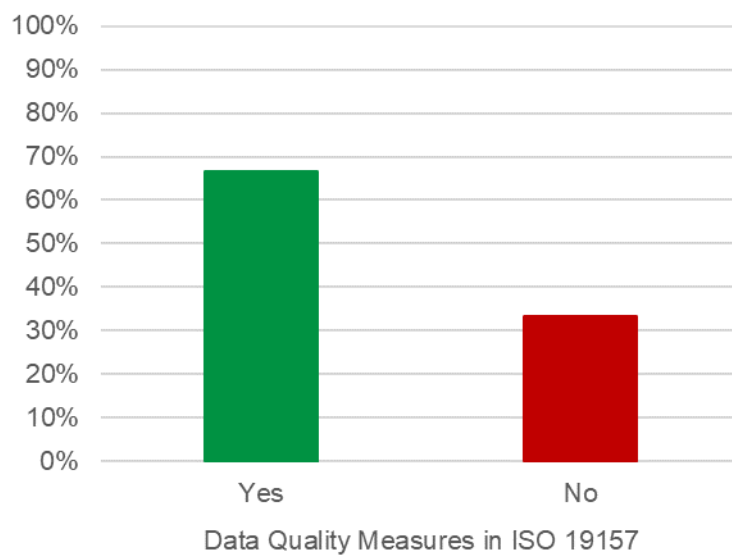
Comments on the question included:

- In progress
- SLS used some criteria from ISO 19157 for quality evaluation of building data (Cadastral map).
- Using a few of the evaluation procedures. Work are ongoing to enhance the use.
- Especially for INSPIRE
- We have our own specification based on the esri pro suite
- We will be considering its use 2022

Is your NMCA using the section on Data Quality Measures in ISO 19157? (Formerly ISO/TR 19138)

Result

67% of the members are using the data quality measures described in ISO 19157.



Comments on the question included:

- It differs from data set to data set, but mostly some principles are used.
- Especially for INSPIRE
- We have our own specification based on the esri pro suite
- We will be considering its use 2022

Is your NMCA using ISO 19158 Quality Assurance Of Data Supply?

Result

ISO 19158 is not frequently used by the member organizations. Only 18% of the members answered 'Yes' to this question.



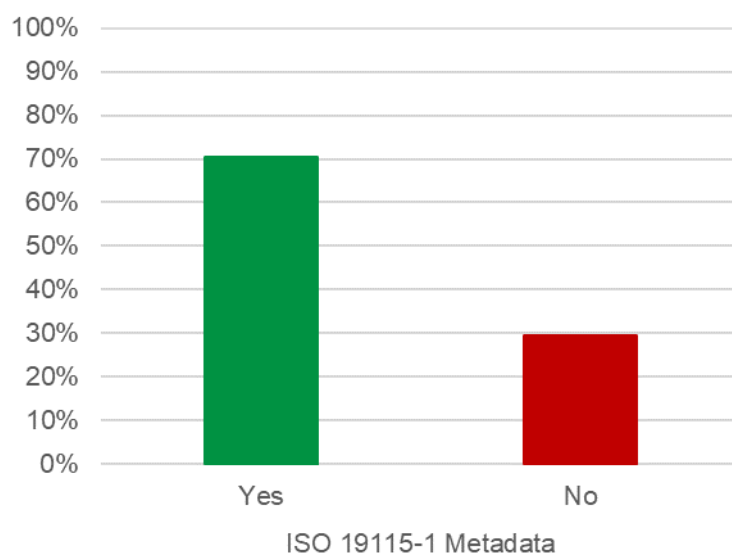
Comments on the question included:

- Not yet
- We use similar QA processes
- Control of geometry rules and control of mandatory associations to other features
- We have our own specification based on the esri pro suite
- We will be considering its use 2022

Is your NMCA using ISO 19115-1 Metadata?

Result

The ISO 19115-1 standards are very frequently used for describing metadata. The fact that the INSPIRE metadata profile is based on the ISO 19115-1 standard helps to increase the number of positive answers.

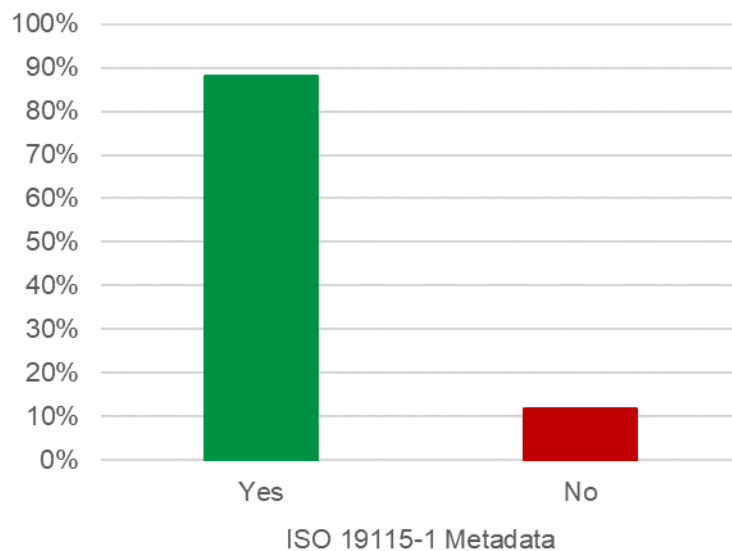


Comments on the question included:

- We used it in the case of preparing national metadata profile - it is extended INSPIRE profile (yes)
- We use INSPIRE metadata implementation rules (no)
- Only on data posted on the geoportal of the organization Do not yet include quality metadata, but are already scheduled to be created (yes)
- Not for quality reporting but general contact information (no)
- We're not using it directly but our published services meet spanish metadata core which is compliant with ISO-19115 (no)
- <https://www.geocat.ch/> (yes)
- We will be considering its use 2022 (no)

The comments that are underlined, were changed into a positive answer and the results were adjusted.

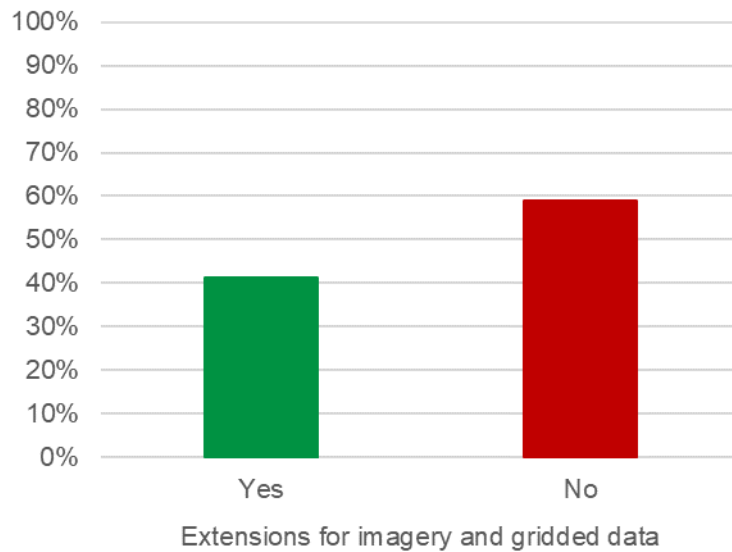
Adjusted result



Is your NMCA using ISO 19115-2 - Metadata Part 2: Extensions for imagery and gridded data?

Result

Compared to ISO 19115-1, the ISO 19115-2 Metadata part 2 standard is not so commonly used. After an adjustment of the results, only 47% of the members are using this standard.

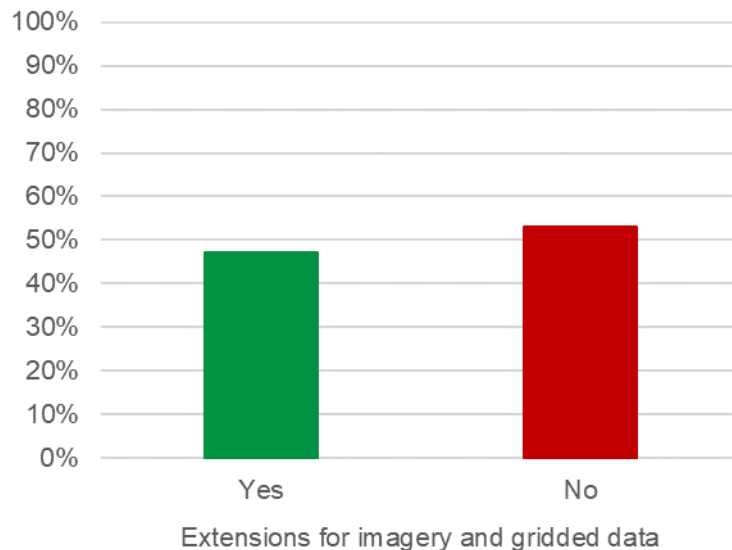


Comments on the question included:

- In progress
- We use INSPIRE metadata implementation rules. (No)
- note that the name of the standard has changed : "extensions for acquisition and processing" 19115-2:2019-01
- We have no plan to consider using this as yet

The comments that are underlined, were changed into a positive answer and the results were adjusted.

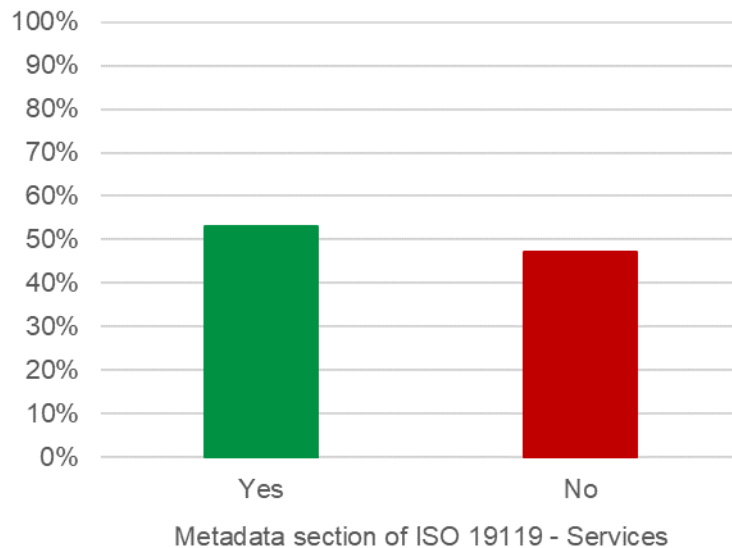
Adjusted result



Is your NMCA using the Metadata section of ISO 19119 - Services?

Result

After adjustment, 59% of the participating members use the metadata section of ISO 19119.

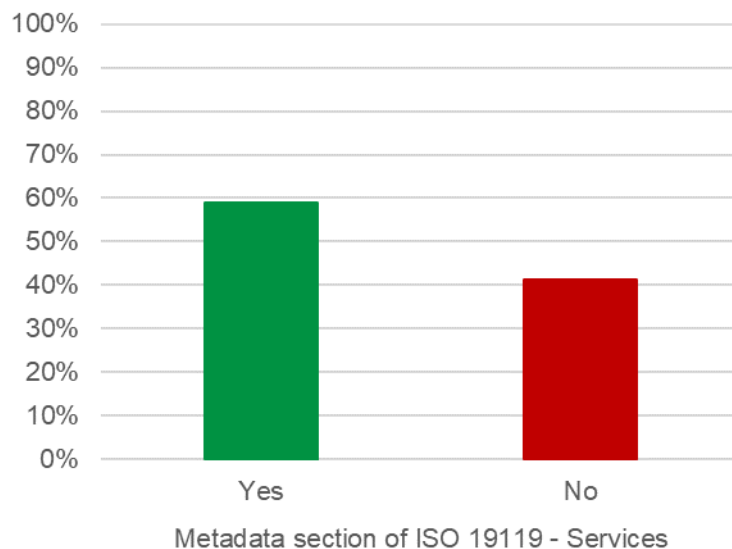


Comments on the question included:

- We use INSPIRE metadata implementation rules. (No)
- Only on data posted on the geoportal of the organization (yes)
- Get capabilities, but not more Note 19115-1 clause 6.5.14 (yes)
- We have no plan to consider using this as yet (no)
- Through Geonetwork. (yes)

The comments that are underlined, were changed into a positive answer and the results were adjusted.

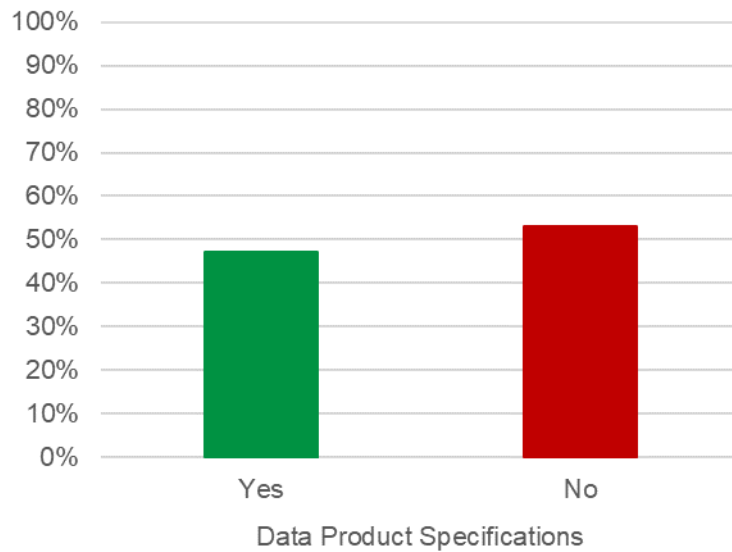
Adjusted result



Is your NMCA using ISO 19131 (Data Product Specifications)?

Result

After adjustment, 53% of the members are using the ISO 19131 standard.

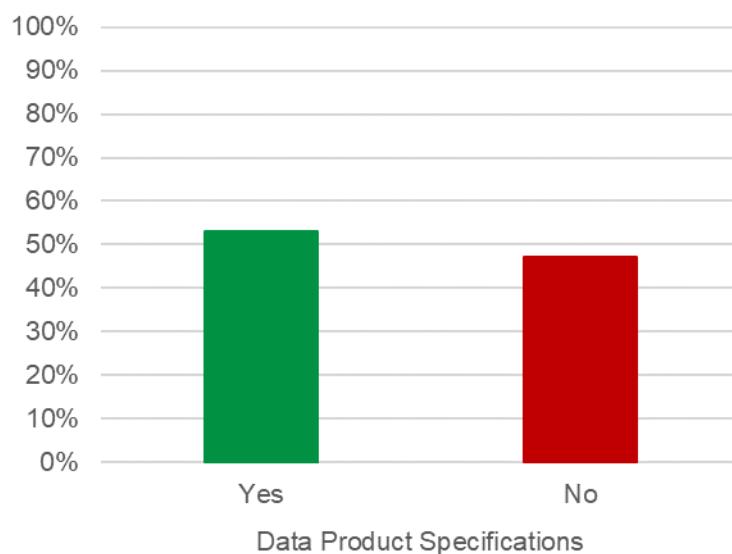


Comments on the question included:

- for specific datasets
- Not for all specifications, ongoing work
- Not yet, as stated before. We are in a very early stage of use of ISO 19100 standards and have started with ISO 19157.
- Our data product specifications is partly based on it.
- We will be considering its use 2022
- Just parts of it (No)
- We just started and have published one Data Product Specification according to ISO 19131. Another one is on its way.

The comments that are underlined, were changed into a positive answer and the results were adjusted.

Adjusted result

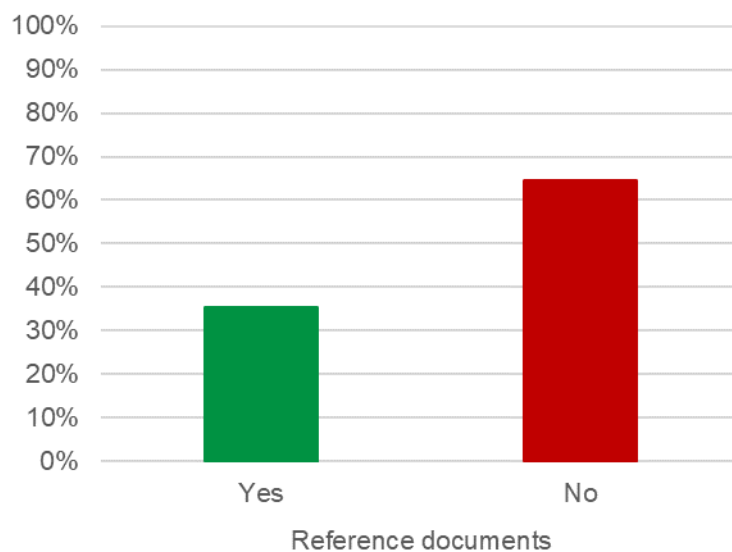


Do you have reference documents that describe how the standards are implemented?

Result

6 member organizations have reference documents and 2 of them have those documents in English:

- Digital Base Map. Conceptual Model. It based by ISO and CEN standards. This data model is used in Land Administration Network Services for Cadastral maps. (just raw translation from Lechner Nonprofi Ltd, HU)
- The documentation is in the form of quality plans which describe what quality controls exist within a production flowline. (Ordnance Survey, GB)



Comments on the question included:

- [https://geoportal.cuzk.cz/\(S\(ik4lv5lbnxkzwhpwu0nzjgwn\)\)/Dokumenty/Dokumentace_metadata_vehu_profilu_CUZZK.pdf](https://geoportal.cuzk.cz/(S(ik4lv5lbnxkzwhpwu0nzjgwn))/Dokumenty/Dokumentace_metadata_vehu_profilu_CUZZK.pdf)
- In progress
- Documents are under development.
- We use Confluence
- For 19115 and 19157

Do you have further reference documents that could be of an interest to other NMCAAs?

Result

Two organizations have interesting reference documents:

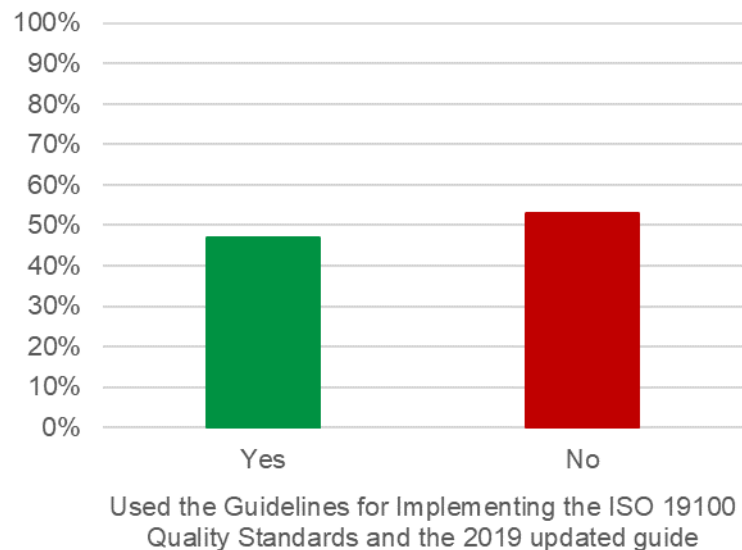
- Surveying and Mapping Authority of the Republic of Slovenia : National metadata profile
- Lechner Nonprofit Ltd, Hungary: Definition of digital topographical database (MSZ 7772-2:2002 Digital maps. Part 2)

Neither are available in English.

Have you used the documents "Guidelines for Implementing the ISO 19100 Geographic Information Quality Standards in National Mapping and Cadastral Agencies" and the 2019 updated guide?

Result

47% of the members have used the Implementing guidelines and the updated guide.



Comments on the question included:

- But not the latest version 2019
- We're analyzing these documents at this moment
- just some products

Comparison with the previous questionnaire

Introduction

From the 17 member organizations that responded in 2021, 16 members also responded in 2017. The answers of these members can be used to compare the results of both questionnaires. The countries involved in the comparison are highlighted in the map below.

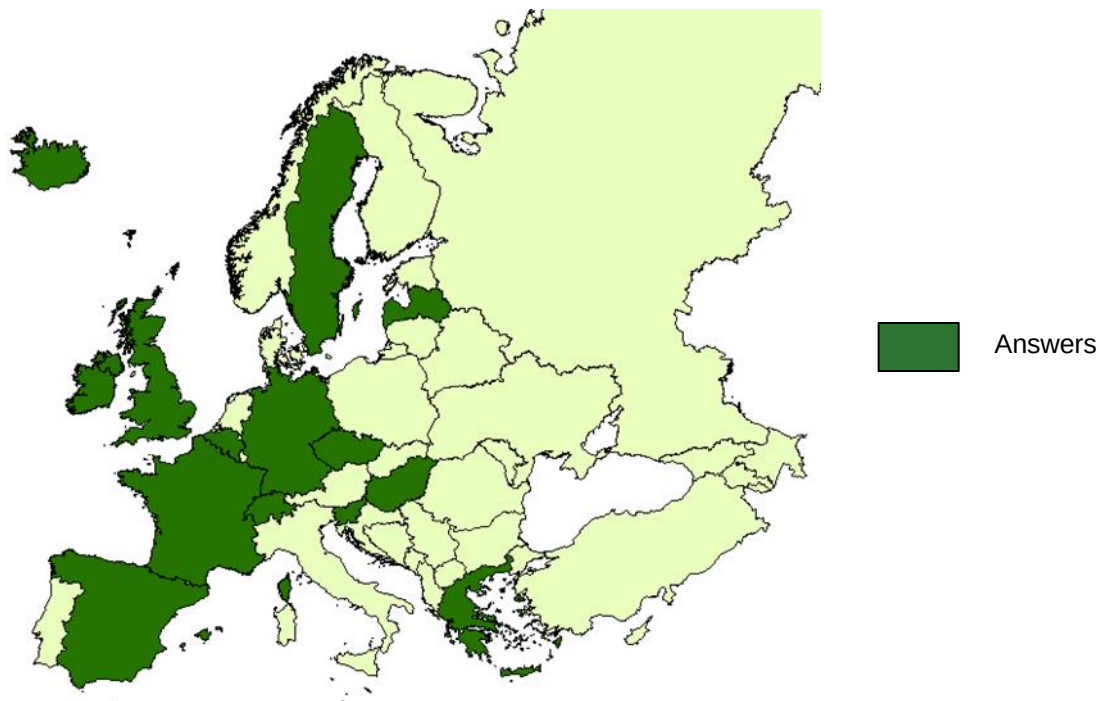
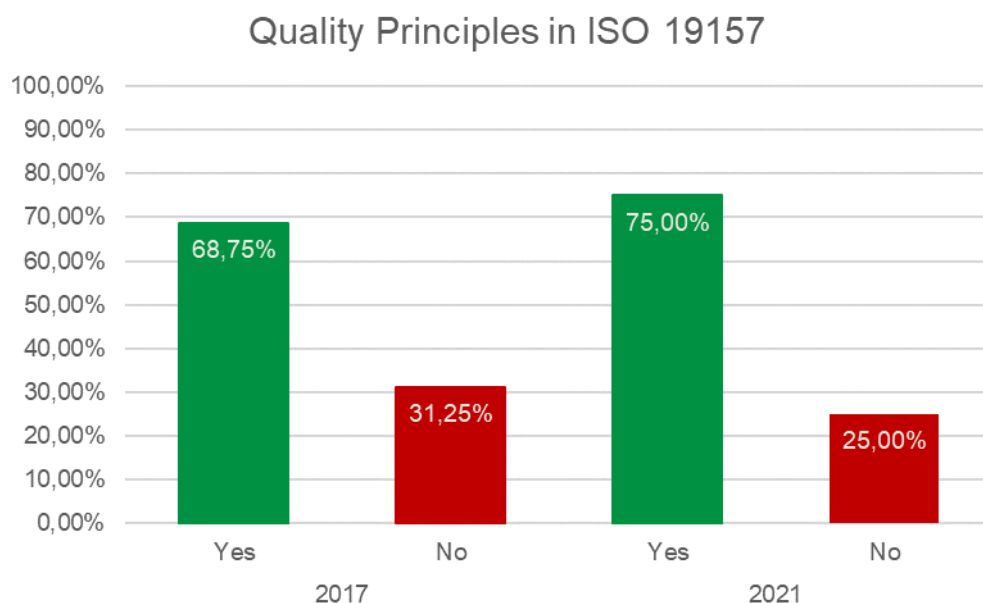


Figure 2 *Nations with members answering the questionnaire 2017 and 2021*

Is your NMCA using the section on Quality Principles in ISO 19157? (Formerly ISO 19113)

Comparison

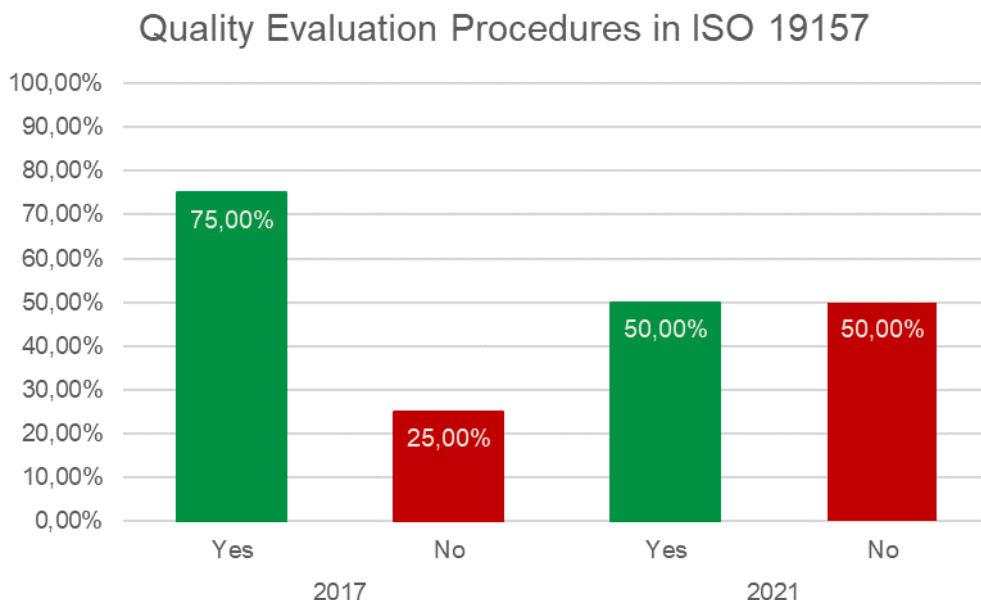
In the last 4 years, the use of the quality principles from ISO 19157 has increased.



Is your NMCA using the section on Quality Evaluation Procedures in ISO 19157? (Formerly ISO 19114)

Comparison

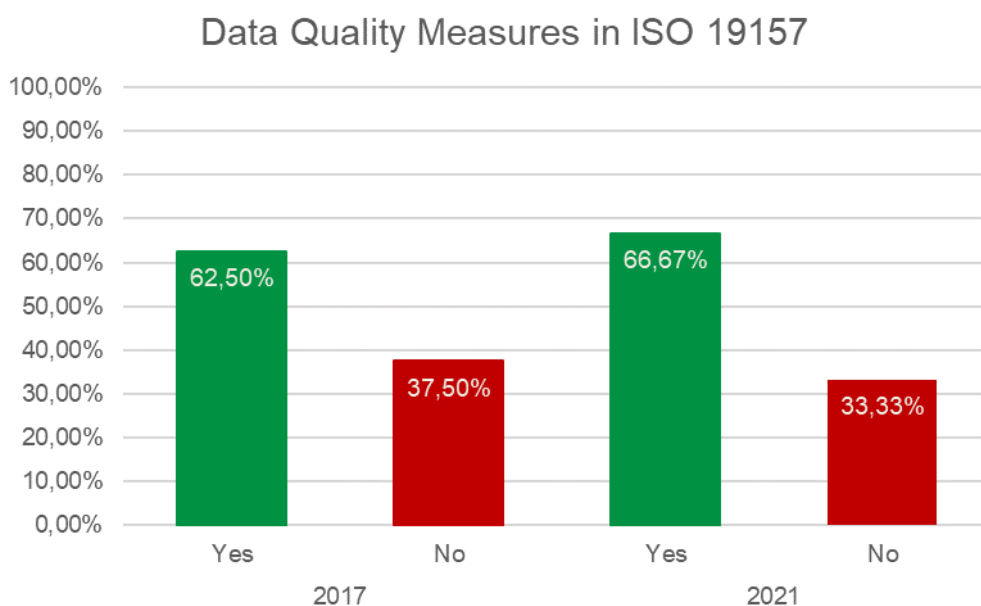
The use of quality evaluation procedures has decreased in the last 4 years. It could also be a different interpretation of the question, because different persons have filled in the questionnaire in 2017 and in 2021 for the concerned member organizations.



Is your NMCA using the section on Data Quality Measures in ISO 19157? (Formerly ISO/TR 19138)

Comparison

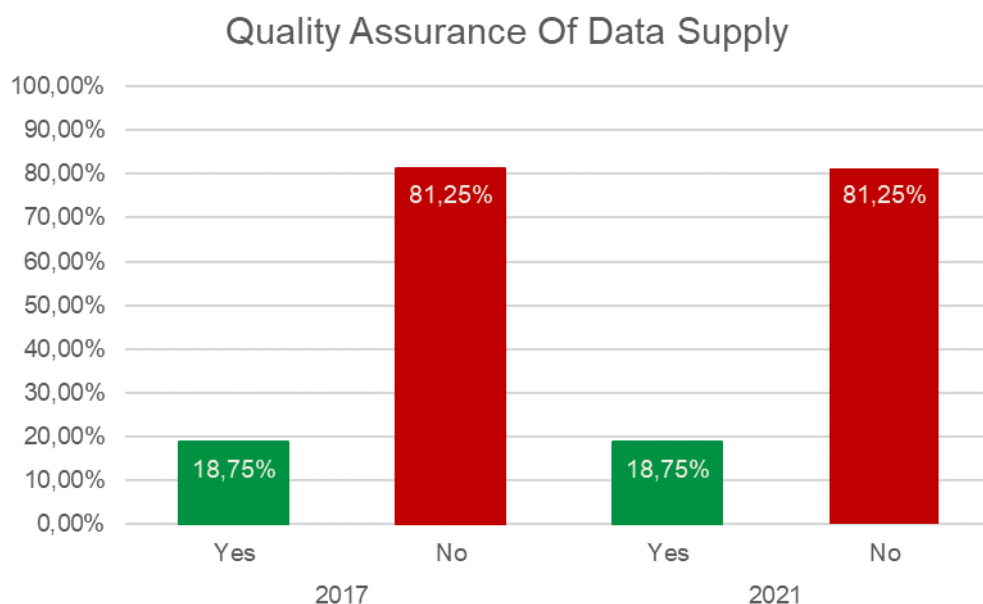
In the last 4 years, the use of the data quality measures from ISO 19157 has increased.



Is your NMCA using ISO 19158 Quality Assurance Of Data Supply?

Comparison

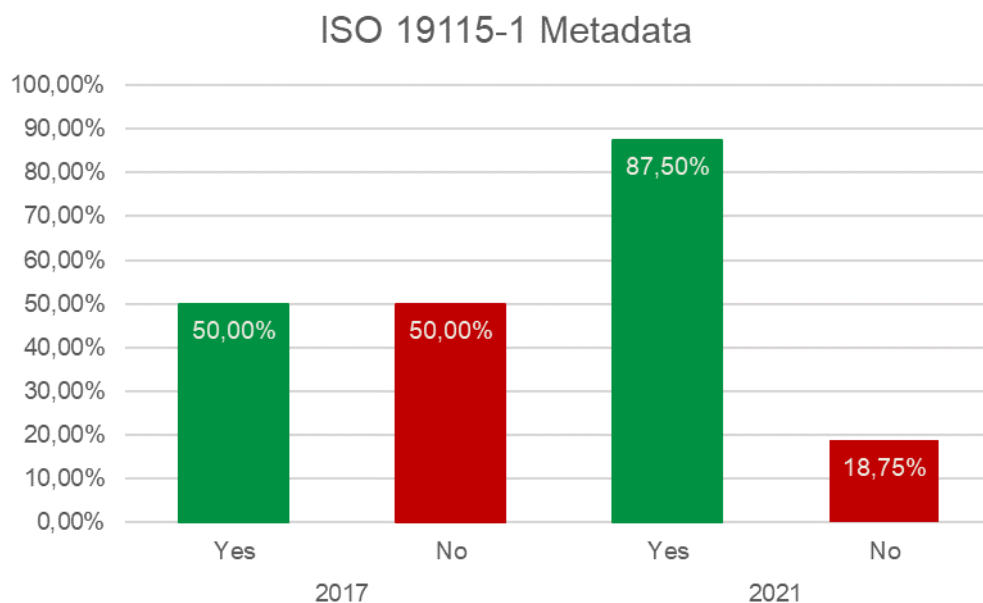
The use of ISO 19158 hasn't changed in the last 4 years, but some members commented that they are considering its use in the near future.



Is your NMCA using ISO 19115-1 Metadata?

Comparison

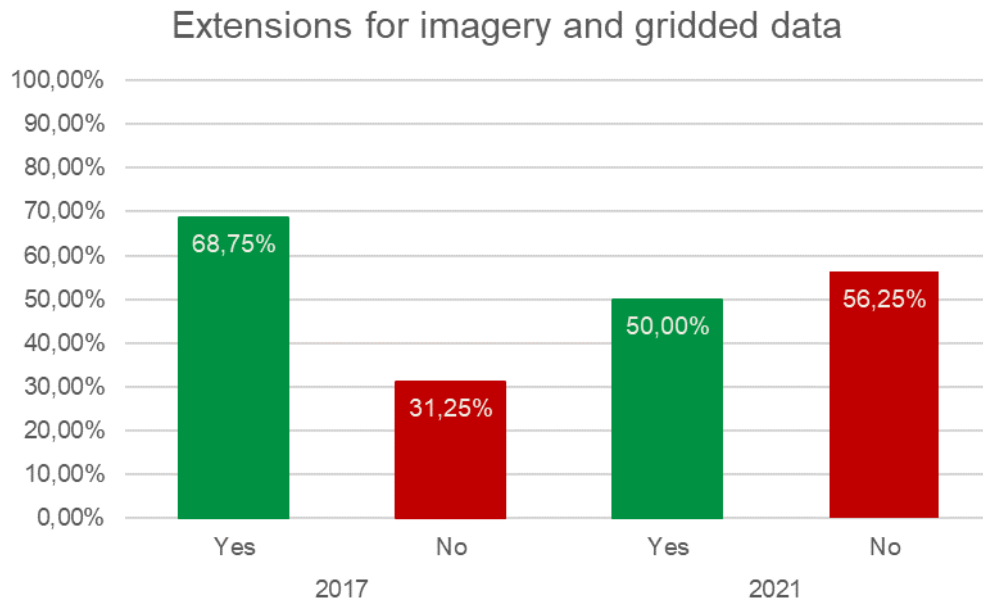
The use of the ISO 19115-1 standard has increased in the last 4 years, mainly thanks to the INSPIRE implementation rules.



Is your NMCA using ISO 19115-2 - Metadata Part 2: Extensions for imagery and gridded data?

Comparison

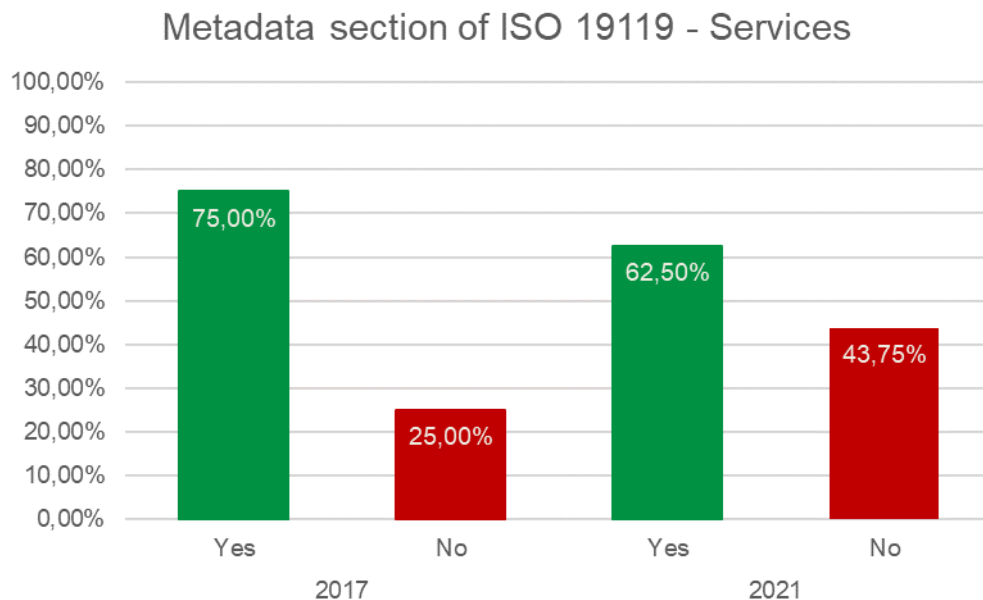
The use of the ISO 19115-2 standard has decreased in the last 4 years.



Is your NMCA using the Metadata section of ISO 19119 - Services?

Comparison

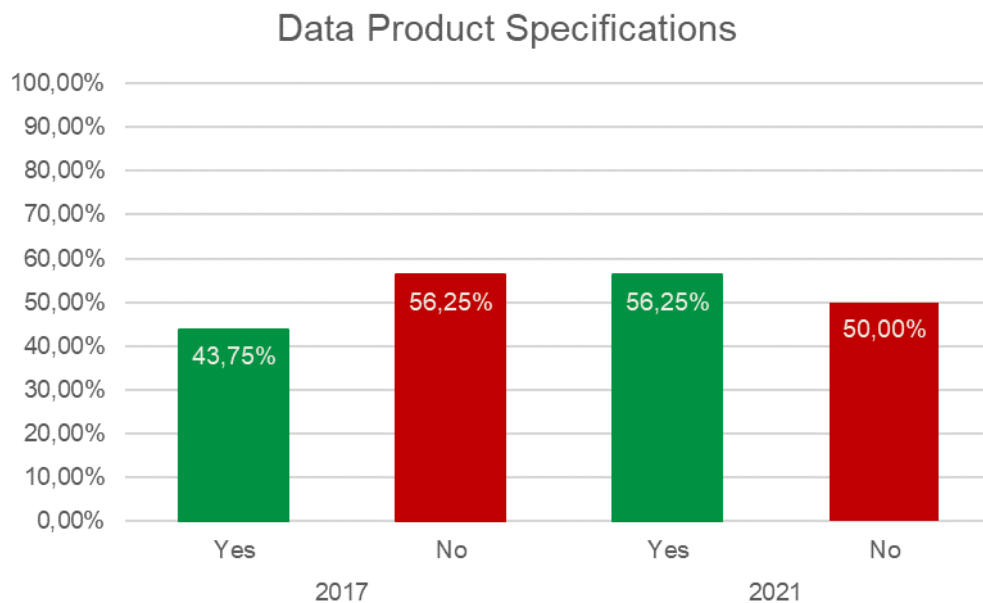
Also the use of the metadata section of ISO 19119 has decreased in the last 4 years.



Is your NMCA using ISO 19131 (Data Product Specifications)?

Comparison

Based on the comments, the use of ISO 19131 is recently adopted by a few member organizations. This causes the increase in the figures underneath.

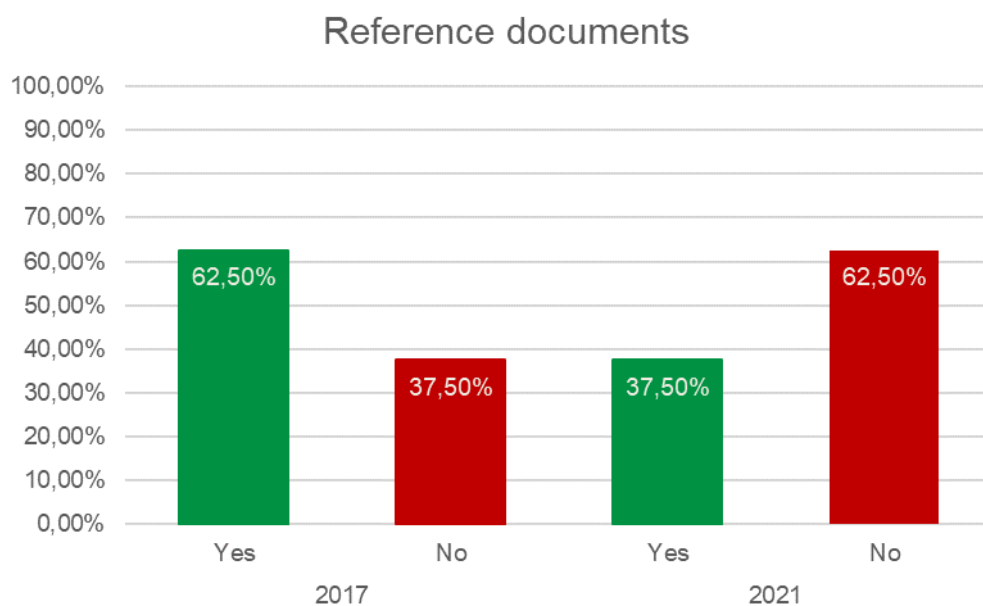


Do you have reference documents that describe how the standards are implemented?

Comparison

In 2017 some organizations declared that they have metadata templates or some implementation guidelines available. In the questionnaire of 2021 these kind of documents weren't mentioned.

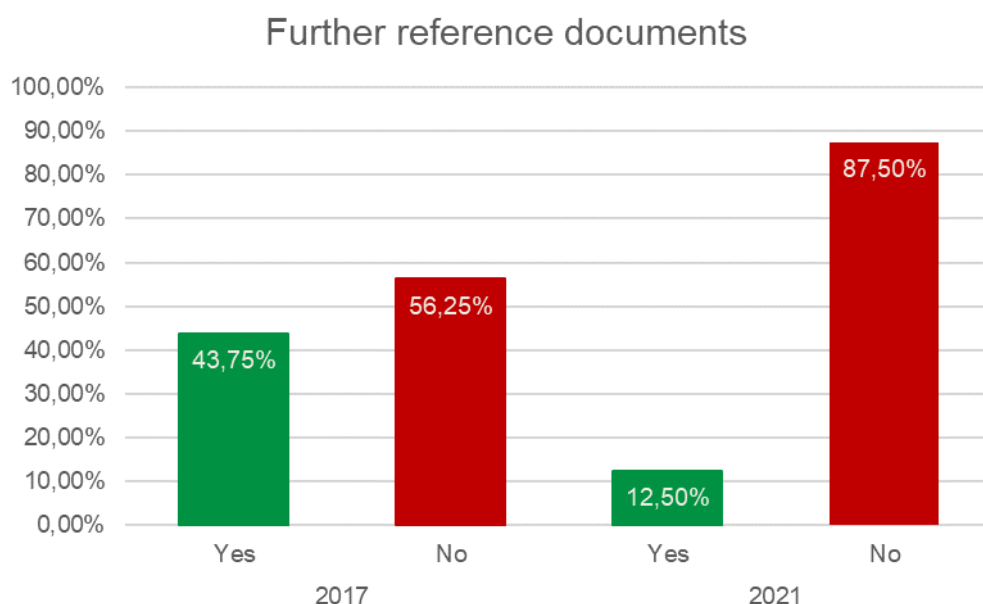
Only 2 organizations have reference documents that are available in English: Ordnance survey GB and Lechner Nonprofit Ltd, Hungary.



Do you have further reference documents that could be of an interest to other NMCA's?

Comparison

In 2017, 7 member organizations answered that they possessed further reference documents, from which even 1 document was available in English. In 2021 only 2 organizations answered that they have interesting reference documents and none of these are in English. The documents that are presented in 2021 and in 2017 are not the same.



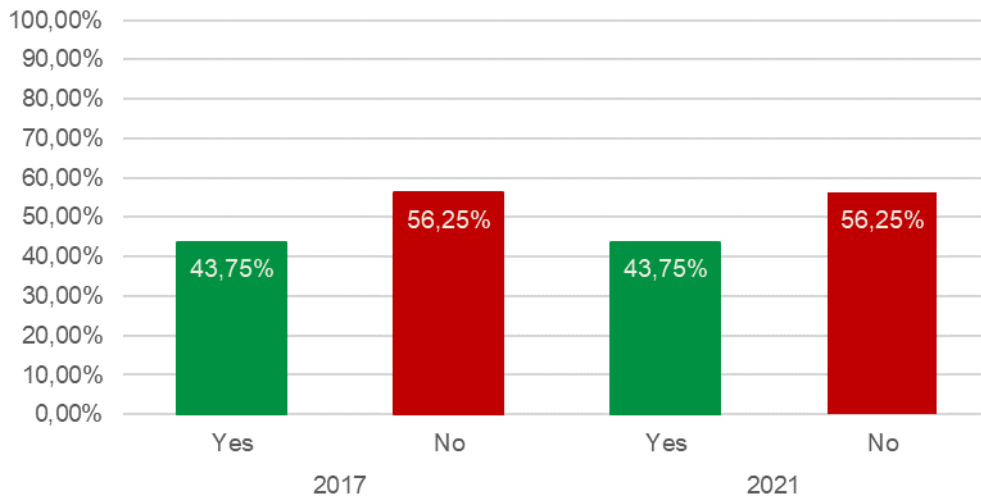
Have you used the documents "Guidelines for Implementing the ISO 19100 Geographic Information Quality Standards in National Mapping and Cadastral Agencies" and the 2019 updated guide?

Comparison

The amount of organizations that uses the guidelines for Implementing the ISO 19100 Geographic Information Quality Standards is the same in 2017 and 2021. The 2019 updated guide didn't invoke an increase of usage within the member organizations.

A more detailed comparison shows that the use of these guidelines is personal. In organizations that have changed the data quality responsible, a change in the answer is noticed. Sometimes the previous data quality responsible used the guidelines and the actual data quality responsible doesn't. Sometimes it's the way around.

Used the Guidelines for Implementing the ISO 19100 Quality Standards



Comparison Summary

There was an increase in the use of

- Quality Principles in ISO 19157
- Data Quality Measures in ISO 19157
- ISO 19115-1 Metadata
- Data Product Specifications in 19131

There was a decrease in the use of

- Quality Evaluation Procedures in ISO 19157
- ISO 19115-2 Metadata
- ISO 19119 Metadata - Services

In the comments several organizations mentioned that the implementation is in progress or that the ISO quality standards will be considered/consulted in the near future.

Based on the results and the comparison, it is safe to conclude that there is an increase in the use of ISO 19100 quality standards. The implementation of the INSPIRE guidelines has helped increasing the use of these standards, especially for the use of ISO 19115-1 Metadata.

It is remarkable that the amount of interesting reference documents has decreased in the last few years. It can be interesting to investigate why the amount has decreased. Was there a different interpretation of the term "reference documents"? Was it because other people filled in the questionnaire? Was there another reason?

The use of the Guidelines for Implementing the ISO 19100 Geographic Information Quality Standards is probably linked to the person that is responsible for the implementing of the ISO 19100 quality standards. Some quality officers use it, some don't.

Conclusion

It was very difficult to get results to the ISO questionnaire this year. In 2017, 28 members responded. In 2021, two reminders were sent and 17 member organizations participated. Probably the covid-situation had an influence on the participation rate of this year.

It can be concluded that the use of and the interest in using the ISO 19100 quality standards are still increasing.