

eENVplus - Building capacity and training

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SUMMARY

eENVplus is a pilot type project, funded by European Union under the Competitiveness and Innovation Framework – Information and Communication Technologies Policy Support Programme (CIP-ICT-PSP). The paper aims to introduce the eENVplus approach in needs analysis and how to transform it into building capacity and training. The results of the investigations and future plans are presented.

1. INTRODUCTION

The aim of eENVplus project is to integrate a huge amount of environmental data put at disposal by the involved national/regional environmental agencies and other public and private environmental stakeholders through the integration and harmonisation of existing services in order to answer to the requests of environmental monitoring and reporting drafted by the European, national and local policies and actions. Within the project a separate workpackage (WP8) aims to develop a Training Framework to give immediate support for project partners both in preparation of the eENVplus training modules and in implementation of eENVplus trainings. The Framework can serve directly INSPIRE (Infrastructure Spatial Information for Europe) and SEIS (Shared Environmental Information System) initiatives with eLearning tools.

The eENVplus Training Framework includes:

1. e-Learning Platform, hosting the training modules and the related eLearning tools. These tools offer functionalities such as course administration, provision of online lectures, monitoring of performance etc.;
2. training materials organized in Modules as detailed in their metadata descriptions; finally
3. customized Training Packages.

Based on the needs analysis the main stakeholders of eENVplus project were divided into three categories

- managers (seniors, decision makers),
- professionals (developers, data providers, service providers) and
- end-users (administrative staff, NGOs, application website visitors etc.).

As a result of the needs analysis vocational training curricula were outlined according to different levels of skills and knowledge requirements for the different project stakeholders. The curricula consist of a number of knowledge areas which were organised into logical learning units, and which allow establishing learning paths in view of pre-defined learning outcomes.

For different stakeholders unique Learning Paths were proposed.

2. TRAINING CURRICULA

Training is an organized activity aimed at transferring information and/or experiences to help trainees attaining required level of knowledge, skills and competencies.

The training curricula recommendations are based on the user needs analysis. The questionnaire asked for the stakeholder's prior knowledge (low, medium and good) and importance of training modules (low, medium and high).

2.1 Managers

For managers the training should primarily focus at getting to know and understand INSPIRE aims, objectives in general more specifically eENVplus infrastructure and services at the executive level. This customized training is an opportunity to discuss and agree on expectations of communication and, for the most part, to agree on a set of values and principles that all stakeholders will abide by.

	knowledge %	importance %
eENVplus services	50	89
eENVplus infrastructure	50	86
INSPIRE	72	85
Data and metadata harmonization	66	76
Data and metadata validation	50	76
OGC Web Services	59	75
Linked Open Data	38	72
Mobile mapping	35	71
GI standards	65	64
SEIS	53	62
Environmental Thesauri	40	50
Environmental risk management	34	44
Forest fire management	25	44
Water Directives	38	38
Nature conservation	44	36
Environmental monitoring	59	32
Air pollution monitoring	40	24
Average	48	60

Table 1. Knowledge / importance table: managers (orange: high importance)

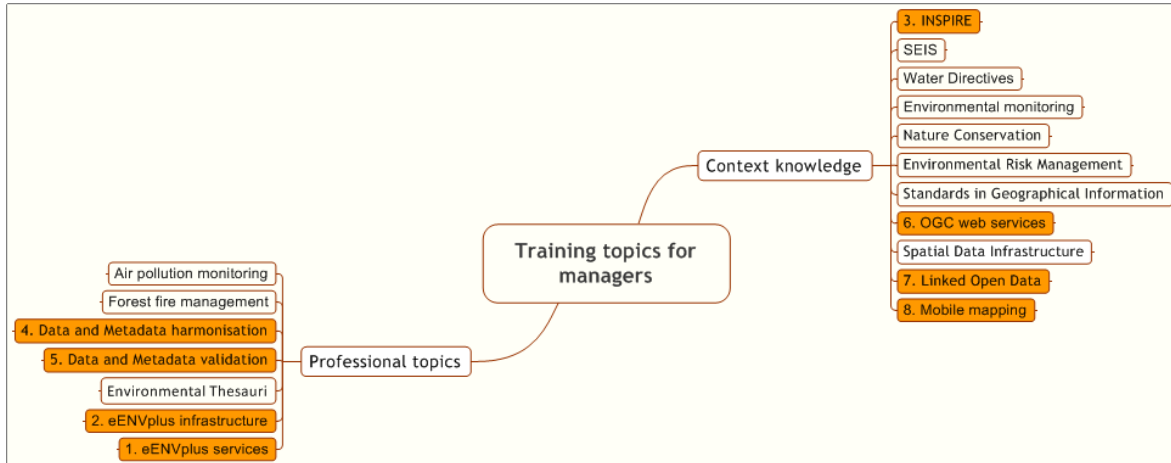


Fig. 1. Most important training topics selected by managers (orange)

Recommended core training topics for managers

- Context knowledge
 - INSPIRE
 - Data and metadata harmonization
 - Data and metadata validation
 - OGC Web Services
 - Linked Open Data
 - Mobile mapping
- Professional topics
 - eENVplus services
 - eENVplus infrastructure

Recommended delivery method

Short seminar and internet sources (e-Learning)

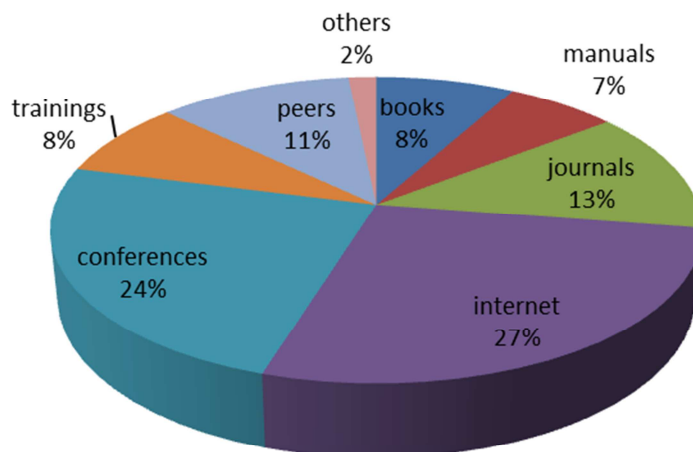


Fig. 2. Conferences and internet are the most popular sources for knowledge improvement

3.2 Professionals

For professionals (developers, data providers, service providers) the training should primarily focus at latest INSPIRE related professional skills and competences from one side and practical knowledge on eENVplus infrastructure and services at technical, operative level. The training is an opportunity to share experiences and approaches between participants. Project FAQ website is recommended.

	knowledge %	importance %
INSPIRE	61	81
Data and metadata harmonization	54	81
eENVplus services	40	79
GI standards	50	77
eENVplus infrastructure	43	75
Data and metadata validation	46	74
SEIS	24	68
Linked Open Data	38	67
OGC Web Services	51	64
Mobile mapping	41	62
Environmental risk management	30	53
Environmental Thesauri	24	52
Environmental monitoring	40	50
Nature conservation	40	47
Forest fire management	11	47
Water Directives	21	41
Air pollution monitoring	23	38
Average	37	62

Table 2. Knowledge / importance table: professionals (orange: high importance)

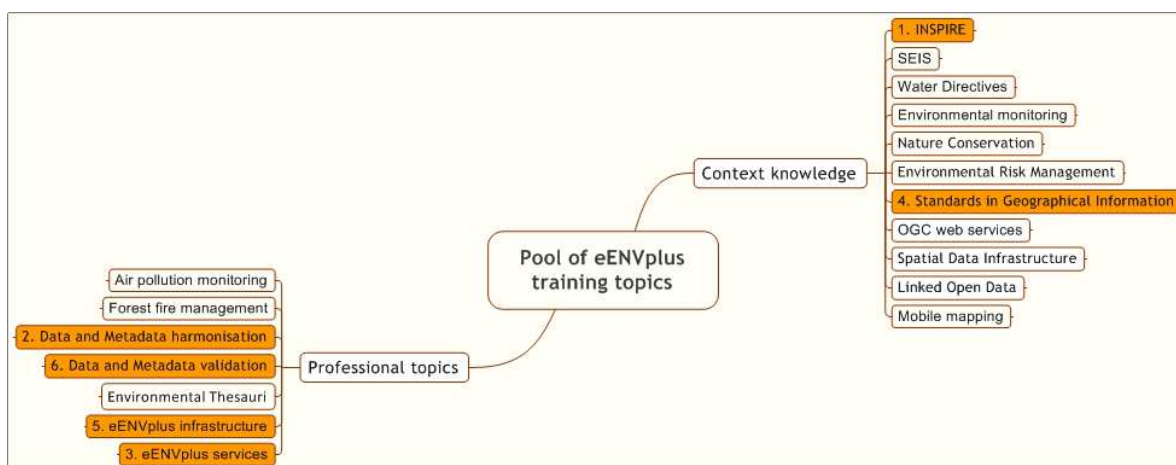


Fig. 3. Most important training topics selected by professionals (orange)

Recommended core training topics for professionals

- Context knowledge
 - INSPIRE
 - GI standards
- Professional modules
 - eENVplus services
 - eENVplus infrastructure
 - Data and metadata harmonisation
 - Data and metadata validation

Recommended delivery methods

- Blended learning
- Face-to-face training, internet sources (e-Learning) and tutorials
- Webinars and seminars

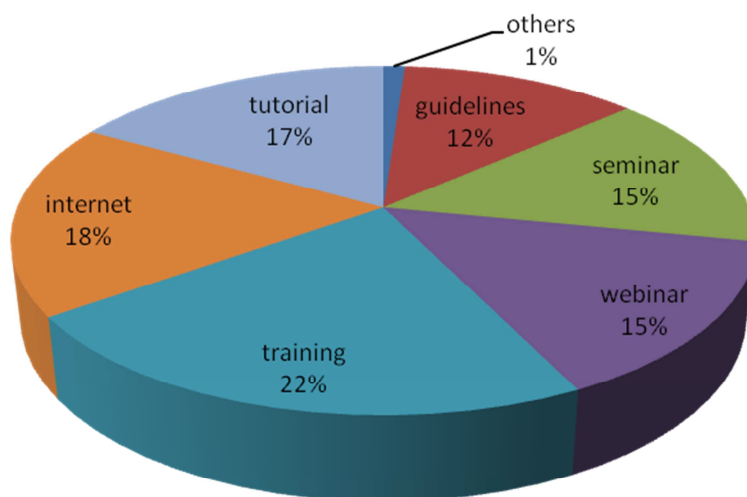


Fig. 4. The most preferred method for improvement of skills and knowledge is training

3.3 End users

For end users (administrative staff, NGOs, application website visitors etc.) the training should primarily focus on getting to know and understand eENVplus aims, objectives in general and specifically eENVplus infrastructure and services at the user level. The training is an opportunity to disseminate project results and discuss on expectations of community, to agree on a set of values and principles that all stakeholders will abide by.

	knowledge	importance
	%	%
eENVplus services	4	75
eENVplus infrastructure	4	65

Data and metadata harmonization	27	60
Mobile mapping	17	60
INSPIRE	50	56
Water Directives	27	56
Environmental monitoring	33	56
GI standards	33	55
OGC Web Services	33	55
Data and metadata validation	25	55
Linked Open Data	13	55
SEIS	21	50
Nature conservation	58	50
Environmental Thesauri	5	50
Air pollution monitoring	8	44
Forest fire management	8	39
Environmental risk management	13	33
Average	22	54

Table 3. Knowledge / importance table: end users (orange: high importance)

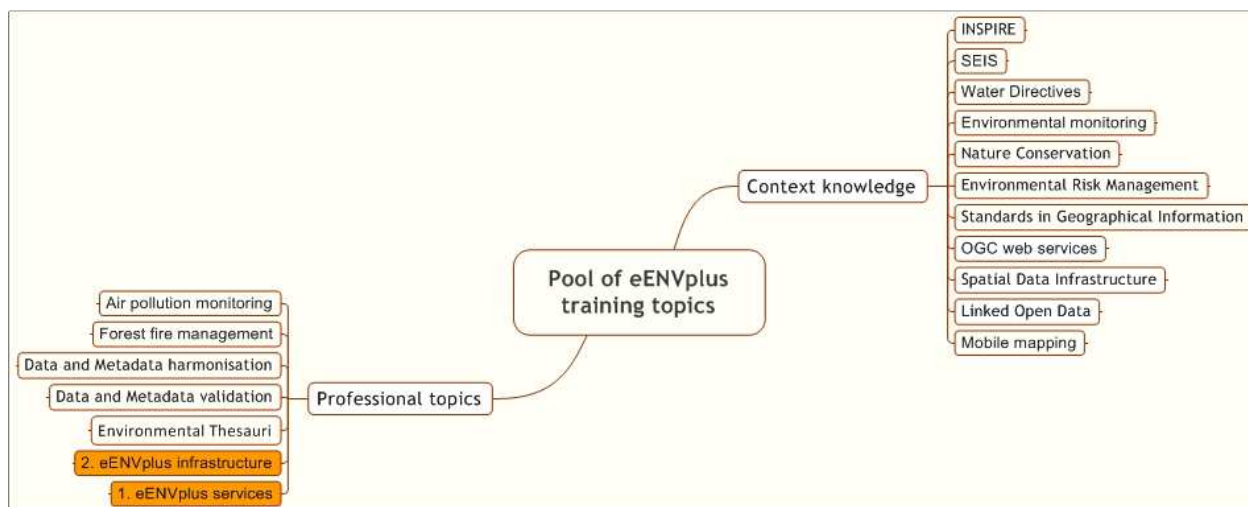


Fig. 5. Most important training topics selected by end users (orange)

Recommended core training topics for end users

The end users are very interested on eENVplus project results. Unfortunately they have not enough background knowledge on Geoinformation Technology. They have heard about INSPIRE, but their knowledge should be updated and the training should get them into GI context. That is why we recommend two additional training topics below.

- Context knowledge
- INSPIRE
- Mobile mapping

Project specific knowledge
eENVplus services
eENVplus infrastructure

Recommended delivery method

Demonstration (face-to-face, video or on-line), tutorials and internet sources (e-Learning or blended learning)

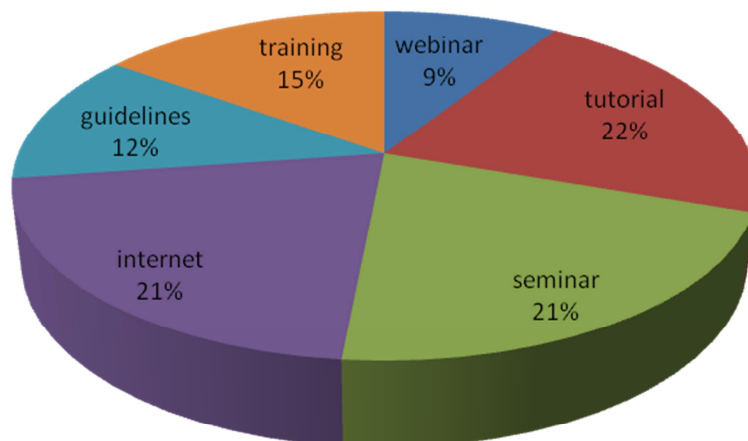


Fig. 6. The preferred methods for improvement of skills and knowledge are tutorial, internet and seminar

Based on the analysis of the training needs, described in the first part of the document, we have designed a comprehensive Training Package with a list of modules, which, in part, are already available from previous projects (most of them represent those ones which eENVplus is based on) and which, in part, will be developed with the results of the other eENVplus Work Packages.

The proposed modules organized in four levels:

- Level 1: Background Knowledge
- Level 2: Thematic Knowledge
- Level 3: The eENVplus Infrastructure
- Level 4: eENVplus scenarios

3. LEARNING PATHS

The development of curricula was partially based on the experience gained in other EU-projects (UNIPHORM, VESTA-GIS, NATURE-SDIplus, NESIS, BRISEIDE etc.) and on the training needs identified within the survey (see D 8.0). From the eENVplus Training Package (knowledge pool) the following recommendations are proposed.

Learning path is the ideal sequence of training modules that drives trainees to build their knowledge progressively; to reach expected learning outcomes in the shortest possible time. Of course the training should focus on the expectations of target group: “Just enough. Just in time. Just for you.” In the specific Learning paths, the necessary modules from Level 2 – Thematic knowledge and Level 4 – eENVplus scenarios should be included. For the reason, they are proposed as optional for the stakeholder categories.

3.1 Managers

Recommended core training modules	Optional modules
Context knowledge	
1.1 Data and metadata harmonization	1.3 Basics of INSPIRE Data Specifications
1.2 Introduction to INSPIRE	1.4 Basics of INSPIRE Network Services
	1.6 Towards the ICT implementation of SEIS
	1.7 Good Practices for Environmental Management
1.8 Linked Data	Level 2 Modules, according to the thematic interest
Project specific	
3.3 The eENVplus Architecture	Other modules of Level 3
	Level 4 Modules, according to the thematic interest

Table 4. Recommended core training modules for managers

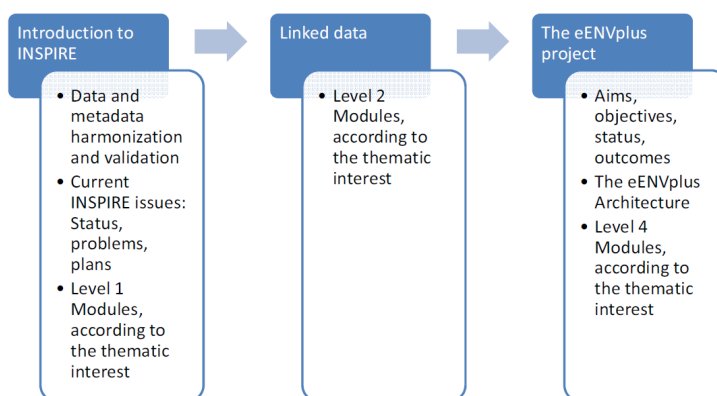


Fig. 7. Typical learning path for a seminar for managers. eENVplus training infrastructure can be used for e-Learning.

3.2 Professionals

Recommended core training modules	Optional modules
Context knowledge	
1.1 Data and metadata harmonization	1.8 Linked Data
1.2 Introduction to INSPIRE	Level 2 Modules, according to the thematic interest
1.3 Basics of INSPIRE Data Specifications	
1.4 Basics of INSPIRE Network Services	
1.5 Procedures for Data and Metadata Harmonisation	
1.9 Standards in Geographical Information	
Professional modules	
3 The eENVplus infrastructure	1.6 Towards the ICT implementation of SEIS
3.1 Example of Data Transformation	1.7 Good Practices for Environmental Management

3.2 Metadata and Data validation for INSPIRE	Level 4 Modules, according to the thematic interest
3.3 The eENVplus architecture	
3.4 The eENVplus Thesaurus Framework	
3.5 The eENVplus services	
3.6 eENVplus catalogue and connection to operational infrastructures	
3.7 Mobile Mapping and advanced visualisation	

Table 5. Recommended core training modules for professionals

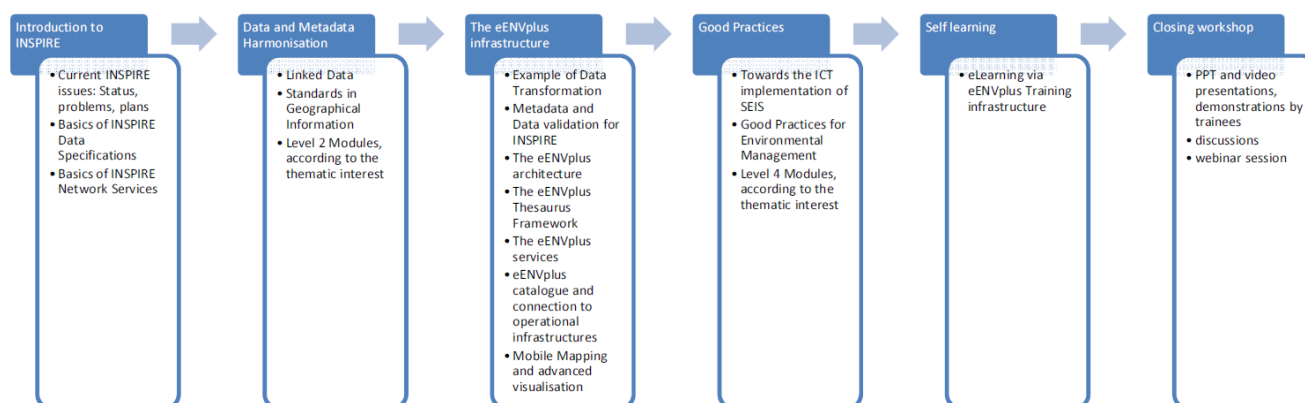


Fig. 8. Typical learning path on blended learning for professionals. eENVplus training infrastructure can be used for e-Learning.

Proposed delivery method is blended learning:

1. Introductory seminar (1 day – PPT and video presentations, demonstrations)
2. Self-learning: internet resources, tutorials (e-Learning), project work
3. Closing workshop (1 day – demonstrations by trainees, webinar session, discussions)

3.3 End users

Recommended core training modules	Optional modules
Context knowledge	
1.2 Introduction to INSPIRE	1.3 Basics of INSPIRE Data Specifications
	1.4 Basics of INSPIRE Network Services
	1.7 Good Practices for Environmental Management
	Level 2 Modules, according to the thematic interest
Project specific	
3.3 The eENVplus architecture	Other modules of Level 3
3.5 The eENVplus services	Level 4 Modules, according to the thematic interest
3.7 Mobile Mapping and advanced visualisation	

Table 6. Recommended core training modules for end users

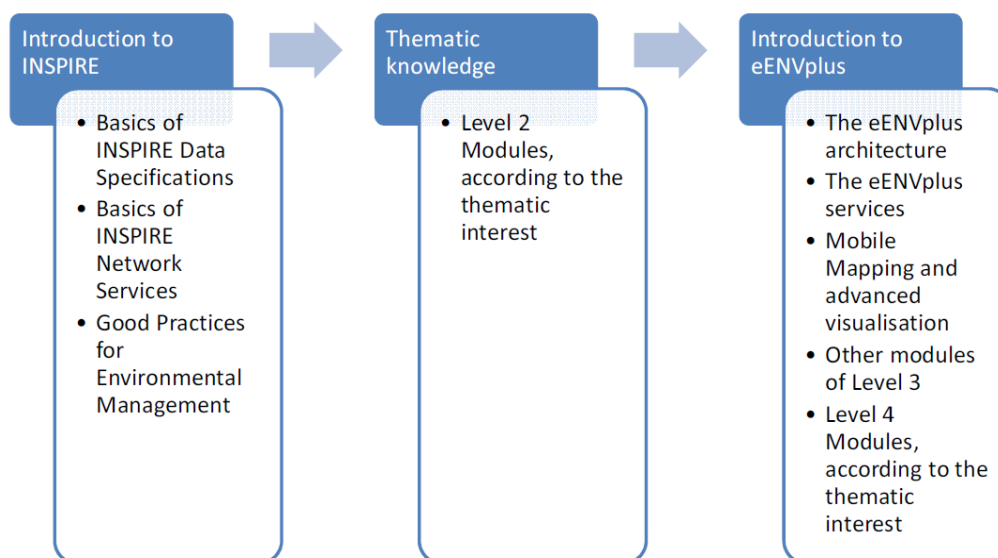


Fig. 9. Typical learning path for a training for end users. For self-learning INSPIRE related brochures, eENVplus factsheets, hand-outs of presentations can be distributed. eENVplus training infrastructure can be used for self study.

4. TRAINING CASE STUDY

The case study is an example, contains the Hungarian training plan. The chapter aims to orientate training organisers in the preparation of training actions.

Training for managers

Target groups:

- Department of Environmental Protection
- Department of National Parks and Landscape Protection

Participants: 25 persons

Date: November 2014

Aims: to inform participants about the recent INSPIRE related development in Europe and current tasks in Hungary; to deepen their knowledge on Linked Open Data and especially Hungarian NSDI applications; to introduce eENVplus services and infrastructure

Delivery method: Short seminar (1 day face-to-face – PPT and video presentations, demonstrations, discussions)

Self-learning: internet resources (e-Learning)

Expected workload: 12 hours

Learning outcomes: the participants will be able to identify and solve the problems in INSPIRE implementation better than before the training

Recognition: certificate

Context knowledge

- INSPIRE introduction - interoperability
- Data and metadata harmonization

Data and metadata validation
Web Services
Linked Open Data
Mobile mapping
NSDI
SEIS
Information security (Hungarian rules)

Project specific
eENVplus services
eENVplus infrastructure

Training for professionals

Target groups:

- Environmental Protection Guard
- National Parks IT staff

Participants: 50

Date: March 2015 (M27)

Aims: the training aims to enhance the GI related knowledge of technical staff in standards, interoperability, data and metadata harmonisation; the practical focus is on eENVplus services and infrastructure, data quality assurance, data and metadata validation

Delivery method: blended learning

- Introductory seminar (1 day – PPT and video presentations, webinar session, demonstrations)
- Self-learning: internet resources, tutorials (e-Learning), project work
- Closing workshop (1 day – demonstrations by trainees, discussions)

Expected workload: 24 hours

Learning outcomes: the participants will be able to use professionally eENVplus services and infrastructure; to apply data quality assurance methods, data and metadata validation tools

Recognition: certificate

Context knowledge

INSPIRE

Data and metadata harmonization – interoperability, legal issues

GI standards

Professional modules

eENVplus services

eENVplus infrastructure

Data and metadata validation – data quality assurance

Procedures and tools for data and metadata harmonisation

Training for end users

Target groups: (High) school students

Participants: 200

Date:

- April 2015 (M28) high school students
- 22 April 2015 (M28) primary school students

Aims: environmental protection and GIS awareness building

Delivery method: Demonstration (face-to-face, video or on-line), tutorials and internet sources (e-Learning)

Expected workload: 6 hours

Learning outcomes: the participants will understand the results of eENVplus project and will be able explain in their community (school, family etc.) the necessity of environmental information systems
Recognition: -

Project specific

eENVplus services

eENVplus infrastructure

Context knowledge

INSPIRE introduction – logics, interoperability

Basics of mobile mapping – GPS navigation

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