

## Deliverable 5.3.

### ClimEd Training №3: Digital tools and datasets for climate change education

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<b>Reviewer(s)</b>	Svyatoslav Tyuryakov (UHEL)
<b>Abstract</b>	Summary of the 3 <sup>rd</sup> ClimEd Online Training on “Digital tools and datasets for climate change education” (26 October – 12 November 2021). All materials of the training are available at: <a href="http://climed.network/events/climed-trainings/climed-training-3-online">http://climed.network/events/climed-trainings/climed-training-3-online</a>

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## 1. INTRODUCTION

The ClimEd project “**Multilevel Local, Nation- and Regionwide Education and Training in Climate Services, Climate Change Adaptation and Mitigation**” (2021-2023; <http://climed.network>) is developing the competency-based curricula for continuous comprehensive training of specialists in the field of climate services in Ukraine, as well as initiating and developing the additional education in climate change for decision-makers, experts in climate-dependent economic sectors and wider public, which are to contribute to stabilization of the national economy in the face of the climate change and its adaptation to the upcoming climate change.

The ClimEd Trainings (<http://climed.network/events/climed-trainings>) are focused on training the faculty/ teaching/ research staff and postgraduates at the ClimEd partner institutions and collaborating organizations in advanced educational and information-and-communication technologies for building a flexible multi-level integrated practice-based education system in the field of Climate Services, Climate Change Adaptation and Mitigation.

In total, 7 trainings (Tr) are planned during lifetime of the ClimEd project, and these are the following:

- Tr1: Competency-Based Approach to Curriculum Development for Climate Education
- Tr2: Adaptation of the Competency Framework for Climate Services to conditions of Ukraine
- Tr3: Digital tools and datasets for climate change education
- Tr4: Learning courses’ development in climate services considering needs of different users
- Tr5: Applying different technologies of blended/on-line learning in education
- Tr6: Mastering technologies of massive open on-line courses development for general public
- Tr7: Skills to use climatic information and services for climate-dependent branches of economy.

## 2. THE 3<sup>RD</sup> CLIMED TRAINING: DIGITAL TOOLS AND DATASETS FOR CLIMATE CHANGE EDUCATION

The ClimEd 3rd Online Training on “Digital Tools and Datasets for Climate Change Education” took place online during 26 October – 12 November 2021. The ClimEd project trainings are focused on training the faculty/ teaching/ research staff and postgraduates at the ClimEd partner institutions and collaborating organizations in advanced educational and information-and-communication technologies for building a flexible multi-level integrated practice-based education system in the field of Climate Services, Climate Change Adaptation and Mitigation.

In total, 45 persons (including 30 female and 15 male; and 15 young teachers/researchers) were accepted to participate in this online training. These were from the Ukrainian ClimEd partners and other institutions such as the Odessa State Environmental University, Kyiv National University of Construction and Architecture, O. Beketov National University of Urban Economy, Lviv Polytechnic National University, Bila Tserkva National Agrarian University, Odessa National Medical University, Kherson State Agrarian and Economic University, Ukrainian Hydrometeorological Institute, EGIS Ukraina, Institute Northern Environmental Problems, Polar Geophysical Institute, and Visva-Bharati University.

The training included a series of lectures delivered during 26-28 October 2021. The presented lectures covered the following topics/ themes: IPCC Assessment Report with its regional focus/context on Ukraine; current status and perspectives; current status and perspectives of activities in support

climate related research and WMO integrated climate services; observations for climatic variables: obs. system, specifics, challenges; remote sensing/satellite observations: current state, perspectives, databases, and applicability of results; global and regional scales climate modelling: current state, perspectives, databases, and applicability of results; urban scale modelling for climate applications; climate related datasets, Copernicus related data, tools for visualization and analysis of climate related data; and finally, the Introductions to Home-Work-Assignments (HWAs). The lectures were delivered by Drs. Svitlana Krakovska (Ukrainian Hydrometeorological Institute, Ukraine); Wilfran Moufouma Okia (World Meteorological Organization, Switzerland); Antti Mäkelä, Larisa Sogacheva, Putian Zhou (Finnish Meteorological Institute, Finland); Alexander Mahura (University of Helsinki, Finland) and Profs. Tomas Halenka (University Charles in Prague, Czech Republic), Igor Esau (Nansen Environmental Remote Sensing Center, Norway).

During followed weeks the Groups of participants completed remotely their HWAs as the Groups' small-scale research projects. Each mixed group included 3-4 persons – from different Universities, gender, age. In total, 12 Groups (C1-C12) focused on the themes of the water management, climate change, agriculture and energy sectors, urban economy, others. The Groups established horizontal communication within/between groups and worked on own related HWAs. Such work included also virtual zoom-consultations by teachers (Svitlana Krakovska, Putian Zhou, Larisa Sogacheva, Inna Khomenko, Alexander Mahura) once per week and it was done actively using the Moodle system of OSENU.

On 12 November 2021, during the last day of the training, each Group presented own completed projects: C1 “Water Management – Vistula river basin”; C2 “Climate change and its impact on beekeeping and sheep breeding in Ukraine”; C3 “Efficiency of green roofs in urban areas for stormwater retention under climate change”; C4 “Climatic prospects of the green energy transition in the city of Zhytomyr”; C5 “Water Management – Assessing the impact of climate change on water resources of Kherson, Odessa, and Kyiv regions on basis of models climate-runoff”; C6 “Dynamics of the meteorological regime and climate of the Antarctic Peninsula”; C7 “Renewable sources energy potential of Odessa region”; C8 “The impact of climate change on the development of agriculture in the Lviv region of Ukraine”; C9 “Assessment the influence of meteorological conditions for safe operation of nuclear power plants in various climatic zones”; C10 “Agriculture (livestock product technology)”; C11 “Water management – Danube basin of Ukraine”; and C12-“Urban economy – energy consumption”. All presentations were constructively criticized and commented as well as overall evaluated on a scale (1-10). As the result of the evaluation, the ClimEd training certificates (corresponding to 3 ECTS) were awarded as recognition of participants' achieved learning outcomes.

Four groups (C03, C04, C09 and C12) got the highest scores of 9.26, 9.29, 9.29, and 9.46, respectively, and these have been awarded the certificates with distinction (“Platinum”). Three other Groups (C02, C06, and C11) obtained certificates having the “Gold” status (i.e. with scores higher than 8.5). Note that members of these 7 Groups were automatically accepted (i.e. without required application procedure) as approved participants for the ClimEd 4th Training (planned in February 2022 as a face-to-face/onsite training in Spain).

It was stressed that participants of the training have obtained new/ upgraded basic knowledge about IPCC Assessment Report, current activities in support climate related research in Ukraine; WMO mechanisms and entities for provision of operational seasonal forecasts, current limitations of WMO regional climate outlook forums and reasons to expand portfolio of climate products, key features of objective seasonal forecasts; existing types, specifications and challenges of meteorological/climate observation systems; main principles, instruments, satellite Earth Observations products; Earth System Modelling, basic information of CMIP6 and its datasets; needs, use and advantages of

regional climate models for local/regional impact studies; urban integrated system approach, principle modeling strategies at fine spatial resolution in the atmospheric boundary layer; datasets at Copernicus Climate Change Service (C3S) Climate Data Store (CDS); and better understanding possibilities of C3S CDS Toolbox in climate data visualisation and analysis as well as skills in usage of C3S CDS Toolbox for group projects (as small-scale research projects) and skills in group's (as the team) developing and realizing research plan, and presenting research project results.

The e-evaluation of the ClimEd 3rd Training was done using two questionnaires distributed among participants. Following the 1st questionnaire – (Evaluation of the Training) – about 90% of the participants estimated overall rating for this course as "very good" and "good"; training materials were of excellent quality (84%) and information about training was sufficient (97%), and participants will recommend such training to colleagues (91%). Following the 2nd questionnaire – (Self-Evaluation of the Obtained Competencies and Skills) – about 70% of participants "fully agreed" and "mostly agreed" that they have obtained/ improved their competencies and got skills in usage of the C3S CDS Toolbox remotely/ virtually working as groups.

Special thanks to all the lecturers and teachers of the training for their professionalism, enthusiasm and commitment to the training. Special thanks to the OSENU team members – Drs. Oleg Shablii and Inna Khomenko, young researchers Kateryna Husieva and Artem Gamaun – for continuous technical support (OSENU Moodle system, e-evaluations, training web-page continuous updates with training materials, for support with ClimEd relevant training preparation and HWAs, etc.) during the entire period of the training.

All materials of the training (slides and videos of lectures, presentations of exercises and homework-assignments as group projects, etc.) are available at <http://climed.network/events/climed-trainings/climed-training-3-online> The training outcomes were also disseminated through the PEEEX (Pan-Eurasian Experiment; <https://www.atm.helsinki.fi/peex>) network through quarterly PEEEX NewsLetters & PEEEX blog: <https://peexhq.home.blog/2021/11/25/summary-of-the-climed-3rd-training>).

## 2.1. Lecturing Materials

During the 3rd ClimEd Training, in total 10 lectures were delivered.

*Lecture 1* – Regional focus of IPCC Assessment Report in Ukraine Context. *Svitlana Krakovska, Ukrainian Hydrometeorological Institute, Ukraine* (slides, [video](#))

*Lecture 2* – UHMI activities in support climate related research: current status and perspectives. *Svitlana Krakovska, Ukrainian Hydrometeorological Institute, Ukraine* (slides, [video](#))

*Lecture 3* – WMO integrated climate services: current status and perspectives. *Wilfran Moufouma Okia, World Meteorological Organization, Switzerland* ([slides](#), [video](#))

*Lecture 4* – Observations for climatic variables: obs. system, specifics, challenges. *Antti Mäkelä, Finnish Meteorological Institute, Finland* ([slides](#), [video](#))

*Lecture 5* – Remote sensing/Satellite observations: current state, perspectives, databases, and applicability of results. *Larisa Sogacheva, Finnish Meteorological Institute, Finland* ([slides](#) – password for opening: 4321, [video](#))

*Lecture 6* – Global scale climate modelling: current state, perspectives, databases, and applicability of results. *Putian Zhou, University of Helsinki / Finnish Meteorological Institute, Finland* ([slides](#), [video](#))

*Lecture 7* – Regional scale climate modelling: current state, perspectives, data/databases, and applicability of results. *Tomas Halenka, University Charles in Prague, Czech Republic* ([slides](#), [video](#))

*Lecture 8* – Urban scale modelling for climate applications. *Igor Esau, Nansen Environmental Remote Sensing Center, Norway* ([slides](#), [video](#))

*Lecture 9* – Climate related datasets, Copernicus related data. *Antti Mäkelä, Finnish Meteorological Institute, Finland* ([slides](#), [video](#))

*Lecture 10* – Tools for visualization and analysis of climate related data. *Antti Mäkelä, Finnish Meteorological Institute, Finland* ([slides](#), [video](#))

Introductions to Home-Work-Assignments/ Group projects. *Alexander Mahura, UHEL-INAR; Svitlana Krakovska, UHMI; Putian Zhou, UHEL/FMI; Larisa Sogacheva, FMI; Inna Khomenko, OSENU* ([slides](#), [video](#))

## 2.2. Home-Work Assignments

At the last day of the lecturing period, the introduction to home-work-assignments (HWAs) as Small-Scale Research Projects (SSRPs) to be realized as group projects was given to participants. The remote work on HWAs (28 October – 12 November 2021) – with online consultations in zoom – on 2 and 9 November 2021.

On the 1<sup>st</sup> online/ virtual consultation (2 November 2021), a series of short oral presentations about Group HWAs plans were delivered by each Group: Group C1 ([video](#)), Group C2 ([video](#)), Group C3 ([video](#)), Group C4 ([video](#)), Group C5 ([video](#)), Group C6 ([video](#)), Group C7 ([video](#)), Group C8 ([video](#)), Group C9 ([video](#)), Group C10 ([video](#)), Group C11 ([video](#)), Group C12 ([video](#)).

HWAs as SSRPs for Groups C1-C12 were realised by each group as own projects. The main focuses for HWAs were developing examples of practical exercises (using ECMWF Copernicus Climate Change Service Climate Data Store ToolBox datasets and research tools for data visualisation and analyses) for development of ClimEd courses for master students in climatology, experts in climatology and meteorology, hydrologists, experts in water management, energy sectors, agriculture, construction and architecture, health-care experts, etc.

## 2.3. HWAs Defenses & Certificates

Welcome – Sergiy Stepanenko & Svyatoslav Tyuryakov ([video](#))

At the last day of the training, each Group presented (in English) HWAs as own realized SSRPs with specific focus. The presentations – Group C01 ([video](#), [slides](#)), Group C02 ([video](#), [slides](#)), Group C03 ([video](#), [slides](#)), Group C04 ([video](#), [slides](#)), Group C05 ([video](#), [slides](#)), Group C06 ([video](#), [slides](#)), Group C07 ([video](#), [slides](#)), Group C08 ([video](#), [slides](#)), Group C09 ([video](#), [slides](#)), Group C10 ([video](#), [slides](#)), Group C11 ([video](#), [slides](#)), Group C12 ([video](#), [slides](#)) and with Sumup ([video](#), [slides](#)) of the 3<sup>rd</sup> Training - were constructively criticized and commented as well as overall evaluated on a scale

(1-10). As the result of the evaluation, all Groups got the ClimEd training certificates (see example in Annex 4.3) corresponding to 3 ECTS as recognition of their achieved learning outcomes.

The following Small-Scale Research Projects were presented and defended by 12 Groups:

- C1 “Water Management – Vistula River basin”;
- C2 “Climate change and its impact on beekeeping and sheep breeding in Ukraine”;
- C3 “Efficiency of green roofs in urban areas for stormwater retention under climate change”;
- C4 “Climatic prospects of the green energy transition in the city of Zhytomyr”;
- C5 “Water Management – Assessing the impact of climate change on water resources of Kherson, Odessa, and Kyiv regions on basis of models climate-runoff”;
- C6 “Dynamics of the meteorological regime and climate of the Antarctic Peninsula”;
- C7 “Renewable sources energy potential of Odessa region”;
- C8 “The impact of climate change on the development of agriculture in the Lviv region of Ukraine”;
- C9 “Assessment the influence of meteorological conditions for safe operation of nuclear power plants in various climatic zones”;
- C10 “Agriculture (livestock product technology)”;
- C11 “Water management – Danube basin of Ukraine”; and
- C12 “Urban economy – energy consumption”.

The Obtained Competencies and Learning Outcomes of 3<sup>rd</sup> ClimEd training included the following:

- Basic knowledge of regional focus of IPCC Assessment Report in Ukraine context
- Basic knowledge of activities in support climate related research in Ukraine
- Basic knowledge of WMO mechanisms and entities for provision of operational seasonal forecasts, current limitations of WMO regional climate outlook forums and reasons to expand portfolio of climate products, key features of objective seasonal forecasts
- Basic knowledge of existing types, specifications and challenges of meteorological/climate observation systems
- Basic knowledge of main principles, instruments, satellite Earth Observations products
- Basic knowledge of Earth System Modelling, basic information of CMIP6 and its datasets
- Basic knowledge of needs, use and advantages of regional climate models for local/regional impact studies
- Basic knowledge of urban integrated system approach, principle modeling strategies at fine spatial resolution in the atmospheric boundary layer
- Basic knowledge of datasets at Copernicus Climate Change Service (C3S) Climate Data Store (CDS)
- Understanding possibilities of C3S CDS Toolbox in climate data visualisation and analysis
- Skills in usage of C3S CDS Toolbox for group projects (as small-scale research projects)
- Skills in group’s (as the team) developing and realizing research plan, and presenting research project results

Four groups (C03, C04, C09 and C12) got the highest scores of 9.26, 9.29, 9.29, and 9.46, respectively, and these have been awarded the certificates with distinction (“Platinum”). Three other Groups (C02, C06, and C11) obtained certificates having the “Gold” status (i.e. with scores higher than 8.5). Note that members of these 7 Groups were automatically accepted (i.e. without required

application procedure) as approved participants for the ClimEd 4th Training (planned as a face-to-face/onsite training in Spain).

## 2.4. Evaluation of the Training

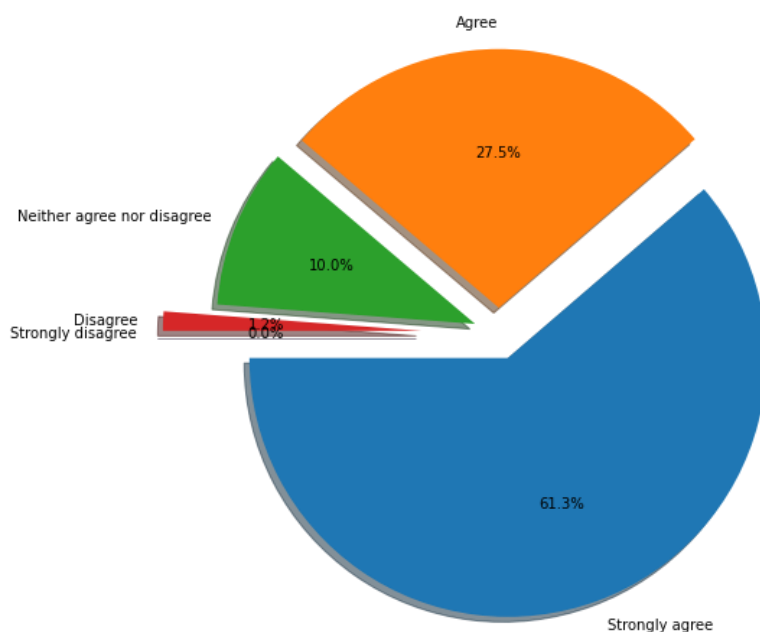
The evaluation of the training was performed through the questionnaires (“Evaluation of the Course” & “Evaluation of the Learning Outcomes”) distributed among participants. For the questionnaires, in total 32 and 38 responses from the participants were obtained for the 1<sup>st</sup> and 2<sup>nd</sup> questionnaires, and these are summarized below. Following the 1st questionnaire – (Evaluation of the Training) – about 90% of the participants estimated overall rating for this course as “strongly agree” and “agree”; training materials were of excellent quality (84%) and information about training was sufficient (97%), and participants will recommend such training to colleagues (91%). Following the 2nd questionnaire – (Self-Evaluation of the Obtained Competencies and Skills) – about 70% of participants “fully agree” and “mostly agree” that they have obtained/ improved their competencies and got skills in usage of the C3S CDS Toolbox remotely/ virtually working as groups.

### Questionnaire N1: Evaluation of the Course:

Scale: *strongly agree* / *agree* / *neither agree nor disagree* / *disagree* / *strongly disagree*

1. The lecturers were supportive and open to participants
2. The lecturers conducted the training excellently (clearly, sparked interest etc.)
3. Training materials were of excellent quality (content, layout, clarity etc.)
4. Information about the training was sufficient (announcement, programme etc.)
5. I will recommend such training to my colleagues

Question	1	2	3	4	5	AVG
<i>strongly agree</i>	53.1	59.4	53.1	71.9	68.8	<b>61.3</b>
<i>agree</i>	40.6	18.8	31.3	25	21.9	<b>27.5</b>
<i>neither agree nor disagree</i>	3.1	21.9	15.6	0	9.4	<b>10.0</b>
<i>disagree</i>	3.1	0	0	3.1	0	<b>1.2</b>
<i>strongly disagree</i>	0	0	0	0	0	<b>0.0</b>



**Questionnaire N2: Evaluation of the Learning Outcomes:**

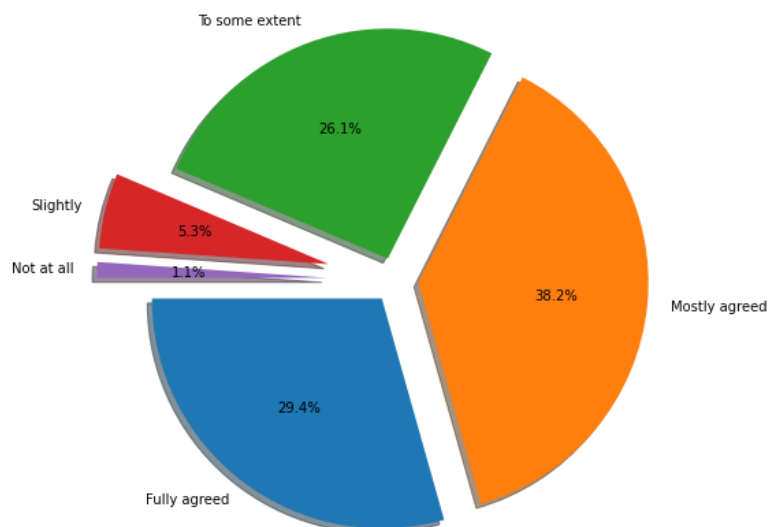
*To which extent do you think that you developed the learning outcomes (competences/ abilities to) of the 3<sup>rd</sup> ClimEd training?*

*Scale: not at all | slightly | somewhat/to some extent | mostly agree | fully agree*

Basic knowledge of

1. regional focus of IPCC Assessment Report in Ukraine context
2. activities in support climate related research in Ukraine
3. WMO mechanisms and entities for provision of operational seasonal forecasts, current limitations of WMO regional climate outlook forums and reasons to expand portfolio of climate products, key features of objective seasonal forecasts
4. existing types, specifications and challenges of meteorological/climate observation systems
5. main principles, instruments, satellite Earth Observations products
6. Earth System Modelling, basic information of CMIP6 and its datasets
7. needs, use and advantages of regional climate models for local/regional impact studies
8. urban integrated system approach, principle modeling strategies at fine spatial resolution in the atmospheric boundary layer
9. datasets at Copernicus Climate Change Service (C3S) Climate Data Store (CDS)
10. Understanding possibilities of C3S CDS Toolbox in climate data visualisation and analysis
11. Skills in usage of C3S CDS Toolbox for group projects (as small-scale research projects)
12. Skills in group’s (as the team) developing and realizing research plan, and presenting research project results.

Learning Outcomes	1	2	3	4	5	6	
<i>fully agreed</i>	29.0	31.6	29.0	31.6	26.3	29.0	
<i>mostly agreed</i>	39.5	39.5	31.6	36.8	39.5	36.8	
<i>to some extent</i>	29.0	23.7	31.6	29.0	26.3	18.4	
<i>slightly</i>	0.0	0.0	7.9	2.6	7.9	10.5	
<i>not at all</i>	2.6	5.3	0.0	0.0	0.0	5.3	
Learning Outcomes	7	8	9	10	11	12	AVG
<i>fully agreed</i>	26.3	23.7	34.2	29.0	23.7	39.5	<b>29.4</b>
<i>mostly agreed</i>	39.5	36.8	39.5	36.8	39.5	42.1	<b>38.2</b>
<i>to some extent</i>	26.3	29.0	23.7	26.3	31.6	18.4	<b>26.1</b>
<i>slightly</i>	7.9	10.5	2.6	7.9	5.3	0.0	<b>5.3</b>
<i>not at all</i>	0.0	0.0	0.0	0.0	0.0	0.0	<b>1.1</b>



### 3. ACKNOWLEDGEMENTS

Special thanks to all lecturers of the training – Profs. Tomas Halenka and Igor Esau, and Drs. Svitlana Krakovska, Wilfran Moufouma Okia, Antti Mäkelä, Larisa Sogacheva and Putian Zhou – for their professionalism, enthusiasm and commitment to the training, and OSENU team - Artem Gamaun & Kateryna Husieva, for continuous technical support (OSENU Moodle system, Zoom-hosting, e-evaluations, etc.) during the entire period of the training. Especial thanks to the OSENU team members (Dr. Oleg Shabliy and Dr. Inna Khomenko) for support with ClimEd relevant modules development; continuous web-update of the training materials and introduction to Group HWAs.

All materials of the training (slides and videos of lectures, presentations of exercises and homework-assignments as group projects, etc.) are available at <http://climed.network/events/climed-trainings/climed-training-3-online>.

Results of the ClimEd Trainings were also presented at:

- International Research-To-Practice Conference “Climate Services: Science and Education” (22-24 September 2021, Odessa, Ukraine) oral presentation “Online Approaches for Climate-Oriented Education” in section “Education in Climate Services” [https://odeku.edu.ua/wp-content/uploads/2021-a-conference\\_proceedings-21-09-isbn.pdf](https://odeku.edu.ua/wp-content/uploads/2021-a-conference_proceedings-21-09-isbn.pdf);
- Eastern Mediterranean & Middle East – Climate Atmosphere Research Center Workshop (11-12 October 2021, Cyprus); oral presentation “Climate-related education: on-line approach in COVID times” in section “Education and Training Opportunities”; [https://climatechange2021.org/wp-content/uploads/Book-of-Abstracts\\_Virtual\\_Workshop\\_AC0710-js1.pdf](https://climatechange2021.org/wp-content/uploads/Book-of-Abstracts_Virtual_Workshop_AC0710-js1.pdf);
- SYMET-14 “Education and Training in a Period of Rapid Change” (22-25 November 2021, Switzerland); poster presentation “Online trainings in climate-oriented education”; <https://symet-14.virtualpostersession.org>.
- European Geosciences Union (EGU) General Assembly 2022 (May 2022); oral presentation “Climate-Oriented Trainings in the Field of Climate Services, Climate Change Adaptation and Mitigation”; <https://meetingorganizer.copernicus.org/EGU22/EGU22-4895.html>; Ovcharuk, V., Mahura, A., Kryvomaz, T., Aguilar, E., Olano, J., Khomenko, I., Shabliy, O., Sogacheva, L., Zhou, P., Mäkelä, A., Krakovska, S., Lappalainen, H., Stepanenko, S., Lauri, K., Riuttanen, L., Tyuryakov, S., and Bashmakova, I.: CLIMATE-ORIENTED TRAININGS in the field of Climate Services, Climate Change Adaptation and Mitigation, EGU General Assembly 2022, Vienna, Austria, 23–27 May 2022, EGU22-4895, <https://doi.org/10.5194/egusphere-egu22-4895>, 2022.

## 4. ANNEXES

### 4.1. Announcement of the 3<sup>rd</sup> ClimEd Training

# Digital Tools and Datasets for Climate Change Education

**ClimEd 3rd Training (online)**

26 October – 12 November 2021



<https://stephenandsonia.com/what-we-do>

## ANNOUNCEMENT

### Erasmus<sup>+</sup> ClimEd Project

*“Multilevel Local, Nation- and Regionwide Education and Training in Climate Services,  
Climate Change Adaptation and Mitigation”*

(619285-EPP-1-2020-1-FI-EPPKA2-CBHE-JP)

<http://climed.network>



Co-funded by the  
Erasmus+ Programme  
of the European Union



## Aim

The ClimEd Trainings are focused on training the faculty staff at the ClimEd partner institutions in advanced educational and information-and-communication technologies for building a flexible multi-level integrated practice-based education system in the field of Climate Services, Climate Change Adaptation and Mitigation.

## Training Programme

- **Block 1 – Lecturing – 26-28 Oct 2021**
  - Lectures on IPCC assessment with regional focus on Ukraine; activities in support climate related research: current status and perspectives; WMO integrated climate services; observations for climatic variables; remote sensing; global/ regional/ urban scale climate related modelling: current state, perspectives, data/databases, and applicability of results; climate/ Copernicus related datasets; tools for visualization and analysis of climate related data; introduction to HWAs
- **Block 2 – Home-Work-Assignments (HWAs) – approximately 2 weeks**
  - Remote work in groups on HWAs
  - HWAs are based on climate related topics to Agriculture, Energy, Technical Design and Construction, Urban Economy, Water Management, Health-care
  - Online consultations on HWAs (once per week)
- **Block 3 – Final Presentations and Discussions – 12 November 2021**
  - Groups' presentations on HWAs and discussions
  - E-evaluations of HWAs, training course, and learning outcomes of the training
  - Awarding e-certificates (3 ECTS)

## Organizing Committee

Markku Kulmala, Hanna Lappalainen, Svyatoslav Tyuryakov, Iryna Bashmakova, Alexander Mahura  
*University of Helsinki, Helsinki, Finland*

Sergiy Stepanenko, Oleg Shabliy, Inna Khomenko, Valeriya Ovcharuk  
*Odessa State Environmental University, Odessa, Ukraine*

Tetyana Kryvomaz – *Kyiv National University of Construction and Architecture, Kyiv, Ukraine*

## Lecturers

Antti Mäkelä, Putian Zhou, Larisa Sogacheva  
*Finnish Meteorological Institute, Helsinki, Finland*

Wilfran Moufouma Okia – *World Meteorological Organization, Geneva, Switzerland*

Svitlana Krakovska – *Ukrainian Hydrometeorological Institute, Kyiv, Ukraine*

Tomas Halenka – *Charles University in Prague, Prague, Czech Republic*

Igor Esau – *Nansen Environmental and Remote Sensing Center, Bergen, Norway*

## Organizers

International Erasmus+ ClimEd project (<http://climed.network>)  
 University of Helsinki, Helsinki, Finland  
 Odessa State Environmental University, Odessa, Ukraine

## Target audience

Teaching/ Research staff and postgraduates in educational and research disciplines

## Selection criteria

Based on motivation letter (incl. why you need this training; how you use climatic information in your profession; how you plan to use such information in future; your commitment to long-term online training) & CV (max 2pages)

**Registration deadline** 18 October 2021

**Language** English

**Costs** no fee

**Please, apply (including motivation letter and CV) from the web-page:**  
<http://climed.network/events/climed-trainings/climed-training-2-online/online-application-form/>

## 4.2. List of Participants of the 3<sup>rd</sup> ClimEd Training



### ClimEd Training 3 (Online)

### Digital tools and datasets for climate change education

26 October – 12 November 2021

#### List of Participants

N	Participant: Surname Name	Group	University
1	Serga Eduard	C1	OSENU
2	Zhukova Olena	C1	KNUCA
3	Martyniuk Maksym	C1	OSENU
4	Kryvyi Vladyslav	C2	KhSAEU
5	Ellina Agayar	C2	OSENU
6	Inna Semenova	C2	OSENU
7	Semerhei Chumachenko Alina	C2	OSENU
8	Diadin Dmytro	C3	BNUUEK
9	Kotova Tetyana	C3	KNUCA
10	Tkachenko Tetyana	C3	KNUCA
11	Boiko Yurii	C3	ONMU
12	Vergeles Yuriy	C4	BNUUEK
13	Perebynos Alona	C4	KNUCA
14	Bohushenko Anna	C4	OSENU
15	Honcharenko Artem	C5	KNUCA
16	Goptsiy Maryna	C5	OSENU
17	Kushchenko Liliia	C5	OSENU
18	Savchenko Antonina	C6	KNUCA
19	Borovska Halyna	C6	OSENU
20	Prokofiev Oleg	C6	OSENU
21	Nedostrelova Larisa	C6	OSENU
22	Krasnozhon Alla	C7	EGIS Ukraina
23	Sabadash Vira	C7	LPNU
24	Gamaiun Artem	C7	OSENU
25	Buchynska Iruna	C7	OSENU
26	Bocharov Boris	C8	BNUUEK
27	Babenko Olena	C8	BTNAU
28	Zavalniuk Vitalii	C8	KNUCA
29	Sliusar Vira	C8	LPNU
30	Maksimova Victoria	C9	INEP
31	Losev Aleksandr	C9	PGI
32	Das Suvendu	C9	VBU

33	Savenets Mykhailo	<b>C9</b>	UHMI
34	Papakina Nataliia	<b>C10</b>	KhSAEU
35	Hustenko Aleksey	<b>C10</b>	OSENU
36	Mishchenko Natalia	<b>C10</b>	OSENU
37	Danilova Natalia	<b>C10</b>	OSENU
38	Drozd Olena	<b>C11</b>	BTNAU
39	Voloshkina Olena	<b>C11</b>	KNUCA
40	Liuta Oksana	<b>C11</b>	LPNU
41	Kuznichenko Svitlana	<b>C11</b>	OSENU
42	Khandogina Olga	<b>C12</b>	BNUUEK
43	Stavetska Ruslana	<b>C12</b>	BTNAU
44	Kryshstop Lidiia	<b>C12</b>	
45	Slobodianykateryna	<b>C12</b>	OSENU

Wilfran Moufouma Okia WMO

Svitlana Krakovska UHMI

Antti Mäkelä FMI

Tomas Halenka CUNI

Larisa Sogacheva FMI

Igor Ezau NERSC

Putian Zhou FMI/ UHEL

Inna Khomenko OSENU

Alexander Mahura UHEL

OSENU	- Odessa State Environmental University
KNUCA	- Kyiv National University of Construction and Architecture
BNUUEK	- O. Beketov National University of Urban Economy
LPNU	- Lviv Polytechnic National University
BTNAU	- Bila Tserkva National Agrarian University
ONMU	- Odessa National Medical University
KhSAEU	- Kherson State Agrarian and Economic University
UHMI	- Ukrainian Hydrometeorological Institute
EGIS	- EGIS Ukraine
INEP	- Institute Northern Environmental Problems
PGI	- Polar Geophysical Institute
VBU	- Visva-Bharati University
NGO	- Non-Governmental Organization
UHEL	- University of Helsinki
WMO	- World Meteorological Organization
FMI	- Finnish Meteorological Institute
CUNI	- Charles University in Prague
NERSC	- Nansen Environmental and Remote Sensing Center

### 4.3. 3<sup>rd</sup> ClimEd Training Certificates (Platinum, Gold, Ordinary)



Co-funded by the  
Erasmus+ Programme  
of the European Union



## PLATINUM CERTIFICATE

This is to confirm that

*Kateryna Slobodianyuk*

has attended and successfully completed  
the Erasmus+ ClimEd Training (online)  
on Digital Tools and Datasets for Climate Change Education

26 October – 12 November 2021



Erasmus+ ClimEd Project  
"Multilevel Local, Nation- and Regionwide Education and Training  
in Climate Services, Climate Change Adaptation and Mitigation"  
(619285-EPP-1-2020-1-FI-EPPKA2-CBHE-JP)  
<http://climed.network>

Hanna K. Lappalainen  
University of Helsinki



Sergiy Stepanenko  
Odessa State Environmental University



**Kateryna Slobodianyuk**

has been awarded three (3) credits according to the  
European Credit Transfer and Accumulation System (ECTS)

**ClimEd Training included:**

**Lectures (L):**

- L1. Regional focus of IPCC Assessment Report in Ukraine Context. Svitlana Krakovska, Ukrainian Hydrometeorological Institute (UHMI), Ukraine
- L2. UHMI activities in support climate related research: current status and perspectives. Svitlana Krakovska, UHMI, Ukraine
- L3. WMO integrated climate services: current status and perspectives. Wilfran Moufouma Okia, WMO, Switzerland
- L4. Observations for climatic variables: observation system, specifics, challenges. Antti Mäkelä, Finnish Meteorological Institute, FMI, Finland
- L5. Remote sensing/Satellite observations: current state, perspectives, databases, and applicability of results. Larisa Sogacheva, FMI, Finland
- L6. Global scale climate modelling: current state, perspectives, databases, and applicability of results. Putian Zhou, University of Helsinki / FMI, Finland
- L7. Regional scale climate modelling: current state, perspectives, data/databases, and applicability of results. Tomas Halenka, Charles University in Prague, the Czech Republic
- L8. Urban scale modelling for climate applications. Igor Esau, Nansen Environmental and Remote Sensing Center, Norway
- L9. Climate related datasets, Copernicus related data. Antti Mäkelä, FMI, Finland
- L10. Tools for visualization and analysis of climate related data. Antti Mäkelä, FMI, Finland

**Home-Work-Assignment (Projects) & Defense:**  
*Urban Economy – Energy Consumption*

**Obtained Competencies/ Training Learning Outcomes:**

1. Basic knowledge of regional focus of IPCC Assessment Report in Ukraine context
2. Basic knowledge of activities in support climate related research in Ukraine
3. Basic knowledge of WMO mechanisms and entities for provision of operational seasonal forecasts, current limitations of WMO regional climate outlook forums and reasons to expand portfolio of climate products, key features of objective seasonal forecasts
4. Basic knowledge of existing types, specifications and challenges of meteorological/climate observation systems
5. Basic knowledge of main principles, instruments, satellite Earth Observations products
6. Basic knowledge of Earth System Modelling, basic information of CMIP6 and its datasets
7. Basic knowledge of needs, use and advantages of regional climate models for local/regional impact studies
8. Basic knowledge of urban integrated system approach, principle modeling strategies at fine spatial resolution in the atmospheric boundary layer
9. Basic knowledge of datasets at Copernicus Climate Change Service (C3S) Climate Data Store (CDS)
10. Understanding possibilities of C3S CDS Toolbox in climate data visualisation and analysis
11. Skills in usage of C3S CDS Toolbox for group projects (as small-scale research projects)
12. Skills in group's (as the team) developing and realizing research plan, and presenting research project results

Certificate Category: with Distinction



Co-funded by the  
Erasmus+ Programme  
of the European Union



## GOLD CERTIFICATE

This is to confirm that

*Oksana Liuta*

has attended and successfully completed  
the Erasmus+ ClimEd Training (online)  
on Digital Tools and Datasets for Climate Change Education

26 October – 12 November 2021



Erasmus+ ClimEd Project  
"Multilevel Local, Nation- and Regionwide Education and Training  
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<http://climed.network>

Hanna K. Lappalainen  
University of Helsinki



Sergiy Stepanenko  
Odessa State Environmental University



**Oksana Liuta**

has been awarded three (3) credits according to the  
European Credit Transfer and Accumulation System (ECTS)

**ClimEd Training included:**

**Lectures (L):**

- L1. Regional focus of IPCC Assessment Report in Ukraine Context. Svitlana Krakovska, Ukrainian Hydrometeorological Institute (UHMI), Ukraine
- L2. UHMI activities in support climate related research: current status and perspectives. Svitlana Krakovska, UHMI, Ukraine
- L3. WMO integrated climate services: current status and perspectives. Wilfran Moufouma Okia, WMO, Switzerland
- L4. Observations for climatic variables: observation system, specifics, challenges. Antti Mäkelä, Finnish Meteorological Institute, FMI, Finland
- L5. Remote sensing/Satellite observations: current state, perspectives, databases, and applicability of results. Larisa Sogacheva, FMI, Finland
- L6. Global scale climate modelling: current state, perspectives, databases, and applicability of results. Putian Zhou, University of Helsinki / FMI, Finland
- L7. Regional scale climate modelling: current state, perspectives, data/databases, and applicability of results. Tomas Halenka, Charles University in Prague, the Czech Republic
- L8. Urban scale modelling for climate applications. Igor Esau, Nansen Environmental and Remote Sensing Center, Norway
- L9. Climate related datasets, Copernicus related data. Antti Mäkelä, FMI, Finland
- L10. Tools for visualization and analysis of climate related data. Antti Mäkelä, FMI, Finland

**Home-Work-Assignment (Projects) & Defense:**  
*Water Management*

**Obtained Competencies/ Training Learning Outcomes:**

1. Basic knowledge of regional focus of IPCC Assessment Report in Ukraine context
2. Basic knowledge of activities in support climate related research in Ukraine
3. Basic knowledge of WMO mechanisms and entities for provision of operational seasonal forecasts, current limitations of WMO regional climate outlook forums and reasons to expand portfolio of climate products, key features of objective seasonal forecasts
4. Basic knowledge of existing types, specifications and challenges of meteorological/climate observation systems
5. Basic knowledge of main principles, instruments, satellite Earth Observations products
6. Basic knowledge of Earth System Modelling, basic information of CMIP6 and its datasets
7. Basic knowledge of needs, use and advantages of regional climate models for local/regional impact studies
8. Basic knowledge of urban integrated system approach, principle modeling strategies at fine spatial resolution in the atmospheric boundary layer
9. Basic knowledge of datasets at Copernicus Climate Change Service (C3S) Climate Data Store (CDS)
10. Understanding possibilities of C3S CDS Toolbox in climate data visualisation and analysis
11. Skills in usage of C3S CDS Toolbox for group projects (as small-scale research projects)
12. Skills in group's (as the team) developing and realizing research plan, and presenting research project results

Certificate Category: with Distinction



# CERTIFICATE

This is to confirm that

*Natalia Danilova*

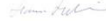
has attended and successfully completed  
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<http://climed.network>

Hanna K. Lappalainen  
University of Helsinki



Sergiy Stepanenko  
Odessa State Environmental University



**Natalia Danilova**

has been awarded three (3) credits according to the  
European Credit Transfer and Accumulation System (ECTS)

**ClimEd Training included:**

**Lectures (L):**

- L1. Regional focus of IPCC Assessment Report in Ukraine Context. Svitlana Krakovska, Ukrainian Hydrometeorological Institute (UHMI), Ukraine
- L2. UHMI activities in support climate related research: current status and perspectives. Svitlana Krakovska, UHMI, Ukraine
- L3. WMO integrated climate services: current status and perspectives. Wilfran Moufouma Okia, WMO, Switzerland
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- L9. Climate related datasets, Copernicus related data. Antti Mäkelä, FMI, Finland
- L10. Tools for visualization and analysis of climate related data. Antti Mäkelä, FMI, Finland

**Home-Work-Assignment (Projects) & Defense:**

*Agriculture livestock product technology*

**Obtained Competencies/ Training Learning Outcomes:**

1. *Basic knowledge of regional focus of IPCC Assessment Report in Ukraine context*
2. *Basic knowledge of activities in support climate related research in Ukraine*
3. *Basic knowledge of WMO mechanisms and entities for provision of operational seasonal forecasts, current limitations of WMO regional climate outlook forums and reasons to expand portfolio of climate products, key features of objective seasonal forecasts*
4. *Basic knowledge of existing types, specifications and challenges of meteorological/climate observation systems*
5. *Basic knowledge of main principles, instruments, satellite Earth Observations products*
6. *Basic knowledge of Earth System Modelling, basic information of CMIP6 and its datasets*
7. *Basic knowledge of needs, use and advantages of regional climate models for local/regional impact studies*
8. *Basic knowledge of urban integrated system approach, principle modeling strategies at fine spatial resolution in the atmospheric boundary layer*
9. *Basic knowledge of datasets at Copernicus Climate Change Service (C3S) Climate Data Store (CDS)*
10. *Understanding possibilities of C3S CDS Toolbox in climate data visualisation and analysis*
11. *Skills in usage of C3S CDS Toolbox for group projects (as small-scale research projects)*
12. *Skills in group's (as the team) developing and realizing research plan, and presenting research project results*