



# THE GLOBE PROGRAM

## Europe and Eurasia Country Reports 2017



GLOBE Program Region Coordination Office Europe and Eurasia  
Regional Meeting - Tel Aviv, Israel  
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## The GLOBE Program Europe and Eurasia Region Coordination Office

The GLOBE Program network is represented by Region Coordination Office (RCO) in each of the world's region. The Europe and Eurasia RCO fosters the program in 41 countries with more than 4000 schools and several thousands of citizen scientists. The office is located in Prague, Czech Republic and hosted by TEREZA, Center for Environmental Education.

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# ***Country reports***

# Belgium

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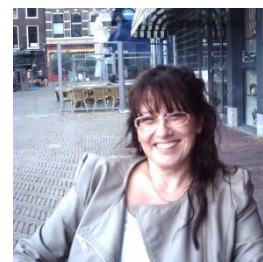
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Cooperating organizations: none

Participating schools: Königliches Athenäum Eupen (KAE); Robert Schuman Institut (RSI); Bischöfliches Institut Büllingen (BIB), all three (from 8 in total) secondary schools

Funding by: Ministry of Education of the German Speaking Community of Belgium

GLOBE protocols used in country: mainly phenology, atmosphere, soil protocols, pH of water

Number of schools currently reporting data (2017): none

Description of the program in your country and recent activities in 2017: participation of students in GLOBE Games, Czech Republic financed by the ministry of education

KAE: GLOBE is used in level 7-12 in geography and science classes, measuring of temperature, atmospheric pressure, air moisture, soil moisture and pH of water around their school and during excursions. They participate in the phenology app project (41 students, most pictures and most precise pictures). Some MASS Project-Materials were used as well, like "how was the weather" and pollution: oil pest in the gulf of Mexico".

RSI: GLOBE during this school year, an exchange between RSI and a German school took place in the High Fens (a natural reserve, High more) with 62 students from Belgium and Germany and 3 teachers. The school principal has confirmed, that this school will start with atmosphere protocols soon since a new teacher will be in charge.

Bischöfliches Institut Büllingen (BIB) starts with a phenological garden, they presented the project "First phenological garden in Belgium" in Czech Republic in May. All students will be involved during their "project day" in April.

The school year 2017-2018 is called "Year of Science and Technology" in East Belgium.

There are a lot of different actions planned beginning in kinder garden and till upper secondary schools concerning inquiry based learning. Motivation for teachers are ensured by free material for experimentation and funding for projects and school programs.



# Croatia

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**Cooperating organizations:** Education and teacher Training Agency, University of Zagreb, Faculty of Science, Division of Biology; National Meteorological Institute.

**Participating schools:** **250;** **8.005 945** data reported to GLOBE ; **3.413** Honor rolls  
387 teachers trained; 39 pre-service teachers trained  
8 GLOBE stars; 25 students' reports

**Funding by:** Ministry of Science and Education of Croatia

**GLOBE protocols:** atmosphere, land cover, surface water, soil, phenology, macrozoobenthos

Croatia is the member of the GLOBE Program since 1995.

**Description of the program and recent activities:** Trainings and workshops for The GLOBE program are announced in the *Catalogue of professional development seminars for teachers*, published 3 times each year by ETТА (Education and teacher Training Agency). ETТА publishes the description of the GLOBE program in another on-line publication: *The Catalogue of National Students' Competitions*. Therefore, there is no need for separate recruitment activities for participation in The GLOBE Program. Croatian teachers register for chosen workshop using on-line application. For participants of ETТА's professional development seminars there is no participation fee, but teachers or their schools pay for traveling and accommodation costs if workshop is not close to their place.

The seminars are organized twice each year at national level, but each time in different parts of the country. In that way, participation is mostly suitable for the teachers from that region, but it is not impossible for teachers from other regions to join as well. At each workshop, there are usually 4-6 trainers, depending of the size of the groups. ETТА funds trainers (travelling, accommodation and their fees).

In last few years, we found two-days lasting seminars mostly suitable, both for participants and for organizers. In that model, we have two parallel groups of participants: the beginners and advanced and they mix just for some activities. The beginners are involved in the modules of Atmosphere and Land Cover (including Biometry and Phenology) and advanced group can choose between Hydrology, Soil or advanced Atmosphere measurements and Atmospheric data analyses and interpretation. Advanced groups are usually consisting of participants who have very different experiences, since some of them just finished beginning level and the others are already working for many years, but they want to refresh their knowledge. The accent of the training in the advanced group is on inquiry-based learning, students' projects and writing reports and that aspect attracts experienced teachers to join GLOBE training again. In such groups the model of the training of GLOBE protocols usually is *peer teaching*, given by experienced GLOBE participants, mentored by the trainers. Protocols are used to collect the data for answering chosen research question. In advance of the seminar, participants are instructed to pass e-training of the protocols they are interested in. The possibility of e-trainings changes the structure of the GLOBE workshops, by opening the possibility to devote more time to didactical aspect of GLOBE activities.

Great advantage of described combined training model is to have GLOBE beginners and experienced GLOBE teachers in a certain moment together. This brings the valuable dialogue among teachers and beginners can get the answers to their questions, not from the trainer, but right from the practice.

Croatian GLOBE organizes Annual GLOBE Games (Students' & Teachers' Conference) each year. In 2017. Croatian Annual GLOBE Conference and Competition was organized in Zadar again, hosted by experienced GLOBE school *Zadarski otoci*. 140 students and 40 teachers from most active GLOBE schools in Croatia participated. In annual meeting GLOBE students represent their school and all activities are designed for school teams of 3 students. Each school team compete in GLOBE survey and present GLOBE research project (project is not obligatory). That was jubilee competition and the article about it was published on the Europa and Euroasia News GLOBE web site <https://www.globe.gov/web/europe-and-eurasia/news/newsdetail/14028/globe-conference-in-croatia?>

Students' projects that are approved by scientists-reviewers are published on Croatian GLOBE web site and they have the abstract and the titles of graphs and photos written in English language, so that they can be reviewed internationally. The address on which published students' projects could be reviewed is [http://globe.pomsk.hr/smotra2017/zadar\\_17\\_projekti.htm](http://globe.pomsk.hr/smotra2017/zadar_17_projekti.htm)



Croatian schools are active in GLOBE campaigns, and especially in European Phenology campaign. They participated in Annual photo-contest, as well as in creating videos about GLOBE in their schools.

One of Croatian GLOBE schools *Škola za medicinske sestre Vrapče* participated on the Annual Partner Meeting in New Haven, USA this summer. School managed to find the sponsors who helped in funding the journey for 2 GLOBE teachers and 2 students, who presented 2 of their research projects.

*The photo presents Croatian team at Annual GLOBE Partner Meeting, New Haven, 2017.*

# Czech Republic

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... and many others ☺ See <http://globe-czech.cz/cz/tym-globe>

## Organization and Human resources (how many people work on GLOBE, what is the capacity, background of the organization)

TEREZA is the leading NGO in the field of environmental and science education for schools in the Czech Republic. More than 800 schools are involved in 3 international programs we coordinate: GLOBE, Eco-Schools and LEAF. We are country coordinator of the GLOBE program since 1995. Since 2012 we have been appointed by the international GLOBE office to host the GLOBE Program Regional Office for Europe and Eurasia. There are currently eight people working in the GLOBE country coordination office (or in partial GLOBE projects) plus two people working in the GLOBE Program Regional Office for Europe and Eurasia.

## Funding by:

- State Environmental Fund of the Czech Republic, Ministry of Education, Youth and Sports, Prague City Hall, U.S. Embassy Prague, European Space Agency, Bohemian Central Region
- Veolia Company – collaboration on the biodiversity project using PI@ntNet app
- Schools pay €70,- per school per year, newcomers pay €115,- for a school year

## Cooperating organizations/individuals (national and international level):

U.S. Embassy Prague, Scientific Board of the GLOBE Czech Republic, Institute of Botany of the CAS, Czech Hydrometeorological Institute, European Space Education Resource Office (ESERO), CzechGlobe – Global Change Research Institute CAS

## GLOBE schools (what types, how many, etc.):

117 registered schools, about 2/3 elementary schools and 1/3 high schools

## GLOBE areas (what areas of investigations you/schools focus on? What areas you plan to develop?:

Czech schools are focusing on all essential GLOBE areas (Atmosphere, Hydrology, Soil, Phenology, Biometry and Land Cover). During the school year 2016/2017 we developed Biodiversity investigations as a theme of the year called “Hidden Life of the City”.

This school year is focused on Phenology investigations – including use of GrowApp, participating in the European Phenology Campaign, collaboration with Phenology Department of the Czech Hydrometeorological Institute and CzechGlobe Research Institute (“Phenophases” Project).



Program implementation in the country and recent activities (trainings, field campaigns, school-to-school projects, events):

Last year we organized several **trainings for teachers** focused on IBSE methods in the GLOBE practice. We were supporting teachers and students who were involved in the **biodiversity investigations** through the year topic “Hidden Life of the City” or in **phenology investigations** through the European Phenology Campaign. Monthly we provided them with training activities developing research skills. We were developing **collaboration with GLOBE mentor-teachers** so as they could support another GLOBE teachers (their colleagues or new GLOBE coordinators at schools) in their regions.

In cooperation with the American Center in Prague we organised second year of the award called **Czech GLOBE STAR** on February 28, 2017. The most active GLOBE schools were awarded for their amazing work in the GLOBE Program in the ceremony that was held under the auspices of US Embassy Prague. SPS Karvina and Delnicka Elementary School in Karvina for an excellent cooperation during preparation and organization of GLOBE Games 2016. Sokolovska Elementary School in Svitavy for an Earth Day celebration with GLOBE Program activities and for exemplary interconnection of GLOBE and Eco Schools. Kpt. Jarose Elementary School in Trebic for a regular organization of Mini GLOBE Games and for a significant increase of number of students involved in GLOBE Program (from ten to ninety!)

**20<sup>th</sup> GLOBE Games in Moravské Budějovice** enabled students from the Czech Republic, Belgium and Slovakia to share results of their GLOBE scientific projects based on their own inquiry during the Student scientific conference. About 300 students, teachers and volunteers listened to the opening speech of Chargé d'affaires of U.S. Embassy in Prague Mrs. Kelly Adams-Smith. The same people had great fun in the research field game placed in the local environment of the Czech Highlands.

Your plans and ideas for next year:

- Organize international GLOBE Games 2018 in Humpolec, May 31 – June 3, 2018.
- Participate in European Phenology Campaign linked with The Theme of the Year “Phenology”.
- Organize workshops for teachers on the country level as well as in the regions.
- Develop collaboration with GLOBE mentor-teachers: common workshops, creating new IBSE lessons, providing consultations, piloting and editing new methodical materials etc.
- Develop collaboration with GLOBE Scientific Board especially in phenological topics.
- Organize 3rd Czech GLOBE STAR 2018 – by the end of January 2018.
- Create new IBSE lessons on Elementary GLOBE topics.
- Translate English GLOBE materials to Czech language (Clouds Protocol, Elementary GLOBE).
- Support Czech schools to participate in 2018 International Virtual Science Symposium.
- Support Czech schools to participate in 2018 GLE in Ireland.



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Organization and Human resources (how many people work on GLOBE, what is the capacity, background of the organization)

3 members of the Board,

Funding by: Estonian Ministry of Education and research, Environment Investment Centre, Schools

Cooperating organizations/individuals (national and international level):

University of Tartu, University of Life Sciences in Estonia, Embassy of the United States in Estonia; Estonian Physical Society.

GLOBE schools (what types, how many, etc.): ca 25 active public schools (ca 80 have joined)

GLOBE areas (what areas of investigations you/schools focus on? What areas you plan to develop?):

Atmosphere, Hydrology, Pedosphere (Soils), Land Cover and Biometry, Phenology  
Develop: Hydrology

Program implementation in the country and recent activities (trainings, field campaigns, school-to-school projects, events):

- Daily observations based on GLOBE protocols
- Competition of students' research papers (annual), January to May. Terms and conditions are set by researchers from the Universities.
- GLOBE Students' seminar - February
- GLOBE Expedition – GLOBE Estonia summer camp (annual), in cooperation with scientists from different universities in Estonia (University of Tartu, University of Life Sciences in Estonia, Tallinn University), Elva, Estonia 7.-9. August
- GLOBE Students' conference (annual, based on research papers), held in Palupera in September 2016, (annual, reports, new courses),
- Teacher's seminar will be held in December 2015 in Tartu (measurements and protocols), - GLOBE protocols, research.
- The Earth day celebration – week of 22.04, in cooperation with the embassy of the US, planting trees, watching movies, trainings, hikes

Your plans and ideas for next year:

- GLOBE Students' seminar
- GLOBE Estonia Learning Expedition and Student's conference
- Earth day Celebrations



*The Earth Day Celebration in Estonian Schools*



*The Earth Day Celebration with GLOBE Alumni*

# Finland

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Organization and Human resources (how many people work on GLOBE, what is the capacity, background of the organization)

Funding by: no separate funding for GLOBE activities. Country coordinator and assistant CC are allowed to use some of their working time for GLOBE activities

Cooperating organizations/individuals (national and international level): Researchers at the University of Helsinki

GLOBE schools (what types, how many, etc.): 140 schools has joined GLOBE and 104 school has reported in the past. Currently there is only two schools reporting GLOBE investigations, Utajärven Yläaste from Utajärvi and Viikin normaalikoulu (Viikki Teacher Training School) from Helsinki. More schools are doing GLOBE investigates but they are not reporting their results to database.

GLOBE areas (what areas of investigations you/schools focus on? What areas you plan to develop?): The most active schools are focusing on Atmosphere investigations, Earth as a system, Hydrology, Land cover and Soil

Program implementation in the country and recent activities (trainings, field campaigns, school-to-school projects, events): Training for biology and geography teacher students, GrowApp competition (Viikki Teacher Training School)

Your plans and ideas for next year:

- 1) make teachers and students more aware the great GrowApp
- 2) activate the passive schools by contacting them personally
- 3) applying for funding



# France



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**Funding organization:** CNES (Centre National d'Etudes Spatiales)

**Participating schools:** 22 (for this year's Measurement Campaign), 55 Globe Schools (not all active)

**GLOBE protocols:** atmosphere: aerosols, weather, ozone, ...

## **Program and recent activities:**

Globe France was started as a pilot project **13 years ago**, when CNES signed a memorandum of understanding with NASA; an extension of this agreement was signed 16<sup>th</sup> September 2010, again between CNES and NASA. In this framework:

- We develop Calisph'Air (<http://www.cnes.fr/web/CNES-fr/7167-calisph-air.php>) which focuses on the atmosphere (air quality and climate) using aerosol protocol, in connection with CALIPSO, IASI... satellite missions. We also helped develop the sun photometers **CALITOO** and now a black Carbon equipment called **BC-EDU**.
- For elementary schools we developed the <http://www.schoolweather.net> project as a first step to approach Globe protocols. We also worked on clouds protocols and compared satellite data to pupils observations (**Clouds Hunters project**).

We have a group of 4 GLOBE *resources teachers* who help us shape development of the program and train the newcomers.

Each year we organize a *teacher conference* at the beginning of the school year to make an assessment of the work that has been done, to prepare the coming year and welcome the new teachers.

We participate to the 2 **Air Quality measurement campaigns (AQ Campaigns)** during the school year and we organize a *student conference* at the end of the school year where students present their GLOBE research to the other schools and to scientists.

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Organization and Human resources (how many people work on GLOBE, what is the capacity, background of the organization)

GLOBE - Deutschland is a free association of teachers and scientists who work in close connection and acceptance with the GLOBE-Program, integrated the program in their everyday work in school and society. GLOBE-Deutschland cooperates with several associations of environmental education, with the Westphalian Ministry of Education and with some different universities in Germany.

Funding by: donations

Cooperating organizations/individuals (national and international level):

Klimawoche Bielefeld

Umweltbildungsinitiative Ostwesfalens

Wuppertalinstitut für Umwelt, Klima und Energie

Natur-und Umweltschutzakademie NRW

Etwinning

Institut für Klima- und Wetterkommunikation Hamburg

GLOBE schools (what types, how many, etc.):

Actual we find about twenty active GLOBE schools in Germany and a number of sixty new members of GLOBE in Germany.

There are Primary Schools, Middle Schools and Gymnasiums

GLOBE areas (what areas of investigations you/schools focus on? What areas you plan to develop?):

In Germany the most accepted areas have been "Atmosphere and clouds", "Phenology", Hydrology and in different parts of Germany, "Soil ". There have been collections and discussions about plastic trash and electronic trash.

My idea is to develop some research with students about the change of behavior as a result of climate change and destruction of environment which we can find in different groups of society.

Program implementation in the country and recent activities (trainings, field campaigns, school-to-school projects, events):

1. The discussion about the implementation of GLOBE in our school programs is active. One school works with GLOBE as part of the curriculum for years, one school even plans to build up the school program in close connection to the GLOBE program.

School to school cooperation succeeded in the last year with a German school in Belgrad , topic plastic trash.

GLOBE-Deutschland organizes an annual meeting of GLOBE schools, this year the meeting was in Bad Lippspringe in Westfalia.

I had a lot of teacher trainings with teacher from Germany. In most cases I do these trainings by skype - they take about 2 hours.

GLOBE – Deutschland has a regular newsletter which we send to all GLOBE members and to all people who are interested in our activities.

Your plans and ideas for next year:

For the next year I want

- to start the cooperation with the new ESERO office in Germany;
- to intensify the school-to-school cooperation with Belgrad;
- to organize a GLOBE meeting in the area of the Western frontier with the neighbour partners (Netherlands, Belgium, France, Luxemburg);
- to restart the cooperation on the former Iron Curtain with schools all along the European partner states;
- to intensify the contacts of GLOBE-Deutschland;
- to work for better funding of GLOBE-Deutschland.

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## Organization:

With its 50,000 students, the University of Cologne (UoC) is one of the largest universities in Germany. In addition, UoC is the official “GLOBE Organizer for Higher Education Students and University-School Networks” in Germany and has implemented GLOBE as part of the pre-service teacher program at the Faculty of Mathematics and Natural Sciences.

## Funding by:

University of Cologne

## Cooperating organizations/individuals (national and international level):

Mount Royal University (Canada), NASA Jet Propulsion Laboratory (USA), University of Toledo (USA)

## Program implementation in the country and recent activities (trainings, field campaigns, school-to-school projects, events):

## **Events**

In 2016 University of Cologne was host of GLOBE Regional Meeting and MASS Educational Conference. More than 90 participants – country coordinators, scientists, teachers and students – from 25 countries attended to discuss approaches of Inquiry-based Learning within STEM disciplines.

## **Teaching**

The University of Cologne offers a broad variety of lectures and seminars linking to GLOBE:

- “Understanding Science through Inquiry-based Learning and Participation” provides examples of integrating science and educational research. The mutual benefit of integrating research projects with broad public participation is discussed, participation approaches are shown and the motivational aspects for STEM disciplines are addressed.
- “Statistical Analysis of Environmental Data” provides the basics of statistics. One of the main aspects is measuring and analyzing data using the GLOBE protocols.
- Scientific foundation
- Science Education
- Environmental Education

CLUSTERVORLESUNG UNIVERSITÄT ZU KÖLN   WINTERSEMESTER 2017/18	
<b>Understanding Science through Inquiry-based Learning and Participation</b>	
Organisation: Prof. Karl Schneider Donnerstag, 16:00–17:30, Hörsaal VIII	
12.10. Opportunities for interdisciplinary and international cooperation in STEM education Prof. Dr. Karl Schneider (Universität zu Köln)	07.12. GLOBE's Role in NASA's Outreach Strategy and its Potentials for Elementary School Education Jessica Taylor (NASA Langley Research Center, USA)
19.10. GLOBE Informed Environmental System Analysis Prof. Dr. Scott Graven (Southern Connecticut University, USA)	14.12. Changing Cities - Understanding Science in Urban Areas through Inquiry-based Learning and Participation Prof. Dr. Constantinos Caralis (University of Athens, Griechenland)
26.10. Inquiry-based Learning - Conceptualization, Assessment, and Improvement of Student's Argumentation Skills Prof. Dr. Jörg Großschädl (Universität zu Köln)	11.01. Dutch Experience with Science and Technology Education for Students and Teachers Dr. Koen Michels (Hogeschool University of Applied Sciences, Niederlande)
02.11. Science and Environmental Education - Towards a Convergence Prof. Dr. Jaster Dillen (University of Bristol, Vereinigtes Königreich)	18.01. The SMAP Satellite Mission - Measuring Soil Moisture from Space and as Citizen Scientists through GLOBE Dr. Erika Podest (NASA Jet Propulsion Laboratory, USA)
09.11. Environmental Action through Inquiry-based Learning Prof. Dr. Shantia Kumar (Bharati Vidyapeeth University, Indien)	25.01. Inquiry-based Learning on or nearby the School Campus - Practical Offices implemented by GLOBE Switzerland Dr. Eric Wysi (GLOBE Schweiz)
16.11. STEAM Education - An Integrated Place-based Approach to Teacher Training Prof. Dr. Kevin O'Connor (Mount Royal University, Kanada)	01.02. Diskussion zur Vorlesungreihe: Interdisziplinäre Kooperation und internationale Kompetenz - Brauchen Lehrämterstärkerende das wirklich für ihre berufliche Zukunft? Prof. Dr. Karl Schneider (Universität zu Köln)
23.11. Using Mobile Devices for Environmental Monitoring Prof. Dr. André Breges (Universität zu Köln)	
30.11. Education in Learning and Living - Engaging Students with Purposeful Experiences Prof. Dr. Bruce Johnson (University of Arizona, USA)	

## School project

From 2017 on there is a cooperation between UoC and Otto-Hahn-Gymnasium in Bergisch Gladbach. An elective course has been offered, where pupils will build a weather station from the ground up and develop a software to log the measured environmental data. At the same time the theoretical background will be taught and discussed by teachers and pre-service teachers.

## Research

*Environmental Monitoring using Smartphones* is funded by RheinEnergie Foundation. The project aims at developing new approaches to participate environmental discovery and research by addressing students and citizens. According to the different target groups the project combines different expertise with didactic and media competence at elementary and junior high school level, environmental research and remote sensing with particular focus on students at senior high school level and competence in international water management. First prototypes of educational apps covering the following issues have been developed:

- River monitoring
- Land use and land cover mapping
- Soil texture determination
- Cloud identification

## Tutorials

GLOBE eTraining modules have been edited and translated into German language. The documents will be uploaded on University of Cologne's GLOBE-Website ([globe.uni-koeln.de](http://globe.uni-koeln.de)).

At this time the following modules are available:

### Atmosphere

- Clouds
- Precipitation
- Air Temperature
- Relative Humidity
- Barometric Pressure
- Surface Temperature

### Hydrosphere

- Water Temperature
- Water Transparency
- Electrical Conductivity
- Water pH
- Alkalinity
- Dissolved Oxygen
- Salinity
- Nitrates

### Pedosphere

- Soil Temperature
- SMAP Soil Moisture

### GLOBE

- Introduction to GLOBE
- Visualization System



## Your plans and ideas for next year:

- Further development of IBL teaching formats with GLOBE
- GLOBE Training for students and teachers
- Establishment of research projects in terms of Science Education
- International student exchange with GLOBE



# Greece

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Organization and Human resources (how many people work on GLOBE, what is the capacity, background of the organization)

GLOBE Greece is supported by the University of Athens, an organization with wide scientific, educational and administrative capacities. The GLOBE Greece core team accounts for four people.

Funding by: University of Athens

Cooperating organizations/individuals (national and international level): Ministry of Environment, National Observatory of Athens, Foundation for Research and Technology, Eco-schools in Greece, Corallia incubator, University of Cologne.

GLOBE schools (what types, how many, etc.): 23 in total although active < 10. All types (primary, 12-15 and 15-18). Both public and private.

GLOBE areas (what areas of investigations you/schools focus on? What areas you plan to develop?): Atmosphere, climate and hydrology. Emphasis is given to climate change, especially at the city level.

Program implementation in the country and recent activities (trainings, field campaigns, school-to-school projects, events):

Training on the urban environment, mentoring for environmental technology applications, information on new educational products, dissemination of MASS results.

Your plans and ideas for next year:

Reactivation of schools which have failed to stay active, link and coordination of activities with Eco-Schools, activation in the framework of the European Commission – proposal for school and out of school environmental activities, pre-teacher GLOBE education at the University of Athens, enhance the involvement of STEM professionals,

# Ireland

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## An Taisce & EPA launch GLOBE in Ireland

### 28th September 2017:

“We in the EPA recognise our important role in providing online, up-to-date and accessible information on the environment to stakeholders. We are working hard to make environmental information interesting and relevant to the public, to stimulate increased engagement with the environment and to mobilise sustainable behaviours”, said Laura Burke, Director General of the Environmental Protection Agency, speaking at the 13th annual Environment Ireland conference today.

In discussing the state of the environment in Ireland in 2017, Ms Burke's keynote speech highlighted ongoing and future challenges in relation to environmental protection. It focused particularly on two of the challenges identified in the EPA's recent state of environment report – the implementation of legislation and community engagement.

At the conference, Laura Burke also announced that the EPA and An Taisce will work together to rollout the GLOBE citizen science programme in Ireland,

“GLOBE is an international science and education programme that connects students, teachers and scientists to better understand, sustain and improve Earth's environment. Since 1995, more than 29,000 schools in 117 countries have participated in GLOBE. Nearly 140 million measurements have been contributed to the GLOBE science database creating research-quality datasets that are available to all. The initial focus of the GLOBE programme in Ireland will be on air and will involve a pilot programme in a number of primary, secondary, urban and rural schools in Ireland.”

Michael-John O'Mahony, Director Environmental Education Unit, An Taisce added,

“The Environmental Education Unit of An Taisce is delighted to bring the hugely successful GLOBE programme to Ireland in partnership with the EPA. GLOBE will give teachers and students across Ireland the skills, training and support to engage in meaningful scientific investigations about their local environment and to put this in a global perspective.”

# Italy



**Name:** Lorella Rigonat and Sandro Sutti  
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Participating schools: 73 schools are officially part of GLOBE program in Italy – 8 schools are actively working in the GLOBE Program at this moment, even if they not always upload data.

GLOBE Italy is a local network of schools and scientific institutions. 73 schools are officially part of GLOBE program in Italy, but only few schools are regularly reporting data.

Some GLOBE schools co-ordinate local or regional networks of schools, and so the real number of schools working in GLOBE is larger than the apparent one. The networks are the following:

- PROGETTO TERRITORIO e BIODIVERSITA' network, Friuli Venezia Giulia - Regional School Network (about 30 schools including primary, middle and secondary schools). It is involved in hydrology, soil investigation and atmosphere investigation in Northern Italy, in collaboration with many scientific and environmental protection agencies. The project includes chemical and physical analysis and the use of bio-indicators in relation to environmental quality. The project lasts a whole school year. Funding by: regions, and private foundations through calls for proposal, municipalities and schools own budget. About 20.000 euro.

- Progetto MINCIO network of schools (2 Junior High Schools with 3 classes, 74 students, 6 teachers and 1 Senior High School with 2 classes, 46 students and 6 teachers) that investigate the waters of the Mincio watershed (Lombardia Region) in 6 monitoring stations, in collaboration with a number of local institutions and agencies (research, environmental protection, health protection). The chemical/bacterial results of Progetto MINCIO are integrated by the results of another project which investigates water macroinvertebrates of River Mincio and its tributaries: the Progetto MACROINVERTEBRATI is held by Bertazzolo Junior High School in Mantova with 3 classes, 71 students and 6 teachers. Both projects are co-ordinated and supported by Labter-Crea and last the whole school year.

- Progetto PERCORSI D'ACQUA, a continuation and an extension of Progetto MAGO (please, refer to previous Report), is a multidisciplinary project conceived and managed by the 4 schools (Piubega, Gazoldo, Casaloldo and Ceresara) of the Istituto Comprensivo Ceresara, focusing on the quality of the main streams of Upper Mantua: Seriola Piubega, Seriola Marchionale and Osone. The Ceresara Comprehensive School, taking part in the Labter-Crea School Network, is candidate to become a GLOBE School in the near future. The Secondary School Classes conducted chemical/bacteriological investigations and macroinvertebrate surveys by means of kit and simple equipment, supplemented by more sophisticated analysis on nitrates, nitrites, ammonia and Escherichia coli performed by a Laboratory of Analysis that provided his collaboration free of charge. On the same water courses the Primary School pupils have been hiking through, learning to recognize plants and herbs and familiarizing themselves with the hydrographic grid. Further observations and activities were made involving historical, artistic and social aspects of their territory. An Environmental Lab is being planned in the school, while buying equipment and collecting data, information and documents. Thanks to the dynamism of its promoting teachers, the Project gained important collaborations from a multitude of public and private organizations and associations: Parco Oglio-Sud, Per il Parco Association, Postumia Association, Alto Mantovano Ecological Group, Fermi High School Mantova, Sisam – Integrated Water Service SISAM, Marcegaglia Analysis Lab MA.DE, Associazione The Root Association in Castelgoffredo. Some teachers of the 4 schools are leader component of Piubega Health and Environment Committee, a movement of active citizens against the pollution of surface waters used for irrigation, that damages agricultural crops and makes agricultural products quality of that territory unmarketable. The project lasted the full school year

and involved 9 Junior High School Classes (153 students, 14 teachers), 9 Elementary Classes (172 children, 13 teachers), 4 Kindergarten Classes (73 children, 7 teachers). Funding: by municipalities and private foundations through calls for proposal. About 3.000,00 euro.

Report: Please refer to the .ppt presentation in Italian, here enclosed

- Progetto INFORM, "Improved monitoring and forecasting of ecological status of European INland waters by combining Future earth Observation data and Models" aims to explore how the capabilities of upcoming sensors (EnMap, PRISMA, S2, S3), combined with innovative analysis and the coupling with biogeochemical models, can be exploited to deliver improved products for inland water quality addressing better the end-user demands". INFORM is a Collaborative Project (2014-2017) funded by the European Commission within the 7th Framework Program (Grant agreement no: 606865). The Project integrates the traditional methods of monitoring of inland waters by remote sensing. Mariano Bresciani and Monica, researchers at Centro di Rilevamento Elettromagnetico per l'Ambiente at Consiglio Nazionale delle Ricerche (CNR\_IREA) in Milan, involved in the project 6 Classes of Goito, Castellucchio and Mantova 3 Junior High Schools, monitoring the water quality of the 3 Mantova Lakes (Upper, Middle and Lower) in 3 sampling stations and producing a set of data subsequently compared with the satellite maps. The steps of the project: a Teacher Training Workshop (December 2016), 3 Student Training Workshops (January and February 2017), 3 demonstration monitoring Workshops on the sampling stations of the 3 Lakes (March 2017), 2 monitoring days for each school (April-May 2017) close to LANDSAT 7&8 and Sentinel-2 satellite passages on Mantova area, data elaboration and discussion (May 2017). 6 Classes, about 120 students and 10 teachers were involved. The local press gave great emphasis to the project. Unfortunately the European Project INFORM will end in November 2017. Contacts are in place to explore the possible continuation, in different forms, of the project that has been very successful. (River Mincio Contract, Action 1; please refer to 2016 Report)

Report: <http://www.labtercrea.it/progetto-inform-2016-2017/progetto-inform-2017.htm>

GLOBE protocols\*:

**Weather and aerosols,**

**Hydrology** with E.T.P. Regional Laboratory of Hydrobiology of Friuli Venezia Giulia

**Soil** with CRA and University Department of Agriculture and Environmental Sciences (DISA) Udine

**Phenology/land cover** with CFR (Regional Forestry Group).

The protocols are not integrated in the national curricula but schools insert them in special activities called u.d.a. (a period of full immersion, maximum two weeks of cross curricular teaching)

Cooperating organizations: Labter-Crea (Territorial Laboratory - Reference Center for Environmental Education) in Mantova, ISIS Malignani- Bassa Friulana Cervignano del Friuli (UD), University Department of Agriculture and Environmental Sciences (DISA) Udine, E.T.P. – Regional Laboratory of Hydrobiology of Friuli Venezia Giulia, CFR (Regional Forestry Group).

Description of the program and recent activities:

**EVENTS 2017\*\*\* according to the GLOBE Hydrology, Land Cover, soil, aerosol, phenology protocols.**

**WORLD WATER DAY 2017 - RIVERS IN SPRING (Fiumi di Primavera),** the World Water Day Celebration in Mantova

On March 22, 2017, about 3.000 children, students, teachers and citizens took part in the great event - Rivers in Spring -in Mantova, Northern Italy, to celebrate the World Water Day 2017 for the 17th time: people gathered on Mantova Lakes (Mincio River), to carry on scientific, naturalistic and artistic activities, or make foot, boat excursions, all action in the environment to sensitize people to take action to defend it.

WASTEWATER, the worldly theme chosen by UN WATER for WWD 2017, the relation water-energy-food, the aware consumption of the natural resources and the access to water resources as a natural human right were some topics of the event. Other local important topics: the relation between Mantova and water (the water culture), the River Mincio Contract, the participatory negotiation path between regions, provinces, organizations, agencies, associations and groups of citizens for the recovery of the Mincio River basin waters, water saving in agriculture, etc.



In about 59 workstations 61 activities were carried out by children of Elementary Schools, students from Junior and Senior High Schools, scientists from University of Parma, experts of Inter-regional Agency for the River Po (AIPO), and Mincio Territories Consortium Remediation (Consorzio di Bonifica Territori del Mincio), volunteers of various groups of Civil Protection, volunteers of the Mincio Park and the Oglio Sud Park, experts in the management of hydroelectric power stations, volunteers of ethnographic museums, the Mantova Diving Club, the Fishing Sport Italian Federation, etc. . As usual, 3 GLOBE Senior High Schools took part in the event: IISS della Bassa Friulana (Globe school leader at national level) in Cervignano del Friuli (Udine), IS Fermi (another important school in Italy, with a long tradition of surface water monitoring and environmental education ) and IS Strozzi in Mantova.

Students from Friuli Region presented 5 activities and run workshops on the re-use of wastewater in agriculture and Mantova Lake water monitoring according to Globe and Green Protocols; they discussed on water-plant-soil interaction, presented a case study and an operating model of plant-ground-water cycle. IS Fermi students managed two workshops based on the discussion about the presence of high concentrations of Glyphosate and Arsenic in surface waters and lab demonstrations how to reduce it. Water conservation in agriculture (COP21 theme) and scientific experiments to measure the toxicity of irrigation water were the two activities run by IS Strozzi Mantova.

Report: <http://www.labtercrea.it/gma-2017/gma2017.htm>

#### EARTH DAY 2017 IN ITALY

##### **Earth Day at Gorizia (I) and Nova Gorica (SLO) April, 21. 2017**

On the 21st of April 2017 the event **Earth Day at Gorizia (I) and Nova Gorica (SLO)** has taken place, organized by ISIS Bassa Friulana- ITT Malignani Cervignano del Friuli, in cooperation with the School Network Territory and Biodiversity, Gorizia and Nova Gorica municipalities, LabterCrea GLOBE School Network and a number of local institutions. The seventh edition of Earth Day entitled "Environment beyond borders", joined two European countries in working to protect the common environment by means of a series of exhibit (70) centered on: agriculture, feeding, new technologies for life, scientific research, new materials, protection of environment. A square just on the border between the two countries, Italy and Slovenia, called Europe Square, has been chosen for this edition: in our region is the place where the border crossing between Italy and Slovenia is open . About 1.500 students participated, from elementary to high school and University. Older students and experts of ETP, ERSA, Udine and Trieste Universities (participating in Territory and Biodiversity ,Landscape Observatory, Interreg and Globe projects)and University of Nova Gorica tutored younger or less expert students.

The event was followed by local and regional televisions and was later broadcasted in the news. The day activity was completed by a Concert about Earth, with the song We are the world .



##### **Earth Day at Parco Desenzani in Castiglione delle Stiviere (Mantova), 5th edition, 21-22-23 April, 2017**

The Earth Day in Castiglione delle Stiviere, with a format imported from the model invented by the network of schools of Friuli coordinated by Istituto Superiore della Bassa Friulana Friuli (ex ITIS Malignani) in Cervignano del Friuli, was held over three days: from 21st to 23rd April. The first day dedicated to schools, the second and the third ones to public bodies, associations, trades, companies.

Let's safeguard the Landscape was the theme of the event, promoted and organized by the Municipality of Castiglione delle Stiviere, in collaboration with Labter-Crea and other public and private bodies.

Many topics related to the title of the event were covered in 43 stations set up under 3 large marquee tents, as well as during the conferences and actions taken in these three days. To prepare the community to the event, which in five years has become the main social event of the Castiglione area, the town council had organized several evening meetings. More than 2.000 students and teachers and about 2.000 citizens had taken part in it.

<http://gazzettadimantova.gelocal.it/mantova/cronaca/2017/04/21/news/piu-di-1-800-studenti-per-la-giornata-della-terra-1.15227735>

**PROGETTO MINCIO 27a edizione (Mincio Project, 27th edition):** April 27, 2017 River Mincio monitoring day in Mantova . About 132 students and teachers of Junior and Senior High Schools involved in the water quality testing in 6 monitoring stations distributed along the River Mincio from its origin from Garda Lake to its confluence into Po river. The tests have been made according to GLOBE and GREEN hydrology protocols. Other parameters like Escherichia coli were tested, as requested by the Italian law. Particular features: tutoring methodology, final Report presentation, dissemination among community, taking part in River Mincio Contract.

(2 Junior High Schools with 3 classes, 74 students, 6 teachers and 1 Senior High School with 2 classes, 46 students and 6 teachers did the investigation)

Report: <http://www.labtercrea.it/pm-2017/pm-2017.htm>

**A SCUOLA SUL FIUME 18a edizione (To school on the river, 18th edition):**

On May 10th, more than 450 students and teachers of Junior and Senior High Schools monitored and studied the waters in Nord Friuli, Tagliamento River – Conca Tolmezzina. Using GLOBE and GREEN protocols, Microinvertebrates and IFF (Indice di Funzionalità Fluviale, River Functionality Index), Chemical/Bacterial parameters of the river were investigated by students and teachers, in cooperation with public agencies. During this event, experienced students of secondary schools tutored younger or inexperienced students.

“At school on the river” now in its 18th year, is coordinated by ISIS della Bassa Friulana and by ISIS Solari (both Globe School), within the networks Territorio and Biodiversità - GLOBE. It represents the final event in a series of activities that took place during the school year, aimed at making young people aware of environmental protection issues through the study and monitoring of natural resources.

Particular attention is devoted to the study of surface water that students examine, together with their teachers and experts, in a given area, carrying out chemical and microbiological analysis with field instrumentation and the use of bio-indicators such as macroinvertebrates. Checklist and ecological landscape are compiled according to some protocols provided by international environmental education project (GLOBE Project [www.globe.gov](http://www.globe.gov), Act 4 Rivers project [www.act4rivers.net](http://www.act4rivers.net), GOLENA BLU project). ([www.osservatoriodelpaesaggiobassafriulana.it](http://www.osservatoriodelpaesaggiobassafriulana.it))

# Latvia

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**Cooperating organizations:** University of Latvia, US Embassy in Latvia, National Centre for Education, Nature Conservation Agency, local municipalities

**Participating schools:** 35, active – 10

**Funding by:** Ministry of Education and Science, schools, parents, local municipalities

**GLOBE protocols:** atmosphere, hydrology, land cover, phenology, soil, aerosols (all are translated in Latvian). Seasons and Biomes project.

## Description of the program and recent activities:

At present there are 35 schools, who are involved in GLOBE programme in Latvia. Only 7 are currently reporting data, 10 schools had reported between 1<sup>st</sup> October 2016 and 31<sup>st</sup> October 2017. Students mostly do investigations during afterschool activities or project weeks, but some teachers use the project also in science lessons. The most popular study area are atmosphere, hydrology, and phenology. Some schools send pictures to Markus Eugster in the Seasons and Biomes project.

Year 2016 in the GLOBE Latvia

1. The daily work in the project was performed in all project schools. One workshop was organized for the project teachers – atmosphere protocols, new GLOBE applications and Europe Phenology Campaign.
2. Several public workshops about citizen science, GLOBE applications and Europe Phenology Campaign where held, i.e., at The LAMPA conversation festival in Cesis, July 1<sup>st</sup>, where teacher and students from Malpils Secondary School participated, Environmental Educators Meeting, August 5<sup>th</sup>, Limbaži city festival, August 5<sup>th</sup>, conference for science and math teachers held by the University of Latvia, August 28<sup>th</sup>, and Environmental education' coordinators meeting held by the National Centre for Education, September 28<sup>th</sup>.
3. July 30<sup>th</sup> till August 3<sup>rd</sup> CC Krisjanis Liepins participated at GLOBE Annual Meeting in New Haven, USA.
4. August 21<sup>st</sup> till August 25<sup>th</sup> Summer School for GLOBE participants was organised in the framework of still ongoing project "Young Environment Explorers for Future Latvia", in cooperation with experts from The Nature Conservation Agency and Institute for Environmental Solutions. Summer School took place in Zemgale Secondary School, Tukums district, 20 kilometres vicinity from Kemeru National Park where some of learning activities happened. GLOBE protocol learning and lessons from science experts were supplemented by visual art, public speaking and debate classes. Participating schools are now organising their experience dissemination events for local community in their municipality.
5. New initiative of "GLOBE Embassies" started where most active schools in GLOBE data entry, research and GLOBE publicity will be rewarded.

- An idea of workshops for students has been developed. They will be held once in a month, with previously announced topic and previous sign-up.



*Picture 1. Participants of GLOBE Summer School at Zemgale Secondary School, Tukums district, Latvia*



# Lithuania

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Organization and Human resources (how many people work on GLOBE, what is the capacity, background of the organization).

The GLOBE Program is coordinated by Lithuanian Centre of Non-formal Youth Education. One employee (Country coordinator) works in the GLOBE program.

Funding by The Ministry of Science and Education of the Republic of Lithuania, schools and parents.

GLOBE schools (what types, how many, etc.):

53 schools are in the list, 18 schools are active, 14 schools currently reporting data. Most of schools are high schools. Lithuanian schools reported 256278 data and got 506 Honor Rolls. GLOBE schools' teachers strongly cooperate in network and share their experience.

GLOBE areas (what areas of investigations you/schools focus on? What areas you plan to develop?):

Lithuanian schools work on different protocols, but the most popular are Atmosphere, Phenology, Earth as a system and Hydrology themes.

Program implementation in the country and recent activities (trainings, field campaigns, school-to-school projects, events):

## GLOBE program Summer Camp

40 students participated in GLOBE program Summer Camp which was held on 3-6 July, 2017. Camp was dedicated for most active GLOBE program students from schools which send GLOBE collected data regularly. The Camp took place in Lithuanian protected area – Aukštaitija National Park Nature School.



Students had a great possibility to get acquainted with unique landscape, biodiversity and cultural heritage; participated in many activities, such as scientific workshops in the nature, bicycles and indicative trips, lectures in Visitors Centre of National Park.

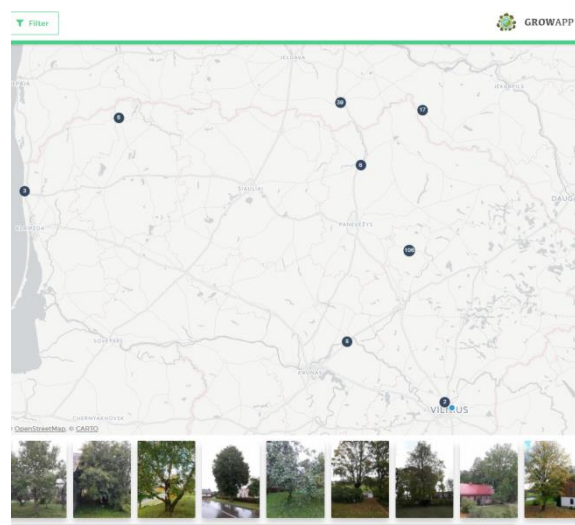


GLOBE students also tested a new activity – they created comics by using GLOBE environmental measurements. There were many other activities, GLOBE games and excursions as well.



### Autumn Phenology Campaign in Europe

Fourty GLOBE students from six schools participate in Autumn Phenology Campaign in Europe. Students observed the Green Down process of seven tree species and collected 126 pictures by using The GrowApp.



### The annual Students' and Teachers' GLOBE program conference.

The annual Students and Teachers' GLOBE conference "Possibilities of Learning GLOBE" will be held on December, 2017. The main aim of the conference - to develop the knowledge of students in different fields of the environmental investigation. About 50 participants are expected to be involved in the event. Students will present the results of the GLOBE investigations and related themes.

**For next year** we expected to organize two courses, dedicated to new teachers and the ones with a few years' experience. Also we are planning to organize annual events for students - Conference and Sumer Camp.

# Malta

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Organization and Human resources (how many people work on GLOBE, what is the capacity, background of the organization): currently there is no one formally employed to work on GLOBE. The responsibility of promoting GLOBE rests on the CC and his Assistant. This is done over and above their respective workloads in their respective institution.

Funding by: support for initiatives is offered by the Directorate for Learning and Assessment Programmes - Ministry for Education and Employment; the Faculty of Education - University of Malta; and the US Embassy

Cooperating organizations/individuals (national and international level): currently none, but contacts have been initiated with the Environment & Resource Authority (ERA).

GLOBE schools (what types, how many, etc.): currently no school is formally registered. We only have teachers who have shown interest in beginning the programme.

GLOBE areas (what areas of investigations you/schools focus on? What areas you plan to develop?): Atmosphere, Hydrosphere and Pedosphere

Program implementation in the country and recent activities (trainings, field campaigns, school-to-school projects, events): during the 2016-17 scholastic year we organised two training events:

- 14-16 June 2017: Ms Bára Semeráková and Ms Dana Votápková, from the Regional Coordination Office for Europe and Eurasia, provided training on the use of GLOBE resources, inquiry-based learning and ways of using GLOBE materials to promote cross-curricularity. The training was attended by 44 science teachers, Education Officers, Heads of Departments, peripatetic teachers in ESD and geography who will be spearheading the implementation of GLOBE in schools.
- 16 June 2017: Fifteen Eco-Schools link persons attended an interactive session with Ms Kim Martinez (US National Eco-Schools Coordinator) about ways of promoting STEM via Eco-Schools and GLOBE

Your plans and ideas for next year: the programme will be officially launched during a nationwide event during this scholastic year. This year will be treated as a pilot year during which implementation issues identified by participating schools will be monitored and evaluated.

# Netherlands



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## Participating schools:

90 secondary schools from everywhere in the country have a paid membership

## Funding by:

### Program funding:

- Schools pay €290,- per school per year
- 1 small sponsors (€750 yearly)

### Project funding:

- Training fee for course 'science education' with University Utrecht
- GLOBE Science School project (see below), funded by schools
- US embassy
- Science Fair for bilingual schools, funded by institute for internationalization (Nuffic)
- Investigation of light used by citizens in their houses done with spectrometer by students.



## Cooperating organizations and protocols:

### GLOBE protocols:

- **Weather** and **aerosols** together with *Dutch Royal Meteorological Institute (KNMI)*:
- **Water** together with *Wageningen University*

### Non GLOBE protocols (developed by Dutch institutes):

- **Soil** together with *National Institute for public Health and the Environment (RIVM)*: 'living soil'. Students investigate living organisms in the ground and relate that to the respiration of the soil (amount of CO<sub>2</sub> exhausted) using the respiration kit developed by RIVM
- **Phenology** with *Wageningen University*: (using the network [www.naturetoday.com](http://www.naturetoday.com))

## Description of the program and recent activities:

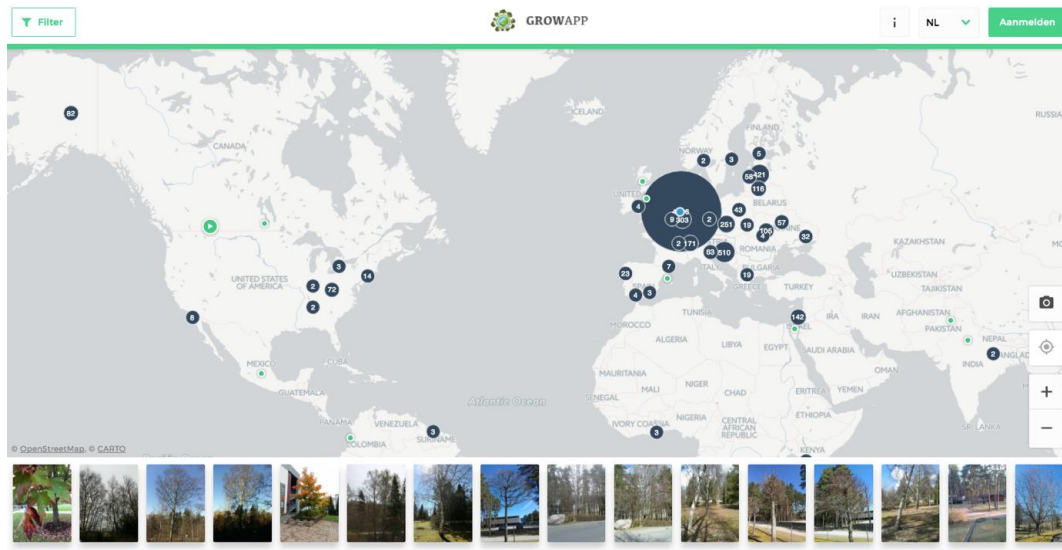
### **GLOBE Science School**

We did an investigation on what GLOBE could offer to schools in such a way that we really help them solving an issue that they have. The result was that 'learning to do research' is still not on the level that schools would like it. It is taught fragmentary with hardly a connection between subjects. Funded by a national donor we have developed a GLOBE learning trajectory on 'doing science', 'sustainability' and 'internationalization'. We currently have 12 participating schools.

### **GrowApp and campaign**



This smartphone app was developed by GLOBE Netherlands. It gives students the opportunity to follow the development of a tree during the year by taking pictures that are automatically combined into a *time lapse* movie. In this way they contribute to science and learn how nature reacts to climate change. The GrowApp is used in the European phenology campaign: [www.globe.gov/web/european-phenology-campaign](http://www.globe.gov/web/european-phenology-campaign) Many schools have been taking pictures, see screenshot below:



### Science Fair for bilingual schools

We have started a cooperation with the organization that certifies bilingual schools in the Netherlands. We organized our first Science Fair at Wageningen University where students of secondary education will shared their GLOBE results in English to each other and to the scientific jury. It was very successful in 2016 and 2017so we organize it again in 2018.



### National Light investigation

We organize a national campaign where schools get free build it yourself spectroscopes that they make out of a building plate and a small piece of plastic called diffraction grating. The spectroscope splits the light into an array of separate colors, called a [spectrum](#). Students investigate with the spectroscope how sustainable households are lightening their houses in the Netherlands. They add their data to the national website that shows the national Light Map.



# Poland

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Organization and Human resources (how many people work on GLOBE, what is the capacity, background of the organization)



Since 1997 GLOBE Program in Poland has been coordinated by UNEP/GRID-Warsaw Centre ([www.gridw.pl/en](http://www.gridw.pl/en)). The Centre, established on 17 September 1991, is a member of the GRID (Global Resource Information Database) global network developed by the United Nations Environment Programme (UNEP) to foster sustainable management of natural resources.

Our organisation is well recognized as the leading educational centre and important node of environmental and science education in Poland with excellent networking capabilities. There are about 20 experts working at the Centre right now – 4-5 out of them have been involved in GLOBE related activities for the last year. Moreover, we have group of external experts (scientists, experts in pedagogy, etc.) cooperating with our organisation.

Funding by: UNEP/GRID-Warsaw's own resources, small grants (U.S. Embassy in Warsaw), sponsorship coming from business partners, attendance fees (paid by participants of the teacher trainings and GLOBE Games).

Cooperating organizations/individuals (national and international level): Program implementation in Poland is supported mainly by the Scientific Board (team of scientists from the University of Warsaw, Warsaw University of Life Sciences, Institute of Geophysics of Polish Academy of Science, etc.) and group of external experts (for example experts in pedagogy, etc.) cooperating with the Country Coordinator.

GLOBE schools (what types, how many, etc.): There are 183 schools involved in GLOBE in Poland, both primary (students aged 7-15) and secondary (students aged 16-19).

GLOBE areas (what areas of investigations you/schools focus on? What areas you plan to develop?): Most of GLOBE schools in Poland are involved in the atmosphere and hydrology research (233 Science Honor Rolls at level III in atmosphere and 65 Rolls at level III). All GLOBE sub-projects implemented at the national level in the past few years were mainly focused on those areas. Our future goal is to get more schools involved in the biosphere investigations, phenology in particular (right now we have 56 schools holding Science Honor Rolls at level III in this field). We would like to combine these observations with atmosphere research (with more focus on air pollution) and water investigations.

Program implementation in the country and recent activities (trainings, field campaigns, school-to-school projects, events):

In 2017 we are celebrating 20th Anniversary of GLOBE Program activity in Poland. Therefore, we put our main effort to organize exceptional student's science seminar called GLOBE Games. Nearly 120 teachers and students from primary, secondary, and high schools all over Poland gathered to celebrate together and to exchange experiences, learn about the local culture and history, and enjoy activities outdoors. This special event with the theme "Climate, Water, Forest" took place between 09-12 June in the Great Masurian Lake district of Poland. As a tradition, the main part of Polish GLOBE Games was conducted as a field game. The best teams, and the most active students in each group, were given awards. There was also time for GLOBE students' mini-conference – a presentation of the projects and activities implemented during the school year, including those submitted to the 2017 International Virtual Science Symposium –

and special afternoon/evening sessions with experts Brian Campbell from NASA (talking about his career in NASA) and Mr. Gorski from the Biology Department, University of Warsaw (presenting use of drones for environmental monitoring).



*Credits: Gimnazjum in Wieliszew*



*Credits: UNEP/GRID-Warsaw Centre*

During this lovely, warm, and sunny weekend, GLOBE members spent 15 hours in the field and worked on almost 40 research stations. The event was organized in cooperation with Complex of Forest Schools Unii Europejskiej in Ruciane-Nida, Maskulinskie Forest District and Local Community of Ruciane-Nida. It was supported by the U.S. Embassy Warsaw, and two business sponsors. You can read more about Polish GLOBE Games at News section at <https://www.globe.gov/web/poland/news> Do you want to feel the atmosphere of GLOBE Games 2017 in Poland? See the photo gallery at <http://globe.gridw.pl/globe-games-2017/galeria>

Moreover, we focused on development of GLOBE community in Poland:

- conducting several (face-to-face and online) trainings both – for teachers and students from new schools joining GLOBE Program (supported by business partners),
- encouraging teachers and students to get involved in European Phenology Campaign 2017 through school-to-school projects (both at the international and national level)

Your plans and ideas for next year: In the next year we would like to:

- get more schools involved in school-to-school projects at national and international level,
- organize Students' Science Seminar GLOBE Games 2018,
- update/refresh our national website,
- develop new training models for teachers/students, incl. update of GLOBE Teachers' Guide with all protocols.

# Russia

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Cooperating organizations: Russia Ministry of Education and Science

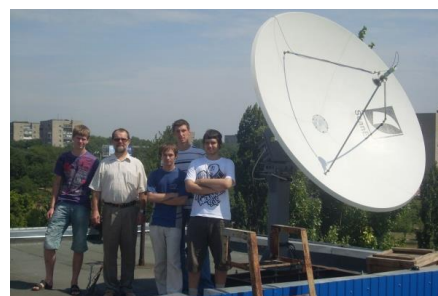
Participating schools: 108

Funding by: GLOBE schools

GLOBE protocols used in country: Atmosphere, Hydrology, Soil.

Description of the program in your country and recent activities in 2017

New direction of GLOBE Program development – more wide using the remote sensing satellite monitoring data. Now 3D models of every GLOBE school can be constructed and shown on the Google Earth pages.



We are trying to use Russia Federal University network to implement GLOBE program in all Russia Federal Districts.

We have in Rostov-on-Don an expert group of around 10 GLOBE teachers who works with us to shape and develop the program. They come together a few times a year and work together on specific subjects.



**Rostov-on-Don, Russia**

**Ребята МБОУ СОШ № 61 после уроков в школе  
занимаются экспериментальной работой в рамках  
международной программы «GLOBE»**





# Ukraine

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Organization and Human resources (how many people work on GLOBE, what is the capacity, background of the organization)

National Ecology and Nature Center is an educational institution of the Ministry of Education and Science of Ukraine, a component of the system of extracurricular education for gifted and motivated school students. It is also a coordination centre for 155 regional educational institutions of environmental orientation. GLOBE is part of a program of national integration into European and world educational space. There are three people working in GLOBE coordination office in Ukraine, however the center has capacity to include other people during organization of events or competitions. Also, there are active regional educational institutions which participate in the program development. We have 4 active regional coordination centers (Rivne, Sumy, Chernivtsi, Uzhgorod).

Funding by:

Main funding: Ministry of Education and Science of Ukraine.

Cooperating organizations/individuals (national and international level):

Ministry of Education and Science of Ukraine, Minor Academy of Sciences of Ukraine, Ukrainian Hydrometeorological Center, State Space Agency of Ukraine, Palladin Institute of Biochemistry.

GLOBE schools (what types, how many, etc.):

There are 486 schools and educational institutions registered on the website, actively participating schools – about 50. The GLOBE network in Ukraine includes not only secondary schools, but also regional environmental education centres that are part of system of afterschool education in Ukraine.

GLOBE areas (what areas of investigations you/schools focus on? What areas you plan to develop?):

The most popular areas among Ukrainian GLOBE students are phenology (green up / green down), atmosphere (air temperature, clouds, relative humidity), and biometry. We would like to increase interest in soil investigations and hydrology (freshwater macroinvertebrates).

Program implementation in the country and recent activities (trainings, field campaigns, school-to-school projects, events):

Today GLOBE in Ukraine includes about 50 active schools and teachers almost from every region of Ukraine. There are total amount of 31,807 data entries and 87 honor rolls. In 2017 GLOBE in Ukraine has been working on several tasks:

- Provide training and support for existing GLOBE teachers and schools;
- Engage students and schools in GLOBE through events, competitions and campaigns;
- Involve new teachers;
- Develop translated instructions;

- Enhance international cooperation.

### **GLOBE Games Ukraine**

On 19-22 of June 68 school students and teachers from different parts of Ukraine participated in the second GLOBE Games in Ukraine. The event took place on the territory of National Ecology and Nature Center, Kyiv.



During these days participants attended workshops from the leading scientists in hydrology, botany, meteorology, water chemistry and others. With the help of experts students learned about research field work and scientific research outdoors. After the workshop with scientists student teams were able to test their knowledge participating in the fun science quest while teachers learned about new tools and methods of environmental education. During the first day students were able to present the results of their work in GLOBE during the year.

The event was supported by Ministry of Education and Science of Ukraine, Ministry of Ecology and Environmental Protection and

project UNIDO in Ukraine. The scientific support was provided by Palladin Institute of Biochemistry, Kholodny Institute of Botany, Institute of Hydrobiology, Minor Academy of Sciences of Ukraine, Glushkov Institute of Cybernetics, National University of life and Environmental Sciences of Ukraine, Central Geophysical Observatory.

### **Annual Seminar-cum-Workshop for teachers**

From 13-15 June, teachers from Ukraine participated in an annual GLOBE workshop that took place in Rivne in western Ukraine. The workshop was organized by GLOBE coordinators from the National Ecology and Nature Center, together with Rivne Young Naturalists Station and supported by the Regional Department of Ministry of Education and Science of Ukraine.



During three-day conference, which was combined with a GLOBE training, teachers from 9 regions of Ukraine presented their work, shared experiences, and discussed ideas for the program implementation. Teachers also had an opportunity to join a training on atmosphere, biosphere, hydrosphere and pedosphere protocols accompanied by scientists from National Technical University of Ukraine "Igor Sikorsky Kyiv Polytechnic Institute."

### **Calendar GLOBE 2018**

During several years Ukraine took a part in GLOBE at My School Picture Contest. And this year although this project was finished we continued competition on the best photo of working with GLOBE. This event will be finished in December.

### **International cooperation**

In 2017 Ivano-Frankivsk City Environmental Station cooperated with Shaab School (Israel). On 21-24 of April was realized meeting of school students and teachers from above mentioned schools. The event took place in Ivano-Frankivsk City Environmental Station.

#### Your plans and ideas for next year:

- Conduct traditions annual events (annual seminar for teachers, webinars).
- GLOBE Games 2018
- Participate in European Phenology Campaign
- Conduct regional workshops in active regions
- Create a short booklet for dissemination at schools and institutions
- Translate new GLOBE protocols on soil and hydrology



# ***Working group reports***

# Education working group

30.October, 2017

## Members:

- Jessica Taylor, Chair, United States
- Henry Saunders, Vice Chair, Trinidad and Tobago
- Audra Edwards, Secretary, United States
- Yaqoub Yousuf Ali AL-Balushi, Oman
- Marta Kingsland, Argentina
- Francis Wasswa N. Nsubuga, Uganda
- Binoda Sabata, India
- John Ristvey, GIO Liaison
- Diana Garašić, Croatia



## Working areas and focuses:

- Student “Field Guide” videos -

Activity led by Audra Edwards. The idea is to refresh the training materials with videos of students doing GLOBE, with the purpose for inspiring students and teachers. One film was made at Annual Partner meeting, on Outer Island with students, on the topic of water analyses and it was very good. Therefore, Audra and her students got “green light” to continue with this pilot project.

- Review and provide Feedback on Trainer and Master Trainer Certification Process

The group spent a lot of time discussing about that topic. There are different experiences and different views in different regions. The representatives of the regions in which the same language is broadly used were more focused on the selection and further training of the trainers/ master trainers. In countries with many different languages, focus is more on the problems tied to certification process, if the procedure described on GLOBE web site is still to be followed. The problem, which for example we face in our region, is the opportunity in which the trainer or master trainer candidate could train under the supervision of master trainer for certain GLOBE area. Imagine some candidate from Croatia who should become the trainer in the country, but is not good in speaking English. Who should be the evaluator, because in Croatia we do not have master trainers? Several group members stated that certain trainer candidate, who has academic background and is specialized in certain research area that matches well with GLOBE, should just be evaluated concerning his/her didactical (andragogic) competences. The other members insisted that the person who became the candidate should have obligatory teaching experiences and should be skilled in data entry and in using GLOBE data base. But, whatever rules we set, it could present a problem in certain situations in some of the countries. Another identified problem is about the nomination of candidates. Should it be the responsibility of country coordinators? But, some members of the group stated that in some cases CC-s are representatives of local administration (ministries) and they are not trained in GLOBE or even do not understand what are the competences of good trainer.

Almost the same dilemma appeared in discussion group at the Annual meeting in New Haven. It seems that this problem needs more inputs and should be significantly reviewed, from the very beginning – from the goals and basic procedures, having in mind the possibilities and all kind of obstacles that appear in different regions.

- School Collaborations

This topic was also discussed in our group and common understanding is that collaboration among schools, especially international collaboration is one of most important goals of GLOBE Program. Today it is enhanced by possibility to use various technological tools and social networks. The problem in focus were the guidelines or kind of manual for the teachers who want to start collaboration with another school. Some guidelines were already prepared, with procedures described in details. The group came to conclusion that described examples could be very helpful and inspirational. Therefore, the members of the WGE got the task to write a blogs. The group should publish 2 blogs per month,

with the examples from the countries or from the region. Blog from Marta (Argentina) is describing how to prepare first steps in school-to-school collaboration. Blog from Audra (USA) brought authentic letters from 3 girls, coming from 3 different continents, who became friends after their schools collaborated on certain GLOBE project. Yaqoub (Oman) and Diana (Croatia) were describing the experiences of the schools from their countries. The articles could be viewed at <https://www.globe.gov/globe-community/community-blogs> by selecting a category Education working group.

It would be very important to hear the examples of good practice in school collaboration from the countries in the region. Even more, described examples could be incorporated in new blog representing Europe&Eurasia region. So, if you have such experience, please talk with Diana Garašić or send an e-mail to [diana.garasic@gmail.com](mailto:diana.garasic@gmail.com)

Thank you!  
Diana Garašić,  
Country coordinator for Croatia

# ***Evaluation Working Group***

**2016-2017**

## **1. Evaluation webinar**

The Group has decided to prepare evaluation related webinars, starting with a webinar for the teachers. We are at the point of planning the practical issues. The purpose of the webinar will be to provide some highlights from the feedback we have had from teachers with respect to evaluation tools needed, available and support wanted. We will have invited speakers who are members of the GLOBE community and are involved in evaluation related efforts. It will be recorded for people to watch at their convenience. We are planning to put it together at the end of December 2017.

## **2. The Group has collaborating with the other WGs.**

a. Our collaboration with the Education Working Group resulted in the participation of two members of our group (Nektaria and Kevin) in the Water cooler, organized by Jen Bourgeault for US partners. There was a very good turn out with interesting discussions. We talked about the group's work, the teachers' report results and about feedback we are looking for. That is:

- Existing student assessment and program **evaluation tools** that can be shared with other members of the GLOBE community.
- Existing data that partners have from their studies on Program effectiveness:
  - I) **short-term results** (student gains in learning, interests, motivation, social-emotional development, or teacher outcomes).
  - II) **longitudinal studies** (for example, related to improved graduation rates, entry to postsecondary education, and career-related outcomes).

b. Our collaboration with the Technology Group involved the provision of suggestions as to what be useful for our Group. The suggestions were:

- i. Dedicated space on the website for our materials - which was done.
- ii. Get notifications when blogs are posted.
- iii. Evaluation questions pop-up when people upload data.

The questions we provided for that purpose were:

- A. Do you use evaluation tools to assess student learning and GLOBE implementation in your school? If yes, which types? Can you share your results with the evaluation group and the community?
- B. What are the outcomes you have seen from the participation of your students in GLOBE? Please describe.

**3. Presentation about our group's work at NARM** organized in January 2017. We were not able to attend, so Tony Murphy presented our ppt.

## **4. Communication with Regional Offices**

The Group wants to be win touch with the colleagues at the Reg. offices. Throughout the year we provide monthly meeting notes, we participate in person or virtually in the regional meetings and in some Board meetings.

## **5. Collaboration with others involved in GLOBE and its evaluation.**

For this year we communicated and exchanged views/ materials with:

- Valerie Williams (GLOBE evaluator at UCAR).
- Ann Martin (NASA evaluator for GLOBE campaigns).

## **6. Invited speakers**

For this year we had Matt Silbergliitt, from WestEd, who talked about the GLOBE rubrics.



Following this talk, Nektaria prepared and posted a blog about the use of rubrics as an assessment tool. The blog has had 602.639 views so far!

#### **7. One pager for funders**

The group has prepared a one pager for funders, along with a document with instructions. for use. At this point, we are completing the translations into Spanish, French, Portuguese and Arabic and the materials will be ready to upload to the website.

#### **8. Survey in the field**

During the New Haven Annual Meeting we prepared and provided a survey to the participants who joined the training sessions. We have analyzed the results and are in the process of preparing a report to be shared with the community shortly.

#### **9. Poster session in CT**

We participated in the session during the New Haven Annual Meeting with a blank poster that was filled with feedback from the participants, with useful information and good ideas. We will be following up on this within the upcoming year.

**We are encouraging the CCs to use the one pager for funders that could be useful in their efforts to find support for their GLOBE activities.**

**The CCs feedback is very important for the Group. Any information on what was noted in 2.a. above is really valuable, as well as anything else the CCs consider relevant and would like to share with us.**

Nektaria Adaktilou-Chair of the Group  
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# **Technology Working Group**

## **2016-2017 short report**

Main task of the Technology WG is to support development and updates of the technologies implemented within GLOBE Program, including the GLOBE website, GLOBE Data Entry system, the Visualization System, ADAT (Advanced Data Access Tool), mobile apps, etc. We provide feedback and comments for the IT team working under supervision of David Overoye and Cornell Lewis.

### **For the last year we have been working on:**

- Complete reorganization of the GLOBE website, incl. new Spheres landing pages, new region/country pages, new School pages and My Pages, new functionality supporting school-to-school collaboration, etc. The fresh new design and updated features will be unveiled on 06 November so you would be able to see the results of our work directly in your web browser;
- Adjustments of the Visualization system (to make it more user-friendly and responsive, so it can be easily used on mobile devices),
- Development and updates of GLOBE apps, incl.: integration of a Mosquito Protocol for GLOBE Observer App, integration of the new Cloud protocols into GLOBE Observer, etc.,
- A way on how to officially approve new sensors for GLOBE – thanks to technological evolution there are more and more devices/tools available for the GLOBE community. They are not expensive, available worldwide, making accurate and precise measurements. We cooperate with Science WG to find the way to make GLOBE even more attractive for students but also be sure that all data collected with use of these sensors fulfill scientific requirements.

### **How do we share our ideas and look for feedback?**

- We are taking part in the development of the GLOBE Strategic Plan 2017-2022, doing our best to find an appropriate place for technologies in the future vision for GLOBE. During the Annual Meeting in CT members of our Group were co-organizing the World Café session on the Strategic Plan;
- Also during the Annual Meeting in CT we organized dedicated Technology Share-a-Thon session. Main goal was to encourage participants to share information about new technologies they use in their everyday GLOBE activities;
- Every year there are some technology-related questions within GLOBE survey.

Dear CCs, your (and your teachers') feedback on the technology used within GLOBE is very important for our Group. If you have any suggestions about the website, mobile apps, etc. (how to improve these tools? how to make it more user-friendly?), please let us know.

Ela Wołoszyńska-Wiśniewska, Chair of the Technology WG  
e-mail: [ela@gridw.pl](mailto:ela@gridw.pl)

# ***Science Working Group***

**Contribution by C. Cartalis**

## **What topics did you discuss during the year?**

- GLOBE Program Strategic Plan for 2017-2022
- Tools on the website or lack of tools that have caused struggles in doing research with GLOBE data and/or reaching out to other GLOBE members in regards to working with GLOBE
- Aerosol e-training
- Development and use of apps: Cloud Observer and Mosquito Apps
- Quality assessment
- Use of satellite data in the GLOBE world. Which satellites data is used. How to make correlation between in situ measurements and satellite data.
- Front-end characterization study of GLOBE field campaigns and the role of NASA partners.

## **What are the outputs?**

The GLOBE Program Strategic Plan for 2017-2022.

## **What are the plans for next period?**

GLOBE Protocol Reviewing (Atmosphere, Biosphere, Pedosphere and Hydrosphere).

What to be reviewed includes: Protocols, Equipment and Lesson Plans

The major plan for the next period is the revision of GLOBE Protocols to the extent needed.

## **Do you need any help of CCs with some of planned activities?**

Yes, CCs will be asked for their opinion on the changes to be applied to the under revision protocols.

## **Any other information that you want to share with CCs.**

The WG is open to suggestions for new apps, for science protocols to be considered and most importantly on ways to assess and exploit GLOBE data.



# THE GLOBE PROGRAM

**Europe and Eurasia  
Country Reports 2017**

GLOBE Program Region Coordination Office Europe and Eurasia  
Regional Meeting - Tel Aviv, Israel  
6.11.2017 - 10.11.2017