



Europe and Eurasia 2018 Country Reports



GLOBE Program

Region Coordination Office Europe and Eurasia

Regional Meeting - Toulouse, France

12.11.2018 - 16.11.2018

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, Educational Centre.

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Croatia

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Organization and Human resources

Ministry of Science and Education of the Republic of Croatia is national organization which signed the Agreement of implementation of The GLOBE Program in 1995. Ministry appointed Country Coordinator, back in 1995, and recently Deputy of CC, as well as the Government Point of Contact Mrs. Mirjana Miknić.

In GLOBE implementation main partner is Education and Teacher Training Agency, which organizes teacher training and *Annual GLOBE Competition & GLOBE Students Science Projects Fair*.

Funding by: Ministry of Science and Education

Cooperating organizations/individuals:

Organizations that cooperate with GLOBE and support GLOBE implementation are National Meteorological Service and Faculty of Sciences/ Department for Biology.

GLOBE schools:

There are more than 250 schools listed on GLOBE web site. Mostly they are primary schools (students' age 10 – 14), but there are also secondary schools involved (students' age 15 – 18). In October 2018. There were first kindergarten teacher trained, so we expect to have even small children involved in GLOBE.

International Collaboration within GLOBE network:

Croatian GLOBE schools are very active in international campaigns and challenges. There were several examples of school collaborating with other schools on international level. Collaboration among Croatian schools happens regularly, since national network was organized around 7 regional centers. Those centers are in charge of additional teacher training and follow up seminars, as well as for regional science fairs.

GLOBE areas:

Majority of Croatian schools start their activity in GLOBE with atmospheric measurements, but more and more of them are active with hydrology measurements, soil, phenology and land cover investigations. There are several schools with automatic weather stations and they contribute mostly to the total number of measurements. The other fact that influence number of data are the cloud protocols for which no expensive equipment is needed.

Program implementation and recent activities:

There was 21. GLOBE Survey Competition and Science Projects Fair organized in May, 2018. The representatives of 40 GLOBE schools participated and the photo shows all of them forming GLOBE sign on the beautiful Adriatic coast in the city of Omiš.



There is active GLOBE alumni organization in Croatia. They organized themselves as NGO called ZNAM (acronym for Citizen Scientists), are active in Science Picnic where they promote GLOBE and science education (photo below). They also apply for funding on different calls.

We had big group of 50 teachers included in GLOBE training 11. – 12- October, so we hope to have even more active GLOBE schools, many of them interested in mosquito protocols, as it was main topic both for advanced group and for beginners.



Your plans and ideas for next year:

We hope to strengthen GLOBE Alumni NGO “ZNAM” with more members, in order to become respectful partner in Croatian GLOBE implementation strategy.

October 14, 2018.

Diana Garašić

Cyprus



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Organization and Human resources (how many people work on GLOBE)

We are under control of the Ministry of Education and Culture, so people that get involved with GLOBE are the country coordinator, 16 teachers and approximately 150 students.

Funding by:

We are funded by the ministry in a way that every teacher has two teaching hour reduction from classes per week to coordinate GLOBE in his school. In addition the Ministry supplies each school with GLOBE instruments as needed.

Cooperating organizations/individuals:

CYCERE, Open University of Cyprus, CYMEPA

GLOBE schools:

We have 14 Second Grade Schools (6 High schools: 7-9K and 8 Lyceum: 10-12K)

International Collaboration within GLOBE network:

We were involved in MASS project with the collaboration of CYCERY and we hope to continue international collaboration as we participate in Open Schooling proposal with the collaboration of Cyprus Open University.

GLOBE areas: Atmosphere, Phenology, Hydrology

Program implementation and recent activities:

Every GLOBE school will take part in the yearly Cyprus Science School Conference held by the Physics Society with a poster about GLOBE activities.

Plans and ideas for next year:

We are planning to organize a student seminar in May so GLOBE students all around Cyprus will have the chance to exchange ideas about GLOBE in their schools.

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

Organization and Human resources

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 five 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
- Plastia Company – collaboration on the biodiversity project using
- Schools pay €70 per school per year, newcomers pay €115 for a school year

Cooperating organizations/individuals:

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:

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

GLOBE areas:

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” and during the school year 2017/2018 we have continued with questing – focused on place-based education.

This school year is focused on– 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:

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 and questing** 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. We also organized Summer school for our mentor-teachers.



In cooperation with the American Center in Prague we organised third year of the award called **Czech GLOBE STAR** on January 29, 2018. 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. Elementary School Bystrice nad Pernštejnem for an organizing Mini GLOBE Games. Sokolovska Elementary School in Svitavy for an Earth Day celebration with GLOBE Program activities and for exemplary interconnection of GLOBE and Eco Schools. Gymnazium Kadan a regular organization of Mini GLOBE Games for ten years. Their Mini GLOBE Games are popular throughout Ústí region. **21st GLOBE Games in Humpolec** enabled students from the Czech Republic, Poland, Ukraine, Israel, Netherland, Italy, and Slovakia to share results of their GLOBE scientific projects based on their own inquiry during the Student scientific conference. About 320 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.

Plans and ideas for next year:

- Organize international GLOBE Games 2019 in Kadan, May 30 – June 2, 2019.
- The Theme of the Year “Wildlife garden”
- Participate in European Phenology Campaign.
- 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 phenology topics.
- Organize 4th Czech GLOBE STAR 2019 – by the end of January 2019.
- 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 2019 International Virtual Science Symposium.

Estonia

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Organization and Human resources

3 members of the Board, GPoC Mrs Imbi Henno, 11 trainers, 3 trainer candidates

Funding by:

Estonian Ministry of Education and research, Environment Investment Centre, Estonian Research Council, Schools

Cooperating with organizations/individuals:

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

GLOBE schools: ca 25 active public schools (ca 90 have joined, 5 candidates)



GLOBE areas:

- Atmosphere, Hydrology, Pedosphere (Soils), Land Cover and Biometry, Phenology
- Developing: Hydrology, 360 photos, satellite image analysis
- Competition of students' research papers (annual), January to May. Terms and conditions are set by researchers from the Universities.
- Participating in research paper's contests



- The Earth day celebration – week of 22.04, in cooperation with the U.S. Embassy, planting trees
- Participating in GLE in Ireland



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), Jõulumäe, Estonia 13.-16. August



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Organization and Human resources

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:

Researchers at the University of Helsinki and Finnish Meteorological Institute.

GLOBE schools: 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 normaalkoulu (Viikki Teacher Training School) from Helsinki. More schools are doing GLOBE investigates but they are not reporting their results to database.

GLOBE areas: 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:

Training for biology and geography teacher students (Viikki Teacher Training School), GrowApp translation to Finnish started, introduction of GLOBE infrared observation protocol at Think like a Forest –course to Atmospheric Science and Art University students and Formulating hypothesis in international Autumn 2018 School, Analysis of atmosphere - surface interactions and feedbacks – course. Utajärvi comprehensive school does international collaboration with GLOBE schools, took part in ENSO Field Measurement Campaign with Water in Our Environment – Webinar presentation and won national Tiedetoni (Science thousand euros) competition with the study “Do we get enough Vitamin D?” held the Minister of Education in Finland.

Plans and ideas for next year:

- 1) Teacher climate change forum, LUMA centre
- 2) make teachers and students more aware the great GrowApp
- 3) applying for funding

France



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

Participating schools: *27 (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 **14 years ago**, when CNES signed a memorandum of understanding with NASA; an extension of this agreement was signed 16th 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 6 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

GLOBE – Deutschland is a free association of institutions and teachers working for GLOBE, funded in 2011 in Unna.

The leading group developing the GLOBE program in Germany :

Anna Heyne-Mudrich
Thomas Beer
Sonja Drzensla
Jörg Hüttenhoff
Mathias Schmitt



Funding by: private Sponsoring – savings`bank - participants

Cooperating organizations/individuals:

Natur- und Umweltschutzakademie NRW, Wuppertalinstitut für Klima, Umwelt und Energie, ESERO Deutschland, Max-Planck-Institut für Meteorologie Hamburg, Geographisches Institut der Universität Bochum, UBI (Umweltbildungsinitiative OWL), BMBF Berlin

GLOBE schools:

Gymnasium, Gesamtschule, Realschulen, about 50 schools all over Germany.

International Collaboration within GLOBE network:

Ghana – Germany : The cooperation goes on continuously since 2015

E-twinning project : Climate and peace in Europe

New European project in development : My River

GLOBE Phenology campaign

Gymnasium Schloß Neuhaus, Paderborn took part in the wonderful GLE Killarney, Ireland this year.



GLOBE areas:

In the cooperating schools we find different topics : hydrology, phenology, atmosphere(aerosols)

Program implementation and recent activities:

1. In April GLOBE Deutschland organized a teacher training and a lecture in the Heinz-Nixdorf-Institut in Paderborn, the largest computer museum in the world. The most interesting lecture held by Dr. Andreas Rienow from Bochum introduced the actual development of apps concerning the interpretation of satellite images of the Ruhr-Universität Bochum. The following teacher training introduced 10 new teachers from Westphalia to GLOBE.
2. The 16th of May GLOBE-Deutschland was invited to the opening of the new ESERO Germany office in Bochum.
3. GLOBE - Deutschland was invited to take part in the teacher training of ESA in connection with the world space exhibition in Bremen in the first week of October.
4. There was a most interesting excursion to the Wetterpark in Offenbach, run and equipped by the German National Weather Service.
5. GLOBE - Deutschland continues the research about the compatibility of GLOBE with the different didactical developments in the German countries and in some European countries.
6. In 2019, Gesamtschule Bad Lippspringe-Schlagen is going to establish GLOBE Program as one of their electives in years 5-10."

Plans and ideas for next year:

- 1) We look forward to intensify our cooperation with ESERO Germany. The first step will be the cooperation with the ESA Program "Climate Detectives", the phenology campaign and the Tree Campaign.
- 2) We plan to renew the old GLOBE-Rhine-Project cooperating with other schools.
- 3) In Paderborn we will intensify the cooperation with Ghana and develop a basic project.
- 4) We plan to intensify our efforts for the project " Climate and Peace"
- 5) We plan several lectures in different schools in Westphalia with the basic topic "Sustainability"
- 6) We plan several teacher trainings.

In the weatherparc of the German National Weatherservice



The German table in Killarney



GLOBE-Deutschland and Dr. Rienow at the ESERO opening in Bochum



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Organization and Human resources

The GLOBE staff at the University of Cologne (UoC) is limited to one fulltime scientist (Dr. Thiemer), who is supported by a changing number of student assistants. In addition, organization, teaching and research is supported by Prof. Dr. Karl Schneider (Geography) and Prof. Dr. Edelmann (Biology). Cooperation in pre-service teacher education exists with Prof. Dr. Bresges (Physics) and in terms of organizing internationalization with the Centre for Teacher Education. The GLOBE@UoC focusses on bringing GLOBE into pre-service teacher education programs to facilitate interdisciplinary cooperation using inquiry based learning as a common approach, internationalization in teacher education, societal integration (e.g. migrants) and as a network to develop new research projects. With its 50,000 students, University of Cologne (UoC) is one of the largest universities in Germany. In addition, UoC is 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. Various teaching formats have been developed and implemented in the past years (see below). With these lectures we reach about 100 pre-service teachers each semester, which learn about GLOBE and which may implement it in schools once they become active teachers.

Funding by:

University of Cologne (until March 2019). Currently negotiations with the UoC rectorate are underway to apply for continued funding.

Cooperating organizations/individuals:

- Institute of Geography
- Institute of Physics Didactics
- Institute of Biology Didactics
- Center for Teacher Education
- Otto-Hahn-Gymnasium, Bergisch-Gladbach

International Collaboration within GLOBE network:

- Mount Royal University, Canada
- TEREZA Education Centre, Czech Republic
- NASA Jet Propulsion Laboratory, USA
- Southern Connecticut State University (SCSU), USA
- University of Toledo, USA
- National and Kapodistrian University of Athens, Greece
- GLOBE Swiss
- GLOBE Netherland

GLOBE areas:

- Atmosphere
- Hydrosphere
- Pedosphere
- Biosphere

Program implementation and recent activities:

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

- Understanding Science through Inquiry-based Learning and Participation provides examples of integrating science and educational research and facilitates internationalization in pre-service teacher education at home. 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 a practical approach to the basics of statistics using the GLOBE Database and GLOBE Visualization System.
- Scientific foundation and Environmental Education. One of the main aspects is measuring and analyzing data using the GLOBE protocols.
- Teachers and pre-service teachers achieved GLOBE certification through practical workshops performed by international experts. In addition, the workshops were accredited by the Hessian Ministry of Education as further education course.

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

Environmental Monitoring using Smartphones is funded by RheinEnergie Foundation. The project aims at developing new approaches to facilitate participation in environmental discovery and research, addressing students and citizens. Educational apps covering water (river monitoring, structural quality of rivers), soil (soil texture, soil type), plant (land use / land cover, phenology), atmosphere (cloud identification) and fauna (animal tracks) were developed. The apps are available in different languages and are integral part of the "Explore Nature, Explain through Research, Learn in your Environment (ENERLE)" concept. In the context of citizen science, we currently implement ENERLE on Learning, Exploring and Activity Paths (LEAPs), which are walkways in and around Cologne. For more information, see <http://www.geographie.uni-koeln.de/16602.html?&L=1>.

GLOBE eTraining modules have been edited and translated into German. The following documents can be downloaded at University of Cologne's GLOBE-Website (globe.uni-koeln.de).

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

A DataTool has been developed for macOS and Windows to facilitate upload and analysis of environmental measurements into the GLOBE database. Instead of form-based data entry using the GLOBE homepage, existing data can easily be imported as a CSV file from a spreadsheet and then edited, visualized and uploaded. The software is available for download at globe.uni-koeln.de

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
- Integrate GLOBE as a key component into UoC's strategic development goals for excellence in teacher education and internationalization

Greece

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Organization and Human resources

GLOBE Greece is supported by the University of Athens, an organization with wide scientific, educational and administrative capacities. The GLOBE Greece core team accounts four scientists supported by a small group of undergraduate students.

Funding by: University of Athens (some schools cover partly their expenses)

Cooperating organizations/individuals: Ministry of Environment, Municipality of Athens, National Observatory of Athens, Foundation for Research and Technology, Corallia innovation incubator, University of Cologne.

GLOBE schools: 29 schools (23 in 2017). All types (primary, 12-15 and 15-18). Both public and private.

GLOBE areas: Atmosphere, climate and hydrology. Emphasis is given to urban environment (for instance Land Use/Land Cover, Land Surface Temperature-Urban Heat Island-Urban Microclimate, Greenery).

Program implementation in the country and recent activities:

Training on the urban environment, mentoring for environmental technology applications, information on new educational products, dissemination of MASS results, link to the Copernicus Relay and Copernicus Academy of the European Commission, link to the Erasmus program in terms of school visits.

Overall contribution to the GLOBE program:

Participation to the Science Working Group of GLOBE, contribution to the reviewing process of the GLOBE protocols, co-preparation of two bundle protocols (urban and weather), support of the International Virtual Science Symposium (IVSS) 2018.

Plans and ideas for next year:

Enhancement of the link of the GLOBE activities to the ERASMUS program, reactivation of schools which have failed to stay active mostly in terms of data reporting, link and coordination of activities with Eco-Schools, activation in the framework of the H2020 research program of the European Union (theme: open schooling), pre-teacher GLOBE training at the University of Athens, increase the number of STEM professionals.

Ireland

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Organization and Human resources

GLOBE is coordinated in Ireland by the Environmental Education Unit of An Taisce. An Taisce is an Environmental NGO.

1 Full-time GLOBE Officer

1 Part-time GLOBE Manager

Funding by:

Ireland's Environmental Protection Agency is currently funding a two-year GLOBE pilot programme in Ireland. This agreement will expire in August 2019.

Cooperating organizations/individuals:

The Environmental Protection Agency is the lead strategic partner for GLOBE in Ireland and is an active member and contributor to the programme.

An Taisce is currently cooperating with the Department of Agriculture and is in advanced stages of discussion around developing a GLOBE soil project supported by the Department.

An Taisce is at an early stage of discussion with Dublin City University in relation to potential opportunities for assisting and advising on aligning GLOBE protocols and activities with the primary and post primary curricula in Ireland.

GLOBE schools:

Primary and Secondary schools are actively participating in the GLOBE programme. There are approximately 75 schools registered for GLOBE in Ireland, for the 2018-19 academic year.

International Collaboration within GLOBE network:

An Taisce was a collaborator on the 2018 International Air Quality Campaign and successfully implemented the programme in Ireland with some schools liaising with schools from other countries.

An Taisce was the host country for the 2018 GLE and worked closely with the GLOBE Implementation Office and various working groups in planning, preparation and delivery of the GLE.

GLOBE areas:

Due to the nature of funding and the early stage of the GLOBE programme in Ireland, An Taisce has focused on the promotion of the Atmosphere elements of the programme to date. This includes protocols related to weather and climate (clouds, temperature, precipitation, barometric pressure) and aerosols.

Program implementation and recent activities during 2018:

On 11th January 2018 An Taisce hosted a day of GLOBE teacher training to participating teachers. The event was well attended with 16 teachers present representing 13 schools and 4 staff members from the EPA present on the day. Following the teacher training in January, the teachers had two months to get ready for the Air Quality Campaign. Resources were shared to help them introduce GLOBE and the campaign to their students.

The spring Air Quality campaign was scheduled from March 1st to May 30th with two months for data collection and upload (March and April) and one month for data analyses and projects. Thirteen Irish schools contributed over 350 measurements to the GLOBE database over two months. The clouds protocol was the most commonly performed. Unlike aerosols, there was no weather limitation in performing the clouds protocol and students enjoyed observing the changeable sky. Thirty-five aerosol measurements were performed; the main limitation to measuring aerosol was unsuitable weather conditions).

The GLE took place from July 1st to 6th in Killarney, Ireland, with around 400 participants from 40 countries. The overall theme of the event was "Mountain, Woods, and Water: Developing a Sense of Place". The 200 students present had an opportunity to study the ecology of the Killarney National Park using GLOBE protocols and were initiated to the local history and folklore by the Park Rangers. They also presented their research projects and were given the opportunity to showcase their culture on cultural nights. Sessions for adults included professional development sessions for teachers and country coordinators, as well as theme-based working groups for GLOBE Partners. An Taisce presented a global overview of the Air Quality campaign to advertise the campaign to schools and country coordinators.

Plans and ideas for next year:

An Taisce plans to run an air quality campaign focusing on Nitrous dioxide in 2019. This campaign will act as a pilot project for a European Air Quality campaign supported by European EPAs and the European Environment Agency. There may be opportunities for the involvement of GLOBE coordinators in other European countries during the latter part of 2019 and 2020.

An Taisce intends to introduce the Soil aspect of GLOBE to Irish schools over the 2019-2020 academic year, in partnership with the Department of Agriculture. Teachers will be encouraged to undertake online training and carry out soil investigations and activities with their students.

Israel



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Cooperating organizations:

Ministry OF Education, Ben & Jerry's company, Globisens Company, Dlila Company. .

Participating schools: 132 schools :

108 Elementary schools, 22 Junior High Schools , 2 High Schools.

Funding by: Ministry Of Education. USA Grant .

GLOBE protocols: Atmosphere & Climate , Hydrology ,SMAP, Plants Phenology .

Description of the program and recent activities:

136 GLOBE Israeli schools are actively joining the GLOBE program in Israel from different sectors: Jewish Sector, Arab Sector, Bedouin Sector and Druze Sector. The Globe Program in Israel helps different teachers in charge of activities connected with environmental education even those who are not specialists. Some are trained, the majority use methodological guides and protocols which, suggest problem-situations on the theme of the environment such as: How to protect nature and how to implement Globe according their demands. GLOBE improves student understanding of science because it involves them in performing real science - taking measurements, analyzing data, and participating in research in collaboration with scientists. GLOBE students contribute data for scientists to use in their research.

Main Events 2018 :

1. **October 2018:** Opening Globe National Conference in Holon , where teachers and principals have met face to face from different sectors to be exposed to the Globe Program.
2. **October 2018 :** Opening a national workshop for new globe teachers .
A multiculture teacher meeting where science & culture meet together.
Recruiting new globe teachers for next year – Globe Meeting
Where teachers , globe students from different schools present their projects or Globe curriculum implemented in their different disciplines at school .
3. **March ,2018 :** Each globe school celebrate during the month "the Green Day"
So that students make different activities concerning the Globe Program for their community.
4. **May 2018 :**

The Israeli Globe Annual ceremony will be held among 26 best schools from different regions which are awarded for their science research campaign, others for their collaboration in the local level / international level others for entering the most data in the Globe website and also Best Globe Video Contest and for the first time Globe Digital Games .

Recent Photos :



GLOBE DAY IN Essawiyeh Elementary School- Jerusalem . Israel.



GLOBE Students in Der Hana C Elementary School . Der Hana , North Israel. Mosquito Protocol .

Italy



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Organization and Human resources

Globe Italia is coordinated by a group of 6 people, 2 Coordinators and a staff of 4 teachers of scientific subjects; one of them plays the role of webmaster. Two more people support the staff for communication and events. Globe Italy office is located in Labter-Crea (Territorial Laboratory - Reference Center for Environmental Education in Mantova and IISS Bassa Friulana Cervignano del Friuli (UD) a High secondary school.

Funding by:

European, National, Regional and from private foundations Calls for proposal. Municipalities and schools own budget.

Cooperating organizations/individuals:

Three scientists - one from University Department of Agriculture and Environmental Sciences (DISA) Udine, one from E.T.P.– Regional Laboratory of Hydrobiology of Friuli Venezia Giulia, and one from CREA-Center for Research in Agriculture and Analysis of Agricultural Economy, support the staff.

For specific projects, other organizations or individuals have cooperated, as showed below:

Progetto MINCIO - Agency for the River Po (AIPO), Mincio Territories Consortium Remediation (Consorzio di Bonifica Territori del Mincio), ARPA Lombardia, SAVI Laboratories & Service of Roncoferraro, a company highly specialized and certified in environmental analysis, volunteers of various groups such as Civil Protection, Mincio Park and Oglio Sud Park and ethnographic museums, experts in the management of hydroelectric power stations, the Mantova Diving Club, the Fishing Sport Italian Federation, etc. .

The Rivers of Spring – new partners: CNR-IBIMET FI, Bicocca University, Biodiversity National Center of Bosco Fontana, continua University of Parma, ARPA Lombardia and ERSAF Lombardia,

Progetto TERRITORIO e BIODIVERSITA'- ETP (Ente Tutela Pesca), ERSA(Ente Regionale per lo Sviluppo in Agricoltura), CREA (Centro per la Ricerca in Agricoltura e l'Analisi dell'Economia Agraria), Italia Nostra.

GLOBE schools:

81 schools are officially part of GLOBE program in Italy –This year about 10 Junior High School, 9 Senior High Schools, 8 Primary School and 2 Kinder Garden have actively taken part in Globe activities organized and coordinated by the offices of Mantova and Cervignano del Friuli. 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.

International Collaboration within GLOBE network:

Globe Italy is collaborating with UniUD- Udine University, UniUD is the one of Project Partner of Consortium Globe EU to build The PULCHRA project-Science in the City: Building Participatory Urban Learning Community Hubs through Research and Activation.

GLOBE areas:

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) and partners of the European Campaign.

Weather and aerosols.

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) or in School-Work Alternation

Program implementation in the country and recent activities:

MINCIO Project: Chemical / bacteriological investigation on the waters of the Mincio, Goldone and Osone rivers (28th edition) (Action No.10 Mincio River Contract) Many new features were introduced the 28th edition of the PM

- School-Work Alternation for the Convention between Parco del Mincio and IS Fermi;
- the inclusion of the PM in the Mincio River Contract,
- the re-joining to the project by three schools;
- two monitoring days instead of one;
- the intensification of the consultancy activity of ARPA Lombardia;
- the collaboration offered by the company SAVI Laboratories & Service of Roncoferraro, a company highly specialized and certified in environmental analysis.

The School-Work Alternation Project was proposed by the PARCO DEL MINCIO within a wider environmental education project approved and financially supported by Lombardia Region. The coordinator of Labter-Crea acted as a coordinating element of the whole project. For the 2018 edition, ARPA intensified its cooperation, to provide a real consultation for analytical instrumentation and evaluation of data collected during the survey. The SAVI company provided an extremely valuable collaboration to examine the water samples of the 16 stations, providing certified results for the analysis of Nitrates, Phosphates, Chlorides, Sulfates, Glyphosate (the most used pesticide in the world). In May and June the REPORT 2018 ON THE STATE OF THE WATERS OF MINCIO, GOLDONE AND OSONE was drawn up on the basis of the monitoring. <http://www.labtercrea.it/pm-2018/pm-2018.htm>

Projects WATER COURSES (SSPG Piubega) and NATURA IN MOVIMENTO (Primary School Piubega), IC Ceresara- Continuation and evolution of the Ma.Go. (acronym that stands for Marchionale and Goldone), which has carried out the investigation on the physical / chemical / bacteriological state of waters, shores and surroundings of some channels of the Middle and Upper Mantua. The first version of Ma.Go. Project was implemented by the Health-Environment Committee of Piubega and involved Mantua Province and ARPA Lombardia Mantua in a survey on the waters of the Seriona, Marchionale and Goldone canal basin. The results were presented in a conference held in Piubega April 23, 2013. In the same year a Training Course was designed and managed by Labter-Crea for the teachers of the Piubega schools, creating the premises for further projects such as **WATER COURSES**, made by all classes of the Low Secondary School of Piubega, and **NATURE IN MOVEMENT**, realized in the first three classes of the Primary School of Piubega. **RIO SCUOLE Project** -Purposes, objectives and organizational details are contained in the project text, available on the pages dedicated to it on the Labter-Crea www.labtercrea.it/progetto-rio/progetto-rio

EVENTS 2018* according to the GLOBE Hydrology, Land Cover, soil, aerosol, phenology protocols.**

The Rivers of Spring, World Water Day 2018 in Mantova, 18th edition- Since 2001 celebrates the World Water Day in Mantua, from 2017 constitutes Action n. 9.09 of the Mincio River contract. New prestigious partners in environmental research (CNR-IBIMET FI, Bicocca University, Biodiversity National Center of Bosco Fontana) offered noteworthy proposals while historical partners, such as the University of Parma,

ARPA Lombardia and ERSAF Lombardia, were present at full size. For the first time in its history, the event was able to benefit from a small but important sponsorship due to its symbolic meaning, by S.T.A. the water treatment company based in Valdaro. A small sponsorship, by San Giorgio Servizi srl, was due to the GREEN Band of Città di Mantova.

The event has featured scientific-environmental education laboratories, water excursions for sampling, analysis, artistic performances (musical, theatrical, etc.) aimed at the defense of water and other natural resources and the diffusion of alternative energies and energy saving. It is the largest Italian event and one of the largest in Europe, with its 3.000 overall participants, especially from schools of all levels.

<http://www.labtercrea.it/gma-2018/gma2018.htm>

A SCUOLA SUL FIUME XIX edizione (To school on the river, 19th edition):

On May 8th, more than 400 students and teachers of Junior and Senior High Schools monitored and studied the waters in Nord Friuli, Natural Park of Prealpi Giulie. 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. Checklist and ecological landscape are compiled according to some protocols provided by international environmental education project (GLOBE Project www.globe.gov, Act 4 Rivers project www.act4rivers.net). <http://www.globeitalia.it/?start=10>

Plans and ideas for next year:

To develop the study of indoor and outdoor **air quality** in schools, from Kindergarten to High schools, using also some of globe protocols.

To improve the activity of “**river contracts**” including various agencies, with the target to add active citizenship to water monitoring

To participate in ESOF 2020 Trieste (Italy), with good practices based on Globe Program, as examples in the Area **Science to Citizens**. This area aims to create a scientific citizenship for all and to promote the idea of science as fundamental to problem solving.

ESOF is the largest interdisciplinary science meeting in Europe focused on cutting edge scientific research and innovation. It offers a unique biennial platform for scientists, young researchers, entrepreneurs, policy makers, communicators and citizens for interacting and debating.

Kyrgyzstan

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Organization and Human resources (how many people work on GLOBE): 1 person

Funding by: No funding

Cooperating organizations/individuals: 1-2

GLOBE schools (what types, how many): Currently all inactive

International Collaboration within GLOBE network:

None, would like to develop partnerships with EU schools

GLOBE areas: We did Atmosphere, Hydrology and Phenology before

Program implementation and recent activities:

None. Planning Teacher training since 2015. Also would like to host Regional Meeting.

Plans and ideas for next year:

1. Host Regional Meeting of GLOBE CC
2. Regional Teacher training in August, 2019 (Kyrgyzstan, Kazakhstan, Russia)
3. Develop partnership with EU GLOBE schools
4. Apply for EU grants for 5 schools to buy equipment
5. To take part in Atmosphere and Phenology Campaigns

Latvia

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Organization and Human resources (how many people work on the GLOBE)

A number of people working for GLOBE depend on the occasion. Everyday coordination work is done by CC Krisjanis Liepins with help of Deputy CC Inese Liepina. On events like GLOBE National Meeting etc. other people – up to 3 – participate as well.

We have two GLOBE Trainers in Latvia – active and experienced trainer Ms Gunta Kalvane and Ms Ieva Kalka – new trainer undergoing a training herself at the moment.

Funding by:

- Ministry of Education and Science, providing funds for basic coordination of the GLOBE program;
- USA Embassy in Latvia, Latvian Environmental Protection Foundation – support projects to fund GLOBE activities;
- Schools, parents, local municipalities – support equipment costs, participation in different events.

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

GLOBE schools: 36 in total, active (have entered data and/or participated in projects/events) – 10

International Collaboration within GLOBE network (school partnerships, international projects):

We have no information about school partnerships done this year.

GLOBE areas:

From GLOBE areas where schools have reported data most popular by the total number of schools that have reported are:

TOP#	GLOBE investigation area	Total number of schools reported data	Number of schools reported data within the last two years (01.10.2016-23.10.2018)
1	Atmosphere	20	9
2	Earth As System	12	5
3	Hydrology	10	5
4	Soil	6	3
5	Land cover	2	2

Program implementation and recent activities:

1. The daily work in the project was performed in all project schools. One workshop was organized for the project teachers – hydrology protocols and organization of students research projects – and at the same occasion a workshop for students on how to retrieve data from GLOBE database and what to do with them.

2. On the March 13th, the Year 2018, the final conference of the project “Young Environment Explorers for Future Latvia”, made in cooperation with experts from The Nature Conservation Agency and Institute for Environmental Solutions and supported by the Latvian Environmental Protection Foundation. At this occasion, in a ceremony featuring Deputy Chief of Mission of the USA Embassy in Latvia Mr Paul Poletes, first 9 GLOBE Ambassador Schools were awarded. This new initiative started to reward most active schools in GLOBE data entry, research and GLOBE publicity.

3. On August 13-16 Latvian teachers and students participated in GLOBE Expedition in Estonia, organised by the GLOBE Estonia.

4. On August 21 CC Krisjanis Liepins participated in a workshop for teachers organized by the Institute for Environmental Solutions within the framework of the project “GrassLIFE - Restoring EU priority grasslands and promoting their multiple use”, where presented GLOBE programme and Soil protocols.

Plans and ideas for next year:

We plan to hold GLOBE Annual National Meeting at the very beginning of the January 2019. During this event, GLOBE Games involving local community and workshops about different GLOBE activities will be organized.

Two workshops for the project teachers per year are planned, next will be at the end of November or beginning of December.

On September 2019 we will celebrate the 20th anniversary of GLOBE in Latvia. On this occasion, we plan to award next GLOBE Ambassador Schools.

First GLOBE Ambassador Schools at the awarding ceremony with Mr Paul Poletes:



Lithuania

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In 2018 GLOBE program net in Lithuania involved 15 active schools. Teachers in these schools have been working for a long time in GLOBE program and thus they have reached a considerable knowledge and experience. Many of them have been working with the same protocols and methodic for many years. Some of them were interested in adapting new measurements and methods thus they have started to explore new subjects. Some teachers were very initiative about international cooperation, hence they were seeking for collaboration with schools in other countries.

Summer camp for the most active students and teachers has been held on 1-4th August. Environmental scientists and researchers introduced to the participants various scientific methods of observing, measuring and analyzing environmental parameters. Students experienced the scientific approach and familiarized themselves with various environmental processes. Students created environmental action plans, sustainable development strategies and discussed about how to achieve sustainable development goals. Additionally, teachers and students expressed their opinions about GLOBE activities in Lithuania. Their ideas, positive and negative feedback has been carefully considered and has been used for creating strategies for further GLOBE coordination in Lithuania.

In September, some schools have started to participate in Phenology campaign. On October there were some participating schools in Lake Measurements Campaign.

There were several changes in Lithuanian GLOBE coordinator position. Migle Simanaviciene has passed on the coordination to Julija Fediajevaite on March 2018 and Julija Fediajevaite has passed on this position to Grete Vaicaityte on October 2018.

REPUBLIC OF MACEDONIA

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Funding by: Ministry of Environment and Physical Planning

Cooperating organizations/individuals: Ministry of Education and Science, Faculty of Civil Engineering, Faculty of Forestry (University "St.Cyril and Methodius, Skopje), Hydrobiological Institute-Ohrid.etc)

GLOBE schools: Until now, we have included 28 schools, 15 secondary schools and 13 primary schools.

GLOBE areas:

Earth as a System, GPS Protocol, Land Cover, Atmosphere, Water, Phenology, Soil and GLOBE at night

Program implementation in the country and recent activities:

In the process of the programme implementation, we continue to encounter financial problems regarding the support for the programme for supply of new equipment. But, all enrolled schools remain enthusiastic for their work and continue using the available equipment. Despite of the constraints, a couple of actions and activities have been noted in relation to reporting data for several protocols.

In some schools, teachers use the GLOBE data and previous measurement results in other projects that are implemented together with international schools under the cooperation with the ERASMUS+ programme, and this way the data gains more value and recognition.

Earth Day Celebrations in Macedonia

Macedonian teachers and students celebrated Earth Day by a series of remarkable events organized at "Dimitar Miladinov" Elementary School in Skopje and the "Goce Delcev" High School in Valandovo.

"Dimitar Miladinov" Elementary School in Skopje

200 Macedonian students and 6 teachers joined activities that aimed to raise environmental awareness. Another 5 student teams from Italy, Spain, România, Turkey and India joined the event online.

Earth Day activities included planting of trees, cleaning up litter, or simply enjoying nature through hiking, gardening or taking a stroll in a local park.

On top of it, two events Plant a Fruit Tree and "Let's meet and know each other in the garden" - United with plants were held on April 20. Two more events called The Art of Recycling and School Festival of Innovations took place on April 23.

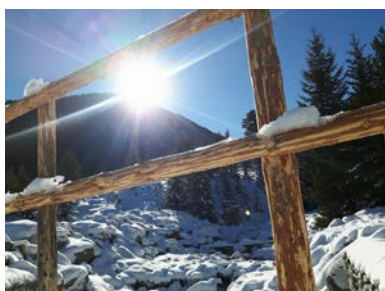


"Goce Delcev" High School in Valandovo

The "Goce Delcev" High School in Valandovo organized a competition to motivate students to create artworks with environmental protection topics in various subjects such as Macedonian, French, arts, music and etc. Students who participated in the competition were awarded and special prizes were given to those, who submitted the best work. Prizes were awarded on April 23, in honour of the Earth Day.



Awarded photographs



First place



Second place



Third place

Your plans and ideas for next year:

For the next year, if we manage to secure financial sources, as allocation in the Budget of the Ministry for the purposes of the GLOBE Programme, we will be able to procure chemicals, instruments and other requirements necessary for uninterrupted performance of the activities. We will indeed made additional efforts to organize a country workshop for all GLOBE teachers, aiming to motivate our national participants in the GLOBE programme and reinvigorate the work and contribution of the GLOBE activities.

Malta

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Organization and Human resources:

There is no one formally employed to work on GLOBE. The responsibility of promoting GLOBE rests mainly on the CC and his Assistant. This is done over and above their respective workloads in their respective institution. A group of around 15 trainers promote GLOBE in their respective school/training 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:

Currently there are none registered. An invite to enroll as Scientists / STEM Professionals was sent to the Malta Chamber of Scientists and to Science related academic centres, institutes and faculties of the University of Malta.

GLOBE schools:

Eleven primary schools (ages 5-11), five secondary (ages 11-16); and one post-secondary school (ages 16-18).

International Collaboration within GLOBE network:

Some registered schools will be integrating GLOBE with two Foundation for Environmental Education (FEE) programmes, i.e. Eco-Schools and Learning About Forests (LEAF)

GLOBE areas:

During the 2018-19 scholastic year we plan to support schools in the following areas: Atmosphere, Hydrosphere, Pedosphere, Phenology and Mosquito Protocol.

Program implementation in the country and recent activities:

During 2017 – 2018 eight schools were identified to initiate the GLOBE Programme pilot project on a national level; addressing the Atmosphere protocol. These schools are from the primary, secondary and post-secondary education cycles. Labdisc (Enviro) sets were purchased through funding from the US Embassy in Malta and the Directorate for Learning and Assessment Programmes. Training focusing on the use of this equipment was held in October 2018.



One teacher participating in the pilot project also attended the GLOBE Learning Expedition (GLE) held in Killarney Ireland between 1st and 6th July 2018. Dissemination of this experience with Primary Science teachers is scheduled for December 2018.

Plans and ideas for next year:

Support will be provided to the 17 registered schools. Eight of these schools will be monitored closely and evaluated to provide data on further GLOBE implementation. The official Globe launch ceremony is set for May and will involve sharing of experiences from the various participating schools.

Netherlands



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Participating schools:

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

Funding by:

Program funding:

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

Project funding:

- Training fee for course 'science education' with University Utrecht
- GLOBE Science School project (see below), funded by schools
- US embassy
- Ministry of environment (for water animals project)

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 CO₂ exhausted) using the respiration kit developed by RIVM
- **Phenology** with *Wageningen University*: (using the network www.naturetoday.com)
- **Water animals** with *Wageningen University*



Description of the program and recent activities:

Climate planet

Giant globe with 3d projection inside about climate change (live NASA satellite projections) was brought to the Netherlands for the month of November. In the screening of 35 minutes that was open to schools and the general public a teaser about GLOBE in the Netherlands was also projected.



GrowApp improvements

This GrowApp 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 2018 we have worked on some technical improvements of the GrowApp that will be launched soon. is used in the European phenology campaign: www.globe.gov/web/european-phenology-campaign

Science Fair for bilingual schools

We organized the GLOBE Science Fair for the third time. Students presented their research to scientists and to each other. The winning school received a cheque from the US ambassador to go the the GLE.



National Light investigation

We organized a national campaign where schools get free 'build it yourself' spectroscopes.

Students investigated 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.



Water animals investigation

We started a new national research project on small water animals together with Wageningen University. The new website gives a color grade to your water quality based on the animals that you catch. On hundreds of locations animals were caught and the campaign got attention on national TV, radio, news papers and the internet.

Poland

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Organization and Human resources

Since 1997 GLOBE Program in Poland has been coordinated by UNEP/GRID-Warsaw Centre (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 25 experts working at the Centre right now – 4-5 out of them have been recently involved in GLOBE related activities. 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 trainings, etc.).

Cooperating organizations/individuals: Program implementation in Poland is supported mainly by group of external experts and scientists cooperating with the Country Coordinator.

GLOBE schools: There are about 60 schools active in GLOBE in Poland (out of ca. 200 registered), 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. Our future goal is to get more schools involved in the biosphere investigations, phenology in particular (right now we have around 15 schools collecting data on greening up and greening down – 3 schools involved in school to school collaboration in the frames of the European Phenology Campaign). 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:

- National campaign “Observers of the Spring Sky” held as the part of GLOBE NASA Clouds: Spring Cloud Observations Data Challenge! (15th of March – 15th of April)

This campaign was organized to promote GLOBE among all citizens. 14 720 reports were sent to NASA during that time, from 2752 different places in Poland. Around 2500 observations were made by citizens scientists, including employees of our business partners (potential GLOBE sponsors) using GLOBE Observer app. Students from 30 schools got also involved – some of the teams consisted of more than 50 people! Two most active schools (Primary School no. 1 in Gora – 4431 reports and Janusz Korczak Primary School no. 10 in Tarnobrzeg – 2072 observations) won the special award – online lecture with NASA expert.

- “Colourful Kwidzyn” and “My river – blue Starogard” – two local projects implemented with the support of business partners.

Main goal of this project was to help 5 schools from two small cities in the northern part of Poland to join GLOBE Program. We organised trainings for 14 teachers on atmosphere, hydrology and biosphere research as well as outdoor lessons with around 150 students. To encourage and motivate children to start their own field observations, photo contest was planned.

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

- conducting face-to-face open GLOBE training for teachers “Do trees check the weather forecast?” in April 2018 with focus on biosphere and atmosphere research (in cooperation with GLOBE mentor-teacher from Primary School no. 88 in Poznan),
- encouraging teachers and students to get involved in European Phenology Campaign 2018 through school-to-school projects.

Plans and ideas for the next year:

In the next year we would like to:

- organise Students’ Science Seminar GLOBE Games 2019,
- get more students involved in school-to-school projects at national and international level and development of their own research projects,
- update/refresh our national website.



Students from Kwidzyn measuring tree height.



Students during cloud observation in the frame of GLOBE NASA Clouds: Spring Cloud Observations Data Challenge.

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 and recent activities in 2018

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.



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



**Rostov-on-Don,
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Switzerland

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Association GLOBE Switzerland: National implementation office in Berne, regional GLOBE implementation by mandates to five Universities of teacher Education (10-20% each).

Cooperating organizations: Members of [GLOBE Switzerland association](#) grouping Universities of Teacher Education and Scientific Institutions like University departments, Swiss Parks Network and a school book edition.

Registered schools: 199, most of them are public schools, secondary I and II.

General Funding by: Federal Office of Environment.

Project funding: Foundations, Federal Office of Meteorology, Climatology MeteoSwiss, Federal Office, Federal Office for Agriculture

GLOBE protocols: atmosphere, hydrology, phenology, soil, SAB; Landcover, Elementary GLOBE, GLOBE at Night

Funding of Trainings: Workshop fees and general funding for free training of single schools

GLOBE projects and activities with included international GLOBE protocols or GLOBE concepts:

- **LERNfeld:** Agriculture in context climate change and biodiversity. Funded by 3 foundations and the Federal Office of Environment, Division Biodiversity (2014-2016). GLOBE protocols (soil) and non-GLOBE protocols.
- **PhaenoNet:** Phenology platform. With integrated GLOBE protocols and non-GLOBE protocols. Funded by Federal Office of Meteorology and Climatology and Federal Office of Environment (2014-2016)
- Climate Change Education and Science Outreach Project (**CCESO**). With partners from education and climate research (4 Universities of Teacher Education, Oeschger Center for Climate Change, ProClim). Common development of education concept on climate change (inquiry based) based on curricula, elaboration of a model for teaching planning (all school levels).
- GLOBE in Primary: New project on effects of climate change on migration of white stork ("**Storchenforscher**", in german and french). Strong link to GLOBE phenology, Elementary GLOBE.
- Mein Rhein, project on water investigations along the Rhine
- European phenology campaign (GrowApp)

- We got the opportunity to get a partner in an exhibition in the Musée d'Histoire naturelle Neuchâtel concerning climate change in the poles, [Pôles-Feu la glace](#). We offer there diverse GLOBE activities, inclusive GLOBE trainings.

National GLOBE Protocols

Complementary national protocols (Biodiversity): Bioindication Makrozoobenthos and Landscape ecology (addition to intl. hydrology protocols) with [national database](#), Micro/Macrofauna, School pond, Invasive Neophytes (data are sent to [www.infoflora.ch](#) where they are used by science). Selected protocols from project [LERNfeld /Agriculture](#).

Development in Switzerland

We still are strongly working on regional GLOBE centers. The regional GLOBE centers are now all integrated in Universities of teacher education. The idea of this collaboration is to integrate GLOBE in preservice teacher trainings and to invite the Universities to offer public teacher trainings on GLOBE. The five Universities PH St. Gallen, PH FHNW, PH Luzern, HEP BEJUNE and SUPSI are working hard on this objective. By these efforts we have a strong national network into all regions of Switzerland. The challenge is the communication between the regions (language, different curricula and teaching cultures). What needs a lot of resources: The translations (website, documents, newsletters...).

We organized now successfully first national meetings for all involved responsible of regional GLOBE centers to train together GLOBE protocols and data entry/visualization and to exchange experiences. We realize that these meetings are very important to guarantee a common and standardized implementation of GLOBE.

To enhance activity and data entry in **Atmosphere protocols** we follow our pilot project: We loan out weather stations inclusive the instruments to motivate schools to start measuring. Many schools don't have the funds to buy one, unfortunately. We have many interested schools and we make one-to-one training in school area after having arranged weather stations. We hope to motivate them to make a lot of data entries in future. We are making now enhanced fundraising to get more funds for additional weather stations. The first results in the last six months are very positive.

In our newsletters to GLOBE Switzerland community we regularly write about GLOBE offers and campaigns.

And a great student team was participating in GLE in Ireland. They have done very interesting investigation projects in advance and were highly motivated to meet other students from all over the world.



And last but not least: The GLE Team was invited by US Embassy in Bern to present their research projects and to talk about their great experiences in Killarney, Ireland. The event has been a great success for all participants. [GLOBE Star](#) for this event.

As in the last years our plan for the next year is to set a priority on enhanced trainings of GLOBE RegioTrainers and to get more data entries. And we would like to enhance international collaboration!

Ukraine

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Organization and Human resources

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 a part of a program of national integration into European and world educational space.

There are two 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, Chernivtsi, Ivano-Frankivsk).

Funding by: Main funding: Ministry of Education and Science of Ukraine.

Cooperating organizations/individuals:

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 and others.

GLOBE schools

There are 528 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.

International Collaboration within GLOBE network:

International Collaboration is carried out within the framework European Phenology Campaign:

1. Ivano-Frankivsk City Environmental Station cooperated with Shaab School, Israel;
2. Dunaivtsi City Young Naturalists Station – with ZŠ a MŠ Píšť, Czech Republic;
3. Yarevysche Secondary School with ZS J.A.Komenskeho Prerov – Predmosti, Czech Republic;
4. Chernivtsi Regional Ecology and Nature Center for Youth – with Gimnazija Vukovar, Croatia.

GLOBE areas:

The most popular areas among Ukrainian GLOBE students is Phenology (GreenUp/GreenDown), as well as Atmosphere (Air Temperature, Cloud observations, Barometric Pressure, Precipitation). Some teachers have joined to Local Lake Challenge this year and have made measurements of Water Temperatures, Water pH.

Program implementation in the country and recent activities:

Today GLOBE in Ukraine includes about 50 active schools and teachers almost from every region of Ukraine. There are total amount of 37,951 data entries and 108 honor rolls (20 awards for the Phenology for the mentioned period), Cherkassy school # 30 has obtain the best animation on European Phenology Campaign

from November 2017. Zhoravsky secondary school collaborates with Udachnenska Secondary School in Phenology.

In 2018 GLOBE in Ukraine has worked on several tasks:

- Provided training and support for existing GLOBE teachers and schools;
- Engaged students and schools in GLOBE events, competitions and campaigns;
- Involved new teachers;
- Developed translated instructions.



GLOBE Games Ukraine

On 25-28 of June GLOBE Ukraine held the GLOBE Games for students who participate in the GLOBE Program in Ukraine. The event took place in National Ecology and Nature Center (Kyiv, Ukraine). Traditionally during four days students, teachers and scientist worked together participating in interesting workshops, science games and other activities. The teams competed among themselves in the game quest on the territory of the National Ecological and Naturalistic Center. At each point the participants had to solve proposed tasks in certain areas of research in the GLOBE program.



This year we have cooperated with Teambuilding School and Youth Training Club Crew-Leader. As a result of simple but at the same time interesting games in the teams, the all participants have united in a single whole and have felt themselves ready-witted, strong, friendly. All the participants got an unforgettable impressions of communicating with each other, jointly solving the tasks presented, having fun. Also was organized a School of Crafts, where every participant could relax after scientific trainings.



Annual GLOBE workshop for teachers

From 12 to 14 June teachers from Ukraine were participating in annual GLOBE workshop that took place in Ivano-Frankivsk, Ukraine. Workshop was organized by National Ecology and Nature Center together with Ivano-Frankivsk City Environmental Station and was held in the traditional format - conference combined with GLOBE training. During 3 days teachers from 13 regions of Ukraine were presenting their work, sharing experiences and discussing ideas for GLOBE implementation. During the workshop teachers were trained on some kind of Atmosphere, Biosphere, Hydrosphere Protocols. The scientists from Carpathian National Nature Park accompanied them. In the end all participants received GLOBE certificates.

The focus of this year's meeting was on working with an international web site. Some scientific trainings were conducted outdoors, which made this meeting bright and unsurpassed. Also, the participants met with students from Ivano-Frankivsk City Environmental Station who visited Israel in GLOBE collaboration. Students shared the impressions from meeting with their peers from the partner school, presented their results and demonstrated a Globe room.



Plans and ideas for next year:

- Conduct traditions annual events (annual seminar for teachers, GLOBE Games 2019).
- Participate in European Phenology Campaign, Tree Around GLOBE Campaign and others.
- Conduct regional workshops in active regions.
- Translate new GLOBE protocols on soil and hydrology.

Technology Working Group

Purpose of our WG:

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.

Members:



Activities:

For the last year we have been supporting SSAI team, working on:

- Further reorganization of the GLOBE website, incl. brand new Spheres landing pages (<https://www.globe.gov/do-globe/globe-spheres>)! In all over 100 new enhancements and changes were incorporated with a new design across GLOBE countries, 34,000 schools, 135,000 users and over 200,000 website pages.
- Development and updates of GLOBE apps, incl.: new Landcover App for GLOBE Observer (Adopt-a-Pixel),
- Re-designing of the Visualization system – to make it more user-friendly and help to take advantage of all data collected time-laps function was added.

We will continue this work over the next year. Moreover, we would like to focus on possibilities of implementation of great interactive technologies, such as Virtual Reality (VR), into GLOBE – use of 360 photos and sphere videos, 3D googles, etc. in environmental research and monitoring.

Dear CCs, trainers and teachers, would you like to support our work, sharing your experience and providing feedback on the technology used within GLOBE? We really appreciate your help! 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.

Contact:

Ela Wołoszyńska-Wiśniewska, Chair of the Technology WG, e-mail: ela@gridw.pl

Science Working Group

(contribution by C. Cartalis)

What topics did you discuss during the year?

- 1) GLOBE's Strategic Plan for 2017-2022
- 2) Tools to support environmental research at the school level.
- 3) The utility of GLOBE protocols on the basis of such criteria as: number of data reported, number of workshops where the protocol was trained, number of countries that apply the protocol, number of IVSS projects (using which GLOBE protocols), importance to the curriculum, number of papers published, number of community impacts
- 4) The need to revise running GLOBE protocols.
- 5) New protocols for use in GLOBE (indoor air quality, trees height, etc.).
- 6) The development of bundle protocols for such themes as ENSO, soil, lakes, urban, weather, mosquitos, etc.)
- 7) The use of satellite data in the GLOBE world.
- 8) The IVSS 2018.

What are the outputs?

- 1/ A thorough revision of GLOBE protocols for use in schools.
- 2/ Blogs developed and uploaded in the web site of GLOBE, in support of setting, organizing and conducting environmental research at the school level.
- 3/ A 1st version of bundle protocols (lake, mosquito, urban, etc.).
- 4/ Support of IVSS 2018.

What are the plans for next period?

- 1/ Implementation of Strategic Goal 4: Increase the number of projects focused on environmental awareness and contributing to environmental benefits
- 2/ Finalization of bundle protocols – dissemination to CCs and GLOBE scientists for expert advice.
- 3/ Completion of research guide.

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

Yes, CCs will be asked for their opinion and proposals, for instance in terms of the bundle protocols or the means to implement SG4.

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.

Evaluation Working Group

The purpose of this group is to collect information to find out how the Program affects its participants, to identify evaluation tools and resources and build on the existing experience to provide suggestions that can help its implementation and outcomes.

Achievements for Year 4

1. One pager for funders

This document presents the benefits that students gain from participating in the GLOBE program and provides this more formal presentation to give to potential funding agencies. Available in English, French, Spanish, Portuguese, and Arabic.

2. New Haven Protocol Training

Participants' impressions (2017 Annual Meeting). Reports for: Atmosphere, Hydrology, Soils, Land cover and Mosquitoes.

Both available at: <https://www.globe.gov/about/impact-and-metrics/globe-teacher-survey>

3. Recorded webinar: 'What do we do in GLOBE? Why evaluate'?

www.youtube.com/watch?v=xmDiGmS2O7Y&feature=youtu.be

4. Evaluation surveys for the GLE:

- ▶ A Professional Development evaluation survey for GLOBE adults that participated in the sessions.
- ▶ An Annual Meeting and GLE evaluation survey for all the participants.
- ▶ A Student Experience Evaluation survey for all the students who participated in the GLE.

Available at the GLOBE website.

Currently working on:

a. Set of three questions for teachers. Developed in Ireland. We have had responses from teachers in Estonia, the Czech Republic and Croatia. Responses still being collected. The questions are:

1. How have you seen your students benefiting from participating in GLOBE (knowledge, skills, attitudes)?
2. Recognizing that there are many other environmental education programs, why do you include GLOBE in your activities?
3. Help us identify the key questions that YOU would like to answer about the impact of the GLOBE program.

b. 'Attitudes towards science' test being developed to share - at a pilot phase- with the Irish GLOBE team.

Education Working Group

Members:

1. Jessica Taylor, Chair, USA
2. Henry Saunders, Vice Chair, Trinidad and Tobago
3. Lynne Hehr, USA
4. Yaqoub Yousuf Ali AL-Balushi, Oman
5. Francis Wasswa N. Nsubuga, Uganda
6. Binoda Sabata, India
7. John Ristvey, GIO Liaison
8. Diana Garašić, Croatia

Working areas and focuses:

Educational Resources

School Collaboration Blogs

Field Campaign Reviews

Teacher Recognition Ideas

Special Focus in 2018: Updates to GLOBE Trainer Certification Process

- Input and feedback from the Region is needed
- Two main categories: **1. Trainer and Mentor Trainer (changed title and role of Master Trainer)**
- Defining requirements for each category

A) Trainer

- List of requirements done by EWG
- Certification includes documentation and observation (alive/video) by mentor trainer.
- Mentor uses rubrics, review documentation and makes report to CC/ RCO

B) Mentor Trainer

- List of requirements done by EWG
- Certification includes documentation and observation (alive or video) by another mentor trainer.

Plans for 2018-2019

- Show evidence that students' data are analysed scientifically during the year
- Develop / Customize a School GLOBE Action Plan during the year
- Demonstrate evidence of curricula integration of GLOBE skills
- Organise at least one GLOBE Promotional activity during the year
- Show evidence of knowledge of the latest GLOBE Strategic Plan by organizing at least one activity related to SP
- Must show evidence of getting at least one new staff member involved in GP

<https://www.globe.gov/globe-community/globe-working-groups>



THE GLOBE PROGRAM

Europe and Eurasia

2018 Country Reports

GLOBE Program Region Coordination Office Europe and Eurasia

Regional Meeting - Toulouse, France

12.11.2018 - 16.11.2018