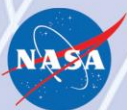


GLOBE BRAZIL

ANNUAL REPORT

2018/2019

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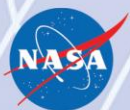


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THE GLOBE PROGRAM

INTRODUCTION

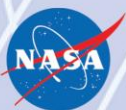
The GLOBE Program in Brazil has had a strategic shift in 2018/2019, promoting Citizen Science with Brazilian Space Agency's new partnerships. The present report will show our workshops in the reported period and how we have addressed GLOBE with the Ministry of Science, Technology and Communications (MCTIC) and a "Science in Schools Project" to get started in 2019's second semester. The Agency will grant six teachers or young academics that will partner with schools in four regions of Brazil, conducting research and contributing to the formation of new citizen scientists.

According to GLOBE-NASA¹, to date, 22,250 scientific observations have been made on the program's website. 21,229 observations related to the Atmosphere protocols, 968 to the Hydrology protocol, 53 were Land Cover observations.

In 2018/2019 period, we were in the Amazon region and managed to disclosure the Program in each state of Brazil. Four workshops were made in total, with thousands of Citizen Science miles traversed.

¹ Statistical data for this note were taken from the Globe NASA website on 7/19/2018. The website is available at www.globe.gov and is the responsibility of NASA Goddard Space Flight Center.

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EDUCATION

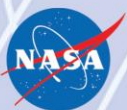
On August 15, 2018, the GLOBE Program arrived for the first time in the north of Brazil, Manaus. With Renée Codsí and Inês Mauad's presence, the motivation of teachers and students to participate in Zika research and science since elementary School was obvious.

In Brasília, about 35 people were trained on September 24, 2018. With representatives of the Federal District Department of Education, the third event held in the country's capital took place this time at the Brasilia Planetarium. Teachers attended the event from the Brasília Department of Education, regular education, undergraduate students and health professionals, as well as the training of Planetarium staff.

Returning to the northern region of the country, this time the workshop took place in the city of Leticia, at the Ethnographic Library and Museum, in the border of Tabatinga (Amazon region). It was a triple frontier effort in partnership with Brazil, Colombia and Peru, on May 3, 2019. We trained almost 140 people, Brazilians, Colombians and Peruvians. Representatives of the Department of Education, the Federal Institute of Amazonas, and the Central Control Zoonosis also attended the event.

The last CMT (Country Mosquito Training) was Recife's turn, on August, 12, 2019, with teachers from *Secretaria de Educação de Recife*, Professors from Pernambuco State University and Representatives of the Department of Education from the city of Recife. The American Consulate in Recife offered great help to make this event a successful one, and for the first time, we will apply an e-training developed by the Brazilian Space Agency to follow up with teachers and Professors who attend workshops, CMTs and LMWs (Local Mosquito Workshops).

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SCIENCE

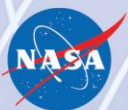
One way to call people to be in the GLOBE science network is through virtual Science fairs. In the 1st semester of 2019 we launched a Virtual Science Fair. The Science Fair offers to the winner School a trip to the Hell's barrier Launch Center. Teachers and students from High School and Elementary School are participating with projects and the team that does the best protocol research will get there with all their expenses paid by the Brazilian Space Agency.

From another perspective, we want to work closer with the "Earth as a System" idea. Nature Sciences university courses have as their main objects of study the diversity and functioning of life, the history and organization of planet Earth and the universe, using knowledge of physics, chemistry, biology, mathematics and geosciences.

The city of Planaltina, Northern Region of Brasilia, currently occupies the second highest rate of cases of Dengue. We are working on a Community Action within the University, through the training of Campus students, who work directly with the schools of the region with the GLOBE Program protocols.

Last but not least, we have started a space epidemiology research inside the Brazilian Space Agency. One of our staff members is now working part time on our attempt to unite GLOBE mosquito with space data such as Dipteron UG examples. This startup pilot is going to start running in the city of São Jose dos Campos next October with an application for detecting aedes mosquito risk areas. We also had the great opportunity offered by MCTIC to work with fullbright scholarship winner Nancy Songer. She has already met with AEB several times to discuss GLOBE implementation in Brazil. Dr. Songer has great experience in education national policies and we are already benefiting from her advices.

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THE GLOBE PROGRAM

TECHNOLOGY

Considering the reality in which the GLOBE Program is inserted in Brazil, through the Brazilian Space Agency, a proposal for a local remote sensing protocol emerged. We aim to disseminate this technology in school education, encouraging adolescents to vocation in space, understanding natural resources and how remote sensing data can assist in this task.

Thus, we have managed to plan and finance, through the Brazilian Space Agency, the Brazilian Space Olympiad, that will happen in August/September 2019 through 3 regions in Brazil (the first edition will occur parallel to the latin American and Caribbean Meeting in Natal). The Olympiad will promote GLOBE Workshops with specialist Russanne Low and at the same time compare images obtained by remote sensing, taken by satellites, with images obtained by drones in field work, making a vegetation analysis. Conclusions will focus on naturally occurring changes and impact of human activities such as deforestation and burning.

With this proposal, we seek to work on fundamentals and applications of remote sensing; use of the electromagnetic spectrum to obtain vegetation information as well as tools for collecting and analyzing remote sensing data; use of temporal data to characterize man's action on the environment; the use of images of different resolutions for local studies. In addition to integrating data from photographs, thematic maps and field trips, the students will learn and characterize where they live and how to interact with the surrounding landscape.

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COMMUNITY

Looking to strengthen the program in the country through local actions, we are studying cities that are severely affected by dengue/zika mosquitoes. Also, with the MCTIC/AEB initiative, we will grant six people in four regions of Brazil, in order to expand the GLOBE program, inspire the next generation of scientists and make connections with institutions that have similar missions.

The next workshops follow the schedule below:

Agenda, 2nd semester of 2019:

Regional Meeting LAC, Natal/BR: August 28-30.

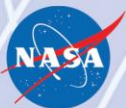
GLOBE Workshops Natal/CVT: August 29 and 30.

GLOBE Workshop Alcântara/MA: September 1st.

GLOBE Workshop Florianopolis: September 4th.

GLOBE Workshop Brasilia: September 6th.

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COMMUNICATION

We are aware of the urgent need of having a GLOBE Brazil website and audio-visual pieces, and these are our next projects. Still, every time AEB throws a new workshop we get media coverage. When the MCTIC/AEB project to expand the GLOBE Program gets started, in 2019, we will have one intern in AEB working full time on communication, since we will have representatives in four regions doing continuous work for GLOBE for, at least, one year.

An example from our CMT in Recife, August 12, 2019:

Brazilian Space Agency trains Pernambuco teachers to combat Aedes Aegypti - *Diario de Pernambuco*

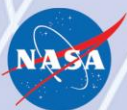


Brasília, Brazil – August 14, 2019

Brazilian Space Agency - Space Transport and Licensing Directorate
Director : Paulo Vasconcellos – Coordinator : Michele Melo

Credits : Nádia Kornijezuk – GLOBE Brazil Country Coordinator; Amélia Onohara – Brazil Deputy Country Coordinator; Ruth Muniz - Intern

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