

Dear Marinela Labas, Ira Beck, and Jelka Škoton,

Badges are posted! The judges were very impressed with all of the hard work by our GLOBE students. Check out the student project page to see what badges your students earned! (The badges are posted on your school page.) Comments from judges are at the end of this email. Judges scores are based upon the 2017 GLOBE International Virtual Science Symposium scoring guides.

Thank you for participating in the 2017 GLOBE International Virtual Science Symposium and we hope to see a project from your school next year!

**Project Title: *Tempora mutantur (Times are changing), what about aerosols?***

*Aerosols play an important role in air-quality. Some are dangerous to human health, often cause respiratory problems. Is the composition of aerosols changed within a day or whether the size of dispersed particles is also changed considering the change of climatic conditions? Are the changes of aerosol composition seasonal? How important are the wind direction and measurement's stations location? We measured quantity of aerosols in the air at our school yard; air temperature, barometric pressure and wind direction from 1.1.2014. to 18.03.2016. Data for Lycée de la Mer, France and Vågsbygd, Norway are taken from GLOBE base. We concluded that average spring AOT value was higher than winter's therefore the value of aerosols changes seasonally. Repeated daily measurements show that the amount of aerosols change, but it's not consistent trend, therefore, not to be associated with the time of day. For AOT data and the wind direction, it is evident that the value of AOT Red increases by wind blowing from across the mountain. Comparing to Lycée de la Mer's shows that the average values of AOT Green are larger at Vrapče for AOT Red at Lycée de la Mer AOT values compared with temperature and barometric pressure showed no proportionality.*

**1. The report contains all of the criteria very well developed and makes clear connections among them and the students use the Globe data in the research. The research really makes connections between local and global impacts. The idea and purpose of the research were excellent and relevant to the planet. The report is well organized, neat and well presented. The writing is clear and concise. The analysis was concise and very well demonstrated and the research was coached by a STEM professional to help them during the project analysis and the research .**

**2. Project was thorough, well-planned and informative!**

**3. Excellent project. The video was also very informative and extremely engaging.**

**4. The report was very well-organized and there is very little by way of shortcomings. Some of the research questions were answered based upon the methodology and data analysis. With respect to variations related to diurnal cycle, it would be useful to take data multiple times for several different days to produce enough data to make more definitive conclusions. It was great to see such great collaboration among team members, and also with scientists and other schools. Very impressive project.**

**Project Title: *Light pollution and our sleep***

*In our research area we met with strong light pollution, and because it's negative influence on life course we wanted to find out could we prove it's influence on sleeping disorder, too. We were researching that problem in our environment using GLOBE protocols for relevant type of observing. 109 students during 2 school years – 10 cycles made 6270 measurements according GLOBE at night project's calendar visibility of the stars. Observing area was divided in 3 zones according city map. They also collected data for: type of settlement, position of a bed related to public lightning and other sources of artificial lightning, sleeping quality and possible causes for lack of sleeping. Collected data about constellation's visibility magnitudes values were statistically analyzed, graphically presented for each group (so that we could see if every group noticed the same visibility trend, further processed, compared and analyzed in Microsoft Excel program). Some data were downloaded from our GLOBE base and from National hydro-meteorological institute data base. Results and conclusions are: problem is bigger in center than in wider area and it affects sleeping quality but there is no significant connection with air humidity*

**1. This is a fantastic research project. It is a brilliant idea on how to use the GLOBE at night data with sleeping pattern. It is a great data collections (2 years and 100+ students). Here are my questions.**

**(1) You have divided your study areas into three categories: inner, wide and wider centers and tested the light pollution by using GLOBE at night protocols. In order to analyze your data better, what kind of statistical analysis should you use?**

**(2) For the sleep data, how do you control for individual differences between students in three areas?**

**(3) What are other GLOBE protocols that you might measure in order to gain a better understanding about this?**

**2. Great project and keep doing this great work. The report is well written. The study is long enough to get volumes of data sets.**

**3. The specific laws that effect your research should have been shared. I learned a lot about my sleep and light pollution from your presentation. It was presented at a level even younger students would understand. A link to the data form the 2 school and 109 students should also be posted on the presentation. The maps from Goggle Earth really help the presentation and the understanding of the region being examined. Connection with STEM professional is good to see.**

**4. The presentation was organized and really showed and understanding of the problem which is really a global problem and effects everyone. You used the STEM motto to engage and organize your thoughts and that was wonderful!**

**Julie Malmberg, Ph.D.**

**Education, Outreach, and Technology Specialist**

**The GLOBE Implementation Office**