

# Preview of Award 1950139 - Annual Project Report

## Cover

Federal Agency and Organization Element to Which Report is Submitted:

**4900**

Federal Grant or Other Identifying Number Assigned by Agency:

**1950139**

Project Title:

**Preparing and Supporting Bilingual STEM Teachers in Puerto Rico**

PD/PI Name:

- **Carmen Bellido, Principal Investigator**
- **Juan J Lopez-Garriga, Co-Principal Investigator**

Recipient Organization:

**University of Puerto Rico Mayaguez**

Project/Grant Period:

**10/01/2020 - 09/30/2025**

Reporting Period:

**10/01/2020 - 09/30/2021**

Submitting Official (if other than PD/PI):

- **Carmen Bellido**
- **Principal Investigator**

Submission Date:

**09/30/2021**

Signature of Submitting Official (signature shall be submitted in accordance with agency specific instructions)

**Carmen Bellido**

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## Accomplishments

### \* What are the major goals of the project?

The Preparing and Supporting Bilingual STEM Teachers in Puerto Rico program has the following goals and objectives.

Goal 1. Respond to the critical need for highly effective mathematics, science, and engineering teachers by increasing the number of highly qualified UPRM STEM majors preparing to become STEM teachers.

Objective 1: Increase the number of highly qualified UPRM STEM majors preparing to become bilingual STEM teachers.

Objective 2: Support UPRM STEM Noyce Scholars efforts to become certified STEM teachers.

Objective 3: Assist UPRM Noyce Scholars for up to two years in a teaching position (Induction).

Goal 2. Develop a culture at UPRM in which undergraduate STEM majors are encouraged and supported to become bilingual STEM teachers in high-need educational agencies.

Objective 4: Integrate the STEM learning activities generated by UPRM STEM outreach programs into STEM Methodology and Teaching Practice courses.

Objective 5. (in response to recommendations of the evaluation of the proposal) Use of Rosetta Stone English program to practice language skills and evaluate English proficiency to ensure they can communicate effectively at a professional level in English as a second language, given Spanish as their first language.

The UPRM NoTeS program also aims to enhance and expose highly qualified STEM majors to become teachers and strengthen their STEM education experiences using the GLOBE (Global Learning and Observations to Benefit the Environment and NASA Educational Materials). Pre-teachers' STEM experiences imply that each UPRM NoTeS scholar will learn the use of the GLOBE electronic page ([www.globe.gov](http://www.globe.gov)) and will support their cooperating teacher to learn about it. Thus, the process will facilitate STEM teachers to implement NASA, GLOBE STEM learning activities in classrooms, improving their students' STEM environmental knowledge, concepts, and hands-on activities. In addition, each NoTeS Scholar will align at least one GLOBE existing STEM learning activity with the Puerto Rico Department of Education Standards and distribute it via the UPRM Teacher Web Tools page.

**\* What was accomplished under these goals and objectives (you must provide information for at least one of the 4 categories below)?**

Major Activities:

**Recruitment efforts to increase UPRM STEM majors to become STEM teachers.**

The NoTeS program in the University of Puerto Rico at Mayaguez (UPRM) Teacher Preparation Program (TPP) 's recruiting efforts included the following strategies:

Well-crafted emails were sent to STEM majors enrolled in education elective courses explaining the UPRM NoTeS program and inviting interested, qualified STEM majors to apply for the scholarship during October 2020 and again in January and May 2021. The objective was to recruit highly qualified Scholars from the two UPRM STEM colleges: Engineering and Computer Science; and Arts and Sciences (biology, chemistry, physics, mathematics, and geology). All recruiting efforts included the scholarship qualification requirements. The interested potential NoTeS Scholars filled an online application form indicating their qualifications and interest in becoming a STEM teacher.

Three informative online meetings (October 15th, 2020, January 26th & May 4th, 2021) were held to present opportunities, benefits, requirements, and the process for applying to the NoTeS program to interested STEM students. In the October 2020 and the January 2021 orientations, 15 STEM majors enrolled in education courses participated. The May 2021 online orientation was advertised through the UPRM mass email to explain the 2021-2022 academic year NoTeS program, with 132 participants.

We have distributed and posted 34 posters on strategic campus bulletin boards to entice potential NoTeS participants. The posters explained requisites and benefits and contact information to inquire or apply to the NoTeS project. Due to the COVID lockdown and every course moved to the online modality, the proposed face-to-face to STEM and education elective course classroom visits to advertise NoTeS were impossible. Instead, during October 2020 and January 2021, information about the NoTeS project was distributed by email to 12 Education and STEM selected professors. The emails included

information the professors would present to their students in their online courses explaining the requisites and benefits of the NoTes Program to STEM majors.

In October 2021, ten STEM students enrolled in the Teacher Preparation Program applied to the NoTeS program. Of those, seven complied with all requirements to receive the NoTeS scholarships. The other three applicants were invited to become NoTeS program affiliates, and they did accept. Program affiliates were invited to participate in the professional development activities, including access to the Moodle website, without receiving the scholarship money.

### **Support UPRM STEM NoTeS participants to become certified STEM Teachers and Integration of UPRM Outreach Program into Methodology and Practice Courses.**

The NoTeS program provided participants with orientation and mentorship about a variety of issues, including courses needed to finish the Teacher Preparation Program curricular sequence (September 1st, 2020) and Puerto Rico's Department of Education (PRDE) requirements to become a certified teacher for secondary math or science (October 6 & 8, 2020). A needs assessment form was sent to prepare us better to address their necessities, particularly on challenges of online teaching and learning using the MS Teams platform adopted by the PRDE (a workshop was offered on September 3rd, 2020). During the Fall Semester, NoTeS scholars and affiliates were enrolled in a Moodle course containing online professional development modules, including UPRM outreach education activities (NASA, GLOBE, Sea Grant), an online forum for exchanging day-to-day information progress, successes, and challenges among the community of Noyce Teacher Scholars. On November 12th and December 15th, 2020, these professional development interventions included an introduction to the program, its web page, general protocols, GLOBE citizens, and measurements and data importance for learning, schools, environment, and society. In addition, two sets of evaluations were carried out during the process, where seven scholars and two affiliates participated.

All seven scholars and one affiliate took and passed the methodology course in the fall semester, and all spring semester participants passed the science teaching practice course with a grade "A". These are two of the last courses needed to complete the Teacher Preparation Curricular Sequence.

During the spring semester, two online activities were held with NoTeS participants and affiliates. The first was a meeting on February 25th to kick off the semester, present the semester plan, Moodle activities, Rossetta Stone follow up, and check on the participant's needs for the upcoming PCMAS test. The second was the professional development workshop on NASA educational materials offered on March 4th, 2021.

### **Assist UPRM Noyce Scholars for up to two years in a teaching position (Induction)**

In May 2020, each scholar and affiliate were assigned a mentor professor who has met individually with each one at least once a month from June to August 2020 to keep track, coach them and follow up on their certification process and job search as a teacher. Of the seven scholars, six initiated the certification process, and two already have obtained the teacher certification from PRDE, and two are working as teachers in high need schools.

The NoTeS personnel will keep track of Scholars during the period between completing the certification process and finding a teaching position, communicating any temporary teaching opportunities that arise in Puerto Rico and potential teaching positions in high-needs schools on the mainland. We organized an online teacher recruitment orientation with the New Haven District of Connecticut on May 7th and have sent eight communications of potential teaching positions from May 2020 to September 2021 to NoTeS participants and affiliates. Plans are in place to continue the individual mentoring for each NoTeS Alumni for the next four years.

**Use of Rosetta Stone English program to practice language skills and evaluate English proficiency to ensure they can communicate effectively at a professional level in English as a second language, given Spanish as their first language.**

To evaluate scholars' English proficiency, the seven scholars that started in NoTeS in the Fall Semester and one affiliate took a test on the Rosetta Stone Platform. Six scholars and the affiliate obtained, in the pre-test, a proficiency level of "C1: Advanced", according to the Cambridge English Qualifications. People who fall into the "C1: Advanced" category show high-level qualifications, which means they have the language skills that employees and universities require. NoTeS participants can communicate effectively at a professional level and express themselves with a high level of fluency. One of the scholars achieved a proficiency level of "B2: First". A "B2: First" qualification means that the future teacher has the language skills to live and work in an English-speaking country. During the 2020-2021 academic year, they had the opportunity to practice their English language skills and fluency using the Rosetta Stone Platform.

**Specific Objectives:**

Objective 1: Increase the number of highly qualified UPRM STEM majors preparing to become bilingual STEM teachers.

Objective 2: Support UPRM STEM Noyce Scholars efforts to become certified STEM teachers.

Objective 3: Assist UPRM Noyce Scholars for up to two years in a teaching position (Induction).

Objective 4: Integrate the STEM learning activities generated by UPRM STEM outreach programs into STEM Methodology and Teaching Practice courses.

Objective 5. (in response to recommendations of the evaluation of the proposal) Use of Rosetta Stone program to practice language skills and evaluate English proficiency to ensure they can communicate effectively at a professional level in English as a second language, given Spanish as their first language

**Significant Results:**

Of the fifteen STEM students who participated in the 2020 orientation, 12 applied to the NoTeS Program, seven comply with all the requirements to participate and receive the scholarship money. Up 3 became affiliates participating in the professional development and mentoring activities but without receiving the scholarship money. In the Fall semester of 2020-2021, we had 7 participant scholars with teaching majors in Biology (2), Physics (4), Chemistry (1). The two affiliates were Biology (1) and General Science (1). In the Spring semester of 2020-2021, we had 6 participant scholars with teaching majors in Biology (2), Physics (3), Chemistry (1). The three affiliates were Biology (1), General Science (1), and Chemistry (1).

It is important to note that in Puerto Rico, there is usually a lapse of one semester to one year between completing the Teacher Preparation Program and being certified to teach by the Puerto Rico Department of Education (PRDE). After completing their Methodology courses, the teacher candidates requested authorization to take the Puerto Rico Teacher Certification Exams (PCMAS). Most UPRM teacher candidates take the PCMAS test in March and receive their exam results in May. At that point, the teacher candidate who passed the exam can apply for certification. The application requires an official notice of passing the PCMAS, a transcript showing approval of the requisite content and pedagogy courses, and various official certifications from the police, tax offices, and other government agencies. Scholars and affiliates were encouraged to study in the fall semester and plan to take the PCMAS test in March 2021. Of the seven Fall Semester NoTeS Scholars, six took the PCMAS in March 2021. Eighty-nine points are needed to pass the PCMAS test, and all six scholars that took the test passed with scores between 111 to 139 points.

Participants described the professional development activities as effective and would use the resources presented in their classroom when completing their student teaching practice experience. Given that

Spanish is their first language, and Advance qualification in English, all NoTeS Alumni qualified as bilingual in Spanish and English.

All but three of the NoTeS alumni initiated the process of acquiring the Teacher Certification from the PRDE. Three reported having acquired the certification from the first cohort, and two are already working as teachers in public high-needs schools. Nine of the total 10 participants and affiliates continued the requirements to become Science teachers.

Key outcomes or Other achievements:

Participants completed a survey exploring their perceptions and experiences in the project for the academic year. The results indicate that NoTeS participants acquired knowledge and experiences with educational materials and activities they plan to use with future students. In addition, they obtained new tools on how to integrate and demonstrate current issues in the classroom for the benefit of students and how to present the relationship of the issues with real life. Participants described the project's strengths as providing many platforms and technologies and teaching how to use them, for example, the NASA and the Globe websites and other applications to engage students in science and the environment. In addition, they deemed it important how the NoTeS project provided information on the means of becoming certified teachers and career opportunities announcements.

### **\* What opportunities for training and professional development has the project provided?**

UPRM NoTeS participants participated in professional development activities to learn the use of the educational materials of UPRM outreach projects of NASA and GLOBE.

The activities coordinated by the NoTeS project were the following:

- NoTeS Project Participants Meeting and GLOBE Educational Materials – November 12th, 2020. Dr. Carmen Bellido (NoTeS Meeting) & Dr. Juan Lopez Garriga (Globe Educational Materials) with an average of 3.8/4.00 Participants' Satisfaction Rating
- 2nd NoTeS Participants Meeting and GLOBE – December 15th, 2020. Dr. Carmen Bellido (NoTeS Meeting) & Dr. Juan Lopez Garriga (Globe Educational Materials) with an average of 3.6/4.00 Participants' Satisfaction Rating
- Use of NASA Materials – March 4th, 2021. Dr. Rebeca Orama with an average of 4.0/4.0 Participants' Satisfaction Rating

In the evaluation of the activities, the participants needed to answer questions related to (1) if the GLOBE webpage use and its presentation were done effectively, (2) if the process and presentation were well organized, (3) if time was distributed efficiently, (4) If previous STEM knowledge and students needs were taken into account, and if they were persuaded to put in practice the things that they learned.

In general, the average punctuation oscillated from 3.6/4.0 to 4.0/4.0. It was very encouraging to know that the participants Strongly agreed (4.0/4.0) to practice what they learned.

The needs assessment results of the fall semester used with the NoTeS participants were shared with the Teacher Preparation Program (TPP). The TPP organized two online workshops and invited all Methodology courses students: the MS Teams Classroom workshop and the Online Active Learning Strategies workshop. NoTeS participants were invited to Counseling and Psychological Services activities such as Stress Management Techniques During Pandemic Times” to address socioemotional needs.

### **\* Have the results been disseminated to communities of interest? If so, please provide details.**

Nothing to report.

## \* What do you plan to do during the next reporting period to accomplish the goals?

Investigators will present in local and national conferences and will produce peer-reviewed publications based on the results of the project especially in terms of strategies for the recruitment of STEM student majors to become teachers, using pre-clinical experiences as an extension of their preparation and making them useful to in-service teachers as a retention strategy. In addition, instruments, and procedures will be published for the advantage of other universities and colleges confronting similar situations impacting STEM teacher's retention, academic success, and job placement.

### Supporting Files

	Filename	Description
<a href="#">(Download)</a>	NoTeS Cohort 1 Data (2020-2021).pdf	NoTeS Cohort 1 Participants Data (2020-2021)

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## Products

### Books

### Book Chapters

### Inventions

### Journals or Juried Conference Papers

View all journal publications currently available in the [NSF Public Access Repository](#) for this award.

The results in the NSF Public Access Repository will include a comprehensive listing of all journal publications recorded to date that are associated with this award.

### Licenses

### Other Conference Presentations / Papers

### Other Products

### Other Publications

### Patent Applications

### Technologies or Techniques

### Thesis/Dissertations

### Websites or Other Internet Sites

- *Noyce Teacher Scholars NoTeS (Moodle Page)*

<https://decep.upr.edu/course/view.php?id=1227>

Moodle page that serves as a repository of information, presentations, recordings of meetings and calendars. Also, a place where the NoTeS Scholars can share materials and experiences through the forums.

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## Participants/Organizations

### What individuals have worked on the project?

<a href="#">Bellido, Carmen</a>	PD/PI	1
<a href="#">Lopez-Garriga, Juan</a>	Co PD/PI	1

### Full details of individuals who have worked on the project:

#### **Carmen Bellido**

**Email:** carmen.bellido@upr.edu

**Most Senior Project Role:** PD/PI

**Nearest Person Month Worked:** 1

**Contribution to the Project:** Coordinate recruitment efforts for candidates and the selection process with the Co-PI. Work with the campus financial aid and institutional research offices to develop NoTeS Scholar application form. Schedule, plan, and direct monthly meetings with all NoTeS project personal. Coordinate activities and workshops for NoTeS Participants. Oversee and supervise the attainment of established goals and objectives. Requisition materials. Process scholarships. Analyze results. Prepare project report. Attend annual meetings. Disseminate results.

**Funding Support:** Preparing and Supporting Bilingual STEM Teachers in Puerto Rico - Noyce Teacher Scholars (NoTeS) NSF # 1950139

**Change in active other support:** No

**International Collaboration:** No

**International Travel:** No

#### **Juan J Lopez-Garriga**

**Email:** juan.lopez16@upr.edu

**Most Senior Project Role:** Co PD/PI

**Nearest Person Month Worked:** 1

**Contribution to the Project:** Co-coordinate recruitment efforts for candidates and the selection process with the Co-PI. Schedule, plan, and direct GLOBE educational activities with all NoTeS participants. Helps in the attainment of established goals and objectives. Requisition materials for GLOBE activities. Analyze results. Contributes to preparing the project report. Attend annual meetings. Disseminate results.

**Funding Support:** Preparing and Supporting Bilingual STEM Teachers in Puerto Rico - Noyce Teacher Scholars (NoTeS) NSF # 1950139

**Change in active other support:** No

**International Collaboration:** No

**International Travel:** No

## What other organizations have been involved as partners?

Nothing to report.

## Were other collaborators or contacts involved? If so, please provide details.

Nothing to report

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## Impacts

### What is the impact on the development of the principal discipline(s) of the project?

UPRM NoTeS participants participated in professional development activities to learn the use of the educational materials of UPRM outreach projects of NASA and GLOBE. The participants were encouraged to share their knowledge with their assigned cooperative teachers. Thus, the process will facilitate STEM teachers to implement NASA, GLOBE STEM learning activities in local classrooms, improving their students' STEM environmental knowledge, concepts, and hands-on activities. In addition, each UPRM Noyce Scholar will align at least one GLOBE existing STEM learning activity or lesson plan with the Puerto Rico Department of Education (PRDE) Standards and updates the lesson to distribute via the UPRM Teacher Web Tools page. The Teacher Web Tools website is under re-construction with a new platform to be re-launch before the end of fall semester 2021-2022.

The GLOBE webpage was introduced to the NoTeS participants and affiliates in both English and Spanish, showing them the program's versatility and their activities and interventions in these two and other languages through a series of four different interventions. These interventions included introducing the program, its webpage, general protocols, GLOBE citizens, measurements, and the importance of the generated data for learning, schools, environment, and society on November 12 and December 15, 2020. Two sets of evaluations were carried out during the process, and all NoTeS students participated. They answered questions related to

1. the GLOBE web page use and its presentation were presented and accomplished,
2. if the process and presentation were well organized,
3. if time was distributed effectively,
4. If previous knowledge and participant's needs were taken into account in the workshop
5. if they were persuaded to put in practice the things they learned.

In general, the average punctuation oscillated from 3.6/4.0 to 4.0/4.0 (1= do not agree to 4= strongly agree). In particular, it was very encouraging to know that the participants strongly agreed (4.0/4.0) to practice what they learned. Also, students included evaluation comments such as:

(i) I can introduce the GLOBE Program to my students and increase their motivation for environmental science understanding and its study.

(ii) I will use this GLOBE program to integrate activities that involve each student in my classes. For example, I will use them to motivate the students to participate actively in developing field trips.

(iii) Without a doubt, I would use this platform to bring valid information to my class. Furthermore, the experimentation will motivate the student to investigate beyond their knowledge.



(iv) I will use the new GLOBE knowledge to create lesson plans in my teaching practice course.

Indeed, the GLOBE initiative impacted the pre-teachers STEM students to implement the program at their present and future schools, (<https://observer.globe.gov/about/get-the-app>) and motivate them to register in GLOBE and obtain data under the Clouds, Mosquitos Habitat Mapper, Land cover, and trees protocols. Thus, it is a precise integration of STEM to impact society's environmental knowledge and behaviors.

All the students who participated in the NoTeS program attended the March 4th training using NASA's material for teachers and future teachers.

They examine through the website <https://nasa.profesor.pr/> in the Climate Change courses; Earth Sciences; Design for Technology and Space Exploration. In addition, this website provides them with information about the various opportunities that they, as future teachers, have to write proposals to address various scientific issues. Furthermore, it also provides information on the presentations that NASA carries out in Puerto Rico.

Another website they were able to explore was [nasa.gov](https://nasa.gov). There they read about the Artemis project, which will be NASA's next trip to the Moon. On the same page, they learned about some of NASA's missions, such as Moon to Mars; Mars Curiosity and Exploration Program. They took stock at "Galleries," many e-books, images, and videos that they have at their disposal to illustrate scientific concepts. NoTeS participants investigated the "NASA STEM Engagement" website. They can find lessons, applications, and interactive technological means to complement their classes in the areas of Mathematics, Earth Sciences, Life Sciences, Physics, Space Sciences, Technology, and Engineering by type, grade level, and subjects. Many of these lessons published are also in Spanish. The participants were acquainted with teachers' many opportunities to participate in professional development programs, competitions, and challenges NASA offers.

During the spring semester of practicum, due to the pandemic lockdown and classes in PR offered online, our teacher interns only taught two days of classes per week. It was not easy to alter the curriculum and topics that the cooperative teachers had previously planned. However, the benefit obtained is the certainty that they know where to find free and new educational material about the works and discoveries that NASA continuously makes that could be integrated into their science and math classes.

## **What is the impact on other disciplines?**

During these uncertain COVID-19 times, because the schools in Puerto Rico were closed and the STEM students in the teachers' certification program had no access to the schools and students in person, an alternative route was implemented to expand their GLOBE teaching experiences. By taking advantage of the GLOBE observer initiative (<https://observer.globe.gov/about/get-the-app>), a strategy consisting of a webpage entitled "Puerto RICO GLOBE Registration page - Puerto Rico Environmental Data Network (GLOBE) (google.com)" was designed. The information was sent to more than a thousand teachers and pre-college teachers, students, and parents in Puerto Rico to motivate them to register in GLOBE and obtain data under the Clouds, Mosquitos habitat Mapper, Land cover, and trees protocols. [https://docs.google.com/forms/d/e/1FAIpQLSd9azVHJw3i4SGEHMI-bNEjigR5\\_-kD4Ju6juiFje718URxcA/viewform?usp=sf\\_link](https://docs.google.com/forms/d/e/1FAIpQLSd9azVHJw3i4SGEHMI-bNEjigR5_-kD4Ju6juiFje718URxcA/viewform?usp=sf_link).

The intervention included answering: Name, Email, Phone, Academic level (k-12 teacher, k-12 students, university professor, undergraduate student, graduate students, parents, and general public) and "Did you register as a "GLOBE observer"? "Did you send environmental data to NASA from your cell phone? ".

However, there were only ten participants who entered the GLOBE observer page to reports data. The analysis of this unsuccessful attempt to involve pre-college and college teachers led to an autoanalysis, which will help to improve the integration of the pre-college teachers in the Puerto Rico GLOBE bilingual initiative.

## **What is the impact on the development of human resources?**

NoTeS will use internal formative evaluation to modify the strategies and tools seeking to improve effectiveness in the recruitment process and document the modification process, the modifications implemented, and their relative effectiveness for future use.

## **What was the impact on teaching and educational experiences?**

NoTes participants included comments in the evaluation of the professional development activities that throw light on how it could make an impact on their teaching and educational experiences. Comments included were: (i) I can introduce the GLOBE Program and NASA activities to my students and increase their motivation for environmental science understanding and its study. (ii) I will use this GLOBE program to integrate activities that involve each student. For example, I will use them to motivate the students to participate actively in developing field trips. (iii) Without a doubt, I would use this platform to bring valid information to my class. Furthermore, the experimentation will motivate the student to investigate beyond their knowledge. (iv) I will use the new NASA and GLOBE knowledge to create lesson plans in my teaching practice course. Indeed, the GLOBE initiative impacted the pre-teachers STEM students to implement the program at their present and future schools.

## **What is the impact on physical resources that form infrastructure?**

Nothing to report.

## **What is the impact on institutional resources that form infrastructure?**

Nothing to report.

## **What is the impact on information resources that form infrastructure?**

Nothing to report.

## **What is the impact on technology transfer?**

Nothing to report.

## **What is the impact on society beyond science and technology?**

The positive short-term academic impact that science and math teacher candidates have been trained in using the NASA website is assured. Given that the student population in Puerto Rico comes from families with limited economic resources, it is difficult for them to have enough means to buy books and materials necessary to improve their science education. Through these online educative materials that NASA & GLOBE has, teachers can use their many activities, all of them free of cost. In addition, NASA's and GLOBE educational materials will take students to a world unknown to them, undoubtedly impacting the curiosity of many students interested in studying science and mathematics,

The GLOBE observer is an initiative that can involve different members of our society (<https://observer.globe.gov/about/get-the-app>) and motivate them to register in GLOBE and obtain data under the Clouds, Mosquitos habitat Mapper, Land cover, and trees protocols. Thus, it is a precise integration of STEM to impact society's environmental knowledge and behaviors

## **What percentage of the award's budget was spent in a foreign country?**

Nothing to report.

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## Changes/Problems

### Changes in approach and reason for change

The original PI of this project was Dr. Keith Wayland, an outstanding and dedicated math professor. He championed the cause of improving the quality and quantity of math and science teachers for many years. Unfortunately, Dr. Wayland passed two months after receiving the notification of approval for the Noyce Teacher Scholars project #1950139. This coincided with changes in the PO assigned to the project as well as the substitution in the PI role for the NoTeS project. Dr. Carmen Bellido was assigned the role of PI, and in the transition interim, there were somewhat different interpretations on her part regarding recruitment criteria. Dr. Bellido consulted with the assigned PO, Dr. Susan Carson, to review the situation, with the eventual approval of the inclusion of post-baccalaureate scholars in the NoTeS program under the following conditions required within the solicitation:

- Post-baccalaureate scholars may only receive one year of funding, and it must be in their final year of the program. Teacher certification or licensure must be completed by the end of the funding period.
- Post-baccalaureate scholars' degree majors must be in Noyce-eligible STEM disciplines approved and already included in the NoTeS proposal.
- It is anticipated that there will be a more significant number of "unique" scholars than previously described since undergraduates generally receive two years of funding, and post-baccs may only receive one.
- The stipend may not exceed the cost of attendance for any participant, so stipends may need to be prorated in the case of part-time students.

### Actual or Anticipated problems or delays and actions or plans to resolve them

There are two anticipated problems:

1. Reaching the proposed recruitment goals of 13 scholars yearly.
2. Integrating NASA and GLOBE activities in the classes offered by NoTeS scholars and their cooperative teachers.

For the recruitment of problem, we will try new and more early in the academic career of prospective STEM students than the previously proposed recruitment strategies. One of the ideas will be to reach prospective STEM majors in education courses that they usually take as electives to entice them as NoTeS Affiliates, offering them professional development and educational activities in schools but no scholarship money.

The lessons learned on how to promote the use of GLOBE and NASA educational activities in the classroom include: (1) to Establish a robust Puerto RICO GLOBE Registration page - Puerto Rico Environmental Data Network (GLOBE) (google.com) update and fully functional web page. (2) A more effective bilingual promotion of the activity includes direct support and promotion by teachers' associations and the Puerto Rico Department of Education. (3) Bilingual invitations (English and Spanish) to virtual workshops to university students' and communities' organizations are showing how to use the NASA (<https://www.nasa.gov/education/materials/>) and GLOBE web pages ([www.Globe.gov](http://www.Globe.gov)) and the GLOBE observer application (<https://observer.globe.gov/about/get-the-app>). (4) Bilingual invitations (English and Spanish) to hands-on NASA and GLOBE workshops to university students' and communities' organizations to generate data using the GLOBE observer application.

## **Changes that have a significant impact on expenditures**

Nothing to report.

## **Significant changes in use or care of human subjects**

Nothing to report.

## **Significant changes in use or care of vertebrate animals**

Nothing to report.

## **Significant changes in use or care of biohazards**

Nothing to report.

## **Change in primary performance site location**

Nothing to report.

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## **Special Requirements**

**Responses to any special reporting requirements specified in the award terms and conditions, as well as any award specific reporting requirements.**

Nothing to report.

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