



MECHANICAL ENGINEERING DEPARTMENT  
University of Puerto Rico  
Mayagüez Campus

PO BOX 9045  
MAYAGUEZ, P.R. 00681-9045  
Tel (787) 832-4040 Exts. 3659, 2560, 3719  
Fax (787) 265-3817

May 27, 2003

Lcdo. Antonio García Padilla  
President  
University of Puerto Rico

Re: Request for Matching Funds to develop and establish a Meteorology/Atmospheric Science degree program as part of the NOAA/NWS – UPRM Cooperative Agreement Request for Proposal

### Description of proposal

This proposal presents the strategic plan for a proposed master degree program in Meteorology/Atmospheric Sciences (Meteo/AS) at the University of Puerto Rico at Mayagüez (UPRM). The soon-to-be-established **Joint Institute for Caribbean Climate Studies (JICCS)** will be used as the framework and mechanism to develop the required courses and locate the necessary **multidisciplinary and multi-campus** human resources. **Distance education technology** will be used in Puerto Rico and if, necessary, on the mainland to comply with basic requirements as stated in the Operating Manual of the U.S Office of Personnel Management under “**Qualification Standards for General Schedule Positions**” also referred to as “**Individual Occupational Requirements for GS-1340: Meteorology Series (x118 Standard)**”. The U.S. Government uses these individual occupational requirements in conjunction with the “Group Coverage Qualifications Standard for Professional and Scientific Positions”.

The general plan as proposed is to allow students to choose a track early in their undergraduate career and use their electives in Meteo/AS to finish the requirements for a MS degree in Meteo/AS within **one year** after receiving their regular bachelor’s degree in Engineering or Sciences from UPRM. This type of program is usually referred to as a **dual degree** program at some schools. It is envisioned that by 2006 a complete bachelor’s and Ph.D. degree programs in Meteo/AS will be developed.

The participation in this NOAA/NWS initiative is of major importance to the University of Puerto Rico because of its interdisciplinary and multicampus nature in a topic of relevance to the Island and the Caribbean region in general. In particular to the JICCS research team in *Caribbean Climate Studies* this project represents a mechanism to move into mainstreaming competitive research as expected by the EPSCOR initiatives.

As part of the NOAA/NWS – UPRM Cooperative Agreement, NOAA has committed a total of \$300,000 (\$100,000 per year) to support the program as described above. The UPR contribution consists of two new faculty positions at UPRM at a cost of \$82,401 average per year for the three years of the proposed NOAA/NWS Cooperative Agreement. A 25% contribution should come from UPRM and 75% from Central Administration as established by the regulations (see table on page 2).

**Matching Funds Request Letter**  
**Page 2**

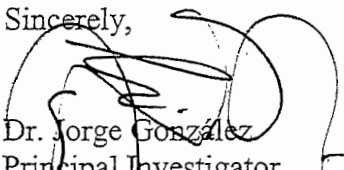
The two new faculty positions will be one assistant professor for Arts & Sciences during the first year (\$43,680 per year) and one assistant professor for Engineering (\$52,500 per year) during the second year. In addition one faculty member will function as a program coordinator for special undergraduate training activities. He or she will be paid an additional compensation from NOAA's contribution. The total UPR+UPRM matching fund contribution including fringe benefits will be \$269,348 distributed between UPR, \$202,011 (75 %), and UPRM, \$67,337 (25 %).

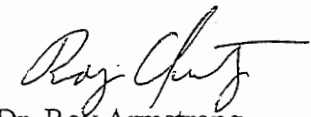
The proposed budget contributions are as follows:

	Year 1	Year 2	Year 3	Total
NOAA Funds	\$100,000	\$100,000	\$100,000	<b>\$300,000</b>
UPR (Matching Funds-75 %)	24,799	66,680	93,923	<b>185,402</b>
UPRM (Matching Funds-25 %)	8,266	22,227	31,308	<b>61,801</b>
Total UPR+UPRM	33,065	88,907	125,231	<b>\$247,203</b>

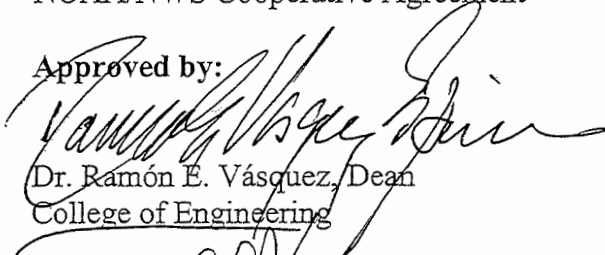
I deeply appreciate your support to this important education and research initiative.

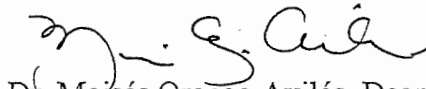
Sincerely,

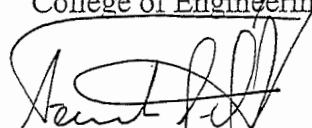
  
 Dr. Jorge González  
 Principal Investigator  
 NOAA/NWS Cooperative Agreement

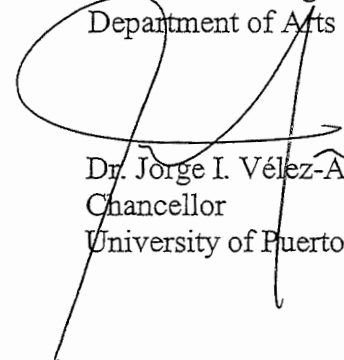
  
 Dr. Roy Armstrong  
 Co-Principal Investigator  
 NOAA/NWS Cooperative Agreement

Approved by:

  
 Dr. Ramón E. Vázquez, Dean  
 College of Engineering

  
 Dr. Moisés Orengo Avilés, Dean  
 Department of Arts and Sciences

  
 Dr. Fernando J. Bird-Pico  
 R&D Center Director  
 University of Puerto Rico-Mayagüez

  
 Dr. Jorge I. Vélez-Arocho  
 Chancellor  
 University of Puerto Rico-Mayagüez

Enclosures: Executive Summary  
 Proposal and RFP

**Cooperative Agreement Request for Proposal by NOAA/NWS  
to Develop and Establish a Meteorology/Atmospheric Science Degree  
Program - the Strategic Plan**

**Jorge E. González, Ph.D.**

**Principal Investigator**

**University of Puerto Rico at Mayagüez**

**Executive Summary**

This proposal presents the strategic plan for a proposed master degree program in Meteorology/Atmospheric Sciences (Meteo/AS) at the University of Puerto Rico at Mayagüez (UPRM). The soon-to-be-established Joint Institute for Caribbean Climate Studies (JICCS) will be used as the framework and mechanism to develop the required courses and locate the necessary multidisciplinary and multi-campus human resources. Distance education technology will be used in if, necessary, to add any additional human resources from partner institutions in mainland. The program will comply with basic course requirements as stated in the Operating Manual of the U.S Office of Personnel Management under "Qualification Standards for General Schedule Positions" also referred to as "Individual Occupational Requirements for GS-1340: Meteorology Series (x118 Standard). The U.S. Government uses these individual occupational requirements in conjunction with the "Group Coverage Qualifications Standard for Professional and Scientific Positions" to qualify meteorologists. The initial framework of this request for proposal is outlined below.

The general plan as proposed is to allow students to choose a track in Meteo/AS early in their undergraduate careers which will allow them to use electives as required courses to complete the requirements for a MS degree in Meteo/AS within one year after receiving their regular bachelor's degree in Engineering or Sciences from UPRM. This is a fast track program that starts at the undergraduate level and continues to a full Meteo/AS degree program. This type of program is usually referred to as a dual degree program at some schools. It is envisioned that by 2006 a bachelor's degree in Meteo/AS will be in place.

The master's degree program will be built upon courses at the undergraduate level in Meteo/AS. The students will use the electives to decide early on a track in Meteo/AS. The program will consist of 15 to 18 credit hours, including research and internships at the undergraduate level and the remaining at the graduate level for a total of 36 credit hours.

Both Sciences and Engineering students are eligible to pursue a regular bachelor's degree in Science or Engineering and a master's degree in Meteo/AS. It takes four years for a science student and five years for an engineering student to graduate at UPRM. In both cases one additional year will be required to obtain a master's degree in Meteo/AS. This is referred to as the 4+1 plan for the science and the 5+1 plan for the engineering student.

The 4+1 plan refers to a science student with a Meteo/AS track, who can complete his or her regular science degree in four years. One additional year (4+1) will be required to complete the Meteo/AS master's degree. On the other hand an engineering student with a Meteo/AS track will receive his or her regular degree in five years. In this case one additional year (5+1) will be required to meet the requirements for a Meteo/AS master's degree. For list of required courses, see table below.

In summary, the total number of required credits to obtain a master's degree in Meteo/ AS will be 36 including internship, coop, research and thesis, project or courses. The accelerated program allows the student to take the required courses at the undergraduate level. It is emphasized that this approach will not preclude students with bachelor's degrees in sciences or engineering to pursue a regular master's degree in Meteo/AS at UPRM.

Courses will be given from expert faculty from UPRM comprising the Departments of Electrical and Computer Engineering, Mechanical Engineering, Industrial Engineering, Agricultural Engineering, Marine Sciences, and Physics. The Co-director of the Center for Atmospheric Sciences at Hampton University (HU), Dr. M. Patrick McCormick, along with and Dr. Jim O'Brien of Florida State University (FSU) and Dr. Vernon from Howard University, will also participate as part of the team of instructors. Twenty (20) selected students per year will participate in this undergraduate program and take courses in the area of climate studies, remote sensing, GIS and GPS. Additional hours of undergraduate research will be performed in areas related to Meteo/AS such as operational meteorology, remote sensing and its applications. It is expected that the selected students will participate during the third and fourth years in Summer Internships and Coop programs at one of the NOAA research institutions. This site will be selected in accordance with the type of training the student needs to complement his or her research education. It is also expected that the student presents and publish his/her results in local and/or national conferences and participates as a co-author in journal and magazines articles.

A total contribution of \$300,000 in three years is requested from NOAA to make this program possible, while the University of Puerto Rico will contribute a total of almost \$430,000 for two new faculty members with expertise in atmospheric sciences.

### List of Existing or Proposed Courses

Course	Institute and Department	Professor
Remote Sensing of Atmospheric Properties I & II	UPRM, Electrical and Computer Eng.	Available Faculty
Atmospheric Dynamics I	UPRM/Physics or Marine Sciences	New Faculty
Atmospheric Dynamics II	Hampton & Howard University	Available and New Faculty
Atmospheric Thermodynamics I & II	UPRM/Mechanical Eng. & Physics	Available Faculty
Atmospheric Radiation	UPRM/Mechanical Engineering & Physics	Available Faculty
Introduction to Atmospheric Modeling and Predictability	UPRM/Mechanical Eng.	Available Faculty
Weather Analysis I (Synoptic)	UPRM, Physics or Marine Sciences	New Faculty
Weather Analysis II (Mesoscale)	FSU	Available Faculty
Statistical Analysis of Meteorological Processes	UPRM/Industrial Engineering	Available Faculty
Physical Meteorology	Howard University	Available Faculty
Physical Climatology	UPRM/Marine Sciences	Available Faculty
Physical Hydrology	UPRM/Agric. & Biosystems Eng.	Available Faculty
Physical Oceanography	UPRM/Marine Sciences	Available Faculty
Operational Meteorology Lab	UPRM/Climate Center & NWS, San Juan	Available & New Faculty

**APPLICATION FOR  
FEDERAL ASSISTANCE**

OMB Approval No. 0348-0043

2. DATE SUBMITTED May 22, 2003	Applicant Identifier
3. DATE RECEIVED BY STATE	State Application Identifier
4. DATE RECEIVED BY FEDERAL AGENCY	Federal Identifier

1. TYPE OF SUBMISSION:

Application <input type="checkbox"/> Construction <input checked="" type="checkbox"/> Non-Construction	Preapplication <input type="checkbox"/> Construction <input type="checkbox"/> Non-Construction
--	--

5. APPLICANT INFORMATION

Legal Name: University of Puerto Rico at Mayagüez	Organizational Unit: College of Engineering
Address (give city, county, State, and zip code): Mayagüez, PR 00680	Name and telephone number of person to be contacted on matters involving this application (give area code) Fernando J. Bird-Picó (787) 832-4040, ext. 2402

8. TYPE OF APPLICATION:

New     Continuation     Revision

If Revision, enter appropriate letter(s) in box(es)       

A. Increase Award    B. Decrease Award    C. Increase Duration  
D. Decrease Duration    Other (Specify): \_\_\_\_\_

7. TYPE OF APPLICANT: (enter appropriate letter in box)

A. State	H. Independent School Dist.	<input type="checkbox"/>
B. County	I. State Controlled Institution of Higher Learning	<input type="checkbox"/>
C. Municipal	J. Private University	<input type="checkbox"/>
D. Township	K. Indian Tribe	<input type="checkbox"/>
E. Interstate	L. Individual	<input type="checkbox"/>
F. Intermunicipal	M. Profit Organization	<input type="checkbox"/>
G. Special District	N. Other (Specify) _____	<input type="checkbox"/>

9. NAME OF FEDERAL AGENCY:  
NOAA/NWS

10. CATALOG OF FEDERAL DOMESTIC ASSISTANCE NUMBER: .

1 1 - 4 8 1

TITLE: NOAA/NWS

12. AREAS AFFECTED BY PROJECT (Cities, Counties, States, etc.):

11. DESCRIPTIVE TITLE OF APPLICANT'S PROJECT:  
Coopertaive Agreement Request Proposal by NOAA/NWS to Develop and Establish a Meteorology/Atmospheric Science Degree Program

13. PROPOSED PROJECT

14. CONGRESSIONAL DISTRICTS OF: N/A

Start Date 07-01-03	Ending Date 06-30-06	a. Applicant	b. Project
------------------------	-------------------------	--------------	------------

15. ESTIMATED FUNDING:

	\$300,000
a. Federal	\$ .00
b. Applicant	\$ .00
c. State	\$ .00
d. Local	\$ .00
e. Other	\$ .00
f. Program Income	\$ .00
g. TOTAL	\$ 0.00

16. IS APPLICATION SUBJECT TO REVIEW BY STATE EXECUTIVE ORDER 12372 PROCESS?

a. YES. THIS PREAPPLICATION/APPLICATION WAS MADE AVAILABLE TO THE STATE EXECUTIVE ORDER 12372 PROCESS FOR REVIEW ON:  
DATE \_\_\_\_\_

b. No.  PROGRAM IS NOT COVERED BY E. O. 12372  
 OR PROGRAM HAS NOT BEEN SELECTED BY STATE FOR REVIEW

17. IS THE APPLICANT DELINQUENT ON ANY FEDERAL DEBT?

Yes If "Yes," attach an explanation.     No

18. TO THE BEST OF MY KNOWLEDGE AND BELIEF, ALL DATA IN THIS APPLICATION/PREAPPLICATION ARE TRUE AND CORRECT, THE DOCUMENT HAS BEEN DULY AUTHORIZED BY THE GOVERNING BODY OF THE APPLICANT AND THE APPLICANT WILL COMPLY WITH THE ATTACHED ASSURANCES IF THE ASSISTANCE IS AWARDED.

a. Type Name of Authorized Representative Dr. Fernando J. Bird-Picó	b. Title Director, R&D Center	c. Telephone Number (787) 831-2065
d. Signature of Authorized Representative		e. Date Signed May 22, 2003