UNIVERSITY OF MIAMI
ROSENSTIEL SCHOOL of MARINE & ATMOSPHERIC SCIENCE

Cooperative Institute for Marine and Atmospheric Studies

Rosenstiel School of Marine and Atmospheric Science
University of Miami
4600 Rickenbacker Causeway, Miami, FL 33149

To: National Oceanic & Atmospheric Administration
Line Office: OAR/CPO
Program: FY 2013 Joint Hurricane Testbed
Attn: Program Manager: Dr. Jiann-Gwo Jiing
Telephone: 305-229-4443
E-mail: Jiann-Gwo.Jiing@noaa.gov

From: Peter Ortner
University of Miami-RSMAS-CIMAS
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Miami, FL 33149
Telephone Number: (305) 421-4619
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CIMAS Adm. Contact: Isabel Castro icastro@rsmas.miami.edu

The attached proposal is being submitted to you for your consideration by a NOAA Cooperative Institute. Should you recommend funding for this proposal, we request that the funding be transferred through our current NOAA cooperative agreement # NA10OAR4320143. The NOAA contact (described below) for this cooperative agreement should be contacted immediately if this proposal is accepted for funding.

Title of Proposal: Guidance on Intensity Guidance

Principal Investigator(s): David Nolan

Proposal #: R1300098

Period of Performance: 08/01/2013 – 07/31/2015

Funding (by year, if multi-year): Year 1: $40,187; Year 2: $42,070; Total: $82,257

Task #: 3

Theme(s): 2: Tropical Weather

NOAA Goal: 1. To understand and predict changes in climate, weather, oceans, and coasts
2. Weather-Ready Nation

DUNS #: 152764007 EIN# 59-0624458 Congressional District: 18

Sponsored Programs Office Contact Person: Bonnie Townsend
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E-mail: btownsend@rsmas.miami.edu

NOAA Administrative Contact: Kristee Hall
Tel #: 301-734-1197
Fax #: 301-713-1459
E-mail: kristee.hall@noaa.gov

Please answer all questions

1. Is there a former DOC employee working for the CI host institution who represented or will represent the host institution before DOC or another Federal agency regarding this proposal? ☒Yes ☐No
2. Does this award include any sub award to a Minority Serving Institution? ☐Yes ☒No
3. Does the proposed award require any non-federal employees or sub awardees to have physical access to Federal premises for more than 180 days or to access a Federal information system ? ☐Yes ☒No
4. Is PROGRAM INCOME anticipated being earned during performance of this project? ☐Yes ☒No
5. Will a VIDEO be created for public viewing be part of this project? ☐Yes ☒No
6. Will DOC/NOAA owned equipment be provided to any investigator for use outside a Federal location for this project? ☐Yes ☒No
7. Are any permits required to conduct this project? ☐Yes ☒No
(If yes, please provide the name of the issuing agency and the permit number.)

Colorado State University

Cooperative Institute for
Research in the Atmosphere
Laporte Ave., Foothills Campus
1375 Campus Delivery
Fort Collins, Colorado 80523-1375
(970) 491-8448
Fax: (970) 491-8241

To: Dr. Jiann-Gwo Jiing
Jiann-Gwo.Jiing@noaa.gov

From: Laura Leinen
CIRA/Colorado State University
970-491-8525
leinen@cira.colostate.edu

The attached proposal is being submitted to you for your consideration by a NOAA Cooperative Institute. Should you recommend funding for this proposal, we request that the funding be transferred through our current NOAA cooperative agreement, # NA09OAR4320074. The NOAA contact (described below) for this cooperative agreement should be contacted immediately if this proposal is accepted for funding.

Title of Proposal: Guidance on Intensity Guidance

Principal Investigator(s): Andrea Schumacher

Proposal # 115704

Period of Performance: August 1, 2013-July 310, 2015

Funding (by year, if multi-year): YR1--$35,000; YR2--$35,000; TOTAL--$70,000

Task #: 3

Theme(s): Regional to Global Scale Modeling

DUNS #: 78-597-9618

EIN# 84-6000545

Congressional District: CO-002

Sponsored Programs Office Contact Person: Linda Loing
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NOAA Administrative Contact: Kristee Hall
Phone: (301) 734-1197
E-mail: Kristee.Hall@noaa.gov
Fax:
FMC for BOPs:

(1) Is there a former DOC employee working for the CI host institution who represented or will represent the host institution before DOC or another Federal agency regarding this proposal? No

(2) Does this award include any subaward to a Minority Serving Institution? No

(3) Does the proposed award require any non-federal employees or subawardees to have physical access to Federal premises for more than 180 days or to access a Federal information system? No.

(4) Is PROGRAM INCOME anticipated being earned during performance of this project? No

(5) Will a VIDEO be created for public viewing as part of this project? No

(6) Will DOC/NOAA owned equipment be provided to any investigator for use outside of a Federal location for this project? No

(7) Are any permits required to conduct this project? (If yes, please provide the name of the issuing agency and the permit number.) No

New Proposal

RESEARCH PROPOSAL SUBMITTED
TO THE
NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION (NOAA)
Joint Hurricane Testbed (JHT) Program

TITLE: Guidance on Intensity Guidance

PERFORMANCE PERIOD: August 1, 2013 – July 31, 2015

AMOUNT REQUESTED:
Year 1: CIRA: $35,000 University of Miami: $40,187 Total: $75,187
Year 2: CIRA: $35,000 University of Miami: $42,070 Total: $77,070

SUBMITTING DATE: December 7, 2012

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New proposal to
National Oceanic & Atmospheric Administration (NOAA)
Joint Hurricane Testbed (JHT) Program
for

Guidance on Intensity Guidance

by

Cooperative Institute for Research in the Atmosphere
Colorado State University
1375 Campus Delivery
Fort Collins, CO 80523-1375

PRINCIPAL INVESTIGATOR: Andrea Schumacher (CSU/CIRA)

COLLABORATOR: Dr. Mark DeMaria (NOAA/NESDIS/STAR)

PERIOD OF ACTIVITY: August 1, 2013 – July 31, 2015

AMOUNT REQUESTED: Year 1: CIRA/CSU $35,000
Year 2: CIRA/CSU $35,000

SUBMITTING DATE: December 7, 2012

ENDORSEMENTS:

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for C. Kummerow
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New proposal to

National Oceanic & Atmospheric Administration (NOAA)
Joint Hurricane Testbed (JHT) Program

for

Guidance on Intensity Guidance

by

University of Miami
Rosenstiel School of Marine & Atmospheric Science
4600 Rickenbacker Causeway
Miami, FL 33149

PRINCIPAL INVESTIGATOR: David Nolan

PERIOD OF ACTIVITY: August 1, 2013 – July 31, 2015

AMOUNT REQUESTED:
Year 1: $40,187
Year 2: $42,070
Total: $82,257

ENDORSEMENTS:

David Nolan, PI, Associate Professor
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Division of Meteorology Physical & Oceanography
Telephone: 305-421-4930
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Fernande Saintilis, Sponsored Programs, Team Manager
University of Miami – RSMAS
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Guidance on Intensity Guidance

PIs: **David Nolan, U. Miami/RSMAS, Miami, FL**
Andrea Schumacher, CIRA/CSU
Collaborator: **Mark DeMaria, NOAA/NESDIS, Fort Collins, CO**

An operational algorithm to estimate the confidence of the intensity forecasts from NHC's primary intensity models and their consensus will be developed. The models include the statistical-dynamical Decay-SHIPS (DSHP) and Logistic Growth Equation Model (LGEM) and the early versions of the GFDL and HWRF coupled ocean-atmosphere models (GHMI and HWFI). The technique builds on the results of Bhatia and Nolan who demonstrated that the errors and biases of DSHP, LGEM, and GFDL have significant systematic variability as a function of a number of storm environmental variables that are available in real time, including the magnitude of the vertical shear, the direction of the shear, the initial intensity, and the maximum potential intensity. The intensity model error will be estimated from a linear combination of these predictors, supplemented with other variables. These include additional synoptic parameters, inner core structure from infrared imagery and the eye diameter and radius of maximum wind parameters from the Automated Tropical Cyclone Forecast (ATCF) system, ocean input from the sea surface temperature and oceanic heat content, the spread of the individual intensity models forecasts, and the recent performance of each model from times before the forecast time. Versions will be developed for the Atlantic and the combined East/Central Pacific. This algorithm will be referred to as the Prediction of Intensity Model Error (PRIME) model. The PRIME model will be run at the end of the SHIPS model script.

Assuming the model errors can be reliability estimated, the output from the PRIME model will be used to develop a corrected consensus forecast, which will be an unequally weighted combination of DSHP, LGEM, GHMI and HWFI forecasts. The error analysis will also be used to provide guidance for improvements to the DSHP and LGEM models.

C. STATEMENT OF WORK

1. Project duration

This is a 2-year project, with work beginning on 1 August 2013 and work being completed by 31 July 2015.

2. Project description

a. Introduction

NHC's operational intensity forecasts have not improved very much in the past decade but, in recent years, the intensity guidance models have shown some improvement in forecast accuracy. Over the past 5 years, the SHIPS and LGEM statistical dynamical models and the regional HWRF and GFDL coupled ocean-atmosphere models have shown some forecast skill relative to climatology and persistence. The errors and biases of these models are often very different on a forecast to forecast basis, resulting in a consensus forecast that has smaller errors than any of the individual models. For example, the 2012 Atlantic basin errors of the SHIPS/LGEM/GHMI/HWFI consensus intensity forecasts were 5 to 15% smaller than those of the best individual model at each forecast time, where GHMI and HWFI are the "early" versions of the GFDL and HWRF models, respectively. In this project we propose to develop a method to estimate the uncertainty of the intensity forecasts from these four models and their consensus using the model spread, basic storm characteristics, parameters from the GFS global forecast model, ocean parameters, and measurements of storm structure. This project also has the potential to provide guidance for improvement of the individual models by identification of regime-dependent errors that might be corrected through model changes or post-processing. This project directly addresses program priority NHC-3/JTWC-6 for guidance on guidance.

b. *Background information*

Recent research has demonstrated that NHC's intensity models have systematic variability in their errors and biases that can be identified by stratification of the forecasts as a function of parameters that are available in real time. Bhatia and Nolan (2012) and Bhatia and Nolan (2013) stratified the 24, 48 and 72 h intensity forecasts from the GFDL, SHIPS and LGEM models as a function of several environmental variables. Figure 1, taken from Bhatia and Nolan (2013), shows the mean 72 h intensity errors from these three models and the NHC Official forecast as a function of latitude and the direction of the 850-200 hPa vertical wind shear for a 5-year Atlantic sample (2006-2010). This figure shows that for low-latitude storms with shear from a northerly to easterly direction, the LGEM model had errors that were two to three times larger than for other cases. This tendency can also be seen for SHIPS, GFDL and OFCL, although the differences are not as large. This result, which was statistically significant, indicates that the intensity forecasts for this regime have much greater uncertainty than for cases that are further north or have westerly shear. Bhatia and Nolan (2013) also show that the intensity model errors have large differences as a function of several other variables, including the initial maximum wind, the magnitude of the vertical shear and the maximum potential intensity.

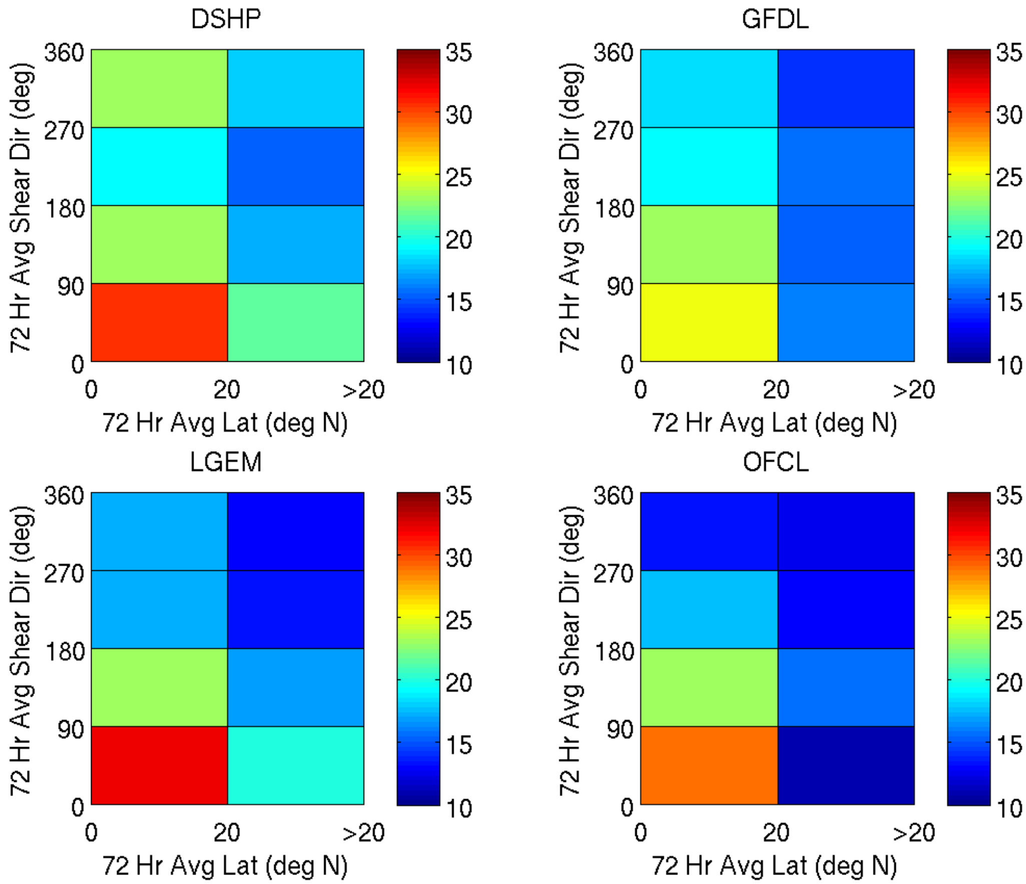

Figure 1. The average intensity errors (kt) from the SHIPS model with inland decay (DSHP), the GFDL and LGEM models, and the NHC Official forecasts (OFCL) for the 5-year sample from 2006-2010 stratified by the direction of the 850-200 hPa vertical shear and latitude. The shear and latitude are the average values along the NHC official forecast track taken from the SHIPS model. The shear direction is the direction that the shear vector is coming from. For example, westerly shear (winds becoming more westerly with height) would have a value of 270 deg.

c. Real time tool for guidance on intensity guidance

Based on the encouraging results of Bhatia and Nolan (2013) we propose to implement a real time forecast tool that will provide a measure of uncertainty of the LGEM, DSHP, GHMI and HWFI models and their consensus forecast out to 5 days. The approach will be very similar to the Goerss Predicted Consensus Error (GPCE), which provides a measure of uncertainty of a multi-model consensus track forecast (Goerss 2007). The GPCE uses a linear regression approach to estimate the expected track error of the consensus model, and the variation of the GPCE values provides a measure of the track forecast uncertainty. For example, the GPCE parameter has been incorporated into NHC's operational wind speed probability model, where the GPCE values are used to stratify the expected track errors into low, medium and high categories. The version for intensity will be referred to as the PRediction of Intensity Model Error (PRIME).

The input for the PRIME model will include variables that are available from the ATCF and the SHIPS model. This will allow a straightforward real time implementation, since all the input is already available in real time. It is expected that the PRIME model would run at the end of the SHIPS model script, similar to other statistically based prediction models such as the Rapid Intensification Index (RII) and the secondary eyewall formation parameter.

The input variables to be tested as predictors in the PRIME model include those from the following basic categories.

1. Climatology and Persistence – These include maximum wind, latitude, longitude, and Julian Day. In typical CLIPER models for track and intensity, only the initial values are used as predictors. However, for prediction of model error, the forecasted track and intensity will also be evaluated.

2. Storm Environment – A variety of parameters such as shear, shear direction, upper level divergence, etc that are available from the SHIPS model will be included. As described above, Bhatia and Nolan have already shown a number of statistically significant differences in error as a function of these variables.

3. Ocean Environment – These will include sea surface temperature (SST) and Ocean Heat Content (OHC) along the forecasted track.

4. Inner Core – The SHIPS model includes several inner core variables obtained from infrared satellite imagery. These will be tested in the PRIME model, even those that are not currently used for the SHIPS and RII predictions. In principle it would be advantageous to use input from microwave satellite imagery and aircraft reconnaissance when available. However, because of the intermittent and asynoptic nature of that data, their usage would complicate the operational implementation of the PRIME model. As an alternative, the radius of maximum wind and eye diameter parameters available from the ATCF will be utilized as additional measures of inner core structure. These are determined subjectively by NHC forecasts, based on all available input, including microwave satellite and aircraft data.

5. Forecast spread – The spread of the intensity forecasts from the four input models will be tested as a PRIME predictor. In addition, the intensity forecast from the GFS model itself will be included. Although the GFS intensity forecast has a low bias when used directly, its tendency has proven to be a useful predictor in the SHIPS model.

6. Serial error correlation – Verification of the four intensity models to be considered in the PRIME model shows that the errors and biases tend to be correlated over several forecast cycles. For example, if the forecast is too low in one cycle it also tends to be too low in the next cycle. The difference between the intensity forecasts and the working best track up to the forecast time from the past few forecast cycles will be considered as an input variable.

d. Developmental data issues

One of the difficulties with developing estimates of models based on past performance is that the model characteristics (resolution, initialization, physics, etc.) change from year to year. This is less of a problem for the statistical-dynamical models since it is relatively easy to run a large number of retrospective cases when the models are updated. For the dynamical models, retrospective cases that are often run before the beginning of each season using the most current version of the model will be used as much as possible. This will require a balance between a suitable sample size and non-stationary statistics.

e. Corrected consensus and deterministic model improvements

The primary goal of this project is to provide an estimate of the uncertainty of each of the four operational models and its consensus. However, assuming the errors of individual models can be estimated reliably, it should also be possible to develop a corrected intensity consensus forecast that applies unequal weights to the forecast members. This will be tested in the second year of the project. In addition, if systematic errors as a function of known parameters can be determined, these can be used to improve the statistical-dynamical SHIPS and LGEM models, and provide guidance to the developers of the dynamical models as to the possible sources of intensity errors.

3. Proposed work plan

This project is a collaborative effort between UM and CIRA. UM will lead the analysis of the developmental data to identify predictors that are best correlated with intensity errors. CIRA will take the lead on putting together the developmental datasets, and the implementation of the real time version of the PRIME model. UM and CIRA will work together on the development of the PRIME model, evaluation of the results, model modifications and development of a corrected consensus model. As described in the timeline below, a prototype version should be ready for testing for the Atlantic 2014 hurricane season, with a revised version for the Atlantic and east Pacific by 2015. The east Pacific version will also include the central Pacific.

4. Project timeline

Year 1:

Aug 2013	Funding and work begins
Sep 2013	Assemble 2006-2012 model error and predictor databases for the Atlantic
Nov 2012	Select the preliminary predictors for input to the PRIME model
Dec 2013	Semi-annual report
Jan 2014	Begin development of PRIME model with combined predictor set
Mar 2014	Present preliminary results at the IHC
Jun 2014	Complete prototype PRIME model for the Atlantic and implement as part of the operational SHIPS script
Jul 2014	Year 1 final report

Year 2:

Aug 2014	Assemble east/central Pacific dataset
Nov 2014	Select the east Pacific preliminary predictors for the PRIME model
Dec 2014	Evaluate the results from the 2014 Atlantic season

Dec 2015	Year 1 semi-annual report
Jan 2015	Adjust PRIME model based on 2014 results, rerun Atlantic and East Pacific for 2013 and 2014 seasons
Mar 2015	Begin corrected consensus model development
Mar 2015	Present results at the IHC
Jun 2015	Finalize PRIME and corrected consensus models and implement for 2015 real time tests
Jul 2015	Year 2 final report

5. Needs and schedule for expected travel

Spring 2014	PI travels to Interdepartmental Hurricane Conference
Spring 2015	PI travels to Interdepartmental Hurricane Conference

6. Estimated JHT staff requirements

Some coordination with JHT staff will be required to maintain access to the NCEP CCS system for implementation of the PRIME model. Also, coordination will be needed regarding the form of the output and the display at NHC for forecaster evaluation. The quantitative intensity error estimates can be provided in the ATCF e-decks similar to the GPCE parameter for track. Supplementary information regarding the PRIME model estimates could be provided in a text format, similar to that for the SHIPS and RII models. This information could be appended to the SHIPS text file so simplify the access by NHC.

References

Bhatia, K. T., and D. S. Nolan, 2012: Predicting the performance of tropical cyclone intensity forecasts using environmental parameters. Preprints, 30th Conference on Hurricanes and Tropical Meteorology, American Meteorological Society, Ponte Vedra Beach, FL, April, 2012.

Bhatia, K. T., and D. S. Nolan, 2013: Relating the skill of tropical cyclone intensity forecasts to the synoptic environment. Submitted to *Wea. Forecast*.

Goerss, J.S., 2007: Prediction of consensus tropical cyclone track forecast error. *Mon. Wea. Rev.*, **135**, 1985–1993.

D. Budget Justification and Summary

Colorado State University's budget for 3 years of research is summarized below. Year 2 assumes the CSU-defined inflation factors (3% for salary, 5% all other categories).

I. PERSONNEL

The budget includes a request for 2 months of support each in Years 1 and 2 for a CIRA Research Associate (A. Schumacher) to help with the development of a PRIME model. Support is also requested in Years 1 and 2 for a CIRA Research Associate (R. DeMaria) to assist with programming and a CIRA Senior Research Associate (R. Brummer) to oversee the project, supervise and direct CIRA personal, prepare reports and proposals, and manage the budget process. This project will be closely coordinated with M. DeMaria from NOAA/NESDIS/STAR. Support for the participation of M. DeMaria is being provided by NOAA base funds. A small percentage of the budget is requested for a CIRA Research Associate (D. Watson) who will provide scientific computer support.

Salary: Base salaries included in this proposal reflect the actual salaries approved by the Governing Board of Colorado State University. Any salaries beyond the approved period are budgeted at a 3% increase over the prior year's annual base. CSU-defined fringe benefit rates have also been applied. All individuals budgeted are employees of Colorado State University.

Fringe Benefits: The following fringe rates were applied to the above salaries based on the individual's payroll classification:

	FY14	FY15	FY16
Faculty/Administrative Professional	24.9%	25.3%	25.9%
Student Hourly	1.0%	1.0%	1.0%

II. OTHER

Infrastructure: Computer Charges: The infrastructure fee provides for high-end computing capacity such as high speed network and associated equipment including 10G firewall, router, multiple subnets, DNS, DHCP, switches, and central computer rooms. The rate is determined by CIRA, applied to all Fort Collins, CO users and correlates to the actual costs of the above.

2013-2014 rates:

A. Schumacher	224	1.90	426
R. DeMaria	224	1.45	325
D. Watson	224	0.30	67
R. Brummer		0.20	0
		Total	818

2014-2015 rates:

A. Schumacher	224	1.85	414
R. DeMaria	224	1.34	300
D. Watson	224	0.60	134
R. Brummer		0.30	0
		Total	848

2015-2016 rates:

A. Schumacher	224	.25	56
R. DeMaria	224	.10	22
D. Watson	224	.20	44
R. Brummer		.05	0
		Total	122

III. INDIRECT COST RATE

An Indirect Rate of 30% charged on this proposal is the negotiated rate for CIRA's Cooperative Agreement with NOAA effective July 1, 2009-June 30, 2014. The rate is applied to Modified Total Direct Costs (MTDC). MTDC is defined as Total Direct Costs less Equipment, GRA Tuition, and Subcontracts > $25,000. This rate was approved in amendment 0 of NA090AR4320074.

Budget Detail: CIRA

	Budget Year 1			**Budget Year 2**		
	Rate	**Months**	**Requested Amount**	**Rate**	**Months**	**Requested Amount**
DIRECT COSTS						
Personnel						
Salaries						
A. Schumacher	4,727	2.00	9,454	4,881*	2.00	9,761
R. DeMaria	3,926	1.63	6,399	4,025*	1.26	5,072
D. Watson	4,430	0.40	1,772	4,566*	0.70	3,196
R. Brummer	10,663	.30	3,199	10,940*	.25	2,735
			-----------			-----------
Subtotal – Salaries			20,824			20,764
Fringe Benefits (24.9% FY13, 25.3% FY14, 25.9%FY15)*			5,196			5,272
Subtotal - Personnel			26, 020			26,036
Computer charges			903			887
Total Direct Costs			**26,923**			**26,923**
INDIRECT COSTS (30%)			**8.077**			**8,077**
TOTAL BUDGET			**35,000**			**35,000**

*A 3% increase in salary rate is estimated for FY14 & FY15

Budget Explanation: University of Miami.

For each year of the two-year project, the UM budget requests 0.5 months of salary support for PI Nolan and one half of an academic year of support (stipend, tuition, and health insurance) for the graduate student. Dr. Nolan will provide oversight of the project and guidance for the graduate student, who will work closely with Drs. Schumacher and DeMaria. Funds to support travel to the IHC are also requested.

Budget Detail: University of Miami.

	YEAR 1			YEAR 2			
	months	%	AMOUNT	months	%	AMOUNT	TOTALS
Principal Investigator:							
David Nolan	0.5	4%	5,529	0.5	4%	5,805	11,334
Graduate Students							
Graduate Student	4.5	38%	10,755	4.5	38%	11,292	22,047
TOTAL SALARIES			16,284			17,097	33,381
Fringe Benefits - Faculty			1,205			1,266	2,471
TOTAL SALARIES & FRINGE BENEFITS			17,489			18,363	35,852
Travel Domestic			1,800			1,800	3,600
Other Direct Costs:							
Student Health Insurance			2,302			2,417	4,719
Modified Total Direct Costs:			21,591			22,580	44,171
Facilities & Administrative Costs		40.0%	8,636			9,032	17,668
Non - MDTC							
Tuition			9,960			10,458	20,418
TOTAL PROJECT COSTS			40,187			42,070	82,257

Combined Budget Details for CIRA and the University of Miami:

	Budget Year 1			Budget Year 2		
	Rate	**Months**	**Requested Amount**	**Rate**	**Months**	**Requested Amount**
DIRECT COSTS						
Personnel						
Salaries						
A. Schumacher	4,727	2.00	9,454	4,881*	2.00	9,761
R. DeMaria	3,926	1.63	6,399	4,025*	1.26	5,072
D. Watson	4,430	0.40	1,772	4,566*	0.70	3,196
R. Brummer	10,663	.30	3,199	10,940*	.25	2,735
D. Nolan		.50	5,529		.50	5,805
Graduate student		4.5	10,755		1.25	11,292
Total Salaries			37,108			37,861
Fringe Benefits (24.9% FY13, 25.3% FY14, 25.9%FY15)*			5,196			5,272
Fringe Benefits Faculty University of Miami			1,205			1,266
Total Fringe Benefits			6,401			6,538
Total Salaries and Fringe Benefits			43,509			44,399
Travel Domestic			1,800			1,800
Computer charges (CIRA)			903			887
Student Health Insurance			2,302			2,417
Total Direct Costs			**48,514**			**49,503**

Continued next page.

INDIRECT COSTS (30%) CIRA	**8,077**	**8,077**
FACILITIES & ADMINISTRATIVE COSTS (40%) U OF MIAMI	**8,636**	**9,032**
NON MODIFIED TOTAL DIRECT COSTS – Tuition	**9,960**	**10,458**
TOTAL BUDGET	**75,187**	**77,070**

*A 3% increase in salary rate is estimated for FY14 & FY15- CIRA

E. NOAA GRANTS AND COOPERATIVE AGREEMENT APPLICATION PACKAGE

F. ABBREVIATED CURRICULUM VITA

Abbreviated Curriculum Vitae (A.B. Schumacher, PI)

Education

Ph.D., Atmospheric Science (Candidate), Colorado State University, Aug 2012-present
M.S., Atmospheric Science, Colorado State University, 2004
B.A., Mathematics/Chemistry, New College of Florida, 2000

Experience

2006 – present:	Research Associate, Cooperative Institute for Research in the Atmosphere (CIRA), Colorado State Univ., Fort Collins, CO
2003 – 2004:	Graduate Teaching Assistant, Dept. of Atmospheric Science, Colorado State Univ., Fort Collins, CO
2001 – 2004:	Graduate Research Assistant, Dept. of Atmospheric Science, Colorado State Univ., Fort Collins, CO

Selected Refereed Publications

Quiring, S.M., **A.B. Schumacher**, and S. Guikema, (submitted): Incorporating Hurricane Forecast Uncertainty into Decision Support Applications. *Bull. Amer. Meteor. Soc*.

Sampson, C.R., **A.B. Schumacher**, J.A. Knaff, M. DeMaria, E.M. Fukada, C.A. Sisko, D.P. Roberts, K.A. Winters and H.M. Wilson, 2012: Objective Guidance for Use in Setting Tropical Cyclone Conditions of Readiness. *Wea. and Forecasting*. **27**, 1052–1060.

Quiring, S., **A. Schumacher**, C. Labosier, and L. Zhu, 2011: Variations in mean annual tropical cyclone size in the Atlantic, *J. Geophys. Res*., **116**, D09114, doi:10.1029/2010JD015011.

Schumacher, R.S., D.T. Lindsey, **A.B. Schumacher**, J. Braun, S.D. Miller and J.L. Demuth, 2010: Meteorology, Climatology, and the Communication and Interpretation of Weather Information during the 22 May 2008 Weld County, Colorado Tornado. *Wea. and Forecasting*, **25**, 1412-1429.

Rappaport, E.N., J.L. Franklin, **A.B. Schumacher**, M. DeMaria, L.K. Shay, and E.J. Gibney, 2010: Tropical cyclone intensity change before U.S. Gulf coast land fall. *Wea. and Forecasting*, **25**, 1380-1396.

Sherman-Morris, K., **A. Schumacher**, S. Drobot and K. McNeal, 2010: Hurricane Preparedness and Response among Pet Care Providers along the Gulf Coast: An Investigation of Hurricanes Gustav and Ike. *International Journal of Mass Emergencies and Disasters*, **28 (3)**.

Professional Honors

- Governor’s Award for High Impact Research (Team Member), CO-LABS, 2012
- Research Initiative Award, Cooperative Institute for Research in the Atmosphere (CIRA), 2011-2012.
- Research Initiative Award, Cooperative Institute for Research in the Atmosphere (CIRA), 2007-2008.

- AMS Industry/Government Graduate Fellowship, American Meteorological Society, 2001-2002.

Professional Service

2004 – present: Member of the American Meteorological Society since 2004
2009 – 2010: Mentor, American Meteorological Society's Board on Women and Minorities

Abrreviated CV for David S. Nolan

Associate Professor
Division of Meteorology and Physical Oceanography
Rosenstiel School of Marine and Atmospheric Science
University of Miami
4600 Rickenbacker Causeway
Miami, Florida 33149
Phone: (305) 421-4930   Fax: (305) 421-4696
email: *dnolan@rsmas.miami.edu*

Born: April 19, 1969
Citizenship: USA

Education:

Harvard University, Graduate School of Arts and Sciences, Cambridge, Massachusetts.
Ph.D. in Earth and Planetary Sciences, completed October, 1996.
Advisor: Brian Farrell.
Thesis: *Axisymmetric and Asymmetric Vortex Dynamics in Convergent Flows.*

Harvard College, Cambridge, Massachusetts.
B.A., Physics, *cum laude* 1990.

Experience:

06/08 - Present: *Associate Professor*, *Division of Meteorology and Physical Oceanography, Rosenstiel School of Marine and Atmospheric Science, University of Miami.*

07/02 - 05/08: *Assistant Professor, Division of Meteorology and Physical Oceanography, Rosenstiel School of Marine and Atmospheric Science, University of Miami.*

07/01 - 06/02: *Visiting Scientist, Program in Atmospheric and Oceanic Sciences, Princeton University.*

11/98 - 06/01: *Postdoctoral Associate, Department of Atmospheric Science, Colorado State University.*

11/96 - 11/98: *Visiting Postdoctoral Fellow*, *Mathematics Department, Computing Sciences Directorate, Lawrence Berkeley National Laboratory.*

Related Publications:

Nolan, D. S., and M. G. McGauley, 2012: Tropical cyclogenesis in wind shear: Climatological relationships and physical processes. *Cyclones: Formation, Triggers, and Control*. K. Oouchi and H. Fudeyasu, eds., Nova Science Publishers, Happauge, New York, 270 pp.

Uhlhorn, E. W., and D. S. Nolan, 2012: Observational undersampling in tropical cyclones and its impact on estimated intensity. *Mon. Wea. Rev.*, **140**, 825-840.

Stern, D. P., and D. S. Nolan, 2012: On the height of the warm core in tropical cyclones. *J. Atmos. Sci.*, **69**, 1657-1680.

Nolan, D. S., D. P. Stern, and J. A. Zhang, 2009: Evaluation of planetary boundary layer parameterizations in tropical cyclones by comparison of in-situ data and high-resolution simulations of Hurricane Isabel (2003). Part II: Inner-core boundary layer and eyewall structure. *Mon. Wea. Rev.*, **137**, 3675-3698.

Nolan, D. S., J. A. Zhang, and D. P. Stern, 2009: Evaluation of planetary boundary layer parameterizations in tropical cyclones by comparison of in-situ data and high-resolution simulations of Hurricane Isabel (2003). Part I: Initialization, maximum winds, and the outer core boundary layer. *Mon. Wea. Rev.*, **137**, 3651-3674.

Other Publications:

Kelly, D. L., D. Letson, F. Nelson, D. S. Nolan, and D. Solis, 2012: Evolution of subjective hurricane risk perceptions: A Bayesian approach. *Journal of Economic Behavior and Organization*, **81**, 644-663.

McGauley, M. G., and D. S. Nolan, 2011: Measuring environmental favorability for tropical cyclogenesis by statistical analysis of threshold parameters. *J. Climate.*, **24**, 5968-5997.

Rappin, Eric D., David S. Nolan, and Kerry A. Emanuel, 2010: Therodynamic control of tropical cyclogenesis in environments of radiative-convective equlibrium with shear. *Q. J. Roy. Meteorol. Soc.*, **136**, 1954-1971.

Fierro, A. O., R. F. Rogers, F. D. Marks, and D. S. Nolan, 2009: Impact of cloud resolving horizontal grid spacing on simulated tropical cyclone structure with emphasis on microphysics and kinematic fields. *Mon. Wea. Rev.*, **137**, 3717-3743.

Nolan, David S., Eric D. Rappin, and Kerry A. Emanuel, 2007: Tropical cyclogenesis sensitivity to environmental parameters in radiative-convective equilibrium. *Q. J. R. Meteorol. Soc.*, **133**, 2085-2107.

Service:

Academic Chair for the Division of Meteorology and Physical Oceanography, 2003-2006.

University of Miami representative to the UCAR President's Advisory Council on University Relations, 2008-present.

International Committee for Dynamical Meteorology, 2010-present.

Hurricane Forecasting Improvement Program Scientific Review Committee, 2012-present.

Graduate and Postdoctoral Advisors:

Brian F. Farrell (Harvard University)

Alexandre J. Chorin (U. C. Berkeley)

Michael T. Montgomery (Colorado State University)

Recent Collaborators:

Scott Braun (NASA-Goddard), Kerry A. Emanuel (MIT), Alexandre Fierro (LANL), Daniel Hodyss (NRL), James P. Kossin (NOAA/SSEC), Brian Mapes (RSMAS), Frank Marks (NOAA/HRD), Melinda Peng (NRL), Eric D. Rappin (RSMAS), Caroline Reynolds (NRL), Robert Rogers (NOAA/HRD), Chris Rozoff (UW-Madison), Jason Sippel (NASA-Goddard), Chris D. Thorncroft (U. Albany), Eric Uhlhorn (NOAA/HRD) Chidong Zhang (RSMAS), Fuqing Zhang (Penn. State), Jun A. Zhang (NOAA/HRD).

Graduate Students and Post-Docs advised:

Yumin Moon, M.S. 2007, PhD 2012; Daniel Stern, Ph.D., 2010; Michael McGauley, PhD 2012; Daniel Hodyss, Post-doc, 2003-2005; Eric Rappin, Post-Doc, 2005-2007.

Abbreviated CV for Mark DeMaria

Education
Ph.D., Atmospheric Science, Colorado State University, 1983
M.S., Atmospheric Science, Colorado State University, 1979
B.S., Meteorology, Florida State University, 1977

Experience

1998-Present	Chief, Regional and Mesoscale Meteorology Branch, NESDIS/StAR
1995-1998	Chief, Technical Support Branch, National Hurricane Center
1987-1995	Research Meteorologist, Hurricane Research Division, NOAA/AOML
1985-1987	Assistant Professor, Dept. of Marine, Earth and Atmospheric Science, NCSU
1984-1985	Post Doctoral Fellow, Advanced Study Program, NCAR

Committees and Professional Societies
Member, American Geophysical Union, 2006-present
Member, American Meteorological Society, 1987-present
OFCM working group on tropical cyclone research, 2009-present
NOAA Hurricane Forecast Improvement Project Science Team Lead 2007-present
NOAA Hurricane Research Joint Action Group 2005-2007
NOAA GOES-R Risk Reduction Program Committee, Joint Chair, 2006-present.
NOAA Cooperative Institute oversight committee, 2005
NOAA internal Hurricane Intensity Research Working Group, 2005
Program manager, GOES Improved Measurement Product Assurance Plan, 2002-present
U.S. Weather Research Program Science Steering Committee, 1999-2003
Weather Research and Forecasting (WRF) Model Oversight Committee, 2000-2003
Associate Editor, Monthly Weather Review, 2002 and 2004-2006
Associate Editor, Weather and Forecasting, 2009-present.
Adjunct Faculty Member, Dept. of Atmospheric Science, CSU, 1999-present

Honors and Awards
2012: Colorado Governor's Award for high impact research
2012: AMS Banner I. Miller Award for best published paper on hurricane forecasting
2011: NOAA Bronze Medal for hurricane intensity model improvements
2010: NOAA Bronze Medal for new operational hurricane wind probability model
2009: OFCM Richard H. Hagemeyer Award for contributions to the U.S. Hurricane Program
2008: NOAA Bronze Medal for a new operational tropical cyclone formation probability product
2005: DOC Silver medal for improving tropical cyclone intensity forecasting using satellite data
2002: NOAA Bronze Medal for Hurricane Mitch Reconstruction Project
2002: AMS Banner I. Miller Award for best published paper on hurricane forecasting
1997: NOAA Bronze Medal for new inland wind model
1996: NWS Modernization Award for the development of N-AWIPS applications
1992: Dept. of Commerce Gold Medal (Group Award) for performance during Andrew
1989: AMS Banner I. Miller Award for best published paper on hurricane forecasting
1987: AMS Banner I. Miller Award for best published paper on hurricane forecasting
1981: AMS Max A. Eaton Prize for best student paper

Formal Publications (last 3 years)

Knaff., J.A., **M. DeMaria**, C.R. Sampson, J.E. Peak, J. Cummings, W.H. Schubert, 2012: Upper oceanic energy response to tropical cyclone passage. *J. Climate*, in press.

Li, X. J.A. Zhang, X. Yang, G. Pichel, **M. DeMaria**, D. Long, and Z. Li., 2012: Tropical cyclone morphology from spaceborne synthetic aperture radar. *Bull. Amer. Meteor. Soc*., in press.

Sampson, C.R., A.B. Schumacher, J.A. Knaff, **M. DeMaria**, E.M. Fukada, C.A. Sisko, D.P. Roberts, K.A. Winters, and H. M. Wilson, 2012: Objective guidance for use in setting tropical cyclone conditions of readiness. *Wea. Forecasting*, **27**, 1052-1060.

DeMaria, M., R.T. DeMaria, J.A. Knaff and D. Molenar, 2012: Tropical cyclone lighting and rapid intensity change. *Mon. Wea. Rev*., **140**, 1828-1842.

Goodman, S.J., J. Gurka, **M. DeMaria**, T. Schmit, A. Mostek, G. Jedlovec, C. Siewert, W. Feltz, J. Gerth, R. Brummer, S. Miller, B. Reed, R.R. Reynolds, 2012: The GOES-R Proving Ground: Accelerating user readiness for the next generation geostationary environmental satellite system. *Bull. Amer. Meteor. Soc.*, **93**, 1029-1040.

Hamill, T.M., M.J. Brennan, B. Brown, **M. DeMaria**, E.N. Rappaport and Z. Toth, 2012: NOAA's future ensemble-based hurricane forecast products. *Bull. Amer. Meteor. Soc.*,**93**, 209-220 .

Tsai, Hsiao-Chung, Kuo-Chen Lu, Nai-Ning Hsu, Aimei Chia, **Mark DeMaria**, 2011: An Application of the Monte Carlo Method: Tropical Cyclone Strike Probabilities. *Atmospheric Sciences*, **39**:3, 269-288.

Knaff, J. A., **M. DeMaria**, D. A. Molenar, C. R. Sampson, M. G. Seybold, 2011: An automated, objective, multiple-satellite-platform tropical cyclone surface wind analysis. *J. Appl. Meteor. Climatol*., **50**, 2149–2166. (Oct)

Sampson, C.R., J. Kaplan, J.A. Knaff, **M. DeMaria** and C.A. Sisko, 2011: A deterministic rapid intensification aid. *Wea. Forecasting*, **26**, 579-585.

Rappaport, E.N., J.L. Franklin, A.B Schumacher, **M. DeMaria**, L.K. Shay, and E.J. Gibney, 2010: Tropical cyclone intensity change before U.S. Gulf coast landfall. *W. Forecasting*, **5**, 1380-1396.

Grasso, L.D., M. Sengupta, and **M. DeMaria**, 2010: Comparison between observed and synthetic 6.5 and 10.7 μm GOES-12 imagery of thunderstorms that occurred on 8 May 2003. *Int. Journal of Remote Sensing*, **31**:3, 647-663.

Kaplan, J., **M. DeMaria**, and J.A. Knaff, 2010: A revised tropical cyclone rapid intensification index for the Atlantic and east Pacific basins. *Wea. Forecasting*, **25**, 220-241.

G. CURRENT AND PENDING FEDERAL SUPPORT

PI Nolan:

Current Funding:

1. Title: Using NOGAPS Singular Vectors to Diagnose Large-scale Influences on Tropical Cyclogenesis (Co-PI)
   Agency: Office of Naval Research
   Award Period Covered: 01/01/09 – 12/31/12
   Amount Funded: $487,713
   Person Months: 0.5
   Location of Project: University of Miami/RSMAS

2. Title: Further Development of Observing System Simulation Experiments for Unmanned Aircraft Systems in Hurricanes
   Agency: NOAA
   Award Period Covered: 10/01/2011 – 08/31/2013
   Amount Funded: $74,960
   Person Months: 1.0
   Location of Project: University of Miami/RSMAS

3. Title: Collaborative Research: Understanding Tropical Cyclone Evolution in Wind Shear through a Synthesis of Observational Data Sets and Idealized Simulations
   Agency: NSF
   Award Period Covered: 09/15/2011 – 08/31/2014
   Amount Funded: $465,491
   Person Months: 1.0
   Location of Project: University of Miami/RSMAS

4. Title: Collaborative Research: Tropical Waves and Intertropical Convergence Zones in Simulations with Explicit Convection
   Agency: NSF
   Award Period Covered: 02/15/2012 – 1/31/2014
   Amount Funded: $269,465
   Person Months: 1.0
   Location of Project: University of Miami/RSMAS

5. Title: Collaborative Research: Advanced Model Diagnostics of Tropical Cyclones Inner-Core Structure Using Aircraft Observations (Co-PI)
   Agency: NOAA
   Award Period Covered: 01/01/2012 – 12/31/2013
   Amount Funded: $98,979
   Person Months: 1.0
   Location of Project: University of Miami/RSMAS

6. Title: Evaluating Global and Regional Observing System Simulation Experiments for Hurricanes

Agency: NOAA
Award Period Covered: 09/01/2012 – 08/31/2013
Amount Funded: $102,367
Person Months: .75
Location of Project: University of Miami/RSMAS

Pending Funding:

1. Title: Regional Precipitation Downscaling with NU-WRF and Application to South Florida Water Management (Co-PI)
   Agency: NASA
   Proposed Time Period: 01/01/2013 – 12/31/2016
   Requested Funds: $921,817
   Person Months: .50
   Location of Project: University of Miami/RSMAS

2. Title: Advancing Understanding of the Tornado Vortex Through Numerical Simulations of Increasing Complexity and Evaluation of Observing Systems
   Agency: NSF
   Proposed Time Period: 04/01/2013 – 03/31/2017
   Requested Funds: $665,418
   Person Months: 1.00
   Location of Project: University of Miami/RSMAS

3. Title: Guidance on Observational Undersampling over the Tropical Cyclone Lifecycle
   Agency: NOAA
   Proposed Time Period: 07/01/2013 – 06/30/2015
   Requested Funds: $120,015
   Person Months: 1.0
   Location of Project: University of Miami/RSMAS

4. Title: Guidance on Intensity Guidance ***This Proposal***
   Agency: NOAA
   Proposed Time Period: 07/01/2013 – 06/30/2015
   Requested Funds: $82,257
   Person Months: .50
   Location of Project: University of Miami/RSMAS

PI Schumacher:

<u>Current Funding:</u>

1. Project Title: Development of a Probabilistic Tropical Cyclone Prediction Scheme
   Status: Funded
   Supporting Agency: NOAA/Joint Hurricane Testbed
   Award Number: NA11OAR4310203
   Award Time Period: 8/1/2011 – 7/31/2013
   Commitment: 3.5 mo/yr
   Award Amount: $70,000 (CIRA portion of $189,464 total)
   Duration: 2 years

2. Project Title: New Statistical-Dynamical Intensity Forecast Models for the Indian Ocean and Southern Hemisphere
   Status: Funded
   Supporting Agency: Dept. of Navy / Joint Typhoon Warning Center
   Award Number: N0010412-M-Q939
   Award Time Period: 9/1/2012 – 8/31/2013
   Commitment: 5.5 mo
   Award Amount: $96,000
   Duration: 1 year

<u>Pending Funding:</u>

1. Project Title: Upgrades to the Operational Monte Carlo Wind Speed Probability Program
   Status: Pending
   Supporting Agency: NOAA/Joint Hurricane Testbed
   Award Number: NA11OAR4310203
   Proposed Time Period: 8/1/2013 – 7/31/2015
   Proposed Commitment: 3.0 mo/yr
   Requested Funds: $86,000
   Proposed Duration: 2 years

2. Project Title: Intensity Guidance on Guidance
   Status: ***This Proposal***
   Supporting Agency: NOAA/Joint Hurricane Testbed
   Award Number: NA11OAR4310203
   Proposed Time Period: 8/1/2013 – 7/31/2015
   Proposed Commitment: 2.0 mo/yr
   Award Amount: $82,257
   Proposed Duration: 2 years

Collaborator DeMaria:

Mark DeMaria is based funded by NESDIS/STAR and his participation in the project will be at no cost to the JHT.

COLLEGES AND UNIVERSITIES RATE AGREEMENT

EIN: 15-90624458

ORGANIZATION:
University of Miami
Office of the Controller
P.O. Box 248106
Coral Gables, FL 33124-1422

DATE:10/16/2012

FILING REF.: The preceding agreement was dated 09/07/2012

The rates approved in this agreement are for use on grants, contracts and other agreements with the Federal Government, subject to the conditions in Section III.

SECTION I: INDIRECT COST RATES

RATE TYPES: FIXED FINAL PROV. (PROVISIONAL) PRED. (PREDETERMINED)

TYPE	EFFECTIVE PERIOD FROM	TO	RATE(%)	LOCATION	APPLICABLE TO
FINAL	06/01/2011	05/31/2012	53.00	On-Campus	Org Rsch Med
PRED.	06/01/2012	05/31/2013	53.00	On-Campus	Org Rsch Med
PRED.	06/01/2013	05/31/2015	53.50	On-Campus	Org Rsch Med
FINAL	06/01/2011	05/31/2012	48.50	On-Campus	Org Rsch Main
PRED.	06/01/2012	05/31/2013	48.50	On-Campus	Org Rsch Main
PRED.	06/01/2013	05/31/2015	50.50	On-Campus	Org Rsch Main
FINAL	06/01/2011	05/31/2012	50.00	On-Campus	Org Rsch Marine
PRED.	06/01/2012	05/31/2013	50.00	On-Campus	Org Rsch Marine
PRED.	06/01/2013	05/31/2014	55.00	On-Campus	Org Rsch Marine
PRED.	06/01/2014	05/31/2015	57.00	On-Campus	Org Rsch Marine
FINAL	06/01/2011	05/31/2012	54.00	On-Campus	Instruction
PRED.	06/01/2012	05/31/2015	50.00	On-Campus	Instruction
FINAL	06/01/2011	05/31/2012	36.00	On-Campus	Other Sponsored Activities
PRED.	06/01/2012	05/31/2015	36.00	On-Campus	Other Sponsored Activities
FINAL	06/01/2011	05/31/2012	26.00	Off-Campus	All Programs
PRED.	06/01/2012	05/31/2015	26.00	Off-Campus	All Programs

ORGANIZATION: University of Miami
AGREEMENT DATE: 10/16/2012

TYPE	FROM	TO	RATE(%)	LOCATION	APPLICABLE TO
PROV.	06/01/2015	Until Amended			Use same rates and conditions as those cited for fiscal year ending May 31, 2015.

*BASE

Modified total direct costs, consisting of all salaries and wages, fringe benefits, materials, supplies, services, travel and subgrants and subcontracts up to the first $25,000 of each subgrant or subcontract (regardless of the period covered by the subgrant or subcontract). Modified total direct costs shall exclude equipment, capital expenditures, charges for patient care, student tuition remission, rental costs of off-site facilities, scholarships, and fellowships as well as the portion of each subgrant and subcontract in excess of $25,000.

ORGANIZATION: University of Miami
AGREEMENT DATE: 10/16/2012

SECTION I: FRINGE BENEFIT RATES**

TYPE	FROM	TO	RATE(%)	LOCATION	APPLICABLE TO
FIXED	6/1/2012	5/31/2013	21.90	All	Regular Faculty (A)
FIXED	6/1/2012	5/31/2013	19.20	All	Clinical Faculty (B)
FIXED	6/1/2012	5/31/2013	35.40	All	Other Staff (A)
FIXED	6/1/2012	5/31/2013	12.70	All	Part-Time (C)
PROV.	6/1/2013	Until amended			Use same rates and conditions as those cited for fiscal year ending May 31, 2013.

** DESCRIPTION OF FRINGE BENEFITS RATE BASE:

Salaries and wages.

SECTION II: SPECIAL REMARKS

TREATMENT OF FRINGE BENEFITS:

The fringe benefits are charged using the rate(s) listed in the Fringe Benefits Section of this Agreement. The fringe benefits included in the rate(s) are listed below.

TREATMENT OF PAID ABSENCES

Vacation, holiday, sick leave pay and other paid absences are included in salaries and wages and are claimed on grants, contracts and other agreements as part of the normal cost for salaries and wages. Separate claims are not made for the cost of these paid absences.

OFF-CAMPUS DEFINITION: For all activities performed in facilities not owned by the institution and to which rent is directly allocated to the project(s). the off-campus rate will apply. Grants or contracts will not be subject to more than one F&A cost rate. If more than 50% of a project is performed off-campus, the off-campus rate will apply to the entire project.

Equipment means an article of nonexpendable tangible personal property having a useful life of more than one year, and an acquisition cost of $2,500 or more per unit.

(A) Fringe Benefits include: FICA, Retirement, Life Insurance, Unemployment Compensation, Health Insurance, Workers' Compensation, Tuition Remission, Fringe Benefits Office and Professional Disability.

(B) Fringe Benefits include: FICA, Retirement, Life Insurance, Health Insurance, Workers' Compensation, Tuition Remission, Fringe Benefits Office and Professional Disability.

(C) Fringe Benefits include: FICA, Retirement, Unemployment, Workers' Compensation and Fringe Benefits Office.

ORGANIZATION: University of Miami

AGREEMENT DATE: 10/16/2012

SECTION III: GENERAL

A. LIMITATIONS:

The rates in this Agreement are subject to any statutory or administrative limitations and apply to a given grant, contract or other agreement only to the extent that funds are available. Acceptance of the rates is subject to the following conditions: (1) Only costs incurred by the organization were included in its facilities and administrative cost pools as finally accepted: such costs are legal obligations of the organization and are allowable under the governing cost principles; (2) The same costs that have been treated as facilities and administrative costs are not claimed as direct costs; (3) Similar types of costs have been accorded consistent accounting treatment; and (4) The information provided by the organization which was used to establish the rates is not later found to be materially incomplete or inaccurate by the Federal Government. In such situations the rate(s) would be subject to renegotiation at the discretion of the Federal Government.

B. ACCOUNTING CHANGES:

This Agreement is based on the accounting system purported by the organization to be in effect during the Agreement period. Changes to the method of accounting for costs which affect the amount of reimbursement resulting from the use of this Agreement require prior approval of the authorized representative of the cognizant agency. Such changes include, but are not limited to, changes in the charging of a particular type of cost from facilities and administrative to direct. Failure to obtain approval may result in cost disallowances.

C. FIXED RATES:

If a fixed rate is in this Agreement, it is based on an estimate of the costs for the period covered by the rate. When the actual costs for this period are determined, an adjustment will be made to a rate of a future year(s) to compensate for the difference between the costs used to establish the fixed rate and actual costs.

D. USE BY OTHER FEDERAL AGENCIES:

The rates in this Agreement were approved in accordance with the authority in Office of Management and Budget Circular A-21, and should be applied to grants, contracts and other agreements covered by this Circular, subject to any limitations in A above. The organization may provide copies of the Agreement to other Federal Agencies to give them early notification of the Agreement.

E. OTHER:

If any Federal contract, grant or other agreement is reimbursing facilities and administrative costs by a means other than the approved rate(s) in this Agreement, the organization should (1) credit such costs to the affected programs, and (2) apply the approved rate(s) to the appropriate base to identify the proper amount of facilities and administrative costs allocable to these programs.

BY THE INSTITUTION:

University of Miami

(INSTITUTION)

(SIGNATURE)

John R. Shipley

(NAME)

VP of Finance & Treasurer

(TITLE)

11/6/12

(DATE)

ON BEHALF OF THE FEDERAL GOVERNMENT:

DEPARTMENT OF HEALTH AND HUMAN SERVICES

(AGENCY)

Darryl W. Mayes

(SIGNATURE)

Darryl W. Mayes

(NAME)

Director, Mid-Atlantic Field Office

(TITLE)

10/16/2012

(DATE) 0305

HHS REPRESENTATIVE: Steven Zuraf

Telephone: (301) 492-4855

OMB Number: 4040-0004
Expiration Date: 03/31/2012

Application for Federal Assistance SF-424

* 1. Type of Submission:	* 2. Type of Application:	* If Revision, select appropriate letter(s):
☐ Preapplication	☒ New	
☐ Application	☐ Continuation	* Other (Specify):
☒ Changed/Corrected Application	☐ Revision	

* 3. Date Received: 12/06/2012
4. Applicant Identifier:

5a. Federal Entity Identifier:
5b. Federal Award Identifier: GRANT11278528

State Use Only:

6. Date Received by State:
7. State Application Identifier:

8. APPLICANT INFORMATION:

* a. Legal Name: University of Miami

* b. Employer/Taxpayer Identification Number (EIN/TIN): 590624458
* c. Organizational DUNS: 1527640070000

d. Address:

* Street1: 4600 Rickenbacker Causeway
Street2:
* City: Miami
County/Parish:
* State: FL: Florida
Province:
* Country: USA: UNITED STATES
* Zip / Postal Code: 33149-1031

e. Organizational Unit:

Department Name:
Division Name:

f. Name and contact information of person to be contacted on matters involving this application:

Prefix: Ms.
* First Name: Fernande
Middle Name:
* Last Name: Saintilis
Suffix:

Title: Research Administration, Team Manager

Organizational Affiliation:

* Telephone Number: 305-421-4181
Fax Number: 305-421-4876

* Email: fsaintilis@miami.edu

Application for Federal Assistance SF-424

*** 9. Type of Applicant 1: Select Applicant Type:**

O: Private Institution of Higher Education

Type of Applicant 2: Select Applicant Type:

Type of Applicant 3: Select Applicant Type:

* Other (specify):

*** 10. Name of Federal Agency:**

Department of Commerce

11. Catalog of Federal Domestic Assistance Number:

11.459

CFDA Title:

Weather and Air Quality Research

*** 12. Funding Opportunity Number:**

NOAA-OAR-OWAQ-2013-2003469

* Title:

FY 2013 Joint Hurricane Testbed

13. Competition Identification Number:

2297052

Title:

14. Areas Affected by Project (Cities, Counties, States, etc.):

Add Attachment | Delete Attachment | View Attachment

*** 15. Descriptive Title of Applicant's Project:**

Guidance on Intensity Guidance

Attach supporting documents as specified in agency instructions.

Add Attachments | Delete Attachments | View Attachments

Application for Federal Assistance SF-424

16. Congressional Districts Of:

* a. Applicant: FL-018

b. Program/Project: FL-018

Attach an additional list of Program/Project Congressional Districts if needed.

[ ] Add Attachment | Delete Attachment | View Attachment

17. Proposed Project:

* a. Start Date: 08/01/2013

* b. End Date: 07/31/2015

18. Estimated Funding ($):

* a. Federal	82,257.00
* b. Applicant	0.00
* c. State	0.00
* d. Local	0.00
* e. Other	0.00
* f. Program Income	0.00
* g. TOTAL	82,257.00

*** 19. Is Application Subject to Review By State Under Executive Order 12372 Process?**

☐ a. This application was made available to the State under the Executive Order 12372 Process for review on [ ].

☐ b. Program is subject to E.O. 12372 but has not been selected by the State for review.

☒ c. Program is not covered by E.O. 12372.

*** 20. Is the Applicant Delinquent On Any Federal Debt? (If "Yes," provide explanation in attachment.)**

☐ Yes ☒ No

If "Yes", provide explanation and attach

[ ] Add Attachment | Delete Attachment | View Attachment

21. *By signing this application, I certify (1) to the statements contained in the list of certifications and (2) that the statements herein are true, complete and accurate to the best of my knowledge. I also provide the required assurances** and agree to comply with any resulting terms if I accept an award. I am aware that any false, fictitious, or fraudulent statements or claims may subject me to criminal, civil, or administrative penalties. (U.S. Code, Title 218, Section 1001)**

☒ ** I AGREE

** The list of certifications and assurances, or an internet site where you may obtain this list, is contained in the announcement or agency specific instructions.

Authorized Representative:

Prefix: Ms.

* First Name: Fernande

Middle Name:

* Last Name: Saintilis

Suffix:

* Title: Research Administration, Team Manager

* Telephone Number: 305-421-4181

Fax Number: 305-421-4876

* Email: fsaintilis@miami.edu

* Signature of Authorized Representative: Fernande Saintilis

* Date Signed: 12/06/2012

BUDGET INFORMATION - Non-Construction Programs

OMB Number: 4040-0006
Expiration Date: 06/30/2014

SECTION A - BUDGET SUMMARY

	Grant Program Function or Activity (a)	Catalog of Federal Domestic Assistance Number (b)	Estimated Unobligated Funds: Federal (c)	Estimated Unobligated Funds: Non-Federal (d)	New or Revised Budget: Federal (e)	New or Revised Budget: Non-Federal (f)	New or Revised Budget: Total (g)
1.	FY 2013 Joint Hurricane Testbed	11.459	$	$	$ 82,257.00	$	$ 82,257.00
2.							
3.							
4.							
5.	Totals		$	$	$ 82,257.00	$	$ 82,257.00

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Prescribed by OMB (Circular A -102) Page 1

SECTION B - BUDGET CATEGORIES

6. Object Class Categories	GRANT PROGRAM, FUNCTION OR ACTIVITY				Total
	(1)	(2)	(3)	(4)	(5)
	FY 2013 Joint Hurricane Testbed	N/A			
a. Personnel	$ 16,284.00	$ 17,097.00	$	$	$ 33,381.00
b. Fringe Benefits	1,205.00	1,266.00			2,471.00
c. Travel	1,800.00	1,800.00			3,600.00
d. Equipment	0.00	0.00			
e. Supplies	0.00	0.00			
f. Contractual	0.00	0.00			
g. Construction	0.00	0.00			
h. Other	12,262.00	12,875.00			25,137.00
i. Total Direct Charges (sum of 6a-6h)	31,551.00	33,038.00			$ 64,589.00
j. Indirect Charges	8,636.00	9,032.00			$ 17,668.00
k. TOTALS (sum of 6i and 6j)	$ 40,187.00	$ 42,070.00	$	$	$ 82,257.00
7. Program Income	$	$	$	$	$

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Prescribed by OMB (Circular A -102) Page 1A

SECTION C - NON-FEDERAL RESOURCES

(a) Grant Program	(b) Applicant	(c) State	(d) Other Sources	(e)TOTALS
8.	$	$	$	$
9.				
10.				
11.				
12. TOTAL (sum of lines 8-11)	$	$	$	$

SECTION D - FORECASTED CASH NEEDS

	Total for 1st Year	1st Quarter	2nd Quarter	3rd Quarter	4th Quarter
13. Federal	$ 40,187.00	$ 10,046.75	$ 10,046.75	$ 10,046.75	$ 10,046.75
14. Non-Federal	$				
15. TOTAL (sum of lines 13 and 14)	$ 40,187.00	$ 10,046.75	$ 10,046.75	$ 10,046.75	$ 10,046.75

SECTION E - BUDGET ESTIMATES OF FEDERAL FUNDS NEEDED FOR BALANCE OF THE PROJECT

(a) Grant Program	FUTURE FUNDING PERIODS (YEARS)			
	(b)First	(c) Second	(d) Third	(e) Fourth
16. FY 2013 Joint Hurricane Testbed-Year 2	$ 42,070.00	$	$	$
17.				
18.				
19.				
20. TOTAL (sum of lines 16 - 19)	$ 42,070.00	$	$	$

SECTION F - OTHER BUDGET INFORMATION

21. Direct Charges: 64589	22. Indirect Charges: 17668
23. Remarks: Indirect Rate for this proposal is based on the CIMAS rate of 40%	

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OMB Number: 4040-0007
Expiration Date: 06/30/2014

ASSURANCES - NON-CONSTRUCTION PROGRAMS

Public reporting burden for this collection of information is estimated to average 15 minutes per response, including time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding the burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to the Office of Management and Budget, Paperwork Reduction Project (0348-0040), Washington, DC 20503.

PLEASE DO NOT RETURN YOUR COMPLETED FORM TO THE OFFICE OF MANAGEMENT AND BUDGET. SEND IT TO THE ADDRESS PROVIDED BY THE SPONSORING AGENCY.

NOTE: Certain of these assurances may not be applicable to your project or program. If you have questions, please contact the awarding agency. Further, certain Federal awarding agencies may require applicants to certify to additional assurances. If such is the case, you will be notified.

As the duly authorized representative of the applicant, I certify that the applicant:

1. Has the legal authority to apply for Federal assistance and the institutional, managerial and financial capability (including funds sufficient to pay the non-Federal share of project cost) to ensure proper planning, management and completion of the project described in this application.

2. Will give the awarding agency, the Comptroller General of the United States and, if appropriate, the State, through any authorized representative, access to and the right to examine all records, books, papers, or documents related to the award; and will establish a proper accounting system in accordance with generally accepted accounting standards or agency directives.

3. Will establish safeguards to prohibit employees from using their positions for a purpose that constitutes or presents the appearance of personal or organizational conflict of interest, or personal gain.

4. Will initiate and complete the work within the applicable time frame after receipt of approval of the awarding agency.

5. Will comply with the Intergovernmental Personnel Act of 1970 (42 U.S.C. §§4728-4763) relating to prescribed standards for merit systems for programs funded under one of the 19 statutes or regulations specified in Appendix A of OPM's Standards for a Merit System of Personnel Administration (5 C.F.R. 900, Subpart F).

6. Will comply with all Federal statutes relating to nondiscrimination. These include but are not limited to: (a) Title VI of the Civil Rights Act of 1964 (P.L. 88-352) which prohibits discrimination on the basis of race, color or national origin; (b) Title IX of the Education Amendments of 1972, as amended (20 U.S.C.§§1681-1683, and 1685-1686), which prohibits discrimination on the basis of sex; (c) Section 504 of the Rehabilitation Act of 1973, as amended (29 U.S.C. §794), which prohibits discrimination on the basis of handicaps; (d) the Age Discrimination Act of 1975, as amended (42 U.S.C. §§6101-6107), which prohibits discrimination on the basis of age; (e) the Drug Abuse Office and Treatment Act of 1972 (P.L. 92-255), as amended, relating to nondiscrimination on the basis of drug abuse; (f) the Comprehensive Alcohol Abuse and Alcoholism Prevention, Treatment and Rehabilitation Act of 1970 (P.L. 91-616), as amended, relating to nondiscrimination on the basis of alcohol abuse or alcoholism; (g) §§523 and 527 of the Public Health Service Act of 1912 (42 U.S.C. §§290 dd-3 and 290 ee- 3), as amended, relating to confidentiality of alcohol and drug abuse patient records; (h) Title VIII of the Civil Rights Act of 1968 (42 U.S.C. §§3601 et seq.), as amended, relating to nondiscrimination in the sale, rental or financing of housing; (i) any other nondiscrimination provisions in the specific statute(s) under which application for Federal assistance is being made; and, (j) the requirements of any other nondiscrimination statute(s) which may apply to the application.

7. Will comply, or has already complied, with the requirements of Titles II and III of the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970 (P.L. 91-646) which provide for fair and equitable treatment of persons displaced or whose property is acquired as a result of Federal or federally-assisted programs. These requirements apply to all interests in real property acquired for project purposes regardless of Federal participation in purchases.

8. Will comply, as applicable, with provisions of the Hatch Act (5 U.S.C. §§1501-1508 and 7324-7328) which limit the political activities of employees whose principal employment activities are funded in whole or in part with Federal funds.

9. Will comply, as applicable, with the provisions of the Davis-Bacon Act (40 U.S.C. §§276a to 276a-7), the Copeland Act (40 U.S.C. §276c and 18 U.S.C. §874), and the Contract Work Hours and Safety Standards Act (40 U.S.C. §§327-333), regarding labor standards for federally-assisted construction subagreements.

10. Will comply, if applicable, with flood insurance purchase requirements of Section 102(a) of the Flood Disaster Protection Act of 1973 (P.L. 93-234) which requires recipients in a special flood hazard area to participate in the program and to purchase flood insurance if the total cost of insurable construction and acquisition is $10,000 or more.

11. Will comply with environmental standards which may be prescribed pursuant to the following: (a) institution of environmental quality control measures under the National Environmental Policy Act of 1969 (P.L. 91-190) and Executive Order (EO) 11514; (b) notification of violating facilities pursuant to EO 11738; (c) protection of wetlands pursuant to EO 11990; (d) evaluation of flood hazards in floodplains in accordance with EO 11988; (e) assurance of project consistency with the approved State management program developed under the Coastal Zone Management Act of 1972 (16 U.S.C. §§1451 et seq.); (f) conformity of Federal actions to State (Clean Air) Implementation Plans under Section 176(c) of the Clean Air Act of 1955, as amended (42 U.S.C. §§7401 et seq.); (g) protection of underground sources of drinking water under the Safe Drinking Water Act of 1974, as amended (P.L. 93-523); and, (h) protection of endangered species under the Endangered Species Act of 1973, as amended (P.L. 93-205).

12. Will comply with the Wild and Scenic Rivers Act of 1968 (16 U.S.C. §§1271 et seq.) related to protecting components or potential components of the national wild and scenic rivers system.

13. Will assist the awarding agency in assuring compliance with Section 106 of the National Historic Preservation Act of 1966, as amended (16 U.S.C. §470), EO 11593 (identification and protection of historic properties), and the Archaeological and Historic Preservation Act of 1974 (16 U.S.C. §§469a-1 et seq.).

14. Will comply with P.L. 93-348 regarding the protection of human subjects involved in research, development, and related activities supported by this award of assistance.

15. Will comply with the Laboratory Animal Welfare Act of 1966 (P.L. 89-544, as amended, 7 U.S.C. §§2131 et seq.) pertaining to the care, handling, and treatment of warm blooded animals held for research, teaching, or other activities supported by this award of assistance.

16. Will comply with the Lead-Based Paint Poisoning Prevention Act (42 U.S.C. §§4801 et seq.) which prohibits the use of lead-based paint in construction or rehabilitation of residence structures.

17. Will cause to be performed the required financial and compliance audits in accordance with the Single Audit Act Amendments of 1996 and OMB Circular No. A-133, "Audits of States, Local Governments, and Non-Profit Organizations."

18. Will comply with all applicable requirements of all other Federal laws, executive orders, regulations, and policies governing this program.

19. Will comply with the requirements of Section 106(g) of the Trafficking Victims Protection Act (TVPA) of 2000, as amended (22 U.S.C. 7104) which prohibits grant award recipients or a sub-recipient from (1) Engaging in severe forms of trafficking in persons during the period of time that the award is in effect (2) Procuring a commercial sex act during the period of time that the award is in effect or (3) Using forced labor in the performance of the award or subawards under the award.

* SIGNATURE OF AUTHORIZED CERTIFYING OFFICIAL	* TITLE
Fernande Saintilis	Research Administration, Team Manager
* APPLICANT ORGANIZATION	* DATE SUBMITTED
University of Miami	12/06/2012

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FORM **CD-511**
(REV 1-05)

U.S. DEPARTMENT OF COMMERCE

CERTIFICATION REGARDING LOBBYING

Applicants should also review the instructions for certification included in the regulations before completing this form. Signature on this form provides for compliance with certification requirements under 15 CFR Part 28, 'New Restrictions on Lobbying.' The certifications shall be treated as a material representation of fact upon which reliance will be placed when the Department of Commerce determines to award the covered transaction, grant, or cooperative agreement.

LOBBYING

As required by Section 1352, Title 31 of the U.S. Code, and implemented at 15 CFR Part 28, for persons entering into a grant, cooperative agreement or contract over $100,000 or a loan or loan guarantee over $150,000 as defined at 15 CFR Part 28, Sections 28.105 and 28.110, the applicant certifies that to the best of his or her knowledge and belief, that:

(1) No Federal appropriated funds have been paid or will be paid, by or on behalf of the undersigned, to any person for influencing or attempting to influence an officer or employee of any agency, a Member of Congress in connection with the awarding of any Federal contract, the making of any Federal grant, the making of any Federal loan, the entering into of any cooperative agreement, and the extension, continuation, renewal, amendment, or modification of any Federal contract, grant, loan, or cooperative agreement.

(2) If any funds other than Federal appropriated funds have been paid or will be paid to any person for influencing or attempting to influence an officer or employee of any agency, a Member of Congress, an officer or employee of Congress, or an employee of a member of Congress in connection with this Federal contract, grant, loan, or cooperative agreement, the undersigned shall complete and submit Standard Form-LLL, 'Disclosure Form to Report Lobbying.' in accordance with its instructions.

(3) The undersigned shall require that the language of this certification be included in the award documents for all subawards at all tiers (including subcontracts, subgrants, and contracts under grants, loans, and cooperative agreements) and that all subrecipients shall certify and disclose accordingly.

This certification is a material representation of fact upon which reliance was placed when this transaction was made or entered into. Submission of this certification is a prerequisite for making or entering into this transaction imposed by section 1352, title 31, U.S. Code. Any person who fails to file the required certification shall be subject to a civil penalty of not less than $10,000 and not more than $100,000 for each such failure occurring on or before October 23, 1996, and of not less than $11,000 and not more than $110,000 for each such failure occurring after October 23, 1996.

Statement for Loan Guarantees and Loan Insurance

The undersigned states, to the best of his or her knowledge and belief, that:

In any funds have been paid or will be paid to any person for influencing or attempting to influence an officer or employee of any agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with this commitment providing for the United States to insure or guarantee a loan, the undersigned shall complete and submit Standard Form-LLL, 'Disclosure Form to Report Lobbying,' in accordance with its instructions.

Submission of this statement is a prerequisite for making or entering into this transaction imposed by section 1352, title 31, U.S. Code. Any person who fails to file the required statement shall be subject to a civil penalty of not less than $10,000 and not more than $100,000 for each such failure occurring on or before October 23, 1996, and of not less than $11,000 and not more than $110,000 for each such failure occurring after October 23, 1996.

As the duly authorized representative of the applicant, I hereby certify that the applicant will comply with the above applicable certification.

* NAME OF APPLICANT: University of Miami

* AWARD NUMBER: N/A

* PROJECT NAME:

Prefix: Ms.
* First Name: Fernande
Middle Name:
* Last Name: Saintilis
Suffix:
* Title: Research Administration, Team Manager

* SIGNATURE: Fernande Saintilis

* DATE: 12/06/2012

Colorado State University
Director and University Controller
Business and Financial Services
6003 Campus Mail
555 S. Howes St.
Fort Collins, CO 80523-6003
(970)491-6694
FAX: (970)491-2253

DATE: July 19, 2012

TO: Deans, Directors, Department Heads, Administrative Assistants and Departmental Secretaries

FROM: Gail Michaud, Associate Controller, Fiscal Operations

SUBJECT: Approved Fringe Benefit Rates

We have received an email from the federal government approving the fiscal year 2013 University Fringe Benefit Rates. For fiscal years beyond FY 2014, the average fringe rate increase is estimated at 1.4% per year, except for Student Hourly, of which the average increase is estimated at 0.1%.

Fringe Class	**FY 2013 Approved Rates**	FY 2014 Estimated Rates		
Faculty/Administrative Professional/ 2nd Year Post Docs & Interns	**24.1%**	24.9%	25.3	25.6
State Classified	**33.1%**	33.7%		
Student Hourly	**1.0%**	1.0%		
Non-Student Hourly	**17.7%**	17.7%		
Graduate Students	**5.1%**	5.5%		
1st Year Post Docs & Interns	**9.2%**	9.3%		
Temp 1st Year Faculty & Admin Pro*	**2.2%**	2.3%		

*This includes first year temporary Faculty and Administrative Professionals and continuing temporary Faculty and Administrative Professionals at less than 50% time.

For questions regarding the Fringe Benefit Rates, please contact Gail Michaud at 491-7134

Attachments: Benefits Chart
Rates by Percentages

DEPARTMENT OF HEALTH AND HUMAN SERVICES

Program Support Center
Financial Management Service
Division of Cost Allocation

DCA Western Field Office
90 7th Street, Suite 4-600
San Francisco, CA 94103
PHONE: (415) 437-7820
FAX: (415) 437-7823
E-MAIL: dcasf@psc.hhs.gov

JUL 26 2012

David Ryan, Controller
Colorado State University
Business and Financial Services
6003 Campus Delivery
Fort Collins, CO 80523-6003

Dear Mr. Ryan:

A copy of an indirect cost/fringe benefit Negotiation Agreement is attached. This Agreement reflects an understanding reached between your organization and a member of my staff concerning the rate(s) that may be used to support your claim for indirect/fringe benefit costs on grants and contracts with the Federal Government. Please have the Agreement signed by a duly authorized representative of your organization and return it to me BY FAX, retaining the copy for your files. We will reproduce and distribute the Agreement to the appropriate awarding organizations of the Federal Government for their use.

An indirect cost and fringe benefit proposal together with supporting information are required to substantiate your claim for costs under grants and contracts awarded by the Federal Government. Thus, your next indirect cost based on your fiscal year ended June 30, 2013 is due in our office by December 31, 2013, and your next fringe benefit proposal based on your fiscal year ending June 30, 2012, is due in our office by December 31, 2012.

Sincerely,

Arif Karim, Director
Division of Cost Allocation

Attachment

PLEASE SIGN AND RETURN THE NEGOTIATION AGREEMENT BY FAX

COLLEGES AND UNIVERSITIES RATE AGREEMENT

EIN:

ORGANIZATION:

Colorado State University Business and Financial Services
202 Johnson Hall
Fort Collins, CO 80523

DATE:07/20/2012

FILING REF.: The preceding agreement was dated 06/21/2011

The rates approved in this agreement are for use on grants, contracts and other agreements with the Federal Government, subject to the conditions in Section III.

SECTION I: INDIRECT COST RATES

RATE TYPES: FIXED FINAL PROV. (PROVISIONAL) PRED. (PREDETERMINED)

	EFFECTIVE PERIOD				
TYPE	**FROM**	**TO**	**RATE(%)**	**LOCATION**	**APPLICABLE TO**
PRED.	07/01/2009	06/30/2010	47.00	On-Campus	Org. Res. (1)
PRED.	07/01/2010	06/30/2011	47.50	On-Campus	Org. Res. (1)
PRED.	07/01/2011	06/30/2012	48.00	On-Campus	Org. Res. (1)
PRED.	07/01/2012	06/30/2013	48.50	On-Campus	Org. Res. (1)
PRED.	07/01/2013	06/30/2014	48.70	On-Campus	Org. Res. (1)
PRED.	07/01/2009	06/30/2014	26.00	Off-Campus	Org. Res. (1)
PRED.	07/01/2009	06/30/2014	55.70	On-Campus	Instruction (1)
PRED.	07/01/2009	06/30/2014	26.00	Off-Campus	Instruction (1)
PRED.	07/01/2009	06/30/2014	31.30	On-Campus	(A) (1)
PRED.	07/01/2009	06/30/2014	26.00	Off-Campus	(A) (1)
PRED.	07/01/2009	06/30/2014	26.00	Off-Campus	(B) (2)
PRED.	07/01/2009	06/30/2014	8.00	Off-Campus	(C) (1)

TYPE	FROM	TO	RATE(%) LOCATION	APPLICABLE TO
PROV.	07/01/2014	Until Amended	(D)	

*BASE

(1) Modified total direct costs, consisting of all salaries and wages, fringe benefits, materials, supplies, services, travel and subgrants and subcontracts up to the first $25,000 of each subgrant or subcontract (regardless of the period covered by the subgrant or subcontract). Modified total direct costs shall exclude equipment, capital expenditures, charges for patient care, student tuition remission, rental costs of off-site facilities, scholarships, and fellowships as well as the portion of each subgrant and subcontract in excess of $25,000.

(2) Same as (1) above except the cost of reimbursements to cooperators performing fire suppression activities funded from the Emergency Fire Fund or Governor's Office Executive Orders, and the cost of direct financial assistance to cooperators for fire prevention and forest management activities are excluded from the State Forest Service rate base.

(A) Other Sponsored Activities

(B) State Forest Service

(C) Intergovernmnetal Personnel Act Agreements

(D) Use same rates and conditions as those cited for fiscal year ending June 30, 2014.

ORGANIZATION: Colorado State University Business and Financial Services

AGREEMENT DATE: 07/20/2012

SECTION I: FRINGE BENEFIT RATES**

TYPE	FROM	TO	RATE(%)	LOCATION		APPLICABLE TO
FIXED	7/1/2012	6/30/2013	24.10	All	(A)	Fac. & Prof. (1)
FIXED	7/1/2012	6/30/2013	33.10	All	(A)	State Classified
FIXED	7/1/2012	6/30/2013	1.00	All	(A)	Student Hourly
FIXED	7/1/2012	6/30/2013	17.70	All	(A)	Temporary (2)
FIXED	7/1/2012	6/30/2013	5.10	All	(A)	All Graduate Students
FIXED	7/1/2012	6/30/2013	9.20	All	(A)	First Year Post Docs (3)
FIXED	7/1/2012	6/30/2013	2.20	All	(A)	Temporary (4)
FIXED	7/1/2012	6/30/2013	16.40	(5)	(B)	All Employees of (5)

** DESCRIPTION OF FRINGE BENEFITS RATE BASE:

(A) Salaries and wages including vacation, holiday, sick leave pay and other paid absences.

(B) Salaries and wages excluding vacation, holiday, sick leave pay and other paid absences.

(1) Faculty, administrative professionals and second-year plus post docs and interns

(2) Temporary non-student hourly

(3) First-year post docs and interns

(4) Temporary first-year faculty, administrative professionals, including continuing temporary faculty and administrative professionals at less than 50% time.

(5) Leave benefit rate for Center for Environmental Management of Military Lands (CEMML) & Colorado National Heritage Program (CNHP)

SECTION II: SPECIAL REMARKS

TREATMENT OF FRINGE BENEFITS:

The fringe benefits are charged using the rate(s) listed in the Fringe Benefits Section of this Agreement. The fringe benefits included in the rate (s) are:

WORKERS COMPENSATION, MEDICAL/LIFE INSURANCE, DISABILITY INSURANCE, UNEMPLOYMENT INSURANCE, MEDICARE, RETIREMENT PERA/DCP, RETIREMENT TERMINATION PAY, EXCESS LEAVE, RETIREE HEALTH INSURANCE, AND EMPLOYEES' TUITION (DOES NOT INCLUDE GRADUATE STUDENTS).

TREATMENT OF PAID ABSENCES

Except for CEMML & CHNP employees, vacation, holiday, sick leave pay and other paid absences are included in salaries and wages and are charged to Federal projects as part of the normal charge for salaries and wages. Separate charges for the cost of these absences are not made.

For CEMML & CHNP employees, the cost of vacation, holiday, sick leave pay, and other paid absences are included in a leave benefit rate which is applied to salaries and wages for budgeting and charging purposes for Federal projects, and are not included in direct charges for salaries and wages. Charges for salaries and wages must exclude those paid to CEMML & CNHP employees for periods when they are on vacation, holiday, or sick leave, or are otherwise absent from work.

DEFINITION OF OFF-CAMPUS

For projects which include activities conducted at both on- and off-campus sites, the following criteria will determine costs to be allocated as off-campus: Must extend over a period of more than 120 consecutive days (or the duration of the project, if less than 120 days) at the off-campus site.

DEFINITION OF EQUIPMENT

Equipment is defined as tangible nonexpendable personal property having a useful life of more than one year and an acquisition cost of $5,000 or more per unit.

This rate agreement updates the fringe benefits only.

ORGANIZATION: Colorado State University Business and Financial Services

AGREEMENT DATE: 07/20/2012

SECTION III: GENERAL

A. LIMITATIONS:

The rates in this Agreement are subject to any statutory or administrative limitations and apply to a given grant, contract or other agreement only to the extent that funds are available. Acceptance of the rates is subject to the following conditions: (1) Only costs incurred by the organization were included in its facilities and administrative cost pools as finally accepted: such costs are legal obligations of the organization and are allowable under the governing cost principles; (2) The same costs that have been treated as facilities and administrative costs are not claimed as direct costs; (3) Similar types of costs have been accorded consistent accounting treatment; and (4) The information provided by the organization which was used to establish the rates is not later found to be materially incomplete or inaccurate by the Federal Government. In such situations the rate(s) would be subject to renegotiation at the discretion of the Federal Government.

B. ACCOUNTING CHANGES:

This Agreement is based on the accounting system purported by the organization to be in effect during the Agreement period. Changes to the method of accounting for costs which affect the amount of reimbursement resulting from the use of this Agreement require prior approval of the authorized representative of the cognizant agency. Such changes include, but are not limited to, changes in the charging of a particular type of cost from facilities and administrative to direct. Failure to obtain approval may result in cost disallowances.

C. FIXED RATES:

If a fixed rate is in this Agreement, it is based on an estimate of the costs for the period covered by the rate. When the actual costs for this period are determined, an adjustment will be made to a rate of a future year(s) to compensate for the difference between the costs used to establish the fixed rate and actual costs.

D. USE BY OTHER FEDERAL AGENCIES:

The rates in this Agreement were approved in accordance with the authority in Office of Management and Budget Circular A-21 Circular, and should be applied to grants, contracts and other agreements covered by this Circular, subject to any limitations in A above. The organization may provide copies of the Agreement to other Federal Agencies to give them early notification of the Agreement.

E. OTHER:

If any Federal contract, grant or other agreement is reimbursing facilities and administrative costs by a means other than the approved rate(s) in this Agreement, the organization should (1) credit such costs to the affected programs, and (2) apply the approved rate(s) to the appropriate base to identify the proper amount of facilities and administrative costs allocable to these programs.

BY THE INSTITUTION:	ON BEHALF OF THE FEDERAL GOVERNMENT:
Colorado State University Business and Financial Services	DEPARTMENT OF HEALTH AND HUMAN SERVICES
(INSTITUTION)	(AGENCY)
(SIGNATURE)	(SIGNATURE)
David Ryan	Arif Karim
(NAME)	(NAME)
Controller	Director, Western Field Office
(TITLE)	(TITLE)
8/1/2012	7/20/2012
(DATE)	(DATE) 1001
	HHS REPRESENTATIVE: Robert Lee
	Telephone: (415) 437-7820

Application for Federal Assistance SF-424

* 1. Type of Submission:
  - [ ] Preapplication
  - [ ] Application
  - [x] Changed/Corrected Application

* 2. Type of Application:
  - [x] New
  - [ ] Continuation
  - [ ] Revision

* If Revision, select appropriate letter(s):

* Other (Specify):

* 3. Date Received: 12/05/2012

4. Applicant Identifier: 115704

5a. Federal Entity Identifier:

5b. Federal Award Identifier: GRANT11279086

State Use Only:

6. Date Received by State:

7. State Application Identifier:

8. APPLICANT INFORMATION:

* a. Legal Name: Colorado State University

* b. Employer/Taxpayer Identification Number (EIN/TIN): 84-6000545

* c. Organizational DUNS: 7859796180000

d. Address:

* Street1: 200 W. Lake Street

Street2:

* City: Fort Collins

County/Parish:

* State: CO: Colorado

Province:

* Country: USA: UNITED STATES

* Zip / Postal Code: 80521-4593

e. Organizational Unit:

Department Name: CIRA

Division Name:

f. Name and contact information of person to be contacted on matters involving this application:

Prefix:

* First Name: Laura

Middle Name:

* Last Name: Leinen

Suffix:

Title:

Organizational Affiliation:

* Telephone Number: 970-491-8525

Fax Number:

* Email: laura.leinen@colostate.edu

Application for Federal Assistance SF-424

*** 9. Type of Applicant 1: Select Applicant Type:**

H: Public/State Controlled Institution of Higher Education

Type of Applicant 2: Select Applicant Type:

Type of Applicant 3: Select Applicant Type:

* Other (specify):

*** 10. Name of Federal Agency:**

Department of Commerce

11. Catalog of Federal Domestic Assistance Number:

11.459

CFDA Title:

Weather and Air Quality Research

*** 12. Funding Opportunity Number:**

NOAA-OAR-OWAQ-2013-2003469

* Title:

FY 2013 Joint Hurricane Testbed

13. Competition Identification Number:

2297052

Title:

14. Areas Affected by Project (Cities, Counties, States, etc.):

Add Attachment | Delete Attachment | View Attachment

*** 15. Descriptive Title of Applicant's Project:**

Guidance on Intensity Guidance

Attach supporting documents as specified in agency instructions.

Add Attachments | Delete Attachments | View Attachments

Application for Federal Assistance SF-424

16. Congressional Districts Of:

* a. Applicant: CO-002

b. Program/Project: CO-002

Attach an additional list of Program/Project Congressional Districts if needed.

[Add Attachment] [Delete Attachment] [View Attachment]

17. Proposed Project:

* a. Start Date: 08/01/2013

* b. End Date: 07/31/2015

18. Estimated Funding ($):

* a. Federal	70,000.00
* b. Applicant	0.00
* c. State	0.00
* d. Local	0.00
* e. Other	0.00
* f. Program Income	0.00
* g. TOTAL	70,000.00

*** 19. Is Application Subject to Review By State Under Executive Order 12372 Process?**

☐ a. This application was made available to the State under the Executive Order 12372 Process for review on ______.

☐ b. Program is subject to E.O. 12372 but has not been selected by the State for review.

☒ c. Program is not covered by E.O. 12372.

*** 20. Is the Applicant Delinquent On Any Federal Debt? (If "Yes," provide explanation in attachment.)**

☐ Yes ☒ No

If "Yes", provide explanation and attach

[Add Attachment] [Delete Attachment] [View Attachment]

21. *By signing this application, I certify (1) to the statements contained in the list of certifications and (2) that the statements herein are true, complete and accurate to the best of my knowledge. I also provide the required assurances** and agree to comply with any resulting terms if I accept an award. I am aware that any false, fictitious, or fraudulent statements or claims may subject me to criminal, civil, or administrative penalties. (U.S. Code, Title 218, Section 1001)**

☒ ** I AGREE

** The list of certifications and assurances, or an internet site where you may obtain this list, is contained in the announcement or agency specific instructions.

Authorized Representative:

Prefix:

* First Name: Linda

Middle Name:

* Last Name: Loing

Suffix:

* Title: Research Administrator

* Telephone Number: 970-491-6586

Fax Number:

* Email: Linda.Loing@colostate.edu

* Signature of Authorized Representative: Linda Loing

* Date Signed: 12/05/2012

BUDGET INFORMATION - Non-Construction Programs

OMB Number: 4040-0006
Expiration Date: 06/30/2014

SECTION A - BUDGET SUMMARY

	Grant Program Function or Activity (a)	Catalog of Federal Domestic Assistance Number (b)	Estimated Unobligated Funds: Federal (c)	Estimated Unobligated Funds: Non-Federal (d)	New or Revised Budget: Federal (e)	New or Revised Budget: Non-Federal (f)	New or Revised Budget: Total (g)
1.	FY 2013 Joint Hurricane Testbed	11.459	$	$	$ 70,000.00	$	$ 70,000.00
2.							
3.							
4.							
5.	Totals		$	$	$ 70,000.00	$	$ 70,000.00

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SECTION B - BUDGET CATEGORIES

6. Object Class Categories	GRANT PROGRAM, FUNCTION OR ACTIVITY				Total
	(1)	(2)	(3)	(4)	(5)
	FY 2013 Joint Hurricane Testbed	N/A			
a. Personnel	$ 20,824.00	$ 20,764.00	$	$	$ 41,588.00
b. Fringe Benefits	5,196.00	5,272.00			10,468.00
c. Travel					
d. Equipment					
e. Supplies					
f. Contractual					
g. Construction					
h. Other	903.00	887.00			1,790.00
i. Total Direct Charges (sum of 6a-6h)	26,923.00	26,923.00			$ 53,846.00
j. Indirect Charges	8,077.00	8,077.00			$ 16,154.00
k. TOTALS (sum of 6i and 6j)	$ 35,000.00	$ 35,000.00	$	$	$ 70,000.00
7. Program Income	$	$	$	$	$

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SECTION C - NON-FEDERAL RESOURCES				
(a) Grant Program	(b) Applicant	(c) State	(d) Other Sources	(e)TOTALS
8.	$	$	$	$
9.				
10.				
11.				
12. TOTAL (sum of lines 8-11)	$	$	$	$

SECTION D - FORECASTED CASH NEEDS					
	Total for 1st Year	1st Quarter	2nd Quarter	3rd Quarter	4th Quarter
13. Federal	$ 35,000.00	$ 35,000.00	$	$	$
14. Non-Federal	$				
15. TOTAL (sum of lines 13 and 14)	$ 35,000.00	$ 35,000.00	$	$	$

SECTION E - BUDGET ESTIMATES OF FEDERAL FUNDS NEEDED FOR BALANCE OF THE PROJECT				
(a) Grant Program	FUTURE FUNDING PERIODS (YEARS)			
	(b)First	(c) Second	(d) Third	(e) Fourth
16. N/A	$ 35,000.00	$	$	$
17.				
18.				
19.				
20. TOTAL (sum of lines 16 - 19)	$ 35,000.00	$	$	$

SECTION F - OTHER BUDGET INFORMATION	
21. Direct Charges: 53846	22. Indirect Charges: 16154
23. Remarks:	

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OMB Number: 4040-0007
Expiration Date: 06/30/2014

ASSURANCES - NON-CONSTRUCTION PROGRAMS

Public reporting burden for this collection of information is estimated to average 15 minutes per response, including time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding the burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to the Office of Management and Budget, Paperwork Reduction Project (0348-0040), Washington, DC 20503.

PLEASE DO NOT RETURN YOUR COMPLETED FORM TO THE OFFICE OF MANAGEMENT AND BUDGET. SEND IT TO THE ADDRESS PROVIDED BY THE SPONSORING AGENCY.

NOTE: Certain of these assurances may not be applicable to your project or program. If you have questions, please contact the awarding agency. Further, certain Federal awarding agencies may require applicants to certify to additional assurances. If such is the case, you will be notified.

As the duly authorized representative of the applicant, I certify that the applicant:

1. Has the legal authority to apply for Federal assistance and the institutional, managerial and financial capability (including funds sufficient to pay the non-Federal share of project cost) to ensure proper planning, management and completion of the project described in this application.

2. Will give the awarding agency, the Comptroller General of the United States and, if appropriate, the State, through any authorized representative, access to and the right to examine all records, books, papers, or documents related to the award; and will establish a proper accounting system in accordance with generally accepted accounting standards or agency directives.

3. Will establish safeguards to prohibit employees from using their positions for a purpose that constitutes or presents the appearance of personal or organizational conflict of interest, or personal gain.

4. Will initiate and complete the work within the applicable time frame after receipt of approval of the awarding agency.

5. Will comply with the Intergovernmental Personnel Act of 1970 (42 U.S.C. §§4728-4763) relating to prescribed standards for merit systems for programs funded under one of the 19 statutes or regulations specified in Appendix A of OPM's Standards for a Merit System of Personnel Administration (5 C.F.R. 900, Subpart F).

6. Will comply with all Federal statutes relating to nondiscrimination. These include but are not limited to: (a) Title VI of the Civil Rights Act of 1964 (P.L. 88-352) which prohibits discrimination on the basis of race, color or national origin; (b) Title IX of the Education Amendments of 1972, as amended (20 U.S.C.§§1681-1683, and 1685-1686), which prohibits discrimination on the basis of sex; (c) Section 504 of the Rehabilitation Act of 1973, as amended (29 U.S.C. §794), which prohibits discrimination on the basis of handicaps; (d) the Age Discrimination Act of 1975, as amended (42 U.S.C. §§6101-6107), which prohibits discrimination on the basis of age; (e) the Drug Abuse Office and Treatment Act of 1972 (P.L. 92-255), as amended, relating to nondiscrimination on the basis of drug abuse; (f) the Comprehensive Alcohol Abuse and Alcoholism Prevention, Treatment and Rehabilitation Act of 1970 (P.L. 91-616), as amended, relating to nondiscrimination on the basis of alcohol abuse or alcoholism; (g) §§523 and 527 of the Public Health Service Act of 1912 (42 U.S.C. §§290 dd-3 and 290 ee- 3), as amended, relating to confidentiality of alcohol and drug abuse patient records; (h) Title VIII of the Civil Rights Act of 1968 (42 U.S.C. §§3601 et seq.), as amended, relating to nondiscrimination in the sale, rental or financing of housing; (i) any other nondiscrimination provisions in the specific statute(s) under which application for Federal assistance is being made; and, (j) the requirements of any other nondiscrimination statute(s) which may apply to the application.

7. Will comply, or has already complied, with the requirements of Titles II and III of the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970 (P.L. 91-646) which provide for fair and equitable treatment of persons displaced or whose property is acquired as a result of Federal or federally-assisted programs. These requirements apply to all interests in real property acquired for project purposes regardless of Federal participation in purchases.

8. Will comply, as applicable, with provisions of the Hatch Act (5 U.S.C. §§1501-1508 and 7324-7328) which limit the political activities of employees whose principal employment activities are funded in whole or in part with Federal funds.

9. Will comply, as applicable, with the provisions of the Davis-Bacon Act (40 U.S.C. §§276a to 276a-7), the Copeland Act (40 U.S.C. §276c and 18 U.S.C. §874), and the Contract Work Hours and Safety Standards Act (40 U.S.C. §§327-333), regarding labor standards for federally-assisted construction subagreements.

10. Will comply, if applicable, with flood insurance purchase requirements of Section 102(a) of the Flood Disaster Protection Act of 1973 (P.L. 93-234) which requires recipients in a special flood hazard area to participate in the program and to purchase flood insurance if the total cost of insurable construction and acquisition is $10,000 or more.

11. Will comply with environmental standards which may be prescribed pursuant to the following: (a) institution of environmental quality control measures under the National Environmental Policy Act of 1969 (P.L. 91-190) and Executive Order (EO) 11514; (b) notification of violating facilities pursuant to EO 11738; (c) protection of wetlands pursuant to EO 11990; (d) evaluation of flood hazards in floodplains in accordance with EO 11988; (e) assurance of project consistency with the approved State management program developed under the Coastal Zone Management Act of 1972 (16 U.S.C. §§1451 et seq.); (f) conformity of Federal actions to State (Clean Air) Implementation Plans under Section 176(c) of the Clean Air Act of 1955, as amended (42 U.S.C. §§7401 et seq.); (g) protection of underground sources of drinking water under the Safe Drinking Water Act of 1974, as amended (P.L. 93-523); and, (h) protection of endangered species under the Endangered Species Act of 1973, as amended (P.L. 93-205).

12. Will comply with the Wild and Scenic Rivers Act of 1968 (16 U.S.C. §§1271 et seq.) related to protecting components or potential components of the national wild and scenic rivers system.

13. Will assist the awarding agency in assuring compliance with Section 106 of the National Historic Preservation Act of 1966, as amended (16 U.S.C. §470), EO 11593 (identification and protection of historic properties), and the Archaeological and Historic Preservation Act of 1974 (16 U.S.C. §§469a-1 et seq.).

14. Will comply with P.L. 93-348 regarding the protection of human subjects involved in research, development, and related activities supported by this award of assistance.

15. Will comply with the Laboratory Animal Welfare Act of 1966 (P.L. 89-544, as amended, 7 U.S.C. §§2131 et seq.) pertaining to the care, handling, and treatment of warm blooded animals held for research, teaching, or other activities supported by this award of assistance.

16. Will comply with the Lead-Based Paint Poisoning Prevention Act (42 U.S.C. §§4801 et seq.) which prohibits the use of lead-based paint in construction or rehabilitation of residence structures.

17. Will cause to be performed the required financial and compliance audits in accordance with the Single Audit Act Amendments of 1996 and OMB Circular No. A-133, "Audits of States, Local Governments, and Non-Profit Organizations."

18. Will comply with all applicable requirements of all other Federal laws, executive orders, regulations, and policies governing this program.

19. Will comply with the requirements of Section 106(g) of the Trafficking Victims Protection Act (TVPA) of 2000, as amended (22 U.S.C. 7104) which prohibits grant award recipients or a sub-recipient from (1) Engaging in severe forms of trafficking in persons during the period of time that the award is in effect (2) Procuring a commercial sex act during the period of time that the award is in effect or (3) Using forced labor in the performance of the award or subawards under the award.

* SIGNATURE OF AUTHORIZED CERTIFYING OFFICIAL	* TITLE
Linda Loing	Research Administrator
* APPLICANT ORGANIZATION	* DATE SUBMITTED
Colorado State University	12/05/2012

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FORM **CD-511**
(REV 1-05)

U.S. DEPARTMENT OF COMMERCE

CERTIFICATION REGARDING LOBBYING

Applicants should also review the instructions for certification included in the regulations before completing this form. Signature on this form provides for compliance with certification requirements under 15 CFR Part 28, 'New Restrictions on Lobbying.' The certifications shall be treated as a material representation of fact upon which reliance will be placed when the Department of Commerce determines to award the covered transaction, grant, or cooperative agreement.

LOBBYING

As required by Section 1352, Title 31 of the U.S. Code, and implemented at 15 CFR Part 28, for persons entering into a grant, cooperative agreement or contract over $100,000 or a loan or loan guarantee over $150,000 as defined at 15 CFR Part 28, Sections 28.105 and 28.110, the applicant certifies that to the best of his or her knowledge and belief, that:

(1) No Federal appropriated funds have been paid or will be paid, by or on behalf of the undersigned, to any person for influencing or attempting to influence an officer or employee of any agency, a Member of Congress in connection with the awarding of any Federal contract, the making of any Federal grant, the making of any Federal loan, the entering into of any cooperative agreement, and the extension, continuation, renewal, amendment, or modification of any Federal contract, grant, loan, or cooperative agreement.

(2) If any funds other than Federal appropriated funds have been paid or will be paid to any person for influencing or attempting to influence an officer or employee of any agency, a Member of Congress, an officer or employee of Congress, or an employee of a member of Congress in connection with this Federal contract, grant, loan, or cooperative agreement, the undersigned shall complete and submit Standard Form-LLL, 'Disclosure Form to Report Lobbying.' in accordance with its instructions.

(3) The undersigned shall require that the language of this certification be included in the award documents for all subawards at all tiers (including subcontracts, subgrants, and contracts under grants, loans, and cooperative agreements) and that all subrecipients shall certify and disclose accordingly.

This certification is a material representation of fact upon which reliance was placed when this transaction was made or entered into. Submission of this certification is a prerequisite for making or entering into this transaction imposed by section 1352, title 31, U.S. Code. Any person who fails to file the required certification shall be subject to a civil penalty of not less than $10,000 and not more than $100,000 for each such failure occurring on or before October 23, 1996, and of not less than $11,000 and not more than $110,000 for each such failure occurring after October 23, 1996.

Statement for Loan Guarantees and Loan Insurance

The undersigned states, to the best of his or her knowledge and belief, that:

In any funds have been paid or will be paid to any person for influencing or attempting to influence an officer or employee of any agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with this commitment providing for the United States to insure or guarantee a loan, the undersigned shall complete and submit Standard Form-LLL, 'Disclosure Form to Report Lobbying,' in accordance with its instructions.

Submission of this statement is a prerequisite for making or entering into this transaction imposed by section 1352, title 31, U.S. Code. Any person who fails to file the required statement shall be subject to a civil penalty of not less than $10,000 and not more than $100,000 for each such failure occurring on or before October 23, 1996, and of not less than $11,000 and not more than $110,000 for each such failure occurring after October 23, 1996.

As the duly authorized representative of the applicant, I hereby certify that the applicant will comply with the above applicable certification.

* NAME OF APPLICANT: Colorado State University

* AWARD NUMBER: TBD

* PROJECT NAME: Guidance on Intensity Guidance

Prefix:

* First Name: Linda

Middle Name:

* Last Name: Loing

Suffix:

* Title: Research Administrator

* SIGNATURE: Linda Loing

* DATE: 12/05/2012