



DEPARTMENT OF COMMERCE RESEARCH PERFORMANCE PROGRESS REPORT (RPPR)

For instructions, please visit

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AWARD INFORMATION	
1. Federal Agency: Department of Commerce / NOAA	2. Federal Award Number: NA21OAR4320204
3. Project Title: Cooperative Institute for Severe and High-Impact Weather Research and Operations (CISHIWRO)	
4. Award Period of Performance Start Date: 10/01/2021	5. Award Period of Performance End Date: 09/30/2026
PRINCIPAL INVESTIGATOR/PROJECT DIRECTOR	
6. Last Name and Suffix: Eads , null	7. First and Middle Name: Cassie ,
8. Title:	
9. Email: ceads@ou.edu	10. Phone Number: 405-325-3041
AUTHORIZING OFFICIAL	
11. Last Name and Suffix: Parker , null	12. First and Middle Name: Cathi ,
13. Title:	
14. Email: gradora1@ou.edu	15. Phone Number: 4053254808
REPORTING INFORMATION	
Signature of Submitting Official: Cassie Eads	
16. Submission Date and Time Stamp: 07/28/2023	17. Reporting Period End Date: 06/30/2023
18. Reporting Frequency: <input checked="" type="radio"/> Annual <input type="radio"/> Semi-Annual <input type="radio"/> Quarterly	19. Report Type: <input checked="" type="radio"/> Not Final <input type="radio"/> Final
RECIPIENT ORGANIZATION	
20. Recipient Name: UNIVERSITY OF OKLAHOMA	
21. Recipient Address: 660 PARRINGTON OVAL RM 301, NORMAN, OK 73019-3003 USA	
22. Recipient UEI: EVTSTTLCEWS5	23. Recipient EIN: 731377584

ACCOMPLISHMENTS

24. What were the major goals and objectives of this project?

See attachment 24

25. What was accomplished under these goals?

See attachment 25

ACCOMPLISHMENTS (cont'd)

26. What opportunities for training and professional development has the project provided?

See attachment 26

27. How were the results disseminated to communities of interest?

See attachment 27

Attach a separate document if more space is needed for #6-10, or #24-50.

ACCOMPLISHMENTS (cont'd)

28. What do you plan to do during the next reporting period to accomplish the goals and objectives?

In the next reporting period, work will continue in the weather radar, storm-scale meteorological phenomena and related subjects with the goal of researching products and procedures for creating better forecasts and warnings. Collaboration among university researchers and NSSL, NWS ROC for the WSR-88D (NEXRAD) Program, NWS SPC, NWS WDTD, NWS Norman Forecast Office (OUN), NWSTC in Kansas City, and NOAA ARL ATDD in Oak Ridge will also continue.

As before, CIWRO will concentrate its resources on the following themes: weather radar research and development, stormscale and mesoscale modeling research and development, forecast and warning improvements research and development and societal and socioeconomic impacts of high impact weather. We will also document impacts of our work beyond science and technology, on technology transfer and human resources, and on teaching and education outreach.

Specific plans involve the following:

- Continue the development of algorithms for classifying & retrieving precipitation and cloud microphysical properties
- Continue to demonstrate uses of polarimetric radar variables & rapid-scan radar observations in prediction & warning decision process
- Continue to support the development, calibration & operation of the Advanced Technology Demonstrator
- Continue to develop & transfer novel calibration & signal-processing techniques for research & operational weather radars
- Continue to develop products for technology transfer that benefit impact-based decision support for the transportation sector
- Continue to develop capability to generate new products to support experiments in the HWT
- Continue to improve techniques to estimate precipitation, including use of dual polarization radar & machine learning
- Continue to develop probabilistic hydrologic forecasting systems that can be used in the FACETs program
- Continue to develop and improve Multi-Radar Multi-Sensor (MRMS) & single radar applications, as well as analyzing prior data for use in development of Probabilistic Hazard Information
- Continue to research on how to communicate warnings & probabilistic information to vulnerable populations, public response to such information, and evaluation of improved forecast information through the hazardous weather testbed with end-users
- Continue to develop & demonstrate products for severe weather prediction that can be tested in the HWT
- Continue to advance the state of knowledge to assimilate satellite data into numerical weather prediction models & into operational environments to improve forecasts of high impact weather through testbed experiments
- Facilitate experiments in the HWT aimed at improving prediction of convective storms, as well as visualizing & verifying output from convection allowing ensembles
- Continue to upgrade weather training simulators at NWS Offices & WDTD lab, including use of cloud-based simulation techniques and remote learning resources as required when NOAA remains at maximum telework
- Provide training for NWS forecasts on warning operations, radar, hardware and software both in-person and remote as required
- Create materials and workshops to configure new Hazard Services warning generation software

PRODUCTS

29. Publications, conference papers, and presentations

See attachment Publications
See attachment Presentations

PRODUCTS (cont'd)

30. Technologies or techniques

See attachment 30

31. Inventions, patent applications, and/or licenses

ART and RED

Continued to license CLEAN-AP, a ground clutter mitigation technique, to Baron Services, Inc.

OPT

Patent application filed for the OU CopterSonde in 2021; additional information provided to patent reviewers in Dec. 2022; still pending

PRODUCTS (cont'd)

32. Other products

See attachment 32

PARTICIPANTS & OTHER COLLABORATING ORGANIZATIONS

33. What individuals have worked on this project?

Cooperative Institute for Severe and High-Impact Weather Research and Operations (CIWRO) Senior Personnel

Greg McFarquhar, PhD – Principal Investigator and CIWRO Director
Randy Pepler, PhD – Co-Principal Investigator and CIWRO Associate Director
Heather Reeves, PhD – CIWRO Assistant Director
Sebastian Torres, PhD – CIWRO Assistant Director for Radar Research and Development
Tracy Reinke – CIWRO Executive Director, Finance and Operations
Cassie Eads – CIWRO Executive Director, Finance and Operations

Refer to Annual Report Demographics appendix for CI Employee Support Table

PARTICIPANTS & OTHER COLLABORATING ORGANIZATIONS (cont'd)

34. Has there been a change in the active other support of the PD/PI(s) or senior/key personnel since the last reporting period?

Tracy Reinke has retired from the university and Cassie Eads has taken over as CIWRO Executive Director, Finance and Operations.

35. What other organizations have been involved as partners?

CIWRO cooperative agreement consortium partners include Howard University (a historically Black research institution), University of Albany, Texas Tech University (a Hispanic serving institution), and Pennsylvania State University.

Attach a separate document if more space is needed for #6-10, or #24-50.

PARTICIPANTS & OTHER COLLABORATING ORGANIZATIONS (cont'd)

36. Have other collaborators or contacts been involved?

See attachment 36

IMPACT

37. What was the impact on the development of the principal discipline(s) of the project?

See attachment 37

IMPACT (cont'd)

38. What was the impact on other disciplines?

Nothing to Report

39. What was the impact on the development of human resources?

Nothing to Report

IMPACT (cont'd)

40. What was the impact on teaching and educational experiences?

See attachment 40

41. What was the impact on physical, institutional, and information resources that form infrastructure?

Nothing to Report

IMPACT (cont'd)

42. What was the impact on technology transfer?

See attachment 42

43. What was the impact on society beyond science and technology?

See attachment 43

IMPACT (cont'd)

44. What percentage of the award's budget was spent in foreign country(ies)?

0 , No foreign expenditures

CHANGES/PROBLEMS

45. Changes in approach and reasons for change

Nothing to Report

CHANGES/PROBLEMS (cont'd)

46. Actual or anticipated problems or delays and actions or plans to resolve them

Nothing to Report

47. Changes that had a significant impact on expenditures

Finishing no-cost extension on NA16OAR4320115

CHANGES/PROBLEMS (cont'd)

48. Significant changes in use or care of human subjects, vertebrate animals, biohazards, and/or select agents

Nothing to Report

49. Change of primary performance site location from that originally proposed

Nothing to Report

PROJECT OUTCOMES

50. What were the outcomes of the award?

See attachment 50

DEMOGRAPHIC INFORMATION FOR SIGNIFICANT CONTRIBUTORS (VOLUNTARY)

Gender:

- Male
- Female
- Do not wish to provide

Ethnicity:

- Hispanic or Latina/o Not
- Hispanic or Latina/o Do not
- wish to provide

Race:

- American Indian or Alaska Native Asian
- Black or African American
- Native Hawaiian or other Pacific Islander
- White
- Do not wish to provide

Disability Status:

- Yes
 - Deaf or serious difficulty hearing
 - Blind or serious difficulty seeing even when wearing glasses
 - Serious difficulty walking or climbing stairs
 - Other serious disability related to a physical, mental, or emotional condition
- No
- Do not wish to provide

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