OMB Number: 0690-0032
Expiration Date: 08/31/2021

DEPARTMENT OF COMMERCE
RESEARCH PERFORMANCE PROGRESS REPORT (RPPR)

For instructions, please visit
http://www.osec.doc.gov/oam/grants_management/policy/documents/RPPR%20Instructions%20and%20Privacy%20Statement.pdf

AWARD INFORMATION	
1. Federal Agency: Department of Commerce / NOAA	2. Federal Award Number: NA21OAR4320203
3. Project Title: Cooperative Institute for Marine Ecosystem and Resources Studies (CIMERS)	
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: Chan , null	7. First and Middle Name: Francis ,
8. Title: Principal Investigator	
9. Email: chanft@science.oregonstate.edu	10. Phone Number: 5417379131
AUTHORIZING OFFICIAL	
11. Last Name and Suffix: Ozkan-Haller , null	12. First and Middle Name: Tuba ,
13. Title: Assoc VP for Research, Finance, and Ops	
14. Email: sponsored.programs@oregonstate.edu	15. Phone Number: 5417374933
REPORTING INFORMATION	
Signature of Submitting Official: Zachary Gill	
16. Submission Date and Time Stamp: 07/27/2022	17. Reporting Period End Date: 06/30/2022
18. Reporting Frequency: (●) Annual ( ) Semi-Annual ( ) Quarterly	19. Report Type: (●) Not Final ( ) Final
RECIPIENT ORGANIZATION	
20. Recipient Name: OREGON STATE UNIVERSITY	
21. Recipient Address: 1500 SW JEFFERSON ST, CORVALLIS, OR 97331-8655 USA	
22. Recipient UEI: MZ4DYXE1SL98	23. Recipient EIN: 611730890

ACCOMPLISHMENTS

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

The major goals of the Cooperative Institute for Marine Ecosystem and Resources Studies (CIMERS) are to:

1. co-produce knowledge with NOAA researchers, resource managers, and stakeholders to understand and predict changes in ocean ecosystems, habitats, resources, coastal communities, and economies,

2. build effective, collaborative, and transdisciplinary teams that develop solutions to complex challenges posed by interacting human and ocean system changes and the needs of a science-empowered sustainable ocean economy,

3. provide a nimble research infrastructure that allows NOAA and OSU to develop and employ technological innovations to anticipate and respond to emerging ocean management challenges,

4. Effectively share knowledge to inform the sustainable use and stewardship of ocean ecosystems and society's ability to adapt to and mitigate the risks of climate change,

5. support and train a diverse and inclusive ocean science workforce that is reflective of the nation that we serve.

CIMERS addresses these goals through collaborative research and training with NOAA partners including the Pacific Marine Environmental Laboratory (PMEL), Northwest Fisheries Science Center (NWFSC), Alaska Fisheries Science Center (AFSC), and the Office of National Marine Sanctuaries (ONMS).

25. What was accomplished under these goals?

The CIMERS award is in the beginning phase and we are beginning to make progress on project goals. These include (numbers reference goals in question 24) efforts in support of:

Goal1: Engagement of commercial fishermen, Tribal entities in development of research ideas and projects to support climate-resilient fisheries and inform impacts of offshore wind development.

Goal2: Partnership with OSU's research office to develop training in transdisciplinary research.

Goal3: Hiring of new research faculty (at assistant research professor level) to respond to emerging expertise needs in marine acoustics and genomics integration, new biomarkers-based research into impacts of ocean acidification and other ocean stressors

Goal4: Informed state and federal legislative representatives on advances in ocean science including the development of climate adaptation tools. Engaged media in understanding of new ocean discoveries.

Goal5: Partnership with the Living Marine Resources Cooperative Science Center to support diversity in graduate student training

ACCOMPLISHMENTS *(cont'd)*

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

Development of transdisciplinary research training programs for OSU researchers.

Training of NOAA personnel in Pacific Island Fishery Science Center in operational deployment of AUVs

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

CIMERS researchers worked with media to share outcomes of our research. These include work:

Protected Species:

· February 10th, 2021: Radio piece on Keni Public Radio station KDLL. https://www.kdll.org/post/genetic-technique-brings-biologists-closer-solving-beluga-mystery#stream/0

· April 7th, 2021: Article on KNOM about beluga aging study. https://www.knom.org/wp/blog/2021/04/07/game-changing-study-uses-genetics-to-study-beluga-whales/

· Curriculum development for highschool students in progress through the Oregon Marine Scientist and Educator Alliance (ORSEA). https://oregoncoaststem.oregonstate.edu/orsea/orsea-2020-2021-cohort

Ocean climate change impacts and solutions:

· https://www.opb.org/article/2021/07/22/hypoxia-season-oregon-dead-zones-crab/

· https://www.washingtonpost.com/nation/2021/07/29/oregon-hypoxic-dead-zone/

· https://www.smithsonianmag.com/innovation/new-tool-may-help-crab-fishers-sidestep-dead-zones-180979688/

ACCOMPLISHMENTS *(cont'd)*

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

We plan to continue to work with our NOAA partners, particularly in PMEL, NWFSC, AFSC, OCMNS, NOS to support ongoing projects and to bring new research and training capacity to meet emerging needs in areas such as climate resilience, equity, and blue economy workforce development.

PRODUCTS

29. Publications, conference papers, and presentations

Nothing to Report

PRODUCTS *(cont'd)*

30. Technologies or techniques

Advances in technology include:

The successful integration and pilot at sea deployment of a 3-frequency echosounder into a Slocum autonomous underwater glider and completed a pilot deployment at sea in support of autonomous surveys of zooplankton and fish populations.

Three test deployments of the Coastal Real-time Acoustic Buoy (CRAB) in Lake Washington and Puget Sound. The system performance, particularly the real-time data transmission from the buoy to the shore, has improved significantly and represents a vital tool for real-time monitoring of the ocean soundscape, including habitat use by protected marine mammals. The technology is developed in conjunction with marine renewal energy development project. Other advances in ocean acoustics include: the fabrication of four Peripheral hydrophones, the development and construction of drifting hydrophone at PNNL, and the development of the new generation of AUH data logger. Another effort aimed at the application of passive acoustics on AUV successfully detected endangered false killer whales in Hawaiian waters, in anticipation of the use of this technology in census work in remote Hawaiian waters.

31. Inventions, patent applications, and/or licenses

Nothing to Report

PRODUCTS *(cont'd)*

32. Other products

Nothing to Report

PARTICIPANTS & OTHER COLLABORATING ORGANIZATIONS

33. What individuals have worked on this project?

CIMERS had 10 researchers, and staff that work on various project under this award. Details below:

Chan, Francis, PI-Lead/CI Director - 4 months - CIMERS - Task 1 - CIMERS Director - Oregon, USA

Erofeev, Anatoli Y., Project Research Staff 2 months - Salmon-oriented ecosystem monitoring in the California Current using autonomous survey technology - Provided data and sample analysis - Oregon, USA

Pierce, Stephen D., Project Research Staff 2 months -Salmon-oriented ecosystem monitoring in the California Current using autonomous survey technology - Provided data and sample analysis and assisted with prep for research cruise - Oregon, USA

Weaver, Brian J., Project Research Staff 4 months Enhanced VDatum Modeling in the Pacific using Multi-Mission Satellite Altimetry Data - Provided data analysis for project - Oregon, USA

Beeson, Jeffrey W., PI - Co -4 months - Impacts of Submarine Volcanism and Hydrothermal Venting of the Global Ocean and Deep-Sea Ecosystems - Provided data analysis for project - Oregon, USA

Haver, Samara, Post Doc Scholar - 2 months - Impacts of Submarine Volcanism and Hydrothermal Venting of the Global Ocean and Deep-Sea Ecosystems - Provided data analysis for project - Oregon, USA

Matsumoto, Haruyoshi, Project Research Staff - 2 months - Impacts of Submarine Volcanism and Hydrothermal Venting of the Global Ocean and Deep-Sea Ecosystems - Provided engineering support for research equipment - hydrophones - Oregon, USA

Mellinger, David K., PI - Co 4 months - Advancing remote marine mammal stock assessment with passive acoustic gliders Provide data analysis and provided research equipment support - Oregon, USA

Roche, Lauren K., Project Research Staff - 4 months - Impacts of Submarine Volcanism and Hydrothermal Venting of the Global Ocean and Deep-Sea Ecosystems - Provide data analysis, collaborated with NOAA scientist and provided research equipment support - Oregon, USA

Rutland, LeAnne, CIMERS Admin. - 4 months - CIMERS - Task 1 - CIMERS Administrator - Oregon, USA

Turnbull, James, Project Research Staff, 6 months - Impacts of Submarine Volcanism and Hydrothermal Venting of the Global Ocean and Deep-Sea Ecosystems - Provided engineering support for research equipment - hydrophones Oregon, USA

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?

Nothing to Report

35. What other organizations have been involved as partners?

Nothing to Report

PARTICIPANTS & OTHER COLLABORATING ORGANIZATIONS *(cont'd)*

36. Have other collaborators or contacts been involved?

Nothing to Report

IMPACT

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

CIMERS projects to date have advanced the use of autonomous vehicles and integration with acoustic technologies in support of NOAA mission science in ecosystem and fishery surveys, and in protected species management.

Analyses of data to produce the most comprehensive atlas of seabird distribution to date in the NE Pacific. This knowledge base will be a resource to inform ocean activities including protected species management, and development of marine renewal energy projects.

The development of molecular chronological aging techniques for marine mammals is helping to inform other NOAA research on beluga whale toxicology and reproduction

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

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

IMPACT *(cont'd)*

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

Nothing to Report

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

Nothing to Report

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

IMPACT *(cont'd)*

42. What was the impact on technology transfer?

Technology skillsets in AUV deployment were transferred to NOAA personnel.

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

Molecular chronological aging techniques are being used in the management of Beluga whales as that information bears on estimates of population dynamics.

State and Federal decision makers have new knowledge of the pathways of climate change in the ocean, their consequences and potential solutions.

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

IMPACT *(cont'd)*

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

0 , Due to COVID there was no budget spent in foreign countries.

CHANGES/PROBLEMS

45. Changes in approach and reasons for change

Nothing to Report

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

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

Nothing to Report

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

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

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

PROJECT OUTCOMES

50. What were the outcomes of the award?

Examples of outcomes include (Goal numbers refer to those described in question 24):

Goal1: New partnerships among NOAA researchers across line offices (OAR, NMFS, NOS), academic researchers, commercial fishermen, and Tribal entities in developing user-relevant collaborative research program in multiple stressor management

Goal2: Enhanced capacity in transdisciplinary research, and engagement of scholars in fields including traditional ecological knowledge research in ocean science.

Goal3: The integration of passive and active acoustics into uncrewed systems is supporting the path to operational deployments of new, cost-effective ocean survey technologies in support of ecosystem, marine fisheries and protected species management.

Goal4: Policy makers and the public that are more informed about the impacts of climate change on ocean ecosystems and resources, the use of new technologies to explore and manage the ocean, and the importance of partnerships in development new knowledge and solutions to ocean challenges.

Goal5: Increased participation of researchers from diverse backgrounds in NOAA science through partnerships with organizations such as the Living Marine Resources Cooperative Science Center.

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

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