Statement of Work

Title: Classification-level annotation development of wildlife targets in high-resolution imagery supporting the Atlantic Marine Assessment Program for Protected Species (AMAPPS)

1.1 Introduction

The Bureau of Ocean Energy Management and the U.S. Fish and Wildlife Service are in the process of conducting high-resolution aerial imagery surveys under the Atlantic Marine Assessment Program (AMAPPS). The objective of AMAPPS is to provide baseline data on regional and seasonal species abundance and distribution in the nearshore and offshore environments to aid decision-making concerning offshore development, transportation, military exercises, and conservation. The AMAPPS collaboration has entered its third phase. The overarching goal of this third phase is to develop cost-efficient remote sensing- and machine learning-based methods to survey and monitor marine birds and other wildlife to improve the quality of population estimates and distribution mapping while enhancing personnel safety. BOEM is seeking subject matter experts to classify seabirds, marine mammals and other marine wildlife to the lowest taxonomic level in aerial imagery.

1.2 Goal and Objectives

The primary objective of this segment of AMAPPS is to enlist expertise in marine wildlife species identification through the Cooperative Environmental Studies Units (CESU) program to classify detected wildlife targets in imagery collected by AMAPPS to an appropriate taxonomic level utilizing remote access to an imagery annotation tool developed at USGS-UMESC and implementing the annotation quality control workflow developed by USGS-UMESC, BOEM, and USFWS.

1.3 TASKS:

1) Review wildlife targets in imagery collected by FWS AMAPPS high resolution aerial surveys and available non BOEM-funded imagery databases. Visually examine imagery with an annotation tool developed by USGS-UMESC in collaboration with BOEM and FWS on BOEM study **NT-19-04** Automated Detection and Classification of Marine Wildlife from Digital Aerial Imagery
2) Identify wildlife targets to the lowest possible taxonomic level (Family, Genus, Species) and create attributes for each target such as age, sex, and behavior when possible. Imagery will primarily be collected over the Atlantic Ocean and will include dozens of birds and marine mammal species that will require identification based on incomplete details on coloration, shape, and size. An example species guide (in aerial imagery) will be available, but annotators will need to be able to identify species not yet in this guide. Some annotation work may also be dedicated to identifying mad made objects in imagery over the ocean (e.g., fishing vessels).
3) Develop a written report that will review the steps taken in the annotation process and develop recommendations for future imagery review and annotation efforts.
4) Support partnerships to produce applicable developments in machine learning processing, experimentation, and algorithm development.

1.4

Project Timeline: Three years. Estimated Total Funding
$324,241 (anticipated incremental funding by fiscal year: FY22 = $174,747; FY23 = 74,747; FY24 = $74,747)
The total amount of federal funds available is anticipated to be $324,241.

1.4 Deliverables:

Deliverable	Method of Submission	Distribution	Due
A. Post-Award Kick-Off Meeting	Email	Electronic copy CO, PO, Environmental Studies Program Representative(ESPR)	Agenda within 1 week of Post-Award Meeting. Meeting within 2 weeks after start of Cooperative Agreement. Summary within 2 weeks after Meeting.
B. Draft and Final Project Management Plan (PMP)	email	Electronic copy CO, PO, ESPR Representative.	Draft due 1 week before Post- award meeting. Final due 2 weeks after Post-award meeting.
C .Monthly Status Reports	Email	Electronic copy CO, PO, ESPR Representative.	Monthly reports shall be submitted by the 7th day of the following month.

D .Annotation via web-based tool	Annotation tool hosted by USGS	Via a web-based tool CVAT and or Amazon Web Services	Rolling annotation when imagery is made available
E .Meetings with BOEM, FWS, USGS team	Microsoft Teams, Zoom, etc.	Microsoft Teams, Zoom, etc.	Bi-weekly
F. Abstracts, Journal Publication(s), and Oral Presentation(s)		Electronic copy CO, PO, ESPR Representative.	Drafts to be sent for review to PO prior to submission to the publisher, conference, or presented at conference. May be done at any point in the contract, or at the conclusion.
G. Draft Annual Reports	e-mail	Electronic copy CO, PO, ESPR Representative.	Six weeks before the end of the federal government's fiscal year
H. Draft Final Report	e-mail	Electronic copy CO, PO, ESPR Representative.	30 months after Cooperative Agreement Award.
I .Proof version of Final Report	e-mail	Electronic copy CO, PO, ESPR Representative.	Within thirty (30) days of receipt of BOEM comments on draft final report, or resolution of all issues.