

**NPS Unmanned Aircraft System (UAS) One-Time Operation Application Form
(Permanent Park UAS Operations Require Submission of an Aviation Enhancement
Application)**

The following template applies to UAS operations and subsequent approval based on current guidance provided by the Associate Director, Visitor and Resource Protection.

The intent of the template is to organize information required by aviation and line managers to make informed decisions.

Published standards have been established to prevent aviation mishaps and to provide a standardized approach to efficient and effective operations. UAS operations on NPS lands are increasing in frequency. It is a benefit to all that UAS operations are approved at all levels of management in DOI, and that these operations meet all applicable FAA and DOI regulatory guidelines.

**Cape Cod National Seashore (CACO) UAS Operation
APPROVALS**

Prepared By:	Date:
Park Aviation Officer Review:	Date:
Park Unit Superintendent, Approval/Transmittal:	Date:
Regional Aviation Manager Review:	Date:
National Aviation Manager Review:	Date:
Regional Director, Approval:	Date:
Associate Director, Visitor and Resource Protection, Approval:	Date:
<p>General Considerations:</p> <ul style="list-style-type: none"> <input type="checkbox"/> <i>Is use of a UAS within the park's enabling legislation?</i> <p>The use of UAS within CACO is not within the Park's enabling legislation. However, use of UAS may be permitted according to Director's memorandum 14-05 of June 19, 2014. under Conditions and Exceptions: Section 1(b).</p> <ul style="list-style-type: none"> <input type="checkbox"/> <i>Are there any natural, cultural, and historic impacts and does the operation conflict with any legislative direction such as the Wilderness, Endangered Species, National Historic Preservation, Marine Mammal Protection or Migratory Bird Treaty Acts?</i> <p>There is a potential for natural impacts. These include a small risk of fire caused by a UAS crash, or damage to Park property (vehicles, buildings, and cultural assets). These risks and steps taken to mitigate them are discussed in the Project Aviation Safety Plan (PASP, attached).</p> <p>The timing and location of the overflights ensures that there are no conflicts with Wilderness, Endangered Species, National Historic Preservation, Marine Mammal</p>	

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Protection or Migratory Bird Treaty Acts.

- Will the operation be contrary to the purposes on which the park was originally created, and could it conflict with the visitor experience or concession operations?*

No. The operation is not considered contrary to the purposes on which the park was created. The long-term goal of this operation is to provide scientific information intended to understand and preserve Park resources.

There is a potential for conflict with the visitor experience. Visitors may hear and see the UAS for a few minutes during the overflights. This potential for conflict is mitigated by timing the research for months between November and March, when visitor numbers are low, and by the short duration of the overflights. Risk of injury to visitors or Park personnel is addressed in the attached PASP.

Specific Considerations: *Does the unmanned aircraft and operator meet FAA and DOI operating requirements?*

Yes. The UAS and UAS operations meet FAA and DOI operating requirements, as indicated by the attached documents. USGS UAS operators are certified under an MOU with the DOI and FAA. Woods Hole Oceanographic Institution and Raptor Maps, Inc. are certified under FAA Section 333 Exemptions.

- Is the unmanned aircraft capable of performing the mission requirements?*

Yes. The DOI UAS platforms have been specifically chosen by the Dept. of Interior Office of Aviation Safety to perform mapping missions, as have the aircraft operated by the Woods Hole Oceanographic Institution and Raptor Maps, Inc..

- Is the sensor package capable of gathering the required data?*

Yes. The UAS and associated cameras and GPS have been specifically selected for collection of aerial mapping data.

- Can the raw data that are gathered be processed in a useful manner?*

Yes. The data will be processed to yield high-resolution digital elevation maps with associated rectified, georeferenced orthophotomosaics. The digital elevations are expected to be as precise and accurate as Lidar data.

- Is the unmanned aircraft a cost effective and efficient tool for the purpose of the mission?*

Yes. The UAS mapping effort will be a cost effective and efficient. Coverage of the study will require one or two days of field work for four people, and approximately two days of data processing for one person. By contrast, a survey by foot would require at least as much time and produce much lower spatial coverage, and an airborne Lidar survey would require several man days, flight time for a fixed-wing aircraft, and similar data processing efforts.

- Is the use of unmanned aircraft the safest way to accomplish the mission?*

Yes. Use of a UAS for data collection is safer than a Lidar flight using manned aircraft, and risk to the Park resources (through erosion and habitat degradation) is lower than that associated with extensive ground surveys by foot.

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- *Could the mission be executed without an unmanned aircraft, and if so, how or what other devices would be utilized instead (e.g. remote sensing, fixed wing or rotary aircraft)?*

Yes, similar data coverage could be obtained (at higher cost and higher risk) with manned fixed-wing aircraft, or lower data coverage could be obtained on foot with greater risk of environmental damage. Although these more traditional survey techniques could be used to map the study area, the objective of this mission is to evaluate the UAS methodology for rapid, cost-effective mapping before and after storm events that reshape the landscape, which neither alternative technique can provide.

General Description: *All requests must reference Policy Memorandum 14-05 and, at minimum, contain the following information:*

- *Briefing statement, outlining:*
 - *The purpose of the mission or project.*
 - *Why the use of an unmanned aircraft would be appropriate and consistent with the Organic Act mandate to protect park resources, values, and visitor enjoyment.*
- *Potential for controversy.*
- *Contacts at the park or program for further questions.*
- *Compliance with NEPA, by one of the following:*
 - *Citing a categorical exclusion under NEPA*
 - *Explaining that administrative use of the unmanned aircraft was necessary to control the immediate impacts of an emergency under 43 CFR 46.150.*
 - *Referring to an EA/EIS that has been prepared to comply with NEPA.*
- *Confirmation of compliance with other relevant laws and regulations including Wilderness Act, ESA, MMPA, MBTA.*
- *Confirmation that the operation complies with current DOI and NPS policies addressing unmanned aircraft.*
- *Type of use:*
 - *Resource Management*
 - *Operational – Fire or other natural hazard, Search and Rescue, or Law Enforcement*
 - *Scientific Research and Collecting*
- *Copy of the FAA COA, MOA or Section 333 authorization (as applicable).*
- *Completed and signed PASP (see RM-60, Appendix 3).*
- *Designated area(s), dates, and times of use for UAS*
- *Copy of the Scientific Research and Collecting Permit, if applicable.*
- *Minimum Requirements Analysis – required for all NPS actions within wilderness that may impact wilderness character.*

Briefing Statement

Purpose

The U.S. Geological Survey, Woods Hole Coastal and Marine Science Center (USGS

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WHCMSC) has embarked on a research program to conduct proof-of-concept surveys of coastal environments using UAS to map landforms and habitat. The immediate goal of this research is to produce detailed orthorectified image and accompanying digital elevation maps of coastal features in the Cape Cod National Seashore. The longer-term objectives of the program are to determine whether UAS are practical and cost-effective methods for mapping coastal landscape change associated with storms and land-use practices, and whether the use of UAS is practical and compatible with the NPS mission.

Why the use of an unmanned aircraft would be appropriate

An unmanned aircraft is appropriate for several reasons. The product of the mapping effort will help achieve the mandates of the Organic Act to protect park resources and values. Specifically, the maps will help in understanding coastal erosion that threatens park resources and provide information about habitat for endangered species and migratory birds. The maps will also be available to visitors as interpretive tools to enhance their enjoyment of the park. The use of unmanned aircraft is also appropriate because it is cost effective, so it makes efficient use of DOI resources to provide high-quality data with minimal cost or disturbance to visitor enjoyment. Scheduling of unmanned aircraft mapping is flexible, so it will ensure that the operation will be scheduled to optimize data collection at low tide and before winter storms, but after the visitor season and after migratory birds have left.

Potential for Controversy

There is little potential for controversy. Overflights will occur over beaches, bluffs, and marsh during a time with few visitors, and disturbance to visitors and impact on Park resources will be minimal. Some visitors may question the presence of UAS when visitor use of UAS is prohibited, but this is analogous to other restrictions placed on visitors that do not apply to Park personnel, maintenance contractors, or permitted researchers, and should not be controversial. An information flyer will be prepared to explain the presences of the UAS, and distributed to Park Interpreters to help minimize any confusion.

Contacts at Cape Cod National Seashore regarding this project

Robert Cook, Wildlife Ecologist
Sophia Fox, Aquatic Ecologist
George Price, Superintendent

Contact at U.S. Geological Survey

Chris Sherwood, Research Oceanographer, 508 457 2269, csherwood@usgs.gov
Jeff Sloan, Cartographer, 303 236 1308, jlsloan@usgs.gov

NEPA Compliance

This action is categorically excluded from detailed review under the National Environmental Policy Act of 1969 under 43 CFR 46.210(e), 515 DM DO-12 3.4 E.5 Nondestructive data collection, inventory (including field, aerial, and satellite surveying and mapping), study, research, and monitoring activities.

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Compliance with laws and regulations, including Wilderness Act, ESA, MMPA, MBTA

The proposed operation is in compliance with relevant Federal, state, and local laws and regulations. The operation location is not Wilderness nor is it designated as Proposed Wilderness. No interactions or conflicts with endangered species or marine mammals will be involved. The operation is scheduled to ensure that migratory birds protected by the MBTA will not be in the study areas.

Compliance with DOI and NPS policies addressing unmanned aircraft.

The proposed operation is in compliance with current and planned DOI and NPS policies addressing the use of unmanned aircraft.

Type of Use

The proposed operation is primarily Scientific Research and Data Collecting, but will also contribute to Resource Management.

Copy of the FAA COA and MOA

Copies of the FAA Certificate of Operation under the FAA/DOI MOA are attached. In addition, copies of the FAA Section 333 Exemptions for potential collaborators and contractors are attached.

Project Aviation Safety Plan

A Project Aviation Plan (PASP) has been completed and is attached. A risk analysis accompanies the PASP.

Areas, dates and times of UAS Operations:

The operation will be conducted along the coast in the vicinity of Coast Guard Beach, Eastham, including the beach, dunes, bluffs, and immediate back-barrier marshes. The first operations will be conducted between February 29, 2016 and March 4, 2016 during daylight hours (approximately 0630 to 1630). Additional operations may be conducted several times between February 29, 2016 and 30 March, 2018 to re-map the coast after significant storms. Each operation may take several days, with multiple flights each day. Operations will only be conducted when migratory or endangered birds are absent, and park and visitor activities will not be affected. All operations will be coordinated with park staff and approved by the Park Supervisor.

Flight lines are likely to cross property owned by the National Park Service, the Town of Eastham, the Eastham Conservation Foundation, and the Massachusetts Audubon Society. These entities have been informed of the UAS operations and granted permission to overfly and map their properties (e-mail exchanges are attached). Flight lines will be planned to avoid other private property in the vicinity.

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Scientific Research and Collecting Permit

NPS Scientific Research and Collecting Permit CACO-2016-87022 describes the proposed studies and specifically authorizes launching, landing, and operating a UAS in Cape Cod National Seashore. A copy of the Scientific Research and Collecting Permit application is attached.

Minimum Requirements Analysis

The operation location is not Wilderness nor is it designated as Proposed Wilderness.

Benefit and Risk Analysis:

- *A Project Aviation Plan (PASP) has been accomplished and is required to accompany this application. A risk analysis should accompany the PASP.*

Note: *Use the Operational Risk Management model.*

A Project Aviation Plan (PASP) has been accomplished and is attached. A risk analysis using the Operational Risk Management model accompanies the PASP.

FAA Certificate of Authorization (COA):

- *An FAA approved COA has been accomplished and is required to accompany this application.*

An FAA approved COA is not required for this project area for DOI operators. It falls under the DOI/FAA Memorandum of Agreement in the Class G airspace (copy attached) and through the Class G Notification process. FAA Section 333 Exemptions have been issued to collaborators and contractors that may operate UAS for this project (copies attached). NOTAMs will also be issued 48 hours in advance.