# UAS Orthoimagery

## Unmanned Aircraft Systems High Resolution Orthorectified Aerial Imagery

## Statement of Capabilities

We deploy Unmanned Aircraft Systems (UAS) outfitted with Micro Four Thirds camera sensor technology and various lens configurations to capture images in a wide range of remote or complex environments.

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An Unmanned Aircraft System (UAS), commonly referred to as a drone, makes it possible to collect data through standard remote sensing technologies without the risks and costs associated with traditional aerial imagery

# UAS *Orthoimagery* SERVICES

## Unmanned Aircraft Systems High Resolution Orthorectified Aerial Imagery

Highly detailed aerial imagery for project sites is now an affordable option, thanks to advancements in unmanned aircraft systems (UAS) technology and digital photogrammetry. These technological advancements allow for the creation of centimeter pixel resolution imagery with much greater detail than that found in satellite imagery and traditional aerial imagery. In fact, UAS orthoimagery can contain over 10,000 pixels within the space of a single satellite imagery pixel. That means through UAS orthoimagery, actual ground conditions are visible to the naked eye—we can now see things that were not previously distinguishable in satellite imagery.

The USGS definition states: "Orthoimagery data typically are high resolution aerial images that combine the visual attributes of an aerial photograph with the spatial accuracy and reliability of a planimetric map".

Through orthorectification of UAS aerial imagery a constant scale is generated, where features are displayed in their "true", or planimetrically correct position. The UAS orthoimage can then be georeferenced to survey data on the ground, resulting in an accurate dataset.


**While small excavations, fuel storage tanks, pipelines and other key site features may be indistinguishable via satellite imagery UAS technology makes them easily visible.**

## Why you should incorporate UAS aerial imagery

UAS orthoimagery can add tremendous value for project scoping, planning, and execution, as well as ongoing site monitoring, especially at small remote sites for which very poor historical aerial and satellite imagery currently exists, if at all. With UAS orthoimagery, we can now document site conditions before, during and after fieldwork at minimal cost. Further, orthorectification and georeferencing give you confidence that the image coordinates of a site feature are a true representation of its ground location. Lastly, image processing turnaround time is minimal, allowing you to use the imagery in near real time to track progress and make decisions on a more timely basis.

| Features | | Benefits |
|---|---|---|
| **Safety** | Reduces safety risks by performing remotely operated data collection | ✓ Does not need qualified pilot on board<br>✓ Can enter environments that are dangerous to human life<br>✓ Access hard-to-reach places |
| **Detailed Data** | More detailed site data | ✓ Enhances project scoping, planning, and estimating<br>✓ Decreases downtime and inspection costs |
| **Accurate Data** | Feature location, ground conditions, etc. | ✓ Reduces project risk<br>✓ Reduces planning and execution costs<br>✓ Avoids project cost overruns<br>✓ Reduces risk of field data gaps |
| **Accurate Estimating** | Ability to more accurately estimate material quantities on the ground (for example: removal actions, backfilling, road materials, etc.) | ✓ Supports accurate cost estimating and planning for field production time |

## Regulations governing the use of UAS

Commercial operation of small UAS is now regulated by the Federal Aviation Administration (FAA), under Title 14 of CFR, part 107. Brice's UAS operators carry the necessary FAA remote airmen endorsement, and are familiar with part 107 regulations. Many UAS flight restrictions still exist, but waivers may be obtained as needed.

## UAS Services

Brice self-performs UAS orthoimagery with minimal additional project costs. We utilize a large-format, Micro Four Thirds (MFT) 16-megapixel camera on our UAS to capture imagery. Different lenses can be outfitted on the camera, to apply the focal length most suitable to site conditions.

- Orthorectified aerial imagery
- 4k high-definition video and oblique imagery
- Thermal Infrared imaging and mapping
- Remote inspection of civil infrastructure, such as towers and bridges
- Digital terrain modeling and volume estimating
- Project site monitoring

## *Capabilities*

### High Resolution Aerial Mapping

- Centimeter resolution orthorectified aerial imagery
- High accuracy georeferencing
- Surface modeling and topographic measurements
- Material quantity estimating

### Site Documentation

- Oblique photography
- High definition video
- Change detection and site monitoring
- Remote infrastructure inspection

### FAA Remote Pilot Endorsement

- Multiple pilot endorsements
- Approximately 100 flight hours with no reportable incidents

# FEATURED *Projects*

**Saint George Harbor Breakwater Repair, Alaska.** This highly complex project involved using mechanical equipment to place over 10,200 cubic yards of 6-12 ton Armor rock on a breakwater.

- Estimated armor rock quantities daily, ensured construction aligned with engineering model
- Assisted stakeholders with decision-making through high resolution imagery when site visits were not possible due to the remote location
- Reduced safety hazard and risk of putting individuals in a dangerous environment when site conditions were not amenable for traditional surveying due to 10-20 foot waves

**Alaska Army National Guard, Federal Scout Readiness Center Remedial Investigation, Emmonak, Alaska.** Emmonak lies 120 air miles northwest of Bethel and 490 air miles from Anchorage in the remote Yukon Delta National Wildlife Refuge.

- Provided highly accurate and detailed imagery of site for reporting and capturing current site conditions and features not visible in satellite imagery

**Federal Aviation Administration, North Dutch Island VHF Station Release Investigation and Interim Removal Action, Prince William Sound, Alaska.** Removed and disposed of approximately 300 cubic yards of petroleum contaminated soil at North Dutch Island located within the Chugach National Forest, 32 miles east of Whittier in Prince William Sound and northeast of Perry Island.

- Provided very accurate basemap that aligned seamlessly with survey data
- Captured site conditions after demolition and remediation detailing the work completed

**Federal Aviation Administration, Infrastructure Removal and Release Investigation, Chirikof Island, Alaska.** The project was performed at a site requiring complex mobilization and demobilization logistics by barge only.

- Generated highly detailed topographic and accurate site basemaps capturing features not visible in available satellite or traditional higher-altitude aerial imagery
- Employed surface modeling to estimate soil and debris quantities for removal

**Federal Aviation Administration, Bench-Scale Pilot Study and Feasibility Study, Puntilla Lake, Alaska.** This is a pilot study of in-situ chemical oxidation at one site and an evaluation of phase-separated product recovery at another site in a remote location with very limited logistical support.

- Generated highly detailed topographic and site basemaps that captured features not visible in available satellite or traditional higher-altitude aerial imagery
- Documented the precise location and detail of a small excavation

**Federal Aviation Administration, Facility and Radio Communications Transmitter Infrastructure Removal and Remediation, Nome, Alaska.**

- Documented existing site conditions with highly detailed and accurate orthoimagery
- Imagery helped client refine the scope work for impending remedial activities
- Captured oblique imagery to inspect standing towers


Saint George


Emmonak


North Dutch Island


Puntilla Lake


Nome

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# Brice ENVIRONMENTAL

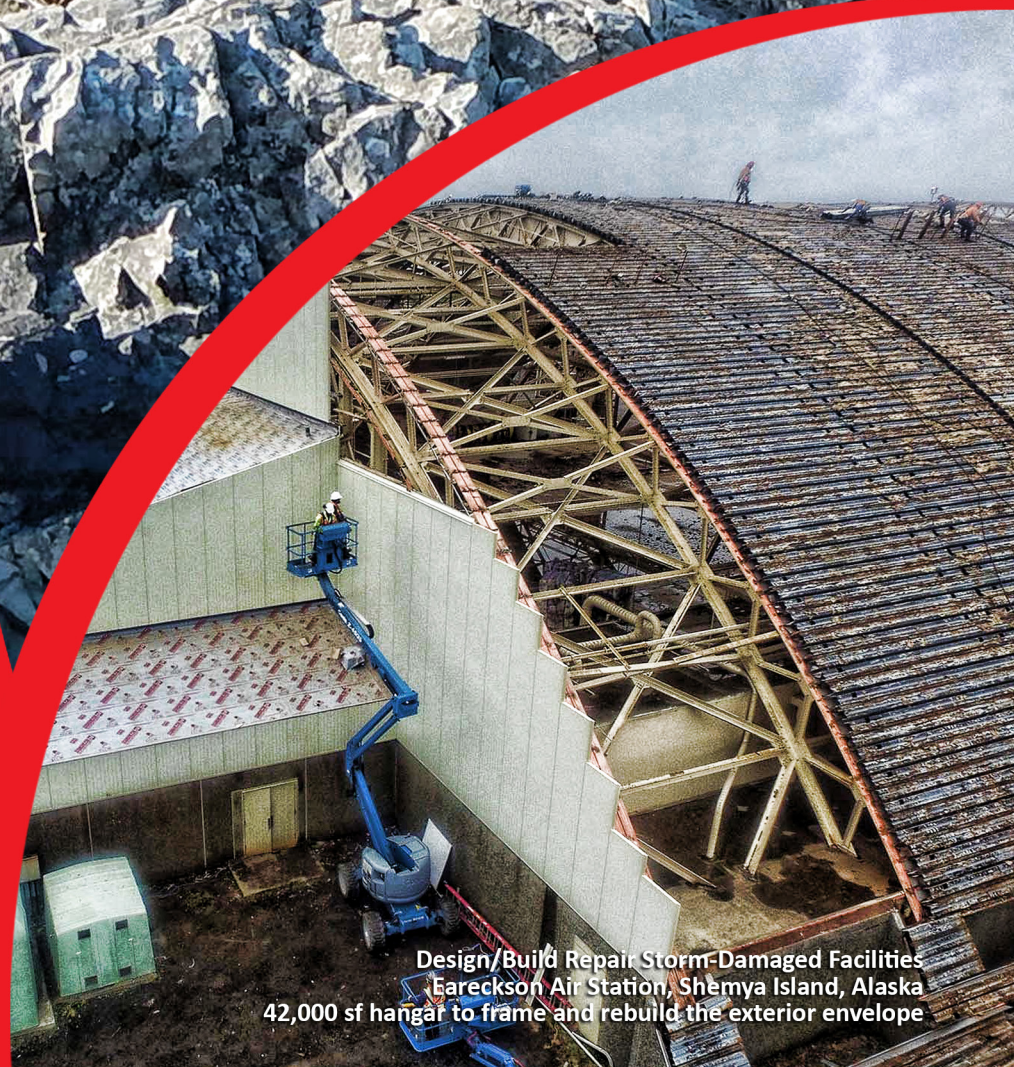

Jamie Oakley, PG
Vice President
907.275.2912
JOakley@BriceEnvironmental.com

Dylan Hickey, LSIT
Geospatial Lead
907.903.5225
DHickey@BriceEnvironmental.com

3800 Centerpoint Drive
Suite 400
Anchorage, Alaska 99503
907.275.2896 PH/FX


More information on Brice and our services can be found at:
www.BriceEnvironmental.com

North Dutch Island, Alaska



Design/Build Repair Storm-Damaged Facilities
Eareckson Air Station, Shemya Island, Alaska
42,000 sf hangar to frame and rebuild the exterior envelope

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