

Aerial Imagery Collection Guidance

Planning and Procuring Imagery Projects in Alaska

Alaska Geospatial Office

State of Alaska | DNR | DGGS

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How to use this guide

This guide is designed to help you scope an aerial imagery project in Alaska. The Alaska Geospatial Office (AGO) does not impose accuracy, resolution, or processing requirements. The goal is to help you specify collection requirements that match your intended application and retire outdated legacy contract language.

Technical specifications follow recognized standard bodies such as the American Society for Photogrammetry and Remote Sensing (ASPRS) and will evolve over time. Always verify specifications against the current standards before incorporating them into a contract:

- ASPRS Positional Accuracy Standards for Digital Geospatial Data (Edition 2, Version 2, 2024): digital sensor photogrammetry, check point counts, aerial triangulation recommendations, accuracy testing and reporting

If you would like AGO to host and publish your data through Skyhub Explorer, your contract should also include data delivery specifications that support streamlined integration. Include a reference to the AGO Imagery Deliverable Guidance documentation and request that your contractor provide a copy of the deliverables to AGO.

Document Organization

- Sections 1 through 3 follow the chronological sequence of project planning.
- Sections 4 through 8 provide reference material to draw on when drafting a scope of work.
- Sections 9 and 10 contain the checklist to work through before a solicitation goes out, as well as the quality assurance checks to perform when the data arrives.

1. Before you scope

Start from the application

Have you ever pulled language from an old scope of work to contract aerial imagery? Those specifications were written for a different project and reusing them means either paying for products you don't need or receiving data that falls short of the ones you do.

Before writing a scope of work, be explicit about what the data is for, what extent it must cover, which products you need, and any technical constraints that affect acquisition or processing. Weigh future use alongside your immediate objective: imagery data has a long service life, and the marginal cost of a better dataset at acquisition is almost always lower than reacquiring.

Coordinate first

Check whether neighboring landowners or agencies are planning imagery acquisitions in or near your area of interest. Early coordination prevents duplicate collection efforts and can establish cost-sharing partnerships that allow you to expand your project footprint without increasing your budget. The Alaska Geospatial Office can help connect you with potential partners.

Define the project area carefully

The Defined Project Area (DPA) is the polygon or polygons (GeoPackage, KML, geodatabase or similar) where the contractor acquires data and delivers products. Nothing outside will be delivered, so the DPA must fully contain every feature that matters to the project. The following mistakes account for most DPA problems:

- **Coastal extents cut short.** Usually caused by outdated or inaccurate coastline reference data. Draw the DPA over current imagery and buffer past the shoreline into coastal waters.
- **Watershed boundaries cut short.** For hydrologic analysis, consider referencing the best available watershed boundaries to ensure full drainage coverage is included. A useful resource is the USGS National Hydrography Products Watershed Boundary Dataset
- **River bends clipped.** Include stream and river segments in their entirety wherever possible, or the data may not support hydrographic applications.
- **Slivers between merged polygons.** Deliver one seamless polygon. Contractors will remove data wherever slivers exist and the final product will have areas void of data.
- **Communities and critical infrastructure.** Where practical, ensure communities, transportation corridors, utilities, airports, ports, pipelines, and other critical infrastructure are fully included. These features are frequently located near project boundaries and may be inadvertently excluded.

2. Alaska acquisition realities

Acquisition windows in Alaska are short and easily lost to snow, weather, and daylight. Each additional operational constraint you impose narrows that window further, driving up standby and airtime expenses. Overly restrictive requirements can delay a project into the following season or cause it to fail completely. Therefore, select collection conditions with careful deliberation.

- **Sun angle.** Low sun angles create shadows that can obscure ground features, especially in mountainous and forested areas. Restrictive sun angle requirements can significantly reduce acquisition opportunities and increase costs, particularly outside of the peak summer season.
- **Cloud-free.** Clouds below the aircraft obscure ground features, while broken cloud layers can create shadows that reduce image usability. Solid overcast conditions can provide uniform lighting and produce high-quality imagery. If some cloud cover is acceptable, define the maximum allowable percentage in the contract.
- **Minimal smoke/haze.** Similar to cloud cover, smoke from regional wildfires or lingering haze and ground fog impacts image quality and visibility.
- **Snow-free.** A reasonable requirement but anticipate perennial snow fields at higher elevations. Snow obscures ground features and infrastructure.

- **Leaf-off.** While standard practice in the Lower 48, this requirement is often infeasible in Alaska because leaf-off periods coincide directly with snow cover. Only specify leaf-off if absolutely required for application and you are willing to accept this seasonal trade-off.
- **Tidal coordination.** While important for shoreline mapping and delineation, tidal constraints significantly restrict operational windows and heighten the risk of project delays. Because Alaska features widely varying coastal tidal ranges, research local conditions in advance and consult your contractor to evaluate how these limitations could affect success in your target area.

Where conditions are difficult to predict, the scope of work should require the contractor to obtain written approval of collection conditions before mobilizing.

The choice of acquisition platform, whether fixed-wing, helicopter, or UAS, naturally follows from project area size, location, required data type, cost, aircraft availability, and contractor recommendation. It is best to work through this decision collaboratively with your vendor rather than prescribing a specific platform upfront.

Other risks to consider for planning: persistent rain, low clouds, and fog; late-season snow and ice lingering in the project area; high-elevation snowpack; early leaf emergence; wildfire and smoke; and restricted airspace near military installations and training areas.

3. Decisions that Drive Cost

Because Alaska's operating environment imposes tight constraints and drives up collection expenses, every technical requirement you introduce carries a direct financial impact. The following matrix outlines how key project decisions influence your budget, helping you balance data needs against realistic procurement costs.

Decision	Options	Cost Considerations	If unsure
Image Resolution (GSD)	• **Low resolution:** 30 cm • **Medium resolution:** 15 cm • **High resolution:** 7.5 cm • **Ultra-high resolution:** ≤ 2.5 cm	Flight altitude, number of flight lines, platform selection, data volume, processing effort, and storage requirements all increase as GSD decreases. Specifying imagery with unnecessarily small pixel sizes can significantly increase project costs while providing little additional value. Ultra-high resolution is typically collected with a drone or helicopter. Consider satellite for resolutions coarser than 30 cm.	15 cm imagery is adequate for most mapping, planning, land management, and GIS applications.
Spectral Bands	• RGB • RGB + NIR	Additional bands require specialized sensors,	AGO recommends RGB + NIR. RGB alone meets

Decision	Options	Cost Considerations	If unsure
	• Advanced Multispectral • Hyperspectral	increased collection costs, and more processing effort. Hyperspectral requires strict environmental constraints and will add standby costs.	most mapping and GIS needs, but the NIR band supports vegetation, wetland, and land cover analysis and costs far less to acquire now than to refly for later.
Radiometric Processing	• Standard color balancing • Temperature and reflectance (thermal and hyperspectral)	Additional editing and processing labor may be required to achieve seamless image appearance.	Standard color balancing is sufficient for most imagery projects.
Pixel Depth	• 8-bit • 16-bit	16-bit imagery increases file size, processing time, and storage cost. Specify 16-bit only where radiometric analysis or tonal post-processing is planned.	8-bit
Acquisition Conditions	• Flexible season • Sun angle • Cloud-free • Snow-free • Leaf-on/off • Low smoke conditions	Each added condition narrows an already short window and increases standby and airtime charges. Combined conditions can extend project timelines into multiple seasons.	Specify only conditions your application genuinely requires; see Section 2.
Image Overlap	• Standard orthophotography (60% forward, 30% side) • Enhanced overlap (80% forward, 60% side) • High overlap photogrammetry (80% forward, 80% side)	Additional overlap increases the number of images collected, flight duration, storage requirements, and processing costs. However, higher overlap improves image matching, supports 3D modeling, generates denser photogrammetric point clouds. Increased side overlap has disproportionately higher cost than forward overlap	60% forward overlap and 30% side overlap are recommended for most large area orthophotography projects
Orthophoto Type	• Standard ortho • True ortho	True orthophoto removes the apparent leaning of buildings and other vertical features, producing a more accurate top-down representation of above-	Standard orthophotos are appropriate for most projects.

Decision	Options	Cost Considerations	If unsure
		ground features. Production requires high overlap, higher-quality surface models, increased processing time, and more QA/QC effort.	
Mosaicking Requirements	• Standard mosaic • Enhanced seamline editing • Custom mosaics	Extensive seamline editing and manual image correction can become a significant production cost.	Standard orthomosaics are sufficient for most projects.
Ground Control Strategy	• Existing control network • Pre-set targets • Photo identifiable features	Ground control often represents a significant project cost, particularly in remote areas. Existing control networks typically offer the lowest cost. Photo-identifiable points can reduce field efforts when suitable features exist. Pre-surveyed targets require additional survey and field deployment costs but often provide the highest level of confidence and accuracy.	Use existing control where available. If additional control is needed, photo-identifiable points often provide a cost-effective alternative to deploying aerial targets.
Horizontal Accuracy	• **Wide regional mapping and resource management: ≤ 3 pixels** • **Engineering design: ≤ 2 pixels**	Higher accuracy requirements typically require additional survey control, more rigorous aerial triangulation, and increased QA/QC effort. Specifying accuracy beyond what the application requires may increase project costs without providing meaningful benefit. If higher accuracy is required, it is often more cost efficient to contract lidar in addition to orthophotos to alleviate control and processing costs and logistics.	≤ 3 pixel $RMSE_r$ horizontal accuracy is appropriate for most mapping and GIS applications.
Elevation Source	• Existing DEM • Photogrammetric surface model	Research existing elevation data sources and evaluate their quality and to use for	Use existing quality-controlled elevation data if available.

Decision	Options	Cost Considerations	If unsure
	• New lidar acquisition	orthorectification before contracting new elevation data. Photogrammetrically derived surface models can be an effective elevation source but may be costly to process in areas with extensive vegetation and relief.	
Oblique Imagery	• Not required • Required	Oblique collections require additional flight planning, sensor configurations, acquisition, processing, and storage.	Consider obliques only if building inspection, asset management, or digital twin applications are planned.

4. Resolution and Accuracy

Resolution expressed as ground sample distance (GSD), positional accuracy, overlap, and intended application are interconnected choices rather than independent variables. Smaller pixel sizes generally support improved positional accuracy and finer feature extraction but require additional flying, processing, and storage. The following matrix provides a planning-level crosswalk between common imagery specifications and typical applications.

Imagery Class	Typical GSD	Horizontal Accuracy (Pixel)	Horizontal Accuracy ($RMSE_r$)	Recommended Overlap (Front/Side)	Common Applications
Low Resolution	30 cm	≤ 3 pixels	≤ 90 cm	60% / 30%	Land management, statewide inventories, resource planning
Medium Resolution	15 cm	≤ 3 pixels	≤ 45 cm	60% / 30%	Municipal GIS, transportation inventories, emergency response
High Resolution	7.5 cm	≤ 3 pixels	≤ 22.5 cm	80% / 60%	Asset management, utility corridors, shoreline mapping
Ultra-High Resolution	≤ 2.5 cm	≤ 2 pixels	≤ 5 cm	80% / 80%	Design, construction, infrastructure documentation

For scoping and budgeting only. Verify current thresholds against ASPRS standards before writing them into a contract. Side overlap may vary depending on landscape and application and can be a significant driver of added cost.

5. Imagery Types and Spectral Options

Imagery products vary by both spectral content and viewing geometry. Specify only the products your project requires, as each additional product increases acquisition, processing, delivery, and storage costs. AGO recommends RGB+NIR imagery to meet diverse use cases and stakeholder needs.

Imagery Product	What it is and when to ask for it.
RGB	Three-band imagery containing red, green, and blue spectral bands. Appropriate for most mapping, planning, asset inventory, visualization, and GIS applications.
RGB + NIR	Four-band imagery containing red, green, blue, and near-infrared (NIR) bands. Recommended for vegetation mapping, wetland delineation, land cover classification, and environmental monitoring.
Advanced Multispectral	Imagery collected in five or more discrete spectral bands, often including combinations of blue, green, red, red-edge, multiple infrared bands, and other specialized wavelengths. Provides greater spectral discrimination than RGB+NIR and supports advanced habitat mapping, species differentiation, water quality analysis, agricultural monitoring, and environmental research. Request only when a specific analytical workflow requires additional spectral information.
Hyperspectral	Imagery collected in dozens to hundreds of narrow, contiguous spectral bands. Provides detailed spectral signatures that can be used to identify minerals, vegetation species, water quality characteristics, and other surface materials that may not be distinguishable using multispectral imagery. Acquisition and processing are significantly more complex and costly than standard imagery products and should only be specified when a defined analytical workflow requires additional spectral information.
Thermal	Measures emitted heat rather than reflected light. Useful for groundwater discharge mapping, stream temperature studies, infrastructure inspections, geothermal, and environmental investigations.
Oblique	Images collected at an angle rather than directly downward. Useful for infrastructure inventories, facilities management, emergency response, and asset inspection programs.

6. Deliverables

These are the final products generated during image acquisition and processing. The products below represent the recommended minimum deliverables for most imagery projects. Thermal, advanced multispectral, and hyperspectral collections carry their own product sets and are specified per project; where those are collected, define the deliverables and formats in the scope of work.

If you would like AGO to host and publish the data through Skyhub Explorer, follow the **AGO Imagery Deliverable Guidance**, which sets out the delivery items, coordinate reference systems, tiling scheme, and folder structure required for ingest.

Formats below favor open, cloud-native standards so deliverables stay usable without proprietary software and can be read directly by automated and machine learning workflows. Cloud Optimized GeoTIFF (COG), STAC, GeoParquet, and GeoPackage are all recommended by the National Geospatial Advisory Committee, which identifies COG, STAC, and GeoParquet as cornerstone formats for AI integration. Avoid specifying proprietary raster formats such as MrSID (SID) and ECW: encoding them requires a licensed toolchain, which limits who can regenerate or reprocess the data later.

Deliverable	Recommended Format	What it is and why you would want it
Orthorectified Imagery (Tiled)	Cloud Optimized GeoTIFF (COG)	The primary mapping product. Individual image tiles corrected for terrain and camera distortion so measurements can be made directly from the imagery. Recommended for nearly all projects.
Orthorectified Imagery (Full DPA)	Cloud Optimized GeoTIFF (COG); BigTIFF where the mosaic exceeds 4 GB	A seamless image created from many orthorectified photographs. Useful for visualization, web services, GIS distribution, and applications where users prefer a single continuous image. A full-DPA mosaic commonly exceeds the 4 GB limit of classic GeoTIFF; specify BigTIFF, which COG supports, rather than a proprietary compressed format.
Stereo Imagery	GeoTIFF, uncompressed or lossless	Overlapping photographs suitable for stereoscopic viewing and photogrammetric compilation. Required if future 3D feature extraction or terrain mapping may occur.
Exterior Orientation File	GeoParquet (preferred) or CSV with a documented column schema	Contains the position and orientation of each source image, typically including X, Y, Z coordinates along with omega, phi, and kappa rotation angles. Essential for photogrammetric reprocessing, troubleshooting, stereo compilation, orthorectification updates, and future data reuse. Often inexpensive to retain at acquisition but impossible to recreate later without substantial effort.
Oblique Imagery	JPEG or GeoTIFF, with exterior orientation supplied separately	Side-looking imagery that captures building facades, infrastructure, and terrain from multiple angles. Useful for asset management, emergency response, and visualization products.
Image Footprints	GeoPackage	Polygon boundaries showing the extent of every source image. Useful for troubleshooting, coverage verification, and image management.
Defined Project Area (DPA)	GeoPackage	The contractual project boundary defining the area of acquisition and delivery. Serves as the reference extent for acceptance and quality control.

Deliverable	Recommended Format	What it is and why you would want it
Acquisition Flightlines	GeoPackage	Flight path information showing where imagery was collected with a time stamp. Useful for auditing coverage and understanding acquisition timing and geometry.
Master Tile Index	GeoPackage	Tiling framework used to organize imagery deliverables. Useful for cataloging and managing large datasets.
Ground Survey Data	GeoPackage	Ground control points and checkpoints used during processing and accuracy assessment.
Seamlines	GeoPackage	Lines defining where adjacent images were merged during mosaic production. Useful for troubleshooting visual artifacts and evaluating mosaic quality.
Camera Calibration Report	PDF	Documents the camera calibration parameters used during processing. Required to independently verify photogrammetric accuracy and supports future reprocessing of raw imagery.
Quality Report	PDF	Documentation describing acquisition conditions, aerial triangulation results, accuracy assessment results, processing methods, and compliance with contractual requirements.
STAC Catalog	JSON	A machine-readable catalog describing every delivered asset, its footprint, acquisition time, coordinate reference system, and band structure. Allows the delivery to be ingested, validated, and served without manual handling, and makes the imagery directly consumable by analysis and machine learning pipelines. Published as static JSON files alongside the data.
Metadata	ISO 19115 (XML)	The ISO 19115 record carries the full lineage and stewardship description. Required for long-term usability.

7. Spatial Reference Systems

Explicitly define your horizontal and vertical datums, coordinate projections, and units in the contract to ensure all deliverables integrate seamlessly with your organization's existing GIS and engineering architecture. Specifications require defining a coordinate reference system (CRS) that links both horizontal and vertical components, alongside the specific geoid model used for orthometric height conversions.

Element	Requirement
Horizontal Reference Frame	NAD83(2011), epoch 2010.00
Projection Used for Processing and Product Delivery	Process and deliver in a single, explicitly named CRS. State it in the solicitation rather than leaving the choice to the contractor.
Projection Used for Statewide Distribution	Alaska Albers Equal Area Conic, NAD83(2011)
Projection Considerations for Enterprise Integration	Match the project where products will be integrated with existing enterprise data eg. cadastral or design data in similar projection
Vertical Datum	NAVD88 (applies to the elevation source used for orthorectification)
Geoid Model	GEOID12B. GEOID18 does not cover Alaska (NGS)
Linear Units	Meters. Where feet are required, international feet.
CRS Declaration	OGC WKT information documented within image metadata and accompanying project documentation.

Multi-zone projects. Where a project area crosses UTM zone boundaries or the antimeridian, the contract should name a single delivery zone or state the tiling rule at the boundary.

Elevation source documentation. The elevation source used for orthorectification should be documented in project metadata so imagery products can be regenerated if improved elevation data becomes available in the future.

Imagery is processed with the same spatial reference system matching final products to reduce the potential of transformation errors. Many users require State Plane deliverables to align with municipal GIS databases, local engineering standards, and regional agency archives. Alaska Albers (NAD83 (2011)) is the preferred coordinate reference system for statewide distribution, visualization, and broad dataset integration, as it minimizes distortion across Alaska's vast geography.

8. Ground Survey

Ground survey data provides the control and verification required to ensure your imagery acquisition meets contractual accuracy standards. Set control accuracies and survey procedures to project requirements. The ASPRS Positional Accuracy Standards are widely used references and useful starting points for accuracy language.

- **Keep check points independent of control.** Points used in aerial triangulation, block adjustment, direct georeferencing calibration, or image rectification should not be used to compute reported accuracy.
- **Specify geographic distribution.** State the quantity of survey points and how they should be distributed throughout the project area to meet accuracy requirements. Recognize the access limitations of working in Alaska.
- **Decide who surveys the check points.** Contractor, third party, or your own staff. If you want absolute independent verification, don't allow the contractor to survey their own.
- **Treat disparate DPAs as separate projects.** Where project area polygons are far apart and imagery blocks do not overlap, each project area needs control and check points within it.
- **Account for access constraints before pricing the survey plan.** Remote sites, challenging terrain, land ownership and associated permitting lead time may constrain access to suitable ground survey locations.
- **Ask for the control and check point data as a deliverable.** Surveyed coordinates, metadata, and the accuracy report are required to perform your own accuracy assessment.

9. What to require in the contract

Each requirement below is stated in the form it should take in the solicitation. The right-hand column points to the section that explains the choice behind it.

Require in the contract	Covered in
The deliverable list and file formats, with the DPA as the authoritative extent.	Sections 1 and 6
Ground Sample Distance (GSD)	Sections 3 and 4
Horizontal accuracy requirements reported using ASPRS methods and independent checkpoints.	Sections 4 and 8
Spectral bands to be delivered, listed explicitly (RGB, RGB + NIR, multispectral, thermal, etc.).	Section 5
Forward overlap and sidelap requirements, if applicable.	Sections 3 and 4
Acquisition conditions, including cloud cover, seasonal requirements, tidal coordination, and sun angle restrictions where required.	Section 2
Require approval of collection conditions before mobilization.	Section 2
Orthorectified imagery delivered in the specified coordinate reference system and units.	Section 6 and 7
Pixel depth (8-bit or 16-bit), stated explicitly	Section 3
Orthophoto type: standard orthophoto or true orthophoto	Section 3
Elevation source used for orthorectification, named in the contract and documented in delivered metadata	Sections 3 and 7
Tiling scheme and master tile index, specifying the Alaska Statewide Tile Index and the tile size to be delivered	Section 6
Quality Report (PDF): Documentation demonstrating compliance with contractual requirements, including acquisition dates, processing methods, positional accuracy results, datums, units, and all project contractors.	Section 6
Open, cloud-native delivery formats stated explicitly (COG for rasters, GeoPackage or GeoParquet for vector and tabular data); proprietary raster formats not accepted in place of COG	Section 6
Metadata for all delivered products: a STAC Item and Collection (JSON) for machine discovery, and an ISO 19115 record (XML) for lineage and stewardship	Section 6
Delivery of all ground survey data used for accuracy verification.	Sections 6 and 8
Conformance with the AGO Imagery Deliverable Guidance, including delivery formats, tiling, and folder structure	How to Use This Guide

10. Acceptance

Evaluate your imagery datasets against the contract specifications before final sign-off and payment. The checklist below covers imagery products, vector deliverables, survey data, and documentation.

Review Phase / Item	Focus Area	Description and Action Required
Spatial Reference Verification	Coordinate Systems	Confirm that all deliverables utilize the specified horizontal datum, vertical datum, projection parameters, and units without shifting or scaling errors.
Accuracy Assessment	RMSEr & Check Points	Compare independent ground survey check points against the orthophotography to verify that horizontal accuracy meets contractual thresholds.
Data Completeness & Coverage	Extents & Tiles	Check the master tile index, image footprints, and acquisition coverage against the defined project area polygon to ensure complete coverage with no gaps or missing tiles.
Spectral and Radiometric Verification	Bands & Pixel Depth	Confirm the delivered imagery carries the band count and pixel depth the contract specified. Open a sample tile and verify the band count (three for RGB, four for RGB + NIR) and the bit depth per band. A contract can call for RGB + NIR at 16-bit and receive 8-bit RGB without any other check catching it.
Image Quality & Artifacts	Orthophotography	Inspect orthophotography for cloud cover, cloud shadows, excessive haze, resolution, overlap, blur, smearing, seamline artifacts, tonal inconsistencies, geometric distortions, or other defects that diminish usability
Metadata & Quality Report	Documentation	Review the delivered STAC Catalog and ISO 19115 metadata records for completeness and accuracy, and confirm the Quality Report documents acquisition conditions, aerial triangulation, and accuracy results against the contract.

11. Key terms

DPA (Defined Project Area). The polygon(s) defining exactly where imagery will be collected and delivered. Also called an area of interest.

Ground Sample Distance (GSD). The size of a single pixel measured on the ground. The primary measure of imagery resolution.

Orthorectification. The process of removing terrain displacement and camera distortion so measurements can be made directly from imagery.

Orthophotography. Aerial imagery that has been orthorectified and georeferenced to a coordinate system.

Orthomosaic. A seamless image created by combining multiple orthorectified photographs into a single dataset.

True Orthophoto. An orthophoto created using a detailed surface model to remove building lean and other distortions caused by elevated features.

RGB Imagery. Standard color imagery containing red, green, and blue spectral bands.

Near-Infrared (NIR). A portion of the electromagnetic spectrum commonly used for vegetation analysis and environmental mapping.

Multispectral Imagery. Imagery containing multiple spectral bands beyond standard RGB, used to improve land cover, vegetation, and environmental analysis.

Thermal Imagery. Imagery that records emitted heat rather than reflected light, revealing temperature differences across the landscape.

Stereo Imagery. Overlapping photographs that allow three-dimensional viewing and photogrammetric measurements.

Oblique Imagery. Images collected at an angle rather than directly downward, allowing side views of buildings, infrastructure, and terrain.

Ground Control Point (GCP). A surveyed location with known coordinates used during image processing to improve positional accuracy.

Check Point. An independently surveyed location used to verify reported positional accuracy.

$RMSE_r$. Root-mean-square error in the horizontal direction. The standard statistical measure used to report horizontal positional accuracy.

Aerial Triangulation. The photogrammetric process used to determine the precise position and orientation of each image within a project.

Exterior Orientation. The position and orientation of an image at the moment it was collected, typically expressed as X, Y, Z coordinates and rotational angles.

Seamline. The boundary where adjacent photographs are merged together during orthomosaic production.

Cloud Optimized GeoTIFF (COG). A GeoTIFF arranged with internal tiling and overviews so that software can read just the portion of an image it needs over the web, without downloading the whole file. An OGC standard since 2023.

STAC (SpatioTemporal Asset Catalog). An open JSON specification describing geospatial assets - their footprint, acquisition time, coordinate reference system, and bands — so they can be searched and loaded automatically. Published as an OGC Community Standard in 2026.

GeoParquet. An open columnar format for vector and tabular data, optimized for cloud storage and analytical queries. Carries a typed schema, so column meaning does not depend on a separate data dictionary.

ISO 19115. The international standard series for geospatial metadata, covering dataset description, lineage, and quality. FGDC encourages ISO 19115 in place of the legacy CSDGM.

Analysis-Ready Data (ARD). Data delivered in a state that can be used directly in analysis or model training without further reformatting, reprojection, or manual preparation.

12. References

- ASPRS Positional Accuracy Standards for Digital Geospatial Data (2024)
- Alaska Skyhub
- OGC Cloud Optimized GeoTIFF Standard (1.0)
- OGC SpatioTemporal Asset Catalog (STAC) Community Standard
- STAC Specification 1.1.0
- NGAC Recommendation for an Initial Set of Minimum Geospatial Standards (March 2026)