

DEPARTMENT OF THE ARMY
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CECW-EC

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Engineering and Design
POLICIES, GUIDANCE, AND REQUIREMENTS FOR
ELEVATION DATA MANAGEMENT AND COORDINATION

1. Purpose. This Engineer Circular (EC) establishes general criteria and policy for the execution and management of CONUS elevation data throughout the U.S. Army Corps of Engineers (USACE). Reference 4.a. establishes the framework for sharing geospatial data with other Federal, state, and local partners in concert with Executive Order 12906 and this EC outlines specific coordination activities relevant to elevation data and the 3D Elevation Program (3DEP).
2. Applicability. This circular applies to all USACE elements planning to acquire elevation data through aerial methods to support Civil Works (CW), Military Programs (MP) and International and Interagency Support to include Light Detection And Ranging (LiDAR) acquisition over military installations. USACE elements are defined as HQUSACE, and all subordinate commands, districts, centers and field operating activities having CW and MP responsibilities. USACE elements also includes all parts of Engineer Research Development Center (ERDC). This EC applies to all contract related activities, including direct acquisition of LiDAR acquisition services as well as activities executed by prime or subcontractors supporting CW and MP missions covering the United States, Guam, American Samoa, Northern Mariana Islands, Puerto Rico and US Virgin Islands. This EC does not apply to any classified LiDAR acquisition.
3. Distribution. This regulation is approved for public release; distribution is unlimited.
4. References.
 - a. ER 1110-1-8156; Policies, Guidance, and Requirements for Geospatial Data and Systems. http://www.publications.usace.army.mil/Portals/76/Publications/EngineerRegulations/ER_1110-1-8156.pdf
 - b. ER 1110-2-8160, Policies for Referencing Project Elevation Grades to Nationwide Vertical Datums. http://www.publications.usace.army.mil/Portals/76/Publications/EngineerRegulations/ER_1110-2-8160.pdf

- c. EM 1110-1-1000, Photogrammetric and LiDAR Mapping Manual.
https://www.publications.usace.army.mil/Portals/76/Publications/EngineerManuals/EM_1110-1-1000.pdf?ver=2016-03-25-080019-613

- d. Heidemann, Hans Karl, 2018, Lidar base specification (ver. 1.3, February 2018): U.S. Geological Survey Techniques and Methods, book 11, chap. B4, 101 p.,
<https://doi.org/10.3133/tm11b4>.

5. Background. LiDAR is a remote sensing technique used to measure the distance to an object by determining the time of flight for an emitted laser beam. The resulting data are typically used to measure topography of the land surface, including bare earth topography that excludes buildings and vegetation and is typically provides the basis for an elevation data set.

6. 3DEP and Interagency Coordination.

- a. The 3DEP is an initiative to respond to a growing need for high-quality topographic data and for a wide range of other three-dimensional representations of the Nation's natural and constructed features. The primary goal of 3DEP is to systematically collect enhanced elevation data in the form of high-quality LiDAR data over the conterminous United States, Hawaii, and the U.S. territories, with data acquired over an 8-year period. Interferometric synthetic aperture radar data will be collected over Alaska, where cloud cover and remote locations preclude the use of lidar over much of the State.

- b. Because no single agency has been identified and funded to acquire nationwide LiDAR coverage, it is important to coordinate data collects with federal partners and state and local government in order to ensure duplicative acquisitions are not flown and acquired data sets are incorporated into a single data elevation data repository. This coordination is part of the 3DEP program.

- c. 3DEP provides the basis for the topographic portion of the elevation theme organized under the Federal Geographic Data Committee (FGDC). FGDC elevation data is defined as: "The measured vertical position of the earth surface and other landscape or bathymetric features relative to a reference datum typically related to sea level. These points normally describe bare earth positions but may also describe the top surface of buildings and other objects, vegetation structure, or submerged objects. Elevation data can be stored as a three-dimensional point cloud or as a continuous surface such as a raster, triangulated irregular network, or contours. Elevation data may also be represented in other derivative forms such as slope, aspect, ridge and drainage lines, and shaded relief." The Interagency Working Group on Ocean and Coastal Mapping (IWGOCM) coordinates coastal topography and bathymetry collections.

7. LiDAR Elevation Standards. LiDAR elevation acquisition (in house and contract) deliverables will adhere to national accuracy standards outlined in reference 4.c. (chapter 3) and 4.b. The elevation data set will meet Quality Level 2 (QL2) specifications or better as defined in the LIDAR Base Specification, Version 1.3, reference 4.c. (Appendix E) or 4.d.

8. Coordination of LiDAR Acquisition.

a. All USACE LiDAR acquisitions will be coordinated by the respective district/division/lab/center geospatial lead as defined in reference 4.a or a designated individual. Regardless of who at the USACE office is acquiring LiDAR data it is the responsibility of division/district/lab/center geospatial lead to coordinate the LiDAR acquisition by following instructions in sections 8.b. and 9. Division/district/lab/center geospatial leads are listed in CDL-GDS-POC-List.

b. Prior to Acquisition.

(1) USACE district/division/lab/center personnel need to review existing elevation data in the 3DEP data repository (<https://viewer.nationalmap.gov/>), the U.S. Interagency Elevation Inventory (<https://coast.noaa.gov/inventory>) and the Geospatial Repository and Data management system (GRiD) (<https://rsgis.erdc.dren.mil/griduc>) prior to engaging in new LiDAR and elevation acquisition activities to determine if preexisting data will meet project requirements.

(2) For new LiDAR and elevation acquisitions all USACE district/division/lab/center geospatial leads or designated representatives must enter a planned collection Area Of Interest in shapefile, KML or KMZ format into the GRiD, collection planning module prior to data acquisition, and after funding has been identified to support the effort. To gain access to the planning module, send an email to GRiD.Core.Team@erdc.dren.mil requesting access to the module. Shapefile, KML or KMZ can be directly uploaded to GRiD's collection planning module once access has been granted.

(3) USACE planned collections to include those over military installations and military CONUS lands will be documented in GRiD and will be automatically published to the 3DEP/IWGOCM SeaSketch site by COB Friday of each week. JABLT CX Topo/bathy planned data collections are directly submitted to the 3DEP/IWGOCM SeaSketch site.

9. Elevation Data Repository.

a. GRiD is the HQ USACE approved archiving and dissemination system for all unclassified LiDAR and elevation products. All district/division/lab/center LiDAR or elevation data acquisitions are stored in GRiD to ensure long term archiving and dissemination within USACE as well as promote sharing the data with stakeholder partners and 3DEP.


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b. Upon new acquisition completion, the collecting district/division/lab/center or contractor will submit a copy of all collected data and all associated metadata to GRiD electronically or on physical media such as DVD or hard drives.

c. To submit data to GRiD send emails to the following e-mail:
GRiD.Core.Team@erdc.dren.mil

d. Once data has been received by the GRiD team, it will be available in GRiD and through the 3DEP website within 2 weeks. LiDAR data over military installations or other military lands will be available to USACE and DoD agencies through the GRiD system, but will not be made public through 3DEP.

10. Proponent. The HQUSACE proponent for this interim guidance is the Engineering and Construction Division, Directorate of Civil Works.


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