ALASKA GEOLOGIC MAPPING SCHEMA (GEMS) MULTI-MAP REPOSITORY DATABASE

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Digital Data Series 24

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ABSTRACT

The Alaska Geologic Mapping System (AK GeMS) comprises several key components working together to ensure that the Alaska Division of Geological & Geophysical Surveys (DGGS) efficiently produces high-quality, standards-based geologic maps. A critical component of this system is our AK GeMS Multi-Map Repository Database, which combines the individual geologic map data into a single GIS-based enterprise geodatabase. This Digital Data Series (DDS) allows users to download file geodatabase date-stamped snapshots of our AK GeMS Multi-Map repository database.

INTRODUCTION

To meet local geologic mapping requirements, the Alaska Division of Geological & Geophysical Surveys (DGGS) designed the Alaska Geologic Mapping Schema (AK GeMS), which is an extension to the Geologic Mapping Schema (GeMS) (U.S. Geological Survey National Cooperative Geologic Mapping Program, 2020). To meet these design considerations, AK GeMS supports various geodatabase implementations as part of the overall Alaska DGGS Geologic Mapping System. Each of these implementations has several unique characteristics:

- **Single Map AK GeMS Production Geodatabases.** This implementation of AK GeMS uses the full AK GeMS specifications, including string-based attribute domains, described in the data dictionary.
- **Single Map AK GeMS Publication Geodatabases.** A public distribution version of an AK GeMS geodatabase. It excludes topologies, feature classes, and empty tables or only required for production. Production-focused fields, such as the editor tracking, are also typically removed.
- **Single Map GeMS National Archive Geodatabases.** The GeMS standard has several naming conventions that differ from AK GeMS, particularly using Pascal case instead of underscore word delimiters for table and field names.
- **A Multi-Map AK GeMS Repository Geodatabase.** A modified AK GeMS geodatabase hosted on PostgreSQL enterprise architecture. This geodatabase modifies the standard AK GeMS schema in several ways, such as using integer-based attribute domains and true Globally Unique Identifiers (GUID) type fields.

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AK GEMS MULTI-MAP DATABASE REPOSITORY

The AK GeMS multi-map database is a repository of AK GeMS single-map databases stored in a single optimized PostgreSQL Enterprise Geodatabase. The database snapshots associated with this Digital Data Series are date-stamped file geodatabase exports from this enterprise database, which are packaged in our standard GeMS data packing format.

DIFFERENCES BETWEEN THE SINGLE-MAP AND MULTI-MAP AK GEMS DATABASES

The AK GeMS multi-map design is based on the AK GeMS single-map design (Hendricks and others, 2024) but is optimized for large volumes of data and handling multiple geologic map products. The key differences from the AK GeMS single-map schema are as follows:

- Attribute fields with defined attribute domains are integer-based to decrease storage and improve performance. AK GeMS single-map databases, on the other hand, employ string-based attribute domains, which geologists find easier to use during map production.

- The ID fields for each feature class and standalone table are true GUID-type fields, unlike the AK GeMS single-map's string-based approach of using GUIDs.

- A single projection is used for all data: Alaska Albers equal-area, NAD 83.

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