

Alaska DGGS Geologic Mapping System

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Publishing Products

GEOLOGICAL & GEOPHYSICAL SURVEYS

Department of Natural Resources

https://geoportal.dggs.dnr.alaska.gov/portal

AK GeMS Multimap Explorer Web App

We are in development of multi-map services and a

Geologic Map Data Exploration web app.

GEOPORTAL

The Alaska DGGS employs a Geologic Mapping System to produce standards-based, GeMS-compliant geologic maps and data for publication. The system has been developed over the course of 7+ years and controls the process of collecting, producing, converting, packaging, publishing, and sharing geologic map data. We designed the AK GeMS Geologic Mapping System as an extension to the GeMS schema to meet Alaska's specific requirements but still ensure that we can deliver GeMS-compliant data.

Published Standards

The system is built upon published data and symbology standards. We recently published version 2 of our AK GeMS Data Dictionary: A description of the AK GeMS Database Schema, which is an extension to the basic USGS published GeMS schema. In addition, we published version 2 of our symbology standard, AK GeMS Symbology: A Description of the AK GeMS Style File. The system supports four major categories of geologic mapping production: new mapping, conversions, digitizations, and compilations. During the mapping process, geologists heavily reference our published data dictionary and style file. In addition, we have built numerous tools and models to support mapping and improve quality assurance.

Introduction

The Alaska Division of Geological and Geophysical Surveys (DGGS) produces and publishes numerous

geologic maps each year. These maps and their associated databases are made available to the public as

downloads and delivered to the USGS in their recently published database standard, GeMS (Geologic

Mapping Schema). To produce standards-based, GeMS-compliant geologic maps we developed the AK

DGGS Geologic Mapping System. The system controls the process of collecting, producing, converting,

packaging, publishing, and sharing geologic map data. To ensure efficient processing we also developed

the AK GeMS production workflow standard, which is a 16-phase process that takes a map and its data

AK GeMS Data Dictionary

AK GEMS DATA DICTIONARY:

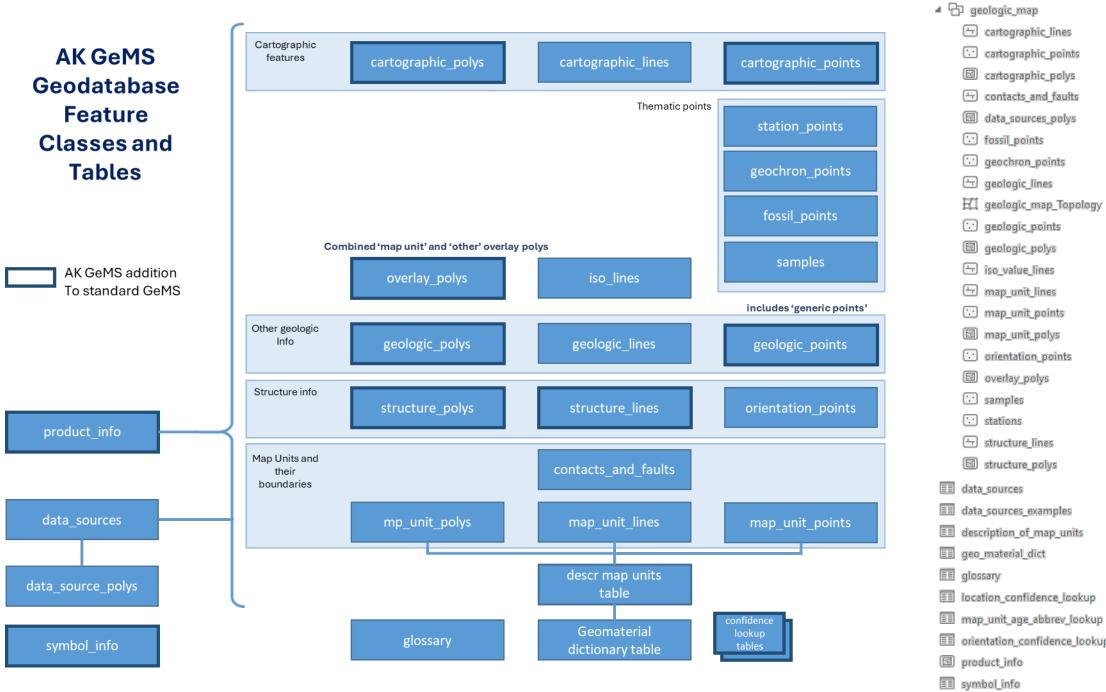
from planning though production, quality control, publication, and archiving.

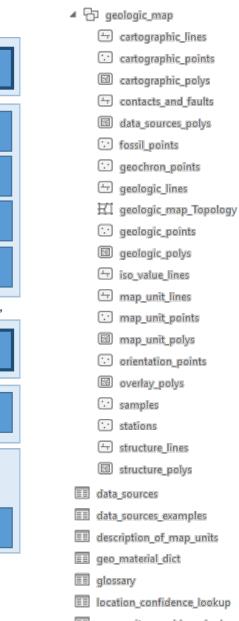
A DESCRIPTION OF THE AK GeMS DATABASE SCHEMA https://dggs.alaska.gov/pubs/id/31172

Includes a Report, Data Dictionary, Entity-Relationship Diagram, XML Workspace Document, and Schema Report in multiple formats

Key Aspects of AK GeMS

- Increased focus on modeling geologic features (as opposed to graphic elements)
- Capable of exporting to National GeMS without signification loss of AK GeMS data extensions.
- Capable of supporting both single-map production geodatabases as well as the DGGS multi-map enterprise geodatabase (PostGreSQL).
- Support multiple geologic layers (i.e. bedrock, surficial, others).
- Formalized pick lists as attribute domains with definitions included in a glossary table.
- Well Documented.



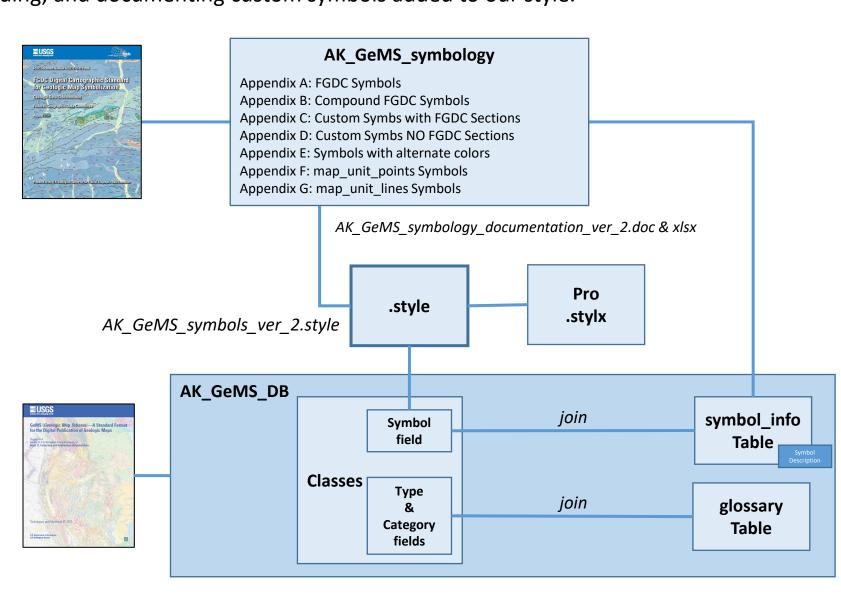


AK GeMS Symbology

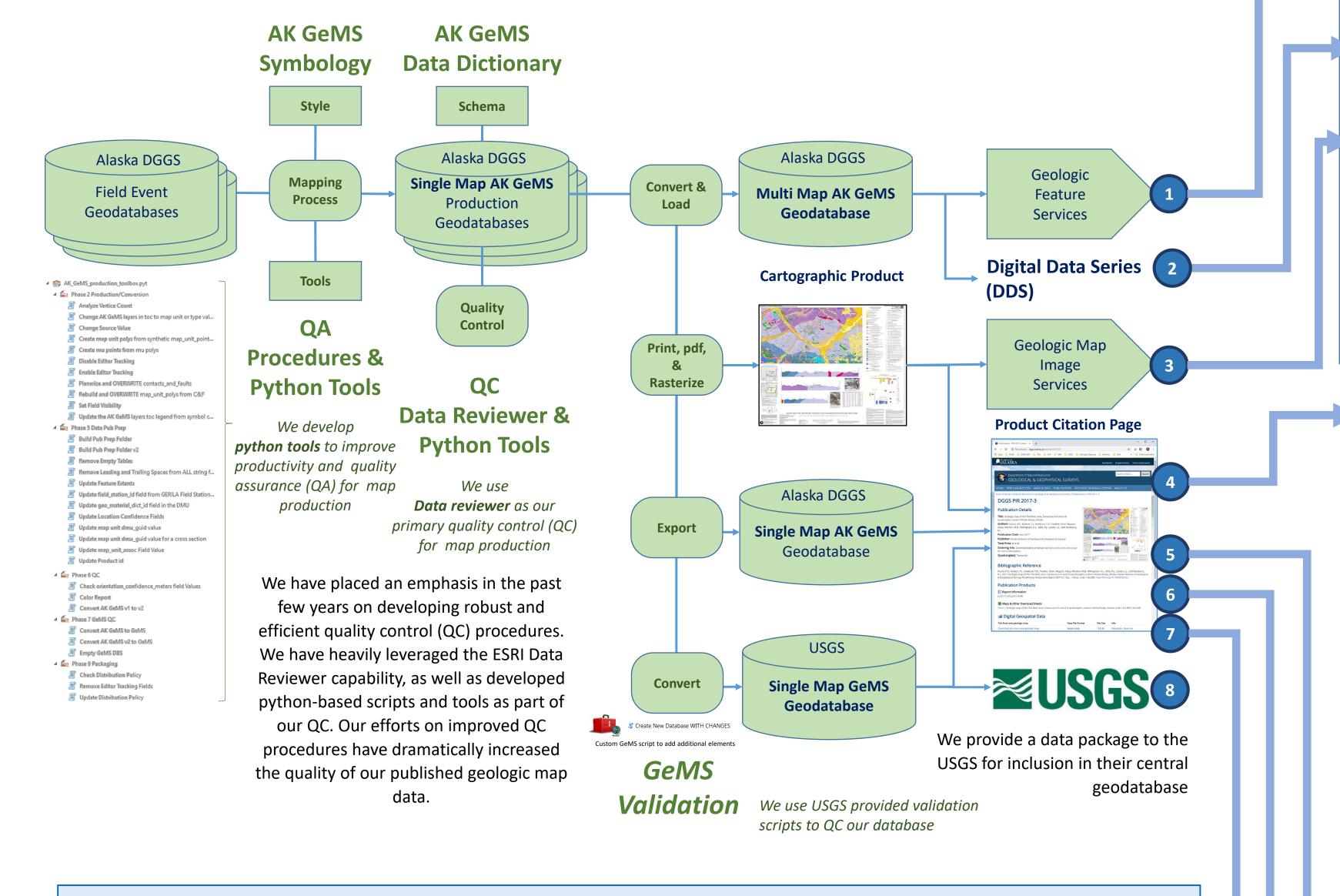


MP 169 v. 2 **AK SYMBOLOGY:** A DESCRIPTION OF THE AK GEMS STYLE FILE https://dggs.alaska.gov/pubs/id/31101

Alaska DGGS has developed and published a GeMS symbology standard and accompanying style file, AK GeMS symbology: A description of the AK GeMS style file. This publication describes the organization and content of the current style file used by DGGS for the Alaska GeMS map production system. In this standard, we have identified the primary and optional FGDC symbols for specific feature type values found within our established attribute domains. In addition, we have established procedures for requesting, creating, coding, and documenting custom symbols added to our style.



AK GeMS Geologic Mapping Product Flow



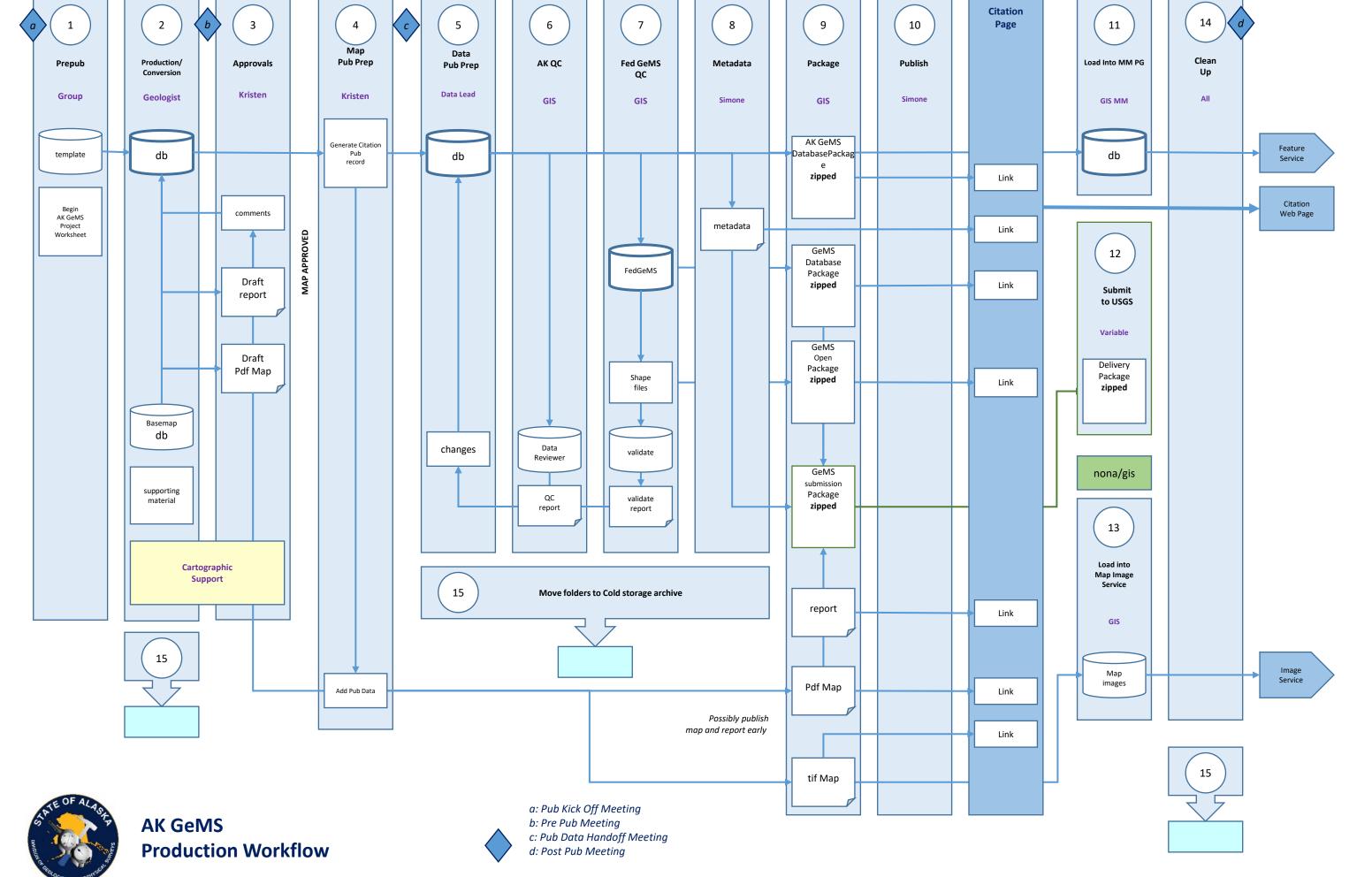
Organizational Procedures



To ensure that all parties involved with moving geologic maps and data through the system complete their assigned tasks requires well-defined organizational procedures. The backbone of our procedures is our AK GeMS production workflow graphic. This workflow is a 16-phase process that takes a map and its data from pre-publication though production, quality control, publication, and archiving.

The workflow Identifies: Workflow, Responsibilities, Location of data, Production meetings, Products

AK GeMS Production Workflow



Standard Cartographic Product We create a standard high quality cartographic product from the AK GeMS

Geodatabase

Multimap Map Image Services

File Geodatabase Export Snapshots

Scanned Geologic Map Image Service

cartographic products of geologic maps.

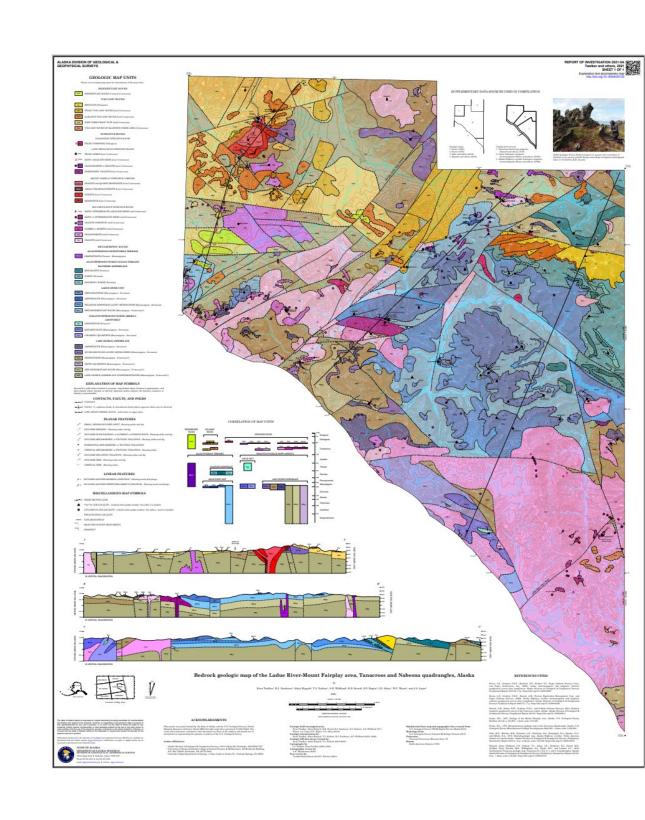
This Image Service hosts raster map images of original

https://geoportal.dggs.dnr.alaska.gov/portal/home/item.html?id=3240b5b3f9d34d3582258b1ec684f1e7

When a map's database passes QC and metadata is complete, we package the geologic map data for publication, sharing, and delivery. We the make following geologic map products available for download: a report, the cartographic product as a pdf, the geologic AK GeMS formatted Geodatabase, the basic GeMS formatted Geodatabase, and shapefiles. In addition, we package and deliver the data to USGS. We also populate web services with our data; we add the cartographic product as a TIF to our Geologic Map Image Service and convert and load the single-map geodatabase into our multi-map PostgreSQL geodatabase.

GeMS Formatted Geodatabase Package

GeMS Formatted Shapefiles



AK GeMS Formatted Geodatabase Package Data Packages contain:

- File Geodatabase
- Map Document
- ArcMap now
- ArcPro in future • resources folder that includes:
- fonts folder Special FGDC fonts used for
- geologic labels and symbols styles folder - ESRI Style file used for visualizing this data. Numerous symbols are dependent on the provided special
- layer files folder ESRI layer files defining symbology and labeling for each feature class in the geodatabase.

AK GeMS Production Status

As of May 2025

Available AK GeMS Geodatabases https://dqqs.alaska.gov/pubs/keyword/gemsdb-l3-compliant

We have **72 Geologic Maps** currently available

In Production AK GeMS Geodatabases We have **32 Geologic Maps** currently in production

Planned AK Geodatabases We have **35+ Geologic Maps** will go into production

Alaska DGGS Map Index Web App

The Map Index Web App is an online web application designed to explore the geologic map holdings of the Alaska Division of Geological & Geophysical Surveys (DGGS). This online exploration tool provides the boundaries of most DGGS and U.S. Geological Survey (USGS) geologic maps of Alaska in a single, interactive web application.

