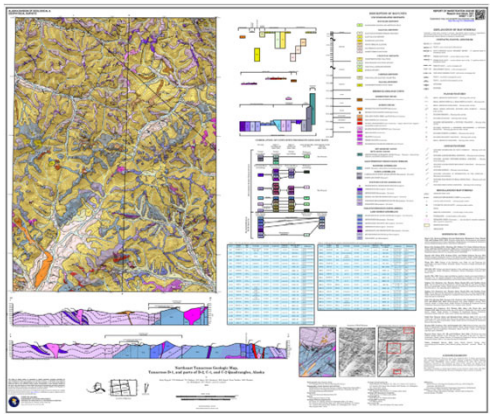
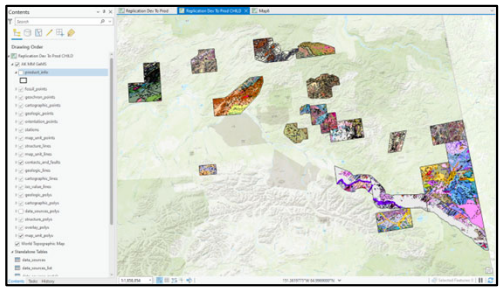
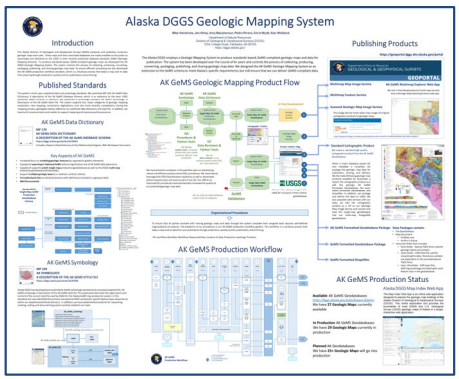
AK GeMS
Geologic Mapping System



Efficiently Creating and Disseminating
Standards Based
Geologic Map Data



Poster View of System



https://pubs.usgs.gov/of/2021/2561/of21-2561.pdf

Mike Hendricks, Amy Macpherson, Ally Steinleitner, Pedro Rivera, Chris Wyatt, Simone Montanye and others

Alaska Division of Geological & Geophysical Surveys
3354 College Rd, Fairbanks AK 99709

Agenda

- What is the Alaksa Geologic Mapping System?
- What is the GEologic Mapping Schema (GeMS)?
- How to find, view, and access what is available
- So, I downloaded an AK GeMS Database, now what?

DGGS Publications in 2025 & 2026

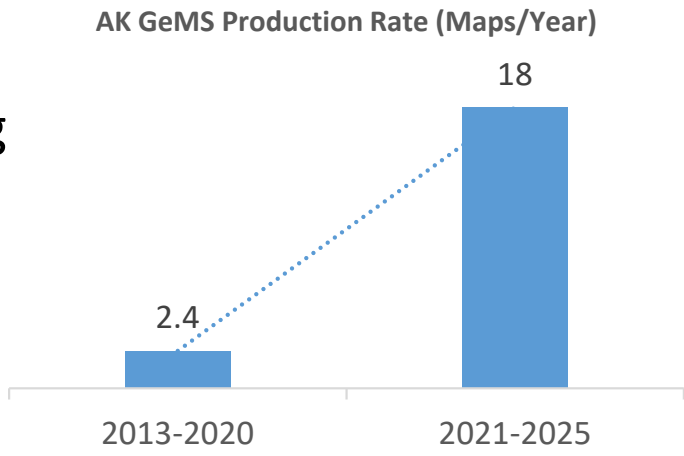
- Since Jan 2025 DGGS has published 112 new geologic reports, maps, and datasets *https://dggs.alaska.gov/pubs/newreports*.
- Highlights of 2025 include
  - 5 geophysical datasets (https://maps.dggs.alaska.gov/gp)
  - 14 Maps
    - 3 community landslide hazards maps
    - Tsunami Inundation map of False Pass, Alaska
    - Statewide landslide susceptibility map
    - **Statewide minerals resource map**
    - **8 geologic maps covering 4,013.58 Sq Miles**

What is the AK GeMS Geologic Mapping System?

Alaksa Geologic Mapping System

- A **modernized system** that controls the process of: *collecting, producing, converting, packaging, publishing, and sharing* geologic map data.
- The system is built by an **integrated team of professionals** that includes *hardware, GIS software, data standards (Geologic Mapping Schema — GeMS), and well-defined organizational procedures.*
- Creation and adoption of the System has dramatically **increased our efficiencies**.

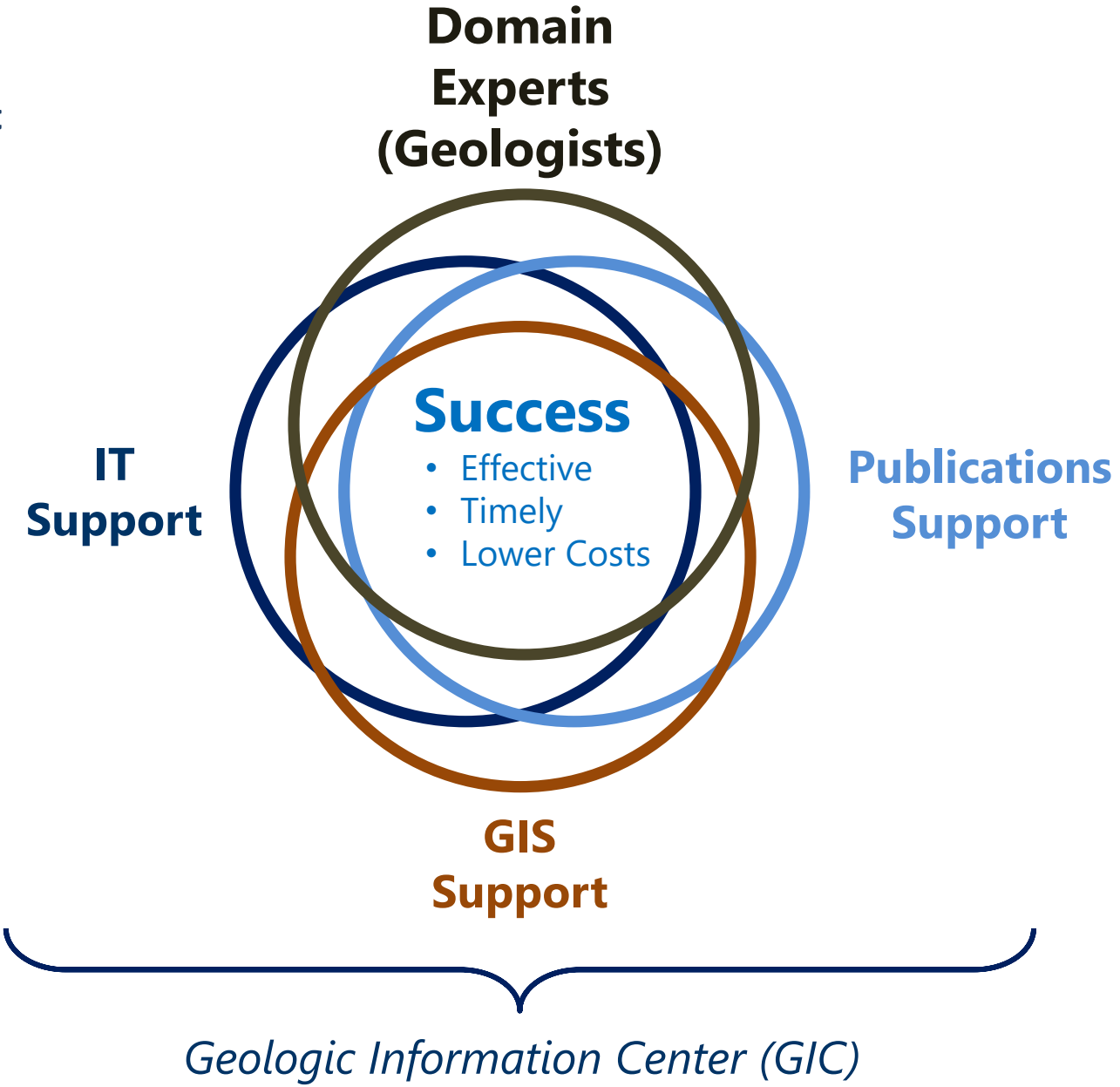
See the GeMS Database & Alaska Geologic Mapping System project page for related pubs and content.
https://dggs.alaska.gov/pubs/project/1607



AK GeMS
Geologic Mapping System

Integrated Team Is Essential!

- **Dedicated and Embedded IT support** at the Division Level is Absolutely Critical
- **Regularly scheduled coordination meetings:**
  - Weekly GEDI meetings (Geologic Data Inquiry)
  - Bi-weekly Division Publications Meetings
  - Weekly GeMS Multimap Meetings
  - Individual Product Production Status Meetings
  - Other Spin Off Meetings
- **Emphasis on Training:**
  - Weekly GIS Tips & Tricks
  - Illustrator sessions
  - ESRI Training emphasis
  - One-on-one training and support from IT, GIS, & Publications.



Alaska DGGS Geologic Mapping System Components

Organizational Procedures

Tools

AK GeMS v2 Data Dictionary

Alaska DGGS Field Event Geodatabases

Mapping Process

Alaska DGGS Single Map AK GeMS Production DBs

Convert & Load

Alaska DGGS Multi Map AK GeMS Repository Geodatabase

Geologic Feature Services & Web App

Digital Data Series (DDS) File Geodatabase Export Snapshots

https://dggs.alaska.gov/pubs/id/31706

Four Categories of Production

- ***New Mapping***
- ***Conversions***
- ***Digitizations***
- ***Compilations***

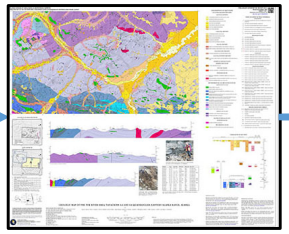
Style

AK GeMS v2 Symbology

Quality Control

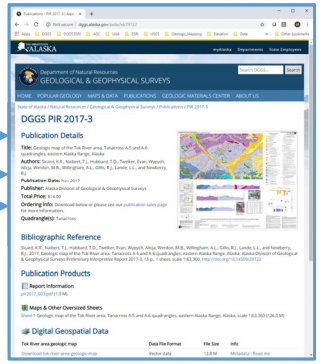
Print, pdf, & Rasterize

Cartographic Product



Geologic Map Image Services

Product Web Page



https://dggs.alaska.gov/pubs/

Export

Alaska DGGS Single Map AK GeMS Geodatabase

AK GEMS DATA DICTIONARY: A DESCRIPTION OF THE AK GEMS DATABASE SCHEMA, MP 170 V.2
https://dggs.alaska.gov/pubs/id/31172

- Report
- Data Dictionary
- Entity-Relationship Diagram
- XML Workspace Document

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

- Report
- AK_GeMS_symbology_documentation_ver_2.xls (Excel)
- AK_GeMS_symbology_ver_2.style (Style File)

Convert

USGS Single Map GeMS Geodatabase

To USGS

>100K views of AK DGGS Data Records in 2025

What is the AK GEologic Mapping Schema (GeMS)?

GIS Data and Symbology Standards

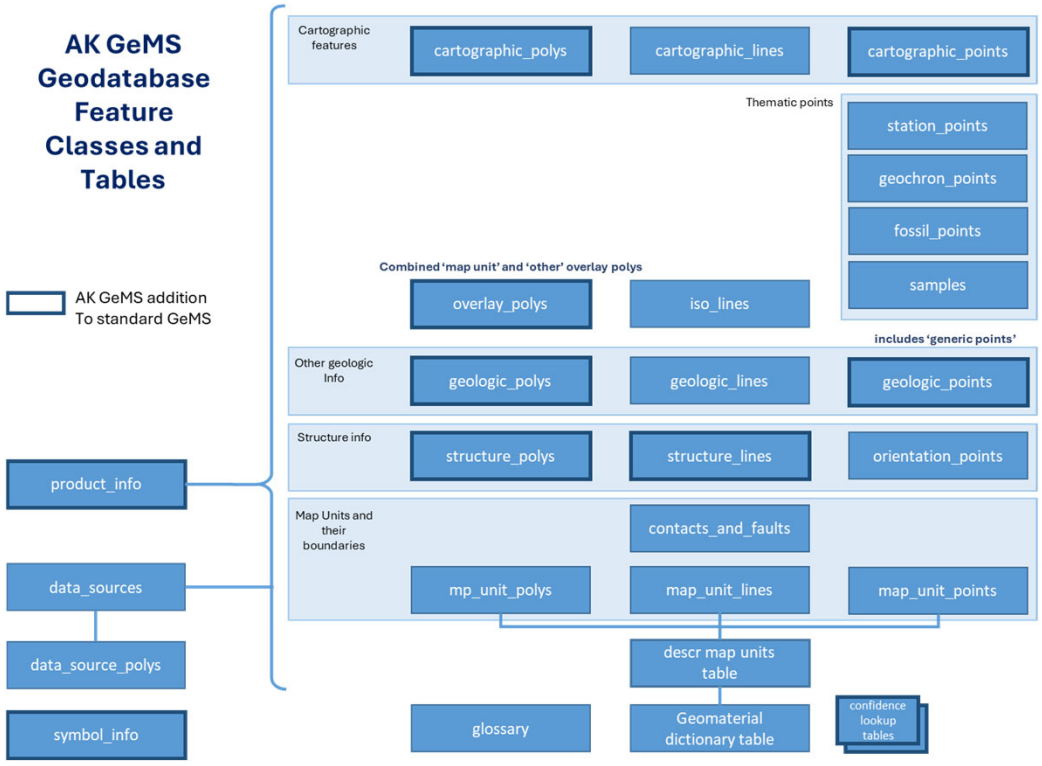
AK GeMS Data Dictionary

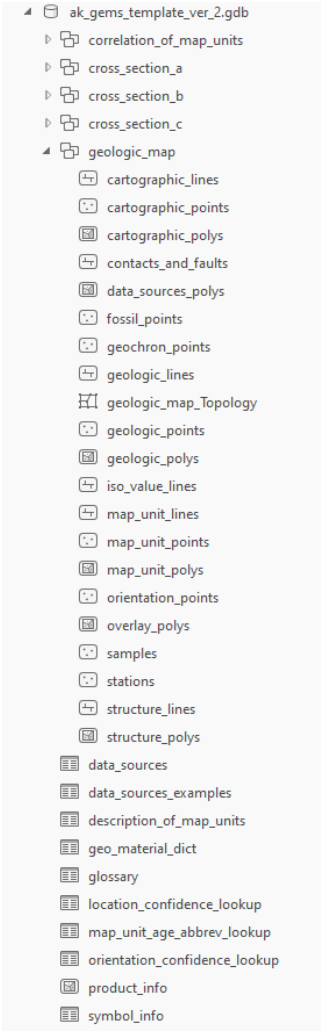
L f z B t q f d u t !

- Increased focus on **modeling geologic features**
- Capable of **exporting to National GeMS**
- Capable of supporting **both single-map** 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.
  - Over 75 domains
  - Over 400 controlled & defined values
- **Well documented**

Version 2.0

AK GeMS Schema





AK GeMS Data Dictionary: A description of the AK GeMS database schema, MP 170

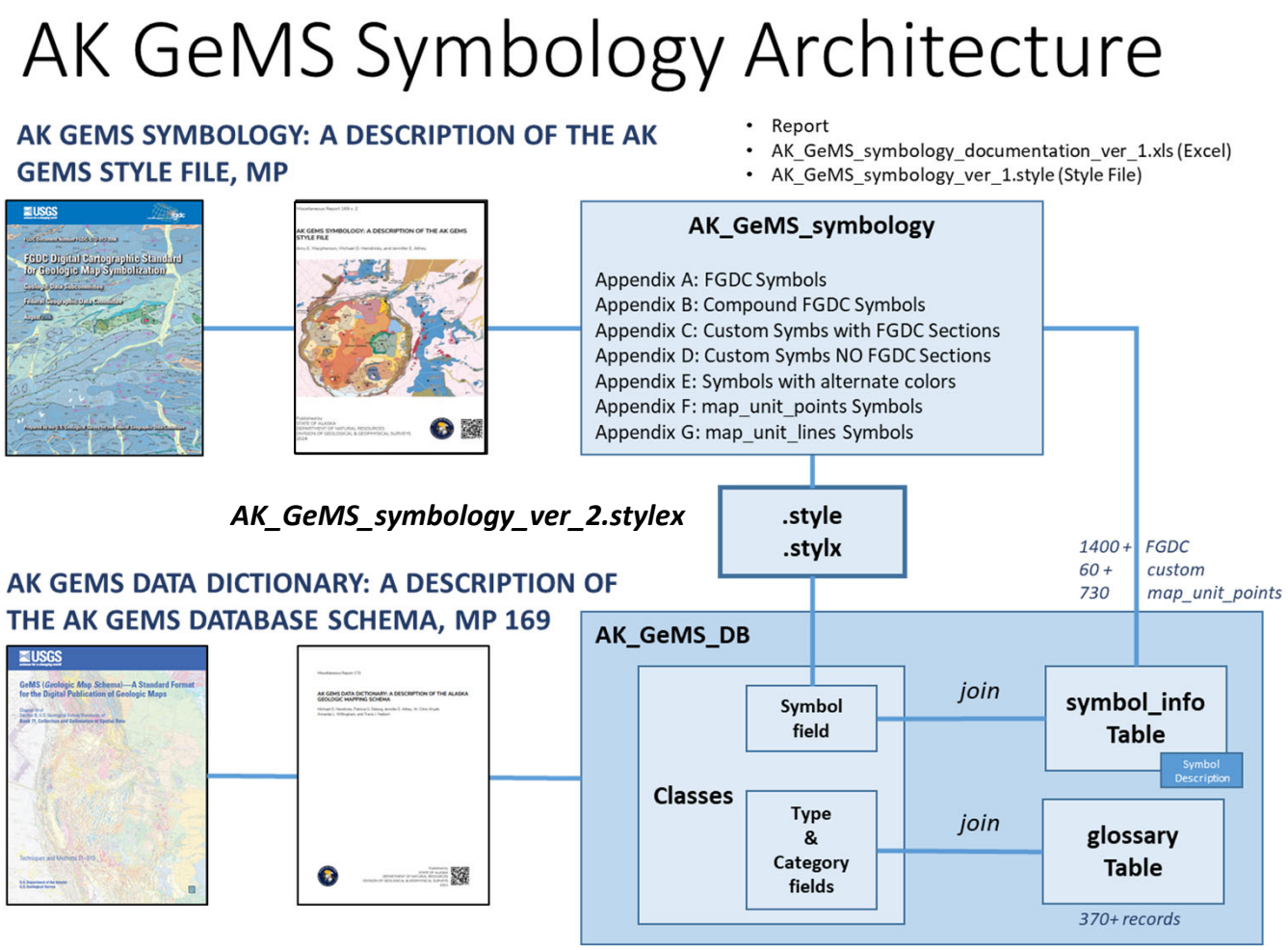
https://dggs.alaska.gov/pubs/id/30669

GIS Data and Symbology Standards

AK GeMS Symbology

- Alaska DGGS has developed and **published a GeMS symbology standard** and accompanying **style file**
- **Describes the organization and content of the style file** used by DGGS for the Alaska GeMS map production system
- **Established procedures** for requesting, creating, coding, and documenting **custom symbols** added to our style

Version 2.0



AK GeMS symbology: A description of the AK GeMS style file, MP 169 v. 2
https://dggs.alaska.gov/pubs/id/31101

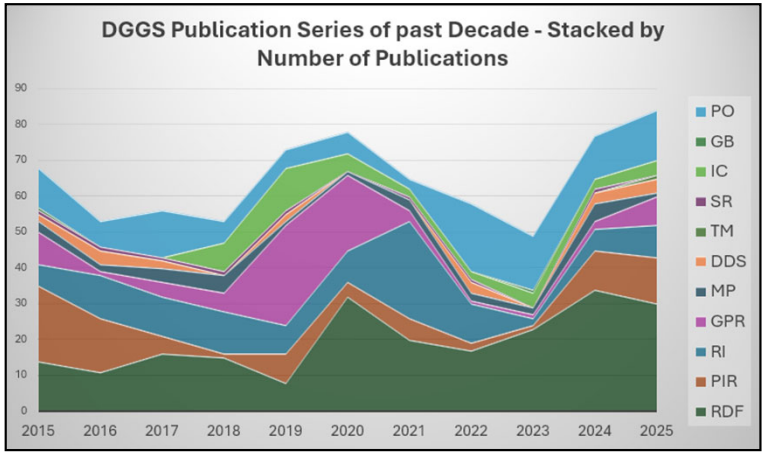
How to find, view, and access what is available

- DGGS Publications Site
  https://dggs.alaska.gov/pubs

DGGS Pubs DB
15,823 records

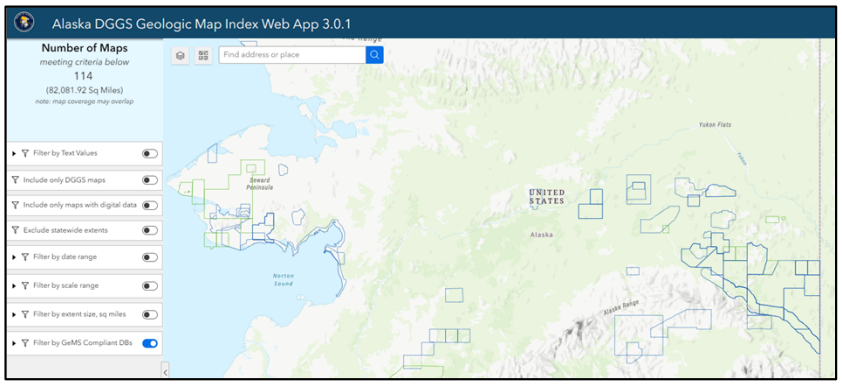
Publications Search

The keyword search does not find words within a publication. Successful search results based on keywords are dependent upon the publication's associated keywords, which are assigned by the author. Need HELP?



- Alaska DGGS Geologic Map Index
  https://maps.dggs.alaska.gov/mapindex

DGGS Map Index
4,160 maps
114 In modern GeMS Standard



Publications Search

The keyword search does not find words within a publication. Successful search results based on keywords are dependent upon the publication's associated keywords, which are assigned by the author. Need **HELP?**

Title

Author

Publication Number

Keyword(s) AK GeMS all these words

Quadrangle
- All Quadrangles -
Adak
Afognak
Alaska General
Alaska Statewide

Publishing Agency - All Publishers -

Publication Year - All Publication Years -

Range of Years - From - - To -

☐ Geospatial Data Only ☐ Exclude Geophysics

Browse by Publication Series

DGGS - Alaska Division of Geological & Geophysical Surveys reports, maps, and geospatial datasets

MIRL - A listing of publications released by the University of Alaska Fairbanks, Mineral Industry Research Laboratory

USBM - Selected U.S. Bureau of Mines reports. DGGS hosts a nearly comprehensive list of Alaska related reports published by USBM

USGS - Alaska related U.S. Geological Survey publications. We are actively adding USGS publications to the database

Outside - Use the search form to find many Alaska related journal articles, theses and dissertations, BLM reports, and more

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Publications Search Results

Found **88** publications that matched ALL of the following criteria:

Quadrangle(s): , Keyword: **AK GeMS**, Publishing Agency: **All**.

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Sort publication list by: Publication Date Sort

PIR 2026-1

Walser, S.L., Gillis, R.J., Bernt, J.D., Salisbury, J.B., Diaz, A.V., and Hubbard, T.D., 2026, Geologic map of the West Susitna area, parts of the Tyonek C-3, C-4, D-4, and D-5 quadrangles, Alaska: Alaska Division of Geological & Geophysical Surveys Preliminary Interpretive Report 2026-1, 10 p., 2 sheets, scale 1:50,000. https://doi.org/10.14509/32075

PIR 2025-4

Larsen, M.C., Regan, S.P., Bull, K.F., Gillis, R.J., Nicolazzo, J.A., Truskowski, C.M., Walser, S.L., and Darrow, M.M., eds., 2025, Geologic investigation of the Haines-Takshanuk Mountains-Chilkat Peninsula area, Southeast Alaska: Alaska Division of Geological & Geophysical Surveys Preliminary Interpretive Report 2025-4. https://doi.org/10.14509/31417

PIR 2025-5

Herriott, T.M., Wartes, M.A., Gillis, R.J., Willingham, A.L., and Qureshi, K.A., 2025, Geologic map of the Rooftop Ridge area, central North Slope, Alaska: Alaska Division of Geological & Geophysical Surveys Preliminary Interpretive Report 2025-5, 1 sheet, scale 1:63,360. https://doi.org/10.14509/31722

PIR 2025-6

Herriott, T.M., Wartes, M.A., Willingham, A.L., Gillis, R.J., and Qureshi, K.A., 2025, Geologic map of the Racetrack Basin area, central North Slope, Alaska: Alaska Division of Geological & Geophysical Surveys Preliminary Interpretive Report 2025-6, 1 sheet, scale 1:63,360. https://doi.org/10.14509/31723

Publication Products

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= Interactive

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Geologic Map Citation Page

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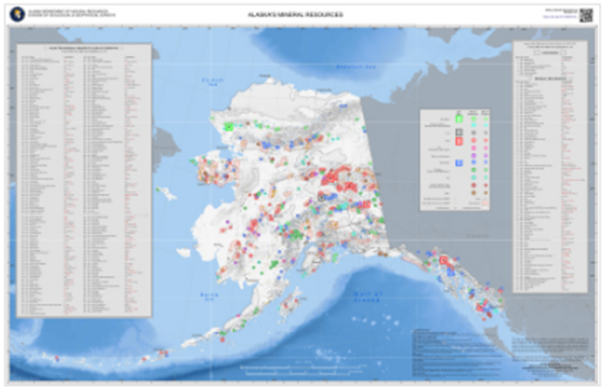
State of Alaska / Natural Resources / Geological & Geophysical Surveys / Publications / MP 178

DGGS MP 178

Alaska's mineral resources



Authors: Szumigala, D.J.

Publication Date: May 2025

Publisher: Alaska Division of Geological & Geophysical Surveys

Print Price: $13.00

Ordering Info: Download below for free or see our publication sales page to order a hard copy.

Quadrangle(s): Alaska Statewide

Related project(s): Alaska mineral resources map

Citation ID: 31614

Bibliographic Reference

Szumigala, D.J., 2025, Alaska's mineral resources: Alaska Division of Geological & Geophysical Surveys Miscellaneous Publication 178, 1 sheet, scale 1:4,000,000. https://doi.org/10.14509/31614

Publication Products

Maps & Other Oversized Sheets

Sheet 1, Alaska's mineral resources, scale 1:4,000,000 (9.0 M)

Keywords

Alaska; Alaska, State of; DGGS; Economic Geology; Exploration; Mineral Assessment; Mineral Deposits; Mineral Development; Mineral Exploration; Mineral Localities; Mineral Prospect; Mineral Resources; Minerals; Mining

Top of Page

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Fax: (907) 451-5050
Email: dggspubs@alaska.gov

Geologic Map Citation Page

Single Map AK GeMS Data

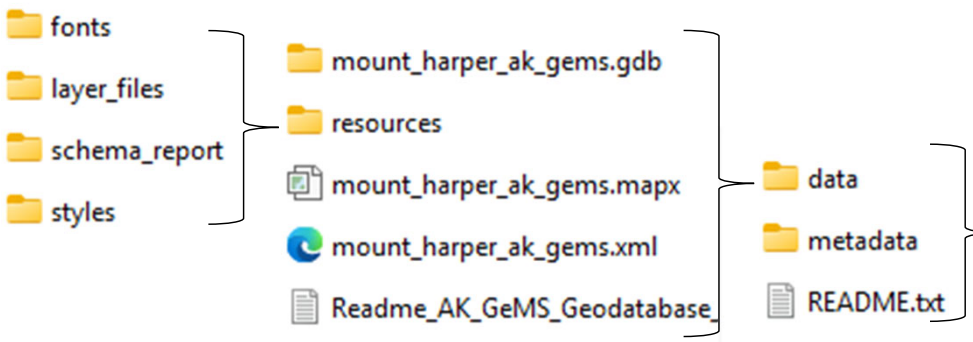
Report

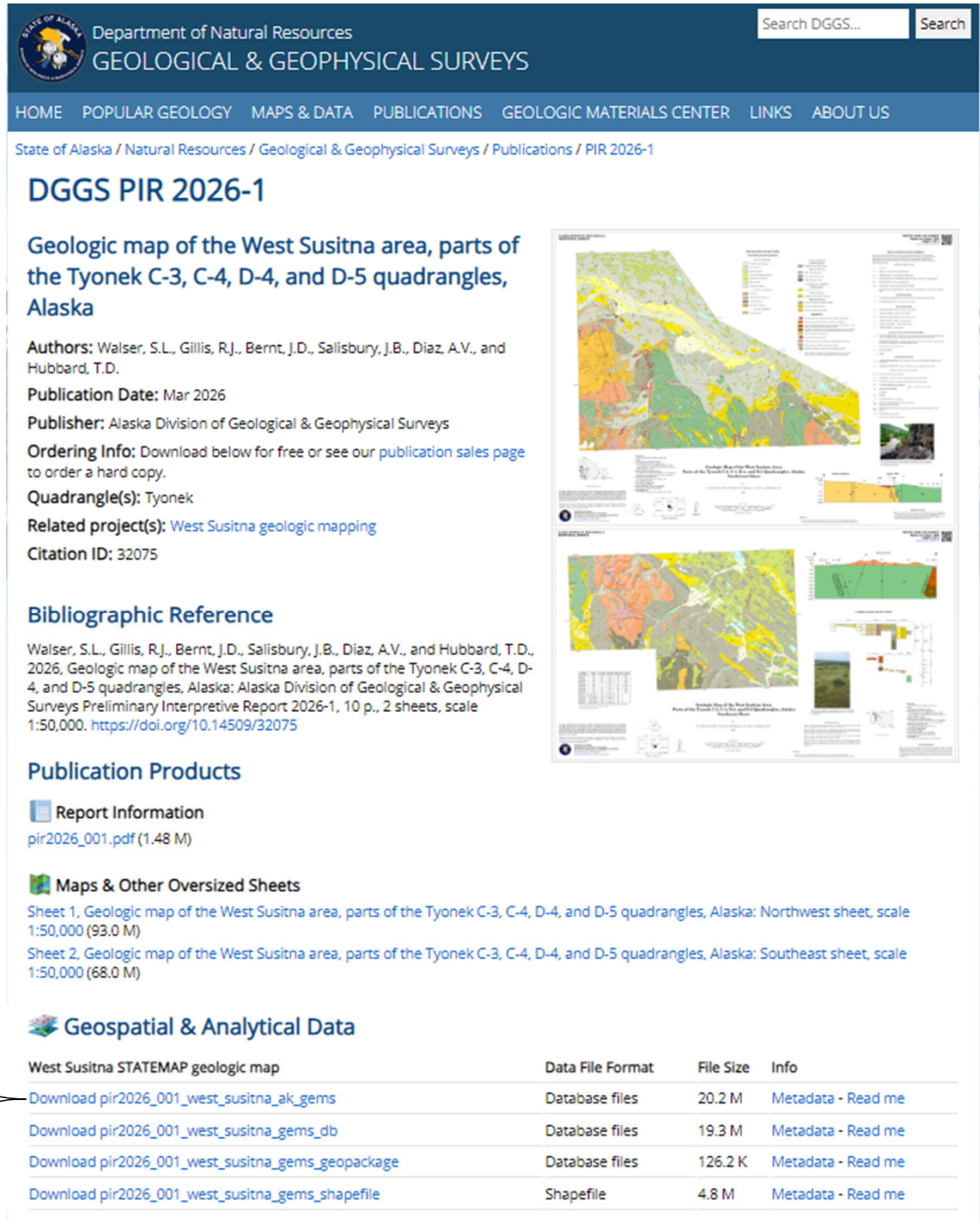
Additional information relating to the geologic map. Varying level so of detail from simple description of map units to longer geologic descriptions of the mapped region.

Map(s)

Classic cartographic representation of geologic map data.

Data





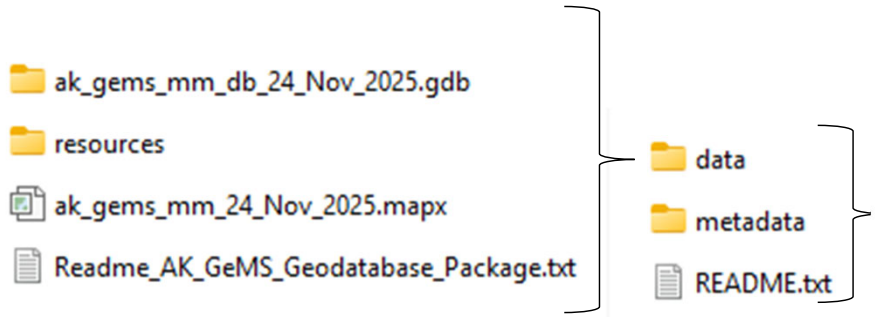
Geologic Map Citation Page

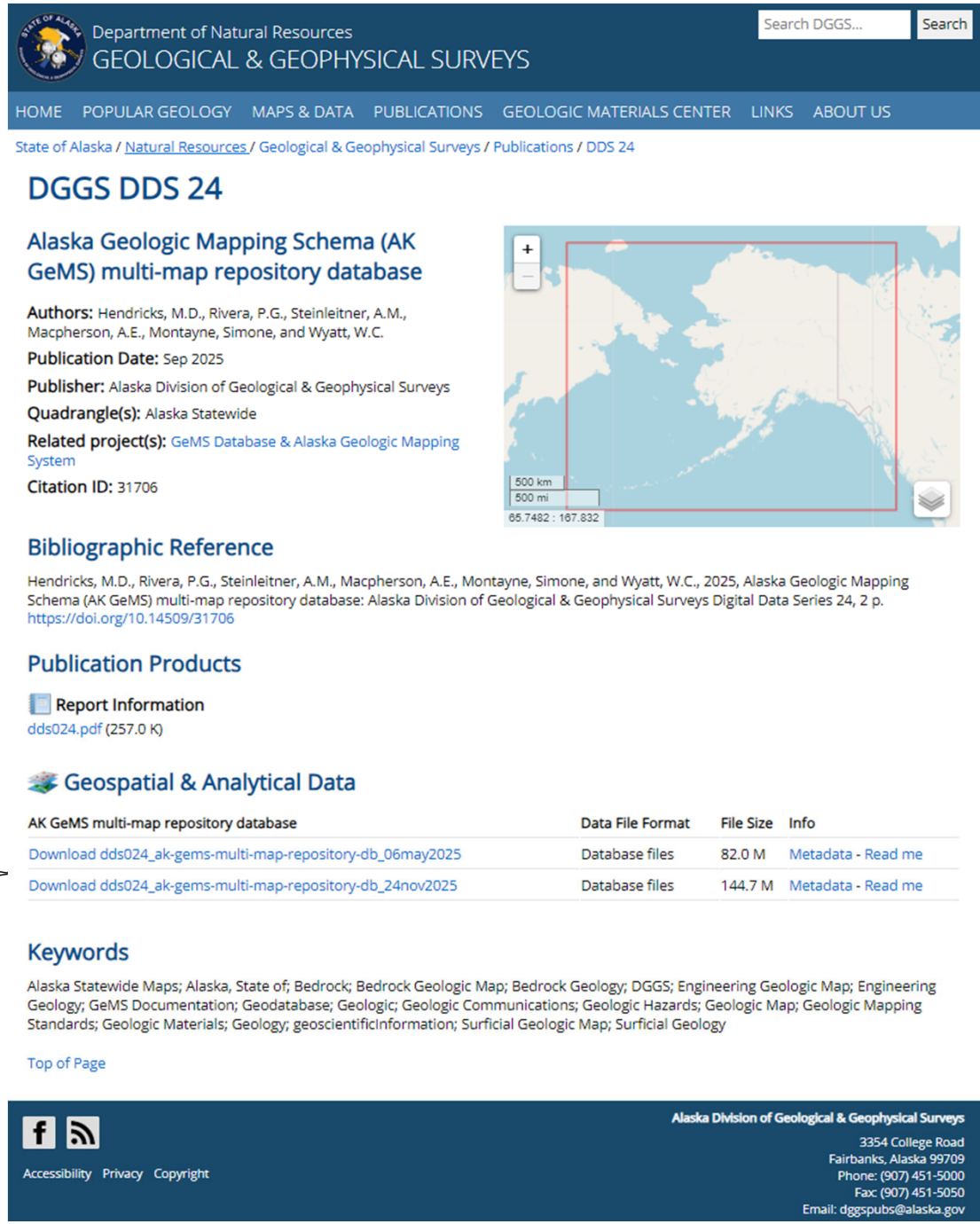
Multimap Map AK GeMS Data

Report

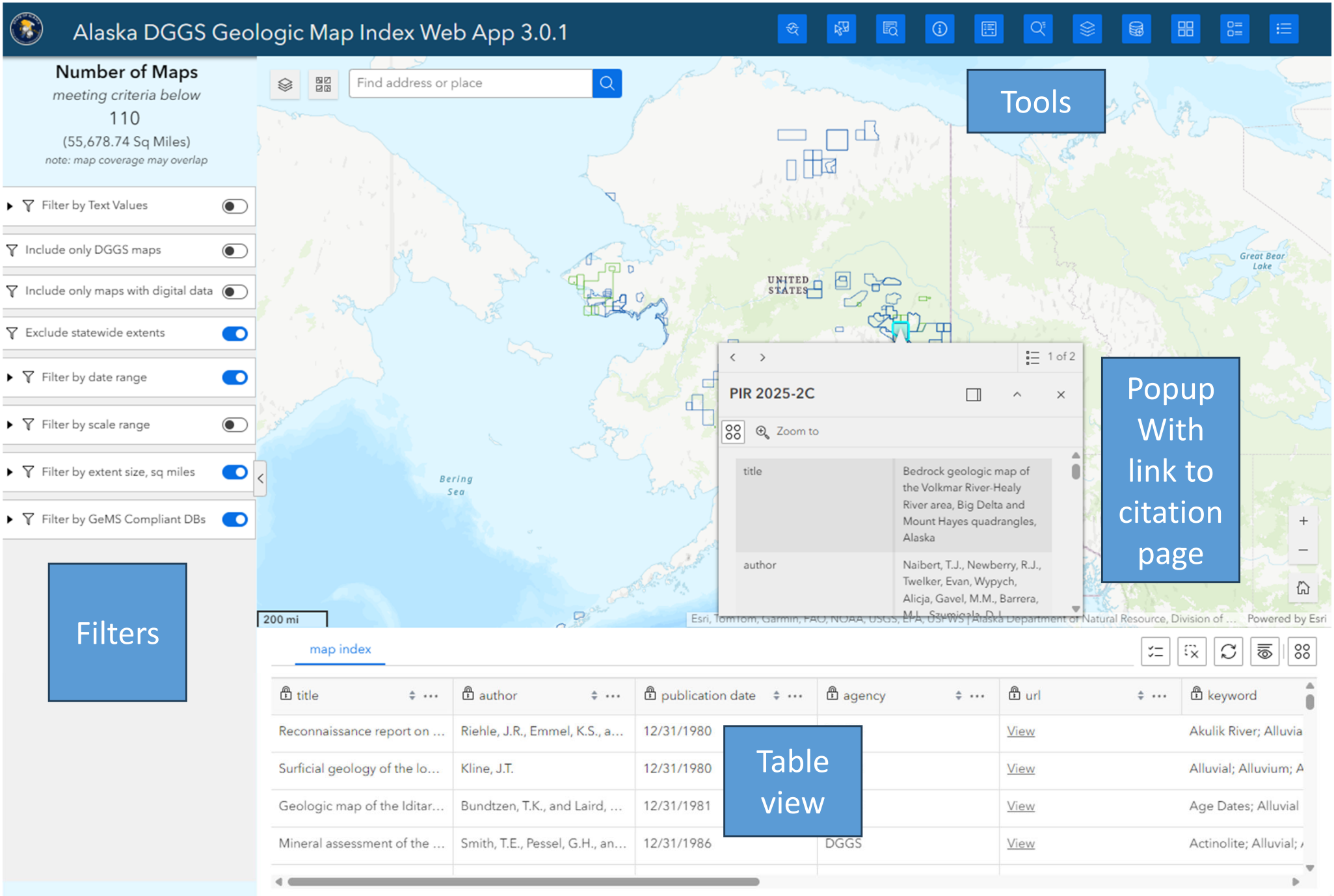
Short description of the multimap database and its differences with the single map schema.

Date Stamped Data





Map Index Web App

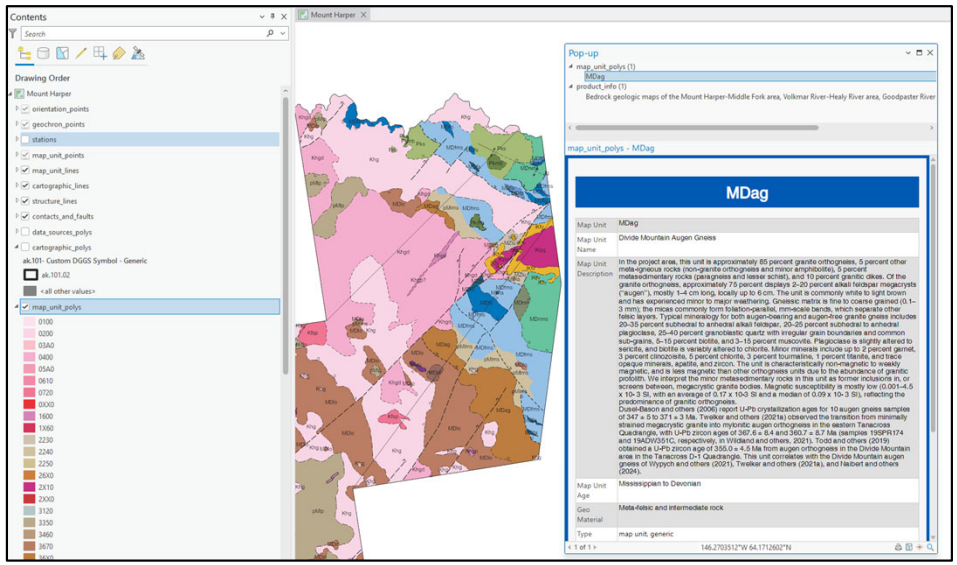


So I downloaded some AK GeMS Data, now what

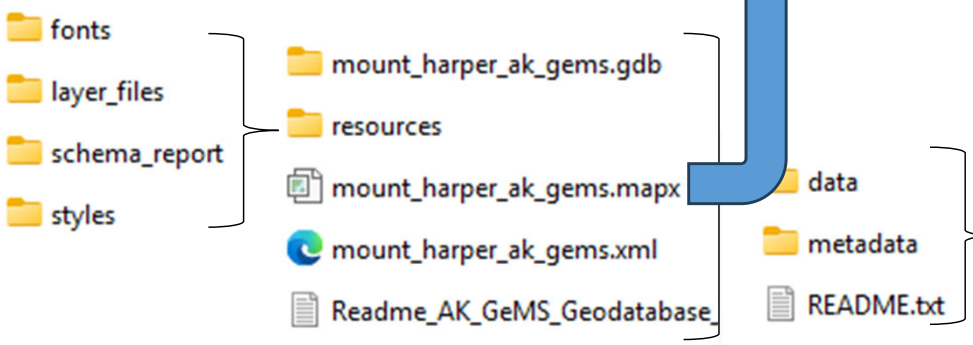
- Best used using ESRI ArcGIS Pro software.
- Data is symbolized according to standards, but is not intended to be an exact representation of the publication's cartographic product
- Single Map Data versus the Multi Map Data

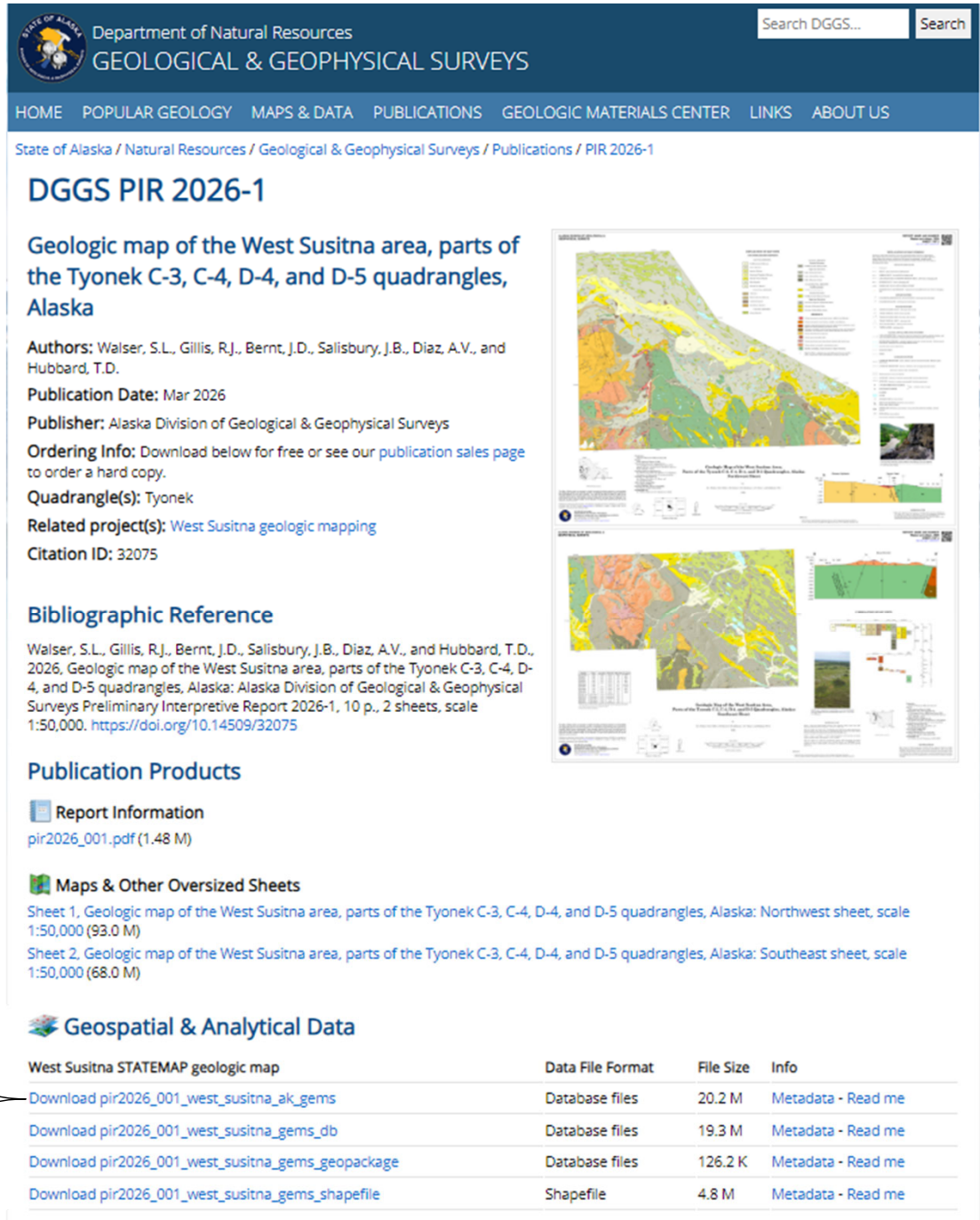
AK GeMS Data

ArcGIS Pro Map File



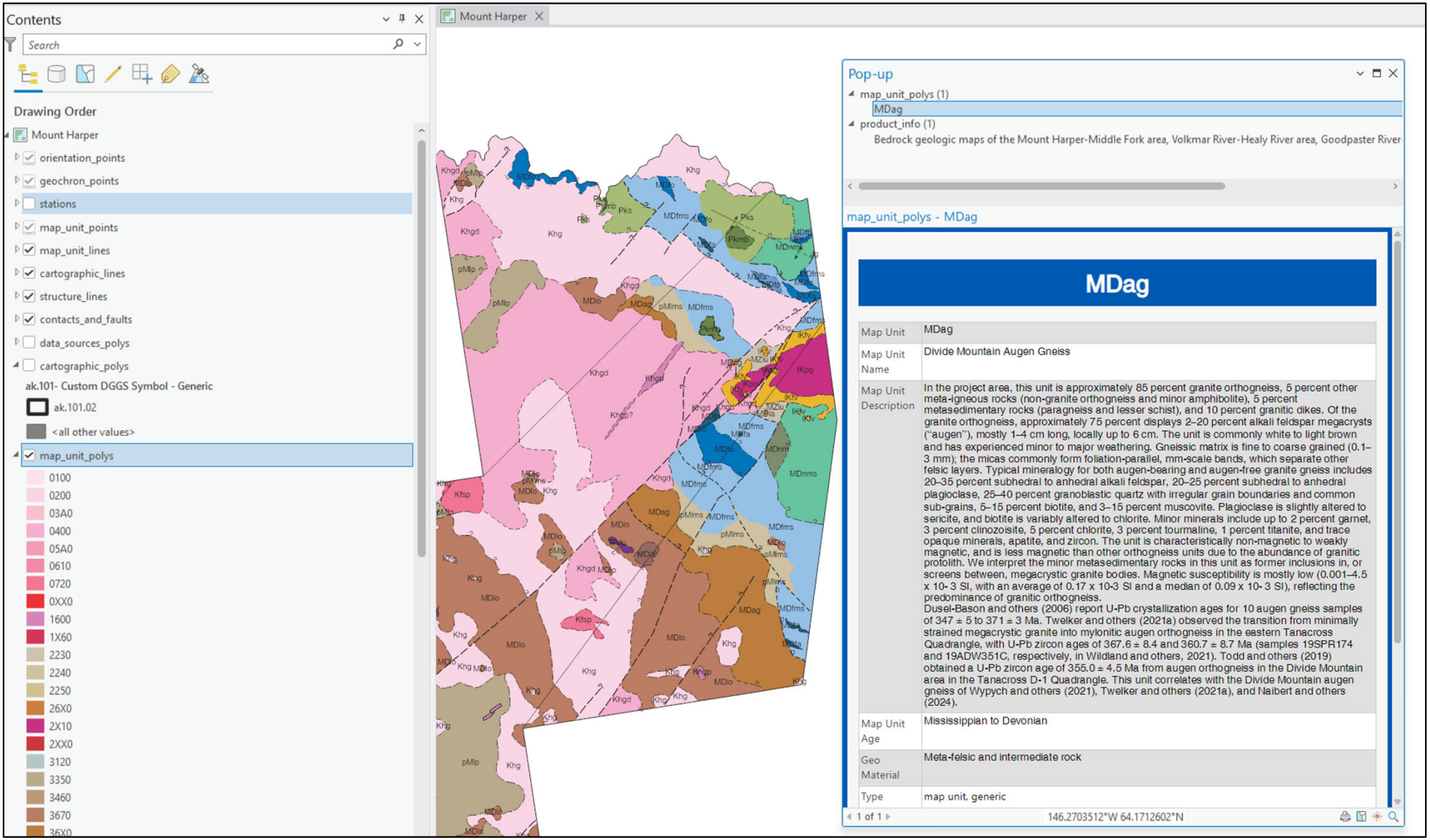
GeMS Data





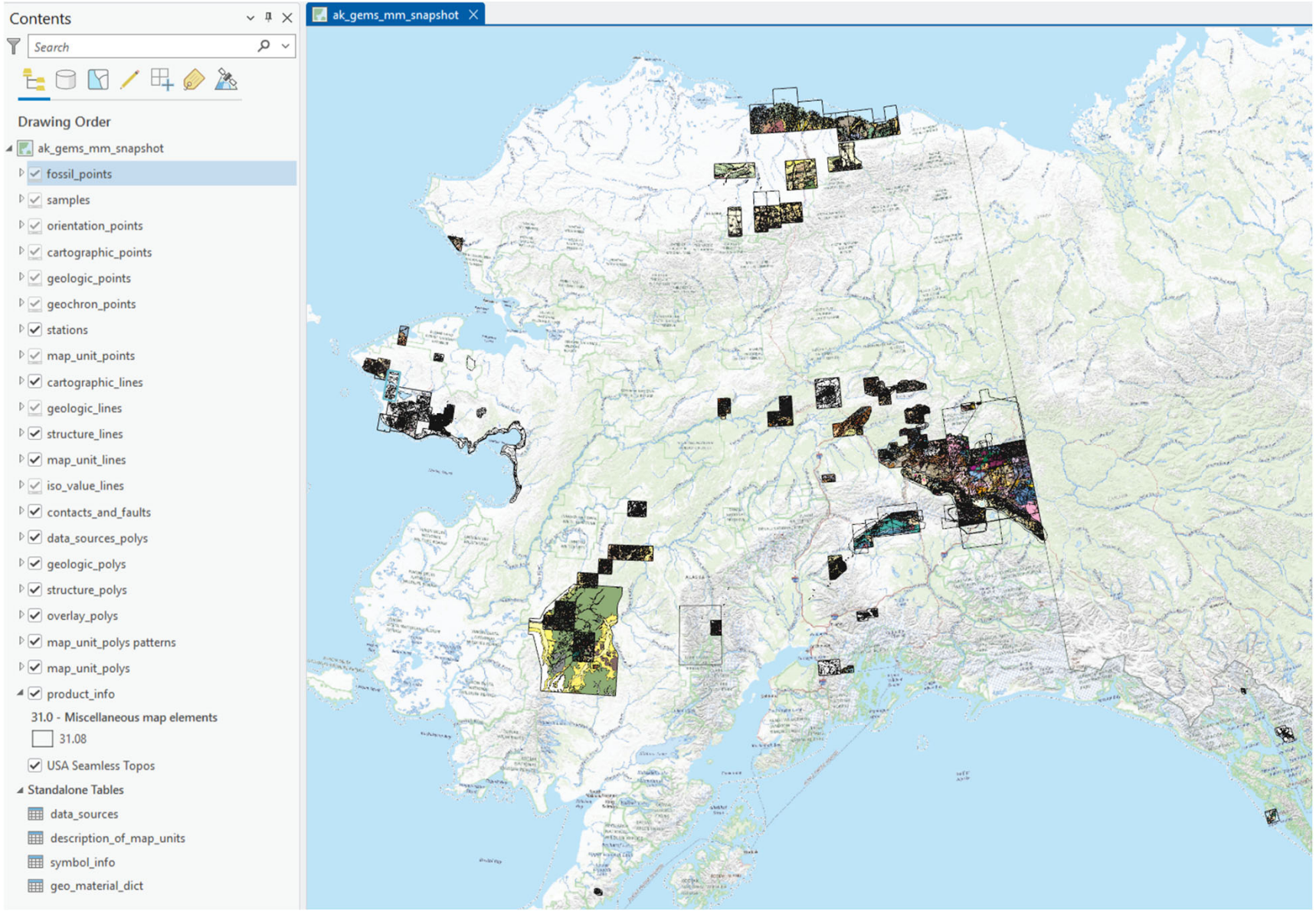
AK GeMS Data

ArcGIS Pro Map File for a Single Map



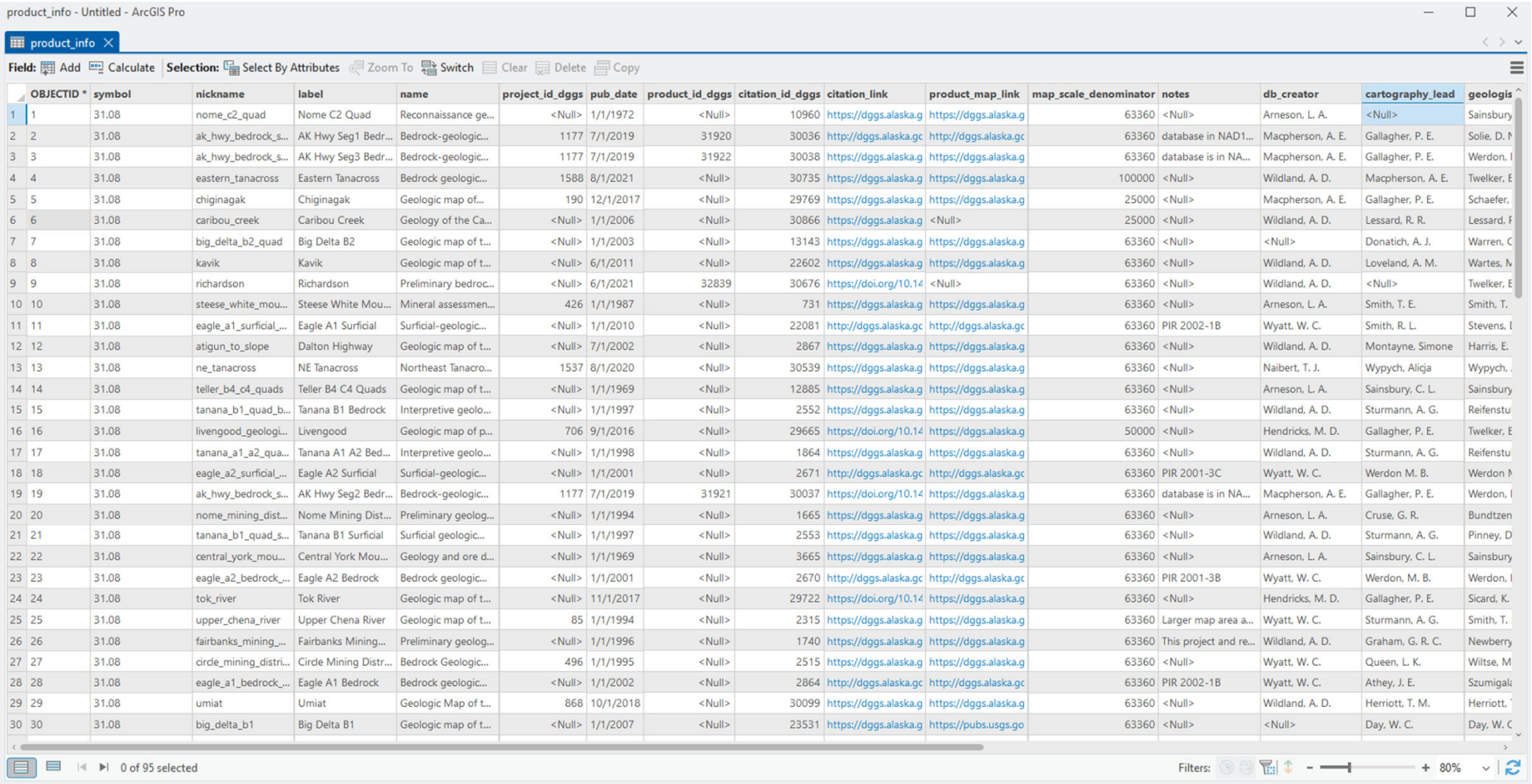
AK GeMS Data

ArcGIS Pro Map File for a Multi Map (DDS 24)



AK GeMS Data

Product_Info attribute table for a Multi Map (DDS 24)


product_info - Untitled - ArcGIS Pro

product_info

Field: Add Calculate | Selection: Select By Attributes Zoom To Switch Clear Delete Copy

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9	9	31.08	richardson	Richardson	Preliminary bedroc...	<Null>	6/1/2021	32839	30676	https://doi.org/10.14	<Null>	63360	<Null>	Wildland, A. D.	<Null>	Twelker, E
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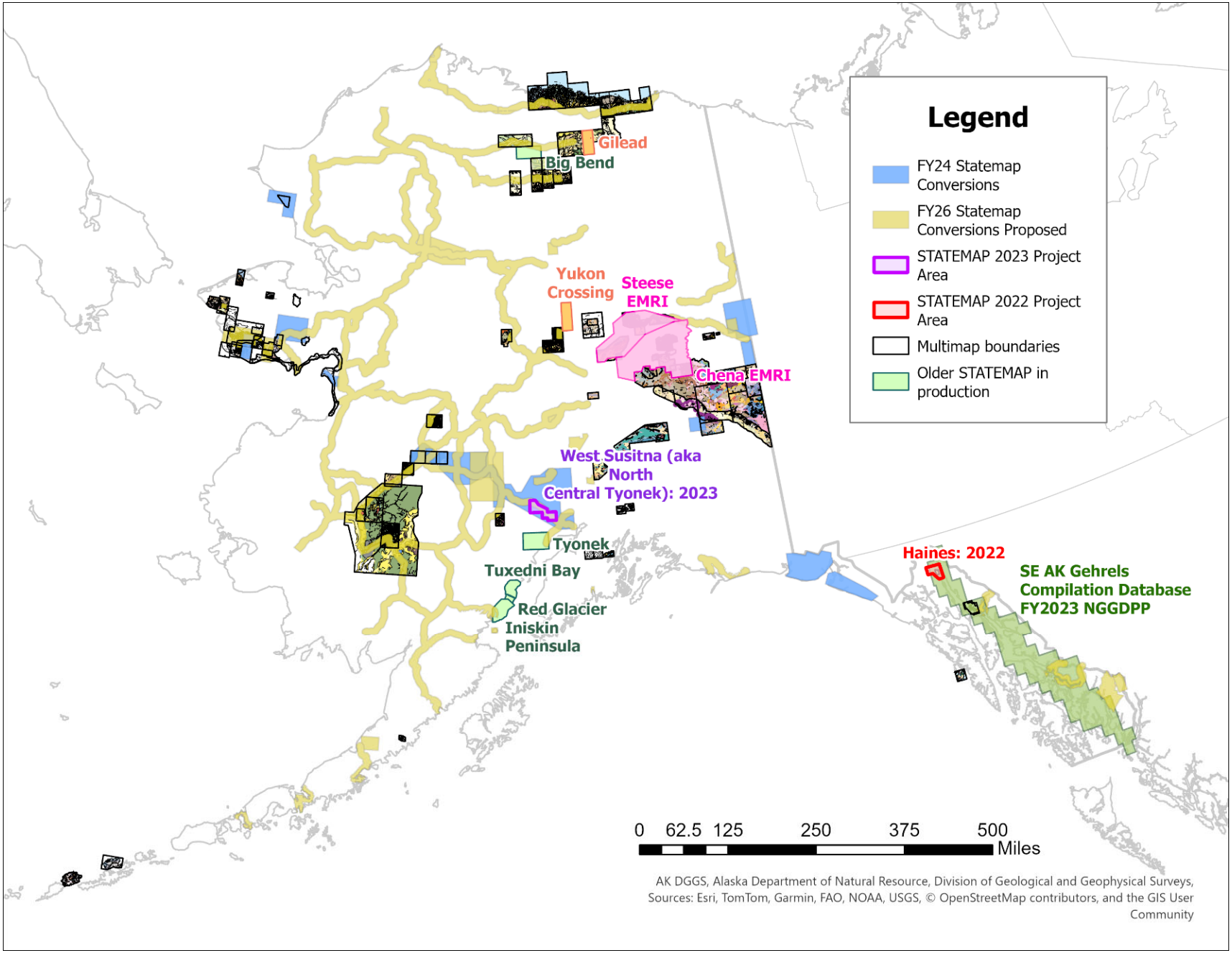
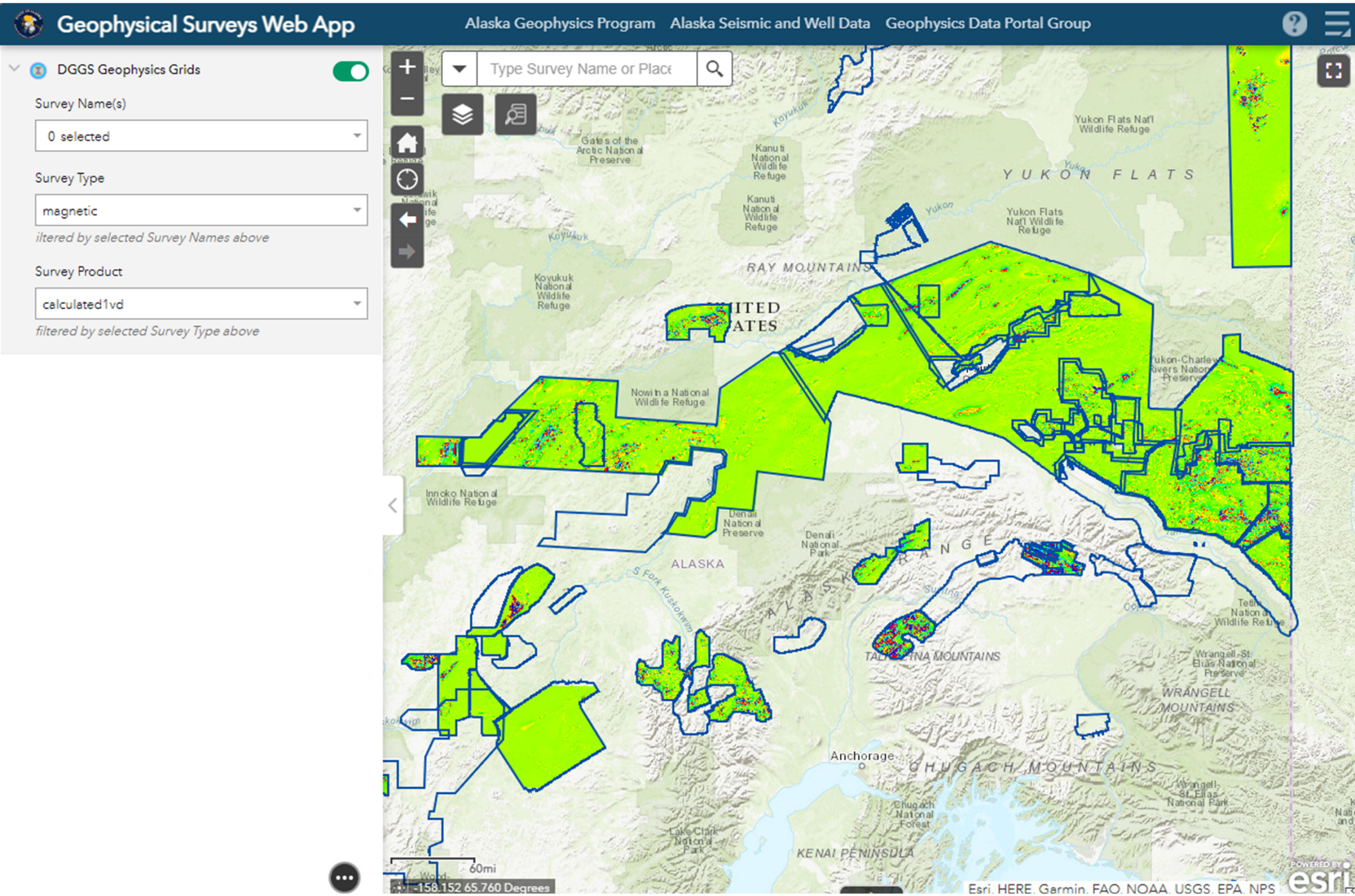
16	16	31.08	livengood_geologi...	Livengood	Geologic map of p...	706	9/1/2016	<Null>	29665	https://doi.org/10.14	https://dggs.alaska.g	50000	<Null>	Hendricks, M. D.	Gallagher, P. E.	Twelker, E
17	17	31.08	tanana_a1_a2_qua...	Tanana A1 A2 Bed...	Interpretive geolo...	<Null>	1/1/1998	<Null>	1864	https://dggs.alaska.g	https://dggs.alaska.g	63360	<Null>	Wildland, A. D.	Sturmann, A. G.	Reifenstu
18	18	31.08	eagle_a2_surficial_...	Eagle A2 Surficial	Surficial-geologic...	<Null>	1/1/2001	<Null>	2671	http://dggs.alaska.gc	http://dggs.alaska.gc	63360	PIR 2001-3C	Wyatt, W. C.	Werdon M. B.	Werdon M
19	19	31.08	ak_hwy_bedrock_s...	AK Hwy Seg2 Bedr...	Bedrock-geologic...	1177	7/1/2019	31921	30037	https://doi.org/10.14	https://dggs.alaska.g	63360	database is in NA...	Macpherson, A. E.	Gallagher, P. E.	Werdon,
20	20	31.08	nome_mining_dist...	Nome Mining Dist...	Preliminary geolog...	<Null>	1/1/1994	<Null>	1665	https://dggs.alaska.g	https://dggs.alaska.g	63360	<Null>	Arneson, L. A.	Cruse, G. R.	Bundtzen
21	21	31.08	tanana_b1_quad_s...	Tanana B1 Surficial	Surficial geologic...	<Null>	1/1/1997	<Null>	2553	https://dggs.alaska.g	https://dggs.alaska.g	63360	<Null>	Wildland, A. D.	Sturmann, A. G.	Pinney, D
22	22	31.08	central_york_mou...	Central York Mou...	Geology and ore d...	<Null>	1/1/1969	<Null>	3665	https://dggs.alaska.g	https://dggs.alaska.g	63360	<Null>	Arneson, L. A.	Sainsbury, C. L.	Sainsbury
23	23	31.08	eagle_a2_bedrock_...	Eagle A2 Bedrock	Bedrock geologic...	<Null>	1/1/2001	<Null>	2670	http://dggs.alaska.gc	http://dggs.alaska.gc	63360	PIR 2001-3B	Wyatt, W. C.	Werdon, M. B.	Werdon,
24	24	31.08	tok_river	Tok River	Geologic map of t...	<Null>	11/1/2017	<Null>	29722	https://doi.org/10.14	https://dggs.alaska.g	63360	<Null>	Hendricks, M. D.	Gallagher, P. E.	Sicard, K.
25	25	31.08	upper_chena_river	Upper Chena River	Geologic map of t...	85	1/1/1994	<Null>	2315	https://dggs.alaska.g	https://dggs.alaska.g	63360	Larger map area a...	Wyatt, W. C.	Sturmann, A. G.	Smith, T.
26	26	31.08	fairbanks_mining_...	Fairbanks Mining...	Preliminary geolog...	<Null>	1/1/1996	<Null>	1740	https://dggs.alaska.g	https://dggs.alaska.g	63360	This project and re...	Wildland, A. D.	Graham, G. R. C.	Newberry
27	27	31.08	circle_mining_distri...	Circle Mining Distr...	Bedrock Geologic...	496	1/1/1995	<Null>	2515	https://dggs.alaska.g	https://dggs.alaska.g	63360	<Null>	Wyatt, W. C.	Queen, L. K.	Wiltse, M
28	28	31.08	eagle_a1_bedrock_...	Eagle A1 Bedrock	Bedrock geologic...	<Null>	1/1/2002	<Null>	2864	http://dggs.alaska.gc	http://dggs.alaska.gc	63360	PIR 2002-1B	Wyatt, W. C.	Athey, J. E.	Szumigal
29	29	31.08	umiat	Umiat	Geologic Map of t...	868	10/1/2018	<Null>	30099	https://dggs.alaska.g	https://dggs.alaska.g	63360	<Null>	Wildland, A. D.	Herriott, T. M.	Herriott,
30	30	31.08	big_delta_b1	Big Delta B1	Geologic map of t...	<Null>	1/1/2007	<Null>	23531	https://dggs.alaska.g	https://pubs.usgs.go	63360	<Null>	<Null>	Day, W. C.	Day, W. C

0 of 95 selected

Filters: 80%

Some Recent and Future Mapping




Geophysical Surveys Web App
Alaska Geophysics Program
Alaska Seismic and Well Data
Geophysics Data Portal Group
DGGS Geophysics Grids
Survey Name(s)
0 selected
Survey Type
magnetic
iltered by selected Survey Names above
Survey Product
calculated1vd
filtered by selected Survey Type above
Type Survey Name or Place
Gates of the Arctic National Preserve
Kanuti National Wildlife Refuge
Yukon Flats Nat'l Wildlife Refuge
YUKON FLATS
RAY MOUNTAINS
Koyukuk National Wildlife Refuge
Nowitna National Wildlife Refuge
Innoko National Wildlife Refuge
Denali National Preserve
Denali National Park
ALASKA RANGE
S Fork Kuskokwim
TALKEETNA MOUNTAINS
Wrangell-St. Elias National Preserve
WRANGELL MOUNTAINS
Anchorage
CHUGACH MOUNTAINS
Chugach National Forest
Lake Clark National Park
KENAI PENINSULA
60mi
-158.152 65.760 Degrees
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