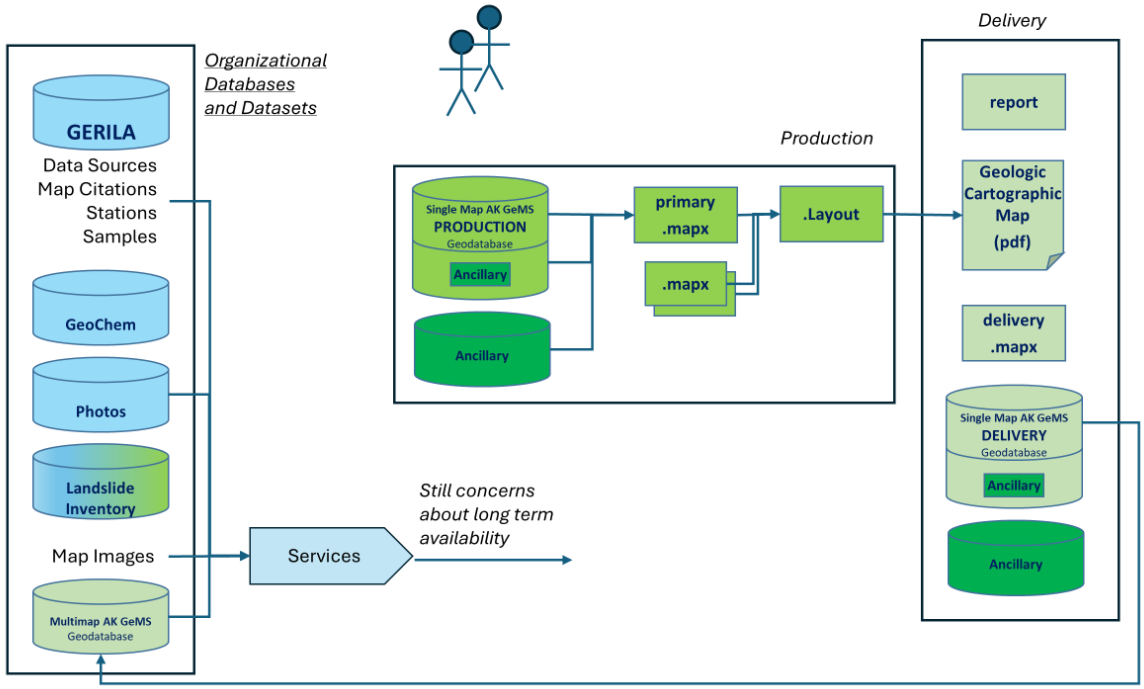
Creating, Managing, and Using Ancillary Data within the AK GeMS Geologic Mapping System



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

Some Ancillary Data “Handling Options”

Ancillary Data: Data relevant to the map that does not have an obvious place within the GeMS schema.

Some Ancillary Data “Handling Options”

Ancillary Data: Data relevant to the map that does not have an obvious place within the GeMS schema.

- Jam it into existing GeMS Schema (tables built with GeMS tool)
- Jam it into existing AK GeMS Schema
    - All type fields have domains. We also have a category field
    - Customization allowed with Type field = other & describe in notes

GIS Data and Symbology Standards

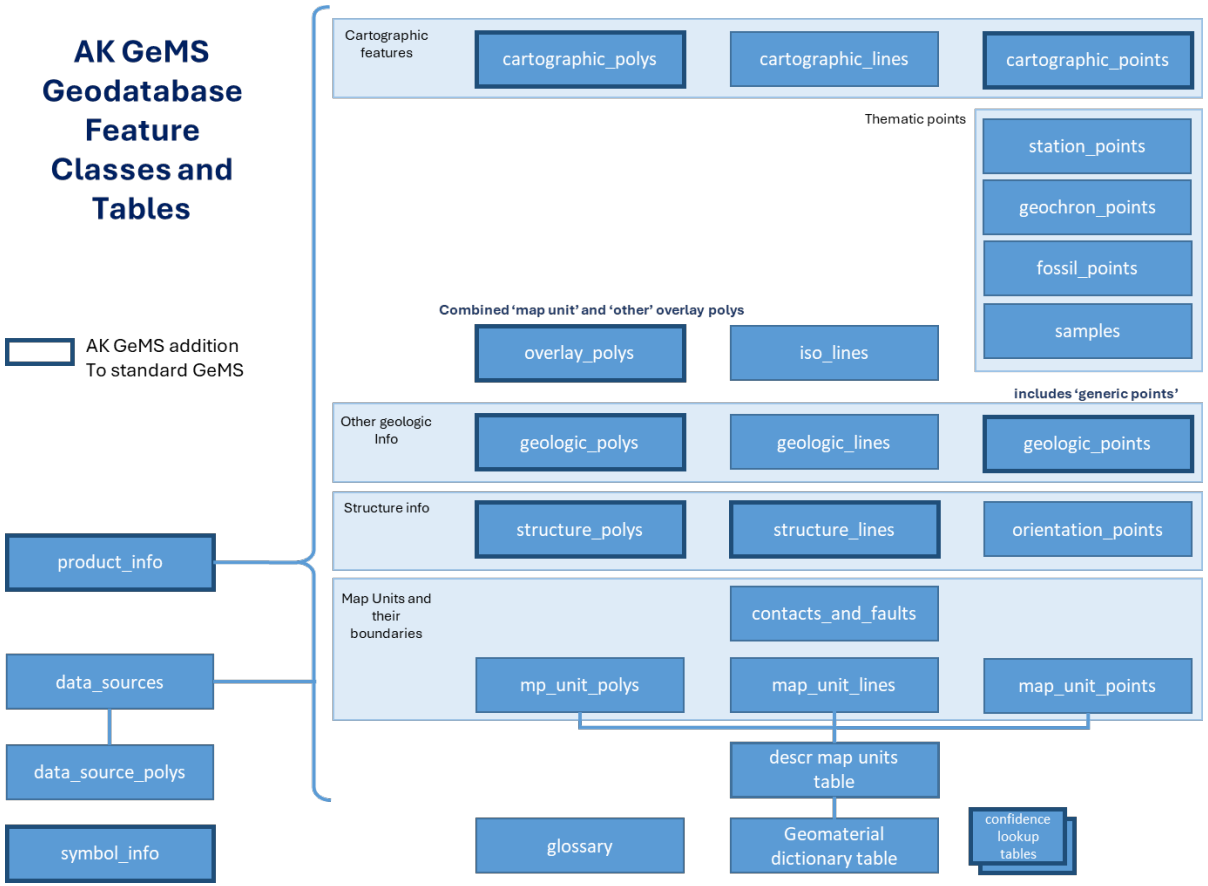
AK GeMS Data Dictionary

Key Aspects

- 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 scheduled for June 2024

AK GeMS Schema



AK GeMS Data Dictionary: A description of the AK GeMS database schema, MP 170
https://dggs.alaska.gov/pubs/id/30669

Some Ancillary Data “Handling Options”

Ancillary Data: Data relevant to the map that does not have an obvious place within the GeMS schema.

- Jam it into existing GeMS Schema (tables built with GeMS tool)
- Jam it into existing AK GeMS Schema
  - All type fields have domains. We also have a category field.
  - Customization allowed with Type field = other & describe in notes
- Reference ancillary data, but don’t include in GeMS
  - Add as data source (most vague use of ancillary data)
  - Include feature link to ancillary data

Some Ancillary Data “Handling Options”

Ancillary Data: Data relevant to the map that does not have an obvious place within the GeMS schema.

- Jam it into existing GeMS Schema (tables built with GeMS tool)
- Jam it into existing AK GeMS Schema
  - All type fields have domains. We also have a category field.
  - Customization allowed with Type field = other & describe in notes
- Reference ancillary data, but don’t include in GeMS
  - Add as data source (most vague use of ancillary data)
  - Include feature link to ancillary data
- Create new ancillary data tables (spatial or nonspatial) in GeMS/AKGeMS
  - One off map specific table (AK GeMS frowns upon new tables)
  - Add a table as a new organizational standard

Adding “new” modeled phenomena into the GeMS schema

1. A lot of specialized tables

   versus
2. A few tables with attributes to define specialization (type/category)

AK GeMS trends towards option 2, but is sliding slowly towards 1

Example – Geologic (Points, Lines, Polygons)
category and type fields and domains

Note: AK GeMS frowns upon new custom tables within AK GeMS until new version published. One reason is custom tables make metadata generation, QC, and production in general less efficient.

AK GeMS Geologic (Points, Lines, Polygons) feature class category and type field domains

Geologic (Points, Line, Polygon) Domains	
Category	**Type**
key bed	key bed, generic
	key bed, clay
	key bed, clinkered coal
	key bed, coal
	key bed, economically important commodity
	key bed, traceable bed
	key bed, other
geomorphic feature	geomorphic feature, generic
	geomorphic feature, lineament
	geomorphic feature, form line
	geomorphic feature, other
glacial and periglacial	glacial and periglacial, generic
	glacial and periglacial, ice wedge polygon
	glacial and periglacial, pingo
	glacial and periglacial, other
lacustrine and marine	lacustrine and marine, generic
	lacustrine and marine, other
landslide and mass wasting	landslide and mass wasting, generic
	landslide and mass wasting, block-glide landslide
	landslide and mass wasting, debris slide
	landslide and mass wasting, displacement vector
	landslide and mass wasting, earth flow
	landslide and mass wasting, hummock
	landslide and mass wasting, rock slide
	landslide and mass wasting, rotational landslide
	landslide and mass wasting, slump
	landslide and mass wasting, soil creep or incipient sliding
	landslide and mass wasting, spring, seep, or drainage
	landslide and mass wasting, tilt direction
	landslide and mass wasting, Toreva block
	landslide and mass wasting, other
volcanic	volcanic, generic
	volcanic, fumarole or steam vent
	volcanic, hornito
	volcanic, thermal spring
	volcanic, geyser
	volcanic, cone, vent, cinder cone, or spatter cone
	volcanic, volcano
	volcanic, diatreme, breccia pipe, or collapse structure
	volcanic, other
natural resources	natural resources, generic
	natural resources, occurrence
	natural resources, prospect
	natural resources, mine
	natural resources, other
tectonic	tectonic, generic
	tectonic, other
unprovided	unprovided
unknown	unknown
other	other

Some Ancillary Data “Handling Options”

Ancillary Data: Data relevant to the map that does not have an obvious place within the GeMS schema.

- Jam it into existing GeMS Schema (tables built with GeMS tool)
- Jam it into existing AK GeMS Schema
  - All type fields have domains. We also have a category field.
  - Customization allowed with Type field = other & describe in notes
- Reference ancillary data, but don’t include in GeMS
  - Add as data source (most vague use of ancillary data)
  - Include feature link to ancillary data
- Create new ancillary data tables (spatial or nonspatial) in GeMS/AKGeMS
  - One off map specific table (AK GeMS frowns upon new tables)
  - Add a table as a new organizational standard
- Use ancillary data in map, but store data outside GeMS DB
  - Files, enterprise database, service

Some Ancillary Data “Handling Options”

Ancillary Data: Data relevant to the map that does not have an obvious place within the GeMS schema.

- Jam it into existing GeMS Schema (tables built with GeMS tool)
- Jam it into existing AK GeMS Schema
  - All type fields have domains. We also have a category field.
  - Customization allowed with Type field = other & describe in notes
- Reference ancillary data, but don’t include in GeMS
  - Add as data source (most vague use of ancillary data)
  - Include feature link to ancillary data
- Create new ancillary data tables (spatial or nonspatial) in GeMS/AKGeMS
  - One off map specific table (AK GeMS frowns upon new tables)
  - Add a table as a new organizational standard
- Use ancillary data in map, but store data outside GeMS DB
  - Files, enterprise database, service

Join custom non-spatial related data to existing GeMS/AK GeMS features with key fields if possible

Some Ancillary Data "Handling Options"

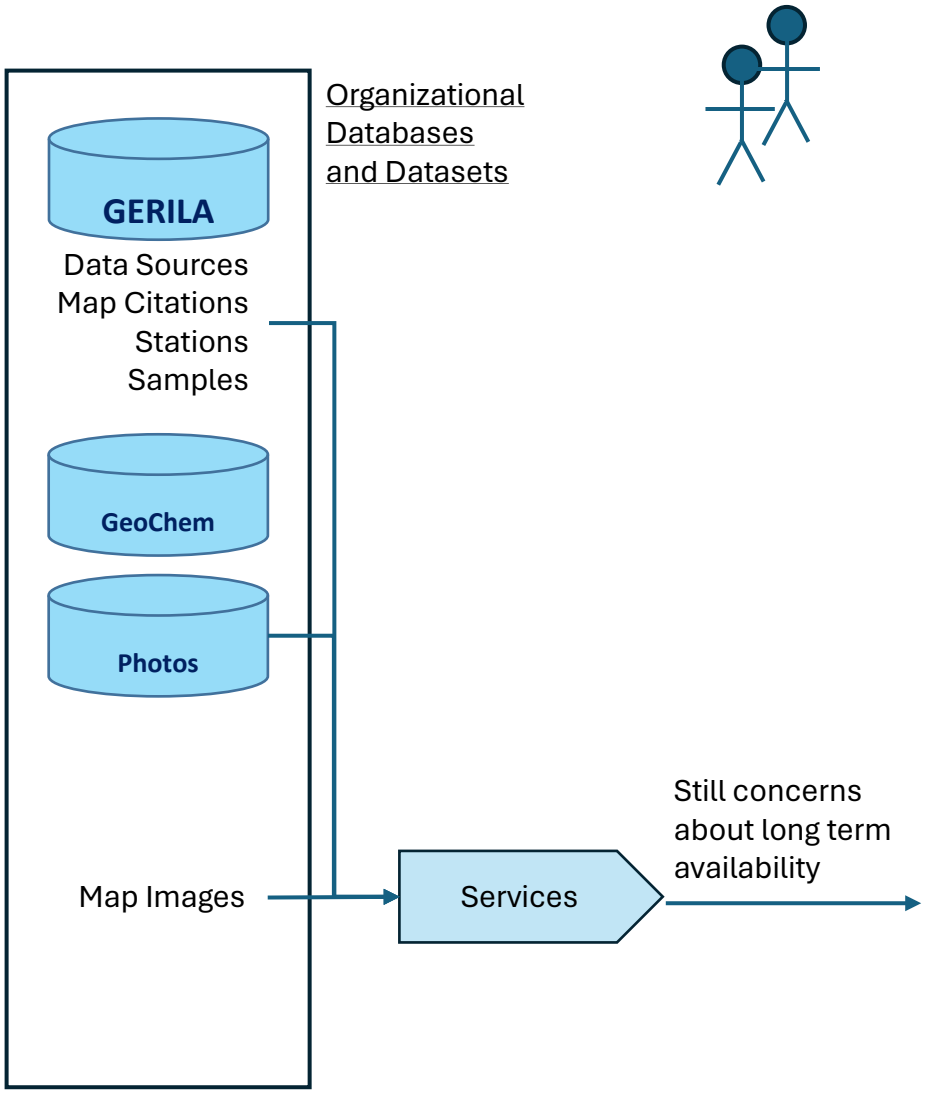
Ancillary Data: Data relevant to the map that does not have an obvious place within the GeMS schema.

- Jam it into existing GeMS Schema (tables built with GeMS tool)
- Jam it into existing AK GeMS Schema
  - All type fields have domains. We also have a category field.
  - Customization allowed with Type field = other & describe in notes
- Reference ancillary data, but don't include in GeMS
  - Add as data source (most vague use of ancillary data)
  - Include feature link to ancillary data
- Create new ancillary data tables (spatial or nonspatial) in GeMS/AKGeMS
  - One off map specific table (AK GeMS frowns upon new tables)
  - Add a table as a new organizational standard
- Use ancillary data in map, but store data outside GeMS DB
  - Files, enterprise database, service

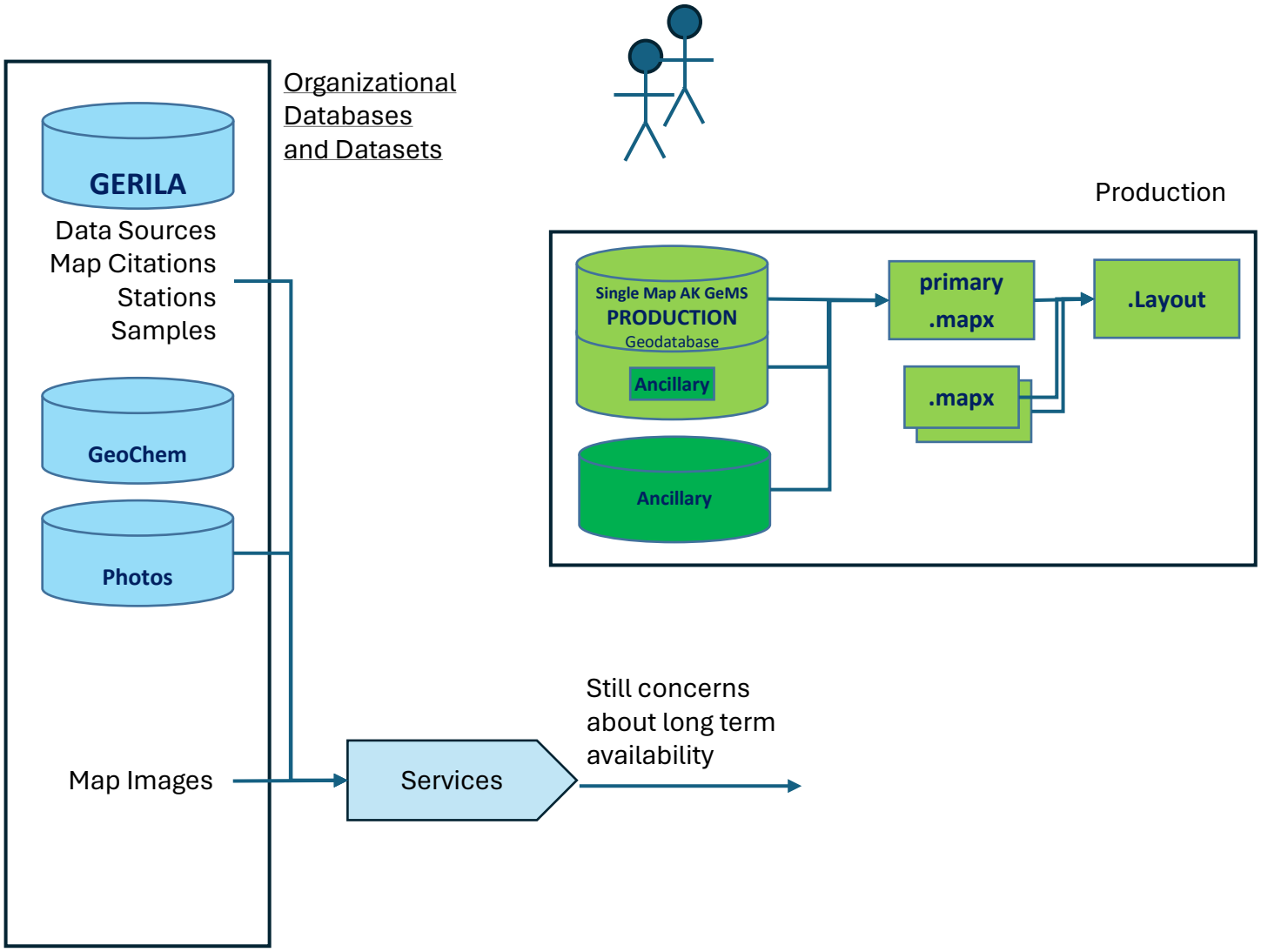
Join custom non-spatial related data to existing GeMS/AK GeMS features with key fields if possible

- Build other Databases/Datasets with GeMS in mind for future linkages

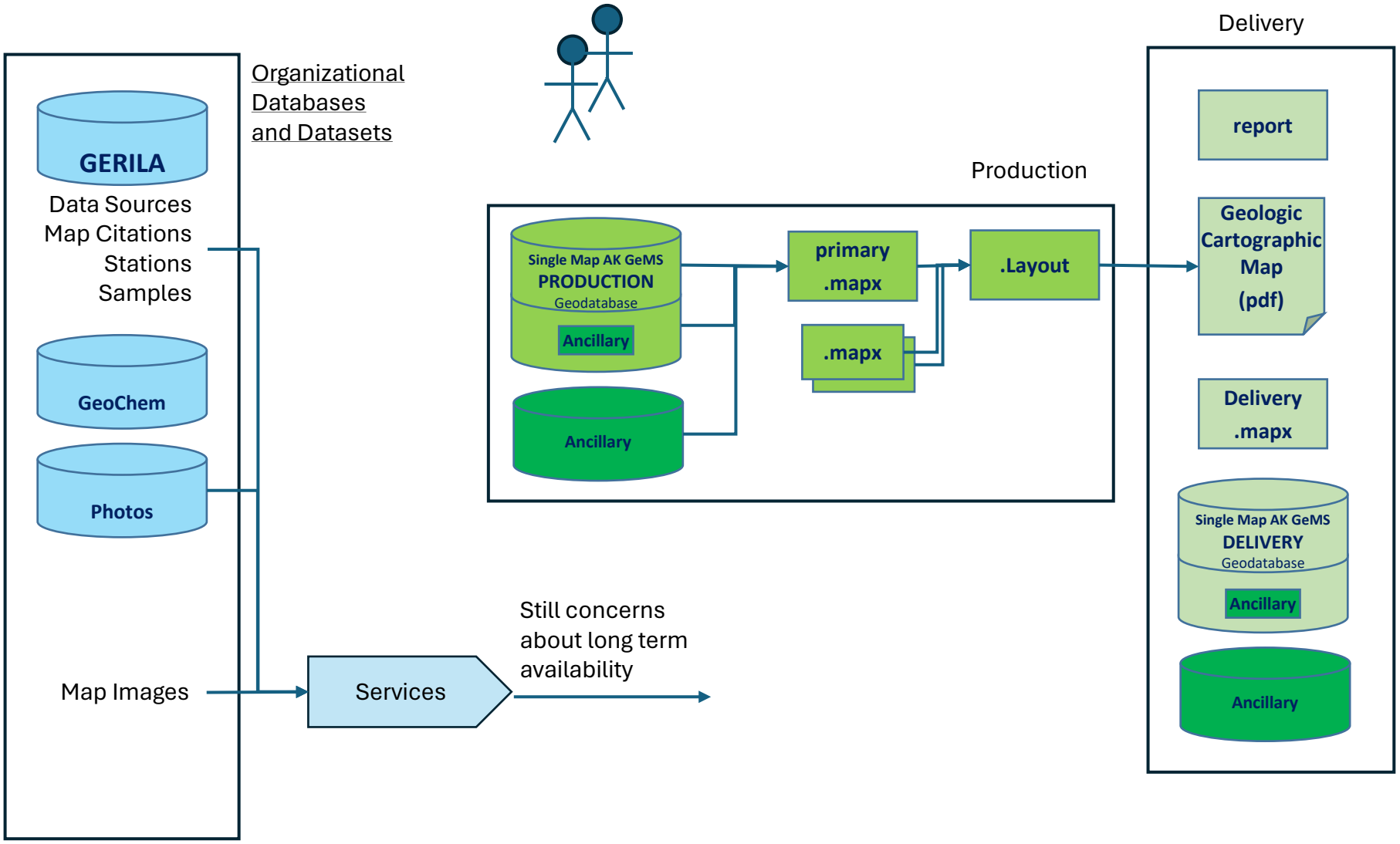
Some Ancillary Data in the process



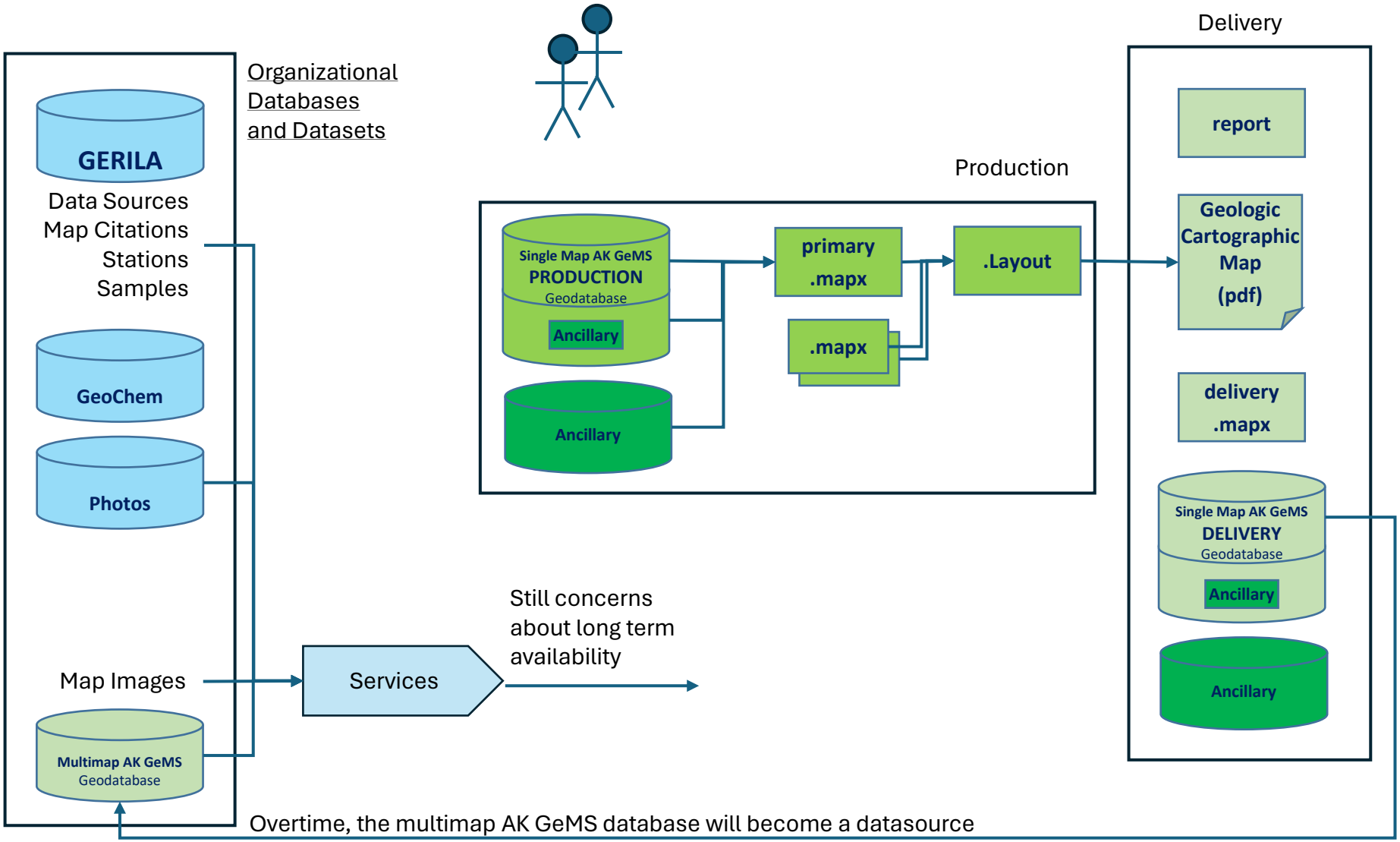
Some Ancillary Data in the process



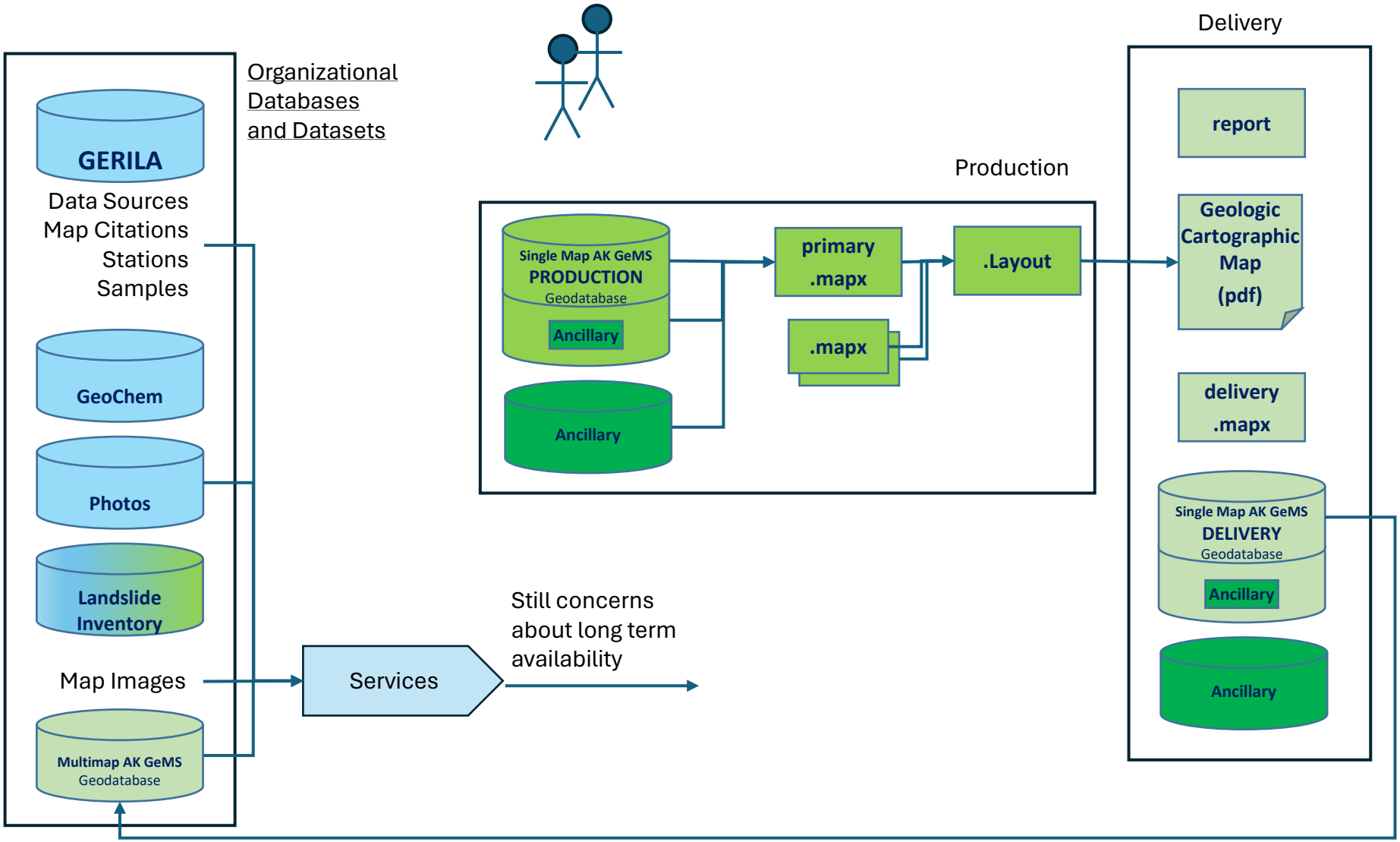
Some Ancillary Data in the process



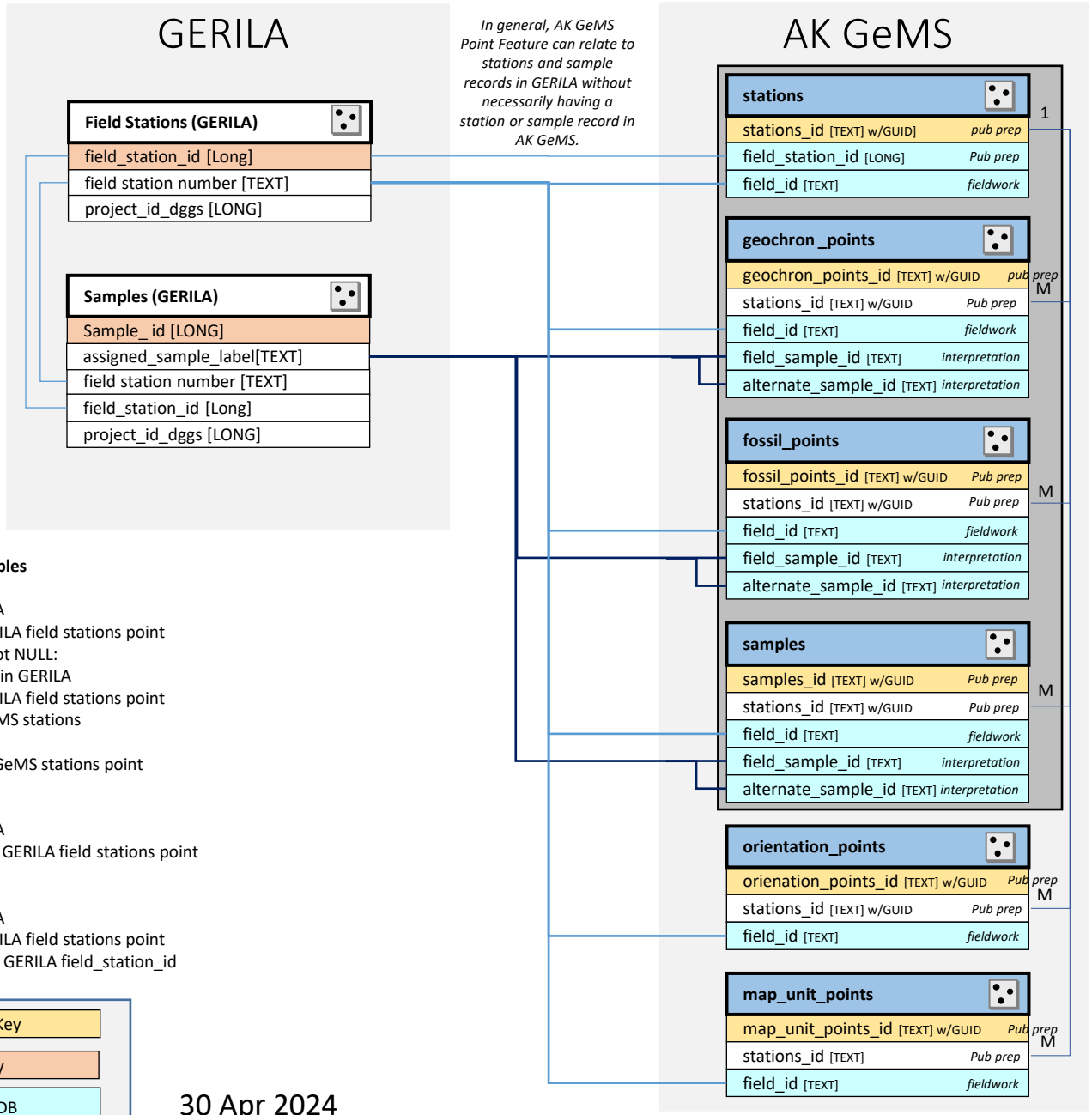
Some Ancillary Data in the process



Some Ancillary Data in the process



AK GeMS Key Relationships with Geo Analytic Data, Stations, Samples & GERILA



Station records in AK GeMS are optional. Typically used for inset map. All stations features must exist in GERILA and be collocated.

Records that relate to GERILA samples (field_sample_id) and/or field stations (field_id) must be collocated with GERILA's sample and station location.

Records that relate to GERILA samples (field_sample_id) and/or field stations (field_id) must be collocated with GERILA's sample and station location.

Version 2 only
Holds sample records that cannot be represented in geochron or fossils. Samples must exist in GERILA and be collocated.

Orientation points can optionally relate to a station in the AK GeMS Database. Note: They DO NOT necessarily have to be collocated with the station. Checked with 500m.

Map_unit_points can optionally relate to a station in the AK GeMS Database. Station must exist in GERILA and be collocated.

QC Checks:

For geochron, fossils, and samples
- If point field_id is not NULL:
  - field_id is found in GERILA
  - point is collated with GERILA field stations point
- If point field_sample_id is not NULL:
  - field_sample_id is found in GERILA
  - point is collated with GERILA field stations point
- If field_id is found in AK_GeMS stations
  - stations_id matches
  - point is collated with AK GeMS stations point

For orientation_points
- If point field_id is not NULL:
  - field_id is found in GERILA
  - point is within 500m with GERILA field stations point

For stations
- for all points
  - field_id is found in GERILA
  - point is collated with GERILA field stations point
  - field_station_id matched GERILA field_station_id

AK GeMS Table Primary Key

GERILA Table Primary Key

Relates to DGGS GERILA DB

30 Apr 2024

Collocation defined as <10m new mapping <100m for older map conversions