

Developing Map Marginalia Design Standards for the Alaska Division of Geological & Geophysical Surveys



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596A - Capstone Proposal Presentation
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Introduction



Geothermal Resources



Metals and Minerals



Groundwater



DGGS MISSION

Determine the potential of Alaskan land for geologic resources and hazards



Fuels

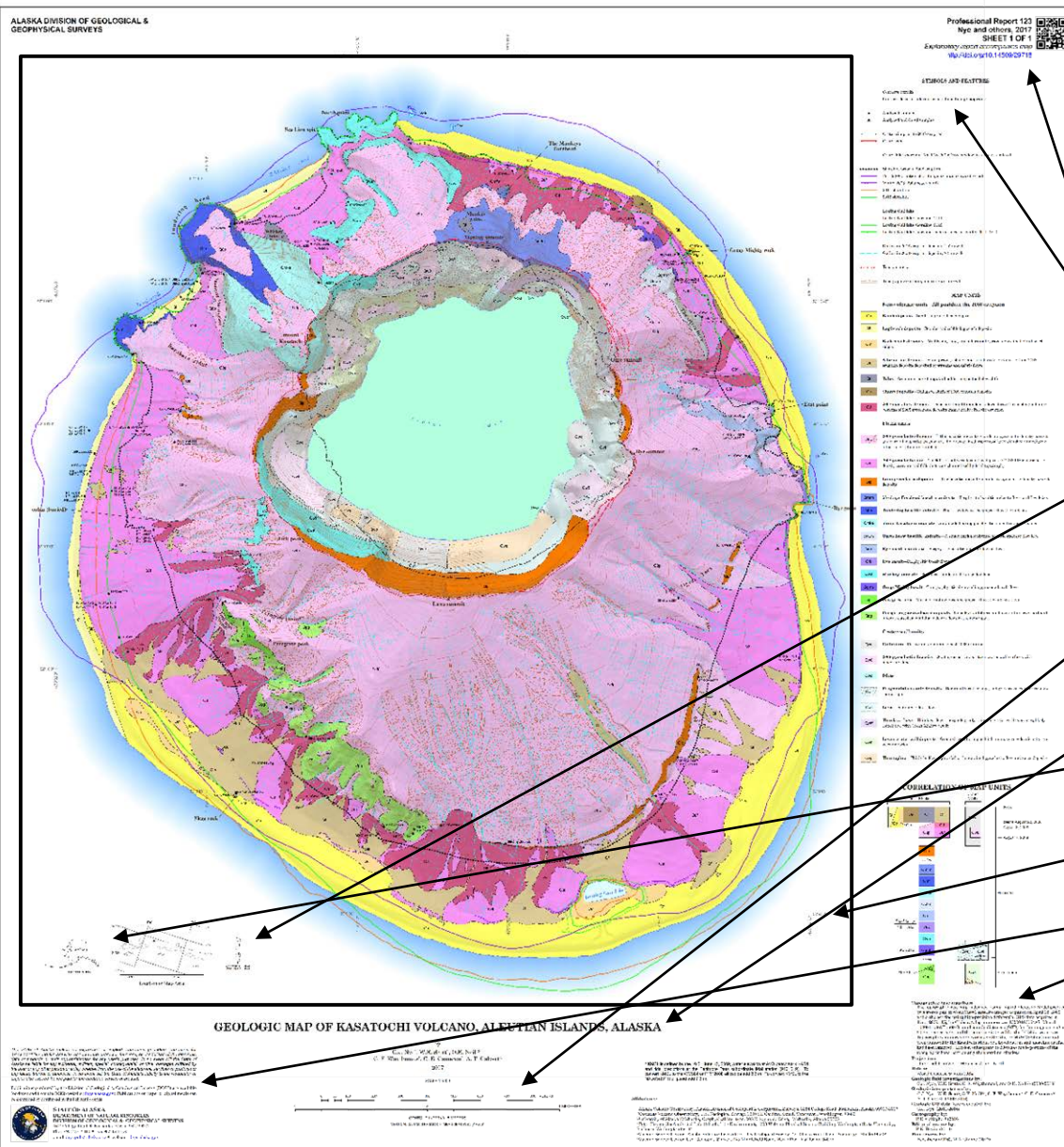


Construction Material



Geologic Hazards

DGGS Map Design



Map Face
Data that is being visualized

Map Marginalia
Information about the map

North Arrow

Scale Bar

Title

Legend

Inset Map

Graticule

Metadata

DGGS Map Topics

Thematic

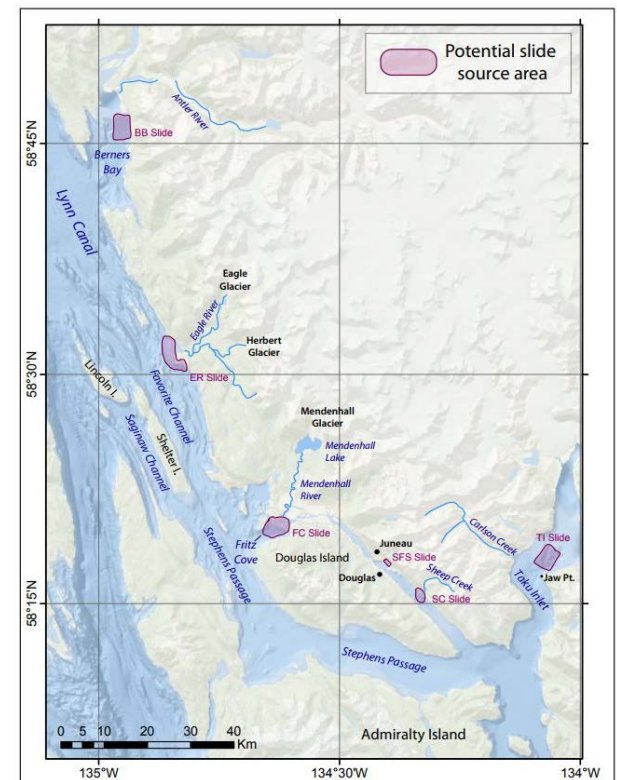
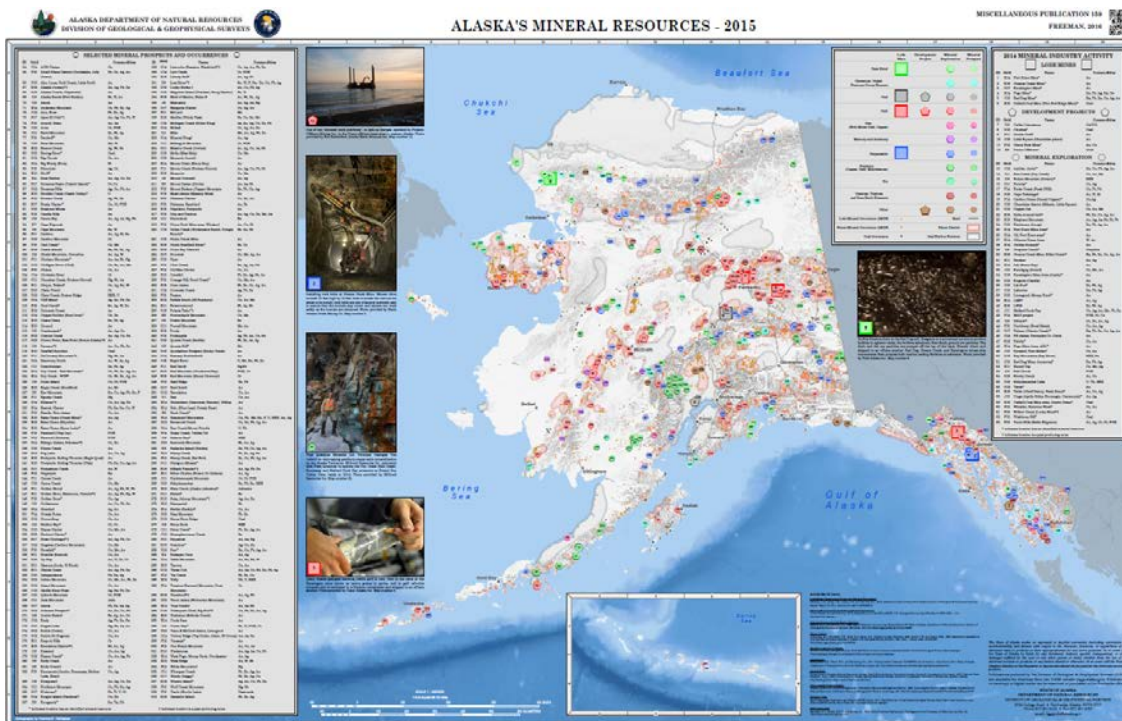
Specific data set for specific purpose

- Geology
- Permafrost
- Ground conductivity
- Flood hazard areas
- Mineral production
- Volcano ashfall
- Landslide hazards

Reference

Show features in relation to each other

- Extent of Study Areas
- Mining regions
- Sample locations
- Volcano locations
- Measured sections
- Geomorphic features
- Landslide source areas



Problems with DGGS Small Format Maps

Problems

**Inconsistent
overall look**

**Included or Excluded
Incorrectly**

**Placed In An
Incorrect Location**

**Design of element is
inappropriate**



Results

**Detracts from consistency
between maps**

Map reader cannot effectively:

- Orient the map
- Measure distances
- Identify symbols
- Identify the topic
- Interpret metadata
- Interpret the map

**Detracts from the
map as a whole**

**No recognizability as
DGGS product**

My Capstone Project

Develop map marginalia design standards for DGGs small format maps

North Arrow

Title

Inset Map

Metadata

Scale Bar

Legend

Graticule

Points addressed:

1. When to include or exclude marginalia elements
2. Placement of marginalia on a map
3. Design standard for appearance of marginalia

Documented guidelines

+

Standard design for
marginalia elements

=

DGGs maps that are:

Recognizable

Well designed

Consistent

Easy to use and understand



Project Organization

1. Introduction
2. Literature Review
3. Qualitative Analysis Methodology
4. Qualitative Analysis Results
5. Establish Design Standards and Guidelines

Literature Review

Cartographic Design

- What is a good design?
- Each elements:

Recognizability and Branding

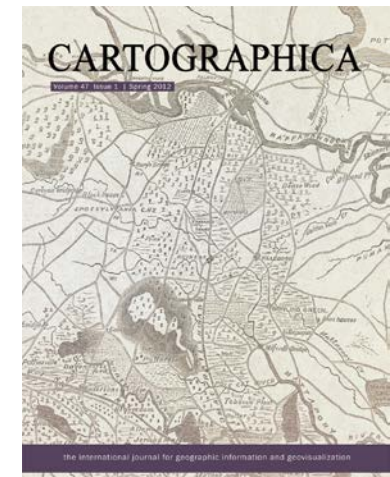
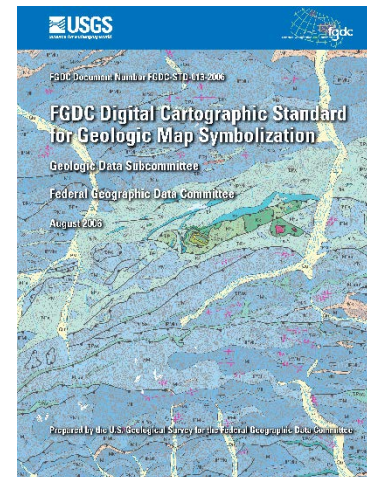
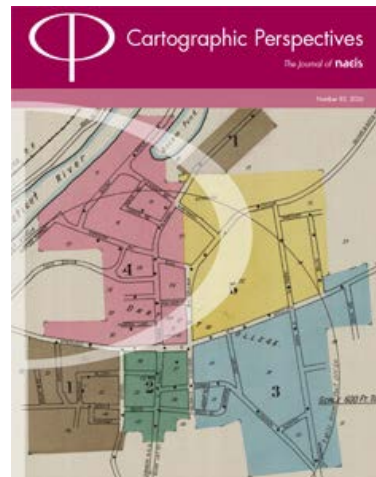
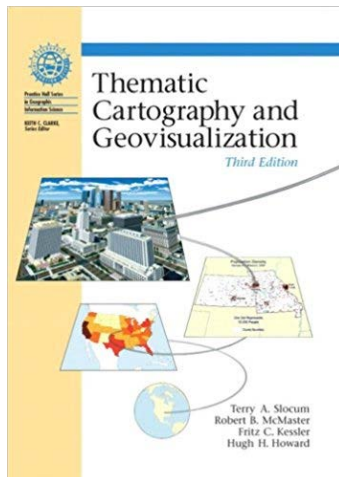
- What supports good brand identity?
- Maps as brands

Cartographic Standards

- What do good standards look like?
- How are they developed and implemented?

Qualitative Cartography Research

- Research approaches
- Best type for my project
- Design methodology



Example of Qualitative Cartography Research

Cartography on the Internet: Thoughts and a Preliminary User Survey

Mark Harrower, Peter Keller and Diana Hocking

Research Goal

- Gather reactions to:
 - Internet map design
 - Map delivery
- Compare groups
 - Geographers
 - Non-Geographers

Assessment Method

- Questionnaire
 - Open questions
 - Closed questions

MAP TITLE: _____

THE PURPOSE OF THE MAP IS: _____

MAP ONE

Accurate | Inaccurate | Biased | Unbiased

Ethical | Unethical | Powerful | Weak

Convincing | Unconvincing

COMMENTS: _____

Harrower et al (1997)

Methodology Steps

1. Selecting the Maps
2. Selecting the Participants
3. Developing the Questionnaire
4. Administrating the Survey

Step 1: Selecting the Maps

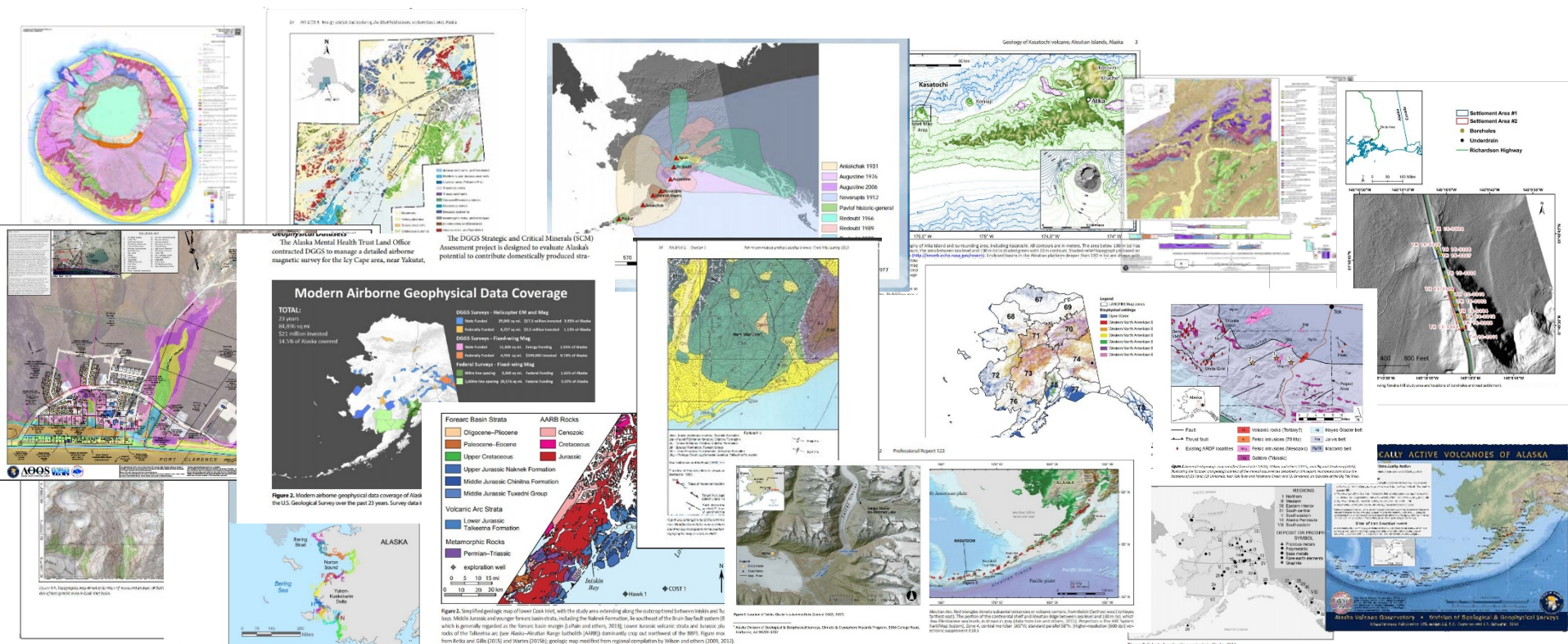
Selection Criteria

- Publication date
- Size
- Presence of marginalia elements

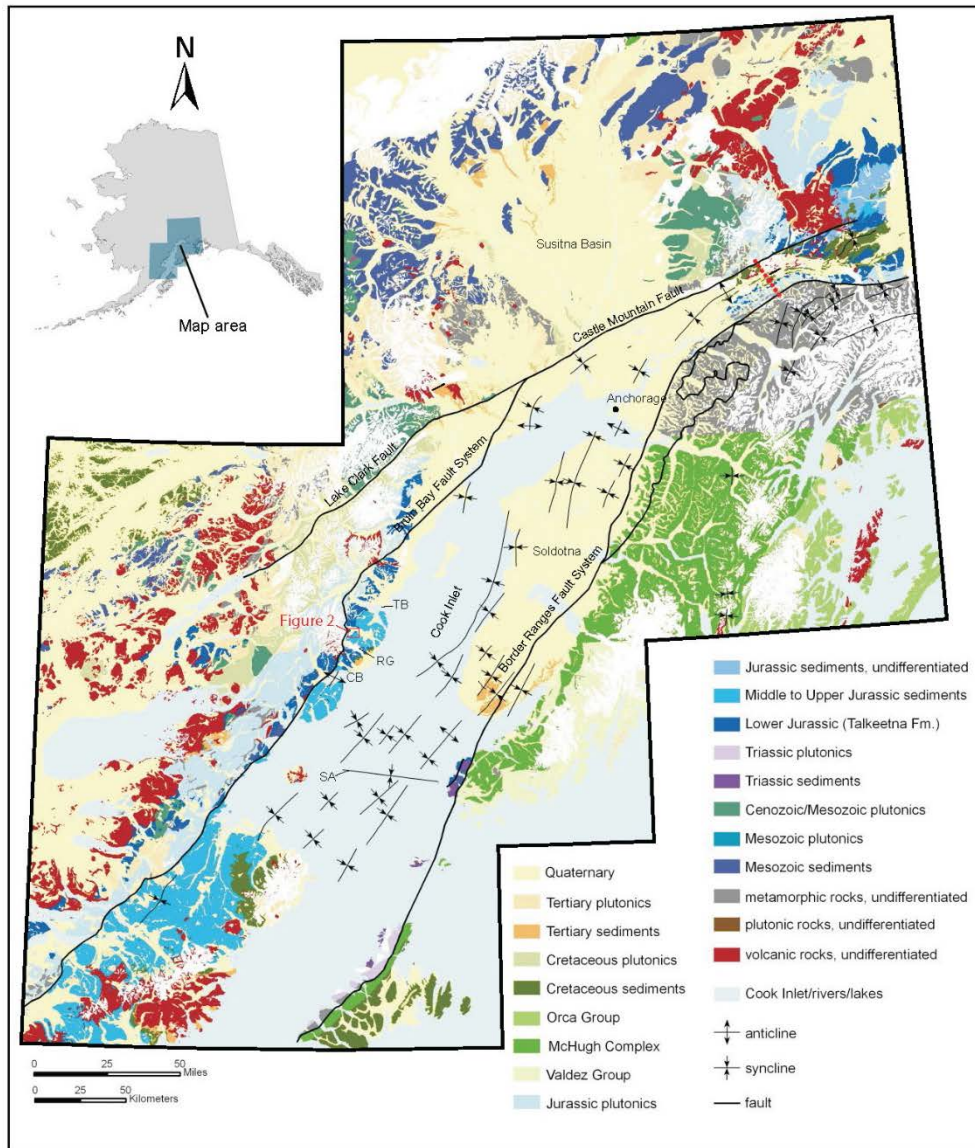
Recent (2015, 2016, 2017)

Page Sized

Variety and distribution of marginalia elements



Step 1: Selecting the Maps



Bedrock Geology of Cook Inlet

- North Arrow
- Scale Bar
- Legend
- Inset Map

Figure 5-1. Bedrock geologic map of the Cook Inlet region. CB = Chinitna Bay; SA = Seldovia arch; RG = Red Glacier; TB = Tuxedni Bay. Modified from Wilson and others (2009).

Step 1: Selecting the Maps

HISTORICALLY ACTIVE VOLCANOES OF ALASKA

Definition of Historically Active

The 54* volcanoes displayed on this map meet at least one of the following criteria since 1700 CE:

- Documented, unquestioned eruption **OR**
- A strongly suspected eruption, often an eruption documented in a historical account with very little information. Current geologic knowledge must not contradict the eruption account **OR**
- Persistent (usually on the order of decades, but certainly longer than several months) fumaroles, with temperatures (where measured) within $\sim 10^{\circ}\text{C}$ of the boiling point, **OR**
- Significant, measured, volcanic-related, non-eruptive deformation, **OR**
- Documented earthquake swarm with strongly suspected volcanic cause

*Gilbert's fumaroles have not been observed in recent years and Gilbert may be removed from future versions of this list. In 2014 and 2015, fieldwork at Tana and Herbert (C. Neal and K. Nicolaysen, personal commun., 2016) revealed the presence of high-temperature fumaroles. Although we do not have decades of observation at Tana or Herbert, they have been added to this version.

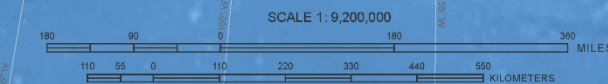
Date of Last Eruptive Event

Where confidently known, the year of the most recent eruptive event is listed below the volcano name. See the accompanying data table for a field containing the year of suspected eruptive events for those volcanoes with no certain historical eruptions.



The Alaska Volcano Observatory (AVO) is a joint program of the United States Geological Survey (USGS), the Geophysical Institute of the University of Alaska Fairbanks (UAF/GI), and the State of Alaska Division of Geological & Geophysical Surveys (DGGGS).

Cartography by Patricia E. Gallagher



Map Projection: Alaska Albers Equal Area Conic Map Datum: North American Datum of 1983



- Scale Bar
- Title
- Inset Map
- Graticules
- Metadata

Step 2: Selecting Survey Participants

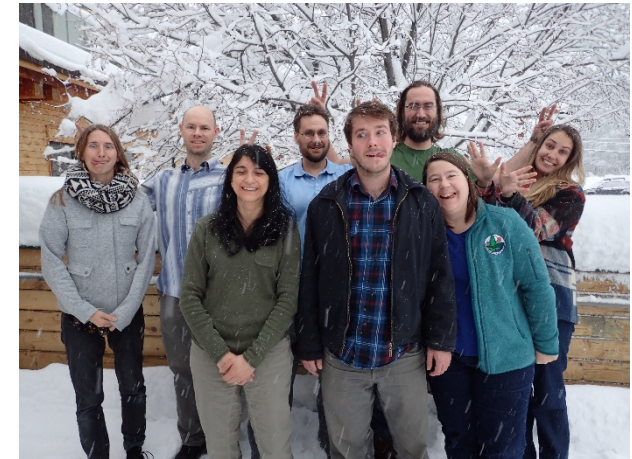
Sample Size

Considerations:

- Limited time
- No financial support
- Fairly homogeneous groups

= 12 ⇒

DGGS Coworkers



Participant Groups

Map Producers:

Create maps regularly

- Geologist
- Scientist
- GIS person

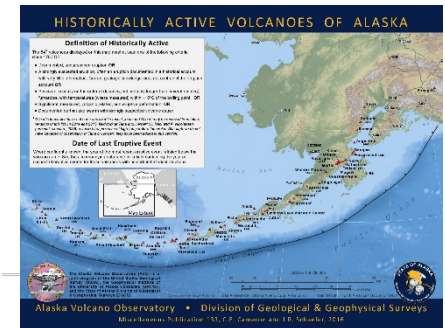
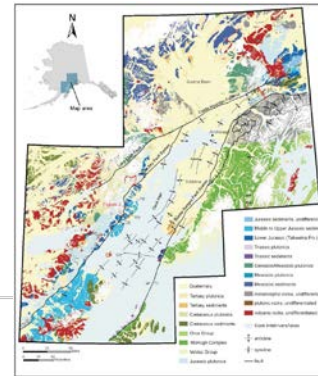
General Map Users:

Views and uses maps only

- Manager
- IT person
- HR person

Step 3: Developing the Questionnaire

Within the context of each map



Evaluate:

presence

necessity

placement

functionality

accuracy

design

North arrow

1. Is there a north arrow on this map?
2. Does this map need a north arrow? Please explain why or why not.
3. Is this north arrow well placed on this map? If yes, please explain why. If not, please describe where this north arrow should be moved to and why.
4. Does this north arrow help you orient the map? Please explain why or why not.
5. Does this north arrow accurately point toward north for all locations shown in this map? Please explain why or why not.
6. Consider the following north arrow designs:



Which north arrow design is the most visually pleasing? Please explain your choice.

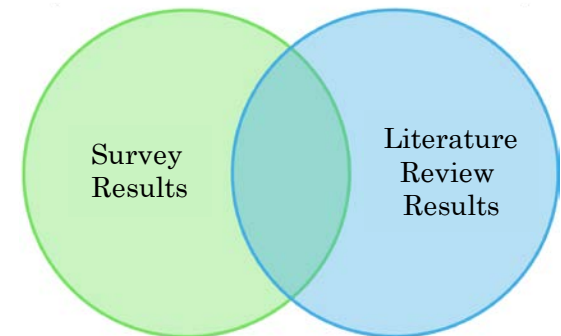
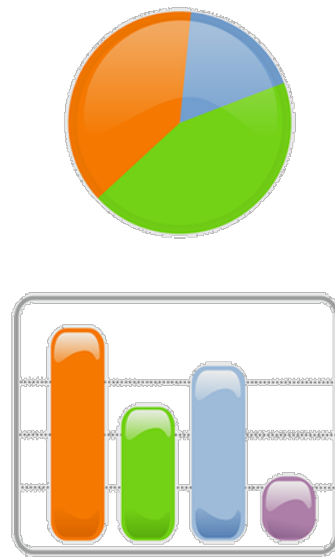
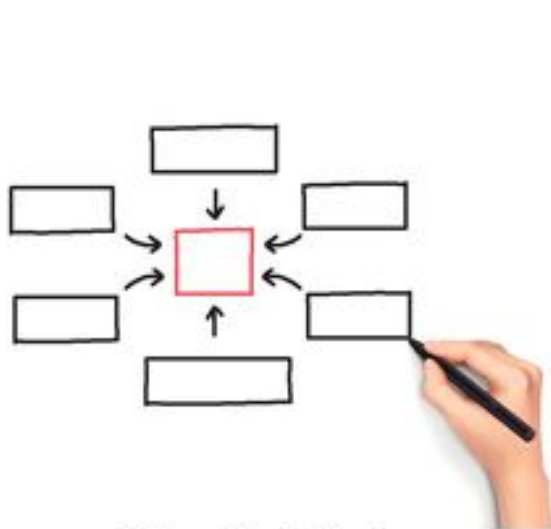
Step 4: Administrating the Survey

- Each person will evaluate each map
- Online survey application
- Printed version of map for viewing alongside survey questions
- Flexible time and location
- Should take ~1 hour to complete



Survey Results and Analysis

- Compile
 - Compile answers to closed questions
 - Table or Graph
- Organize
 - Identify common themes
 - Identify differences
- Compare
 - individuals and groups
 - Participant preferences to cartographic conventions



Thank You



Questions?

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