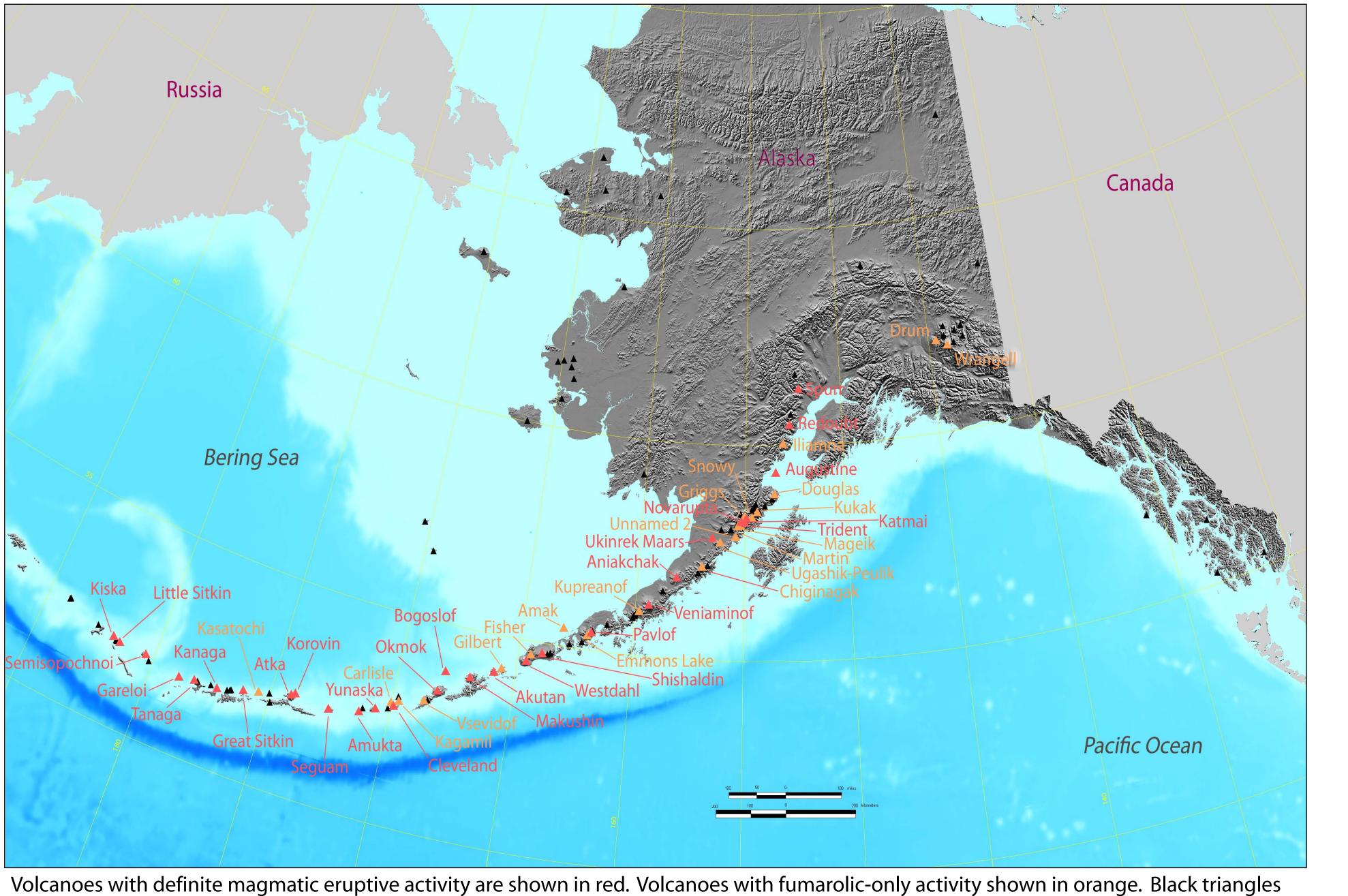




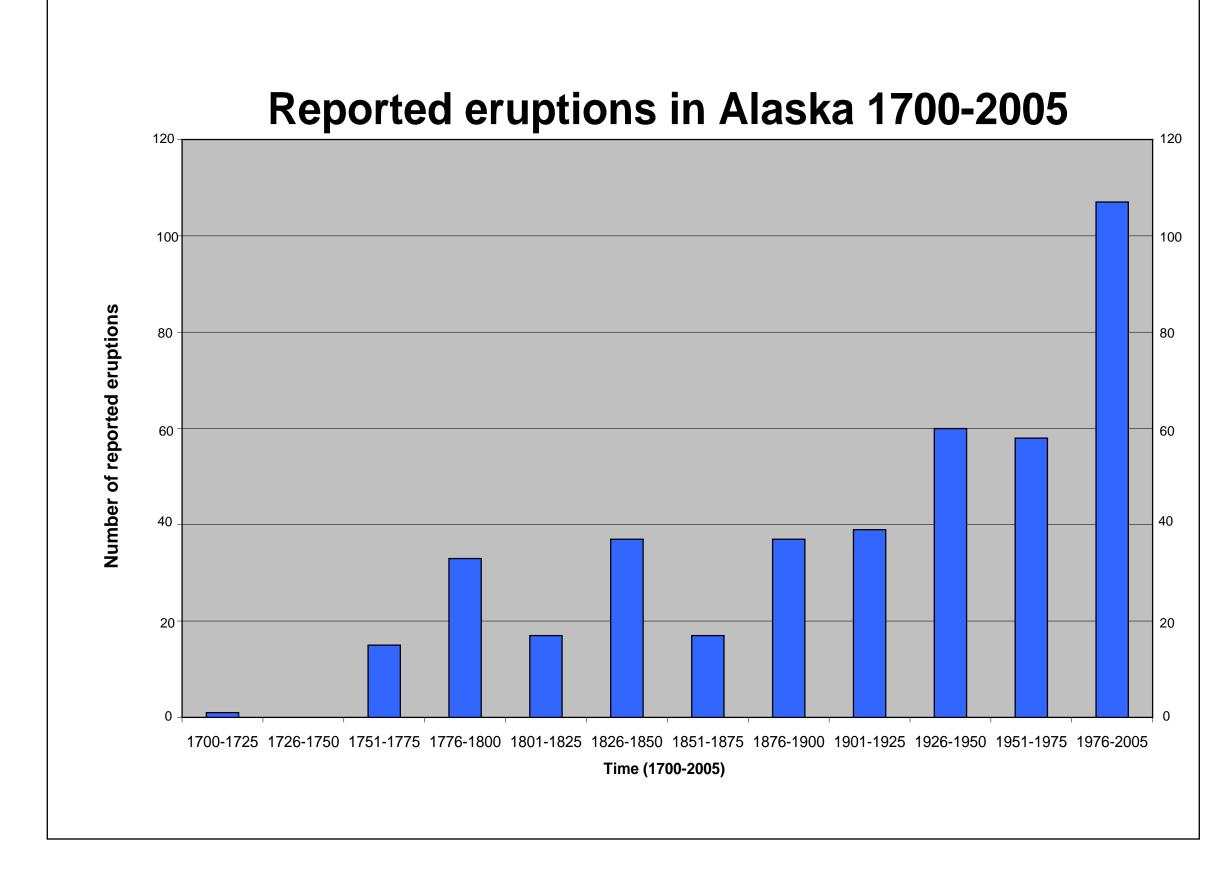
Abstract

As part of the Alaska Volcano Observatory Geologic Database of Information on Volcanoes in Alaska (GeoDIVA), we recently completed a compilation of information about historic eruptions in Alaska. This compilation contains more information on a greater number of eruptions in Alaska than ever previously available. Information on each event, including text of historical accounts, individual eruption bibliographies, and photographs is available online at: http://www.avo.alaska.edu. The database currently holds information from the year 1700 to the present on 423 possible or definite eruptions, from 43 volcanic centers. 192 of these events are considered "questionable eruptions," due to lack of information about the exact nature of activity. The remaining 231 volcanic eruptions from 29 centers are more certain. Twenty-one volcanic centers have had only fumarolic activity or questionable eruptive events. If we consider an "active" volcano to have had either a magmatic eruption or significant fumarolic activity, then this dataset contains 50 historically active volcanoes. These numbers are much higher than the previously used numbers of >265 eruptions from 41 volcanoes, and are derived from the most complete dataset currently available.



Map of historically active volcanoes in Alaska

represent all other Alaskan volcanoes with activity within the last 2 million years.



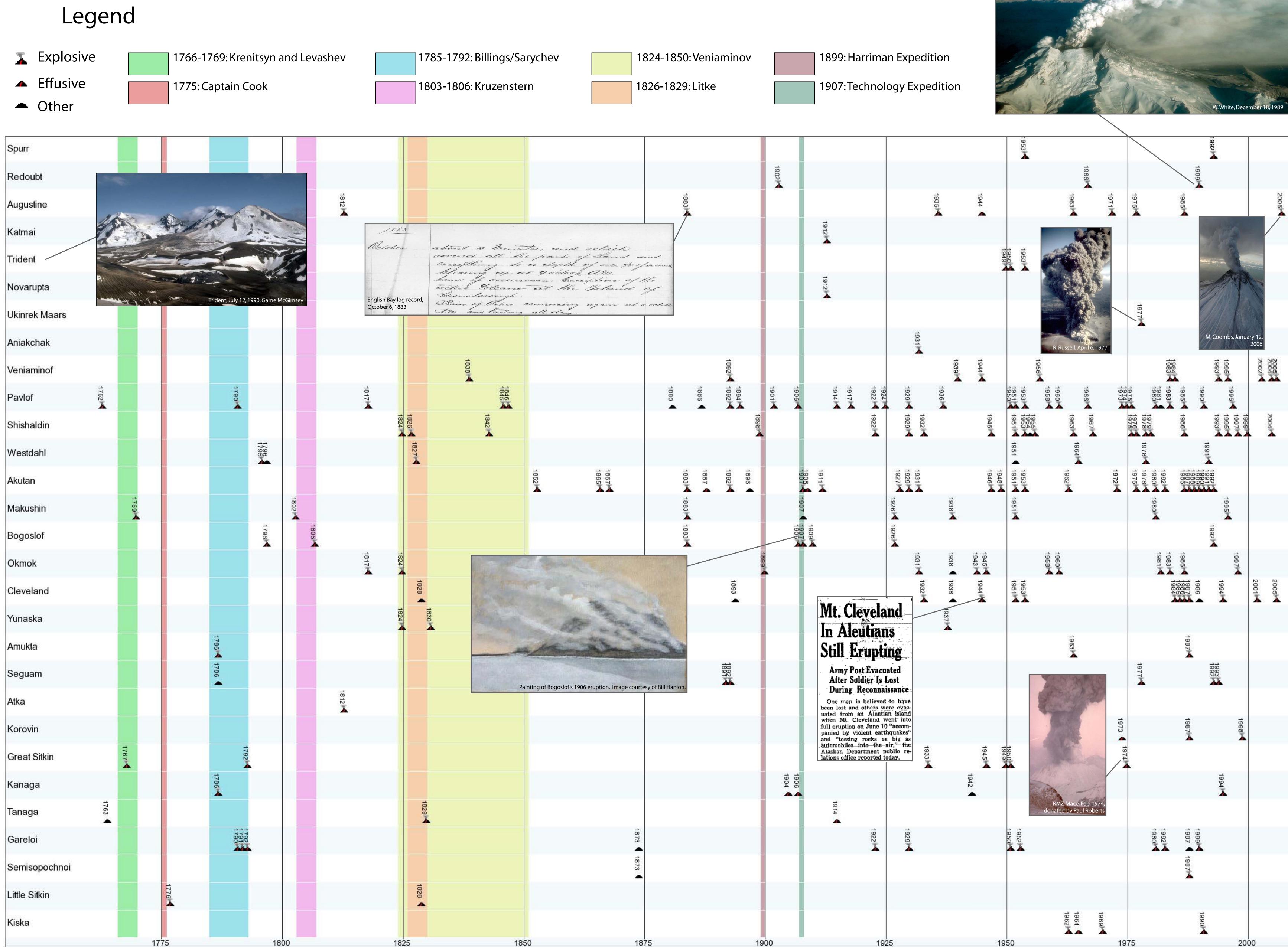
A plot of the number of reported eruptions during twenty-five year periods (approximate - the last interval contains data for a 30-year period, from 1976-2005) from 1700-2004. This graph reports both "questionable" and unquestioned eruptions, for a total of 423 events. Note that this graph plots only eruption start dates. Many Alaskan eruptions continue for months or years, increasing the total number of "currently active volcanoes" for any given year. Using a total of 231 definite eruptions, with the earliest recorded unquestioned eruption in 1762 (Pavlof) yields an average of nearly one eruption per year. However, eruptions from the time period 1700-1950 are almost certainly underreported (see graph at left and listings at right); very few documents from this time period recount eruptions, and those that do are heavily dependent on the brief visits of European travelers. It is a valid assumption that many volcanic eruptions were not reported simply because no European was present as a witness. Another probability is that many eruptions went unseen by any human, due to the remote

and stormy nature of the Aleutians.

An Updated Count of Historic Eruptions and Volcanoes in Alaska

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Legend details

- * Explosive eruption dominantly explosive
- * Effusive eruption dominantly effusive
- * Other explosive/effusive determination not possible

* Colored Bands: mark times of major expeditions or people in Alaska who kept records of early eruptions

- * Late 1940s early 1950s: increase of aviation in Alaska
- * 1988 to present: AVO era

Graphical depiction of known eruptions at active volcanoes in Alaska

Special thanks to Seth Snedigar, for dynamically generating this graphic from the database.

* Questionable eruptions not shown

* Defining "questionable"

a) Primary eyewitness account? Reasonably matches a volcanic eruption? More detail than "smoke"?

- b) Trustworthy source? (e.g. Hantke often not reliable)
- c) If multiple accounts exist, are they in agreement?

d) Does current geologic fieldwork refute or reinforce historical accounts?

There are three reasonably recent efforts to list volcanoes in Alaska, besides GeoDIVA. Miller and others (1998) list 39 historically active volcanic centers, plus two (Iliamna and Dutton) that have had large earthquake swarms. Wood and Kienle (1990) list 116 volcanoes presumed active within the last 5 million years in the header line of their mini-articles, but contain references to many more features and subfeatures within the text. The National Volcano Early Warning System (NVEWS) lists 90 volcanoes in Alaska, and derives their information from the Smithsonian Institution's Global Volcanism Database. GeoDIVA (Alaska Volcano Observatory) lists 129 major volcanic features active within the last 2 million years, 50 of which are historically active (see table below). GeoDIVA's list is more accurate than the previous lists, as it is based on a larger dataset and is the most up-to-date and flexible.

A direct comparison between all of these lists is not straightforward, due to differences in determining volcano names, and which features comprise separate versus grouped features. For example, GeoDIVA groups Table Top and Wide Bay Cone as subfeatures of Makushin, but NVEWS and the Smithsonian list Makushin as one feature and Table Top – Wide Bay as another. NVEWS and the Smithsonian state that Kliuchef, Korovin, Konia, and Sarichef are part of a larger feature called Atka. However, Miller and others (1998) lists only Korovin. After much internal discussion, GeoDIVA lists both Korovin and Atka. There are several other naming discrepancies, and GeoDIVA will remain flexible.

There are also discrepancies between source about what constitute enough activity to count as "historical active." GeoDIVA's definition of "historically active" requires at least one of the following: a) A definite eruption in historical time, with juvenile magmatic material, or b) Frequent steam events or earthquake swarms. Volcanoes exhibiting only fumarolic activity within modern times frequently have older reports of an "eruption" that are too vague to determine if there was any magmatic material involved.

Number comparison of different volcano compilations

	Miller and others (1998)	Wood and Kienle (1990)	NVEWS (2005) (From Smithsonian Institution)	GeoDIVA
Active volcanoes	41	Not listed	90	50
Timeframe for active	Historic time	Not applicable	Quaternary	Historic time
Total listed volcanoes	41	116	90	129
Timeframe for total	Historic time	5 ma	Quaternary	2 ma

Preview the new AVO site! AVO version 6 is coming soon, thanks to our webmaster, Seth Snedigar

Click on a link to go to more volcano information - bibli ography, images, maps, and current activity release

Quick links to webicorders and webcams

> GeoDIVA is intended to be a complete, authoritative, and up-to-date resource for information on Alaska's volcanoes, and forms the back-end to our website: http://www.avo.alaska.edu.

Available online:

- Image database holds thousands of images, nearly all free for download at high-resolution

Coming soon! (Module planned or in progress):

- * Geochemical analysis data

- * Geochronology (arc-wide age dates and references)

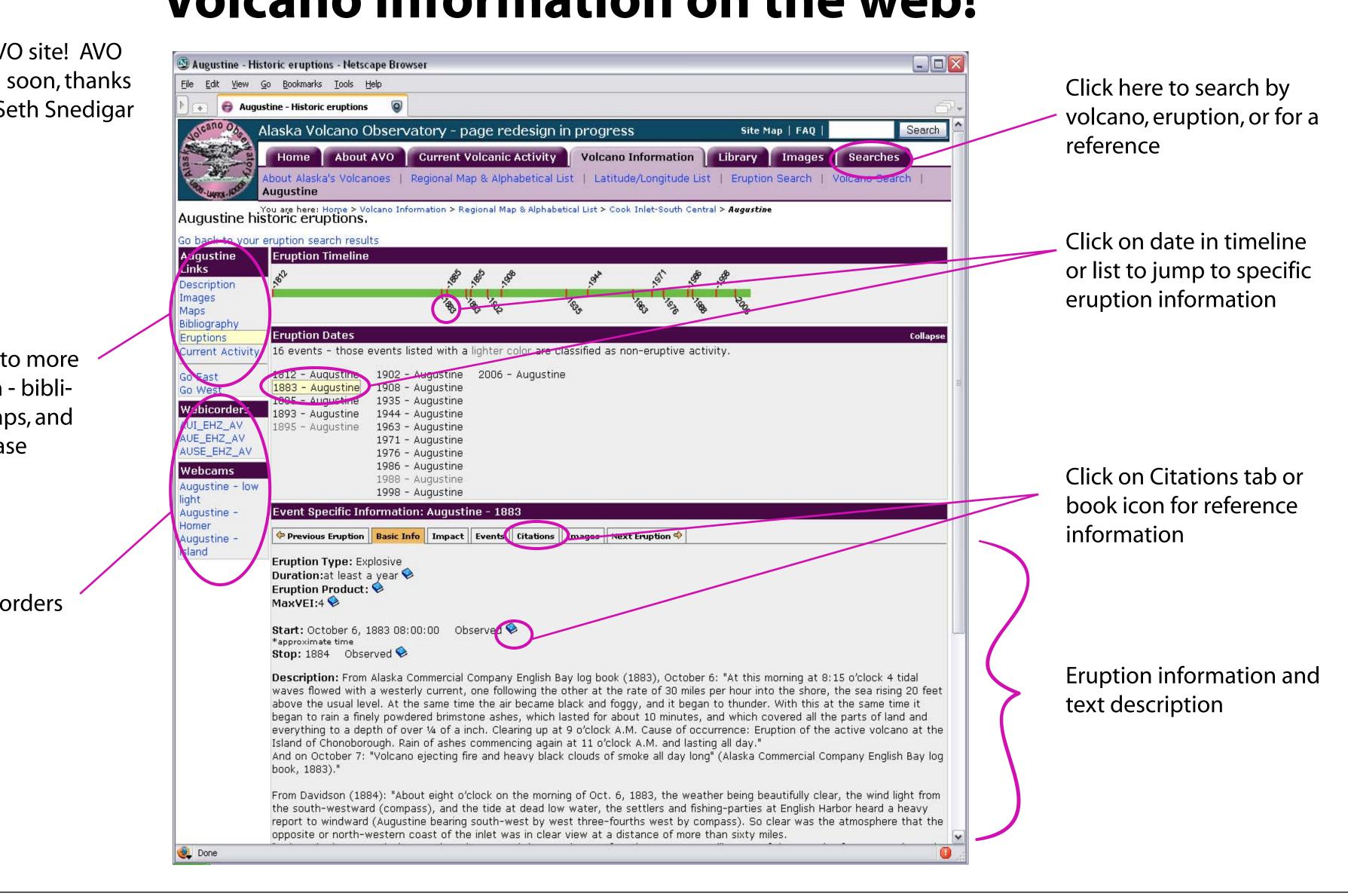


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Why are there so many different answers to "How many active volcanoes are there in Alaska"?

GeoDIVA anticipates that this list of historically active volcanoes will change as field studies add to our current knowledge. For example, Aleut oral tradition (Grewingk, 1850) holds that Kasatochi rose from the ocean in 1760. Bergsland (1959) appears to confirm this by stating that the Aleut name for Kasatochi is "qana-tanar" = which island, as in "Which island is it that is emerging out there?" Hopefully future field studies will be able to determine whether or not Kasatochi should be considered as magmatically active within historic time.

Other ways for the number and listing of historically active volcanoes to change include: changing the volcano groupings as indicated by future fieldwork; continued library research revealing documentation of previously unrecognized eruptions; or, of course, a "new" volcano erupts.



Volcano information on the web!

Existing and planned GeoDIVA modules:

- **Bibliography** contains nearly 4,000 references and is complete through 2004, with hundreds of documents free for download
- **Eruption history** for each volcano including full text of eyewitness accounts and detailed citations
- * **Basic volcano information** name, location, and description * **AVO's activity reports**, keyed by date and volcano
- * Geologic sample information
- * Petrographic analysis data
- * GIS data (maps and data layers)

