Alaska has about twice the number of active volcanoes as the rest of the U.S. combined.

Presented to the Alaska Seismic Hazards Safety Commission

December 6, 2006

Tom Murray

Redoubt, 1990

USGS
science for a changing world

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Alaska Volcano Observatory

- AVO was formed in 1988 in response to the 1986 eruption of Augustine Volcano.
- Combined Federal, State, and University program.
- Offices in Anchorage and Fairbanks.
- Responsible for monitoring activity at more than 40 historically active volcanoes in Alaska.
- Aviation Safety is the primary public safety role, in conjunction with the NWS and FAA.

AVO has three primary objectives

- To conduct monitoring and other scientific investigations in order to assess the nature, timing, and likelihood of volcanic activity

- To assess volcanic hazards associated with anticipated activity, including kinds of events, their effects, and areas at risk

- To provide timely and accurate information on volcanic hazards, and warnings of impending dangerous activity, to local, state, and federal officials and the public.

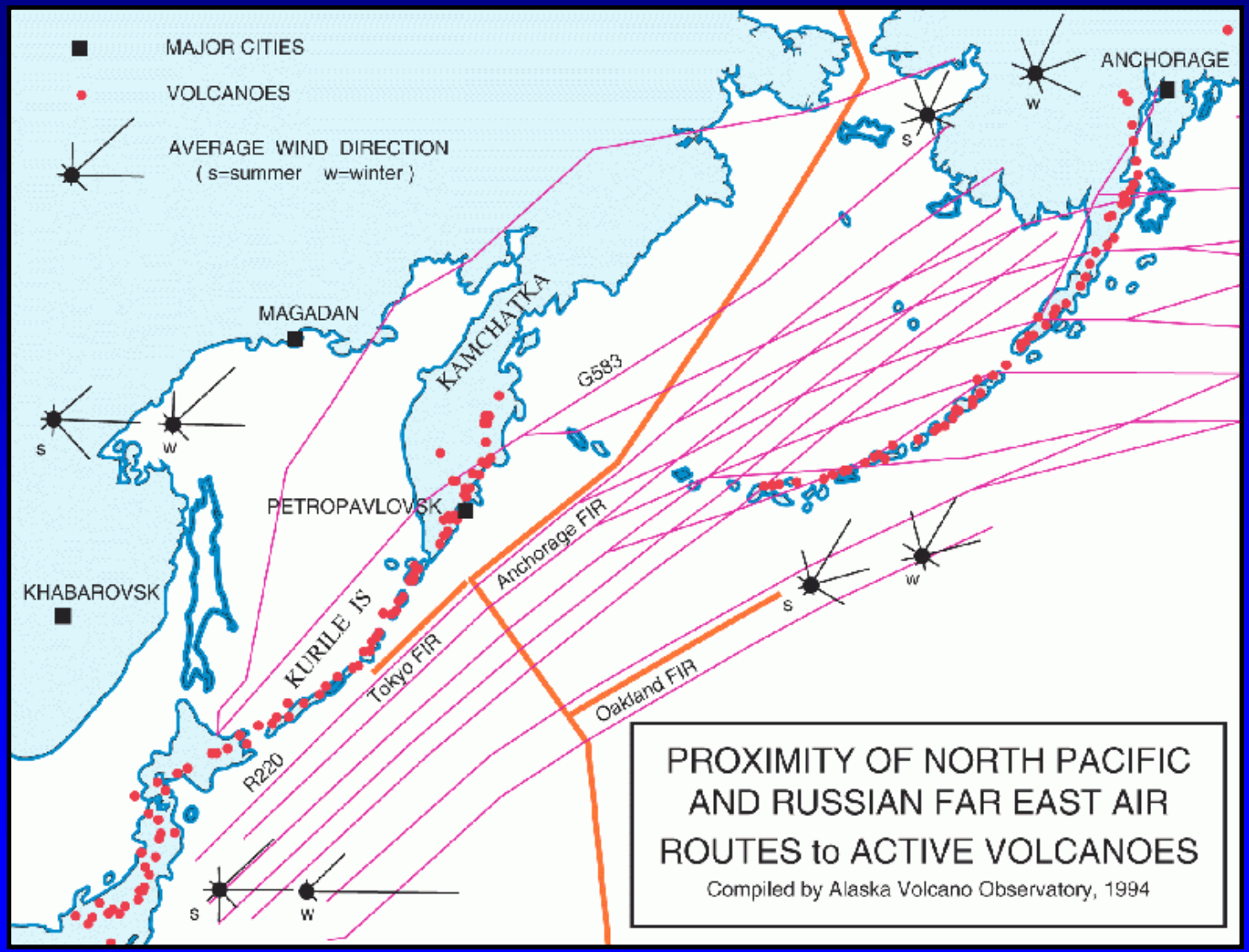
Active Volcanoes of the Aleutian Arc, Alaska

Nye, ADGGS/AVO; volcanoes from Miller et al., 1998

In Alaska, ash is the primary volcanic hazard and the main risk is to aircraft

AVO works closely with National Weather Service, FAA, Air Force, Alaska Division of Emergency Services, and others to track the ash clouds

And one of the primary groups at risk from ash is the aviation industry



Mitigating Risk from Volcanic Activity

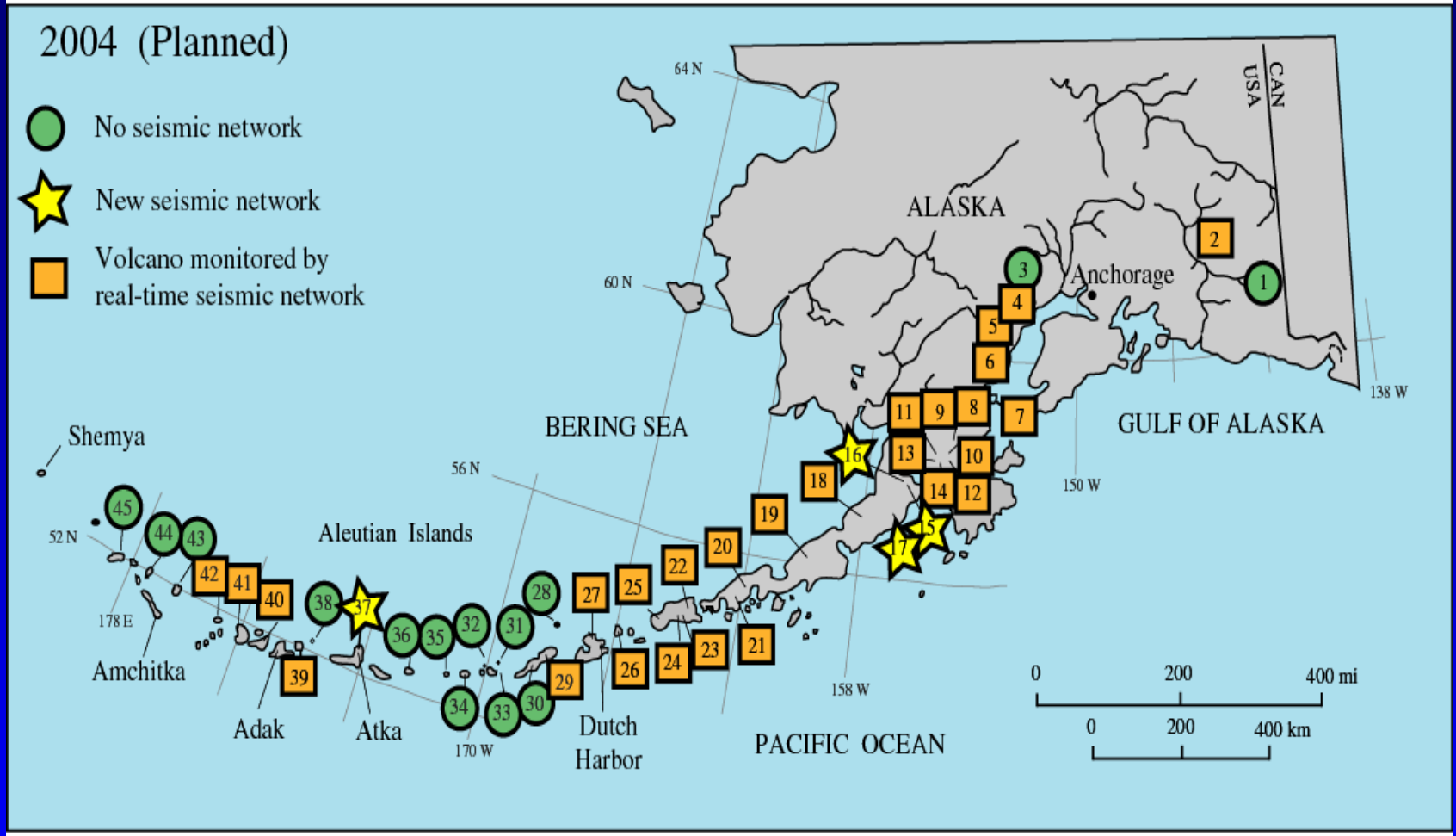
- Study past eruptive behavior to learn what is typical activity for a volcano (geology)
- Monitor volcanoes to forecast eruptions (seismology, geodesy, remote sensing)
- Track and predict the movement of erupted ash (remote sensing)
- Communicate information to the public
- Educate public as what to do

USGS

The real-time seismic networks are the foundation of AVO's monitoring effort

- 43 recently active volcanoes in Alaska
- 34 volcanoes are seismically instrumented by AVO as of fall 2006
  - 4 monitored as of 1989
  - 9 monitored as of 1996

HISTORICALLY ACTIVE ALASKAN VOLCANOES



1. Bona-Churchill [1]
2. Wrangell
3. Hayes [1]
4. Spurr
5. Redoubt
6. Iliamna
7. Augustine
8. Snowy
9. Griggs
10. Katmai
11. Novarupta
12. Trident
13. Mageik
14. Martin
15. Peulik
16. Ukinrek
17. Chiginagak
18. Aniakchak
19. Veniaminof
20. Pavlof
21. Dutton
22. Isanotski
23. Shishaldin
24. Fisher
25. Westdahl
26. Akutan
27. Makushin
28. Bogosloff
29. Okmok
30. Vsevidof
31. Kagamil
32. Carlisle
33. Cleveland
34. Yunaska
35. Amukta
36. Seguam
37. Korovin
38. Kasatochi
39. Great Sitkin
40. Kanaga
41. Tanaga
42. Gareloi
43. Cerebus
44. Little Sitkin
45. Kiska

[1]Though not historically active, merits observation owing to the hazard or eruptive potential

1. *Bona-Churchill*
2. Wrangell
3. *Hayes*
4. Spurr
5. Redoubt
6. Iliamna
7. Augustine
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41. Tanaga
42. Gareloi
43. Cerberus
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45. Kiska

AVO Seismograph Network Statistics (2005)

- AVO located 9,012 earthquakes in 2005. At many volcanoes we routinely locate events with a magnitude less than 1
- Consists of 187 permanent seismograph stations; 265 channels.
- The AVO seismograph network is composed of 23 subnetworks with 4-20 seismograph stations per subnetwork, and nine regional seismograph stations.
- Plus we use data from stations operated by AEIC and the Tsunami Warning Center.

Interactions with other seismic networks

- Sharing telemetry infrastructure
- Sharing of data
- Sharing software

But the data processing and analysis is separate

- Volcanoes generate a diverse set of seismic signals
- Different location model/program
- Separate seismic analyst
- Seismologists specializing in volcano rather than “tectonic” seismology

USGS Earthquake Program developments

- **Possibility of a new agreement between USGS, UAFGI, and DGGS regarding earthquake work in Alaska.**

- **The USGS Earthquake Program Coordinator, David Applegate, intends to come to Alaska in the next few months.**

The End