

Coombs, M.L., Cameron, C., Schneider, D.J. and Wech, A., 2023, December. The use of volcano alert levels by the Alaska Volcano Observatory-current practices and challenges. In AGU Fall Meeting Abstracts (Vol. 2023, No. 214, pp. V33F-0214).

ABSTRACT

Volcano observatories issue products notifying and informing the public and stakeholders about restless and active volcanoes in their area of jurisdiction. The Aviation Color Code (ACC) uses colors for aviation hazard and the Volcano Alert Level (VAL) uses words for ground-based hazard. Here we analyze 15 years of Volcanic Activity Notices (VANs) issued by the Alaska Volcano Observatory (AVO) to assess current application of the ACC and VAL, and reflect on best practices at AVO, which may be of interest for other volcano observatories.

Between 2008 and July 2023, AVO issued 488 VANs and coincident Volcano Observatory Notices for Aviation for 27 volcanoes. Most (80%) announced a VAL/ACC change; the remainder described a significant change in activity without a VAL/ACC change. 140 were for volcanoes at Yellow/Advisory, 180 for Orange/Watch, and 80 for Red/Warning; the remainder were lowering the VAL/ACC to Green/Normal or Unassigned (for volcanoes without adequate ground-based monitoring). In all instances, ACC and VAL were coupled.

AVO typically raised the VAL/ACC to Advisory/Yellow in response to unrest, either volcano-tectonic seismic swarms with or without accompanying deformation (32%) or other types of unrest (elevated surface temperatures, seismic tremor, and/or gas emissions; 68%). Elevation to Watch/Orange was due to escalation of unrest (20%), low-level ash emissions (62%), or effusive eruption (18%), highlighting that Watch/Orange can be used to both describe and forecast activity. Warning/Red was applied at the onset of significant explosive activity, typically with plume heights exceeding 25,000 ft asl (86%) or for sustained ash emissions at lower altitudes but with long, regionally significant plumes (14%). There were no instances of changing to Warning/Red before eruption commenced.

Issues for further consideration include: (a) that Watch/Orange can be applied both to events (effusive or low-level eruptions) and forecasting the likelihood of a larger significant eruption, (b) uncertainty about VAL/ACC for clusters of closely spaced volcanoes; (c) timeliness of raising and lowering VAL/ACC, and (d) whether the current VAL system employed by USGS is most appropriate for ground-based hazards.

Link: <https://ui.adsabs.harvard.edu/abs/2023AGUFM.V33F0214C/abstract>