

## Preparations for Evacuation

It is important to make preparations for evacuation in advance. If volcanic activity increases, obtain up-to-date, accurate information and double check your evacuation preparations.

### Advance Preparations

1. Pay careful attention to volcanic activity reports from the Morioka area Bureau of Meteorology and disaster prevention information put out by the media.
2. Confirm evacuation routes and evacuation assembly areas in advance.
3. Discuss evacuation procedures with your family and neighbours.
4. Take part in emergency drills.
5. Prepare a rucksack equipped with emergency supplies.

### In the event of evacuation

1. If advice or directives to evacuate are given by the mayor or head of your city, town or village, proceed with evacuation immediately.
2. Obtain accurate information from local authorities, the police or the fire brigade. Do not be misled by rumours or gossip.
3. In an emergency, make evacuation your priority.
4. Do not panic. Take action calmly.

### Crisis Information Updates

To obtain information about conditions in the crisis area after evacuation, please call

**Tel: 171- NTT 'Disaster Information Service'**



### Emergency Supplies Checklist

- ☐ helmet (head covering)
- ☐ cold weather clothing
- ☐ change of underwear
- ☐ mask ☐ towel ☐ radio
- ☐ gloves ☐ tissues
- ☐ pocket torch ☐ goggles
- ☐ emergency food rations
- ☐ water for drinking and cooking
- ☐ household medicines
- ☐ valuables and cash
- ☐ raincoat or umbrella



## Weather Bureau Volcanic Activity Information Broadcasts

If there is an increase in volcanic activity, the Morioka Bureau of Meteorology will broadcast the appropriate volcanic activity information announcement (detailed in the table below). Remain calm, take note of the announcement, and make any necessary preparations such as preparing for evacuation.

Announcement Type	Explanation
Volcanic Emergency Alert	Volcanic Emergency Alert is issued when volcanic activity increases to the extent that urgent countermeasures are necessary to prevent/mitigate injury or death.
Volcanic Advisory Announcement	Volcanic Advisory Announcement is issued when abnormal volcanic activity is observed and preparation for disaster prevention/mitigation is required.
Volcanic Information Announcement	Regular or special update reports giving detailed information on the current state of volcanic activity.

**For inquiries  
regarding  
this handbook**

The Ministry of Construction, Tohoku Office, Iwate Construction Office  
Tel: 019-624-3131 (Flood Forecast Division)

Iwate Prefecture Tel: 019-651-3111 (Fire and Disaster Prevention Division /  
Landslide Prevention Division)

Morioka City Tel: 019-651-4111 (Fire and Disaster Prevention Division)

Shizukuishi Town Tel: 019-682-2111 (General Affairs Division)

Nishine Town Tel: 0195-76-2111 (General Affairs Division)

Takizawa Village Tel: 019-684-2111 (General Affairs Division)

Matsuo Village Tel: 0195-74-2111 (General Affairs Division)

Tamayama Village Tel: 019-683-2111 (General Affairs Division)

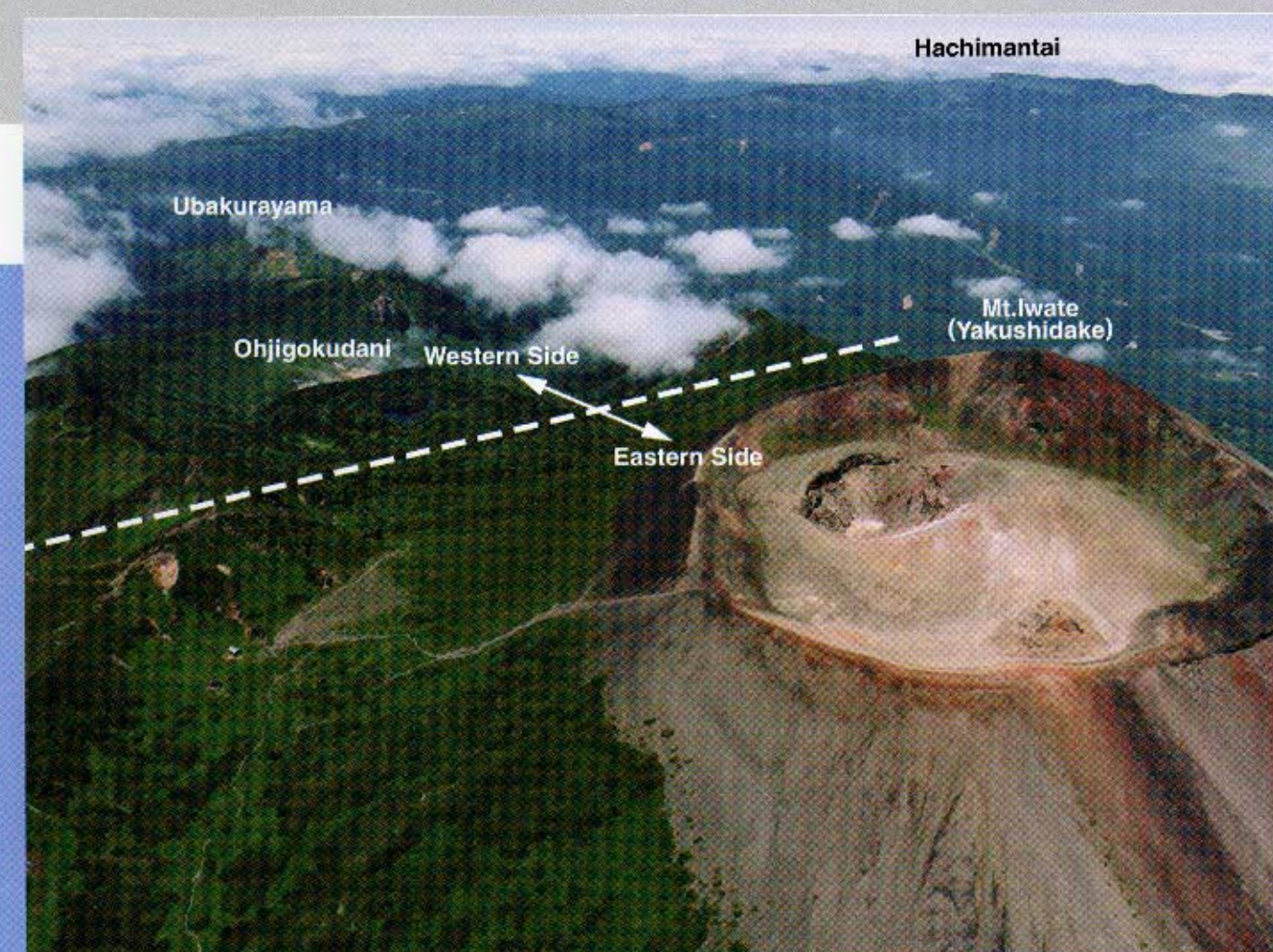
The Counter-measures Investigation  
Committee on Volcanic Disasters  
at Mt. Iwate

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Mayor of Morioka, Town manager of Shizukuishi, Town manager of Nishine, Village Headman of  
Takizawa, Village Headman of Matsuo, Village Headman of Tamayama

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Mt. Iwate

# Volcanic Disaster Prevention Handbook



October 1998

Supervisory Body:

The Counter-measures Investigation Committee on Volcanic Disasters at Mt. Iwate

Available At:

Iwate Office Tohoku Regional Construction Bureau Ministry of Construction Bureau  
Iwate Prefectural Office · Morioka City Office · Shizukuishi Town Office · Nishine Town Office  
Takizawa Village Office · Matsuo Village Office · Tamayama Village Office



## Map of Predicted Danger Zones in the Event of Mt. Iwate's Eruption

Mt. Iwate is a large active volcano with a history of repeated eruptions. Led by the national government, the prefecture and local municipal bodies, the various disaster prevention agencies have formulated policies to protect the local citizens in the event of an eruption. Despite such precautions, if an eruption were to occur, the priority would be to facilitate a quick evacuation of local residents.

This map is based on a study of previous eruptions in Mt. Iwate's history. We aim to inform the public of the potential danger zones in the case of an eruption. Our aim is to provide a map that will be of use to general households, tourist institutions and other related bodies in their efforts to prepare for a possible eruption.

## The Criteria from which the Map is Derived

The map has been developed from the following criteria:

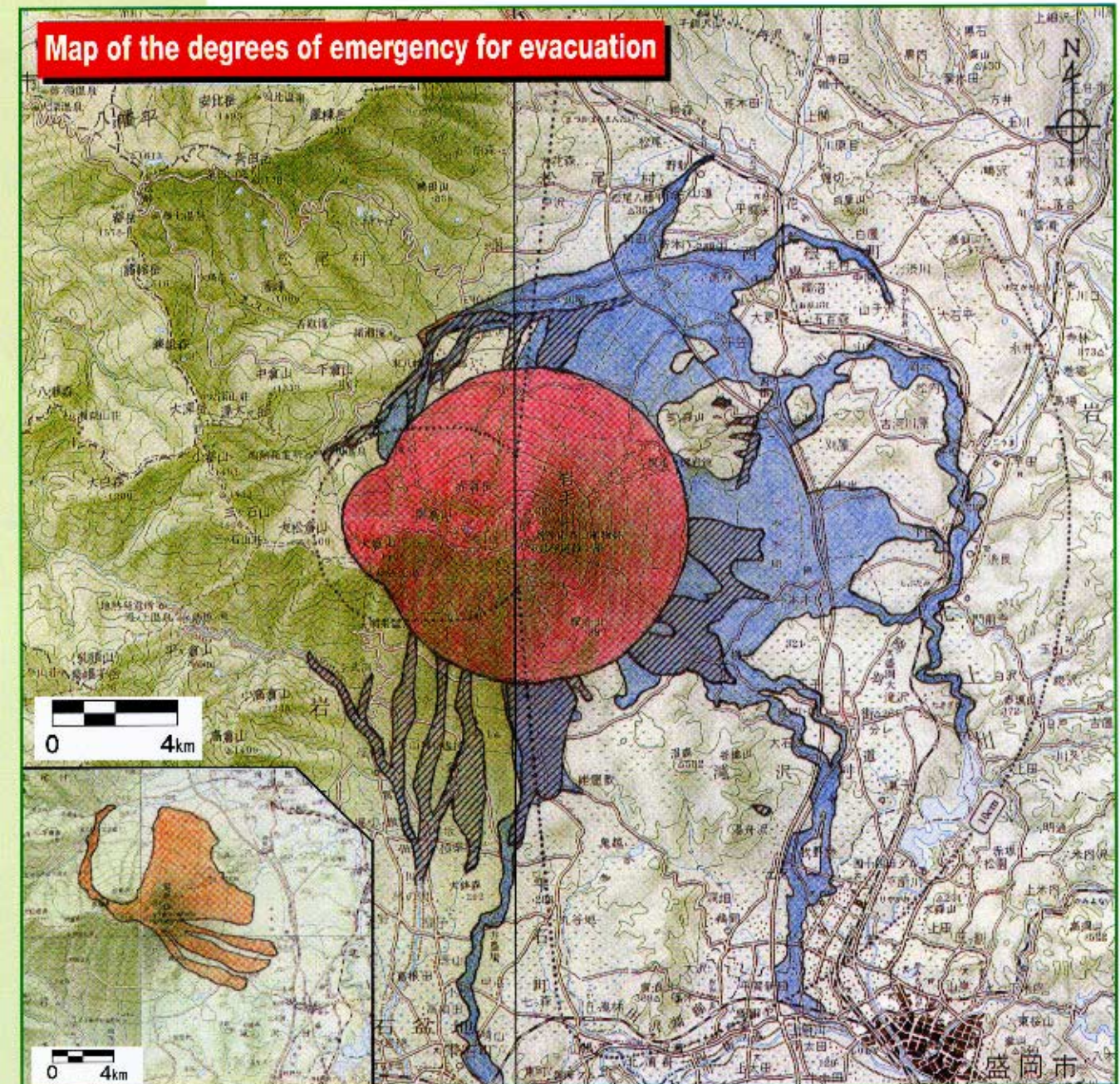
- ① Based on current observations of the volcano and its history of eruptions, the source of the eruption is most likely to occur on the western side (in the form of a steam explosion) and / or on the eastern side (as a magma eruption.)
- ② The Predicted Danger Zones in the case of a steam explosion on the western side are based on a steam explosion that occurred about 3,200 years ago (considered to be the largest such explosion of Mt. Iwate in the last 7,400 years.) The map indicates that this zone extends for about 1.5 kilometres from east to west from its predicted source of Ohjigokudani (where recent volcanic activity has been observed) to near the foot of Mt. Ubakurayama.
- ③ The Predicted Danger Zones in the case of a magma eruption on the eastern side are based on a magma eruption of 1686 (considered to be the largest such eruption of Mt. Iwate in the past 6000 years.) The eruption's source is expected to be at the crater on the summit of Mt. Iwate.

The anticipated results of such an eruption include ballistic ejecta, pyroclastic flow, pyroclastic surge, lava flow, the showering of volcanic ash, and mud-flow resulting from an avalanche or melting snow. The extent of the Predicted Danger Zones resulting from the shower of falling volcanic ash and other materials, as well as the total lava flow, is based on the amounts of ash and lava produced in the 1686 eruption. (Note: Assuming only the one large eruption, rather than a series of smaller eruptions over a short period.) Further, the extent of the Predicted Danger Zones from mud slides resulting from the pyroclastic flow, avalanche and melting snow is determined by the total amount of volcanic ash. The extent of the Predicted Danger Zones affected by ballistic ejecta and pyroclastic surge are based on other past eruptions.

- ④ There are a variety of possibilities for the direction of the falling volcanic ash and of the lava flow, depending upon wind direction and the topography. The area of the Predicted Danger Zones encompasses all possible directions.

However, it is very difficult to accurately predict volcanic eruptions. There is the possibility that the extent of an actual eruption could differ from what is indicated within this map. Please react to the actual conditions of an eruption.

## Map of the degrees of emergency for evacuation



This map issued and approved for use by the Geographical Survey Institute of the Japanese Ministry of Construction and at the scale of 1:200,000th of the original. (Approval number: 17-1017)

The above chart indicates the degrees of emergency in colors for the residents to evacuate according to the types of eruption of Mt. Iwate. Since the types of volcanic phenomenon and its time of arriving are different from region to region, pay careful attention to the following evacuation instructions.



- : This is the range of ballistic ejecta, pyroclastic flows, and pyroclastic surge would reach. Since these phenomena occur immediately after an eruption with great speed, it would be difficult for the residents to evacuate after an eruption of Mt. Iwate. No one can enter this area when an eruption is likely to occur.
- : This is the range where volcanic mudslides caused by the melting snow would reach. Volcanic mudslide is a phenomenon that occurs when snow has accumulated in the area. The speed of a volcanic mudslide is so swift that residents must evacuate as quickly as possible. The residents living in this area should be very careful about updated volcano information and evacuate appropriately when Mt. Iwate is likely to erupt after snow has accumulated.
- : This is the range where volcanic landslides caused by the rain would reach when volcanic ash has accumulated after eruption. As a volcanic landslide comes down very fast, the residents in this area should evacuate immediately when there is a heavy rainfall.
- : This is the range where lava flows would reach. The lava flows from the crater of Mt. Iwate would move slowly, so persons can evacuate on foot.

※ The range of falling volcanic ash is indicated with the dotted line. Refer to p.8 "The Fall of Volcanic Ash and Other Fallout".



## If Mt. Iwate erupts ...

### Ballistic Ejecta (Flying Rock)

These are extremely hot pieces of rock which are spewed out of the crater and fall in the surrounding area. Being hit by one of these rocks will cause injury or death to people and animals and destruction of buildings. Also they are the cause of forest fires.

### Pyroclastic Flow

This is volcanic ejecta of extremely high temperatures that forms a fast flowing stream down the volcano. When it reaches low lying areas the stream can spread out to cover a wide area. The extremely high temperature of the flow gives it a great potential for destruction, causing severe damage and harm to buildings, plants and living creatures, and making it a most dangerous phenomenon.

### Pyroclastic Surge (Blast)

Pyroclastic Surge is an explosive blast mixed with earth and sand, the flow of which can even move up small hills. It is extremely dangerous with its high speed flow capable of knocking down buildings and uprooting trees.

### Volcanic Mudslide Caused by Melting Snow

If pyroclastic flow occurs at a time when snow has fallen, the snow will melt, possibly causing a volcanic mudslide. The volcanic mudslide will pick up snow, earth and sand as it travels down the volcano which will spread out over a wide area once it reaches the bottom of the volcano.

### Lava Flow

If lava flow occurs, farm fields, buildings and other property will be burnt or buried under a thick layer of rock.

### Volcanic Ash and Other Fallout

Ash and Scoria (a lightweight black rocklike substance) thrown up from the crater is carried by air currents. In the event of a large-scale eruption, the sky may be covered with billowing smoke turning the daytime into twilight. Breathing in volcanic ash can be detrimental to a person's health. In area where volcanic ash has fallen and accumulated, there is frequent occurrence of accidents due to skidding and damage may be caused to crops over a wide area. Furthermore, if large amounts of ash accumulate, there is the danger of buildings collapsing under the weight. And in the case of rain, this weight will be increased due to water absorbed by the ash.

### Debris Avalanche (Landslide)

The collapse of a large area of the mountain triggered by eruption or earthquake. The likelihood of such a landslide is relatively small. (Past examples of landslides have been used for the Volcanic Disaster Evacuation Map.)

### Avalanche

Avalanches are triggered when rain falls on an area where volcanic ash has fallen and accumulated. It is below such areas where large amounts of ash have accumulated that there is the danger of avalanche. In this event, swampy or low lying areas are particularly dangerous and should be avoided.



**If a volcanic eruption occurs, or seems about to occur ...**

### Ballistic Ejecta (Flying Rock)



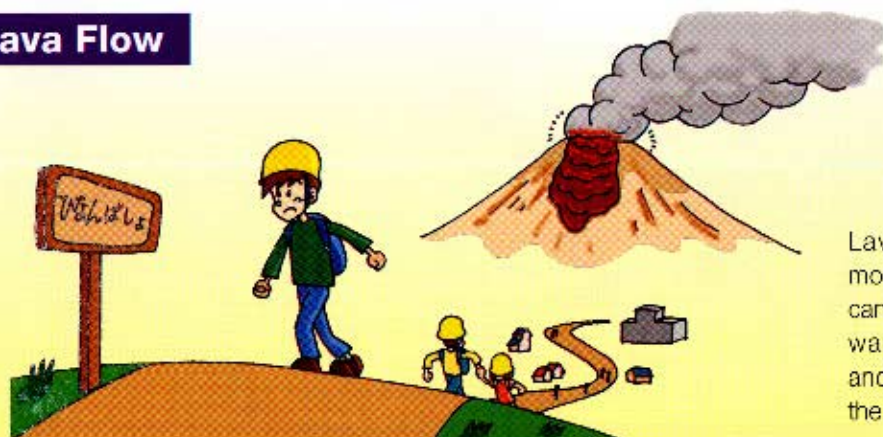
Ballistic Ejecta can land many kilometres away from the crater itself, so to be safe you should move to a place well removed from the volcano. Do not move towards Mt. Iwate.

### Pyroclastic Flow / Pyroclastic Surge



Since pyroclastic flow or pyroclastic surge can travel at very high speeds (reaching over 100 km per hour), reaching a place of refuge once it starts is extremely difficult. When the danger of eruption is high, pay careful attention to all announcements regarding the volcano, and move quickly to an area outside the Predicted Danger Zone. In the event that you do not have time to move to a safe area, take refuge behind a building or other structure situated on higher ground.

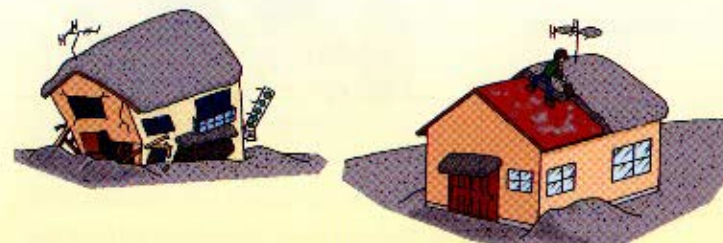
### Lava Flow



Lava flow does not usually move at high speed and you can escape it even at a normal walking pace. Remain calm and move to an area outside the Predicted Danger Zone.

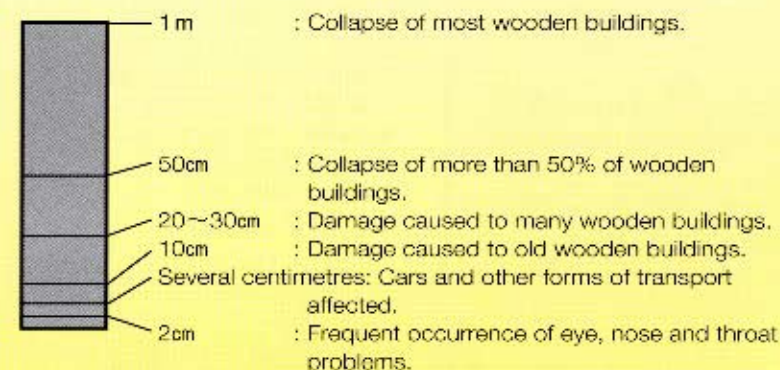
### Volcanic Ash and Other Fallout

In the event of a large amount of volcanic ash fallout, it is advisable to remove ash from the roof of your house to prevent the building from collapse.



#### Adverse effects caused by ash fallout:

a gauge showing the possible damage/effects caused according to the thickness of accumulated volcanic ash and / or Scoria.



"Even when only small amounts of volcanic ash fall, it is best to cover your mouth and nose with a towel or mask so that you don't inhale any ash. Also it is advisable to wear a hat. Although volcanic ash fallout can sometimes cause it to become very dark even during the daytime, it does not usually result in death or injury. Remain calm."



### Avalanche



Avalanches may be caused by rain, and can move at high speeds (up to 50 km/h). If heavy rain due to typhoons etc. is forecast following a volcanic eruption, move a safe distance away from the Predicted Danger Zone. In the event that you do not have time to move to a safe area, move away from rivers or other marshy, low-lying areas and take refuge on higher ground.

### Volcanic Mudslide Caused by Melting Snow

Volcanic mudslides caused by melting snow travel at high speeds (up to 60 km/h) so it is necessary move away from the area quickly. When the danger of eruption is high, pay careful attention to all announcements regarding the volcano, and move as soon as possible to an area outside the Predicted Danger Zone. In the event that you do not have time to move to a safe area, take refuge on higher ground.

