

Auckland Volcanic Hazards Simulation – Interactive Bibliography

Instructions:

1. Go to your assigned role.
2. Review your specific responsibilities.
3. Read and summarize the necessary literature to prepare for the simulation.
4. Read the instructions (separate document).

Note: The more prepared you are for the simulation, the better overall you and your team can respond to the volcanic event.

Click the links (in the readings row) to download the papers from my Dropbox. If you have trouble downloading any of the papers, please email **Jackie** asap (jdohaney@gmail.com).

Emergency Management Team

| | |
|------------------------------------|---|
| <u>Role:</u> | Group Controller |
| <u>Responsibilities:</u> | Team Leader; to lead, direct and coordinate the emergency response. Primary decision-maker. CHALLENGE questions may be posed to you and your teams. Respond accordingly and communicate this information as instructed. Be sure to read the cards with the people noted, so that everyone is informed. |
| <u>Important Readings:</u> | Volcanic Alert Levels (GNS) ; Video Advice to Emergency Management Team Leaders (Australian Govt) |
| <u>Additional Readings:</u> | Hazard Assessment of the Auckland Volcanic Field (Jan Lindsay) Advice to the Public during an Eruption (MCDEM) ; Volcano Fact Sheet: Rangitoto Volcano (GNS) |

| | |
|------------------------------------|--|
| <u>Role:</u> | Duty Manager |
| <u>Responsibilities:</u> | Coordinates and organises the EM Team, assists Group Controller to carry out tasks. Receives incoming information from GeoNet and delegates tasks. When an eruption occurs, your team must fill out Volcanic Impact Reports . It is your responsibility to make sure your team members fill these out. |
| <u>Important Readings:</u> | Volcanic Alert Levels (GNS) ; Video Advice to Emergency Management Team Leaders (Australian Govt) Auckland Volcanic Field Contingency Plan (CDEM) Infrastructure of Auckland |
| <u>Additional Readings:</u> | Proximal tephra hazards: Recent eruption studies applied to volcanic risk in the Auckland volcanic field, New Zealand (Houghton et al) |

| | |
|-----------------------------------|--|
| <u>Role:</u> | Crisis Information Manager |
| <u>Responsibilities:</u> | Records all incoming information from the Newsfeed (i.e., social media) tab, and distributes this information to the team. Keeps the team up to date with the public's wants and needs. Vets information carefully. If an event occurs, you will work with the Public Information Officers to fill out Media Releases . |
| <u>Important Readings:</u> | Advice to the Public during an Eruption (MCDEM) Infrastructure of Auckland |

| | |
|------------------------------------|---|
| <u>Additional Readings:</u> | Media Release to the Public after a small eruption on Ruapehu (MCDEM) ; Media Release to the Public after the Canterbury Earthquake (MCDEM) ; Media coverage after Ruapehu eruptions 1995 (Reuters) ; Example of news article after Ruapehu activity, and misquoting of scientist (Smellie) |
|------------------------------------|---|

| | |
|------------------------------------|---|
| <u>Role:</u> | Public Information Officer |
| <u>Responsibilities:</u> | Writes media releases to the public concerning event advice (what to do, what to be prepared for...). Liaises with GeoNet Team, and gathers incoming information. Media Releases should be timely, concise and considered. |
| <u>Important Readings:</u> | Media Release to the Public after a small eruption on Ruapehu (MCDEM) ; Media Release to the Public after the Canterbury Earthquake (MCDEM) ; Media coverage after Ruapehu eruptions 1995 (Reuters) ; Example of news article after Ruapehu activity, and misquoting of scientist (Smellie) |
| <u>Additional Readings:</u> | VEI: Volcanic Explosivity Index (Newhall & Self) ; Advice to the Public during an Eruption (MCDEM) |

| | |
|------------------------------------|--|
| <u>Role:</u> | Planning Manager |
| <u>Responsibilities:</u> | Primarily concerned with infrastructure and evacuation efforts. Focus on status of major road networks (works with Infrastructure Coordinator on this effort). Evacuations are planned with Welfare Officer. |
| <u>Important Readings:</u> | Auckland Volcanic Field Contingency Plan (CDEM) ; Volcanic ash impacts on critical infrastructure (Wilson) ; Infrastructure of Auckland |
| <u>Additional Readings:</u> | Aviation hazards from Volcanoes (Prata & Tupper) ; Advice for Airports during an Eruption (Wilson & Stewart) ; Advice for use of Generators during an Eruption (Hill et al) ; Advice for Power Plant Operators during an Eruption (Wilson et al) ; Advice for Urban Clean-up following an Eruption (Wilson et al) ; Aviation Alert Level Codes (GNS) ; Auckland's water supply system, and Demand Report in 2011 (WaterCare) |

| | |
|------------------------------------|---|
| <u>Role:</u> | Infrastructure Coordinator |
| <u>Responsibilities:</u> | Primarily in charge of the status of roads, water (waste and drinking), shipping, rail, and airports. Works with VAAC/CAA on air. Works with Planning Manager on roads. Works with Welfare Officer on evacuation routes. |
| <u>Important Readings:</u> | Volcano Fact Sheet: Rangitoto Volcano (GNS) ; Volcanic ash impacts on critical infrastructure (Wilson) ; Advice for use of Generators during an Eruption (Hill et al) ; Advice for Roading Managers during an Eruption (Wilson et al) ; Advice for Building Managers during an Eruption (Wilson et al) ; Advice for Power Plant Operators during an Eruption (Wilson et al) ; Advice for Power Transmission Operators during an Eruption (Wilson et al) ; Advice for Wastewater Managers during an Eruption (Wilson et al) ; Advice for Water Supply Managers during an Eruption (Stewart and Wilson) ; Advice for Urban Clean-up following an Eruption (Wilson et al) ; Infrastructure of Auckland |
| <u>Additional Readings:</u> | Proximal tephra hazards: Recent eruption studies applied to volcanic risk in the Auckland volcanic field, New Zealand (Houghton et al) ; Ash leachates (Stewart et al) |

| | |
|------------------------------------|--|
| <u>Role:</u> | Welfare Officer |
| <u>Responsibilities:</u> | Organising and planning the essentials of life for people affected by an event – Primarily concerned with evacuation centres, Salvation Army, and Housing New Zealand. Works with Planning Manager on evacuation routes and centre locations. Works with VSAG Human Impacts on how volcanic eruptions may affect citizens. |
| <u>Important Readings:</u> | Volcano Fact Sheet: Rangitoto Volcano (GNS) ; Volcanic ash impacts on critical infrastructure (Wilson) ; Advice for Building Managers during an Eruption (Wilson et al) ; Organisational Response to Ruapehu Eruption (Paton et al) Human Impacts from Volcanoes (Doocy et al) Infrastructure of Auckland |
| <u>Additional Readings:</u> | Proximal tephra hazards: Recent eruption studies applied to volcanic risk in the Auckland volcanic field, New Zealand (Houghton et al) |

| | |
|------------------------------------|---|
| <u>Role:</u> | Human Impacts (Volcanic Scientific Advisory Group) |
| <u>Responsibilities:</u> | Specialises on how ash and volcanic eruptions impact humans (health, sociological, and infrastructure related). Liases with other members of the EM Team to assess impacts to human health. Should request information from GeoNet as needed (e.g., ash composition, size, eruption styles, etc.) |
| <u>Important Readings:</u> | Ash leachates (Stewart et al) Contamination of water supplies due to volcanic ash (Stewart et al) ; Proximal tephra hazards: Recent eruption studies applied to volcanic risk in the Auckland volcanic field, New Zealand (Houghton et al) Human Impacts from Volcanoes (Doocy et al) |
| <u>Additional Readings:</u> | Volcanic ash impacts on critical infrastructure (Wilson) ; Auckland's water supply system, and Demand Report in 2011 (WaterCare) ; Health Effects of VOG (Office of the Governor) ; Advice for Water Supply Managers during an Eruption (Stewart and Wilson) ; Advice for Urban Clean-up following an Eruption (Wilson et al) Advice for Building Managers during an Eruption (Wilson et al) ; |

| | |
|------------------------------------|---|
| <u>Role:</u> | Economic Impacts (Volcanic Scientific Advisory Group) |
| <u>Responsibilities:</u> | Provides EM Team with advice on how eruptive activity and decision-making will impact the local and national economy. All decisions made by the Team should be considered (cost, short term and long term) economic impacts. Long term impacts – relocation of people, insurance, tourism, etc. Should be considered. |
| <u>Important Readings:</u> | Proximal tephra hazards: Recent eruption studies applied to volcanic risk in the Auckland volcanic field, New Zealand (Houghton et al) ; Aviation hazards from Volcanoes (Prata & Tupper) ; Exercise Ruauoko - Report of the Economic Workgroup: Assessment of the Impacts of a Volcanic Eruption on the Auckland Economy (Shearer) Infrastructure of Auckland |
| <u>Additional Readings:</u> | Volcano Fact Sheet: Rangitoto Volcano (GNS) ; Volcanic ash impacts on critical infrastructure (Wilson) ; Advice for Urban Clean-up following an Eruption (Wilson et al) Auckland's water supply system, and Demand Report in 2011 (WaterCare) ; Advice for Power Plant Operators during an Eruption (Wilson et al) |

| | |
|------------------------------------|--|
| <u>Role:</u> | VAAC (Volcanic Ash Advisory Centre)/ CAA (Civil Aviation Authority of New Zealand) |
| <u>Responsibilities:</u> | Makes final call on whether to close or open air space over NZ. Should liaise with MetService (in GeoNet) on status of weather and with Ash Specialist (in GeoNet) on location of ash dispersal events. Liaise with Economic Impacts to consider costs of closing airports. |
| <u>Important Readings:</u> | Aviation Alert Level Codes (GNS) ; Volcano Fact Sheet: Rangitoto Volcano (GNS) ; Aviation hazards from Volcanoes (Prata & Tupper) ; Advice for Airports during an Eruption (Wilson & Stewart) |
| <u>Additional Readings:</u> | Proximal tephra hazards: Recent eruption studies applied to volcanic risk in the Auckland volcanic field, New Zealand (Houghton et al) |

GNS GeoNet Team

| | |
|------------------------------------|---|
| <u>Role:</u> | Volcanic Section Manager |
| <u>Responsibilities:</u> | Team Leader; To lead, direct and coordinate monitoring of volcanoes in NZ. Makes final decision to raise or lower alert levels. When/if an Alert Level must be raised or lowered, you need to fill out an Alert Level Change form. CHALLENGE questions may be posed to you and your teams. Respond accordingly and communicate this information as instructed. Be sure to read the cards with the people noted, so that everyone is informed. |
| <u>Important Readings:</u> | Volcanic Alert Levels (GNS) ; Video Volcanic Eruption Meeting Agenda (Jolly) ; Proximal tephra hazards: Recent eruption studies applied to volcanic risk in the Auckland volcanic field, New Zealand (Houghton et al) VEI: Volcanic Explosivity Index (Newhall & Self) ; Advice to Emergency Management Team Leaders (Australian Govt) ; Monitoring seismic precursors to an eruption from the Auckland Volcanic Field, New Zealand (Sherburn et al) ; |
| <u>Additional Readings:</u> | Basics on monitoring Gas, Seismic and Deformation (IRIS) ; Volcanic styles of the Auckland Volcanic Field (Smith & Allen) ; Working on Volcanoes (GNS) |

| | |
|------------------------------------|---|
| <u>Role:</u> | Public Information Officer |
| <u>Responsibilities:</u> | Writes media releases to the public concerning the SCIENCE of an event. Liases with EM Team, and provides timely information as the event unfolds. Media Releases should be timely, concise and considered. |
| <u>Important Readings:</u> | Volcanic Alert Levels (GNS) ; Video VEI: Volcanic Explosivity Index (Newhall & Self) ; Media Release to the Public after a small eruption on Ruapehu (MCDEM) ; Media coverage after Ruapehu eruptions 1995 (Reuters) ; Example of news article after Ruapehu activity, and misquoting of scientist (Smellie) |
| <u>Additional Readings:</u> | Proximal tephra hazards: Recent eruption studies applied to volcanic risk in the Auckland volcanic field, New Zealand (Houghton et al) |

| | |
|------------------------------------|--|
| <u>Role:</u> | Geophysics (Remote Monitoring) |
| <u>Responsibilities:</u> | Monitors seismic data tabs. Records, analyses this data and provides updates to GeoNet Team. Additional datasets may show up in the Newsfeed data tab. |
| <u>Important Readings:</u> | Volcanic Alert Levels (GNS) ; Video Monitoring seismic precursors to an eruption from the Auckland Volcanic Field, New Zealand (Sherburn et al) ; Basics on monitoring Gas, Seismic and Deformation (IRIS) |
| <u>Additional Readings:</u> | VEI: Volcanic Explosivity Index (Newhall & Self) |

| | |
|------------------------------------|---|
| <u>Role:</u> | Geochemistry (Remote Monitoring) |
| <u>Responsibilities:</u> | Monitors geochemistry data tab. Records, analyses this data and provides updates to GeoNet Team. |
| <u>Important Readings:</u> | Volcanic Alert Levels (GNS) ; Video COSPEC at Active Volcanoes (Stix et al) ; Basics on monitoring Gas, Seismic and Deformation (IRIS) |
| <u>Additional Readings:</u> | Proximal tephra hazards: Recent eruption studies applied to volcanic risk in the Auckland volcanic field, New Zealand (Houghton et al) ; VEI: Volcanic Explosivity Index (Newhall & Self) ; Ash leachates (Stewart et al) ; Health Effects of VOG (Office of the Governor) |

| | |
|------------------------------------|--|
| <u>Role:</u> | Geodesy (Remote Monitoring) |
| <u>Responsibilities:</u> | Monitors ground deformation data tab. Records, analyses this data and provides updates to GeoNet Team. |
| <u>Important Readings:</u> | Volcanic Alert Levels (GNS) ; Video Monitoring seismic precursors to an eruption from the Auckland Volcanic Field, New Zealand (Sherburn et al) ; Basics on monitoring Gas, Seismic and Deformation (IRIS) |
| <u>Additional Readings:</u> | Proximal tephra hazards: Recent eruption studies applied to volcanic risk in the Auckland volcanic field, New Zealand (Houghton et al) ; VEI: Volcanic Explosivity Index (Newhall & Self) |

| | |
|------------------------------------|---|
| <u>Role:</u> | Visual Surveillance (Volcanology Unit) |
| <u>Responsibilities:</u> | Monitors Visuals (webcam) data tab. Records, analyses this data and provides ongoing updates to GeoNet Team. Be aware of extra data sets that may show up in the Newsfeed tab. |
| <u>Important Readings:</u> | Volcanic Alert Levels (GNS) ; Video Proximal tephra hazards: Recent eruption studies applied to volcanic risk in the Auckland volcanic field, New Zealand (Houghton et al) ; VEI: Volcanic Explosivity Index (Newhall & Self) ; Proximal tephra hazards: Recent eruption studies applied to volcanic risk in the Auckland volcanic field, New Zealand (Houghton et al) |
| <u>Additional Readings:</u> | COSPEC at Active Volcanoes (Stix et al) ; Basics on monitoring Gas, Seismic and Deformation (IRIS) ; Littoral Hydrovolcanic Explosions: a case study of lava – seawater interaction at Kilauea Volcano (Mattox & Mangan) |

| | |
|-----------------------------|---|
| Role: | MetService Meteorologist (Volcanology Unit) |
| Responsibilities: | Monitors Weather data tab. Records this data and provides ongoing updates to the Ash and Flow scientists (they need this information to make tephra dispersal maps). Be aware that Weather Forecasts will show up in the Newsfeed tab. |
| Important Readings: | Volcanic Alert Levels (GNS) ; Video Basics on monitoring Gas, Seismic and Deformation (IRIS) ; Quantitative Modelling of Ash Plumes (Carey and Sparks) |
| Additional Readings: | Proximal tephra hazards: Recent eruption studies applied to volcanic risk in the Auckland volcanic field, New Zealand (Houghton et al) ; VEI: Volcanic Explosivity Index (Newhall & Self) |

| | |
|-----------------------------|---|
| Role: | Ash Specialist (Volcanology Unit) |
| Responsibilities: | Monitors Ash Reports data tab. Records data, and creates ash dispersal maps based on each eruption. Ash dispersal maps can be made using this Ash Plume Model excel sheet: Ash Plume Dispersal Model Excel Sheet (Hill and Edwards) If you have questions on how to use this excel sheet, please ask. You will need weather information to help calculate ash thicknesses. <i>This information must be sent to the EM team as soon as possible.</i> |
| Important Readings: | Volcanic Alert Levels (GNS) ; Video Ruapehu Ash Isopach Example (Wilson) ; Quantitative fall out models of ash; Used to determine ash cloud distributions (Carey and Sparks) Ash dispersal estimates from the AVF (Bebbington and Cronin) |
| Additional Readings: | Proximal tephra hazards: Recent eruption studies applied to volcanic risk in the Auckland volcanic field, New Zealand (Houghton et al) ; VEI: Volcanic Explosivity Index (Newhall & Self) ; Basics on monitoring Gas, Seismic and Deformation (IRIS) ; Advice for Airports during an Eruption (Wilson & Stewart) |

| | |
|-----------------------------|--|
| Role: | Flow Specialist (Volcanology Unit) |
| Responsibilities: | Monitors Visual tabs with Surveillance expert to assess what possible flows (ash, pyroclastic and lava) can happen when an eruption occurs. Map estimated run-out, confirm with LIDAR data (Additional datasets will show up in Newsfeed tab) and help determine an appropriate “exclusion zone” based on proximal hazards. Liaise with Section Manager and Planning Manager (EM Team) to discuss proximal hazards and run-out. |
| Important Readings: | Volcanic Alert Levels (GNS) ; Video Ruapehu Ash Isopach Example (Wilson) ; Pyroclastic flow assessments from Merapi 2010 eruptions (Jenkins et al) ; Volcanic styles of the Auckland Volcanic Field (Smith & Allen) |
| Additional Readings: | Proximal tephra hazards: Recent eruption studies applied to volcanic risk in the Auckland volcanic field, New Zealand (Houghton et al) ; Quantitative fall out models of ash; Used to determine ash cloud distributions (Carey and Sparks) VEI: Volcanic Explosivity Index (Newhall & Self) ; Basics on monitoring Gas, Seismic and Deformation (IRIS) |

| | |
|------------------------------------|--|
| <u>Role:</u> | Field Team (Volcanology Unit) |
| <u>Responsibilities:</u> | To organise, plan field excursions to check for visually observed and measured data that cannot be assessed remotely. Must ask permission from Section Manager when going out into the field by filling out Fieldwork Risk Assessment forms. Check with other GeoNet team members if additional datasets are needed. When “going to the field” – visit the “ Volcano ” to get your information. |
| <u>Important Readings:</u> | Working on Volcanoes (GNS) ; Volcanic Alert Levels (GNS) ; Video Proximal tephra hazards: Recent eruption studies applied to volcanic risk in the Auckland volcanic field, New Zealand (Houghton et al) ; VEI: Volcanic Explosivity Index (Newhall & Self) ; Basics on monitoring Gas, Seismic and Deformation (IRIS) Pyroclastic flow assessments from Merapi 2010 eruptions (Jenkins et al) ; |
| <u>Additional Readings:</u> | COSPEC at Active Volcanoes (Stix et al) ; Monitoring seismic precursors to an eruption from the Auckland Volcanic Field, New Zealand (Sherburn et al) ; Littoral Hydrovolcanic Explosions: a case study of lava – seawater interaction at Kilauea Volcano (Mattox & Mangan) |