**Living on the Edge Unit 5: SEISMOLOGISTS**

**A report on the seismic activity must be prepared in order to assess and forecast future activity. Complete the following components of the seismology report:**

1. Briefly describe how seismicity is used to monitor volcanoes.
2. What do increases and decreases in RSAM data indicate about magma movement inside the volcano?
3. Use **Table S** on the back of this sheet to describe the type of seismic data and activity you have. This should help organize your description of the evolution of seismic activity at the volcano.
4. Look at the map and cross sections of earthquake locations (use the maps and cross sections) between May 6 and June 8. Are there any changes in the earthquake locations over time? If so, what are those variations?

5) What is your interpretation of the seismic data in terms of the potential for volcanic activity in the future? Use the Mount Rainier area hazard map and the USGS Volcano Alert system (table shown on back of this page) to decide what alert level the volcano should be at today. Explain your answer (use space on back of page as needed).

**Living on the Edge Unit 5: SEISMOLOGISTS**

6) What type of observations or data would you like to have access to (and why) in order to better understand the state of Mount Rainier at this time?

**Table S**

|  |  |  |  |
| --- | --- | --- | --- |
| Date | Type of data | Pattern/description of activity | Interpretation |
| May 15 | Seismogram | 1 earthquake event, recorded at 2 stations — at summit and NE flank | Single event most similar to a VT (volcano-tectonic) event indicating rock movement from magma migration |
| May 6-May 31 | EQ locations |  |  |
| June 1-7 | EQ locations |  |  |
| May 10-June8 | RSAM |  |  |
| June 1-8 | Seismic Events (histogram) |  |  |

|  |  |
| --- | --- |
| Alert Level | Description |
| Normal | Volcano is in typical background, non-eruptive state *or, if changing from a higher level*:The activity has ceased and volcano has returned to non-eruptive background state. |
| Advisory | Volcano is exhibiting signs of elevated unrest above known background level; *or, if changing from a higher level:*Volcanic activity has decreased significantly but continues to be closely monitored for possible renewed increase. |
| Watch | Volcano is exhibiting heightened or escalating unrest with increased potential of eruption, timeframe uncertainOR eruption is underway but poses limited hazards. |
| Warning | Hazardous eruption is imminent, underway, or suspected. |

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From: <http://volcanoes.usgs.gov/activity/alertsystem/index.php#alertlevel>

**Living on the Edge Unit 5: GAS GEOCHEMISTS + ASH DISPERSAL**

**A report on the gas emissions and fumarolic activity must be prepared in order to assess and forecast future activity. Complete the following components of the gas geochemistry report:**

1. Briefly describe how SO2 gas emissions are related to potential volcanic eruptions (in general) and how gas emission data helps monitor volcanoes.
2. What do **increased** SO2 gas emissions indicate about a potential eruption? Why?

What do **decreased** SO2 gas emissions indicate about a potential eruption? Why?

1. What does the Ash Dispersal tell you about activity at the volcano up to this point?
2. Use **Table G** on the back of this sheet to describe type of the gas data and fumaroles activity information you have. This should help organize your description of the evolution of gas and fumarole activity at the volcano since April.
3. What is your interpretation of the SO2 gas emission data in terms of the potential for volcanic activity in the future? Use the Mount Rainier area hazard map and the USGS Volcano Alert system to decide what alert level the volcano should be at today. Explain your answer (use space on back of page as needed).

**Living on the Edge Unit 5: GAS GEOCHEMISTS + ASH DISPERSAL**

5) What type of observations or data would you like to have access to (and why) in order to better understand the state of Mount Rainier at this time?

**Table G**

|  |  |  |  |
| --- | --- | --- | --- |
| Date | Type of activity | Pattern/description of activity | Interpretation |
| April 2 | Ground deformation |  |  |
| May 13-May 25 | SO2 emissions (ton/day) |  |  |
| May 26- May 28 | SO2 emissions (ton/day) |  |  |
| May 30- June 8 | SO2 emissions (ton/day) |  |  |

|  |  |
| --- | --- |
| Alert Level | Description |
| Normal | Volcano is in typical background, non-eruptive state *or, if changing from a higher level*:The activity has ceased and volcano has returned to non-eruptive background state. |
| Advisory | Volcano is exhibiting signs of elevated unrest above known background level; *or, if changing from a higher level:*Volcanic activity has decreased significantly but continues to be closely monitored for possible renewed increase. |
| Watch | Volcano is exhibiting heightened or escalating unrest with increased potential of eruption, timeframe uncertainOR eruption is underway but poses limited hazards. |
| Warning | Hazardous eruption is imminent, underway, or suspected. |

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From: <http://volcanoes.usgs.gov/activity/alertsystem/index.php#alertlevel>**Living on the Edge Unit 5: TILT DATA**

1. Briefly describe what a tiltmeter measures and how a tiltmeter assists in monitoring magma movement in volcanoes (what does the volcano do and how does the tiltmeter help in measuring that)?
2. What do **increases** and **decreases** intilt indicate about the movement of magma inside a volcano?
3. Make a simple sketch of how a tiltmeter is used at volcanoes.
4. Use **Table T** on the back of this sheet to describe the type of tilt data and activity you have. This should help organize your description of the evolution of tilt activity at the volcano since May.

5) What is your overall interpretation of the tilt data in terms of the potential for volcanic activity in the near future? Use the Mount Rainier area hazard map and the USGS Volcano Alert system to decide what alert level the volcano should be at today. Explain your answer (use space on back of page as needed).

**Living on the Edge Unit 5: TILT DATA**

6) What type of observations or data would you like to have access to (and why) in order to better understand the state of Mount Rainier at this time?

**Table T**

|  |  |  |  |
| --- | --- | --- | --- |
| Date(s) | Type of activity | Pattern/description of activity | Interpretation |
| May 31-June 4 |  |  |  |
| June 4- June 8 |  |  |  |

|  |  |
| --- | --- |
| Alert Level | Description |
| Normal | Volcano is in typical background, non-eruptive state *or, if changing from a higher level*:The activity has ceased and volcano has returned to non-eruptive background state. |
| Advisory | Volcano is exhibiting signs of elevated unrest above known background level; *or, if changing from a higher level:*Volcanic activity has decreased significantly but continues to be closely monitored for possible renewed increase. |
| Watch | Volcano is exhibiting heightened or escalating unrest with increased potential of eruption, timeframe uncertainOR eruption is underway but poses limited hazards. |
| Warning | Hazardous eruption is imminent, underway, or suspected. |

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From: <http://volcanoes.usgs.gov/activity/alertsystem/index.php#alertlevel>