

## **Katie Wilkinson Scholarship Report**

### **Investigating Carbon Dioxide Levels in Soils on Montserrat**

by Vicky Simonds

I travelled to Montserrat in October 2007, to study the volcano and assist the volcanologists at the volcano observatory. Montserrat is a small Island in the Lesser Antilles region of the Caribbean, a close neighbour of Antigua. The Soufriere Hills volcano has been erupting for the past 12 years; at present the eruption is in its 3rd pause phase and has been since April 2007, currently there is a very large dome of partially molten lava sitting on top of the volcano that is capable of collapsing or exploding at any time.



**The Soufriere Hills Volcano viewed from the Montserrat Volcano Observatory, November 2007.**

The aim of my project was to record the amount of CO<sub>2</sub> that was in the soil and how this differs over time. This allows me to see how the levels of CO<sub>2</sub> differ with different levels of volcanic activity. Ultimately the aim was to see if this could be used as an aid to the scientists at the Montserrat Volcano Observatory (MVO), as with continuous measurements and monitoring it might be a useful precursor to volcanic activity.

I carried out the data collection at various sites in the exclusion zone on Montserrat to the northwest of the volcano, focusing especially along Cork Hill Road, St Georges Hill and Hot Water Pond. At each location I took a GPS reading, then I hammered a hollow stake into the ground, using a pipe I then attached the GA2000, which is the gas analyser that tells us the percentage of CO<sub>2</sub> in the soil. Once this was all attached I turned the pump on, this was left running until the percentages of gases levelled off, the percentages were then recorded along with any relevant site details, such as the land use and ground cover.



**Left: shows me attaching the gas tubes to the gas probe that has been hammered into the ground  
Right: shows me recording the gas data with all of the apparatus assembled.**

When making a comparison of my results with previous years results (taken by others), my readings were relatively low, as volcanic activity is minimal at present. This however concurs with what I would expect. Activity is fairly low at the moment as no lava is actively being extruded. So the amount of CO<sub>2</sub> that is found in the soil ties in with the activity levels of the volcano. The readings have to be taken in exactly the same places, as the structural geology (faults), will influence whether or not there is increased levels of CO<sub>2</sub> within the soil.

Overall this research has provided another method of monitoring the volcano, hence aiding scientists in their decisions on safe and unsafe areas. As primarily, increased levels of CO<sub>2</sub> can be very harmful to human health, as levels of 5% can be fatal. Secondly if it can be used as a precursor to volcanic activity then it allows evacuations to be planned, in effect saving peoples lives.

The Katie Wilkinson scholarship award greatly assisted this research by allowing me to travel to the Montserrat, West Indies in order to collect my field data.