EGU22-8156
https://doi.org/10.5194/egusphere-egu22-8156
EGU General Assembly 2022

Investigating the carbon biogeochemical cycle at Mt Etna

Maddalena Pennisi, **Simone D'Incecco**, Ilaria Baneschi, Matteo Lelli, Antonello Provenzale, and Brunella Raco
Istituto di Geoscienze e Georisorse, CNR, Pisa, Italy

The continuous acquisition of CO_2 soil flux data has been started on Mt Etna in November 2021, with the aim of assessing a first balance between CO_2 from volcanic and biological origin. Our long-term goal is an interdisciplinary study of volcanic, biological, ecological, biogeochemical, climatic and biogeographical aspects, including the anthropogenic impact on the environment. All aspects are integrated in the study of the so-called *Critical Zone*, i.e. the layer between the deep rock and the top of the vegetation where the main biological, hydrological and geological processes of the ecosystem take place. The new research activity at Mt Etna is performed within the framework of the PON-GRINT project for infrastructure enhancement (EU, MIUR), and it adds up to activities going on at Grand Paradiso National Park (Italian Alps), and Ny Alesund (Svalbard, NO, High Arctic) in the framework of the IGG-CNR Critical Zone Observatories.

During the first phase of the project, two fixed stations were installed in two sites at Piano Bello (Valle del Bove, Milo), in an area where the endemic *Genista aetnensis* grows. An Eddy Covariance system for net CO_2 ecosystem exchange measurement and a weather station will be installed in 2022. Carbon stable isotopes data will be acquired periodically using in-situ instrumentation (i.e. Delta Ray). The installation sites are selected after CO_2 soil flux surveys around the volcano using a portable accumulation chamber. The two stations installed at Piano Bello consist of an automatic accumulation chamber fixed to the ground, a mobile lid with a diffusion infrared sensor for measuring CO_2, a data logger and a sensor for measuring soil moisture and temperature. The accumulation chambers are programmed to acquire data on ecosystem respiration every hour for all day. Data are transmitted to the IGG data collection center. The new IGG-CNR Mt Etna CZO will contribute investigating CO_2 fluxes at the soil-vegetation-atmosphere interface in different geological and environmental contexts. We benefit from the collaboration with the National Institute of Geophysics and Volcanology (INGV), the *Ente Parco dell'Etna, and the Dipartimento Regionale dello Sviluppo Rurale e Territoriale di Catania*.