Federico Rabuffi

Geologist and Earth Scientist

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Work Experience

Postdoc | 16th January 2024 – Present
NASA JET PROPULSION LABORATORY (PASADENA, CA, USA)

- Research activity in Earth Science. Earth Observation using spectral imaging in the optical range

JVSRP at NASA Jet Propulsion Laboratory | 31st October 2022 – 27th January 2023
NASA JET PROPULSION LABORATORY (PASADENA, CA, USA)

- Analysis of Geothermal area by VNIR/SWIR hyperspectral data (RPISMA and AVIRIS) to advance the field of geothermal anomaly mapping for future upcoming missions, a part of the NASA Earth System Observatory.

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Earth Observation Scientist | July 2019 – Jan 2024
INGV (Istituto Nazionale Di Geofisica E Vulcanologia)

· **Research activity in Earth Science – Remote Sensing**

- PhD project concerns the monitoring and analysis of geothermal areas by remote sensed and field data.
- Processing of Multi- and Hyperspectral data in the VNIR/SWIR up to TIR spectral rage by using mainly ENVI software, Python, IDL and QGIS.
- Production and statistical analysis of time series data in Volcanic area to monitor and detect changes in activity by statistical approach.
- Production and enhancement of a spatial relational database in SQL language (PosgreSQL) using PostGIS extention and PgAdmin application in support to the activity.
- Providing support to PhD and MSc candidate in EO.
- Scientific dissemination activity in several international conferences.
- Development & implementation of WEB - GIS platform in different projects
- Participation in the CHIME project (Copernicus Hyperspectral Imaging Mission), one of the three new high priority missions of the Copernicus program, ESA (European Space Agency)
- Processing of satellite data for territorial analysis.
- Field campaigns
- Scientific dissemination activity in several international conferences.

Environmental Geologist | Sept 2018 – Dec 2018 (pt.1) **| Sept 2019 – Dec. 2019** (pt.2)
I.R.I.D.E. SRL – Environmental Sustainability Consulting Service

- **Collection and Data Analysis**:
  Abroad mission (Kuwait City – Kuwait) to collect, process and evaluate geospatial data; archiving mission geospatial data.
  Field campaign to collet sub-surface gas measurements and processing of the to carry out map of the sub-surface gas.

Internship in Remote Sensing | May 2017 – Sept 2018
INGV (Istituto Nazionale Di Geofisica E Vulcanologia)

- **Multi- and Hyperspectral data Analysis**:
  Production and Analysis of Time Series about Land Surface Temperature maps for volcanic monitoring.

Education

PhD in Earth Science - Geology| 2020-2023
Roma Tre University – INGV

MASTER II in Energy Resource Management | Jan. 2019 – July 2019
SAFE

MSc in Field and Natural Resource Geology | 2015 – 2017 | SUMMA CUM LAUDE
Roma Tre University

BSc in Geology | 2012 – 2015
Roma Tre University

Skills

IT:
QGIS and ArcGIS, ENVI, 3D visualization software, MATLAB, Python, Blender, Office suite.

SOFT SKILLS:
Creativity; Problem Solving; Teamworking; Stress and Time management; Growth mindset, Agile Working, Technology trend awareness.

LANGUAGES:
Italian (First Language) English (Advanced) French (Basic)

HOBBIES:
Photography, sailing, horse riding, training, 3D modelling by Blender and QGIS

Publications

Rabuffi, F., Silvestri, M., Buongiorno, M. F., Marotta, E., Belviso, P., Inguaggiato, S., ... & Diaz, J. A. Description and Preliminary Results of the Cal/Val Activity Over Italian Thermally Active Sites During the HyTES 2023 Eurpean Airbone Campaign. (AGU23).

Rabuffi, F., Cawse-Nicholson, k., Hook, S. J., Musacchio, M., Silvestri M., Buongiorno, M. F., (2023), Lithotype Classification in Geothemal Area by The Use Of Hyperspectral Data. In 2023 IEEE International Geoscience and Remote Sensing Symposium IGARSS (Paper THP.P9.6). IEEE.

Silvestri, M., Diaz, J. A., Rabuffi, F., Romaniello, V., Musacchio, M., Corrales, E., ... & Buongiorno, M. F. (2023). MultiGAS Detection from Airborne Platforms on Italian Volcanic and Geothermal Areas. Remote Sensing, 15(9), 2390.

Musacchio, M., Silvestri, M., Buongiorno, M. F., Rabuffi, F., and Falcone, S.: Lava flow delineation by using Sentinel2 and Landsat8 images: Kīlauea -Leilani 2018, Italy Etna 2021, La Palma Cumbre Vieja 2021 cases, EGU General Assembly 2023, Vienna, Austria, 24–28 Apr 2023, EGU23-13797, https://doi.org/10.5194/egusphere-egu23-13797, 2023.

Rabuffi, F., Silvestri, M., Romaniello, V., Musacchio, M., & Buongiorno, M. F. (2022, December). The 2021 Vulcano Island Crisis Observed By Thermal Satellite Sensors: A Comparison Between ECOSTRESS, ASTER And TIRS Landsat-8 Time Series. In AGU Fall Meeting Abstracts (Vol. 2022, pp. GC35A-07).

Rabuffi, F., Silvestri, M., Musacchio, M., Romaniello, V., & Buongiorno, M. F. (2022). A Statistical Approach to Satellite Time Series Analysis to Detect Changes in Thermal Activities: The Vulcano Island 2021 Crisis. Remote Sensing, 14(16), 3933.

Rabuffi, F., Cianfarra, P., Musacchio, M., Silvestri, M., Salvini, F., & Fabrizia Buongiorno, M. (2022, May). Geospatial analysis of thermal and structural data for the characterization of shallow geothermal systems: the Parco Naturalistico delle Biancane (Tuscany/Central Italy) study case. In EGU General Assembly Conference Abstracts (pp. EGU22-3556).

Silvestri, M., Rabuffi, F., Romaniello, V., Musacchio, M., & Fabrizia Buongiorno, M. (2022, May). The use of satellite data to support the volcanic monitoring during the last Vulcano island crisis. In EGU General Assembly Conference Abstracts (pp. EGU22-3532).

Musacchio, M., Silvestri, M., Rabuffi, F., Buongiorno, M. F., & Falcone, S. (2021). Kīlauea- Leilani 2018 lava flow delineation by using Sentinel2 and Landsat8 images. Geological Society, London, Special Publications, 519.

Rabuffi, F., Musacchio, M., Salvini, F., Silvestri, M., & Buongiorno, M. F. (2021). Brittle deformation effects on the geothermal area framework, in Southern Tuscany, by multiscale lineament domain analysis (No. EGU21-10725). Copernicus Meetings.

Silvestri, M., Rabuffi, F., Musacchio, M., Teggi, S., & Buongiorno, M. F. (2021). The use of satellite TIR time series for thermal anomalies' detection on natural and urban areas. Engineering Proceedings, 5(1), 5.

Buongiorno, M. F., Musacchio, M., Silvestri, M., Romaniello, V., Spinetti, C., & Rabuffi, F. (2021, July). Asi-Prisma Hyperspectral Mission for the Analysis of Geophysical Phenomena. In 2021 IEEE International Geoscience and Remote Sensing Symposium IGARSS (pp. 8099-8102). IEEE.

Buongiorno M.F., Silvestri M, Romaniello, Marotta, E. Caputo T., Musacchio, M. Rabuffi F., Bellucci Sessa E., Jorge Andres Diaz, Avvisati G., Belviso P., (2021), Space missions, drones and cameras in situ for thermal analysis and gas retrieval in volcanic areas, (Accepted to be presented at the IGARSS-2021 conference)

M. Musacchio, V. Lombardo, V. Romaniello, M. Silvestri, C.Spinetti, M. F. Buongiorno and F. Rabuffi (2020). "Multi-temporal analysis of radiance acquired by ASTER and Landsat 8 on Mt. Etna volcano"). EGU General Assembly 2020

Younsi, S., Rabuffi, F., Musacchio, M., Ramazzotti, M., Gigante, E. G., & Amara, I. (2020). Survey archaeology and regional analysis: A conceptual model on the selection of past dynamics during the Holocene in Wadi Abiod, Aures, Eastern Algeria. IOSR Journal of Humanities and Social Science.

Buongiorno, M. F., Romaniello, V., Silvestri, M., Musacchio, M., & Rabuffi, F. (2020, December). Analysis of first PRISMA acquisitions on volcanoes and geothermal areas in Italy; comparisons with model simulations, past Hyperion data and field campaigns. In AGU Fall Meeting Abstracts (Vol. 2020, pp. GC029-03).

Silvestri, M., Marotta, E., Buongiorno, M. F., Belviso, P., Avvisati, G., De Leo, V., ... & Peluso, R. (2019, January). Surface temperature monitoring in geothermal districts from space and drones: Parco delle Biancane and Sasso Pisano (Italy) test sites. In Geophysical Research Abstracts (Vol. 21).

Silvestri, M., Rabuffi, F., Pisciotta, A., Musacchio, M., Diliberto, I. S., Spinetti, C., ... & Buongiorno, M. F. (2019). Analysis of Thermal Anomalies in Volcanic Areas Using Multiscale and Multitemporal Monitoring: Vulcano Island Test Case. Remote Sensing, 11(2), 134.

Marotta, E., Buongiorno, M. F., Silvestri, M., Belviso, P., Avvisati, G., Rabuffi, F., ... & Longo, V. (2018, December). Surface temperature monitoring by Earth Observation optical data, drones and field campaigns in the Central Italy geothermal districts. In AGU Fall Meeting 2018. AGU.

Silvestri, M., Diliberto, I. S., Rabuffi, F., Buongiorno, M. F., Pisciotta, A., & Musacchio, M. (2018). How to evaluate the surface heat loss and closely follow the evolution of solphataric activity by integrating satellite data and ground measurements to the thermal monitoring of a closed conduit: The case of the active crater at La Fossa (Island of Vulcano, Italy). EGU General Assembly 2018.

Autorizzo il trattamento dei miei dati personali presenti nel curriculum vitae ai sensi del Decreto Legislativo 30 giugno 2003, n. 196 e del GDPR (Regolamento UE 2016/679).