



What happened in 2015 at the Lucky Strike volcano?

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The multi-disciplinary seafloor EMSO-Azores observatory (Lucky Strike segment of the Mid-Atlantic Ridge) is being developed and maintained since 2007. This observatory is part of the larger European EMSO-ERIC effort towards multidisciplinary seafloor observatories to gain knowledge on ocean and sub-ocean processes and their critical role in the Earth system. Pressure, seismicity, ambient (seawater) temperature as well temperature of hydrothermal outflow, among other parameters (<http://www.emso-fr.org/> EMSO-Azores) are recorded as part of the observatory, using both sensors connected to a monitoring node, with partial data transmission to shore, and autonomous ones.

Seafloor pressure has been continuously recorded both at the summit of the LuckyStrike volcano, and at its base, since 2007. These data contribute to the monitoring of oceanographic processes occurring within the water column and geophysical ones below seafloor. The differential pressure signal between the two monitoring sites is dominated by instrumental drift and local oceanographic variability throughout the record. We have identified a likely seafloor deformation event in Sep-Oct 2015, that is short-lived (~1 month). At that time, we document a slow decrease of pressure at the volcano summit relative to its base, and that corresponds to a relative uplift of ~1.5-2 cm. Temperature of hydrothermal outflow around this pressure event show anomalous behavior. While to a first order these observations may be compatible with a volcanic inflation event, in this presentation, we analyze the various sets of data (pressure records, local seismicity from OBS observations and temperature signals) to investigate different processes, and discriminate those that are compatible with the observations associated with this 2015 event (e.g., magmatic inflation, tectonic deformation, water column variation, etc.).