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Contrasting examples of submarine hydrothermal venting along the Kermadec intraoceanic arc and the Aeolian island arc

C.E.J. de Ronde (1), E.T. Baker (2), J.L. Lupton (3), M. Sprovieri (4), P.P. Bruno (5), K. Faure (1), M.I. Leybourne (1), S.L. Walker (2), F. Italiano (5), R.W. Embley (3), I. Graham (1), R.R. Greene (3), I.C. Wright (6) & NZAPLUME III & Aeolian'07 shipboard parties

(1) GNS Science, Lower Hutt 5040, New Zealand, (2) NOAA/PMEL, Seattle, WA 98115-0070, USA, (3) NOAA/PMEL, Newport, OR 97365-5258, USA, (4) Istituto Ambiente Marino Costiero (IAMC-CNR), 80133 Napoli, Italy, (5) INGV Osservatorio Vesuviano, 80124 Napoli, Italy, (6) NIWA, Wellington 14901, New Zealand

The Sept. - Oct. 2004 NZAPLUME III cruise showed that all the major submarine volcanic centers north of Raoul Island, NE of New Zealand (i.e., Rakahore, Gamble, Putoto, Hinetapeka, Hinepuia, Monowai, 'U' and 'V'), are hydrothermally active. The Monowai Volcanic Complex has two separate and extensive hydrothermal fields associated with the Monowai Caldera and the Monowai Cone, respectively. In addition, the newly discovered Wright Volcanic Center of the mid-Kermadec arc is also hydrothermally active. Thus, the incidence of venting associated with volcanic centers of the Kermadec intraoceanic arc increases northwards, from ca. 67% for the southern Kermadec arc, to ca. 83% for the mid-Kermadec arc, to 100% for the northern Kermadec arc into the southern part of the Tofua arc (ca. 1,680 km). This coincides with a general increase in the spacing between volcanic centers northwards up the arc. The Kermadec arc is therefore the most hydrothermally active intraoceanic arc on Earth, more active than either the Mariana, Tofua or Izu-Bonin arcs. The combined Italian/NZ/US Aeolian07 cruise of Oct. 2007 conducted the first systematic survey for seafloor hydrothermal emissions from submarine volcanoes of the Aeolian arc. Nine volcanoes over ca. 440 km were surveyed for seafloor venting, including; Mar-

sili, Palinuro, Glabro, Alcioni, Lamentini, Arco Alicudi-Flicudi, Eolo, Enarete and Sisifo (poor weather meant Glauco was not surveyed). Each of the volcanoes was first mapped by multibeam before being surveyed for venting. Initial results show at least two of the volcanoes, Palinuro and Lamentini, have weak hydrothermal emissions. In addition, shallow water (<200 m) venting has been recorded offshore the islands of Vulcano, Panaera and Salina (Secca del Cappo), an incidence of submarine venting of 42% which increases to 44% if we include the hotsprings and volcanic activity on Lipari and Stromboli, respectively, and the inactive islands Filicudi and Alicudi. Hundreds of water samples were collected for later analysis onshore, which should confirm the 'real time' results for Palinuro and Lamentini, and determine if any faint hydrothermal emissions occur at the other volcanoes. However, most of the submarine portions of the Aeolian arc appear to largely be inactive, showing that much of the magmatic heat in the arc is currently expressed by volcanic eruptions and hotsprings on the subaerial volcanoes.