

NASA'S SPACEWARD BOUND NEW ZEALAND: THE INAUGURAL EXPEDITION, IN THE TAUPO VOLCANIC ZONE, NORTH ISLAND, 2015. I. H. Mogosanu¹, J. G. Blank², L. Offer³, K. A. Campbell⁴, S. Pointing⁵, J. Thomson⁶, D. Willson⁷, ¹New Zealand Astrobiology Initiative (NZAI), Wellington NZ & Blue Marble Space Inst. Sci. (BMSIS), Wellington NZ, hari@bmsis.org, ²NASA Ames Research Center & BMSIS, Moffett Field CA, jennifer.g.blank@nasa.gov, ³NZAI, Wellington, NZ, Lucinda@astrobiology.kiwi, ⁴University of Auckland, Auckland, NZ & NZAI, ka.campbell@auckland.ac.nz, ⁵Institute for Applied Ecology, AUT, Auckland, NZ, steve.pointing@aut.ac.nz, ⁶GNS Science, Wellington, New Zealand, J.Thomson@gns.cri.nz, ⁷NASA Ames Research Center, Moffett Field CA, david.willson@nasa.gov.

Introduction: NASA Spaceward Bound New Zealand 2015 was an astrobiology field expedition organised in January by the New Zealand Astrobiology Initiative (NZAI) group of the Royal Astronomical Society of New Zealand (RASNZ) in the Taupo Volcanic Zone (TVZ), North Island, New Zealand.

New Zealand features some of the best sites in the world to study astrobiology-related extreme environments. The geographical setup, dynamic and active geological setting, and the science capability of New Zealand supports the study of astrobiology: New Zealand has unique extremophiles in the hot springs in the TVZ, explosive volcanism, has access to the K-Pg Boundary and to the Dry Valleys of Antarctica. New Zealand is also a world-leader in biosecurity (essential to planetary protection) and has a rich cultural heritage derived from exploration, as Polynesians and Europeans arrived there guided by the stars. New Zealand's scientists encompass most of the required fields in astrobiology: microbiology, ecology, biosecurity, physics, astronomy, radio astronomy and geology. This represents an accessible yet rich knowledge base of local expertise.

While New Zealand benefits from excellent field sites and knowledge base, until 2014 astrobiology efforts had been scattered around the country without a centralized strategy for development. However, astrobiology is an emerging field. It was formalized as a field of study in the 1960's, yet NASA established the National Astrobiology Institute only in 1998 (preceded by an earlier Exobiology program).

The first New Zealand national recognition of astrobiology as a study field was supported by the Royal Astronomical Society, which voted in June 2014 for the establishment of the Astrobiology Group also known as New Zealand Astrobiology Initiative (NZAI). By doing so, the RASNZ identified the importance of astrobiology as a scientific discipline in the science and educational landscape of New Zealand. Astrobiology, seeking to answer questions such as 'what is life?' and 'are we alone in the Universe?', can contribute to "the knowledge, skills, and values to be successful citizens in the 21st century."

Synopsis: Spaceward Bound New Zealand consisted of 6 days of field trips, talks and keynote presentations by NZ university staff and graduate students and NASA scientists. It included inquiry-based field work, supported by local universities and experts from both within New Zealand and international organizations.

Fifty scientists, educators, teachers and students attended Spaceward Bound New Zealand 2015. Visitors and locals also participated in various activities at the headquarters and at field sites at geothermal locations, the Tongariro volcanic crossing and the active volcano at White Island. A public event using a drone and rover attracted about 200 people and was held in Rotorua, a present-day geothermal field upon which a modern city has been built.

Deliverables: The expedition represented, above all, a networking event, promoting New Zealand as a significant astrobiological field research location and supporting the development of the NZ secondary schools education curriculum, but also encouraging university-level uptake of science related to astrobiology. Although astrobiology-related knowledge is taught in places as part of the Earth and Space Sciences Secondary Curriculum, until Spaceward Bound New Zealand 2015, there had been no national effort to integrate this field at educational and scientific research levels.

This talk will present an overview of the inaugural SBNZ and include a discussion of the most and least successful elements of the program, based on post-expedition feedback from the participants.



Figure 1. Field trip to Kuirau Park, Rotorua