

ATMOSPHERIC DEPOSITION OF NITROGEN AT THE
THURSTON LAVA TUBE, HAWAI'I

A THESIS SUBMITTED TO THE GRADUATE DIVISION OF THE
UNIVERSITY OF HAWAI'I IN PARTIAL FULFILLMENT OF THE
REQUIREMENTS FOR THE DEGREE OF

MASTER OF SCIENCE

IN

OCEANOGRAPHY

DECEMBER 1996

By

Jacqueline A. Heath

Thesis Committee:

Barry Huebert, Chairperson
Antony Clarke
Guillermo Goldstein

ABSTRACT

Precipitation and dry deposition and cloud water deposition have been measured since October 1993 and June 1996, respectively, at the Thurston Lava Tube on the Island of Hawaii. Both precipitation and dry deposition were small N inputs, averaging $.6 \pm .2$ and $.15 \pm .04$ kg N ha⁻¹ yr⁻¹ respectively. We estimate cloud water deposition to account for between 8 and 22 kg inorganic N ha⁻¹ yr⁻¹ and it may be as high as 50 kg N ha⁻¹ yr⁻¹ if organic N is included. Additionally, cloud water deposition is of hydrological significance as it comprised 39% of the total water input (rain and cloud water). Cloud water samples which were associated with vog and/or laze events were very concentrated in NO₃⁻ and constituted 60% of the cloud water N deposition. It is possible that much of this NO₃⁻ may originate from the ocean or from thermally fixed atmospheric N.