論　説

火山 第55巻 (2010)
第1号 13–20頁

過去の降下火山灰分布公表資料から推測される わが国の降灰確率予測図作成試案

須藤　茂*・猪股隆行**・佐々木　寿**・向山　栄**

（2009年6月1日受付，2009年12月22日受理）

Trial to Make Up the Probability Map of the Volcanic Ash Fall Deposit, Derived from the Published Ash Fall Data, in Japan

Shigeru Suto*, Takayuki Inomata**, Hisashi Sasaki** and Sakae Mukoyama**

More than 500 volcanic ash fall units in Japan were summarized with the data base in the program of the "Research on volcanic ash fall hazard assessment and risk management for industrial location" and the "Impact analysis on the volcanic ash fall in the metropolitan area". The digital data, including the thickness of the ash fall deposit, for around each one kilometer mesh, which is authorized by the Third Digital National Land Information System in Japan, was used for analysis. The degree of flatness, which is shown as the ratio of the short axis and long axis of the distribution pattern, for each unit were from 0.05 to 1.0, and the average was 0.5. There was a minor difference of the degree of flatness depending on their volume. The larger the magnitude the smaller the degree of flatness, excepts the case of caldera forming gigantic eruption. The distribution direction for each unit was determined by the straight line, passing through the crater, which divides the volume of the deposit into halves. Major of the Japanese air fall ash tend to distribute to the east by the strong west wind. Almost 57% and 77% of the distribution direction are in the east plus or minus 20 degrees, and 40 degrees, respectively. The probability of the ash fall deposition was calculated using the data of the degree of flatness and the direction of ash fall units for each classified volume. For example, the probability of the deposition of 1mm and 1cm ash fall in central Tokyo by the same magnitude of the Hoei (1707) eruption of Fuji volcano, which volume was measured to be as 1.3 km^3, were estimated as around 33% and 28%, respectively. And the probability maps of the volcanic ash fall deposit for all over Japan in the next ten thousand years were also shown using the same distribution model assumed that there should be eruptions as same size and frequency as the last ten thousand years from each volcano. This kind of probability map of the volcanic ash fall had not been published, and it is useful for the volcanic disaster mitigation staffs in each municipal office and people living in Japan.

Key words: volcanic ash, ash fall disaster, probability map, Japanese volcano, Fuji volcano

1. はじめに

降下火山灰は，溶岩など，ほかの火山噴出物に比べて遠方にまで達するため，それまで火山災害を想定していない産業活動の中心である都市部にも被害をもたらす可能性がある特徴を有する．最近の例として，セントヘレンズ火山の1980年噴火 (Schuster, 1981)，ピナツボ火山の1991年噴火 (Casadevall *et al.,* 1996; Mercado *et al.,* 1996; Robin *et al.,* 1996)，雲仙の1991–95年噴火（高橋，2000）等についてすでに被害実態の報告がある．それらによれば，1 mmのオーダーの厚さで灰が積もっただけでも，道路交通の障害，空港の閉鎖，商店の営業活動低下などの被害が出るため，その経済的影響は大きい．しかしながら，これまで，わが国における降下火山灰による災害の予測は，溶岩や火砕流などと同様に，火山体の近傍のみを対象に行われることが多かった．また，わが国では，ある地点に降下する火山灰が単一の火山のみか

* 〒305–8567 茨城県つくば市東1–1–1 中央第7産業技術総合研究所地質情報研究部門
Geological Survey of Japan, Central 7, 1–1–1, Higashi, Tsukuba, Ibaraki 305–8567 Japan.
** 〒183–0057 東京都府中市晴見町2–24–1 国際航業株式会社
Kokusai Kogyo Co. Ltd., 2–24–1, Harumi, Fuchu, Tokyo 183–0057 Japan.

Corresponding author: Shigeru Suto
e-mail: shigeru.suto@aist.go.jp