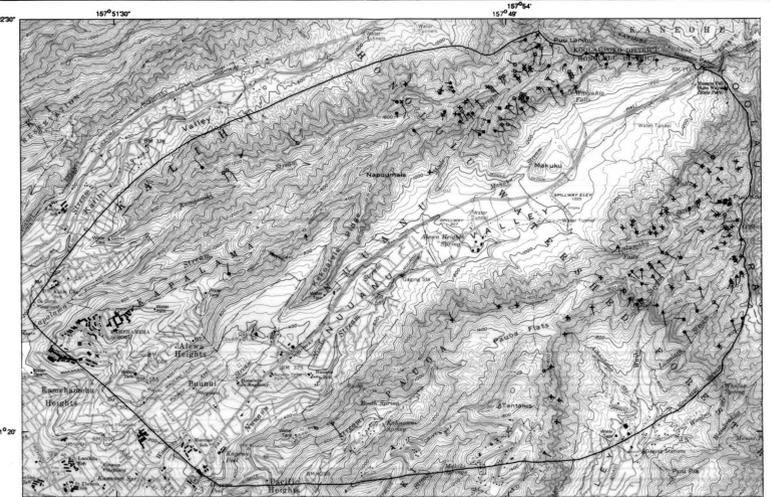


- EXPLANATION**
- Soil slips and debris flows first observed on photographs flows in year indicated. See appendix for dates and areal coverage of photography
- 1952 Soil-slip scar
Debris-flow travel path
Path traveled by successive debris flows mapped in 1952 and 1968 photographs
Cluster of scars and travel paths
 - 1958 Soil-slip scar
Debris-flow travel path
 - 1963 Soil-slip scar
Debris-flow travel path
 - 1965 Soil-slip scar
Debris-flow travel path
Path traveled by successive debris flows mapped in 1963 and 1965 photographs
 - 1966 Soil-slip scar
Debris-flow travel path
 - 1967 Soil-slip scar
Debris-flow travel path
Cluster of scars and travel paths
 - 1968 Soil-slip scar
Debris-flow travel path
Path traveled by successive debris flows mapped in 1952 and 1968 photographs
 - 1969 Soil-slip scar
Debris-flow travel path
 - 1969-1970 Soil-slip scar
Debris-flow travel path
 - 1978 Soil-slip scar
Debris-flow travel path
Cluster of scars and travel paths
 - 1980 Soil-slip scar
Debris-flow travel path
Cluster of scars and travel paths
 - 1988 (Following New Year's Eve storm of 1987-1988)
Soil-slip scar
Debris-flow travel path
Cluster of scars and travel paths
 - Scar from deep landslide of weathered bedrock (supraite)
 - Crack bounding probable incipient deep landslide of weathered bedrock (supraite)
 - 1989 Soil-slip scar
Debris-flow travel path
Cluster of scars and travel paths
- Area of pronounced neotectonic effects, typically including deflation pits and dunes
Boundary of study area

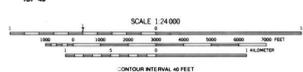
- EXPLANATION**
- Soil slips and debris flows produced by the New Year's Eve storm. Includes only features of certain identification, including those from cut or fill slopes, mapped by Ellen and others (1991)
- Soil-slip scar
 - Scar from deep landslide of weathered bedrock (supraite)
 - Crack bounding probable incipient deep landslide of weathered bedrock (supraite)
 - Debris-flow travel path
 - Area of pronounced neotectonic effects, typically including deflation pits and dunes
 - Boundary of 1988 cluster shown on main map
 - Boundary of area mapped by Ellen and others (1991) within Honolulu District

DEBRIS FLOWS AND RELATED FEATURES IN THE EASTERN PART OF THE HONOLULU DISTRICT PRODUCED BY THE NEW YEAR'S EVE STORM OF 1987-1988



BRACKETED YEARS OF OCCURRENCE OF DEBRIS FLOWS AND RELATED FEATURES IN THE NUUANU VALLEY AREA, 1952-1989

- EXPLANATION**
- Soil slips that appeared during the interval
- ▲ 1940-1952 (appear fresh on 1952 photographs)
 - 1952-1959 (appear fresh on 1959 photographs)
 - 1940-1963 (on generally shaded hillslopes)
 - △ 1959-1965 (appear fresh on 1965 photographs)
 - ◊ 1965-1965 (appear fresh on 1965 photographs)
 - ▽ 1965-1968
 - ▼ 1965-1968 (appear fresh on 1968 photographs)
 - × 1968-1970 (appear fresh on 1969-1970 photographs)
 - 7-1978 (on generally shaded hillslopes)
 - 1970-1978 (appear fresh on 1978 photographs)
 - 1978-1980 (appear fresh on 1980 photographs)
 - ◐ 1980-1989 (appear fresh on 1989 photographs)
 - ◑ During 1989 (between 3/26/89 and 4/2/89)
- Debris-flow travel path
Boundary of Nuuanu Valley study area



**DEBRIS FLOWS AND RELATED FEATURES ON NATURAL HILLSLOPES IN THE HONOLULU DISTRICT
MAPPED FROM 1952-1989 AERIAL PHOTOGRAPHS**

By
David M. Peterson, Stephen D. Ellen, and Donna L. Knifong



This map is preliminary and has not been reviewed for conformity with U.S. Geological Survey standard specifications. Any use of trade, firm, or product names is for descriptive purposes only and does not imply endorsement by the U.S. Government.