

USGS-USAID Landslide Mapping Across FSM

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Tonoas, Chuuk, FSM (2002)

USAID/BHA



Save Lives



Alleviate Human Suffering



Reduce the impact of humanitarian crisis

Lead federal coordinator for international disaster assistance.

Focused on response, early recovery, risk reduction, and resilience.

LDAT
Landslide Disaster Assistance Team

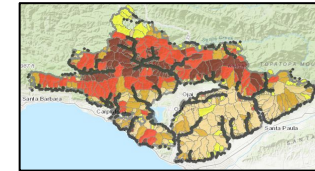


USGS
science for a changing world

USGS/LHP

Reduce losses from landslides through improved understanding of the hazard and mitigation strategies.

Focus on assessments, forecasts and investigations, technical assistance and outreach.



Landslide Disaster Assistance Team (LDAT) is staffed by USGS scientists, funded by USAID Bureau of Humanitarian Assistance (BHA). Established in 2019.

LDAT Activities

- ▶ LDAT supports foreign partners with landslide...
 - ▶ hazard mapping
 - ▶ hazard monitoring
 - ▶ hazard modeling
 - ▶ hazard communication
 - ▶ field and office-based techniques
- ▶ Activities include:
 - ▶ Teaching trainings or workshops (Fiji, Chile, Sri Lanka)
 - ▶ Installing equipment (Chile)
 - ▶ Mapping landslide remotely and in the field (FSM)
 - ▶ Engaging with local partners (all)



Landslide Hazard Assessments in FSM

- ▶ USGS provided technical assistance after landslides on Pohnpei (1997) and Chuuk (2002)
- ▶ Request for continued assistance made through USAID/BHA
- ▶ Creating updated landslide map for main islands of FSM



Hazard Analysis of Landslides Triggered by Typhoon Chata'an on July 2, 2002, in Chuuk State, Federated States of Micronesia

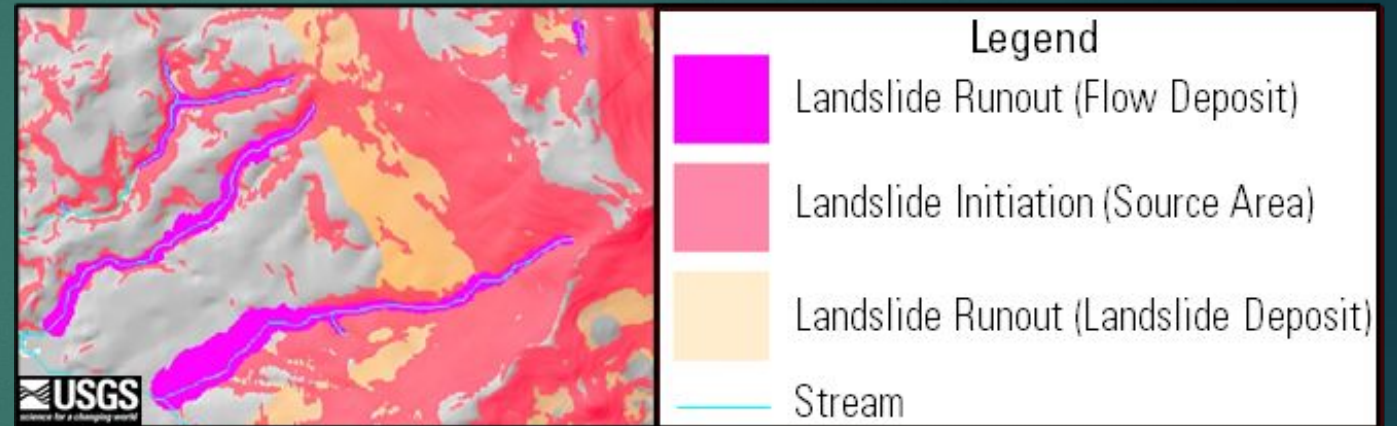
By Edwin L. Harp, Mark E. Reid, and John A. Michael



U.S. Geological Survey Open-File Report 2004-1348

U.S. Department of the Interior
U.S. Geological Survey

Map of where landslides start *(initiation)* and stop *(runout)*



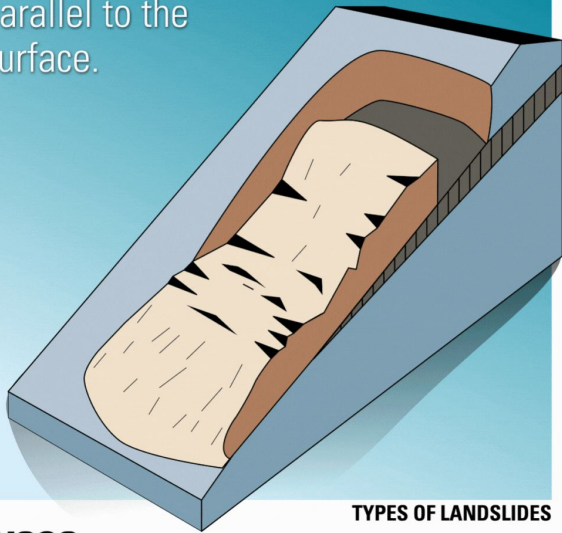
Map of areas that could be affected by landslides, but does not include how often (*frequency*) or how much rain (*warning threshold*).

Landslide and Debris Flows

- ▶ Landslides start in steep areas
- ▶ How far they travel depends on the landslide type
- ▶ Landslides that begin to flow at very fast speeds are called “debris flows” – is there an equivalent term across FSM? *Lapakehn sahpw* – likely closest term in Pohnpeian

TRANSLATIONAL LANDSLIDE

Ground slides with little rotation along a flat plane parallel to the surface.

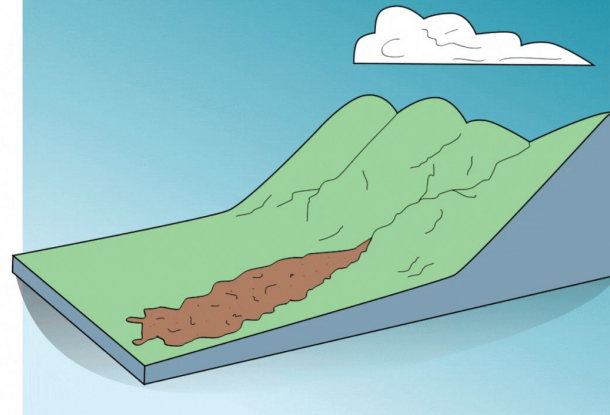


TYPES OF LANDSLIDES

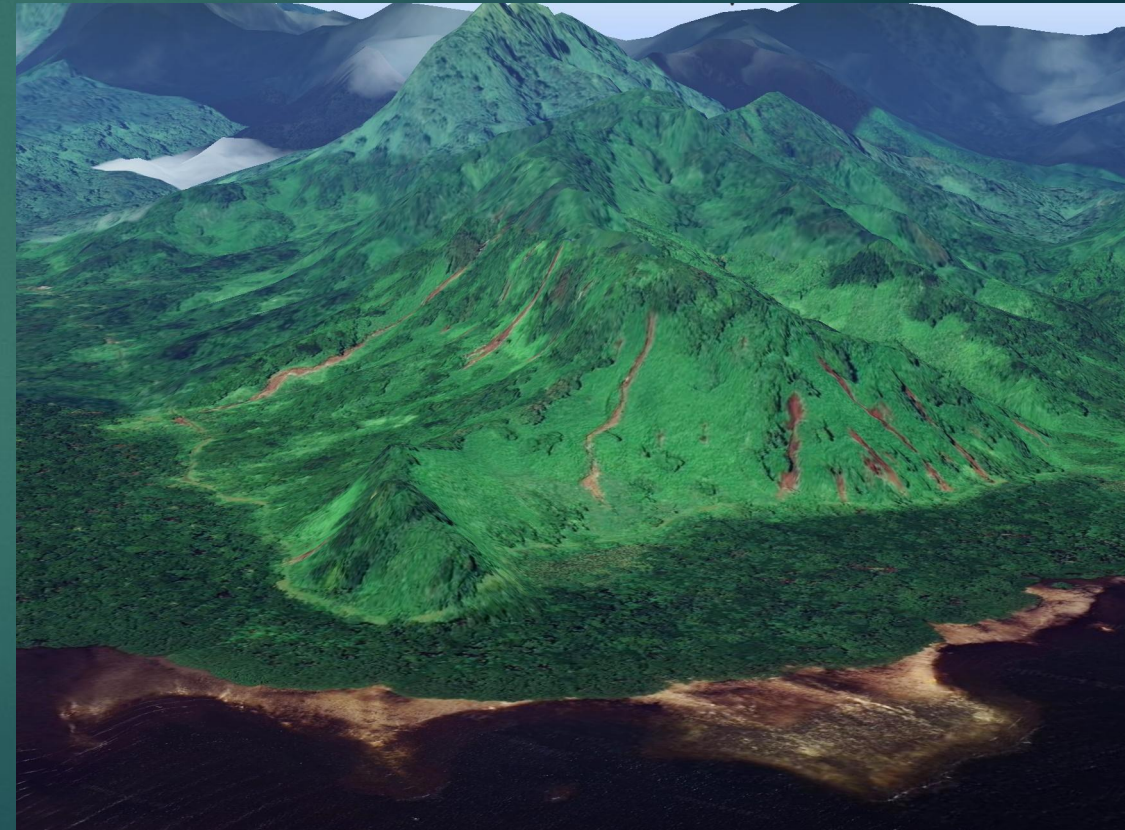


DEBRIS FLOW

Rapidly moving mix of water, mud, trees, and other materials that flows downvalley and can travel great distances.

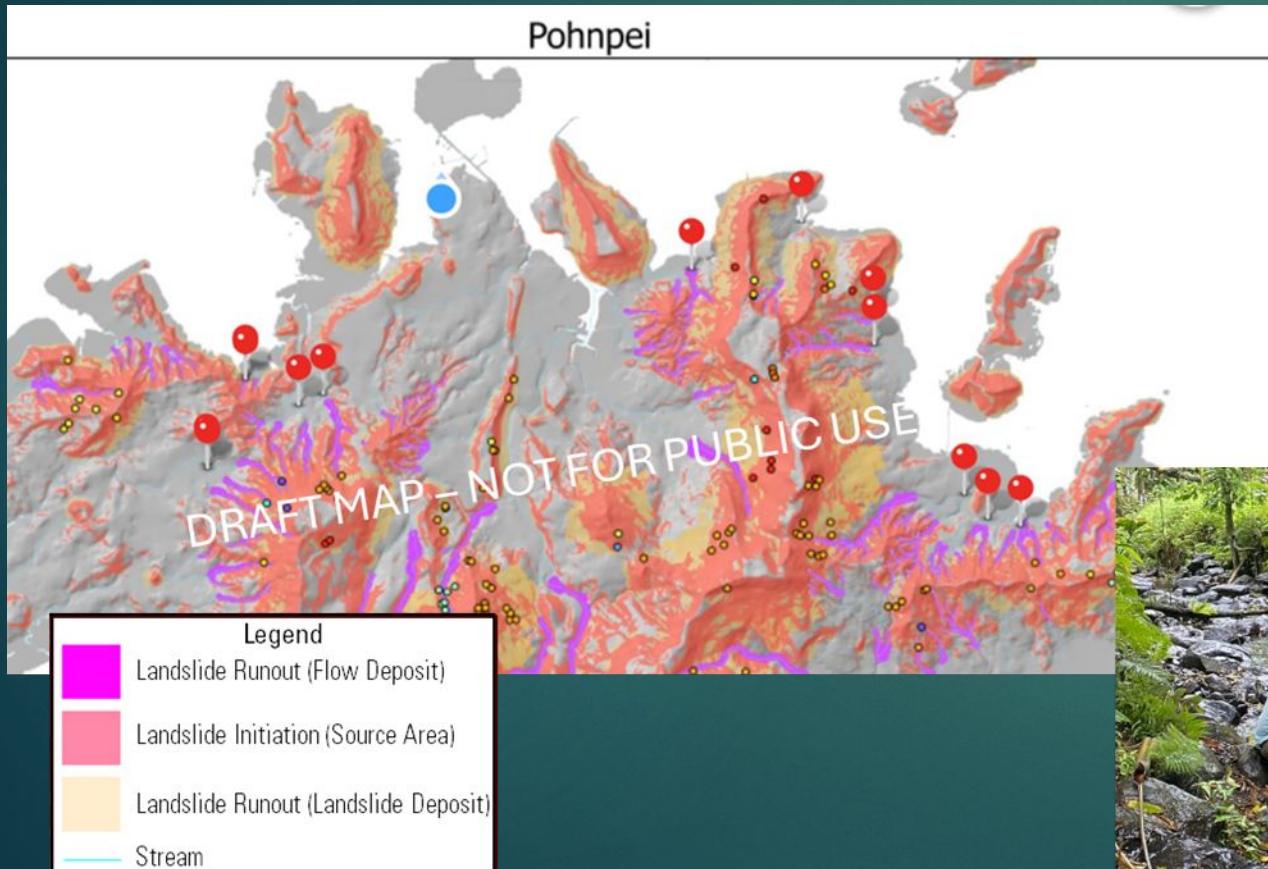


TYPES OF LANDSLIDES



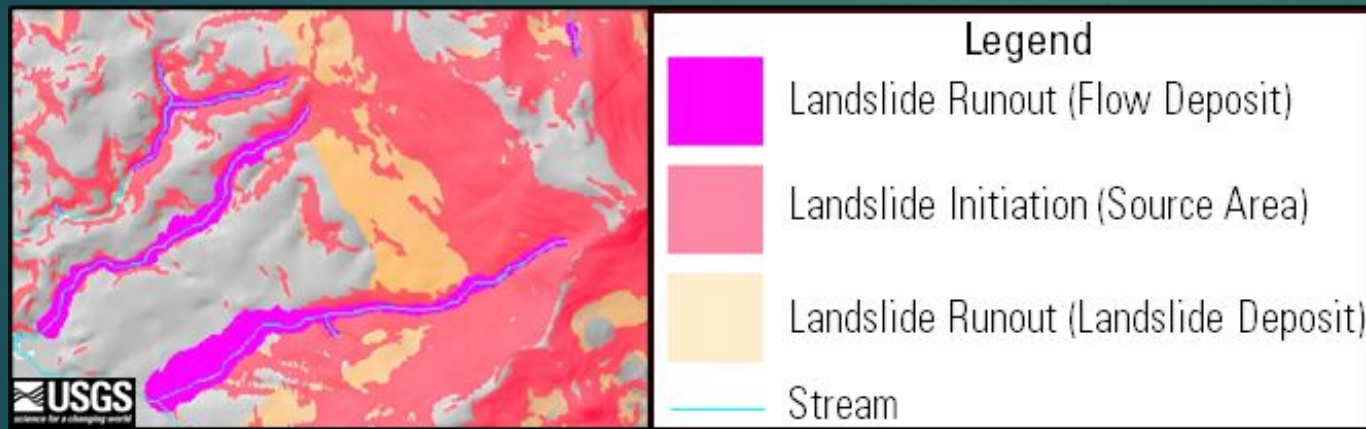
Recent visit to FSM (February 2024)

- ▶ Shared preliminary landslide maps with DCEM, DCOs and other stakeholders
- ▶ Field checked the maps

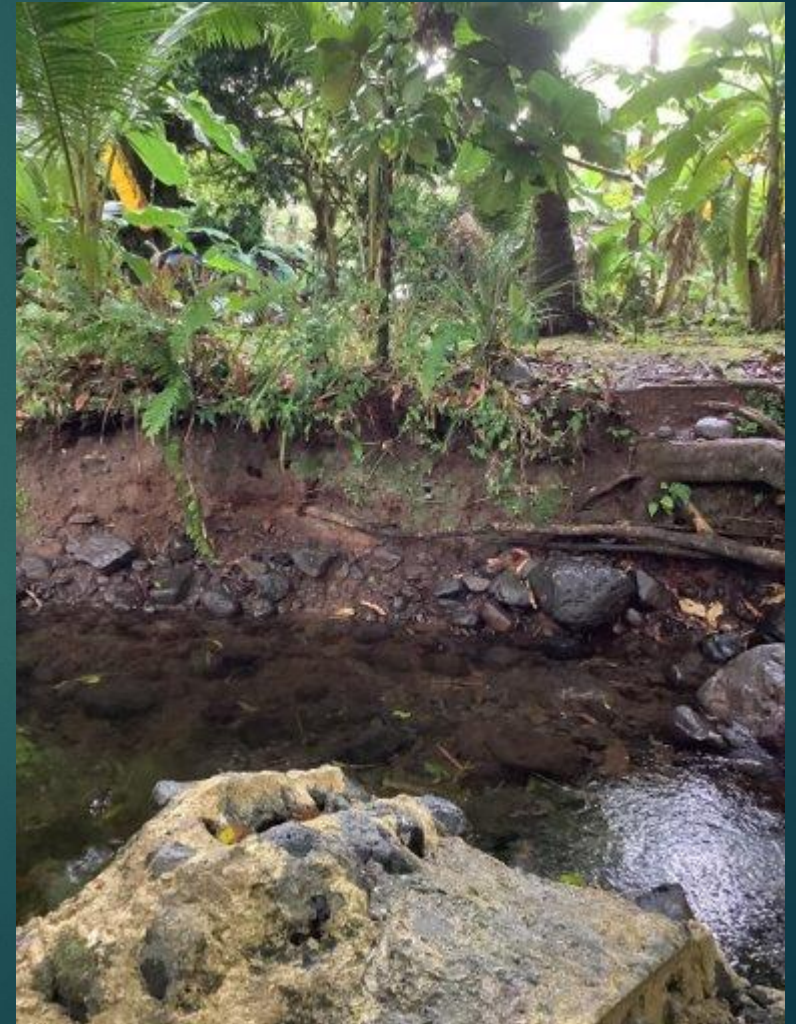


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- ▶ Field checked the maps



Look for where debris flows happened before. If happened in the past, can happen again.



Landslide inventory from satellite images



Sep. 28, 2017



Oct. 31, 2018

NEXT STEPS

- ▶ Update preliminary landslide hazard maps
- ▶ Finalize and share in early 2025
- ▶ Continue conversations with emergency managers and others about potential next steps

QUESTIONS

- ▶ Are there other landslide inventories or datasets?
- ▶ How will these landslide maps be helpful to you or your work?
- ▶ What could help make them more useful?
- ▶ Do you have any questions for me? ccerovski-darriau@usgs.gov