

Towards Global Post Fire Debris Flow Hazard Assessment

Elijah Orland^{1,2,3}, Dalia Kirschbaum³, Thomas Stanley^{1,2,3}

¹Universities Space Research Association, Columbia, Maryland, United States of America

²Goddard Earth Sciences Technology and Research, Columbia, Maryland, United States of America

³Hydrological Sciences Laboratory, NASA Goddard Space Flight Center, Greenbelt, Maryland, United States of America



Project goal: Develop a global predictive model for post-fire debris flow (PFDF or DF) hazard assessment

Methods: Train on database compiled for the Western United States; use only globally available data sources as inputs.

Input data sources:

- Topography via NASA DEM (30m)
- Rainfall via NASA IMERG (~11km)
- Burn Severity via Landsat (30m)
- Global Basin Delineations via WWF Level 12 HydroSHEDS (tens of km²)

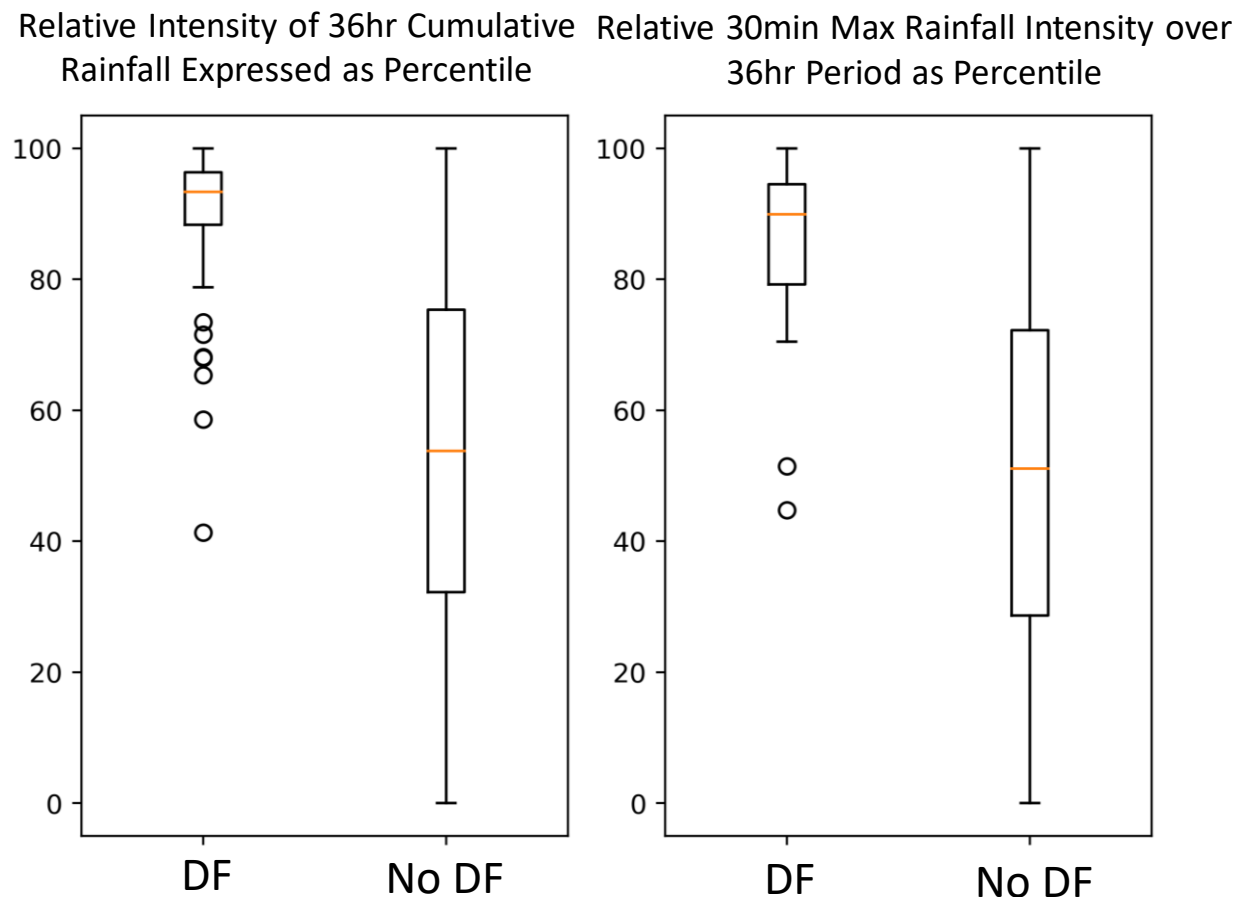


Figure 1: Differences in precipitation recorded during PFDF-inducing storm events compared with rainfall that did not result in PFDF initiation in Southern California, United States

Results: Model distinguishes between rainfall intensities sufficient for DF initiation and those for which no DF events are recorded in Southern California (AUC = ~0.90), with reduced utility for the Interior US (AUC = 0.70).

Next Steps:

- Further validation to assess model utility to unseen physiographic regions, minimize effect of data scarcity.
- Implementation with existing landslide hazard assessment frameworks for global nowcasting.