

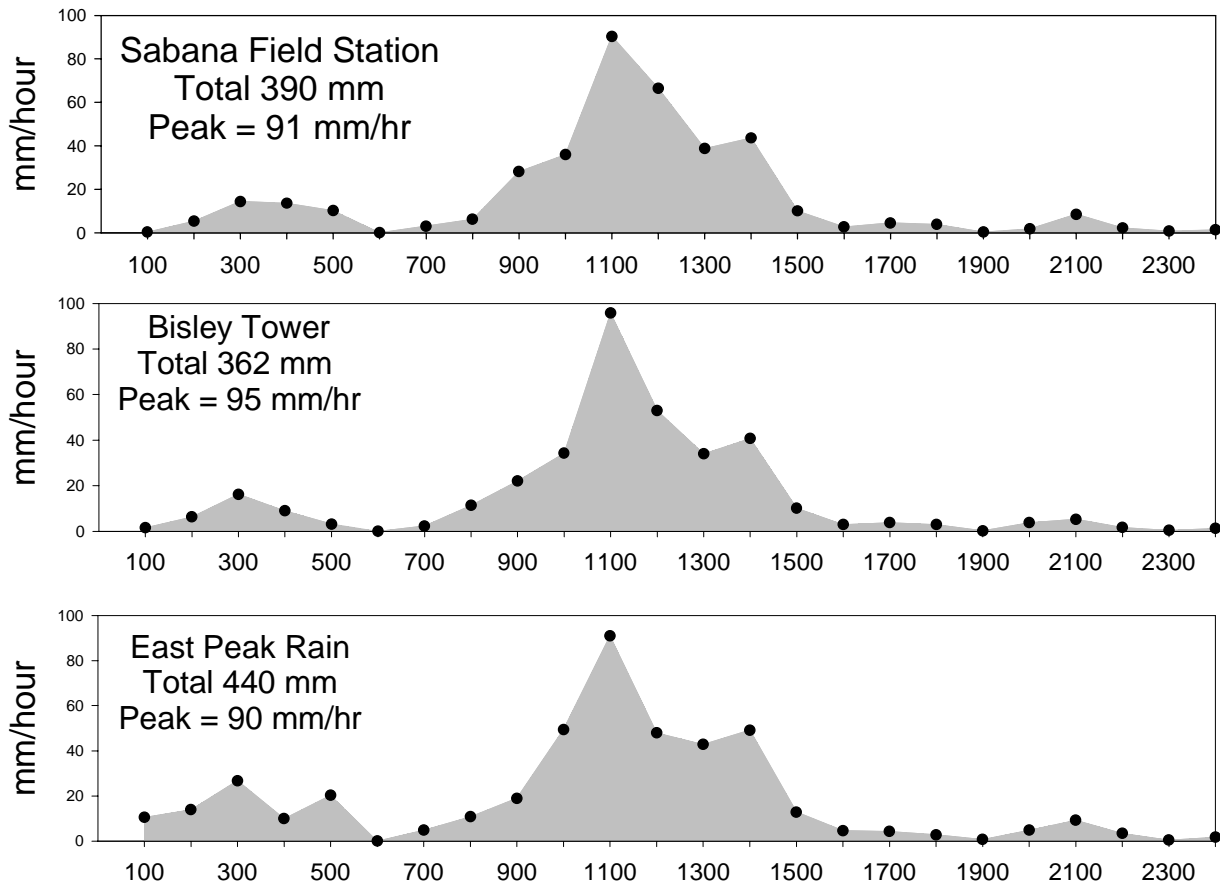
Luquillo LTER Floods & Landslides

As most everyone has probably heard (or in some cases experienced), there was a historic rainfall event in the Luquillo LTER on April 17, 2003. This event was followed by floods and landslides in the forest that made access impossible to some areas. The amount of rainfall for the one day ranged from 229 mm (9.02 inches) in El Verde to 559 mm (22.01 inches) in Naguabo! The peak rainfall occurred just before 11:00 am at most sites with Bisley Tower receiving 95 mm/hour (3.74 inches/hour).

From the National Weather Service:

”Severe flash flooding was concentrated across several municipalities of eastern Puerto Rico. The hardest hit municipalities were Fajardo, Rio Grande, Naguabo, Las Piedras, Juncos, Humacao and Luquillo. The governor of Puerto Rico, Sila Calderon, declared a state of emergency for these 7 municipalities.

The excessive rainfall forced several hundred families from their homes and caused an estimated \$15 Million in damages to infrastructure and agriculture.”



Total Daily Rainfall April 17, 2003
In mm/day

El Verde	229
Fajardo	305
Ponce	330
Luquillo	356
Bisley	362
Sabana	390
Rio Grande	406
Las Piedras	432
East Peak	440
Naguabo	559



Sabana flood: Picture taken by D.J. Lodge of the Sabana River by the field station (when she felt it was safe to walk on it).





Above pictures taken by Bill McDowell: Above left is town of Mameyes, above right is Esp Santo at Jimenez, bottom pictures are of the Mameyes before and after the flooding.

From Aaron Shiels

Ninety-two landslides rumble the LEF

Approximately half of all landslides that occur in the Luquillo Experimental Forest (LEF) are near roads (see Guariguata & Larsen, 1990; Larsen & Torres Sanchez, 1998). I counted landslides in the Luquillo Experimental Forest (LEF) that occurred following the April 17, 2003 storm event. Landslides $\geq 12 \text{ m}^2$ of bare soil were counted and estimated for size and aspect along roadsides that were accessible by vehicle in the LEF. On April 20-26, I assessed entire portions of the following roads in the LEF for landslides: 186, 930, 966, 988, 9966, and the majority of 191. The southern portion of road 191 from the towns of Rio Blanco & Florida to the old landslides that closed 191 over a decade ago was not assessed. Sixty-nine landslides occurred next to roads in the LEF after the April 17th storm. The average landslide size from this storm was 129 m^2 (range=15-510 m^2), and landslides generally faced southeast (mean= 143° aspect; median= 140° aspect). The highest density of landslides along roads in the LEF was between the area of road 191 from the entrance of the Tradewinds trail to the end of the road where the old landslides closed the road (8.0 landslides/km; primarily quartz-diorite parent material). The first 1.8 km of road 930, which ascends from 191 towards Pico del Este, had 6.1 landslides/km. Road 988 (connecting El Portal to Sabana Field Station) had 2.1 landslides/km. Road 186, which is on the western side of the LEF (passing El Verde Field Station), had only three landslides across the entire 11 km section (0.3 landslides/km). Less rainfall from the storm (see El Verde Field Station rainfall data), as well as soil derived from volcanoclastic parent material that is less susceptible to erosion compared to quartz-diorite parent material (Guariguata & Larsen, 1990) may explain why fewer landslides occurred on road 186 as a result of this storm event. From high vantage points in the LEF and from selected portions of hiking trails, I counted 23 more landslides that were not associated with roads, yet resulted from this storm (9 on foot-trails and 14 on non-

trail/non-road areas of the forest). Therefore, the total number of landslides (both road and non-road related) that I counted ($\geq 12 \text{ m}^2$) in the LEF from the storm event occurring April 17-19 was 92. Special congratulations to Jean Lodge who predicted on April 18 that the storm event would cause approximately 100 new landslides in the LEF.



Landslides: Pictures taken from Aaron Shiels. Left picture is of debris from near the Catalina station. Right picture is taken from the road.

Other News

From Randall W. Myster

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